SD EForm - 2232 V1

DOT-166

Application for Highway Access Permit
South Dakota Department of Transportation

Permit Application (to be completed by applicant).

Instructions: Please contact the local South Dakota Department of Transportation office to determine what supporting documents must accompany this application. Please submit a separate application and supporting documentation for each access requested. Attach additional sheets as necessary. Please print or type. Owner and applicant agree to comply with special and standard conditions if access permitted.

Property Owner:
Name(s): Triple H Wind Project, LLC
Mailing Address: 3760 State Street, Suite 200
City, State, Zip: Santa Barbara, CA 93105
Daytime Phone: 805-569-6185

Applicant (if different from Owner):
Name(s): Casey Willis
Mailing Address: On behalf of Triple H Wind Project, LLC
City, State, Zip
Daytime Phone:

Property to be Served by Approach:
County: HYDE
Section: SE/4 of Section 2 Township: 111
Range: 72
Or
Subdivision: _____ Block/Lot: _____
Street Address:
City:

State Highway to be Accessed by Approach:
State Highway Number: Highway 47
Access would be _____ feet (north, south, east or west) from Approx 1,800 feet north of 203 St/Hwy 47 (nearest cross street).

Land Use of Property to be Served (check one):
- ☐ Agricultural: acres served _____
- ☑ Business: type Operations and Maintenance/Ag total square footage of buildings: ____ number of employees _____
- ☐ Residential: number of single-family dwellings _____, or number of multi-family dwellings _____
- ☐ Other: describe

Type of Permit Requested (check one)
- ☑ New approach
- ☐ Change in use
- ☐ Temporary access
- ☐ Improve existing access
- ☐ Relocate existing access
- ☐ Remove existing access

Requested Approach Width (check one)
24' ☐ 30' ☐ 36' ☐ 40' ☑

Local Government Reviews:

County: HYDE
Comments:
Concurrence signature: Date:

Municipality: _____
Comments:
Concurrence signature: Date:

Estimated Date of Construction:

I, the undersigned, request permission to construct or modify an access approach subject to the rules and regulations set forth in SDCL 70:09.

Signature of Applicant: [signature] **Date:** 7/19/19

Signature of Owner (if different than applicant): [signature] **Date:** 7/19/19

Permit Decision (to be completed by SDDOT).

Supporting Materials Required:

(Required)		(Received)
☐	Access Approach Design	☐
☐	Vicinity Map	☐
☐	Traffic Volumes	☐
☐	Three Copies of Site Plan	☐
☐	Traffic Control Plan	☐
☐	Proof of Liability Insurance	☐
☐	Detailed Development Plan	☐
☐	Drainage Plan	☐
☐	Traffic Impact Study	☐
☐	Revegetation Plan	☐
☐	Other _____	☐

Received by SDDOT: Date: ___/___/___

Decision: (to be made after Application Review)
- ☐ Access Approved
- ☐ Access Approved with Variance: _____
- ☐ Access Denied

Terms and Conditions of Approval (or Reason for Denial)

Access Must be Constructed By: ___/___/___

SDDOT Area Engineer Signature:

Date: ___/___/___

SDDOT Area:
Area Office _____
Contact Person _____
Contact Phone _____
Permit Number _____

Distribution: Original – Owner; Copies – Access Management, Area Office v.10/2005

DOT-166

SDDOT Highway Access Permit Application Review Sheet (to be completed by SDDOT)

Highway Access Classification: (check one)

- ☐ Expressway
- ☐ Free Flow Urban
- ☐ Intermediate Urban
- ☐ Urban Developed
- ☐ Urban Fringe
- ☐ Rural

Highway _____
MRM + Displacement ____+____
Left ☐ **Right** ☐
Average Daily Traffic _____
Accidents (three years)_____

Highway Alignment to Left of Access (as seen when standing on access)

- ☐ Straight
- ☐ Turns left
- ☐ Turns right

Stopping Sight Distance: _____ ft.
Entering Sight Distance: _____ ft.
Posted Speed Limit: _____ mph

- ☐ Flat
- ☐ Slopes up
- ☐ Slopes down

- ☐ 0-3% grade
- ☐ 3-5% grade
- ☐ >5% grade

Highway Alignment to Right of Access (as seen when standing on access)

- ☐ Straight
- ☐ Turns left
- ☐ Turns right

Stopping Sight Distance: _____ ft.
Entering Sight Distance: _____ ft.
Posted Speed Limit _____ mph

- ☐ Flat
- ☐ Slopes up
- ☐ Slopes down

- ☐ 0-3% grade
- ☐ 3-5 % grade
- ☐ >5% grade

Significant Design and Potential Impact Considerations (check all that apply and explain checked items):

- ☐ Sidewalks or Bike Paths
- ☐ Curb & Gutter
- ☐ On-Street Parking
- ☐ Shoulder Width
- ☐ Historical Resources
- ☐ Surface Drainage
- ☐ Drainage Structures
- ☐ Major Structures
- ☐ Guard Rail
- ☐ Above-Ground Utilities
- ☐ Railroad Tracks
- ☐ Distance to Nearby Streets, Both Directions
- ☐ Distance to Nearby Driveways, Both Directions
- ☐ Others Streets with Access or Available Access
- ☐ Traffic Control Devices or Relocation Needed
- ☐ Median Crossovers

Explain impact on design:

SDDOT Region Traffic Engineer Review (optional):
Comments:

Signature: _____ date: ___/___/___

SDDOT Access Management Review (optional):
Comments:

Signature: _____ date: ___/___/___

APPROACH DESIGN SKETCH

List Attachments:

- ☐ Driveway details
- ☐ Culvert details
- ☐ Mailbox details
- ☐ Fencing details
- ☐ Cattle guard
- ☐ Sidewalk details
- ☐ Median crossovers
- ☐ Recreation paths
- ☐ Rail crossings
- ☐ Auxiliary lanes
- ☐ Storm sewer
- ☐ Pavement
- ☐ Curb & gutter
- ☐ Traffic Control
- ☐ Sign/signal/marking
- ☐ Other

SDDOT Review Performed by: **Date:** ___/___/___

State Highway Access Approach Permit
Standard Conditions

When this permit was issued, the Department made its decision based in part on information submitted by the applicant, what alternative access to other public roads and streets was available, the operation of the highway and safety and design standards. Changes in access approach use or design not approved by the Department may cause the revocation or suspension of the permit. The permittee is responsible for the costs of construction, maintenance, and removal (if necessary) of the approach.

PERMIT EXPIRATION

A permit shall be considered expired if the access is not under construction within one year of the permit issue date or before the expiration of any authorized extension. When the permittee is unable to commence construction within one year after the permit issue date, the permittee may request a one-year extension from the Department. Only one extension may be granted. Any request for an extension must be in writing and submitted to the Department before the permit expires. The request should state the reasons why the extension is necessary, when construction is anticipated, and include a copy of page 1 (face of permit) of the access permit. Extension approvals shall be in writing. Any person wishing to reestablish an access permit that has expired may begin again with the application procedures.

CONSTRUCTION

1. The construction of the access and its appurtenances as required by the terms and conditions of the permit shall be completed at the expense of the permittee. All materials used in the construction of the access within the highway right-of-way or on permanent easements, become public property. Any materials removed from the highway right-of-way will be disposed of only as directed by the Department. Only clean fill material may be used for construction. Rubble and organic materials are prohibited. Permittee is responsible for salvaging and replacing topsoil, erosion control and revegetation of access.
2. The permittee shall notify the Area Office at least two working days prior to any construction within state highway right-of-way. Construction of the access shall not proceed until the access permit is issued. The access shall be completed in an expeditious and safe manner and shall be finished within 45 days from the initiation of construction within the highway right-of-way. One construction time extension may be requested from the Area Engineer. The permittee shall also notify the Area Office two days prior to substantial completion of the access construction.
3. A utility permit shall be obtained for any utility work within highway right-of-way. Where necessary to remove, relocate, or repair any traffic control device or public or private utility for the construction of a permitted access, the relocation, removal or repair shall be accomplished by the permittee without cost to the Department, and at the direction of the Department or utility company. Any damage to the state highway or other public right-of-way beyond that which is allowed in the permit shall be repaired immediately. The permittee is responsible for the repair of any utility damaged in the course of access construction, reconstruction or repair. Utilities are responsible for salvaging and replacing topsoil and must have an approved erosion control and revegetation plan. A final inspection must be held with the utility at the completion of the work.
4. The Department and the local government may inspect the access during construction and upon completion of the access to determine that all terms and conditions of the permit are met. Inspectors are authorized to enforce the conditions of the permit during and after construction and to halt any activities within state right-of-way that do not comply with the provisions of the permit, that conflict with concurrent highway construction or maintenance work, that endanger highway property, natural or cultural resources protected by law, or the health and safety of workers or the public.
5. Prior to using the access, the permittee is required to complete the construction according to the terms and conditions of the permit. Failure by the permittee to abide by all permit terms and conditions shall be sufficient cause for the Department to initiate action to suspend or revoke the permit and close the access. If in the determination of the Department the failure to comply with or complete the construction requirements of the permit create a highway safety hazard, such shall be sufficient cause for the summary suspension of the permit. If the permittee wishes to use the access prior to completion, arrangements must be approved by the Department and included in the permit. The Department may order a halt to any unauthorized use of the access pursuant to statutory and regulatory powers. Reconstruction or improvement of the access may be required when the permittee has failed to meet required specifications of design or materials.
6. The permittee shall provide construction traffic control devices at all times during access construction, in conformance with the Manual on Uniform Traffic Control Devices as required by state statute.

7. In the event it becomes necessary to remove any right-of-way fence, the posts on either side of the access shall be securely braced with an approved end post before the fence is cut to prevent any slacking of the remaining fence.
8. The permittee shall ensure that a copy of the permit is available for review at the construction site at all times. The permit may require the contractor to notify the individual or office specified on the permit at any specified phases in construction to allow the field inspector to inspect various aspects of the construction such as concrete forms, subbase, base course compaction, and materials specifications. Minor changes and additions may be ordered by the Department or local authority field inspector to meet unanticipated site conditions.
9. Each access shall be constructed in a manner that shall not cause water to enter onto the roadway or shoulder, and shall not interfere with the existing drainage system on the right-of-way or any adopted municipal system and drainage plan.
10. By accepting the permit, permittee agrees to save, indemnify, and hold harmless to the extend allowed by law, the Department, its officers, and employees from suits, actions, claims of any type or character brought because of injuries or damage sustained by any person resulting from the permittee's use of the access permit during construction of the access.

CHANGES IN ACCESS USE AND PERMIT VIOLATIONS

1. It is the responsibility of the property owner and permittee to ensure that the use of the access to the property is not in violation of the permit terms and conditions. The terms and conditions of any permit are binding upon all assigns, successors-in-interest, heirs and occupants. If any significant changes are made or will be made in the use of the property that will affect access operation, traffic volume and or vehicle type, the permittee or property owner shall contact the Department to determine if a new access permit and modification to the access are required.
2. When an access is constructed or used inconsistent with the terms and conditions in violation of the permit, the Department may summarily suspend an access permit and immediately order closure of the access.

MAINTENANCE

The permittee shall be responsible for the repair and maintenance of the access beyond the edge of the roadway including:

(1) surfacing ,
(2) curb and gutter,
(3) cattle guard and gate,
(4) vegetation control,
(5) removal or clearance of snow or ice upon the access even though deposited on the access in the course of department snow removal operations,
(6) repair and replacement of any access-related culverts of 36 inch diameter or smaller within the right-of-way in unincorporated areas,
(7) obtaining department approval for all culvert repairs, drainage repairs, resurfacing, and changes in access design or configuration, and
(8) all other maintenance required for continued safe and satisfactory operation of the access point.

The department shall perform no maintenance of access points, except:

(1) modification of access point as necessary to meet adjacent highway reconstruction, as determined by the department,
(2) access surface maintenance only when the department performs similar type maintenance on the highway at the access,
(3) maintenance of new approaches required for construction under §31-24-1 and §31-24-2.
(4) culvert cleaning in unincorporated areas, and
(5) repair and replacement of culverts larger than 36" diameter in unincorporated areas.

In the event that the permittee fails to maintain an access point, the department may declare the negligently maintained access point a public nuisance, and upon notice to the permittee, may correct maintenance deficiencies at cost to the owner.

DOT-166

Access Approach Construction Inspection Form
South Dakota Department of Transportation

To: (person who will conduct field inspection)	After completion, return form to person/office:
address	
address	
Address/zip	

The assigned field inspector is to complete this form for each newly completed access and return the form as noted in the upper right. This form is to confirm installation of an access. If during construction, the inspector should determine problems, such as poor traffic control, materials, or failure to adhere to the permit, they are to order the problems corrected, work may be shut down if necessary, and/or area office contacted for direction. All construction shall be completed within 45 days unless extension granted in writing by Area Engineer.

Permittee name and phone:

Access location:	Permit number:
Local jurisdiction:	Permit issue date:
SDDOT Area:	Permit construction began: _____ Permit construction ended: _____ Permit extension granted: _____

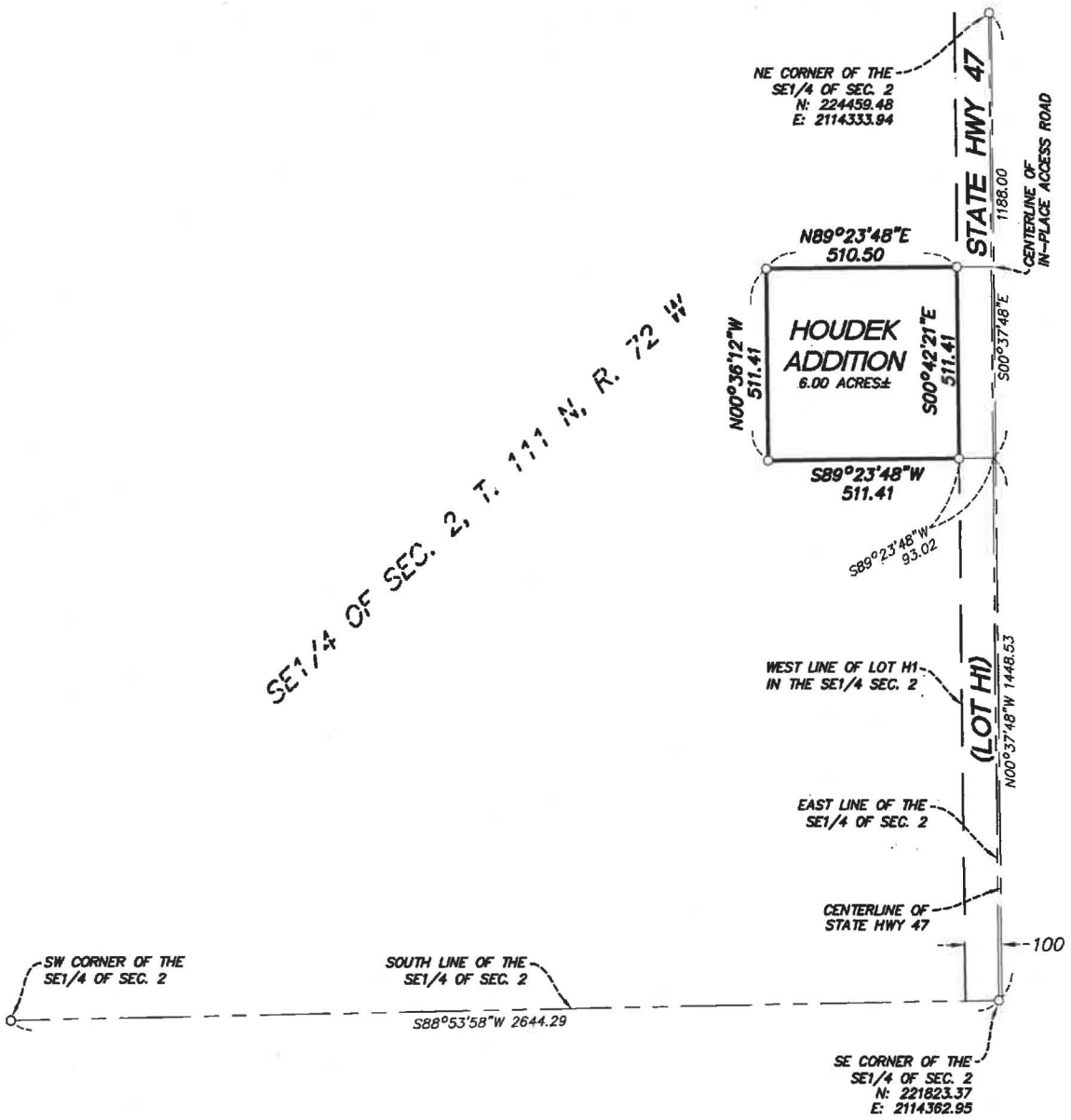
This access has been constructed in reasonable conformance with the issued access permit:
Inspector signature _____ Date _____

This access has NOT been constructed in reasonable conformance with the issued access permit:
Inspector signature _____ Date _____

Items not in conformance or inspector comments:

©2019 Westwood Professional Services, Inc.

PLAT SHOWING
HOUDEK ADDITION
IN THE SE1/4 OF SECTION 2 TOWNSHIP 111 NORTH, RANGE 72 WEST OF THE 5TH P.M., HYDE COUNTY, SOUTH DAKOTA



DRAFT

LEGEND:

○ Set 1/2" rebar with cap LS 10170

BASIS OF BEARINGS:

Bearings shown are based on South Dakota State Plane Coordinate System, North Zone, U.S. survey feet (2011 adjustment). Distances shown are ground distances, coordinates listed are state plane grid coordinates.

300 0 300 600 900

Scale in feet

Westwood
Phone (320) 253-9495 3701 12th Street North, Suite 208
Fax (320) 258-2001 St. Cloud, MN 56303
Toll Free (800) 270-9495 westwoodps.com
Westwood Professional Services, Inc.

0022235_0-M_PLAT.dwg

© 2019 Westwood Professional Services, Inc.

PLAT SHOWING
HOUDEK ADDITION
IN THE SE1/4 OF SECTION 2 TOWNSHIP 111 NORTH, RANGE 72 WEST OF THE 5TH P.M., HYDE COUNTY, SOUTH DAKOTA

OWNERS CERTIFICATE:

WE, THE UNDERSIGNED, DO HEREBY CERTIFY THAT WE ARE THE OWNER OF "HOUDEK ADDITION IN THE SOUTHEAST QUARTER OF SECTION 2, TOWNSHIP 111 NORTH, RANGE 72 WEST OF THE 5TH P.M., HYDE COUNTY, SOUTH DAKOTA", AND THAT SAID PLAT HAS BEEN MADE AT OUR REQUEST AND IN ACCORDANCE WITH MY INSTRUCTIONS FOR THE PURPOSE OF TRANSFER, AND THAT THE DEVELOPMENT OF THIS LAND SHALL CONFORM TO ALL EXISTING APPLICABLE ZONING, SUBDIVISION, EROSION AND SEDIMENT CONTROL REGULATIONS. IT IS FURTHER PROVIDED THAT ANY STREETS, ROADS, ALLEYS, AND/OR OTHER EASEMENTS SHOWN ON THIS PLAT ARE HEREBY, OR HAVE BEEN PREVIOUSLY, DEDICATED FOR THE PURPOSES INDICATED THEREON.

SIGNED THIS _____ DAY OF _____, 2019.

OWNER SIGNATURE: _____

OWNER NAME (PRINTED): RANDY HOUDEK, A/K/A RANDAL W. HOUDEK

ACKNOWLEDGMENT OF OWNER:

ON THIS_____ DAY OF_____,2019, BEFORE ME, THE UNDERSIGNED OFFICER, PERSONALLY APPEARED RANDY HOUDEK, A/K/A RANDAL W. HOUDEK KNOWN TO ME TO BE THE PERSON IN AND WHO EXECUTED THE WITHIN INSTRUMENT.

MY COMMISSION EXPIRES_____ NOTARY PUBLIC_____

COUNTY OF _____

STATE OF_____

SIGNED THIS _____ DAY OF _____, 2019.

OWNER SIGNATURE: _____

OWNER NAMES (PRINTED): RANDY HOUDEK, A/K/A RANDAL W. HOUDEK

ACKNOWLEDGMENT OF OWNER:

ON THIS_____ DAY OF_____,2019, BEFORE ME, THE UNDERSIGNED OFFICER, PERSONALLY APPEARED DEBRA L. HOUDEK KNOWN TO ME TO BE THE PERSON IN AND WHO EXECUTED THE WITHIN INSTRUMENT.

MY COMMISSION EXPIRES_____ NOTARY PUBLIC_____

COUNTY OF _____

STATE OF_____

SIGNED THIS _____ DAY OF _____, 2019.

OWNER SIGNATURE: _____

OWNER NAMES (PRINTED): DEBRA L. HOUDEK

SURVEYOR'S CERTIFICATE:

I, JASON LATZKE, REGISTERED LAND SURVEYOR IN THE STATE OF SOUTH DAKOTA, DO HEREBY CERTIFY THAT AT THE INSTANCE AND REQUEST OF RANDY HOUDEK, RANDAL W. HOUDEK AND DEBRA L. HOUDEK, OWNERS OF THE ABOVE DESCRIBED PROPERTY, DID SURVEY THE PARCEL OF LAND AS SHOWN ON THE ACCOMPANYING PLAT.

I FURTHER CERTIFY THAT THE SAID PLAT IS A TRUE AND CORRECT REPRESENTATION OF THE SAID PARCEL AS SURVEYED AND PLATTED BY ME INTO:

"HOUDEK ADDITION IN THE SOUTHEAST QUARTER OF SECTION 2, TOWNSHIP 111 NORTH, RANGE 72 WEST OF THE 5TH P.M., HYDE COUNTY, SOUTH DAKOTA"

I HEREBY SET MY HAND THIS_____ DAY OF_____, 2019.

Westwood
Phone (320) 253-9495 3701 12th Street North, Suite 206
Fax (320) 356-2001 St. Cloud, MN 56303
Toll Free (800) 270-9495 westwoodps.com
Westwood Professional Services, Inc.

0022235_O-M_PLAT.dwg

©2019 Westwood Professional Services, Inc.

PLAT SHOWING
HOUDEK ADDITION
IN THE SE1/4 OF SECTION 2 TOWNSHIP 111 NORTH, RANGE 72 WEST OF THE 5TH P.M., HYDE COUNTY, SOUTH DAKOTA

TREASURER'S CERTIFICATE:

I HEREBY CERTIFY THAT ALL TAXES WHICH ARE LIENS UPON ANY OF THE LANDS INCLUDED IN THE ATTACHED PLAT ARE SHOWN BY THE RECORDS OF MY OFFICE TO BE FULLY PAID.

SIGNED THIS _____ DAY OF _____, 2019.

COUNTY TREASURER, HYDE COUNTY, SOUTH DAKOTA: _____

HIGHWAY APPROVAL:

ACCESS TO STATE HIGHWAY 47 IS APPROVED. THIS ACCESS APPROVAL DOES NOT REPLACE THE NEED FOR ANY PERMITS REQUIRED BY LAW TO ESTABLISH THE PRECISE ACCESS LOCATION, INCLUDING PERMIT REQUIREMENTS SET FORTH IN ADMINISTRATIVE RULE OF SOUTH DAKOTA 70:09:01:02.

HIGHWAY OR STREET AUTHORITY: _____

DIRECTOR OF EQUALIZATION CERTIFICATE:

I HEREBY CERTIFY THAT I HAVE RECEIVED A COPY OF THIS PLAT THIS _____ DAY OF _____, 2019.

DIRECTOR OF EQUALIZATION, HYDE COUNTY, SOUTH DAKOTA: _____

COUNTY PLANNING COMMISSION APPROVAL:

WE, THE MEMBERS OF THE PLANNING AND ZONING COMMISSION OF HYDE COUNTY, SOUTH DAKOTA, DO HEREBY CERTIFY THAT WE HAVE EXAMINED THE PLAT ENTITLED, "HOUDEK ADDITION IN THE SOUTHEAST QUARTER OF SECTION 2, TOWNSHIP 111 NORTH, RANGE 72 WEST OF THE 5TH P.M., HYDE COUNTY, SOUTH DAKOTA", AND HEREBY GIVE OUR APPROVAL FOR THE INSTRUMENT TO BE RECORDED.

DATED THIS _____ DAY OF_____, 2019.

_____
CHAIRMAN, PLANNING AND ZONING
HYDE COUNTY, SOUTH DAKOTA

RESOLUTION BY COUNTY COMMISSIONERS:

RESOLUTION NO. _____

A RESOLUTION APPROVING THE PLAT OF "HOUDEK ADDITION IN THE SOUTHEAST QUARTER OF SECTION 2, TOWNSHIP 111 NORTH, RANGE 72 WEST OF THE 5TH P.M., HYDE COUNTY, SOUTH DAKOTA"

WHEREAS, THE PLAT OF THE ABOVE DESCRIBED PROPERTY HAS BEEN EXECUTED ACCORDING TO STATUTE, NOW THEREFORE

BE IT RESOLVED THAT THE COUNTY COMMISSION IN AND FOR HYDE COUNTY, DOES HEREBY APPROVE THE SAID PLAT

DATED THIS _____ DAY OF_____, 2019.

_____
CHAIRMAN, BOARD OF COUNTY COMMISSIONERS
HYDE COUNTY, SOUTH DAKOTA

I, AUDITOR OF HYDE COUNTY, DO HEREBY CERTIFY THAT AN OFFICIAL MEETING ON _____, 2019, THE COUNTY COMMISSIONERS DID BY RESOLUTION APPROVE THE PLAT OF "HOUDEK ADDITION IN THE SOUTHEAST QUARTER OF SECTION 2, TOWNSHIP 111 NORTH, RANGE 72 WEST OF THE 5TH P.M., HYDE COUNTY, SOUTH DAKOTA"

_____
COUNTY AUDITOR, HYDE COUNTY, SOUTH DAKOTA

REGISTER OF DEEDS' CERTIFICATE:

FILED FOR RECORD THIS _____ DAY OF _____, 2019, AT _____ O'CLOCK ____.M. AND DULY RECORDED IN

BOOK NO. _____, PAGE NO. _____

REGISTER OF DEEDS, HYDE COUNTY, SOUTH DAKOTA: _____

Westwood
Phone (320) 253-9495 3701 12th Street North, Suite 206
Fax (320) 258-2001 St. Cloud, MN 56303
Toll Free (800) 270-9495 westwoodps.com
Westwood Professional Services, Inc.

SD EForm - 2232 V1

DOT-166

Application for Highway Access Permit
South Dakota Department of Transportation

Permit Application (to be completed by applicant).

Instructions: Please contact the local South Dakota Department of Transportation office to determine what supporting documents must accompany this application. Please submit a separate application and supporting documentation for each access requested. Attach additional sheets as necessary. Please print or type. Owner and applicant agree to comply with special and standard conditions if access permitted.

Property Owner:
Name(s): Triple H Wind Project, LLC
Mailing Address: 3760 State Street, Suite 200
City, State, Zip: Santa Barbara, CA 93105
Daytime Phone: 805-569-6185

Applicant (if different from Owner):
Name(s): Casey Willis
Mailing Address: On behalf of Triple H Wind Project, LLC
City, State, Zip:
Daytime Phone:

Property to be Served by Approach:
County: HYDE
Section: SE/4 of Section 2 Township: 111
Range: 72
Or
Subdivision: _____ Block/Lot: _____
Street Address:
City:

State Highway to be Accessed by Approach:
State Highway Number: Highway 47
Access would be _____ feet (north, south, east or west) from Approx 1,900 feet north of 293 St/Hwy 47 (nearest cross street).

Land Use of Property to be Served (check one):
- ☐ Agricultural: acres served _____
- ☑ Business: type Operations and Maintenance/Ag total square footage of buildings: ____ number of employees _____
- ☐ Residential: number of single-family dwellings _____, or number of multi-family dwellings _____
- ☐ Other: describe _____

Type of Permit Requested (check one)
- ☑ New approach
- ☐ Change in use
- ☐ Temporary access
- ☐ Improve existing access
- ☒ Relocate existing access
- ☐ Remove existing access

Requested Approach Width (check one)
24' ☐ 30' ☐ 36' ☐ 40' ☑

Local Government Reviews:

County: HYDE
Comments:
Concurrence signature: Date:

Municipality: _____
Comments:
Concurrence signature: Date:

Estimated Date of Construction:

I, the undersigned, request permission to construct or modify an access approach subject to the rules and regulations set forth in SDCL 70:09

Signature of Applicant: [signature] **Date:** 7/19/19

Signature of Owner (if different than applicant): **Date:** 7/19/19

Permit Decision (to be completed by SDDOT).

Supporting Materials Required:

(Required)		(Received)
☐	Access Approach Design	☐
☐	Vicinity Map	☐
☐	Traffic Volumes	☐
☐	Three Copies of Site Plan	☐
☐	Traffic Control Plan	☐
☐	Proof of Liability Insurance	☐
☐	Detailed Development Plan	☐
☐	Drainage Plan	☐
☐	Traffic Impact Study	☐
☐	Revegetation Plan	☐
☐	Other	☐

Received by SDDOT: Date: ___/___/___

Decision: (to be made after Application Review)
- ☒ Access Approved
- ☐ Access Approved with Variance: _____
- ☐ Access Denied

Terms and Conditions of Approval (or Reason for Denial) The access shall be constructed in accordance with the attached drawings & Standard Plates 120.1 & 450.38. The applicant is responsible for construction and maintenance of the access. The in-place access shall be removed/relocated

Access Must be Constructed By: 06/1/20

SDDOT Area Engineer Signature: [signature]
Date: 9/5/19

SDDOT Area:
Area Office: Huron Area
Contact Person: Brad Letcher
Contact Phone: (605) 353-7140
Permit Number: _____

Distribution: Original – Owner; Copies – Access Management, Area Office v.10/2005

DOT-166

SDDOT Highway Access Permit Application Review Sheet (to be completed by SDDOT)

Highway Access Classification: (check one)

- ☐ Expressway
- ☐ Free Flow Urban
- ☐ Intermediate Urban
- ☐ Urban Developed
- ☐ Urban Fringe
- ☒ Rural

Highway SD 47
MRM + Displacement 131 + 0.565
Left ☒ **Right** ☐
Average Daily Traffic _____
Accidents (three years) _____

Highway Alignment to Left of Access (as seen when standing on access)

- ☒ Straight
- ☐ Turns left
- ☐ Turns right

Stopping Sight Distance: _____ ft.
Entering Sight Distance: _____ ft.
Posted Speed Limit: 65 mph

- ☐ Flat
- ☐ Slopes up
- ☒ Slopes down

- ☒ 0-3% grade
- ☐ 3-5% grade
- ☐ >5% grade

Highway Alignment to Right of Access (as seen when standing on access)

- ☒ Straight
- ☐ Turns left
- ☐ Turns right

Stopping Sight Distance: _____ ft.
Entering Sight Distance: _____ ft.
Posted Speed Limit 65 mph

- ☐ Flat
- ☒ Slopes up
- ☐ Slopes down

- ☒ 0-3% grade
- ☐ 3-5 % grade
- ☐ >5% grade

Significant Design and Potential Impact Considerations (check all that apply and explain checked items):

- ☐ Sidewalks or Bike Paths
- ☐ Curb & Gutter
- ☐ On-Street Parking
- ☐ Shoulder Width
- ☐ Historical Resources
- ☐ Surface Drainage
- ☐ Drainage Structures
- ☐ Major Structures
- ☐ Guard Rail
- ☐ Above-Ground Utilities
- ☐ Railroad Tracks
- ☐ Distance to Nearby Streets, Both Directions
- ☒ Distance to Nearby Driveways, Both Directions
- ☐ Others Streets with Access or Available Access
- ☐ Traffic Control Devices or Relocation Needed
- ☐ Median Crossovers

Explain impact on design:

SDDOT Region Traffic Engineer Review (optional):
Comments:

Signature: _____ date: ___/___/___

SDDOT Access Management Review (optional):
Comments:

Signature: _____ date: ___/___/___

APPROACH DESIGN SKETCH

See Attached

List Attachments:

- ☒ Driveway details
- ☒ Culvert details
- ☐ Mailbox details
- ☐ Fencing details
- ☐ Cattle guard
- ☐ Sidewalk details
- ☐ Median crossovers
- ☐ Recreation paths
- ☐ Rail crossings
- ☐ Auxiliary lanes
- ☐ Storm sewer
- ☐ Pavement
- ☐ Curb & gutter
- ☐ Traffic Control
- ☐ Sign/signal/marking
- ☐ Other

SDDOT Review Performed by: **Date:** ___/___/___

State Highway Access Approach Permit
Standard Conditions

When this permit was issued, the Department made its decision based in part on information submitted by the applicant, what alternative access to other public roads and streets was available, the operation of the highway and safety and design standards. Changes in access approach use or design not approved by the Department may cause the revocation or suspension of the permit. The permittee is responsible for the costs of construction, maintenance, and removal (if necessary) of the approach.

PERMIT EXPIRATION

A permit shall be considered expired if the access is not under construction within one year of the permit issue date or before the expiration of any authorized extension. When the permittee is unable to commence construction within one year after the permit issue date, the permittee may request a one-year extension from the Department. Only one extension may be granted. Any request for an extension must be in writing and submitted to the Department before the permit expires. The request should state the reasons why the extension is necessary, when construction is anticipated, and include a copy of page 1 (face of permit) of the access permit. Extension approvals shall be in writing. Any person wishing to reestablish an access permit that has expired may begin again with the application procedures.

CONSTRUCTION

1. The construction of the access and its appurtenances as required by the terms and conditions of the permit shall be completed at the expense of the permittee. All materials used in the construction of the access within the highway right-of-way or on permanent easements, become public property. Any materials removed from the highway right-of-way will be disposed of only as directed by the Department. Only clean fill material may be used for construction. Rubble and organic materials are prohibited. Permittee is responsible for salvaging and replacing topsoil, erosion control and revegetation of access.
2. The permittee shall notify the Area Office at least two working days prior to any construction within state highway right-of-way. Construction of the access shall not proceed until the access permit is issued. The access shall be completed in an expeditious and safe manner and shall be finished within 45 days from the initiation of construction within the highway right-of-way. One construction time extension may be requested from the Area Engineer. The permittee shall also notify the Area Office two days prior to substantial completion of the access construction.
3. A utility permit shall be obtained for any utility work within highway right-of-way. Where necessary to remove, relocate, or repair any traffic control device or public or private utility for the construction of a permitted access, the relocation, removal or repair shall be accomplished by the permittee without cost to the Department, and at the direction of the Department or utility company. Any damage to the state highway or other public right-of-way beyond that which is allowed in the permit shall be repaired immediately. The permittee is responsible for the repair of any utility damaged in the course of access construction, reconstruction or repair. Utilities are responsible for salvaging and replacing topsoil and must have an approved erosion control and revegetation plan. A final inspection must be held with the utility at the completion of the work.
4. The Department and the local government may inspect the access during construction and upon completion of the access to determine that all terms and conditions of the permit are met. Inspectors are authorized to enforce the conditions of the permit during and after construction and to halt any activities within state right-of-way that do not comply with the provisions of the permit, that conflict with concurrent highway construction or maintenance work, that endanger highway property, natural or cultural resources protected by law, or the health and safety of workers or the public.
5. Prior to using the access, the permittee is required to complete the construction according to the terms and conditions of the permit. Failure by the permittee to abide by all permit terms and conditions shall be sufficient cause for the Department to initiate action to suspend or revoke the permit and close the access. If in the determination of the Department the failure to comply with or complete the construction requirements of the permit create a highway safety hazard, such shall be sufficient cause for the summary suspension of the permit. If the permittee wishes to use the access prior to completion, arrangements must be approved by the Department and included in the permit. The Department may order a halt to any unauthorized use of the access pursuant to statutory and regulatory powers. Reconstruction or improvement of the access may be required when the permittee has failed to meet required specifications of design or materials.
6. The permittee shall provide construction traffic control devices at all times during access construction, in conformance with the Manual on Uniform Traffic Control Devices as required by state statute.

7. In the event it becomes necessary to remove any right-of-way fence, the posts on either side of the access shall be securely braced with an approved end post before the fence is cut to prevent any slacking of the remaining fence.
8. The permittee shall ensure that a copy of the permit is available for review at the construction site at all times. The permit may require the contractor to notify the individual or office specified on the permit at any specified phases in construction to allow the field inspector to inspect various aspects of the construction such as concrete forms, subbase, base course compaction, and materials specifications. Minor changes and additions may be ordered by the Department or local authority field inspector to meet unanticipated site conditions.
9. Each access shall be constructed in a manner that shall not cause water to enter onto the roadway or shoulder, and shall not interfere with the existing drainage system on the right-of-way or any adopted municipal system and drainage plan.
10. By accepting the permit, permittee agrees to save, indemnify, and hold harmless to the extend allowed by law, the Department, its officers, and employees from suits, actions, claims of any type or character brought because of injuries or damage sustained by any person resulting from the permittee's use of the access permit during construction of the access.

CHANGES IN ACCESS USE AND PERMIT VIOLATIONS

1. It is the responsibility of the property owner and permittee to ensure that the use of the access to the property is not in violation of the permit terms and conditions. The terms and conditions of any permit are binding upon all assigns, successors-in-interest, heirs and occupants. If any significant changes are made or will be made in the use of the property that will affect access operation, traffic volume and or vehicle type, the permittee or property owner shall contact the Department to determine if a new access permit and modification to the access are required.
2. When an access is constructed or used inconsistent with the terms and conditions in violation of the permit, the Department may summarily suspend an access permit and immediately order closure of the access.

MAINTENANCE

The permittee shall be responsible for the repair and maintenance of the access beyond the edge of the roadway including:

(1) surfacing ,
(2) curb and gutter,
(3) cattle guard and gate,
(4) vegetation control,
(5) removal or clearance of snow or ice upon the access even though deposited on the access in the course of department snow removal operations,
(6) repair and replacement of any access-related culverts of 36 inch diameter or smaller within the right-of-way in unincorporated areas,
(7) obtaining department approval for all culvert repairs, drainage repairs, resurfacing, and changes in access design or configuration, and
(8) all other maintenance required for continued safe and satisfactory operation of the access point.

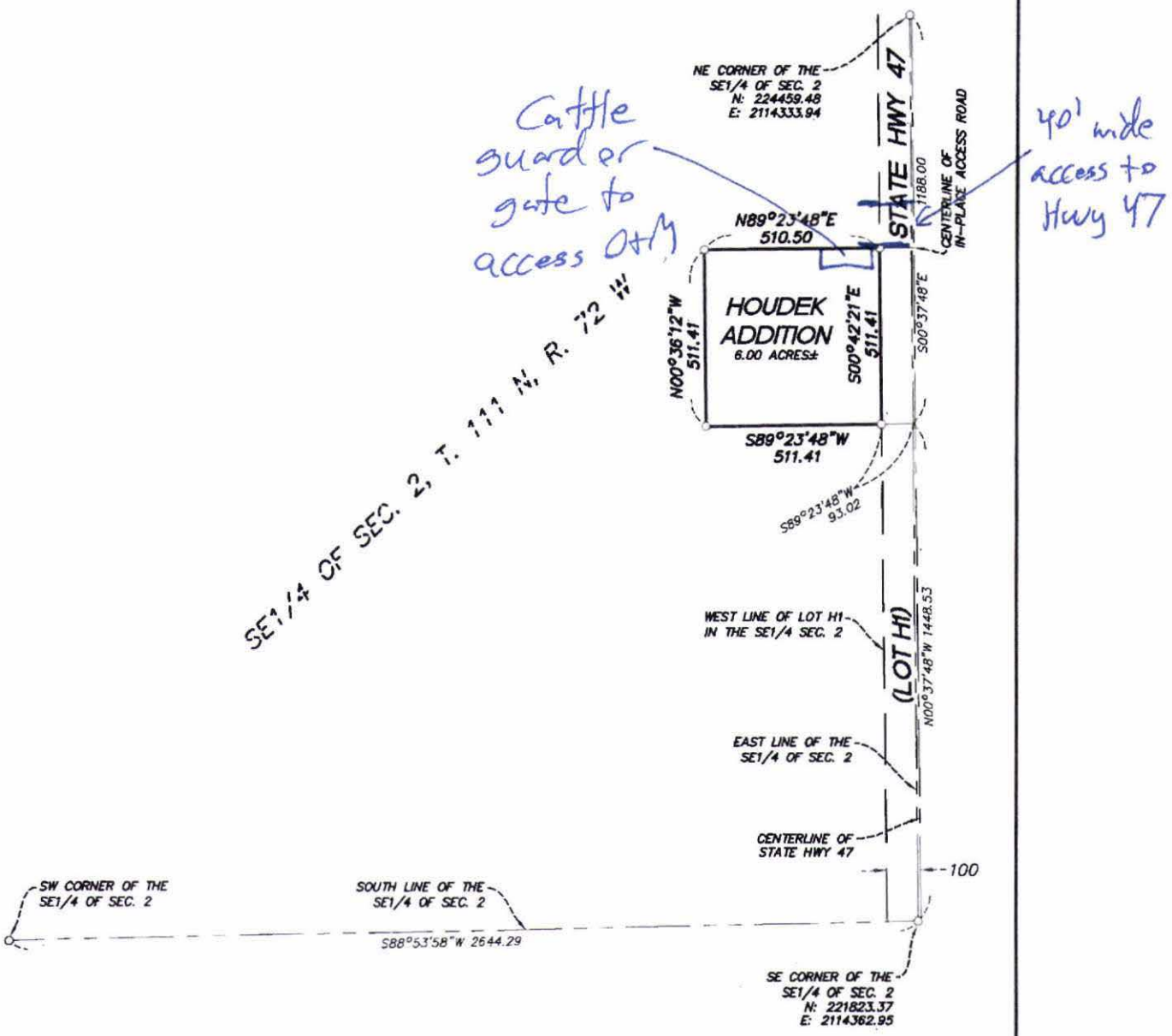
The department shall perform no maintenance of access points, except:

(1) modification of access point as necessary to meet adjacent highway reconstruction, as determined by the department,
(2) access surface maintenance only when the department performs similar type maintenance on the highway at the access,
(3) maintenance of new approaches required for construction under §31-24-1 and §31-24-2.
(4) culvert cleaning in unincorporated areas, and
(5) repair and replacement of culverts larger than 36" diameter in unincorporated areas.

In the event that the permittee fails to maintain an access point, the department may declare the negligently maintained access point a public nuisance, and upon notice to the permittee, may correct maintenance deficiencies at cost to the owner.

©2019 Westwood Professional Services, Inc.

PLAT SHOWING
HOUDEK ADDITION
IN THE SE1/4 OF SECTION 2 TOWNSHIP 111 NORTH, RANGE 72 WEST OF THE 5TH P.M., HYDE COUNTY, SOUTH DAKOTA



DRAFT

LEGEND:

○ Set 1/2" rebar with cap LS 10170

BASIS OF BEARINGS:

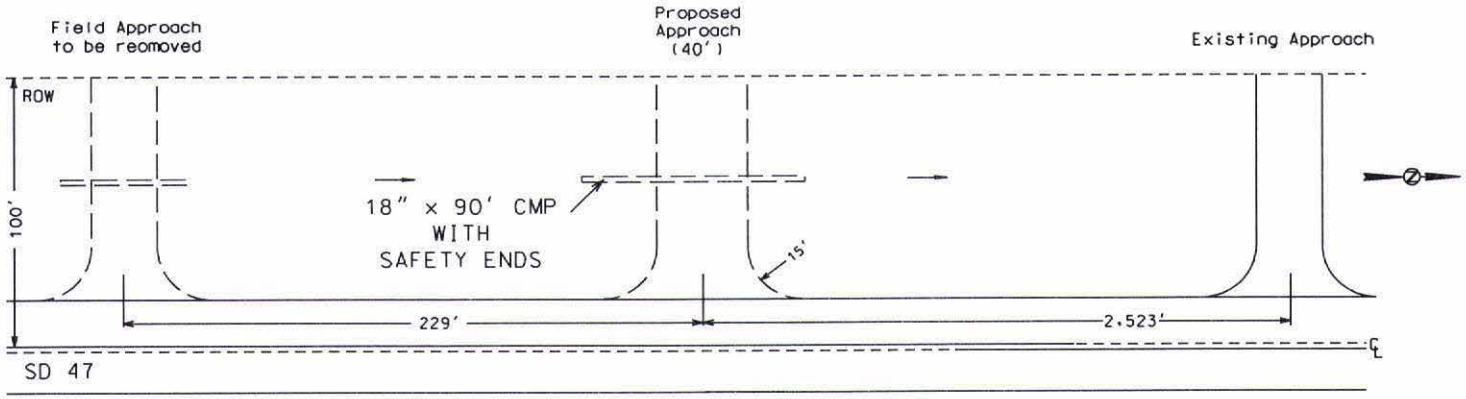
Bearings shown are based on South Dakota State Plane Coordinate System, North Zone, U.S. survey feet (2011 adjustment). Distances shown are ground distances, coordinates listed are state plane grid coordinates.

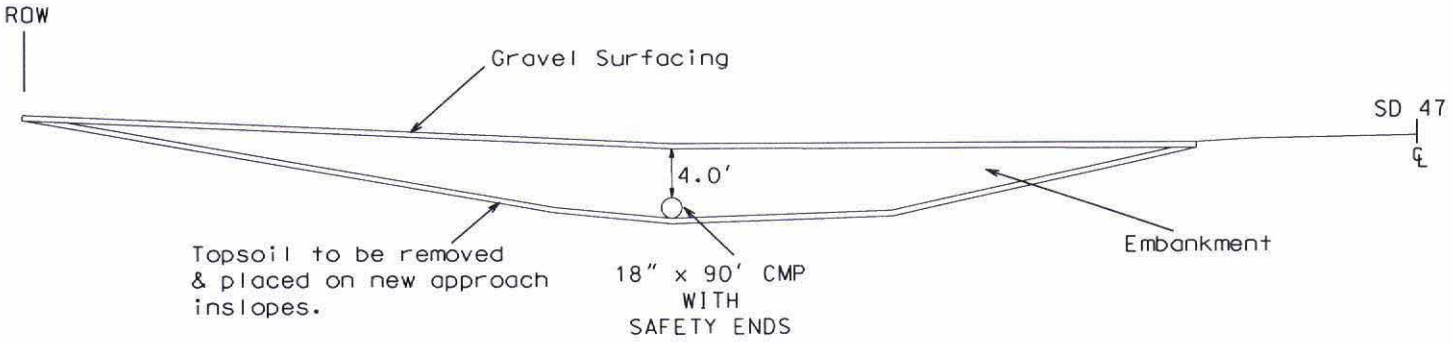
300 0 300 600 900
Scale in feet

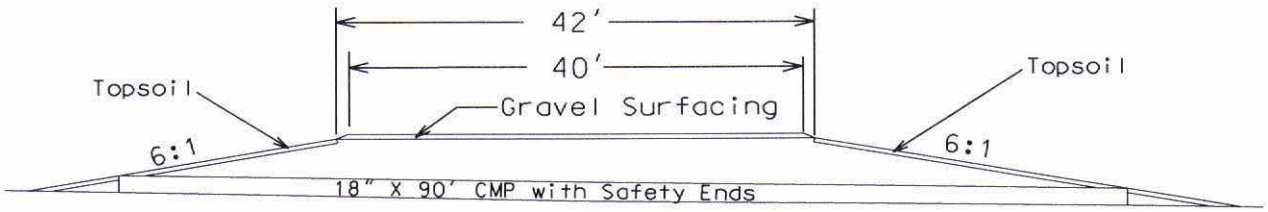
Westwood
Phone (320) 252-9495 2701 13th Street North, Suite 296
Fax (320) 368-2001 St. Cloud, MN 56303
Toll Free (800) 270-9495 westwoodps.com
Westwood Professional Services, Inc.

SHEET 1 OF 3

0022235_O-M_PLAT.dwg

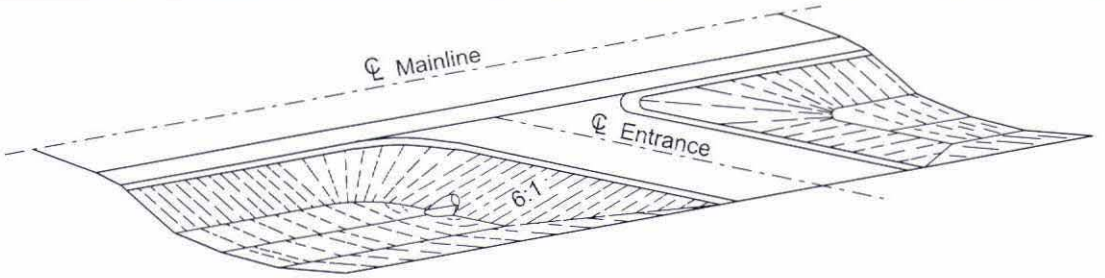




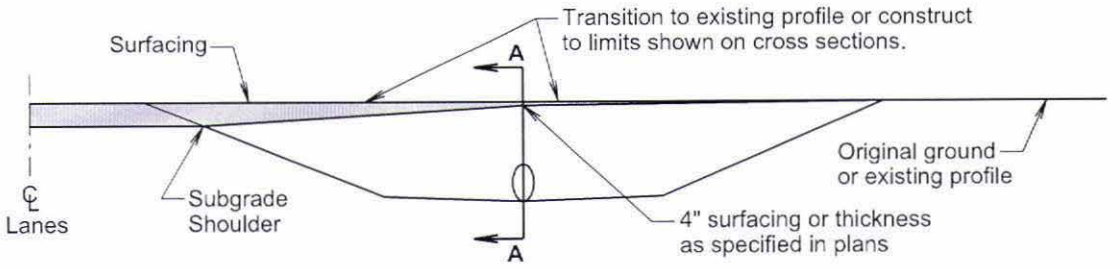


* Horizontal and vertical sight distances are adequate.
* 65 MPH Zone
* The approach is not on a curve.
* Topsoil must be removed and stockpiled from the approach slopes, then spread over the area after removal of the approach.
* The pipe shall be placed so the flowline is level with the existing ditch bottom.
* The approach must be constructed in accordance with this drawing and attached Standard Plates.
* If longer slopes are used, the pipe length will be adjusted accordingly.
* Topsoil shall be removed from the proposed approach area and stockpiled for use on the newly constructed inslopes.
* The newly placed topsoil shall be seeded with the following seed mixture:

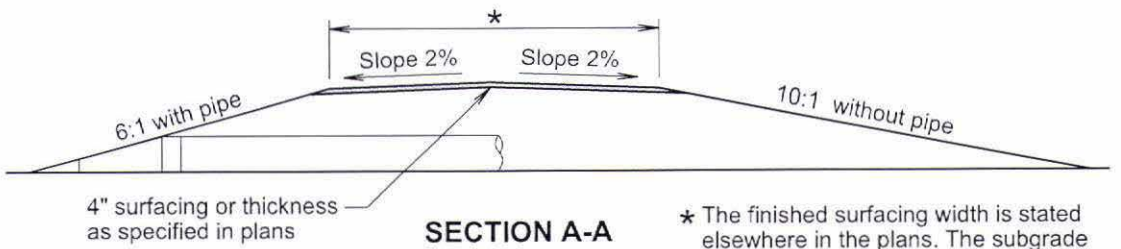
Western Wheatgrass (Flintlock, Rodan, Rosanna)	-	16 PLS Lbs./Acre
Canada Wildrye (Mandan)	-	2 PLS Lbs./Acre
Total		18 PLS Lbs./Acre



PERSPECTIVE OF ENTRANCE



ELEVATION VIEW
(Entrance)



SECTION A-A
(Entrance)

* The finished surfacing width is stated elsewhere in the plans. The subgrade width is 4' wider than the finished surfacing width unless stated otherwise in the plans.

GENERAL NOTES:

The ditch section shown above in the perspective and elevation view is only for illustrative purpose.

A 6:1 inslope will be constructed for an entrance when a pipe is required. A 10:1 inslope will be constructed when a pipe is not required.

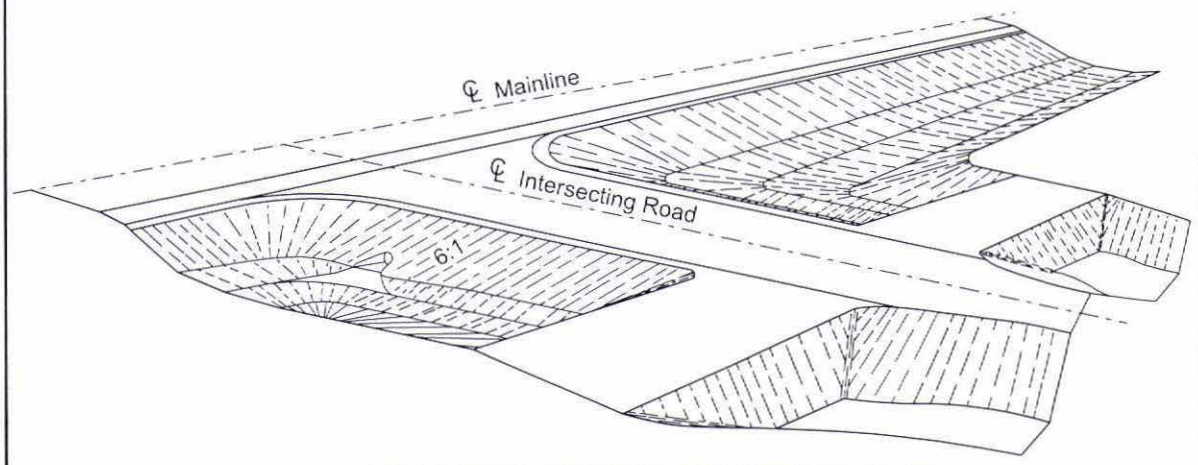
Pipe length will be adjusted if necessary during construction to obtain the 6:1 slope. For grading projects, the pipe length is estimated typically using a 4" thickness of surfacing directly over the subgrade above the pipe.

The transition area between the mainline inslope and the approach inslope for entrances will be rounded to eliminate an abrupt transition.

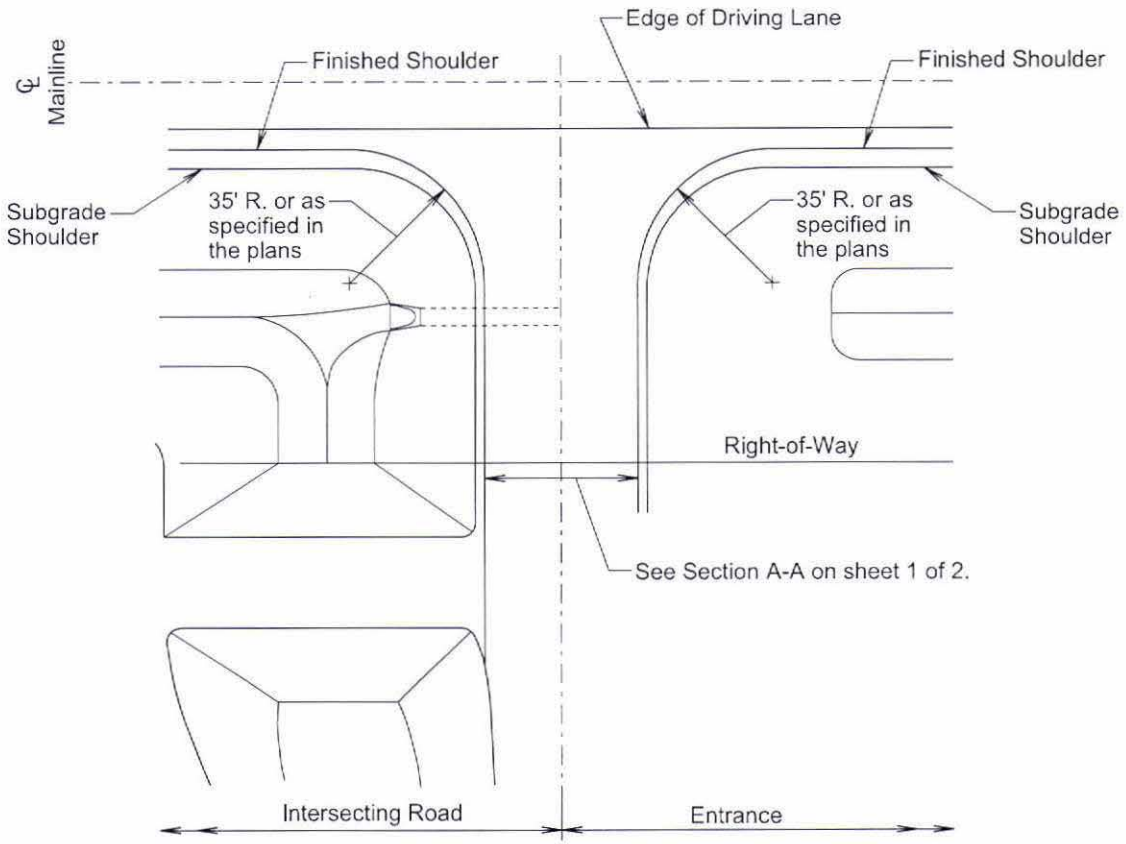
The turning radii will be 35' for intersecting roads and entrances unless stated otherwise in the plans.

September 14, 2018

Published Date: 3rd Qtr. 2019	SDDOT	INTERSECTING ROADS AND ENTRANCES	PLATE NUMBER 120.01
			Sheet 1 of 2



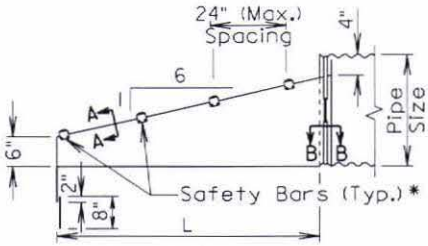
PERSPECTIVE OF INTERSECTING ROAD



PLAN VIEW

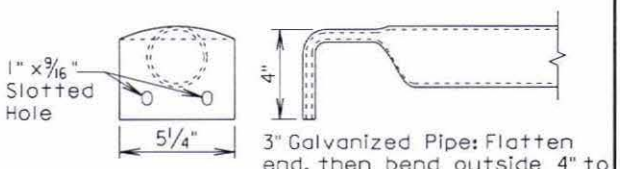
September 14, 2018

Published Date: 3rd Qtr. 2019	SDDOT	INTERSECTING ROADS AND ENTRANCES	PLATE NUMBER 120.01 Sheet 2 of 2

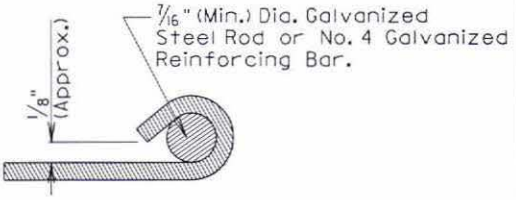


ELEVATION VIEW

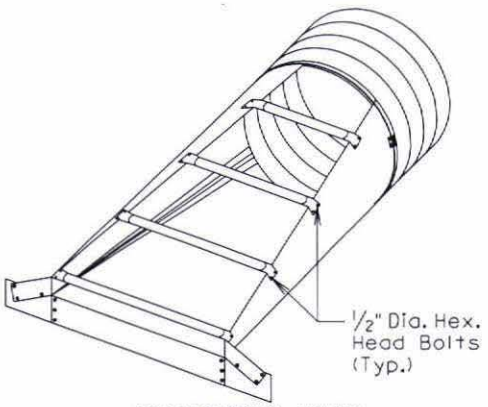
*Number of bars required will vary depending on the length of the end section.



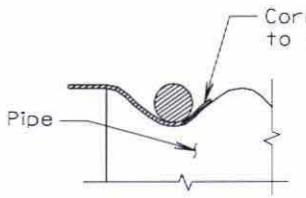
DETAIL OF SAFETY BARS



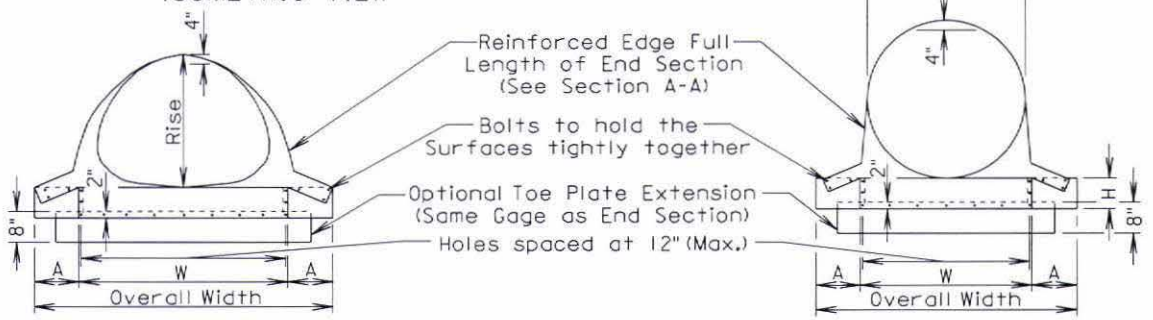
SECTION A-A



ISOMETRIC VIEW

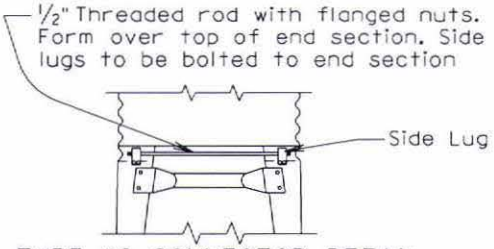


SECTION B-B

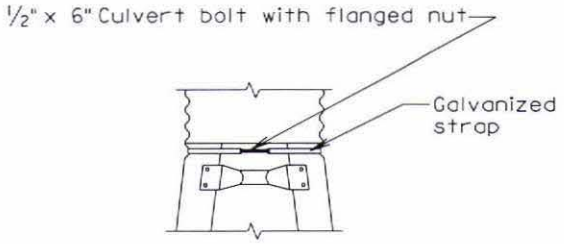


FRONT VIEW

FRONT VIEW



TYPE #2 CONNECTOR DETAIL
(For 30" and Larger)
(For 21" X 15" and Larger)



TYPE #1 CONNECTOR DETAIL
(For 15" Through 24")

June 26, 2015

Published Date: 3rd Qtr. 2019	SDDOT	C. M. P. SAFETY ENDS	PLATE NUMBER 450.38
			Sheet 1 of 2

ARCH C.M.P. SAFETY ENDS										
Equv. Dia. (Inch)	(Inches)		Min. Thick.		Dimensions (Inches)				L Dimensions	
	Span	Rise	Inch	Gage	A	H	W	Overall Width	Slope	Length (Inch)
18	21	15	.064	16	8	6	27	43	6:1	30
21	24	18	.064	16	8	6	30	46	6:1	48
24	28	20	.064	16	8	6	34	50	6:1	60
30	35	24	.079	14	12	9	41	65	6:1	84
36	42	29	.109	12	12	9	48	72	6:1	114
42	49	33	.109	12	16	12	55	87	6:1	138
48	57	38	.109	12	16	12	63	95	6:1	168
54	64	43	.109	12	16	12	70	102	6:1	198
60	71	47	.109	12	16	12	77	109	6:1	222
72	83	57	.109	12	16	12	89	121	6:1	282

CIRCULAR C.M.P. SAFETY ENDS								
Pipe Dia. (Inch)	Min. Thick.		Dimensions (Inches)				L Dimensions	
	Inch	Gage	A	H	W	Overall Width	Slope	Length (Inch)
15	.064	16	8	6	21	37	6:1	30
18	.064	16	8	6	24	40	6:1	48
21	.064	16	8	6	27	43	6:1	66
24	.064	16	8	6	30	46	6:1	84
30	.109	12	12	9	36	60	6:1	120
36	.109	12	12	9	42	66	6:1	156
42	.109	12	16	12	48	80	6:1	192
48	.109	12	16	12	54	86	6:1	228
54	.109	12	16	12	60	92	6:1	264
60	.109	12	16	12	66	98	6:1	300

GENERAL NOTES:

Safety ends shall be fabricated from galvanized steel conforming to the requirements of the Specifications.

Safety bars shall be fabricated from steel schedule 40 pipe in conformance with ASTM A53, grade B or HSS 3.5X.216 in conformance with ASTM A500, grade B.

Slotted holes for safety bar attachment shall be provided for all end sections.

Attachment to circular pipes 15" through 24" diameter shall be made with Type #1 straps. All other sizes shall be attached with Type #2 rods and lugs.

When stated in the plans, optional toe plate extension shall be punched and bolted to end section apron lip with $\frac{3}{8}$" diameter galvanized bolts. Steel for toe plate extension shall be same gauge as end section. Dimensions shall be overall width less 6" by 8" high.

Installation shall be performed in accordance with the Specifications.

Cost of all work and materials required for fabrication and installation of safety ends shall be incidental to the bid items for the various sizes of safety ends.

June 26, 2015

Published Date: 3rd Qtr. 2019	SDDOT	C. M. P. SAFETY ENDS	PLATE NUMBER 450.38
			Sheet 2 of 2

DOT-166

Access Approach Construction Inspection Form
South Dakota Department of Transportation

To: (person who will conduct field inspection)	After completion, return form to person/office:
address	
address	
Address/zip	

The assigned field inspector is to complete this form for each newly completed access and return the form as noted in the upper right. This form is to confirm installation of an access. If during construction, the inspector should determine problems, such as poor traffic control, materials, or failure to adhere to the permit, they are to order the problems corrected, work may be shut down if necessary, and/or area office contacted for direction. All construction shall be completed within 45 days unless extension granted in writing by Area Engineer.

Permittee name and phone:

Access location:	Permit number:
Local jurisdiction:	Permit issue date:
SDDOT Area:	Permit construction began: _____ Permit construction ended: _____ Permit extension granted: _____

This access has been constructed in reasonable conformance with the issued access permit:
Inspector signature _____ Date _____

This access has NOT been constructed in reasonable conformance with the issued access permit:
Inspector signature _____ Date _____

Items not in conformance or inspector comments:

CONFIDENTIAL

Reference

NAD 1983 South Dakota State Plane North

N

0 0.05 0.1 Miles

Legend

O & M

6 ac

Project Location

Triple H Wind Project

T111-R72

PID: 77
Name: Houdek, Randy and Debra

PID: 76
Name: Baloun, Darwin

PID: 80
Name: Smith Trust, Elizabeth

PID: 376
Name: Webb Trust, Jerome & Debra (C)

PID: 79
Name: Hieb, David & Porter, Katherine (A)

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Triple H Wind Land Holdings, LLC for an entrance to be located along Hyde County Highway No. 204th Street in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm _____ field _____ business ✓ Residence _____
3. Exact location: Approximately 1,200 feet east of 204th & 330th
   (Feet from nearest intersection or landmark)
   Lat. 44° 25' 30.85" Long. 99° 33' 29.91"
4. Width of entrance: 40 feet
   (Check attached spec sheet)
5. Size & length of culvert: As determined by County Highway Dept.
   (Check attached spec sheet)
6. Location by legal description: SW/4, SW/4, Sec. 12 Town 111 Range 73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 7/22/19 Receipt # 120795

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted July 19, 2019 Date Approved: July 22, 2019

Signature of Applicant

Robert A Bawden
Chairman, Hyde County Commissioners

Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

→ On behalf of Triple H Wind Land Holdings, LLC

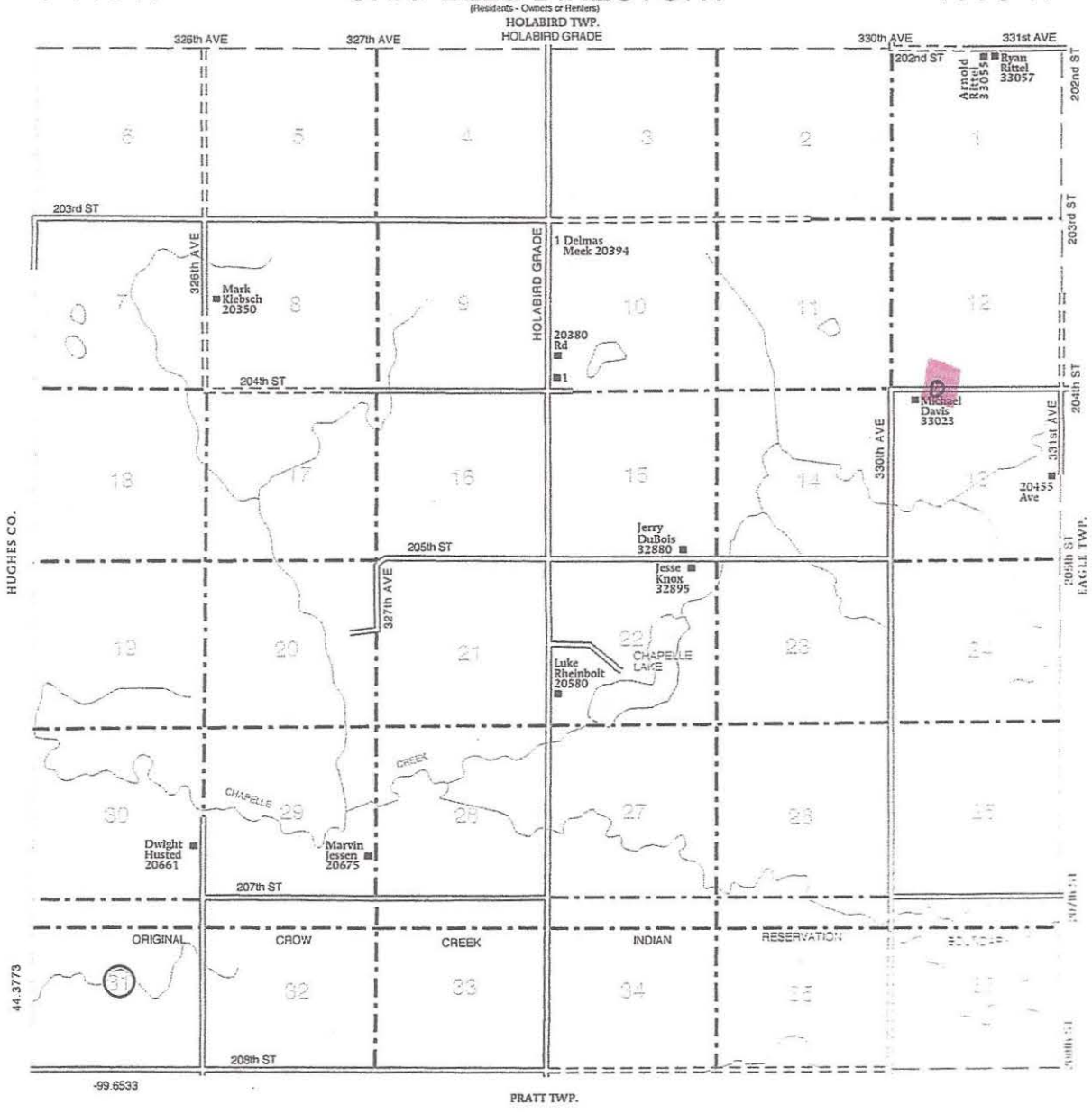
FHP®
Farm and Home Publishers
www.farmandhomepublishers.com

Extends Its *Thanks* To All The Businesses Who Have Made This Plat & Directory Possible Through Their Advertisements. These Advertisers Are Community-Minded Individuals Who Are Willing To Support This Plat & Directory.
Support These Fine Businesses!

T-111-N

CHAPELLE DIRECTORY

R-73-W



Approximately 1,200' east of 330th Avenue on 204th Street

Mike Cowan believes this approach will possibly need a culvert.

Hyde County Approach Policy

1. New Approach

- Complete application for entrance
- $100 fee for the right to install a new approach due before starting
- New approach must be approved by Highway Superintendent
- Highway Superintendent decides if approach needs a culvert
    - If approach requires a culvert, it is the landowner responsibility to make a contribution to the road for the price of the culvert or purchase a culvert themselves elsewhere
- All approaches must be done to Hyde County Policy specs (see attached)
- Highway superintendent must approve after completion
- All entrances will be at landowner's expense

2. Widening of Approach with Culvert

- Complete application for entrance
- Widening of approach must be approved by Highway Superintendent
- County will replace length of existing culvert but only if the culvert is in failing condition. It will be the landowner's responsibility to replace the whole culvert if the culvert is not in failing condition.
- Any footage of culvert over the original length will be paid by landowner as a contribution to the road if the current culvert is in failing condition (ex. 30' existing culvert that will be extended to a 45' culvert – Hyde County will replace original 30' culvert and the landowner must make a contribution to the road for the remain 15' of culvert and the band)
- All approaches must be done to Hyde County Policy specs (see attached)
- Highway superintendent must approve after completion
- All entrances will be at landowner's expense

3. Widening of Approach without Culvert

- Complete application for entrance
- Contact Highway Superintendent
- Widening of approach must be approved by Highway Superintendent
- All approaches must be done to Hyde County Policy specs (see attached)
- Highway superintendent must approve after completion
- All entrances will be at landowner's expense

4. Widening of Approach Originally without a Culvert but Now Requires Culvert

- Complete application for entrance
- Widening of approach must be approved by Highway Superintendent
- Highway Superintendent decides the length of culvert needed
    - It is the landowner responsibility to make a contribution to the road for the price of the culvert or purchase a culvert themselves elsewhere
- All approaches must be done to Hyde County Policy specs (see attached)
- Highway superintendent must approve approach after completion
- All entrances will be at landowner's expense

5. Contribution

- All contributions to the road must be made prior to obtaining the culverts and bands

HYDE COUNTY HIGHWAY DEPARTMENT

200 Scoby Avenue N.E.
P.O. Box 260
Highmore, SD 57345

Office: 605-852-2518
Cell: 605-870-1020

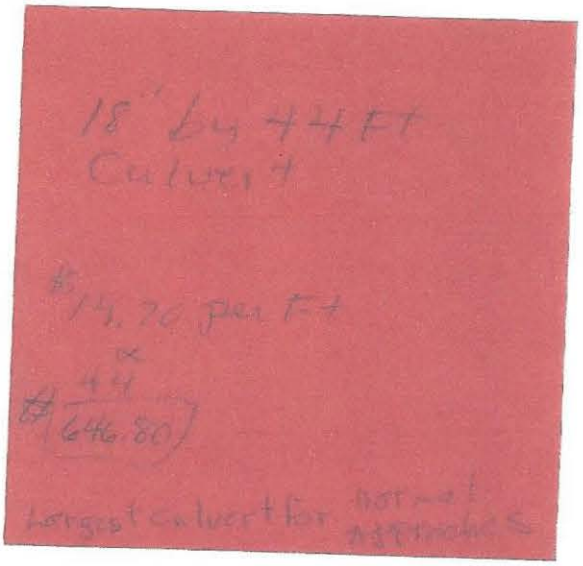
Driveway Specs.

1. Minimum of 30 ft. driveway top and maximum of 40 ft. driveway top
2. 6 to 1 End Slopes
3. Minimum of 18" (new) steel culvert (no plastic or concrete)
4. Only Clean fill dirt (no rocks, concrete, wood)
5. Minimum of 6" of gravel for surface, no quartzite, or rock in R.O.W.
6. Minimum of 0.2' of drop per 40'
7. No decorative rock or landscaping on end slopes.
8. End Slopes must be seeded, SDDOT Type C seed mixture

After installation is complete Hwy. Supt. will inspect & sign off.

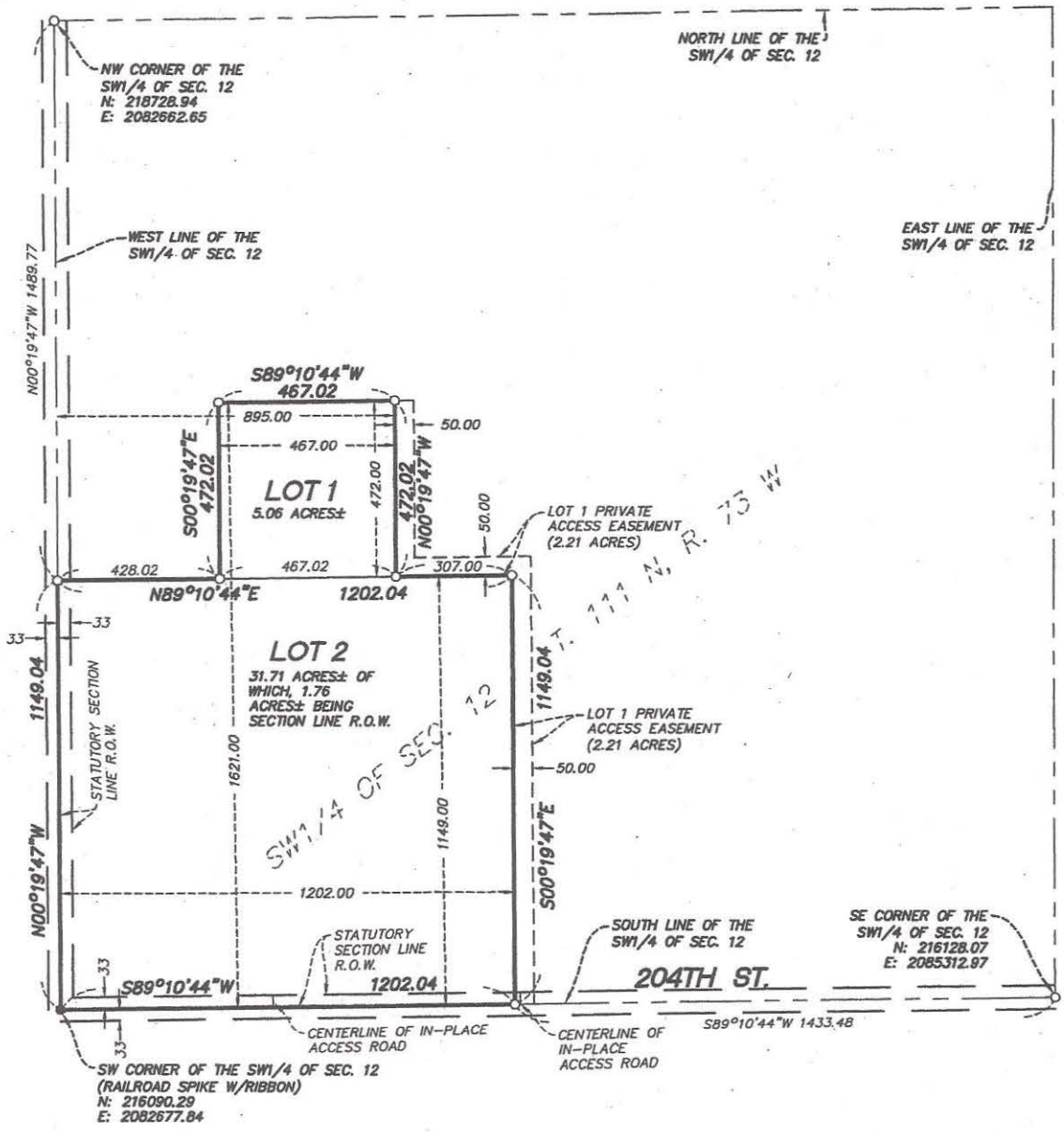
Hyde County Highway Department

Mike Cowan
Hyde County Highway Superintendent



©2019 Westwood Professional Services, Inc.

PLAT SHOWING
LOTS 1 AND 2 OF KUSSER ADDITION
IN THE SW1/4 OF SECTION 12
TOWNSHIP 111 NORTH, RANGE 73 WEST OF THE 5TH P.M., HYDE COUNTY, SOUTH DAKOTA



DRAFT

LEGEND:

- ● Found Monument (as noted)
- ○ Set 1/2" rebar with cap LS 10170

BASIS OF BEARINGS:

Bearings shown are based on South Dakota State Plane Coordinate System, North Zone, U.S. survey feet (2011 adjustment). Distances shown are ground distances, coordinates listed are state plane grid coordinates.

300 0 300 600 900
Scale in feet

Westwood
Phone (320) 253-8495 3701 12th Street North, Suite 206
Fax (320) 356-2001 St. Cloud, MN 56303
Toll Free (800) 270-8495 westwoodps.com
Westwood Professional Services, Inc.

0022235_SUB_PLAT1.dwg

©2019 Westwood Professional Services, Inc.

PLAT SHOWING
LOTS 1 AND 2 OF KUSSER ADDITION
IN THE SW1/4 OF SECTION 12
TOWNSHIP 111 NORTH, RANGE 73 WEST OF THE 5TH P.M., HYDE COUNTY, SOUTH DAKOTA

OWNERS CERTIFICATE:

I, THE UNDERSIGNED, DO HEREBY CERTIFY THAT I AM THE OWNER OF "LOTS 1 AND 2 OF KUSSER ADDITION IN THE SOUTHWEST QUARTER OF SECTION 12, TOWNSHIP 111 NORTH, RANGE 73 WEST OF THE 5TH P.M., HYDE COUNTY, SOUTH DAKOTA", AND THAT SAID PLAT HAS BEEN MADE AT MY REQUEST AND IN ACCORDANCE WITH MY INSTRUCTIONS FOR THE PURPOSE OF TRANSFER, AND THAT THE DEVELOPMENT OF THIS LAND SHALL CONFORM TO ALL EXISTING APPLICABLE ZONING, SUBDIVISION, EROSION AND SEDIMENT CONTROL REGULATIONS. IT IS FURTHER PROVIDED THAT ANY STREETS, ROADS, ALLEYS, AND/OR OTHER EASEMENTS SHOWN ON THIS PLAT ARE HEREBY, OR HAVE BEEN PREVIOUSLY, DEDICATED FOR THE PURPOSES INDICATED THEREON.

SIGNED THIS _____ DAY OF _____, 2019.

OWNER SIGNATURE: _____

OWNER NAME (PRINTED): RODNEY R. KUSSER, AS TRUSTEE OF THE RODNEY R. KUSSER LIVING TRUST DATED AUGUST 1, 2015

ACKNOWLEDGMENT OF OWNER:

ON THIS_____ DAY OF_____,2019, BEFORE ME, THE UNDERSIGNED OFFICER, PERSONALLY APPEARED RODNEY R. KUSSER, AS TRUSTEE OF THE RODNEY R. KUSSER LIVING TRUST DATED AUGUST 1, 2015 KNOWN TO ME TO BE THE PERSON IN AND WHO EXECUTED THE WITHIN INSTRUMENT.

MY COMMISSION EXPIRES_____ NOTARY PUBLIC_____

COUNTY OF _____

STATE OF_____

SIGNED THIS _____ DAY OF _____, 2019.

OWNER SIGNATURE: _____

OWNER NAMES (PRINTED): RODNEY R. KUSSER, AS TRUSTEE OF THE RODNEY R. KUSSER LIVING TRUST DATED AUGUST 1, 2015

SURVEYOR'S CERTIFICATE:

I, JASON LATZKE, REGISTERED LAND SURVEYOR IN THE STATE OF SOUTH DAKOTA, DO HEREBY CERTIFY THAT AT THE INSTANCE AND REQUEST OF RODNEY R. KUSSER, OWNER OF THE ABOVE DESCRIBED PROPERTY, DID SURVEY THE PARCEL OF LAND AS SHOWN ON THE ACCOMPANYING PLAT.

I FURTHER CERTIFY THAT THE SAID PLAT IS A TRUE AND CORRECT REPRESENTATION OF THE SAID PARCEL AS SURVEYED AND PLATTED BY ME INTO:

"LOTS 1 AND 2 OF KUSSER ADDITION IN THE SOUTHWEST QUARTER OF SECTION 12, TOWNSHIP 111 NORTH, RANGE 73 WEST OF THE 5TH P.M., HYDE COUNTY, SOUTH DAKOTA"

I HEREBY SET MY HAND THIS_____ DAY OF_____, 2019.

TREASURER'S CERTIFICATE:

I HEREBY CERTIFY THAT ALL TAXES WHICH ARE LIENS UPON ANY OF THE LANDS INCLUDED IN THE ATTACHED PLAT ARE SHOWN BY THE RECORDS OF MY OFFICE TO BE FULLY PAID.

SIGNED THIS _____ DAY OF _____, 2019.

COUNTY TREASURER, HYDE COUNTY, SOUTH DAKOTA: _____

DIRECTOR OF EQUALIZATION CERTIFICATE:

I HEREBY CERTIFY THAT I HAVE RECEIVED A COPY OF THIS PLAT THIS _____ DAY OF _____, 2019.

DIRECTOR OF EQUALIZATION, HYDE COUNTY, SOUTH DAKOTA: _____

Westwood
Phone (320) 253-9495 3701 12th Street North, Suite 206
Fax (320) 356-2001 St. Cloud, MN 56303
Toll Free (800) 270-9495 westwoodps.com
Westwood Professional Services, Inc.

0022235_SUB_PLAT1.dwg

©2019 Westwood Professional Services, Inc.

PLAT SHOWING
LOTS 1 AND 2 OF KUSSER ADDITION
IN THE SW1/4 OF SECTION 12 TOWNSHIP 111 NORTH, RANGE 73 WEST OF THE 5TH P.M., HYDE COUNTY, SOUTH DAKOTA

COUNTY PLANNING COMMISSION APPROVAL:

WE, THE MEMBERS OF THE PLANNING AND ZONING COMMISSION OF HYDE COUNTY, SOUTH DAKOTA, DO HEREBY CERTIFY THAT WE HAVE EXAMINED THE PLAT ENTITLED, "LOTS 1 AND 2 OF KUSSER ADDITION IN THE SOUTHWEST QUARTER OF SECTION 12, TOWNSHIP 111 NORTH, RANGE 73 WEST OF THE 5TH P.M., HYDE COUNTY, SOUTH DAKOTA", AND HEREBY GIVE OUR APPROVAL FOR THE INSTRUMENT TO BE RECORDED.

DATED THIS _____ DAY OF_____, 2019.

_____
CHAIRMAN, PLANNING AND ZONING
HYDE COUNTY, SOUTH DAKOTA

RESOLUTION BY COUNTY COMMISSIONERS:

RESOLUTION NO. _____

A RESOLUTION APPROVING THE PLAT OF "LOTS 1 AND 2 OF KUSSER ADDITION IN THE SOUTHWEST QUARTER OF SECTION 12, TOWNSHIP 111 NORTH, RANGE 73 WEST OF THE 5TH P.M., HYDE COUNTY, SOUTH DAKOTA"

WHEREAS, THE PLAT OF THE ABOVE DESCRIBED PROPERTY HAS BEEN EXECUTED ACCORDING TO STATUTE, NOW THEREFORE

BE IT RESOLVED THAT THE COUNTY COMMISSION IN AND FOR HYDE COUNTY, DOES HEREBY APPROVE THE SAID PLAT

DATED THIS _____ DAY OF_____, 2019.

_____
CHAIRMAN, BOARD OF COUNTY COMMISSIONERS
HYDE COUNTY, SOUTH DAKOTA

I, AUDITOR OF HYDE COUNTY, DO HEREBY CERTIFY THAT AN OFFICIAL MEETING ON _____, 2019, THE COUNTY COMMISSIONERS DID BY RESOLUTION APPROVE THE PLAT OF "LOTS 1 AND 2 OF KUSSER ADDITION IN THE SOUTHWEST QUARTER OF SECTION 12, TOWNSHIP 111 NORTH, RANGE 73 WEST OF THE 5TH P.M., HYDE COUNTY, SOUTH DAKOTA"

_____
COUNTY AUDITOR, HYDE COUNTY, SOUTH DAKOTA

REGISTER OF DEEDS' CERTIFICATE:

FILED FOR RECORD THIS _____ DAY OF _____, 2019, AT _____ O'CLOCK _____.M. AND DULY RECORDED IN

BOOK NO. _____, PAGE NO. _____

REGISTER OF DEEDS, HYDE COUNTY, SOUTH DAKOTA: _____

Westwood
Phone (320) 253-9485 3701 12th Street North, Suite 206
Fax (320) 368-2001 St. Cloud, MN 56303
Toll Free (800) 270-9495 westwoodps.com
Westwood Professional Services, Inc.

0022235_SUB_PLAT1.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 200th Street in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 1545' East of 326th Ave & 200th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.28'59.73" W Long. -99.38'16.77"W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: ~~N/A~~ As determined by Hyde County Highway Superintendent
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001678 NW4 29-112-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Tanya Dance
Signature of Applicant

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 200th Street in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 1545' East of 326th Ave & 200th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.28'59.73" W Long. -99.38'16.77"W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: N/A
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001678 NW4 29-112-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

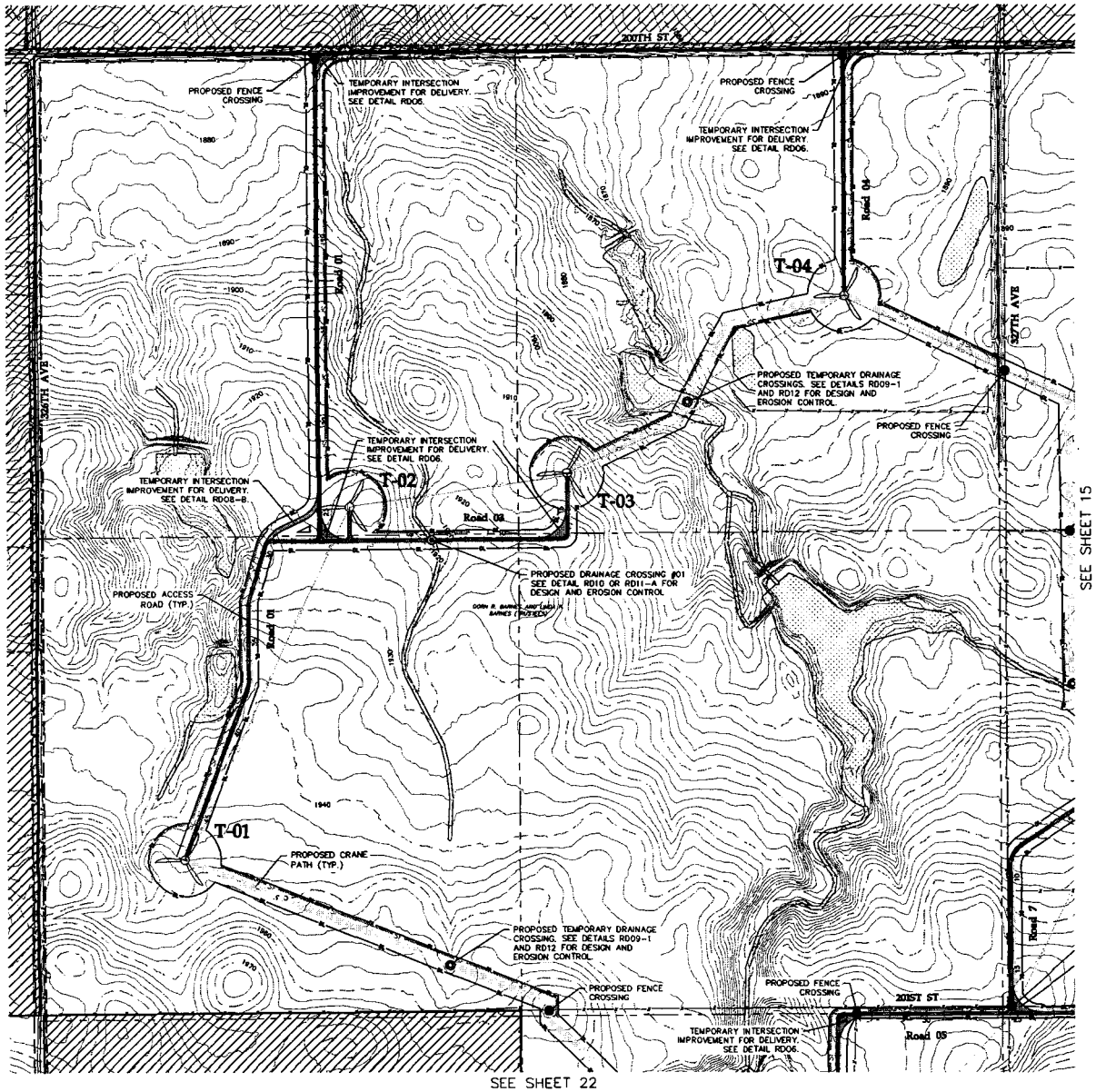
Submitted August 1, 20 19 Date Approved: _____

Tanya Dana
_____ _____
Signature of Applicant Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

©2019 Westwood Professional Services, Inc.



LEGEND:

- PROPOSED TURBINE LOCATION
- T-XX — PROPOSED TURBINE NUMBER
- PROPOSED ALTERNATE TURBINE LOCATION
- ALT-XX — PROPOSED ALTERNATE TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED ALTERNATE ACCESS ROAD
- PROPOSED CRANE PATH
- PROPOSED UNDERGROUND COLLECTION*
- PROPOSED DISTURBANCE LIMITS
- PROPOSED PERIMETER SEDIMENT CONTROL
- EXISTING 10' CONTOURS
- EXISTING 2' CONTOURS
- EXISTING GRAVEL EDGE
- EXISTING BITUMINUS EDGE
- EXISTING RIGHT-OF-WAY
- EXISTING PARCEL LINE
- EXISTING BUILDING
- EXISTING FENCE
- EXISTING OVERHEAD POWER
- EXISTING HIGH VOLTAGE OVERHEAD POWER
- EXISTING UNDERGROUND POWER LINE
- EXISTING FIBER OPTIC LINE
- EXISTING WATER LINE
- DELINEATED WETLAND
- ARCHAEOLOGICAL AVOIDANCE AREA
- EXISTING USFWS EASEMENT
- PROJECT BOUNDARY
- 1900 — EXISTING GROUND ELEVATION
- PROPOSED DRAINAGE CROSSING**
- PROPOSED TEMPORARY DRAINAGE CROSSING**
- PROPOSED FENCE CROSSING***
- PROPOSED UTILITY CROSSING
- PROPOSED CULVERT

* PROVIDED BY OTHERS AND SHOWN FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSTRUCTION PLANS FOR DETAILS.

** SEE SHEET 11 FOR DRAINAGE CROSSING TYPE AND SIZING. DRAINAGE CROSSINGS SHALL CONSIST OF LOW WATER CROSSING OR CULVERT. DRAINAGE CROSSINGS ALONG CRANE PATH SHALL CONSIST OF CRANE MATS OR TEMPORARY CULVERT.

*** ALL GATE INSTALLATIONS SHALL BE FIELD DETERMINED AND AGREED UPON BY THE CONTRACTOR AND OWNER.

							14	15	16	17	18	19	20				
21	22	23	24	25	26	27	28	29	30	31							
							32	33	34	35	36	37	38				
						39	40	41	42	43	44	45	46				
					47	48	49	50	51								
				52	53	54	55										

KEY MAP

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com

Westwood Professional Services, Inc.

Designed: BMC
Checked: DSN
Drawn: BMC
As-Built Drawing:

Revisions #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2320 2nd Avenue NW
West Fargo, ND 58078

0' 300' 600' 900'

Triple H Wind Farm

Hyde County, South Dakota

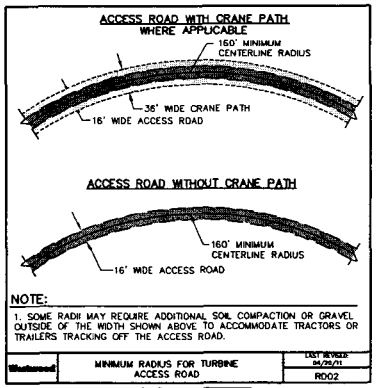
Site Plan T-01 - T-04

90% COMPLETE NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 14 OF 57

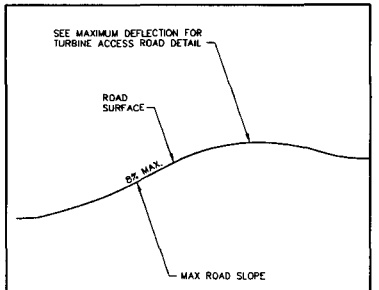
0014440SP01.dwg

©2019 Westwood Professional Services, Inc.



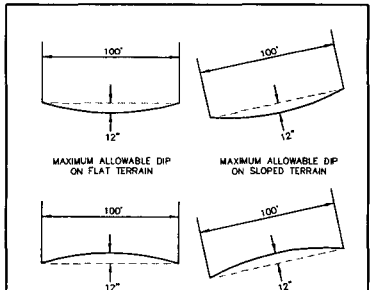
NOTE:
1. SOME RADII MAY REQUIRE ADDITIONAL SOIL COMPACTION OR GRAVEL OUTSIDE OF THE WIDTH SHOWN ABOVE TO ACCOMMODATE TRACTORS OR TRAILERS TRACKING OFF THE ACCESS ROAD.

Westwood	MINIMUM RADIUS FOR TURBINE ACCESS ROAD	LAST REVISED: 06/05/19
		RD02

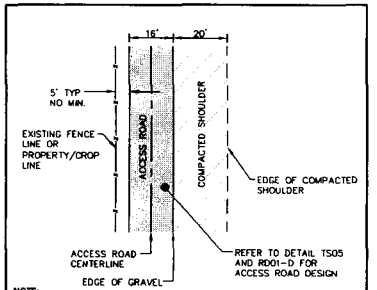


NOTES:
1. ROAD SLOPE SHALL NOT EXCEED 8% WITHOUT OWNER APPROVAL

Westwood	MAXIMUM VERT. SLOPE FOR TURBINE ACCESS ROAD/CRANE TRAVEL PATH	LAST REVISED: 3/29/07
		RD03

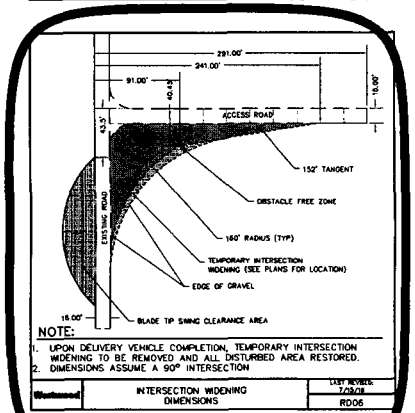


Westwood	MAXIMUM DEFLECTION FOR TURBINE ACCESS ROAD	LAST REVISED: 11/20/08
		RD04



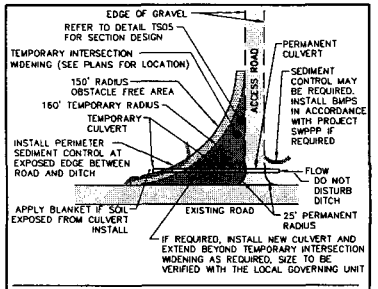
NOTE:
1. COMPACTED SHOULDER SHALL BE RETURNED TO NATIVE CONDITION FOLLOWING TURBINE GENERATOR CONSTRUCTION.
2. THE ACCESS ROAD MAY NEED TO BE CONSTRUCTED FARTHER FROM THE PROPERTY LINE IF OBSTRUCTIONS SUCH AS TREES FOLLOW THE PROPERTY LINE.

Westwood	TURBINE ACCESS ROAD ALONG FENCE/PROPERTY/CROP LINE	LAST REVISED: 3/29/07
		RD05



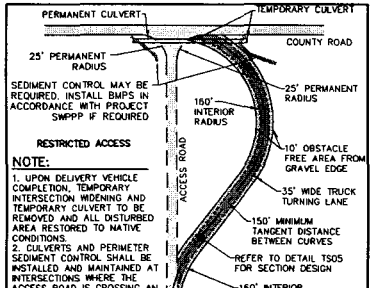
NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING TO BE REMOVED AND ALL DISTURBED AREA RESTORED.
2. DIMENSIONS ASSUME A 90° INTERSECTION

Westwood	INTERSECTION WIDENING DIMENSIONS	LAST REVISED: 7/09/18
		RD06



1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.

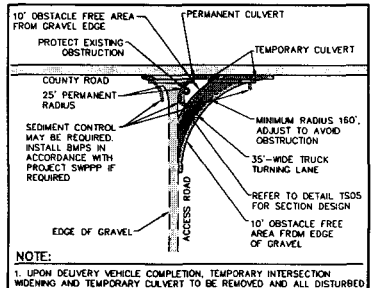
Westwood	TURBINE ACCESS ROAD TYPICAL INTERSECTION WIDENING	LAST REVISED: 3/29/07
		RD07



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

NOT TO SCALE

Westwood	TRUCK TRAFFIC TURNING LANE A	LAST REVISED: 3/29/07
		RD08-A



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

Westwood	TRUCK TRAFFIC TURNING LANE B	LAST REVISED: 12/3/14
		RD08-B

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
TollFree (888) 937-5150 westwood@e.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: TDH
Drawn: BMK
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/08/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

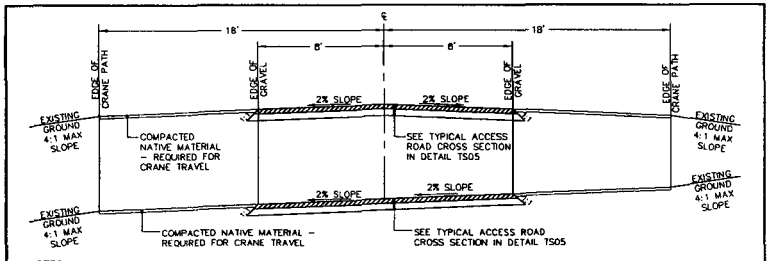
Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 5 OF 57

0014440DTP.dwg

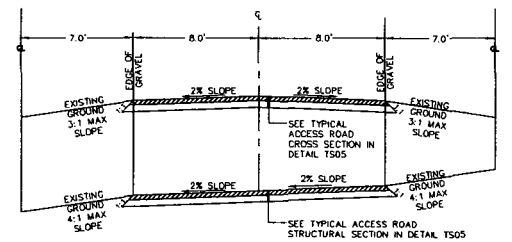
© 2019 Westwood Professional Services, Inc.



NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE ACCESS ROAD DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

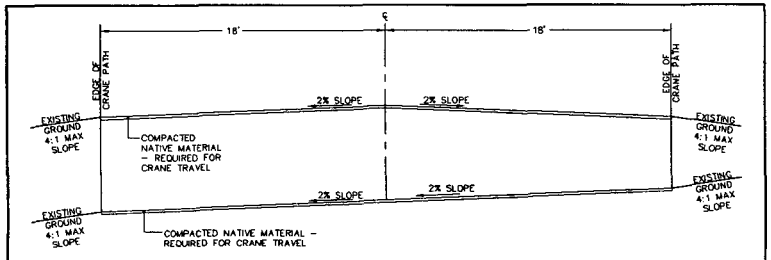
Westwood	TYPICAL TURBINE ACCESS ROAD AND CRANE PATH	LAST REVISED: 05/29/19
		RD01-A



NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

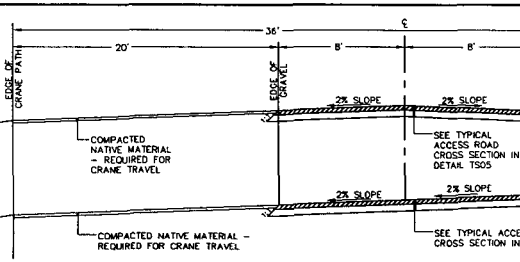
Westwood	TYPICAL TURBINE ACCESS ROAD SECTION	LAST REVISED: 3/29/19
		RD01-B



NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE WHERE CRANE PATHS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT CRANE PATH REMAINS WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%

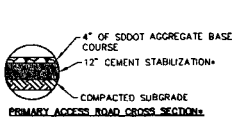
Westwood	TYPICAL CRANE PATH	LAST REVISED: 05/29/19
		RD01-C



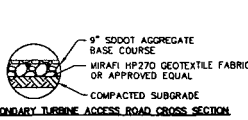
NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE EDGE OF COMPACTED SHOULDER DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

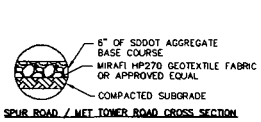
Westwood	TYPICAL TURBINE ACCESS ROAD AND OFFSET CRANE PATH	LAST REVISED: 05/29/19
		RD01-D



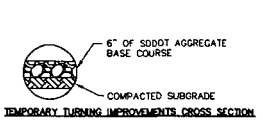
PRIMARY ACCESS ROAD CROSS SECTION*



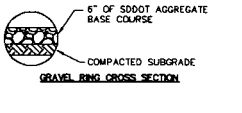
SECONDARY TURBINE ACCESS ROAD CROSS SECTION



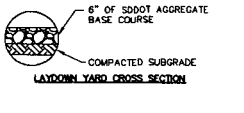
SPUR ROAD / WET TOWER ROAD CROSS SECTION



TEMPORARY TURNING IMPROVEMENTS CROSS SECTION



GRAVEL RING CROSS SECTION



LAYDOWN YARD CROSS SECTION

* CEMENT APPLICATION RATE MAY VARY BASED ON TEST STRIPS AND FIELD PERFORMANCE. SEE SHEET 13 FOR CEMENT STABILIZATION PROCEDURE AND DESIGN BASIS.

NOTES:

STRUCTURAL SECTIONS SHOWN ARE THE MINIMUM THICKNESS REQUIREMENTS DURING NORMAL FIELD CONDITIONS. THE SECTIONS MAY NEED TO BE INCREASED BASED ON ACTUAL FIELD CONDITIONS AT THE TIME OF CONSTRUCTION. CONDITIONS INCLUDE BUT ARE NOT LIMITED TO CONSTRUCTION DURING THE FREEZE/THAW CYCLE, UNUSUALLY WET PERIODS, OR IN LOW/WET AREAS. SEE SHEET 12 FOR TESTING REQUIREMENTS AND SPECIFICATIONS.

Westwood	TYPICAL STRUCTURAL CROSS SECTIONS

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (866) 937-5150 twinstate@w-ben.com
Westwood Professional Services, Inc.

Designed: BMC
Checked: DEN
Drawn: BMC
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	05/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 4 OF 57

00144400TP.dwg

©2019 Westwood Professional Services, Inc.

ROAD DESIGN PARAMETERS

1. ACCESS ROADS HAVE BEEN DESIGNED TO ACCOMMODATE LIGHT DUTY TRUCKS (PICKUP TRUCKS AND MAINTENANCE VEHICLES) FOR LOW VOLUME USE IN NORMAL OPERATING CONDITIONS AS WELL AS HEAVY DUTY CONSTRUCTION TRAFFIC UNDER DRY CONDITIONS. THE ROAD DESIGN SPECIFIED IS NOT INTENDED FOR ALL WEATHER USE FOR HEAVY DUTY CONSTRUCTION LOADS.
2. ROAD MAINTENANCE CAN BE EXPECTED OVER THE LIFE OF THE PERMANENT FACILITY.

PRODUCTS

1. AGGREGATE BASE SHALL CONSIST OF SDDOT AGGREGATE BASE COURSE (AND IN CONFORMANCE WITH THE GRADATION TABLE 1). AGGREGATE MAY BE CRUSHER RUN UPON ENGINEERS APPROVAL. AGGREGATE GRADATIONS SHALL BE SUBMITTED TO ENGINEER FOR REVIEW.
2. ROAD SHOULDERS AND CRANE PADS SHALL CONSIST OF COMPACTED NATIVE SOILS.
3. CULVERTS: ACCESS ROAD CULVERTS SHALL MEET THE MINIMUM SPECIFICATIONS SET FORTH BY THE SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION AND/OR HYDE COUNTY. ALL CULVERTS ARE PLANNED TO BE A MINIMUM 18" DIAMETER AND MANUFACTURED OF 16-GAGE CORRUGATED METAL PIPE WITH NO END TREATMENTS UNLESS NOTED OTHERWISE. ACTUAL SIZE WILL BE DETERMINED THROUGH HYDRAULIC ANALYSIS.
4. GEOTEXTILE FABRIC: MIRAFI HP270 OR APPROVED EQUAL.

EXECUTION

1. CLEARING AND GRUBBING
   A. THE CONTRACTOR SHALL BE REQUIRED TO GRUB ALL TREES, STUMPS, BRUSH, AND DEBRIS WITHIN THE GRADING AREAS SHOWN ON THE PLANS. GRUBBING INCLUDES REMOVAL OF ALL PLANT MATERIAL GREATER THAN 2" INCLUDING STUMPS, BRANCHES, ROOTS, ETC. TO A DEPTH BELOW THE FINAL SUBGRADE. THE CONTRACTOR IS TO REMOVE ONLY THOSE TREES WHICH ARE DESIGNATED BY THE OWNER'S REPRESENTATIVE FOR REMOVAL, AND SHALL EXERCISE EXTREME CARE AROUND EXISTING TREES TO BE SAVED.
2. TOPSOIL STRIPPING
   A. TOPSOIL, INCLUDING ROOTS LARGER THAN 2" AND LARGE ROOT MASSES, SHALL BE STRIPPED FROM ALL ROADWAY AND FOUNDATION AREAS UP TO 10". TOPSOIL SHALL NOT BE STRIPPED OUTSIDE OF THE DESIGNATED DISTURBANCE AREAS.
   B. ANY TOPSOIL THAT HAS BEEN STRIPPED SHALL BE STOCKPILED FOR POST CONSTRUCTION REVEGETATION. ALL TOPSOIL SHALL BE REDISTRIBUTED TO THE LAND OWNER'S PROPERTY OF WHERE IT ORIGINATED FROM.
3. FILL PLACEMENT
   A. FILL PLACEMENT SHALL CONSIST OF THE PLACING OF SUITABLE FILL MATERIAL, AFTER TOPSOIL STRIPPING, ABOVE THE EXISTING GRADE. GENERALLY, SIDE SLOPES SHALL BE CONSTRUCTED AT FOUR FOOT HORIZONTAL TO ONE FOOT VERTICAL, WITH SOME LOCATIONS THROUGHOUT THE PROJECT WITH SLOPES OF TWO FEET HORIZONTAL TO ONE FOOT VERTICAL. THE MATERIAL FOR FILL CONSTRUCTION SHALL BE OBTAINED FROM THE ACCESS ROAD/TURBINE EXCAVATION (SEE GEOTECHNICAL REPORT FOR RESTRICTIONS), OR ANY SUITABLE, APPROVED SOIL OBTAINED ONSITE/OFFSITE BY CONTRACTOR, AS DIRECTED OR APPROVED BY THE ENGINEER. THIS MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 12" AND CONSTRUCTED TO 95% OF THE MAXIMUM DRY DENSITY AND WITHIN 2% OF OPTIMUM MOISTURE CONTENT, AS DETERMINED BY THE STANDARD PROCTOR (AASHTO T99).
   B. SIDE SLOPES GREATER THAN 4:1 WILL NOT BE PERMITTED, UNLESS OTHERWISE NOTED ON THE PLAN.
   C. FILL SLOPES SHALL BE BENCHED INTO THE EXISTING SLOPE TO PREVENT MOVEMENT BETWEEN THE FILL AND NATIVE SOILS. BENCHES SHOULD BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO FILL PLACEMENT. POSITIVE DRAINAGE IS REQUIRED AT BENCHED AREAS AND AT THE TOE OF FILL SLOPES TO REMOVE SURFACE WATER.
4. SUBGRADE
   A. SUBGRADE PREPARED AT GRADE OR IN CUT REQUIRES SCARIFICATION AND RECOMPACTION TO A DEPTH OF 12" OR MORE.
   B. ACCESS ROAD CROSS SLOPES SHOWN IN THE PLANS ARE MEANT AS A GUIDE. ACCESS ROAD CROSS SLOPES MAY RANGE FROM 1% – 2%, CHECK WITH THE ENGINEER IF THE CROSS SLOPE FALLS OUTSIDE OF THIS RANGE. ACCESS ROADS BEING UTILIZED FOR CRANE TRAVEL SHOULD HAVE A MAX CROSS SLOPE OF 2%

TABLE 1: SDDOT AGGREGATE BASE COURSE – LOCALLY SOURCED	
SIEVE SIZE	PERCENT PASSING
1"	100
3/4"	80–100
1/2"	68–91
NO. 4	46–70
NO. 8	34–58
NO. 40	13–35
NO. 200	3–12

MEET FOLLOWING REQUIREMENTS PER 882.2

LIQUID LIMIT (MAX) = 25
PLASTICITY INDEX = 0–6
L.A ABRASION (% MAX) = 40%

GRADATION HAS BEEN OBTAINED FROM THE 2015 SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION BOOK.

STORM WATER DESIGN PARAMETERS

1. SEE SHEET 6 FOR CULVERT SIZING AND DESIGN PARAMETERS. SEE HYDROLOGY MEMO FOR FURTHER DESIGN CALCULATIONS. CULVERTS SHALL BE MINIMUM 18" CORRUGATED METAL PIPE. ALL TEMPORARY PORTIONS OF THE INSTALLED CULVERTS SHALL BE REMOVED UPON COMPLETION OF THE PROJECT.
2. IT IS EXPECTED THAT CULVERTS WILL BE OVERTOPPED DURING SOME STORMS AND MAINTENANCE WILL BE REQUIRED THROUGH THE LIFE OF THE PROJECT.
3. WHEN INSTALLING DRAINAGE CULVERTS THE CONTRACTOR SHALL USE JUDGMENT IN SETTING THE FLOW LINE ELEVATIONS AND CULVERT LONGITUDINAL SLOPE. TYPICALLY THE FLOW LINE ELEVATIONS AND LONGITUDINAL SLOPE OF THE CULVERT SHOULD MATCH THE NATURAL GROUND ELEVATIONS AND SLOPE TO ENSURE POSITIVE DRAINAGE. WHEN POSSIBLE, ALL CULVERTS SHOULD BE PLACED AT A MINIMUM 0.5% GRADE.
4. ANTICIPATED CULVERT CROSSINGS ARE SHOWN ON THE CONSTRUCTION PLAN, ADDITIONAL CULVERTS MAY NEED TO BE INSTALLED IN AREAS WHERE CONCENTRATED FLOW IS EXPECTED DUE TO CONSTRUCTION ACTIVITIES.
5. CONSTRUCTION DRAINAGE CROSSINGS TO MAINTAIN EXISTING FLOW CHARACTERISTICS OF THE FEATURES. FEATURES SHALL BE GRADED TO PRECONSTRUCTION CONTOURS.

TESTING

1. TESTING SHALL BE PERFORMED BY A DESIGNATED INDEPENDENT TESTING AGENCY.
2. SUBMIT ONE SET OF TESTING AND INSPECTION RECORDS SPECIFIED TO THE CIVIL ENGINEER OF RECORD.

DEFINITIONS:

1. PROOF ROLLING:
   SHALL BE PERFORMED IN THE PRESENCE OF THE GEOTECHNICAL ENGINEER OR QUALIFIED GEOTECHNICAL REPRESENTATIVE USING A FULLY LOADED TANDEM AXLE DUMP TRUCK OR WATER TRUCK WITH A MINIMUM GROSS WEIGHT OF 25 TONS OR A FULLY LOADED BELLY DUMP WITH AN EQUIVALENT AXLE LOADING. PROOF-ROLLING ACCEPTANCE STANDARDS INCLUDE NO RUTTING GREATER THAN 1.5 INCHES, AND NO "PUMPING" OF THE SOIL BEHIND THE LOADED TRUCK.
2. SIEVE ANALYSIS:
   SHALL BE CONDUCTED IN ACCORDANCE WITH AASHTO T27
3. PROCTORS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T99
4. ATTERBERG LIMITS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T89 AND T90
5. MOISTURE DENSITY (NUCLEAR DENSITY):
   SHALL BE DONE IN ACCORDANCE WITH AASHTO T310
6. DYNAMIC CONE PENETROMETER (DCP) TESTING:
   SHALL BE DONE IN ACCORDANCE WITH ASTM D6951-03

REQUIREMENTS:

1. FILL PLACEMENT:
   A. SOILS USED AS FILL MATERIAL SHALL BE TESTED FOR MOISTURE CONTENT AND PROCTOR TESTS.
   B. WHERE FILL CONSTRUCTION REQUIRES MORE THAN 12 INCHES OF FILL PLACEMENT, COMPACT EACH LIFT TO A MINIMUM OF 95 PERCENT OF THE MATERIAL'S MAXIMUM STANDARD PROCTOR DRY DENSITY.
2. COMPACTED SUBGRADE (CEMENT STABILIZED):
   A. SEE SHEET 13 FOR TESTING REQUIREMENTS AND PROCEDURE.
3. COMPACTED SUBGRADE (NON-CEMENT STABILIZED):
   A. THE ENTIRE SUBGRADE SHALL BE PROOF-ROLLED PRIOR TO THE PLACEMENT OF THE AGGREGATE BASE TO IDENTIFY AREAS OF UNSTABLE SUBGRADE.
   B. PERFORM A MINIMUM OF 3 DYNAMIC CONE PENETROMETER (DCP) TESTS PER ACCESS ROAD OR ONE FOR EVERY 1,000 LF OF ROAD, WHICHEVER IS GREATER. SUBGRADE MUST MEET A MINIMUM DCP OF 3 BLOWS PER 6" TO A TOTAL DEPTH OF 2' (MINIMUM CBR=1.5).
   C. IF A PASSING PROOF-ROLL OR DCP REQUIREMENTS CANNOT BE ACHIEVED THE FOLLOWING ALTERNATIVES MAY BE IMPLEMENTED:
      a. SCARIFY, DRY, AND RECOMPACT SUBGRADE
      b. REMOVE UNSUITABLE MATERIAL AND REPLACE WITH SUITABLE MATERIAL
      c. INCREASE AGGREGATE BASE THICKNESS
4. AGGREGATE BASE:
   A. AGGREGATE BASE SHALL BE PROOF-ROLLED OVER THE ENTIRE LENGTH. IF PROOF ROLLING DETERMINES THAT THE ROAD IS UNSTABLE, ADDITIONAL AGGREGATE SHALL BE ADDED UNTIL THE UNSTABLE SECTION IS ABLE TO PASS A PROOF ROLL.
   B. PROVIDE 1 SIEVE ANALYSIS (PROJECT MAX OF 20) PER 2500 CY OF ROAD BASE PLACED.
5. CRANE PAD AND CRANE PATHS / CRANE TRAVEL SHOULDERS:
   A. TESTING REQUIREMENTS ARE PENDING BASED ON CRANE PICK PLANS PROVIDED BY THE CONTRACTOR.

TABLE 2: TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
FILL PLACEMENT	PROCTOR	1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER LIFT PER 5000 SF OF FILL PLACED OR 1 PER 500 LF OF ROAD OR CRANE WALK
COMPACTED SUBGRADE (CEMENT STABILIZED):	SEE SHEET 13	SEE SHEET 13
COMPACTED SUBGRADE (NON-CEMENT STABILIZED):	PROOF-ROLL	ENTIRE AREA
	DCP	1 PER 1,000 FT OR MIN. 3 PER ROAD
AGGREGATE BASE	PROOF-ROLL	ENTIRE AREA
	SIEVE ANALYSIS, LL, PL, AND L.A ABRASION	1 PER 2,500 CY

GENERAL NOTES:

1. GROUND SURFACE CONTOURS (AT TWO-FOOT VERTICAL INTERVALS) AND ELEVATIONS ARE BASED ON A PHOTOGRAMMETRY SURFACE PROVIDED BY GEOTERRA. IF MAJOR DISCREPANCIES ARE FOUND IN THE GROUND ELEVATIONS DURING FIELD STAKING TO THE GROUND ELEVATIONS SHOWN ON THE PLANS, THE OWNER AND ENGINEER SHALL BE NOTIFIED.
2. WHERE SECTION OR SUBSECTION MONUMENTS ARE ENCOUNTERED, THE OWNER SHALL BE NOTIFIED BEFORE SUCH MONUMENTS ARE REMOVED. THE CONTRACTOR SHALL PROTECT AND CAREFULLY PRESERVE ALL PROPERTY MARKERS AND MONUMENTS UNTIL THE OWNER, AN AUTHORIZED SURVEYOR OR AGENT HAS WITNESSED OR OTHERWISE REFERENCED THEIR LOCATION.
3. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. TYPICAL DISTURBANCE SHALL BE LIMITED TO 10 LF FROM THE EDGE OF PROPOSED GRADING.
4. FINALIZE GRADING AROUND THE BASE OF TURBINES IN ACCORDANCE WITH DETAIL TS-03 AND TS-04.
5. GRADE ALL PROPOSED ROADS TO A MAXIMUM SLOPE OF 8% IF 8% SLOPE CANNOT BE ACHIEVED, THE CONTRACTOR MAY UTILIZE ASSIST VEHICLES FOR THE PURPOSE OF DELIVERIES. GRADE ALL PROPOSED CRANE PATHS TO A MAXIMUM OF 8% UNLESS OTHERWISE NOTED IN PLAN SHEETS.
6. ANY FACILITIES REMOVED TO ALLOW FOR CONSTRUCTION (MAILBOXES, SIGNS, FENCES, ETC.) SHALL BE REPLACED BY THE CONTRACTOR IN A CONDITION AS GOOD AS EXISTING.
7. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING DRAINAGE THROUGHOUT THE CONSTRUCTION OF THIS PROJECT. CONSTRUCTION ACTIVITIES SHALL NOT BLOCK THE NATURAL OR MANMADE CREEKS OR DRAINAGE SWALES CAUSING RAINWATER TO POND. DEPENDING ON FIELD CONDITIONS, ADDITIONAL CULVERTS IN EXCESS OF THOSE ON THE PLANS MAY BE REQUIRED.
8. WHILE BUILDING THE ROADS AND EXCAVATING THE TURBINE FOUNDATIONS, EXCESS SOIL WILL RESULT. THE CONTRACTOR SHALL DISPOSE OF THIS EXCESS SOIL IN AN APPROVED MANNER. EXCESS TOPSOIL SHALL BE DISTRIBUTED INTO A THIN LAYER ON LAND IMMEDIATELY ADJACENT TO WHERE THE TOPSOIL ORIGINATED. ALL EXCESS TOPSOIL TO BE WASTED ONSITE. WHILE DOING SO THE CONTRACTOR SHALL AVOID CAUSING RIDGES OR MOUNDS THAT WOULD MAKE IT DIFFICULT FOR STORM WATER RUNOFF TO DRAIN. THE FINAL SURFACE OF THE DISTURBED TOPSOIL SHALL BE SMOOTH AND FOLLOW THE NATURAL CONTOUR OF THE LAND.
9. THE CONTRACTOR SHALL NOTIFY SOUTH DAKOTA 811 AT LEAST 48 HOURS BEFORE EXCAVATION ACTIVITIES COMMENCE.
10. TEMPORARY INTERSECTION WIDENING SHALL, UPON COMPLETION OF ALL PROJECT CONSTRUCTION OR UPON NOTIFICATION OF THE ENGINEER, BE REMOVED AND THE AREA RESTORED TO ITS ORIGINAL LINES AND GRADES WITH TOPSOIL REPLACED, EXCEPT WHERE REQUESTED BY THE TOWNSHIP OR COUNTY TO PERMANENTLY REMAIN. DISTURBED AREAS OUTSIDE OF THE FINAL ROADWAY SHALL BE SEEDED AND MULCHED.
11. TURBINE SETBACKS ARE NOT IDENTIFIED ON THE CONSTRUCTION PLANS. IT SHALL BE THE RESPONSIBILITY OF THE OWNER AND CONTRACTOR TO ENSURE THAT ALL TURBINE SETBACKS MEET PROJECT REQUIREMENTS.
12. GEOTECHNICAL REPORTS WITH RECOMMENDATIONS HAVE BEEN PROVIDED BY THE OWNER. ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL ENGINEERING REPORT AND RECOMMENDATIONS.
13. FIELD SURVEY WETLAND INFORMATION HAS BEEN PROVIDED BY THE OWNER. ALL WETLAND DELINEATIONS AND PERMITTING SHALL BE THE RESPONSIBILITY OF OTHERS AND BE COMPLETED PRIOR TO CONSTRUCTION COMMENCING. THE OWNER AND GENERAL CONTRACTOR SHALL VERIFY THAT ALL WETLAND PERMITS HAVE BEEN SUBMITTED AND APPROVED PRIOR TO CONSTRUCTION COMMENCING.
14. CULTURAL RESOURCE REPORTS HAVE NOT BEEN PROVIDED. CULTURAL RESOURCE LOCATIONS ARE NOT SHOWN ON THE PLANS. INFORMATION WILL BE THE RESPONSIBILITY OF THE OWNER AND GENERAL CONTRACTOR. THE LOCATIONS OF CULTURAL RESOURCE SITES MAY BE CONFIDENTIAL AND PROTECTED BY STATE OR FEDERAL LAW. PUBLIC RELEASE OF SPECIFIC INFORMATION REGARDING THESE RESOURCES MAY BE RESTRICTED.
15. AN ENVIRONMENTAL ASSESSMENT HAS NOT BEEN PROVIDED. THE CONTRACTOR SHALL BE FAMILIAR WITH THE REPORT AND REVIEW ALL RECOMMENDATIONS.
16. ELECTRICAL INFORMATION SHOWN ON THE PLANS IS FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSULTANT'S PLANS FOR SPECIFIC LOCATIONS AND CONSTRUCTION DETAILS FOR THE UNDERGROUND POWER COLLECTION SYSTEM AND SUBSTATION.
17. CRANE PATHS ARE SHOWN ON THE CONSTRUCTION PLANS. IF THE CONTRACTOR PROPOSES ALTERNATE CRANE PATHS, THEY SHALL ENSURE THAT WETLAND AND CULTURAL RESOURCE CORRIDORS ARE NOT DISTURBED. FINAL CRANE PATH ALIGNMENTS SHALL BE DETERMINED BY THE CONTRACTOR BASED ON FIELD CONDITIONS WITHIN THE WETLAND AND CULTURAL RESOURCE CORRIDORS, SPECIAL LANDOWNER AGREEMENTS AND THE PROJECT BOUNDARY.
18. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. DISTURBANCE SHALL BE LIMITED TO 50 LF WIDTH FOR PROPOSED ACCESS ROADS AND 50 LF FOR CRANE PATHS, AND SHALL BE LIMITED TO A 250 LF RADIUS FOR PROPOSED WIND TURBINE GENERATORS. THE GRADING LIMITS SHALL BE CENTERED ON THE ROADWAYS AND WIND TURBINES. THE CONTRACTOR SHALL MAKE ALL EFFORTS TO KEEP ACTIVITIES WITHIN THE ERECTION AREAS SHOWN ON THE PLANS BUT IT IS UNDERSTOOD THAT SOME ACTIVITIES THAT WILL NOT REQUIRE GRADING OR SOIL DISTURBANCE MAY EXTEND BEYOND THE DEFINED LIMITS. DURING ERECTION OF THE ROTOR, TRUCKS AND/OR FORKLIFTS MAY EXTEND BEYOND THESE LIMITS. SEE DETAIL TS01 FOR TYPICAL ERECTION AREAS.
19. AN ALTA SURVEY HAS BEEN PROVIDED BY WESTWOOD. CONTRACTOR AND OWNER ARE RESPONSIBLE FOR LOCATING ALL UTILITIES AND VERIFYING LOCATION OF CONSTRUCTION ACTIVITIES PRIOR TO COMMENCING WORK.

STORMWATER POLLUTION PREVENTION PLAN (SWPPP):

1. THE CONTRACTOR SHALL PROVIDE EROSION CONTROL MEASURES AS PLANNED AND SPECIFIED FOLLOWING BEST MANAGEMENT PRACTICES AS OUTLINED BY THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND BEING IN CONFORMANCE WITH THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL STORMWATER PERMIT.
2. REFER TO THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR THE TRIPLE H WIND FARM, PREPARED BY WESTWOOD PROFESSIONAL SERVICES, FOR EROSION CONTROL AND RESTORATION SPECIFICATIONS, SEDIMENT AND EROSION CONTROL PROCEDURES, LOCATIONS OF BMPs, DETAILS, AND INSPECTION INFORMATION.
3. ALL PASTURES AND DRAINAGE SWALES DISTURBED DURING CONSTRUCTION ACTIVITIES AND NOT COVERED BY ROAD SURFACING MATERIALS, SHALL BE SEEDED IN ACCORDANCE WITH THE SWPP PLAN.
4. TEMPORARY EROSION CONTROL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE TEMPORARY EROSION CONTROL PLAN SHALL BE IN ACCORDANCE WITH THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND THE TRIPLE H WIND FARM STORMWATER POLLUTION PREVENTION PLAN ON FILE.

PROJECT CONTACT INFORMATION:

TITLE	COMPANY	NAME	CONTACT NUMBER
OWNER (PRIMARY)	ENGIE	CASEY WILLIS	805-569-6185
PROJECT MANAGER	WESTWOOD	DANI NYGREN	952-906-7493
ENGINEER OF RECORD	WESTWOOD	ROB COPOULS	952-906-7470
CONTRACTOR	WANZEK	JASON HELLERUD	701-893-3685

Westwood

Westwood Professional Services, Inc.

Designed:	SNK
Checked:	DJM
Drawn:	SNK
As-Built Drawing:	

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2020 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19

Sheet: 12 OF 57

0014440DTP.dwg

©2019 Westwood Professional Services, Inc.

CEMENT STABILIZATION - PROCEDURE

THE SPECIFICATIONS BELOW ARE GENERAL RECOMMENDATIONS/GUIDELINES FOR CEMENT STABILIZATION OF SUBGRADES FOR THE PROJECT. ACTUAL FIELD CONDITIONS MAY ALTER APPLICATION RATE. CONSULT GEOTECHNICAL ENGINEER FOR FURTHER RECOMMENDATIONS.

1. STRIP THE TOP ±4 INCHES OF TOPSOIL (THROUGH THE ROOT ZONE) FROM THE AREA TO BE STABILIZED. ROOTS SMALLER THAN 1/4" DIAMETER ARE CONSIDERED INSIGNIFICANT.
2. PERFORM A PROCTOR (ASTM D 698) TEST TO DETERMINE THE OPTIMUM MOISTURE CONTENT IF THE MATERIAL TO BE STABILIZED DOES NOT MATCH A PREVIOUSLY PERFORMED PROCTOR.
3. DETERMINE THE IN-SITU MOISTURE CONTENT USING A NUCLEAR DENSITY GAUGE (OR EQUIVALENT MOISTURE CONTENT TEST) DAILY, PRIOR TO INCORPORATION OF THE CEMENT. PROVIDE ADDITIONAL MOISTURE CONTENT TESTING AS NEEDED BASED ON WEATHER CONDITIONS.
   - 3.1. THE CONTRACTOR WILL BE ADVISED OF IN-SITU MOISTURE CONTENT, AND MOISTURE ADJUSTMENTS SHOULD BE MADE IF IN-SITU MOISTURE IS LESS THAN OPTIMUM MOISTURE CONTENT AS DETERMINED BY THE PROCTOR (ASTM D 698).
4. SOIL AND CEMENT BLENDING:
   - 4.1. COMPLETELY BLEND SUBGRADE SOIL WITH THE APPROPRIATE AMOUNT OF CEMENT BY WEIGHT. FIELD RESULTS FROM TEST STRIPS WILL DICTATE THE CEMENT APPLICATION RATE.
   - 4.2. IN AREAS OF HIGH MOISTURE OR POOR SOILS, THE CONTRACTOR MAY INCREASE THE PERCENT OF CEMENT IN ORDER TO MEET THE MINIMUM SUBGRADE STRENGTH REQUIREMENTS.
   - 4.3. THE USE OF A RECLAIMER IS AN ADEQUATE BLENDING METHOD. DISCING IS NOT AN ADEQUATE BLENDING METHOD.
   - 4.4. A STABILIZATION DEPTH OF 12" WAS USED FOR DESIGN PURPOSES. STABILIZATION DEPTH MAY NEED TO INCREASE TO 18" IN AREAS OF EXTREME MOISTURE OR POOR SOILS IN ORDER TO MEET THE STRENGTH AND PROOF ROLL REQUIREMENTS.
5. COMPACTION:
   - 5.1. A ROLLING PATTERN WILL BE ESTABLISHED USING A NUCLEAR DENSITY GAUGE DURING COMPACTION.
     - 5.1.1. COMPACTION WILL BE PERFORMED UNTIL THE STABILIZED MATERIAL REACHES THE "BREAK POINT" AFTER WHICH ADDITIONAL PASSES WITH A ROLLER RESULTS IN A LOSS OF DENSITY AS MEASURED BY A NUCLEAR DENSITY GAUGE.
     - 5.1.2. COMPACTION IS TYPICALLY ACHIEVED BY MULTIPLE PASSES OF A PADFOOT ROLLER UNTIL THE ROLLER "WALKS" OUT OF THE RECLAIMED MATERIAL (SPACE IS VISIBLE BETWEEN THE DRUM AND THE RECLAIMED MATERIAL). THIS IS FOLLOWED BY BLADING AND SHAPING THE RECLAIMED MATERIAL TO FINAL PROFILE AND CROSS SECTION, REMOVING HIGH AND LOW POINTS. SMOOTH DRUM OR RUBBER TIRE ROLLERS ARE THEN USED TO FINISH ROLLING (THIS IS WHEN THE DENSITY TESTS ARE PERFORMED) UNTIL THE DENSITY OF THE MATERIAL REACHES THE "BREAK POINT."
     - 5.1.3. THE NUMBER OF PASSES AND EQUIPMENT USED TO REACH THE "BREAK POINT" IS CONSIDERED THE ROLLING PATTERN.
     - 5.1.4. A NEW ROLLING PATTERN MAY NEED TO BE ESTABLISHED IF THE PERFORMANCE REQUIREMENTS ARE NOT BEING MET. THIS MAY BE DUE TO CHANGES IN THE MOISTURE CONTENT, THE SOIL TYPE, OR THE CEMENT RATE.
   - 5.2. THE TARGET DENSITY IS 98% OF THE MAXIMUM DENSITY DETERMINED FROM THE ROLLING PATTERN.
     - 5.2.1. DENSITY TESTS SHALL BE TAKEN AT THE RATE OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER TO CONFIRM THE DENSITY IS MATCHING THE TARGET. ONCE THE ROLLING PATTERN HAS BEEN CONFIRMED IT IS RECOMMENDED THAT TESTING CONTINUE AT 1 TEST PER 1,000 LF IN EACH PASS OF THE RECLAIMER.
     - 5.2.2. IF IT IS NOT POSSIBLE TO ATTAIN THE TARGET DENSITY, AND ADDITIONAL COMPACTION DOES NOT IMPROVE THE DENSITY, A NEW ROLLING PATTERN SHOULD BE ESTABLISHED.
   - 5.3. THE AIR TEMPERATURE SHALL BE ABOVE 40 DEGREES (F) DURING THE CEMENT STABILIZATION PROCESS. MIXING CEMENT INTO FROZEN GROUND IS NOT ACCEPTABLE.
6. THE STABILIZED MATERIAL SHALL BE CONTINUOUSLY WET CURED FOR A MINIMUM OF 24 HOURS (WET CURED IS IDENTIFIED VISUALLY AS DAMP SURFACE).
7. PERFORM SUBGRADE TESTING IN ACCORDANCE WITH TESTING SCHEDULE.
8. AGGREGATE PLACEMENT:
   - 8.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 8.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 8.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

CEMENT STABILIZATION - DESIGN BASIS

1. DURING INITIAL CONSTRUCTION, CONTRACTOR SHALL CONSTRUCT MINIMUM 300 LF TEST STRIPS CONTAINING 4%, 5%, AND 6% CEMENT IN ACCORDANCE WITH CEMENT STABILIZATION PROCEDURES.
2. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 3 FOR ANTICIPATED RESULTS):
   - 2.1. PERFORM INITIAL SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M BETWEEN 4 TO 6 HOURS AFTER FINAL COMPACTION.
   - 2.2. PERFORM ADDITIONAL DCP TESTING AT 24 AND 48 HOURS AFTER FINAL COMPACTION.
   - 2.3. PERFORM SUBSEQUENT DCP TESTS AT 7 DAYS AFTER FINAL COMPACTION AS VERIFICATION OF STRENGTH CURVE.
   - 2.4. A MINIMUM OF 3 TESTS PER TEST SECTION PER TIMEFRAME IS REQUIRED. TESTS SHALL BE TAKEN AT THE CENTERLINE AND 2' FROM EACH SHOULDER.
   - 2.5. RECORD DCP TEST RESULTS EVERY 6 INCHES TO TOTAL DEPTH OF 12 INCHES.

TABLE 3: TEST STRIP CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	COMPRESSIVE STRENGTH (PSF)
4 - 6 HOURS	6	5	1,800
24 HOURS	10	7	2,500
48 HOURS	15	10	3,300
7 DAYS	30	21	5,200

CEMENT STABILIZATION - PRODUCTION

1. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 5 FOR SUMMARY OF TESTING REQUIREMENTS):
   - 1.1. PERFORM SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M NO SOONER THAN 24 HOURS AFTER FINAL COMPACTION.
   - 1.2. DCP TESTING FREQUENCY SHALL BE WITH A RANDOM SPACING AND A MINIMUM OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER. A MINIMUM OF 3 TESTS PER ROAD IS REQUIRED.
   - 1.3. THE CBR OF THE STABILIZED SUBGRADE SHOULD BE CALCULATED IN 6" INCREMENTS THROUGH THE ENTIRE DEPTH OF THE STABILIZED LAYER.
   - 1.4. THE MINIMUM REQUIRED CBR PRIOR TO PROOF-ROLLING IS PROVIDED IN TABLE 4 BELOW:

TABLE 4: FINAL CEMENT STABILIZED CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	UNDRAINED SHEAR STRENGTH (PSF)	BEARING CAPACITY (PSF)
24 - 48 HOURS	15	10	3,500	9,800
3 - 7 DAYS	30	21	7,000	18,000
28 DAYS	50	33	12,000	28,500

NOTE: UNDRAINED SHEAR STRENGTH WAS CALCULATED USING THE BLACK (1961) EQUATION. BEARING CAPACITY WAS CALCULATED USING THE VESIC EQUATION MODIFIED FOR TWO LAYERS (12" CEMENT STABILIZED SUBGRADE OVER A NATURAL SUBGRADE WITH A CBR OF 1.5)

   - 1.5. ONCE THE MINIMUM REQUIRED CBR IS ACHIEVED AT ANY CORRESPONDING TIME PERIOD, THE SUBGRADE IS CONSIDERED ADEQUATE AND THE CONTRACTOR MAY PROCEED WITH PROOF-ROLL TESTING. FUTURE DCP TESTING ON THAT SEGMENT OF SUBGRADE IS NOT REQUIRED.
   - 1.6. IF TESTING DOES NOT INDICATE A CBR OF 30 WITHIN 7 DAYS, ADDITIONAL GRAVEL SURFACING AND/OR THE ADDITION OF GEOTEXTILE FABRIC MAY BE REQUIRED. FOR FUTURE SUBGRADE STABILIZATION AREAS, CONTACT THE ENGINEER AND OWNER VIA RFI FOR RECOMMENDATIONS AND APPROVAL.
2. SUBGRADE PROOF-ROLL TESTING AND ACCEPTANCE:
   - 2.1. ONCE THE REQUIRED DCP VALUE HAS BEEN OBTAINED BUT PRIOR TO PLACING AGGREGATE, THE SUBGRADE SHALL BE PROOF-ROLLED. REFER TO THE PROJECT TESTING REQUIREMENTS FOR PROOF-ROLL DEFINITION.
   - 2.2. PROOF-ROLLING SHOULD BE PERFORMED WITH ONE PASS DOWN THE CENTER AND NOT BE PERFORMED WITHIN 12 INCHES OF THE EDGE OF THE STABILIZED SECTION.
   - 2.3. IF PROOF-ROLLING FAILS, RE-STABILIZATION MAY BE REQUIRED AND A NEW ROLLING PATTERN OR ADDITIONAL CEMENT MAY BE REQUIRED.
3. AGGREGATE PLACEMENT:
   - 3.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 3.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 3.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

TABLE 5: CEMENT STABILIZATION PRODUCTION TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
COMPACTED SUBGRADE (CEMENT STABILIZED)	PROCTOR	MINIMUM 1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER 1000 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
NOTE: SEE ABOVE FOR INITIAL TESTING REQUIREMENTS	DCP TEST	1 PER 500 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
	PROOF-ROLL (AFTER PASSING DCP TESTS)	ENTIRE LENGTH

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 mail@westwoodps.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: DBH
Drawn: BMK
As-Built Drawing:

Revisions #	DATE	DESCRIPTION
A	12/08/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 13 of 57

001444D7P.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 200th Street in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 855' East of 326th Ave & 200th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.29'00.02" W Long. -99.37'37.03"W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: ~~N/A~~ As determined by Hyde County Highway Superintendent
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001677 NE4 29-112-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Signature of Applicant

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 200th Street in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 855' East of 326th Ave & 200th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.29'00.02" W Long. -99.37'37.03"W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: N/A
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001677 NE4 29-112-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: _____

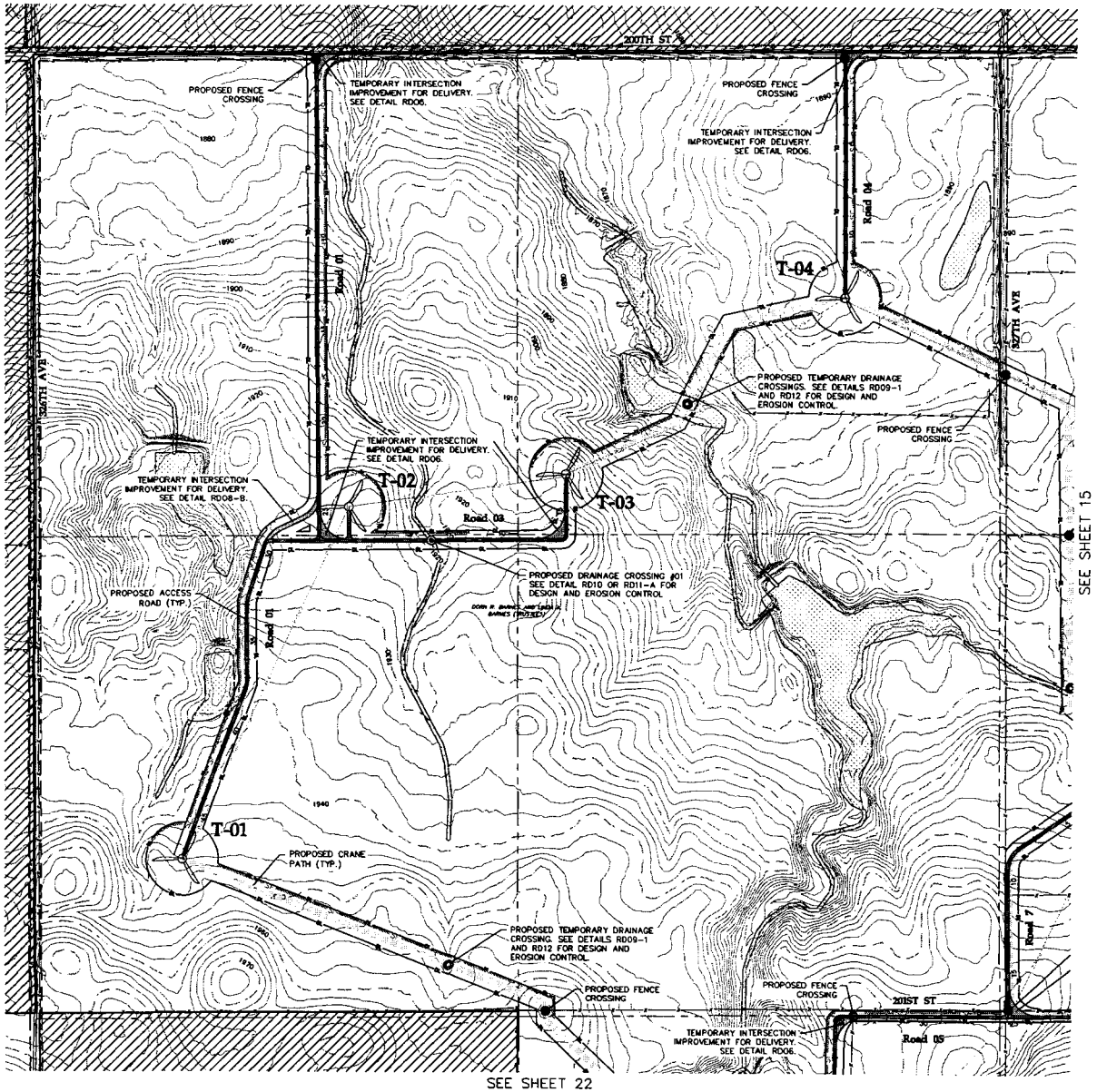
Signature of Applicant

Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

© 2019 Westwood Professional Services, Inc.



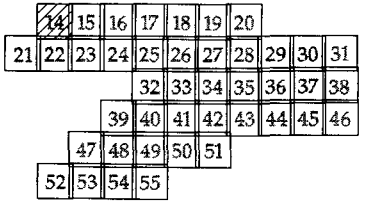
LEGEND:

- PROPOSED TURBINE LOCATION
- T-XX PROPOSED TURBINE NUMBER
- PROPOSED ALTERNATE TURBINE LOCATION
- ALT-XX PROPOSED ALTERNATE TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED ALTERNATE ACCESS ROAD
- PROPOSED CRANE PATH
- PROPOSED UNDERGROUND COLLECTION*
- PROPOSED DISTURBANCE LIMITS
- PROPOSED PERIMETER SEDIMENT CONTROL
- EXISTING 10' CONTOURS
- EXISTING 2' CONTOURS
- EXISTING GRAVEL EDGE
- EXISTING BITUMINUS EDGE
- EXISTING RIGHT-OF-WAY
- EXISTING PARCEL LINE
- EXISTING BUILDING
- EXISTING FENCE
- EXISTING OVERHEAD POWER
- EXISTING HIGH VOLTAGE OVERHEAD POWER
- EXISTING UNDERGROUND POWER LINE
- EXISTING FIBER OPTIC LINE
- EXISTING WATER LINE
- DELINEATED WETLAND
- ARCHAEOLOGICAL AVOIDANCE AREA
- EXISTING USFWS EASEMENT
- PROJECT BOUNDARY
- 1900 EXISTING GROUND ELEVATION
- PROPOSED DRAINAGE CROSSING**
- PROPOSED TEMPORARY DRAINAGE CROSSING**
- PROPOSED FENCE CROSSING***
- PROPOSED UTILITY CROSSING
- PROPOSED CULVERT

* PROVIDED BY OTHERS AND SHOWN FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSTRUCTION PLANS FOR DETAILS.

** SEE SHEET 11 FOR DRAINAGE CROSSING TYPE AND SIZING. DRAINAGE CROSSINGS SHALL CONSIST OF LOW WATER CROSSING OR CULVERT. DRAINAGE CROSSINGS ALONG CRANE PATH SHALL CONSIST OF CRANE MATS OR TEMPORARY CULVERT.

*** ALL GATE INSTALLATIONS SHALL BE FIELD DETERMINED AND AGREED UPON BY THE CONTRACTOR AND OWNER.



KEY MAP

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-free (866) 937-0150 westwoodps.com

Westwood Professional Services, Inc.

Designed: BMC
Checked: DEH
Drawn: BMC
As-Built Drawing:

Revisions #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2020 2nd Avenue NW
West Fargo, ND 58078

N

0' 300' 600' 900'

Triple H Wind Farm

Hyde County, South Dakota

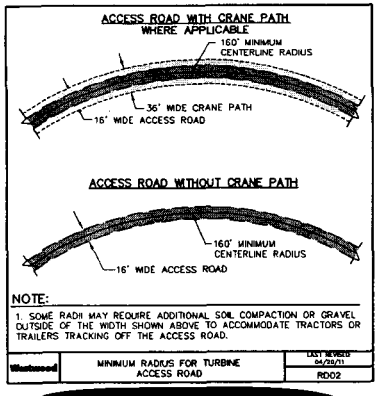
Site Plan T-01 - T-04

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 14 OF 57

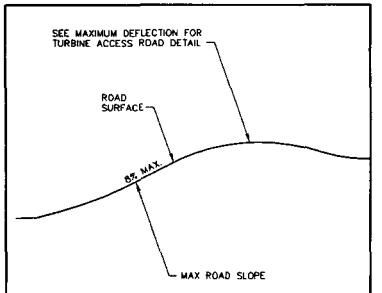
0014440SP01.dwg

© 2019 Westwood Professional Services, Inc.



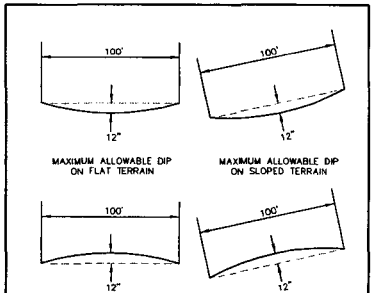
NOTE:
1. SOME RADII MAY REQUIRE ADDITIONAL SOIL COMPACTION OR GRAVEL OUTSIDE OF THE WIDTH SHOWN ABOVE TO ACCOMMODATE TRACTORS OR TRAILERS TRACKING OFF THE ACCESS ROAD.

Westwood	MINIMUM RADIUS FOR TURBINE ACCESS ROAD	LAST REVISED 04/29/11 RD02

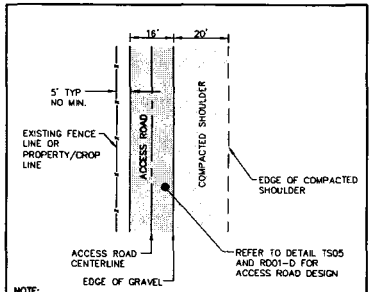


NOTES:
1. ROAD SLOPE SHALL NOT EXCEED 8% WITHOUT OWNER APPROVAL

Westwood	MAXIMUM VERT. SLOPE FOR TURBINE ACCESS ROAD/CRANE TRAVEL PATH	LAST REVISED 3/29/12 RD03

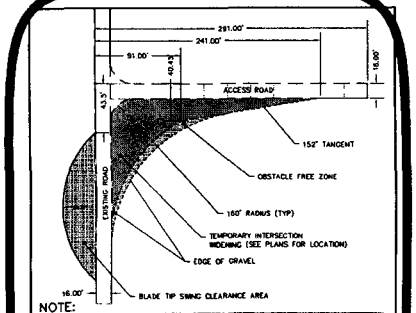


Westwood	MAXIMUM DEFLECTION FOR TURBINE ACCESS ROAD	LAST REVISED 01/02/08 RD04



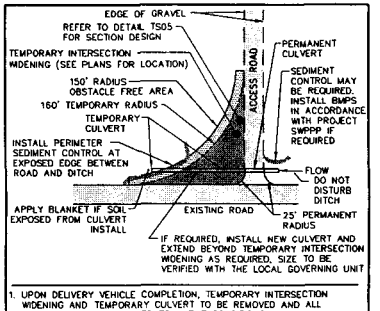
NOTE:
1. COMPACTED SHOULDER SHALL BE RETURNED TO NATIVE CONDITION FOLLOWING TURBINE GENERATOR CONSTRUCTION.
2. THE ACCESS ROAD MAY NEED TO BE CONSTRUCTED FARTHER FROM THE PROPERTY LINE IF OBSTRUCTIONS SUCH AS TREES FOLLOW THE PROPERTY LINE.

Westwood	TURBINE ACCESS ROAD ALONG FENCE/PROPERTY/CROP LINE	LAST REVISED 3/29/12 RD05



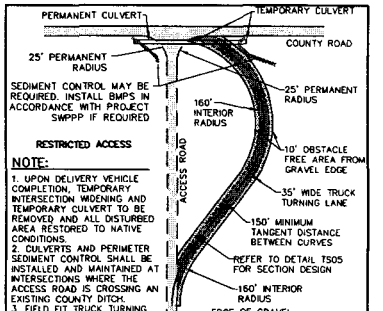
NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING TO BE REMOVED AND ALL DISTURBED AREA RESTORED.
2. DIMENSIONS ASSUME A 90° INTERSECTION

Westwood	INTERSECTION WIDENING DIMENSIONS	LAST REVISED 7/25/19 RD06



1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.

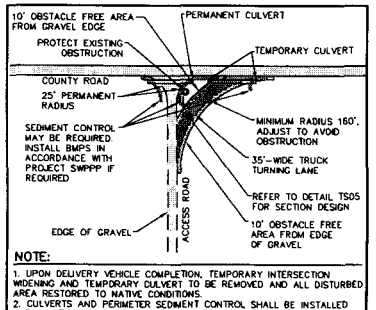
TURBINE ACCESS ROAD TYPICAL INTERSECTION WIDENING	LAST REVISED 3/2/07 RD07



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

NOT TO SCALE

Westwood	TRUCK TRAFFIC TURNING LANE A	LAST REVISED 3/2/07 RD08-A



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

Westwood	TRUCK TRAFFIC TURNING LANE B	LAST REVISED 12/3/14 RD08-B

Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (866) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed: BMC
Checked: DJH
Drawn: BMC
As-Built Drawings:

Revisions #	DATE	DESCRIPTION
A	12/08/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	05/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2028 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

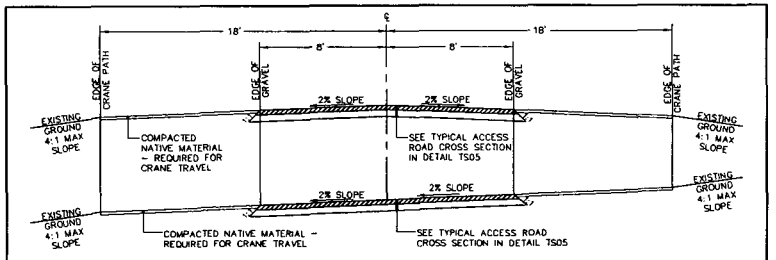
Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 5 OF 57

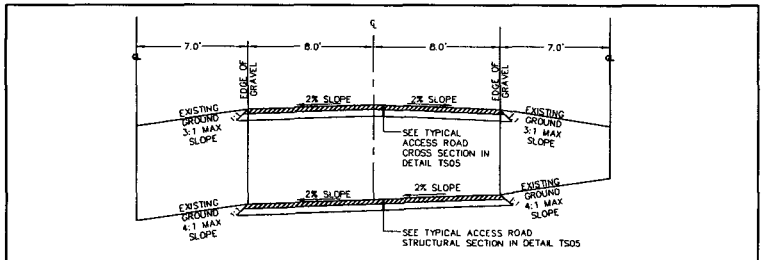
0014440DTP.dwg

© 2019 Westwood Professional Services, Inc.



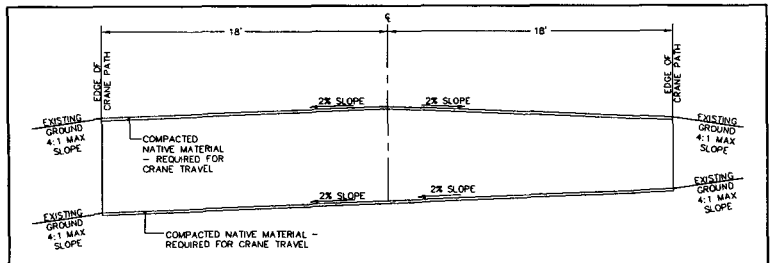
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE ACCESS ROAD DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

Westwood | TYPICAL TURBINE ACCESS ROAD AND CRANE PATH | LAST REVISED: 04/29/01 | RD01-A



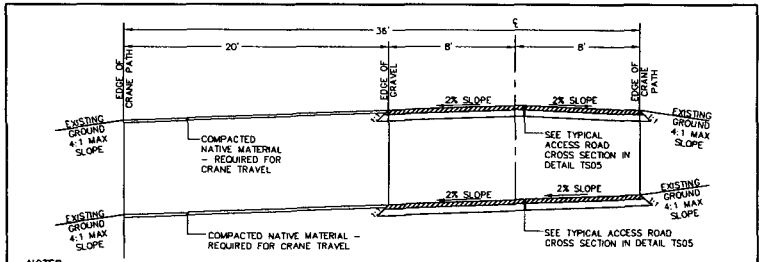
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

Westwood | TYPICAL TURBINE ACCESS ROAD SECTION | LAST REVISED: 3/28/19 | RD01-B



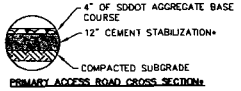
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE WHERE CRANE PATHS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT CRANE PATH REMAINS WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%

Westwood | TYPICAL CRANE PATH | LAST REVISED: 04/29/01 | RD01-C

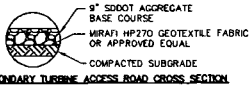


NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE EDGE OF COMPACTED SHOULDER DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

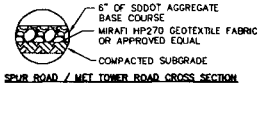
Westwood | TYPICAL TURBINE ACCESS ROAD AND OFFSET CRANE PATH | LAST REVISED: 05/29/01 | RD01-D



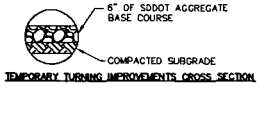
PRIMARY ACCESS ROAD CROSS SECTION*



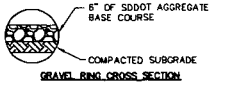
SECONDARY TURBINE ACCESS ROAD CROSS SECTION



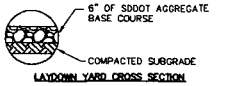
SPUR ROAD / MET TOWER ROAD CROSS SECTION



TEMPORARY TURNING IMPROVEMENTS CROSS SECTION



GRAVEL RING CROSS SECTION



LAYDOWN YARD CROSS SECTION

* CEMENT APPLICATION RATE MAY VARY BASED ON TEST STRIPS AND FIELD PERFORMANCE. SEE SHEET 13 FOR CEMENT STABILIZATION PROCEDURE AND DESIGN BASIS.

NOTES:
STRUCTURAL SECTIONS SHOWN ARE THE MINIMUM THICKNESS REQUIREMENTS DURING NORMAL FIELD CONDITIONS. THE SECTIONS MAY NEED TO BE INCREASED BASED ON ACTUAL FIELD CONDITIONS AT THE TIME OF CONSTRUCTION. CONDITIONS INCLUDE BUT ARE NOT LIMITED TO CONSTRUCTION DURING THE FREEZE/THAW CYCLE, UNUSUALLY WET PERIODS, OR IN LOW/WET AREAS. SEE SHEET 12 FOR TESTING REQUIREMENTS AND SPECIFICATIONS.

Westwood | TYPICAL STRUCTURAL CROSS SECTIONS

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (866) 937-5150 info@westwoodps.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: DEH
Drawn: BMK
As-Built Drawing:

Revisions #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	05/07/19	50% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 4 OF 57

001444DTP.dwg

© 2019 Westwood Professional Services, Inc.

ROAD DESIGN PARAMETERS

1. ACCESS ROADS HAVE BEEN DESIGNED TO ACCOMMODATE LIGHT DUTY TRUCKS (PICKUP TRUCKS AND MAINTENANCE VEHICLES) FOR LOW VOLUME USE IN NORMAL OPERATING CONDITIONS AS WELL AS HEAVY DUTY CONSTRUCTION TRAFFIC UNDER DRY CONDITIONS. THE ROAD DESIGN SPECIFIED IS NOT INTENDED FOR ALL WEATHER USE FOR HEAVY DUTY CONSTRUCTION LOADS.
2. ROAD MAINTENANCE CAN BE EXPECTED OVER THE LIFE OF THE PERMANENT FACILITY.

PRODUCTS

1. AGGREGATE BASE SHALL CONSIST OF SDDOT AGGREGATE BASE COURSE (AND IN CONFORMANCE WITH THE GRADATION TABLE 1). AGGREGATE MAY BE CRUSHER RUN UPON ENGINEERS APPROVAL. AGGREGATE GRADATIONS SHALL BE SUBMITTED TO ENGINEER FOR REVIEW.
2. ROAD SHOULDERS AND CRANE PADS SHALL CONSIST OF COMPACTED NATIVE SOILS.
3. CULVERTS: ACCESS ROAD CULVERTS SHALL MEET THE MINIMUM SPECIFICATIONS SET FORTH BY THE SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION AND/OR HYDE COUNTY. ALL CULVERTS ARE PLANNED TO BE A MINIMUM 18" DIAMETER AND MANUFACTURED OF 16-GAGE CORRUGATED METAL PIPE WITH NO END TREATMENTS UNLESS NOTED OTHERWISE. ACTUAL SIZE WILL BE DETERMINED THROUGH HYDRAULIC ANALYSIS.
4. GEOTEXTILE FABRIC: MIRAFI HP270 OR APPROVED EQUAL.

EXECUTION

1. CLEARING AND GRUBBING
   A. THE CONTRACTOR SHALL BE REQUIRED TO GRUB ALL TREES, STUMPS, BRUSH, AND DEBRIS WITHIN THE GRADING AREAS SHOWN ON THE PLANS. GRUBBING INCLUDES REMOVAL OF ALL PLANT MATERIAL GREATER THAN 2" INCLUDING STUMPS, BRANCHES, ROOTS, ETC. TO A DEPTH BELOW THE FINAL SUBGRADE. THE CONTRACTOR IS TO REMOVE ONLY THOSE TREES WHICH ARE DESIGNATED BY THE OWNER'S REPRESENTATIVE FOR REMOVAL, AND SHALL EXERCISE EXTREME CARE AROUND EXISTING TREES TO BE SAVED.
2. TOPSOIL STRIPPING
   A. TOPSOIL, INCLUDING ROOTS LARGER THAN 2" AND LARGE ROOT MASSES, SHALL BE STRIPPED FROM ALL ROADWAY AND FOUNDATION AREAS UP TO 10". TOPSOIL SHALL NOT BE STRIPPED OUTSIDE OF THE DESIGNATED DISTURBANCE AREAS.
   B. ANY TOPSOIL THAT HAS BEEN STRIPPED SHALL BE STOCKPILED FOR POST CONSTRUCTION REVEGETATION. ALL TOPSOIL SHALL BE REDISTRIBUTED TO THE LAND OWNER'S PROPERTY OF WHERE IT ORIGINATED FROM.
3. FILL PLACEMENT
   A. FILL PLACEMENT SHALL CONSIST OF THE PLACING OF SUITABLE FILL MATERIAL, AFTER TOPSOIL STRIPPING, ABOVE THE EXISTING GRADE. GENERALLY, SIDE SLOPES SHALL BE CONSTRUCTED AT FOUR FOOT HORIZONTAL TO ONE FOOT VERTICAL, WITH SOME LOCATIONS THROUGHOUT THE PROJECT WITH SLOPES OF TWO FEET HORIZONTAL TO ONE FOOT VERTICAL. THE MATERIAL FOR FILL CONSTRUCTION SHALL BE OBTAINED FROM THE ACCESS ROAD/TURBINE EXCAVATION (SEE GEOTECHNICAL REPORT FOR RESTRICTIONS), OR ANY SUITABLE, APPROVED SOIL OBTAINED ONSITE/OFFSITE BY CONTRACTOR, AS DIRECTED OR APPROVED BY THE ENGINEER. THIS MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 12" AND CONSTRUCTED TO 95% OF THE MAXIMUM DRY DENSITY AND WITHIN 2% OF OPTIMUM MOISTURE CONTENT, AS DETERMINED BY THE STANDARD PROCTOR (AASHTO T99).
   B. SIDE SLOPES GREATER THAN 4:1 WILL NOT BE PERMITTED, UNLESS OTHERWISE NOTED ON THE PLAN.
   C. FILL SLOPES SHALL BE BENCHED INTO THE EXISTING SLOPE TO PREVENT MOVEMENT BETWEEN THE FILL AND NATIVE SOILS. BENCHES SHOULD BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO FILL PLACEMENT. POSITIVE DRAINAGE IS REQUIRED AT BENCHED AREAS AND AT THE TOE OF FILL SLOPES TO REMOVE SURFACE WATER.
4. SUBGRADE
   A. SUBGRADE PREPARED AT GRADE OR IN CUT REQUIRES SCARIFICATION AND RECOMPACTION TO A DEPTH OF 12" OR MORE.
   B. ACCESS ROAD CROSS SLOPES SHOWN IN THE PLANS ARE MEANT AS A GUIDE. ACCESS ROAD CROSS SLOPES MAY RANGE FROM 1% - 2%, CHECK WITH THE ENGINEER IF THE CROSS SLOPE FALLS OUTSIDE OF THIS RANGE. ACCESS ROADS BEING UTILIZED FOR CRANE TRAVEL SHOULD HAVE A MAX CROSS SLOPE OF 2%.

TABLE 1: SDDOT AGGREGATE BASE COURSE - LOCALLY SOURCED	
SIEVE SIZE	PERCENT PASSING
1"	100
3/4"	80-100
1/2"	68-91
NO. 4	46-70
NO. 8	34-58
NO. 40	13-35
NO. 200	3-12

MEET FOLLOWING REQUIREMENTS PER 882.2

LIQUID LIMIT (MAX) = 25
PLASTICITY INDEX = 0-6
L.A ABRASION (% MAX) = 40%

GRADATION HAS BEEN OBTAINED FROM THE 2015 SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION BOOK.

STORM WATER DESIGN PARAMETERS

1. SEE SHEET 6 FOR CULVERT SIZING AND DESIGN PARAMETERS. SEE HYDROLOGY MEMO FOR FURTHER DESIGN CALCULATIONS. CULVERTS SHALL BE MINIMUM 18" CORRUGATED METAL PIPE. ALL TEMPORARY PORTIONS OF THE INSTALLED CULVERTS SHALL BE REMOVED UPON COMPLETION OF THE PROJECT.
2. IT IS EXPECTED THAT CULVERTS WILL BE OVERTOPPED DURING SOME STORMS AND MAINTENANCE WILL BE REQUIRED THROUGH THE LIFE OF THE PROJECT.
3. WHEN INSTALLING DRAINAGE CULVERTS THE CONTRACTOR SHALL USE JUDGMENT IN SETTING THE FLOW LINE ELEVATIONS AND CULVERT LONGITUDINAL SLOPE. TYPICALLY THE FLOW LINE ELEVATIONS AND LONGITUDINAL SLOPE OF THE CULVERT SHOULD MATCH THE NATURAL GROUND ELEVATIONS AND SLOPE TO ENSURE POSITIVE DRAINAGE. WHEN POSSIBLE, ALL CULVERTS SHOULD BE PLACED AT A MINIMUM 0.5% GRADE.
4. ANTICIPATED CULVERT CROSSINGS ARE SHOWN ON THE CONSTRUCTION PLAN, ADDITIONAL CULVERTS MAY NEED TO BE INSTALLED IN AREAS WHERE CONCENTRATED FLOW IS EXPECTED DUE TO CONSTRUCTION ACTIVITIES.
5. CONSTRUCTION DRAINAGE CROSSINGS TO MAINTAIN EXISTING FLOW CHARACTERISTICS OF THE FEATURES. FEATURES SHALL BE GRADED TO PRECONSTRUCTION CONTOURS.

TESTING:

1. TESTING SHALL BE PERFORMED BY A DESIGNATED INDEPENDENT TESTING AGENCY.
2. SUBMIT ONE SET OF TESTING AND INSPECTION RECORDS SPECIFIED TO THE CIVIL ENGINEER OF RECORD.

DEFINITIONS:

1. PROOF ROLLING:
   SHALL BE PERFORMED IN THE PRESENCE OF THE GEOTECHNICAL ENGINEER OR QUALIFIED GEOTECHNICAL REPRESENTATIVE USING A FULLY LOADED TANDEM AXLE DUMP TRUCK OR WATER TRUCK WITH A MINIMUM GROSS WEIGHT OF 25 TONS OR A FULLY LOADED BELLY DUMP WITH AN EQUIVALENT AXLE LOADING. PROOF-ROLLING ACCEPTANCE STANDARDS INCLUDE NO RUTTING GREATER THAN 1.5 INCHES, AND NO "PUMPING" OF THE SOIL BEHIND THE LOADED TRUCK.
2. SIEVE ANALYSIS:
   SHALL BE CONDUCTED IN ACCORDANCE WITH AASHTO T27
3. PROCTORS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T99
4. ATTERBERG LIMITS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T89 AND T90
5. MOISTURE DENSITY (NUCLEAR DENSITY):
   SHALL BE DONE IN ACCORDANCE WITH AASHTO T310
6. DYNAMIC CONE PENETROMETER (DCP) TESTING:
   SHALL BE DONE IN ACCORDANCE WITH ASTM D6951-03

REQUIREMENTS:

1. FILL PLACEMENT:
   A. SOILS USED AS FILL MATERIAL SHALL BE TESTED FOR MOISTURE CONTENT AND PROCTOR TESTS.
   B. WHERE FILL CONSTRUCTION REQUIRES MORE THAN 12 INCHES OF FILL PLACEMENT, COMPACT EACH LIFT TO A MINIMUM OF 95 PERCENT OF THE MATERIAL'S MAXIMUM STANDARD PROCTOR DRY DENSITY.
2. COMPACTED SUBGRADE (CEMENT STABILIZED):
   A. SEE SHEET 13 FOR TESTING REQUIREMENTS AND PROCEDURE.
3. COMPACTED SUBGRADE (NON-CEMENT STABILIZED):
   A. THE ENTIRE SUBGRADE SHALL BE PROOF-ROLLED PRIOR TO THE PLACEMENT OF THE AGGREGATE BASE TO IDENTIFY AREAS OF UNSTABLE SUBGRADE.
   B. PERFORM A MINIMUM OF 3 DYNAMIC CONE PENETROMETER (DCP) TESTS PER ACCESS ROAD OR ONE FOR EVERY 1,000 LF OF ROAD, WHICHEVER IS GREATER. SUBGRADE MUST MEET A MINIMUM DCP OF 3 BLOWS PER 6" TO A TOTAL DEPTH OF 2' (MINIMUM CBR=1.5).
   C. IF A PASSING PROOF-ROLL OR DCP REQUIREMENTS CANNOT BE ACHIEVED THE FOLLOWING ALTERNATIVES MAY BE IMPLEMENTED:
      a. SCARIFY, DRY, AND RECOMPACT SUBGRADE
      b. REMOVE UNSUITABLE MATERIAL AND REPLACE WITH SUITABLE MATERIAL
      c. INCREASE AGGREGATE BASE THICKNESS
4. AGGREGATE BASE:
   A. AGGREGATE BASE SHALL BE PROOF-ROLLED OVER THE ENTIRE LENGTH. IF PROOF ROLLING DETERMINES THAT THE ROAD IS UNSTABLE, ADDITIONAL AGGREGATE SHALL BE ADDED UNTIL THE UNSTABLE SECTION IS ABLE TO PASS A PROOF ROLL.
   B. PROVIDE 1 SIEVE ANALYSIS (PROJECT MAX OF 20) PER 2500 CY OF ROAD BASE PLACED.
5. CRANE PAD AND CRANE PATHS / CRANE TRAVEL SHOULDERS:
   A. TESTING REQUIREMENTS ARE PENDING BASED ON CRANE PICK PLANS PROVIDED BY THE CONTRACTOR.

TABLE 2: TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
FILL PLACEMENT	PROCTOR	1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER LIFT PER 5000 SF OF FILL PLACED OR 1 PER 500 LF OF ROAD OR CRANE WALK
COMPACTED SUBGRADE (CEMENT STABILIZED):	SEE SHEET 13	SEE SHEET 13
COMPACTED SUBGRADE (NON-CEMENT STABILIZED):	PROOF-ROLL	ENTIRE AREA
	DCP	1 PER 1,000 FT OR MIN. 3 PER ROAD
AGGREGATE BASE	PROOF-ROLL	ENTIRE AREA
	SIEVE ANALYSIS, LL, PL, AND L.A ABRASION	1 PER 2,500 CY

GENERAL NOTES:

1. GROUND SURFACE CONTOURS (AT TWO-FOOT VERTICAL INTERVALS) AND ELEVATIONS ARE BASED ON A PHOTOGRAMMETRY SURFACE PROVIDED BY GEOTERRA. IF MAJOR DISCREPANCIES ARE FOUND IN THE GROUND ELEVATIONS DURING FIELD STAKING TO THE GROUND ELEVATIONS SHOWN ON THE PLANS, THE OWNER AND ENGINEER SHALL BE NOTIFIED.
2. WHERE SECTION OR SUBSECTION MONUMENTS ARE ENCOUNTERED, THE OWNER SHALL BE NOTIFIED BEFORE SUCH MONUMENTS ARE REMOVED. THE CONTRACTOR SHALL PROTECT AND CAREFULLY PRESERVE ALL PROPERTY MARKERS AND MONUMENTS UNTIL THE OWNER, AN AUTHORIZED SURVEYOR OR AGENT HAS WITNESSED OR OTHERWISE REFERENCED THEIR LOCATION.
3. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. TYPICAL DISTURBANCE SHALL BE LIMITED TO 10 LF FROM THE EDGE OF PROPOSED GRADING.
4. FINALIZE GRADING AROUND THE BASE OF TURBINES IN ACCORDANCE WITH DETAIL TS-03 AND TS-04.
5. GRADE ALL PROPOSED ROADS TO A MAXIMUM SLOPE OF 8%. IF 8% SLOPE CANNOT BE ACHIEVED, THE CONTRACTOR MAY UTILIZE ASSIST VEHICLES FOR THE PURPOSE OF DELIVERIES. GRADE ALL PROPOSED CRANE PATHS TO A MAXIMUM OF 8% UNLESS OTHERWISE NOTED IN PLAN SHEETS.
6. ANY FACILITIES REMOVED TO ALLOW FOR CONSTRUCTION (MAILBOXES, SIGNS, FENCES, ETC.) SHALL BE REPLACED BY THE CONTRACTOR IN A CONDITION AS GOOD AS EXISTING.
7. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING DRAINAGE THROUGHOUT THE CONSTRUCTION OF THIS PROJECT. CONSTRUCTION ACTIVITIES SHALL NOT BLOCK THE NATURAL OR MANMADE CREEKS OR DRAINAGE SWALES CAUSING RAINWATER TO POND. DEPENDING ON FIELD CONDITIONS, ADDITIONAL CULVERTS IN EXCESS OF THOSE ON THE PLANS MAY BE REQUIRED.
8. WHILE BUILDING THE ROADS AND EXCAVATING THE TURBINE FOUNDATIONS, EXCESS SOIL WILL RESULT. THE CONTRACTOR SHALL DISPOSE OF THIS EXCESS SOIL IN AN APPROVED MANNER. EXCESS TOPSOIL SHALL BE DISTRIBUTED INTO A THIN LAYER ON LAND IMMEDIATELY ADJACENT TO WHERE THE TOPSOIL ORIGINATED. ALL EXCESS TOPSOIL TO BE WASTED ONSITE. WHILE DOING SO THE CONTRACTOR SHALL AVOID CAUSING RIDGES OR MOUNDS THAT WOULD MAKE IT DIFFICULT FOR STORM WATER RUNOFF TO DRAIN. THE FINAL SURFACE OF THE DISTURBED TOPSOIL SHALL BE SMOOTH AND FOLLOW THE NATURAL CONTOUR OF THE LAND.
9. THE CONTRACTOR SHALL NOTIFY SOUTH DAKOTA 811 AT LEAST 48 HOURS BEFORE EXCAVATION ACTIVITIES COMMENCE.
10. TEMPORARY INTERSECTION WIDENING SHALL, UPON COMPLETION OF ALL PROJECT CONSTRUCTION OR UPON NOTIFICATION OF THE ENGINEER, BE REMOVED AND THE AREA RESTORED TO ITS ORIGINAL LINES AND GRADES WITH TOPSOIL REPLACED, EXCEPT WHERE REQUESTED BY THE TOWNSHIP OR COUNTY TO PERMANENTLY REMAIN. DISTURBED AREAS OUTSIDE OF THE FINAL ROADWAY SHALL BE SEEDED AND MULCHED.
11. TURBINE SETBACKS ARE NOT IDENTIFIED ON THE CONSTRUCTION PLANS. IT SHALL BE THE RESPONSIBILITY OF THE OWNER AND CONTRACTOR TO ENSURE THAT ALL TURBINE SETBACKS MEET PROJECT REQUIREMENTS.
12. GEOTECHNICAL REPORTS WITH RECOMMENDATIONS HAVE BEEN PROVIDED BY THE OWNER. ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL ENGINEERING REPORT AND RECOMMENDATIONS.
13. FIELD SURVEY WETLAND INFORMATION HAS BEEN PROVIDED BY THE OWNER. ALL WETLAND DELINEATIONS AND PERMITTING SHALL BE THE RESPONSIBILITY OF OTHERS AND BE COMPLETED PRIOR TO CONSTRUCTION COMMENCING. THE OWNER AND GENERAL CONTRACTOR SHALL VERIFY THAT ALL WETLAND PERMITS HAVE BEEN SUBMITTED AND APPROVED PRIOR TO CONSTRUCTION COMMENCING.
14. CULTURAL RESOURCE REPORTS HAVE NOT BEEN PROVIDED. CULTURAL RESOURCE LOCATIONS ARE NOT SHOWN ON THE PLANS. INFORMATION WILL BE THE RESPONSIBILITY OF THE OWNER AND GENERAL CONTRACTOR. THE LOCATIONS OF CULTURAL RESOURCE SITES MAY BE CONFIDENTIAL AND PROTECTED BY STATE OR FEDERAL LAW. PUBLIC RELEASE OF SPECIFIC INFORMATION REGARDING THESE RESOURCES MAY BE RESTRICTED.
15. AN ENVIRONMENTAL ASSESSMENT HAS NOT BEEN PROVIDED. THE CONTRACTOR SHALL BE FAMILIAR WITH THE REPORT AND REVIEW ALL RECOMMENDATIONS.
16. ELECTRICAL INFORMATION SHOWN ON THE PLANS IS FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSULTANT'S PLANS FOR SPECIFIC LOCATIONS AND CONSTRUCTION DETAILS FOR THE UNDERGROUND POWER COLLECTION SYSTEM AND SUBSTATION.
17. CRANE PATHS ARE SHOWN ON THE CONSTRUCTION PLANS. IF THE CONTRACTOR PROPOSES ALTERNATE CRANE PATHS, THEY SHALL ENSURE THAT WETLAND AND CULTURAL RESOURCE CORRIDORS ARE NOT DISTURBED. FINAL CRANE PATH ALIGNMENTS SHALL BE DETERMINED BY THE CONTRACTOR BASED ON FIELD CONDITIONS WITHIN THE WETLAND AND CULTURAL RESOURCE CORRIDORS, SPECIAL LANDOWNER AGREEMENTS AND THE PROJECT BOUNDARY.
18. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. DISTURBANCE SHALL BE LIMITED TO 50 LF WIDTH FOR PROPOSED ACCESS ROADS AND 50 LF FOR CRANE PATHS, AND SHALL BE LIMITED TO A 250 LF RADIUS FOR PROPOSED WIND TURBINE GENERATORS. THE GRADING LIMITS SHALL BE CENTERED ON THE ROADWAYS AND WIND TURBINES. THE CONTRACTOR SHALL MAKE ALL EFFORTS TO KEEP ACTIVITIES WITHIN THE ERECTION AREAS SHOWN ON THE PLANS BUT IT IS UNDERSTOOD THAT SOME ACTIVITIES THAT WILL NOT REQUIRE GRADING OR SOIL DISTURBANCE MAY EXTEND BEYOND THE DEFINED LIMITS. DURING ERECTION OF THE ROTOR, TRUCKS AND/OR FORKLIFTS MAY EXTEND BEYOND THESE LIMITS. SEE DETAIL TS01 FOR TYPICAL ERECTION AREAS.
19. AN ALTA SURVEY HAS BEEN PROVIDED BY WESTWOOD. CONTRACTOR AND OWNER ARE RESPONSIBLE FOR LOCATING ALL UTILITIES AND VERIFYING LOCATION OF CONSTRUCTION ACTIVITIES PRIOR TO COMMENCING WORK.

STORMWATER POLLUTION PREVENTION PLAN (SWPPP):

1. THE CONTRACTOR SHALL PROVIDE EROSION CONTROL MEASURES AS PLANNED AND SPECIFIED FOLLOWING BEST MANAGEMENT PRACTICES AS OUTLINED BY THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND BEING IN CONFORMANCE WITH THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL STORMWATER PERMIT.
2. REFER TO THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR THE TRIPLE H WIND FARM, PREPARED BY WESTWOOD PROFESSIONAL SERVICES, FOR EROSION CONTROL AND RESTORATION SPECIFICATIONS, SEDIMENT AND EROSION CONTROL PROCEDURES, LOCATIONS OF BMPs, DETAILS, AND INSPECTION INFORMATION.
3. ALL PASTURES AND DRAINAGE SWALES DISTURBED DURING CONSTRUCTION ACTIVITIES AND NOT COVERED BY ROAD SURFACING MATERIALS, SHALL BE SEEDED IN ACCORDANCE WITH THE SWPP PLAN.
4. TEMPORARY EROSION CONTROL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE TEMPORARY EROSION CONTROL PLAN SHALL BE IN ACCORDANCE WITH THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND THE TRIPLE H WIND FARM STORMWATER POLLUTION PREVENTION PLAN ON FILE.

PROJECT CONTACT INFORMATION:

TITLE	COMPANY	NAME	CONTACT NUMBER
OWNER (PRIMARY)	ENGIE	CASEY WILLIS	805-569-6185
PROJECT MANAGER	WESTWOOD	DANI NYGREN	952-906-7493
ENGINEER OF RECORD	WESTWOOD	ROB COPOULS	952-906-7470
CONTRACTOR	WANZEK	JASON HELLERUD	701-893-3685

Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite 300
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: DBN
Drawn: BMK
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK
A MasTec Company

2028 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 12 OF 57
001444OOTP.dwg

© 2019 Westwood Professional Services, Inc.

CEMENT STABILIZATION - PROCEDURE

THE SPECIFICATIONS BELOW ARE GENERAL RECOMMENDATIONS/GUIDELINES FOR CEMENT STABILIZATION OF SUBGRADES FOR THE PROJECT. ACTUAL FIELD CONDITIONS MAY ALTER APPLICATION RATE. CONSULT GEOTECHNICAL ENGINEER FOR FURTHER RECOMMENDATIONS.

1. STRIP THE TOP ±4 INCHES OF TOPSOIL (THROUGH THE ROOT ZONE) FROM THE AREA TO BE STABILIZED. ROOTS SMALLER THAN 1/4" DIAMETER ARE CONSIDERED INSIGNIFICANT.
2. PERFORM A PROCTOR (ASTM D 698) TEST TO DETERMINE THE OPTIMUM MOISTURE CONTENT IF THE MATERIAL TO BE STABILIZED DOES NOT MATCH A PREVIOUSLY PERFORMED PROCTOR.
3. DETERMINE THE IN-SITU MOISTURE CONTENT USING A NUCLEAR DENSITY GAUGE (OR EQUIVALENT MOISTURE CONTENT TEST) DAILY, PRIOR TO INCORPORATION OF THE CEMENT. PROVIDE ADDITIONAL MOISTURE CONTENT TESTING AS NEEDED BASED ON WEATHER CONDITIONS.
   - 3.1. THE CONTRACTOR WILL BE ADVISED OF IN-SITU MOISTURE CONTENT, AND MOISTURE ADJUSTMENTS SHOULD BE MADE IF IN-SITU MOISTURE IS LESS THAN OPTIMUM MOISTURE CONTENT AS DETERMINED BY THE PROCTOR (ASTM D 698).
4. SOIL AND CEMENT BLENDING:
   - 4.1. COMPLETELY BLEND SUBGRADE SOIL WITH THE APPROPRIATE AMOUNT OF CEMENT BY WEIGHT. FIELD RESULTS FROM TEST STRIPS WILL DICTATE THE CEMENT APPLICATION RATE.
   - 4.2. IN AREAS OF HIGH MOISTURE OR POOR SOILS, THE CONTRACTOR MAY INCREASE THE PERCENT OF CEMENT IN ORDER TO MEET THE MINIMUM SUBGRADE STRENGTH REQUIREMENTS.
   - 4.3. THE USE OF A RECLAIMER IS AN ADEQUATE BLENDING METHOD. DISCING IS NOT AN ADEQUATE BLENDING METHOD.
   - 4.4. A STABILIZATION DEPTH OF 12" WAS USED FOR DESIGN PURPOSES. STABILIZATION DEPTH MAY NEED TO INCREASE TO 16" IN AREAS OF EXTREME MOISTURE OR POOR SOILS IN ORDER TO MEET THE STRENGTH AND PROOF ROLL REQUIREMENTS.
5. COMPACTION:
   - 5.1. A ROLLING PATTERN WILL BE ESTABLISHED USING A NUCLEAR DENSITY GAUGE DURING COMPACTION.
     - 5.1.1. COMPACTION WILL BE PERFORMED UNTIL THE STABILIZED MATERIAL REACHES THE "BREAK POINT" AFTER WHICH ADDITIONAL PASSES WITH A ROLLER RESULTS IN A LOSS OF DENSITY AS MEASURED BY A NUCLEAR DENSITY GAUGE.
     - 5.1.2. COMPACTION IS TYPICALLY ACHIEVED BY MULTIPLE PASSES OF A PADFOOT ROLLER UNTIL THE ROLLER "WALKS" OUT OF THE RECLAIMED MATERIAL (SPACE IS VISIBLE BETWEEN THE DRUM AND THE RECLAIMED MATERIAL). THIS IS FOLLOWED BY BLADING AND SHAPING THE RECLAIMED MATERIAL TO FINAL PROFILE AND CROSS SECTION, REMOVING HIGH AND LOW POINTS. SMOOTH DRUM OR RUBBER TIRE ROLLERS ARE THEN USED TO FINISH ROLLING (THIS IS WHEN THE DENSITY TESTS ARE PERFORMED) UNTIL THE DENSITY OF THE MATERIAL REACHES THE "BREAK POINT."
     - 5.1.3. THE NUMBER OF PASSES AND EQUIPMENT USED TO REACH THE "BREAK POINT" IS CONSIDERED THE ROLLING PATTERN.
     - 5.1.4. A NEW ROLLING PATTERN MAY NEED TO BE ESTABLISHED IF THE PERFORMANCE REQUIREMENTS ARE NOT BEING MET. THIS MAY BE DUE TO CHANGES IN THE MOISTURE CONTENT, THE SOIL TYPE, OR THE CEMENT RATE.
   - 5.2. THE TARGET DENSITY IS 98% OF THE MAXIMUM DENSITY DETERMINED FROM THE ROLLING PATTERN.
     - 5.2.1. DENSITY TESTS SHALL BE TAKEN AT THE RATE OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER TO CONFIRM THE DENSITY IS MATCHING THE TARGET. ONCE THE ROLLING PATTERN HAS BEEN CONFIRMED IT IS RECOMMENDED THAT TESTING CONTINUE AT 1 TEST PER 1,000 LF IN EACH PASS OF THE RECLAIMER.
     - 5.2.2. IF IT IS NOT POSSIBLE TO ATTAIN THE TARGET DENSITY, AND ADDITIONAL COMPACTION DOES NOT IMPROVE THE DENSITY, A NEW ROLLING PATTERN SHOULD BE ESTABLISHED.
   - 5.3. THE AIR TEMPERATURE SHALL BE ABOVE 40 DEGREES (F) DURING THE CEMENT STABILIZATION PROCESS. MIXING CEMENT INTO FROZEN GROUND IS NOT ACCEPTABLE.
6. THE STABILIZED MATERIAL SHALL BE CONTINUOUSLY WET CURED FOR A MINIMUM OF 24 HOURS (WET CURED IS IDENTIFIED VISUALLY AS DAMP SURFACE).
7. PERFORM SUBGRADE TESTING IN ACCORDANCE WITH TESTING SCHEDULE.
8. AGGREGATE PLACEMENT:
   - 8.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 8.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 8.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

CEMENT STABILIZATION - DESIGN BASIS

1. DURING INITIAL CONSTRUCTION, CONTRACTOR SHALL CONSTRUCT MINIMUM 300 LF TEST STRIPS CONTAINING 4%, 5%, AND 6% CEMENT IN ACCORDANCE WITH CEMENT STABILIZATION PROCEDURES.
2. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 3 FOR ANTICIPATED RESULTS):
   - 2.1. PERFORM INITIAL SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M BETWEEN 4 TO 6 HOURS AFTER FINAL COMPACTION.
   - 2.2. PERFORM ADDITIONAL DCP TESTING AT 24 AND 48 HOURS AFTER FINAL COMPACTION.
   - 2.3. PERFORM SUBSEQUENT DCP TESTS AT 7 DAYS AFTER FINAL COMPACTION AS VERIFICATION OF STRENGTH CURVE.
   - 2.4. A MINIMUM OF 3 TESTS PER TEST SECTION PER TIMEFRAME IS REQUIRED. TESTS SHALL BE TAKEN AT THE CENTERLINE AND 2' FROM EACH SHOULDER.
   - 2.5. RECORD DCP TEST RESULTS EVERY 6 INCHES TO TOTAL DEPTH OF 12 INCHES.

TABLE 3: TEST STRIP CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	COMPRESSIVE STRENGTH (PSF)
4 – 6 HOURS	6	5	1,800
24 HOURS	10	7	2,500
48 HOURS	15	10	3,300
7 DAYS	30	21	5,200

CEMENT STABILIZATION - PRODUCTION

1. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 5 FOR SUMMARY OF TESTING REQUIREMENTS):
   - 1.1. PERFORM SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M NO SOONER THAN 24 HOURS AFTER FINAL COMPACTION.
   - 1.2. DCP TESTING FREQUENCY SHALL BE WITH A RANDOM SPACING AND A MINIMUM OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER. A MINIMUM OF 3 TESTS PER ROAD IS REQUIRED.
   - 1.3. THE CBR OF THE STABILIZED SUBGRADE SHOULD BE CALCULATED IN 6" INCREMENTS THROUGH THE ENTIRE DEPTH OF THE STABILIZED LAYER.
   - 1.4. THE MINIMUM REQUIRED CBR PRIOR TO PROOF-ROLLING IS PROVIDED IN TABLE 4 BELOW.

TABLE 4: FINAL CEMENT STABILIZED CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	UNDRAINED SHEAR STRENGTH (PSF)	BEARING CAPACITY (PSF)
24 – 48 HOURS	15	10	3,500	9,800
3 – 7 DAYS	30	21	7,000	18,000
28 DAYS	50	33	12,000	28,500

NOTE: UNDRAINED SHEAR STRENGTH WAS CALCULATED USING THE BLACK (1961) EQUATION. BEARING CAPACITY WAS CALCULATED USING THE MESIC EQUATION MODIFIED FOR TWO LAYERS (12" CEMENT STABILIZED SUBGRADE OVER A NATURAL SUBGRADE WITH A CBR OF 1.5)

   - 1.5. ONCE THE MINIMUM REQUIRED CBR IS ACHIEVED AT ANY CORRESPONDING TIME PERIOD, THE SUBGRADE IS CONSIDERED ADEQUATE AND THE CONTRACTOR MAY PROCEED WITH PROOF-ROLL TESTING. FUTURE DCP TESTING ON THAT SEGMENT OF SUBGRADE IS NOT REQUIRED.
   - 1.6. IF TESTING DOES NOT INDICATE A CBR OF 30 WITHIN 7 DAYS, ADDITIONAL GRAVEL SURFACING AND/OR THE ADDITION OF GEOTEXTILE FABRIC MAY BE REQUIRED. FOR FUTURE SUBGRADE STABILIZATION AREAS, CONTACT THE ENGINEER AND OWNER VIA RFI FOR RECOMMENDATIONS AND APPROVAL.
2. SUBGRADE PROOF-ROLL TESTING AND ACCEPTANCE:
   - 2.1. ONCE THE REQUIRED DCP VALUE HAS BEEN OBTAINED BUT PRIOR TO PLACING AGGREGATE, THE SUBGRADE SHALL BE PROOF-ROLLED. REFER TO THE PROJECT TESTING REQUIREMENTS FOR PROOF-ROLL DEFINITION.
   - 2.2. PROOF-ROLLING SHOULD BE PERFORMED WITH ONE PASS DOWN THE CENTER AND NOT BE PERFORMED WITHIN 12 INCHES OF THE EDGE OF THE STABILIZED SECTION.
   - 2.3. IF PROOF-ROLLING FAILS, RE-STABILIZATION MAY BE REQUIRED AND A NEW ROLLING PATTERN OR ADDITIONAL CEMENT MAY BE REQUIRED.
3. AGGREGATE PLACEMENT:
   - 3.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 3.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 3.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

TABLE 5: CEMENT STABILIZATION PRODUCTION TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
COMPACTED SUBGRADE (CEMENT STABILIZED)	PROCTOR	MINIMUM 1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER 1000 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
NOTE: SEE ABOVE FOR INITIAL TESTING REQUIREMENTS	DCP TEST	1 PER 500 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
	PROOF-ROLL (AFTER PASSING DCP TESTS)	ENTIRE LENGTH

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (866) 937-5150 www.westwoodps.com

Westwood Professional Services, Inc.

Designed: BMK
Checked: DJH
Drawn: BMK
As-Built Drawings:

Revisions

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 13 OF 57

00144400TP.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. County Road 649 in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 2005' South of CR 649 & 200th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.28'40.22" W Long. -99.36'12.32" W
4. Width of entrance: 16' access road with 35' temporary intersection imporvement RD08-B
   (Check attached spec sheet)
5. Size & length of culvert: ~~16"~~ 18" Hyde County approach minimum
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001670 NW4 27-112-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Signature of Applicant

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. County Road 649 in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 2005' South of CR 649 & 200th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.28'40.22" W Long. -99.36'12.32" W
4. Width of entrance: 16' access road with 35' temporary intersection imporvement RD08-B
   (Check attached spec sheet)
5. Size & length of culvert: 16"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001670 NW4 27-112-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

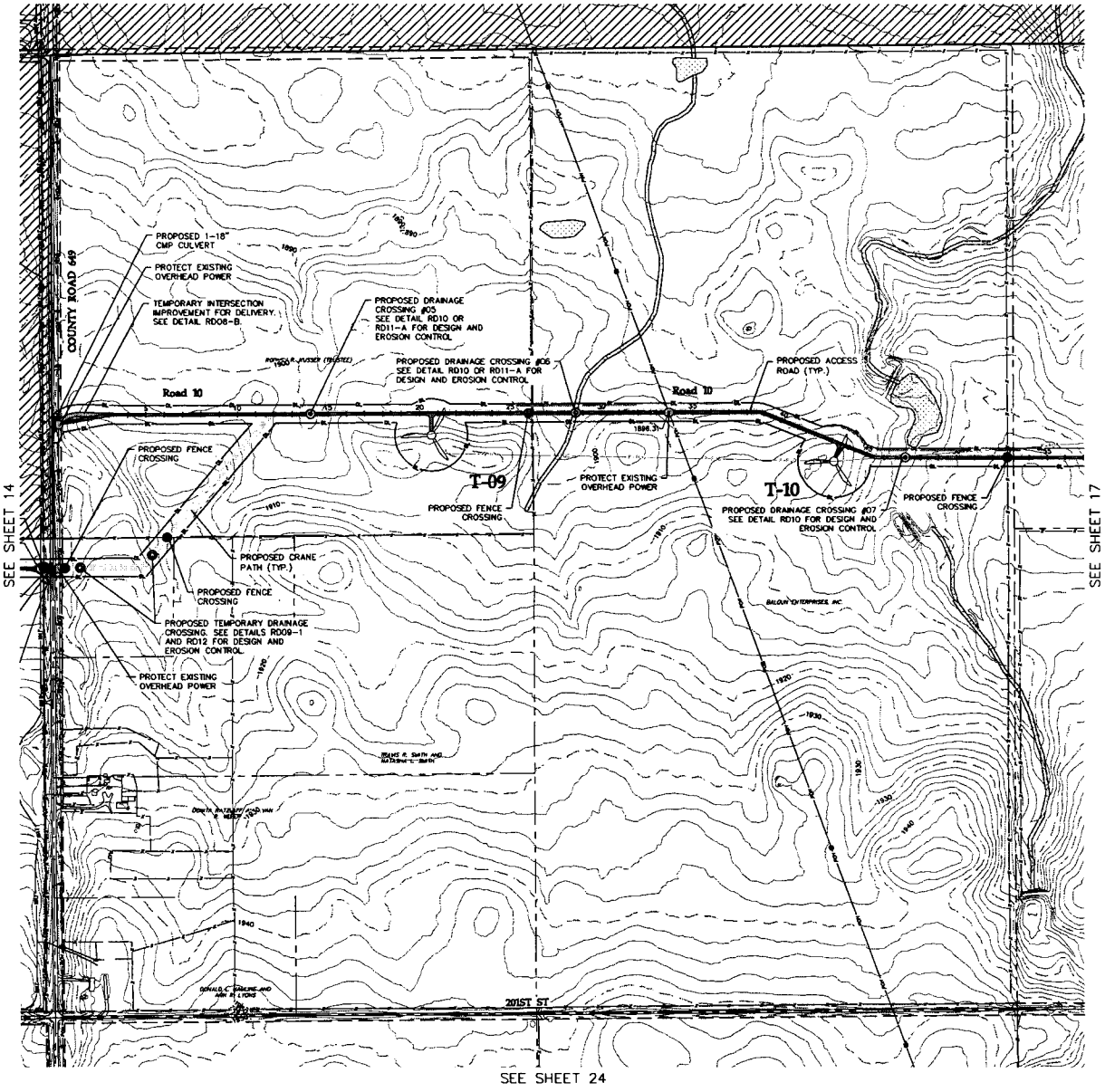
Submitted August 1, 20 19 Date Approved: _____

_____ _____
Signature of Applicant Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

©2019 Westwood Professional Services, Inc.



LEGEND:

- PROPOSED TURBINE LOCATION
- T-XX PROPOSED TURBINE NUMBER
- PROPOSED ALTERNATE TURBINE LOCATION
- ALT-XX PROPOSED ALTERNATE TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED ALTERNATE ACCESS ROAD
- PROPOSED CRANE PATH
- PROPOSED UNDERGROUND COLLECTION*
- PROPOSED DISTURBANCE LIMITS
- PROPOSED PERIMETER SEDIMENT CONTROL
- EXISTING 10' CONTOURS
- EXISTING 2' CONTOURS
- EXISTING GRAVEL EDGE
- EXISTING BITUMINUS EDGE
- EXISTING RIGHT-OF-WAY
- EXISTING PARCEL LINE
- EXISTING BUILDING
- EXISTING FENCE
- EXISTING OVERHEAD POWER
- EXISTING HIGH VOLTAGE OVERHEAD POWER
- EXISTING UNDERGROUND POWER LINE
- EXISTING FIBER OPTIC LINE
- EXISTING WATER LINE
- DELINEATED WETLAND
- ARCHAEOLOGICAL AVOIDANCE AREA
- EXISTING USFWS EASEMENT
- PROJECT BOUNDARY
- 1900 EXISTING GROUND ELEVATION
- PROPOSED DRAINAGE CROSSING**
- PROPOSED TEMPORARY DRAINAGE CROSSING**
- PROPOSED FENCE CROSSING***
- PROPOSED UTILITY CROSSING
- PROPOSED CULVERT

* PROVIDED BY OTHERS AND SHOWN FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSTRUCTION PLANS FOR DETAILS.

** SEE SHEET 11 FOR DRAINAGE CROSSING TYPE AND SIZING. DRAINAGE CROSSINGS SHALL CONSIST OF LOW WATER CROSSING OR CULVERT. DRAINAGE CROSSINGS ALONG CRANE PATH SHALL CONSIST OF CRANE MATS OR TEMPORARY CULVERT.

*** ALL GATE INSTALLATIONS SHALL BE FIELD DETERMINED AND AGREED UPON BY THE CONTRACTOR AND OWNER.

			14	15	16	17	18	19	20	
21	22	23	24	25	26	27	28	29	30	31
				32	33	34	35	36	37	38
			39	40	41	42	43	44	45	46
		47	48	49	50	51				
52	53	54	55							

KEY MAP

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (866) 937-5150 westwoodps.com

Westwood Professional Services, Inc.

Designed:	BMK
Checked:	TJM
Drawn:	BMK
As-Built Drawing:	

Revisions

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

3030 2nd Avenue NW
West Fargo, ND 58078

0' 300' 600' 900'

Triple H Wind Farm

Hyde County, South Dakota

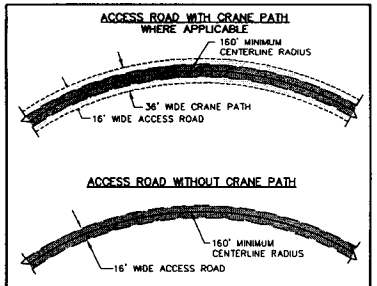
Site Plan T-09 - T-10

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 16 OF 57

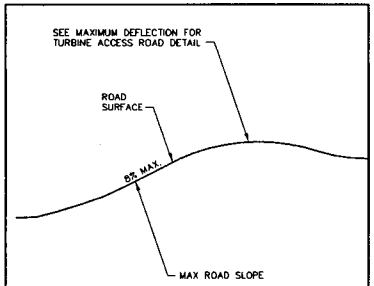
0014440SP01.dwg

©2019 Westwood Professional Services, Inc.



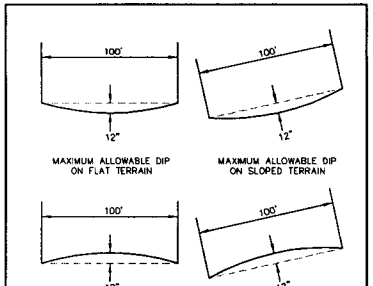
NOTE:
1. SOME RADII MAY REQUIRE ADDITIONAL SOIL COMPACTION OR GRAVEL OUTSIDE OF THE WIDTH SHOWN ABOVE TO ACCOMMODATE TRACTORS OR TRAILERS TRACKING OFF THE ACCESS ROAD.

Westwood	MINIMUM RADIUS FOR TURBINE ACCESS ROAD	LAST REVISED 05/29/13 RD02

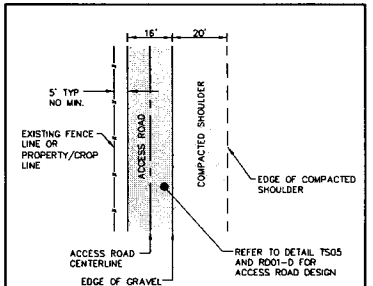


NOTES:
1. ROAD SLOPE SHALL NOT EXCEED 8% WITHOUT OWNER APPROVAL

Westwood	MAXIMUM VERT. SLOPE FOR TURBINE ACCESS ROAD/CRANE TRAVEL PATH	LAST REVISED 3/3/17 RD03

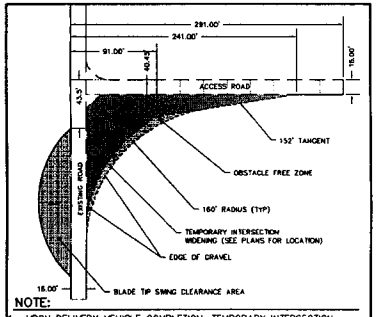


Westwood	MAXIMUM DEFLECTION FOR TURBINE ACCESS ROAD	LAST REVISED 11/09/09 RD04



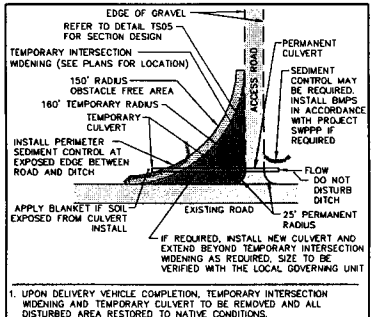
NOTE:
1. COMPACTED SHOULDER SHALL BE RETURNED TO NATIVE CONDITION FOLLOWING TURBINE GENERATOR CONSTRUCTION.
2. THE ACCESS ROAD MAY NEED TO BE CONSTRUCTED FARTHER FROM THE PROPERTY LINE IF OBSTRUCTIONS SUCH AS TREES FOLLOW THE PROPERTY LINE.

Westwood	TURBINE ACCESS ROAD ALONG FENCE/PROPERTY/CROP LINE	LAST REVISED 3/3/17 RD05



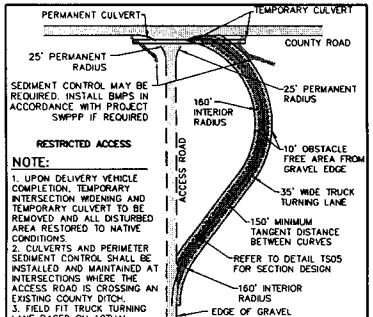
NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING TO BE REMOVED AND ALL DISTURBED AREA RESTORED.
2. DIMENSIONS ASSUME A 90° INTERSECTION

Westwood	INTERSECTION WIDENING DIMENSIONS	LAST REVISED 7/05/19 RD06



1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.

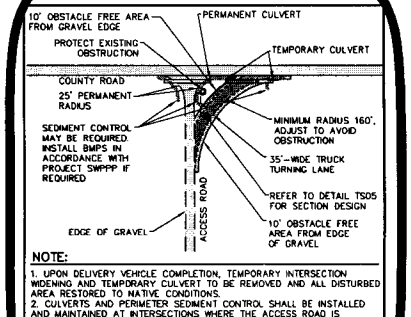
Westwood	TURBINE ACCESS ROAD TYPICAL INTERSECTION WIDENING	LAST REVISED 3/3/17 RD07



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

NOT TO SCALE

Westwood	TRUCK TRAFFIC TURNING LANE A	LAST REVISED 3/3/17 RD08-A



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

Westwood	TRUCK TRAFFIC TURNING LANE B	LAST REVISED 12/3/14 RD08-B

Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-Free (866) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: DJH
Drawn: BMK
As-Built Drawing:

Revisions

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

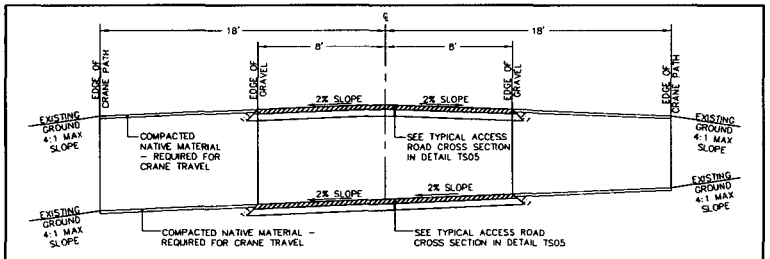
Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 5 OF 57

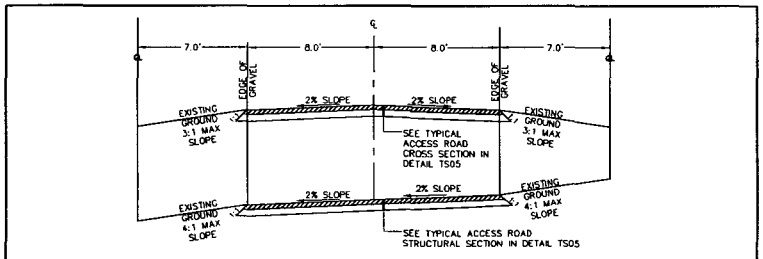
0014440DTP.dwg

© 2019 Westwood Professional Services, Inc.



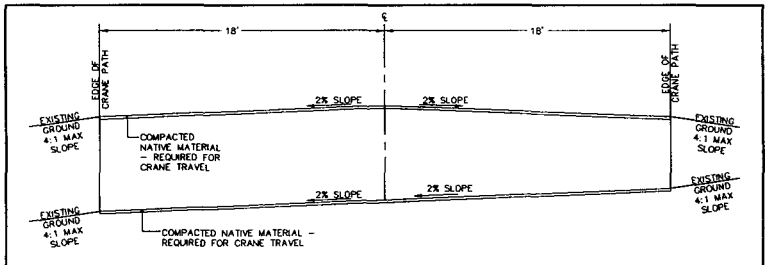
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE ACCESS ROAD DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

Westwood | TYPICAL TURBINE ACCESS ROAD AND CRANE PATH | LAST REVISED: 04/29/21 | RD01-A



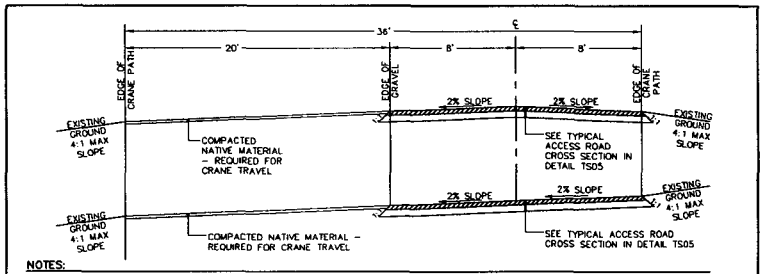
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

Westwood | TYPICAL TURBINE ACCESS ROAD SECTION | LAST REVISED: 3/29/21 | RD01-B



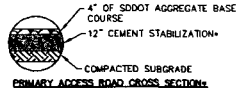
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE WHERE CRANE PATHS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT CRANE PATH REMAINS WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%

Westwood | TYPICAL CRANE PATH | LAST REVISED: 04/29/21 | RD01-C

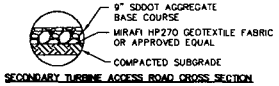


NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE EDGE OF COMPACTED SHOULDER DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

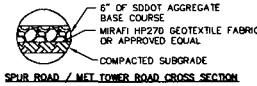
Westwood | TYPICAL TURBINE ACCESS ROAD AND OFFSET CRANE PATH | LAST REVISED: 04/29/21 | RD01-D



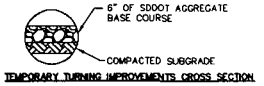
PRIMARY ACCESS ROAD CROSS SECTION*



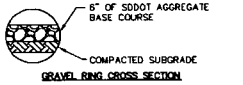
SECONDARY TURBINE ACCESS ROAD CROSS SECTION



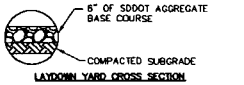
SPUR ROAD / MET TOWER ROAD CROSS SECTION



TEMPORARY TURNING IMPROVEMENTS CROSS SECTION



GRAVEL RING CROSS SECTION



LAYDOWN YARD CROSS SECTION

* CEMENT APPLICATION RATE MAY VARY BASED ON TEST STRIPS AND FIELD PERFORMANCE. SEE SHEET 13 FOR CEMENT STABILIZATION PROCEDURE AND DESIGN BASIS.

NOTES:
STRUCTURAL SECTIONS SHOWN ARE THE MINIMUM THICKNESS REQUIREMENTS DURING NORMAL FIELD CONDITIONS. THE SECTIONS MAY NEED TO BE INCREASED BASED ON ACTUAL FIELD CONDITIONS AT THE TIME OF CONSTRUCTION. CONDITIONS INCLUDE BUT ARE NOT LIMITED TO CONSTRUCTION DURING THE FREEZE/THAW CYCLE, UNUSUALLY WET PERIODS, OR IN LOW/WET AREAS. SEE SHEET 12 FOR TESTING REQUIREMENTS AND SPECIFICATIONS.

Westwood | TYPICAL STRUCTURAL CROSS SECTIONS

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150
Westwood Professional Services, Inc.

Designed: SMK
Checked: DJH
Drawn: SMK
As-Built Drawing:

Revisions: #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 4 OF 57

0014440DTP.dwg

© 2019 Westwood Professional Services, Inc.

ROAD DESIGN PARAMETERS

1. ACCESS ROADS HAVE BEEN DESIGNED TO ACCOMMODATE LIGHT DUTY TRUCKS (PICKUP TRUCKS AND MAINTENANCE VEHICLES) FOR LOW VOLUME USE IN NORMAL OPERATING CONDITIONS AS WELL AS HEAVY DUTY CONSTRUCTION TRAFFIC UNDER DRY CONDITIONS. THE ROAD DESIGN SPECIFIED IS NOT INTENDED FOR ALL WEATHER USE FOR HEAVY DUTY CONSTRUCTION LOADS.
2. ROAD MAINTENANCE CAN BE EXPECTED OVER THE LIFE OF THE PERMANENT FACILITY.

PRODUCTS

1. AGGREGATE BASE SHALL CONSIST OF SDDOT AGGREGATE BASE COURSE (AND IN CONFORMANCE WITH THE GRADATION TABLE 1). AGGREGATE MAY BE CRUSHER RUN UPON ENGINEERS APPROVAL. AGGREGATE GRADATIONS SHALL BE SUBMITTED TO ENGINEER FOR REVIEW.
2. ROAD SHOULDERS AND CRANE PADS SHALL CONSIST OF COMPACTED NATIVE SOILS.
3. CULVERTS: ACCESS ROAD CULVERTS SHALL MEET THE MINIMUM SPECIFICATIONS SET FORTH BY THE SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION AND/OR HYDE COUNTY. ALL CULVERTS ARE PLANNED TO BE A MINIMUM 18" DIAMETER AND MANUFACTURED OF 16-GAGE CORRUGATED METAL PIPE WITH NO END TREATMENTS UNLESS NOTED OTHERWISE. ACTUAL SIZE WILL BE DETERMINED THROUGH HYDRAULIC ANALYSIS.
4. GEOTEXTILE FABRIC: MIRAFI HP270 OR APPROVED EQUAL.

EXECUTION

1. CLEARING AND GRUBBING
   A. THE CONTRACTOR SHALL BE REQUIRED TO GRUB ALL TREES, STUMPS, BRUSH, AND DEBRIS WITHIN THE GRADING AREAS SHOWN ON THE PLANS. GRUBBING INCLUDES REMOVAL OF ALL PLANT MATERIAL GREATER THAN 2" INCLUDING STUMPS, BRANCHES, ROOTS, ETC. TO A DEPTH BELOW THE FINAL SUBGRADE. THE CONTRACTOR IS TO REMOVE ONLY THOSE TREES WHICH ARE DESIGNATED BY THE OWNER'S REPRESENTATIVE FOR REMOVAL, AND SHALL EXERCISE EXTREME CARE AROUND EXISTING TREES TO BE SAVED.
2. TOPSOIL STRIPPING
   A. TOPSOIL, INCLUDING ROOTS LARGER THAN 2" AND LARGE ROOT MASSES, SHALL BE STRIPPED FROM ALL ROADWAY AND FOUNDATION AREAS UP TO 10". TOPSOIL SHALL NOT BE STRIPPED OUTSIDE OF THE DESIGNATED DISTURBANCE AREAS.
   B. ANY TOPSOIL THAT HAS BEEN STRIPPED SHALL BE STOCKPILED FOR POST CONSTRUCTION REVEGETATION. ALL TOPSOIL SHALL BE REDISTRIBUTED TO THE LAND OWNER'S PROPERTY OF WHERE IT ORIGINATED FROM.
3. FILL PLACEMENT
   A. FILL PLACEMENT SHALL CONSIST OF THE PLACING OF SUITABLE FILL MATERIAL, AFTER TOPSOIL STRIPPING, ABOVE THE EXISTING GRADE. GENERALLY, SIDE SLOPES SHALL BE CONSTRUCTED AT FOUR FOOT HORIZONTAL TO ONE FOOT VERTICAL, WITH SOME LOCATIONS THROUGHOUT THE PROJECT WITH SLOPES OF TWO FEET HORIZONTAL TO ONE FOOT VERTICAL. THE MATERIAL FOR FILL CONSTRUCTION SHALL BE OBTAINED FROM THE ACCESS ROAD/TURBINE EXCAVATION (SEE GEOTECHNICAL REPORT FOR RESTRICTIONS), OR ANY SUITABLE, APPROVED SOIL OBTAINED ONSITE/OFFSITE BY CONTRACTOR, AS DIRECTED OR APPROVED BY THE ENGINEER. THIS MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 12" AND CONSTRUCTED TO 95% OF THE MAXIMUM DRY DENSITY AND WITHIN 2% OF OPTIMUM MOISTURE CONTENT, AS DETERMINED BY THE STANDARD PROCTOR (AASHTO T99).
   B. SIDE SLOPES GREATER THAN 4:1 WILL NOT BE PERMITTED, UNLESS OTHERWISE NOTED ON THE PLAN.
   C. FILL SLOPES SHALL BE BENCHED INTO THE EXISTING SLOPE TO PREVENT MOVEMENT BETWEEN THE FILL AND NATIVE SOILS. BENCHES SHOULD BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO FILL PLACEMENT. POSITIVE DRAINAGE IS REQUIRED AT BENCHED AREAS AND AT THE TOE OF FILL SLOPES TO REMOVE SURFACE WATER.
4. SUBGRADE
   A. SUBGRADE PREPARED AT GRADE OR IN CUT REQUIRES SCARIFICATION AND RECOMPACTION TO A DEPTH OF 12" OR MORE.
   B. ACCESS ROAD CROSS SLOPES SHOWN IN THE PLANS ARE MEANT AS A GUIDE. ACCESS ROAD CROSS SLOPES MAY RANGE FROM 1% - 2%, CHECK WITH THE ENGINEER IF THE CROSS SLOPE FALLS OUTSIDE OF THIS RANGE. ACCESS ROADS BEING UTILIZED FOR CRANE TRAVEL SHOULD HAVE A MAX CROSS SLOPE OF 2%

STORM WATER DESIGN PARAMETERS

1. SEE SHEET 6 FOR CULVERT SIZING AND DESIGN PARAMETERS. SEE HYDROLOGY MEMO FOR FURTHER DESIGN CALCULATIONS. CULVERTS SHALL BE MINIMUM 18" CORRUGATED METAL PIPE. ALL TEMPORARY PORTIONS OF THE INSTALLED CULVERTS SHALL BE REMOVED UPON COMPLETION OF THE PROJECT.
2. IT IS EXPECTED THAT CULVERTS WILL BE OVERTOPPED DURING SOME STORMS AND MAINTENANCE WILL BE REQUIRED THROUGH THE LIFE OF THE PROJECT.
3. WHEN INSTALLING DRAINAGE CULVERTS THE CONTRACTOR SHALL USE JUDGMENT IN SETTING THE FLOW LINE ELEVATIONS AND CULVERT LONGITUDINAL SLOPE. TYPICALLY THE FLOW LINE ELEVATIONS AND LONGITUDINAL SLOPE OF THE CULVERT SHOULD MATCH THE NATURAL GROUND ELEVATIONS AND SLOPE TO ENSURE POSITIVE DRAINAGE. WHEN POSSIBLE, ALL CULVERTS SHOULD BE PLACED AT A MINIMUM 0.5% GRADE.
4. ANTICIPATED CULVERT CROSSINGS ARE SHOWN ON THE CONSTRUCTION PLAN, ADDITIONAL CULVERTS MAY NEED TO BE INSTALLED IN AREAS WHERE CONCENTRATED FLOW IS EXPECTED DUE TO CONSTRUCTION ACTIVITIES.
5. CONSTRUCTION DRAINAGE CROSSINGS TO MAINTAIN EXISTING FLOW CHARACTERISTICS OF THE FEATURES. FEATURES SHALL BE GRADED TO PRECONSTRUCTION CONTOURS.

TESTING:

1. TESTING SHALL BE PERFORMED BY A DESIGNATED INDEPENDENT TESTING AGENCY.
2. SUBMIT ONE SET OF TESTING AND INSPECTION RECORDS SPECIFIED TO THE CIVIL ENGINEER OF RECORD.

DEFINITIONS:

1. PROOF ROLLING:
   SHALL BE PERFORMED IN THE PRESENCE OF THE GEOTECHNICAL ENGINEER OR QUALIFIED GEOTECHNICAL REPRESENTATIVE USING A FULLY LOADED TANDEM AXLE DUMP TRUCK OR WATER TRUCK WITH A MINIMUM GROSS WEIGHT OF 25 TONS OR A FULLY LOADED BELLY DUMP WITH AN EQUIVALENT AXLE LOADING. PROOF-ROLLING ACCEPTANCE STANDARDS INCLUDE NO RUTTING GREATER THAN 1.5 INCHES, AND NO "PUMPING" OF THE SOIL BEHIND THE LOADED TRUCK.
2. SIEVE ANALYSIS:
   SHALL BE CONDUCTED IN ACCORDANCE WITH AASHTO T27
3. PROCTORS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T99
4. ATTERBERG LIMITS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T89 AND T90
5. MOISTURE DENSITY (NUCLEAR DENSITY):
   SHALL BE DONE IN ACCORDANCE WITH AASHTO T310
6. DYNAMIC CONE PENETROMETER (DCP) TESTING:
   SHALL BE DONE IN ACCORDANCE WITH ASTM D6951-03

REQUIREMENTS:

1. FILL PLACEMENT:
   A. SOILS USED AS FILL MATERIAL SHALL BE TESTED FOR MOISTURE CONTENT AND PROCTOR TESTS.
   B. WHERE FILL CONSTRUCTION REQUIRES MORE THAN 12 INCHES OF FILL PLACEMENT, COMPACT EACH LIFT TO A MINIMUM OF 95 PERCENT OF THE MATERIAL'S MAXIMUM STANDARD PROCTOR DRY DENSITY.
2. COMPACTED SUBGRADE (CEMENT STABILIZED):
   A. SEE SHEET 13 FOR TESTING REQUIREMENTS AND PROCEDURE.
3. COMPACTED SUBGRADE (NON-CEMENT STABILIZED):
   A. THE ENTIRE SUBGRADE SHALL BE PROOF-ROLLED PRIOR TO THE PLACEMENT OF THE AGGREGATE BASE TO IDENTIFY AREAS OF UNSTABLE SUBGRADE.
   B. PERFORM A MINIMUM OF 3 DYNAMIC CONE PENETROMETER (DCP) TESTS PER ACCESS ROAD OR ONE FOR EVERY 1,000 LF OF ROAD, WHICHEVER IS GREATER. SUBGRADE MUST MEET A MINIMUM DCP OF 3 BLOWS PER 6" TO A TOTAL DEPTH OF 2' (MINIMUM CBR=1.5).
   C. IF A PASSING PROOF-ROLL OR DCP REQUIREMENTS CANNOT BE ACHIEVED THE FOLLOWING ALTERNATIVES MAY BE IMPLEMENTED:
      a. SCARIFY, DRY, AND RECOMPACT SUBGRADE
      b. REMOVE UNSUITABLE MATERIAL AND REPLACE WITH SUITABLE MATERIAL
      c. INCREASE AGGREGATE BASE THICKNESS
4. AGGREGATE BASE:
   A. AGGREGATE BASE SHALL BE PROOF-ROLLED OVER THE ENTIRE LENGTH. IF PROOF ROLLING DETERMINES THAT THE ROAD IS UNSTABLE, ADDITIONAL AGGREGATE SHALL BE ADDED UNTIL THE UNSTABLE SECTION IS ABLE TO PASS A PROOF ROLL.
   B. PROVIDE 1 SIEVE ANALYSIS (PROJECT MAX OF 20) PER 2500 CY OF ROAD BASE PLACED.
5. CRANE PAD AND CRANE PATHS / CRANE TRAVEL SHOULDERS:
   A. TESTING REQUIREMENTS ARE PENDING BASED ON CRANE PICK PLANS PROVIDED BY THE CONTRACTOR.

GENERAL NOTES:

1. GROUND SURFACE CONTOURS (AT TWO-FOOT VERTICAL INTERVALS) AND ELEVATIONS ARE BASED ON A PHOTOGRAMMETRY SURFACE PROVIDED BY GEOTERRA. IF MAJOR DISCREPANCIES ARE FOUND IN THE GROUND ELEVATIONS DURING FIELD STAKING TO THE GROUND ELEVATIONS SHOWN ON THE PLANS, THE OWNER AND ENGINEER SHALL BE NOTIFIED.
2. WHERE SECTION OR SUBSECTION MONUMENTS ARE ENCOUNTERED, THE OWNER SHALL BE NOTIFIED BEFORE SUCH MONUMENTS ARE REMOVED. THE CONTRACTOR SHALL PROTECT AND CAREFULLY PRESERVE ALL PROPERTY MARKERS AND MONUMENTS UNTIL THE OWNER, AN AUTHORIZED SURVEYOR OR AGENT HAS WITNESSED OR OTHERWISE REFERENCED THEIR LOCATION.
3. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. TYPICAL DISTURBANCE SHALL BE LIMITED TO 10 LF FROM THE EDGE OF PROPOSED GRADING.
4. FINALIZE GRADING AROUND THE BASE OF TURBINES IN ACCORDANCE WITH DETAIL TS-03 AND TS-04.
5. GRADE ALL PROPOSED ROADS TO A MAXIMUM SLOPE OF 8%. IF 8% SLOPE CANNOT BE ACHIEVED, THE CONTRACTOR MAY UTILIZE ASSIST VEHICLES FOR THE PURPOSE OF DELIVERIES. GRADE ALL PROPOSED CRANE PATHS TO A MAXIMUM OF 8% UNLESS OTHERWISE NOTED IN PLAN SHEETS.
6. ANY FACILITIES REMOVED TO ALLOW FOR CONSTRUCTION (MAILBOXES, SIGNS, FENCES, ETC.) SHALL BE REPLACED BY THE CONTRACTOR IN A CONDITION AS GOOD AS EXISTING.
7. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING DRAINAGE THROUGHOUT THE CONSTRUCTION OF THIS PROJECT. CONSTRUCTION ACTIVITIES SHALL NOT BLOCK THE NATURAL OR MANMADE CREEKS OR DRAINAGE SWALES CAUSING RAINWATER TO POND. DEPENDING ON FIELD CONDITIONS, ADDITIONAL CULVERTS IN EXCESS OF THOSE ON THE PLANS MAY BE REQUIRED.
8. WHILE BUILDING THE ROADS AND EXCAVATING THE TURBINE FOUNDATIONS, EXCESS SOIL WILL RESULT. THE CONTRACTOR SHALL DISPOSE OF THIS EXCESS SOIL IN AN APPROVED MANNER. EXCESS TOPSOIL SHALL BE DISTRIBUTED INTO A THIN LAYER ON LAND IMMEDIATELY ADJACENT TO WHERE THE TOPSOIL ORIGINATED. ALL EXCESS TOPSOIL TO BE WASTED ONSITE. WHILE DOING SO THE CONTRACTOR SHALL AVOID CAUSING RIDGES OR MOUNDS THAT WOULD MAKE IT DIFFICULT FOR STORM WATER RUNOFF TO DRAIN. THE FINAL SURFACE OF THE DISTURBED TOPSOIL SHALL BE SMOOTH AND FOLLOW THE NATURAL CONTOUR OF THE LAND.
9. THE CONTRACTOR SHALL NOTIFY SOUTH DAKOTA 811 AT LEAST 48 HOURS BEFORE EXCAVATION ACTIVITIES COMMENCE.
10. TEMPORARY INTERSECTION WIDENING SHALL, UPON COMPLETION OF ALL PROJECT CONSTRUCTION OR UPON NOTIFICATION OF THE ENGINEER, BE REMOVED AND THE AREA RESTORED TO ITS ORIGINAL LINES AND GRADES WITH TOPSOIL REPLACED, EXCEPT WHERE REQUESTED BY THE TOWNSHIP OR COUNTY TO PERMANENTLY REMAIN. DISTURBED AREAS OUTSIDE OF THE FINAL ROADWAY SHALL BE SEEDED AND MULCHED.
11. TURBINE SETBACKS ARE NOT IDENTIFIED ON THE CONSTRUCTION PLANS. IT SHALL BE THE RESPONSIBILITY OF THE OWNER AND CONTRACTOR TO ENSURE THAT ALL TURBINE SETBACKS MEET PROJECT REQUIREMENTS.
12. GEOTECHNICAL REPORTS WITH RECOMMENDATIONS HAVE BEEN PROVIDED BY THE OWNER. ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL ENGINEERING REPORT AND RECOMMENDATIONS.
13. FIELD SURVEY WETLAND INFORMATION HAS BEEN PROVIDED BY THE OWNER. ALL WETLAND DELINEATIONS AND PERMITTING SHALL BE THE RESPONSIBILITY OF OTHERS AND BE COMPLETED PRIOR TO CONSTRUCTION COMMENCING. THE OWNER AND GENERAL CONTRACTOR SHALL VERIFY THAT ALL WETLAND PERMITS HAVE BEEN SUBMITTED AND APPROVED PRIOR TO CONSTRUCTION COMMENCING.
14. CULTURAL RESOURCE REPORTS HAVE NOT BEEN PROVIDED. CULTURAL RESOURCE LOCATIONS ARE NOT SHOWN ON THE PLANS. INFORMATION WILL BE THE RESPONSIBILITY OF THE OWNER AND GENERAL CONTRACTOR. THE LOCATIONS OF CULTURAL RESOURCE SITES MAY BE CONFIDENTIAL AND PROTECTED BY STATE OR FEDERAL LAW. PUBLIC RELEASE OF SPECIFIC INFORMATION REGARDING THESE RESOURCES MAY BE RESTRICTED.
15. AN ENVIRONMENTAL ASSESSMENT HAS NOT BEEN PROVIDED. THE CONTRACTOR SHALL BE FAMILIAR WITH THE REPORT AND REVIEW ALL RECOMMENDATIONS.
16. ELECTRICAL INFORMATION SHOWN ON THE PLANS IS FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSULTANT'S PLANS FOR SPECIFIC LOCATIONS AND CONSTRUCTION DETAILS FOR THE UNDERGROUND POWER COLLECTION SYSTEM AND SUBSTATION.
17. CRANE PATHS ARE SHOWN ON THE CONSTRUCTION PLANS. IF THE CONTRACTOR PROPOSES ALTERNATE CRANE PATHS, THEY SHALL ENSURE THAT WETLAND AND CULTURAL RESOURCE CORRIDORS ARE NOT DISTURBED. FINAL CRANE PATH ALIGNMENTS SHALL BE DETERMINED BY THE CONTRACTOR BASED ON FIELD CONDITIONS WITHIN THE WETLAND AND CULTURAL RESOURCE CORRIDORS, SPECIAL LANDOWNER AGREEMENTS AND THE PROJECT BOUNDARY.
18. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. DISTURBANCE SHALL BE LIMITED TO 50 LF WIDTH FOR PROPOSED ACCESS ROADS AND 50 LF FOR CRANE PATHS, AND SHALL BE LIMITED TO A 250 LF RADIUS FOR PROPOSED WIND TURBINE GENERATORS. THE GRADING LIMITS SHALL BE CENTERED ON THE ROADWAYS AND WIND TURBINES. THE CONTRACTOR SHALL MAKE ALL EFFORTS TO KEEP ACTIVITIES WITHIN THE ERECTION AREAS SHOWN ON THE PLANS BUT IT IS UNDERSTOOD THAT SOME ACTIVITIES THAT WILL NOT REQUIRE GRADING OR SOIL DISTURBANCE MAY EXTEND BEYOND THE DEFINED LIMITS. DURING ERECTION OF THE ROTOR, TRUCKS AND/OR FORKLIFTS MAY EXTEND BEYOND THESE LIMITS. SEE DETAIL TS01 FOR TYPICAL ERECTION AREAS.
19. AN ALTA SURVEY HAS BEEN PROVIDED BY WESTWOOD. CONTRACTOR AND OWNER ARE RESPONSIBLE FOR LOCATING ALL UTILITIES AND VERIFYING LOCATION OF CONSTRUCTION ACTIVITIES PRIOR TO COMMENCING WORK.

STORMWATER POLLUTION PREVENTION PLAN (SWPPP):

1. THE CONTRACTOR SHALL PROVIDE EROSION CONTROL MEASURES AS PLANNED AND SPECIFIED FOLLOWING BEST MANAGEMENT PRACTICES AS OUTLINED BY THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND BEING IN CONFORMANCE WITH THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL STORMWATER PERMIT.
2. REFER TO THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR THE TRIPLE H WIND FARM, PREPARED BY WESTWOOD PROFESSIONAL SERVICES, FOR EROSION CONTROL AND RESTORATION SPECIFICATIONS, SEDIMENT AND EROSION CONTROL PROCEDURES, LOCATIONS OF BMPs, DETAILS, AND INSPECTION INFORMATION.
3. ALL PASTURES AND DRAINAGE SWALES DISTURBED DURING CONSTRUCTION ACTIVITIES AND NOT COVERED BY ROAD SURFACING MATERIALS, SHALL BE SEEDED IN ACCORDANCE WITH THE SWPP PLAN.
4. TEMPORARY EROSION CONTROL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE TEMPORARY EROSION CONTROL PLAN SHALL BE IN ACCORDANCE WITH THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND THE TRIPLE H WIND FARM STORMWATER POLLUTION PREVENTION PLAN ON FILE.

TABLE 1: SDDOT AGGREGATE BASE COURSE – LOCALLY SOURCED

SIEVE SIZE	PERCENT PASSING
1"	100
3/4"	80-100
1/2"	68-91
NO. 4	46-70
NO. 8	34-58
NO. 40	13-35
NO. 200	3-12

MEET FOLLOWING REQUIREMENTS PER 882.2

LIQUID LIMIT (MAX) = 25
PLASTICITY INDEX = 0-6
L.A ABRASION (% MAX) = 40%

GRADATION HAS BEEN OBTAINED FROM THE 2015 SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION BOOK.

TABLE 2: TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
FILL PLACEMENT	PROCTOR	1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER LIFT PER 5000 SF OF FILL PLACED OR 1 PER 500 LF OF ROAD OR CRANE WALK
COMPACTED SUBGRADE (CEMENT STABILIZED):	SEE SHEET 13	SEE SHEET 13
COMPACTED SUBGRADE (NON-CEMENT STABILIZED):	PROOF-ROLL	ENTIRE AREA
	DCP	1 PER 1,000 FT OR MIN. 3 PER ROAD
AGGREGATE BASE	PROOF-ROLL	ENTIRE AREA
	SIEVE ANALYSIS, LL, PL, AND L.A ABRASION	1 PER 2,500 CY

PROJECT CONTACT INFORMATION:

TITLE	COMPANY	NAME	CONTACT NUMBER
OWNER (PRIMARY)	ENGIE	CASEY WILLIS	805-569-6185
PROJECT MANAGER	WESTWOOD	DANI NYGREN	952-906-7493
ENGINEER OF RECORD	WESTWOOD	ROB COPOULS	952-906-7470
CONTRACTOR	WANZEK	JASON HELLERUD	701-893-3685

Westwood

Westwood Professional Services, Inc.

Designed: BMK
Checked: DJN
Drawn: BMK
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 12 OF 57

0014440OTP.dwg

© 2019 Westwood Professional Services, Inc.

CEMENT STABILIZATION - PROCEDURE

THE SPECIFICATIONS BELOW ARE GENERAL RECOMMENDATIONS/GUIDELINES FOR CEMENT STABILIZATION OF SUBGRADES FOR THE PROJECT. ACTUAL FIELD CONDITIONS MAY ALTER APPLICATION RATE. CONSULT GEOTECHNICAL ENGINEER FOR FURTHER RECOMMENDATIONS.

1. STRIP THE TOP ±4 INCHES OF TOPSOIL (THROUGH THE ROOT ZONE) FROM THE AREA TO BE STABILIZED. ROOTS SMALLER THAN 1/4" DIAMETER ARE CONSIDERED INSIGNIFICANT.
2. PERFORM A PROCTOR (ASTM D 698) TEST TO DETERMINE THE OPTIMUM MOISTURE CONTENT IF THE MATERIAL TO BE STABILIZED DOES NOT MATCH A PREVIOUSLY PERFORMED PROCTOR.
3. DETERMINE THE IN-SITU MOISTURE CONTENT USING A NUCLEAR DENSITY GAUGE (OR EQUIVALENT MOISTURE CONTENT TEST) DAILY, PRIOR TO INCORPORATION OF THE CEMENT. PROVIDE ADDITIONAL MOISTURE CONTENT TESTING AS NEEDED BASED ON WEATHER CONDITIONS.
   - 3.1. THE CONTRACTOR WILL BE ADVISED OF IN-SITU MOISTURE CONTENT, AND MOISTURE ADJUSTMENTS SHOULD BE MADE IF IN-SITU MOISTURE IS LESS THAN OPTIMUM MOISTURE CONTENT AS DETERMINED BY THE PROCTOR (ASTM D 698).
4. SOIL AND CEMENT BLENDING:
   - 4.1. COMPLETELY BLEND SUBGRADE SOIL WITH THE APPROPRIATE AMOUNT OF CEMENT BY WEIGHT. FIELD RESULTS FROM TEST STRIPS WILL DICTATE THE CEMENT APPLICATION RATE.
   - 4.2. IN AREAS OF HIGH MOISTURE OR POOR SOILS, THE CONTRACTOR MAY INCREASE THE PERCENT OF CEMENT IN ORDER TO MEET THE MINIMUM SUBGRADE STRENGTH REQUIREMENTS.
   - 4.3. THE USE OF A RECLAIMER IS AN ADEQUATE BLENDING METHOD. DISCING IS NOT AN ADEQUATE BLENDING METHOD.
   - 4.4. A STABILIZATION DEPTH OF 12" WAS USED FOR DESIGN PURPOSES. STABILIZATION DEPTH MAY NEED TO INCREASE TO 16" IN AREAS OF EXTREME MOISTURE OR POOR SOILS IN ORDER TO MEET THE STRENGTH AND PROOF ROLL REQUIREMENTS.
5. COMPACTION:
   - 5.1. A ROLLING PATTERN WILL BE ESTABLISHED USING A NUCLEAR DENSITY GAUGE DURING COMPACTION.
     - 5.1.1. COMPACTION WILL BE PERFORMED UNTIL THE STABILIZED MATERIAL REACHES THE "BREAK POINT" AFTER WHICH ADDITIONAL PASSES WITH A ROLLER RESULTS IN A LOSS OF DENSITY AS MEASURED BY A NUCLEAR DENSITY GAUGE.
     - 5.1.2. COMPACTION IS TYPICALLY ACHIEVED BY MULTIPLE PASSES OF A PADFOOT ROLLER UNTIL THE ROLLER "WALKS" OUT OF THE RECLAIMED MATERIAL (SPACE IS VISIBLE BETWEEN THE DRUM AND THE RECLAIMED MATERIAL). THIS IS FOLLOWED BY BLADING AND SHAPING THE RECLAIMED MATERIAL TO FINAL PROFILE AND CROSS SECTION, REMOVING HIGH AND LOW POINTS. SMOOTH DRUM OR RUBBER TIRE ROLLERS ARE THEN USED TO FINISH ROLLING (THIS IS WHEN THE DENSITY TESTS ARE PERFORMED) UNTIL THE DENSITY OF THE MATERIAL REACHES THE "BREAK POINT."
     - 5.1.3. THE NUMBER OF PASSES AND EQUIPMENT USED TO REACH THE "BREAK POINT" IS CONSIDERED THE ROLLING PATTERN.
     - 5.1.4. A NEW ROLLING PATTERN MAY NEED TO BE ESTABLISHED IF THE PERFORMANCE REQUIREMENTS ARE NOT BEING MET. THIS MAY BE DUE TO CHANGES IN THE MOISTURE CONTENT, THE SOIL TYPE, OR THE CEMENT RATE.
   - 5.2. THE TARGET DENSITY IS 98% OF THE MAXIMUM DENSITY DETERMINED FROM THE ROLLING PATTERN.
     - 5.2.1. DENSITY TESTS SHALL BE TAKEN AT THE RATE OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER TO CONFIRM THE DENSITY IS MATCHING THE TARGET. ONCE THE ROLLING PATTERN HAS BEEN CONFIRMED IT IS RECOMMENDED THAT TESTING CONTINUE AT 1 TEST PER 1,000 LF IN EACH PASS OF THE RECLAIMER.
     - 5.2.2. IF IT IS NOT POSSIBLE TO ATTAIN THE TARGET DENSITY, AND ADDITIONAL COMPACTION DOES NOT IMPROVE THE DENSITY, A NEW ROLLING PATTERN SHOULD BE ESTABLISHED.
   - 5.3. THE AIR TEMPERATURE SHALL BE ABOVE 40 DEGREES (F) DURING THE CEMENT STABILIZATION PROCESS. MIXING CEMENT INTO FROZEN GROUND IS NOT ACCEPTABLE.
6. THE STABILIZED MATERIAL SHALL BE CONTINUOUSLY WET CURED FOR A MINIMUM OF 24 HOURS (WET CURED IS IDENTIFIED VISUALLY AS DAMP SURFACE).
7. PERFORM SUBGRADE TESTING IN ACCORDANCE WITH TESTING SCHEDULE.
8. AGGREGATE PLACEMENT:
   - 8.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 8.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 8.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

CEMENT STABILIZATION - DESIGN BASIS

1. DURING INITIAL CONSTRUCTION, CONTRACTOR SHALL CONSTRUCT MINIMUM 300 LF TEST STRIPS CONTAINING 4%, 5%, AND 6% CEMENT IN ACCORDANCE WITH CEMENT STABILIZATION PROCEDURES.
2. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 3 FOR ANTICIPATED RESULTS):
   - 2.1. PERFORM INITIAL SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M BETWEEN 4 TO 6 HOURS AFTER FINAL COMPACTION.
   - 2.2. PERFORM ADDITIONAL DCP TESTING AT 24 AND 48 HOURS AFTER FINAL COMPACTION.
   - 2.3. PERFORM SUBSEQUENT DCP TESTS AT 7 DAYS AFTER FINAL COMPACTION AS VERIFICATION OF STRENGTH CURVE.
   - 2.4. A MINIMUM OF 3 TESTS PER TEST SECTION PER TIMEFRAME IS REQUIRED. TESTS SHALL BE TAKEN AT THE CENTERLINE AND 2' FROM EACH SHOULDER.
   - 2.5. RECORD DCP TEST RESULTS EVERY 6 INCHES TO TOTAL DEPTH OF 12 INCHES.

TABLE 3: TEST STRIP CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	COMPRESSIVE STRENGTH (PSF)
4 – 6 HOURS	6	5	1,800
24 HOURS	10	7	2,500
48 HOURS	15	10	3,300
7 DAYS	30	21	5,200

CEMENT STABILIZATION - PRODUCTION

1. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 5 FOR SUMMARY OF TESTING REQUIREMENTS):
   - 1.1. PERFORM SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M NO SOONER THAN 24 HOURS AFTER FINAL COMPACTION.
   - 1.2. DCP TESTING FREQUENCY SHALL BE WITH A RANDOM SPACING AND A MINIMUM OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER. A MINIMUM OF 3 TESTS PER ROAD IS REQUIRED.
   - 1.3. THE CBR OF THE STABILIZED SUBGRADE SHOULD BE CALCULATED IN 6" INCREMENTS THROUGH THE ENTIRE DEPTH OF THE STABILIZED LAYER.
   - 1.4. THE MINIMUM REQUIRED CBR PRIOR TO PROOF-ROLLING IS PROVIDED IN TABLE 4 BELOW:

TABLE 4: FINAL CEMENT STABILIZED CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	UNDRAINED SHEAR STRENGTH (PSF)	BEARING CAPACITY (PSF)
24 – 48 HOURS	15	10	3,500	9,800
3 – 7 DAYS	30	21	7,000	18,000
28 DAYS	50	33	12,000	28,500

NOTE: UNDRAINED SHEAR STRENGTH WAS CALCULATED USING THE BLACK (1981) EQUATION. BEARING CAPACITY WAS CALCULATED USING THE VESIC EQUATION MODIFIED FOR TWO LAYERS (12" CEMENT STABILIZED SUBGRADE OVER A NATURAL SUBGRADE WITH A CBR OF 1.5)

   - 1.5. ONCE THE MINIMUM REQUIRED CBR IS ACHIEVED AT ANY CORRESPONDING TIME PERIOD, THE SUBGRADE IS CONSIDERED ADEQUATE AND THE CONTRACTOR MAY PROCEED WITH PROOF-ROLL TESTING. FUTURE DCP TESTING ON THAT SEGMENT OF SUBGRADE IS NOT REQUIRED.
   - 1.6. IF TESTING DOES NOT INDICATE A CBR OF 30 WITHIN 7 DAYS, ADDITIONAL GRAVEL SURFACING AND/OR THE ADDITION OF GEOTEXTILE FABRIC MAY BE REQUIRED. FOR FUTURE SUBGRADE STABILIZATION AREAS, CONTACT THE ENGINEER AND OWNER VIA RFI FOR RECOMMENDATIONS AND APPROVAL.
2. SUBGRADE PROOF-ROLL TESTING AND ACCEPTANCE:
   - 2.1. ONCE THE REQUIRED DCP VALUE HAS BEEN OBTAINED BUT PRIOR TO PLACING AGGREGATE, THE SUBGRADE SHALL BE PROOF-ROLLED. REFER TO THE PROJECT TESTING REQUIREMENTS FOR PROOF-ROLL DEFINITION.
   - 2.2. PROOF-ROLLING SHOULD BE PERFORMED WITH ONE PASS DOWN THE CENTER AND NOT BE PERFORMED WITHIN 12 INCHES OF THE EDGE OF THE STABILIZED SECTION.
   - 2.3. IF PROOF-ROLLING FAILS, RE-STABILIZATION MAY BE REQUIRED AND A NEW ROLLING PATTERN OR ADDITIONAL CEMENT MAY BE REQUIRED.
3. AGGREGATE PLACEMENT:
   - 3.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 3.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 3.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

TABLE 5: CEMENT STABILIZATION PRODUCTION TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
COMPACTED SUBGRADE (CEMENT STABILIZED)	PROCTOR	MINIMUM 1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER 1000 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
NOTE: SEE ABOVE FOR INITIAL TESTING REQUIREMENTS	DCP TEST	1 PER 500 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
	PROOF-ROLL (AFTER PASSING DCP TESTS)	ENTIRE LENGTH

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (866) 937-5150 westwoodps.com

Westwood Professional Services, Inc.

Designed: BMK
Checked: DJH
Drawn: BMK
As-Built Drawing:

Revisions #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 13 OF 57

001444DTP.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. County Road 649 in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 1755' South of CR 649 & 201st Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.27'50.59" W Long. -99.36'12.25" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD08-A
   (Check attached spec sheet)
5. Size & length of culvert: (2) 24"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001699 NW4 34-112-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19

Tanya Dance
Signature of Applicant

Date Approved: 08-06-2019

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. County Road 649 in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 1755' South of CR 649 & 201st Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.27'50.59" W Long. -99.36'12.25" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD08-A
   (Check attached spec sheet)
5. Size & length of culvert: (2) 24"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001699 NW4 34-112-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: _____

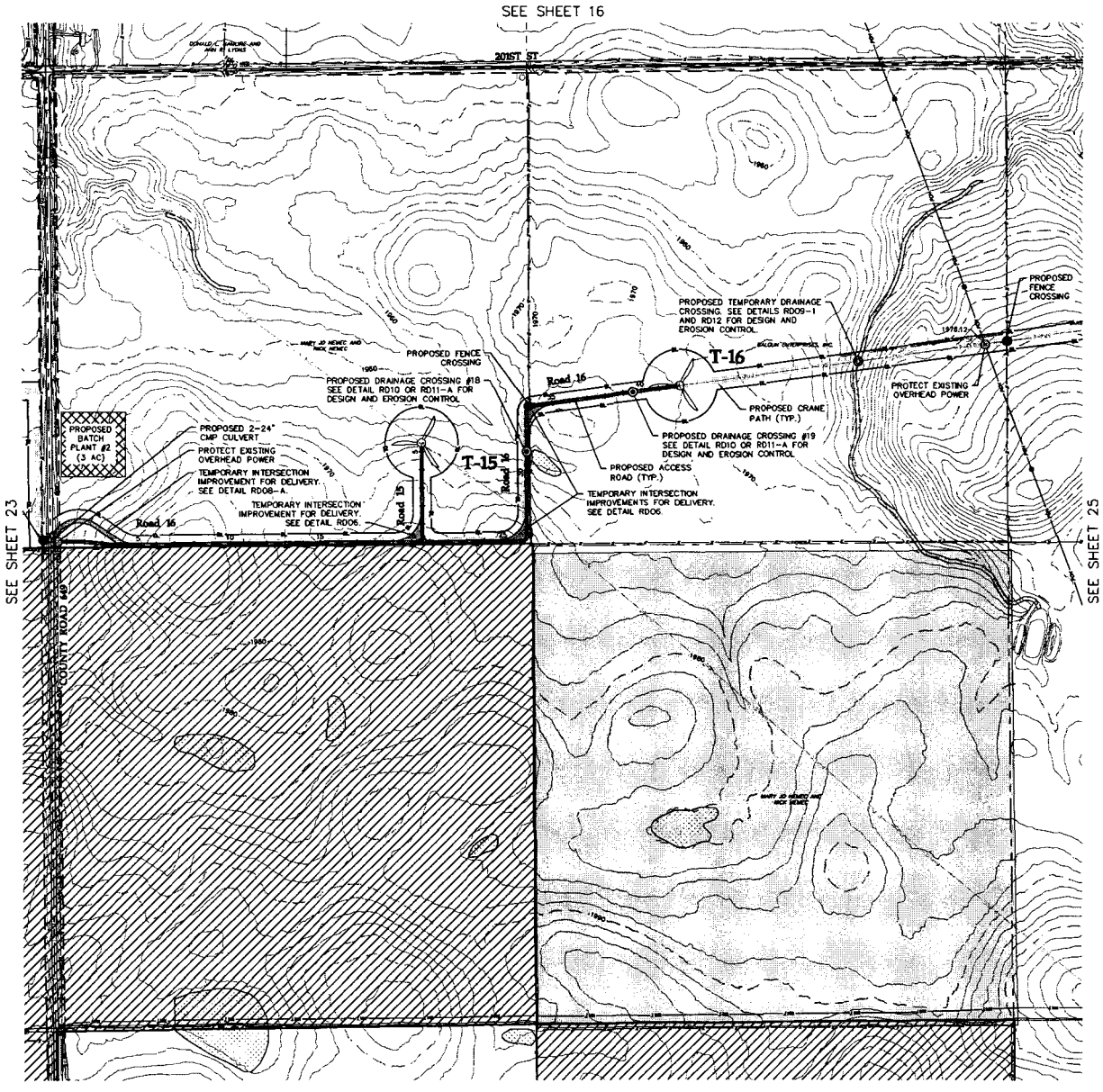
Tanya Klarer
Signature of Applicant

_____
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

©2019 Westwood Professional Services, Inc.



LEGEND:

- PROPOSED TURBINE LOCATION
- T-XX — PROPOSED TURBINE NUMBER
- PROPOSED ALTERNATE TURBINE LOCATION
- ALT-XX — PROPOSED ALTERNATE TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED ALTERNATE ACCESS ROAD
- PROPOSED CRANE PATH
- PROPOSED UNDERGROUND COLLECTION*
- PROPOSED DISTURBANCE LIMITS
- SF — PROPOSED PERIMETER SEDIMENT CONTROL
- 980 — EXISTING 10' CONTOURS
- EXISTING 2' CONTOURS
- EXISTING GRAVEL EDGE
- EXISTING BITUMINUS EDGE
- EXISTING RIGHT-OF-WAY
- EXISTING PARCEL LINE
- EXISTING BUILDING
- EXISTING FENCE
- OH — EXISTING OVERHEAD POWER
- HOH — EXISTING HIGH VOLTAGE OVERHEAD POWER
- UGP — EXISTING UNDERGROUND POWER LINE
- FOP — EXISTING FIBER OPTIC LINE
- WAT — EXISTING WATER LINE
- DELINEATED WETLAND
- ARCHAEOLOGICAL AVOIDANCE AREA
- EXISTING USFWS EASEMENT
- PROJECT BOUNDARY
- 1900 — EXISTING GROUND ELEVATION
- PROPOSED DRAINAGE CROSSING**
- PROPOSED TEMPORARY DRAINAGE CROSSING**
- PROPOSED FENCE CROSSING***
- PROPOSED UTILITY CROSSING
- PROPOSED CULVERT

* PROVIDED BY OTHERS AND SHOWN FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSTRUCTION PLANS FOR DETAILS.

** SEE SHEET 11 FOR DRAINAGE CROSSING TYPE AND SIZING. DRAINAGE CROSSINGS SHALL CONSIST OF LOW WATER CROSSING OR CULVERT. DRAINAGE CROSSINGS ALONG CRANE PATH SHALL CONSIST OF CRANE MATS OR TEMPORARY CULVERT.

*** ALL GATE INSTALLATIONS SHALL BE FIELD DETERMINED AND AGREED UPON BY THE CONTRACTOR AND OWNER.

		14	15	16	17	18	19	20		
21	22	23	24	25	26	27	28	29	30	31
				32	33	34	35	36	37	38
			39	40	41	42	43	44	45	46
		47	48	49	50	51				
	52	53	54	55						

KEY MAP

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 www.westwoodps.com
Westwood Professional Services, Inc.

Designed: BMC
Checked: DJH
Drawn: BMC
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078

0' 300' 600' 900'

Triple H Wind Farm

Hyde County, South Dakota

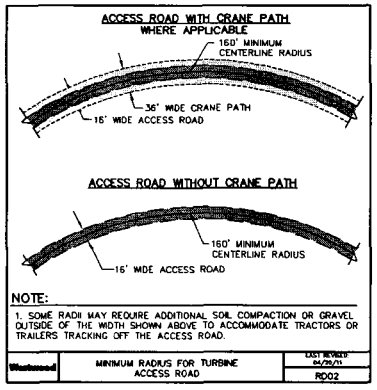
Site Plan T-15 - T-16

90% COMPLETE NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 24 OF 57

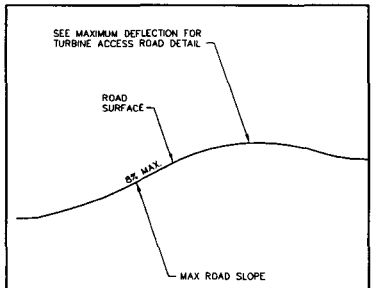
0014440SP01.dwg

©2019 Westwood Professional Services, Inc.



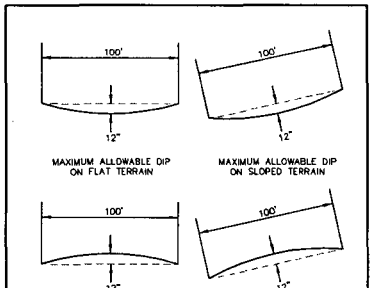
NOTE:
1. SOME RADII MAY REQUIRE ADDITIONAL SOIL COMPACTION OR GRAVEL OUTSIDE OF THE WIDTH SHOWN ABOVE TO ACCOMMODATE TRACTORS OR TRAILERS TRACKING OFF THE ACCESS ROAD.

Westwood	MINIMUM RADIUS FOR TURBINE ACCESS ROAD	LAST REVISED: 04/29/11 RD02

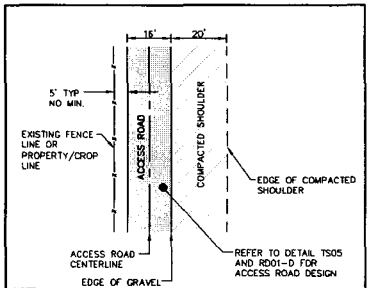


NOTES:
1. ROAD SLOPE SHALL NOT EXCEED 8% WITHOUT OWNER APPROVAL

Westwood	MAXIMUM VERT. SLOPE FOR TURBINE ACCESS ROAD/CRANE TRAVEL PATH	LAST REVISED: 3/29/07 RD03

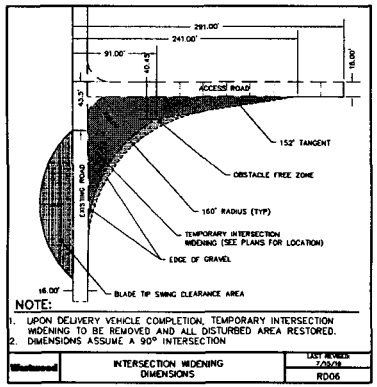


Westwood	MAXIMUM DEFLECTION FOR TURBINE ACCESS ROAD	LAST REVISED: 01/29/08 RD04



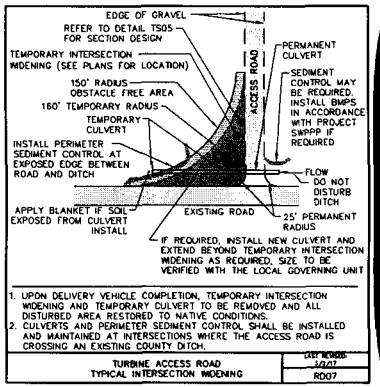
NOTE:
1. COMPACTED SHOULDER SHALL BE RETURNED TO NATIVE CONDITION FOLLOWING TURBINE GENERATOR CONSTRUCTION.
2. THE ACCESS ROAD MAY NEED TO BE CONSTRUCTED FARTHER FROM THE PROPERTY LINE IF OBSTRUCTIONS SUCH AS TREES FOLLOW THE PROPERTY LINE.

Westwood	TURBINE ACCESS ROAD ALONG FENCE/PROPERTY/CROP LINE	LAST REVISED: 3/29/08 RD05



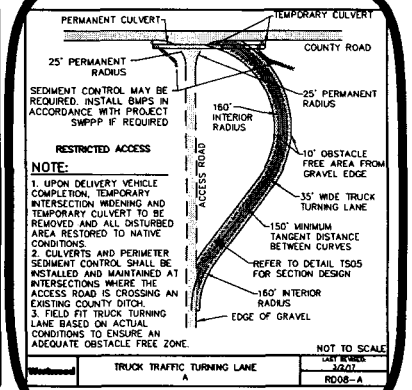
NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING TO BE REMOVED AND ALL DISTURBED AREA RESTORED.
2. DIMENSIONS ASSUME A 90° INTERSECTION

Westwood	INTERSECTION WIDENING DIMENSIONS	LAST REVISED: 7/09/19 RD06



1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.

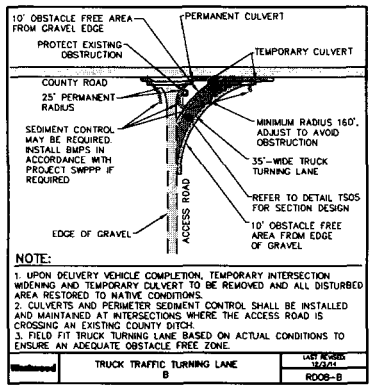
Westwood	TURBINE ACCESS ROAD TYPICAL INTERSECTION WIDENING	LAST REVISED: 3/2/07 RD07



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

NOT TO SCALE

Westwood	TRUCK TRAFFIC TURNING LANE A	LAST REVISED: 3/2/07 RD08-A



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

Westwood	TRUCK TRAFFIC TURNING LANE B	LAST REVISED: 12/3/14 RD08-B

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-Free (800) 937-5150 westwood@pwse.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: DJH
Drawn: BMK
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK
MasTec

2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

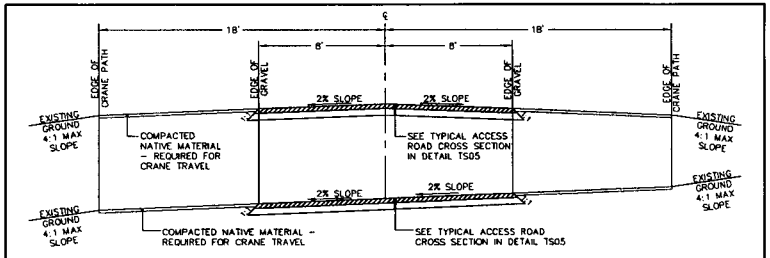
Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 5 OF 57

0014440DTP.dwg

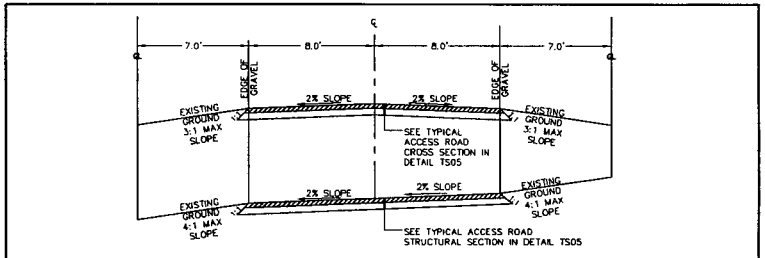
©2019 Westwood Professional Services, Inc.



NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE ACCESS ROAD DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

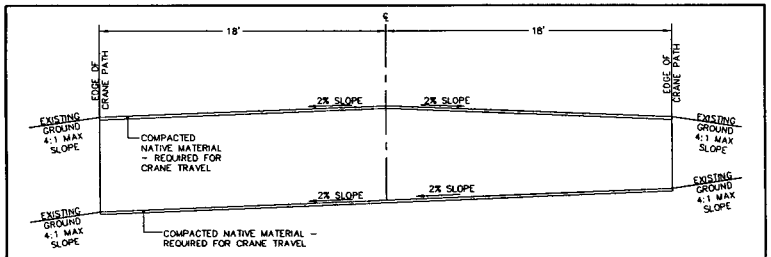
Westwood | TYPICAL TURBINE ACCESS ROAD AND CRANE PATH | LAST REVISED: 04/29/19 | RD01-A



NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

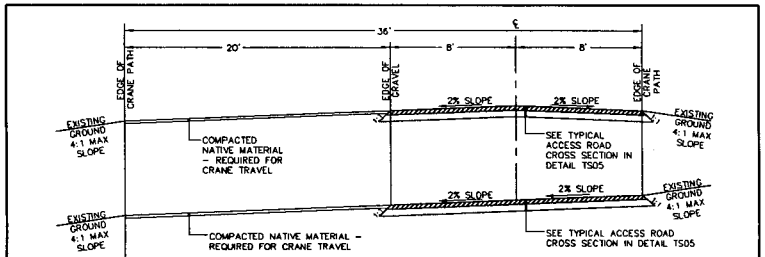
Westwood | TYPICAL TURBINE ACCESS ROAD SECTION | LAST REVISED: 3/18/19 | RD01-B



NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE WHERE CRANE PATHS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT CRANE PATH REMAINS WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%

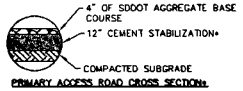
Westwood | TYPICAL CRANE PATH | LAST REVISED: 04/29/19 | RD01-C



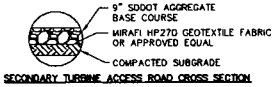
NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE EDGE OF COMPACTED SHOULDER DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

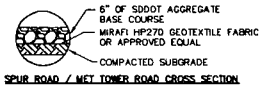
Westwood | TYPICAL TURBINE ACCESS ROAD AND OFFSET CRANE PATH | LAST REVISED: 04/29/19 | RD01-D



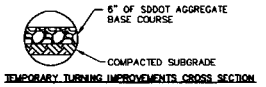
PRIMARY ACCESS ROAD CROSS SECTION*



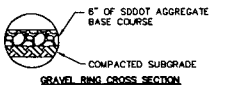
SECONDARY TURBINE ACCESS ROAD CROSS SECTION



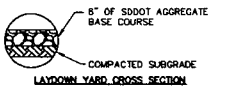
SPUR ROAD / MET TOWER ROAD CROSS SECTION



TEMPORARY TURNING IMPROVEMENTS CROSS SECTION



GRAVEL RING CROSS SECTION



LAYDOWN YARD CROSS SECTION

* CEMENT APPLICATION RATE MAY VARY BASED ON TEST STRIPS AND FIELD PERFORMANCE. SEE SHEET 13 FOR CEMENT STABILIZATION PROCEDURE AND DESIGN BASIS.

NOTES:

STRUCTURAL SECTIONS SHOWN ARE THE MINIMUM THICKNESS REQUIREMENTS DURING NORMAL FIELD CONDITIONS. THE SECTIONS MAY NEED TO BE INCREASED BASED ON ACTUAL FIELD CONDITIONS AT THE TIME OF CONSTRUCTION. CONDITIONS INCLUDE BUT ARE NOT LIMITED TO CONSTRUCTION DURING THE FREEZE/THAW CYCLE, UNUSUALLY WET PERIODS, OR IN LOW/WET AREAS. SEE SHEET 12 FOR TESTING REQUIREMENTS AND SPECIFICATIONS.

Westwood | TYPICAL STRUCTURAL CROSS SECTIONS

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-Free (888) 937-5150 westwoodps.com

Westwood Professional Services, Inc.

Designed: BMC
Checked: DJH
Drawn: BMC
As-Built Drawing:

Revisions #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 4 OF 57

001444D01P.dwg

©2019 Westwood Professional Services, Inc.

ROAD DESIGN PARAMETERS

1. ACCESS ROADS HAVE BEEN DESIGNED TO ACCOMMODATE LIGHT DUTY TRUCKS (PICKUP TRUCKS AND MAINTENANCE VEHICLES) FOR LOW VOLUME USE IN NORMAL OPERATING CONDITIONS AS WELL AS HEAVY DUTY CONSTRUCTION TRAFFIC UNDER DRY CONDITIONS. THE ROAD DESIGN SPECIFIED IS NOT INTENDED FOR ALL WEATHER USE FOR HEAVY DUTY CONSTRUCTION LOADS.
2. ROAD MAINTENANCE CAN BE EXPECTED OVER THE LIFE OF THE PERMANENT FACILITY.

PRODUCTS

1. AGGREGATE BASE SHALL CONSIST OF SDDOT AGGREGATE BASE COURSE (AND IN CONFORMANCE WITH THE GRADATION TABLE 1). AGGREGATE MAY BE CRUSHER RUN UPON ENGINEERS APPROVAL. AGGREGATE GRADATIONS SHALL BE SUBMITTED TO ENGINEER FOR REVIEW.
2. ROAD SHOULDERS AND CRANE PADS SHALL CONSIST OF COMPACTED NATIVE SOILS.
3. CULVERTS: ACCESS ROAD CULVERTS SHALL MEET THE MINIMUM SPECIFICATIONS SET FORTH BY THE SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION AND/OR HYDE COUNTY. ALL CULVERTS ARE PLANNED TO BE A MINIMUM 18" DIAMETER AND MANUFACTURED OF 16-GAGE CORRUGATED METAL PIPE WITH NO END TREATMENTS UNLESS NOTED OTHERWISE. ACTUAL SIZE WILL BE DETERMINED THROUGH HYDRAULIC ANALYSIS.
4. GEOTEXTILE FABRIC: MIRAFI HP270 OR APPROVED EQUAL.

EXECUTION

1. CLEARING AND GRUBBING
   A. THE CONTRACTOR SHALL BE REQUIRED TO GRUB ALL TREES, STUMPS, BRUSH, AND DEBRIS WITHIN THE GRADING AREAS SHOWN ON THE PLANS. GRUBBING INCLUDES REMOVAL OF ALL PLANT MATERIAL GREATER THAN 2" INCLUDING STUMPS, BRANCHES, ROOTS, ETC. TO A DEPTH BELOW THE FINAL SUBGRADE. THE CONTRACTOR IS TO REMOVE ONLY THOSE TREES WHICH ARE DESIGNATED BY THE OWNER'S REPRESENTATIVE FOR REMOVAL, AND SHALL EXERCISE EXTREME CARE AROUND EXISTING TREES TO BE SAVED.
2. TOPSOIL STRIPPING
   A. TOPSOIL, INCLUDING ROOTS LARGER THAN 2" AND LARGE ROOT MASSES, SHALL BE STRIPPED FROM ALL ROADWAY AND FOUNDATION AREAS UP TO 10". TOPSOIL SHALL NOT BE STRIPPED OUTSIDE OF THE DESIGNATED DISTURBANCE AREAS.
   B. ANY TOPSOIL THAT HAS BEEN STRIPPED SHALL BE STOCKPILED FOR POST CONSTRUCTION REVEGETATION. ALL TOPSOIL SHALL BE REDISTRIBUTED TO THE LAND OWNER'S PROPERTY OF WHERE IT ORIGINATED FROM.
3. FILL PLACEMENT
   A. FILL PLACEMENT SHALL CONSIST OF THE PLACING OF SUITABLE FILL MATERIAL, AFTER TOPSOIL STRIPPING, ABOVE THE EXISTING GRADE. GENERALLY, SIDE SLOPES SHALL BE CONSTRUCTED AT FOUR FOOT HORIZONTAL TO ONE FOOT VERTICAL, WITH SOME LOCATIONS THROUGHOUT THE PROJECT WITH SLOPES OF TWO FEET HORIZONTAL TO ONE FOOT VERTICAL. THE MATERIAL FOR FILL CONSTRUCTION SHALL BE OBTAINED FROM THE ACCESS ROAD/TURBINE EXCAVATION (SEE GEOTECHNICAL REPORT FOR RESTRICTIONS), OR ANY SUITABLE, APPROVED SOIL OBTAINED ONSITE/OFFSITE BY CONTRACTOR, AS DIRECTED OR APPROVED BY THE ENGINEER. THIS MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 12" AND CONSTRUCTED TO 95% OF THE MAXIMUM DRY DENSITY AND WITHIN 2% OF OPTIMUM MOISTURE CONTENT, AS DETERMINED BY THE STANDARD PROCTOR (AASHTO T99).
   B. SIDE SLOPES GREATER THAN 4:1 WILL NOT BE PERMITTED, UNLESS OTHERWISE NOTED ON THE PLAN.
   C. FILL SLOPES SHALL BE BENCHED INTO THE EXISTING SLOPE TO PREVENT MOVEMENT BETWEEN THE FILL AND NATIVE SOILS. BENCHES SHOULD BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO FILL PLACEMENT. POSITIVE DRAINAGE IS REQUIRED AT BENCHED AREAS AND AT THE TOE OF FILL SLOPES TO REMOVE SURFACE WATER.
4. SUBGRADE
   A. SUBGRADE PREPARED AT GRADE OR IN CUT REQUIRES SCARIFICATION AND RECOMPACTION TO A DEPTH OF 12" OR MORE.
   B. ACCESS ROAD CROSS SLOPES SHOWN IN THE PLANS ARE MEANT AS A GUIDE. ACCESS ROAD CROSS SLOPES MAY RANGE FROM 1% - 2%, CHECK WITH THE ENGINEER IF THE CROSS SLOPE FALLS OUTSIDE OF THIS RANGE. ACCESS ROADS BEING UTILIZED FOR CRANE TRAVEL SHOULD HAVE A MAX CROSS SLOPE OF 2%

TABLE 1: SDDOT AGGREGATE BASE COURSE - LOCALLY SOURCED	
SIEVE SIZE	PERCENT PASSING
1"	100
3/4"	80-100
1/2"	68-91
NO. 4	46-70
NO. 8	34-58
NO. 40	13-35
NO. 200	3-12

MEET FOLLOWING REQUIREMENTS PER 882.2

LIQUID LIMIT (MAX) = 25
PLASTICITY INDEX = 0-6
L.A ABRASION (% MAX) = 40%

GRADATION HAS BEEN OBTAINED FROM THE 2015 SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION BOOK.

STORM WATER DESIGN PARAMETERS

1. SEE SHEET 6 FOR CULVERT SIZING AND DESIGN PARAMETERS. SEE HYDROLOGY MEMO FOR FURTHER DESIGN CALCULATIONS. CULVERTS SHALL BE MINIMUM 18" CORRUGATED METAL PIPE. ALL TEMPORARY PORTIONS OF THE INSTALLED CULVERTS SHALL BE REMOVED UPON COMPLETION OF THE PROJECT.
2. IT IS EXPECTED THAT CULVERTS WILL BE OVERTOPPED DURING SOME STORMS AND MAINTENANCE WILL BE REQUIRED THROUGH THE LIFE OF THE PROJECT.
3. WHEN INSTALLING DRAINAGE CULVERTS THE CONTRACTOR SHALL USE JUDGMENT IN SETTING THE FLOW LINE ELEVATIONS AND CULVERT LONGITUDINAL SLOPE. TYPICALLY THE FLOW LINE ELEVATIONS AND LONGITUDINAL SLOPE OF THE CULVERT SHOULD MATCH THE NATURAL GROUND ELEVATIONS AND SLOPE TO ENSURE POSITIVE DRAINAGE. WHEN POSSIBLE, ALL CULVERTS SHOULD BE PLACED AT A MINIMUM 0.5% GRADE.
4. ANTICIPATED CULVERT CROSSINGS ARE SHOWN ON THE CONSTRUCTION PLAN, ADDITIONAL CULVERTS MAY NEED TO BE INSTALLED IN AREAS WHERE CONCENTRATED FLOW IS EXPECTED DUE TO CONSTRUCTION ACTIVITIES.
5. CONSTRUCTION DRAINAGE CROSSINGS TO MAINTAIN EXISTING FLOW CHARACTERISTICS OF THE FEATURES. FEATURES SHALL BE GRADED TO PRECONSTRUCTION CONTOURS.

TESTING:

1. TESTING SHALL BE PERFORMED BY A DESIGNATED INDEPENDENT TESTING AGENCY.
2. SUBMIT ONE SET OF TESTING AND INSPECTION RECORDS SPECIFIED TO THE CIVIL ENGINEER OF RECORD.

DEFINITIONS:

1. PROOF ROLLING:
   SHALL BE PERFORMED IN THE PRESENCE OF THE GEOTECHNICAL ENGINEER OR QUALIFIED GEOTECHNICAL REPRESENTATIVE USING A FULLY LOADED TANDEM AXLE DUMP TRUCK OR WATER TRUCK WITH A MINIMUM GROSS WEIGHT OF 25 TONS OR A FULLY LOADED BELLY DUMP WITH AN EQUIVALENT AXLE LOADING. PROOF-ROLLING ACCEPTANCE STANDARDS INCLUDE NO RUTTING GREATER THAN 1.5 INCHES, AND NO "PUMPING" OF THE SOIL BEHIND THE LOADED TRUCK.
2. SIEVE ANALYSIS:
   SHALL BE CONDUCTED IN ACCORDANCE WITH AASHTO T27
3. PROCTORS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T99
4. ATTERBERG LIMITS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T89 AND T90
5. MOISTURE DENSITY (NUCLEAR DENSITY):
   SHALL BE DONE IN ACCORDANCE WITH AASHTO T310
6. DYNAMIC CONE PENETROMETER (DCP) TESTING:
   SHALL BE DONE IN ACCORDANCE WITH ASTM D6951-03

REQUIREMENTS:

1. FILL PLACEMENT:
   A. SOILS USED AS FILL MATERIAL SHALL BE TESTED FOR MOISTURE CONTENT AND PROCTOR TESTS.
   B. WHERE FILL CONSTRUCTION REQUIRES MORE THAN 12 INCHES OF FILL PLACEMENT, COMPACT EACH LIFT TO A MINIMUM OF 95 PERCENT OF THE MATERIAL'S MAXIMUM STANDARD PROCTOR DRY DENSITY.
2. COMPACTED SUBGRADE (CEMENT STABILIZED):
   A. SEE SHEET 13 FOR TESTING REQUIREMENTS AND PROCEDURE.
3. COMPACTED SUBGRADE (NON-CEMENT STABILIZED):
   A. THE ENTIRE SUBGRADE SHALL BE PROOF-ROLLED PRIOR TO THE PLACEMENT OF THE AGGREGATE BASE TO IDENTIFY AREAS OF UNSTABLE SUBGRADE.
   B. PERFORM A MINIMUM OF 3 DYNAMIC CONE PENETROMETER (DCP) TESTS PER ACCESS ROAD OR ONE FOR EVERY 1,000 LF OF ROAD, WHICHEVER IS GREATER. SUBGRADE MUST MEET A MINIMUM DCP OF 3 BLOWS PER 6" TO A TOTAL DEPTH OF 2' (MINIMUM CBR=1.5).
   C. IF A PASSING PROOF-ROLL OR DCP REQUIREMENTS CANNOT BE ACHIEVED THE FOLLOWING ALTERNATIVES MAY BE IMPLEMENTED:
      a. SCARIFY, DRY, AND RECOMPACT SUBGRADE
      b. REMOVE UNSUITABLE MATERIAL AND REPLACE WITH SUITABLE MATERIAL
      c. INCREASE AGGREGATE BASE THICKNESS
4. AGGREGATE BASE:
   A. AGGREGATE BASE SHALL BE PROOF-ROLLED OVER THE ENTIRE LENGTH. IF PROOF ROLLING DETERMINES THAT THE ROAD IS UNSTABLE, ADDITIONAL AGGREGATE SHALL BE ADDED UNTIL THE UNSTABLE SECTION IS ABLE TO PASS A PROOF ROLL.
   B. PROVIDE 1 SIEVE ANALYSIS (PROJECT MAX OF 20) PER 2500 CY OF ROAD BASE PLACED.
5. CRANE PAD AND CRANE PATHS / CRANE TRAVEL SHOULDERS:
   A. TESTING REQUIREMENTS ARE PENDING BASED ON CRANE PICK PLANS PROVIDED BY THE CONTRACTOR.

TABLE 2: TESTING SCHEDULE SUMMARY		
LOCATION	TEST	FREQUENCY
FILL PLACEMENT	PROCTOR	1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER LIFT PER 5000 SF OF FILL PLACED OR 1 PER 500 LF OF ROAD OR CRANE WALK
COMPACTED SUBGRADE (CEMENT STABILIZED):	SEE SHEET 13	SEE SHEET 13
COMPACTED SUBGRADE (NON-CEMENT STABILIZED):	PROOF-ROLL	ENTIRE AREA
	DCP	1 PER 1,000 FT OR MIN. 3 PER ROAD
AGGREGATE BASE	PROOF-ROLL	ENTIRE AREA
	SIEVE ANALYSIS, LL, PL, AND L.A ABRASION	1 PER 2,500 CY

GENERAL NOTES:

1. GROUND SURFACE CONTOURS (AT TWO-FOOT VERTICAL INTERVALS) AND ELEVATIONS ARE BASED ON A PHOTOGRAMMETRY SURFACE PROVIDED BY GEOTERRA. IF MAJOR DISCREPANCIES ARE FOUND IN THE GROUND ELEVATIONS DURING FIELD STAKING TO THE GROUND ELEVATIONS SHOWN ON THE PLANS, THE OWNER AND ENGINEER SHALL BE NOTIFIED.
2. WHERE SECTION OR SUBSECTION MONUMENTS ARE ENCOUNTERED, THE OWNER SHALL BE NOTIFIED BEFORE SUCH MONUMENTS ARE REMOVED. THE CONTRACTOR SHALL PROTECT AND CAREFULLY PRESERVE ALL PROPERTY MARKERS AND MONUMENTS UNTIL THE OWNER, AN AUTHORIZED SURVEYOR OR AGENT HAS WITNESSED OR OTHERWISE REFERENCED THEIR LOCATION.
3. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. TYPICAL DISTURBANCE SHALL BE LIMITED TO 10 LF FROM THE EDGE OF PROPOSED GRADING.
4. FINALIZE GRADING AROUND THE BASE OF TURBINES IN ACCORDANCE WITH DETAIL TS-03 AND TS-04.
5. GRADE ALL PROPOSED ROADS TO A MAXIMUM SLOPE OF 8%. IF 8% SLOPE CANNOT BE ACHIEVED, THE CONTRACTOR MAY UTILIZE ASSIST VEHICLES FOR THE PURPOSE OF DELIVERIES. GRADE ALL PROPOSED CRANE PATHS TO A MAXIMUM OF 8% UNLESS OTHERWISE NOTED IN PLAN SHEETS.
6. ANY FACILITIES REMOVED TO ALLOW FOR CONSTRUCTION (MAILBOXES, SIGNS, FENCES, ETC.) SHALL BE REPLACED BY THE CONTRACTOR IN A CONDITION AS GOOD AS EXISTING.
7. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING DRAINAGE THROUGHOUT THE CONSTRUCTION OF THIS PROJECT. CONSTRUCTION ACTIVITIES SHALL NOT BLOCK THE NATURAL OR MANMADE CREEKS OR DRAINAGE SWALES CAUSING RAINWATER TO POND. DEPENDING ON FIELD CONDITIONS, ADDITIONAL CULVERTS IN EXCESS OF THOSE ON THE PLANS MAY BE REQUIRED.
8. WHILE BUILDING THE ROADS AND EXCAVATING THE TURBINE FOUNDATIONS, EXCESS SOIL WILL RESULT. THE CONTRACTOR SHALL DISPOSE OF THIS EXCESS SOIL IN AN APPROVED MANNER. EXCESS TOPSOIL SHALL BE DISTRIBUTED INTO A THIN LAYER ON LAND IMMEDIATELY ADJACENT TO WHERE THE TOPSOIL ORIGINATED. ALL EXCESS TOPSOIL TO BE WASTED ONSITE. WHILE DOING SO THE CONTRACTOR SHALL AVOID CAUSING RIDGES OR MOUNDS THAT WOULD MAKE IT DIFFICULT FOR STORM WATER RUNOFF TO DRAIN. THE FINAL SURFACE OF THE DISTURBED TOPSOIL SHALL BE SMOOTH AND FOLLOW THE NATURAL CONTOUR OF THE LAND.
9. THE CONTRACTOR SHALL NOTIFY SOUTH DAKOTA 811 AT LEAST 48 HOURS BEFORE EXCAVATION ACTIVITIES COMMENCE.
10. TEMPORARY INTERSECTION WIDENING SHALL, UPON COMPLETION OF ALL PROJECT CONSTRUCTION OR UPON NOTIFICATION OF THE ENGINEER, BE REMOVED AND THE AREA RESTORED TO ITS ORIGINAL LINES AND GRADES WITH TOPSOIL REPLACED, EXCEPT WHERE REQUESTED BY THE TOWNSHIP OR COUNTY TO PERMANENTLY REMAIN. DISTURBED AREAS OUTSIDE OF THE FINAL ROADWAY SHALL BE SEEDED AND MULCHED.
11. TURBINE SETBACKS ARE NOT IDENTIFIED ON THE CONSTRUCTION PLANS. IT SHALL BE THE RESPONSIBILITY OF THE OWNER AND CONTRACTOR TO ENSURE THAT ALL TURBINE SETBACKS MEET PROJECT REQUIREMENTS.
12. GEOTECHNICAL REPORTS WITH RECOMMENDATIONS HAVE BEEN PROVIDED BY THE OWNER. ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL ENGINEERING REPORT AND RECOMMENDATIONS.
13. FIELD SURVEY WETLAND INFORMATION HAS BEEN PROVIDED BY THE OWNER. ALL WETLAND DELINEATIONS AND PERMITTING SHALL BE THE RESPONSIBILITY OF OTHERS AND BE COMPLETED PRIOR TO CONSTRUCTION COMMENCING. THE OWNER AND GENERAL CONTRACTOR SHALL VERIFY THAT ALL WETLAND PERMITS HAVE BEEN SUBMITTED AND APPROVED PRIOR TO CONSTRUCTION COMMENCING.
14. CULTURAL RESOURCE REPORTS HAVE NOT BEEN PROVIDED. CULTURAL RESOURCE LOCATIONS ARE NOT SHOWN ON THE PLANS. INFORMATION WILL BE THE RESPONSIBILITY OF THE OWNER AND GENERAL CONTRACTOR. THE LOCATIONS OF CULTURAL RESOURCE SITES MAY BE CONFIDENTIAL AND PROTECTED BY STATE OR FEDERAL LAW. PUBLIC RELEASE OF SPECIFIC INFORMATION REGARDING THESE RESOURCES MAY BE RESTRICTED.
15. AN ENVIRONMENTAL ASSESSMENT HAS NOT BEEN PROVIDED. THE CONTRACTOR SHALL BE FAMILIAR WITH THE REPORT AND REVIEW ALL RECOMMENDATIONS.
16. ELECTRICAL INFORMATION SHOWN ON THE PLANS IS FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSULTANT'S PLANS FOR SPECIFIC LOCATIONS AND CONSTRUCTION DETAILS FOR THE UNDERGROUND POWER COLLECTION SYSTEM AND SUBSTATION.
17. CRANE PATHS ARE SHOWN ON THE CONSTRUCTION PLANS. IF THE CONTRACTOR PROPOSES ALTERNATE CRANE PATHS, THEY SHALL ENSURE THAT WETLAND AND CULTURAL RESOURCE CORRIDORS ARE NOT DISTURBED. FINAL CRANE PATH ALIGNMENTS SHALL BE DETERMINED BY THE CONTRACTOR BASED ON FIELD CONDITIONS WITHIN THE WETLAND AND CULTURAL RESOURCE CORRIDORS, SPECIAL LANDOWNER AGREEMENTS AND THE PROJECT BOUNDARY.
18. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. DISTURBANCE SHALL BE LIMITED TO 50 LF WIDTH FOR PROPOSED ACCESS ROADS AND 50 LF FOR CRANE PATHS, AND SHALL BE LIMITED TO A 250 LF RADIUS FOR PROPOSED WIND TURBINE GENERATORS. THE GRADING LIMITS SHALL BE CENTERED ON THE ROADWAYS AND WIND TURBINES. THE CONTRACTOR SHALL MAKE ALL EFFORTS TO KEEP ACTIVITIES WITHIN THE ERECTION AREAS SHOWN ON THE PLANS BUT IT IS UNDERSTOOD THAT SOME ACTIVITIES THAT WILL NOT REQUIRE GRADING OR SOIL DISTURBANCE MAY EXTEND BEYOND THE DEFINED LIMITS. DURING ERECTION OF THE ROTOR, TRUCKS AND/OR FORKLIFTS MAY EXTEND BEYOND THESE LIMITS. SEE DETAIL TS01 FOR TYPICAL ERECTION AREAS.
19. AN ALTA SURVEY HAS BEEN PROVIDED BY WESTWOOD. CONTRACTOR AND OWNER ARE RESPONSIBLE FOR LOCATING ALL UTILITIES AND VERIFYING LOCATION OF CONSTRUCTION ACTIVITIES PRIOR TO COMMENCING WORK.

STORMWATER POLLUTION PREVENTION PLAN (SWPPP):

1. THE CONTRACTOR SHALL PROVIDE EROSION CONTROL MEASURES AS PLANNED AND SPECIFIED FOLLOWING BEST MANAGEMENT PRACTICES AS OUTLINED BY THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND BEING IN CONFORMANCE WITH THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL STORMWATER PERMIT.
2. REFER TO THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR THE TRIPLE H WIND FARM, PREPARED BY WESTWOOD PROFESSIONAL SERVICES, FOR EROSION CONTROL AND RESTORATION SPECIFICATIONS, SEDIMENT AND EROSION CONTROL PROCEDURES, LOCATIONS OF BMPs, DETAILS, AND INSPECTION INFORMATION.
3. ALL PASTURES AND DRAINAGE SWALES DISTURBED DURING CONSTRUCTION ACTIVITIES AND NOT COVERED BY ROAD SURFACING MATERIALS, SHALL BE SEEDED IN ACCORDANCE WITH THE SWPP PLAN.
4. TEMPORARY EROSION CONTROL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE TEMPORARY EROSION CONTROL PLAN SHALL BE IN ACCORDANCE WITH THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND THE TRIPLE H WIND FARM STORMWATER POLLUTION PREVENTION PLAN ON FILE.

PROJECT CONTACT INFORMATION:

TITLE	COMPANY	NAME	CONTACT NUMBER
OWNER (PRIMARY)	ENGIE	CASEY WILLIS	805-569-6185
PROJECT MANAGER	WESTWOOD	DANI NYGREN	952-906-7493
ENGINEER OF RECORD	WESTWOOD	ROB COPOULS	952-906-7470
CONTRACTOR	WANZEK	JASON HELLERUD	701-893-3685

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #300
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com

Westwood Professional Services, Inc.

Designed: SNK
Checked: DSN
Drawn: SNK
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2028 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 12 OF 57

0014440DTP.dwg

© 2019 Westwood Professional Services, Inc.

CEMENT STABILIZATION - PROCEDURE

THE SPECIFICATIONS BELOW ARE GENERAL RECOMMENDATIONS/GUIDELINES FOR CEMENT STABILIZATION OF SUBGRADES FOR THE PROJECT. ACTUAL FIELD CONDITIONS MAY ALTER APPLICATION RATE. CONSULT GEOTECHNICAL ENGINEER FOR FURTHER RECOMMENDATIONS.

1. STRIP THE TOP ±4 INCHES OF TOPSOIL (THROUGH THE ROOT ZONE) FROM THE AREA TO BE STABILIZED. ROOTS SMALLER THAN 1/4" DIAMETER ARE CONSIDERED INSIGNIFICANT.
2. PERFORM A PROCTOR (ASTM D 698) TEST TO DETERMINE THE OPTIMUM MOISTURE CONTENT IF THE MATERIAL TO BE STABILIZED DOES NOT MATCH A PREVIOUSLY PERFORMED PROCTOR.
3. DETERMINE THE IN-SITU MOISTURE CONTENT USING A NUCLEAR DENSITY GAUGE (OR EQUIVALENT MOISTURE CONTENT TEST) DAILY, PRIOR TO INCORPORATION OF THE CEMENT. PROVIDE ADDITIONAL MOISTURE CONTENT TESTING AS NEEDED BASED ON WEATHER CONDITIONS.
   - 3.1. THE CONTRACTOR WILL BE ADVISED OF IN-SITU MOISTURE CONTENT, AND MOISTURE ADJUSTMENTS SHOULD BE MADE IF IN-SITU MOISTURE IS LESS THAN OPTIMUM MOISTURE CONTENT AS DETERMINED BY THE PROCTOR (ASTM D 698).
4. SOIL AND CEMENT BLENDING:
   - 4.1. COMPLETELY BLEND SUBGRADE SOIL WITH THE APPROPRIATE AMOUNT OF CEMENT BY WEIGHT. FIELD RESULTS FROM TEST STRIPS WILL DICTATE THE CEMENT APPLICATION RATE.
   - 4.2. IN AREAS OF HIGH MOISTURE OR POOR SOILS, THE CONTRACTOR MAY INCREASE THE PERCENT OF CEMENT IN ORDER TO MEET THE MINIMUM SUBGRADE STRENGTH REQUIREMENTS.
   - 4.3. THE USE OF A RECLAIMER IS AN ADEQUATE BLENDING METHOD. DISCING IS NOT AN ADEQUATE BLENDING METHOD.
   - 4.4. A STABILIZATION DEPTH OF 12" WAS USED FOR DESIGN PURPOSES. STABILIZATION DEPTH MAY NEED TO INCREASE TO 16" IN AREAS OF EXTREME MOISTURE OR POOR SOILS IN ORDER TO MEET THE STRENGTH AND PROOF ROLL REQUIREMENTS.
5. COMPACTION:
   - 5.1. A ROLLING PATTERN WILL BE ESTABLISHED USING A NUCLEAR DENSITY GAUGE DURING COMPACTION.
     - 5.1.1. COMPACTION WILL BE PERFORMED UNTIL THE STABILIZED MATERIAL REACHES THE "BREAK POINT" AFTER WHICH ADDITIONAL PASSES WITH A ROLLER RESULTS IN A LOSS OF DENSITY AS MEASURED BY A NUCLEAR DENSITY GAUGE.
     - 5.1.2. COMPACTION IS TYPICALLY ACHIEVED BY MULTIPLE PASSES OF A PADFOOT ROLLER UNTIL THE ROLLER "WALKS" OUT OF THE RECLAIMED MATERIAL (SPACE IS VISIBLE BETWEEN THE DRUM AND THE RECLAIMED MATERIAL). THIS IS FOLLOWED BY BLADING AND SHAPING THE RECLAIMED MATERIAL TO FINAL PROFILE AND CROSS SECTION, REMOVING HIGH AND LOW POINTS. SMOOTH DRUM OR RUBBER TIRE ROLLERS ARE THEN USED TO FINISH ROLLING (THIS IS WHEN THE DENSITY TESTS ARE PERFORMED) UNTIL THE DENSITY OF THE MATERIAL REACHES THE "BREAK POINT."
     - 5.1.3. THE NUMBER OF PASSES AND EQUIPMENT USED TO REACH THE "BREAK POINT" IS CONSIDERED THE ROLLING PATTERN.
     - 5.1.4. A NEW ROLLING PATTERN MAY NEED TO BE ESTABLISHED IF THE PERFORMANCE REQUIREMENTS ARE NOT BEING MET. THIS MAY BE DUE TO CHANGES IN THE MOISTURE CONTENT, THE SOIL TYPE, OR THE CEMENT RATE.
   - 5.2. THE TARGET DENSITY IS 98% OF THE MAXIMUM DENSITY DETERMINED FROM THE ROLLING PATTERN.
     - 5.2.1. DENSITY TESTS SHALL BE TAKEN AT THE RATE OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER TO CONFIRM THE DENSITY IS MATCHING THE TARGET. ONCE THE ROLLING PATTERN HAS BEEN CONFIRMED IT IS RECOMMENDED THAT TESTING CONTINUE AT 1 TEST PER 1,000 LF IN EACH PASS OF THE RECLAIMER.
     - 5.2.2. IF IT IS NOT POSSIBLE TO ATTAIN THE TARGET DENSITY, AND ADDITIONAL COMPACTION DOES NOT IMPROVE THE DENSITY, A NEW ROLLING PATTERN SHOULD BE ESTABLISHED.
   - 5.3. THE AIR TEMPERATURE SHALL BE ABOVE 40 DEGREES (F) DURING THE CEMENT STABILIZATION PROCESS. MIXING CEMENT INTO FROZEN GROUND IS NOT ACCEPTABLE.
6. THE STABILIZED MATERIAL SHALL BE CONTINUOUSLY WET CURED FOR A MINIMUM OF 24 HOURS (WET CURED IS IDENTIFIED VISUALLY AS DAMP SURFACE).
7. PERFORM SUBGRADE TESTING IN ACCORDANCE WITH TESTING SCHEDULE.
8. AGGREGATE PLACEMENT:
   - 8.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 8.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 8.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

CEMENT STABILIZATION - DESIGN BASIS

1. DURING INITIAL CONSTRUCTION, CONTRACTOR SHALL CONSTRUCT MINIMUM 300 LF TEST STRIPS CONTAINING 4%, 5%, AND 6% CEMENT IN ACCORDANCE WITH CEMENT STABILIZATION PROCEDURES.
2. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 3 FOR ANTICIPATED RESULTS):
   - 2.1. PERFORM INITIAL SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M BETWEEN 4 TO 6 HOURS AFTER FINAL COMPACTION.
   - 2.2. PERFORM ADDITIONAL DCP TESTING AT 24 AND 48 HOURS AFTER FINAL COMPACTION.
   - 2.3. PERFORM SUBSEQUENT DCP TESTS AT 7 DAYS AFTER FINAL COMPACTION AS VERIFICATION OF STRENGTH CURVE.
   - 2.4. A MINIMUM OF 3 TESTS PER TEST SECTION PER TIMEFRAME IS REQUIRED. TESTS SHALL BE TAKEN AT THE CENTERLINE AND 2' FROM EACH SHOULDER.
   - 2.5. RECORD DCP TEST RESULTS EVERY 6 INCHES TO TOTAL DEPTH OF 12 INCHES.

TABLE 3: TEST STRIP CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	COMPRESSIVE STRENGTH (PSF)
4 - 6 HOURS	6	5	1,800
24 HOURS	10	7	2,500
48 HOURS	15	10	3,300
7 DAYS	30	21	5,200

CEMENT STABILIZATION - PRODUCTION

1. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 5 FOR SUMMARY OF TESTING REQUIREMENTS):
   - 1.1. PERFORM SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M NO SOONER THAN 24 HOURS AFTER FINAL COMPACTION.
   - 1.2. DCP TESTING FREQUENCY SHALL BE WITH A RANDOM SPACING AND A MINIMUM OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER. A MINIMUM OF 3 TESTS PER ROAD IS REQUIRED.
   - 1.3. THE CBR OF THE STABILIZED SUBGRADE SHOULD BE CALCULATED IN 6" INCREMENTS THROUGH THE ENTIRE DEPTH OF THE STABILIZED LAYER.
   - 1.4. THE MINIMUM REQUIRED CBR PRIOR TO PROOF-ROLLING IS PROVIDED IN TABLE 4 BELOW:

TABLE 4: FINAL CEMENT STABILIZED CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	UNDRAINED SHEAR STRENGTH (PSF)	BEARING CAPACITY (PSF)
24 - 48 HOURS	15	10	3,500	9,800
3 - 7 DAYS	30	21	7,000	18,000
28 DAYS	50	33	12,000	28,500

NOTE: UNDRAINED SHEAR STRENGTH WAS CALCULATED USING THE BLACK (1961) EQUATION. BEARING CAPACITY WAS CALCULATED USING THE VESIC EQUATION MODIFIED FOR TWO LAYERS (12" CEMENT STABILIZED SUBGRADE OVER A NATURAL SUBGRADE WITH A CBR OF 1.5)

   - 1.5. ONCE THE MINIMUM REQUIRED CBR IS ACHIEVED AT ANY CORRESPONDING TIME PERIOD, THE SUBGRADE IS CONSIDERED ADEQUATE AND THE CONTRACTOR MAY PROCEED WITH PROOF-ROLL TESTING. FUTURE DCP TESTING ON THAT SEGMENT OF SUBGRADE IS NOT REQUIRED.
   - 1.6. IF TESTING DOES NOT INDICATE A CBR OF 30 WITHIN 7 DAYS, ADDITIONAL GRAVEL SURFACING AND/OR THE ADDITION OF GEOTEXTILE FABRIC MAY BE REQUIRED. FOR FUTURE SUBGRADE STABILIZATION AREAS, CONTACT THE ENGINEER AND OWNER VIA RFI FOR RECOMMENDATIONS AND APPROVAL.
2. SUBGRADE PROOF-ROLL TESTING AND ACCEPTANCE:
   - 2.1. ONCE THE REQUIRED DCP VALUE HAS BEEN OBTAINED BUT PRIOR TO PLACING AGGREGATE, THE SUBGRADE SHALL BE PROOF-ROLLED. REFER TO THE PROJECT TESTING REQUIREMENTS FOR PROOF-ROLL DEFINITION.
   - 2.2. PROOF-ROLLING SHOULD BE PERFORMED WITH ONE PASS DOWN THE CENTER AND NOT BE PERFORMED WITHIN 12 INCHES OF THE EDGE OF THE STABILIZED SECTION.
   - 2.3. IF PROOF-ROLLING FAILS, RE-STABILIZATION MAY BE REQUIRED AND A NEW ROLLING PATTERN OR ADDITIONAL CEMENT MAY BE REQUIRED.
3. AGGREGATE PLACEMENT:
   - 3.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 3.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 3.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

TABLE 5: CEMENT STABILIZATION PRODUCTION TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
COMPACTED SUBGRADE (CEMENT STABILIZED)	PROCTOR	MINIMUM 1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER 1000 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
NOTE: SEE ABOVE FOR INITIAL TESTING REQUIREMENTS	DCP TEST	1 PER 500 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
	PROOF-ROLL (AFTER PASSING DCP TESTS)	ENTIRE LENGTH

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 www.westwoodps.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: DBH
Drawn: BMK
As-Built Drawing:

Revisions #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 13 OF 57

001444DD1P.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. County Road 649 in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 935' South of County Road 649 & 203rd Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.26'13.35" W Long. -99.36'11.95" W
4. Width of entrance: 16' access road with 35' temporary intersection imporvement RD08-B
   (Check attached spec sheet)
5. Size & length of culvert: ~~N/A~~ As determined by Hyde County Highway Superintendent
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001109 NW4 10-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Signature of Applicant

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. County Road 649 in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 935' South of County Road 649 & 203rd Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.26'13.35" W Long. -99.36'11.95" W
4. Width of entrance: 16' access road with 35' temporary intersection imporvement RD08-B
   (Check attached spec sheet)
5. Size & length of culvert: N/A
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001109 NW4 10-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

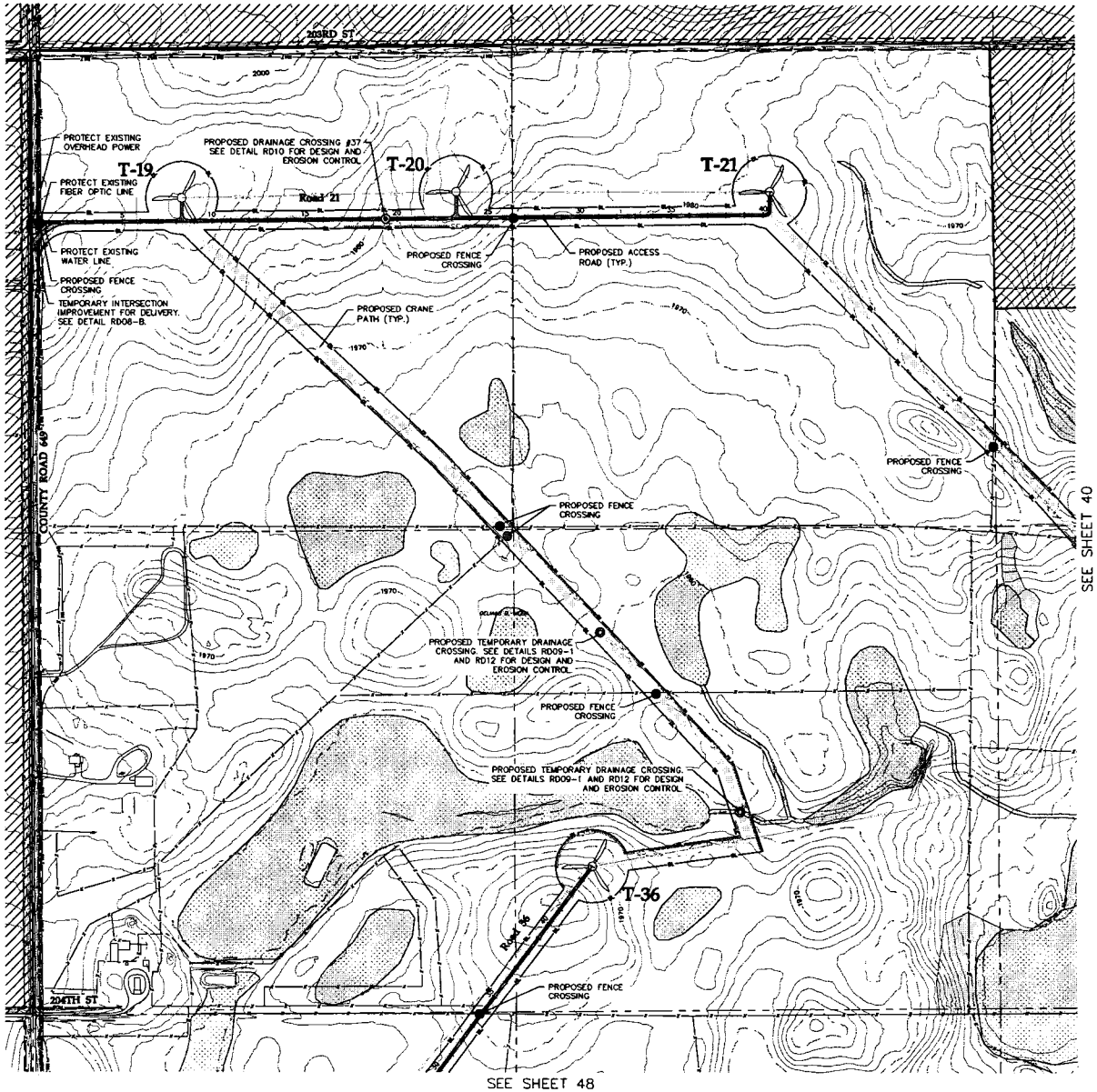
Submitted August 1, 20 19 Date Approved: _____

_____ _____
Signature of Applicant Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

© 2019 Westwood Professional Services, Inc.



LEGEND:

- PROPOSED TURBINE LOCATION
- T-XX — PROPOSED TURBINE NUMBER
- PROPOSED ALTERNATE TURBINE LOCATION
- ALT-XX — PROPOSED ALTERNATE TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED ALTERNATE ACCESS ROAD
- PROPOSED CRANE PATH
- PROPOSED UNDERGROUND COLLECTION*
- PROPOSED DISTURBANCE LIMITS
- PROPOSED PERIMETER SEDIMENT CONTROL
- EXISTING 10' CONTOURS
- EXISTING 2' CONTOURS
- EXISTING GRAVEL EDGE
- EXISTING BITUMINUS EDGE
- EXISTING RIGHT-OF-WAY
- EXISTING PARCEL LINE
- EXISTING BUILDING
- EXISTING FENCE
- EXISTING OVERHEAD POWER
- EXISTING HIGH VOLTAGE OVERHEAD POWER
- EXISTING UNDERGROUND POWER LINE
- EXISTING FIBER OPTIC LINE
- EXISTING WATER LINE
- DELINEATED WETLAND
- ARCHAEOLOGICAL AVOIDANCE AREA
- EXISTING USFWS EASEMENT
- PROJECT BOUNDARY
- 1900 — EXISTING GROUND ELEVATION
- PROPOSED DRAINAGE CROSSING**
- PROPOSED TEMPORARY DRAINAGE CROSSING**
- PROPOSED FENCE CROSSING***
- PROPOSED UTILITY CROSSING
- PROPOSED CULVERT

* PROVIDED BY OTHERS AND SHOWN FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSTRUCTION PLANS FOR DETAILS.

** SEE SHEET 11 FOR DRAINAGE CROSSING TYPE AND SIZING. DRAINAGE CROSSINGS SHALL CONSIST OF LOW WATER CROSSING OR CULVERT. DRAINAGE CROSSINGS ALONG CRANE PATH SHALL CONSIST OF CRANE MATS OR TEMPORARY CULVERT.

*** ALL GATE INSTALLATIONS SHALL BE FIELD DETERMINED AND AGREED UPON BY THE CONTRACTOR AND OWNER.

		14	15	16	17	18	19	20		
21	22	23	24	25	26	27	28	29	30	31
				32	33	34	35	36	37	38
				39	40	41	42	43	44	45	46
		47	48	49	50	51				
52	53	54	55							

KEY MAP

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-Free (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed:	SMK
Checked:	RJH
Drawn:	SMK
As-Built Drawing:	

Revisions:		
#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078

0' 300' 600' 900'

Triple H Wind Farm

Hyde County, South Dakota

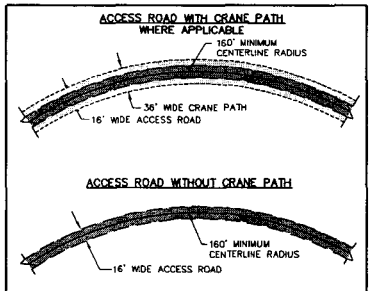
Site Plan T-19 - T-21, T-36

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 39 OF 57

0014440SP01.dwg

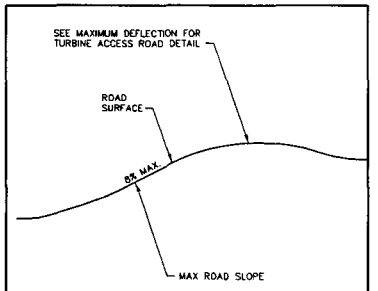
©2019 Westwood Professional Services, Inc.



NOTE:

1. SOME RADII MAY REQUIRE ADDITIONAL SOIL COMPACTION OR GRAVEL OUTSIDE OF THE WIDTH SHOWN ABOVE TO ACCOMMODATE TRACTORS OR TRAILERS TRACKING OFF THE ACCESS ROAD.

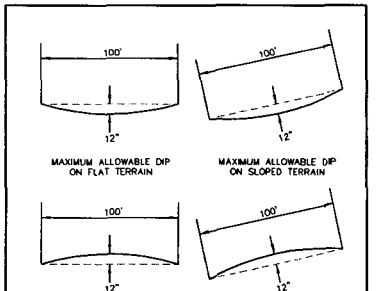
Westwood	MINIMUM RADIUS FOR TURBINE ACCESS ROAD	LAST REVISED: 04/25/11 RD02



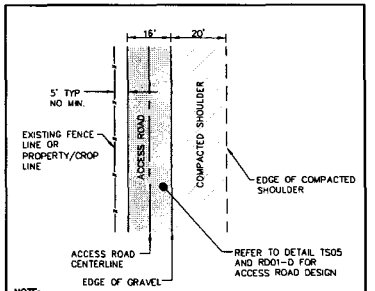
NOTES:

1. ROAD SLOPE SHALL NOT EXCEED 8% WITHOUT OWNER APPROVAL

Westwood	MAXIMUM VERT. SLOPE FOR TURBINE ACCESS ROAD/CRANE TRAVEL PATH	LAST REVISED: 1/29/07 RD03



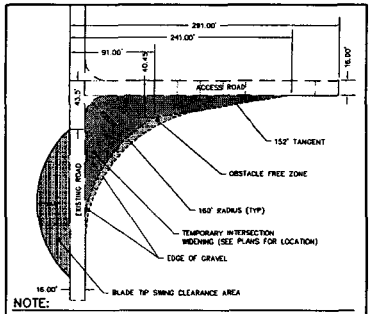
Westwood	MAXIMUM DEFLECTION FOR TURBINE ACCESS ROAD	LAST REVISED: 01/02/08 RD04



NOTE:

1. COMPACTED SHOULDER SHALL BE RETURNED TO NATIVE CONDITION FOLLOWING TURBINE GENERATOR CONSTRUCTION.
2. THE ACCESS ROAD MAY NEED TO BE CONSTRUCTED FARTHER FROM THE PROPERTY LINE IF OBSTRUCTIONS SUCH AS TREES FOLLOW THE PROPERTY LINE.

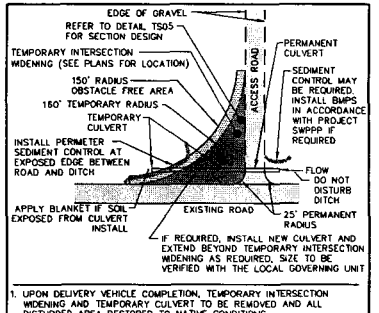
Westwood	TURBINE ACCESS ROAD ALONG FENCE/PROPERTY/CROP LINE	LAST REVISED: 3/29/07 RD05



NOTE:

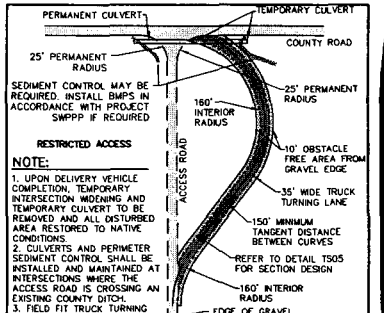
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING TO BE REMOVED AND ALL DISTURBED AREA RESTORED.
2. DIMENSIONS ASSUME A 90° INTERSECTION

Westwood	INTERSECTION WIDENING DIMENSIONS	LAST REVISED: 7/23/19 RD06



1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.

Westwood	TURBINE ACCESS ROAD TYPICAL INTERSECTION WIDENING	LAST REVISED: 1/3/17 RD07

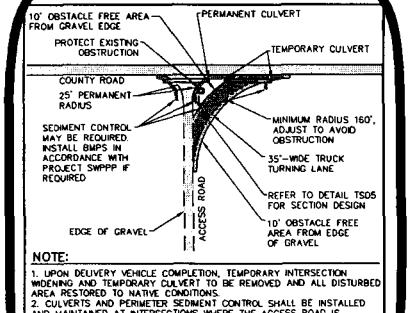


NOTE:

1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

NOT TO SCALE

Westwood	TRUCK TRAFFIC TURNING LANE A	LAST REVISED: 3/3/17 RD08-A



NOTE:

1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

Westwood	TRUCK TRAFFIC TURNING LANE B	LAST REVISED: 12/2/14 RD08-B

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (866) 937-5150 www.westwoodps.com

Westwood Professional Services, Inc.

Designed: BMK
Checked: TEN
Drawn: BMK
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

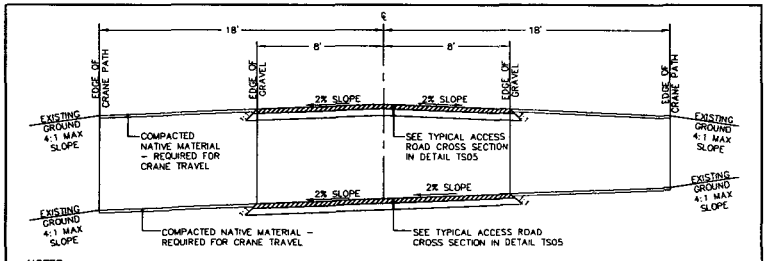
Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 5 OF 57

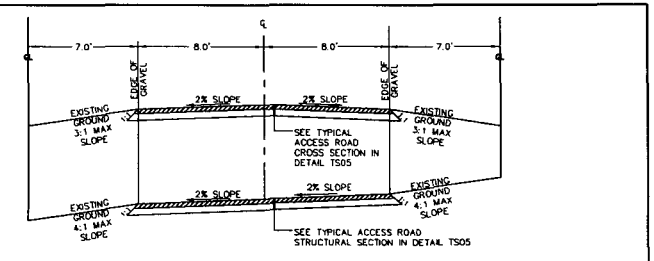
0014440DTP.dwg

©2019 Westwood Professional Services, Inc.



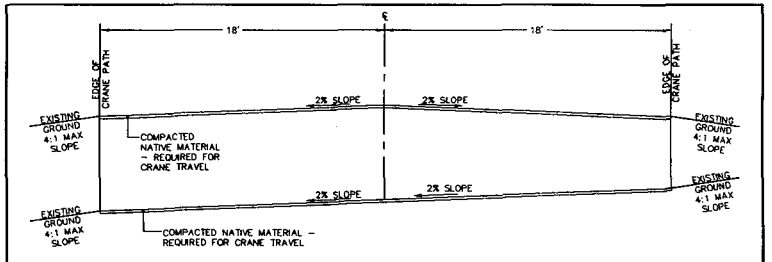
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE ACCESS ROAD DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

Westwood | TYPICAL TURBINE ACCESS ROAD AND CRANE PATH | LAST REVISED: 05/28/19 | RD01-A



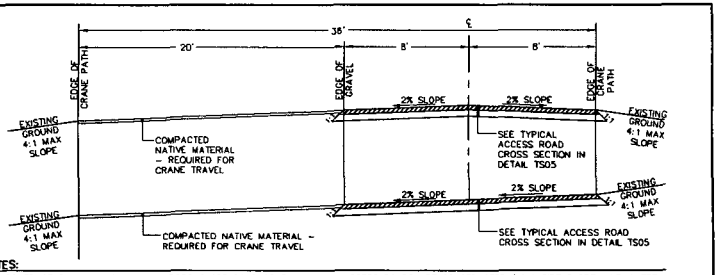
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

Westwood | TYPICAL TURBINE ACCESS ROAD SECTION | LAST REVISED: 3/28/19 | RD01-B



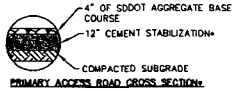
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE WHERE CRANE PATHS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERMISE NOTED ON PLANS, TO ENSURE THAT CRANE PATH REMAINS WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%

Westwood | TYPICAL CRANE PATH | LAST REVISED: 05/28/19 | RD01-C

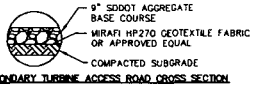


NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE EDGE OF COMPACTED SHOULDER DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

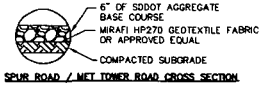
Westwood | TYPICAL TURBINE ACCESS ROAD AND OFFSET CRANE PATH | LAST REVISED: 05/28/19 | RD01-D



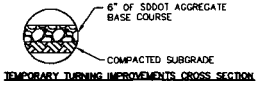
PRIMARY ACCESS ROAD CROSS SECTION*



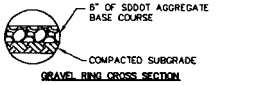
SECONDARY TURBINE ACCESS ROAD CROSS SECTION



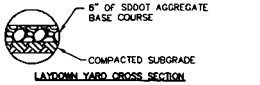
SPUR ROAD / MET TOWER ROAD CROSS SECTION



TEMPORARY TURNING IMPROVEMENTS CROSS SECTION



GRAVEL RING CROSS SECTION



LAYDOWN YARD CROSS SECTION

* CEMENT APPLICATION RATE MAY VARY BASED ON TEST STRIPS AND FIELD PERFORMANCE. SEE SHEET 13 FOR CEMENT STABILIZATION PROCEDURE AND DESIGN BASIS.

NOTES:
STRUCTURAL SECTIONS SHOWN ARE THE MINIMUM THICKNESS REQUIREMENTS DURING NORMAL FIELD CONDITIONS. THE SECTIONS MAY NEED TO BE INCREASED BASED ON ACTUAL FIELD CONDITIONS AT THE TIME OF CONSTRUCTION. CONDITIONS INCLUDE BUT ARE NOT LIMITED TO CONSTRUCTION DURING THE FREEZE/THAW CYCLE, UNUSUALLY WET PERIODS, OR IN LOW/WET AREAS. SEE SHEET 12 FOR TESTING REQUIREMENTS AND SPECIFICATIONS.

Westwood | TYPICAL STRUCTURAL CROSS SECTIONS

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-Free (888) 937-5150 twestwood@w-ps.com
Westwood Professional Services, Inc.

Designed: BMC
Checked: DJH
Drawn: BMC
As-Built Drawing:

Revisions #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2888 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 4 OF 57

0014440DTP.dwg

© 2019 Westwood Professional Services, Inc.

ROAD DESIGN PARAMETERS

1. ACCESS ROADS HAVE BEEN DESIGNED TO ACCOMMODATE LIGHT DUTY TRUCKS (PICKUP TRUCKS AND MAINTENANCE VEHICLES) FOR LOW VOLUME USE IN NORMAL OPERATING CONDITIONS AS WELL AS HEAVY DUTY CONSTRUCTION TRAFFIC UNDER DRY CONDITIONS. THE ROAD DESIGN SPECIFIED IS NOT INTENDED FOR ALL WEATHER USE FOR HEAVY DUTY CONSTRUCTION LOADS.
2. ROAD MAINTENANCE CAN BE EXPECTED OVER THE LIFE OF THE PERMANENT FACILITY.

PRODUCTS

1. AGGREGATE BASE SHALL CONSIST OF SDDOT AGGREGATE BASE COURSE (AND IN CONFORMANCE WITH THE GRADATION TABLE 1). AGGREGATE MAY BE CRUSHER RUN UPON ENGINEERS APPROVAL. AGGREGATE GRADATIONS SHALL BE SUBMITTED TO ENGINEER FOR REVIEW.
2. ROAD SHOULDERS AND CRANE PADS SHALL CONSIST OF COMPACTED NATIVE SOILS.
3. CULVERTS: ACCESS ROAD CULVERTS SHALL MEET THE MINIMUM SPECIFICATIONS SET FORTH BY THE SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION AND/OR HYDE COUNTY. ALL CULVERTS ARE PLANNED TO BE A MINIMUM 18" DIAMETER AND MANUFACTURED OF 16-GAGE CORRUGATED METAL PIPE WITH NO END TREATMENTS UNLESS NOTED OTHERWISE. ACTUAL SIZE WILL BE DETERMINED THROUGH HYDRAULIC ANALYSIS.
4. GEOTEXTILE FABRIC: MIRAFI HP270 OR APPROVED EQUAL.

EXECUTION

1. CLEARING AND GRUBBING
   A. THE CONTRACTOR SHALL BE REQUIRED TO GRUB ALL TREES, STUMPS, BRUSH, AND DEBRIS WITHIN THE GRADING AREAS SHOWN ON THE PLANS. GRUBBING INCLUDES REMOVAL OF ALL PLANT MATERIAL GREATER THAN 2" INCLUDING STUMPS, BRANCHES, ROOTS, ETC. TO A DEPTH BELOW THE FINAL SUBGRADE. THE CONTRACTOR IS TO REMOVE ONLY THOSE TREES WHICH ARE DESIGNATED BY THE OWNER'S REPRESENTATIVE FOR REMOVAL, AND SHALL EXERCISE EXTREME CARE AROUND EXISTING TREES TO BE SAVED.
2. TOPSOIL STRIPPING
   A. TOPSOIL, INCLUDING ROOTS LARGER THAN 2" AND LARGE ROOT MASSES, SHALL BE STRIPPED FROM ALL ROADWAY AND FOUNDATION AREAS UP TO 10". TOPSOIL SHALL NOT BE STRIPPED OUTSIDE OF THE DESIGNATED DISTURBANCE AREAS.
   B. ANY TOPSOIL THAT HAS BEEN STRIPPED SHALL BE STOCKPILED FOR POST CONSTRUCTION REVEGETATION. ALL TOPSOIL SHALL BE REDISTRIBUTED TO THE LAND OWNER'S PROPERTY OF WHERE IT ORIGINATED FROM.
3. FILL PLACEMENT
   A. FILL PLACEMENT SHALL CONSIST OF THE PLACING OF SUITABLE FILL MATERIAL, AFTER TOPSOIL STRIPPING, ABOVE THE EXISTING GRADE. GENERALLY, SIDE SLOPES SHALL BE CONSTRUCTED AT FOUR FOOT HORIZONTAL TO ONE FOOT VERTICAL, WITH SOME LOCATIONS THROUGHOUT THE PROJECT WITH SLOPES OF TWO FEET HORIZONTAL TO ONE FOOT VERTICAL. THE MATERIAL FOR FILL CONSTRUCTION SHALL BE OBTAINED FROM THE ACCESS ROAD/TURBINE EXCAVATION (SEE GEOTECHNICAL REPORT FOR RESTRICTIONS), OR ANY SUITABLE, APPROVED SOIL OBTAINED ONSITE/OFFSITE BY CONTRACTOR, AS DIRECTED OR APPROVED BY THE ENGINEER. THIS MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 12" AND CONSTRUCTED TO 95% OF THE MAXIMUM DRY DENSITY AND WITHIN 2% OF OPTIMUM MOISTURE CONTENT, AS DETERMINED BY THE STANDARD PROCTOR (AASHTO T99).
   B. SIDE SLOPES GREATER THAN 4:1 WILL NOT BE PERMITTED, UNLESS OTHERWISE NOTED ON THE PLAN.
   C. FILL SLOPES SHALL BE BENCHED INTO THE EXISTING SLOPE TO PREVENT MOVEMENT BETWEEN THE FILL AND NATIVE SOILS. BENCHES SHOULD BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO FILL PLACEMENT. POSITIVE DRAINAGE IS REQUIRED AT BENCHED AREAS AND AT THE TOE OF FILL SLOPES TO REMOVE SURFACE WATER.
4. SUBGRADE
   A. SUBGRADE PREPARED AT GRADE OR IN CUT REQUIRES SCARIFICATION AND RECOMPACTION TO A DEPTH OF 12" OR MORE.
   B. ACCESS ROAD CROSS SLOPES SHOWN IN THE PLANS ARE MEANT AS A GUIDE. ACCESS ROAD CROSS SLOPES MAY RANGE FROM 1% - 2%. CHECK WITH THE ENGINEER IF THE CROSS SLOPE FALLS OUTSIDE OF THIS RANGE. ACCESS ROADS BEING UTILIZED FOR CRANE TRAVEL SHOULD HAVE A MAX CROSS SLOPE OF 2%.

TABLE 1: SDDOT AGGREGATE BASE COURSE - LOCALLY SOURCED	
SIEVE SIZE	PERCENT PASSING
1"	100
3/4"	80-100
1/2"	68-91
NO. 4	46-70
NO. 8	34-58
NO. 40	13-35
NO. 200	3-12

MEET FOLLOWING REQUIREMENTS PER 882.2

LIQUID LIMIT (MAX) = 25
PLASTICITY INDEX = 0-6
L.A ABRASION (% MAX) = 40%

GRADATION HAS BEEN OBTAINED FROM THE 2015 SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION BOOK.

STORM WATER DESIGN PARAMETERS

1. SEE SHEET 6 FOR CULVERT SIZING AND DESIGN PARAMETERS. SEE HYDROLOGY MEMO FOR FURTHER DESIGN CALCULATIONS. CULVERTS SHALL BE MINIMUM 18" CORRUGATED METAL PIPE. ALL TEMPORARY PORTIONS OF THE INSTALLED CULVERTS SHALL BE REMOVED UPON COMPLETION OF THE PROJECT.
2. IT IS EXPECTED THAT CULVERTS WILL BE OVERTOPPED DURING SOME STORMS AND MAINTENANCE WILL BE REQUIRED THROUGH THE LIFE OF THE PROJECT.
3. WHEN INSTALLING DRAINAGE CULVERTS THE CONTRACTOR SHALL USE JUDGMENT IN SETTING THE FLOW LINE ELEVATIONS AND CULVERT LONGITUDINAL SLOPE. TYPICALLY THE FLOW LINE ELEVATIONS AND LONGITUDINAL SLOPE OF THE CULVERT SHOULD MATCH THE NATURAL GROUND ELEVATIONS AND SLOPE TO ENSURE POSITIVE DRAINAGE. WHEN POSSIBLE, ALL CULVERTS SHOULD BE PLACED AT A MINIMUM 0.5% GRADE.
4. ANTICIPATED CULVERT CROSSINGS ARE SHOWN ON THE CONSTRUCTION PLAN, ADDITIONAL CULVERTS MAY NEED TO BE INSTALLED IN AREAS WHERE CONCENTRATED FLOW IS EXPECTED DUE TO CONSTRUCTION ACTIVITIES.
5. CONSTRUCTION DRAINAGE CROSSINGS TO MAINTAIN EXISTING FLOW CHARACTERISTICS OF THE FEATURES. FEATURES SHALL BE GRADED TO PRECONSTRUCTION CONTOURS.

TESTING:

1. TESTING SHALL BE PERFORMED BY A DESIGNATED INDEPENDENT TESTING AGENCY.
2. SUBMIT ONE SET OF TESTING AND INSPECTION RECORDS SPECIFIED TO THE CIVIL ENGINEER OF RECORD.

DEFINITIONS:

1. PROOF ROLLING:
   SHALL BE PERFORMED IN THE PRESENCE OF THE GEOTECHNICAL ENGINEER OR QUALIFIED GEOTECHNICAL REPRESENTATIVE USING A FULLY LOADED TANDEM AXLE DUMP TRUCK OR WATER TRUCK WITH A MINIMUM GROSS WEIGHT OF 25 TONS OR A FULLY LOADED BELLY DUMP WITH AN EQUIVALENT AXLE LOADING. PROOF-ROLLING ACCEPTANCE STANDARDS INCLUDE NO RUTTING GREATER THAN 1.5 INCHES, AND NO "PUMPING" OF THE SOIL BEHIND THE LOADED TRUCK.
2. SIEVE ANALYSIS:
   SHALL BE CONDUCTED IN ACCORDANCE WITH AASHTO T27
3. PROCTORS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T99
4. ATTERBERG LIMITS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T89 AND T90
5. MOISTURE DENSITY (NUCLEAR DENSITY):
   SHALL BE DONE IN ACCORDANCE WITH AASHTO T310
6. DYNAMIC CONE PENETROMETER (DCP) TESTING:
   SHALL BE DONE IN ACCORDANCE WITH ASTM D6951-03

REQUIREMENTS:

1. FILL PLACEMENT:
   A. SOILS USED AS FILL MATERIAL SHALL BE TESTED FOR MOISTURE CONTENT AND PROCTOR TESTS.
   B. WHERE FILL CONSTRUCTION REQUIRES MORE THAN 12 INCHES OF FILL PLACEMENT, COMPACT EACH LIFT TO A MINIMUM OF 95 PERCENT OF THE MATERIAL'S MAXIMUM STANDARD PROCTOR DRY DENSITY.
2. COMPACTED SUBGRADE (CEMENT STABILIZED):
   A. SEE SHEET 13 FOR TESTING REQUIREMENTS AND PROCEDURE.
3. COMPACTED SUBGRADE (NON-CEMENT STABILIZED):
   A. THE ENTIRE SUBGRADE SHALL BE PROOF-ROLLED PRIOR TO THE PLACEMENT OF THE AGGREGATE BASE TO IDENTIFY AREAS OF UNSTABLE SUBGRADE.
   B. PERFORM A MINIMUM OF 3 DYNAMIC CONE PENETROMETER (DCP) TESTS PER ACCESS ROAD OR ONE FOR EVERY 1,000 LF OF ROAD, WHICHEVER IS GREATER. SUBGRADE MUST MEET A MINIMUM DCP OF 3 BLOWS PER 6" TO A TOTAL DEPTH OF 2' (MINIMUM CBR=1.5).
   C. IF A PASSING PROOF-ROLL OR DCP REQUIREMENTS CANNOT BE ACHIEVED THE FOLLOWING ALTERNATIVES MAY BE IMPLEMENTED:
      a. SCARIFY, DRY, AND RECOMPACT SUBGRADE
      b. REMOVE UNSUITABLE MATERIAL AND REPLACE WITH SUITABLE MATERIAL
      c. INCREASE AGGREGATE BASE THICKNESS
4. AGGREGATE BASE:
   A. AGGREGATE BASE SHALL BE PROOF-ROLLED OVER THE ENTIRE LENGTH. IF PROOF ROLLING DETERMINES THAT THE ROAD IS UNSTABLE, ADDITIONAL AGGREGATE SHALL BE ADDED UNTIL THE UNSTABLE SECTION IS ABLE TO PASS A PROOF ROLL.
   B. PROVIDE 1 SIEVE ANALYSIS (PROJECT MAX OF 20) PER 2500 CY OF ROAD BASE PLACED.
5. CRANE PAD AND CRANE PATHS / CRANE TRAVEL SHOULDERS:
   A. TESTING REQUIREMENTS ARE PENDING BASED ON CRANE PICK PLANS PROVIDED BY THE CONTRACTOR.

TABLE 2: TESTING SCHEDULE SUMMARY		
LOCATION	TEST	FREQUENCY
FILL PLACEMENT	PROCTOR	1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER LIFT PER 5000 SF OF FILL PLACED OR 1 PER 500 LF OF ROAD OR CRANE WALK
COMPACTED SUBGRADE (CEMENT STABILIZED):	SEE SHEET 13	SEE SHEET 13
COMPACTED SUBGRADE (NON-CEMENT STABILIZED):	PROOF-ROLL	ENTIRE AREA
	DCP	1 PER 1,000 FT OR MIN. 3 PER ROAD
AGGREGATE BASE	PROOF-ROLL	ENTIRE AREA
	SIEVE ANALYSIS, LL, PL, AND L.A ABRASION	1 PER 2,500 CY

GENERAL NOTES:

1. GROUND SURFACE CONTOURS (AT TWO-FOOT VERTICAL INTERVALS) AND ELEVATIONS ARE BASED ON A PHOTOGRAMMETRY SURFACE PROVIDED BY GEOTERRA. IF MAJOR DISCREPANCIES ARE FOUND IN THE GROUND ELEVATIONS DURING FIELD STAKING TO THE GROUND ELEVATIONS SHOWN ON THE PLANS, THE OWNER AND ENGINEER SHALL BE NOTIFIED.
2. WHERE SECTION OR SUBSECTION MONUMENTS ARE ENCOUNTERED, THE OWNER SHALL BE NOTIFIED BEFORE SUCH MONUMENTS ARE REMOVED. THE CONTRACTOR SHALL PROTECT AND CAREFULLY PRESERVE ALL PROPERTY MARKERS AND MONUMENTS UNTIL THE OWNER, AN AUTHORIZED SURVEYOR OR AGENT HAS WITNESSED OR OTHERWISE REFERENCED THEIR LOCATION.
3. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. TYPICAL DISTURBANCE SHALL BE LIMITED TO 10 LF FROM THE EDGE OF PROPOSED GRADING.
4. FINALIZE GRADING AROUND THE BASE OF TURBINES IN ACCORDANCE WITH DETAIL TS-03 AND TS-04.
5. GRADE ALL PROPOSED ROADS TO A MAXIMUM SLOPE OF 8%. IF 8% SLOPE CANNOT BE ACHIEVED, THE CONTRACTOR MAY UTILIZE ASSIST VEHICLES FOR THE PURPOSE OF DELIVERIES. GRADE ALL PROPOSED CRANE PATHS TO A MAXIMUM OF 8% UNLESS OTHERWISE NOTED IN PLAN SHEETS.
6. ANY FACILITIES REMOVED TO ALLOW FOR CONSTRUCTION (MAILBOXES, SIGNS, FENCES, ETC.) SHALL BE REPLACED BY THE CONTRACTOR IN A CONDITION AS GOOD AS EXISTING.
7. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING DRAINAGE THROUGHOUT THE CONSTRUCTION OF THIS PROJECT. CONSTRUCTION ACTIVITIES SHALL NOT BLOCK THE NATURAL OR MANMADE CREEKS OR DRAINAGE SWALES CAUSING RAINWATER TO POND. DEPENDING ON FIELD CONDITIONS, ADDITIONAL CULVERTS IN EXCESS OF THOSE ON THE PLANS MAY BE REQUIRED.
8. WHILE BUILDING THE ROADS AND EXCAVATING THE TURBINE FOUNDATIONS, EXCESS SOIL WILL RESULT. THE CONTRACTOR SHALL DISPOSE OF THIS EXCESS SOIL IN AN APPROVED MANNER. EXCESS TOPSOIL SHALL BE DISTRIBUTED INTO A THIN LAYER ON LAND IMMEDIATELY ADJACENT TO WHERE THE TOPSOIL ORIGINATED. ALL EXCESS TOPSOIL TO BE WASTED ONSITE. WHILE DOING SO THE CONTRACTOR SHALL AVOID CAUSING RIDGES OR MOUNDS THAT WOULD MAKE IT DIFFICULT FOR STORM WATER RUNOFF TO DRAIN. THE FINAL SURFACE OF THE DISTURBED TOPSOIL SHALL BE SMOOTH AND FOLLOW THE NATURAL CONTOUR OF THE LAND.
9. THE CONTRACTOR SHALL NOTIFY SOUTH DAKOTA 811 AT LEAST 48 HOURS BEFORE EXCAVATION ACTIVITIES COMMENCE.
10. TEMPORARY INTERSECTION WIDENING SHALL, UPON COMPLETION OF ALL PROJECT CONSTRUCTION OR UPON NOTIFICATION OF THE ENGINEER, BE REMOVED AND THE AREA RESTORED TO ITS ORIGINAL LINES AND GRADES WITH TOPSOIL REPLACED, EXCEPT WHERE REQUESTED BY THE TOWNSHIP OR COUNTY TO PERMANENTLY REMAIN. DISTURBED AREAS OUTSIDE OF THE FINAL ROADWAY SHALL BE SEEDED AND MULCHED.
11. TURBINE SETBACKS ARE NOT IDENTIFIED ON THE CONSTRUCTION PLANS. IT SHALL BE THE RESPONSIBILITY OF THE OWNER AND CONTRACTOR TO ENSURE THAT ALL TURBINE SETBACKS MEET PROJECT REQUIREMENTS.
12. GEOTECHNICAL REPORTS WITH RECOMMENDATIONS HAVE BEEN PROVIDED BY THE OWNER. ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL ENGINEERING REPORT AND RECOMMENDATIONS.
13. FIELD SURVEY WETLAND INFORMATION HAS BEEN PROVIDED BY THE OWNER. ALL WETLAND DELINEATIONS AND PERMITTING SHALL BE THE RESPONSIBILITY OF OTHERS AND BE COMPLETED PRIOR TO CONSTRUCTION COMMENCING. THE OWNER AND GENERAL CONTRACTOR SHALL VERIFY THAT ALL WETLAND PERMITS HAVE BEEN SUBMITTED AND APPROVED PRIOR TO CONSTRUCTION COMMENCING.
14. CULTURAL RESOURCE REPORTS HAVE NOT BEEN PROVIDED. CULTURAL RESOURCE LOCATIONS ARE NOT SHOWN ON THE PLANS. INFORMATION WILL BE THE RESPONSIBILITY OF THE OWNER AND GENERAL CONTRACTOR. THE LOCATIONS OF CULTURAL RESOURCE SITES MAY BE CONFIDENTIAL AND PROTECTED BY STATE OR FEDERAL LAW. PUBLIC RELEASE OF SPECIFIC INFORMATION REGARDING THESE RESOURCES MAY BE RESTRICTED.
15. AN ENVIRONMENTAL ASSESSMENT HAS NOT BEEN PROVIDED. THE CONTRACTOR SHALL BE FAMILIAR WITH THE REPORT AND REVIEW ALL RECOMMENDATIONS.
16. ELECTRICAL INFORMATION SHOWN ON THE PLANS IS FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSULTANT'S PLANS FOR SPECIFIC LOCATIONS AND CONSTRUCTION DETAILS FOR THE UNDERGROUND POWER COLLECTION SYSTEM AND SUBSTATION.
17. CRANE PATHS ARE SHOWN ON THE CONSTRUCTION PLANS. IF THE CONTRACTOR PROPOSES ALTERNATE CRANE PATHS, THEY SHALL ENSURE THAT WETLAND AND CULTURAL RESOURCE CORRIDORS ARE NOT DISTURBED. FINAL CRANE PATH ALIGNMENTS SHALL BE DETERMINED BY THE CONTRACTOR BASED ON FIELD CONDITIONS WITHIN THE WETLAND AND CULTURAL RESOURCE CORRIDORS, SPECIAL LANDOWNER AGREEMENTS AND THE PROJECT BOUNDARY.
18. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. DISTURBANCE SHALL BE LIMITED TO 50 LF WIDTH FOR PROPOSED ACCESS ROADS AND 50 LF FOR CRANE PATHS, AND SHALL BE LIMITED TO A 250 LF RADIUS FOR PROPOSED WIND TURBINE GENERATORS. THE GRADING LIMITS SHALL BE CENTERED ON THE ROADWAYS AND WIND TURBINES. THE CONTRACTOR SHALL MAKE ALL EFFORTS TO KEEP ACTIVITIES WITHIN THE ERECTION AREAS SHOWN ON THE PLANS BUT IT IS UNDERSTOOD THAT SOME ACTIVITIES THAT WILL NOT REQUIRE GRADING OR SOIL DISTURBANCE MAY EXTEND BEYOND THE DEFINED LIMITS. DURING ERECTION OF THE ROTOR, TRUCKS AND/OR FORKLIFTS MAY EXTEND BEYOND THESE LIMITS. SEE DETAIL TS01 FOR TYPICAL ERECTION AREAS.
19. AN ALTA SURVEY HAS BEEN PROVIDED BY WESTWOOD. CONTRACTOR AND OWNER ARE RESPONSIBLE FOR LOCATING ALL UTILITIES AND VERIFYING LOCATION OF CONSTRUCTION ACTIVITIES PRIOR TO COMMENCING WORK.

STORMWATER POLLUTION PREVENTION PLAN (SWPPP):

1. THE CONTRACTOR SHALL PROVIDE EROSION CONTROL MEASURES AS PLANNED AND SPECIFIED FOLLOWING BEST MANAGEMENT PRACTICES AS OUTLINED BY THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND BEING IN CONFORMANCE WITH THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL STORMWATER PERMIT.
2. REFER TO THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR THE TRIPLE H WIND FARM, PREPARED BY WESTWOOD PROFESSIONAL SERVICES, FOR EROSION CONTROL AND RESTORATION SPECIFICATIONS, SEDIMENT AND EROSION CONTROL PROCEDURES, LOCATIONS OF BMPs, DETAILS, AND INSPECTION INFORMATION.
3. ALL PASTURES AND DRAINAGE SWALES DISTURBED DURING CONSTRUCTION ACTIVITIES AND NOT COVERED BY ROAD SURFACING MATERIALS, SHALL BE SEEDED IN ACCORDANCE WITH THE SWPP PLAN.
4. TEMPORARY EROSION CONTROL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE TEMPORARY EROSION CONTROL PLAN SHALL BE IN ACCORDANCE WITH THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND THE TRIPLE H WIND FARM STORMWATER POLLUTION PREVENTION PLAN ON FILE.

PROJECT CONTACT INFORMATION:

TITLE	COMPANY	NAME	CONTACT NUMBER
OWNER (PRIMARY)	ENGIE	CASEY WILLIS	805-569-6185
PROJECT MANAGER	WESTWOOD	DANI NYGREN	952-906-7493
ENGINEER OF RECORD	WESTWOOD	ROB COPOULS	952-906-7470
CONTRACTOR	WANZEK	JASON HELLERUD	701-893-3685

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #300
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed: BNK
Checked: DJN
Drawn: BNK
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2028 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 12 OF 57

0014440DTP.dwg

©2019 Westwood Professional Services, Inc.

CEMENT STABILIZATION - PROCEDURE

THE SPECIFICATIONS BELOW ARE GENERAL RECOMMENDATIONS/GUIDELINES FOR CEMENT STABILIZATION OF SUBGRADES FOR THE PROJECT. ACTUAL FIELD CONDITIONS MAY ALTER APPLICATION RATE. CONSULT GEOTECHNICAL ENGINEER FOR FURTHER RECOMMENDATIONS.

1. STRIP THE TOP ±4 INCHES OF TOPSOIL (THROUGH THE ROOT ZONE) FROM THE AREA TO BE STABILIZED. ROOTS SMALLER THAN 1/4" DIAMETER ARE CONSIDERED INSIGNIFICANT.
2. PERFORM A PROCTOR (ASTM D 698) TEST TO DETERMINE THE OPTIMUM MOISTURE CONTENT IF THE MATERIAL TO BE STABILIZED DOES NOT MATCH A PREVIOUSLY PERFORMED PROCTOR.
3. DETERMINE THE IN-SITU MOISTURE CONTENT USING A NUCLEAR DENSITY GAUGE (OR EQUIVALENT MOISTURE CONTENT TEST) DAILY, PRIOR TO INCORPORATION OF THE CEMENT. PROVIDE ADDITIONAL MOISTURE CONTENT TESTING AS NEEDED BASED ON WEATHER CONDITIONS.
   - 3.1. THE CONTRACTOR WILL BE ADVISED OF IN-SITU MOISTURE CONTENT, AND MOISTURE ADJUSTMENTS SHOULD BE MADE IF IN-SITU MOISTURE IS LESS THAN OPTIMUM MOISTURE CONTENT AS DETERMINED BY THE PROCTOR (ASTM D 698).
4. SOIL AND CEMENT BLENDING:
   - 4.1. COMPLETELY BLEND SUBGRADE SOIL WITH THE APPROPRIATE AMOUNT OF CEMENT BY WEIGHT. FIELD RESULTS FROM TEST STRIPS WILL DICTATE THE CEMENT APPLICATION RATE.
   - 4.2. IN AREAS OF HIGH MOISTURE OR POOR SOILS, THE CONTRACTOR MAY INCREASE THE PERCENT OF CEMENT IN ORDER TO MEET THE MINIMUM SUBGRADE STRENGTH REQUIREMENTS.
   - 4.3. THE USE OF A RECLAIMER IS AN ADEQUATE BLENDING METHOD. DISCING IS NOT AN ADEQUATE BLENDING METHOD.
   - 4.4. A STABILIZATION DEPTH OF 12" WAS USED FOR DESIGN PURPOSES. STABILIZATION DEPTH MAY NEED TO INCREASE TO 16" IN AREAS OF EXTREME MOISTURE OR POOR SOILS IN ORDER TO MEET THE STRENGTH AND PROOF ROLL REQUIREMENTS.
5. COMPACTION:
   - 5.1. A ROLLING PATTERN WILL BE ESTABLISHED USING A NUCLEAR DENSITY GAUGE DURING COMPACTION.
     - 5.1.1. COMPACTION WILL BE PERFORMED UNTIL THE STABILIZED MATERIAL REACHES THE "BREAK POINT" AFTER WHICH ADDITIONAL PASSES WITH A ROLLER RESULTS IN A LOSS OF DENSITY AS MEASURED BY A NUCLEAR DENSITY GAUGE.
     - 5.1.2. COMPACTION IS TYPICALLY ACHIEVED BY MULTIPLE PASSES OF A PADFOOT ROLLER UNTIL THE ROLLER "WALKS" OUT OF THE RECLAIMED MATERIAL (SPACE IS VISIBLE BETWEEN THE DRUM AND THE RECLAIMED MATERIAL). THIS IS FOLLOWED BY BLADING AND SHAPING THE RECLAIMED MATERIAL TO FINAL PROFILE AND CROSS SECTION, REMOVING HIGH AND LOW POINTS. SMOOTH DRUM OR RUBBER TIRE ROLLERS ARE THEN USED TO FINISH ROLLING (THIS IS WHEN THE DENSITY TESTS ARE PERFORMED) UNTIL THE DENSITY OF THE MATERIAL REACHES THE "BREAK POINT."
     - 5.1.3. THE NUMBER OF PASSES AND EQUIPMENT USED TO REACH THE "BREAK POINT" IS CONSIDERED THE ROLLING PATTERN.
     - 5.1.4. A NEW ROLLING PATTERN MAY NEED TO BE ESTABLISHED IF THE PERFORMANCE REQUIREMENTS ARE NOT BEING MET. THIS MAY BE DUE TO CHANGES IN THE MOISTURE CONTENT, THE SOIL TYPE, OR THE CEMENT RATE.
   - 5.2. THE TARGET DENSITY IS 98% OF THE MAXIMUM DENSITY DETERMINED FROM THE ROLLING PATTERN.
     - 5.2.1. DENSITY TESTS SHALL BE TAKEN AT THE RATE OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER TO CONFIRM THE DENSITY IS MATCHING THE TARGET. ONCE THE ROLLING PATTERN HAS BEEN CONFIRMED IT IS RECOMMENDED THAT TESTING CONTINUE AT 1 TEST PER 1,000 LF IN EACH PASS OF THE RECLAIMER.
     - 5.2.2. IF IT IS NOT POSSIBLE TO ATTAIN THE TARGET DENSITY, AND ADDITIONAL COMPACTION DOES NOT IMPROVE THE DENSITY, A NEW ROLLING PATTERN SHOULD BE ESTABLISHED.
   - 5.3. THE AIR TEMPERATURE SHALL BE ABOVE 40 DEGREES (F) DURING THE CEMENT STABILIZATION PROCESS. MIXING CEMENT INTO FROZEN GROUND IS NOT ACCEPTABLE.
6. THE STABILIZED MATERIAL SHALL BE CONTINUOUSLY WET CURED FOR A MINIMUM OF 24 HOURS (WET CURED IS IDENTIFIED VISUALLY AS DAMP SURFACE).
7. PERFORM SUBGRADE TESTING IN ACCORDANCE WITH TESTING SCHEDULE.
8. AGGREGATE PLACEMENT:
   - 8.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 8.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 8.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

CEMENT STABILIZATION - DESIGN BASIS

1. DURING INITIAL CONSTRUCTION, CONTRACTOR SHALL CONSTRUCT MINIMUM 300 LF TEST STRIPS CONTAINING 4%, 5% AND 6% CEMENT IN ACCORDANCE WITH CEMENT STABILIZATION PROCEDURES.
2. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 3 FOR ANTICIPATED RESULTS):
   - 2.1. PERFORM INITIAL SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M BETWEEN 4 TO 6 HOURS AFTER FINAL COMPACTION.
   - 2.2. PERFORM ADDITIONAL DCP TESTING AT 24 AND 48 HOURS AFTER FINAL COMPACTION.
   - 2.3. PERFORM SUBSEQUENT DCP TESTS AT 7 DAYS AFTER FINAL COMPACTION AS VERIFICATION OF STRENGTH CURVE.
   - 2.4. A MINIMUM OF 3 TESTS PER TEST SECTION PER TIMEFRAME IS REQUIRED. TESTS SHALL BE TAKEN AT THE CENTERLINE AND 2' FROM EACH SHOULDER.
   - 2.5. RECORD DCP TEST RESULTS EVERY 6 INCHES TO TOTAL DEPTH OF 12 INCHES.

TABLE 3: TEST STRIP CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	COMPRESSIVE STRENGTH (PSF)
4 - 6 HOURS	6	5	1,800
24 HOURS	10	7	2,500
48 HOURS	15	10	3,200
7 DAYS	30	21	5,200

CEMENT STABILIZATION - PRODUCTION

1. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 5 FOR SUMMARY OF TESTING REQUIREMENTS):
   - 1.1. PERFORM SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M NO SOONER THAN 24 HOURS AFTER FINAL COMPACTION.
   - 1.2. DCP TESTING FREQUENCY SHALL BE WITH A RANDOM SPACING AND A MINIMUM OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER. A MINIMUM OF 3 TESTS PER ROAD IS REQUIRED.
   - 1.3. THE CBR OF THE STABILIZED SUBGRADE SHOULD BE CALCULATED IN 6" INCREMENTS THROUGH THE ENTIRE DEPTH OF THE STABILIZED LAYER.
   - 1.4. THE MINIMUM REQUIRED CBR PRIOR TO PROOF-ROLLING IS PROVIDED IN TABLE 4 BELOW:

TABLE 4: FINAL CEMENT STABILIZED CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	UNDRAINED SHEAR STRENGTH (PSF)	BEARING CAPACITY (PSF)
24 - 48 HOURS	15	10	3,500	9,800
3 - 7 DAYS	30	21	7,000	18,000
28 DAYS	50	33	12,000	28,500

NOTE: UNDRAINED SHEAR STRENGTH WAS CALCULATED USING THE BLACK (1961) EQUATION. BEARING CAPACITY WAS CALCULATED USING THE VESIC EQUATION MODIFIED FOR TWO LAYERS (12" CEMENT STABILIZED SUBGRADE OVER A NATURAL SUBGRADE WITH A CBR OF 1.5)

   - 1.5. ONCE THE MINIMUM REQUIRED CBR IS ACHIEVED AT ANY CORRESPONDING TIME PERIOD, THE SUBGRADE IS CONSIDERED ADEQUATE AND THE CONTRACTOR MAY PROCEED WITH PROOF-ROLL TESTING. FUTURE DCP TESTING ON THAT SEGMENT OF SUBGRADE IS NOT REQUIRED.
   - 1.6. IF TESTING DOES NOT INDICATE A CBR OF 30 WITHIN 7 DAYS, ADDITIONAL GRAVEL SURFACING AND/OR THE ADDITION OF GEOTEXTILE FABRIC MAY BE REQUIRED. FOR FUTURE SUBGRADE STABILIZATION AREAS, CONTACT THE ENGINEER AND OWNER VIA RFI FOR RECOMMENDATIONS AND APPROVAL.
2. SUBGRADE PROOF-ROLL TESTING AND ACCEPTANCE:
   - 2.1. ONCE THE REQUIRED DCP VALUE HAS BEEN OBTAINED BUT PRIOR TO PLACING AGGREGATE, THE SUBGRADE SHALL BE PROOF-ROLLED. REFER TO THE PROJECT TESTING REQUIREMENTS FOR PROOF-ROLL DEFINITION.
   - 2.2. PROOF-ROLLING SHOULD BE PERFORMED WITH ONE PASS DOWN THE CENTER AND NOT BE PERFORMED WITHIN 12 INCHES OF THE EDGE OF THE STABILIZED SECTION.
   - 2.3. IF PROOF-ROLLING FAILS, RE-STABILIZATION MAY BE REQUIRED AND A NEW ROLLING PATTERN OR ADDITIONAL CEMENT MAY BE REQUIRED.
3. AGGREGATE PLACEMENT:
   - 3.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 3.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 3.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

TABLE 5: CEMENT STABILIZATION PRODUCTION TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
COMPACTED SUBGRADE (CEMENT STABILIZED)	PROCTOR	MINIMUM 1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER 1000 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
NOTE: SEE ABOVE FOR INITIAL TESTING REQUIREMENTS	DCP TEST	1 PER 500 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
	PROOF-ROLL (AFTER PASSING DCP TESTS)	ENTIRE LENGTH

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (866) 937-5150 twinecities@w-ps.com

Westwood Professional Services, Inc.

Designed: BMK
Checked: DBH
Drawn: BMK
As-Built Drawing:

Revisions: #	DATE	DESCRIPTION
A	12/08/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2200 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 13 OF 57

0014440D1P.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 202nd Street in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 615' West of 204th Street & 202nd Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.27'15.88" W Long. -99.33'18.66" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001708 SW4 36-112-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Signature of Applicant

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 202nd Street in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 615' West of 204th Street & 202nd Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.27'15.88" W Long. -99.33'18.66" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001708 SW4 36-112-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

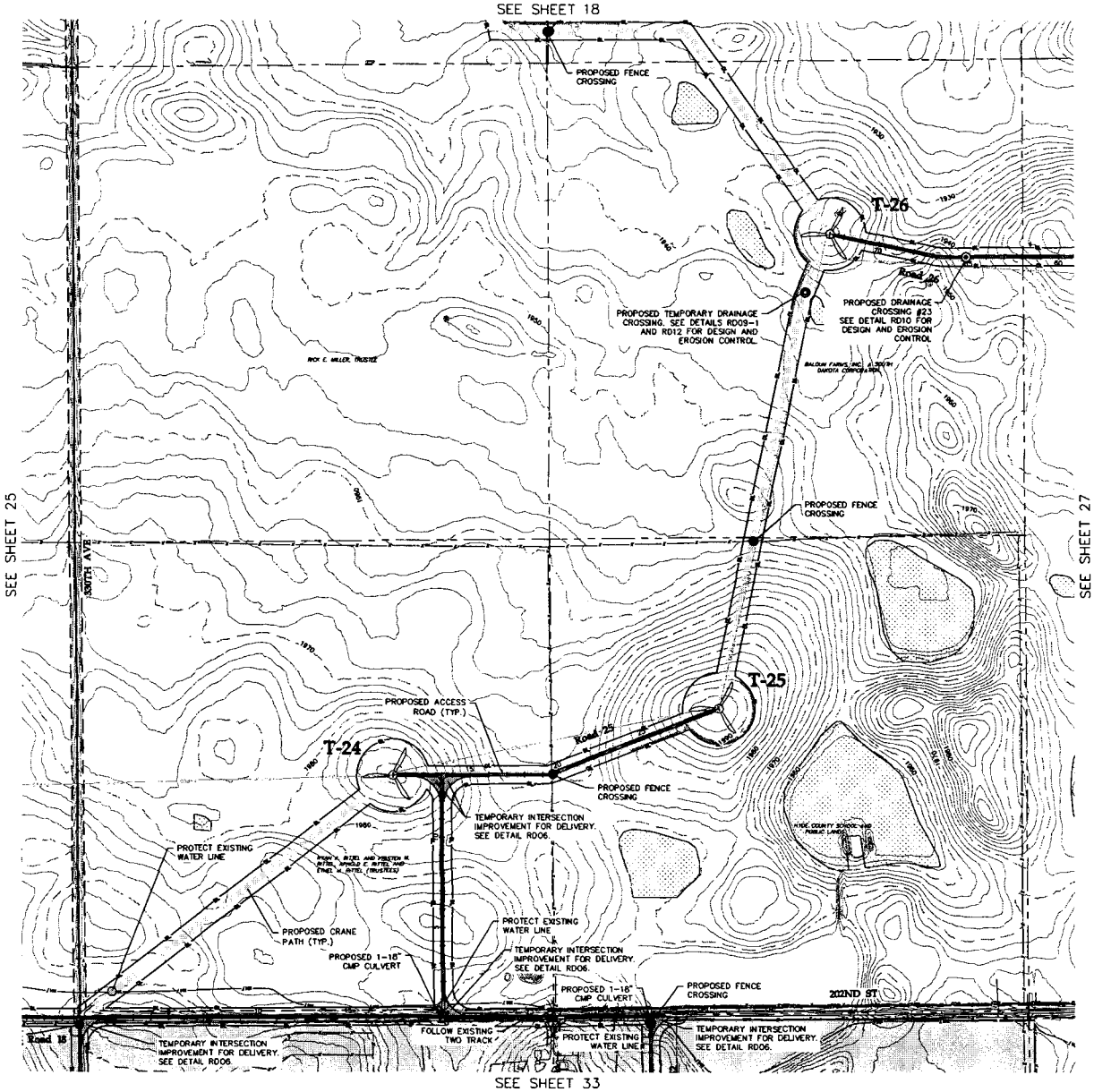
Submitted August 1, 20 19 Date Approved: _____

_____ _____
Signature of Applicant Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

©2019 Westwood Professional Services, Inc.



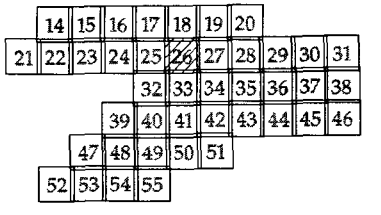
LEGEND:

- PROPOSED TURBINE LOCATION
- T-XX PROPOSED TURBINE NUMBER
- PROPOSED ALTERNATE TURBINE LOCATION
- ALT-XX PROPOSED ALTERNATE TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED ALTERNATE ACCESS ROAD
- PROPOSED CRANE PATH
- PROPOSED UNDERGROUND COLLECTION*
- PROPOSED DISTURBANCE LIMITS
- PROPOSED PERIMETER SEDIMENT CONTROL
- EXISTING 10' CONTOURS
- EXISTING 2' CONTOURS
- EXISTING GRAVEL EDGE
- EXISTING BITUMINUS EDGE
- EXISTING RIGHT-OF-WAY
- EXISTING PARCEL LINE
- EXISTING BUILDING
- EXISTING FENCE
- EXISTING OVERHEAD POWER
- EXISTING HIGH VOLTAGE OVERHEAD POWER
- EXISTING UNDERGROUND POWER LINE
- EXISTING FIBER OPTIC LINE
- EXISTING WATER LINE
- DELINEATED WETLAND
- ARCHAEOLOGICAL AVOIDANCE AREA
- EXISTING USFWS EASEMENT
- PROJECT BOUNDARY
- EXISTING GROUND ELEVATION
- PROPOSED DRAINAGE CROSSING**
- PROPOSED TEMPORARY DRAINAGE CROSSING**
- PROPOSED FENCE CROSSING***
- PROPOSED UTILITY CROSSING
- PROPOSED CULVERT

* PROVIDED BY OTHERS AND SHOWN FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSTRUCTION PLANS FOR DETAILS.

** SEE SHEET 11 FOR DRAINAGE CROSSING TYPE AND SIZING. DRAINAGE CROSSINGS SHALL CONSIST OF LOW WATER CROSSING OR CULVERT. DRAINAGE CROSSINGS ALONG CRANE PATH SHALL CONSIST OF CRANE MATS OR TEMPORARY CULVERT.

*** ALL GATE INSTALLATIONS SHALL BE FIELD DETERMINED AND AGREED UPON BY THE CONTRACTOR AND OWNER.



KEY MAP

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwood@westwood.com
Westwood Professional Services, Inc.

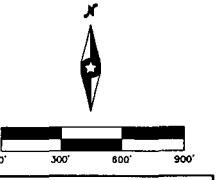
Designed: SMK
Checked: BDM
Drawn: SMK
As-Built Drawing:

Revisions		
#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078



Triple H Wind Farm

Hyde County, South Dakota

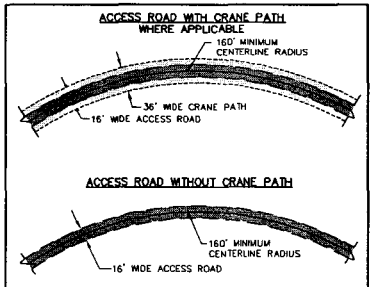
Site Plan T-24 - T-26

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 26 OF 57

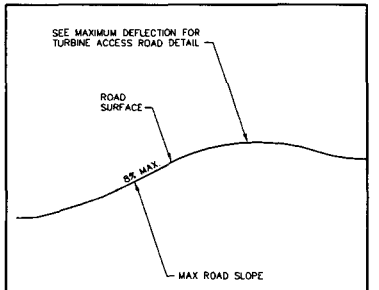
00144405P01.dwg

©2019 Westwood Professional Services, Inc.



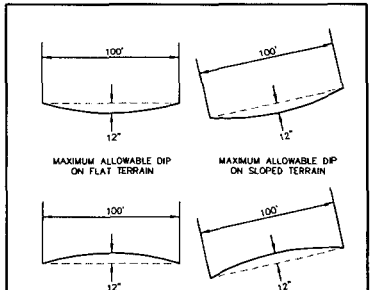
NOTE:
1. SOME RADII MAY REQUIRE ADDITIONAL SOIL COMPACTION OR GRAVEL OUTSIDE OF THE WIDTH SHOWN ABOVE TO ACCOMMODATE TRACTORS OR TRAILERS TRACKING OFF THE ACCESS ROAD.

Westwood	MINIMUM RADIUS FOR TURBINE ACCESS ROAD	LAST REVISED: 04/26/11 RD02

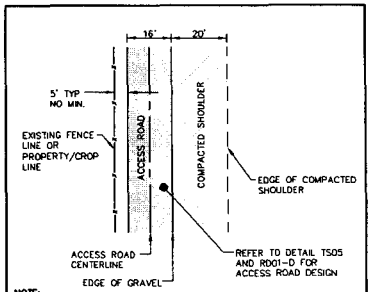


NOTES:
1. ROAD SLOPE SHALL NOT EXCEED 8% WITHOUT OWNER APPROVAL

Westwood	MAXIMUM VERT. SLOPE FOR TURBINE ACCESS ROAD/CRANE TRAVEL PATH	LAST REVISED: 3/30/07 RD03

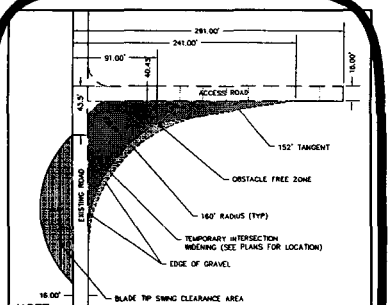


Westwood	MAXIMUM DEFLECTION FOR TURBINE ACCESS ROAD	LAST REVISED: 11/01/08 RD04



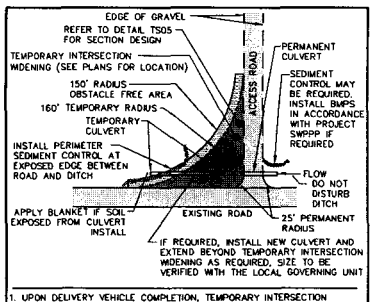
NOTE:
1. COMPACTED SHOULDER SHALL BE RETURNED TO NATIVE CONDITION FOLLOWING TURBINE GENERATOR CONSTRUCTION.
2. THE ACCESS ROAD MAY NEED TO BE CONSTRUCTED FARTHER FROM THE PROPERTY LINE IF OBSTRUCTIONS SUCH AS TREES FOLLOW THE PROPERTY LINE.

Westwood	TURBINE ACCESS ROAD ALONG FENCE/PROPERTY/CROP LINE	LAST REVISED: 3/01/07 RD05



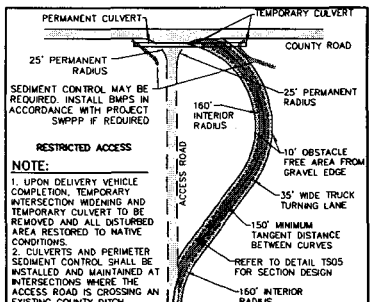
NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING TO BE REMOVED AND ALL DISTURBED AREA RESTORED.
2. DIMENSIONS ASSUME A 90° INTERSECTION

Westwood	INTERSECTION WIDENING DIMENSIONS	LAST REVISED: 7/13/18 RD06



1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.

Westwood	TURBINE ACCESS ROAD TYPICAL INTERSECTION WIDENING	LAST REVISED: 3/2/07 RD07

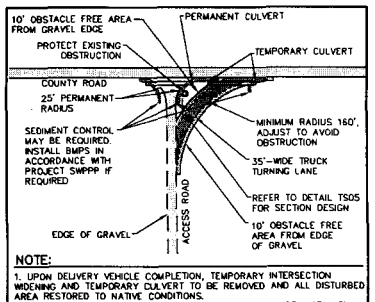


RESTRICTED ACCESS

NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

NOT TO SCALE

Westwood	TRUCK TRAFFIC TURNING LANE A	LAST REVISED: 3/2/07 RD08-A



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

Westwood	TRUCK TRAFFIC TURNING LANE B	LAST REVISED: 12/3/11 RD08-B

Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-free (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: DPH
Drawn: BMK
As-Built Drawing:

Revisions #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

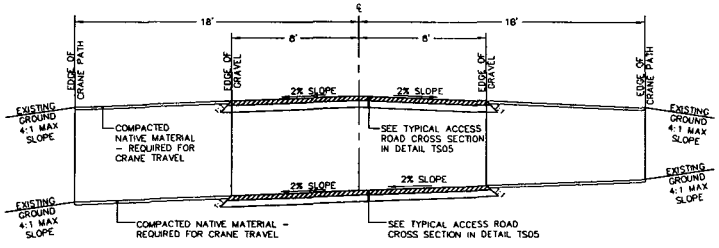
Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 5 OF 57

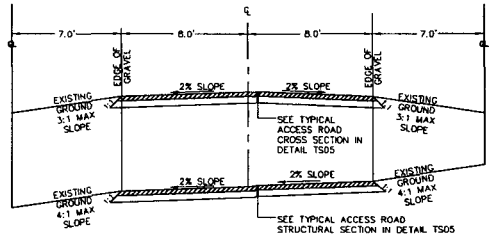
0014440DTP.dwg

© 2019 Westwood Professional Services, Inc.



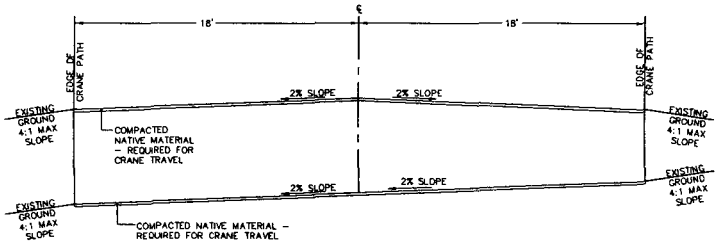
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE ACCESS ROAD DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

Westwood	TYPICAL TURBINE ACCESS ROAD AND CRANE PATH	LAST REVISED: 05/29/19
		RD01–A



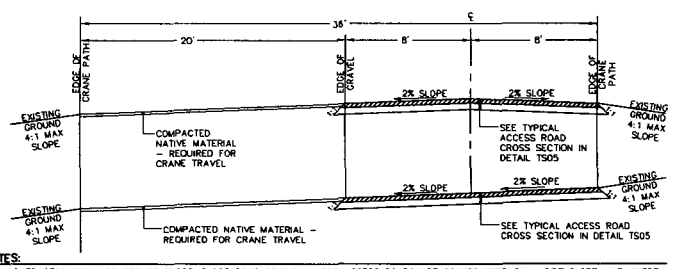
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

Westwood	TYPICAL TURBINE ACCESS ROAD SECTION	LAST REVISED: 3/19/19
		RD01–B



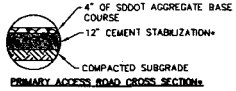
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE WHERE CRANE PATHS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT CRANE PATH REMAINS WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%.

Westwood	TYPICAL CRANE PATH	LAST REVISED: 05/29/19
		RD01–C

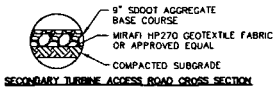


NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE EDGE OF COMPACTED SHOULDER DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

Westwood	TYPICAL TURBINE ACCESS ROAD AND OFFSET CRANE PATH	LAST REVISED: 05/29/19
		RD01–D

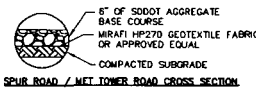


PRIMARY ACCESS ROAD CROSS SECTION*

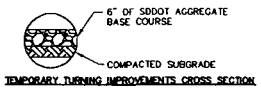


SECONDARY TURBINE ACCESS ROAD CROSS SECTION

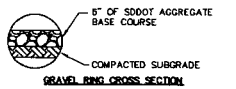
* CEMENT APPLICATION RATE MAY VARY BASED ON TEST STRIPS AND FIELD PERFORMANCE. SEE SHEET 13 FOR CEMENT STABILIZATION PROCEDURE AND DESIGN BASIS.



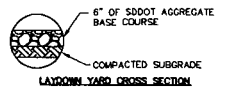
SPUR ROAD / WET TOWER ROAD CROSS SECTION



TEMPORARY TURNING IMPROVEMENTS CROSS SECTION



GRAVEL RING CROSS SECTION



LAYDOWN YARD CROSS SECTION

NOTES:
STRUCTURAL SECTIONS SHOWN ARE THE MINIMUM THICKNESS REQUIREMENTS DURING NORMAL FIELD CONDITIONS. THE SECTIONS MAY NEED TO BE INCREASED BASED ON ACTUAL FIELD CONDITIONS AT THE TIME OF CONSTRUCTION. CONDITIONS INCLUDE BUT ARE NOT LIMITED TO CONSTRUCTION DURING THE FREEZE/THAW CYCLE, UNUSUALLY WET PERIODS, OR IN LOW/WET AREAS. SEE SHEET 12 FOR TESTING REQUIREMENTS AND SPECIFICATIONS.

Westwood	TYPICAL STRUCTURAL CROSS SECTIONS

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-Free (888) 937-5150 westwoodps.com

Westwood Professional Services, Inc.

Designed: BMK
Checked: DJH
Drawn: BMK
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK MINN.

3808 3rd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 4 OF 57

0014440DTP.dwg

©2019 Westwood Professional Services, Inc.

ROAD DESIGN PARAMETERS

1. ACCESS ROADS HAVE BEEN DESIGNED TO ACCOMMODATE LIGHT DUTY TRUCKS (PICKUP TRUCKS AND MAINTENANCE VEHICLES) FOR LOW VOLUME USE IN NORMAL OPERATING CONDITIONS AS WELL AS HEAVY DUTY CONSTRUCTION TRAFFIC UNDER DRY CONDITIONS. THE ROAD DESIGN SPECIFIED IS NOT INTENDED FOR ALL WEATHER USE FOR HEAVY DUTY CONSTRUCTION LOADS.
2. ROAD MAINTENANCE CAN BE EXPECTED OVER THE LIFE OF THE PERMANENT FACILITY.

PRODUCTS

1. AGGREGATE BASE SHALL CONSIST OF SDDOT AGGREGATE BASE COURSE (AND IN CONFORMANCE WITH THE GRADATION TABLE 1). AGGREGATE MAY BE CRUSHER RUN UPON ENGINEERS APPROVAL. AGGREGATE GRADATIONS SHALL BE SUBMITTED TO ENGINEER FOR REVIEW.
2. ROAD SHOULDERS AND CRANE PADS SHALL CONSIST OF COMPACTED NATIVE SOILS.
3. CULVERTS: ACCESS ROAD CULVERTS SHALL MEET THE MINIMUM SPECIFICATIONS SET FORTH BY THE SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION AND/OR HYDE COUNTY. ALL CULVERTS ARE PLANNED TO BE A MINIMUM 18" DIAMETER AND MANUFACTURED OF 16-GAGE CORRUGATED METAL PIPE WITH NO END TREATMENTS UNLESS NOTED OTHERWISE. ACTUAL SIZE WILL BE DETERMINED THROUGH HYDRAULIC ANALYSIS.
4. GEOTEXTILE FABRIC: MIRAFI HP270 OR APPROVED EQUAL.

EXECUTION

1. CLEARING AND GRUBBING
   A. THE CONTRACTOR SHALL BE REQUIRED TO GRUB ALL TREES, STUMPS, BRUSH, AND DEBRIS WITHIN THE GRADING AREAS SHOWN ON THE PLANS. GRUBBING INCLUDES REMOVAL OF ALL PLANT MATERIAL GREATER THAN 2" INCLUDING STUMPS, BRANCHES, ROOTS, ETC. TO A DEPTH BELOW THE FINAL SUBGRADE. THE CONTRACTOR IS TO REMOVE ONLY THOSE TREES WHICH ARE DESIGNATED BY THE OWNER'S REPRESENTATIVE FOR REMOVAL, AND SHALL EXERCISE EXTREME CARE AROUND EXISTING TREES TO BE SAVED.
2. TOPSOIL STRIPPING
   A. TOPSOIL, INCLUDING ROOTS LARGER THAN 2" AND LARGE ROOT MASSES, SHALL BE STRIPPED FROM ALL ROADWAY AND FOUNDATION AREAS UP TO 10". TOPSOIL SHALL NOT BE STRIPPED OUTSIDE OF THE DESIGNATED DISTURBANCE AREAS.
   B. ANY TOPSOIL THAT HAS BEEN STRIPPED SHALL BE STOCKPILED FOR POST CONSTRUCTION REVEGETATION. ALL TOPSOIL SHALL BE REDISTRIBUTED TO THE LAND OWNER'S PROPERTY OF WHERE IT ORIGINATED FROM.
3. FILL PLACEMENT
   A. FILL PLACEMENT SHALL CONSIST OF THE PLACING OF SUITABLE FILL MATERIAL, AFTER TOPSOIL STRIPPING, ABOVE THE EXISTING GRADE. GENERALLY, SIDE SLOPES SHALL BE CONSTRUCTED AT FOUR FOOT HORIZONTAL TO ONE FOOT VERTICAL, WITH SOME LOCATIONS THROUGHOUT THE PROJECT WITH SLOPES OF TWO FEET HORIZONTAL TO ONE FOOT VERTICAL. THE MATERIAL FOR FILL CONSTRUCTION SHALL BE OBTAINED FROM THE ACCESS ROAD/TURBINE EXCAVATION (SEE GEOTECHNICAL REPORT FOR RESTRICTIONS), OR ANY SUITABLE, APPROVED SOIL OBTAINED ONSITE/OFFSITE BY CONTRACTOR, AS DIRECTED OR APPROVED BY THE ENGINEER. THIS MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 12" AND CONSTRUCTED TO 95% OF THE MAXIMUM DRY DENSITY AND WITHIN 2% OF OPTIMUM MOISTURE CONTENT, AS DETERMINED BY THE STANDARD PROCTOR (AASHTO T99).
   B. SIDE SLOPES GREATER THAN 4:1 WILL NOT BE PERMITTED, UNLESS OTHERWISE NOTED ON THE PLAN.
   C. FILL SLOPES SHALL BE BENCHED INTO THE EXISTING SLOPE TO PREVENT MOVEMENT BETWEEN THE FILL AND NATIVE SOILS. BENCHES SHOULD BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO FILL PLACEMENT. POSITIVE DRAINAGE IS REQUIRED AT BENCHED AREAS AND AT THE TOE OF FILL SLOPES TO REMOVE SURFACE WATER.
4. SUBGRADE
   A. SUBGRADE PREPARED AT GRADE OR IN CUT REQUIRES SCARIFICATION AND RECOMPACTION TO A DEPTH OF 12" OR MORE.
   B. ACCESS ROAD CROSS SLOPES SHOWN IN THE PLANS ARE MEANT AS A GUIDE. ACCESS ROAD CROSS SLOPES MAY RANGE FROM 1% - 2%, CHECK WITH THE ENGINEER IF THE CROSS SLOPE FALLS OUTSIDE OF THIS RANGE. ACCESS ROADS BEING UTILIZED FOR CRANE TRAVEL SHOULD HAVE A MAX CROSS SLOPE OF 2%

TABLE 1: SDDOT AGGREGATE BASE COURSE - LOCALLY SOURCED	
SIEVE SIZE	PERCENT PASSING
1"	100
3/4"	80-100
1/2"	68-91
NO. 4	46-70
NO. 8	34-58
NO. 40	13-35
NO. 200	3-12

MEET FOLLOWING REQUIREMENTS PER 882.2

LIQUID LIMIT (MAX) = 25
PLASTICITY INDEX = 0-6
L.A ABRASION (% MAX) = 40%

GRADATION HAS BEEN OBTAINED FROM THE 2015 SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION BOOK.

STORM WATER DESIGN PARAMETERS

1. SEE SHEET 6 FOR CULVERT SIZING AND DESIGN PARAMETERS. SEE HYDROLOGY MEMO FOR FURTHER DESIGN CALCULATIONS. CULVERTS SHALL BE MINIMUM 18" CORRUGATED METAL PIPE. ALL TEMPORARY PORTIONS OF THE INSTALLED CULVERTS SHALL BE REMOVED UPON COMPLETION OF THE PROJECT.
2. IT IS EXPECTED THAT CULVERTS WILL BE OVERTOPPED DURING SOME STORMS AND MAINTENANCE WILL BE REQUIRED THROUGH THE LIFE OF THE PROJECT.
3. WHEN INSTALLING DRAINAGE CULVERTS THE CONTRACTOR SHALL USE JUDGMENT IN SETTING THE FLOW LINE ELEVATIONS AND CULVERT LONGITUDINAL SLOPE. TYPICALLY THE FLOW LINE ELEVATIONS AND LONGITUDINAL SLOPE OF THE CULVERT SHOULD MATCH THE NATURAL GROUND ELEVATIONS AND SLOPE TO ENSURE POSITIVE DRAINAGE. WHEN POSSIBLE, ALL CULVERTS SHOULD BE PLACED AT A MINIMUM 0.5% GRADE.
4. ANTICIPATED CULVERT CROSSINGS ARE SHOWN ON THE CONSTRUCTION PLAN, ADDITIONAL CULVERTS MAY NEED TO BE INSTALLED IN AREAS WHERE CONCENTRATED FLOW IS EXPECTED DUE TO CONSTRUCTION ACTIVITIES.
5. CONSTRUCTION DRAINAGE CROSSINGS TO MAINTAIN EXISTING FLOW CHARACTERISTICS OF THE FEATURES. FEATURES SHALL BE GRADED TO PRECONSTRUCTION CONTOURS.

TESTING:

1. TESTING SHALL BE PERFORMED BY A DESIGNATED INDEPENDENT TESTING AGENCY.
2. SUBMIT ONE SET OF TESTING AND INSPECTION RECORDS SPECIFIED TO THE CIVIL ENGINEER OF RECORD.

DEFINITIONS:

1. PROOF ROLLING:
   SHALL BE PERFORMED IN THE PRESENCE OF THE GEOTECHNICAL ENGINEER OR QUALIFIED GEOTECHNICAL REPRESENTATIVE USING A FULLY LOADED TANDEM AXLE DUMP TRUCK OR WATER TRUCK WITH A MINIMUM GROSS WEIGHT OF 25 TONS OR A FULLY LOADED BELLY DUMP WITH AN EQUIVALENT AXLE LOADING. PROOF-ROLLING ACCEPTANCE STANDARDS INCLUDE NO RUTTING GREATER THAN 1.5 INCHES, AND NO "PUMPING" OF THE SOIL BEHIND THE LOADED TRUCK.
2. SIEVE ANALYSIS:
   SHALL BE CONDUCTED IN ACCORDANCE WITH AASHTO T27
3. PROCTORS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T99
4. ATTERBERG LIMITS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T89 AND T90
5. MOISTURE DENSITY (NUCLEAR DENSITY):
   SHALL BE DONE IN ACCORDANCE WITH AASHTO T310
6. DYNAMIC CONE PENETROMETER (DCP) TESTING:
   SHALL BE DONE IN ACCORDANCE WITH ASTM D6951-03

REQUIREMENTS:

1. FILL PLACEMENT:
   A. SOILS USED AS FILL MATERIAL SHALL BE TESTED FOR MOISTURE CONTENT AND PROCTOR TESTS.
   B. WHERE FILL CONSTRUCTION REQUIRES MORE THAN 12 INCHES OF FILL PLACEMENT, COMPACT EACH LIFT TO A MINIMUM OF 95 PERCENT OF THE MATERIAL'S MAXIMUM STANDARD PROCTOR DRY DENSITY.
2. COMPACTED SUBGRADE (CEMENT STABILIZED):
   A. SEE SHEET 13 FOR TESTING REQUIREMENTS AND PROCEDURE.
3. COMPACTED SUBGRADE (NON-CEMENT STABILIZED):
   A. THE ENTIRE SUBGRADE SHALL BE PROOF-ROLLED PRIOR TO THE PLACEMENT OF THE AGGREGATE BASE TO IDENTIFY AREAS OF UNSTABLE SUBGRADE.
   B. PERFORM A MINIMUM OF 3 DYNAMIC CONE PENETROMETER (DCP) TESTS PER ACCESS ROAD OR ONE FOR EVERY 1,000 LF OF ROAD, WHICHEVER IS GREATER. SUBGRADE MUST MEET A MINIMUM DCP OF 3 BLOWS PER 6" TO A TOTAL DEPTH OF 2' (MINIMUM CBR=1.5).
   C. IF A PASSING PROOF-ROLL OR DCP REQUIREMENTS CANNOT BE ACHIEVED THE FOLLOWING ALTERNATIVES MAY BE IMPLEMENTED:
      a. SCARIFY, DRY, AND RECOMPACT SUBGRADE
      b. REMOVE UNSUITABLE MATERIAL AND REPLACE WITH SUITABLE MATERIAL
      c. INCREASE AGGREGATE BASE THICKNESS
4. AGGREGATE BASE:
   A. AGGREGATE BASE SHALL BE PROOF-ROLLED OVER THE ENTIRE LENGTH. IF PROOF ROLLING DETERMINES THAT THE ROAD IS UNSTABLE, ADDITIONAL AGGREGATE SHALL BE ADDED UNTIL THE UNSTABLE SECTION IS ABLE TO PASS A PROOF ROLL.
   B. PROVIDE 1 SIEVE ANALYSIS (PROJECT MAX OF 20) PER 2500 CY OF ROAD BASE PLACED.
5. CRANE PAD AND CRANE PATHS / CRANE TRAVEL SHOULDERS:
   A. TESTING REQUIREMENTS ARE PENDING BASED ON CRANE PICK PLANS PROVIDED BY THE CONTRACTOR.

TABLE 2: TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
FILL PLACEMENT	PROCTOR	1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER LIFT PER 5000 SF OF FILL PLACED OR 1 PER 500 LF OF ROAD OR CRANE WALK
COMPACTED SUBGRADE (CEMENT STABILIZED):	SEE SHEET 13	SEE SHEET 13
COMPACTED SUBGRADE (NON-CEMENT STABILIZED):	PROOF-ROLL	ENTIRE AREA
	DCP	1 PER 1,000 FT OR MIN. 3 PER ROAD
AGGREGATE BASE	PROOF-ROLL	ENTIRE AREA
	SIEVE ANALYSIS, LL, PL, AND L.A ABRASION	1 PER 2,500 CY

GENERAL NOTES:

1. GROUND SURFACE CONTOURS (AT TWO-FOOT VERTICAL INTERVALS) AND ELEVATIONS ARE BASED ON A PHOTOGRAMMETRY SURFACE PROVIDED BY GEOTERRA. IF MAJOR DISCREPANCIES ARE FOUND IN THE GROUND ELEVATIONS DURING FIELD STAKING TO THE GROUND ELEVATIONS SHOWN ON THE PLANS, THE OWNER AND ENGINEER SHALL BE NOTIFIED.
2. WHERE SECTION OR SUBSECTION MONUMENTS ARE ENCOUNTERED, THE OWNER SHALL BE NOTIFIED BEFORE SUCH MONUMENTS ARE REMOVED. THE CONTRACTOR SHALL PROTECT AND CAREFULLY PRESERVE ALL PROPERTY MARKERS AND MONUMENTS UNTIL THE OWNER, AN AUTHORIZED SURVEYOR OR AGENT HAS WITNESSED OR OTHERWISE REFERENCED THEIR LOCATION.
3. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. TYPICAL DISTURBANCE SHALL BE LIMITED TO 10 LF FROM THE EDGE OF PROPOSED GRADING.
4. FINALIZE GRADING AROUND THE BASE OF TURBINES IN ACCORDANCE WITH DETAIL TS-03 AND TS-04.
5. GRADE ALL PROPOSED ROADS TO A MAXIMUM SLOPE OF 8%. IF 8% SLOPE CANNOT BE ACHIEVED, THE CONTRACTOR MAY UTILIZE ASSIST VEHICLES FOR THE PURPOSE OF DELIVERIES. GRADE ALL PROPOSED CRANE PATHS TO A MAXIMUM OF 8% UNLESS OTHERWISE NOTED IN PLAN SHEETS.
6. ANY FACILITIES REMOVED TO ALLOW FOR CONSTRUCTION (MAILBOXES, SIGNS, FENCES, ETC.) SHALL BE REPLACED BY THE CONTRACTOR IN A CONDITION AS GOOD AS EXISTING.
7. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING DRAINAGE THROUGHOUT THE CONSTRUCTION OF THIS PROJECT. CONSTRUCTION ACTIVITIES SHALL NOT BLOCK THE NATURAL OR MANMADE CREEKS OR DRAINAGE SWALES CAUSING RAINWATER TO POND. DEPENDING ON FIELD CONDITIONS, ADDITIONAL CULVERTS IN EXCESS OF THOSE ON THE PLANS MAY BE REQUIRED.
8. WHILE BUILDING THE ROADS AND EXCAVATING THE TURBINE FOUNDATIONS, EXCESS SOIL WILL RESULT. THE CONTRACTOR SHALL DISPOSE OF THIS EXCESS SOIL IN AN APPROVED MANNER. EXCESS TOPSOIL SHALL BE DISTRIBUTED INTO A THIN LAYER ON LAND IMMEDIATELY ADJACENT TO WHERE THE TOPSOIL ORIGINATED. ALL EXCESS TOPSOIL TO BE WASTED ONSITE. WHILE DOING SO THE CONTRACTOR SHALL AVOID CAUSING RIDGES OR MOUNDS THAT WOULD MAKE IT DIFFICULT FOR STORM WATER RUNOFF TO DRAIN. THE FINAL SURFACE OF THE DISTURBED TOPSOIL SHALL BE SMOOTH AND FOLLOW THE NATURAL CONTOUR OF THE LAND.
9. THE CONTRACTOR SHALL NOTIFY SOUTH DAKOTA 811 AT LEAST 48 HOURS BEFORE EXCAVATION ACTIVITIES COMMENCE.
10. TEMPORARY INTERSECTION WIDENING SHALL, UPON COMPLETION OF ALL PROJECT CONSTRUCTION OR UPON NOTIFICATION OF THE ENGINEER, BE REMOVED AND THE AREA RESTORED TO ITS ORIGINAL LINES AND GRADES WITH TOPSOIL REPLACED, EXCEPT WHERE REQUESTED BY THE TOWNSHIP OR COUNTY TO PERMANENTLY REMAIN. DISTURBED AREAS OUTSIDE OF THE FINAL ROADWAY SHALL BE SEEDED AND MULCHED.
11. TURBINE SETBACKS ARE NOT IDENTIFIED ON THE CONSTRUCTION PLANS. IT SHALL BE THE RESPONSIBILITY OF THE OWNER AND CONTRACTOR TO ENSURE THAT ALL TURBINE SETBACKS MEET PROJECT REQUIREMENTS.
12. GEOTECHNICAL REPORTS WITH RECOMMENDATIONS HAVE BEEN PROVIDED BY THE OWNER. ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL ENGINEERING REPORT AND RECOMMENDATIONS.
13. FIELD SURVEY WETLAND INFORMATION HAS BEEN PROVIDED BY THE OWNER. ALL WETLAND DELINEATIONS AND PERMITTING SHALL BE THE RESPONSIBILITY OF OTHERS AND BE COMPLETED PRIOR TO CONSTRUCTION COMMENCING. THE OWNER AND GENERAL CONTRACTOR SHALL VERIFY THAT ALL WETLAND PERMITS HAVE BEEN SUBMITTED AND APPROVED PRIOR TO CONSTRUCTION COMMENCING.
14. CULTURAL RESOURCE REPORTS HAVE NOT BEEN PROVIDED. CULTURAL RESOURCE LOCATIONS ARE NOT SHOWN ON THE PLANS. INFORMATION WILL BE THE RESPONSIBILITY OF THE OWNER AND GENERAL CONTRACTOR. THE LOCATIONS OF CULTURAL RESOURCE SITES MAY BE CONFIDENTIAL AND PROTECTED BY STATE OR FEDERAL LAW. PUBLIC RELEASE OF SPECIFIC INFORMATION REGARDING THESE RESOURCES MAY BE RESTRICTED.
15. AN ENVIRONMENTAL ASSESSMENT HAS NOT BEEN PROVIDED. THE CONTRACTOR SHALL BE FAMILIAR WITH THE REPORT AND REVIEW ALL RECOMMENDATIONS.
16. ELECTRICAL INFORMATION SHOWN ON THE PLANS IS FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSULTANT'S PLANS FOR SPECIFIC LOCATIONS AND CONSTRUCTION DETAILS FOR THE UNDERGROUND POWER COLLECTION SYSTEM AND SUBSTATION.
17. CRANE PATHS ARE SHOWN ON THE CONSTRUCTION PLANS. IF THE CONTRACTOR PROPOSES ALTERNATE CRANE PATHS, THEY SHALL ENSURE THAT WETLAND AND CULTURAL RESOURCE CORRIDORS ARE NOT DISTURBED. FINAL CRANE PATH ALIGNMENTS SHALL BE DETERMINED BY THE CONTRACTOR BASED ON FIELD CONDITIONS WITHIN THE WETLAND AND CULTURAL RESOURCE CORRIDORS, SPECIAL LANDOWNER AGREEMENTS AND THE PROJECT BOUNDARY.
18. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. DISTURBANCE SHALL BE LIMITED TO 50 LF WIDTH FOR PROPOSED ACCESS ROADS AND 50 LF FOR CRANE PATHS, AND SHALL BE LIMITED TO A 250 LF RADIUS FOR PROPOSED WIND TURBINE GENERATORS. THE GRADING LIMITS SHALL BE CENTERED ON THE ROADWAYS AND WIND TURBINES. THE CONTRACTOR SHALL MAKE ALL EFFORTS TO KEEP ACTIVITIES WITHIN THE ERECTION AREAS SHOWN ON THE PLANS BUT IT IS UNDERSTOOD THAT SOME ACTIVITIES THAT WILL NOT REQUIRE GRADING OR SOIL DISTURBANCE MAY EXTEND BEYOND THE DEFINED LIMITS. DURING ERECTION OF THE ROTOR, TRUCKS AND/OR FORKLIFTS MAY EXTEND BEYOND THESE LIMITS. SEE DETAIL TS01 FOR TYPICAL ERECTION AREAS.
19. AN ALTA SURVEY HAS BEEN PROVIDED BY WESTWOOD. CONTRACTOR AND OWNER ARE RESPONSIBLE FOR LOCATING ALL UTILITIES AND VERIFYING LOCATION OF CONSTRUCTION ACTIVITIES PRIOR TO COMMENCING WORK.

STORMWATER POLLUTION PREVENTION PLAN (SWPPP):

1. THE CONTRACTOR SHALL PROVIDE EROSION CONTROL MEASURES AS PLANNED AND SPECIFIED FOLLOWING BEST MANAGEMENT PRACTICES AS OUTLINED BY THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND BEING IN CONFORMANCE WITH THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL STORMWATER PERMIT.
2. REFER TO THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR THE TRIPLE H WIND FARM, PREPARED BY WESTWOOD PROFESSIONAL SERVICES, FOR EROSION CONTROL AND RESTORATION SPECIFICATIONS, SEDIMENT AND EROSION CONTROL PROCEDURES, LOCATIONS OF BMPs, DETAILS, AND INSPECTION INFORMATION.
3. ALL PASTURES AND DRAINAGE SWALES DISTURBED DURING CONSTRUCTION ACTIVITIES AND NOT COVERED BY ROAD SURFACING MATERIALS, SHALL BE SEEDED IN ACCORDANCE WITH THE SWPP PLAN.
4. TEMPORARY EROSION CONTROL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE TEMPORARY EROSION CONTROL PLAN SHALL BE IN ACCORDANCE WITH THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND THE TRIPLE H WIND FARM STORMWATER POLLUTION PREVENTION PLAN ON FILE.

PROJECT CONTACT INFORMATION:

TITLE	COMPANY	NAME	CONTACT NUMBER
OWNER (PRIMARY)	ENGIE	CASEY WILLIS	805-569-6185
PROJECT MANAGER	WESTWOOD	DAN NYGREN	952-906-7493
ENGINEER OF RECORD	WESTWOOD	ROB COPOULS	952-906-7470
CONTRACTOR	WANZEK	JASON HELLERUD	701-893-3685

Westwood

Westwood Professional Services, Inc.

Designed:
Checked: DDH
Drawn:
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK
A MasTec Company

2028 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 12 OF 57

0014440DTP.dwg

©2019 Westwood Professional Services, Inc.

CEMENT STABILIZATION - PROCEDURE

THE SPECIFICATIONS BELOW ARE GENERAL RECOMMENDATIONS/GUIDELINES FOR CEMENT STABILIZATION OF SUBGRADES FOR THE PROJECT. ACTUAL FIELD CONDITIONS MAY ALTER APPLICATION RATE. CONSULT GEOTECHNICAL ENGINEER FOR FURTHER RECOMMENDATIONS.

1. STRIP THE TOP ±4 INCHES OF TOPSOIL (THROUGH THE ROOT ZONE) FROM THE AREA TO BE STABILIZED. ROOTS SMALLER THAN 1/4" DIAMETER ARE CONSIDERED INSIGNIFICANT.
2. PERFORM A PROCTOR (ASTM D 698) TEST TO DETERMINE THE OPTIMUM MOISTURE CONTENT IF THE MATERIAL TO BE STABILIZED DOES NOT MATCH A PREVIOUSLY PERFORMED PROCTOR.
3. DETERMINE THE IN-SITU MOISTURE CONTENT USING A NUCLEAR DENSITY GAUGE (OR EQUIVALENT MOISTURE CONTENT TEST) DAILY, PRIOR TO INCORPORATION OF THE CEMENT. PROVIDE ADDITIONAL MOISTURE CONTENT TESTING AS NEEDED BASED ON WEATHER CONDITIONS.
   - 3.1. THE CONTRACTOR WILL BE ADVISED OF IN-SITU MOISTURE CONTENT, AND MOISTURE ADJUSTMENTS SHOULD BE MADE IF IN-SITU MOISTURE IS LESS THAN OPTIMUM MOISTURE CONTENT AS DETERMINED BY THE PROCTOR (ASTM D 698).
4. SOIL AND CEMENT BLENDING:
   - 4.1. COMPLETELY BLEND SUBGRADE SOIL WITH THE APPROPRIATE AMOUNT OF CEMENT BY WEIGHT. FIELD RESULTS FROM TEST STRIPS WILL DICTATE THE CEMENT APPLICATION RATE.
   - 4.2. IN AREAS OF HIGH MOISTURE OR POOR SOILS, THE CONTRACTOR MAY INCREASE THE PERCENT OF CEMENT IN ORDER TO MEET THE MINIMUM SUBGRADE STRENGTH REQUIREMENTS.
   - 4.3. THE USE OF A RECLAIMER IS AN ADEQUATE BLENDING METHOD. DISCING IS NOT AN ADEQUATE BLENDING METHOD.
   - 4.4. A STABILIZATION DEPTH OF 12" WAS USED FOR DESIGN PURPOSES. STABILIZATION DEPTH MAY NEED TO INCREASE TO 16" IN AREAS OF EXTREME MOISTURE OR POOR SOILS IN ORDER TO MEET THE STRENGTH AND PROOF ROLL REQUIREMENTS.
5. COMPACTION:
   - 5.1. A ROLLING PATTERN WILL BE ESTABLISHED USING A NUCLEAR DENSITY GAUGE DURING COMPACTION.
     - 5.1.1. COMPACTION WILL BE PERFORMED UNTIL THE STABILIZED MATERIAL REACHES THE "BREAK POINT" AFTER WHICH ADDITIONAL PASSES WITH A ROLLER RESULTS IN A LOSS OF DENSITY AS MEASURED BY A NUCLEAR DENSITY GAUGE.
     - 5.1.2. COMPACTION IS TYPICALLY ACHIEVED BY MULTIPLE PASSES OF A PADFOOT ROLLER UNTIL THE ROLLER "WALKS" OUT OF THE RECLAIMED MATERIAL (SPACE IS VISIBLE BETWEEN THE DRUM AND THE RECLAIMED MATERIAL). THIS IS FOLLOWED BY BLADING AND SHAPING THE RECLAIMED MATERIAL TO FINAL PROFILE AND CROSS SECTION, REMOVING HIGH AND LOW POINTS. SMOOTH DRUM OR RUBBER TIRE ROLLERS ARE THEN USED TO FINISH ROLLING (THIS IS WHEN THE DENSITY TESTS ARE PERFORMED) UNTIL THE DENSITY OF THE MATERIAL REACHES THE "BREAK POINT."
     - 5.1.3. THE NUMBER OF PASSES AND EQUIPMENT USED TO REACH THE "BREAK POINT" IS CONSIDERED THE ROLLING PATTERN.
     - 5.1.4. A NEW ROLLING PATTERN MAY NEED TO BE ESTABLISHED IF THE PERFORMANCE REQUIREMENTS ARE NOT BEING MET. THIS MAY BE DUE TO CHANGES IN THE MOISTURE CONTENT, THE SOIL TYPE, OR THE CEMENT RATE.
   - 5.2. THE TARGET DENSITY IS 98% OF THE MAXIMUM DENSITY DETERMINED FROM THE ROLLING PATTERN.
     - 5.2.1. DENSITY TESTS SHALL BE TAKEN AT THE RATE OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER TO CONFIRM THE DENSITY IS MATCHING THE TARGET. ONCE THE ROLLING PATTERN HAS BEEN CONFIRMED IT IS RECOMMENDED THAT TESTING CONTINUE AT 1 TEST PER 1,000 LF IN EACH PASS OF THE RECLAIMER.
     - 5.2.2. IF IT IS NOT POSSIBLE TO ATTAIN THE TARGET DENSITY, AND ADDITIONAL COMPACTION DOES NOT IMPROVE THE DENSITY, A NEW ROLLING PATTERN SHOULD BE ESTABLISHED.
   - 5.3. THE AIR TEMPERATURE SHALL BE ABOVE 40 DEGREES (F) DURING THE CEMENT STABILIZATION PROCESS. MIXING CEMENT INTO FROZEN GROUND IS NOT ACCEPTABLE.
6. THE STABILIZED MATERIAL SHALL BE CONTINUOUSLY WET CURED FOR A MINIMUM OF 24 HOURS (WET CURED IS IDENTIFIED VISUALLY AS DAMP SURFACE).
7. PERFORM SUBGRADE TESTING IN ACCORDANCE WITH TESTING SCHEDULE.
8. AGGREGATE PLACEMENT:
   - 8.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 8.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 8.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

CEMENT STABILIZATION - DESIGN BASIS

1. DURING INITIAL CONSTRUCTION, CONTRACTOR SHALL CONSTRUCT MINIMUM 300 LF TEST STRIPS CONTAINING 4%, 5%, AND 6% CEMENT IN ACCORDANCE WITH CEMENT STABILIZATION PROCEDURES.
2. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 3 FOR ANTICIPATED RESULTS):
   - 2.1. PERFORM INITIAL SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M BETWEEN 4 TO 6 HOURS AFTER FINAL COMPACTION.
   - 2.2. PERFORM ADDITIONAL DCP TESTING AT 24 AND 48 HOURS AFTER FINAL COMPACTION.
   - 2.3. PERFORM SUBSEQUENT DCP TESTS AT 7 DAYS AFTER FINAL COMPACTION AS VERIFICATION OF STRENGTH CURVE.
   - 2.4. A MINIMUM OF 3 TESTS PER TEST SECTION PER TIMEFRAME IS REQUIRED. TESTS SHALL BE TAKEN AT THE CENTERLINE AND 2' FROM EACH SHOULDER.
   - 2.5. RECORD DCP TEST RESULTS EVERY 6 INCHES TO TOTAL DEPTH OF 12 INCHES.

TABLE 3: TEST STRIP CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	COMPRESSIVE STRENGTH (PSF)
4 – 6 HOURS	6	5	1,800
24 HOURS	10	7	2,500
48 HOURS	15	10	3,900
7 DAYS	30	21	5,200

CEMENT STABILIZATION - PRODUCTION

1. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 5 FOR SUMMARY OF TESTING REQUIREMENTS):
   - 1.1. PERFORM SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M NO SOONER THAN 24 HOURS AFTER FINAL COMPACTION.
   - 1.2. DCP TESTING FREQUENCY SHALL BE WITH A RANDOM SPACING AND A MINIMUM OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER. A MINIMUM OF 3 TESTS PER ROAD IS REQUIRED.
   - 1.3. THE CBR OF THE STABILIZED SUBGRADE SHOULD BE CALCULATED IN 6" INCREMENTS THROUGH THE ENTIRE DEPTH OF THE STABILIZED LAYER.
   - 1.4. THE MINIMUM REQUIRED CBR PRIOR TO PROOF-ROLLING IS PROVIDED IN TABLE 4 BELOW:

TABLE 4: FINAL CEMENT STABILIZED CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	UNDRAINED SHEAR STRENGTH (PSF)	BEARING CAPACITY (PSF)
24 – 48 HOURS	15	10	3,500	9,800
3 – 7 DAYS	30	21	7,000	18,000
28 DAYS	50	33	12,000	28,500

NOTE: UNDRAINED SHEAR STRENGTH WAS CALCULATED USING THE BLACK (1961) EQUATION. BEARING CAPACITY WAS CALCULATED USING THE VESIC EQUATION MODIFIED FOR TWO LAYERS (12" CEMENT STABILIZED SUBGRADE OVER A NATURAL SUBGRADE WITH A CBR OF 1.5)

   - 1.5. ONCE THE MINIMUM REQUIRED CBR IS ACHIEVED AT ANY CORRESPONDING TIME PERIOD, THE SUBGRADE IS CONSIDERED ADEQUATE AND THE CONTRACTOR MAY PROCEED WITH PROOF-ROLL TESTING. FUTURE DCP TESTING ON THAT SEGMENT OF SUBGRADE IS NOT REQUIRED.
   - 1.6. IF TESTING DOES NOT INDICATE A CBR OF 30 WITHIN 7 DAYS, ADDITIONAL GRAVEL SURFACING AND/OR THE ADDITION OF GEOTEXTILE FABRIC MAY BE REQUIRED. FOR FUTURE SUBGRADE STABILIZATION AREAS, CONTACT THE ENGINEER AND OWNER VIA RFI FOR RECOMMENDATIONS AND APPROVAL.
2. SUBGRADE PROOF-ROLL TESTING AND ACCEPTANCE:
   - 2.1. ONCE THE REQUIRED DCP VALUE HAS BEEN OBTAINED BUT PRIOR TO PLACING AGGREGATE, THE SUBGRADE SHALL BE PROOF-ROLLED. REFER TO THE PROJECT TESTING REQUIREMENTS FOR PROOF-ROLL DEFINITION.
   - 2.2. PROOF-ROLLING SHOULD BE PERFORMED WITH ONE PASS DOWN THE CENTER AND NOT BE PERFORMED WITHIN 12 INCHES OF THE EDGE OF THE STABILIZED SECTION.
   - 2.3. IF PROOF-ROLLING FAILS, RE-STABILIZATION MAY BE REQUIRED AND A NEW ROLLING PATTERN OR ADDITIONAL CEMENT MAY BE REQUIRED.
3. AGGREGATE PLACEMENT:
   - 3.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 3.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 3.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

TABLE 5: CEMENT STABILIZATION PRODUCTION TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
COMPACTED SUBGRADE (CEMENT STABILIZED)	PROCTOR	MINIMUM 1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER 1000 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
NOTE: SEE ABOVE FOR INITIAL TESTING REQUIREMENTS	DCP TEST	1 PER 500 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
	PROOF-ROLL (AFTER PASSING DCP TESTS)	ENTIRE LENGTH

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (866) 937-5150 www.westwoodps.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: DBH
Drawn: BMK
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 13 OF 57

0014440DTP.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. County Road 649 in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 2020' South of County Road 649 & 204th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.25'10.70" W Long. -99.36'12.05" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001132 NE4 16-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Signature of Applicant

Robert Bawdon
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. County Road 649 in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 2020' South of County Road 649 & 204th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.25'10.70" W Long. -99.36'12.05" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001132 NE4 16-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: _____

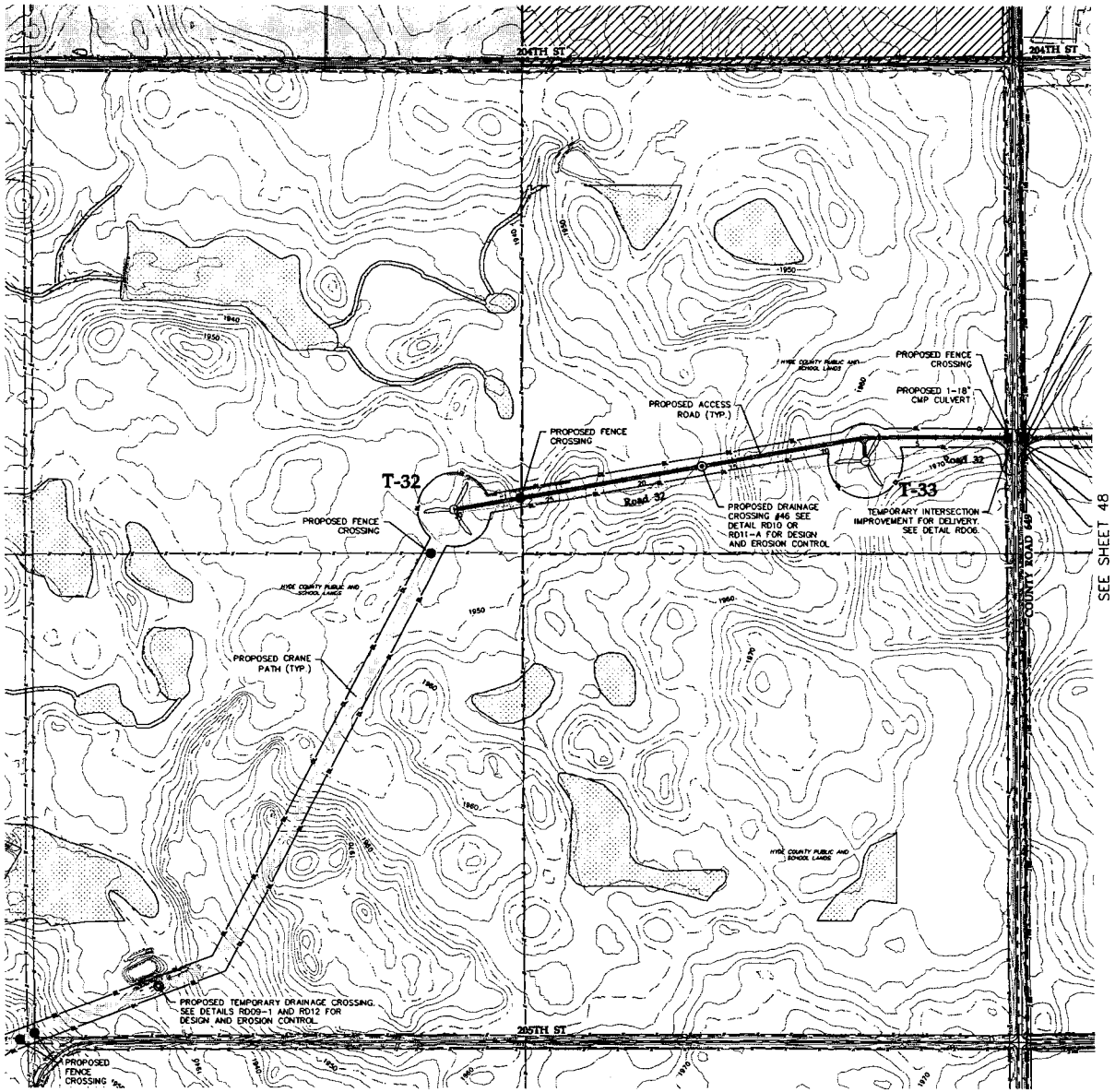
Signature of Applicant

Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

©2019 Westwood Professional Services, Inc.



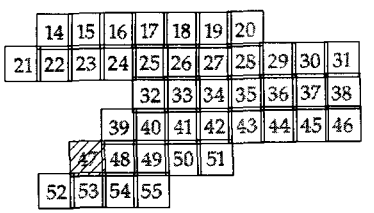
LEGEND:

- PROPOSED TURBINE LOCATION
- T-XX — PROPOSED TURBINE NUMBER
- PROPOSED ALTERNATE TURBINE LOCATION
- ALT-XX — PROPOSED ALTERNATE TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED ALTERNATE ACCESS ROAD
- PROPOSED CRANE PATH
- PROPOSED UNDERGROUND COLLECTION*
- PROPOSED DISTURBANCE LIMITS
- PROPOSED PERIMETER SEDIMENT CONTROL
- EXISTING 10' CONTOURS
- EXISTING 2' CONTOURS
- EXISTING GRAVEL EDGE
- EXISTING BITUMINUS EDGE
- EXISTING RIGHT-OF-WAY
- EXISTING PARCEL LINE
- EXISTING BUILDING
- EXISTING FENCE
- EXISTING OVERHEAD POWER
- EXISTING HIGH VOLTAGE OVERHEAD POWER
- EXISTING UNDERGROUND POWER LINE
- EXISTING FIBER OPTIC LINE
- EXISTING WATER LINE
- DELINEATED WETLAND
- ARCHAEOLOGICAL AVOIDANCE AREA
- EXISTING USFWS EASEMENT
- PROJECT BOUNDARY
- 1900 — EXISTING GROUND ELEVATION
- PROPOSED DRAINAGE CROSSING**
- PROPOSED TEMPORARY DRAINAGE CROSSING**
- PROPOSED FENCE CROSSING***
- PROPOSED UTILITY CROSSING
- PROPOSED CULVERT

* PROVIDED BY OTHERS AND SHOWN FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSTRUCTION PLANS FOR DETAILS.

** SEE SHEET 11 FOR DRAINAGE CROSSING TYPE AND SIZING. DRAINAGE CROSSINGS SHALL CONSIST OF LOW WATER CROSSING OR CULVERT. DRAINAGE CROSSINGS ALONG CRANE PATH SHALL CONSIST OF CRANE MATS OR TEMPORARY CULVERT.

*** ALL GATE INSTALLATIONS SHALL BE FIELD DETERMINED AND AGREED UPON BY THE CONTRACTOR AND OWNER.



KEY MAP

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: DBM
Drawn: BMK
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2028 2nd Avenue NW
West Fargo, ND 58078

0' 300' 600' 900'

Triple H Wind Farm

Hyde County, South Dakota

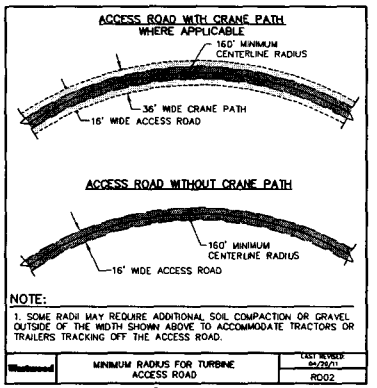
Site Plan T-32 - T-33

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 47 OF 57

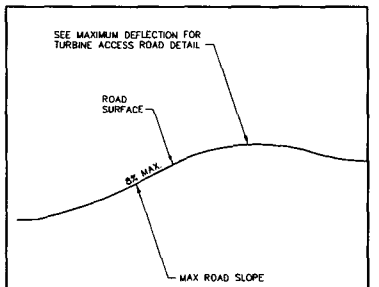
0014440SP01.dwg

©2019 Westwood Professional Services, Inc.



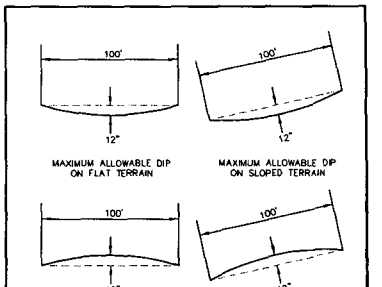
NOTE:
1. SOME RADII MAY REQUIRE ADDITIONAL SOIL COMPACTION OR GRAVEL OUTSIDE OF THE WIDTH SHOWN ABOVE TO ACCOMMODATE TRACTORS OR TRAILERS TRACKING OFF THE ACCESS ROAD.

Westwood	MINIMUM RADIUS FOR TURBINE ACCESS ROAD	LAST REVISED: 04/29/11 RD02

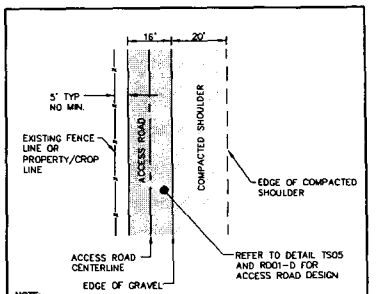


NOTES:
1. ROAD SLOPE SHALL NOT EXCEED 8% WITHOUT OWNER APPROVAL

Westwood	MAXIMUM VERT. SLOPE FOR TURBINE ACCESS ROAD/CRANE TRAVEL PATH	LAST REVISED: 3/28/13 RD03

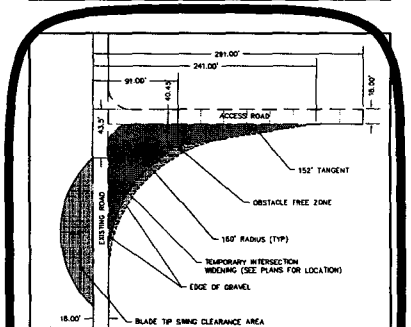


Westwood	MAXIMUM DEFLECTION FOR TURBINE ACCESS ROAD	LAST REVISED: 01/22/08 RD04



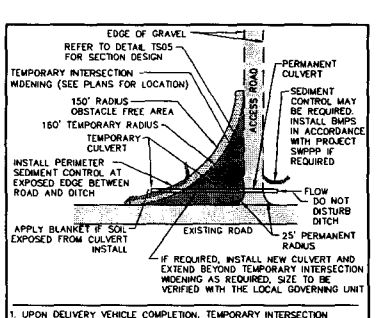
NOTE:
1. COMPACTED SHOULDER SHALL BE RETURNED TO NATIVE CONDITION FOLLOWING TURBINE GENERATOR CONSTRUCTION.
2. THE ACCESS ROAD MAY NEED TO BE CONSTRUCTED FARTHER FROM THE PROPERTY LINE IF OBSTRUCTIONS SUCH AS TREES FOLLOW THE PROPERTY LINE.

Westwood	TURBINE ACCESS ROAD ALONG FENCE/PROPERTY/CROP LINE	LAST REVISED: 3/28/13 RD05



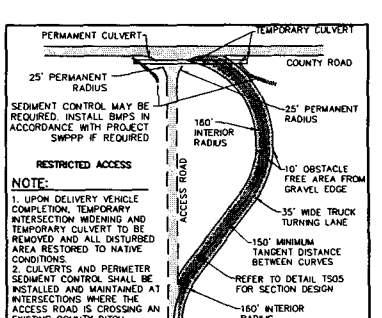
NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING TO BE REMOVED AND ALL DISTURBED AREA RESTORED.
2. DIMENSIONS ASSUME A 90° INTERSECTION

Westwood	INTERSECTION WIDENING DIMENSIONS	LAST REVISED: 7/29/19 RD06



1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.

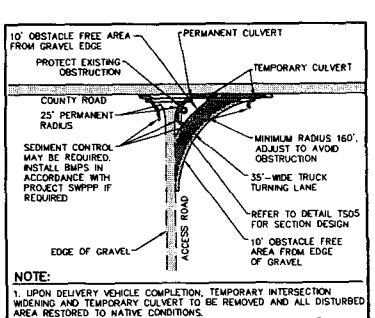
Westwood	TURBINE ACCESS ROAD TYPICAL INTERSECTION WIDENING	LAST REVISED: 3/2/13 RD07



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

NOT TO SCALE

Westwood	TRUCK TRAFFIC TURNING LANE A	LAST REVISED: 3/2/07 RD08-A



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

Westwood	TRUCK TRAFFIC TURNING LANE B	LAST REVISED: 3/2/07 RD08-B

Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-free (888) 937-5150 www.westwoodps.com
Westwood Professional Services, Inc.

Designed: SMC
Checked: DJH
Drawn: SMC
As-Built Drawing:

Revisions #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

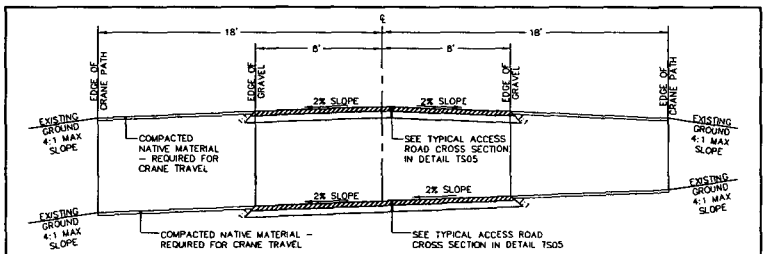
Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 5 OF 57

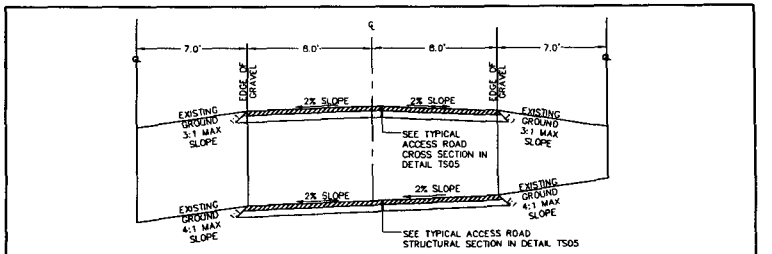
001444OD1P.dwg

© 2019 Westwood Professional Services, Inc.



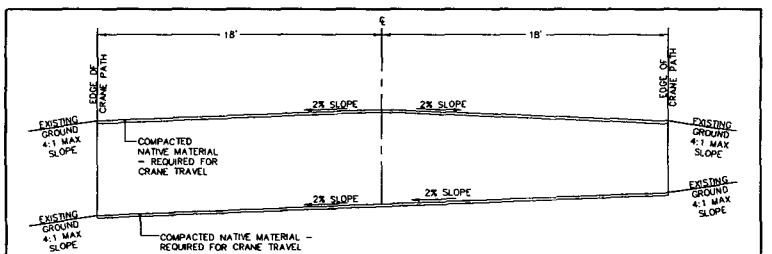
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE ACCESS ROAD DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

Westwood | TYPICAL TURBINE ACCESS ROAD AND CRANE PATH | LAST REVISED: 04/29/21 | RD01-A



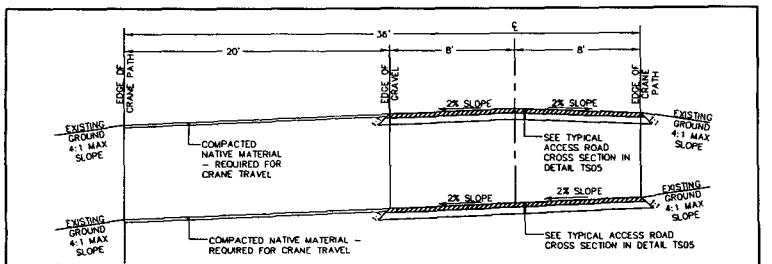
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

Westwood | TYPICAL TURBINE ACCESS ROAD SECTION | LAST REVISED: 3/19/19 | RD01-B



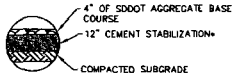
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE WHERE CRANE PATHS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT CRANE PATH REMAINS WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%

Westwood | TYPICAL CRANE PATH | LAST REVISED: 04/29/21 | RD01-C

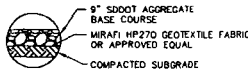


NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE EDGE OF COMPACTED SHOULDER DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

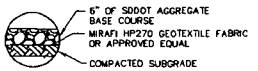
Westwood | TYPICAL TURBINE ACCESS ROAD AND OFFSET CRANE PATH | LAST REVISED: 04/29/21 | RD01-D



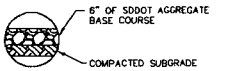
PRIMARY ACCESS ROAD CROSS SECTION*



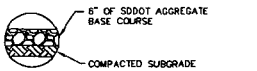
SECONDARY TURBINE ACCESS ROAD CROSS SECTION



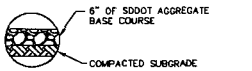
SPUR ROAD / MET TOWER ROAD CROSS SECTION



TEMPORARY TURNING IMPROVEMENTS CROSS SECTION



GRAVEL RING CROSS SECTION



LAYDOWN YARD CROSS SECTION

* CEMENT APPLICATION RATE MAY VARY BASED ON TEST STRIPS AND FIELD PERFORMANCE. SEE SHEET 13 FOR CEMENT STABILIZATION PROCEDURE AND DESIGN BASIS.

NOTES:
STRUCTURAL SECTIONS SHOWN ARE THE MINIMUM THICKNESS REQUIREMENTS DURING NORMAL FIELD CONDITIONS. THE SECTIONS MAY NEED TO BE INCREASED BASED ON ACTUAL FIELD CONDITIONS AT THE TIME OF CONSTRUCTION. CONDITIONS INCLUDE BUT ARE NOT LIMITED TO CONSTRUCTION DURING THE FREEZE/THAW CYCLE, UNUSUALLY WET PERIODS, OR IN LOW/WET AREAS. SEE SHEET 12 FOR TESTING REQUIREMENTS AND SPECIFICATIONS.

Westwood | TYPICAL STRUCTURAL CROSS SECTIONS

Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-free (888) 937-5150
Westwood Professional Services, Inc.

Designed: BMK
Checked: DDY
Drawn: BMK
As-Built Drawing:

Revisions #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	50% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:
WANZEK
2035 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 4 OF 57

D0144400TP.dwg

© 2019 Westwood Professional Services, Inc.

ROAD DESIGN PARAMETERS

1. ACCESS ROADS HAVE BEEN DESIGNED TO ACCOMMODATE LIGHT DUTY TRUCKS (PICKUP TRUCKS AND MAINTENANCE VEHICLES) FOR LOW VOLUME USE IN NORMAL OPERATING CONDITIONS AS WELL AS HEAVY DUTY CONSTRUCTION TRAFFIC UNDER DRY CONDITIONS. THE ROAD DESIGN SPECIFIED IS NOT INTENDED FOR ALL WEATHER USE FOR HEAVY DUTY CONSTRUCTION LOADS.
2. ROAD MAINTENANCE CAN BE EXPECTED OVER THE LIFE OF THE PERMANENT FACILITY.

PRODUCTS

1. AGGREGATE BASE SHALL CONSIST OF SDDOT AGGREGATE BASE COURSE (AND IN CONFORMANCE WITH THE GRADATION TABLE 1). AGGREGATE MAY BE CRUSHER RUN UPON ENGINEERS APPROVAL. AGGREGATE GRADATIONS SHALL BE SUBMITTED TO ENGINEER FOR REVIEW.
2. ROAD SHOULDERS AND CRANE PADS SHALL CONSIST OF COMPACTED NATIVE SOILS.
3. CULVERTS: ACCESS ROAD CULVERTS SHALL MEET THE MINNUM SPECIFICATIONS SET FORTH BY THE SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION AND/OR HYDE COUNTY. ALL CULVERTS ARE PLANNED TO BE A MINIMUM 18" DIAMETER AND MANUFACTURED OF 16-GAGE CORRUGATED METAL PIPE WITH NO END TREATMENTS UNLESS NOTED OTHERWISE. ACTUAL SIZE WILL BE DETERMINED THROUGH HYDRAULIC ANALYSIS.
4. GEOTEXTILE FABRIC: MIRAFI HP270 OR APPROVED EQUAL.

EXECUTION

1. CLEARING AND GRUBBING
   A. THE CONTRACTOR SHALL BE REQUIRED TO GRUB ALL TREES, STUMPS, BRUSH, AND DEBRIS WITHIN THE GRADING AREAS SHOWN ON THE PLANS. GRUBBING INCLUDES REMOVAL OF ALL PLANT MATERIAL GREATER THAN 2" INCLUDING STUMPS, BRANCHES, ROOTS, ETC. TO A DEPTH BELOW THE FINAL SUBGRADE. THE CONTRACTOR IS TO REMOVE ONLY THOSE TREES WHICH ARE DESIGNATED BY THE OWNER'S REPRESENTATIVE FOR REMOVAL, AND SHALL EXERCISE EXTREME CARE AROUND EXISTING TREES TO BE SAVED.
2. TOPSOIL STRIPPING
   A. TOPSOIL, INCLUDING ROOTS LARGER THAN 2" AND LARGE ROOT MASSES, SHALL BE STRIPPED FROM ALL ROADWAY AND FOUNDATION AREAS UP TO 10". TOPSOIL SHALL NOT BE STRIPPED OUTSIDE OF THE DESIGNATED DISTURBANCE AREAS.
   B. ANY TOPSOIL THAT HAS BEEN STRIPPED SHALL BE STOCKPILED FOR POST CONSTRUCTION REVEGETATION. ALL TOPSOIL SHALL BE REDISTRIBUTED TO THE LAND OWNER'S PROPERTY OF WHERE IT ORIGINATED FROM.
3. FILL PLACEMENT
   A. FILL PLACEMENT SHALL CONSIST OF THE PLACING OF SUITABLE FILL MATERIAL, AFTER TOPSOIL STRIPPING, ABOVE THE EXISTING GRADE. GENERALLY, SIDE SLOPES SHALL BE CONSTRUCTED AT FOUR FOOT HORIZONTAL TO ONE FOOT VERTICAL, WITH SOME LOCATIONS THROUGHOUT THE PROJECT WITH SLOPES OF TWO FEET HORIZONTAL TO ONE FOOT VERTICAL. THE MATERIAL FOR FILL CONSTRUCTION SHALL BE OBTAINED FROM THE ACCESS ROAD/TURBINE EXCAVATION (SEE GEOTECHNICAL REPORT FOR RESTRICTIONS), OR ANY SUITABLE, APPROVED SOIL OBTAINED ONSITE/OFFSITE BY CONTRACTOR, AS DIRECTED OR APPROVED BY THE ENGINEER. THIS MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 12" AND CONSTRUCTED TO 95% OF THE MAXIMUM DRY DENSITY AND WITHIN 2% OF OPTIMUM MOISTURE CONTENT, AS DETERMINED BY THE STANDARD PROCTOR (AASHTO T99).
   B. SIDE SLOPES GREATER THAN 4:1 WILL NOT BE PERMITTED, UNLESS OTHERWISE NOTED ON THE PLAN.
   C. FILL SLOPES SHALL BE BENCHED INTO THE EXISTING SLOPE TO PREVENT MOVEMENT BETWEEN THE FILL AND NATIVE SOILS. BENCHES SHOULD BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO FILL PLACEMENT. POSITIVE DRAINAGE IS REQUIRED AT BENCHED AREAS AND AT THE TOE OF FILL SLOPES TO REMOVE SURFACE WATER.
4. SUBGRADE
   A. SUBGRADE PREPARED AT GRADE OR IN CUT REQUIRES SCARIFICATION AND RECOMPACTION TO A DEPTH OF 12" OR MORE.
   B. ACCESS ROAD CROSS SLOPES SHOWN IN THE PLANS ARE MEANT AS A GUIDE. ACCESS ROAD CROSS SLOPES MAY RANGE FROM 1% - 2%, CHECK WITH THE ENGINEER IF THE CROSS SLOPE FALLS OUTSIDE OF THIS RANGE. ACCESS ROADS BEING UTILIZED FOR CRANE TRAVEL SHOULD HAVE A MAX CROSS SLOPE OF 2%.

TABLE 1: SDDOT AGGREGATE BASE COURSE – LOCALLY SOURCED	
SIEVE SIZE	PERCENT PASSING
1"	100
3/4"	80-100
1/2"	68-91
NO. 4	46-70
NO. 8	34-58
NO. 40	13-35
NO. 200	3-12

MEET FOLLOWING REQUIREMENTS PER 882.2

LIQUID LIMIT (MAX) = 25
PLASTICITY INDEX = 0-6
L.A ABRASION (% MAX) = 40%

GRADATION HAS BEEN OBTAINED FROM THE 2015 SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION BOOK.

STORM WATER DESIGN PARAMETERS

1. SEE SHEET 6 FOR CULVERT SIZING AND DESIGN PARAMETERS. SEE HYDROLOGY MEMO FOR FURTHER DESIGN CALCULATIONS. CULVERTS SHALL BE MINIMUM 18" CORRUGATED METAL PIPE. ALL TEMPORARY PORTIONS OF THE INSTALLED CULVERTS SHALL BE REMOVED UPON COMPLETION OF THE PROJECT.
2. IT IS EXPECTED THAT CULVERTS WILL BE OVERTOPPED DURING SOME STORMS AND MAINTENANCE WILL BE REQUIRED THROUGH THE LIFE OF THE PROJECT.
3. WHEN INSTALLING DRAINAGE CULVERTS THE CONTRACTOR SHALL USE JUDGMENT IN SETTING THE FLOW LINE ELEVATIONS AND CULVERT LONGITUDINAL SLOPE. TYPICALLY THE FLOW LINE ELEVATIONS AND LONGITUDINAL SLOPE OF THE CULVERT SHOULD MATCH THE NATURAL GROUND ELEVATIONS AND SLOPE TO ENSURE POSITIVE DRAINAGE. WHEN POSSIBLE, ALL CULVERTS SHOULD BE PLACED AT A MINIMUM 0.5% GRADE.
4. ANTICIPATED CULVERT CROSSINGS ARE SHOWN ON THE CONSTRUCTION PLAN, ADDITIONAL CULVERTS MAY NEED TO BE INSTALLED IN AREAS WHERE CONCENTRATED FLOW IS EXPECTED DUE TO CONSTRUCTION ACTIVITIES.
5. CONSTRUCTION DRAINAGE CROSSINGS TO MAINTAIN EXISTING FLOW CHARACTERISTICS OF THE FEATURES. FEATURES SHALL BE GRADED TO PRECONSTRUCTION CONTOURS.

TESTING:

1. TESTING SHALL BE PERFORMED BY A DESIGNATED INDEPENDENT TESTING AGENCY.
2. SUBMIT ONE SET OF TESTING AND INSPECTION RECORDS SPECIFIED TO THE CIVIL ENGINEER OF RECORD.

DEFINITIONS:

1. PROOF ROLLING:
   SHALL BE PERFORMED IN THE PRESENCE OF THE GEOTECHNICAL ENGINEER OR QUALIFIED GEOTECHNICAL REPRESENTATIVE USING A FULLY LOADED TANDEM AXLE DUMP TRUCK OR WATER TRUCK WITH A MINIMUM GROSS WEIGHT OF 25 TONS OR A FULLY LOADED BELLY DUMP WITH AN EQUIVALENT AXLE LOADING. PROOF-ROLLING ACCEPTANCE STANDARDS INCLUDE NO RUTTING GREATER THAN 1.5 INCHES, AND NO "PUMPING" OF THE SOIL BEHIND THE LOADED TRUCK.
2. SIEVE ANALYSIS:
   SHALL BE CONDUCTED IN ACCORDANCE WITH AASHTO T27
3. PROCTORS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T99
4. ATTERBERG LIMITS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T89 AND T90
5. MOISTURE DENSITY (NUCLEAR DENSITY):
   SHALL BE DONE IN ACCORDANCE WITH AASHTO T310
6. DYNAMIC CONE PENETROMETER (DCP) TESTING:
   SHALL BE DONE IN ACCORDANCE WITH ASTM D6951-03

REQUIREMENTS:

1. FILL PLACEMENT:
   A. SOILS USED AS FILL MATERIAL SHALL BE TESTED FOR MOISTURE CONTENT AND PROCTOR TESTS.
   B. WHERE FILL CONSTRUCTION REQUIRES MORE THAN 12 INCHES OF FILL PLACEMENT, COMPACT EACH LIFT TO A MINIMUM OF 95 PERCENT OF THE MATERIAL'S MAXIMUM STANDARD PROCTOR DRY DENSITY.
2. COMPACTED SUBGRADE (CEMENT STABILIZED):
   A. SEE SHEET 13 FOR TESTING REQUIREMENTS AND PROCEDURE.
3. COMPACTED SUBGRADE (NON-CEMENT STABILIZED):
   A. THE ENTIRE SUBGRADE SHALL BE PROOF-ROLLED PRIOR TO THE PLACEMENT OF THE AGGREGATE BASE TO IDENTIFY AREAS OF UNSTABLE SUBGRADE.
   B. PERFORM A MINIMUM OF 3 DYNAMIC CONE PENETROMETER (DCP) TESTS PER ACCESS ROAD OR ONE FOR EVERY 1,000 LF OF ROAD, WHICHEVER IS GREATER. SUBGRADE MUST MEET A MINIMUM DCP OF 3 BLOWS PER 6" TO A TOTAL DEPTH OF 2' (MINIMUM CBR=1.5).
   C. IF A PASSING PROOF-ROLL OR DCP REQUIREMENTS CANNOT BE ACHIEVED THE FOLLOWING ALTERNATIVES MAY BE IMPLEMENTED:
      a. SCARIFY, DRY, AND RECOMPACT SUBGRADE
      b. REMOVE UNSUITABLE MATERIAL AND REPLACE WITH SUITABLE MATERIAL
      c. INCREASE AGGREGATE BASE THICKNESS
4. AGGREGATE BASE:
   A. AGGREGATE BASE SHALL BE PROOF-ROLLED OVER THE ENTIRE LENGTH. IF PROOF ROLLING DETERMINES THAT THE ROAD IS UNSTABLE, ADDITIONAL AGGREGATE SHALL BE ADDED UNTIL THE UNSTABLE SECTION IS ABLE TO PASS A PROOF ROLL.
   B. PROVIDE 1 SIEVE ANALYSIS (PROJECT MAX OF 20) PER 2500 CY OF ROAD BASE PLACED.
5. CRANE PAD AND CRANE PATHS / CRANE TRAVEL SHOULDERS:
   A. TESTING REQUIREMENTS ARE PENDING BASED ON CRANE PICK PLANS PROVIDED BY THE CONTRACTOR.

TABLE 2: TESTING SCHEDULE SUMMARY		
LOCATION	TEST	FREQUENCY
FILL PLACEMENT	PROCTOR	1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER LIFT PER 5000 SF OF FILL PLACED OR 1 PER 500 LF OF ROAD OR CRANE WALK
COMPACTED SUBGRADE (CEMENT STABILIZED):	SEE SHEET 13	SEE SHEET 13
COMPACTED SUBGRADE (NON-CEMENT STABILIZED):	PROOF-ROLL	ENTIRE AREA
	DCP	1 PER 1,000 FT OR MIN. 3 PER ROAD
AGGREGATE BASE	PROOF-ROLL	ENTIRE AREA
	SIEVE ANALYSIS, LL, PL, AND L.A ABRASION	1 PER 2,500 CY

GENERAL NOTES:

1. GROUND SURFACE CONTOURS (AT TWO-FOOT VERTICAL INTERVALS) AND ELEVATIONS ARE BASED ON A PHOTOGRAMMETRY SURFACE PROVIDED BY GEOTERRA. IF MAJOR DISCREPANCIES ARE FOUND IN THE GROUND ELEVATIONS DURING FIELD STAKING TO THE GROUND ELEVATIONS SHOWN ON THE PLANS, THE OWNER AND ENGINEER SHALL BE NOTIFIED.
2. WHERE SECTION OR SUBSECTION MONUMENTS ARE ENCOUNTERED, THE OWNER SHALL BE NOTIFIED BEFORE SUCH MONUMENTS ARE REMOVED. THE CONTRACTOR SHALL PROTECT AND CAREFULLY PRESERVE ALL PROPERTY MARKERS AND MONUMENTS UNTIL THE OWNER, AN AUTHORIZED SURVEYOR OR AGENT HAS WITNESSED OR OTHERWISE REFERENCED THEIR LOCATION.
3. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. TYPICAL DISTURBANCE SHALL BE LIMITED TO 10 LF FROM THE EDGE OF PROPOSED GRADING.
4. FINALIZE GRADING AROUND THE BASE OF TURBINES IN ACCORDANCE WITH DETAIL TS-03 AND TS-04.
5. GRADE ALL PROPOSED ROADS TO A MAXIMUM SLOPE OF 8%. IF 8% SLOPE CANNOT BE ACHIEVED, THE CONTRACTOR MAY UTILIZE ASSIST VEHICLES FOR THE PURPOSE OF DELIVERIES. GRADE ALL PROPOSED CRANE PATHS TO A MAXIMUM OF 8% UNLESS OTHERWISE NOTED IN PLAN SHEETS.
6. ANY FACILITIES REMOVED TO ALLOW FOR CONSTRUCTION (MAILBOXES, SIGNS, FENCES, ETC.) SHALL BE REPLACED BY THE CONTRACTOR IN A CONDITION AS GOOD AS EXISTING.
7. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING DRAINAGE THROUGHOUT THE CONSTRUCTION OF THIS PROJECT. CONSTRUCTION ACTIVITIES SHALL NOT BLOCK THE NATURAL OR MANMADE CREEKS OR DRAINAGE SWALES CAUSING RAINWATER TO POND. DEPENDING ON FIELD CONDITIONS, ADDITIONAL CULVERTS IN EXCESS OF THOSE ON THE PLANS MAY BE REQUIRED.
8. WHILE BUILDING THE ROADS AND EXCAVATING THE TURBINE FOUNDATIONS, EXCESS SOIL WILL RESULT. THE CONTRACTOR SHALL DISPOSE OF THIS EXCESS SOIL IN AN APPROVED MANNER. EXCESS TOPSOIL SHALL BE DISTRIBUTED INTO A THIN LAYER ON LAND IMMEDIATELY ADJACENT TO WHERE THE TOPSOIL ORIGINATED. ALL EXCESS TOPSOIL TO BE WASTED ONSITE. WHILE DOING SO THE CONTRACTOR SHALL AVOID CAUSING RIDGES OR MOUNDS THAT WOULD MAKE IT DIFFICULT FOR STORM WATER RUNOFF TO DRAIN. THE FINAL SURFACE OF THE DISTURBED TOPSOIL SHALL BE SMOOTH AND FOLLOW THE NATURAL CONTOUR OF THE LAND.
9. THE CONTRACTOR SHALL NOTIFY SOUTH DAKOTA 811 AT LEAST 48 HOURS BEFORE EXCAVATION ACTIVITIES COMMENCE.
10. TEMPORARY INTERSECTION WIDENING SHALL, UPON COMPLETION OF ALL PROJECT CONSTRUCTION OR UPON NOTIFICATION OF THE ENGINEER, BE REMOVED AND THE AREA RESTORED TO ITS ORIGINAL LINES AND GRADES WITH TOPSOIL REPLACED, EXCEPT WHERE REQUESTED BY THE TOWNSHIP OR COUNTY TO PERMANENTLY REMAIN. DISTURBED AREAS OUTSIDE OF THE FINAL ROADWAY SHALL BE SEEDED AND MULCHED.
11. TURBINE SETBACKS ARE NOT IDENTIFIED ON THE CONSTRUCTION PLANS. IT SHALL BE THE RESPONSIBILITY OF THE OWNER AND CONTRACTOR TO ENSURE THAT ALL TURBINE SETBACKS MEET PROJECT REQUIREMENTS.
12. GEOTECHNICAL REPORTS WITH RECOMMENDATIONS HAVE BEEN PROVIDED BY THE OWNER. ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL ENGINEERING REPORT AND RECOMMENDATIONS.
13. FIELD SURVEY WETLAND INFORMATION HAS BEEN PROVIDED BY THE OWNER. ALL WETLAND DELINEATIONS AND PERMITTING SHALL BE THE RESPONSIBILITY OF OTHERS AND BE COMPLETED PRIOR TO CONSTRUCTION COMMENCING. THE OWNER AND GENERAL CONTRACTOR SHALL VERIFY THAT ALL WETLAND PERMITS HAVE BEEN SUBMITTED AND APPROVED PRIOR TO CONSTRUCTION COMMENCING.
14. CULTURAL RESOURCE REPORTS HAVE NOT BEEN PROVIDED. CULTURAL RESOURCE LOCATIONS ARE NOT SHOWN ON THE PLANS. INFORMATION WILL BE THE RESPONSIBILITY OF THE OWNER AND GENERAL CONTRACTOR. THE LOCATIONS OF CULTURAL RESOURCE SITES MAY BE CONFIDENTIAL AND PROTECTED BY STATE OR FEDERAL LAW. PUBLIC RELEASE OF SPECIFIC INFORMATION REGARDING THESE RESOURCES MAY BE RESTRICTED.
15. AN ENVIRONMENTAL ASSESSMENT HAS NOT BEEN PROVIDED. THE CONTRACTOR SHALL BE FAMILIAR WITH THE REPORT AND REVIEW ALL RECOMMENDATIONS.
16. ELECTRICAL INFORMATION SHOWN ON THE PLANS IS FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSULTANT'S PLANS FOR SPECIFIC LOCATIONS AND CONSTRUCTION DETAILS FOR THE UNDERGROUND POWER COLLECTION SYSTEM AND SUBSTATION.
17. CRANE PATHS ARE SHOWN ON THE CONSTRUCTION PLANS. IF THE CONTRACTOR PROPOSES ALTERNATE CRANE PATHS, THEY SHALL ENSURE THAT WETLAND AND CULTURAL RESOURCE CORRIDORS ARE NOT DISTURBED. FINAL CRANE PATH ALIGNMENTS SHALL BE DETERMINED BY THE CONTRACTOR BASED ON FIELD CONDITIONS WITHIN THE WETLAND AND CULTURAL RESOURCE CORRIDORS, SPECIAL LANDOWNER AGREEMENTS AND THE PROJECT BOUNDARY.
18. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. DISTURBANCE SHALL BE LIMITED TO 50 LF WIDTH FOR PROPOSED ACCESS ROADS AND 50 LF FOR CRANE PATHS, AND SHALL BE LIMITED TO A 250 LF RADIUS FOR PROPOSED WIND TURBINE GENERATORS. THE GRADING LIMITS SHALL BE CENTERED ON THE ROADWAYS AND WIND TURBINES. THE CONTRACTOR SHALL MAKE ALL EFFORTS TO KEEP ACTIVITIES WITHIN THE ERECTION AREAS SHOWN ON THE PLANS BUT IT IS UNDERSTOOD THAT SOME ACTIVITIES THAT WILL NOT REQUIRE GRADING OR SOIL DISTURBANCE MAY EXTEND BEYOND THE DEFINED LIMITS. DURING ERECTION OF THE ROTOR, TRUCKS AND/OR FORKLIFTS MAY EXTEND BEYOND THESE LIMITS. SEE DETAIL TS01 FOR TYPICAL ERECTION AREAS.
19. AN ALTA SURVEY HAS BEEN PROVIDED BY WESTWOOD. CONTRACTOR AND OWNER ARE RESPONSIBLE FOR LOCATING ALL UTILITIES AND VERIFYING LOCATION OF CONSTRUCTION ACTIVITIES PRIOR TO COMMENCING WORK.

STORMWATER POLLUTION PREVENTION PLAN (SWPPP):

1. THE CONTRACTOR SHALL PROVIDE EROSION CONTROL MEASURES AS PLANNED AND SPECIFIED FOLLOWING BEST MANAGEMENT PRACTICES AS OUTLINED BY THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND BEING IN CONFORMANCE WITH THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL STORMWATER PERMIT.
2. REFER TO THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR THE TRIPLE H WIND FARM, PREPARED BY WESTWOOD PROFESSIONAL SERVICES, FOR EROSION CONTROL AND RESTORATION SPECIFICATIONS, SEDIMENT AND EROSION CONTROL PROCEDURES, LOCATIONS OF BMPs, DETAILS, AND INSPECTION INFORMATION.
3. ALL PASTURES AND DRAINAGE SWALES DISTURBED DURING CONSTRUCTION ACTIVITIES AND NOT COVERED BY ROAD SURFACING MATERIALS, SHALL BE SEEDED IN ACCORDANCE WITH THE SWPP PLAN.
4. TEMPORARY EROSION CONTROL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE TEMPORARY EROSION CONTROL PLAN SHALL BE IN ACCORDANCE WITH THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND THE TRIPLE H WIND FARM STORMWATER POLLUTION PREVENTION PLAN ON FILE.

PROJECT CONTACT INFORMATION:

TITLE	COMPANY	NAME	CONTACT NUMBER
OWNER (PRIMARY)	ENGIE	CASEY WILLIS	605-569-6185
PROJECT MANAGER	WESTWOOD	DANI NYGREN	952-906-7493
ENGINEER OF RECORD	WESTWOOD	ROB COPOULS	952-906-7470
CONTRACTOR	WANZEK	JASON HELLERUD	701-893-3685

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #300
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150

Westwood Professional Services, Inc.

Designed: BMK
Checked: DBN
Drawn: BMK
As-Built Drawing:

Revisions: #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2028 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 12 OF 57

0014440DTP.dwg

©2019 Westwood Professional Services, Inc.

CEMENT STABILIZATION - PROCEDURE

THE SPECIFICATIONS BELOW ARE GENERAL RECOMMENDATIONS/GUIDELINES FOR CEMENT STABILIZATION OF SUBGRADES FOR THE PROJECT. ACTUAL FIELD CONDITIONS MAY ALTER APPLICATION RATE. CONSULT GEOTECHNICAL ENGINEER FOR FURTHER RECOMMENDATIONS.

1. STRIP THE TOP ±4 INCHES OF TOPSOIL (THROUGH THE ROOT ZONE) FROM THE AREA TO BE STABILIZED. ROOTS SMALLER THAN 1/4" DIAMETER ARE CONSIDERED INSIGNIFICANT.
2. PERFORM A PROCTOR (ASTM D 698) TEST TO DETERMINE THE OPTIMUM MOISTURE CONTENT IF THE MATERIAL TO BE STABILIZED DOES NOT MATCH A PREVIOUSLY PERFORMED PROCTOR.
3. DETERMINE THE IN-SITU MOISTURE CONTENT USING A NUCLEAR DENSITY GAUGE (OR EQUIVALENT MOISTURE CONTENT TEST) DAILY, PRIOR TO INCORPORATION OF THE CEMENT. PROVIDE ADDITIONAL MOISTURE CONTENT TESTING AS NEEDED BASED ON WEATHER CONDITIONS.
   - 3.1. THE CONTRACTOR WILL BE ADVISED OF IN-SITU MOISTURE CONTENT, AND MOISTURE ADJUSTMENTS SHOULD BE MADE IF IN-SITU MOISTURE IS LESS THAN OPTIMUM MOISTURE CONTENT AS DETERMINED BY THE PROCTOR (ASTM D 698).
4. SOIL AND CEMENT BLENDING:
   - 4.1. COMPLETELY BLEND SUBGRADE SOIL WITH THE APPROPRIATE AMOUNT OF CEMENT BY WEIGHT. FIELD RESULTS FROM TEST STRIPS WILL DICTATE THE CEMENT APPLICATION RATE.
   - 4.2. IN AREAS OF HIGH MOISTURE OR POOR SOILS, THE CONTRACTOR MAY INCREASE THE PERCENT OF CEMENT IN ORDER TO MEET THE MINIMUM SUBGRADE STRENGTH REQUIREMENTS.
   - 4.3. THE USE OF A RECLAIMER IS AN ADEQUATE BLENDING METHOD. DISCING IS NOT AN ADEQUATE BLENDING METHOD.
   - 4.4. A STABILIZATION DEPTH OF 12" WAS USED FOR DESIGN PURPOSES. STABILIZATION DEPTH MAY NEED TO INCREASE TO 16" IN AREAS OF EXTREME MOISTURE OR POOR SOILS IN ORDER TO MEET THE STRENGTH AND PROOF ROLL REQUIREMENTS.
5. COMPACTION:
   - 5.1. A ROLLING PATTERN WILL BE ESTABLISHED USING A NUCLEAR DENSITY GAUGE DURING COMPACTION.
     - 5.1.1. COMPACTION WILL BE PERFORMED UNTIL THE STABILIZED MATERIAL REACHES THE "BREAK POINT" AFTER WHICH ADDITIONAL PASSES WITH A ROLLER RESULTS IN A LOSS OF DENSITY AS MEASURED BY A NUCLEAR DENSITY GAUGE.
     - 5.1.2. COMPACTION IS TYPICALLY ACHIEVED BY MULTIPLE PASSES OF A PADFOOT ROLLER UNTIL THE ROLLER "WALKS" OUT OF THE RECLAIMED MATERIAL (SPACE IS VISIBLE BETWEEN THE DRUM AND THE RECLAIMED MATERIAL). THIS IS FOLLOWED BY BLADING AND SHAPING THE RECLAIMED MATERIAL TO FINAL PROFILE AND CROSS SECTION, REMOVING HIGH AND LOW POINTS. SMOOTH DRUM OR RUBBER TIRE ROLLERS ARE THEN USED TO FINISH ROLLING (THIS IS WHEN THE DENSITY TESTS ARE PERFORMED) UNTIL THE DENSITY OF THE MATERIAL REACHES THE "BREAK POINT."
     - 5.1.3. THE NUMBER OF PASSES AND EQUIPMENT USED TO REACH THE "BREAK POINT" IS CONSIDERED THE ROLLING PATTERN.
     - 5.1.4. A NEW ROLLING PATTERN MAY NEED TO BE ESTABLISHED IF THE PERFORMANCE REQUIREMENTS ARE NOT BEING MET. THIS MAY BE DUE TO CHANGES IN THE MOISTURE CONTENT, THE SOIL TYPE, OR THE CEMENT RATE.
   - 5.2. THE TARGET DENSITY IS 98% OF THE MAXIMUM DENSITY DETERMINED FROM THE ROLLING PATTERN.
     - 5.2.1. DENSITY TESTS SHALL BE TAKEN AT THE RATE OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER TO CONFIRM THE DENSITY IS MATCHING THE TARGET. ONCE THE ROLLING PATTERN HAS BEEN CONFIRMED IT IS RECOMMENDED THAT TESTING CONTINUE AT 1 TEST PER 1,000 LF IN EACH PASS OF THE RECLAIMER.
     - 5.2.2. IF IT IS NOT POSSIBLE TO ATTAIN THE TARGET DENSITY, AND ADDITIONAL COMPACTION DOES NOT IMPROVE THE DENSITY, A NEW ROLLING PATTERN SHOULD BE ESTABLISHED.
   - 5.3. THE AIR TEMPERATURE SHALL BE ABOVE 40 DEGREES (F) DURING THE CEMENT STABILIZATION PROCESS. MIXING CEMENT INTO FROZEN GROUND IS NOT ACCEPTABLE.
6. THE STABILIZED MATERIAL SHALL BE CONTINUOUSLY WET CURED FOR A MINIMUM OF 24 HOURS (WET CURED IS IDENTIFIED VISUALLY AS DAMP SURFACE).
7. PERFORM SUBGRADE TESTING IN ACCORDANCE WITH TESTING SCHEDULE.
8. AGGREGATE PLACEMENT:
   - 8.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 8.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 8.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

CEMENT STABILIZATION - DESIGN BASIS

1. DURING INITIAL CONSTRUCTION, CONTRACTOR SHALL CONSTRUCT MINIMUM 300 LF TEST STRIPS CONTAINING 4%, 5%, AND 6% CEMENT IN ACCORDANCE WITH CEMENT STABILIZATION PROCEDURES.
2. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 3 FOR ANTICIPATED RESULTS):
   - 2.1. PERFORM INITIAL SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M BETWEEN 4 TO 6 HOURS AFTER FINAL COMPACTION.
   - 2.2. PERFORM ADDITIONAL DCP TESTING AT 24 AND 48 HOURS AFTER FINAL COMPACTION.
   - 2.3. PERFORM SUBSEQUENT DCP TESTS AT 7 DAYS AFTER FINAL COMPACTION AS VERIFICATION OF STRENGTH CURVE.
   - 2.4. A MINIMUM OF 3 TESTS PER TEST SECTION PER TIMEFRAME IS REQUIRED. TESTS SHALL BE TAKEN AT THE CENTERLINE AND 2' FROM EACH SHOULDER.
   - 2.5. RECORD DCP TEST RESULTS EVERY 6 INCHES TO TOTAL DEPTH OF 12 INCHES.

TABLE 3: TEST STRIP CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	COMPRESSIVE STRENGTH (PSF)
4 – 6 HOURS	6	5	1,800
24 HOURS	10	7	2,300
48 HOURS	15	10	3,200
7 DAYS	30	21	5,200

CEMENT STABILIZATION - PRODUCTION

1. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 5 FOR SUMMARY OF TESTING REQUIREMENTS):
   - 1.1. PERFORM SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M NO SOONER THAN 24 HOURS AFTER FINAL COMPACTION.
   - 1.2. DCP TESTING FREQUENCY SHALL BE WITH A RANDOM SPACING AND A MINIMUM OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER. A MINIMUM OF 3 TESTS PER ROAD IS REQUIRED.
   - 1.3. THE CBR OF THE STABILIZED SUBGRADE SHOULD BE CALCULATED IN 6" INCREMENTS THROUGH THE ENTIRE DEPTH OF THE STABILIZED LAYER.
   - 1.4. THE MINIMUM REQUIRED CBR PRIOR TO PROOF-ROLLING IS PROVIDED IN TABLE 4 BELOW:

TABLE 4: FINAL CEMENT STABILIZED CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	UNDRAINED SHEAR STRENGTH (PSF)	BEARING CAPACITY (PSF)
24 – 48 HOURS	15	10	3,500	9,800
3 – 7 DAYS	30	21	7,000	18,000
28 DAYS	50	33	12,000	28,500

NOTE: UNDRAINED SHEAR STRENGTH WAS CALCULATED USING THE BLACK (1961) EQUATION. BEARING CAPACITY WAS CALCULATED USING THE VESIC EQUATION MODIFIED FOR TWO LAYERS (12" CEMENT STABILIZED SUBGRADE OVER A NATURAL SUBGRADE WITH A CBR OF 1.5)

   - 1.5. ONCE THE MINIMUM REQUIRED CBR IS ACHIEVED AT ANY CORRESPONDING TIME PERIOD, THE SUBGRADE IS CONSIDERED ADEQUATE AND THE CONTRACTOR MAY PROCEED WITH PROOF-ROLL TESTING. FUTURE DCP TESTING ON THAT SEGMENT OF SUBGRADE IS NOT REQUIRED.
   - 1.6. IF TESTING DOES NOT INDICATE A CBR OF 30 WITHIN 7 DAYS, ADDITIONAL GRAVEL SURFACING AND/OR THE ADDITION OF GEOTEXTILE FABRIC MAY BE REQUIRED. FOR FUTURE SUBGRADE STABILIZATION AREAS, CONTACT THE ENGINEER AND OWNER VIA RFI FOR RECOMMENDATIONS AND APPROVAL.
2. SUBGRADE PROOF-ROLL TESTING AND ACCEPTANCE:
   - 2.1. ONCE THE REQUIRED DCP VALUE HAS BEEN OBTAINED BUT PRIOR TO PLACING AGGREGATE, THE SUBGRADE SHALL BE PROOF-ROLLED. REFER TO THE PROJECT TESTING REQUIREMENTS FOR PROOF-ROLL DEFINITION.
   - 2.2. PROOF-ROLLING SHOULD BE PERFORMED WITH ONE PASS DOWN THE CENTER AND NOT BE PERFORMED WITHIN 12 INCHES OF THE EDGE OF THE STABILIZED SECTION.
   - 2.3. IF PROOF-ROLLING FAILS, RE-STABILIZATION MAY BE REQUIRED AND A NEW ROLLING PATTERN OR ADDITIONAL CEMENT MAY BE REQUIRED.
3. AGGREGATE PLACEMENT:
   - 3.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 3.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 3.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

TABLE 5: CEMENT STABILIZATION PRODUCTION TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
COMPACTED SUBGRADE (CEMENT STABILIZED)	PROCTOR	MINIMUM 1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER 1000 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
NOTE: SEE ABOVE FOR INITIAL TESTING REQUIREMENTS	DCP TEST	1 PER 500 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
	PROOF-ROLL (AFTER PASSING DCP TESTS)	ENTIRE LENGTH

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com

Westwood Professional Services, Inc.

Designed: BMK
Checked: BJH
Drawn: BMK
As-Built Drawn by:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 13 OF 57

001444001P.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. County Road 649 in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 2020' South of County Road 649 & 204th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.25'10.70" W Long. -99.36'12.05" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: 24"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001129 NW4 15-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Taya Lee — Robert Bawden

Signature of Applicant — Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. County Road 649 in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 2020' South of County Road 649 & 204th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.25'10.70" W Long. -99.36'12.05" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: 24"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001129 NW4 15-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: _____

Signature of Applicant

Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

© 2019 Westwood Professional Services, Inc.

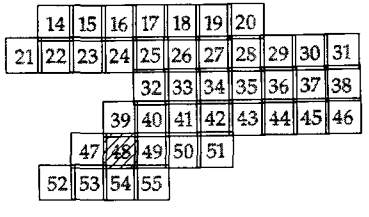
LEGEND:

- PROPOSED TURBINE LOCATION
- T-XX — PROPOSED TURBINE NUMBER
- PROPOSED ALTERNATE TURBINE LOCATION
- ALT-XX — PROPOSED ALTERNATE TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED ALTERNATE ACCESS ROAD
- PROPOSED CRANE PATH
- PROPOSED UNDERGROUND COLLECTION*
- PROPOSED DISTURBANCE LIMITS
- PROPOSED PERIMETER SEDIMENT CONTROL
- EXISTING 10' CONTOURS
- EXISTING 2' CONTOURS
- EXISTING GRAVEL EDGE
- EXISTING BITUMINUS EDGE
- EXISTING RIGHT-OF-WAY
- EXISTING PARCEL LINE
- EXISTING BUILDING
- EXISTING FENCE
- EXISTING OVERHEAD POWER
- EXISTING HIGH VOLTAGE OVERHEAD POWER
- EXISTING UNDERGROUND POWER LINE
- EXISTING FIBER OPTIC LINE
- EXISTING WATER LINE
- DELINEATED WETLAND
- ARCHAEOLOGICAL AVOIDANCE AREA
- EXISTING USFWS EASEMENT
- PROJECT BOUNDARY
- 1900 — EXISTING GROUND ELEVATION
- PROPOSED DRAINAGE CROSSING**
- PROPOSED TEMPORARY DRAINAGE CROSSING**
- PROPOSED FENCE CROSSING***
- PROPOSED UTILITY CROSSING
- PROPOSED CULVERT

* PROVIDED BY OTHERS AND SHOWN FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSTRUCTION PLANS FOR DETAILS.

** SEE SHEET 11 FOR DRAINAGE CROSSING TYPE AND SIZING. DRAINAGE CROSSINGS SHALL CONSIST OF LOW WATER CROSSING OR CULVERT. DRAINAGE CROSSINGS ALONG CRANE PATH SHALL CONSIST OF CRANE MATS OR TEMPORARY CULVERT.

*** ALL GATE INSTALLATIONS SHALL BE FIELD DETERMINED AND AGREED UPON BY THE CONTRACTOR AND OWNER.



KEY MAP

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: DJH
Drawn: BMK
As-Built Drawing:

Revisions:		
#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078

0' 300' 600' 900'

Triple H Wind Farm

Hyde County, South Dakota

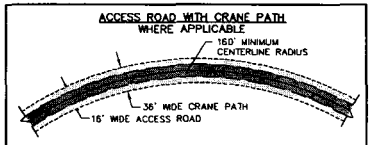
Site Plan T-34 - T-35

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 48 OF 57

0014440SP01.dwg

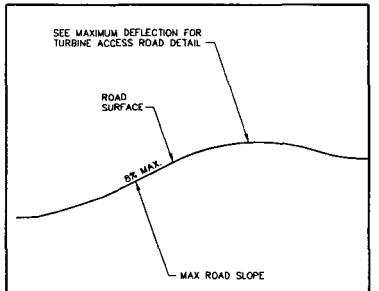
©2019 Westwood Professional Services, Inc.



NOTE:

1. SOME RADII MAY REQUIRE ADDITIONAL SOIL COMPACTION OR GRAVEL OUTSIDE OF THE WIDTH SHOWN ABOVE TO ACCOMMODATE TRACTORS OR TRAILERS TRACKING OFF THE ACCESS ROAD.

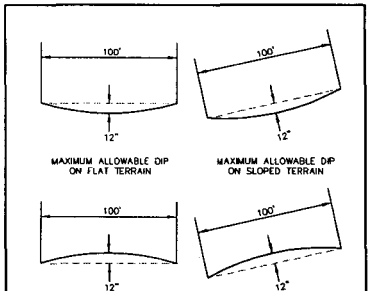
Westwood	MINIMUM RADIUS FOR TURBINE ACCESS ROAD	LAST REVISED 04/26/11
		RD02



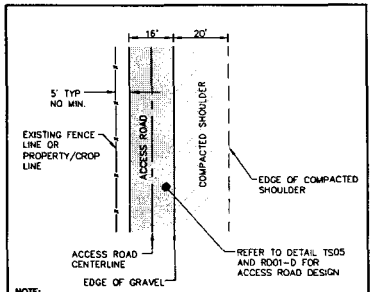
NOTES:

1. ROAD SLOPE SHALL NOT EXCEED 8% WITHOUT OWNER APPROVAL

Westwood	MAXIMUM VERT. SLOPE FOR TURBINE ACCESS ROAD/CRANE TRAVEL PATH	LAST REVISED 3/21/07
		RD03



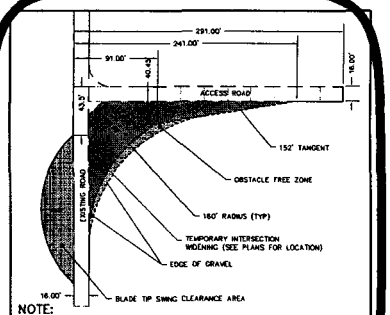
Westwood	MAXIMUM DEFLECTION FOR TURBINE ACCESS ROAD	LAST REVISED 11/21/08
		RD04



NOTE:

1. COMPACTED SHOULDER SHALL BE RETURNED TO NATIVE CONDITION FOLLOWING TURBINE GENERATOR CONSTRUCTION.
2. THE ACCESS ROAD MAY NEED TO BE CONSTRUCTED FARTHER FROM THE PROPERTY LINE IF OBSTRUCTIONS SUCH AS TREES FOLLOW THE PROPERTY LINE.

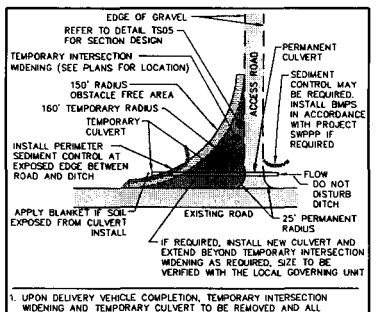
Westwood	TURBINE ACCESS ROAD ALONG FENCE/PROPERTY/CROP LINE	LAST REVISED 3/21/07
		RD05



NOTE:

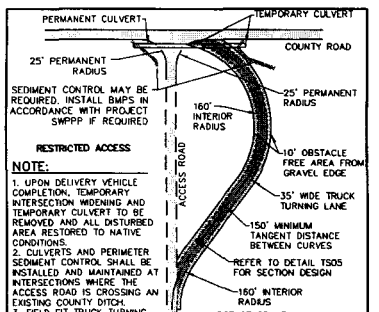
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING TO BE REMOVED AND ALL DISTURBED AREA RESTORED.
2. DIMENSIONS ASSUME A 90° INTERSECTION

Westwood	INTERSECTION WIDENING DIMENSIONS	LAST REVISED 7/03/19
		RD06



1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.

Westwood	TURBINE ACCESS ROAD TYPICAL INTERSECTION WIDENING	LAST REVISED 3/2/07
		RD07



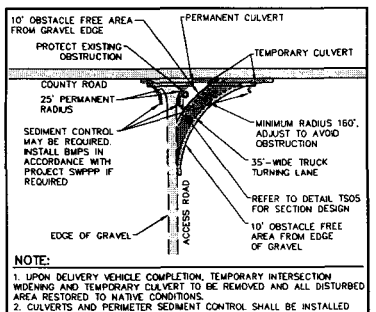
RESTRICTED ACCESS

NOTE:

1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

NOT TO SCALE

Westwood	TRUCK TRAFFIC TURNING LANE A	LAST REVISED 3/2/07
		RD08-A



NOTE:

1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

Westwood	TRUCK TRAFFIC TURNING LANE B	LAST REVISED 12/3/15
		RD08-B

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-Free (800) 937-5150 www.westwoodps.com
Westwood Professional Services, Inc.

Designed: BMC
Checked: DJH
Drawn: BMC
As-Built Drawings:

Revisions: #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2020 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

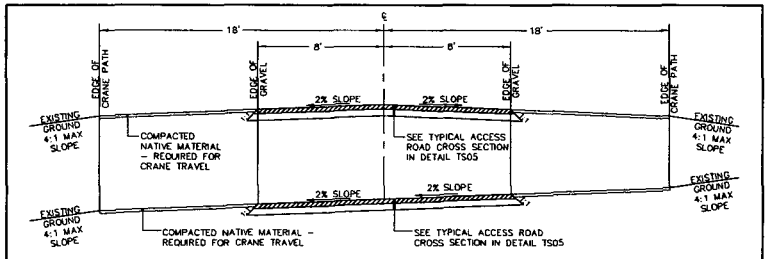
Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 5 OF 57

0014440DTP.dwg

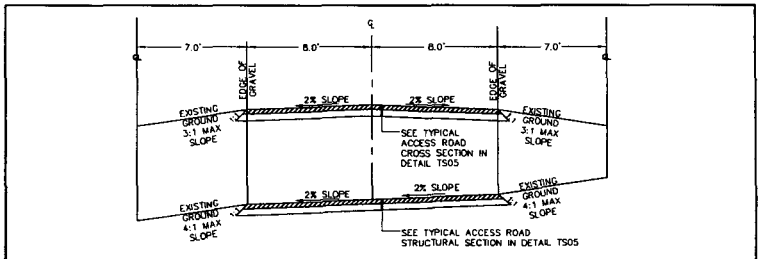
©2019 Westwood Professional Services, Inc.



NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%.
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE ACCESS ROAD DIRECTLY INTO EXISTING GROUND SURFACE.
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

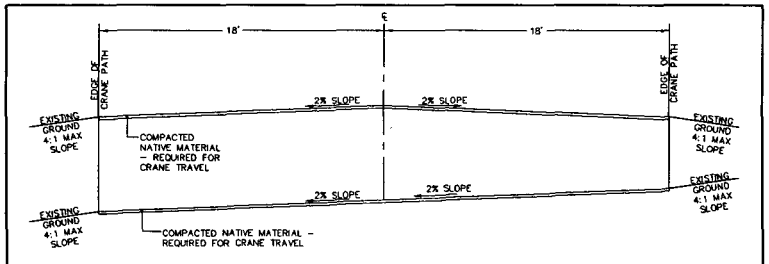
Westwood | TYPICAL TURBINE ACCESS ROAD AND CRANE PATH | LAST REVISED: 05/28/21 | RD01-A



NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

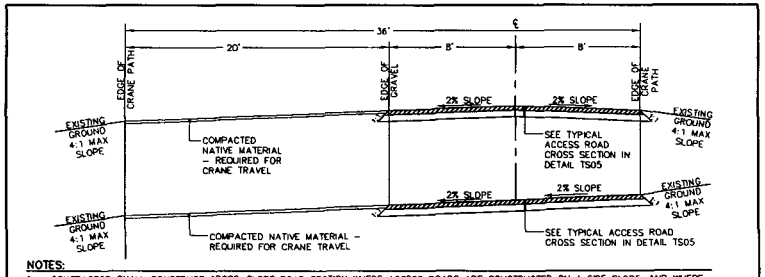
Westwood | TYPICAL TURBINE ACCESS ROAD SECTION | LAST REVISED: 3/28/22 | RD01-B



NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE WHERE CRANE PATHS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT CRANE PATH REMAINS WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%.

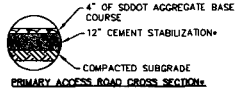
Westwood | TYPICAL CRANE PATH | LAST REVISED: 05/28/21 | RD01-C



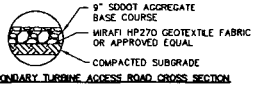
NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%.
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE EDGE OF COMPACTED SHOULDER DIRECTLY INTO EXISTING GROUND SURFACE.
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

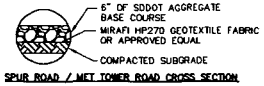
Westwood | TYPICAL TURBINE ACCESS ROAD AND OFFSET CRANE PATH | LAST REVISED: 01/28/21 | RD01-D



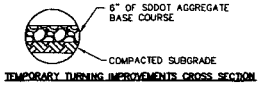
PRIMARY ACCESS ROAD CROSS SECTION*



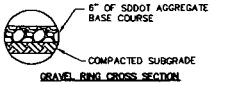
SECONDARY TURBINE ACCESS ROAD CROSS SECTION



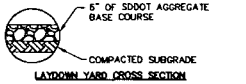
SPUR ROAD / MET TOWER ROAD CROSS SECTION



TEMPORARY TURNING IMPROVEMENTS CROSS SECTION



GRAVEL RING CROSS SECTION



LAYDOWN YARD CROSS SECTION

* CEMENT APPLICATION RATE MAY VARY BASED ON TEST STRIPS AND FIELD PERFORMANCE. SEE SHEET 13 FOR CEMENT STABILIZATION PROCEDURE AND DESIGN BASIS.

NOTES:

STRUCTURAL SECTIONS SHOWN ARE THE MINIMUM THICKNESS REQUIREMENTS DURING NORMAL FIELD CONDITIONS. THE SECTIONS MAY NEED TO BE INCREASED BASED ON ACTUAL FIELD CONDITIONS AT THE TIME OF CONSTRUCTION. CONDITIONS INCLUDE BUT ARE NOT LIMITED TO CONSTRUCTION DURING THE FREEZE/THAW CYCLE, UNUSUALLY WET PERIODS, OR IN LOW/WET AREAS. SEE SHEET 12 FOR TESTING REQUIREMENTS AND SPECIFICATIONS.

Westwood | TYPICAL STRUCTURAL CROSS SECTIONS

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwood@us.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: DJH
Drawn: BMK
As-Built Drawing:

Revisions #	DATE	DESCRIPTION
A	12/08/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

3200 3rd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 4 OF 57

0014440DTP.dwg

© 2019 Westwood Professional Services, Inc.

ROAD DESIGN PARAMETERS

1. ACCESS ROADS HAVE BEEN DESIGNED TO ACCOMMODATE LIGHT DUTY TRUCKS (PICKUP TRUCKS AND MAINTENANCE VEHICLES) FOR LOW VOLUME USE IN NORMAL OPERATING CONDITIONS AS WELL AS HEAVY DUTY CONSTRUCTION TRAFFIC UNDER DRY CONDITIONS. THE ROAD DESIGN SPECIFIED IS NOT INTENDED FOR ALL WEATHER USE FOR HEAVY DUTY CONSTRUCTION LOADS.
2. ROAD MAINTENANCE CAN BE EXPECTED OVER THE LIFE OF THE PERMANENT FACILITY.

PRODUCTS

1. AGGREGATE BASE SHALL CONSIST OF SDDOT AGGREGATE BASE COURSE (AND IN CONFORMANCE WITH THE GRADATION TABLE 1). AGGREGATE MAY BE CRUSHER RUN UPON ENGINEERS APPROVAL. AGGREGATE GRADATIONS SHALL BE SUBMITTED TO ENGINEER FOR REVIEW.
2. ROAD SHOULDERS AND CRANE PADS SHALL CONSIST OF COMPACTED NATIVE SOILS.
3. CULVERTS: ACCESS ROAD CULVERTS SHALL MEET THE MINIMUM SPECIFICATIONS SET FORTH BY THE SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION AND/OR HYDE COUNTY. ALL CULVERTS ARE PLANNED TO BE A MINIMUM 18" DIAMETER AND MANUFACTURED OF 16-GAGE CORRUGATED METAL PIPE WITH NO END TREATMENTS UNLESS NOTED OTHERWISE. ACTUAL SIZE WILL BE DETERMINED THROUGH HYDRAULIC ANALYSIS.
4. GEOTEXTILE FABRIC: MIRAFI HP270 OR APPROVED EQUAL.

EXECUTION

1. CLEARING AND GRUBBING
   A. THE CONTRACTOR SHALL BE REQUIRED TO GRUB ALL TREES, STUMPS, BRUSH, AND DEBRIS WITHIN THE GRADING AREAS SHOWN ON THE PLANS. GRUBBING INCLUDES REMOVAL OF ALL PLANT MATERIAL GREATER THAN 2" INCLUDING STUMPS, BRANCHES, ROOTS, ETC. TO A DEPTH BELOW THE FINAL SUBGRADE. THE CONTRACTOR IS TO REMOVE ONLY THOSE TREES WHICH ARE DESIGNATED BY THE OWNER'S REPRESENTATIVE FOR REMOVAL, AND SHALL EXERCISE EXTREME CARE AROUND EXISTING TREES TO BE SAVED.
2. TOPSOIL STRIPPING
   A. TOPSOIL, INCLUDING ROOTS LARGER THAN 2" AND LARGE ROOT MASSES, SHALL BE STRIPPED FROM ALL ROADWAY AND FOUNDATION AREAS UP TO 10". TOPSOIL SHALL NOT BE STRIPPED OUTSIDE OF THE DESIGNATED DISTURBANCE AREAS.
   B. ANY TOPSOIL THAT HAS BEEN STRIPPED SHALL BE STOCKPILED FOR POST CONSTRUCTION REVEGETATION. ALL TOPSOIL SHALL BE REDISTRIBUTED TO THE LAND OWNER'S PROPERTY OF WHERE IT ORIGINATED FROM.
3. FILL PLACEMENT
   A. FILL PLACEMENT SHALL CONSIST OF THE PLACING OF SUITABLE FILL MATERIAL, AFTER TOPSOIL STRIPPING, ABOVE THE EXISTING GRADE. GENERALLY, SIDE SLOPES SHALL BE CONSTRUCTED AT FOUR FOOT HORIZONTAL TO ONE FOOT VERTICAL, WITH SOME LOCATIONS THROUGHOUT THE PROJECT WITH SLOPES OF TWO FEET HORIZONTAL TO ONE FOOT VERTICAL. THE MATERIAL FOR FILL CONSTRUCTION SHALL BE OBTAINED FROM THE ACCESS ROAD/TURBINE EXCAVATION (SEE GEOTECHNICAL REPORT FOR RESTRICTIONS), OR ANY SUITABLE, APPROVED SOIL OBTAINED ONSITE/OFFSITE BY CONTRACTOR, AS DIRECTED OR APPROVED BY THE ENGINEER. THIS MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 12" AND CONSTRUCTED TO 95% OF THE MAXIMUM DRY DENSITY AND WITHIN 2% OF OPTIMUM MOISTURE CONTENT, AS DETERMINED BY THE STANDARD PROCTOR (AASHTO T99).
   B. SIDE SLOPES GREATER THAN 4:1 WILL NOT BE PERMITTED, UNLESS OTHERWISE NOTED ON THE PLAN.
   C. FILL SLOPES SHALL BE BENCHED INTO THE EXISTING SLOPE TO PREVENT MOVEMENT BETWEEN THE FILL AND NATIVE SOILS. BENCHES SHOULD BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO FILL PLACEMENT. POSITIVE DRAINAGE IS REQUIRED AT BENCHED AREAS AND AT THE TOE OF FILL SLOPES TO REMOVE SURFACE WATER.
4. SUBGRADE
   A. SUBGRADE PREPARED AT GRADE OR IN CUT REQUIRES SCARIFICATION AND RECOMPACTION TO A DEPTH OF 12" OR MORE.
   B. ACCESS ROAD CROSS SLOPES SHOWN IN THE PLANS ARE MEANT AS A GUIDE. ACCESS ROAD CROSS SLOPES MAY RANGE FROM 1% – 2%. CHECK WITH THE ENGINEER IF THE CROSS SLOPE FALLS OUTSIDE OF THIS RANGE. ACCESS ROADS BEING UTILIZED FOR CRANE TRAVEL SHOULD HAVE A MAX CROSS SLOPE OF 2%

STORM WATER DESIGN PARAMETERS

1. SEE SHEET 6 FOR CULVERT SIZING AND DESIGN PARAMETERS. SEE HYDROLOGY MEMO FOR FURTHER DESIGN CALCULATIONS. CULVERTS SHALL BE MINIMUM 18" CORRUGATED METAL PIPE. ALL TEMPORARY PORTIONS OF THE INSTALLED CULVERTS SHALL BE REMOVED UPON COMPLETION OF THE PROJECT.
2. IT IS EXPECTED THAT CULVERTS WILL BE OVERTOPPED DURING SOME STORMS AND MAINTENANCE WILL BE REQUIRED THROUGH THE LIFE OF THE PROJECT.
3. WHEN INSTALLING DRAINAGE CULVERTS THE CONTRACTOR SHALL USE JUDGMENT IN SETTING THE FLOW LINE ELEVATIONS AND CULVERT LONGITUDINAL SLOPE. TYPICALLY THE FLOW LINE ELEVATIONS AND LONGITUDINAL SLOPE OF THE CULVERT SHOULD MATCH THE NATURAL GROUND ELEVATIONS AND SLOPE TO ENSURE POSITIVE DRAINAGE. WHEN POSSIBLE, ALL CULVERTS SHOULD BE PLACED AT A MINIMUM 0.5% GRADE.
4. ANTICIPATED CULVERT CROSSINGS ARE SHOWN ON THE CONSTRUCTION PLAN, ADDITIONAL CULVERTS MAY NEED TO BE INSTALLED IN AREAS WHERE CONCENTRATED FLOW IS EXPECTED DUE TO CONSTRUCTION ACTIVITIES.
5. CONSTRUCTION DRAINAGE CROSSINGS TO MAINTAIN EXISTING FLOW CHARACTERISTICS OF THE FEATURES. FEATURES SHALL BE GRADED TO PRECONSTRUCTION CONTOURS.

TESTING

1. TESTING SHALL BE PERFORMED BY A DESIGNATED INDEPENDENT TESTING AGENCY.
2. SUBMIT ONE SET OF TESTING AND INSPECTION RECORDS SPECIFIED TO THE CIVIL ENGINEER OF RECORD.

DEFINITIONS:

1. PROOF ROLLING:
   SHALL BE PERFORMED IN THE PRESENCE OF THE GEOTECHNICAL ENGINEER OR QUALIFIED GEOTECHNICAL REPRESENTATIVE USING A FULLY LOADED TANDEM AXLE DUMP TRUCK OR WATER TRUCK WITH A MINIMUM GROSS WEIGHT OF 25 TONS OR A FULLY LOADED BELLY DUMP WITH AN EQUIVALENT AXLE LOADING. PROOF-ROLLING ACCEPTANCE STANDARDS INCLUDE NO RUTTING GREATER THAN 1.5 INCHES, AND NO "PUMPING" OF THE SOIL BEHIND THE LOADED TRUCK.
2. SIEVE ANALYSIS:
   SHALL BE CONDUCTED IN ACCORDANCE WITH AASHTO T27
3. PROCTORS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T99
4. ATTERBERG LIMITS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T89 AND T90
5. MOISTURE DENSITY (NUCLEAR DENSITY):
   SHALL BE DONE IN ACCORDANCE WITH AASHTO T310
6. DYNAMIC CONE PENETROMETER (DCP) TESTING:
   SHALL BE DONE IN ACCORDANCE WITH ASTM D6951-03

REQUIREMENTS:

1. FILL PLACEMENT:
   A. SOILS USED AS FILL MATERIAL SHALL BE TESTED FOR MOISTURE CONTENT AND PROCTOR TESTS.
   B. WHERE FILL CONSTRUCTION REQUIRES MORE THAN 12 INCHES OF FILL PLACEMENT, COMPACT EACH LIFT TO A MINIMUM OF 95 PERCENT OF THE MATERIAL'S MAXIMUM STANDARD PROCTOR DRY DENSITY.
2. COMPACTED SUBGRADE (CEMENT STABILIZED):
   A. SEE SHEET 13 FOR TESTING REQUIREMENTS AND PROCEDURE.
3. COMPACTED SUBGRADE (NON-CEMENT STABILIZED):
   A. THE ENTIRE SUBGRADE SHALL BE PROOF-ROLLED PRIOR TO THE PLACEMENT OF THE AGGREGATE BASE TO IDENTIFY AREAS OF UNSTABLE SUBGRADE.
   B. PERFORM A MINIMUM OF 3 DYNAMIC CONE PENETROMETER (DCP) TESTS PER ACCESS ROAD OR ONE FOR EVERY 1,000 LF OF ROAD, WHICHEVER IS GREATER. SUBGRADE MUST MEET A MINIMUM DCP OF 3 BLOWS PER 6" TO A TOTAL DEPTH OF 2' (MINIMUM CBR=1.5).
   C. IF A PASSING PROOF-ROLL OR DCP REQUIREMENTS CANNOT BE ACHIEVED THE FOLLOWING ALTERNATIVES MAY BE IMPLEMENTED:
      a. SCARIFY, DRY, AND RECOMPACT SUBGRADE
      b. REMOVE UNSUITABLE MATERIAL AND REPLACE WITH SUITABLE MATERIAL
      c. INCREASE AGGREGATE BASE THICKNESS
4. AGGREGATE BASE:
   A. AGGREGATE BASE SHALL BE PROOF-ROLLED OVER THE ENTIRE LENGTH. IF PROOF ROLLING DETERMINES THAT THE ROAD IS UNSTABLE, ADDITIONAL AGGREGATE SHALL BE ADDED UNTIL THE UNSTABLE SECTION IS ABLE TO PASS A PROOF ROLL.
   B. PROVIDE 1 SIEVE ANALYSIS (PROJECT MAX OF 20) PER 2500 CY OF ROAD BASE PLACED.
5. CRANE PAD AND CRANE PATHS / CRANE TRAVEL SHOULDERS:
   A. TESTING REQUIREMENTS ARE PENDING BASED ON CRANE PICK PLANS PROVIDED BY THE CONTRACTOR.

GENERAL NOTES:

1. GROUND SURFACE CONTOURS (AT TWO-FOOT VERTICAL INTERVALS) AND ELEVATIONS ARE BASED ON A PHOTOGRAMMETRY SURFACE PROVIDED BY GEOTERRA. IF MAJOR DISCREPANCIES ARE FOUND IN THE GROUND ELEVATIONS DURING FIELD STAKING TO THE GROUND ELEVATIONS SHOWN ON THE PLANS, THE OWNER AND ENGINEER SHALL BE NOTIFIED.
2. WHERE SECTION OR SUBSECTION MONUMENTS ARE ENCOUNTERED, THE OWNER SHALL BE NOTIFIED BEFORE SUCH MONUMENTS ARE REMOVED. THE CONTRACTOR SHALL PROTECT AND CAREFULLY PRESERVE ALL PROPERTY MARKERS AND MONUMENTS UNTIL THE OWNER, AN AUTHORIZED SURVEYOR OR AGENT HAS WITNESSED OR OTHERWISE REFERENCED THEIR LOCATION.
3. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. TYPICAL DISTURBANCE SHALL BE LIMITED TO 10 LF FROM THE EDGE OF PROPOSED GRADING.
4. FINALIZE GRADING AROUND THE BASE OF TURBINES IN ACCORDANCE WITH DETAIL TS-03 AND TS-04.
5. GRADE ALL PROPOSED ROADS TO A MAXIMUM SLOPE OF 8%. IF 8% SLOPE CANNOT BE ACHIEVED, THE CONTRACTOR MAY UTILIZE ASSIST VEHICLES FOR THE PURPOSE OF DELIVERIES. GRADE ALL PROPOSED CRANE PATHS TO A MAXIMUM OF 8% UNLESS OTHERWISE NOTED IN PLAN SHEETS.
6. ANY FACILITIES REMOVED TO ALLOW FOR CONSTRUCTION (MAILBOXES, SIGNS, FENCES, ETC.) SHALL BE REPLACED BY THE CONTRACTOR IN A CONDITION AS GOOD AS EXISTING.
7. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING DRAINAGE THROUGHOUT THE CONSTRUCTION OF THIS PROJECT. CONSTRUCTION ACTIVITIES SHALL NOT BLOCK THE NATURAL OR MANMADE CREEKS OR DRAINAGE SWALES CAUSING RAINWATER TO POND. DEPENDING ON FIELD CONDITIONS, ADDITIONAL CULVERTS IN EXCESS OF THOSE ON THE PLANS MAY BE REQUIRED.
8. WHILE BUILDING THE ROADS AND EXCAVATING THE TURBINE FOUNDATIONS, EXCESS SOIL WILL RESULT. THE CONTRACTOR SHALL DISPOSE OF THIS EXCESS SOIL IN AN APPROVED MANNER. EXCESS TOPSOIL SHALL BE DISTRIBUTED INTO A THIN LAYER ON LAND IMMEDIATELY ADJACENT TO WHERE THE TOPSOIL ORIGINATED. ALL EXCESS TOPSOIL TO BE WASTED ONSITE, WHILE DOING SO THE CONTRACTOR SHALL AVOID CAUSING RIDGES OR MOUNDS THAT WOULD MAKE IT DIFFICULT FOR STORM WATER RUNOFF TO DRAIN. THE FINAL SURFACE OF THE DISTURBED TOPSOIL SHALL BE SMOOTH AND FOLLOW THE NATURAL CONTOUR OF THE LAND.
9. THE CONTRACTOR SHALL NOTIFY SOUTH DAKOTA 811 AT LEAST 48 HOURS BEFORE EXCAVATION ACTIVITIES COMMENCE.
10. TEMPORARY INTERSECTION WIDENING SHALL, UPON COMPLETION OF ALL PROJECT CONSTRUCTION OR UPON NOTIFICATION OF THE ENGINEER, BE REMOVED AND THE AREA RESTORED TO ITS ORIGINAL LINES AND GRADES WITH TOPSOIL REPLACED, EXCEPT WHERE REQUESTED BY THE TOWNSHIP OR COUNTY TO PERMANENTLY REMAIN. DISTURBED AREAS OUTSIDE OF THE FINAL ROADWAY SHALL BE SEEDED AND MULCHED.
11. TURBINE SETBACKS ARE NOT IDENTIFIED ON THE CONSTRUCTION PLANS. IT SHALL BE THE RESPONSIBILITY OF THE OWNER AND CONTRACTOR TO ENSURE THAT ALL TURBINE SETBACKS MEET PROJECT REQUIREMENTS.
12. GEOTECHNICAL REPORTS WITH RECOMMENDATIONS HAVE BEEN PROVIDED BY THE OWNER. ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL ENGINEERING REPORT AND RECOMMENDATIONS.
13. FIELD SURVEY WETLAND INFORMATION HAS BEEN PROVIDED BY THE OWNER. ALL WETLAND DELINEATIONS AND PERMITTING SHALL BE THE RESPONSIBILITY OF OTHERS AND BE COMPLETED PRIOR TO CONSTRUCTION COMMENCING. THE OWNER AND GENERAL CONTRACTOR SHALL VERIFY THAT ALL WETLAND PERMITS HAVE BEEN SUBMITTED AND APPROVED PRIOR TO CONSTRUCTION COMMENCING.
14. CULTURAL RESOURCE REPORTS HAVE NOT BEEN PROVIDED. CULTURAL RESOURCE LOCATIONS ARE NOT SHOWN ON THE PLANS. INFORMATION WILL BE THE RESPONSIBILITY OF THE OWNER AND GENERAL CONTRACTOR. THE LOCATIONS OF CULTURAL RESOURCE SITES MAY BE CONFIDENTIAL AND PROTECTED BY STATE OR FEDERAL LAW. PUBLIC RELEASE OF SPECIFIC INFORMATION REGARDING THESE RESOURCES MAY BE RESTRICTED.
15. AN ENVIRONMENTAL ASSESSMENT HAS NOT BEEN PROVIDED. THE CONTRACTOR SHALL BE FAMILIAR WITH THE REPORT AND REVIEW ALL RECOMMENDATIONS.
16. ELECTRICAL INFORMATION SHOWN ON THE PLANS IS FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSULTANT'S PLANS FOR SPECIFIC LOCATIONS AND CONSTRUCTION DETAILS FOR THE UNDERGROUND POWER COLLECTION SYSTEM AND SUBSTATION.
17. CRANE PATHS ARE SHOWN ON THE CONSTRUCTION PLANS. IF THE CONTRACTOR PROPOSES ALTERNATE CRANE PATHS, THEY SHALL ENSURE THAT WETLAND AND CULTURAL RESOURCE CORRIDORS ARE NOT DISTURBED. FINAL CRANE PATH ALIGNMENTS SHALL BE DETERMINED BY THE CONTRACTOR BASED ON FIELD CONDITIONS WITHIN THE WETLAND AND CULTURAL RESOURCE CORRIDORS, SPECIAL LANDOWNER AGREEMENTS AND THE PROJECT BOUNDARY.
18. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. DISTURBANCE SHALL BE LIMITED TO 50 LF WIDTH FOR PROPOSED ACCESS ROADS AND 50 LF FOR CRANE PATHS, AND SHALL BE LIMITED TO A 250 LF RADIUS FOR PROPOSED WIND TURBINE GENERATORS. GRADING LIMITS SHALL BE CENTERED ON THE ROADWAYS AND WIND TURBINES. THE CONTRACTOR SHALL MAKE ALL EFFORTS TO KEEP ACTIVITIES WITHIN THE ERECTION AREAS SHOWN ON THE PLANS BUT IT IS UNDERSTOOD THAT SOME ACTIVITIES THAT WILL NOT REQUIRE GRADING OR SOIL DISTURBANCE MAY EXTEND BEYOND THE DEFINED LIMITS. DURING ERECTION OF THE ROTOR, TRUCKS AND/OR FORKLIFTS MAY EXTEND BEYOND THESE LIMITS. SEE DETAIL TSD1 FOR TYPICAL ERECTION AREAS.
19. AN ALTA SURVEY HAS BEEN PROVIDED BY WESTWOOD. CONTRACTOR AND OWNER ARE RESPONSIBLE FOR LOCATING ALL UTILITIES AND VERIFYING LOCATION OF CONSTRUCTION ACTIVITIES PRIOR TO COMMENCING WORK.

STORMWATER POLLUTION PREVENTION PLAN (SWPPP):

1. THE CONTRACTOR SHALL PROVIDE EROSION CONTROL MEASURES AS PLANNED AND SPECIFIED FOLLOWING BEST MANAGEMENT PRACTICES AS OUTLINED BY THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND BEING IN CONFORMANCE WITH THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL STORMWATER PERMIT.
2. REFER TO THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR THE TRIPLE H WIND FARM, PREPARED BY WESTWOOD PROFESSIONAL SERVICES, FOR EROSION CONTROL AND RESTORATION SPECIFICATIONS, SEDIMENT AND EROSION CONTROL PROCEDURES, LOCATIONS OF BMPs, DETAILS, AND INSPECTION INFORMATION.
3. ALL PASTURES AND DRAINAGE SWALES DISTURBED DURING CONSTRUCTION ACTIVITIES AND NOT COVERED BY ROAD SURFACING MATERIALS, SHALL BE SEEDED IN ACCORDANCE WITH THE SWPP PLAN.
4. TEMPORARY EROSION CONTROL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE TEMPORARY EROSION CONTROL PLAN SHALL BE IN ACCORDANCE WITH THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND THE TRIPLE H WIND FARM STORMWATER POLLUTION PREVENTION PLAN ON FILE.

TABLE 1: SDDOT AGGREGATE BASE COURSE – LOCALLY SOURCED

SIEVE SIZE	PERCENT PASSING
1"	100
3/4"	80-100
1/2"	68-91
NO. 4	46-70
NO. 8	34-58
NO. 40	13-35
NO. 200	3-12

MEET FOLLOWING REQUIREMENTS PER 882.2

LIQUID LIMIT (MAX) = 25
PLASTICITY INDEX = 0-6
L.A ABRASION (% MAX) = 40%

GRADATION HAS BEEN OBTAINED FROM THE 2015 SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION BOOK.

TABLE 2: TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
FILL PLACEMENT	PROCTOR	1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER LIFT PER 3000 SF OF FILL PLACED OR 1 PER 300 LF OF ROAD OR CRANE WALK
COMPACTED SUBGRADE (CEMENT STABILIZED):	SEE SHEET 13	SEE SHEET 13
COMPACTED SUBGRADE (NON-CEMENT STABILIZED):	PROOF-ROLL	ENTIRE AREA
	DCP	1 PER 1,000 FT OR MIN. 3 PER ROAD
AGGREGATE BASE	PROOF-ROLL	ENTIRE AREA
	SIEVE ANALYSIS, LL, PL, AND L.A ABRASION	1 PER 2,500 CY

PROJECT CONTACT INFORMATION:

TITLE	COMPANY	NAME	CONTACT NUMBER
OWNER (PRIMARY)	ENGIE	CASEY WILLIS	805-569-6185
PROJECT MANAGER	WESTWOOD	DANI NYGREN	952-906-7493
ENGINEER OF RECORD	WESTWOOD	ROB COPOULS	952-906-7470
CONTRACTOR	WANZEK	JASON HELLERUD	701-893-3685

Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
TollFree (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed: BMC
Checked: DJM
Drawn: BMC
As-Built Drawing:

Revisions: #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2020 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 12 OF 57

0014440D1P.dwg

©2019 Westwood Professional Services, Inc.

CEMENT STABILIZATION - PROCEDURE

THE SPECIFICATIONS BELOW ARE GENERAL RECOMMENDATIONS/GUIDELINES FOR CEMENT STABILIZATION OF SUBGRADES FOR THE PROJECT. ACTUAL FIELD CONDITIONS MAY ALTER APPLICATION RATE. CONSULT GEOTECHNICAL ENGINEER FOR FURTHER RECOMMENDATIONS.

1. STRIP THE TOP ±4 INCHES OF TOPSOIL (THROUGH THE ROOT ZONE) FROM THE AREA TO BE STABILIZED. ROOTS SMALLER THAN 1/4" DIAMETER ARE CONSIDERED INSIGNIFICANT.
2. PERFORM A PROCTOR (ASTM D 698) TEST TO DETERMINE THE OPTIMUM MOISTURE CONTENT IF THE MATERIAL TO BE STABILIZED DOES NOT MATCH A PREVIOUSLY PERFORMED PROCTOR.
3. DETERMINE THE IN-SITU MOISTURE CONTENT USING A NUCLEAR DENSITY GAUGE (OR EQUIVALENT MOISTURE CONTENT TEST) DAILY, PRIOR TO INCORPORATION OF THE CEMENT. PROVIDE ADDITIONAL MOISTURE CONTENT TESTING AS NEEDED BASED ON WEATHER CONDITIONS.
   - 3.1. THE CONTRACTOR WILL BE ADVISED OF IN-SITU MOISTURE CONTENT, AND MOISTURE ADJUSTMENTS SHOULD BE MADE IF IN-SITU MOISTURE IS LESS THAN OPTIMUM MOISTURE CONTENT AS DETERMINED BY THE PROCTOR (ASTM D 698).
4. SOIL AND CEMENT BLENDING:
   - 4.1. COMPLETELY BLEND SUBGRADE SOIL WITH THE APPROPRIATE AMOUNT OF CEMENT BY WEIGHT. FIELD RESULTS FROM TEST STRIPS WILL DICTATE THE CEMENT APPLICATION RATE.
   - 4.2. IN AREAS OF HIGH MOISTURE OR POOR SOILS, THE CONTRACTOR MAY INCREASE THE PERCENT OF CEMENT IN ORDER TO MEET THE MINIMUM SUBGRADE STRENGTH REQUIREMENTS.
   - 4.3. THE USE OF A RECLAIMER IS AN ADEQUATE BLENDING METHOD. DISCING IS NOT AN ADEQUATE BLENDING METHOD.
   - 4.4. A STABILIZATION DEPTH OF 12" WAS USED FOR DESIGN PURPOSES. STABILIZATION DEPTH MAY NEED TO INCREASE TO 16" IN AREAS OF EXTREME MOISTURE OR POOR SOILS IN ORDER TO MEET THE STRENGTH AND PROOF ROLL REQUIREMENTS.
5. COMPACTION:
   - 5.1. A ROLLING PATTERN WILL BE ESTABLISHED USING A NUCLEAR DENSITY GAUGE DURING COMPACTION.
     - 5.1.1. COMPACTION WILL BE PERFORMED UNTIL THE STABILIZED MATERIAL REACHES THE "BREAK POINT" AFTER WHICH ADDITIONAL PASSES WITH A ROLLER RESULTS IN A LOSS OF DENSITY AS MEASURED BY A NUCLEAR DENSITY GAUGE.
     - 5.1.2. COMPACTION IS TYPICALLY ACHIEVED BY MULTIPLE PASSES OF A PADFOOT ROLLER UNTIL THE ROLLER "WALKS" OUT OF THE RECLAIMED MATERIAL (SPACE IS VISIBLE BETWEEN THE DRUM AND THE RECLAIMED MATERIAL). THIS IS FOLLOWED BY BLADING AND SHAPING THE RECLAIMED MATERIAL TO FINAL PROFILE AND CROSS SECTION. REMOVING HIGH AND LOW POINTS. SMOOTH DRUM OR RUBBER TIRE ROLLERS ARE THEN USED TO FINISH ROLLING (THIS IS WHEN THE DENSITY TESTS ARE PERFORMED) UNTIL THE DENSITY OF THE MATERIAL REACHES THE "BREAK POINT."
     - 5.1.3. THE NUMBER OF PASSES AND EQUIPMENT USED TO REACH THE "BREAK POINT" IS CONSIDERED THE ROLLING PATTERN.
     - 5.1.4. A NEW ROLLING PATTERN MAY NEED TO BE ESTABLISHED IF THE PERFORMANCE REQUIREMENTS ARE NOT BEING MET. THIS MAY BE DUE TO CHANGES IN THE MOISTURE CONTENT, THE SOIL TYPE, OR THE CEMENT RATE.
   - 5.2. THE TARGET DENSITY IS 98% OF THE MAXIMUM DENSITY DETERMINED FROM THE ROLLING PATTERN.
     - 5.2.1. DENSITY TESTS SHALL BE TAKEN AT THE RATE OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER TO CONFIRM THE DENSITY IS MATCHING THE TARGET. ONCE THE ROLLING PATTERN HAS BEEN CONFIRMED IT IS RECOMMENDED THAT TESTING CONTINUE AT 1 TEST PER 1,000 LF IN EACH PASS OF THE RECLAIMER.
     - 5.2.2. IF IT IS NOT POSSIBLE TO ATTAIN THE TARGET DENSITY, AND ADDITIONAL COMPACTION DOES NOT IMPROVE THE DENSITY, A NEW ROLLING PATTERN SHOULD BE ESTABLISHED.
   - 5.3. THE AIR TEMPERATURE SHALL BE ABOVE 40 DEGREES (F) DURING THE CEMENT STABILIZATION PROCESS. MIXING CEMENT INTO FROZEN GROUND IS NOT ACCEPTABLE.
6. THE STABILIZED MATERIAL SHALL BE CONTINUOUSLY WET CURED FOR A MINIMUM OF 24 HOURS (WET CURED IS IDENTIFIED VISUALLY AS DAMP SURFACE).
7. PERFORM SUBGRADE TESTING IN ACCORDANCE WITH TESTING SCHEDULE.
8. AGGREGATE PLACEMENT:
   - 8.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 8.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 8.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

CEMENT STABILIZATION - DESIGN BASIS

1. DURING INITIAL CONSTRUCTION, CONTRACTOR SHALL CONSTRUCT MINIMUM 300 LF TEST STRIPS CONTAINING 4%, 5%, AND 6% CEMENT IN ACCORDANCE WITH CEMENT STABILIZATION PROCEDURES.
2. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 3 FOR ANTICIPATED RESULTS):
   - 2.1. PERFORM INITIAL SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M BETWEEN 4 TO 6 HOURS AFTER FINAL COMPACTION.
   - 2.2. PERFORM ADDITIONAL DCP TESTING AT 24 AND 48 HOURS AFTER FINAL COMPACTION.
   - 2.3. PERFORM SUBSEQUENT DCP TESTS AT 7 DAYS AFTER FINAL COMPACTION AS VERIFICATION OF STRENGTH CURVE.
   - 2.4. A MINIMUM OF 3 TESTS PER TEST SECTION PER TIMEFRAME IS REQUIRED. TESTS SHALL BE TAKEN AT THE CENTERLINE AND 2' FROM EACH SHOULDER.
   - 2.5. RECORD DCP TEST RESULTS EVERY 6 INCHES TO TOTAL DEPTH OF 12 INCHES.

TABLE 3: TEST STRIP CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	COMPRESSIVE STRENGTH (PSF)
4 – 6 HOURS	6	5	1,800
24 HOURS	10	7	2,500
48 HOURS	15	10	3,200
7 DAYS	30	21	5,200

CEMENT STABILIZATION - PRODUCTION

1. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 5 FOR SUMMARY OF TESTING REQUIREMENTS):
   - 1.1. PERFORM SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M NO SOONER THAN 24 HOURS AFTER FINAL COMPACTION.
   - 1.2. DCP TESTING FREQUENCY SHALL BE WITH A RANDOM SPACING AND A MINIMUM OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER. A MINIMUM OF 3 TESTS PER ROAD IS REQUIRED.
   - 1.3. THE CBR OF THE STABILIZED SUBGRADE SHOULD BE CALCULATED IN 6" INCREMENTS THROUGH THE ENTIRE DEPTH OF THE STABILIZED LAYER.
   - 1.4. THE MINIMUM REQUIRED CBR PRIOR TO PROOF-ROLLING IS PROVIDED IN TABLE 4 BELOW:

TABLE 4: FINAL CEMENT STABILIZED CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	UNDRAINED SHEAR STRENGTH (PSF)	BEARING CAPACITY (PSF)
24 – 48 HOURS	15	10	3,500	8,800
3 – 7 DAYS	30	21	7,000	18,000
28 DAYS	50	33	12,000	28,500

NOTE: UNDRAINED SHEAR STRENGTH WAS CALCULATED USING THE BLACK (1961) EQUATION. BEARING CAPACITY WAS CALCULATED USING THE VESIC EQUATION MODIFIED FOR TWO LAYERS (12" CEMENT STABILIZED SUBGRADE OVER A NATURAL SUBGRADE WITH A CBR OF 1.5)

   - 1.5. ONCE THE MINIMUM REQUIRED CBR IS ACHIEVED AT ANY CORRESPONDING TIME PERIOD, THE SUBGRADE IS CONSIDERED ADEQUATE AND THE CONTRACTOR MAY PROCEED WITH PROOF-ROLL TESTING. FUTURE DCP TESTING ON THAT SEGMENT OF SUBGRADE IS NOT REQUIRED.
   - 1.6. IF TESTING DOES NOT INDICATE A CBR OF 30 WITHIN 7 DAYS, ADDITIONAL GRAVEL SURFACING AND/OR THE ADDITION OF GEOTEXTILE FABRIC MAY BE REQUIRED. FOR FUTURE SUBGRADE STABILIZATION AREAS, CONTACT THE ENGINEER AND OWNER VIA RFI FOR RECOMMENDATIONS AND APPROVAL.
2. SUBGRADE PROOF-ROLL TESTING AND ACCEPTANCE:
   - 2.1. ONCE THE REQUIRED DCP VALUE HAS BEEN OBTAINED BUT PRIOR TO PLACING AGGREGATE, THE SUBGRADE SHALL BE PROOF-ROLLED. REFER TO THE PROJECT TESTING REQUIREMENTS FOR PROOF-ROLL DEFINITION.
   - 2.2. PROOF-ROLLING SHOULD BE PERFORMED WITH ONE PASS DOWN THE CENTER AND NOT BE PERFORMED WITHIN 12 INCHES OF THE EDGE OF THE STABILIZED SECTION.
   - 2.3. IF PROOF-ROLLING FAILS, RE-STABILIZATION MAY BE REQUIRED AND A NEW ROLLING PATTERN OR ADDITIONAL CEMENT MAY BE REQUIRED.
3. AGGREGATE PLACEMENT:
   - 3.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 3.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 3.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

TABLE 5: CEMENT STABILIZATION PRODUCTION TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
COMPACTED SUBGRADE (CEMENT STABILIZED) NOTE: SEE ABOVE FOR INITIAL TESTING REQUIREMENTS	PROCTOR	MINIMUM 1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER 1000 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
	DCP TEST	1 PER 500 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
	PROOF-ROLL (AFTER PASSING DCP TESTS)	ENTIRE LENGTH

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 www.thinkwestwood.com
Westwood Professional Services, Inc.

Designed: BNK
Checked: DJH
Drawn: BNK
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	50% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 13 OF 57

0014440DTP.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 202nd Street in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 2640' West of 204th Street & 202nd Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.27'15.74" W Long. -99.33'46.40" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001073 NW4 41-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Tanya Dare
Signature of Applicant

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 202nd Street in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 2640' West of 204th Street & 202nd Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.27'15.74" W Long. -99.33'46.40" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001073 NW4 41-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: _____

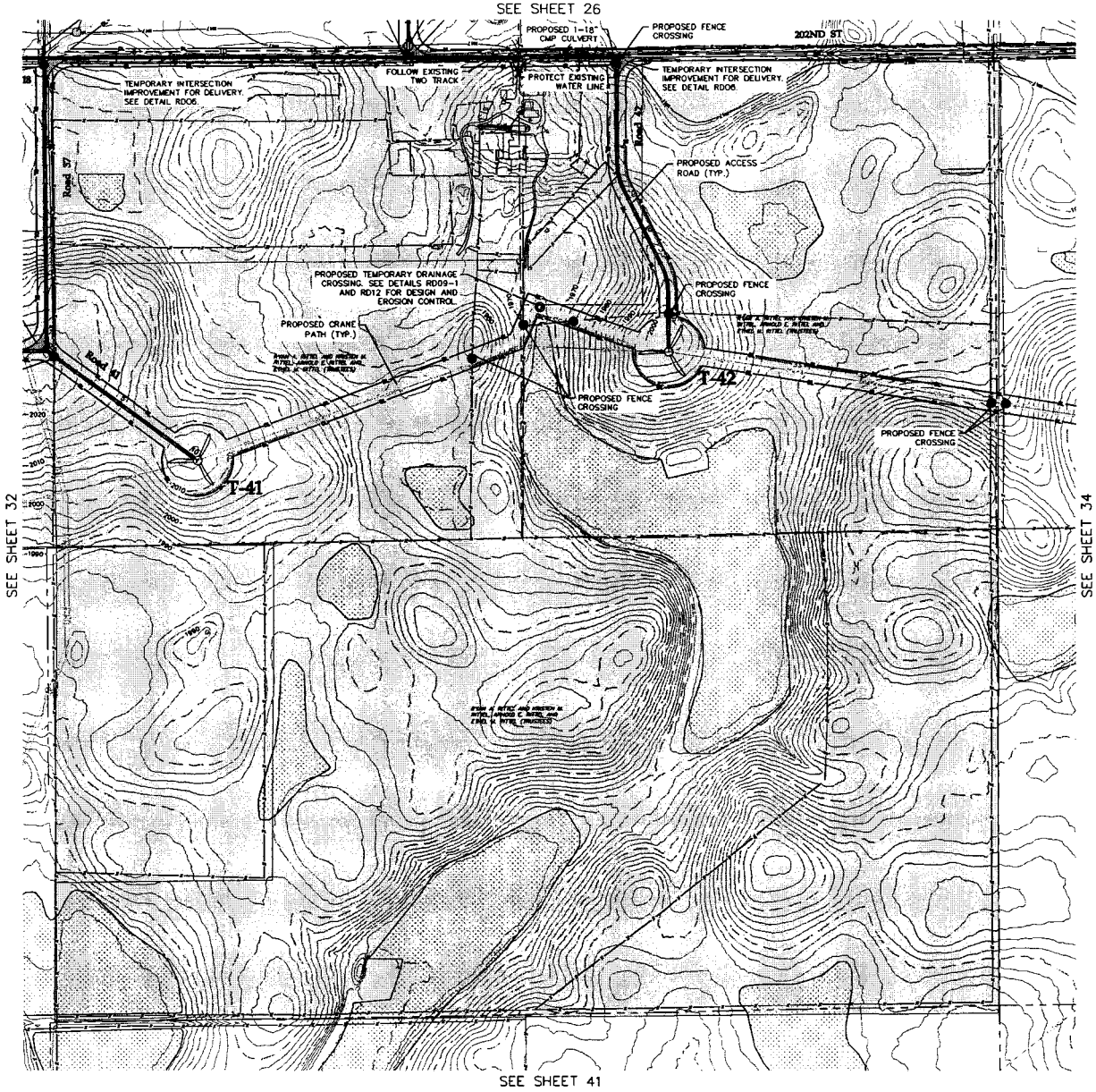
Signature of Applicant

Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

©2019 Westwood Professional Services, Inc.



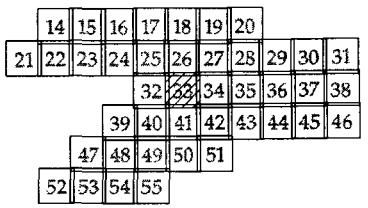
LEGEND:

- PROPOSED TURBINE LOCATION
- T-XX — PROPOSED TURBINE NUMBER
- PROPOSED ALTERNATE TURBINE LOCATION
- ALT-XX — PROPOSED ALTERNATE TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED ALTERNATE ACCESS ROAD
- PROPOSED CRANE PATH
- PROPOSED UNDERGROUND COLLECTION*
- PROPOSED DISTURBANCE LIMITS
- PROPOSED PERIMETER SEDIMENT CONTROL
- EXISTING 10' CONTOURS
- EXISTING 2' CONTOURS
- EXISTING GRAVEL EDGE
- EXISTING BITUMINUS EDGE
- EXISTING RIGHT-OF-WAY
- EXISTING PARCEL LINE
- EXISTING BUILDING
- EXISTING FENCE
- EXISTING OVERHEAD POWER
- EXISTING HIGH VOLTAGE OVERHEAD POWER
- EXISTING UNDERGROUND POWER LINE
- EXISTING FIBER OPTIC LINE
- EXISTING WATER LINE
- DELINEATED WETLAND
- ARCHAEOLOGICAL AVOIDANCE AREA
- EXISTING USFWS EASEMENT
- PROJECT BOUNDARY
- 1900 — EXISTING GROUND ELEVATION
- PROPOSED DRAINAGE CROSSING**
- PROPOSED TEMPORARY DRAINAGE CROSSING**
- PROPOSED FENCE CROSSING***
- PROPOSED UTILITY CROSSING
- PROPOSED CULVERT

* PROVIDED BY OTHERS AND SHOWN FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSTRUCTION PLANS FOR DETAILS.

** SEE SHEET 11 FOR DRAINAGE CROSSING TYPE AND SIZING. DRAINAGE CROSSINGS SHALL CONSIST OF LOW WATER CROSSING OR CULVERT. DRAINAGE CROSSINGS ALONG CRANE PATH SHALL CONSIST OF CRANE MATS OR TEMPORARY CULVERT.

*** ALL GATE INSTALLATIONS SHALL BE FIELD DETERMINED AND AGREED UPON BY THE CONTRACTOR AND OWNER.



KEY MAP

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (866) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed: BHK
Checked: DBH
Drawn: BHK
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2028 2nd Avenue NW
West Fargo, ND 58078

N

0' 300' 600' 900'

Triple H Wind Farm

Hyde County, South Dakota

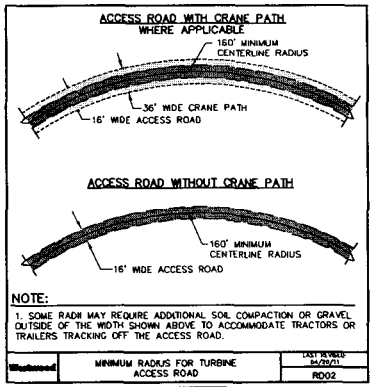
Site Plan T-41 - T-42

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 33 OF 57

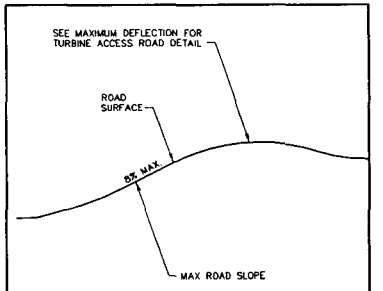
0014440SP01.dwg

©2019 Westwood Professional Services, Inc.



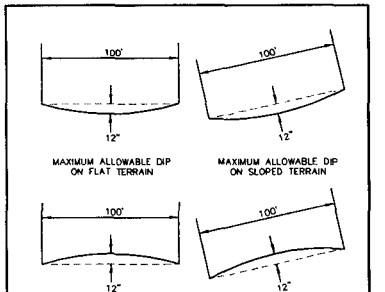
NOTE:
1. SOME RADII MAY REQUIRE ADDITIONAL SOIL COMPACTION OR GRAVEL OUTSIDE OF THE WIDTH SHOWN ABOVE TO ACCOMMODATE TRACTORS OR TRAILERS TRACKING OFF THE ACCESS ROAD.

Westwood	MINIMUM RADIUS FOR TURBINE ACCESS ROAD	LAST REVISED: 04/29/11 RD02

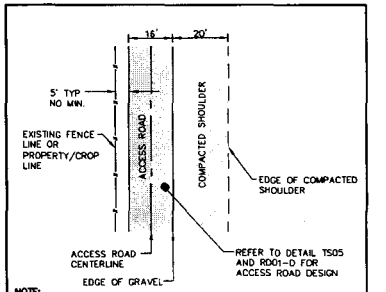


NOTES:
1. ROAD SLOPE SHALL NOT EXCEED 8% WITHOUT OWNER APPROVAL

Westwood	MAXIMUM VERT. SLOPE FOR TURBINE ACCESS ROAD/CRANE TRAVEL PATH	LAST REVISED: 3/31/23 RD03

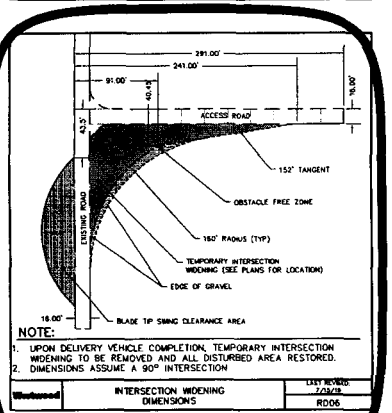


Westwood	MAXIMUM DEFLECTION FOR TURBINE ACCESS ROAD	LAST REVISED: 01/03/08 RD04



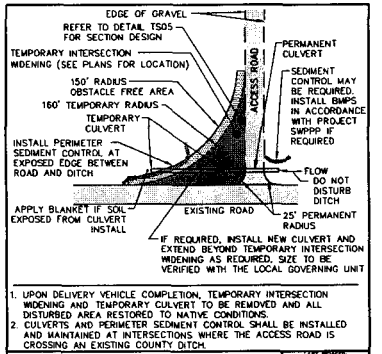
NOTE:
1. COMPACTED SHOULDER SHALL BE RETURNED TO NATIVE CONDITION FOLLOWING TURBINE GENERATOR CONSTRUCTION.
2. THE ACCESS ROAD MAY NEED TO BE CONSTRUCTED FARTHER FROM THE PROPERTY LINE IF OBSTRUCTIONS SUCH AS TREES FOLLOW THE PROPERTY LINE.

Westwood	TURBINE ACCESS ROAD ALONG FENCE/PROPERTY/CROP LINE	LAST REVISED: 3/31/22 RD05



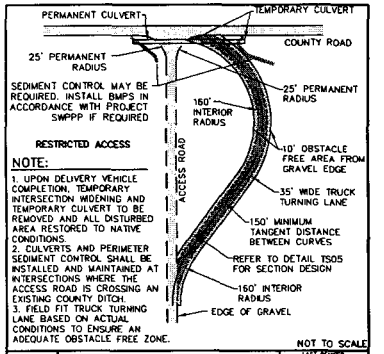
NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING TO BE REMOVED AND ALL DISTURBED AREA RESTORED.
2. DIMENSIONS ASSUME A 90° INTERSECTION

Westwood	INTERSECTION WIDENING DIMENSIONS	LAST REVISED: 2/23/18 RD06



1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.

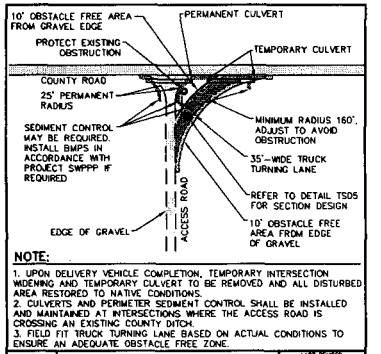
	TURBINE ACCESS ROAD TYPICAL INTERSECTION WIDENING	LAST REVISED: 3/0/07 RD07



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

NOT TO SCALE

Westwood	TRUCK TRAFFIC TURNING LANE A	LAST REVISED: 3/0/07 RD08-A



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

Westwood	TRUCK TRAFFIC TURNING LANE B	LAST REVISED: 12/0/11 RD08-B

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-Free (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: DBH
Drawn: BMK
As-Built Drawing:

Revisions: #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK
MinnTec

2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

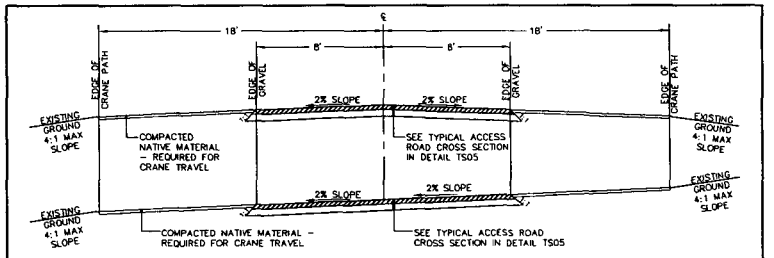
Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 5 OF 57

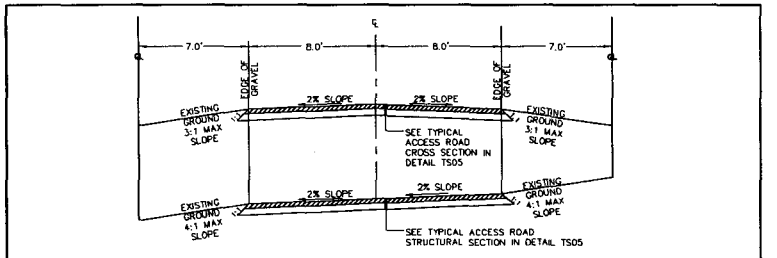
0014440DTP.dwg

© 2019 Westwood Professional Services, Inc.



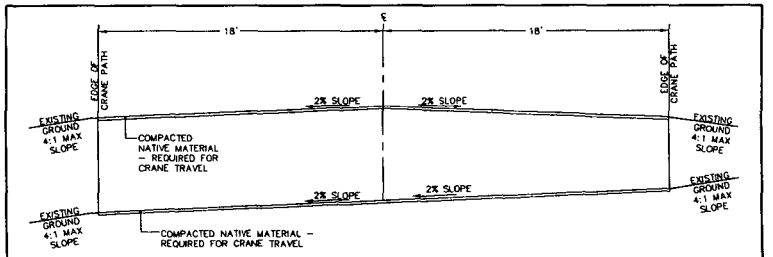
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE ACCESS ROAD DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

Westwood | TYPICAL TURBINE ACCESS ROAD AND CRANE PATH | LAST REVISED: 04/29/01 | RD01-A



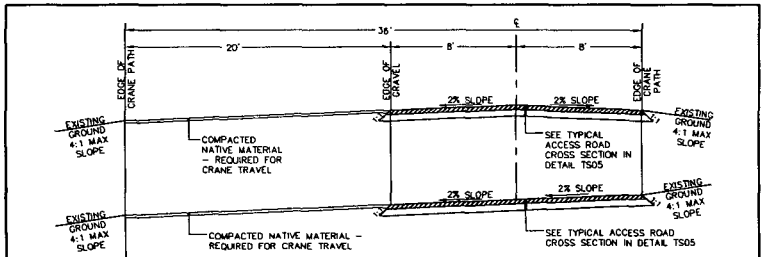
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

Westwood | TYPICAL TURBINE ACCESS ROAD SECTION | LAST REVISED: 3/29/01 | RD01-B



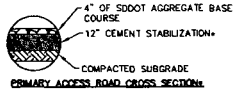
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE WHERE CRANE PATHS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT CRANE PATH REMAINS WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%

Westwood | TYPICAL CRANE PATH | LAST REVISED: 04/29/01 | RD01-C

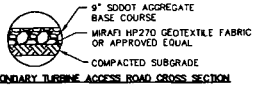


NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE EDGE OF COMPACTED SHOULDER DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

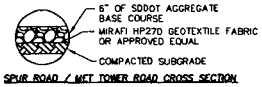
Westwood | TYPICAL TURBINE ACCESS ROAD AND OFFSET CRANE PATH | LAST REVISED: 3/29/01 | RD01-D



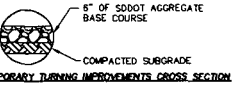
PRIMARY ACCESS ROAD CROSS SECTION*



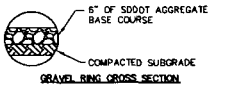
SECONDARY TURBINE ACCESS ROAD CROSS SECTION



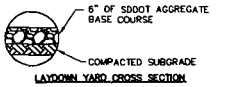
SPUR ROAD / WET TOWER ROAD CROSS SECTION



TEMPORARY TURNING IMPROVEMENTS CROSS SECTION



GRAVEL RING CROSS SECTION



LAYDOWN YARD CROSS SECTION

* CEMENT APPLICATION RATE MAY VARY BASED ON TEST STRIPS AND FIELD PERFORMANCE. SEE SHEET 13 FOR CEMENT STABILIZATION PROCEDURE AND DESIGN BASIS.

NOTES:
STRUCTURAL SECTIONS SHOWN ARE THE MINIMUM THICKNESS REQUIREMENTS DURING NORMAL FIELD CONDITIONS. THE SECTIONS MAY NEED TO BE INCREASED BASED ON ACTUAL FIELD CONDITIONS AT THE TIME OF CONSTRUCTION. CONDITIONS INCLUDE BUT ARE NOT LIMITED TO CONSTRUCTION DURING THE FREEZE/THAW CYCLE, UNUSUALLY WET PERIODS, OR IN LOW/WET AREAS. SEE SHEET 12 FOR TESTING REQUIREMENTS AND SPECIFICATIONS.

Westwood | TYPICAL STRUCTURAL CROSS SECTIONS

Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (866) 937-5150 www.westwoodps.com
Westwood Professional Services, Inc.

Designed: BMC
Checked: BJH
Drawn: BMC
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:
WANZEK
MasTec
2028 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 4 OF 57

0014440D1P.dwg

©2019 Westwood Professional Services, Inc.

ROAD DESIGN PARAMETERS

1. ACCESS ROADS HAVE BEEN DESIGNED TO ACCOMMODATE LIGHT DUTY TRUCKS (PICKUP TRUCKS AND MAINTENANCE VEHICLES) FOR LOW VOLUME USE IN NORMAL OPERATING CONDITIONS AS WELL AS HEAVY DUTY CONSTRUCTION TRAFFIC UNDER DRY CONDITIONS. THE ROAD DESIGN SPECIFIED IS NOT INTENDED FOR ALL WEATHER USE FOR HEAVY DUTY CONSTRUCTION LOADS.
2. ROAD MAINTENANCE CAN BE EXPECTED OVER THE LIFE OF THE PERMANENT FACILITY.

PRODUCTS

1. AGGREGATE BASE SHALL CONSIST OF SDDOT AGGREGATE BASE COURSE (AND IN CONFORMANCE WITH THE GRADATION TABLE 1). AGGREGATE MAY BE CRUSHER RUN UPON ENGINEERS APPROVAL. AGGREGATE GRADATIONS SHALL BE SUBMITTED TO ENGINEER FOR REVIEW.
2. ROAD SHOULDERS AND CRANE PADS SHALL CONSIST OF COMPACTED NATIVE SOILS.
3. CULVERTS: ACCESS ROAD CULVERTS SHALL MEET THE MINIMUM SPECIFICATIONS SET FORTH BY THE SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION AND/OR HYDE COUNTY. ALL CULVERTS ARE PLANNED TO BE A MINIMUM 18" DIAMETER AND MANUFACTURED OF 16-GAGE CORRUGATED METAL PIPE WITH NO END TREATMENTS UNLESS NOTED OTHERWISE. ACTUAL SIZE WILL BE DETERMINED THROUGH HYDRAULIC ANALYSIS.
4. GEOTEXTILE FABRIC: MIRAFI HP270 OR APPROVED EQUAL.

EXECUTION

1. CLEARING AND GRUBBING
   A. THE CONTRACTOR SHALL BE REQUIRED TO GRUB ALL TREES, STUMPS, BRUSH, AND DEBRIS WITHIN THE GRADING AREAS SHOWN ON THE PLANS. GRUBBING INCLUDES REMOVAL OF ALL PLANT MATERIAL GREATER THAN 2" INCLUDING STUMPS, BRANCHES, ROOTS, ETC. TO A DEPTH BELOW THE FINAL SUBGRADE. THE CONTRACTOR IS TO REMOVE ONLY THOSE TREES WHICH ARE DESIGNATED BY THE OWNER'S REPRESENTATIVE FOR REMOVAL, AND SHALL EXERCISE EXTREME CARE AROUND EXISTING TREES TO BE SAVED.
2. TOPSOIL STRIPPING
   A. TOPSOIL, INCLUDING ROOTS LARGER THAN 2" AND LARGE ROOT MASSES, SHALL BE STRIPPED FROM ALL ROADWAY AND FOUNDATION AREAS UP TO 10". TOPSOIL SHALL NOT BE STRIPPED OUTSIDE OF THE DESIGNATED DISTURBANCE AREAS.
   B. ANY TOPSOIL THAT HAS BEEN STRIPPED SHALL BE STOCKPILED FOR POST CONSTRUCTION REVEGETATION. ALL TOPSOIL SHALL BE REDISTRIBUTED TO THE LAND OWNER'S PROPERTY OF WHERE IT ORIGINATED FROM.
3. FILL PLACEMENT
   A. FILL PLACEMENT SHALL CONSIST OF THE PLACING OF SUITABLE FILL MATERIAL, AFTER TOPSOIL STRIPPING, ABOVE THE EXISTING GRADE. GENERALLY, SIDE SLOPES SHALL BE CONSTRUCTED AT FOUR FOOT HORIZONTAL TO ONE FOOT VERTICAL, WITH SOME LOCATIONS THROUGHOUT THE PROJECT WITH SLOPES OF TWO FEET HORIZONTAL TO ONE FOOT VERTICAL. THE MATERIAL FOR FILL CONSTRUCTION SHALL BE OBTAINED FROM THE ACCESS ROAD/TURBINE EXCAVATION (SEE GEOTECHNICAL REPORT FOR RESTRICTIONS), OR ANY SUITABLE, APPROVED SOIL OBTAINED ONSITE/OFFSITE BY CONTRACTOR, AS DIRECTED OR APPROVED BY THE ENGINEER. THIS MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 12" AND CONSTRUCTED TO 95% OF THE MAXIMUM DRY DENSITY AND WITHIN 2% OF OPTIMUM MOISTURE CONTENT, AS DETERMINED BY THE STANDARD PROCTOR (AASHTO T99).
   B. SIDE SLOPES GREATER THAN 4:1 WILL NOT BE PERMITTED, UNLESS OTHERWISE NOTED ON THE PLAN.
   C. FILL SLOPES SHALL BE BENCHED INTO THE EXISTING SLOPE TO PREVENT MOVEMENT BETWEEN THE FILL AND NATIVE SOILS. BENCHES SHOULD BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO FILL PLACEMENT. POSITIVE DRAINAGE IS REQUIRED AT BENCHED AREAS AND AT THE TOE OF FILL SLOPES TO REMOVE SURFACE WATER.
4. SUBGRADE
   A. SUBGRADE PREPARED AT GRADE OR IN CUT REQUIRES SCARIFICATION AND RECOMPACTION TO A DEPTH OF 12" OR MORE.
   B. ACCESS ROAD CROSS SLOPES SHOWN IN THE PLANS ARE MEANT AS A GUIDE. ACCESS ROAD CROSS SLOPES MAY RANGE FROM 1% - 2%. CHECK WITH THE ENGINEER IF THE CROSS SLOPE FALLS OUTSIDE OF THIS RANGE. ACCESS ROADS BEING UTILIZED FOR CRANE TRAVEL SHOULD HAVE A MAX CROSS SLOPE OF 2%.

TABLE 1: SDDOT AGGREGATE BASE COURSE - LOCALLY SOURCED	
SIEVE SIZE	PERCENT PASSING
1"	100
3/4"	80-100
1/2"	68-91
NO. 4	46-70
NO. 8	34-58
NO. 40	13-35
NO. 200	3-12

MEET FOLLOWING REQUIREMENTS PER 882.2

LIQUID LIMIT (MAX) = 25
PLASTICITY INDEX = 0-6
L.A. ABRASION (% MAX) = 40%

GRADATION HAS BEEN OBTAINED FROM THE 2015 SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION BOOK.

STORM WATER DESIGN PARAMETERS

1. SEE SHEET 6 FOR CULVERT SIZING AND DESIGN PARAMETERS. SEE HYDROLOGY MEMO FOR FURTHER DESIGN CALCULATIONS. CULVERTS SHALL BE MINIMUM 18" CORRUGATED METAL PIPE. ALL TEMPORARY PORTIONS OF THE INSTALLED CULVERTS SHALL BE REMOVED UPON COMPLETION OF THE PROJECT.
2. IT IS EXPECTED THAT CULVERTS WILL BE OVERTOPPED DURING SOME STORMS AND MAINTENANCE WILL BE REQUIRED THROUGH THE LIFE OF THE PROJECT.
3. WHEN INSTALLING DRAINAGE CULVERTS THE CONTRACTOR SHALL USE JUDGMENT IN SETTING THE FLOW LINE ELEVATIONS AND CULVERT LONGITUDINAL SLOPE. TYPICALLY THE FLOW LINE ELEVATIONS AND LONGITUDINAL SLOPE OF THE CULVERT SHOULD MATCH THE NATURAL GROUND ELEVATIONS AND SLOPE TO ENSURE POSITIVE DRAINAGE. WHEN POSSIBLE, ALL CULVERTS SHOULD BE PLACED AT A MINIMUM 0.5% GRADE.
4. ANTICIPATED CULVERT CROSSINGS ARE SHOWN ON THE CONSTRUCTION PLAN, ADDITIONAL CULVERTS MAY NEED TO BE INSTALLED IN AREAS WHERE CONCENTRATED FLOW IS EXPECTED DUE TO CONSTRUCTION ACTIVITIES.
5. CONSTRUCTION DRAINAGE CROSSINGS TO MAINTAIN EXISTING FLOW CHARACTERISTICS OF THE FEATURES. FEATURES SHALL BE GRADED TO PRECONSTRUCTION CONTOURS.

TESTING:

1. TESTING SHALL BE PERFORMED BY A DESIGNATED INDEPENDENT TESTING AGENCY.
2. SUBMIT ONE SET OF TESTING AND INSPECTION RECORDS SPECIFIED TO THE CIVIL ENGINEER OF RECORD.

DEFINITIONS:

1. PROOF ROLLING:
   SHALL BE PERFORMED IN THE PRESENCE OF THE GEOTECHNICAL ENGINEER OR QUALIFIED GEOTECHNICAL REPRESENTATIVE USING A FULLY LOADED TANDEM AXLE DUMP TRUCK OR WATER TRUCK WITH A MINIMUM GROSS WEIGHT OF 25 TONS OR A FULLY LOADED BELLY DUMP WITH AN EQUIVALENT AXLE LOADING. PROOF-ROLLING ACCEPTANCE STANDARDS INCLUDE NO RUTTING GREATER THAN 1.5 INCHES, AND NO "PUMPING" OF THE SOIL BEHIND THE LOADED TRUCK.
2. SIEVE ANALYSIS:
   SHALL BE CONDUCTED IN ACCORDANCE WITH AASHTO T27
3. PROCTORS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T99
4. ATTERBERG LIMITS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T89 AND T90
5. MOISTURE DENSITY (NUCLEAR DENSITY):
   SHALL BE DONE IN ACCORDANCE WITH AASHTO T310
6. DYNAMIC CONE PENETROMETER (DCP) TESTING:
   SHALL BE DONE IN ACCORDANCE WITH ASTM D6951-03

REQUIREMENTS:

1. FILL PLACEMENT:
   A. SOILS USED AS FILL MATERIAL SHALL BE TESTED FOR MOISTURE CONTENT AND PROCTOR TESTS.
   B. WHERE FILL CONSTRUCTION REQUIRES MORE THAN 12 INCHES OF FILL PLACEMENT, COMPACT EACH LIFT TO A MINIMUM OF 95 PERCENT OF THE MATERIAL'S MAXIMUM STANDARD PROCTOR DRY DENSITY.
2. COMPACTED SUBGRADE (CEMENT STABILIZED):
   A. SEE SHEET 13 FOR TESTING REQUIREMENTS AND PROCEDURE.
3. COMPACTED SUBGRADE (NON-CEMENT STABILIZED):
   A. THE ENTIRE SUBGRADE SHALL BE PROOF-ROLLED PRIOR TO THE PLACEMENT OF THE AGGREGATE BASE TO IDENTIFY AREAS OF UNSTABLE SUBGRADE.
   B. PERFORM A MINIMUM OF 3 DYNAMIC CONE PENETROMETER (DCP) TESTS PER ACCESS ROAD OR ONE FOR EVERY 1,000 LF OF ROAD, WHICHEVER IS GREATER. SUBGRADE MUST MEET A MINIMUM DCP OF 3 BLOWS PER 6" TO A TOTAL DEPTH OF 2' (MINIMUM CBR=1.5).
   C. IF A PASSING PROOF-ROLL OR DCP REQUIREMENTS CANNOT BE ACHIEVED THE FOLLOWING ALTERNATIVES MAY BE IMPLEMENTED:
      a. SCARIFY, DRY, AND RECOMPACT SUBGRADE
      b. REMOVE UNSUITABLE MATERIAL AND REPLACE WITH SUITABLE MATERIAL
      c. INCREASE AGGREGATE BASE THICKNESS
4. AGGREGATE BASE:
   A. AGGREGATE BASE SHALL BE PROOF-ROLLED OVER THE ENTIRE LENGTH. IF PROOF ROLLING DETERMINES THAT THE ROAD IS UNSTABLE, ADDITIONAL AGGREGATE SHALL BE ADDED UNTIL THE UNSTABLE SECTION IS ABLE TO PASS A PROOF ROLL.
   B. PROVIDE 1 SIEVE ANALYSIS (PROJECT MAX OF 20) PER 2500 CY OF ROAD BASE PLACED.
5. CRANE PAD AND CRANE PATHS / CRANE TRAVEL SHOULDERS:
   A. TESTING REQUIREMENTS ARE PENDING BASED ON CRANE PICK PLANS PROVIDED BY THE CONTRACTOR.

TABLE 2: TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
FILL PLACEMENT	PROCTOR	1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER LIFT PER 5000 SF OF FILL PLACED OR 1 PER 500 LF OF ROAD OR CRANE WALK
COMPACTED SUBGRADE (CEMENT STABILIZED):	SEE SHEET 13	SEE SHEET 13
COMPACTED SUBGRADE (NON-CEMENT STABILIZED):	PROOF-ROLL	ENTIRE AREA
	DCP	1 PER 1,000 FT OR MIN. 3 PER ROAD
AGGREGATE BASE	PROOF-ROLL	ENTIRE AREA
	SIEVE ANALYSIS, LL, PL, AND L.A ABRASION	1 PER 2,500 CY

GENERAL NOTES:

1. GROUND SURFACE CONTOURS (AT TWO-FOOT VERTICAL INTERVALS) AND ELEVATIONS ARE BASED ON A PHOTOGRAMMETRY SURFACE PROVIDED BY GEOTERRA. IF MAJOR DISCREPANCIES ARE FOUND IN THE GROUND ELEVATIONS DURING FIELD STAKING TO THE GROUND ELEVATIONS SHOWN ON THE PLANS, THE OWNER AND ENGINEER SHALL BE NOTIFIED.
2. WHERE SECTION OR SUBSECTION MONUMENTS ARE ENCOUNTERED, THE OWNER SHALL BE NOTIFIED BEFORE SUCH MONUMENTS ARE REMOVED. THE CONTRACTOR SHALL PROTECT AND CAREFULLY PRESERVE ALL PROPERTY MARKERS AND MONUMENTS UNTIL THE OWNER, AN AUTHORIZED SURVEYOR OR AGENT HAS WITNESSED OR OTHERWISE REFERENCED THEIR LOCATION.
3. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. TYPICAL DISTURBANCE SHALL BE LIMITED TO 10 LF FROM THE EDGE OF PROPOSED GRADING.
4. FINALIZE GRADING AROUND THE BASE OF TURBINES IN ACCORDANCE WITH DETAIL TS-03 AND TS-04.
5. GRADE ALL PROPOSED ROADS TO A MAXIMUM SLOPE OF 8%. IF 8% SLOPE CANNOT BE ACHIEVED, THE CONTRACTOR MAY UTILIZE ASSIST VEHICLES FOR THE PURPOSE OF DELIVERIES. GRADE ALL PROPOSED CRANE PATHS TO A MAXIMUM OF 8% UNLESS OTHERWISE NOTED IN PLAN SHEETS.
6. ANY FACILITIES REMOVED TO ALLOW FOR CONSTRUCTION (MAILBOXES, SIGNS, FENCES, ETC.) SHALL BE REPLACED BY THE CONTRACTOR IN A CONDITION AS GOOD AS EXISTING.
7. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING DRAINAGE THROUGHOUT THE CONSTRUCTION OF THIS PROJECT. CONSTRUCTION ACTIVITIES SHALL NOT BLOCK THE NATURAL OR MANMADE CREEKS OR DRAINAGE SWALES CAUSING RAINWATER TO POND. DEPENDING ON FIELD CONDITIONS, ADDITIONAL CULVERTS IN EXCESS OF THOSE ON THE PLANS MAY BE REQUIRED.
8. WHILE BUILDING THE ROADS AND EXCAVATING THE TURBINE FOUNDATIONS, EXCESS SOIL WILL RESULT. THE CONTRACTOR SHALL DISPOSE OF THIS EXCESS SOIL IN AN APPROVED MANNER. EXCESS TOPSOIL SHALL BE DISTRIBUTED INTO A THIN LAYER ON LAND IMMEDIATELY ADJACENT TO WHERE THE TOPSOIL ORIGINATED. ALL EXCESS TOPSOIL TO BE WASTED ONSITE. WHILE DOING SO THE CONTRACTOR SHALL AVOID CAUSING RIDGES OR MOUNDS THAT WOULD MAKE IT DIFFICULT FOR STORM WATER RUNOFF TO DRAIN. THE FINAL SURFACE OF THE DISTURBED TOPSOIL SHALL BE SMOOTH AND FOLLOW THE NATURAL CONTOUR OF THE LAND.
9. THE CONTRACTOR SHALL NOTIFY SOUTH DAKOTA 811 AT LEAST 48 HOURS BEFORE EXCAVATION ACTIVITIES COMMENCE.
10. TEMPORARY INTERSECTION WIDENING SHALL, UPON COMPLETION OF ALL PROJECT CONSTRUCTION OR UPON NOTIFICATION OF THE ENGINEER, BE REMOVED AND THE AREA RESTORED TO ITS ORIGINAL LINES AND GRADES WITH TOPSOIL REPLACED, EXCEPT WHERE REQUESTED BY THE TOWNSHIP OR COUNTY TO PERMANENTLY REMAIN. DISTURBED AREAS OUTSIDE OF THE FINAL ROADWAY SHALL BE SEEDED AND MULCHED.
11. TURBINE SETBACKS ARE NOT IDENTIFIED ON THE CONSTRUCTION PLANS. IT SHALL BE THE RESPONSIBILITY OF THE OWNER AND CONTRACTOR TO ENSURE THAT ALL TURBINE SETBACKS MEET PROJECT REQUIREMENTS.
12. GEOTECHNICAL REPORTS WITH RECOMMENDATIONS HAVE BEEN PROVIDED BY THE OWNER. ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL ENGINEERING REPORT AND RECOMMENDATIONS.
13. FIELD SURVEY WETLAND INFORMATION HAS BEEN PROVIDED BY THE OWNER. ALL WETLAND DELINEATIONS AND PERMITTING SHALL BE THE RESPONSIBILITY OF OTHERS AND BE COMPLETED PRIOR TO CONSTRUCTION COMMENCING. THE OWNER AND GENERAL CONTRACTOR SHALL VERIFY THAT ALL WETLAND PERMITS HAVE BEEN SUBMITTED AND APPROVED PRIOR TO CONSTRUCTION COMMENCING.
14. CULTURAL RESOURCE REPORTS HAVE NOT BEEN PROVIDED. CULTURAL RESOURCE LOCATIONS ARE NOT SHOWN ON THE PLANS. INFORMATION WILL BE THE RESPONSIBILITY OF THE OWNER AND GENERAL CONTRACTOR. THE LOCATIONS OF CULTURAL RESOURCE SITES MAY BE CONFIDENTIAL AND PROTECTED BY STATE OR FEDERAL LAW. PUBLIC RELEASE OF SPECIFIC INFORMATION REGARDING THESE RESOURCES MAY BE RESTRICTED.
15. AN ENVIRONMENTAL ASSESSMENT HAS NOT BEEN PROVIDED. THE CONTRACTOR SHALL BE FAMILIAR WITH THE REPORT AND REVIEW ALL RECOMMENDATIONS.
16. ELECTRICAL INFORMATION SHOWN ON THE PLANS IS FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSULTANT'S PLANS FOR SPECIFIC LOCATIONS AND CONSTRUCTION DETAILS FOR THE UNDERGROUND POWER COLLECTION SYSTEM AND SUBSTATION.
17. CRANE PATHS ARE SHOWN ON THE CONSTRUCTION PLANS. IF THE CONTRACTOR PROPOSES ALTERNATE CRANE PATHS, THEY SHALL ENSURE THAT WETLAND AND CULTURAL RESOURCE CORRIDORS ARE NOT DISTURBED. FINAL CRANE PATH ALIGNMENTS SHALL BE DETERMINED BY THE CONTRACTOR BASED ON FIELD CONDITIONS WITHIN THE WETLAND AND CULTURAL RESOURCE CORRIDORS, SPECIAL LANDOWNER AGREEMENTS AND THE PROJECT BOUNDARY.
18. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. DISTURBANCE SHALL BE LIMITED TO 50 LF WIDTH FOR PROPOSED ACCESS ROADS AND 50 LF FOR CRANE PATHS, AND SHALL BE LIMITED TO A 250 LF RADIUS FOR PROPOSED WIND TURBINE GENERATORS. THE GRADING LIMITS SHALL BE CENTERED ON THE ROADWAYS AND WIND TURBINES. THE CONTRACTOR SHALL MAKE ALL EFFORTS TO KEEP ACTIVITIES WITHIN THE ERECTION AREAS SHOWN ON THE PLANS BUT IT IS UNDERSTOOD THAT SOME ACTIVITIES THAT WILL NOT REQUIRE GRADING OR SOIL DISTURBANCE MAY EXTEND BEYOND THE DEFINED LIMITS. DURING ERECTION OF THE ROTOR, TRUCKS AND/OR FORKLIFTS MAY EXTEND BEYOND THESE LIMITS. SEE DETAIL TS01 FOR TYPICAL ERECTION AREAS.
19. AN ALTA SURVEY HAS BEEN PROVIDED BY WESTWOOD. CONTRACTOR AND OWNER ARE RESPONSIBLE FOR LOCATING ALL UTILITIES AND VERIFYING LOCATION OF CONSTRUCTION ACTIVITIES PRIOR TO COMMENCING WORK.

STORMWATER POLLUTION PREVENTION PLAN (SWPPP):

1. THE CONTRACTOR SHALL PROVIDE EROSION CONTROL MEASURES AS PLANNED AND SPECIFIED FOLLOWING BEST MANAGEMENT PRACTICES AS OUTLINED BY THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND BEING IN CONFORMANCE WITH THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL STORMWATER PERMIT.
2. REFER TO THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR THE TRIPLE H WIND FARM, PREPARED BY WESTWOOD PROFESSIONAL SERVICES, FOR EROSION CONTROL AND RESTORATION SPECIFICATIONS, SEDIMENT AND EROSION CONTROL PROCEDURES, LOCATIONS OF BMPs, DETAILS, AND INSPECTION INFORMATION.
3. ALL PASTURES AND DRAINAGE SWALES DISTURBED DURING CONSTRUCTION ACTIVITIES AND NOT COVERED BY ROAD SURFACING MATERIALS, SHALL BE SEEDED IN ACCORDANCE WITH THE SWPP PLAN.
4. TEMPORARY EROSION CONTROL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE TEMPORARY EROSION CONTROL PLAN SHALL BE IN ACCORDANCE WITH THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND THE TRIPLE H WIND FARM STORMWATER POLLUTION PREVENTION PLAN ON FILE.

PROJECT CONTACT INFORMATION:

TITLE	COMPANY	NAME	CONTACT NUMBER
OWNER (PRIMARY)	ENGIE	CASEY WILLIS	805-569-6185
PROJECT MANAGER	WESTWOOD	DANI NYGREN	952-906-7493
ENGINEER OF RECORD	WESTWOOD	ROB COPOULS	952-906-7470
CONTRACTOR	WANZEK	JASON HELLERUD	701-893-3685

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 300
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com

Westwood Professional Services, Inc.

Designed: BMK
Checked: DPX
Drawn: BMK
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/08/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2028 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 12 of 57

0014400TP.dwg

©2019 Westwood Professional Services, Inc.

CEMENT STABILIZATION - PROCEDURE

THE SPECIFICATIONS BELOW ARE GENERAL RECOMMENDATIONS/GUIDELINES FOR CEMENT STABILIZATION OF SUBGRADES FOR THE PROJECT. ACTUAL FIELD CONDITIONS MAY ALTER APPLICATION RATE. CONSULT GEOTECHNICAL ENGINEER FOR FURTHER RECOMMENDATIONS.

1. STRIP THE TOP ±4 INCHES OF TOPSOIL (THROUGH THE ROOT ZONE) FROM THE AREA TO BE STABILIZED. ROOTS SMALLER THAN 1/4" DIAMETER ARE CONSIDERED INSIGNIFICANT.
2. PERFORM A PROCTOR (ASTM D 698) TEST TO DETERMINE THE OPTIMUM MOISTURE CONTENT IF THE MATERIAL TO BE STABILIZED DOES NOT MATCH A PREVIOUSLY PERFORMED PROCTOR.
3. DETERMINE THE IN-SITU MOISTURE CONTENT USING A NUCLEAR DENSITY GAUGE (OR EQUIVALENT MOISTURE CONTENT TEST) DAILY, PRIOR TO INCORPORATION OF THE CEMENT. PROVIDE ADDITIONAL MOISTURE CONTENT TESTING AS NEEDED BASED ON WEATHER CONDITIONS.
   - 3.1. THE CONTRACTOR WILL BE ADVISED OF IN-SITU MOISTURE CONTENT, AND MOISTURE ADJUSTMENTS SHOULD BE MADE IF IN-SITU MOISTURE IS LESS THAN OPTIMUM MOISTURE CONTENT AS DETERMINED BY THE PROCTOR (ASTM D 698).
4. SOIL AND CEMENT BLENDING:
   - 4.1. COMPLETELY BLEND SUBGRADE SOIL WITH THE APPROPRIATE AMOUNT OF CEMENT BY WEIGHT. FIELD RESULTS FROM TEST STRIPS WILL DICTATE THE CEMENT APPLICATION RATE.
   - 4.2. IN AREAS OF HIGH MOISTURE OR POOR SOILS, THE CONTRACTOR MAY INCREASE THE PERCENT OF CEMENT IN ORDER TO MEET THE MINIMUM SUBGRADE STRENGTH REQUIREMENTS.
   - 4.3. THE USE OF A RECLAIMER IS AN ADEQUATE BLENDING METHOD. DISCING IS NOT AN ADEQUATE BLENDING METHOD.
   - 4.4. A STABILIZATION DEPTH OF 12" WAS USED FOR DESIGN PURPOSES. STABILIZATION DEPTH MAY NEED TO INCREASE TO 16" IN AREAS OF EXTREME MOISTURE OR POOR SOILS IN ORDER TO MEET THE STRENGTH AND PROOF ROLL REQUIREMENTS.
5. COMPACTION:
   - 5.1. A ROLLING PATTERN WILL BE ESTABLISHED USING A NUCLEAR DENSITY GAUGE DURING COMPACTION.
     - 5.1.1. COMPACTION WILL BE PERFORMED UNTIL THE STABILIZED MATERIAL REACHES THE "BREAK POINT" AFTER WHICH ADDITIONAL PASSES WITH A ROLLER RESULTS IN A LOSS OF DENSITY AS MEASURED BY A NUCLEAR DENSITY GAUGE.
     - 5.1.2. COMPACTION IS TYPICALLY ACHIEVED BY MULTIPLE PASSES OF A PADFOOT ROLLER UNTIL THE ROLLER "WALKS" OUT OF THE RECLAIMED MATERIAL (SPACE IS VISIBLE BETWEEN THE DRUM AND THE RECLAIMED MATERIAL). THIS IS FOLLOWED BY BLADING AND SHAPING THE RECLAIMED MATERIAL TO FINAL PROFILE AND CROSS SECTION. REMOVING HIGH AND LOW POINTS. SMOOTH DRUM OR RUBBER TIRE ROLLERS ARE THEN USED TO FINISH ROLLING (THIS IS WHEN THE DENSITY TESTS ARE PERFORMED) UNTIL THE DENSITY OF THE MATERIAL REACHES THE "BREAK POINT."
     - 5.1.3. THE NUMBER OF PASSES AND EQUIPMENT USED TO REACH THE "BREAK POINT" IS CONSIDERED THE ROLLING PATTERN.
     - 5.1.4. A NEW ROLLING PATTERN MAY NEED TO BE ESTABLISHED IF THE PERFORMANCE REQUIREMENTS ARE NOT BEING MET. THIS MAY BE DUE TO CHANGES IN THE MOISTURE CONTENT, THE SOIL TYPE, OR THE CEMENT RATE.
   - 5.2. THE TARGET DENSITY IS 98% OF THE MAXIMUM DENSITY DETERMINED FROM THE ROLLING PATTERN.
     - 5.2.1. DENSITY TESTS SHALL BE TAKEN AT THE RATE OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER TO CONFIRM THE DENSITY IS MATCHING THE TARGET. ONCE THE ROLLING PATTERN HAS BEEN CONFIRMED IT IS RECOMMENDED THAT TESTING CONTINUE AT 1 TEST PER 1,000 LF IN EACH PASS OF THE RECLAIMER.
     - 5.2.2. IF IT IS NOT POSSIBLE TO ATTAIN THE TARGET DENSITY, AND ADDITIONAL COMPACTION DOES NOT IMPROVE THE DENSITY, A NEW ROLLING PATTERN SHOULD BE ESTABLISHED.
   - 5.3. THE AIR TEMPERATURE SHALL BE ABOVE 40 DEGREES (F) DURING THE CEMENT STABILIZATION PROCESS. MIXING CEMENT INTO FROZEN GROUND IS NOT ACCEPTABLE.
6. THE STABILIZED MATERIAL SHALL BE CONTINUOUSLY WET CURED FOR A MINIMUM OF 24 HOURS (WET CURED IS IDENTIFIED VISUALLY AS DAMP SURFACE).
7. PERFORM SUBGRADE TESTING IN ACCORDANCE WITH TESTING SCHEDULE.
8. AGGREGATE PLACEMENT:
   - 8.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 8.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 8.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

CEMENT STABILIZATION - DESIGN BASIS

1. DURING INITIAL CONSTRUCTION, CONTRACTOR SHALL CONSTRUCT MINIMUM 300 LF TEST STRIPS CONTAINING 4%, 5%, AND 6% CEMENT IN ACCORDANCE WITH CEMENT STABILIZATION PROCEDURES.
2. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 3 FOR ANTICIPATED RESULTS):
   - 2.1. PERFORM INITIAL SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M BETWEEN 4 TO 6 HOURS AFTER FINAL COMPACTION.
   - 2.2. PERFORM ADDITIONAL DCP TESTING AT 24 AND 48 HOURS AFTER FINAL COMPACTION.
   - 2.3. PERFORM SUBSEQUENT DCP TESTS AT 7 DAYS AFTER FINAL COMPACTION AS VERIFICATION OF STRENGTH CURVE.
   - 2.4. A MINIMUM OF 3 TESTS PER TEST SECTION PER TIMEFRAME IS REQUIRED. TESTS SHALL BE TAKEN AT THE CENTERLINE AND 2' FROM EACH SHOULDER.
   - 2.5. RECORD DCP TEST RESULTS EVERY 6 INCHES TO TOTAL DEPTH OF 12 INCHES.

TABLE 3: TEST STRIP CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	COMPRESSIVE STRENGTH (PSF)
4 – 6 HOURS	6	5	1,800
24 HOURS	10	7	2,500
48 HOURS	15	10	3,300
7 DAYS	30	21	5,200

CEMENT STABILIZATION - PRODUCTION

1. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 5 FOR SUMMARY OF TESTING REQUIREMENTS):
   - 1.1. PERFORM SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M NO SOONER THAN 24 HOURS AFTER FINAL COMPACTION.
   - 1.2. DCP TESTING FREQUENCY SHALL BE WITH A RANDOM SPACING AND A MINIMUM OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER. A MINIMUM OF 3 TESTS PER ROAD IS REQUIRED.
   - 1.3. THE CBR OF THE STABILIZED SUBGRADE SHOULD BE CALCULATED IN 6" INCREMENTS THROUGH THE ENTIRE DEPTH OF THE STABILIZED LAYER.
   - 1.4. THE MINIMUM REQUIRED CBR PRIOR TO PROOF-ROLLING IS PROVIDED IN TABLE 4 BELOW:

TABLE 4: FINAL CEMENT STABILIZED CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	UNDRAINED SHEAR STRENGTH (PSF)	BEARING CAPACITY (PSF)
24 – 48 HOURS	15	10	3,500	9,800
3 – 7 DAYS	30	21	7,000	18,000
28 DAYS	50	33	12,000	28,500

NOTE: UNDRAINED SHEAR STRENGTH WAS CALCULATED USING THE BLACK (1961) EQUATION. BEARING CAPACITY WAS CALCULATED USING THE VESIC EQUATION MODIFIED FOR TWO LAYERS (12" CEMENT STABILIZED SUBGRADE OVER A NATURAL SUBGRADE WITH A CBR OF 1.5)

   - 1.5. ONCE THE MINIMUM REQUIRED CBR IS ACHIEVED AT ANY CORRESPONDING TIME PERIOD, THE SUBGRADE IS CONSIDERED ADEQUATE AND THE CONTRACTOR MAY PROCEED WITH PROOF-ROLL TESTING. FUTURE DCP TESTING ON THAT SEGMENT OF SUBGRADE IS NOT REQUIRED.
   - 1.6. IF TESTING DOES NOT INDICATE A CBR OF 30 WITHIN 7 DAYS, ADDITIONAL GRAVEL SURFACING AND/OR THE ADDITION OF GEOTEXTILE FABRIC MAY BE REQUIRED. FOR FUTURE SUBGRADE STABILIZATION AREAS, CONTACT THE ENGINEER AND OWNER VIA RFI FOR RECOMMENDATIONS AND APPROVAL.
2. SUBGRADE PROOF-ROLL TESTING AND ACCEPTANCE:
   - 2.1. ONCE THE REQUIRED DCP VALUE HAS BEEN OBTAINED BUT PRIOR TO PLACING AGGREGATE, THE SUBGRADE SHALL BE PROOF-ROLLED. REFER TO THE PROJECT TESTING REQUIREMENTS FOR PROOF-ROLL DEFINITION.
   - 2.2. PROOF-ROLLING SHOULD BE PERFORMED WITH ONE PASS DOWN THE CENTER AND NOT BE PERFORMED WITHIN 12 INCHES OF THE EDGE OF THE STABILIZED SECTION.
   - 2.3. IF PROOF-ROLLING FAILS, RE-STABILIZATION MAY BE REQUIRED AND A NEW ROLLING PATTERN OR ADDITIONAL CEMENT MAY BE REQUIRED.
3. AGGREGATE PLACEMENT:
   - 3.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 3.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 3.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

TABLE 5: CEMENT STABILIZATION PRODUCTION TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
COMPACTED SUBGRADE (CEMENT STABILIZED)	PROCTOR	MINIMUM 1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER 1000 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
NOTE: SEE ABOVE FOR INITIAL TESTING REQUIREMENTS	DCP TEST	1 PER 500 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
	PROOF-ROLL (AFTER PASSING DCP TESTS)	ENTIRE LENGTH

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 www.westwoodps.com
Westwood Professional Services, Inc.

Designed: BMC
Checked: DBH
Drawn: BMC
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2028 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 13 OF 57

0014440TP.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 202nd Street in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 540' East of 204th Street & 202nd Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.27'15.81" W Long. -99.33'02.70" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001072 NE4 Less Lot 2 1-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Tanya Stanc
Signature of Applicant

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 202nd Street in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 540' East of 204th Street & 202nd Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.27'15.81" W Long. -99.33'02.70" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001072 NE4 Less Lot 2 1-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: _____

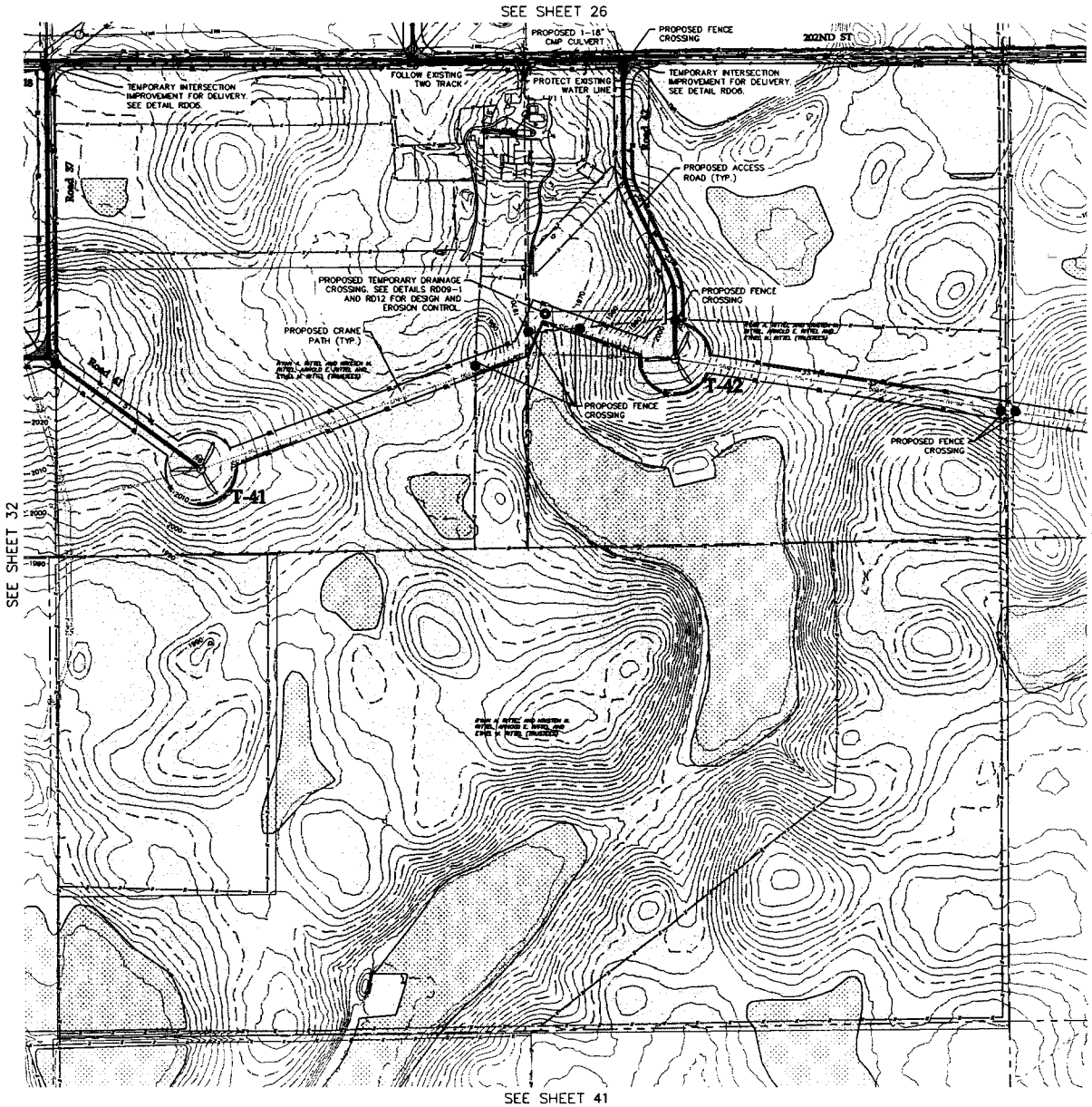
Signature of Applicant

Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

©2019 Westwood Professional Services, Inc.



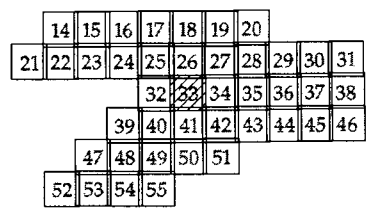
LEGEND:

- PROPOSED TURBINE LOCATION
- T-XX — PROPOSED TURBINE NUMBER
- PROPOSED ALTERNATE TURBINE LOCATION
- ALT-XX — PROPOSED ALTERNATE TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED ALTERNATE ACCESS ROAD
- PROPOSED CRANE PATH
- PROPOSED UNDERGROUND COLLECTION*
- PROPOSED DISTURBANCE LIMITS
- SF — PROPOSED PERIMETER SEDIMENT CONTROL
- 980 — EXISTING 10' CONTOURS
- EXISTING 2' CONTOURS
- EXISTING GRAVEL EDGE
- EXISTING BITUMINUS EDGE
- EXISTING RIGHT-OF-WAY
- EXISTING PARCEL LINE
- EXISTING BUILDING
- EXISTING FENCE
- EXISTING OVERHEAD POWER
- EXISTING HIGH VOLTAGE OVERHEAD POWER
- EXISTING UNDERGROUND POWER LINE
- EXISTING FIBER OPTIC LINE
- EXISTING WATER LINE
- DELINEATED WETLAND
- ARCHAEOLOGICAL AVOIDANCE AREA
- EXISTING USFWS EASEMENT
- PROJECT BOUNDARY
- 1900 — EXISTING GROUND ELEVATION
- PROPOSED DRAINAGE CROSSING**
- PROPOSED TEMPORARY DRAINAGE CROSSING**
- PROPOSED FENCE CROSSING***
- PROPOSED UTILITY CROSSING
- PROPOSED CULVERT

* PROVIDED BY OTHERS AND SHOWN FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSTRUCTION PLANS FOR DETAILS.

** SEE SHEET 11 FOR DRAINAGE CROSSING TYPE AND SIZING. DRAINAGE CROSSINGS SHALL CONSIST OF LOW WATER CROSSING OR CULVERT. DRAINAGE CROSSINGS ALONG CRANE PATH SHALL CONSIST OF CRANE MATS OR TEMPORARY CULVERT.

*** ALL GATE INSTALLATIONS SHALL BE FIELD DETERMINED AND AGREED UPON BY THE CONTRACTOR AND OWNER.



KEY MAP

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-Free (888) 937-5150 westwoodps.com

Whitetail Professional Services, Inc.

Designed:	BMC
Checked:	DJH
Drawn:	BMC
As-Built Drawings:	

Revisions

#	Date	Description
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

3626 2nd Avenue NW
West Fargo, ND 58078

0' 300' 600' 900'

Triple H Wind Farm

Hyde County, South Dakota

Site Plan T-41 - T-42

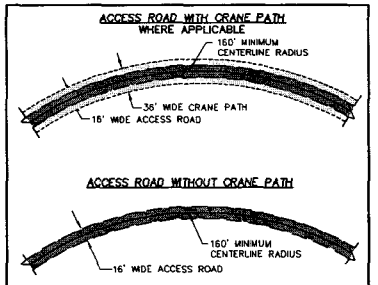
90% COMPLETE NOT FOR CONSTRUCTION

Date: 07/19/19

Sheet: 33 OF 57

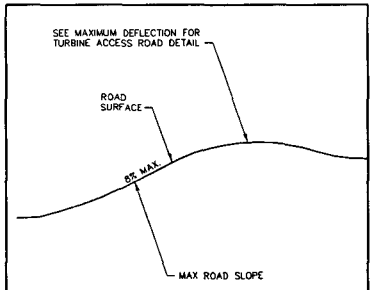
001444SP01.dwg

© 2019 Westwood Professional Services, Inc.



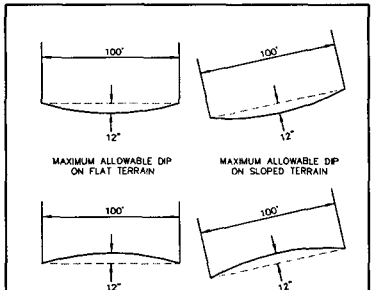
NOTE:
1. SOME RADII MAY REQUIRE ADDITIONAL SOIL COMPACTION OR GRAVEL OUTSIDE OF THE WIDTH SHOWN ABOVE TO ACCOMMODATE TRACTORS OR TRAILERS TRACKING OFF THE ACCESS ROAD.

	MINIMUM RADIUS FOR TURBINE ACCESS ROAD	LAST REVISED: 04/29/11
Westwood		RD02

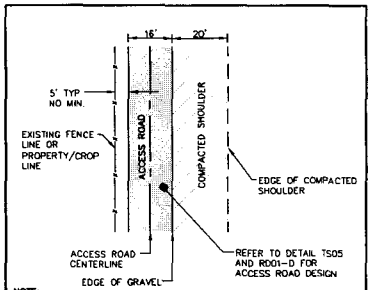


NOTES:
1. ROAD SLOPE SHALL NOT EXCEED 8% WITHOUT OWNER APPROVAL.

	MAXIMUM VERT. SLOPE FOR TURBINE ACCESS ROAD/CRANE TRAVEL PATH	LAST REVISED: 3/23/07
Westwood		RD03

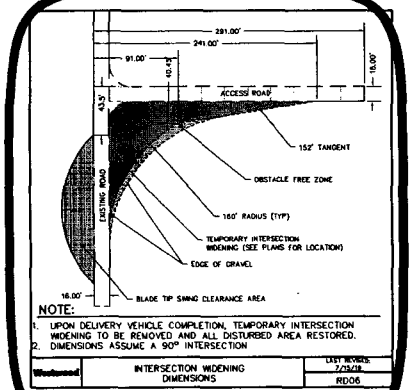


	MAXIMUM DEFLECTION FOR TURBINE ACCESS ROAD	LAST REVISED: 8/28/08
Westwood		RD04



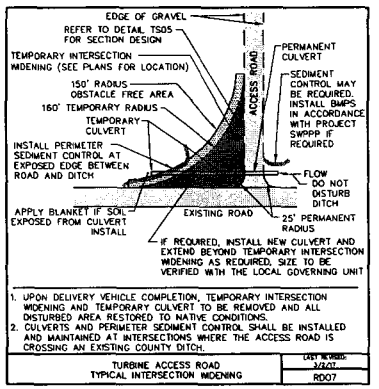
NOTE:
1. COMPACTED SHOULDER SHALL BE RETURNED TO NATIVE CONDITION FOLLOWING TURBINE GENERATOR CONSTRUCTION.
2. THE ACCESS ROAD MAY NEED TO BE CONSTRUCTED FARTHER FROM THE PROPERTY LINE IF OBSTRUCTIONS SUCH AS TREES FOLLOW THE PROPERTY LINE.

	TURBINE ACCESS ROAD ALONG FENCE/PROPERTY/CROP LINE	LAST REVISED: 3/23/07
Westwood		RD05



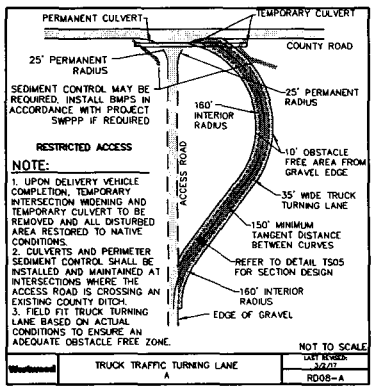
NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING TO BE REMOVED AND ALL DISTURBED AREA RESTORED.
2. DIMENSIONS ASSUME A 90° INTERSECTION

	INTERSECTION WIDENING DIMENSIONS	LAST REVISED: 7/13/18
Westwood		RD06



1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.

	TURBINE ACCESS ROAD TYPICAL INTERSECTION WIDENING	LAST REVISED: 3/23/07
Westwood		RD07

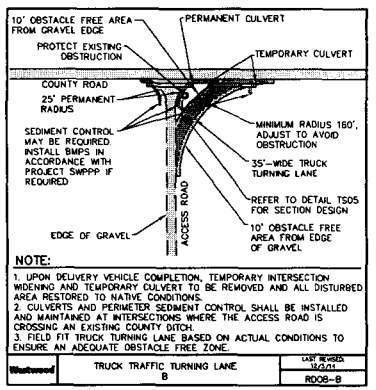


RESTRICTED ACCESS

NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

NOT TO SCALE

	TRUCK TRAFFIC TURNING LANE A	LAST REVISED: 3/23/07
Westwood		RD08-A



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

	TRUCK TRAFFIC TURNING LANE B	LAST REVISED: 12/3/11
Westwood		RD08-B

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-Free (888) 937-5150 twpmail@westwoodps.com
Westwood Professional Services, Inc.

Designed: GMK
Checked: DSH
Drawn: GMK
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2030 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

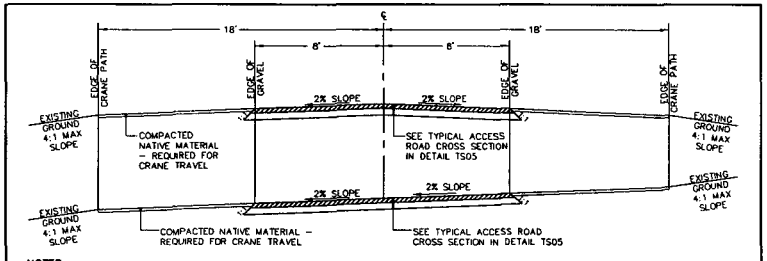
Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 5 OF 57

0014440D1P.dwg

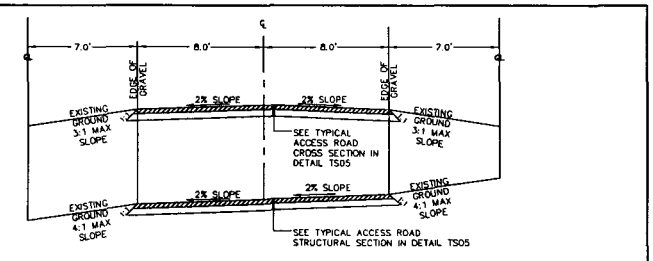
©2019 Westwood Professional Services, Inc.



NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE ACCESS ROAD DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

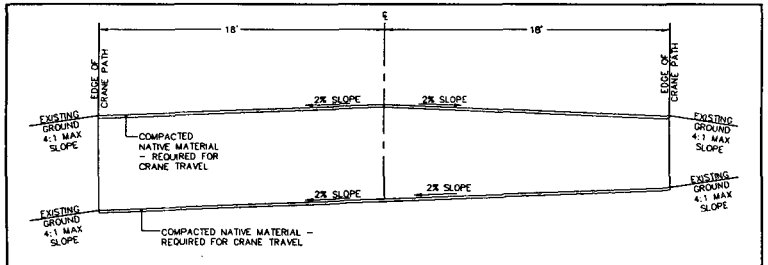
Westwood | TYPICAL TURBINE ACCESS ROAD AND CRANE PATH | LAST REVISED: 04/29/21 | RD01-A



NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

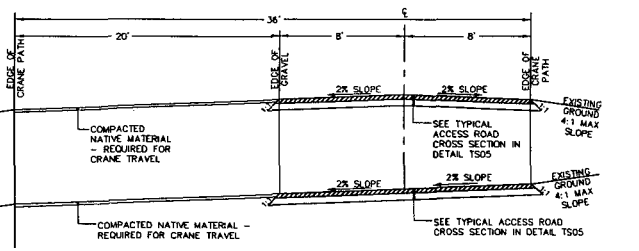
Westwood | TYPICAL TURBINE ACCESS ROAD SECTION | LAST REVISED: 3/18/19 | RD01-B



NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE WHERE CRANE PATHS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT CRANE PATH REMAINS WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%

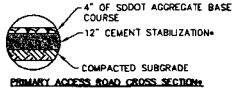
Westwood | TYPICAL CRANE PATH | LAST REVISED: 04/29/21 | RD01-C



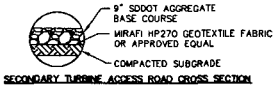
NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE EDGE OF COMPACTED SHOULDER DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

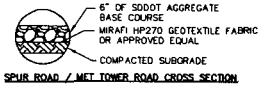
Westwood | TYPICAL TURBINE ACCESS ROAD AND OFFSET CRANE PATH | LAST REVISED: 04/29/21 | RD01-D



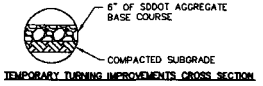
PRIMARY ACCESS ROAD CROSS SECTION



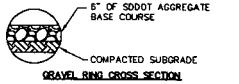
SECONDARY TURBINE ACCESS ROAD CROSS SECTION



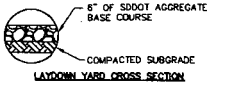
SPUR ROAD / MET TOWER ROAD CROSS SECTION



TEMPORARY TURNING IMPROVEMENTS CROSS SECTION



GRAVEL RING CROSS SECTION



LAYDOWN YARD CROSS SECTION

* CEMENT APPLICATION RATE MAY VARY BASED ON TEST STRIPS AND FIELD PERFORMANCE. SEE SHEET 13 FOR CEMENT STABILIZATION PROCEDURE AND DESIGN BASIS.

NOTES:

STRUCTURAL SECTIONS SHOWN ARE THE MINIMUM THICKNESS REQUIREMENTS DURING NORMAL FIELD CONDITIONS. THE SECTIONS MAY NEED TO BE INCREASED BASED ON ACTUAL FIELD CONDITIONS AT THE TIME OF CONSTRUCTION. CONDITIONS INCLUDE BUT ARE NOT LIMITED TO CONSTRUCTION DURING THE FREEZE/THAW CYCLE, UNUSUALLY WET PERIODS, OR IN LOW/WET AREAS. SEE SHEET 12 FOR TESTING REQUIREMENTS AND SPECIFICATIONS.

Westwood | TYPICAL STRUCTURAL CROSS SECTIONS

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed: BMC
Checked: DJM
Drawn: BMC
As-Built Drawing:

Revisions

#	DATE	DESCRIPTION
A	12/08/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 4 OF 57

001444DTP.dwg

©2019 Westwood Professional Services, Inc.

ROAD DESIGN PARAMETERS

1. ACCESS ROADS HAVE BEEN DESIGNED TO ACCOMMODATE LIGHT DUTY TRUCKS (PICKUP TRUCKS AND MAINTENANCE VEHICLES) FOR LOW VOLUME USE IN NORMAL OPERATING CONDITIONS AS WELL AS HEAVY DUTY CONSTRUCTION TRAFFIC UNDER DRY CONDITIONS. THE ROAD DESIGN SPECIFIED IS NOT INTENDED FOR ALL WEATHER USE FOR HEAVY DUTY CONSTRUCTION LOADS.
2. ROAD MAINTENANCE CAN BE EXPECTED OVER THE LIFE OF THE PERMANENT FACILITY.

PRODUCTS

1. AGGREGATE BASE SHALL CONSIST OF SDDOT AGGREGATE BASE COURSE (AND IN CONFORMANCE WITH THE GRADATION TABLE 1). AGGREGATE MAY BE CRUSHER RUN UPON ENGINEERS APPROVAL. AGGREGATE GRADATIONS SHALL BE SUBMITTED TO ENGINEER FOR REVIEW.
2. ROAD SHOULDERS AND CRANE PADS SHALL CONSIST OF COMPACTED NATIVE SOILS.
3. CULVERTS: ACCESS ROAD CULVERTS SHALL MEET THE MINIMUM SPECIFICATIONS SET FORTH BY THE SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION AND/OR HYDE COUNTY. ALL CULVERTS ARE PLANNED TO BE A MINIMUM 18" DIAMETER AND MANUFACTURED OF 16-GAGE CORRUGATED METAL PIPE WITH NO END TREATMENTS UNLESS NOTED OTHERWISE. ACTUAL SIZE WILL BE DETERMINED THROUGH HYDRAULIC ANALYSIS.
4. GEOTEXTILE FABRIC: MIRAFI HP270 OR APPROVED EQUAL.

EXECUTION

1. CLEARING AND GRUBBING
   A. THE CONTRACTOR SHALL BE REQUIRED TO GRUB ALL TREES, STUMPS, BRUSH, AND DEBRIS WITHIN THE GRADING AREAS SHOWN ON THE PLANS. GRUBBING INCLUDES REMOVAL OF ALL PLANT MATERIAL GREATER THAN 2" INCLUDING STUMPS, BRANCHES, ROOTS, ETC. TO A DEPTH BELOW THE FINAL SUBGRADE. THE CONTRACTOR IS TO REMOVE ONLY THOSE TREES WHICH ARE DESIGNATED BY THE OWNER'S REPRESENTATIVE FOR REMOVAL, AND SHALL EXERCISE EXTREME CARE AROUND EXISTING TREES TO BE SAVED.
2. TOPSOIL STRIPPING
   A. TOPSOIL, INCLUDING ROOTS LARGER THAN 2" AND LARGE ROOT MASSES, SHALL BE STRIPPED FROM ALL ROADWAY AND FOUNDATION AREAS UP TO 10". TOPSOIL SHALL NOT BE STRIPPED OUTSIDE OF THE DESIGNATED DISTURBANCE AREAS.
   B. ANY TOPSOIL THAT HAS BEEN STRIPPED SHALL BE STOCKPILED FOR POST CONSTRUCTION REVEGETATION. ALL TOPSOIL SHALL BE REDISTRIBUTED TO THE LAND OWNER'S PROPERTY OF WHERE IT ORIGINATED FROM.
3. FILL PLACEMENT
   A. FILL PLACEMENT SHALL CONSIST OF THE PLACING OF SUITABLE FILL MATERIAL, AFTER TOPSOIL STRIPPING, ABOVE THE EXISTING GRADE. GENERALLY, SIDE SLOPES SHALL BE CONSTRUCTED AT FOUR FOOT HORIZONTAL TO ONE FOOT VERTICAL, WITH SOME LOCATIONS THROUGHOUT THE PROJECT WITH SLOPES OF TWO FEET HORIZONTAL TO ONE FOOT VERTICAL. THE MATERIAL FOR FILL CONSTRUCTION SHALL BE OBTAINED FROM THE ACCESS ROAD/TURBINE EXCAVATION (SEE GEOTECHNICAL REPORT FOR RESTRICTIONS), OR ANY SUITABLE, APPROVED SOIL OBTAINED ONSITE/OFFSITE BY CONTRACTOR, AS DIRECTED OR APPROVED BY THE ENGINEER. THIS MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 12" AND CONSTRUCTED TO 95% OF THE MAXIMUM DRY DENSITY AND WITHIN 2% OF OPTIMUM MOISTURE CONTENT, AS DETERMINED BY THE STANDARD PROCTOR (AASHTO T99).
   B. SIDE SLOPES GREATER THAN 4:1 WILL NOT BE PERMITTED, UNLESS OTHERWISE NOTED ON THE PLAN.
   C. FILL SLOPES SHALL BE BENCHED INTO THE EXISTING SLOPE TO PREVENT MOVEMENT BETWEEN THE FILL AND NATIVE SOILS. BENCHES SHOULD BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO FILL PLACEMENT. POSITIVE DRAINAGE IS REQUIRED AT BENCHED AREAS AND AT THE TOE OF FILL SLOPES TO REMOVE SURFACE WATER.
4. SUBGRADE
   A. SUBGRADE PREPARED AT GRADE OR IN CUT REQUIRES SCARIFICATION AND RECOMPACTION TO A DEPTH OF 12" OR MORE.
   B. ACCESS ROAD CROSS SLOPES SHOWN IN THE PLANS ARE MEANT AS A GUIDE. ACCESS ROAD CROSS SLOPES MAY RANGE FROM 1% - 2%, CHECK WITH THE ENGINEER IF THE CROSS SLOPE FALLS OUTSIDE OF THIS RANGE. ACCESS ROADS BEING UTILIZED FOR CRANE TRAVEL SHOULD HAVE A MAX CROSS SLOPE OF 2%

TABLE 1: SDDOT AGGREGATE BASE COURSE - LOCALLY SOURCED	
SIEVE SIZE	PERCENT PASSING
1"	100
3/4"	80-100
1/2"	68-91
NO. 4	46-70
NO. 8	34-58
NO. 40	13-35
NO. 200	3-12

MEET FOLLOWING REQUIREMENTS PER 882.2

LIQUID LIMIT (MAX) = 25
PLASTICITY INDEX = 0-6
L.A ABRASION (% MAX) = 40%

GRADATION HAS BEEN OBTAINED FROM THE 2015 SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION BOOK.

STORM WATER DESIGN PARAMETERS

1. SEE SHEET 6 FOR CULVERT SIZING AND DESIGN PARAMETERS. SEE HYDROLOGY MEMO FOR FURTHER DESIGN CALCULATIONS. CULVERTS SHALL BE MINIMUM 18" CORRUGATED METAL PIPE. ALL TEMPORARY PORTIONS OF THE INSTALLED CULVERTS SHALL BE REMOVED UPON COMPLETION OF THE PROJECT.
2. IT IS EXPECTED THAT CULVERTS WILL BE OVERTOPPED DURING SOME STORMS AND MAINTENANCE WILL BE REQUIRED THROUGH THE LIFE OF THE PROJECT.
3. WHEN INSTALLING DRAINAGE CULVERTS THE CONTRACTOR SHALL USE JUDGMENT IN SETTING THE FLOW LINE ELEVATIONS AND CULVERT LONGITUDINAL SLOPE. TYPICALLY THE FLOW LINE ELEVATIONS AND LONGITUDINAL SLOPE OF THE CULVERT SHOULD MATCH THE NATURAL GROUND ELEVATIONS AND SLOPE TO ENSURE POSITIVE DRAINAGE. WHEN POSSIBLE, ALL CULVERTS SHOULD BE PLACED AT A MINIMUM 0.5% GRADE.
4. ANTICIPATED CULVERT CROSSINGS ARE SHOWN ON THE CONSTRUCTION PLAN, ADDITIONAL CULVERTS MAY NEED TO BE INSTALLED IN AREAS WHERE CONCENTRATED FLOW IS EXPECTED DUE TO CONSTRUCTION ACTIVITIES.
5. CONSTRUCTION DRAINAGE CROSSINGS TO MAINTAIN EXISTING FLOW CHARACTERISTICS OF THE FEATURES. FEATURES SHALL BE GRADED TO PRECONSTRUCTION CONTOURS.

TESTING:

1. TESTING SHALL BE PERFORMED BY A DESIGNATED INDEPENDENT TESTING AGENCY.
2. SUBMIT ONE SET OF TESTING AND INSPECTION RECORDS SPECIFIED TO THE CIVIL ENGINEER OF RECORD.

DEFINITIONS:

1. PROOF ROLLING:
   SHALL BE PERFORMED IN THE PRESENCE OF THE GEOTECHNICAL ENGINEER OR QUALIFIED GEOTECHNICAL REPRESENTATIVE USING A FULLY LOADED TANDEM AXLE DUMP TRUCK OR WATER TRUCK WITH A MINIMUM GROSS WEIGHT OF 25 TONS OR A FULLY LOADED BELLY DUMP WITH AN EQUIVALENT AXLE LOADING. PROOF-ROLLING ACCEPTANCE STANDARDS INCLUDE NO RUTTING GREATER THAN 1.5 INCHES, AND NO "PUMPING" OF THE SOIL BEHIND THE LOADED TRUCK.
2. SIEVE ANALYSIS:
   SHALL BE CONDUCTED IN ACCORDANCE WITH AASHTO T27
3. PROCTORS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T99
4. ATTERBERG LIMITS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T89 AND T90
5. MOISTURE DENSITY (NUCLEAR DENSITY):
   SHALL BE DONE IN ACCORDANCE WITH AASHTO T310
6. DYNAMIC CONE PENETROMETER (DCP) TESTING:
   SHALL BE DONE IN ACCORDANCE WITH ASTM D6951-03

REQUIREMENTS:

1. FILL PLACEMENT:
   A. SOILS USED AS FILL MATERIAL SHALL BE TESTED FOR MOISTURE CONTENT AND PROCTOR TESTS.
   B. WHERE FILL CONSTRUCTION REQUIRES MORE THAN 12 INCHES OF FILL PLACEMENT, COMPACT EACH LIFT TO A MINIMUM OF 95 PERCENT OF THE MATERIAL'S MAXIMUM STANDARD PROCTOR DRY DENSITY.
2. COMPACTED SUBGRADE (CEMENT STABILIZED):
   A. SEE SHEET 13 FOR TESTING REQUIREMENTS AND PROCEDURE.
3. COMPACTED SUBGRADE (NON-CEMENT STABILIZED):
   A. THE ENTIRE SUBGRADE SHALL BE PROOF-ROLLED PRIOR TO THE PLACEMENT OF THE AGGREGATE BASE TO IDENTIFY AREAS OF UNSTABLE SUBGRADE.
   B. PERFORM A MINIMUM OF 3 DYNAMIC CONE PENETROMETER (DCP) TESTS PER ACCESS ROAD OR ONE FOR EVERY 1,000 LF OF ROAD, WHICHEVER IS GREATER. SUBGRADE MUST MEET A MINIMUM DCP OF 3 BLOWS PER 6" TO A TOTAL DEPTH OF 2' (MINIMUM CBR=1.5).
   C. IF A PASSING PROOF-ROLL OR DCP REQUIREMENTS CANNOT BE ACHIEVED THE FOLLOWING ALTERNATIVES MAY BE IMPLEMENTED:
      a. SCARIFY, DRY, AND RECOMPACT SUBGRADE
      b. REMOVE UNSUITABLE MATERIAL AND REPLACE WITH SUITABLE MATERIAL
      c. INCREASE AGGREGATE BASE THICKNESS
4. AGGREGATE BASE:
   A. AGGREGATE BASE SHALL BE PROOF-ROLLED OVER THE ENTIRE LENGTH. IF PROOF ROLLING DETERMINES THAT THE ROAD IS UNSTABLE, ADDITIONAL AGGREGATE SHALL BE ADDED UNTIL THE UNSTABLE SECTION IS ABLE TO PASS A PROOF ROLL.
   B. PROVIDE 1 SIEVE ANALYSIS (PROJECT MAX OF 20) PER 2500 CY OF ROAD BASE PLACED.
5. CRANE PAD AND CRANE PATHS / CRANE TRAVEL SHOULDERS:
   A. TESTING REQUIREMENTS ARE PENDING BASED ON CRANE PICK PLANS PROVIDED BY THE CONTRACTOR.

TABLE 2: TESTING SCHEDULE SUMMARY		
LOCATION	TEST	FREQUENCY
FILL PLACEMENT	PROCTOR	1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER LIFT PER 5000 SF OF FILL PLACED OR 1 PER 500 LF OF ROAD OR CRANE WALK
COMPACTED SUBGRADE (CEMENT STABILIZED):	SEE SHEET 13	SEE SHEET 13
COMPACTED SUBGRADE (NON-CEMENT STABILIZED):	PROOF-ROLL	ENTIRE AREA
	DCP	1 PER 1,000 FT OR MIN. 3 PER ROAD
AGGREGATE BASE	PROOF-ROLL	ENTIRE AREA
	SIEVE ANALYSIS, LL, PL, AND LA ABRASION	1 PER 2,500 CY

GENERAL NOTES:

1. GROUND SURFACE CONTOURS (AT TWO-FOOT VERTICAL INTERVALS) AND ELEVATIONS ARE BASED ON A PHOTOGRAMMETRY SURFACE PROVIDED BY GEOTERRA. IF MAJOR DISCREPANCIES ARE FOUND IN THE GROUND ELEVATIONS DURING FIELD STAKING TO THE GROUND ELEVATIONS SHOWN ON THE PLANS, THE OWNER AND ENGINEER SHALL BE NOTIFIED.
2. WHERE SECTION OR SUBSECTION MONUMENTS ARE ENCOUNTERED, THE OWNER SHALL BE NOTIFIED BEFORE SUCH MONUMENTS ARE REMOVED. THE CONTRACTOR SHALL PROTECT AND CAREFULLY PRESERVE ALL PROPERTY MARKERS AND MONUMENTS UNTIL THE OWNER, AN AUTHORIZED SURVEYOR OR AGENT HAS WITNESSED OR OTHERWISE REFERENCED THEIR LOCATION.
3. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. TYPICAL DISTURBANCE SHALL BE LIMITED TO 10 LF FROM THE EDGE OF PROPOSED GRADING.
4. FINALIZE GRADING AROUND THE BASE OF TURBINES IN ACCORDANCE WITH DETAIL TS-03 AND TS-04.
5. GRADE ALL PROPOSED ROADS TO A MAXIMUM SLOPE OF 8%. IF 8% SLOPE CANNOT BE ACHIEVED, THE CONTRACTOR MAY UTILIZE ASSIST VEHICLES FOR THE PURPOSE OF DELIVERIES. GRADE ALL PROPOSED CRANE PATHS TO A MAXIMUM OF 8% UNLESS OTHERWISE NOTED IN PLAN SHEETS.
6. ANY FACILITIES REMOVED TO ALLOW FOR CONSTRUCTION (MAILBOXES, SIGNS, FENCES, ETC.) SHALL BE REPLACED BY THE CONTRACTOR IN A CONDITION AS GOOD AS EXISTING.
7. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING DRAINAGE THROUGHOUT THE CONSTRUCTION OF THIS PROJECT. CONSTRUCTION ACTIVITIES SHALL NOT BLOCK THE NATURAL OR MANMADE CREEKS OR DRAINAGE SWALES CAUSING RAINWATER TO POND. DEPENDING ON FIELD CONDITIONS, ADDITIONAL CULVERTS IN EXCESS OF THOSE ON THE PLANS MAY BE REQUIRED.
8. WHILE BUILDING THE ROADS AND EXCAVATING THE TURBINE FOUNDATIONS, EXCESS SOIL WILL RESULT. THE CONTRACTOR SHALL DISPOSE OF THIS EXCESS SOIL IN AN APPROVED MANNER. EXCESS TOPSOIL SHALL BE DISTRIBUTED INTO A THIN LAYER ON LAND IMMEDIATELY ADJACENT TO WHERE THE TOPSOIL ORIGINATED. ALL EXCESS TOPSOIL TO BE WASTED ONSITE. WHILE DOING SO THE CONTRACTOR SHALL AVOID CAUSING RIDGES OR MOUNDS THAT WOULD MAKE IT DIFFICULT FOR STORM WATER RUNOFF TO DRAIN. THE FINAL SURFACE OF THE DISTURBED TOPSOIL SHALL BE SMOOTH AND FOLLOW THE NATURAL CONTOUR OF THE LAND.
9. THE CONTRACTOR SHALL NOTIFY SOUTH DAKOTA 811 AT LEAST 48 HOURS BEFORE EXCAVATION ACTIVITIES COMMENCE.
10. TEMPORARY INTERSECTION WIDENING SHALL, UPON COMPLETION OF ALL PROJECT CONSTRUCTION OR UPON NOTIFICATION OF THE ENGINEER, BE REMOVED AND THE AREA RESTORED TO ITS ORIGINAL LINES AND GRADES WITH TOPSOIL REPLACED, EXCEPT WHERE REQUESTED BY THE TOWNSHIP OR COUNTY TO PERMANENTLY REMAIN. DISTURBED AREAS OUTSIDE OF THE FINAL ROADWAY SHALL BE SEEDED AND MULCHED.
11. TURBINE SETBACKS ARE NOT IDENTIFIED ON THE CONSTRUCTION PLANS. IT SHALL BE THE RESPONSIBILITY OF THE OWNER AND CONTRACTOR TO ENSURE THAT ALL TURBINE SETBACKS MEET PROJECT REQUIREMENTS.
12. GEOTECHNICAL REPORTS WITH RECOMMENDATIONS HAVE BEEN PROVIDED BY THE OWNER. ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL ENGINEERING REPORT AND RECOMMENDATIONS.
13. FIELD SURVEY WETLAND INFORMATION HAS BEEN PROVIDED BY THE OWNER. ALL WETLAND DELINEATIONS AND PERMITTING SHALL BE THE RESPONSIBILITY OF OTHERS AND BE COMPLETED PRIOR TO CONSTRUCTION COMMENCING. THE OWNER AND GENERAL CONTRACTOR SHALL VERIFY THAT ALL WETLAND PERMITS HAVE BEEN SUBMITTED AND APPROVED PRIOR TO CONSTRUCTION COMMENCING.
14. CULTURAL RESOURCE REPORTS HAVE NOT BEEN PROVIDED. CULTURAL RESOURCE LOCATIONS ARE NOT SHOWN ON THE PLANS. INFORMATION WILL BE THE RESPONSIBILITY OF THE OWNER AND GENERAL CONTRACTOR. THE LOCATIONS OF CULTURAL RESOURCE SITES MAY BE CONFIDENTIAL AND PROTECTED BY STATE OR FEDERAL LAW. PUBLIC RELEASE OF SPECIFIC INFORMATION REGARDING THESE RESOURCES MAY BE RESTRICTED.
15. AN ENVIRONMENTAL ASSESSMENT HAS NOT BEEN PROVIDED. THE CONTRACTOR SHALL BE FAMILIAR WITH THE REPORT AND REVIEW ALL RECOMMENDATIONS.
16. ELECTRICAL INFORMATION SHOWN ON THE PLANS IS FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSULTANT'S PLANS FOR SPECIFIC LOCATIONS AND CONSTRUCTION DETAILS FOR THE UNDERGROUND POWER COLLECTION SYSTEM AND SUBSTATION.
17. CRANE PATHS ARE SHOWN ON THE CONSTRUCTION PLANS. IF THE CONTRACTOR PROPOSES ALTERNATE CRANE PATHS, THEY SHALL ENSURE THAT WETLAND AND CULTURAL RESOURCE CORRIDORS ARE NOT DISTURBED. FINAL CRANE PATH ALIGNMENTS SHALL BE DETERMINED BY THE CONTRACTOR BASED ON FIELD CONDITIONS WITHIN THE WETLAND AND CULTURAL RESOURCE CORRIDORS, SPECIAL LANDOWNER AGREEMENTS AND THE PROJECT BOUNDARY.
18. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. DISTURBANCE SHALL BE LIMITED TO 50 LF WIDTH FOR PROPOSED ACCESS ROADS AND 50 LF FOR CRANE PATHS, AND SHALL BE LIMITED TO A 250 LF RADIUS FOR PROPOSED WIND TURBINE GENERATORS. THE GRADING LIMITS SHALL BE CENTERED ON THE ROADWAYS AND WIND TURBINES. THE CONTRACTOR SHALL MAKE ALL EFFORTS TO KEEP ACTIVITIES WITHIN THE ERECTION AREAS SHOWN ON THE PLANS BUT IT IS UNDERSTOOD THAT SOME ACTIVITIES THAT WILL NOT REQUIRE GRADING OR SOIL DISTURBANCE MAY EXTEND BEYOND THE DEFINED LIMITS. DURING ERECTION OF THE ROTOR, TRUCKS AND/OR FORKLIFTS MAY EXTEND BEYOND THESE LIMITS. SEE DETAIL TS01 FOR TYPICAL ERECTION AREAS.
19. AN ALTA SURVEY HAS BEEN PROVIDED BY WESTWOOD. CONTRACTOR AND OWNER ARE RESPONSIBLE FOR LOCATING ALL UTILITIES AND VERIFYING LOCATION OF CONSTRUCTION ACTIVITIES PRIOR TO COMMENCING WORK.

STORMWATER POLLUTION PREVENTION PLAN (SWPPP):

1. THE CONTRACTOR SHALL PROVIDE EROSION CONTROL MEASURES AS PLANNED AND SPECIFIED FOLLOWING BEST MANAGEMENT PRACTICES AS OUTLINED BY THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND BEING IN CONFORMANCE WITH THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL STORMWATER PERMIT.
2. REFER TO THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR THE TRIPLE H WIND FARM, PREPARED BY WESTWOOD PROFESSIONAL SERVICES, FOR EROSION CONTROL AND RESTORATION SPECIFICATIONS, SEDIMENT AND EROSION CONTROL PROCEDURES, LOCATIONS OF BMPs, DETAILS, AND INSPECTION INFORMATION.
3. ALL PASTURES AND DRAINAGE SWALES DISTURBED DURING CONSTRUCTION ACTIVITIES AND NOT COVERED BY ROAD SURFACING MATERIALS, SHALL BE SEEDED IN ACCORDANCE WITH THE SWPP PLAN.
4. TEMPORARY EROSION CONTROL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE TEMPORARY EROSION CONTROL PLAN SHALL BE IN ACCORDANCE WITH THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND THE TRIPLE H WIND FARM STORMWATER POLLUTION PREVENTION PLAN ON FILE.

PROJECT CONTACT INFORMATION:

TITLE	COMPANY	NAME	CONTACT NUMBER
OWNER (PRIMARY)	ENGIE	CASEY WILLIS	805-569-6185
PROJECT MANAGER	WESTWOOD	DANI NYGREN	952-906-7493
ENGINEER OF RECORD	WESTWOOD	ROB COPOULS	952-906-7470
CONTRACTOR	WANZEK	JASON HELLERUD	701-893-3685

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #300
Fax (952) 937-5822 Minnetonka, MN 55343
TollFree (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed: SMK
Checked: DBN
Drawn: SMK
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2028 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 12 OF 57

0014440DTP.dwg

©2019 Westwood Professional Services, Inc.

CEMENT STABILIZATION - PROCEDURE

THE SPECIFICATIONS BELOW ARE GENERAL RECOMMENDATIONS/GUIDELINES FOR CEMENT STABILIZATION OF SUBGRADES FOR THE PROJECT. ACTUAL FIELD CONDITIONS MAY ALTER APPLICATION RATE. CONSULT GEOTECHNICAL ENGINEER FOR FURTHER RECOMMENDATIONS.

1. STRIP THE TOP ±4 INCHES OF TOPSOIL (THROUGH THE ROOT ZONE) FROM THE AREA TO BE STABILIZED. ROOTS SMALLER THAN 1/4" DIAMETER ARE CONSIDERED INSIGNIFICANT.
2. PERFORM A PROCTOR (ASTM D 698) TEST TO DETERMINE THE OPTIMUM MOISTURE CONTENT IF THE MATERIAL TO BE STABILIZED DOES NOT MATCH A PREVIOUSLY PERFORMED PROCTOR.
3. DETERMINE THE IN-SITU MOISTURE CONTENT USING A NUCLEAR DENSITY GAUGE (OR EQUIVALENT MOISTURE CONTENT TEST) DAILY, PRIOR TO INCORPORATION OF THE CEMENT. PROVIDE ADDITIONAL MOISTURE CONTENT TESTING AS NEEDED BASED ON WEATHER CONDITIONS.
   - 3.1. THE CONTRACTOR WILL BE ADVISED OF IN-SITU MOISTURE CONTENT, AND MOISTURE ADJUSTMENTS SHOULD BE MADE IF IN-SITU MOISTURE IS LESS THAN OPTIMUM MOISTURE CONTENT AS DETERMINED BY THE PROCTOR (ASTM D 698).
4. SOIL AND CEMENT BLENDING:
   - 4.1. COMPLETELY BLEND SUBGRADE SOIL WITH THE APPROPRIATE AMOUNT OF CEMENT BY WEIGHT. FIELD RESULTS FROM TEST STRIPS WILL DICTATE THE CEMENT APPLICATION RATE.
   - 4.2. IN AREAS OF HIGH MOISTURE OR POOR SOILS, THE CONTRACTOR MAY INCREASE THE PERCENT OF CEMENT IN ORDER TO MEET THE MINIMUM SUBGRADE STRENGTH REQUIREMENTS.
   - 4.3. THE USE OF A RECLAIMER IS AN ADEQUATE BLENDING METHOD. DISCING IS NOT AN ADEQUATE BLENDING METHOD.
   - 4.4. A STABILIZATION DEPTH OF 12" WAS USED FOR DESIGN PURPOSES. STABILIZATION DEPTH MAY NEED TO INCREASE TO 18" IN AREAS OF EXTREME MOISTURE OR POOR SOILS IN ORDER TO MEET THE STRENGTH AND PROOF ROLL REQUIREMENTS.
5. COMPACTION:
   - 5.1. A ROLLING PATTERN WILL BE ESTABLISHED USING A NUCLEAR DENSITY GAUGE DURING COMPACTION.
     - 5.1.1. COMPACTION WILL BE PERFORMED UNTIL THE STABILIZED MATERIAL REACHES THE "BREAK POINT" AFTER WHICH ADDITIONAL PASSES WITH A ROLLER RESULTS IN A LOSS OF DENSITY AS MEASURED BY A NUCLEAR DENSITY GAUGE.
     - 5.1.2. COMPACTION IS TYPICALLY ACHIEVED BY MULTIPLE PASSES OF A PADFOOT ROLLER UNTIL THE ROLLER "WALKS" OUT OF THE RECLAIMED MATERIAL (SPACE IS VISIBLE BETWEEN THE DRUM AND THE RECLAIMED MATERIAL). THIS IS FOLLOWED BY BLADING AND SHAPING THE RECLAIMED MATERIAL TO FINAL PROFILE AND CROSS SECTION, REMOVING HIGH AND LOW POINTS. SMOOTH DRUM OR RUBBER TIRE ROLLERS ARE THEN USED TO FINISH ROLLING (THIS IS WHEN THE DENSITY TESTS ARE PERFORMED) UNTIL THE DENSITY OF THE MATERIAL REACHES THE "BREAK POINT."
     - 5.1.3. THE NUMBER OF PASSES AND EQUIPMENT USED TO REACH THE "BREAK POINT" IS CONSIDERED THE ROLLING PATTERN.
     - 5.1.4. A NEW ROLLING PATTERN MAY NEED TO BE ESTABLISHED IF THE PERFORMANCE REQUIREMENTS ARE NOT BEING MET. THIS MAY BE DUE TO CHANGES IN THE MOISTURE CONTENT, THE SOIL TYPE, OR THE CEMENT RATE.
   - 5.2. THE TARGET DENSITY IS 98% OF THE MAXIMUM DENSITY DETERMINED FROM THE ROLLING PATTERN.
     - 5.2.1. DENSITY TESTS SHALL BE TAKEN AT THE RATE OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER TO CONFIRM THE DENSITY IS MATCHING THE TARGET. ONCE THE ROLLING PATTERN HAS BEEN CONFIRMED IT IS RECOMMENDED THAT TESTING CONTINUE AT 1 TEST PER 1,000 LF IN EACH PASS OF THE RECLAIMER.
     - 5.2.2. IF IT IS NOT POSSIBLE TO ATTAIN THE TARGET DENSITY, AND ADDITIONAL COMPACTION DOES NOT IMPROVE THE DENSITY, A NEW ROLLING PATTERN SHOULD BE ESTABLISHED.
   - 5.3. THE AIR TEMPERATURE SHALL BE ABOVE 40 DEGREES (F) DURING THE CEMENT STABILIZATION PROCESS. MIXING CEMENT INTO FROZEN GROUND IS NOT ACCEPTABLE.
6. THE STABILIZED MATERIAL SHALL BE CONTINUOUSLY WET CURED FOR A MINIMUM OF 24 HOURS (WET CURED IS IDENTIFIED VISUALLY AS DAMP SURFACE).
7. PERFORM SUBGRADE TESTING IN ACCORDANCE WITH TESTING SCHEDULE.
8. AGGREGATE PLACEMENT:
   - 8.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 8.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 8.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

CEMENT STABILIZATION - DESIGN BASIS

1. DURING INITIAL CONSTRUCTION, CONTRACTOR SHALL CONSTRUCT MINIMUM 300 LF TEST STRIPS CONTAINING 4%, 5%, AND 6% CEMENT IN ACCORDANCE WITH CEMENT STABILIZATION PROCEDURES.
2. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 3 FOR ANTICIPATED RESULTS):
   - 2.1. PERFORM INITIAL SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M BETWEEN 4 TO 6 HOURS AFTER FINAL COMPACTION.
   - 2.2. PERFORM ADDITIONAL DCP TESTING AT 24 AND 48 HOURS AFTER FINAL COMPACTION.
   - 2.3. PERFORM SUBSEQUENT DCP TESTS AT 7 DAYS AFTER FINAL COMPACTION AS VERIFICATION OF STRENGTH CURVE.
   - 2.4. A MINIMUM OF 3 TESTS PER TEST SECTION PER TIMEFRAME IS REQUIRED. TESTS SHALL BE TAKEN AT THE CENTERLINE AND 2' FROM EACH SHOULDER.
   - 2.5. RECORD DCP TEST RESULTS EVERY 6 INCHES TO TOTAL DEPTH OF 12 INCHES.

TABLE 3: TEST STRIP CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	COMPRESSIVE STRENGTH (PSF)
4 – 6 HOURS	6	5	1,800
24 HOURS	10	7	2,500
48 HOURS	15	10	3,200
7 DAYS	30	21	5,200

CEMENT STABILIZATION - PRODUCTION

1. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 5 FOR SUMMARY OF TESTING REQUIREMENTS):
   - 1.1. PERFORM SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M NO SOONER THAN 24 HOURS AFTER FINAL COMPACTION.
   - 1.2. DCP TESTING FREQUENCY SHALL BE WITH A RANDOM SPACING AND A MINIMUM OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER. A MINIMUM OF 3 TESTS PER ROAD IS REQUIRED.
   - 1.3. THE CBR OF THE STABILIZED SUBGRADE SHOULD BE CALCULATED IN 6" INCREMENTS THROUGH THE ENTIRE DEPTH OF THE STABILIZED LAYER.
   - 1.4. THE MINIMUM REQUIRED CBR PRIOR TO PROOF-ROLLING IS PROVIDED IN TABLE 4 BELOW:

TABLE 4: FINAL CEMENT STABILIZED CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	UNDRAINED SHEAR STRENGTH (PSF)	BEARING CAPACITY (PSF)
24 – 48 HOURS	15	10	3,500	9,800
3 – 7 DAYS	30	21	7,000	18,000
28 DAYS	50	33	12,000	28,500

NOTE: UNDRAINED SHEAR STRENGTH WAS CALCULATED USING THE BLACK (1961) EQUATION. BEARING CAPACITY WAS CALCULATED USING THE MEYRC EQUATION MODIFIED FOR TWO LAYERS (12" CEMENT STABILIZED SUBGRADE OVER A NATURAL SUBGRADE WITH A CBR OF 1.5)

   - 1.5. ONCE THE MINIMUM REQUIRED CBR IS ACHIEVED AT ANY CORRESPONDING TIME PERIOD, THE SUBGRADE IS CONSIDERED ADEQUATE AND THE CONTRACTOR MAY PROCEED WITH PROOF-ROLL TESTING. FUTURE DCP TESTING ON THAT SEGMENT OF SUBGRADE IS NOT REQUIRED.
   - 1.6. IF TESTING DOES NOT INDICATE A CBR OF 30 WITHIN 7 DAYS, ADDITIONAL GRAVEL SURFACING AND/OR THE ADDITION OF GEOTEXTILE FABRIC MAY BE REQUIRED. FOR FUTURE SUBGRADE STABILIZATION AREAS, CONTACT THE ENGINEER AND OWNER VIA RFI FOR RECOMMENDATIONS AND APPROVAL.
2. SUBGRADE PROOF-ROLL TESTING AND ACCEPTANCE:
   - 2.1. ONCE THE REQUIRED DCP VALUE HAS BEEN OBTAINED BUT PRIOR TO PLACING AGGREGATE, THE SUBGRADE SHALL BE PROOF-ROLLED. REFER TO THE PROJECT TESTING REQUIREMENTS FOR PROOF-ROLL DEFINITION.
   - 2.2. PROOF-ROLLING SHOULD BE PERFORMED WITH ONE PASS DOWN THE CENTER AND NOT BE PERFORMED WITHIN 12 INCHES OF THE EDGE OF THE STABILIZED SECTION.
   - 2.3. IF PROOF-ROLLING FAILS, RE-STABILIZATION MAY BE REQUIRED AND A NEW ROLLING PATTERN OR ADDITIONAL CEMENT MAY BE REQUIRED.
3. AGGREGATE PLACEMENT:
   - 3.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 3.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 3.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

TABLE 5: CEMENT STABILIZATION PRODUCTION TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
COMPACTED SUBGRADE (CEMENT STABILIZED)	PROCTOR	MINIMUM 1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER 1000 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
NOTE: SEE ABOVE FOR INITIAL TESTING REQUIREMENTS	DCP TEST	1 PER 500 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
	PROOF-ROLL (AFTER PASSING DCP TESTS)	ENTIRE LENGTH

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-Free (888) 937-5150 westwoodps.com

Westwood Professional Services, Inc.

Designed: BMK
Checked: ZJH
Drawn: BMK
As-Built Drawing:

Revisions: #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2020 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 13 OF 57

00144400TP.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 333rd Ave in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 1245' South of 333rd Ave & 202nd Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.27'03.84" W Long. -99.31'21.64" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 000945 NE4 6-111-72
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Taye L Dare
Signature of Applicant

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 333rd Ave in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 1245' South of 333rd Ave & 202nd Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.27'03.84" W Long. -99.31'21.64" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 000945 NE4 6-111-72
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: _____

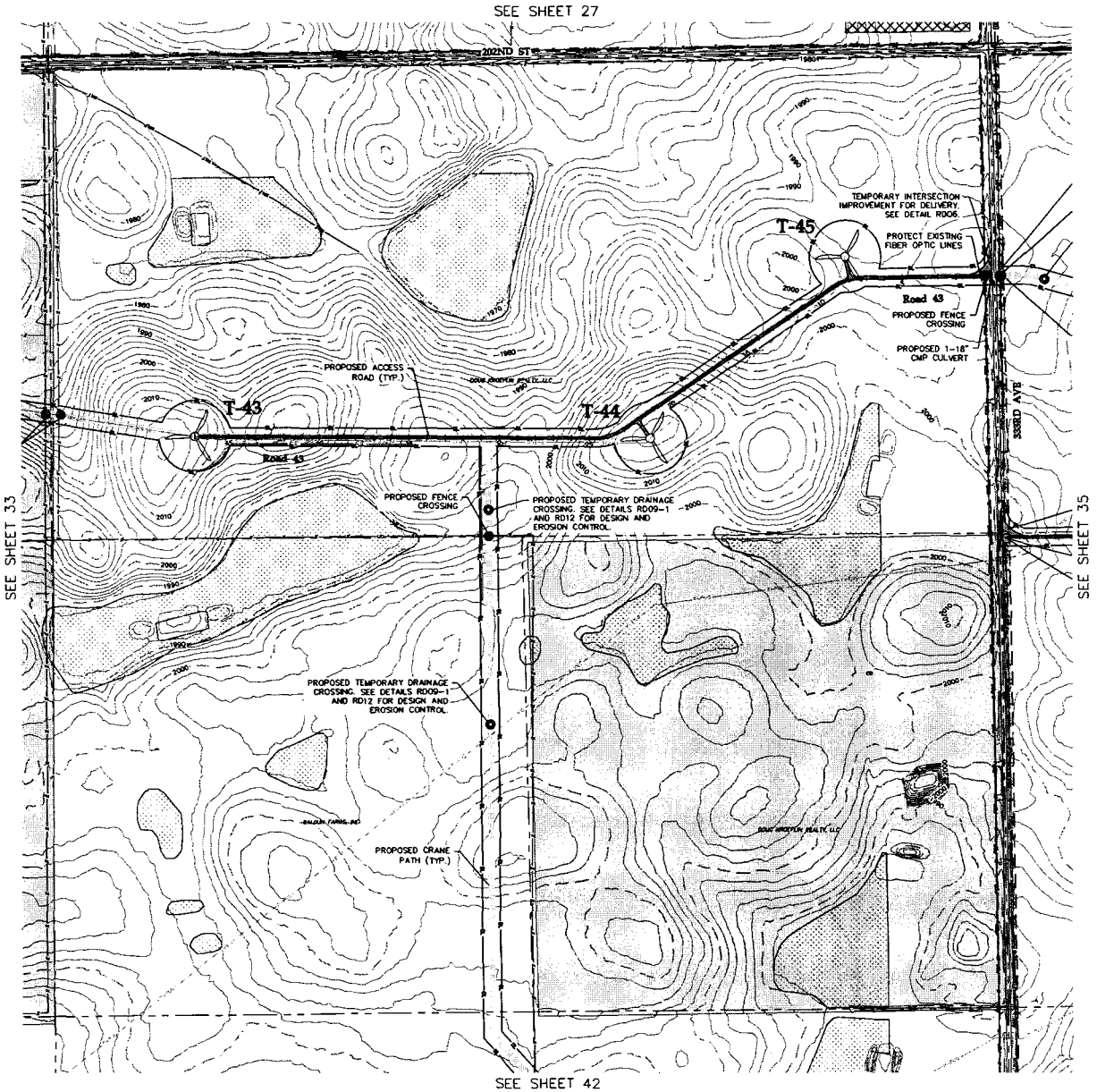
Taye Stave
Signature of Applicant

Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

©2019 Westwood Professional Services, Inc.



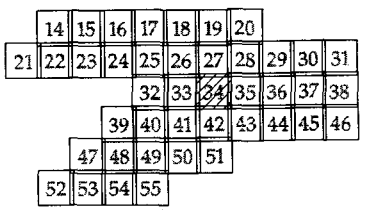
LEGEND:

- PROPOSED TURBINE LOCATION
- T-XX PROPOSED TURBINE NUMBER
- PROPOSED ALTERNATE TURBINE LOCATION
- ALT-XX PROPOSED ALTERNATE TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED ALTERNATE ACCESS ROAD
- PROPOSED CRANE PATH
- PROPOSED UNDERGROUND COLLECTION*
- PROPOSED DISTURBANCE LIMITS
- PROPOSED PERIMETER SEDIMENT CONTROL
- EXISTING 10' CONTOURS
- EXISTING 2' CONTOURS
- EXISTING GRAVEL EDGE
- EXISTING BITUMINUS EDGE
- EXISTING RIGHT-OF-WAY
- EXISTING PARCEL LINE
- EXISTING BUILDING
- EXISTING FENCE
- EXISTING OVERHEAD POWER
- EXISTING HIGH VOLTAGE OVERHEAD POWER
- EXISTING UNDERGROUND POWER LINE
- EXISTING FIBER OPTIC LINE
- EXISTING WATER LINE
- DELINEATED WETLAND
- ARCHAEOLOGICAL AVOIDANCE AREA
- EXISTING USFWS EASEMENT
- PROJECT BOUNDARY
- EXISTING GROUND ELEVATION
- PROPOSED DRAINAGE CROSSING**
- PROPOSED TEMPORARY DRAINAGE CROSSING**
- PROPOSED FENCE CROSSING***
- PROPOSED UTILITY CROSSING
- PROPOSED CULVERT

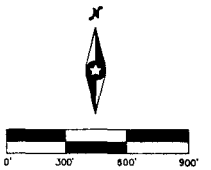
* PROVIDED BY OTHERS AND SHOWN FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSTRUCTION PLANS FOR DETAILS.

** SEE SHEET 11 FOR DRAINAGE CROSSING TYPE AND SIZING. DRAINAGE CROSSINGS SHALL CONSIST OF LOW WATER CROSSING OR CULVERT. DRAINAGE CROSSINGS ALONG CRANE PATH SHALL CONSIST OF CRANE MATS OR TEMPORARY CULVERT.

*** ALL GATE INSTALLATIONS SHALL BE FIELD DETERMINED AND AGREED UPON BY THE CONTRACTOR AND OWNER.



KEY MAP



Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-free (888) 937-5150 westwoodps.com

Westwood Professional Services, Inc.

Designed:	BMK
Checked:	DJH
Drawn:	BMK

As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2028 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

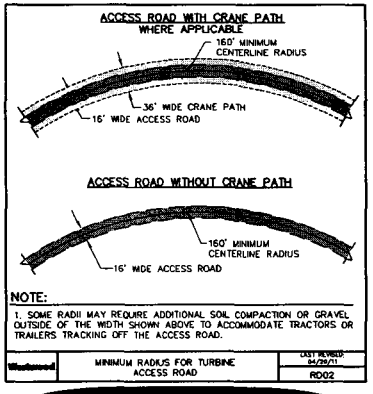
Site Plan T-43 - T-45

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 34 OF 57

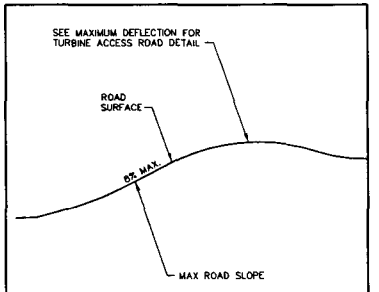
0014440SP01.dwg

©2019 Westwood Professional Services, Inc.



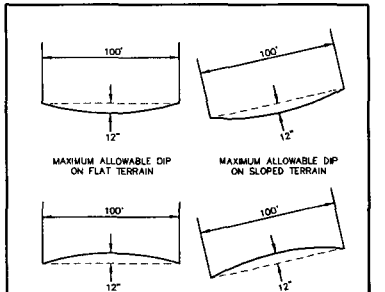
NOTE:
1. SOME RADII MAY REQUIRE ADDITIONAL SOIL COMPACTION OR GRAVEL OUTSIDE OF THE WIDTH SHOWN ABOVE TO ACCOMMODATE TRACTORS OR TRAILERS TRACKING OFF THE ACCESS ROAD.

Westwood	MINIMUM RADIUS FOR TURBINE ACCESS ROAD	LAST REVISED: 04/29/11 RD02

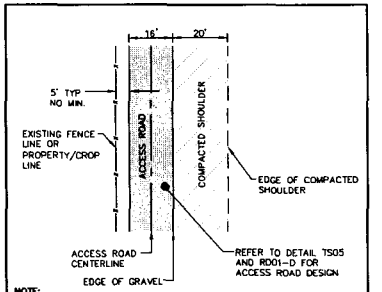


NOTES:
1. ROAD SLOPE SHALL NOT EXCEED 8% WITHOUT OWNER APPROVAL

Westwood	MAXIMUM VERT. SLOPE FOR TURBINE ACCESS ROAD/CRANE TRAVEL PATH	LAST REVISED: 3/28/11 RD03

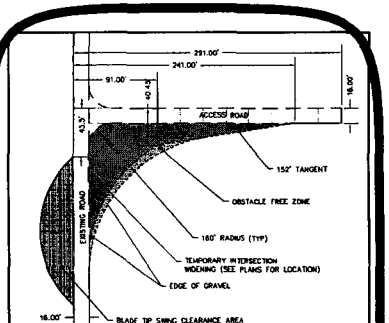


Westwood	MAXIMUM DEFLECTION FOR TURBINE ACCESS ROAD	LAST REVISED: 01/31/08 RD04



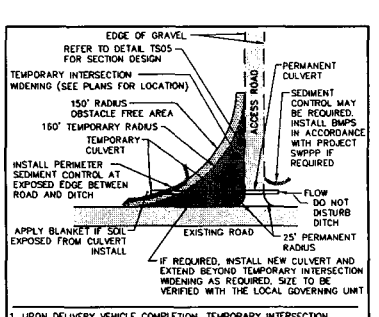
NOTE:
1. COMPACTED SHOULDER SHALL BE RETURNED TO NATIVE CONDITION FOLLOWING TURBINE GENERATOR CONSTRUCTION.
2. THE ACCESS ROAD MAY NEED TO BE CONSTRUCTED FARTHER FROM THE PROPERTY LINE IF OBSTRUCTIONS SUCH AS TREES FOLLOW THE PROPERTY LINE.

Westwood	TURBINE ACCESS ROAD ALONG FENCE/PROPERTY/CROP LINE	LAST REVISED: 3/31/08 RD05



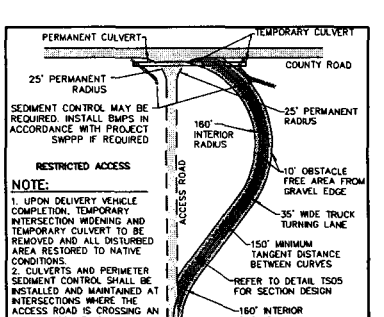
NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING TO BE REMOVED AND ALL DISTURBED AREA RESTORED.
2. DIMENSIONS ASSUME A 90° INTERSECTION

Westwood	INTERSECTION WIDENING DIMENSIONS	LAST REVISED: 7/19/19 RD06



1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.

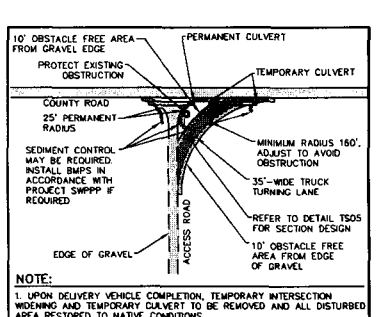
	TURBINE ACCESS ROAD TYPICAL INTERSECTION WIDENING	LAST REVISED: 3/3/17 RD07



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

NOT TO SCALE

Westwood	TRUCK TRAFFIC TURNING LANE A	LAST REVISED: 3/3/17 RD08-A



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

Westwood	TRUCK TRAFFIC TURNING LANE B	LAST REVISED: 12/3/14 RD08-B

Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwood@pi.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: TJH
Drawn: BMK
As-Built Drawing

Revisions: #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:
WANZEK
2888 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

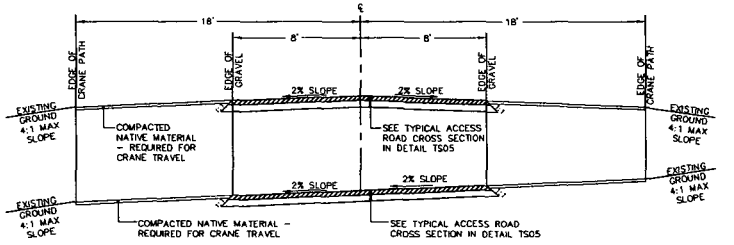
Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 5 OF 57

0011440DTP.dwg

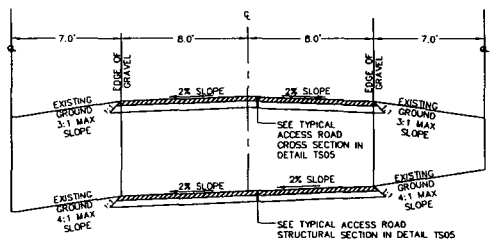
© 2019 Westwood Professional Services, Inc.



NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE ACCESS ROAD DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

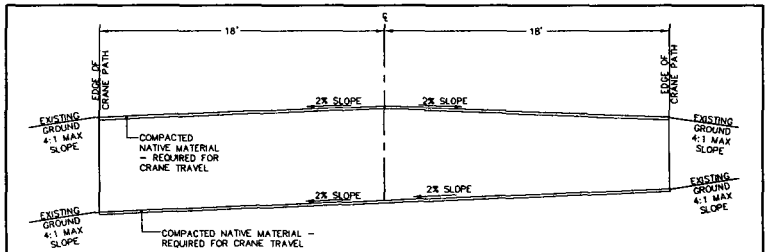
Westwood | TYPICAL TURBINE ACCESS ROAD AND CRANE PATH | LAST REVISED: 04/29/19 | RD01-A



NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

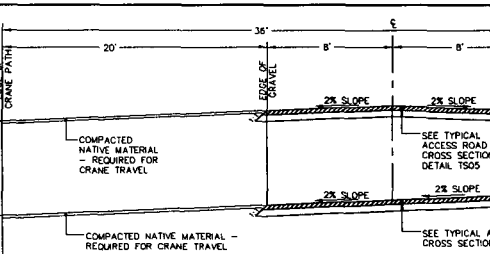
Westwood | TYPICAL TURBINE ACCESS ROAD SECTION | LAST REVISED: 4/29/19 | RD01-B



NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE WHERE CRANE PATHS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT CRANE PATH REMAINS WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%

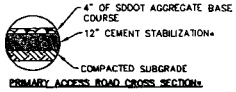
Westwood | TYPICAL CRANE PATH | LAST REVISED: 04/29/19 | RD01-C



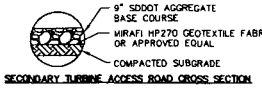
NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE EDGE OF COMPACTED SHOULDER DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

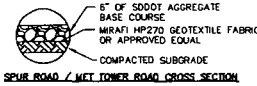
Westwood | TYPICAL TURBINE ACCESS ROAD AND OFFSET CRANE PATH | LAST REVISED: 04/29/19 | RD01-D



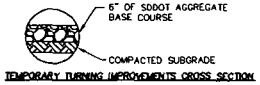
PRIMARY ACCESS ROAD CROSS SECTION*



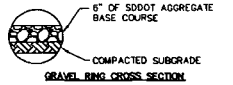
SECONDARY TURBINE ACCESS ROAD CROSS SECTION



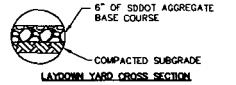
SPUR ROAD / WET TOWER ROAD CROSS SECTION



TEMPORARY TURNING IMPROVEMENTS CROSS SECTION



GRAVEL RING CROSS SECTION



LAYDOWN YARD CROSS SECTION

* CEMENT APPLICATION RATE MAY VARY BASED ON TEST STRIPS AND FIELD PERFORMANCE. SEE SHEET 13 FOR CEMENT STABILIZATION PROCEDURE AND DESIGN BASIS.

NOTES:

STRUCTURAL SECTIONS SHOWN ARE THE MINIMUM THICKNESS REQUIREMENTS DURING NORMAL FIELD CONDITIONS. THE SECTIONS MAY NEED TO BE INCREASED BASED ON ACTUAL FIELD CONDITIONS AT THE TIME OF CONSTRUCTION. CONDITIONS INCLUDE BUT ARE NOT LIMITED TO CONSTRUCTION DURING THE FREEZE/THAW CYCLE, UNUSUALLY WET PERIODS, OR IN LOW/WET AREAS. SEE SHEET 12 FOR TESTING REQUIREMENTS AND SPECIFICATIONS.

Westwood | TYPICAL STRUCTURAL CROSS SECTIONS

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-free (866) 937-5150 www.westwoodps.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: RJH
Drawn: BMK
As-Built Drawing:

Revisions:

#	Date	Description
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2008 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 4 OF 57

0014440DTP.dwg

©2019 Westwood Professional Services, Inc.

ROAD DESIGN PARAMETERS

1. ACCESS ROADS HAVE BEEN DESIGNED TO ACCOMMODATE LIGHT DUTY TRUCKS (PICKUP TRUCKS AND MAINTENANCE VEHICLES) FOR LOW VOLUME USE IN NORMAL OPERATING CONDITIONS AS WELL AS HEAVY DUTY CONSTRUCTION TRAFFIC UNDER DRY CONDITIONS. THE ROAD DESIGN SPECIFIED IS NOT INTENDED FOR ALL WEATHER USE FOR HEAVY DUTY CONSTRUCTION LOADS.
2. ROAD MAINTENANCE CAN BE EXPECTED OVER THE LIFE OF THE PERMANENT FACILITY.

PRODUCTS

1. AGGREGATE BASE SHALL CONSIST OF SDDOT AGGREGATE BASE COURSE (AND IN CONFORMANCE WITH THE GRADATION TABLE 1). AGGREGATE MAY BE CRUSHER RUN UPON ENGINEERS APPROVAL. AGGREGATE GRADATIONS SHALL BE SUBMITTED TO ENGINEER FOR REVIEW.
2. ROAD SHOULDERS AND CRANE PADS SHALL CONSIST OF COMPACTED NATIVE SOILS.
3. CULVERTS: ACCESS ROAD CULVERTS SHALL MEET THE MINIMUM SPECIFICATIONS SET FORTH BY THE SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION AND/OR HYDE COUNTY. ALL CULVERTS ARE PLANNED TO BE A MINIMUM 18" DIAMETER AND MANUFACTURED OF 16-GAGE CORRUGATED METAL PIPE WITH NO END TREATMENTS UNLESS NOTED OTHERWISE. ACTUAL SIZE WILL BE DETERMINED THROUGH HYDRAULIC ANALYSIS.
4. GEOTEXTILE FABRIC: MIRAFI HP270 OR APPROVED EQUAL.

EXECUTION

1. CLEARING AND GRUBBING
   A. THE CONTRACTOR SHALL BE REQUIRED TO GRUB ALL TREES, STUMPS, BRUSH, AND DEBRIS WITHIN THE GRADING AREAS SHOWN ON THE PLANS. GRUBBING INCLUDES REMOVAL OF ALL PLANT MATERIAL GREATER THAN 2" INCLUDING STUMPS, BRANCHES, ROOTS, ETC. TO A DEPTH BELOW THE FINAL SUBGRADE. THE CONTRACTOR IS TO REMOVE ONLY THOSE TREES WHICH ARE DESIGNATED BY THE OWNER'S REPRESENTATIVE FOR REMOVAL, AND SHALL EXERCISE EXTREME CARE AROUND EXISTING TREES TO BE SAVED.
2. TOPSOIL STRIPPING
   A. TOPSOIL, INCLUDING ROOTS LARGER THAN 2" AND LARGE ROOT MASSES, SHALL BE STRIPPED FROM ALL ROADWAY AND FOUNDATION AREAS UP TO 10". TOPSOIL SHALL NOT BE STRIPPED OUTSIDE OF THE DESIGNATED DISTURBANCE AREAS.
   B. ANY TOPSOIL THAT HAS BEEN STRIPPED SHALL BE STOCKPILED FOR POST CONSTRUCTION REVEGETATION. ALL TOPSOIL SHALL BE REDISTRIBUTED TO THE LAND OWNER'S PROPERTY OF WHERE IT ORIGINATED FROM.
3. FILL PLACEMENT
   A. FILL PLACEMENT SHALL CONSIST OF THE PLACING OF SUITABLE FILL MATERIAL, AFTER TOPSOIL STRIPPING, ABOVE THE EXISTING GRADE. GENERALLY, SIDE SLOPES SHALL BE CONSTRUCTED AT FOUR FOOT HORIZONTAL TO ONE FOOT VERTICAL, WITH SOME LOCATIONS THROUGHOUT THE PROJECT WITH SLOPES OF TWO FEET HORIZONTAL TO ONE FOOT VERTICAL. THE MATERIAL FOR FILL CONSTRUCTION SHALL BE OBTAINED FROM THE ACCESS ROAD/TURBINE EXCAVATION (SEE GEOTECHNICAL REPORT FOR RESTRICTIONS), OR ANY SUITABLE, APPROVED SOIL OBTAINED ONSITE/OFFSITE BY CONTRACTOR, AS DIRECTED OR APPROVED BY THE ENGINEER. THIS MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 12" AND CONSTRUCTED TO 95% OF THE MAXIMUM DRY DENSITY AND WITHIN 2% OF OPTIMUM MOISTURE CONTENT, AS DETERMINED BY THE STANDARD PROCTOR (AASHTO T99).
   B. SIDE SLOPES GREATER THAN 4:1 WILL NOT BE PERMITTED, UNLESS OTHERWISE NOTED ON THE PLAN.
   C. FILL SLOPES SHALL BE BENCHED INTO THE EXISTING SLOPE TO PREVENT MOVEMENT BETWEEN THE FILL AND NATIVE SOILS. BENCHES SHOULD BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO FILL PLACEMENT. POSITIVE DRAINAGE IS REQUIRED AT BENCHED AREAS AND AT THE TOE OF FILL SLOPES TO REMOVE SURFACE WATER.
4. SUBGRADE
   A. SUBGRADE PREPARED AT GRADE OR IN CUT REQUIRES SCARIFICATION AND RECOMPACTION TO A DEPTH OF 12" OR MORE.
   B. ACCESS ROAD CROSS SLOPES SHOWN IN THE PLANS ARE MEANT AS A GUIDE. ACCESS ROAD CROSS SLOPES MAY RANGE FROM 1% - 2%, CHECK WITH THE ENGINEER IF THE CROSS SLOPE FALLS OUTSIDE OF THIS RANGE. ACCESS ROADS BEING UTILIZED FOR CRANE TRAVEL SHOULD HAVE A MAX CROSS SLOPE OF 2%.

TABLE 1: SDDOT AGGREGATE BASE COURSE - LOCALLY SOURCED	
SIEVE SIZE	PERCENT PASSING
1"	100
3/4"	80-100
1/2"	68-91
NO. 4	46-70
NO. 8	34-58
NO. 40	13-35
NO. 200	3-12

MEET FOLLOWING REQUIREMENTS PER 882.2

LIQUID LIMIT (MAX) = 25
PLASTICITY INDEX = 0-6
L.A ABRASION (% MAX) = 40%

GRADATION HAS BEEN OBTAINED FROM THE 2015 SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION BOOK.

STORM WATER DESIGN PARAMETERS

1. SEE SHEET 6 FOR CULVERT SIZING AND DESIGN PARAMETERS. SEE HYDROLOGY MEMO FOR FURTHER DESIGN CALCULATIONS. CULVERTS SHALL BE MINIMUM 18" CORRUGATED METAL PIPE. ALL TEMPORARY PORTIONS OF THE INSTALLED CULVERTS SHALL BE REMOVED UPON COMPLETION OF THE PROJECT.
2. IT IS EXPECTED THAT CULVERTS WILL BE OVERTOPPED DURING SOME STORMS AND MAINTENANCE WILL BE REQUIRED THROUGH THE LIFE OF THE PROJECT.
3. WHEN INSTALLING DRAINAGE CULVERTS THE CONTRACTOR SHALL USE JUDGMENT IN SETTING THE FLOW LINE ELEVATIONS AND CULVERT LONGITUDINAL SLOPE. TYPICALLY THE FLOW LINE ELEVATIONS AND LONGITUDINAL SLOPE OF THE CULVERT SHOULD MATCH THE NATURAL GROUND ELEVATIONS AND SLOPE TO ENSURE POSITIVE DRAINAGE. WHEN POSSIBLE, ALL CULVERTS SHOULD BE PLACED AT A MINIMUM 0.5% GRADE.
4. ANTICIPATED CULVERT CROSSINGS ARE SHOWN ON THE CONSTRUCTION PLAN, ADDITIONAL CULVERTS MAY NEED TO BE INSTALLED IN AREAS WHERE CONCENTRATED FLOW IS EXPECTED DUE TO CONSTRUCTION ACTIVITIES.
5. CONSTRUCTION DRAINAGE CROSSINGS TO MAINTAIN EXISTING FLOW CHARACTERISTICS OF THE FEATURES. FEATURES SHALL BE GRADED TO PRECONSTRUCTION CONTOURS.

TESTING:

1. TESTING SHALL BE PERFORMED BY A DESIGNATED INDEPENDENT TESTING AGENCY.
2. SUBMIT ONE SET OF TESTING AND INSPECTION RECORDS SPECIFIED TO THE CIVIL ENGINEER OF RECORD.

DEFINITIONS:

1. PROOF ROLLING:
   SHALL BE PERFORMED IN THE PRESENCE OF THE GEOTECHNICAL ENGINEER OR QUALIFIED GEOTECHNICAL REPRESENTATIVE USING A FULLY LOADED TANDEM AXLE DUMP TRUCK OR WATER TRUCK WITH A MINIMUM GROSS WEIGHT OF 25 TONS OR A FULLY LOADED BELLY DUMP WITH AN EQUIVALENT AXLE LOADING. PROOF-ROLLING ACCEPTANCE STANDARDS INCLUDE NO RUTTING GREATER THAN 1.5 INCHES, AND NO "PUMPING" OF THE SOIL BEHIND THE LOADED TRUCK.
2. SIEVE ANALYSIS:
   SHALL BE CONDUCTED IN ACCORDANCE WITH AASHTO T27
3. PROCTORS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T99
4. ATTERBERG LIMITS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T89 AND T90
5. MOISTURE DENSITY (NUCLEAR DENSITY):
   SHALL BE DONE IN ACCORDANCE WITH AASHTO T310
6. DYNAMIC CONE PENETROMETER (DCP) TESTING:
   SHALL BE DONE IN ACCORDANCE WITH ASTM D6951-03

REQUIREMENTS:

1. FILL PLACEMENT:
   A. SOILS USED AS FILL MATERIAL SHALL BE TESTED FOR MOISTURE CONTENT AND PROCTOR TESTS.
   B. WHERE FILL CONSTRUCTION REQUIRES MORE THAN 12 INCHES OF FILL PLACEMENT, COMPACT EACH LIFT TO A MINIMUM OF 95 PERCENT OF THE MATERIAL'S MAXIMUM STANDARD PROCTOR DRY DENSITY.
2. COMPACTED SUBGRADE (CEMENT STABILIZED):
   A. SEE SHEET 13 FOR TESTING REQUIREMENTS AND PROCEDURE.
3. COMPACTED SUBGRADE (NON-CEMENT STABILIZED):
   A. THE ENTIRE SUBGRADE SHALL BE PROOF-ROLLED PRIOR TO THE PLACEMENT OF THE AGGREGATE BASE TO IDENTIFY AREAS OF UNSTABLE SUBGRADE.
   B. PERFORM A MINIMUM OF 3 DYNAMIC CONE PENETROMETER (DCP) TESTS PER ACCESS ROAD OR ONE FOR EVERY 1,000 LF OF ROAD, WHICHEVER IS GREATER. SUBGRADE MUST MEET A MINIMUM DCP OF 3 BLOWS PER 6" TO A TOTAL DEPTH OF 2' (MINIMUM CBR=1.5).
   C. IF A PASSING PROOF-ROLL OR DCP REQUIREMENTS CANNOT BE ACHIEVED THE FOLLOWING ALTERNATIVES MAY BE IMPLEMENTED:
      a. SCARIFY, DRY, AND RECOMPACT SUBGRADE
      b. REMOVE UNSUITABLE MATERIAL AND REPLACE WITH SUITABLE MATERIAL
      c. INCREASE AGGREGATE BASE THICKNESS
4. AGGREGATE BASE:
   A. AGGREGATE BASE SHALL BE PROOF-ROLLED OVER THE ENTIRE LENGTH. IF PROOF ROLLING DETERMINES THAT THE ROAD IS UNSTABLE, ADDITIONAL AGGREGATE SHALL BE ADDED UNTIL THE UNSTABLE SECTION IS ABLE TO PASS A PROOF ROLL.
   B. PROVIDE 1 SIEVE ANALYSIS (PROJECT MAX OF 20) PER 2500 CY OF ROAD BASE PLACED.
5. CRANE PAD AND CRANE PATHS / CRANE TRAVEL SHOULDERS:
   A. TESTING REQUIREMENTS ARE PENDING BASED ON CRANE PICK PLANS PROVIDED BY THE CONTRACTOR.

TABLE 2: TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
FILL PLACEMENT	PROCTOR	1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER LIFT PER 5000 SF OF FILL PLACED OR 1 PER 500 LF OF ROAD OR CRANE WALK
COMPACTED SUBGRADE (CEMENT STABILIZED):	SEE SHEET 13	SEE SHEET 13
COMPACTED SUBGRADE (NON-CEMENT STABILIZED):	PROOF-ROLL	ENTIRE AREA
	DCP	1 PER 1,000 FT OR MIN. 3 PER ROAD
AGGREGATE BASE	PROOF-ROLL	ENTIRE AREA
	SIEVE ANALYSIS, LL, PL, AND L.A ABRASION	1 PER 2,500 CY

GENERAL NOTES:

1. GROUND SURFACE CONTOURS (AT TWO-FOOT VERTICAL INTERVALS) AND ELEVATIONS ARE BASED ON A PHOTOGRAMMETRY SURFACE PROVIDED BY GEOTERRA. IF MAJOR DISCREPANCIES ARE FOUND IN THE GROUND ELEVATIONS DURING FIELD STAKING TO THE GROUND ELEVATIONS SHOWN ON THE PLANS, THE OWNER AND ENGINEER SHALL BE NOTIFIED.
2. WHERE SECTION OR SUBSECTION MONUMENTS ARE ENCOUNTERED, THE OWNER SHALL BE NOTIFIED BEFORE SUCH MONUMENTS ARE REMOVED. THE CONTRACTOR SHALL PROTECT AND CAREFULLY PRESERVE ALL PROPERTY MARKERS AND MONUMENTS UNTIL THE OWNER, AN AUTHORIZED SURVEYOR OR AGENT HAS WITNESSED OR OTHERWISE REFERENCED THEIR LOCATION.
3. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. TYPICAL DISTURBANCE SHALL BE LIMITED TO 10 LF FROM THE EDGE OF PROPOSED GRADING.
4. FINALIZE GRADING AROUND THE BASE OF TURBINES IN ACCORDANCE WITH DETAIL TS-03 AND TS-04.
5. GRADE ALL PROPOSED ROADS TO A MAXIMUM SLOPE OF 8%. IF 8% SLOPE CANNOT BE ACHIEVED, THE CONTRACTOR MAY UTILIZE ASSIST VEHICLES FOR THE PURPOSE OF DELIVERIES. GRADE ALL PROPOSED CRANE PATHS TO A MAXIMUM OF 8% UNLESS OTHERWISE NOTED IN PLAN SHEETS.
6. ANY FACILITIES REMOVED TO ALLOW FOR CONSTRUCTION (MAILBOXES, SIGNS, FENCES, ETC.) SHALL BE REPLACED BY THE CONTRACTOR IN A CONDITION AS GOOD AS EXISTING.
7. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING DRAINAGE THROUGHOUT THE CONSTRUCTION OF THIS PROJECT. CONSTRUCTION ACTIVITIES SHALL NOT BLOCK THE NATURAL OR MANMADE CREEKS OR DRAINAGE SWALES CAUSING RAINWATER TO POND. DEPENDING ON FIELD CONDITIONS, ADDITIONAL CULVERTS IN EXCESS OF THOSE ON THE PLANS MAY BE REQUIRED.
8. WHILE BUILDING THE ROADS AND EXCAVATING THE TURBINE FOUNDATIONS, EXCESS SOIL WILL RESULT. THE CONTRACTOR SHALL DISPOSE OF THIS EXCESS SOIL IN AN APPROVED MANNER. EXCESS TOPSOIL SHALL BE DISTRIBUTED INTO A THIN LAYER ON LAND IMMEDIATELY ADJACENT TO WHERE THE TOPSOIL ORIGINATED. ALL EXCESS TOPSOIL TO BE WASTED ONSITE. WHILE DOING SO THE CONTRACTOR SHALL AVOID CAUSING RIDGES OR MOUNDS THAT WOULD MAKE IT DIFFICULT FOR STORM WATER RUNOFF TO DRAIN. THE FINAL SURFACE OF THE DISTURBED TOPSOIL SHALL BE SMOOTH AND FOLLOW THE NATURAL CONTOUR OF THE LAND.
9. THE CONTRACTOR SHALL NOTIFY SOUTH DAKOTA 811 AT LEAST 48 HOURS BEFORE EXCAVATION ACTIVITIES COMMENCE.
10. TEMPORARY INTERSECTION WIDENING SHALL, UPON COMPLETION OF ALL PROJECT CONSTRUCTION OR UPON NOTIFICATION OF THE ENGINEER, BE REMOVED AND THE AREA RESTORED TO ITS ORIGINAL LINES AND GRADES WITH TOPSOIL REPLACED, EXCEPT WHERE REQUESTED BY THE TOWNSHIP OR COUNTY TO PERMANENTLY REMAIN. DISTURBED AREAS OUTSIDE OF THE FINAL ROADWAY SHALL BE SEEDED AND MULCHED.
11. TURBINE SETBACKS ARE NOT IDENTIFIED ON THE CONSTRUCTION PLANS. IT SHALL BE THE RESPONSIBILITY OF THE OWNER AND CONTRACTOR TO ENSURE THAT ALL TURBINE SETBACKS MEET PROJECT REQUIREMENTS.
12. GEOTECHNICAL REPORTS WITH RECOMMENDATIONS HAVE BEEN PROVIDED BY THE OWNER. ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL ENGINEERING REPORT AND RECOMMENDATIONS.
13. FIELD SURVEY WETLAND INFORMATION HAS BEEN PROVIDED BY THE OWNER. ALL WETLAND DELINEATIONS AND PERMITTING SHALL BE THE RESPONSIBILITY OF OTHERS AND BE COMPLETED PRIOR TO CONSTRUCTION COMMENCING. THE OWNER AND GENERAL CONTRACTOR SHALL VERIFY THAT ALL WETLAND PERMITS HAVE BEEN SUBMITTED AND APPROVED PRIOR TO CONSTRUCTION COMMENCING.
14. CULTURAL RESOURCE REPORTS HAVE NOT BEEN PROVIDED. CULTURAL RESOURCE LOCATIONS ARE NOT SHOWN ON THE PLANS. INFORMATION WILL BE THE RESPONSIBILITY OF THE OWNER AND GENERAL CONTRACTOR. THE LOCATIONS OF CULTURAL RESOURCE SITES MAY BE CONFIDENTIAL AND PROTECTED BY STATE OR FEDERAL LAW. PUBLIC RELEASE OF SPECIFIC INFORMATION REGARDING THESE RESOURCES MAY BE RESTRICTED.
15. AN ENVIRONMENTAL ASSESSMENT HAS NOT BEEN PROVIDED. THE CONTRACTOR SHALL BE FAMILIAR WITH THE REPORT AND REVIEW ALL RECOMMENDATIONS.
16. ELECTRICAL INFORMATION SHOWN ON THE PLANS IS FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSULTANT'S PLANS FOR SPECIFIC LOCATIONS AND CONSTRUCTION DETAILS FOR THE UNDERGROUND POWER COLLECTION SYSTEM AND SUBSTATION.
17. CRANE PATHS ARE SHOWN ON THE CONSTRUCTION PLANS. IF THE CONTRACTOR PROPOSES ALTERNATE CRANE PATHS, THEY SHALL ENSURE THAT WETLAND AND CULTURAL RESOURCE CORRIDORS ARE NOT DISTURBED. FINAL CRANE PATH ALIGNMENTS SHALL BE DETERMINED BY THE CONTRACTOR BASED ON FIELD CONDITIONS WITHIN THE WETLAND AND CULTURAL RESOURCE CORRIDORS, SPECIAL LANDOWNER AGREEMENTS AND THE PROJECT BOUNDARY.
18. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. DISTURBANCE SHALL BE LIMITED TO 50 LF WIDTH FOR PROPOSED ACCESS ROADS AND 50 LF FOR CRANE PATHS, AND SHALL BE LIMITED TO A 250 LF RADIUS FOR PROPOSED WIND TURBINE GENERATORS. THE GRADING LIMITS SHALL BE CENTERED ON THE ROADWAYS AND WIND TURBINES. THE CONTRACTOR SHALL MAKE ALL EFFORTS TO KEEP ACTIVITIES WITHIN THE ERECTION AREAS SHOWN ON THE PLANS BUT IT IS UNDERSTOOD THAT SOME ACTIVITIES THAT WILL NOT REQUIRE GRADING OR SOIL DISTURBANCE MAY EXTEND BEYOND THE DEFINED LIMITS. DURING ERECTION OF THE ROTOR, TRUCKS AND/OR FORKLIFTS MAY EXTEND BEYOND THESE LIMITS. SEE DETAIL TS01 FOR TYPICAL ERECTION AREAS.
19. AN ALTA SURVEY HAS BEEN PROVIDED BY WESTWOOD. CONTRACTOR AND OWNER ARE RESPONSIBLE FOR LOCATING ALL UTILITIES AND VERIFYING LOCATION OF CONSTRUCTION ACTIVITIES PRIOR TO COMMENCING WORK.

STORMWATER POLLUTION PREVENTION PLAN (SWPPP):

1. THE CONTRACTOR SHALL PROVIDE EROSION CONTROL MEASURES AS PLANNED AND SPECIFIED FOLLOWING BEST MANAGEMENT PRACTICES AS OUTLINED BY THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND BEING IN CONFORMANCE WITH THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL STORMWATER PERMIT.
2. REFER TO THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR THE TRIPLE H WIND FARM, PREPARED BY WESTWOOD PROFESSIONAL SERVICES, FOR EROSION CONTROL AND RESTORATION SPECIFICATIONS, SEDIMENT AND EROSION CONTROL PROCEDURES, LOCATIONS OF BMPs, DETAILS, AND INSPECTION INFORMATION.
3. ALL PASTURES AND DRAINAGE SWALES DISTURBED DURING CONSTRUCTION ACTIVITIES AND NOT COVERED BY ROAD SURFACING MATERIALS, SHALL BE SEEDED IN ACCORDANCE WITH THE SWPP PLAN.
4. TEMPORARY EROSION CONTROL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE TEMPORARY EROSION CONTROL PLAN SHALL BE IN ACCORDANCE WITH THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND THE TRIPLE H WIND FARM STORMWATER POLLUTION PREVENTION PLAN ON FILE.

PROJECT CONTACT INFORMATION:

TITLE	COMPANY	NAME	CONTACT NUMBER
OWNER (PRIMARY)	ENGIE	CASEY WILLIS	805-569-6185
PROJECT MANAGER	WESTWOOD	DANI NYGREN	952-906-7493
ENGINEER OF RECORD	WESTWOOD	ROB COPOULS	952-906-7470
CONTRACTOR	WANZEK	JASON HELLERUD	701-893-3685

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #300
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: DBN
Drawn: BMK
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/08/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK
MasTec

2028 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 12 OF 57

0014440DTP.dwg

©2019 Westwood Professional Services, Inc.

CEMENT STABILIZATION - PROCEDURE

THE SPECIFICATIONS BELOW ARE GENERAL RECOMMENDATIONS/GUIDELINES FOR CEMENT STABILIZATION OF SUBGRADES FOR THE PROJECT. ACTUAL FIELD CONDITIONS MAY ALTER APPLICATION RATE. CONSULT GEOTECHNICAL ENGINEER FOR FURTHER RECOMMENDATIONS.

1. STRIP THE TOP ±4 INCHES OF TOPSOIL (THROUGH THE ROOT ZONE) FROM THE AREA TO BE STABILIZED. ROOTS SMALLER THAN 1/4" DIAMETER ARE CONSIDERED INSIGNIFICANT.
2. PERFORM A PROCTOR (ASTM D 698) TEST TO DETERMINE THE OPTIMUM MOISTURE CONTENT IF THE MATERIAL TO BE STABILIZED DOES NOT MATCH A PREVIOUSLY PERFORMED PROCTOR.
3. DETERMINE THE IN-SITU MOISTURE CONTENT USING A NUCLEAR DENSITY GAUGE (OR EQUIVALENT MOISTURE CONTENT TEST) DAILY, PRIOR TO INCORPORATION OF THE CEMENT. PROVIDE ADDITIONAL MOISTURE CONTENT TESTING AS NEEDED BASED ON WEATHER CONDITIONS.
   - 3.1. THE CONTRACTOR WILL BE ADVISED OF IN-SITU MOISTURE CONTENT, AND MOISTURE ADJUSTMENTS SHOULD BE MADE IF IN-SITU MOISTURE IS LESS THAN OPTIMUM MOISTURE CONTENT AS DETERMINED BY THE PROCTOR (ASTM D 698).
4. SOIL AND CEMENT BLENDING:
   - 4.1. COMPLETELY BLEND SUBGRADE SOIL WITH THE APPROPRIATE AMOUNT OF CEMENT BY WEIGHT. FIELD RESULTS FROM TEST STRIPS WILL DICTATE THE CEMENT APPLICATION RATE.
   - 4.2. IN AREAS OF HIGH MOISTURE OR POOR SOILS, THE CONTRACTOR MAY INCREASE THE PERCENT OF CEMENT IN ORDER TO MEET THE MINIMUM SUBGRADE STRENGTH REQUIREMENTS.
   - 4.3. THE USE OF A RECLAIMER IS AN ADEQUATE BLENDING METHOD. DISCING IS NOT AN ADEQUATE BLENDING METHOD.
   - 4.4. A STABILIZATION DEPTH OF 12" WAS USED FOR DESIGN PURPOSES. STABILIZATION DEPTH MAY NEED TO INCREASE TO 16" IN AREAS OF EXTREME MOISTURE OR POOR SOILS IN ORDER TO MEET THE STRENGTH AND PROOF ROLL REQUIREMENTS.
5. COMPACTION:
   - 5.1. A ROLLING PATTERN WILL BE ESTABLISHED USING A NUCLEAR DENSITY GAUGE DURING COMPACTION.
     - 5.1.1. COMPACTION WILL BE PERFORMED UNTIL THE STABILIZED MATERIAL REACHES THE "BREAK POINT" AFTER WHICH ADDITIONAL PASSES WITH A ROLLER RESULTS IN A LOSS OF DENSITY AS MEASURED BY A NUCLEAR DENSITY GAUGE.
     - 5.1.2. COMPACTION IS TYPICALLY ACHIEVED BY MULTIPLE PASSES OF A PADFOOT ROLLER UNTIL THE ROLLER "WALKS" OUT OF THE RECLAIMED MATERIAL (SPACE IS VISIBLE BETWEEN THE DRUM AND THE RECLAIMED MATERIAL). THIS IS FOLLOWED BY BLADING AND SHAPING THE RECLAIMED MATERIAL TO FINAL PROFILE AND CROSS SECTION, REMOVING HIGH AND LOW POINTS. SMOOTH DRUM OR RUBBER TIRE ROLLERS ARE THEN USED TO FINISH ROLLING (THIS IS WHEN THE DENSITY TESTS ARE PERFORMED) UNTIL THE DENSITY OF THE MATERIAL REACHES THE "BREAK POINT."
     - 5.1.3. THE NUMBER OF PASSES AND EQUIPMENT USED TO REACH THE "BREAK POINT" IS CONSIDERED THE ROLLING PATTERN.
     - 5.1.4. A NEW ROLLING PATTERN MAY NEED TO BE ESTABLISHED IF THE PERFORMANCE REQUIREMENTS ARE NOT BEING MET. THIS MAY BE DUE TO CHANGES IN THE MOISTURE CONTENT, THE SOIL TYPE, OR THE CEMENT RATE.
   - 5.2. THE TARGET DENSITY IS 98% OF THE MAXIMUM DENSITY DETERMINED FROM THE ROLLING PATTERN.
     - 5.2.1. DENSITY TESTS SHALL BE TAKEN AT THE RATE OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER TO CONFIRM THE DENSITY IS MATCHING THE TARGET. ONCE THE ROLLING PATTERN HAS BEEN CONFIRMED IT IS RECOMMENDED THAT TESTING CONTINUE AT 1 TEST PER 1,000 LF IN EACH PASS OF THE RECLAIMER.
     - 5.2.2. IF IT IS NOT POSSIBLE TO ATTAIN THE TARGET DENSITY, AND ADDITIONAL COMPACTION DOES NOT IMPROVE THE DENSITY, A NEW ROLLING PATTERN SHOULD BE ESTABLISHED.
   - 5.3. THE AIR TEMPERATURE SHALL BE ABOVE 40 DEGREES (F) DURING THE CEMENT STABILIZATION PROCESS. MIXING CEMENT INTO FROZEN GROUND IS NOT ACCEPTABLE.
6. THE STABILIZED MATERIAL SHALL BE CONTINUOUSLY WET CURED FOR A MINIMUM OF 24 HOURS (WET CURED IS IDENTIFIED VISUALLY AS DAMP SURFACE).
7. PERFORM SUBGRADE TESTING IN ACCORDANCE WITH TESTING SCHEDULE.
8. AGGREGATE PLACEMENT:
   - 8.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 8.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 8.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

CEMENT STABILIZATION - DESIGN BASIS

1. DURING INITIAL CONSTRUCTION, CONTRACTOR SHALL CONSTRUCT MINIMUM 300 LF TEST STRIPS CONTAINING 4%, 5%, AND 6% CEMENT IN ACCORDANCE WITH CEMENT STABILIZATION PROCEDURES.
2. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 3 FOR ANTICIPATED RESULTS):
   - 2.1. PERFORM INITIAL SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M BETWEEN 4 TO 6 HOURS AFTER FINAL COMPACTION.
   - 2.2. PERFORM ADDITIONAL DCP TESTING AT 24 AND 48 HOURS AFTER FINAL COMPACTION.
   - 2.3. PERFORM SUBSEQUENT DCP TESTS AT 7 DAYS AFTER FINAL COMPACTION AS VERIFICATION OF STRENGTH CURVE.
   - 2.4. A MINIMUM OF 3 TESTS PER TEST SECTION PER TIMEFRAME IS REQUIRED. TESTS SHALL BE TAKEN AT THE CENTERLINE AND 2' FROM EACH SHOULDER.
   - 2.5. RECORD DCP TEST RESULTS EVERY 6 INCHES TO TOTAL DEPTH OF 12 INCHES.

TABLE 3: TEST STRIP CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	COMPRESSIVE STRENGTH (PSF)
4 - 6 HOURS	6	5	1,800
24 HOURS	10	7	2,500
48 HOURS	15	10	3,200
7 DAYS	30	21	5,200

CEMENT STABILIZATION - PRODUCTION

1. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 5 FOR SUMMARY OF TESTING REQUIREMENTS):
   - 1.1. PERFORM SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M NO SOONER THAN 24 HOURS AFTER FINAL COMPACTION.
   - 1.2. DCP TESTING FREQUENCY SHALL BE WITH A RANDOM SPACING AND A MINIMUM OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER. A MINIMUM OF 3 TESTS PER ROAD IS REQUIRED.
   - 1.3. THE CBR OF THE STABILIZED SUBGRADE SHOULD BE CALCULATED IN 6" INCREMENTS THROUGH THE ENTIRE DEPTH OF THE STABILIZED LAYER.
   - 1.4. THE MINIMUM REQUIRED CBR PRIOR TO PROOF-ROLLING IS PROVIDED IN TABLE 4 BELOW.

TABLE 4: FINAL CEMENT STABILIZED CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	UNDRAINED SHEAR STRENGTH (PSF)	BEARING CAPACITY (PSF)
24 - 48 HOURS	15	10	3,500	9,800
3 - 7 DAYS	30	21	7,000	18,000
28 DAYS	50	33	12,000	28,500

NOTE: UNDRAINED SHEAR STRENGTH WAS CALCULATED USING THE BLACK (1961) EQUATION. BEARING CAPACITY WAS CALCULATED USING THE VESIC EQUATION MODIFIED FOR TWO LAYERS (12" CEMENT STABILIZED SUBGRADE OVER A NATURAL SUBGRADE WITH A CBR OF 1.5)

   - 1.5. ONCE THE MINIMUM REQUIRED CBR IS ACHIEVED AT ANY CORRESPONDING TIME PERIOD, THE SUBGRADE IS CONSIDERED ADEQUATE AND THE CONTRACTOR MAY PROCEED WITH PROOF-ROLL TESTING. FUTURE DCP TESTING ON THAT SEGMENT OF SUBGRADE IS NOT REQUIRED.
   - 1.6. IF TESTING DOES NOT INDICATE A CBR OF 30 WITHIN 7 DAYS, ADDITIONAL GRAVEL SURFACING AND/OR THE ADDITION OF GEOTEXTILE FABRIC MAY BE REQUIRED. FOR FUTURE SUBGRADE STABILIZATION AREAS, CONTACT THE ENGINEER AND OWNER VIA RFI FOR RECOMMENDATIONS AND APPROVAL.
2. SUBGRADE PROOF-ROLL TESTING AND ACCEPTANCE:
   - 2.1. ONCE THE REQUIRED DCP VALUE HAS BEEN OBTAINED BUT PRIOR TO PLACING AGGREGATE, THE SUBGRADE SHALL BE PROOF-ROLLED. REFER TO THE PROJECT TESTING REQUIREMENTS FOR PROOF-ROLL DEFINITION.
   - 2.2. PROOF-ROLLING SHOULD BE PERFORMED WITH ONE PASS DOWN THE CENTER AND NOT BE PERFORMED WITHIN 12 INCHES OF THE EDGE OF THE STABILIZED SECTION.
   - 2.3. IF PROOF-ROLLING FAILS, RE-STABILIZATION MAY BE REQUIRED AND A NEW ROLLING PATTERN OR ADDITIONAL CEMENT MAY BE REQUIRED.
3. AGGREGATE PLACEMENT:
   - 3.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 3.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 3.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

TABLE 5: CEMENT STABILIZATION PRODUCTION TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
COMPACTED SUBGRADE (CEMENT STABILIZED) NOTE: SEE ABOVE FOR INITIAL TESTING REQUIREMENTS	PROCTOR	MINIMUM 1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER 1000 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
	DCP TEST	1 PER 500 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
	PROOF-ROLL (AFTER PASSING DCP TESTS)	ENTIRE LENGTH

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150
Westwood Professional Services, Inc.

Designed: BMK
Checked: TJH
Drawn: BMK
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/08/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK MasTec

2020 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 13 OF 57

0014440DTP.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 333rd Ave in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 1245' South of 333rd Ave & 202nd Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.27'03.84" W Long. -99.31'21.64" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: ~~N/A~~ As determined by Hyde County Highway Superintendent
   (Check attached spec sheet)
6. Location by legal description: Parcel # 000942 NW4 5-111-72
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Taylor Lee
Signature of Applicant

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 333rd Ave in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 1245' South of 333rd Ave & 202nd Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.27'03.84" W Long. -99.31'21.64" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: N/A
   (Check attached spec sheet)
6. Location by legal description: Parcel # 000942 NW4 5-111-72
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: _____

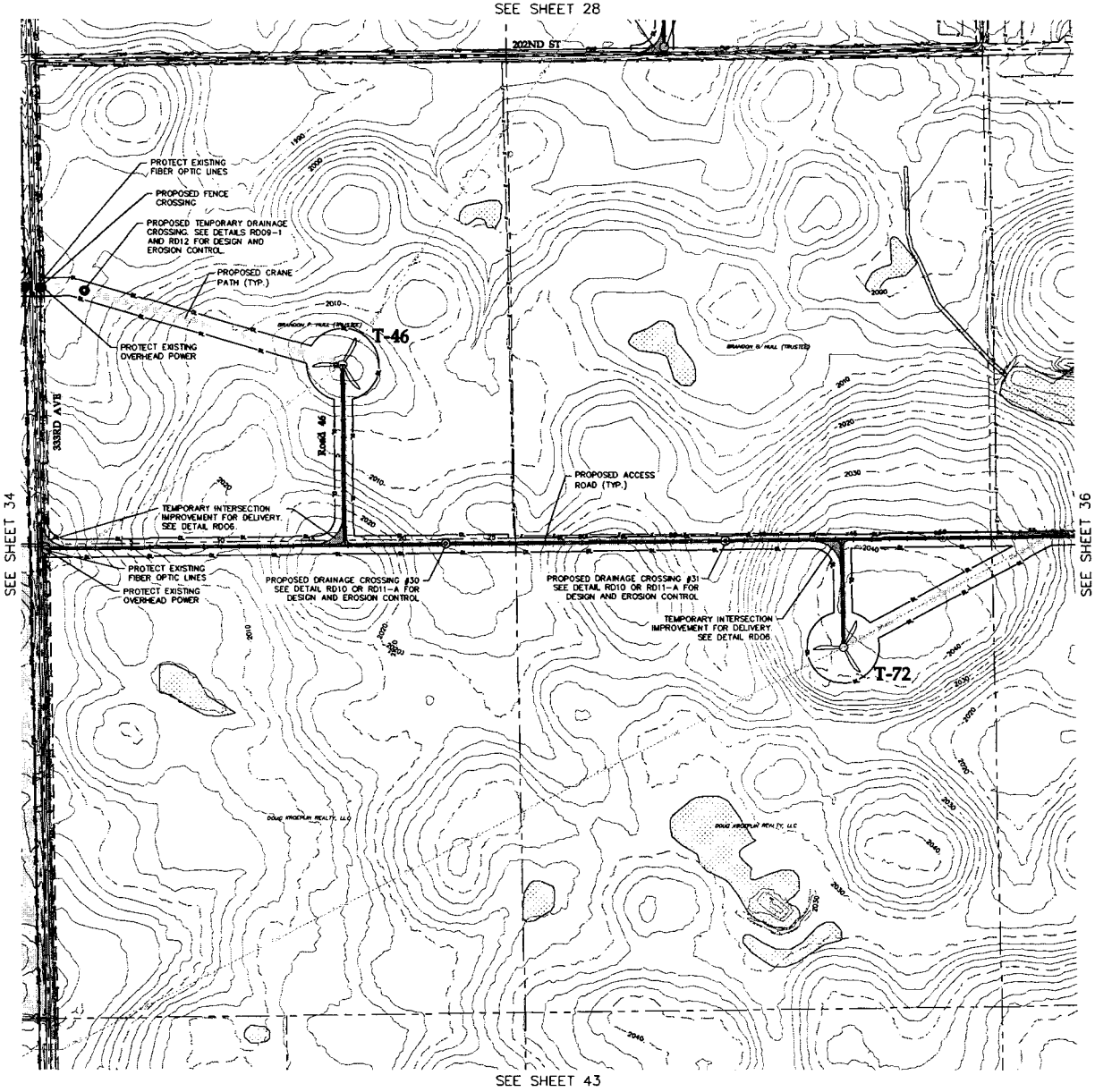
Taylor Lee
Signature of Applicant

_____
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

©2019 Westwood Professional Services, Inc.



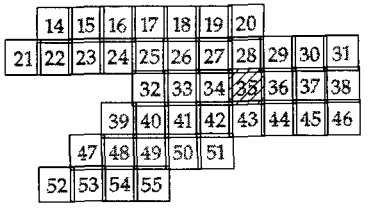
LEGEND:

- PROPOSED TURBINE LOCATION
- T-XX PROPOSED TURBINE NUMBER
- PROPOSED ALTERNATE TURBINE LOCATION
- ALT-XX PROPOSED ALTERNATE TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED ALTERNATE ACCESS ROAD
- PROPOSED CRANE PATH
- PROPOSED UNDERGROUND COLLECTION*
- PROPOSED DISTURBANCE LIMITS
- PROPOSED PERIMETER SEDIMENT CONTROL
- 980 EXISTING 10' CONTOURS
- EXISTING 2' CONTOURS
- EXISTING GRAVEL EDGE
- EXISTING BITUMINUS EDGE
- EXISTING RIGHT-OF-WAY
- EXISTING PARCEL LINE
- EXISTING BUILDING
- EXISTING FENCE
- EXISTING OVERHEAD POWER
- EXISTING HIGH VOLTAGE OVERHEAD POWER
- EXISTING UNDERGROUND POWER LINE
- EXISTING FIBER OPTIC LINE
- EXISTING WATER LINE
- DELINEATED WETLAND
- ARCHAEOLOGICAL AVOIDANCE AREA
- EXISTING USFWS EASEMENT
- PROJECT BOUNDARY
- 1900 EXISTING GROUND ELEVATION
- PROPOSED DRAINAGE CROSSING**
- PROPOSED TEMPORARY DRAINAGE CROSSING**
- PROPOSED FENCE CROSSING***
- PROPOSED UTILITY CROSSING
- PROPOSED CULVERT

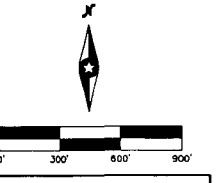
* PROVIDED BY OTHERS AND SHOWN FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSTRUCTION PLANS FOR DETAILS.

** SEE SHEET 11 FOR DRAINAGE CROSSING TYPE AND SIZING. DRAINAGE CROSSINGS SHALL CONSIST OF LOW WATER CROSSING OR CULVERT. DRAINAGE CROSSINGS ALONG CRANE PATH SHALL CONSIST OF CRANE MATS OR TEMPORARY CULVERT.

*** ALL GATE INSTALLATIONS SHALL BE FIELD DETERMINED AND AGREED UPON BY THE CONTRACTOR AND OWNER.



KEY MAP



Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwood@pwse.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: BEH
Drawn: BMK
As-Built Drawing:

Revisions #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2200 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

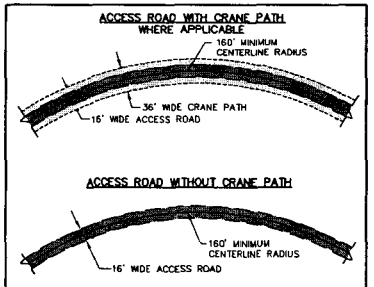
Site Plan T-46, T-72

90% COMPLETE NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 35 OF 57

0014440SP01.dwg

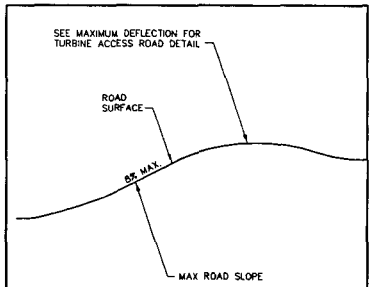
© 2019 Westwood Professional Services, Inc.



NOTE:

1. SOME RADII MAY REQUIRE ADDITIONAL SOIL COMPACTION OR GRAVEL OUTSIDE OF THE WIDTH SHOWN ABOVE TO ACCOMMODATE TRACTORS OR TRAILERS TRACKING OFF THE ACCESS ROAD.

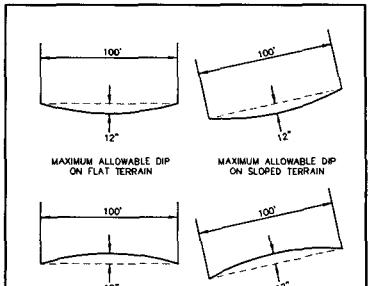
Westwood	MINIMUM RADIUS FOR TURBINE ACCESS ROAD	LAST REVISED: 04/29/11 RD02



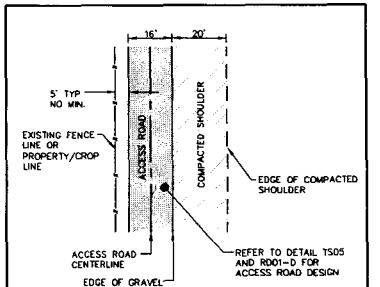
NOTES:

1. ROAD SLOPE SHALL NOT EXCEED 8% WITHOUT OWNER APPROVAL

Westwood	MAXIMUM VERT. SLOPE FOR TURBINE ACCESS ROAD/CRANE TRAVEL PATH	LAST REVISED: 3/28/12 RD03



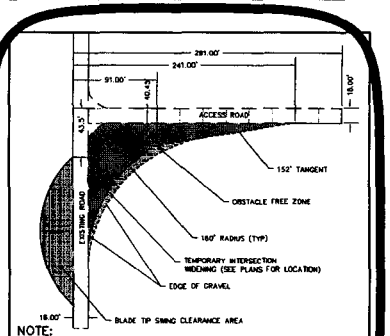
Westwood	MAXIMUM DEFLECTION FOR TURBINE ACCESS ROAD	LAST REVISED: 01/02/08 RD04



NOTE:

1. COMPACTED SHOULDER SHALL BE RETURNED TO NATIVE CONDITION FOLLOWING TURBINE GENERATOR CONSTRUCTION.
2. THE ACCESS ROAD MAY NEED TO BE CONSTRUCTED FARTHER FROM THE PROPERTY LINE IF OBSTRUCTIONS SUCH AS TREES FOLLOW THE PROPERTY LINE.

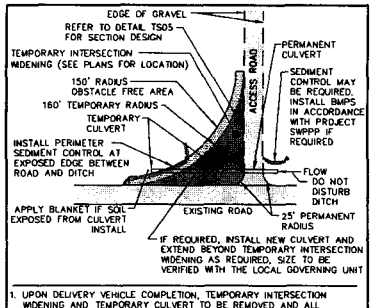
Westwood	TURBINE ACCESS ROAD ALONG FENCE/PROPERTY/CROP LINE	LAST REVISED: 3/28/07 RD05



NOTE:

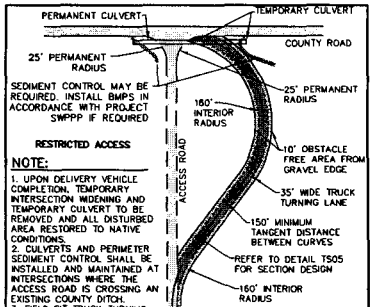
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING TO BE REMOVED AND ALL DISTURBED AREA RESTORED.
2. DIMENSIONS ASSUME A 90° INTERSECTION

Westwood	INTERSECTION WIDENING DIMENSIONS	LAST REVISED: 7/15/09 RD06



1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.

Westwood	TURBINE ACCESS ROAD TYPICAL INTERSECTION WIDENING	LAST REVISED: 3/3/17 RD07

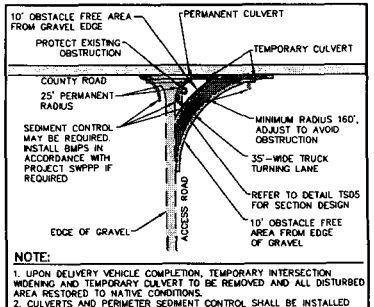


NOTE:

1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

NOT TO SCALE

Westwood	TRUCK TRAFFIC TURNING LANE A	LAST REVISED: 3/3/17 RD08-A



NOTE:

1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

Westwood	TRUCK TRAFFIC TURNING LANE B	LAST REVISED: 12/3/11 RD08-B

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-Free (888) 937-5150 westwood@us.com
Westwood Professional Services, Inc.

Designed:	SMK
Checked:	DJH
Drawn:	SMK
As-Built Drawing:	

Revisions:

#	Date	Description
A	12/06/18	10% CIVIL PLANS
B	03/27/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

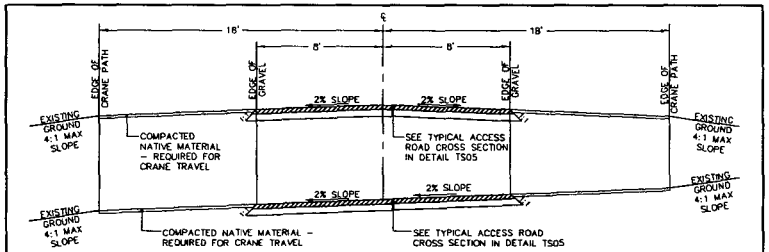
90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19

Sheet: 5 OF 57

0014440DTP.dwg

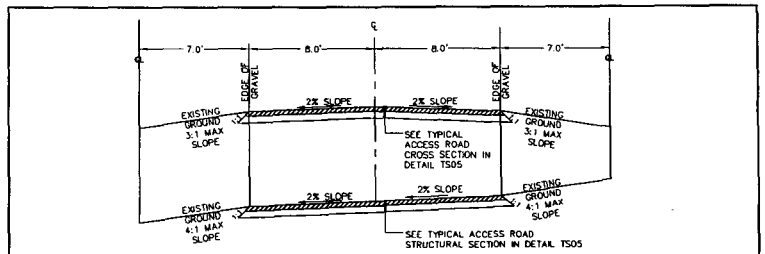
© 2019 Westwood Professional Services, Inc.



NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE ACCESS ROAD DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

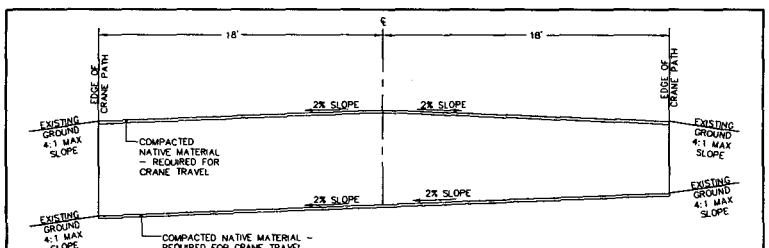
Westwood | TYPICAL TURBINE ACCESS ROAD AND CRANE PATH | LAST REVISED: 01/09/01 | RD01-A



NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

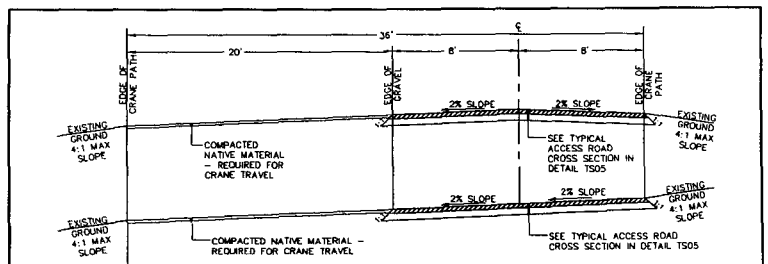
Westwood | TYPICAL TURBINE ACCESS ROAD SECTION | LAST REVISED: 1/09/02 | RD01-B



NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE WHERE CRANE PATHS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT CRANE PATH REMAINS WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%

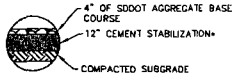
Westwood | TYPICAL CRANE PATH | LAST REVISED: 01/09/01 | RD01-C



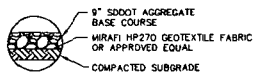
NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE EDGE OF COMPACTED SHOULDER DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

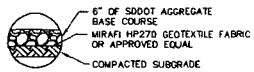
Westwood | TYPICAL TURBINE ACCESS ROAD AND OFFSET CRANE PATH | LAST REVISED: 04/29/01 | RD01-D



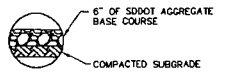
PRIMARY ACCESS ROAD CROSS SECTION*



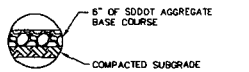
SECONDARY TURBINE ACCESS ROAD CROSS SECTION



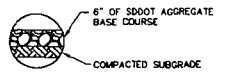
SPUR ROAD / MET TOWER ROAD CROSS SECTION



TEMPORARY TURNING IMPROVEMENTS CROSS SECTION



GRAVEL RING CROSS SECTION



LAYDOWN YARD CROSS SECTION

* CEMENT APPLICATION RATE MAY VARY BASED ON TEST STRIPS AND FIELD PERFORMANCE. SEE SHEET 13 FOR CEMENT STABILIZATION PROCEDURE AND DESIGN BASIS.

NOTES:

STRUCTURAL SECTIONS SHOWN ARE THE MINIMUM THICKNESS REQUIREMENTS DURING NORMAL FIELD CONDITIONS. THE SECTIONS MAY NEED TO BE INCREASED BASED ON ACTUAL FIELD CONDITIONS AT THE TIME OF CONSTRUCTION. CONDITIONS INCLUDE BUT ARE NOT LIMITED TO CONSTRUCTION DURING THE FREEZE/THAW CYCLE, UNUSUALLY WET PERIODS, OR IN LOW/WET AREAS. SEE SHEET 12 FOR TESTING REQUIREMENTS AND SPECIFICATIONS.

Westwood | TYPICAL STRUCTURAL CROSS SECTIONS

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 1000
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-free (866) 937-5150 westwoodps.com

Whitewood Professional Services, Inc.

Designed: MK
Checked: DJH
Drawn: MK
As-Built Drawing:

Revisions		
#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE NOT FOR CONSTRUCTION

Date: 07/19/19

Sheet: 4 OF 57

00144400.dwg

©2019 Westwood Professional Services, Inc.

ROAD DESIGN PARAMETERS

1. ACCESS ROADS HAVE BEEN DESIGNED TO ACCOMMODATE LIGHT DUTY TRUCKS (PICKUP TRUCKS AND MAINTENANCE VEHICLES) FOR LOW VOLUME USE IN NORMAL OPERATING CONDITIONS AS WELL AS HEAVY DUTY CONSTRUCTION TRAFFIC UNDER DRY CONDITIONS. THE ROAD DESIGN SPECIFIED IS NOT INTENDED FOR ALL WEATHER USE FOR HEAVY DUTY CONSTRUCTION LOADS.
2. ROAD MAINTENANCE CAN BE EXPECTED OVER THE LIFE OF THE PERMANENT FACILITY.

PRODUCTS

1. AGGREGATE BASE SHALL CONSIST OF SDDOT AGGREGATE BASE COURSE (AND IN CONFORMANCE WITH THE GRADATION TABLE 1). AGGREGATE MAY BE CRUSHER RUN UPON ENGINEERS APPROVAL. AGGREGATE GRADATIONS SHALL BE SUBMITTED TO ENGINEER FOR REVIEW.
2. ROAD SHOULDERS AND CRANE PADS SHALL CONSIST OF COMPACTED NATIVE SOILS.
3. CULVERTS: ACCESS ROAD CULVERTS SHALL MEET THE MINIMUM SPECIFICATIONS SET FORTH BY THE SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION AND/OR HYDE COUNTY. ALL CULVERTS ARE PLANNED TO BE A MINIMUM 18" DIAMETER AND MANUFACTURED OF 16-GAGE CORRUGATED METAL PIPE WITH NO END TREATMENTS UNLESS NOTED OTHERWISE. ACTUAL SIZE WILL BE DETERMINED THROUGH HYDRAULIC ANALYSIS.
4. GEOTEXTILE FABRIC: MIRAFI HP270 OR APPROVED EQUAL.

EXECUTION

1. CLEARING AND GRUBBING
   A. THE CONTRACTOR SHALL BE REQUIRED TO GRUB ALL TREES, STUMPS, BRUSH, AND DEBRIS WITHIN THE GRADING AREAS SHOWN ON THE PLANS. GRUBBING INCLUDES REMOVAL OF ALL PLANT MATERIAL GREATER THAN 2" INCLUDING STUMPS, BRANCHES, ROOTS, ETC. TO A DEPTH BELOW THE FINAL SUBGRADE. THE CONTRACTOR IS TO REMOVE ONLY THOSE TREES WHICH ARE DESIGNATED BY THE OWNER'S REPRESENTATIVE FOR REMOVAL, AND SHALL EXERCISE EXTREME CARE AROUND EXISTING TREES TO BE SAVED.
2. TOPSOIL STRIPPING
   A. TOPSOIL, INCLUDING ROOTS LARGER THAN 2" AND LARGE ROOT MASSES, SHALL BE STRIPPED FROM ALL ROADWAY AND FOUNDATION AREAS UP TO 10". TOPSOIL SHALL NOT BE STRIPPED OUTSIDE OF THE DESIGNATED DISTURBANCE AREAS.
   B. ANY TOPSOIL THAT HAS BEEN STRIPPED SHALL BE STOCKPILED FOR POST CONSTRUCTION REVEGETATION. ALL TOPSOIL SHALL BE REDISTRIBUTED TO THE LAND OWNER'S PROPERTY OF WHERE IT ORIGINATED FROM.
3. FILL PLACEMENT
   A. FILL PLACEMENT SHALL CONSIST OF THE PLACING OF SUITABLE FILL MATERIAL, AFTER TOPSOIL STRIPPING, ABOVE THE EXISTING GRADE. GENERALLY, SIDE SLOPES SHALL BE CONSTRUCTED AT FOUR FOOT HORIZONTAL TO ONE FOOT VERTICAL, WITH SOME LOCATIONS THROUGHOUT THE PROJECT WITH SLOPES OF TWO FEET HORIZONTAL TO ONE FOOT VERTICAL. THE MATERIAL FOR FILL CONSTRUCTION SHALL BE OBTAINED FROM THE ACCESS ROAD/TURBINE EXCAVATION (SEE GEOTECHNICAL REPORT FOR RESTRICTIONS), OR ANY SUITABLE, APPROVED SOIL OBTAINED ONSITE/OFFSITE BY CONTRACTOR, AS DIRECTED OR APPROVED BY THE ENGINEER. THIS MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 12" AND CONSTRUCTED TO 95% OF THE MAXIMUM DRY DENSITY AND WITHIN 2% OF OPTIMUM MOISTURE CONTENT, AS DETERMINED BY THE STANDARD PROCTOR (AASHTO T99).
   B. SIDE SLOPES GREATER THAN 4:1 WILL NOT BE PERMITTED, UNLESS OTHERWISE NOTED ON THE PLAN.
   C. FILL SLOPES SHALL BE BENCHED INTO THE EXISTING SLOPE TO PREVENT MOVEMENT BETWEEN THE FILL AND NATIVE SOILS. BENCHES SHOULD BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO FILL PLACEMENT. POSITIVE DRAINAGE IS REQUIRED AT BENCHED AREAS AND AT THE TOE OF FILL SLOPES TO REMOVE SURFACE WATER.
4. SUBGRADE
   A. SUBGRADE PREPARED AT GRADE OR IN CUT REQUIRES SCARIFICATION AND RECOMPACTION TO A DEPTH OF 12" OR MORE.
   B. ACCESS ROAD CROSS SLOPES SHOWN IN THE PLANS ARE MEANT AS A GUIDE. ACCESS ROAD CROSS SLOPES MAY RANGE FROM 1% - 2%, CHECK WITH THE ENGINEER IF THE CROSS SLOPE FALLS OUTSIDE OF THIS RANGE. ACCESS ROADS BEING UTILIZED FOR CRANE TRAVEL SHOULD HAVE A MAX CROSS SLOPE OF 2%

TABLE 1: SDDOT AGGREGATE BASE COURSE - LOCALLY SOURCED	
SIEVE SIZE	PERCENT PASSING
1"	100
3/4"	80-100
1/2"	68-91
NO. 4	46-70
NO. 8	34-58
NO. 40	13-35
NO. 200	3-12

MEET FOLLOWING REQUIREMENTS PER 882.2

LIQUID LIMIT (MAX) = 25
PLASTICITY INDEX = 0-6
L.A ABRASION (% MAX) = 40%

GRADATION HAS BEEN OBTAINED FROM THE 2015 SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION BOOK.

STORM WATER DESIGN PARAMETERS

1. SEE SHEET 6 FOR CULVERT SIZING AND DESIGN PARAMETERS. SEE HYDROLOGY MEMO FOR FURTHER DESIGN CALCULATIONS. CULVERTS SHALL BE MINIMUM 18" CORRUGATED METAL PIPE. ALL TEMPORARY PORTIONS OF THE INSTALLED CULVERTS SHALL BE REMOVED UPON COMPLETION OF THE PROJECT.
2. IT IS EXPECTED THAT CULVERTS WILL BE OVERTOPPED DURING SOME STORMS AND MAINTENANCE WILL BE REQUIRED THROUGH THE LIFE OF THE PROJECT.
3. WHEN INSTALLING DRAINAGE CULVERTS THE CONTRACTOR SHALL USE JUDGMENT IN SETTING THE FLOW LINE ELEVATIONS AND CULVERT LONGITUDINAL SLOPE. TYPICALLY THE FLOW LINE ELEVATIONS AND LONGITUDINAL SLOPE OF THE CULVERT SHOULD MATCH THE NATURAL GROUND ELEVATIONS AND SLOPE TO ENSURE POSITIVE DRAINAGE. WHEN POSSIBLE, ALL CULVERTS SHOULD BE PLACED AT A MINIMUM 0.5% GRADE.
4. ANTICIPATED CULVERT CROSSINGS ARE SHOWN ON THE CONSTRUCTION PLAN, ADDITIONAL CULVERTS MAY NEED TO BE INSTALLED IN AREAS WHERE CONCENTRATED FLOW IS EXPECTED DUE TO CONSTRUCTION ACTIVITIES.
5. CONSTRUCTION DRAINAGE CROSSINGS TO MAINTAIN EXISTING FLOW CHARACTERISTICS OF THE FEATURES. FEATURES SHALL BE GRADED TO PRECONSTRUCTION CONTOURS.

TESTING:

1. TESTING SHALL BE PERFORMED BY A DESIGNATED INDEPENDENT TESTING AGENCY.
2. SUBMIT ONE SET OF TESTING AND INSPECTION RECORDS SPECIFIED TO THE CIVIL ENGINEER OF RECORD.

DEFINITIONS:

1. PROOF ROLLING:
   SHALL BE PERFORMED IN THE PRESENCE OF THE GEOTECHNICAL ENGINEER OR QUALIFIED GEOTECHNICAL REPRESENTATIVE USING A FULLY LOADED TANDEM AXLE DUMP TRUCK OR WATER TRUCK WITH A MINIMUM GROSS WEIGHT OF 25 TONS OR A FULLY LOADED BELLY DUMP WITH AN EQUIVALENT AXLE LOADING. PROOF-ROLLING ACCEPTANCE STANDARDS INCLUDE NO RUTTING GREATER THAN 1.5 INCHES, AND NO "PUMPING" OF THE SOIL BEHIND THE LOADED TRUCK.
2. SIEVE ANALYSIS:
   SHALL BE CONDUCTED IN ACCORDANCE WITH AASHTO T27
3. PROCTORS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T99
4. ATTERBERG LIMITS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T89 AND T90
5. MOISTURE DENSITY (NUCLEAR DENSITY):
   SHALL BE DONE IN ACCORDANCE WITH AASHTO T310
6. DYNAMIC CONE PENETROMETER (DCP) TESTING:
   SHALL BE DONE IN ACCORDANCE WITH ASTM D6951-03

REQUIREMENTS:

1. FILL PLACEMENT:
   A. SOILS USED AS FILL MATERIAL SHALL BE TESTED FOR MOISTURE CONTENT AND PROCTOR TESTS.
   B. WHERE FILL CONSTRUCTION REQUIRES MORE THAN 12 INCHES OF FILL PLACEMENT, COMPACT EACH LIFT TO A MINIMUM OF 95 PERCENT OF THE MATERIAL'S MAXIMUM STANDARD PROCTOR DRY DENSITY.
2. COMPACTED SUBGRADE (CEMENT STABILIZED):
   A. SEE SHEET 13 FOR TESTING REQUIREMENTS AND PROCEDURE.
3. COMPACTED SUBGRADE (NON-CEMENT STABILIZED):
   A. THE ENTIRE SUBGRADE SHALL BE PROOF-ROLLED PRIOR TO THE PLACEMENT OF THE AGGREGATE BASE TO IDENTIFY AREAS OF UNSTABLE SUBGRADE.
   B. PERFORM A MINIMUM OF 3 DYNAMIC CONE PENETROMETER (DCP) TESTS PER ACCESS ROAD OR ONE FOR EVERY 1,000 LF OF ROAD, WHICHEVER IS GREATER. SUBGRADE MUST MEET A MINIMUM DCP OF 3 BLOWS PER 6" TO A TOTAL DEPTH OF 2' (MINIMUM CBR=1.5).
   C. IF A PASSING PROOF-ROLL OR DCP REQUIREMENTS CANNOT BE ACHIEVED THE FOLLOWING ALTERNATIVES MAY BE IMPLEMENTED:
      a. SCARIFY, DRY, AND RECOMPACT SUBGRADE
      b. REMOVE UNSUITABLE MATERIAL AND REPLACE WITH SUITABLE MATERIAL
      c. INCREASE AGGREGATE BASE THICKNESS
4. AGGREGATE BASE:
   A. AGGREGATE BASE SHALL BE PROOF-ROLLED OVER THE ENTIRE LENGTH. IF PROOF ROLLING DETERMINES THAT THE ROAD IS UNSTABLE, ADDITIONAL AGGREGATE SHALL BE ADDED UNTIL THE UNSTABLE SECTION IS ABLE TO PASS A PROOF ROLL.
   B. PROVIDE 1 SIEVE ANALYSIS (PROJECT MAX OF 20) PER 2500 CY OF ROAD BASE PLACED.
5. CRANE PAD AND CRANE PATHS / CRANE TRAVEL SHOULDERS:
   A. TESTING REQUIREMENTS ARE PENDING BASED ON CRANE PICK PLANS PROVIDED BY THE CONTRACTOR.

TABLE 2: TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
FILL PLACEMENT	PROCTOR	1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER LIFT PER 5000 SF OF FILL PLACED OR 1 PER 500 LF OF ROAD OR CRANE WALK
COMPACTED SUBGRADE (CEMENT STABILIZED):	SEE SHEET 13	SEE SHEET 13
COMPACTED SUBGRADE (NON-CEMENT STABILIZED):	PROOF-ROLL	ENTIRE AREA
	DCP	1 PER 1,000 FT OR MIN. 3 PER ROAD
AGGREGATE BASE	PROOF-ROLL	ENTIRE AREA
	SIEVE ANALYSIS, LL, PL, AND L.A ABRASION	1 PER 2,500 CY

GENERAL NOTES:

1. GROUND SURFACE CONTOURS (AT TWO-FOOT VERTICAL INTERVALS) AND ELEVATIONS ARE BASED ON A PHOTOGRAMMETRY SURFACE PROVIDED BY GEOTERRA. IF MAJOR DISCREPANCIES ARE FOUND IN THE GROUND ELEVATIONS DURING FIELD STAKING TO THE GROUND ELEVATIONS SHOWN ON THE PLANS, THE OWNER AND ENGINEER SHALL BE NOTIFIED.
2. WHERE SECTION OR SUBSECTION MONUMENTS ARE ENCOUNTERED, THE OWNER SHALL BE NOTIFIED BEFORE SUCH MONUMENTS ARE REMOVED. THE CONTRACTOR SHALL PROTECT AND CAREFULLY PRESERVE ALL PROPERTY MARKERS AND MONUMENTS UNTIL THE OWNER, AN AUTHORIZED SURVEYOR OR AGENT HAS WITNESSED OR OTHERWISE REFERENCED THEIR LOCATION.
3. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. TYPICAL DISTURBANCE SHALL BE LIMITED TO 10 LF FROM THE EDGE OF PROPOSED GRADING.
4. FINALIZE GRADING AROUND THE BASE OF TURBINES IN ACCORDANCE WITH DETAIL TS-03 AND TS-04.
5. GRADE ALL PROPOSED ROADS TO A MAXIMUM SLOPE OF 8%. IF 8% SLOPE CANNOT BE ACHIEVED, THE CONTRACTOR MAY UTILIZE ASSIST VEHICLES FOR THE PURPOSE OF DELIVERIES. GRADE ALL PROPOSED CRANE PATHS TO A MAXIMUM OF 8% UNLESS OTHERWISE NOTED IN PLAN SHEETS.
6. ANY FACILITIES REMOVED TO ALLOW FOR CONSTRUCTION (MAILBOXES, SIGNS, FENCES, ETC.) SHALL BE REPLACED BY THE CONTRACTOR IN A CONDITION AS GOOD AS EXISTING.
7. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING DRAINAGE THROUGHOUT THE CONSTRUCTION OF THIS PROJECT. CONSTRUCTION ACTIVITIES SHALL NOT BLOCK THE NATURAL OR MANMADE CREEKS OR DRAINAGE SWALES CAUSING RAINWATER TO POND. DEPENDING ON FIELD CONDITIONS, ADDITIONAL CULVERTS IN EXCESS OF THOSE ON THE PLANS MAY BE REQUIRED.
8. WHILE BUILDING THE ROADS AND EXCAVATING THE TURBINE FOUNDATIONS, EXCESS SOIL WILL RESULT. THE CONTRACTOR SHALL DISPOSE OF THIS EXCESS SOIL IN AN APPROVED MANNER. EXCESS TOPSOIL SHALL BE DISTRIBUTED INTO A THIN LAYER ON LAND IMMEDIATELY ADJACENT TO WHERE THE TOPSOIL ORIGINATED. ALL EXCESS TOPSOIL TO BE WASTED ONSITE. WHILE DOING SO THE CONTRACTOR SHALL AVOID CAUSING RIDGES OR MOUNDS THAT WOULD MAKE IT DIFFICULT FOR STORM WATER RUNOFF TO DRAIN. THE FINAL SURFACE OF THE DISTURBED TOPSOIL SHALL BE SMOOTH AND FOLLOW THE NATURAL CONTOUR OF THE LAND.
9. THE CONTRACTOR SHALL NOTIFY SOUTH DAKOTA 811 AT LEAST 48 HOURS BEFORE EXCAVATION ACTIVITIES COMMENCE.
10. TEMPORARY INTERSECTION WIDENING SHALL, UPON COMPLETION OF ALL PROJECT CONSTRUCTION OR UPON NOTIFICATION OF THE ENGINEER, BE REMOVED AND THE AREA RESTORED TO ITS ORIGINAL LINES AND GRADES WITH TOPSOIL REPLACED, EXCEPT WHERE REQUESTED BY THE TOWNSHIP OR COUNTY TO PERMANENTLY REMAIN. DISTURBED AREAS OUTSIDE OF THE FINAL ROADWAY SHALL BE SEEDED AND MULCHED.
11. TURBINE SETBACKS ARE NOT IDENTIFIED ON THE CONSTRUCTION PLANS. IT SHALL BE THE RESPONSIBILITY OF THE OWNER AND CONTRACTOR TO ENSURE THAT ALL TURBINE SETBACKS MEET PROJECT REQUIREMENTS.
12. GEOTECHNICAL REPORTS WITH RECOMMENDATIONS HAVE BEEN PROVIDED BY THE OWNER. ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL ENGINEERING REPORT AND RECOMMENDATIONS.
13. FIELD SURVEY WETLAND INFORMATION HAS BEEN PROVIDED BY THE OWNER. ALL WETLAND DELINEATIONS AND PERMITTING SHALL BE THE RESPONSIBILITY OF OTHERS AND BE COMPLETED PRIOR TO CONSTRUCTION COMMENCING. THE OWNER AND GENERAL CONTRACTOR SHALL VERIFY THAT ALL WETLAND PERMITS HAVE BEEN SUBMITTED AND APPROVED PRIOR TO CONSTRUCTION COMMENCING.
14. CULTURAL RESOURCE REPORTS HAVE NOT BEEN PROVIDED. CULTURAL RESOURCE LOCATIONS ARE NOT SHOWN ON THE PLANS. INFORMATION WILL BE THE RESPONSIBILITY OF THE OWNER AND GENERAL CONTRACTOR. THE LOCATIONS OF CULTURAL RESOURCE SITES MAY BE CONFIDENTIAL AND PROTECTED BY STATE OR FEDERAL LAW. PUBLIC RELEASE OF SPECIFIC INFORMATION REGARDING THESE RESOURCES MAY BE RESTRICTED.
15. AN ENVIRONMENTAL ASSESSMENT HAS NOT BEEN PROVIDED. THE CONTRACTOR SHALL BE FAMILIAR WITH THE REPORT AND REVIEW ALL RECOMMENDATIONS.
16. ELECTRICAL INFORMATION SHOWN ON THE PLANS IS FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSULTANT'S PLANS FOR SPECIFIC LOCATIONS AND CONSTRUCTION DETAILS FOR THE UNDERGROUND POWER COLLECTION SYSTEM AND SUBSTATION.
17. CRANE PATHS ARE SHOWN ON THE CONSTRUCTION PLANS. IF THE CONTRACTOR PROPOSES ALTERNATE CRANE PATHS, THEY SHALL ENSURE THAT WETLAND AND CULTURAL RESOURCE CORRIDORS ARE NOT DISTURBED. FINAL CRANE PATH ALIGNMENTS SHALL BE DETERMINED BY THE CONTRACTOR BASED ON FIELD CONDITIONS WITHIN THE WETLAND AND CULTURAL RESOURCE CORRIDORS, SPECIAL LANDOWNER AGREEMENTS AND THE PROJECT BOUNDARY.
18. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. DISTURBANCE SHALL BE LIMITED TO 50 LF WIDTH FOR PROPOSED ACCESS ROADS AND 50 LF FOR CRANE PATHS, AND SHALL BE LIMITED TO A 250 LF RADIUS FOR PROPOSED WIND TURBINE GENERATORS. THE GRADING LIMITS SHALL BE CENTERED ON THE ROADWAYS AND WIND TURBINES. THE CONTRACTOR SHALL MAKE ALL EFFORTS TO KEEP ACTIVITIES WITHIN THE ERECTION AREAS SHOWN ON THE PLANS BUT IT IS UNDERSTOOD THAT SOME ACTIVITIES THAT WILL NOT REQUIRE GRADING OR SOIL DISTURBANCE MAY EXTEND BEYOND THE DEFINED LIMITS. DURING ERECTION OF THE ROTOR, TRUCKS AND/OR FORKLIFTS MAY EXTEND BEYOND THESE LIMITS. SEE DETAIL TS01 FOR TYPICAL ERECTION AREAS.
19. AN ALTA SURVEY HAS BEEN PROVIDED BY WESTWOOD. CONTRACTOR AND OWNER ARE RESPONSIBLE FOR LOCATING ALL UTILITIES AND VERIFYING LOCATION OF CONSTRUCTION ACTIVITIES PRIOR TO COMMENCING WORK.

STORMWATER POLLUTION PREVENTION PLAN (SWPPP):

1. THE CONTRACTOR SHALL PROVIDE EROSION CONTROL MEASURES AS PLANNED AND SPECIFIED FOLLOWING BEST MANAGEMENT PRACTICES AS OUTLINED BY THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND BEING IN CONFORMANCE WITH THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL STORMWATER PERMIT.
2. REFER TO THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR THE TRIPLE H WIND FARM, PREPARED BY WESTWOOD PROFESSIONAL SERVICES, FOR EROSION CONTROL AND RESTORATION SPECIFICATIONS, SEDIMENT AND EROSION CONTROL PROCEDURES, LOCATIONS OF BMPs, DETAILS, AND INSPECTION INFORMATION.
3. ALL PASTURES AND DRAINAGE SWALES DISTURBED DURING CONSTRUCTION ACTIVITIES AND NOT COVERED BY ROAD SURFACING MATERIALS, SHALL BE SEEDED IN ACCORDANCE WITH THE SWPP PLAN.
4. TEMPORARY EROSION CONTROL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE TEMPORARY EROSION CONTROL PLAN SHALL BE IN ACCORDANCE WITH THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND THE TRIPLE H WIND FARM STORMWATER POLLUTION PREVENTION PLAN ON FILE.

PROJECT CONTACT INFORMATION:

TITLE	COMPANY	NAME	CONTACT NUMBER
OWNER (PRIMARY)	ENGIE	CASEY WILLIS	805-569-6185
PROJECT MANAGER	WESTWOOD	DANI NYGREN	952-906-7493
ENGINEER OF RECORD	WESTWOOD	ROB COPOULS	952-906-7470
CONTRACTOR	WANZEK	JASON HELLERUD	701-893-3685

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #300
Westwood Professional Services, Inc.

Designed: BMK
Checked: DDY
Drawn: BMK
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

3030 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 12 OF 57

0014440DTP.dwg

©2019 Westwood Professional Services, Inc.

CEMENT STABILIZATION - PROCEDURE

THE SPECIFICATIONS BELOW ARE GENERAL RECOMMENDATIONS/GUIDELINES FOR CEMENT STABILIZATION OF SUBGRADES FOR THE PROJECT. ACTUAL FIELD CONDITIONS MAY ALTER APPLICATION RATE. CONSULT GEOTECHNICAL ENGINEER FOR FURTHER RECOMMENDATIONS.

1. STRIP THE TOP ±4 INCHES OF TOPSOIL (THROUGH THE ROOT ZONE) FROM THE AREA TO BE STABILIZED. ROOTS SMALLER THAN 1/4" DIAMETER ARE CONSIDERED INSIGNIFICANT.
2. PERFORM A PROCTOR (ASTM D 698) TEST TO DETERMINE THE OPTIMUM MOISTURE CONTENT IF THE MATERIAL TO BE STABILIZED DOES NOT MATCH A PREVIOUSLY PERFORMED PROCTOR.
3. DETERMINE THE IN-SITU MOISTURE CONTENT USING A NUCLEAR DENSITY GAUGE (OR EQUIVALENT MOISTURE CONTENT TEST) DAILY, PRIOR TO INCORPORATION OF THE CEMENT. PROVIDE ADDITIONAL MOISTURE CONTENT TESTING AS NEEDED BASED ON WEATHER CONDITIONS.
   - 3.1. THE CONTRACTOR WILL BE ADVISED OF IN-SITU MOISTURE CONTENT, AND MOISTURE ADJUSTMENTS SHOULD BE MADE IF IN-SITU MOISTURE IS LESS THAN OPTIMUM MOISTURE CONTENT AS DETERMINED BY THE PROCTOR (ASTM D 698).
4. SOIL AND CEMENT BLENDING:
   - 4.1. COMPLETELY BLEND SUBGRADE SOIL WITH THE APPROPRIATE AMOUNT OF CEMENT BY WEIGHT. FIELD RESULTS FROM TEST STRIPS WILL DICTATE THE CEMENT APPLICATION RATE.
   - 4.2. IN AREAS OF HIGH MOISTURE OR POOR SOILS, THE CONTRACTOR MAY INCREASE THE PERCENT OF CEMENT IN ORDER TO MEET THE MINIMUM SUBGRADE STRENGTH REQUIREMENTS.
   - 4.3. THE USE OF A RECLAIMER IS AN ADEQUATE BLENDING METHOD. DISCING IS NOT AN ADEQUATE BLENDING METHOD.
   - 4.4. A STABILIZATION DEPTH OF 12" WAS USED FOR DESIGN PURPOSES. STABILIZATION DEPTH MAY NEED TO INCREASE TO 16" IN AREAS OF EXTREME MOISTURE OR POOR SOILS IN ORDER TO MEET THE STRENGTH AND PROOF ROLL REQUIREMENTS.
5. COMPACTION:
   - 5.1. A ROLLING PATTERN WILL BE ESTABLISHED USING A NUCLEAR DENSITY GAUGE DURING COMPACTION.
     - 5.1.1. COMPACTION WILL BE PERFORMED UNTIL THE STABILIZED MATERIAL REACHES THE "BREAK POINT" AFTER WHICH ADDITIONAL PASSES WITH A ROLLER RESULTS IN A LOSS OF DENSITY AS MEASURED BY A NUCLEAR DENSITY GAUGE.
     - 5.1.2. COMPACTION IS TYPICALLY ACHIEVED BY MULTIPLE PASSES OF A PADFOOT ROLLER UNTIL THE ROLLER "WALKS" OUT OF THE RECLAIMED MATERIAL (SPACE IS VISIBLE BETWEEN THE DRUM AND THE RECLAIMED MATERIAL). THIS IS FOLLOWED BY BLADING AND SHAPING THE RECLAIMED MATERIAL TO FINAL PROFILE AND CROSS SECTION, REMOVING HIGH AND LOW POINTS. SMOOTH DRUM OR RUBBER TIRE ROLLERS ARE THEN USED TO FINISH ROLLING (THIS IS WHEN THE DENSITY TESTS ARE PERFORMED) UNTIL THE DENSITY OF THE MATERIAL REACHES THE "BREAK POINT."
     - 5.1.3. THE NUMBER OF PASSES AND EQUIPMENT USED TO REACH THE "BREAK POINT" IS CONSIDERED THE ROLLING PATTERN.
     - 5.1.4. A NEW ROLLING PATTERN MAY NEED TO BE ESTABLISHED IF THE PERFORMANCE REQUIREMENTS ARE NOT BEING MET. THIS MAY BE DUE TO CHANGES IN THE MOISTURE CONTENT, THE SOIL TYPE, OR THE CEMENT RATE.
   - 5.2. THE TARGET DENSITY IS 98% OF THE MAXIMUM DENSITY DETERMINED FROM THE ROLLING PATTERN.
     - 5.2.1. DENSITY TESTS SHALL BE TAKEN AT THE RATE OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER TO CONFIRM THE DENSITY IS MATCHING THE TARGET. ONCE THE ROLLING PATTERN HAS BEEN CONFIRMED IT IS RECOMMENDED THAT TESTING CONTINUE AT 1 TEST PER 1,000 LF IN EACH PASS OF THE RECLAIMER.
     - 5.2.2. IF IT IS NOT POSSIBLE TO ATTAIN THE TARGET DENSITY, AND ADDITIONAL COMPACTION DOES NOT IMPROVE THE DENSITY, A NEW ROLLING PATTERN SHOULD BE ESTABLISHED.
   - 5.3. THE AIR TEMPERATURE SHALL BE ABOVE 40 DEGREES (F) DURING THE CEMENT STABILIZATION PROCESS. MIXING CEMENT INTO FROZEN GROUND IS NOT ACCEPTABLE.
6. THE STABILIZED MATERIAL SHALL BE CONTINUOUSLY WET CURED FOR A MINIMUM OF 24 HOURS (WET CURED IS IDENTIFIED VISUALLY AS DAMP SURFACE).
7. PERFORM SUBGRADE TESTING IN ACCORDANCE WITH TESTING SCHEDULE.
8. AGGREGATE PLACEMENT.
   - 8.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 8.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 8.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

CEMENT STABILIZATION - DESIGN BASIS

1. DURING INITIAL CONSTRUCTION, CONTRACTOR SHALL CONSTRUCT MINIMUM 300 LF TEST STRIPS CONTAINING 4%, 5%, AND 6% CEMENT IN ACCORDANCE WITH CEMENT STABILIZATION PROCEDURES.
2. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 3 FOR ANTICIPATED RESULTS):
   - 2.1. PERFORM INITIAL SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M BETWEEN 4 TO 6 HOURS AFTER FINAL COMPACTION.
   - 2.2. PERFORM ADDITIONAL DCP TESTING AT 24 AND 48 HOURS AFTER FINAL COMPACTION.
   - 2.3. PERFORM SUBSEQUENT DCP TESTS AT 7 DAYS AFTER FINAL COMPACTION AS VERIFICATION OF STRENGTH CURVE.
   - 2.4. A MINIMUM OF 3 TESTS PER TEST SECTION PER TIMEFRAME IS REQUIRED. TESTS SHALL BE TAKEN AT THE CENTERLINE AND 2' FROM EACH SHOULDER.
   - 2.5. RECORD DCP TEST RESULTS EVERY 6 INCHES TO TOTAL DEPTH OF 12 INCHES.

TABLE 3: TEST STRIP CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	COMPRESSIVE STRENGTH (PSF)
4 – 6 HOURS	6	5	1,800
24 HOURS	10	7	2,500
48 HOURS	15	10	3,200
7 DAYS	30	21	5,200

CEMENT STABILIZATION - PRODUCTION

1. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 5 FOR SUMMARY OF TESTING REQUIREMENTS):
   - 1.1. PERFORM SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M NO SOONER THAN 24 HOURS AFTER FINAL COMPACTION.
   - 1.2. DCP TESTING FREQUENCY SHALL BE WITH A RANDOM SPACING AND A MINIMUM OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER. A MINIMUM OF 3 TESTS PER ROAD IS REQUIRED.
   - 1.3. THE CBR OF THE STABILIZED SUBGRADE SHOULD BE CALCULATED IN 6" INCREMENTS THROUGH THE ENTIRE DEPTH OF THE STABILIZED LAYER.
   - 1.4. THE MINIMUM REQUIRED CBR PRIOR TO PROOF-ROLLING IS PROVIDED IN TABLE 4 BELOW.

TABLE 4: FINAL CEMENT STABILIZED CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	UNDRAINED SHEAR STRENGTH (PSF)	BEARING CAPACITY (PSF)
24 – 48 HOURS	15	10	3,500	9,800
3 – 7 DAYS	30	21	7,000	18,000
28 DAYS	50	33	12,000	28,500

NOTE: UNDRAINED SHEAR STRENGTH WAS CALCULATED USING THE BLACK (1961) EQUATION. BEARING CAPACITY WAS CALCULATED USING THE VESIC EQUATION MODIFIED FOR TWO LAYERS (12" CEMENT STABILIZED SUBGRADE OVER A NATURAL SUBGRADE WITH A CBR OF 1.5)

   - 1.5. ONCE THE MINIMUM REQUIRED CBR IS ACHIEVED AT ANY CORRESPONDING TIME PERIOD, THE SUBGRADE IS CONSIDERED ADEQUATE AND THE CONTRACTOR MAY PROCEED WITH PROOF-ROLL TESTING. FUTURE DCP TESTING ON THAT SEGMENT OF SUBGRADE IS NOT REQUIRED.
   - 1.6. IF TESTING DOES NOT INDICATE A CBR OF 30 WITHIN 7 DAYS, ADDITIONAL GRAVEL SURFACING AND/OR THE ADDITION OF GEOTEXTILE FABRIC MAY BE REQUIRED. FOR FUTURE SUBGRADE STABILIZATION AREAS, CONTACT THE ENGINEER AND OWNER VIA RFI FOR RECOMMENDATIONS AND APPROVAL.
2. SUBGRADE PROOF-ROLL TESTING AND ACCEPTANCE:
   - 2.1. ONCE THE REQUIRED DCP VALUE HAS BEEN OBTAINED BUT PRIOR TO PLACING AGGREGATE, THE SUBGRADE SHALL BE PROOF-ROLLED. REFER TO THE PROJECT TESTING REQUIREMENTS FOR PROOF-ROLL DEFINITION.
   - 2.2. PROOF-ROLLING SHOULD BE PERFORMED WITH ONE PASS DOWN THE CENTER AND NOT BE PERFORMED WITHIN 12 INCHES OF THE EDGE OF THE STABILIZED SECTION.
   - 2.3. IF PROOF-ROLLING FAILS, RE-STABILIZATION MAY BE REQUIRED AND A NEW ROLLING PATTERN OR ADDITIONAL CEMENT MAY BE REQUIRED.
3. AGGREGATE PLACEMENT:
   - 3.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 3.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 3.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

TABLE 5: CEMENT STABILIZATION PRODUCTION TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
COMPACTED SUBGRADE (CEMENT STABILIZED)	PROCTOR	MINIMUM 1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER 1000 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
NOTE: SEE ABOVE FOR INITIAL TESTING REQUIREMENTS	DCP TEST	1 PER 500 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
	PROOF-ROLL (AFTER PASSING DCP TESTS)	ENTIRE LENGTH

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-Free (866) 937-5150 westwoodps.com

Westwood Professional Services, Inc.

Designed: BMK
Checked: BJH
Drawn: BMK
As-Built Drawing:

Revisions: #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 13 OF 57

0014440DTP.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 202nd Street in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 1775' West of 334th Ave & 202nd Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.27'16.63" W Long. -99.30'33.26" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001530 S2 of SE4 32-112-72
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Tanya L Lance
Signature of Applicant

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 202nd Street in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 1775' West of 334th Ave & 202nd Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.27'16.63" W Long. -99.30'33.26" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001530 S2 of SE4 32-112-72
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: _____

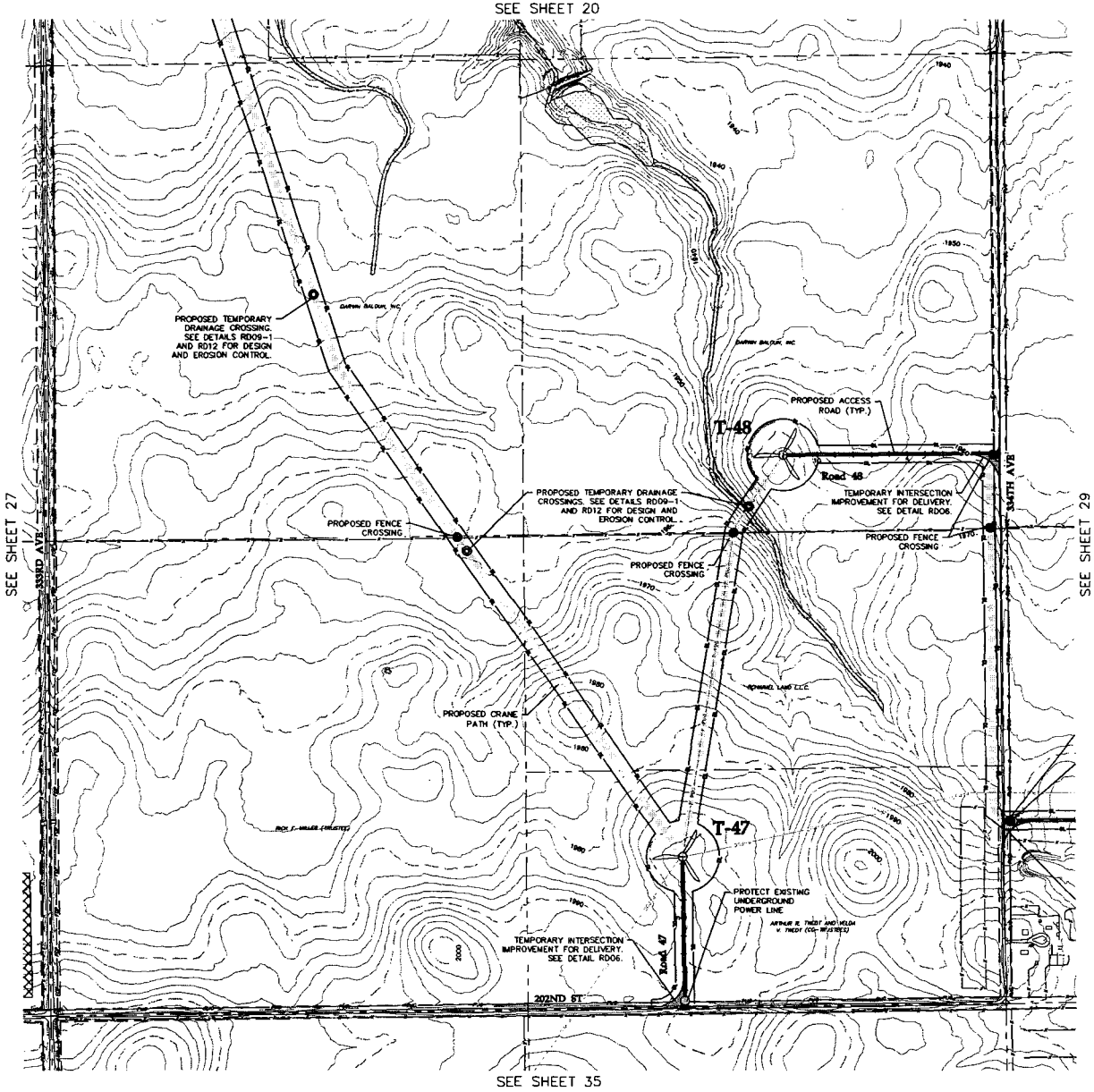
Tanya L Lance
Signature of Applicant

_____
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

© 2019 Westwood Professional Services, Inc.



LEGEND:

- PROPOSED TURBINE LOCATION
- T-XX — PROPOSED TURBINE NUMBER
- PROPOSED ALTERNATE TURBINE LOCATION
- ALT-XX — PROPOSED ALTERNATE TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED ALTERNATE ACCESS ROAD
- PROPOSED CRANE PATH
- PROPOSED UNDERGROUND COLLECTION*
- PROPOSED DISTURBANCE LIMITS
- PROPOSED PERIMETER SEDIMENT CONTROL
- 980 — EXISTING 10' CONTOURS
- EXISTING 2' CONTOURS
- EXISTING GRAVEL EDGE
- EXISTING BITUMINUS EDGE
- EXISTING RIGHT-OF-WAY
- EXISTING PARCEL LINE
- EXISTING BUILDING
- EXISTING FENCE
- EXISTING OVERHEAD POWER
- EXISTING HIGH VOLTAGE OVERHEAD POWER
- EXISTING UNDERGROUND POWER LINE
- EXISTING FIBER OPTIC LINE
- EXISTING WATER LINE
- DELINEATED WETLAND
- ARCHAEOLOGICAL AVOIDANCE AREA
- EXISTING USFWS EASEMENT
- PROJECT BOUNDARY
- 1900 — EXISTING GROUND ELEVATION
- PROPOSED DRAINAGE CROSSING**
- PROPOSED TEMPORARY DRAINAGE CROSSING**
- PROPOSED FENCE CROSSING***
- PROPOSED UTILITY CROSSING
- PROPOSED CULVERT

* PROVIDED BY OTHERS AND SHOWN FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSTRUCTION PLANS FOR DETAILS.

** SEE SHEET 11 FOR DRAINAGE CROSSING TYPE AND SIZING. DRAINAGE CROSSINGS SHALL CONSIST OF LOW WATER CROSSING OR CULVERT. DRAINAGE CROSSINGS ALONG CRANE PATH SHALL CONSIST OF CRANE MATS OR TEMPORARY CULVERT.

*** ALL GATE INSTALLATIONS SHALL BE FIELD DETERMINED AND AGREED UPON BY THE CONTRACTOR AND OWNER.

							14	15	16	17	18	19	20				
21	22	23	24	25	26	27	28	29	30	31							
							32	33	34	35	36	37	38				
						39	40	41	42	43	44	45	46				
					47	48	49	50	51								
				52	53	54	55										

KEY MAP

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed: BMC
Checked: BJH
Drawn: BMC
As-Built Drawing:

Revisions		
#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2888 2nd Avenue NW
West Fargo, ND 58078

0' 300' 600' 900'

Triple H Wind Farm

Hyde County, South Dakota

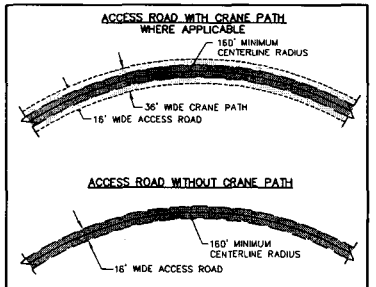
Site Plan T-47 - T-48

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 28 OF 57

0014440SP01.dwg

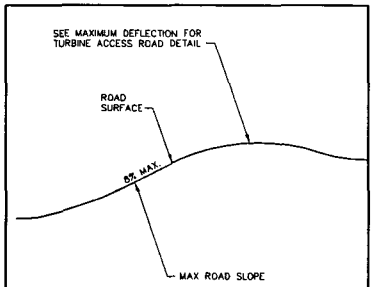
© 2019 Westwood Professional Services, Inc.



NOTE:

1. SOME RADII MAY REQUIRE ADDITIONAL SOIL COMPACTION OR GRAVEL OUTSIDE OF THE WIDTH SHOWN ABOVE TO ACCOMMODATE TRACTORS OR TRAILERS TRACKING OFF THE ACCESS ROAD.

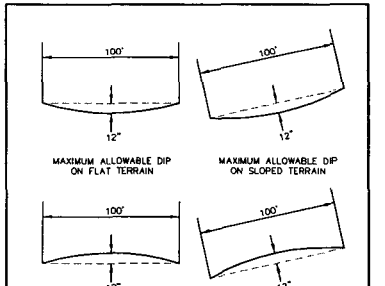
Westwood	MINIMUM RADIUS FOR TURBINE ACCESS ROAD	LAST REVISED: 04/29/11 RD02



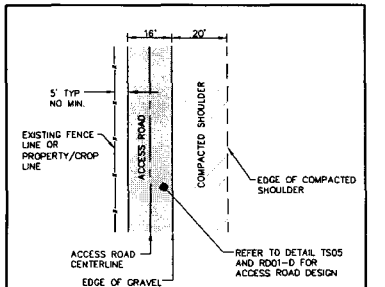
NOTES:

1. ROAD SLOPE SHALL NOT EXCEED 8% WITHOUT OWNER APPROVAL

Westwood	MAXIMUM VERT. SLOPE FOR TURBINE ACCESS ROAD/CRANE TRAVEL PATH	LAST REVISED: 3/28/13 RD03



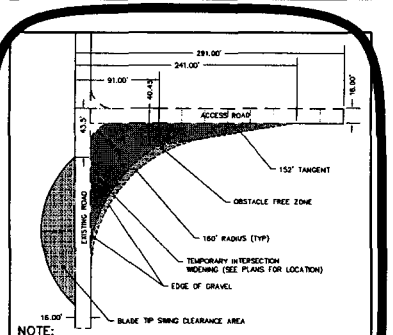
Westwood	MAXIMUM DEFLECTION FOR TURBINE ACCESS ROAD	LAST REVISED: 01/30/08 RD04



NOTE:

1. COMPACTED SHOULDER SHALL BE RETURNED TO NATIVE CONDITION FOLLOWING TURBINE GENERATOR CONSTRUCTION.
2. THE ACCESS ROAD MAY NEED TO BE CONSTRUCTED FARTHER FROM THE PROPERTY LINE IF OBSTRUCTIONS SUCH AS TREES FOLLOW THE PROPERTY LINE.

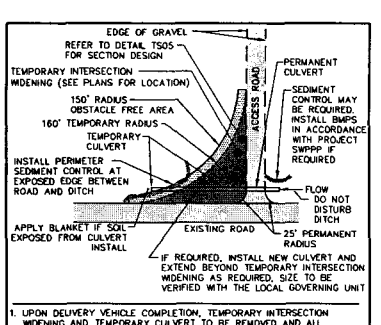
Westwood	TURBINE ACCESS ROAD ALONG FENCE/PROPERTY/CROP LINE	LAST REVISED: 3/28/13 RD05



NOTE:

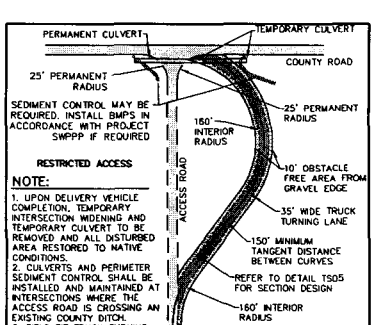
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING TO BE REMOVED AND ALL DISTURBED AREA RESTORED.
2. DIMENSIONS ASSUME A 90° INTERSECTION

Westwood	INTERSECTION WIDENING DIMENSIONS	LAST REVISED: 7/03/19 RD06



1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.

Westwood	TURBINE ACCESS ROAD TYPICAL INTERSECTION WIDENING	LAST REVISED: 3/2/17 RD07



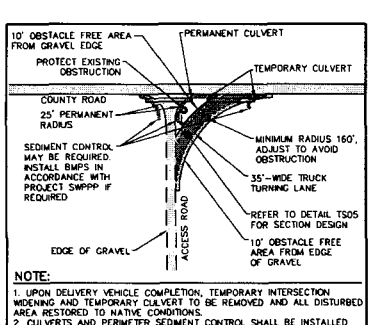
RESTRICTED ACCESS

NOTE:

1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

NOT TO SCALE

Westwood	TRUCK TRAFFIC TURNING LANE A	LAST REVISED: 3/2/17 RD08-A



NOTE:

1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

Westwood	TRUCK TRAFFIC TURNING LANE B	LAST REVISED: 12/04/14 RD08-B

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-Free (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: DBH
Drawn: BMK
As-Built Drawing:

Revisions:

#	Date	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK
MasTec

2200 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

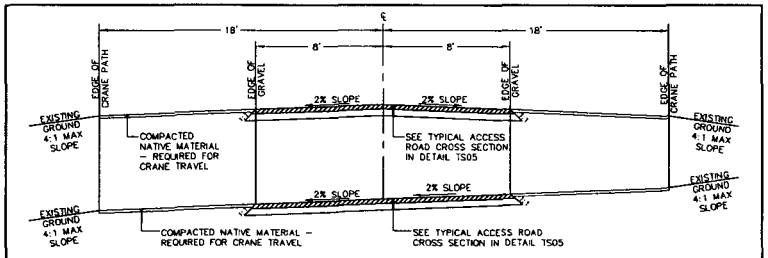
Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 5 OF 57

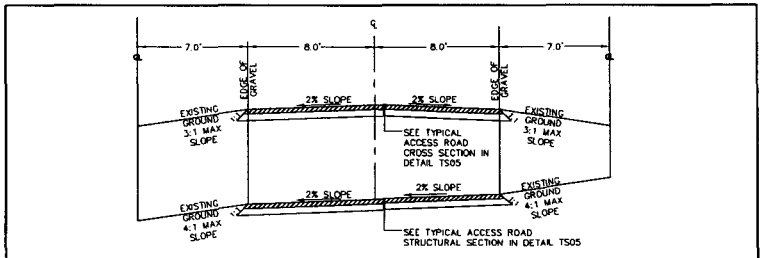
0014440DTP.dwg

©2019 Westwood Professional Services, Inc.



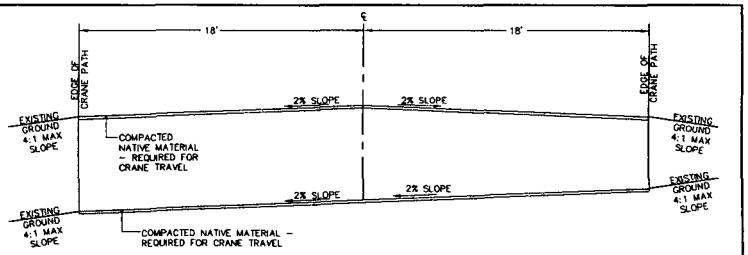
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE ACCESS ROAD DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

Westwood	TYPICAL TURBINE ACCESS ROAD AND CRANE PATH	LAST REVISED: 05/28/19
		RD01-A



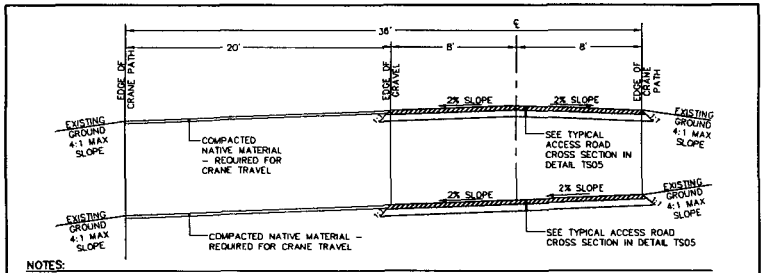
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

Westwood	TYPICAL TURBINE ACCESS ROAD SECTION	LAST REVISED: 3/28/19
		RD01-B



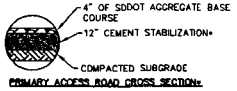
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE WHERE CRANE PATHS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT CRANE PATH REMAINS WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%

Westwood	TYPICAL CRANE PATH	LAST REVISED: 05/28/19
		RD01-C

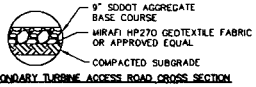


NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE EDGE OF COMPACTED SHOULDER DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

Westwood	TYPICAL TURBINE ACCESS ROAD AND OFFSET CRANE PATH	LAST REVISED: 05/28/19
		RD01-D

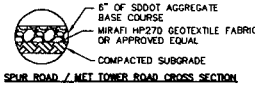


PRIMARY ACCESS ROAD CROSS SECTION*

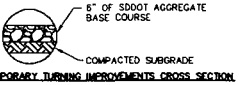


SECONDARY TURBINE ACCESS ROAD CROSS SECTION

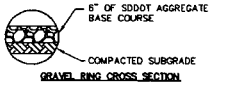
* CEMENT APPLICATION RATE MAY VARY BASED ON TEST STRIPS AND FIELD PERFORMANCE. SEE SHEET 13 FOR CEMENT STABILIZATION PROCEDURE AND DESIGN BASIS.



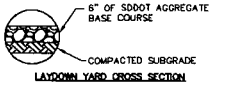
SPUR ROAD / MET TOWER ROAD CROSS SECTION



TEMPORARY TURNING IMPROVEMENTS CROSS SECTION



GRAVEL RING CROSS SECTION



LAYDOWN YARD CROSS SECTION

NOTES:
STRUCTURAL SECTIONS SHOWN ARE THE MINIMUM THICKNESS REQUIREMENTS DURING NORMAL FIELD CONDITIONS. THE SECTIONS MAY NEED TO BE INCREASED BASED ON ACTUAL FIELD CONDITIONS AT THE TIME OF CONSTRUCTION. CONDITIONS INCLUDE BUT ARE NOT LIMITED TO CONSTRUCTION DURING THE FREEZE/THAW CYCLE, UNUSUALLY WET PERIODS, OR IN LOW/WET AREAS. SEE SHEET 12 FOR TESTING REQUIREMENTS AND SPECIFICATIONS.

Westwood	TYPICAL STRUCTURAL CROSS SECTIONS

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-Free (866) 937-5150 twobtoinc@w.com
Westwood Professional Services, Inc.

Designed:	BMC
Checked:	RJH
Drawn:	BMC

As-Built Drawing

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	05/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2028 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 4 OF 57

0014440DTP.dwg

©2019 Westwood Professional Services, Inc.

ROAD DESIGN PARAMETERS

1. ACCESS ROADS HAVE BEEN DESIGNED TO ACCOMMODATE LIGHT DUTY TRUCKS (PICKUP TRUCKS AND MAINTENANCE VEHICLES) FOR LOW VOLUME USE IN NORMAL OPERATING CONDITIONS AS WELL AS HEAVY DUTY CONSTRUCTION TRAFFIC UNDER DRY CONDITIONS. THE ROAD DESIGN SPECIFIED IS NOT INTENDED FOR ALL WEATHER USE FOR HEAVY DUTY CONSTRUCTION LOADS.
2. ROAD MAINTENANCE CAN BE EXPECTED OVER THE LIFE OF THE PERMANENT FACILITY.

PRODUCTS

1. AGGREGATE BASE SHALL CONSIST OF SDDOT AGGREGATE BASE COURSE (AND IN CONFORMANCE WITH THE GRADATION TABLE 1). AGGREGATE MAY BE CRUSHER RUN UPON ENGINEERS APPROVAL. AGGREGATE GRADATIONS SHALL BE SUBMITTED TO ENGINEER FOR REVIEW.
2. ROAD SHOULDERS AND CRANE PADS SHALL CONSIST OF COMPACTED NATIVE SOILS.
3. CULVERTS: ACCESS ROAD CULVERTS SHALL MEET THE MINIMUM SPECIFICATIONS SET FORTH BY THE SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION AND/OR HYDE COUNTY. ALL CULVERTS ARE PLANNED TO BE A MINIMUM 18" DIAMETER AND MANUFACTURED OF 16-GAGE CORRUGATED METAL PIPE WITH NO END TREATMENTS UNLESS NOTED OTHERWISE. ACTUAL SIZE WILL BE DETERMINED THROUGH HYDRAULIC ANALYSIS.
4. GEOTEXTILE FABRIC: MIRAFI HP270 OR APPROVED EQUAL.

EXECUTION

1. CLEARING AND GRUBBING
   A. THE CONTRACTOR SHALL BE REQUIRED TO GRUB ALL TREES, STUMPS, BRUSH, AND DEBRIS WITHIN THE GRADING AREAS SHOWN ON THE PLANS. GRUBBING INCLUDES REMOVAL OF ALL PLANT MATERIAL GREATER THAN 2" INCLUDING STUMPS, BRANCHES, ROOTS, ETC. TO A DEPTH BELOW THE FINAL SUBGRADE. THE CONTRACTOR IS TO REMOVE ONLY THOSE TREES WHICH ARE DESIGNATED BY THE OWNER'S REPRESENTATIVE FOR REMOVAL, AND SHALL EXERCISE EXTREME CARE AROUND EXISTING TREES TO BE SAVED.
2. TOPSOIL STRIPPING
   A. TOPSOIL, INCLUDING ROOTS LARGER THAN 2" AND LARGE ROOT MASSES, SHALL BE STRIPPED FROM ALL ROADWAY AND FOUNDATION AREAS UP TO 10'. TOPSOIL SHALL NOT BE STRIPPED OUTSIDE OF THE DESIGNATED DISTURBANCE AREAS.
   B. ANY TOPSOIL THAT HAS BEEN STRIPPED SHALL BE STOCKPILED FOR POST CONSTRUCTION REVEGETATION. ALL TOPSOIL SHALL BE REDISTRIBUTED TO THE LAND OWNER'S PROPERTY OF WHERE IT ORIGINATED FROM.
3. FILL PLACEMENT
   A. FILL PLACEMENT SHALL CONSIST OF THE PLACING OF SUITABLE FILL MATERIAL, AFTER TOPSOIL STRIPPING, ABOVE THE EXISTING GRADE. GENERALLY, SIDE SLOPES SHALL BE CONSTRUCTED AT FOUR FOOT HORIZONTAL TO ONE FOOT VERTICAL, WITH SOME LOCATIONS THROUGHOUT THE PROJECT WITH SLOPES OF TWO FEET HORIZONTAL TO ONE FOOT VERTICAL. THE MATERIAL FOR FILL CONSTRUCTION SHALL BE OBTAINED FROM THE ACCESS ROAD/TURBINE EXCAVATION (SEE GEOTECHNICAL REPORT FOR RESTRICTIONS), OR ANY SUITABLE, APPROVED SOIL OBTAINED ONSITE/OFFSITE BY CONTRACTOR, AS DIRECTED OR APPROVED BY THE ENGINEER. THIS MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 12" AND CONSTRUCTED TO 95% OF THE MAXIMUM DRY DENSITY AND WITHIN 2% OF OPTIMUM MOISTURE CONTENT, AS DETERMINED BY THE STANDARD PROCTOR (AASHTO T99).
   B. SIDE SLOPES GREATER THAN 4:1 WILL NOT BE PERMITTED, UNLESS OTHERWISE NOTED ON THE PLAN.
   C. FILL SLOPES SHALL BE BENCHED INTO THE EXISTING SLOPE TO PREVENT MOVEMENT BETWEEN THE FILL AND NATIVE SOILS. BENCHES SHOULD BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO FILL PLACEMENT. POSITIVE DRAINAGE IS REQUIRED AT BENCHED AREAS AND AT THE TOE OF FILL SLOPES TO REMOVE SURFACE WATER.
4. SUBGRADE
   A. SUBGRADE PREPARED AT GRADE OR IN CUT REQUIRES SCARIFICATION AND RECOMPACTION TO A DEPTH OF 12" OR MORE.
   B. ACCESS ROAD CROSS SLOPES SHOWN IN THE PLANS ARE MEANT AS A GUIDE. ACCESS ROAD CROSS SLOPES MAY RANGE FROM 1% - 2%, CHECK WITH THE ENGINEER IF THE CROSS SLOPE FALLS OUTSIDE OF THIS RANGE. ACCESS ROADS BEING UTILIZED FOR CRANE TRAVEL SHOULD HAVE A MAX CROSS SLOPE OF 2%.

TABLE 1: SDDOT AGGREGATE BASE COURSE - LOCALLY SOURCED	
SIEVE SIZE	PERCENT PASSING
1"	100
3/4"	80-100
1/2"	68-91
NO. 4	46-70
NO. 8	34-58
NO. 40	13-35
NO. 200	3-12

MEET FOLLOWING REQUIREMENTS PER 882.2

LIQUID LIMIT (MAX) = 25
PLASTICITY INDEX = 0-6
L.A ABRASION (% MAX) = 40%

GRADATION HAS BEEN OBTAINED FROM THE 2015 SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION BOOK.

STORM WATER DESIGN PARAMETERS

1. SEE SHEET 6 FOR CULVERT SIZING AND DESIGN PARAMETERS. SEE HYDROLOGY MEMO FOR FURTHER DESIGN CALCULATIONS. CULVERTS SHALL BE MINIMUM 18" CORRUGATED METAL PIPE. ALL TEMPORARY PORTIONS OF THE INSTALLED CULVERTS SHALL BE REMOVED UPON COMPLETION OF THE PROJECT.
2. IT IS EXPECTED THAT CULVERTS WILL BE OVERTOPPED DURING SOME STORMS AND MAINTENANCE WILL BE REQUIRED THROUGH THE LIFE OF THE PROJECT.
3. WHEN INSTALLING DRAINAGE CULVERTS THE CONTRACTOR SHALL USE JUDGMENT IN SETTING THE FLOW LINE ELEVATIONS AND CULVERT LONGITUDINAL SLOPE. TYPICALLY THE FLOW LINE ELEVATIONS AND LONGITUDINAL SLOPE OF THE CULVERT SHOULD MATCH THE NATURAL GROUND ELEVATIONS AND SLOPE TO ENSURE POSITIVE DRAINAGE. WHEN POSSIBLE, ALL CULVERTS SHOULD BE PLACED AT A MINIMUM 0.5% GRADE.
4. ANTICIPATED CULVERT CROSSINGS ARE SHOWN ON THE CONSTRUCTION PLAN, ADDITIONAL CULVERTS MAY NEED TO BE INSTALLED IN AREAS WHERE CONCENTRATED FLOW IS EXPECTED DUE TO CONSTRUCTION ACTIVITIES.
5. CONSTRUCTION DRAINAGE CROSSINGS TO MAINTAIN EXISTING FLOW CHARACTERISTICS OF THE FEATURES. FEATURES SHALL BE GRADED TO PRECONSTRUCTION CONTOURS.

TESTING:

1. TESTING SHALL BE PERFORMED BY A DESIGNATED INDEPENDENT TESTING AGENCY.
2. SUBMIT ONE SET OF TESTING AND INSPECTION RECORDS SPECIFIED TO THE CIVIL ENGINEER OF RECORD.

DEFINITIONS:

1. PROOF ROLLING:
   SHALL BE PERFORMED IN THE PRESENCE OF THE GEOTECHNICAL ENGINEER OR QUALIFIED GEOTECHNICAL REPRESENTATIVE USING A FULLY LOADED TANDEM AXLE DUMP TRUCK OR WATER TRUCK WITH A MINIMUM GROSS WEIGHT OF 25 TONS OR A FULLY LOADED BELLY DUMP WITH AN EQUIVALENT AXLE LOADING. PROOF-ROLLING ACCEPTANCE STANDARDS INCLUDE NO RUTTING GREATER THAN 1.5 INCHES, AND NO "PUMPING" OF THE SOIL BEHIND THE LOADED TRUCK.
2. SIEVE ANALYSIS:
   SHALL BE CONDUCTED IN ACCORDANCE WITH AASHTO T27
3. PROCTORS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T99
4. ATTERBERG LIMITS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T89 AND T90
5. MOISTURE DENSITY (NUCLEAR DENSITY):
   SHALL BE DONE IN ACCORDANCE WITH AASHTO T310
6. DYNAMIC CONE PENETROMETER (DCP) TESTING:
   SHALL BE DONE IN ACCORDANCE WITH ASTM D6951-03

REQUIREMENTS:

1. FILL PLACEMENT:
   A. SOILS USED AS FILL MATERIAL SHALL BE TESTED FOR MOISTURE CONTENT AND PROCTOR TESTS.
   B. WHERE FILL CONSTRUCTION REQUIRES MORE THAN 12 INCHES OF FILL PLACEMENT, COMPACT EACH LIFT TO A MINIMUM OF 95 PERCENT OF THE MATERIAL'S MAXIMUM STANDARD PROCTOR DRY DENSITY.
2. COMPACTED SUBGRADE (CEMENT STABILIZED):
   A. SEE SHEET 13 FOR TESTING REQUIREMENTS AND PROCEDURE.
3. COMPACTED SUBGRADE (NON-CEMENT STABILIZED):
   A. THE ENTIRE SUBGRADE SHALL BE PROOF-ROLLED PRIOR TO THE PLACEMENT OF THE AGGREGATE BASE TO IDENTIFY AREAS OF UNSTABLE SUBGRADE.
   B. PERFORM A MINIMUM OF 3 DYNAMIC CONE PENETROMETER (DCP) TESTS PER ACCESS ROAD OR ONE FOR EVERY 1,000 LF OF ROAD, WHICHEVER IS GREATER. SUBGRADE MUST MEET A MINIMUM DCP OF 3 BLOWS PER 6" TO A TOTAL DEPTH OF 2' (MINIMUM CBR=1.5).
   C. IF A PASSING PROOF-ROLL OR DCP REQUIREMENTS CANNOT BE ACHIEVED THE FOLLOWING ALTERNATIVES MAY BE IMPLEMENTED:
      a. SCARIFY, DRY, AND RECOMPACT SUBGRADE
      b. REMOVE UNSUITABLE MATERIAL AND REPLACE WITH SUITABLE MATERIAL
      c. INCREASE AGGREGATE BASE THICKNESS
4. AGGREGATE BASE:
   A. AGGREGATE BASE SHALL BE PROOF-ROLLED OVER THE ENTIRE LENGTH. IF PROOF ROLLING DETERMINES THAT THE ROAD IS UNSTABLE, ADDITIONAL AGGREGATE SHALL BE ADDED UNTIL THE UNSTABLE SECTION IS ABLE TO PASS A PROOF ROLL.
   B. PROVIDE 1 SIEVE ANALYSIS (PROJECT MAX OF 20) PER 2500 CY OF ROAD BASE PLACED.
5. CRANE PAD AND CRANE PATHS / CRANE TRAVEL SHOULDERS:
   A. TESTING REQUIREMENTS ARE PENDING BASED ON CRANE PICK PLANS PROVIDED BY THE CONTRACTOR.

TABLE 2: TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
FILL PLACEMENT	PROCTOR	1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER LIFT PER 5000 SF OF FILL PLACED OR 1 PER 500 LF OF ROAD OR CRANE WALK
COMPACTED SUBGRADE (CEMENT STABILIZED):	SEE SHEET 13	SEE SHEET 13
COMPACTED SUBGRADE (NON-CEMENT STABILIZED):	PROOF-ROLL	ENTIRE AREA
	DCP	1 PER 1,000 FT OR MIN. 3 PER ROAD
AGGREGATE BASE	PROOF-ROLL	ENTIRE AREA
	SIEVE ANALYSIS, LL, PL, AND L.A ABRASION	1 PER 2,500 CY

GENERAL NOTES:

1. GROUND SURFACE CONTOURS (AT TWO-FOOT VERTICAL INTERVALS) AND ELEVATIONS ARE BASED ON A PHOTOGRAMMETRY SURFACE PROVIDED BY GEOTERRA. IF MAJOR DISCREPANCIES ARE FOUND IN THE GROUND ELEVATIONS DURING FIELD STAKING TO THE GROUND ELEVATIONS SHOWN ON THE PLANS, THE OWNER AND ENGINEER SHALL BE NOTIFIED.
2. WHERE SECTION OR SUBSECTION MONUMENTS ARE ENCOUNTERED, THE OWNER SHALL BE NOTIFIED BEFORE SUCH MONUMENTS ARE REMOVED. THE CONTRACTOR SHALL PROTECT AND CAREFULLY PRESERVE ALL PROPERTY MARKERS AND MONUMENTS UNTIL THE OWNER, AN AUTHORIZED SURVEYOR OR AGENT HAS WITNESSED OR OTHERWISE REFERENCED THEIR LOCATION.
3. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. TYPICAL DISTURBANCE SHALL BE LIMITED TO 10 LF FROM THE EDGE OF PROPOSED GRADING.
4. FINALIZE GRADING AROUND THE BASE OF TURBINES IN ACCORDANCE WITH DETAIL TS-03 AND TS-04.
5. GRADE ALL PROPOSED ROADS TO A MAXIMUM SLOPE OF 8%. IF 8% SLOPE CANNOT BE ACHIEVED, THE CONTRACTOR MAY UTILIZE ASSIST VEHICLES FOR THE PURPOSE OF DELIVERIES. GRADE ALL PROPOSED CRANE PATHS TO A MAXIMUM OF 8% UNLESS OTHERWISE NOTED IN PLAN SHEETS.
6. ANY FACILITIES REMOVED TO ALLOW FOR CONSTRUCTION (MAILBOXES, SIGNS, FENCES, ETC.) SHALL BE REPLACED BY THE CONTRACTOR IN A CONDITION AS GOOD AS EXISTING.
7. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING DRAINAGE THROUGHOUT THE CONSTRUCTION OF THIS PROJECT. CONSTRUCTION ACTIVITIES SHALL NOT BLOCK THE NATURAL OR MANMADE CREEKS OR DRAINAGE SWALES CAUSING RAINWATER TO POND. DEPENDING ON FIELD CONDITIONS, ADDITIONAL CULVERTS IN EXCESS OF THOSE ON THE PLANS MAY BE REQUIRED.
8. WHILE BUILDING THE ROADS AND EXCAVATING THE TURBINE FOUNDATIONS, EXCESS SOIL WILL RESULT. THE CONTRACTOR SHALL DISPOSE OF THIS EXCESS SOIL IN AN APPROVED MANNER. EXCESS TOPSOIL SHALL BE DISTRIBUTED INTO A THIN LAYER ON LAND IMMEDIATELY ADJACENT TO WHERE THE TOPSOIL ORIGINATED. ALL EXCESS TOPSOIL TO BE WASTED ONSITE. WHILE DOING SO THE CONTRACTOR SHALL AVOID CAUSING RIDGES OR MOUNDS THAT WOULD MAKE IT DIFFICULT FOR STORM WATER RUNOFF TO DRAIN. THE FINAL SURFACE OF THE DISTURBED TOPSOIL SHALL BE SMOOTH AND FOLLOW THE NATURAL CONTOUR OF THE LAND.
9. THE CONTRACTOR SHALL NOTIFY SOUTH DAKOTA 811 AT LEAST 48 HOURS BEFORE EXCAVATION ACTIVITIES COMMENCE.
10. TEMPORARY INTERSECTION WIDENING SHALL, UPON COMPLETION OF ALL PROJECT CONSTRUCTION OR UPON NOTIFICATION OF THE ENGINEER, BE REMOVED AND THE AREA RESTORED TO ITS ORIGINAL LINES AND GRADES WITH TOPSOIL REPLACED, EXCEPT WHERE REQUESTED BY THE TOWNSHIP OR COUNTY TO PERMANENTLY REMAIN. DISTURBED AREAS OUTSIDE OF THE FINAL ROADWAY SHALL BE SEEDED AND MULCHED.
11. TURBINE SETBACKS ARE NOT IDENTIFIED ON THE CONSTRUCTION PLANS. IT SHALL BE THE RESPONSIBILITY OF THE OWNER AND CONTRACTOR TO ENSURE THAT ALL TURBINE SETBACKS MEET PROJECT REQUIREMENTS.
12. GEOTECHNICAL REPORTS WITH RECOMMENDATIONS HAVE BEEN PROVIDED BY THE OWNER. ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL ENGINEERING REPORT AND RECOMMENDATIONS.
13. FIELD SURVEY WETLAND INFORMATION HAS BEEN PROVIDED BY THE OWNER. ALL WETLAND DELINEATIONS AND PERMITTING SHALL BE THE RESPONSIBILITY OF OTHERS AND BE COMPLETED PRIOR TO CONSTRUCTION COMMENCING. THE OWNER AND GENERAL CONTRACTOR SHALL VERIFY THAT ALL WETLAND PERMITS HAVE BEEN SUBMITTED AND APPROVED PRIOR TO CONSTRUCTION COMMENCING.
14. CULTURAL RESOURCE REPORTS HAVE NOT BEEN PROVIDED. CULTURAL RESOURCE LOCATIONS ARE NOT SHOWN ON THE PLANS. INFORMATION WILL BE THE RESPONSIBILITY OF THE OWNER AND GENERAL CONTRACTOR. THE LOCATIONS OF CULTURAL RESOURCE SITES MAY BE CONFIDENTIAL AND PROTECTED BY STATE OR FEDERAL LAW. PUBLIC RELEASE OF SPECIFIC INFORMATION REGARDING THESE RESOURCES MAY BE RESTRICTED.
15. AN ENVIRONMENTAL ASSESSMENT HAS NOT BEEN PROVIDED. THE CONTRACTOR SHALL BE FAMILIAR WITH THE REPORT AND REVIEW ALL RECOMMENDATIONS.
16. ELECTRICAL INFORMATION SHOWN ON THE PLANS IS FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSULTANT'S PLANS FOR SPECIFIC LOCATIONS AND CONSTRUCTION DETAILS FOR THE UNDERGROUND POWER COLLECTION SYSTEM AND SUBSTATION.
17. CRANE PATHS ARE SHOWN ON THE CONSTRUCTION PLANS. IF THE CONTRACTOR PROPOSES ALTERNATE CRANE PATHS, THEY SHALL ENSURE THAT WETLAND AND CULTURAL RESOURCE CORRIDORS ARE NOT DISTURBED. FINAL CRANE PATH ALIGNMENTS SHALL BE DETERMINED BY THE CONTRACTOR BASED ON FIELD CONDITIONS WITHIN THE WETLAND AND CULTURAL RESOURCE CORRIDORS, SPECIAL LANDOWNER AGREEMENTS AND THE PROJECT BOUNDARY.
18. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. DISTURBANCE SHALL BE LIMITED TO 50 LF WIDTH FOR PROPOSED ACCESS ROADS AND 50 LF FOR CRANE PATHS, AND SHALL BE LIMITED TO A 250 LF RADIUS FOR PROPOSED WIND TURBINE GENERATORS. THE GRADING LIMITS SHALL BE CENTERED ON THE ROADWAYS AND WIND TURBINES. THE CONTRACTOR SHALL MAKE ALL EFFORTS TO KEEP ACTIVITIES WITHIN THE ERECTION AREAS SHOWN ON THE PLANS BUT IT IS UNDERSTOOD THAT SOME ACTIVITIES THAT WILL NOT REQUIRE GRADING OR SOIL DISTURBANCE MAY EXTEND BEYOND THE DEFINED LIMITS. DURING ERECTION OF THE ROTOR, TRUCKS AND/OR FORKLIFTS MAY EXTEND BEYOND THESE LIMITS. SEE DETAIL TS01 FOR TYPICAL ERECTION AREAS.
19. AN ALTA SURVEY HAS BEEN PROVIDED BY WESTWOOD. CONTRACTOR AND OWNER ARE RESPONSIBLE FOR LOCATING ALL UTILITIES AND VERIFYING LOCATION OF CONSTRUCTION ACTIVITIES PRIOR TO COMMENCING WORK.

STORMWATER POLLUTION PREVENTION PLAN (SWPPP):

1. THE CONTRACTOR SHALL PROVIDE EROSION CONTROL MEASURES AS PLANNED AND SPECIFIED FOLLOWING BEST MANAGEMENT PRACTICES AS OUTLINED BY THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND BEING IN CONFORMANCE WITH THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL STORMWATER PERMIT.
2. REFER TO THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR THE TRIPLE H WIND FARM, PREPARED BY WESTWOOD PROFESSIONAL SERVICES, FOR EROSION CONTROL AND RESTORATION SPECIFICATIONS, SEDIMENT AND EROSION CONTROL PROCEDURES, LOCATIONS OF BMPs, DETAILS, AND INSPECTION INFORMATION.
3. ALL PASTURES AND DRAINAGE SWALES DISTURBED DURING CONSTRUCTION ACTIVITIES AND NOT COVERED BY ROAD SURFACING MATERIALS, SHALL BE SEEDED IN ACCORDANCE WITH THE SWPP PLAN.
4. TEMPORARY EROSION CONTROL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE TEMPORARY EROSION CONTROL PLAN SHALL BE IN ACCORDANCE WITH THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND THE TRIPLE H WIND FARM STORMWATER POLLUTION PREVENTION PLAN ON FILE.

PROJECT CONTACT INFORMATION:

TITLE	COMPANY	NAME	CONTACT NUMBER
OWNER (PRIMARY)	ENGIE	CASEY WILLIS	805-569-6185
PROJECT MANAGER	WESTWOOD	DANI NYGREN	952-906-7493
ENGINEER OF RECORD	WESTWOOD	ROB COPOULS	952-906-7470
CONTRACTOR	WANZEK	JASON HELLERUD	701-893-3685

Westwood
Westwood Professional Services, Inc.

Designed: JMK
Checked: DDY
Drawn: JMK
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK
2028 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 12 OF 57

0014440DTP.dwg

©2019 Westwood Professional Services, Inc.

CEMENT STABILIZATION - PROCEDURE

THE SPECIFICATIONS BELOW ARE GENERAL RECOMMENDATIONS/GUIDELINES FOR CEMENT STABILIZATION OF SUBGRADES FOR THE PROJECT. ACTUAL FIELD CONDITIONS MAY ALTER APPLICATION RATE. CONSULT GEOTECHNICAL ENGINEER FOR FURTHER RECOMMENDATIONS.

1. STRIP THE TOP ±4 INCHES OF TOPSOIL (THROUGH THE ROOT ZONE) FROM THE AREA TO BE STABILIZED. ROOTS SMALLER THAN 1/4" DIAMETER ARE CONSIDERED INSIGNIFICANT.
2. PERFORM A PROCTOR (ASTM D 698) TEST TO DETERMINE THE OPTIMUM MOISTURE CONTENT IF THE MATERIAL TO BE STABILIZED DOES NOT MATCH A PREVIOUSLY PERFORMED PROCTOR.
3. DETERMINE THE IN-SITU MOISTURE CONTENT USING A NUCLEAR DENSITY GAUGE (OR EQUIVALENT MOISTURE CONTENT TEST) DAILY, PRIOR TO INCORPORATION OF THE CEMENT. PROVIDE ADDITIONAL MOISTURE CONTENT TESTING AS NEEDED BASED ON WEATHER CONDITIONS.
   - 3.1. THE CONTRACTOR WILL BE ADVISED OF IN-SITU MOISTURE CONTENT, AND MOISTURE ADJUSTMENTS SHOULD BE MADE IF IN-SITU MOISTURE IS LESS THAN OPTIMUM MOISTURE CONTENT AS DETERMINED BY THE PROCTOR (ASTM D 698).
4. SOIL AND CEMENT BLENDING:
   - 4.1. COMPLETELY BLEND SUBGRADE SOIL WITH THE APPROPRIATE AMOUNT OF CEMENT BY WEIGHT. FIELD RESULTS FROM TEST STRIPS WILL DICTATE THE CEMENT APPLICATION RATE.
   - 4.2. IN AREAS OF HIGH MOISTURE OR POOR SOILS, THE CONTRACTOR MAY INCREASE THE PERCENT OF CEMENT IN ORDER TO MEET THE MINIMUM SUBGRADE STRENGTH REQUIREMENTS.
   - 4.3. THE USE OF A RECLAIMER IS AN ADEQUATE BLENDING METHOD. DISCING IS NOT AN ADEQUATE BLENDING METHOD.
   - 4.4. A STABILIZATION DEPTH OF 12" WAS USED FOR DESIGN PURPOSES. STABILIZATION DEPTH MAY NEED TO INCREASE TO 16" IN AREAS OF EXTREME MOISTURE OR POOR SOILS IN ORDER TO MEET THE STRENGTH AND PROOF ROLL REQUIREMENTS.
5. COMPACTION:
   - 5.1. A ROLLING PATTERN WILL BE ESTABLISHED USING A NUCLEAR DENSITY GAUGE DURING COMPACTION.
     - 5.1.1. COMPACTION WILL BE PERFORMED UNTIL THE STABILIZED MATERIAL REACHES THE "BREAK POINT" AFTER WHICH ADDITIONAL PASSES WITH A ROLLER RESULTS IN A LOSS OF DENSITY AS MEASURED BY A NUCLEAR DENSITY GAUGE.
     - 5.1.2. COMPACTION IS TYPICALLY ACHIEVED BY MULTIPLE PASSES OF A PADFOOT ROLLER UNTIL THE ROLLER "WALKS" OUT OF THE RECLAIMED MATERIAL (SPACE IS VISIBLE BETWEEN THE DRUM AND THE RECLAIMED MATERIAL). THIS IS FOLLOWED BY BLADING AND SHAPING THE RECLAIMED MATERIAL TO FINAL PROFILE AND CROSS SECTION, REMOVING HIGH AND LOW POINTS. SMOOTH DRUM OR RUBBER TIRE ROLLERS ARE THEN USED TO FINISH ROLLING (THIS IS WHEN THE DENSITY TESTS ARE PERFORMED) UNTIL THE DENSITY OF THE MATERIAL REACHES THE "BREAK POINT."
     - 5.1.3. THE NUMBER OF PASSES AND EQUIPMENT USED TO REACH THE "BREAK POINT" IS CONSIDERED THE ROLLING PATTERN.
     - 5.1.4. A NEW ROLLING PATTERN MAY NEED TO BE ESTABLISHED IF THE PERFORMANCE REQUIREMENTS ARE NOT BEING MET. THIS MAY BE DUE TO CHANGES IN THE MOISTURE CONTENT, THE SOIL TYPE, OR THE CEMENT RATE.
   - 5.2. THE TARGET DENSITY IS 98% OF THE MAXIMUM DENSITY DETERMINED FROM THE ROLLING PATTERN.
     - 5.2.1. DENSITY TESTS SHALL BE TAKEN AT THE RATE OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER TO CONFIRM THE DENSITY IS MATCHING THE TARGET. ONCE THE ROLLING PATTERN HAS BEEN CONFIRMED IT IS RECOMMENDED THAT TESTING CONTINUE AT 1 TEST PER 1,000 LF IN EACH PASS OF THE RECLAIMER.
     - 5.2.2. IF IT IS NOT POSSIBLE TO ATTAIN THE TARGET DENSITY, AND ADDITIONAL COMPACTION DOES NOT IMPROVE THE DENSITY, A NEW ROLLING PATTERN SHOULD BE ESTABLISHED.
   - 5.3. THE AIR TEMPERATURE SHALL BE ABOVE 40 DEGREES (F) DURING THE CEMENT STABILIZATION PROCESS. MIXING CEMENT INTO FROZEN GROUND IS NOT ACCEPTABLE.
6. THE STABILIZED MATERIAL SHALL BE CONTINUOUSLY WET CURED FOR A MINIMUM OF 24 HOURS (WET CURED IS IDENTIFIED VISUALLY AS DAMP SURFACE).
7. PERFORM SUBGRADE TESTING IN ACCORDANCE WITH TESTING SCHEDULE.
8. AGGREGATE PLACEMENT:
   - 8.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 8.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 8.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

CEMENT STABILIZATION - DESIGN BASIS

1. DURING INITIAL CONSTRUCTION, CONTRACTOR SHALL CONSTRUCT MINIMUM 300 LF TEST STRIPS CONTAINING 4%, 5%, AND 6% CEMENT IN ACCORDANCE WITH CEMENT STABILIZATION PROCEDURES.
2. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 3 FOR ANTICIPATED RESULTS):
   - 2.1. PERFORM INITIAL SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M BETWEEN 4 TO 6 HOURS AFTER FINAL COMPACTION.
   - 2.2. PERFORM ADDITIONAL DCP TESTING AT 24 AND 48 HOURS AFTER FINAL COMPACTION.
   - 2.3. PERFORM SUBSEQUENT DCP TESTS AT 7 DAYS AFTER FINAL COMPACTION AS VERIFICATION OF STRENGTH CURVE.
   - 2.4. A MINIMUM OF 3 TESTS PER TEST SECTION PER TIMEFRAME IS REQUIRED. TESTS SHALL BE TAKEN AT THE CENTERLINE AND 2' FROM EACH SHOULDER.
   - 2.5. RECORD DCP TEST RESULTS EVERY 6 INCHES TO TOTAL DEPTH OF 12 INCHES.

TABLE 3: TEST STRIP CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	COMPRESSIVE STRENGTH (PSF)
4 - 6 HOURS	6	5	1,800
24 HOURS	10	7	2,500
48 HOURS	15	10	3,200
7 DAYS	30	21	5,200

CEMENT STABILIZATION - PRODUCTION

1. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 5 FOR SUMMARY OF TESTING REQUIREMENTS):
   - 1.1. PERFORM SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M NO SOONER THAN 24 HOURS AFTER FINAL COMPACTION.
   - 1.2. DCP TESTING FREQUENCY SHALL BE WITH A RANDOM SPACING AND A MINIMUM OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER. A MINIMUM OF 3 TESTS PER ROAD IS REQUIRED.
   - 1.3. THE CBR OF THE STABILIZED SUBGRADE SHOULD BE CALCULATED IN 6" INCREMENTS THROUGH THE ENTIRE DEPTH OF THE STABILIZED LAYER.
   - 1.4. THE MINIMUM REQUIRED CBR PRIOR TO PROOF-ROLLING IS PROVIDED IN TABLE 4 BELOW:

TABLE 4: FINAL CEMENT STABILIZED CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	UNDRAINED SHEAR STRENGTH (PSF)	BEARING CAPACITY (PSF)
24 - 48 HOURS	15	10	3,500	9,800
3 - 7 DAYS	30	21	7,000	18,000
28 DAYS	50	33	12,000	28,500

NOTE: UNDRAINED SHEAR STRENGTH WAS CALCULATED USING THE BLACK (1961) EQUATION. BEARING CAPACITY WAS CALCULATED USING THE VESIC EQUATION MODIFIED FOR TWO LAYERS (12" CEMENT STABILIZED SUBGRADE OVER A NATURAL SUBGRADE WITH A CBR OF 1.5)

   - 1.5. ONCE THE MINIMUM REQUIRED CBR IS ACHIEVED AT ANY CORRESPONDING TIME PERIOD, THE SUBGRADE IS CONSIDERED ADEQUATE AND THE CONTRACTOR MAY PROCEED WITH PROOF-ROLL TESTING. FUTURE DCP TESTING ON THAT SEGMENT OF SUBGRADE IS NOT REQUIRED.
   - 1.6. IF TESTING DOES NOT INDICATE A CBR OF 30 WITHIN 7 DAYS, ADDITIONAL GRAVEL SURFACING AND/OR THE ADDITION OF GEOTEXTILE FABRIC MAY BE REQUIRED. FOR FUTURE SUBGRADE STABILIZATION AREAS, CONTACT THE ENGINEER AND OWNER VIA RFI FOR RECOMMENDATIONS AND APPROVAL.
2. SUBGRADE PROOF-ROLL TESTING AND ACCEPTANCE:
   - 2.1. ONCE THE REQUIRED DCP VALUE HAS BEEN OBTAINED BUT PRIOR TO PLACING AGGREGATE, THE SUBGRADE SHALL BE PROOF-ROLLED. REFER TO THE PROJECT TESTING REQUIREMENTS FOR PROOF-ROLL DEFINITION.
   - 2.2. PROOF-ROLLING SHOULD BE PERFORMED WITH ONE PASS DOWN THE CENTER AND NOT BE PERFORMED WITHIN 12 INCHES OF THE EDGE OF THE STABILIZED SECTION.
   - 2.3. IF PROOF-ROLLING FAILS, RE-STABILIZATION MAY BE REQUIRED AND A NEW ROLLING PATTERN OR ADDITIONAL CEMENT MAY BE REQUIRED.
3. AGGREGATE PLACEMENT:
   - 3.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 3.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 3.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

TABLE 5: CEMENT STABILIZATION PRODUCTION TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
COMPACTED SUBGRADE (CEMENT STABILIZED) NOTE: SEE ABOVE FOR INITIAL TESTING REQUIREMENTS	PROCTOR	MINIMUM 1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER 1000 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
	DCP TEST	1 PER 500 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
	PROOF-ROLL (AFTER PASSING DCP TESTS)	ENTIRE LENGTH

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-Free (866) 937-5150 westwoodps.com

Westwood Professional Services, Inc.

Designed: BMK
Checked: TSH
Drawn: BMK
As-Built Drawing:

Revisions

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2020 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 13 OF 57

00144400TP.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 334th Ave in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 3035' North of 334th Ave & 202nd Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.27'46.88" W Long. -99.30'08.99" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001526 NE4 32-112-72
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Signature of Applicant

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 334th Ave in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 3035' North of 334th Ave & 202nd Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.27'46.88" W Long. -99.30'08.99" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001526 NE4 32-112-72
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: _____

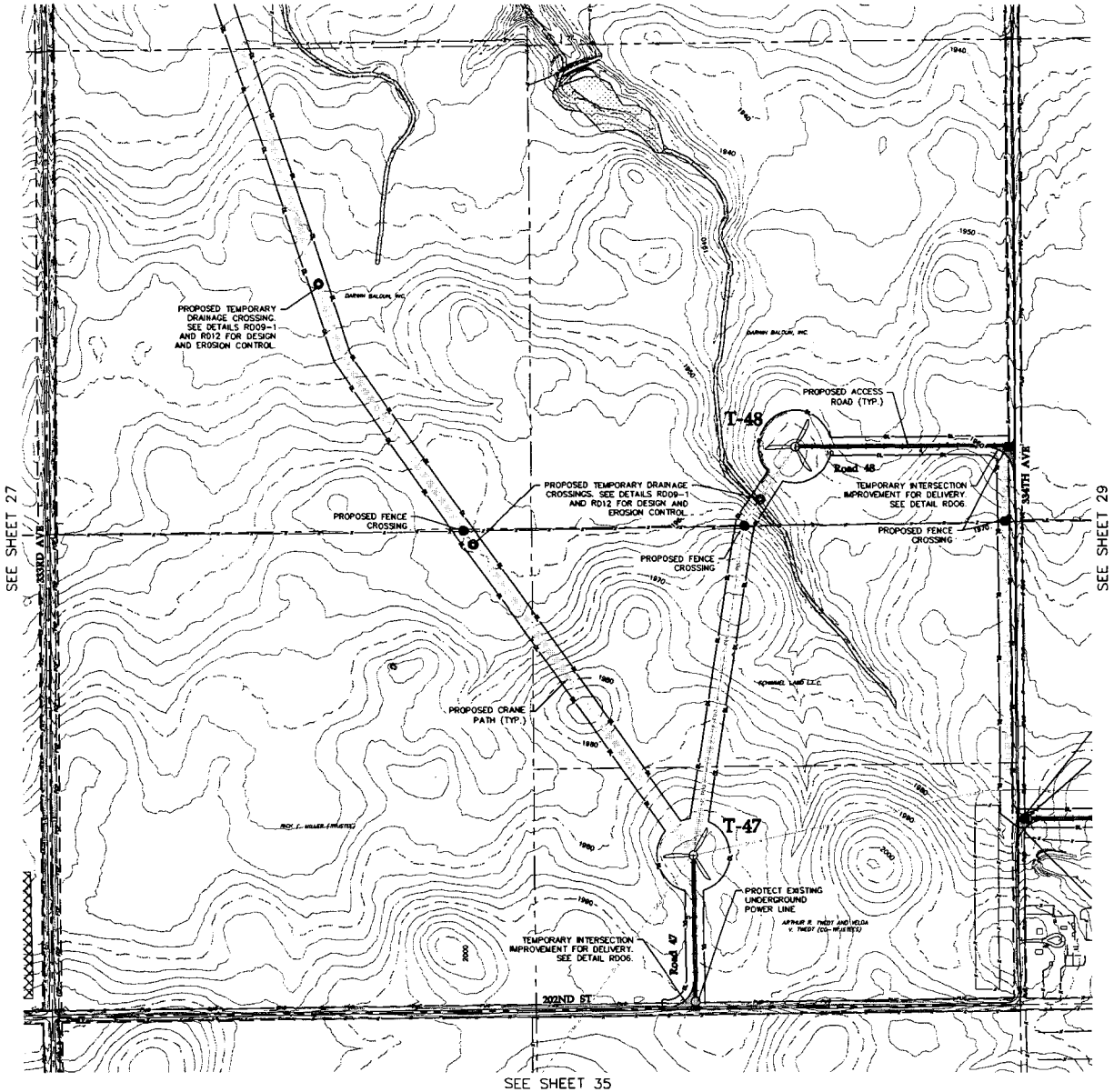
Signature of Applicant

Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

© 2019 Westwood Professional Services, Inc.



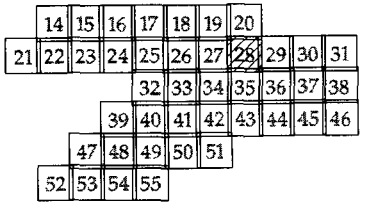
LEGEND:

- PROPOSED TURBINE LOCATION
- T-XX PROPOSED TURBINE NUMBER
- PROPOSED ALTERNATE TURBINE LOCATION
- ALT-XX PROPOSED ALTERNATE TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED ALTERNATE ACCESS ROAD
- PROPOSED CRANE PATH
- PROPOSED UNDERGROUND COLLECTION*
- PROPOSED DISTURBANCE LIMITS
- PROPOSED PERIMETER SEDIMENT CONTROL
- EXISTING 10' CONTOURS
- EXISTING 2' CONTOURS
- EXISTING GRAVEL EDGE
- EXISTING BITUMINUS EDGE
- EXISTING RIGHT-OF-WAY
- EXISTING PARCEL LINE
- EXISTING BUILDING
- EXISTING FENCE
- EXISTING OVERHEAD POWER
- EXISTING HIGH VOLTAGE OVERHEAD POWER
- EXISTING UNDERGROUND POWER LINE
- EXISTING FIBER OPTIC LINE
- EXISTING WATER LINE
- DELINEATED WETLAND
- ARCHAEOLOGICAL AVOIDANCE AREA
- EXISTING USFWS EASEMENT
- PROJECT BOUNDARY
- 1900 EXISTING GROUND ELEVATION
- PROPOSED DRAINAGE CROSSING**
- PROPOSED TEMPORARY DRAINAGE CROSSING**
- PROPOSED FENCE CROSSING***
- PROPOSED UTILITY CROSSING
- PROPOSED CULVERT

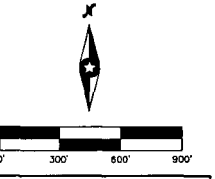
* PROVIDED BY OTHERS AND SHOWN FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSTRUCTION PLANS FOR DETAILS.

** SEE SHEET 11 FOR DRAINAGE CROSSING TYPE AND SIZING. DRAINAGE CROSSINGS SHALL CONSIST OF LOW WATER CROSSING OR CULVERT. DRAINAGE CROSSINGS ALONG CRANE PATH SHALL CONSIST OF CRANE MATS OR TEMPORARY CULVERT.

*** ALL GATE INSTALLATIONS SHALL BE FIELD DETERMINED AND AGREED UPON BY THE CONTRACTOR AND OWNER.



KEY MAP



Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 www.westwoodps.com
Westwood Professional Services, Inc.

Designed:	BMK
Checked:	DJH
Drawn:	BMK
As-Built Drawing:	

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2020 3rd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

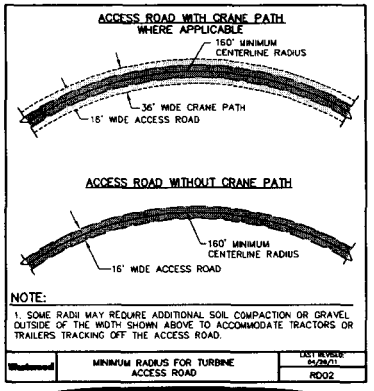
Site Plan T-47 - T-48

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 28 OF 57

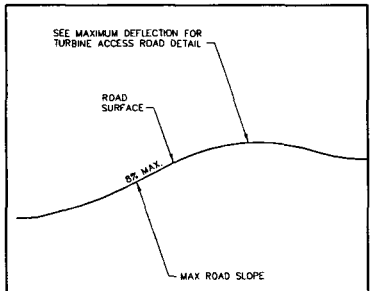
0014440SP01.dwg

© 2019 Westwood Professional Services, Inc.



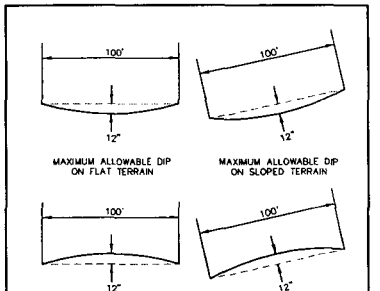
NOTE:
1. SOME RADII MAY REQUIRE ADDITIONAL SOIL COMPACTION OR GRAVEL OUTSIDE OF THE WIDTH SHOWN ABOVE TO ACCOMMODATE TRACTORS OR TRAILERS TRACKING OFF THE ACCESS ROAD.

Westwood	MINIMUM RADIUS FOR TURBINE ACCESS ROAD	LAST REVISED: 04/26/11 RD02

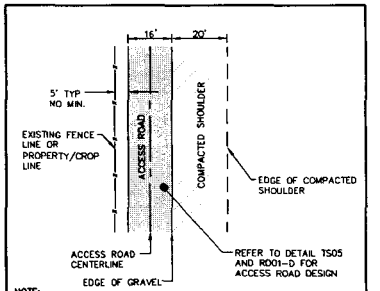


NOTES:
1. ROAD SLOPE SHALL NOT EXCEED 8% WITHOUT OWNER APPROVAL

Westwood	MAXIMUM VERT. SLOPE FOR TURBINE ACCESS ROAD/CRANE TRAVEL PATH	LAST REVISED: 3/28/12 RD03

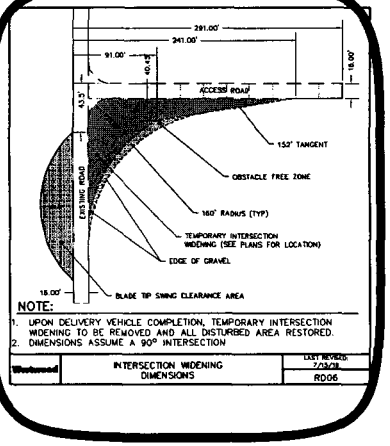


Westwood	MAXIMUM DEFLECTION FOR TURBINE ACCESS ROAD	LAST REVISED: 01/09/08 RD04



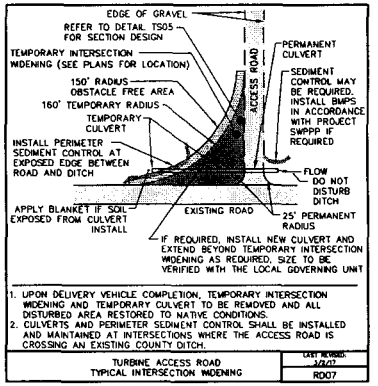
NOTE:
1. COMPACTED SHOULDER SHALL BE RETURNED TO NATIVE CONDITION FOLLOWING TURBINE GENERATOR CONSTRUCTION.
2. THE ACCESS ROAD MAY NEED TO BE CONSTRUCTED FARTHER FROM THE PROPERTY LINE IF OBSTRUCTIONS SUCH AS TREES FOLLOW THE PROPERTY LINE.

Westwood	TURBINE ACCESS ROAD ALONG FENCE/PROPERTY/CROP LINE	LAST REVISED: 3/28/12 RD05



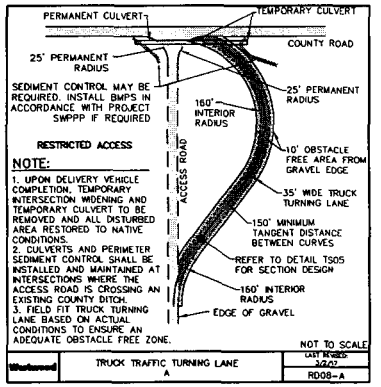
NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING TO BE REMOVED AND ALL DISTURBED AREA RESTORED.
2. DIMENSIONS ASSUME A 90° INTERSECTION

Westwood	INTERSECTION WIDENING DIMENSIONS	LAST REVISED: 7/13/18 RD06



1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.

TURBINE ACCESS ROAD TYPICAL INTERSECTION WIDENING	LAST REVISED: 3/3/17 RD07

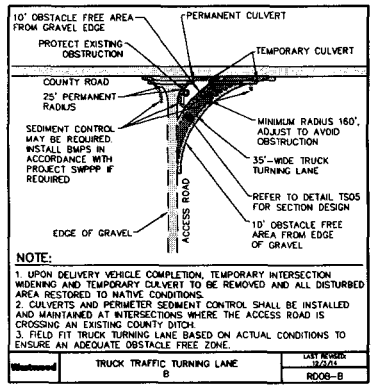


RESTRICTED ACCESS

NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

NOT TO SCALE

Westwood	TRUCK TRAFFIC TURNING LANE A	LAST REVISED: 3/2/17 RD08-A



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

Westwood	TRUCK TRAFFIC TURNING LANE B	LAST REVISED: 12/3/14 RD08-B

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-free (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: DPH
Drawn: BMK
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2200 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

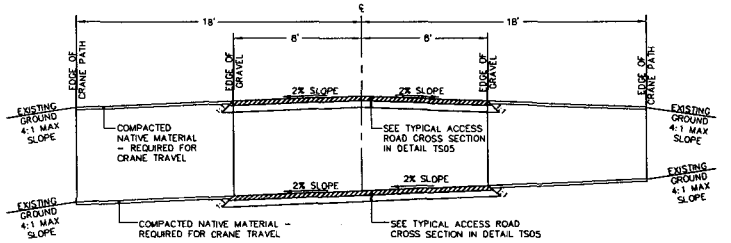
Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 5 OF 57

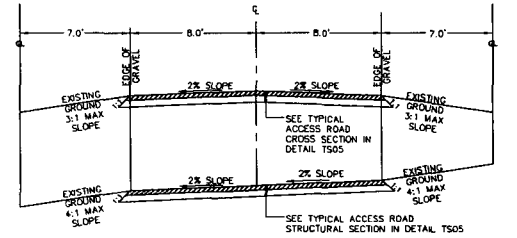
0014440DTP.dwg

© 2019 Westwood Professional Services, Inc.



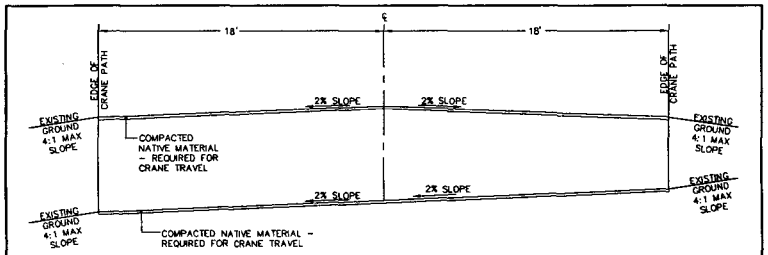
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE ACCESS ROAD DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

Westwood | TYPICAL TURBINE ACCESS ROAD AND CRANE PATH | LAST REVISED: 04/29/11 | RD01-A



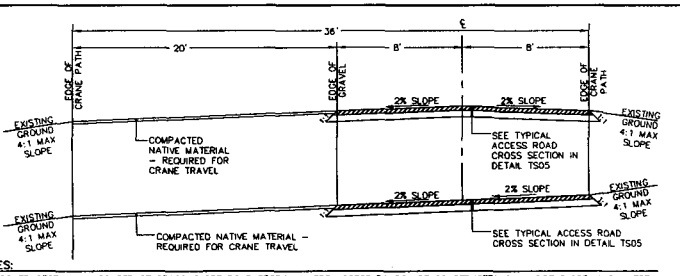
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

Westwood | TYPICAL TURBINE ACCESS ROAD SECTION | LAST REVISED: 3/16/12 | RD01-B



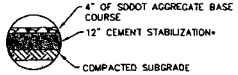
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE WHERE CRANE PATHS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT CRANE PATH REMAINS WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%

Westwood | TYPICAL CRANE PATH | LAST REVISED: 04/29/11 | RD01-C

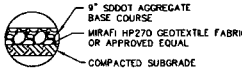


NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE EDGE OF COMPACTED SHOULDER DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

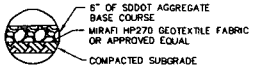
Westwood | TYPICAL TURBINE ACCESS ROAD AND OFFSET CRANE PATH | LAST REVISED: 04/29/11 | RD01-D



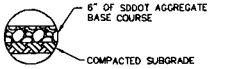
PRIMARY ACCESS ROAD CROSS SECTION*



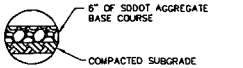
SECONDARY TURBINE ACCESS ROAD CROSS SECTION



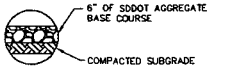
SPUR ROAD / MET TOWER ROAD CROSS SECTION



TEMPORARY TURNING IMPROVEMENTS CROSS SECTION



GRAVEL RING CROSS SECTION



LAYDOWN YARD CROSS SECTION

* CEMENT APPLICATION RATE MAY VARY BASED ON TEST STRIPS AND FIELD PERFORMANCE. SEE SHEET 13 FOR CEMENT STABILIZATION PROCEDURE AND DESIGN BASIS.

NOTES:
STRUCTURAL SECTIONS SHOWN ARE THE MINIMUM THICKNESS REQUIREMENTS DURING NORMAL FIELD CONDITIONS. THE SECTIONS MAY NEED TO BE INCREASED BASED ON ACTUAL FIELD CONDITIONS AT THE TIME OF CONSTRUCTION. CONDITIONS INCLUDE BUT ARE NOT LIMITED TO CONSTRUCTION DURING THE FREEZE/THAW CYCLE, UNUSUALLY WET PERIODS, OR IN LOW/WET AREAS. SEE SHEET 12 FOR TESTING REQUIREMENTS AND SPECIFICATIONS.

Westwood | TYPICAL STRUCTURAL CROSS SECTIONS

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (800) 937-5150 www.westwoodps.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: BDH
Drawn: BMK
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2035 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 4 OF 57

001444CDTP.dwg

©2019 Westwood Professional Services, Inc.

ROAD DESIGN PARAMETERS

1. ACCESS ROADS HAVE BEEN DESIGNED TO ACCOMMODATE LIGHT DUTY TRUCKS (PICKUP TRUCKS AND MAINTENANCE VEHICLES) FOR LOW VOLUME USE IN NORMAL OPERATING CONDITIONS AS WELL AS HEAVY DUTY CONSTRUCTION TRAFFIC UNDER DRY CONDITIONS. THE ROAD DESIGN SPECIFIED IS NOT INTENDED FOR ALL WEATHER USE FOR HEAVY DUTY CONSTRUCTION LOADS.
2. ROAD MAINTENANCE CAN BE EXPECTED OVER THE LIFE OF THE PERMANENT FACILITY.

PRODUCTS

1. AGGREGATE BASE SHALL CONSIST OF SDDOT AGGREGATE BASE COURSE (AND IN CONFORMANCE WITH THE GRADATION TABLE 1). AGGREGATE MAY BE CRUSHER RUN UPON ENGINEERS APPROVAL. AGGREGATE GRADATIONS SHALL BE SUBMITTED TO ENGINEER FOR REVIEW.
2. ROAD SHOULDERS AND CRANE PADS SHALL CONSIST OF COMPACTED NATIVE SOILS.
3. CULVERTS: ACCESS ROAD CULVERTS SHALL MEET THE MINIMUM SPECIFICATIONS SET FORTH BY THE SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION AND/OR HYDE COUNTY. ALL CULVERTS ARE PLANNED TO BE A MINIMUM 18" DIAMETER AND MANUFACTURED OF 16-GAGE CORRUGATED METAL PIPE WITH NO END TREATMENTS UNLESS NOTED OTHERWISE. ACTUAL SIZE WILL BE DETERMINED THROUGH HYDRAULIC ANALYSIS.
4. GEOTEXTILE FABRIC: MIRAFI HP270 OR APPROVED EQUAL.

EXECUTION

1. CLEARING AND GRUBBING
   A. THE CONTRACTOR SHALL BE REQUIRED TO GRUB ALL TREES, STUMPS, BRUSH, AND DEBRIS WITHIN THE GRADING AREAS SHOWN ON THE PLANS. GRUBBING INCLUDES REMOVAL OF ALL PLANT MATERIAL GREATER THAN 2" INCLUDING STUMPS, BRANCHES, ROOTS, ETC. TO A DEPTH BELOW THE FINAL SUBGRADE. THE CONTRACTOR IS TO REMOVE ONLY THOSE TREES WHICH ARE DESIGNATED BY THE OWNER'S REPRESENTATIVE FOR REMOVAL, AND SHALL EXERCISE EXTREME CARE AROUND EXISTING TREES TO BE SAVED.
2. TOPSOIL STRIPPING
   A. TOPSOIL, INCLUDING ROOTS LARGER THAN 2" AND LARGE ROOT MASSES, SHALL BE STRIPPED FROM ALL ROADWAY AND FOUNDATION AREAS UP TO 10". TOPSOIL SHALL NOT BE STRIPPED OUTSIDE OF THE DESIGNATED DISTURBANCE AREAS.
   B. ANY TOPSOIL THAT HAS BEEN STRIPPED SHALL BE STOCKPILED FOR POST CONSTRUCTION REVEGETATION. ALL TOPSOIL SHALL BE REDISTRIBUTED TO THE LAND OWNER'S PROPERTY OF WHERE IT ORIGINATED FROM.
3. FILL PLACEMENT
   A. FILL PLACEMENT SHALL CONSIST OF THE PLACING OF SUITABLE FILL MATERIAL, AFTER TOPSOIL STRIPPING, ABOVE THE EXISTING GRADE. GENERALLY, SIDE SLOPES SHALL BE CONSTRUCTED AT FOUR FOOT HORIZONTAL TO ONE FOOT VERTICAL, WITH SOME LOCATIONS THROUGHOUT THE PROJECT WITH SLOPES OF TWO FEET HORIZONTAL TO ONE FOOT VERTICAL. THE MATERIAL FOR FILL CONSTRUCTION SHALL BE OBTAINED FROM THE ACCESS ROAD/TURBINE EXCAVATION (SEE GEOTECHNICAL REPORT FOR RESTRICTIONS), OR ANY SUITABLE, APPROVED SOIL OBTAINED ONSITE/OFFSITE BY CONTRACTOR, AS DIRECTED OR APPROVED BY THE ENGINEER. THIS MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 12" AND CONSTRUCTED TO 95% OF THE MAXIMUM DRY DENSITY AND WITHIN 2% OF OPTIMUM MOISTURE CONTENT, AS DETERMINED BY THE STANDARD PROCTOR (AASHTO T99).
   B. SIDE SLOPES GREATER THAN 4:1 WILL NOT BE PERMITTED, UNLESS OTHERWISE NOTED ON THE PLAN.
   C. FILL SLOPES SHALL BE BENCHED INTO THE EXISTING SLOPE TO PREVENT MOVEMENT BETWEEN THE FILL AND NATIVE SOILS. BENCHES SHOULD BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO FILL PLACEMENT. POSITIVE DRAINAGE IS REQUIRED AT BENCHED AREAS AND AT THE TOE OF FILL SLOPES TO REMOVE SURFACE WATER.
4. SUBGRADE
   A. SUBGRADE PREPARED AT GRADE OR IN CUT REQUIRES SCARIFICATION AND RECOMPACTION TO A DEPTH OF 12" OR MORE.
   B. ACCESS ROAD CROSS SLOPES SHOWN IN THE PLANS ARE MEANT AS A GUIDE. ACCESS ROAD CROSS SLOPES MAY RANGE FROM 1% - 2%, CHECK WITH THE ENGINEER IF THE CROSS SLOPE FALLS OUTSIDE OF THIS RANGE. ACCESS ROADS BEING UTILIZED FOR CRANE TRAVEL SHOULD HAVE A MAX CROSS SLOPE OF 2%.

TABLE 1: SDDOT AGGREGATE BASE COURSE - LOCALLY SOURCED	
SIEVE SIZE	PERCENT PASSING
1"	100
3/4"	80-100
1/2"	68-91
NO. 4	46-70
NO. 8	34-58
NO. 40	13-35
NO. 200	3-12

MEET FOLLOWING REQUIREMENTS PER 882.2

LIQUID LIMIT (MAX) = 25
PLASTICITY INDEX = 0-6
L.A. ABRASION (% MAX) = 40%

GRADATION HAS BEEN OBTAINED FROM THE 2015 SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION BOOK.

STORM WATER DESIGN PARAMETERS

1. SEE SHEET 6 FOR CULVERT SIZING AND DESIGN PARAMETERS. SEE HYDROLOGY MEMO FOR FURTHER DESIGN CALCULATIONS. CULVERTS SHALL BE MINIMUM 18" CORRUGATED METAL PIPE. ALL TEMPORARY PORTIONS OF THE INSTALLED CULVERTS SHALL BE REMOVED UPON COMPLETION OF THE PROJECT.
2. IT IS EXPECTED THAT CULVERTS WILL BE OVERTOPPED DURING SOME STORMS AND MAINTENANCE WILL BE REQUIRED THROUGH THE LIFE OF THE PROJECT.
3. WHEN INSTALLING DRAINAGE CULVERTS THE CONTRACTOR SHALL USE JUDGMENT IN SETTING THE FLOW LINE ELEVATIONS AND CULVERT LONGITUDINAL SLOPE. TYPICALLY THE FLOW LINE ELEVATIONS AND LONGITUDINAL SLOPE OF THE CULVERT SHOULD MATCH THE NATURAL GROUND ELEVATIONS AND SLOPE TO ENSURE POSITIVE DRAINAGE. WHEN POSSIBLE, ALL CULVERTS SHOULD BE PLACED AT A MINIMUM 0.5% GRADE.
4. ANTICIPATED CULVERT CROSSINGS ARE SHOWN ON THE CONSTRUCTION PLAN, ADDITIONAL CULVERTS MAY NEED TO BE INSTALLED IN AREAS WHERE CONCENTRATED FLOW IS EXPECTED DUE TO CONSTRUCTION ACTIVITIES.
5. CONSTRUCTION DRAINAGE CROSSINGS TO MAINTAIN EXISTING FLOW CHARACTERISTICS OF THE FEATURES. FEATURES SHALL BE GRADED TO PRECONSTRUCTION CONTOURS.

TESTING:

1. TESTING SHALL BE PERFORMED BY A DESIGNATED INDEPENDENT TESTING AGENCY.
2. SUBMIT ONE SET OF TESTING AND INSPECTION RECORDS SPECIFIED TO THE CIVIL ENGINEER OF RECORD.

DEFINITIONS:

1. PROOF ROLLING:
   SHALL BE PERFORMED IN THE PRESENCE OF THE GEOTECHNICAL ENGINEER OR QUALIFIED GEOTECHNICAL REPRESENTATIVE USING A FULLY LOADED TANDEM AXLE DUMP TRUCK OR WATER TRUCK WITH A MINIMUM GROSS WEIGHT OF 25 TONS OR A FULLY LOADED BELLY DUMP WITH AN EQUIVALENT AXLE LOADING. PROOF-ROLLING ACCEPTANCE STANDARDS INCLUDE NO RUTTING GREATER THAN 1.5 INCHES, AND NO "PUMPING" OF THE SOIL BEHIND THE LOADED TRUCK.
2. SIEVE ANALYSIS:
   SHALL BE CONDUCTED IN ACCORDANCE WITH AASHTO T27
3. PROCTORS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T99
4. ATTERBERG LIMITS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T89 AND T90
5. MOISTURE DENSITY (NUCLEAR DENSITY):
   SHALL BE DONE IN ACCORDANCE WITH AASHTO T310
6. DYNAMIC CONE PENETROMETER (DCP) TESTING:
   SHALL BE DONE IN ACCORDANCE WITH ASTM D6951-03

REQUIREMENTS:

1. FILL PLACEMENT:
   A. SOILS USED AS FILL MATERIAL SHALL BE TESTED FOR MOISTURE CONTENT AND PROCTOR TESTS.
   B. WHERE FILL CONSTRUCTION REQUIRES MORE THAN 12 INCHES OF FILL PLACEMENT, COMPACT EACH LIFT TO A MINIMUM OF 95 PERCENT OF THE MATERIAL'S MAXIMUM STANDARD PROCTOR DRY DENSITY.
2. COMPACTED SUBGRADE (CEMENT STABILIZED):
   A. SEE SHEET 13 FOR TESTING REQUIREMENTS AND PROCEDURE.
3. COMPACTED SUBGRADE (NON-CEMENT STABILIZED):
   A. THE ENTIRE SUBGRADE SHALL BE PROOF-ROLLED PRIOR TO THE PLACEMENT OF THE AGGREGATE BASE TO IDENTIFY AREAS OF UNSTABLE SUBGRADE.
   B. PERFORM A MINIMUM OF 3 DYNAMIC CONE PENETROMETER (DCP) TESTS PER ACCESS ROAD OR ONE FOR EVERY 1,000 LF OF ROAD, WHICHEVER IS GREATER. SUBGRADE MUST MEET A MINIMUM DCP OF 3 BLOWS PER 6" TO A TOTAL DEPTH OF 2' (MINIMUM CBR=1.5).
   C. IF A PASSING PROOF-ROLL OR DCP REQUIREMENTS CANNOT BE ACHIEVED THE FOLLOWING ALTERNATIVES MAY BE IMPLEMENTED:
      a. SCARIFY, DRY, AND RECOMPACT SUBGRADE
      b. REMOVE UNSUITABLE MATERIAL AND REPLACE WITH SUITABLE MATERIAL
      c. INCREASE AGGREGATE BASE THICKNESS
4. AGGREGATE BASE:
   A. AGGREGATE BASE SHALL BE PROOF-ROLLED OVER THE ENTIRE LENGTH. IF PROOF ROLLING DETERMINES THAT THE ROAD IS UNSTABLE, ADDITIONAL AGGREGATE SHALL BE ADDED UNTIL THE UNSTABLE SECTION IS ABLE TO PASS A PROOF ROLL.
   B. PROVIDE 1 SIEVE ANALYSIS (PROJECT MAX OF 20) PER 2500 CY OF ROAD BASE PLACED.
5. CRANE PAD AND CRANE PATHS / CRANE TRAVEL SHOULDERS:
   A. TESTING REQUIREMENTS ARE PENDING BASED ON CRANE PICK PLANS PROVIDED BY THE CONTRACTOR.

TABLE 2: TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
FILL PLACEMENT	PROCTOR	1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER LIFT PER 5000 SF OF FILL PLACED OR 1 PER 500 LF OF ROAD OR CRANE WALK
COMPACTED SUBGRADE (CEMENT STABILIZED):	SEE SHEET 13	SEE SHEET 13
COMPACTED SUBGRADE (NON-CEMENT STABILIZED):	PROOF-ROLL	ENTIRE AREA
	DCP	1 PER 1,000 FT OR MIN. 3 PER ROAD
AGGREGATE BASE	PROOF-ROLL	ENTIRE AREA
	SIEVE ANALYSIS, LL, PL, AND L.A ABRASION	1 PER 2,500 CY

GENERAL NOTES:

1. GROUND SURFACE CONTOURS (AT TWO-FOOT VERTICAL INTERVALS) AND ELEVATIONS ARE BASED ON A PHOTOGRAMMETRY SURFACE PROVIDED BY GEOTERRA. IF MAJOR DISCREPANCIES ARE FOUND IN THE GROUND ELEVATIONS DURING FIELD STAKING TO THE GROUND ELEVATIONS SHOWN ON THE PLANS, THE OWNER AND ENGINEER SHALL BE NOTIFIED.
2. WHERE SECTION OR SUBSECTION MONUMENTS ARE ENCOUNTERED, THE OWNER SHALL BE NOTIFIED BEFORE SUCH MONUMENTS ARE REMOVED. THE CONTRACTOR SHALL PROTECT AND CAREFULLY PRESERVE ALL PROPERTY MARKERS AND MONUMENTS UNTIL THE OWNER, AN AUTHORIZED SURVEYOR OR AGENT HAS WITNESSED OR OTHERWISE REFERENCED THEIR LOCATION.
3. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. TYPICAL DISTURBANCE SHALL BE LIMITED TO 10 LF FROM THE EDGE OF PROPOSED GRADING.
4. FINALIZE GRADING AROUND THE BASE OF TURBINES IN ACCORDANCE WITH DETAIL TS-03 AND TS-04.
5. GRADE ALL PROPOSED ROADS TO A MAXIMUM SLOPE OF 8%. IF 8% SLOPE CANNOT BE ACHIEVED, THE CONTRACTOR MAY UTILIZE ASSIST VEHICLES FOR THE PURPOSE OF DELIVERIES. GRADE ALL PROPOSED CRANE PATHS TO A MAXIMUM OF 8% UNLESS OTHERWISE NOTED IN PLAN SHEETS.
6. ANY FACILITIES REMOVED TO ALLOW FOR CONSTRUCTION (MAILBOXES, SIGNS, FENCES, ETC.) SHALL BE REPLACED BY THE CONTRACTOR IN A CONDITION AS GOOD AS EXISTING.
7. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING DRAINAGE THROUGHOUT THE CONSTRUCTION OF THIS PROJECT. CONSTRUCTION ACTIVITIES SHALL NOT BLOCK THE NATURAL OR MANMADE CREEKS OR DRAINAGE SWALES CAUSING RAINWATER TO POND. DEPENDING ON FIELD CONDITIONS, ADDITIONAL CULVERTS IN EXCESS OF THOSE ON THE PLANS MAY BE REQUIRED.
8. WHILE BUILDING THE ROADS AND EXCAVATING THE TURBINE FOUNDATIONS, EXCESS SOIL WILL RESULT. THE CONTRACTOR SHALL DISPOSE OF THIS EXCESS SOIL IN AN APPROVED MANNER. EXCESS TOPSOIL SHALL BE DISTRIBUTED INTO A THIN LAYER ON LAND IMMEDIATELY ADJACENT TO WHERE THE TOPSOIL ORIGINATED. ALL EXCESS TOPSOIL TO BE WASTED ONSITE. WHILE DOING SO THE CONTRACTOR SHALL AVOID CAUSING RIDGES OR MOUNDS THAT WOULD MAKE IT DIFFICULT FOR STORM WATER RUNOFF TO DRAIN. THE FINAL SURFACE OF THE DISTURBED TOPSOIL SHALL BE SMOOTH AND FOLLOW THE NATURAL CONTOUR OF THE LAND.
9. THE CONTRACTOR SHALL NOTIFY SOUTH DAKOTA 811 AT LEAST 48 HOURS BEFORE EXCAVATION ACTIVITIES COMMENCE.
10. TEMPORARY INTERSECTION WIDENING SHALL, UPON COMPLETION OF ALL PROJECT CONSTRUCTION OR UPON NOTIFICATION OF THE ENGINEER, BE REMOVED AND THE AREA RESTORED TO ITS ORIGINAL LINES AND GRADES WITH TOPSOIL REPLACED, EXCEPT WHERE REQUESTED BY THE TOWNSHIP OR COUNTY TO PERMANENTLY REMAIN. DISTURBED AREAS OUTSIDE OF THE FINAL ROADWAY SHALL BE SEEDED AND MULCHED.
11. TURBINE SETBACKS ARE NOT IDENTIFIED ON THE CONSTRUCTION PLANS. IT SHALL BE THE RESPONSIBILITY OF THE OWNER AND CONTRACTOR TO ENSURE THAT ALL TURBINE SETBACKS MEET PROJECT REQUIREMENTS.
12. GEOTECHNICAL REPORTS WITH RECOMMENDATIONS HAVE BEEN PROVIDED BY THE OWNER. ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL ENGINEERING REPORT AND RECOMMENDATIONS.
13. FIELD SURVEY WETLAND INFORMATION HAS BEEN PROVIDED BY THE OWNER. ALL WETLAND DELINEATIONS AND PERMITTING SHALL BE THE RESPONSIBILITY OF OTHERS AND BE COMPLETED PRIOR TO CONSTRUCTION COMMENCING. THE OWNER AND GENERAL CONTRACTOR SHALL VERIFY THAT ALL WETLAND PERMITS HAVE BEEN SUBMITTED AND APPROVED PRIOR TO CONSTRUCTION COMMENCING.
14. CULTURAL RESOURCE REPORTS HAVE NOT BEEN PROVIDED. CULTURAL RESOURCE LOCATIONS ARE NOT SHOWN ON THE PLANS. INFORMATION WILL BE THE RESPONSIBILITY OF THE OWNER AND GENERAL CONTRACTOR. THE LOCATIONS OF CULTURAL RESOURCE SITES MAY BE CONFIDENTIAL AND PROTECTED BY STATE OR FEDERAL LAW. PUBLIC RELEASE OF SPECIFIC INFORMATION REGARDING THESE RESOURCES MAY BE RESTRICTED.
15. AN ENVIRONMENTAL ASSESSMENT HAS NOT BEEN PROVIDED. THE CONTRACTOR SHALL BE FAMILIAR WITH THE REPORT AND REVIEW ALL RECOMMENDATIONS.
16. ELECTRICAL INFORMATION SHOWN ON THE PLANS IS FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSULTANT'S PLANS FOR SPECIFIC LOCATIONS AND CONSTRUCTION DETAILS FOR THE UNDERGROUND POWER COLLECTION SYSTEM AND SUBSTATION.
17. CRANE PATHS ARE SHOWN ON THE CONSTRUCTION PLANS. IF THE CONTRACTOR PROPOSES ALTERNATE CRANE PATHS, THEY SHALL ENSURE THAT WETLAND AND CULTURAL RESOURCE CORRIDORS ARE NOT DISTURBED. FINAL CRANE PATH ALIGNMENTS SHALL BE DETERMINED BY THE CONTRACTOR BASED ON FIELD CONDITIONS WITHIN THE WETLAND AND CULTURAL RESOURCE CORRIDORS, SPECIAL LANDOWNER AGREEMENTS AND THE PROJECT BOUNDARY.
18. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. DISTURBANCE SHALL BE LIMITED TO 50 LF WIDTH FOR PROPOSED ACCESS ROADS AND 50 LF FOR CRANE PATHS, AND SHALL BE LIMITED TO A 250 LF RADIUS FOR PROPOSED WIND TURBINE GENERATORS. THE GRADING LIMITS SHALL BE CENTERED ON THE ROADWAYS AND WIND TURBINES. THE CONTRACTOR SHALL MAKE ALL EFFORTS TO KEEP ACTIVITIES WITHIN THE ERECTION AREAS SHOWN ON THE PLANS BUT IT IS UNDERSTOOD THAT SOME ACTIVITIES THAT WILL NOT REQUIRE GRADING OR SOIL DISTURBANCE MAY EXTEND BEYOND THE DEFINED LIMITS. DURING ERECTION OF THE ROTOR, TRUCKS AND/OR FORKLIFTS MAY EXTEND BEYOND THESE LIMITS. SEE DETAIL TS01 FOR TYPICAL ERECTION AREAS.
19. AN ALTA SURVEY HAS BEEN PROVIDED BY WESTWOOD. CONTRACTOR AND OWNER ARE RESPONSIBLE FOR LOCATING ALL UTILITIES AND VERIFYING LOCATION OF CONSTRUCTION ACTIVITIES PRIOR TO COMMENCING WORK.

STORMWATER POLLUTION PREVENTION PLAN (SWPPP):

1. THE CONTRACTOR SHALL PROVIDE EROSION CONTROL MEASURES AS PLANNED AND SPECIFIED FOLLOWING BEST MANAGEMENT PRACTICES AS OUTLINED BY THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND BEING IN CONFORMANCE WITH THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL STORMWATER PERMIT.
2. REFER TO THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR THE TRIPLE H WIND FARM, PREPARED BY WESTWOOD PROFESSIONAL SERVICES, FOR EROSION CONTROL AND RESTORATION SPECIFICATIONS, SEDIMENT AND EROSION CONTROL PROCEDURES, LOCATIONS OF BMPs, DETAILS, AND INSPECTION INFORMATION.
3. ALL PASTURES AND DRAINAGE SWALES DISTURBED DURING CONSTRUCTION ACTIVITIES AND NOT COVERED BY ROAD SURFACING MATERIALS, SHALL BE SEEDED IN ACCORDANCE WITH THE SWPP PLAN.
4. TEMPORARY EROSION CONTROL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE TEMPORARY EROSION CONTROL PLAN SHALL BE IN ACCORDANCE WITH THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND THE TRIPLE H WIND FARM STORMWATER POLLUTION PREVENTION PLAN ON FILE.

PROJECT CONTACT INFORMATION:

TITLE	COMPANY	NAME	CONTACT NUMBER
OWNER (PRIMARY)	ENGIE	CASEY WILLIS	805-569-6185
PROJECT MANAGER	WESTWOOD	DANI NYGREN	952-906-7493
ENGINEER OF RECORD	WESTWOOD	ROB COPOULS	952-906-7470
CONTRACTOR	WANZEK	JASON HELLERUD	701-893-3685

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 300
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed:	SMK
Checked:	DSN
Drawn:	SMK
As-Built Drawing:	

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK
MasTec

3838 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 12 OF 57

0014440OTP.dwg

©2019 Westwood Professional Services, Inc.

CEMENT STABILIZATION - PROCEDURE

THE SPECIFICATIONS BELOW ARE GENERAL RECOMMENDATIONS/GUIDELINES FOR CEMENT STABILIZATION OF SUBGRADES FOR THE PROJECT. ACTUAL FIELD CONDITIONS MAY ALTER APPLICATION RATE. CONSULT GEOTECHNICAL ENGINEER FOR FURTHER RECOMMENDATIONS.

1. STRIP THE TOP ±4 INCHES OF TOPSOIL (THROUGH THE ROOT ZONE) FROM THE AREA TO BE STABILIZED. ROOTS SMALLER THAN 1/4" DIAMETER ARE CONSIDERED INSIGNIFICANT.
2. PERFORM A PROCTOR (ASTM D 698) TEST TO DETERMINE THE OPTIMUM MOISTURE CONTENT IF THE MATERIAL TO BE STABILIZED DOES NOT MATCH A PREVIOUSLY PERFORMED PROCTOR.
3. DETERMINE THE IN-SITU MOISTURE CONTENT USING A NUCLEAR DENSITY GAUGE (OR EQUIVALENT MOISTURE CONTENT TEST) DAILY, PRIOR TO INCORPORATION OF THE CEMENT. PROVIDE ADDITIONAL MOISTURE CONTENT TESTING AS NEEDED BASED ON WEATHER CONDITIONS.
   - 3.1. THE CONTRACTOR WILL BE ADVISED OF IN-SITU MOISTURE CONTENT, AND MOISTURE ADJUSTMENTS SHOULD BE MADE IF IN-SITU MOISTURE IS LESS THAN OPTIMUM MOISTURE CONTENT AS DETERMINED BY THE PROCTOR (ASTM D 698).
4. SOIL AND CEMENT BLENDING:
   - 4.1. COMPLETELY BLEND SUBGRADE SOIL WITH THE APPROPRIATE AMOUNT OF CEMENT BY WEIGHT. FIELD RESULTS FROM TEST STRIPS WILL DICTATE THE CEMENT APPLICATION RATE.
   - 4.2. IN AREAS OF HIGH MOISTURE OR POOR SOILS, THE CONTRACTOR MAY INCREASE THE PERCENT OF CEMENT IN ORDER TO MEET THE MINIMUM SUBGRADE STRENGTH REQUIREMENTS.
   - 4.3. THE USE OF A RECLAIMER IS AN ADEQUATE BLENDING METHOD. DISCING IS NOT AN ADEQUATE BLENDING METHOD.
   - 4.4. A STABILIZATION DEPTH OF 12" WAS USED FOR DESIGN PURPOSES. STABILIZATION DEPTH MAY NEED TO INCREASE TO 16" IN AREAS OF EXTREME MOISTURE OR POOR SOILS IN ORDER TO MEET THE STRENGTH AND PROOF ROLL REQUIREMENTS.
5. COMPACTION:
   - 5.1. A ROLLING PATTERN WILL BE ESTABLISHED USING A NUCLEAR DENSITY GAUGE DURING COMPACTION.
     - 5.1.1. COMPACTION WILL BE PERFORMED UNTIL THE STABILIZED MATERIAL REACHES THE "BREAK POINT" AFTER WHICH ADDITIONAL PASSES WITH A ROLLER RESULTS IN A LOSS OF DENSITY AS MEASURED BY A NUCLEAR DENSITY GAUGE.
     - 5.1.2. COMPACTION IS TYPICALLY ACHIEVED BY MULTIPLE PASSES OF A PADFOOT ROLLER UNTIL THE ROLLER "WALKS" OUT OF THE RECLAIMED MATERIAL (SPACE IS VISIBLE BETWEEN THE DRUM AND THE RECLAIMED MATERIAL). THIS IS FOLLOWED BY BLADING AND SHAPING THE RECLAIMED MATERIAL TO FINAL PROFILE AND CROSS SECTION, REMOVING HIGH AND LOW POINTS. SMOOTH DRUM OR RUBBER TIRE ROLLERS ARE THEN USED TO FINISH ROLLING (THIS IS WHEN THE DENSITY TESTS ARE PERFORMED) UNTIL THE DENSITY OF THE MATERIAL REACHES THE "BREAK POINT."
     - 5.1.3. THE NUMBER OF PASSES AND EQUIPMENT USED TO REACH THE "BREAK POINT" IS CONSIDERED THE ROLLING PATTERN.
     - 5.1.4. A NEW ROLLING PATTERN MAY NEED TO BE ESTABLISHED IF THE PERFORMANCE REQUIREMENTS ARE NOT BEING MET. THIS MAY BE DUE TO CHANGES IN THE MOISTURE CONTENT, THE SOIL TYPE, OR THE CEMENT RATE.
   - 5.2. THE TARGET DENSITY IS 98% OF THE MAXIMUM DENSITY DETERMINED FROM THE ROLLING PATTERN.
     - 5.2.1. DENSITY TESTS SHALL BE TAKEN AT THE RATE OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER TO CONFIRM THE DENSITY IS MATCHING THE TARGET. ONCE THE ROLLING PATTERN HAS BEEN CONFIRMED IT IS RECOMMENDED THAT TESTING CONTINUE AT 1 TEST PER 1,000 LF IN EACH PASS OF THE RECLAIMER.
     - 5.2.2. IF IT IS NOT POSSIBLE TO ATTAIN THE TARGET DENSITY, AND ADDITIONAL COMPACTION DOES NOT IMPROVE THE DENSITY, A NEW ROLLING PATTERN SHOULD BE ESTABLISHED.
   - 5.3. THE AIR TEMPERATURE SHALL BE ABOVE 40 DEGREES (F) DURING THE CEMENT STABILIZATION PROCESS. MIXING CEMENT INTO FROZEN GROUND IS NOT ACCEPTABLE.
6. THE STABILIZED MATERIAL SHALL BE CONTINUOUSLY WET CURED FOR A MINIMUM OF 24 HOURS (WET CURED IS IDENTIFIED VISUALLY AS DAMP SURFACE).
7. PERFORM SUBGRADE TESTING IN ACCORDANCE WITH TESTING SCHEDULE.
8. AGGREGATE PLACEMENT:
   - 8.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 8.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 8.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

CEMENT STABILIZATION - DESIGN BASIS

1. DURING INITIAL CONSTRUCTION, CONTRACTOR SHALL CONSTRUCT MINIMUM 300 LF TEST STRIPS CONTAINING 4%, 5%, AND 6% CEMENT IN ACCORDANCE WITH CEMENT STABILIZATION PROCEDURES.
2. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 3 FOR ANTICIPATED RESULTS):
   - 2.1. PERFORM INITIAL SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M BETWEEN 4 TO 6 HOURS AFTER FINAL COMPACTION.
   - 2.2. PERFORM ADDITIONAL DCP TESTING AT 24 AND 48 HOURS AFTER FINAL COMPACTION.
   - 2.3. PERFORM SUBSEQUENT DCP TESTS AT 7 DAYS AFTER FINAL COMPACTION AS VERIFICATION OF STRENGTH CURVE.
   - 2.4. A MINIMUM OF 3 TESTS PER TEST SECTION PER TIMEFRAME IS REQUIRED. TESTS SHALL BE TAKEN AT THE CENTERLINE AND 2' FROM EACH SHOULDER.
   - 2.5. RECORD DCP TEST RESULTS EVERY 6 INCHES TO TOTAL DEPTH OF 12 INCHES.

TABLE 3: TEST STRIP CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	COMPRESSIVE STRENGTH (PSF)
4 – 6 HOURS	6	5	1,800
24 HOURS	10	7	2,500
48 HOURS	15	10	3,300
7 DAYS	30	21	5,200

CEMENT STABILIZATION - PRODUCTION

1. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 5 FOR SUMMARY OF TESTING REQUIREMENTS):
   - 1.1. PERFORM SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M NO SOONER THAN 24 HOURS AFTER FINAL COMPACTION.
   - 1.2. DCP TESTING FREQUENCY SHALL BE WITH A RANDOM SPACING AND A MINIMUM OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER. A MINIMUM OF 3 TESTS PER ROAD IS REQUIRED.
   - 1.3. THE CBR OF THE STABILIZED SUBGRADE SHOULD BE CALCULATED IN 6" INCREMENTS THROUGH THE ENTIRE DEPTH OF THE STABILIZED LAYER.
   - 1.4. THE MINIMUM REQUIRED CBR PRIOR TO PROOF-ROLLING IS PROVIDED IN TABLE 4 BELOW:

TABLE 4: FINAL CEMENT STABILIZED CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	UNDRAINED SHEAR STRENGTH (PSF)	BEARING CAPACITY (PSF)
24 – 48 HOURS	15	10	3,500	9,800
3 – 7 DAYS	30	21	7,000	18,000
28 DAYS	50	33	12,000	28,300

NOTE: UNDRAINED SHEAR STRENGTH WAS CALCULATED USING THE BLACK (1961) EQUATION. BEARING CAPACITY WAS CALCULATED USING THE VESIC EQUATION MODIFIED FOR TWO LAYERS (12" CEMENT STABILIZED SUBGRADE OVER A NATURAL SUBGRADE WITH A CBR OF 1.5)

   - 1.5. ONCE THE MINIMUM REQUIRED CBR IS ACHIEVED AT ANY CORRESPONDING TIME PERIOD, THE SUBGRADE IS CONSIDERED ADEQUATE AND THE CONTRACTOR MAY PROCEED WITH PROOF-ROLL TESTING. FUTURE DCP TESTING ON THAT SEGMENT OF SUBGRADE IS NOT REQUIRED.
   - 1.6. IF TESTING DOES NOT INDICATE A CBR OF 30 WITHIN 7 DAYS, ADDITIONAL GRAVEL SURFACING AND/OR THE ADDITION OF GEOTEXTILE FABRIC MAY BE REQUIRED. FOR FUTURE SUBGRADE STABILIZATION AREAS, CONTACT THE ENGINEER AND OWNER VIA RFI FOR RECOMMENDATIONS AND APPROVAL.
2. SUBGRADE PROOF-ROLL TESTING AND ACCEPTANCE:
   - 2.1. ONCE THE REQUIRED DCP VALUE HAS BEEN OBTAINED BUT PRIOR TO PLACING AGGREGATE, THE SUBGRADE SHALL BE PROOF-ROLLED. REFER TO THE PROJECT TESTING REQUIREMENTS FOR PROOF-ROLL DEFINITION.
   - 2.2. PROOF-ROLLING SHOULD BE PERFORMED WITH ONE PASS DOWN THE CENTER AND NOT BE PERFORMED WITHIN 12 INCHES OF THE EDGE OF THE STABILIZED SECTION.
   - 2.3. IF PROOF-ROLLING FAILS, RE-STABILIZATION MAY BE REQUIRED AND A NEW ROLLING PATTERN OR ADDITIONAL CEMENT MAY BE REQUIRED.
3. AGGREGATE PLACEMENT:
   - 3.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 3.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 3.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

TABLE 5: CEMENT STABILIZATION PRODUCTION TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
COMPACTED SUBGRADE (CEMENT STABILIZED)	PROCTOR	MINIMUM 1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER 1000 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
NOTE: SEE ABOVE FOR INITIAL TESTING REQUIREMENTS	DCP TEST	1 PER 500 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
	PROOF-ROLL (AFTER PASSING DCP TESTS)	ENTIRE LENGTH

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 www.westwoodps.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: DJH
Drawn: BMK
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK
Metric

3008 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 13 OF 57

0014440DTP.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 327th Street in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 900' South of 327th Ave & 205th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.24'29.65" W Long. -99.37'24.83" W
4. Width of entrance: 16' access road
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001148 NE4 20-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Signature of Applicant

Robert Bawdon
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 327th Street in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 900' South of 327th Ave & 205th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.24'29.65" W Long. -99.37'24.83" W
4. Width of entrance: 16' access road
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001148 NE4 20-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: _____

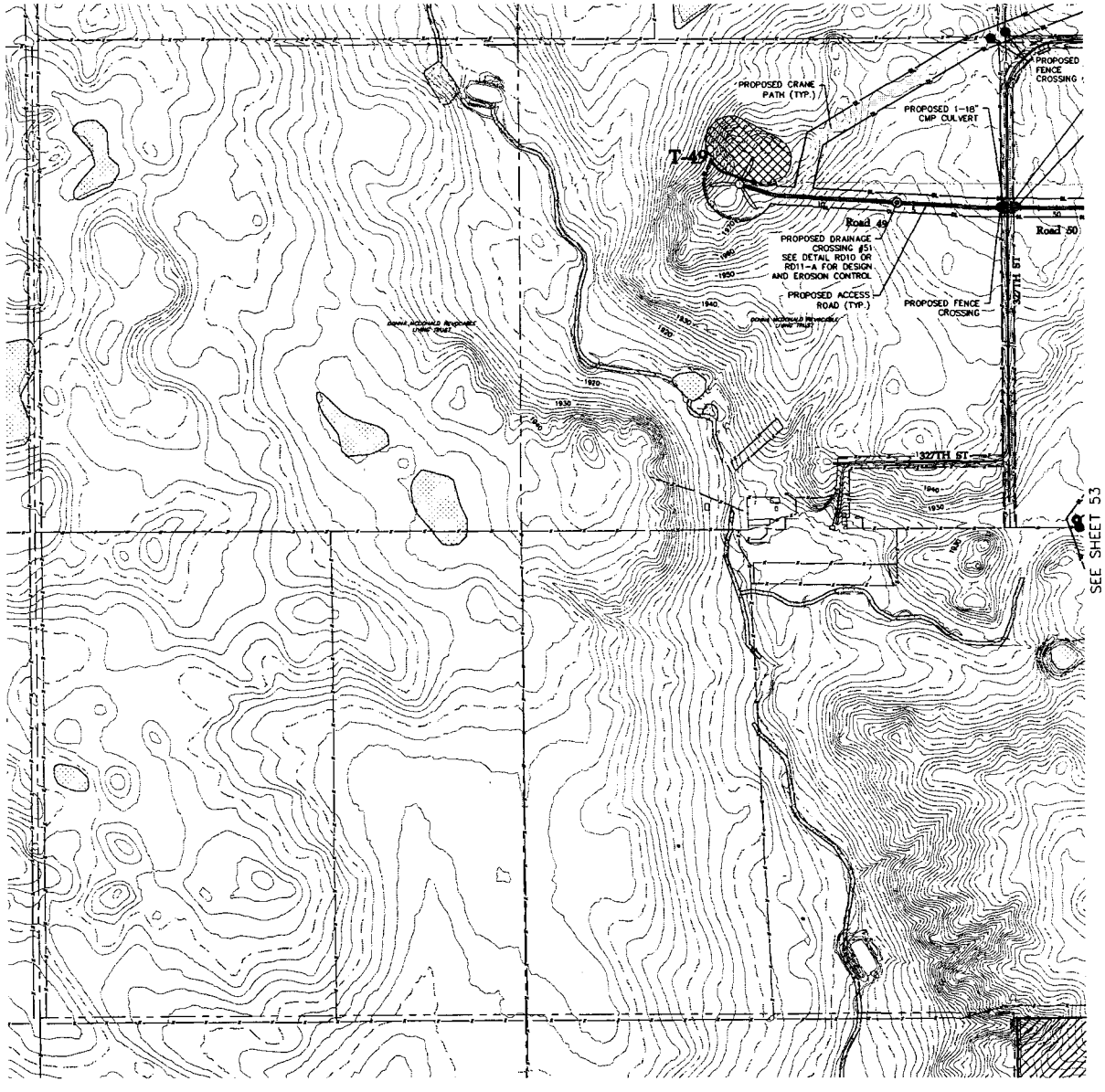
Taya Lore
Signature of Applicant

_____
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

© 2019 Westwood Professional Services, Inc.



LEGEND:

- PROPOSED TURBINE LOCATION
- T-XX PROPOSED TURBINE NUMBER
- PROPOSED ALTERNATE TURBINE LOCATION
- ALT-XX PROPOSED ALTERNATE TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED ALTERNATE ACCESS ROAD
- PROPOSED CRANE PATH
- PROPOSED UNDERGROUND COLLECTION*
- PROPOSED DISTURBANCE LIMITS
- PROPOSED PERIMETER SEDIMENT CONTROL
- 980 EXISTING 10' CONTOURS
- EXISTING 2' CONTOURS
- EXISTING GRAVEL EDGE
- EXISTING BITUMINUS EDGE
- EXISTING RIGHT-OF-WAY
- EXISTING PARCEL LINE
- EXISTING BUILDING
- EXISTING FENCE
- EXISTING OVERHEAD POWER
- EXISTING HIGH VOLTAGE OVERHEAD POWER
- EXISTING UNDERGROUND POWER LINE
- EXISTING FIBER OPTIC LINE
- EXISTING WATER LINE
- DELINEATED WETLAND
- ARCHAEOLOGICAL AVOIDANCE AREA
- EXISTING USFWS EASEMENT
- PROJECT BOUNDARY
- 1900 EXISTING GROUND ELEVATION
- PROPOSED DRAINAGE CROSSING**
- PROPOSED TEMPORARY DRAINAGE CROSSING**
- PROPOSED FENCE CROSSING***
- PROPOSED UTILITY CROSSING
- PROPOSED CULVERT

* PROVIDED BY OTHERS AND SHOWN FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSTRUCTION PLANS FOR DETAILS.

** SEE SHEET 11 FOR DRAINAGE CROSSING TYPE AND SIZING. DRAINAGE CROSSINGS SHALL CONSIST OF LOW WATER CROSSING OR CULVERT. DRAINAGE CROSSINGS ALONG CRANE PATH SHALL CONSIST OF CRANE MATS OR TEMPORARY CULVERT.

*** ALL GATE INSTALLATIONS SHALL BE FIELD DETERMINED AND AGREED UPON BY THE CONTRACTOR AND OWNER.

							14	15	16	17
18	19	20								
21	22	23	24	25	26	27	28	29	30	31
				32	33	34	35	36	37	38
			39	40	41	42	43	44	45	46
		47	48	49	50	51				
52	53	54	55							

KEY MAP

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (866) 937-5150 westwoodps.com

Westwood Professional Services, Inc.

Designed: BMK
Checked: DDH
Drawn: BMK
As-Built Drawing:

Revisions #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2020 2nd Avenue NW
West Fargo, ND 58078

0' 300' 600' 900'

Triple H Wind Farm

Hyde County, South Dakota

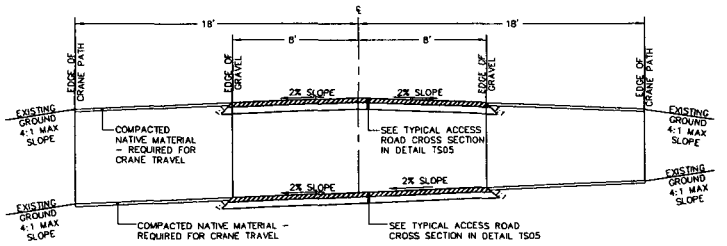
Site Plan T-49

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 52 OF 57

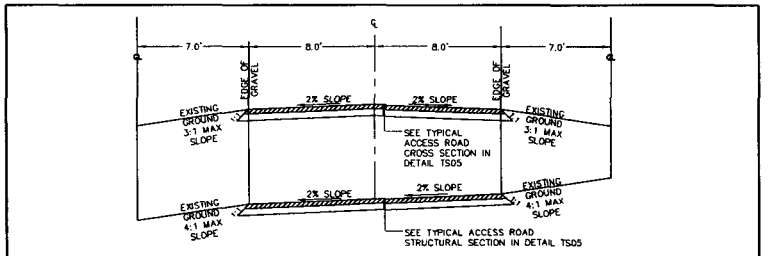
0014440SP01.dwg

© 2019 Westwood Professional Services, Inc.



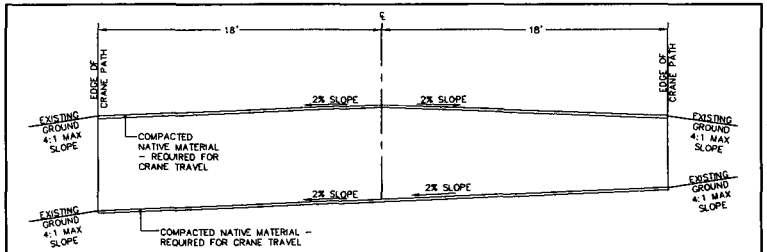
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE ACCESS ROAD DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES. IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

Westwood | TYPICAL TURBINE ACCESS ROAD AND CRANE PATH | LAST REVISED: 05/28/01 | RD01-A



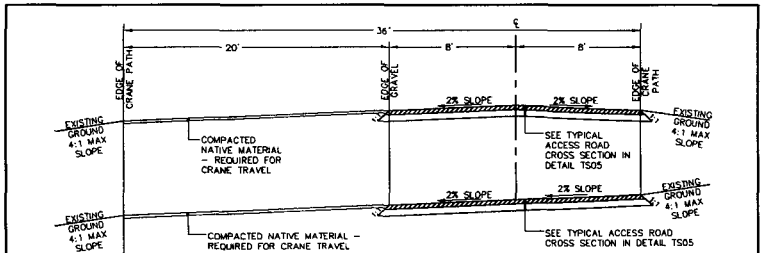
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES. IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

Westwood | TYPICAL TURBINE ACCESS ROAD SECTION | LAST REVISED: 3/08/12 | RD01-B



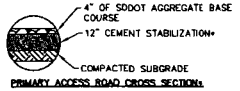
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE WHERE CRANE PATHS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT CRANE PATH REMAINS WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%

Westwood | TYPICAL CRANE PATH | LAST REVISED: 05/28/01 | RD01-C

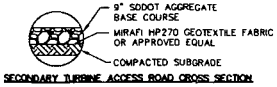


NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE EDGE OF COMPACTED SHOULDER DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES. IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

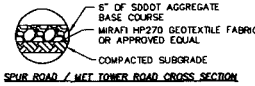
Westwood | TYPICAL TURBINE ACCESS ROAD AND OFFSET CRANE PATH | LAST REVISED: 05/29/01 | RD01-D



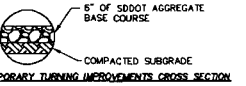
PRIMARY ACCESS ROAD CROSS SECTION*



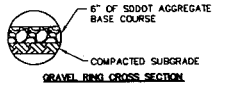
SECONDARY TURBINE ACCESS ROAD CROSS SECTION



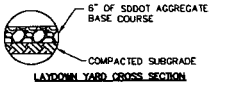
SPUR ROAD / MET TOWER ROAD CROSS SECTION



TEMPORARY TURNING IMPROVEMENTS CROSS SECTION



GRAVEL RING CROSS SECTION



LAYDOWN YARD CROSS SECTION

* CEMENT APPLICATION RATE MAY VARY BASED ON TEST STRIPS AND FIELD PERFORMANCE. SEE SHEET 13 FOR CEMENT STABILIZATION PROCEDURE AND DESIGN BASIS.

NOTES:
STRUCTURAL SECTIONS SHOWN ARE THE MINIMUM THICKNESS REQUIREMENTS DURING NORMAL FIELD CONDITIONS. THE SECTIONS MAY NEED TO BE INCREASED BASED ON ACTUAL FIELD CONDITIONS AT THE TIME OF CONSTRUCTION. CONDITIONS INCLUDE BUT ARE NOT LIMITED TO CONSTRUCTION DURING THE FREEZE/THAW CYCLE, UNUSUALLY WET PERIODS, OR IN LOW/WET AREAS. SEE SHEET 12 FOR TESTING REQUIREMENTS AND SPECIFICATIONS.

Westwood | TYPICAL STRUCTURAL CROSS SECTIONS

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-free (888) 937-5150 westwoodps.com

Westwood Professional Services, Inc.

Designed: BMK
Checked: DJH
Drawn: BMK
As-Built Drawing:

Revisions:

#	Date	Description
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2020 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 4 OF 57

0014440DTP.dwg

©2019 Westwood Professional Services, Inc.

ROAD DESIGN PARAMETERS

1. ACCESS ROADS HAVE BEEN DESIGNED TO ACCOMMODATE LIGHT DUTY TRUCKS (PICKUP TRUCKS AND MAINTENANCE VEHICLES) FOR LOW VOLUME USE IN NORMAL OPERATING CONDITIONS AS WELL AS HEAVY DUTY CONSTRUCTION TRAFFIC UNDER DRY CONDITIONS. THE ROAD DESIGN SPECIFIED IS NOT INTENDED FOR ALL WEATHER USE FOR HEAVY DUTY CONSTRUCTION LOADS.
2. ROAD MAINTENANCE CAN BE EXPECTED OVER THE LIFE OF THE PERMANENT FACILITY.

PRODUCTS

1. AGGREGATE BASE SHALL CONSIST OF SDDOT AGGREGATE BASE COURSE (AND IN CONFORMANCE WITH THE GRADATION TABLE 1). AGGREGATE MAY BE CRUSHER RUN UPON ENGINEERS APPROVAL. AGGREGATE GRADATIONS SHALL BE SUBMITTED TO ENGINEER FOR REVIEW.
2. ROAD SHOULDERS AND CRANE PADS SHALL CONSIST OF COMPACTED NATIVE SOILS.
3. CULVERTS: ACCESS ROAD CULVERTS SHALL MEET THE MINIMUM SPECIFICATIONS SET FORTH BY THE SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION AND/OR HYDE COUNTY. ALL CULVERTS ARE PLANNED TO BE A MINIMUM 18" DIAMETER AND MANUFACTURED OF 16-GAGE CORRUGATED METAL PIPE WITH NO END TREATMENTS UNLESS NOTED OTHERWISE. ACTUAL SIZE WILL BE DETERMINED THROUGH HYDRAULIC ANALYSIS.
4. GEOTEXTILE FABRIC: MIRAFI HP270 OR APPROVED EQUAL.

EXECUTION

1. CLEARING AND GRUBBING
   A. THE CONTRACTOR SHALL BE REQUIRED TO GRUB ALL TREES, STUMPS, BRUSH, AND DEBRIS WITHIN THE GRADING AREAS SHOWN ON THE PLANS. GRUBBING INCLUDES REMOVAL OF ALL PLANT MATERIAL GREATER THAN 2" INCLUDING STUMPS, BRANCHES, ROOTS, ETC. TO A DEPTH BELOW THE FINAL SUBGRADE. THE CONTRACTOR IS TO REMOVE ONLY THOSE TREES WHICH ARE DESIGNATED BY THE OWNER'S REPRESENTATIVE FOR REMOVAL, AND SHALL EXERCISE EXTREME CARE AROUND EXISTING TREES TO BE SAVED.
2. TOPSOIL STRIPPING
   A. TOPSOIL, INCLUDING ROOTS LARGER THAN 2" AND LARGE ROOT MASSES, SHALL BE STRIPPED FROM ALL ROADWAY AND FOUNDATION AREAS UP TO 10". TOPSOIL SHALL NOT BE STRIPPED OUTSIDE OF THE DESIGNATED DISTURBANCE AREAS.
   B. ANY TOPSOIL THAT HAS BEEN STRIPPED SHALL BE STOCKPILED FOR POST CONSTRUCTION REVEGETATION. ALL TOPSOIL SHALL BE REDISTRIBUTED TO THE LAND OWNER'S PROPERTY OF WHERE IT ORIGINATED FROM.
3. FILL PLACEMENT
   A. FILL PLACEMENT SHALL CONSIST OF THE PLACING OF SUITABLE FILL MATERIAL, AFTER TOPSOIL STRIPPING, ABOVE THE EXISTING GRADE. GENERALLY, SIDE SLOPES SHALL BE CONSTRUCTED AT FOUR FOOT HORIZONTAL TO ONE FOOT VERTICAL, WITH SOME LOCATIONS THROUGHOUT THE PROJECT WITH SLOPES OF TWO FEET HORIZONTAL TO ONE FOOT VERTICAL. THE MATERIAL FOR FILL CONSTRUCTION SHALL BE OBTAINED FROM THE ACCESS ROAD/TURBINE EXCAVATION (SEE GEOTECHNICAL REPORT FOR RESTRICTIONS), OR ANY SUITABLE, APPROVED SOIL OBTAINED ONSITE/OFFSITE BY CONTRACTOR, AS DIRECTED OR APPROVED BY THE ENGINEER. THIS MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 12" AND CONSTRUCTED TO 95% OF THE MAXIMUM DRY DENSITY AND WITHIN 2% OF OPTIMUM MOISTURE CONTENT, AS DETERMINED BY THE STANDARD PROCTOR (AASHTO T99).
   B. SIDE SLOPES GREATER THAN 4:1 WILL NOT BE PERMITTED, UNLESS OTHERWISE NOTED ON THE PLAN.
   C. FILL SLOPES SHALL BE BENCHED INTO THE EXISTING SLOPE TO PREVENT MOVEMENT BETWEEN THE FILL AND NATIVE SOILS. BENCHES SHOULD BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO FILL PLACEMENT. POSITIVE DRAINAGE IS REQUIRED AT BENCHED AREAS AND AT THE TOE OF FILL SLOPES TO REMOVE SURFACE WATER.
4. SUBGRADE
   A. SUBGRADE PREPARED AT GRADE OR IN CUT REQUIRES SCARIFICATION AND RECOMPACTION TO A DEPTH OF 12" OR MORE.
   B. ACCESS ROAD CROSS SLOPES SHOWN IN THE PLANS ARE MEANT AS A GUIDE. ACCESS ROAD CROSS SLOPES MAY RANGE FROM 1% - 2%, CHECK WITH THE ENGINEER IF THE CROSS SLOPE FALLS OUTSIDE OF THIS RANGE. ACCESS ROADS BEING UTILIZED FOR CRANE TRAVEL SHOULD HAVE A MAX CROSS SLOPE OF 2%

TABLE 1: SDDOT AGGREGATE BASE COURSE - LOCALLY SOURCED	
SIEVE SIZE	PERCENT PASSING
1"	100
3/4"	80-100
1/2"	68-91
NO. 4	46-70
NO. 8	34-58
NO. 40	13-35
NO. 200	3-12

MEET FOLLOWING REQUIREMENTS PER 882.2

LIQUID LIMIT (MAX) = 25
PLASTICITY INDEX = 0-6
L.A ABRASION (% MAX) = 40%

GRADATION HAS BEEN OBTAINED FROM THE 2015 SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION BOOK.

STORM WATER DESIGN PARAMETERS

1. SEE SHEET 6 FOR CULVERT SIZING AND DESIGN PARAMETERS. SEE HYDROLOGY MEMO FOR FURTHER DESIGN CALCULATIONS. CULVERTS SHALL BE MINIMUM 18" CORRUGATED METAL PIPE. ALL TEMPORARY PORTIONS OF THE INSTALLED CULVERTS SHALL BE REMOVED UPON COMPLETION OF THE PROJECT.
2. IT IS EXPECTED THAT CULVERTS WILL BE OVERTOPPED DURING SOME STORMS AND MAINTENANCE WILL BE REQUIRED THROUGH THE LIFE OF THE PROJECT.
3. WHEN INSTALLING DRAINAGE CULVERTS THE CONTRACTOR SHALL USE JUDGMENT IN SETTING THE FLOW LINE ELEVATIONS AND CULVERT LONGITUDINAL SLOPE. TYPICALLY THE FLOW LINE ELEVATIONS AND LONGITUDINAL SLOPE OF THE CULVERT SHOULD MATCH THE NATURAL GROUND ELEVATIONS AND SLOPE TO ENSURE POSITIVE DRAINAGE. WHEN POSSIBLE, ALL CULVERTS SHOULD BE PLACED AT A MINIMUM 0.5% GRADE.
4. ANTICIPATED CULVERT CROSSINGS ARE SHOWN ON THE CONSTRUCTION PLAN, ADDITIONAL CULVERTS MAY NEED TO BE INSTALLED IN AREAS WHERE CONCENTRATED FLOW IS EXPECTED DUE TO CONSTRUCTION ACTIVITIES.
5. CONSTRUCTION DRAINAGE CROSSINGS TO MAINTAIN EXISTING FLOW CHARACTERISTICS OF THE FEATURES. FEATURES SHALL BE GRADED TO PRECONSTRUCTION CONTOURS.

TESTING:

1. TESTING SHALL BE PERFORMED BY A DESIGNATED INDEPENDENT TESTING AGENCY.
2. SUBMIT ONE SET OF TESTING AND INSPECTION RECORDS SPECIFIED TO THE CIVIL ENGINEER OF RECORD.

DEFINITIONS:

1. PROOF ROLLING:
   SHALL BE PERFORMED IN THE PRESENCE OF THE GEOTECHNICAL ENGINEER OR QUALIFIED GEOTECHNICAL REPRESENTATIVE USING A FULLY LOADED TANDEM AXLE DUMP TRUCK OR WATER TRUCK WITH A MINIMUM GROSS WEIGHT OF 25 TONS OR A FULLY LOADED BELLY DUMP WITH AN EQUIVALENT AXLE LOADING. PROOF-ROLLING ACCEPTANCE STANDARDS INCLUDE NO RUTTING GREATER THAN 1.5 INCHES, AND NO "PUMPING" OF THE SOIL BEHIND THE LOADED TRUCK.
2. SIEVE ANALYSIS:
   SHALL BE CONDUCTED IN ACCORDANCE WITH AASHTO T27
3. PROCTORS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T99
4. ATTERBERG LIMITS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T89 AND T90
5. MOISTURE DENSITY (NUCLEAR DENSITY):
   SHALL BE DONE IN ACCORDANCE WITH AASHTO T310
6. DYNAMIC CONE PENETROMETER (DCP) TESTING:
   SHALL BE DONE IN ACCORDANCE WITH ASTM D6951-03

REQUIREMENTS:

1. FILL PLACEMENT:
   A. SOILS USED AS FILL MATERIAL SHALL BE TESTED FOR MOISTURE CONTENT AND PROCTOR TESTS.
   B. WHERE FILL CONSTRUCTION REQUIRES MORE THAN 12 INCHES OF FILL PLACEMENT, COMPACT EACH LIFT TO A MINIMUM OF 95 PERCENT OF THE MATERIAL'S MAXIMUM STANDARD PROCTOR DRY DENSITY.
2. COMPACTED SUBGRADE (CEMENT STABILIZED):
   A. SEE SHEET 13 FOR TESTING REQUIREMENTS AND PROCEDURE.
3. COMPACTED SUBGRADE (NON-CEMENT STABILIZED):
   A. THE ENTIRE SUBGRADE SHALL BE PROOF-ROLLED PRIOR TO THE PLACEMENT OF THE AGGREGATE BASE TO IDENTIFY AREAS OF UNSTABLE SUBGRADE.
   B. PERFORM A MINIMUM OF 3 DYNAMIC CONE PENETROMETER (DCP) TESTS PER ACCESS ROAD OR ONE FOR EVERY 1,000 LF OF ROAD, WHICHEVER IS GREATER. SUBGRADE MUST MEET A MINIMUN DCP OF 3 BLOWS PER 6" TO A TOTAL DEPTH OF 2' (MINIMUM CBR=1.5).
   C. IF A PASSING PROOF-ROLL OR DCP REQUIREMENTS CANNOT BE ACHIEVED THE FOLLOWING ALTERNATIVES MAY BE IMPLEMENTED:
      a. SCARIFY, DRY, AND RECOMPACT SUBGRADE
      b. REMOVE UNSUITABLE MATERIAL AND REPLACE WITH SUITABLE MATERIAL
      c. INCREASE AGGREGATE BASE THICKNESS
4. AGGREGATE BASE:
   A. AGGREGATE BASE SHALL BE PROOF-ROLLED OVER THE ENTIRE LENGTH. IF PROOF ROLLING DETERMINES THAT THE ROAD IS UNSTABLE, ADDITIONAL AGGREGATE SHALL BE ADDED UNTIL THE UNSTABLE SECTION IS ABLE TO PASS A PROOF ROLL.
   B. PROVIDE 1 SIEVE ANALYSIS (PROJECT MAX OF 20) PER 2500 CY OF ROAD BASE PLACED.
5. CRANE PAD AND CRANE PATHS / CRANE TRAVEL SHOULDERS:
   A. TESTING REQUIREMENTS ARE PENDING BASED ON CRANE PICK PLANS PROVIDED BY THE CONTRACTOR.

TABLE 2: TESTING SCHEDULE SUMMARY		
LOCATION	TEST	FREQUENCY
FILL PLACEMENT	PROCTOR	1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER LIFT PER 5000 SF OF FILL PLACED OR 1 PER 500 LF OF ROAD OR CRANE WALK
COMPACTED SUBGRADE (CEMENT STABILIZED):	SEE SHEET 13	SEE SHEET 13
COMPACTED SUBGRADE (NON-CEMENT STABILIZED):	PROOF-ROLL	ENTIRE AREA
	DCP	1 PER 1,000 FT OR MIN. 3 PER ROAD
AGGREGATE BASE	PROOF-ROLL	ENTIRE AREA
	SIEVE ANALYSIS, LL, PL, AND L.A ABRASION	1 PER 2,500 CY

GENERAL NOTES:

1. GROUND SURFACE CONTOURS (AT TWO-FOOT VERTICAL INTERVALS) AND ELEVATIONS ARE BASED ON A PHOTOGRAMMETRY SURFACE PROVIDED BY GEOTERRA. IF MAJOR DISCREPANCIES ARE FOUND IN THE GROUND ELEVATIONS DURING FIELD STAKING TO THE GROUND ELEVATIONS SHOWN ON THE PLANS, THE OWNER AND ENGINEER SHALL BE NOTIFIED.
2. WHERE SECTION OR SUBSECTION MONUMENTS ARE ENCOUNTERED, THE OWNER SHALL BE NOTIFIED BEFORE SUCH MONUMENTS ARE REMOVED. THE CONTRACTOR SHALL PROTECT AND CAREFULLY PRESERVE ALL PROPERTY MARKERS AND MONUMENTS UNTIL THE OWNER, AN AUTHORIZED SURVEYOR OR AGENT HAS WITNESSED OR OTHERWISE REFERENCED THEIR LOCATION.
3. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. TYPICAL DISTURBANCE SHALL BE LIMITED TO 10 LF FROM THE EDGE OF PROPOSED GRADING.
4. FINALIZE GRADING AROUND THE BASE OF TURBINES IN ACCORDANCE WITH DETAIL TS-03 AND TS-04.
5. GRADE ALL PROPOSED ROADS TO A MAXIMUM SLOPE OF 8%. IF 8% SLOPE CANNOT BE ACHIEVED, THE CONTRACTOR MAY UTILIZE ASSIST VEHICLES FOR THE PURPOSE OF DELIVERIES. GRADE ALL PROPOSED CRANE PATHS TO A MAXIMUM OF 8% UNLESS OTHERWISE NOTED IN PLAN SHEETS.
6. ANY FACILITIES REMOVED TO ALLOW FOR CONSTRUCTION (MAILBOXES, SIGNS, FENCES, ETC.) SHALL BE REPLACED BY THE CONTRACTOR IN A CONDITION AS GOOD AS EXISTING.
7. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING DRAINAGE THROUGHOUT THE CONSTRUCTION OF THIS PROJECT. CONSTRUCTION ACTIVITIES SHALL NOT BLOCK THE NATURAL OR MANMADE CREEKS OR DRAINAGE SWALES CAUSING RAINWATER TO POND. DEPENDING ON FIELD CONDITIONS, ADDITIONAL CULVERTS IN EXCESS OF THOSE ON THE PLANS MAY BE REQUIRED.
8. WHILE BUILDING THE ROADS AND EXCAVATING THE TURBINE FOUNDATIONS, EXCESS SOIL WILL RESULT. THE CONTRACTOR SHALL DISPOSE OF THIS EXCESS SOIL IN AN APPROVED MANNER. EXCESS TOPSOIL SHALL BE DISTRIBUTED INTO A THIN LAYER ON LAND IMMEDIATELY ADJACENT TO WHERE THE TOPSOIL ORIGINATED. ALL EXCESS TOPSOIL TO BE WASTED ONSITE. WHILE DOING SO THE CONTRACTOR SHALL AVOID CAUSING RIDGES OR MOUNDS THAT WOULD MAKE IT DIFFICULT FOR STORM WATER RUNOFF TO DRAIN. THE FINAL SURFACE OF THE DISTURBED TOPSOIL SHALL BE SMOOTH AND FOLLOW THE NATURAL CONTOUR OF THE LAND.
9. THE CONTRACTOR SHALL NOTIFY SOUTH DAKOTA 811 AT LEAST 48 HOURS BEFORE EXCAVATION ACTIVITIES COMMENCE.
10. TEMPORARY INTERSECTION WIDENING SHALL, UPON COMPLETION OF ALL PROJECT CONSTRUCTION OR UPON NOTIFICATION OF THE ENGINEER, BE REMOVED AND THE AREA RESTORED TO ITS ORIGINAL LINES AND GRADES WITH TOPSOIL REPLACED, EXCEPT WHERE REQUESTED BY THE TOWNSHIP OR COUNTY TO PERMANENTLY REMAIN. DISTURBED AREAS OUTSIDE OF THE FINAL ROADWAY SHALL BE SEEDED AND MULCHED.
11. TURBINE SETBACKS ARE NOT IDENTIFIED ON THE CONSTRUCTION PLANS. IT SHALL BE THE RESPONSIBILITY OF THE OWNER AND CONTRACTOR TO ENSURE THAT ALL TURBINE SETBACKS MEET PROJECT REQUIREMENTS.
12. GEOTECHNICAL REPORTS WITH RECOMMENDATIONS HAVE BEEN PROVIDED BY THE OWNER. ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL ENGINEERING REPORT AND RECOMMENDATIONS.
13. FIELD SURVEY WETLAND INFORMATION HAS BEEN PROVIDED BY THE OWNER. ALL WETLAND DELINEATIONS AND PERMITTING SHALL BE THE RESPONSIBILITY OF OTHERS AND BE COMPLETED PRIOR TO CONSTRUCTION COMMENCING. THE OWNER AND GENERAL CONTRACTOR SHALL VERIFY THAT ALL WETLAND PERMITS HAVE BEEN SUBMITTED AND APPROVED PRIOR TO CONSTRUCTION COMMENCING.
14. CULTURAL RESOURCE REPORTS HAVE NOT BEEN PROVIDED. CULTURAL RESOURCE LOCATIONS ARE NOT SHOWN ON THE PLANS. INFORMATION WILL BE THE RESPONSIBILITY OF THE OWNER AND GENERAL CONTRACTOR. THE LOCATIONS OF CULTURAL RESOURCE SITES MAY BE CONFIDENTIAL AND PROTECTED BY STATE OR FEDERAL LAW. PUBLIC RELEASE OF SPECIFIC INFORMATION REGARDING THESE RESOURCES MAY BE RESTRICTED.
15. AN ENVIRONMENTAL ASSESSMENT HAS NOT BEEN PROVIDED. THE CONTRACTOR SHALL BE FAMILIAR WITH THE REPORT AND REVIEW ALL RECOMMENDATIONS.
16. ELECTRICAL INFORMATION SHOWN ON THE PLANS IS FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSULTANT'S PLANS FOR SPECIFIC LOCATIONS AND CONSTRUCTION DETAILS FOR THE UNDERGROUND POWER COLLECTION SYSTEM AND SUBSTATION.
17. CRANE PATHS ARE SHOWN ON THE CONSTRUCTION PLANS. IF THE CONTRACTOR PROPOSES ALTERNATE CRANE PATHS, THEY SHALL ENSURE THAT WETLAND AND CULTURAL RESOURCE CORRIDORS ARE NOT DISTURBED. FINAL CRANE PATH ALIGNMENTS SHALL BE DETERMINED BY THE CONTRACTOR BASED ON FIELD CONDITIONS WITHIN THE WETLAND AND CULTURAL RESOURCE CORRIDORS, SPECIAL LANDOWNER AGREEMENTS AND THE PROJECT BOUNDARY.
18. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. DISTURBANCE SHALL BE LIMITED TO 50 LF WIDTH FOR PROPOSED ACCESS ROADS AND 50 LF FOR CRANE PATHS, AND SHALL BE LIMITED TO A 250 LF RADIUS FOR PROPOSED WIND TURBINE GENERATORS. THE GRADING LIMITS SHALL BE CENTERED ON THE ROADWAYS AND WIND TURBINES. THE CONTRACTOR SHALL MAKE ALL EFFORTS TO KEEP ACTIVITIES WITHIN THE ERECTION AREAS SHOWN ON THE PLANS BUT IT IS UNDERSTOOD THAT SOME ACTIVITIES THAT WILL NOT REQUIRE GRADING OR SOIL DISTURBANCE MAY EXTEND BEYOND THE DEFINED LIMITS. DURING ERECTION OF THE ROTOR, TRUCKS AND/OR FORKLIFTS MAY EXTEND BEYOND THESE LIMITS. SEE DETAIL TS01 FOR TYPICAL ERECTION AREAS.
19. AN ALTA SURVEY HAS BEEN PROVIDED BY WESTWOOD. CONTRACTOR AND OWNER ARE RESPONSIBLE FOR LOCATING ALL UTILITIES AND VERIFYING LOCATION OF CONSTRUCTION ACTIVITIES PRIOR TO COMMENCING WORK.

STORMWATER POLLUTION PREVENTION PLAN (SWPPP):

1. THE CONTRACTOR SHALL PROVIDE EROSION CONTROL MEASURES AS PLANNED AND SPECIFIED FOLLOWING BEST MANAGEMENT PRACTICES AS OUTLINED BY THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND BEING IN CONFORMANCE WITH THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL STORMWATER PERMIT.
2. REFER TO THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR THE TRIPLE H WIND FARM, PREPARED BY WESTWOOD PROFESSIONAL SERVICES, FOR EROSION CONTROL AND RESTORATION SPECIFICATIONS, SEDIMENT AND EROSION CONTROL PROCEDURES, LOCATIONS OF BMPs, DETAILS, AND INSPECTION INFORMATION.
3. ALL PASTURES AND DRAINAGE SWALES DISTURBED DURING CONSTRUCTION ACTIVITIES AND NOT COVERED BY ROAD SURFACING MATERIALS, SHALL BE SEEDED IN ACCORDANCE WITH THE SWPP PLAN.
4. TEMPORARY EROSION CONTROL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE TEMPORARY EROSION CONTROL PLAN SHALL BE IN ACCORDANCE WITH THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND THE TRIPLE H WIND FARM STORMWATER POLLUTION PREVENTION PLAN ON FILE.

PROJECT CONTACT INFORMATION:

TITLE	COMPANY	NAME	CONTACT NUMBER
OWNER (PRIMARY)	ENGIE	CASEY WILLIS	805-569-6185
PROJECT MANAGER	WESTWOOD	DANI NYGREN	952-906-7493
ENGINEER OF RECORD	WESTWOOD	ROB COPOULS	952-906-7470
CONTRACTOR	WANZEK	JASON HELLERUD	701-893-3685

Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite #300
Fax (952) 937-5822 Minnetonka, MN 55343
TollFree (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: DPH
Drawn: BMK
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2028 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 12 OF 57

0014440DTP.dwg

©2019 Westwood Professional Services, Inc.

CEMENT STABILIZATION - PROCEDURE

THE SPECIFICATIONS BELOW ARE GENERAL RECOMMENDATIONS/GUIDELINES FOR CEMENT STABILIZATION OF SUBGRADES FOR THE PROJECT. ACTUAL FIELD CONDITIONS MAY ALTER APPLICATION RATE. CONSULT GEOTECHNICAL ENGINEER FOR FURTHER RECOMMENDATIONS.

1. STRIP THE TOP ±4 INCHES OF TOPSOIL (THROUGH THE ROOT ZONE) FROM THE AREA TO BE STABILIZED. ROOTS SMALLER THAN 1/4" DIAMETER ARE CONSIDERED INSIGNIFICANT.
2. PERFORM A PROCTOR (ASTM D 698) TEST TO DETERMINE THE OPTIMUM MOISTURE CONTENT IF THE MATERIAL TO BE STABILIZED DOES NOT MATCH A PREVIOUSLY PERFORMED PROCTOR.
3. DETERMINE THE IN-SITU MOISTURE CONTENT USING A NUCLEAR DENSITY GAUGE (OR EQUIVALENT MOISTURE CONTENT TEST) DAILY, PRIOR TO INCORPORATION OF THE CEMENT. PROVIDE ADDITIONAL MOISTURE CONTENT TESTING AS NEEDED BASED ON WEATHER CONDITIONS.
   - 3.1. THE CONTRACTOR WILL BE ADVISED OF IN-SITU MOISTURE CONTENT, AND MOISTURE ADJUSTMENTS SHOULD BE MADE IF IN-SITU MOISTURE IS LESS THAN OPTIMUM MOISTURE CONTENT AS DETERMINED BY THE PROCTOR (ASTM D 698).
4. SOIL AND CEMENT BLENDING:
   - 4.1. COMPLETELY BLEND SUBGRADE SOIL WITH THE APPROPRIATE AMOUNT OF CEMENT BY WEIGHT. FIELD RESULTS FROM TEST STRIPS WILL DICTATE THE CEMENT APPLICATION RATE.
   - 4.2. IN AREAS OF HIGH MOISTURE OR POOR SOILS, THE CONTRACTOR MAY INCREASE THE PERCENT OF CEMENT IN ORDER TO MEET THE MINIMUM SUBGRADE STRENGTH REQUIREMENTS.
   - 4.3. THE USE OF A RECLAIMER IS AN ADEQUATE BLENDING METHOD. DISCING IS NOT AN ADEQUATE BLENDING METHOD.
   - 4.4. A STABILIZATION DEPTH OF 12" WAS USED FOR DESIGN PURPOSES. STABILIZATION DEPTH MAY NEED TO INCREASE TO 16" IN AREAS OF EXTREME MOISTURE OR POOR SOILS IN ORDER TO MEET THE STRENGTH AND PROOF ROLL REQUIREMENTS.
5. COMPACTION:
   - 5.1. A ROLLING PATTERN WILL BE ESTABLISHED USING A NUCLEAR DENSITY GAUGE DURING COMPACTION.
     - 5.1.1. COMPACTION WILL BE PERFORMED UNTIL THE STABILIZED MATERIAL REACHES THE "BREAK POINT" AFTER WHICH ADDITIONAL PASSES WITH A ROLLER RESULTS IN A LOSS OF DENSITY AS MEASURED BY A NUCLEAR DENSITY GAUGE.
     - 5.1.2. COMPACTION IS TYPICALLY ACHIEVED BY MULTIPLE PASSES OF A PADFOOT ROLLER UNTIL THE ROLLER "WALKS" OUT OF THE RECLAIMED MATERIAL (SPACE IS VISIBLE BETWEEN THE DRUM AND THE RECLAIMED MATERIAL). THIS IS FOLLOWED BY BLADING AND SHAPING THE RECLAIMED MATERIAL TO FINAL PROFILE AND CROSS SECTION, REMOVING HIGH AND LOW POINTS. SMOOTH DRUM OR RUBBER TIRE ROLLERS ARE THEN USED TO FINISH ROLLING (THIS IS WHEN THE DENSITY TESTS ARE PERFORMED) UNTIL THE DENSITY OF THE MATERIAL REACHES THE "BREAK POINT."
     - 5.1.3. THE NUMBER OF PASSES AND EQUIPMENT USED TO REACH THE "BREAK POINT" IS CONSIDERED THE ROLLING PATTERN.
     - 5.1.4. A NEW ROLLING PATTERN MAY NEED TO BE ESTABLISHED IF THE PERFORMANCE REQUIREMENTS ARE NOT BEING MET. THIS MAY BE DUE TO CHANGES IN THE MOISTURE CONTENT, THE SOIL TYPE, OR THE CEMENT RATE.
   - 5.2. THE TARGET DENSITY IS 98% OF THE MAXIMUM DENSITY DETERMINED FROM THE ROLLING PATTERN.
     - 5.2.1. DENSITY TESTS SHALL BE TAKEN AT THE RATE OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER TO CONFIRM THE DENSITY IS MATCHING THE TARGET. ONCE THE ROLLING PATTERN HAS BEEN CONFIRMED IT IS RECOMMENDED THAT TESTING CONTINUE AT 1 TEST PER 1,000 LF IN EACH PASS OF THE RECLAIMER.
     - 5.2.2. IF IT IS NOT POSSIBLE TO ATTAIN THE TARGET DENSITY, AND ADDITIONAL COMPACTION DOES NOT IMPROVE THE DENSITY, A NEW ROLLING PATTERN SHOULD BE ESTABLISHED.
   - 5.3. THE AIR TEMPERATURE SHALL BE ABOVE 40 DEGREES (F) DURING THE CEMENT STABILIZATION PROCESS. MIXING CEMENT INTO FROZEN GROUND IS NOT ACCEPTABLE.
6. THE STABILIZED MATERIAL SHALL BE CONTINUOUSLY WET CURED FOR A MINIMUM OF 24 HOURS (WET CURED IS IDENTIFIED VISUALLY AS DAMP SURFACE).
7. PERFORM SUBGRADE TESTING IN ACCORDANCE WITH TESTING SCHEDULE.
8. AGGREGATE PLACEMENT:
   - 8.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 8.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 8.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

CEMENT STABILIZATION - DESIGN BASIS

1. DURING INITIAL CONSTRUCTION, CONTRACTOR SHALL CONSTRUCT MINIMUM 300 LF TEST STRIPS CONTAINING 4%, 5%, AND 6% CEMENT IN ACCORDANCE WITH CEMENT STABILIZATION PROCEDURES.
2. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 3 FOR ANTICIPATED RESULTS):
   - 2.1. PERFORM INITIAL SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M BETWEEN 4 TO 6 HOURS AFTER FINAL COMPACTION.
   - 2.2. PERFORM ADDITIONAL DCP TESTING AT 24 AND 48 HOURS AFTER FINAL COMPACTION.
   - 2.3. PERFORM SUBSEQUENT DCP TESTS AT 7 DAYS AFTER FINAL COMPACTION AS VERIFICATION OF STRENGTH CURVE.
   - 2.4. A MINIMUM OF 3 TESTS PER TEST SECTION PER TIMEFRAME IS REQUIRED. TESTS SHALL BE TAKEN AT THE CENTERLINE AND 2' FROM EACH SHOULDER.
   - 2.5. RECORD DCP TEST RESULTS EVERY 6 INCHES TO TOTAL DEPTH OF 12 INCHES.

TABLE 3: TEST STRIP CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	COMPRESSIVE STRENGTH (PSF)
4 – 6 HOURS	6	5	1,800
24 HOURS	10	7	2,500
48 HOURS	15	10	3,900
7 DAYS	30	21	5,200

CEMENT STABILIZATION - PRODUCTION

1. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 5 FOR SUMMARY OF TESTING REQUIREMENTS):
   - 1.1. PERFORM SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M NO SOONER THAN 24 HOURS AFTER FINAL COMPACTION.
   - 1.2. DCP TESTING FREQUENCY SHALL BE WITH A RANDOM SPACING AND A MINIMUM OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER. A MINIMUM OF 3 TESTS PER ROAD IS REQUIRED.
   - 1.3. THE CBR OF THE STABILIZED SUBGRADE SHOULD BE CALCULATED IN 6" INCREMENTS THROUGH THE ENTIRE DEPTH OF THE STABILIZED LAYER.
   - 1.4. THE MINIMUM REQUIRED CBR PRIOR TO PROOF-ROLLING IS PROVIDED IN TABLE 4 BELOW.

TABLE 4: FINAL CEMENT STABILIZED CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	UNDRAINED SHEAR STRENGTH (PSF)	BEARING CAPACITY (PSF)
24 – 48 HOURS	15	10	3,500	9,800
3 – 7 DAYS	30	21	7,000	18,000
28 DAYS	50	33	12,000	28,500

NOTE: UNDRAINED SHEAR STRENGTH WAS CALCULATED USING THE BLACK (1961) EQUATION. BEARING CAPACITY WAS CALCULATED USING THE VESIC EQUATION MODIFIED FOR TWO LAYERS (12" CEMENT STABILIZED SUBGRADE OVER A NATURAL SUBGRADE WITH A CBR OF 1.5)

   - 1.5. ONCE THE MINIMUM REQUIRED CBR IS ACHIEVED AT ANY CORRESPONDING TIME PERIOD, THE SUBGRADE IS CONSIDERED ADEQUATE AND THE CONTRACTOR MAY PROCEED WITH PROOF-ROLL TESTING. FUTURE DCP TESTING ON THAT SEGMENT OF SUBGRADE IS NOT REQUIRED.
   - 1.6. IF TESTING DOES NOT INDICATE A CBR OF 30 WITHIN 7 DAYS, ADDITIONAL GRAVEL SURFACING AND/OR THE ADDITION OF GEOTEXTILE FABRIC MAY BE REQUIRED. FOR FUTURE SUBGRADE STABILIZATION AREAS, CONTACT THE ENGINEER AND OWNER VIA RFI FOR RECOMMENDATIONS AND APPROVAL.
2. SUBGRADE PROOF-ROLL TESTING AND ACCEPTANCE:
   - 2.1. ONCE THE REQUIRED DCP VALUE HAS BEEN OBTAINED BUT PRIOR TO PLACING AGGREGATE, THE SUBGRADE SHALL BE PROOF-ROLLED. REFER TO THE PROJECT TESTING REQUIREMENTS FOR PROOF-ROLL DEFINITION.
   - 2.2. PROOF-ROLLING SHOULD BE PERFORMED WITH ONE PASS DOWN THE CENTER AND NOT BE PERFORMED WITHIN 12 INCHES OF THE EDGE OF THE STABILIZED SECTION.
   - 2.3. IF PROOF-ROLLING FAILS, RE-STABILIZATION MAY BE REQUIRED AND A NEW ROLLING PATTERN OR ADDITIONAL CEMENT MAY BE REQUIRED.
3. AGGREGATE PLACEMENT:
   - 3.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 3.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 3.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

TABLE 5: CEMENT STABILIZATION PRODUCTION TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
COMPACTED SUBGRADE (CEMENT STABILIZED)	PROCTOR	MINIMUM 1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER 1000 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
NOTE: SEE ABOVE FOR INITIAL TESTING REQUIREMENTS	DCP TEST	1 PER 500 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
	PROOF-ROLL (AFTER PASSING DCP TESTS)	ENTIRE LENGTH

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (866) 937-5150 www.westwoodps.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: BEN
Drawn: BMK
As-Built Drawing:

Revisions #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2888 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 13 OF 57

001444001P.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. County Road 649 in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 900' South of County Road 649 & 205th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.24'29.60" W Long. -99.36'12.11" W
4. Width of entrance: 16' access road & 25' temporary intersection modification
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001152 NE4 21-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Tanya R Lane
Signature of Applicant

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. County Road 649 in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 900' South of County Road 649 & 205th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.24'29.60" W Long. -99.36'12.11" W
4. Width of entrance: 16' access road & 25' temporary intersection modification
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001152 NE4 21-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: _____

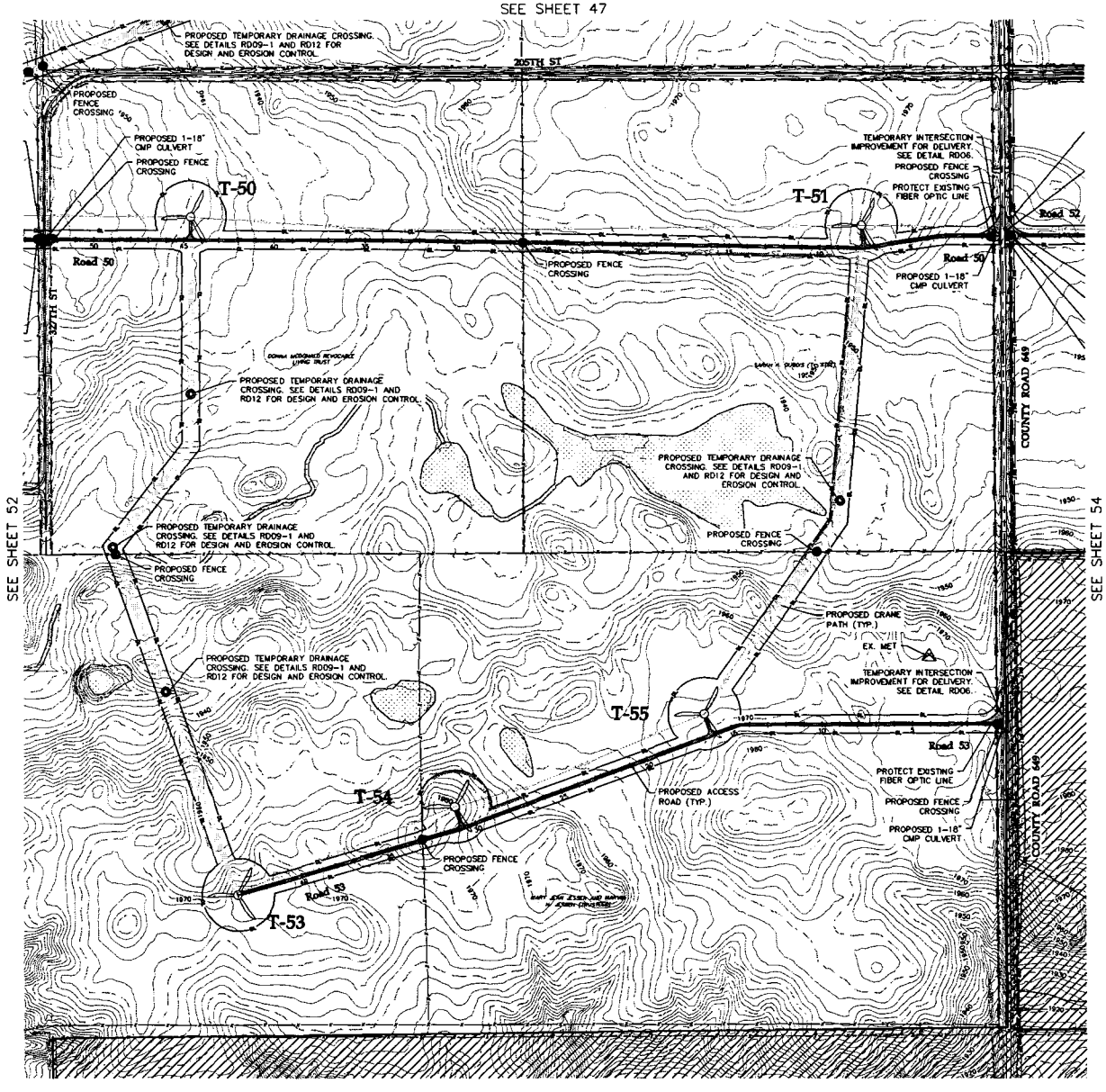
Signature of Applicant

Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

© 2019 Westwood Professional Services, Inc.



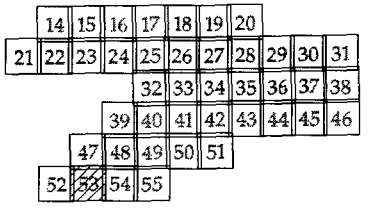
LEGEND:

- PROPOSED TURBINE LOCATION
- T-XX PROPOSED TURBINE NUMBER
- PROPOSED ALTERNATE TURBINE LOCATION
- ALT-XX PROPOSED ALTERNATE TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED ALTERNATE ACCESS ROAD
- PROPOSED CRANE PATH
- PROPOSED UNDERGROUND COLLECTION*
- PROPOSED DISTURBANCE LIMITS
- PROPOSED PERIMETER SEDIMENT CONTROL
- EXISTING 10' CONTOURS
- EXISTING 2' CONTOURS
- EXISTING GRAVEL EDGE
- EXISTING BITUMINUS EDGE
- EXISTING RIGHT-OF-WAY
- EXISTING PARCEL LINE
- EXISTING BUILDING
- EXISTING FENCE
- EXISTING OVERHEAD POWER
- EXISTING HIGH VOLTAGE OVERHEAD POWER
- EXISTING UNDERGROUND POWER LINE
- EXISTING FIBER OPTIC LINE
- EXISTING WATER LINE
- DELINEATED WETLAND
- ARCHAEOLOGICAL AVOIDANCE AREA
- EXISTING USFWS EASEMENT
- PROJECT BOUNDARY
- 1900 EXISTING GROUND ELEVATION
- PROPOSED DRAINAGE CROSSING**
- PROPOSED TEMPORARY DRAINAGE CROSSING**
- PROPOSED FENCE CROSSING***
- PROPOSED UTILITY CROSSING
- PROPOSED CULVERT

* PROVIDED BY OTHERS AND SHOWN FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSTRUCTION PLANS FOR DETAILS.

** SEE SHEET 11 FOR DRAINAGE CROSSING TYPE AND SIZING. DRAINAGE CROSSINGS SHALL CONSIST OF LOW WATER CROSSING OR CULVERT. DRAINAGE CROSSINGS ALONG CRANE PATH SHALL CONSIST OF CRANE MATS OR TEMPORARY CULVERT.

*** ALL GATE INSTALLATIONS SHALL BE FIELD DETERMINED AND AGREED UPON BY THE CONTRACTOR AND OWNER.



KEY MAP

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-free (888) 937-5150 www.thinkwestwood.com

Westwood Professional Services, Inc.

Designed: mtk
Checked: DJH
Drawn: mtk
As-Built Drawing:

Revisions		
#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	05/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2035 2nd Avenue NW
West Fargo, ND 58078

0' 300' 600' 900'

Triple H Wind Farm

Hyde County, South Dakota

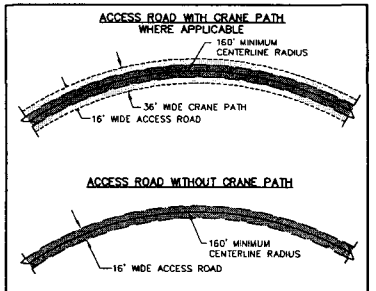
Site Plan T-50 - T-51, T-53 - T-55

90% COMPLETE NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 53 OF 57

0014440SP01.dwg

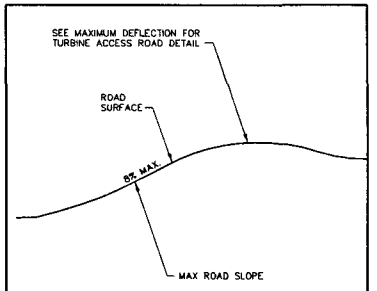
©2019 Westwood Professional Services, Inc.



NOTE:

1. SOME RADII MAY REQUIRE ADDITIONAL SOIL COMPACTION OR GRAVEL OUTSIDE OF THE WIDTH SHOWN ABOVE TO ACCOMMODATE TRACTORS OR TRAILERS TRACKING OFF THE ACCESS ROAD.

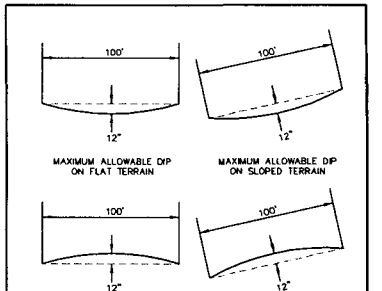
Westwood	MINIMUM RADIUS FOR TURBINE ACCESS ROAD	LAST REVISED: 04/29/11 RD02



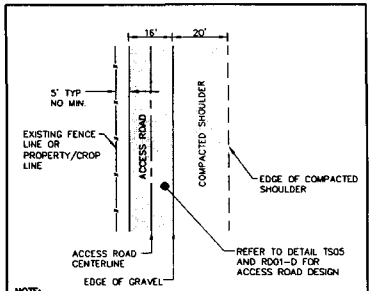
NOTES:

1. ROAD SLOPE SHALL NOT EXCEED 8% WITHOUT OWNER APPROVAL

Westwood	MAXIMUM VERT. SLOPE FOR TURBINE ACCESS ROAD/CRANE TRAVEL PATH	LAST REVISED: 3/28/12 RD03



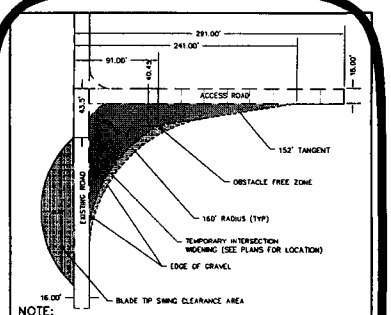
Westwood	MAXIMUM DEFLECTION FOR TURBINE ACCESS ROAD	LAST REVISED: 01/22/08 RD04



NOTE:

1. COMPACTED SHOULDER SHALL BE RETURNED TO NATIVE CONDITION FOLLOWING TURBINE GENERATOR CONSTRUCTION.
2. THE ACCESS ROAD MAY NEED TO BE CONSTRUCTED FARTHER FROM THE PROPERTY LINE IF OBSTRUCTIONS SUCH AS TREES FOLLOW THE PROPERTY LINE.

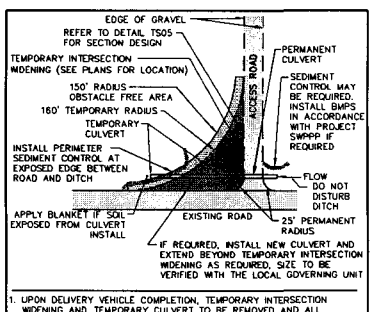
Westwood	TURBINE ACCESS ROAD ALONG FENCE/PROPERTY/CROP LINE	LAST REVISED: 3/28/12 RD05



NOTE:

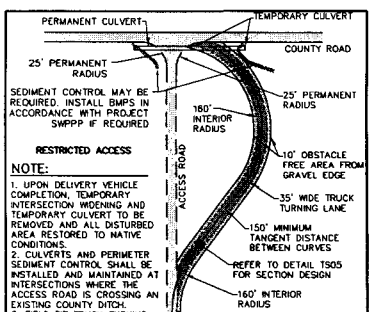
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING TO BE REMOVED AND ALL DISTURBED AREA RESTORED.
2. DIMENSIONS ASSUME A 90° INTERSECTION

Westwood	INTERSECTION WIDENING DIMENSIONS	LAST REVISED: 7/25/19 RD06



1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.

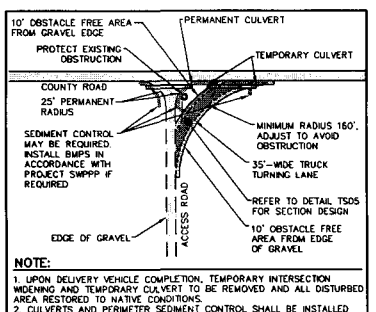
Westwood	TURBINE ACCESS ROAD TYPICAL INTERSECTION WIDENING	LAST REVISED: 3/2/07 RD07



NOTE:

1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

Westwood	TRUCK TRAFFIC TURNING LANE A	LAST REVISED: 3/2/07 RD08-A



NOTE:

1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

Westwood	TRUCK TRAFFIC TURNING LANE B	LAST REVISED: 12/3/11 RD08-B

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-free (800) 937-5150 info@westwoodps.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: DJM
Drawn: BMK
As-Built Drawing:

Revisions #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

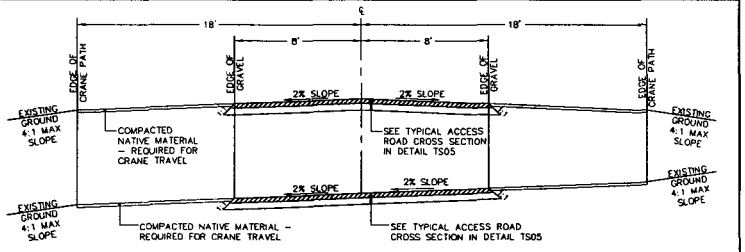
Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 5 OF 57

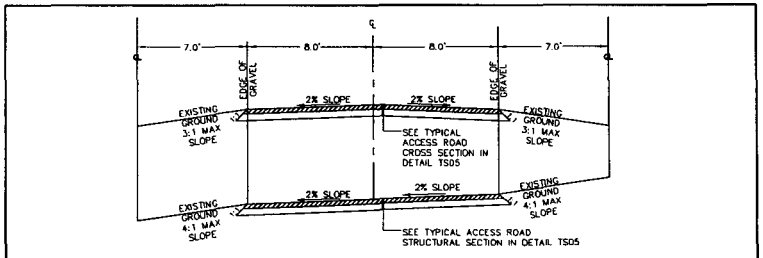
0014440DTP.dwg

© 2019 Westwood Professional Services, Inc.



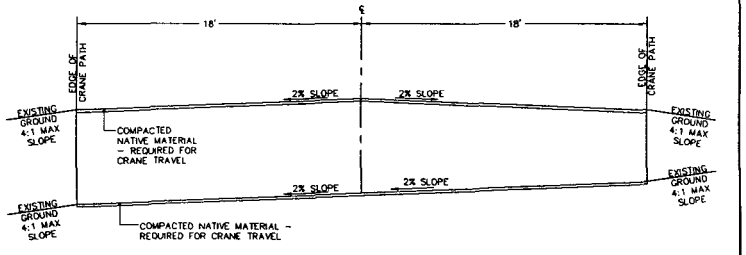
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%.
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE ACCESS ROAD DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

Westwood | TYPICAL TURBINE ACCESS ROAD AND CRANE PATH | LAST REVISED: 01/28/21 | RD01-A



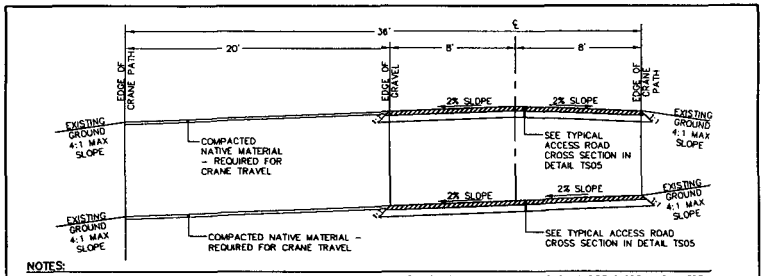
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

Westwood | TYPICAL TURBINE ACCESS ROAD SECTION | LAST REVISED: 1/28/21 | RD01-B



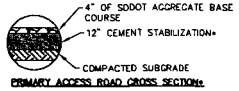
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE WHERE CRANE PATHS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT CRANE PATH REMAINS WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%.

Westwood | TYPICAL CRANE PATH | LAST REVISED: 01/28/21 | RD01-C

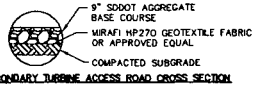


NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%.
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE EDGE OF COMPACTED SHOULDER DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

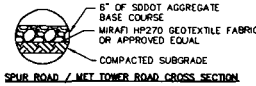
Westwood | TYPICAL TURBINE ACCESS ROAD AND OFFSET CRANE PATH | LAST REVISED: 01/28/21 | RD01-D



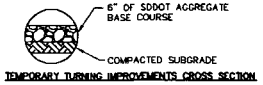
PRIMARY ACCESS ROAD CROSS SECTION*



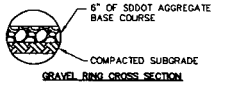
SECONDARY TURBINE ACCESS ROAD CROSS SECTION



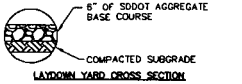
SPUR ROAD / MET TOWER ROAD CROSS SECTION



TEMPORARY TURNING IMPROVEMENTS CROSS SECTION



GRAVEL RING CROSS SECTION



LAYDOWN YARD CROSS SECTION

* CEMENT APPLICATION RATE MAY VARY BASED ON TEST STRIPS AND FIELD PERFORMANCE. SEE SHEET 13 FOR CEMENT STABILIZATION PROCEDURE AND DESIGN BASIS.

NOTES:
STRUCTURAL SECTIONS SHOWN ARE THE MINIMUM THICKNESS REQUIREMENTS DURING NORMAL FIELD CONDITIONS. THE SECTIONS MAY NEED TO BE INCREASED BASED ON ACTUAL FIELD CONDITIONS AT THE TIME OF CONSTRUCTION. CONDITIONS INCLUDE BUT ARE NOT LIMITED TO CONSTRUCTION DURING THE FREEZE/THAW CYCLE, UNUSUALLY WET PERIODS, OR IN LOW/WET AREAS. SEE SHEET 12 FOR TESTING REQUIREMENTS AND SPECIFICATIONS.

Westwood | TYPICAL STRUCTURAL CROSS SECTIONS

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwood@pw.com
Westwood Professional Services, Inc.

Designed: SMC
Checked: TDH
Drawn: SMC
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2888 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 4 OF 57

001444DTP.dwg

©2019 Westwood Professional Services, Inc.

ROAD DESIGN PARAMETERS

1. ACCESS ROADS HAVE BEEN DESIGNED TO ACCOMMODATE LIGHT DUTY TRUCKS (PICKUP TRUCKS AND MAINTENANCE VEHICLES) FOR LOW VOLUME USE IN NORMAL OPERATING CONDITIONS AS WELL AS HEAVY DUTY CONSTRUCTION TRAFFIC UNDER DRY CONDITIONS. THE ROAD DESIGN SPECIFIED IS NOT INTENDED FOR ALL WEATHER USE FOR HEAVY DUTY CONSTRUCTION LOADS.
2. ROAD MAINTENANCE CAN BE EXPECTED OVER THE LIFE OF THE PERMANENT FACILITY.

PRODUCTS

1. AGGREGATE BASE SHALL CONSIST OF SDDOT AGGREGATE BASE COURSE (AND IN CONFORMANCE WITH THE GRADATION TABLE 1). AGGREGATE MAY BE CRUSHER RUN UPON ENGINEERS APPROVAL. AGGREGATE GRADATIONS SHALL BE SUBMITTED TO ENGINEER FOR REVIEW.
2. ROAD SHOULDERS AND CRANE PADS SHALL CONSIST OF COMPACTED NATIVE SOILS.
3. CULVERTS: ACCESS ROAD CULVERTS SHALL MEET THE MINIMUM SPECIFICATIONS SET FORTH BY THE SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION AND/OR HYDE COUNTY. ALL CULVERTS ARE PLANNED TO BE A MINIMUM 18" DIAMETER AND MANUFACTURED OF 16-GAGE CORRUGATED METAL PIPE WITH NO END TREATMENTS UNLESS NOTED OTHERWISE. ACTUAL SIZE WILL BE DETERMINED THROUGH HYDRAULIC ANALYSIS.
4. GEOTEXTILE FABRIC: MIRAFI HP270 OR APPROVED EQUAL.

EXECUTION

1. CLEARING AND GRUBBING
   A. THE CONTRACTOR SHALL BE REQUIRED TO GRUB ALL TREES, STUMPS, BRUSH, AND DEBRIS WITHIN THE GRADING AREAS SHOWN ON THE PLANS. GRUBBING INCLUDES REMOVAL OF ALL PLANT MATERIAL GREATER THAN 2" INCLUDING STUMPS, BRANCHES, ROOTS, ETC. TO A DEPTH BELOW THE FINAL SUBGRADE. THE CONTRACTOR IS TO REMOVE ONLY THOSE TREES WHICH ARE DESIGNATED BY THE OWNER'S REPRESENTATIVE FOR REMOVAL AND SHALL EXERCISE EXTREME CARE AROUND EXISTING TREES TO BE SAVED.
2. TOPSOIL STRIPPING
   A. TOPSOIL, INCLUDING ROOTS LARGER THAN 2" AND LARGE ROOT MASSES, SHALL BE STRIPPED FROM ALL ROADWAY AND FOUNDATION AREAS UP TO 10". TOPSOIL SHALL NOT BE STRIPPED OUTSIDE OF THE DESIGNATED DISTURBANCE AREAS.
   B. ANY TOPSOIL THAT HAS BEEN STRIPPED SHALL BE STOCKPILED FOR POST CONSTRUCTION REVEGETATION. ALL TOPSOIL SHALL BE REDISTRIBUTED TO THE LAND OWNER'S PROPERTY OF WHERE IT ORIGINATED FROM.
3. FILL PLACEMENT
   A. FILL PLACEMENT SHALL CONSIST OF THE PLACING OF SUITABLE FILL MATERIAL, AFTER TOPSOIL STRIPPING, ABOVE THE EXISTING GRADE. GENERALLY, SIDE SLOPES SHALL BE CONSTRUCTED AT FOUR FOOT HORIZONTAL TO ONE FOOT VERTICAL, WITH SOME LOCATIONS THROUGHOUT THE PROJECT WITH SLOPES OF TWO FEET HORIZONTAL TO ONE FOOT VERTICAL. THE MATERIAL FOR FILL CONSTRUCTION SHALL BE OBTAINED FROM THE ACCESS ROAD/TURBINE EXCAVATION (SEE GEOTECHNICAL REPORT FOR RESTRICTIONS), OR ANY SUITABLE, APPROVED SOIL OBTAINED ONSITE/OFFSITE BY CONTRACTOR, AS DIRECTED OR APPROVED BY THE ENGINEER. THIS MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 12" AND CONSTRUCTED TO 95% OF THE MAXIMUM DRY DENSITY AND WITHIN 2% OF OPTIMUM MOISTURE CONTENT, AS DETERMINED BY THE STANDARD PROCTOR (AASHTO T99).
   B. SIDE SLOPES GREATER THAN 4:1 WILL NOT BE PERMITTED, UNLESS OTHERWISE NOTED ON THE PLAN.
   C. FILL SLOPES SHALL BE BENCHED INTO THE EXISTING SLOPE TO PREVENT MOVEMENT BETWEEN THE FILL AND NATIVE SOILS. BENCHES SHOULD BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO FILL PLACEMENT. POSITIVE DRAINAGE IS REQUIRED AT BENCHED AREAS AND AT THE TOE OF FILL SLOPES TO REMOVE SURFACE WATER.
4. SUBGRADE
   A. SUBGRADE PREPARED AT GRADE OR IN CUT REQUIRES SCARIFICATION AND RECOMPACTION TO A DEPTH OF 12" OR MORE.
   B. ACCESS ROAD CROSS SLOPES SHOWN IN THE PLANS ARE MEANT AS A GUIDE. ACCESS ROAD CROSS SLOPES MAY RANGE FROM 1% – 2%. CHECK WITH THE ENGINEER IF THE CROSS SLOPE FALLS OUTSIDE OF THIS RANGE. ACCESS ROADS BEING UTILIZED FOR CRANE TRAVEL SHOULD HAVE A MAX CROSS SLOPE OF 2%.

STORM WATER DESIGN PARAMETERS

1. SEE SHEET 6 FOR CULVERT SIZING AND DESIGN PARAMETERS. SEE HYDROLOGY MEMO FOR FURTHER DESIGN CALCULATIONS. CULVERTS SHALL BE MINIMUM 18" CORRUGATED METAL PIPE. ALL TEMPORARY PORTIONS OF THE INSTALLED CULVERTS SHALL BE REMOVED UPON COMPLETION OF THE PROJECT.
2. IT IS EXPECTED THAT CULVERTS WILL BE OVERTOPPED DURING SOME STORMS AND MAINTENANCE WILL BE REQUIRED THROUGH THE LIFE OF THE PROJECT.
3. WHEN INSTALLING DRAINAGE CULVERTS THE CONTRACTOR SHALL USE JUDGMENT IN SETTING THE FLOW LINE ELEVATIONS AND CULVERT LONGITUDINAL SLOPE. TYPICALLY THE FLOW LINE ELEVATIONS AND LONGITUDINAL SLOPE OF THE CULVERT SHOULD MATCH THE NATURAL GROUND ELEVATIONS AND SLOPE TO ENSURE POSITIVE DRAINAGE. WHEN POSSIBLE, ALL CULVERTS SHOULD BE PLACED AT A MINIMUM 0.5% GRADE.
4. ANTICIPATED CULVERT CROSSINGS ARE SHOWN ON THE CONSTRUCTION PLAN. ADDITIONAL CULVERTS MAY NEED TO BE INSTALLED IN AREAS WHERE CONCENTRATED FLOW IS EXPECTED DUE TO CONSTRUCTION ACTIVITIES.
5. CONSTRUCTION DRAINAGE CROSSINGS TO MAINTAIN EXISTING FLOW CHARACTERISTICS OF THE FEATURES. FEATURES SHALL BE GRADED TO PRECONSTRUCTION CONTOURS.

TESTING

1. TESTING SHALL BE PERFORMED BY A DESIGNATED INDEPENDENT TESTING AGENCY.
2. SUBMIT ONE SET OF TESTING AND INSPECTION RECORDS SPECIFIED TO THE CIVIL ENGINEER OF RECORD.

DEFINITIONS:

1. PROOF ROLLING:
   SHALL BE PERFORMED IN THE PRESENCE OF THE GEOTECHNICAL ENGINEER OR QUALIFIED GEOTECHNICAL REPRESENTATIVE USING A FULLY LOADED TANDEM AXLE DUMP TRUCK OR WATER TRUCK WITH A MINIMUM GROSS WEIGHT OF 23 TONS OR A FULLY LOADED BELLY DUMP WITH AN EQUIVALENT AXLE LOADING. PROOF-ROLLING ACCEPTANCE STANDARDS INCLUDE NO RUTTING GREATER THAN 1.5 INCHES, AND NO "PUMPING" OF THE SOIL BEHIND THE LOADED TRUCK.
2. SIEVE ANALYSIS:
   SHALL BE CONDUCTED IN ACCORDANCE WITH AASHTO T27
3. PROCTORS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T99
4. ATTERBERG LIMITS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T89 AND T90
5. MOISTURE DENSITY (NUCLEAR DENSITY):
   SHALL BE DONE IN ACCORDANCE WITH AASHTO T310
6. DYNAMIC CONE PENETROMETER (DCP) TESTING:
   SHALL BE DONE IN ACCORDANCE WITH ASTM D6951-03

REQUIREMENTS:

1. FILL PLACEMENT:
   A. SOILS USED AS FILL MATERIAL SHALL BE TESTED FOR MOISTURE CONTENT AND PROCTOR TESTS.
   B. WHERE FILL CONSTRUCTION REQUIRES MORE THAN 12 INCHES OF FILL PLACEMENT, COMPACT EACH LIFT TO A MINIMUM OF 95 PERCENT OF THE MATERIAL'S MAXIMUM STANDARD PROCTOR DRY DENSITY.
2. COMPACTED SUBGRADE (CEMENT STABILIZED):
   A. SEE SHEET 13 FOR TESTING REQUIREMENTS AND PROCEDURE.
3. COMPACTED SUBGRADE (NON-CEMENT STABILIZED):
   A. THE ENTIRE SUBGRADE SHALL BE PROOF-ROLLED PRIOR TO THE PLACEMENT OF THE AGGREGATE BASE TO IDENTIFY AREAS OF UNSTABLE SUBGRADE.
   B. PERFORM A MINIMUM OF 3 DYNAMIC CONE PENETROMETER (DCP) TESTS PER ACCESS ROAD OR ONE FOR EVERY 1,000 LF OF ROAD, WHICHEVER IS GREATER. SUBGRADE MUST MEET A MINIMUM DCP OF 3 BLOWS PER 6" TO A TOTAL DEPTH OF 2' (MINIMUM CBR=1.5).
   C. IF A PASSING PROOF-ROLL OR DCP REQUIREMENTS CANNOT BE ACHIEVED THE FOLLOWING ALTERNATIVES MAY BE IMPLEMENTED:
      a. SCARIFY, DRY, AND RECOMPACT SUBGRADE
      b. REMOVE UNSUITABLE MATERIAL AND REPLACE WITH SUITABLE MATERIAL
      c. INCREASE AGGREGATE BASE THICKNESS
4. AGGREGATE BASE:
   A. AGGREGATE BASE SHALL BE PROOF-ROLLED OVER THE ENTIRE LENGTH. IF PROOF ROLLING DETERMINES THAT THE ROAD IS UNSTABLE, ADDITIONAL AGGREGATE SHALL BE ADDED UNTIL THE UNSTABLE SECTION IS ABLE TO PASS A PROOF ROLL.
   B. PROVIDE 1 SIEVE ANALYSIS (PROJECT MAX OF 20) PER 2500 CY OF ROAD BASE PLACED.
5. CRANE PAD AND CRANE PATHS / CRANE TRAVEL SHOULDERS:
   A. TESTING REQUIREMENTS ARE PENDING BASED ON CRANE PICK PLANS PROVIDED BY THE CONTRACTOR.

GENERAL NOTES:

1. GROUND SURFACE CONTOURS (AT TWO-FOOT VERTICAL INTERVALS) AND ELEVATIONS ARE BASED ON A PHOTOGRAMMETRY SURFACE PROVIDED BY GEOTERRA. IF MAJOR DISCREPANCIES ARE FOUND IN THE GROUND ELEVATIONS DURING FIELD STAKING TO THE GROUND ELEVATIONS SHOWN ON THE PLANS, THE OWNER AND ENGINEER SHALL BE NOTIFIED.
2. WHERE SECTION OR SUBSECTION MONUMENTS ARE ENCOUNTERED, THE OWNER SHALL BE NOTIFIED BEFORE SUCH MONUMENTS ARE REMOVED. THE CONTRACTOR SHALL PROTECT AND CAREFULLY PRESERVE ALL PROPERTY MARKERS AND MONUMENTS UNTIL THE OWNER, AN AUTHORIZED SURVEYOR OR AGENT HAS WITNESSED OR OTHERWISE REFERENCED THEIR LOCATION.
3. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. TYPICAL DISTURBANCE SHALL BE LIMITED TO 10 LF FROM THE EDGE OF PROPOSED GRADING.
4. FINALIZE GRADING AROUND THE BASE OF TURBINES IN ACCORDANCE WITH DETAIL TS-03 AND TS-04.
5. GRADE ALL PROPOSED ROADS TO A MAXIMUM SLOPE OF 8%. IF 8% SLOPE CANNOT BE ACHIEVED, THE CONTRACTOR MAY UTILIZE ASSIST VEHICLES FOR THE PURPOSE OF DELIVERIES. GRADE ALL PROPOSED CRANE PATHS TO A MAXIMUM OF 8% UNLESS OTHERWISE NOTED IN PLAN SHEETS.
6. ANY FACILITIES REMOVED TO ALLOW FOR CONSTRUCTION (MAILBOXES, SIGNS, FENCES, ETC.) SHALL BE REPLACED BY THE CONTRACTOR IN A CONDITION AS GOOD AS EXISTING.
7. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING DRAINAGE THROUGHOUT THE CONSTRUCTION OF THIS PROJECT. CONSTRUCTION ACTIVITIES SHALL NOT BLOCK THE NATURAL OR MANMADE CREEKS OR DRAINAGE SWALES CAUSING RAINWATER TO POND. DEPENDING ON FIELD CONDITIONS, ADDITIONAL CULVERTS IN EXCESS OF THOSE ON THE PLANS MAY BE REQUIRED.
8. WHILE BUILDING THE ROADS AND EXCAVATING THE TURBINE FOUNDATIONS, EXCESS SOIL WILL RESULT. THE CONTRACTOR SHALL DISPOSE OF THIS EXCESS SOIL IN AN APPROVED MANNER. EXCESS TOPSOIL SHALL BE DISTRIBUTED INTO A THIN LAYER ON LAND IMMEDIATELY ADJACENT TO WHERE THE TOPSOIL ORIGINATED. ALL EXCESS TOPSOIL TO BE WASTED ONSITE, WHILE DOING SO THE CONTRACTOR SHALL AVOID CAUSING RIDGES OR MOUNDS THAT WOULD MAKE IT DIFFICULT FOR STORM WATER RUNOFF TO DRAIN. THE FINAL SURFACE OF THE DISTURBED TOPSOIL SHALL BE SMOOTH AND FOLLOW THE NATURAL CONTOUR OF THE LAND.
9. THE CONTRACTOR SHALL NOTIFY SOUTH DAKOTA 811 AT LEAST 48 HOURS BEFORE EXCAVATION ACTIVITIES COMMENCE.
10. TEMPORARY INTERSECTION WIDENING SHALL, UPON COMPLETION OF ALL PROJECT CONSTRUCTION OR UPON NOTIFICATION OF THE ENGINEER, BE REMOVED AND THE AREA RESTORED TO ITS ORIGINAL LINES AND GRADES WITH TOPSOIL REPLACED, EXCEPT WHERE REQUESTED BY THE TOWNSHIP OR COUNTY TO PERMANENTLY REMAIN. DISTURBED AREAS OUTSIDE OF THE FINAL ROADWAY SHALL BE SEEDED AND MULCHED.
11. TURBINE SETBACKS ARE NOT IDENTIFIED ON THE CONSTRUCTION PLANS. IT SHALL BE THE RESPONSIBILITY OF THE OWNER AND CONTRACTOR TO ENSURE THAT ALL TURBINE SETBACKS MEET PROJECT REQUIREMENTS.
12. GEOTECHNICAL REPORTS WITH RECOMMENDATIONS HAVE BEEN PROVIDED BY THE OWNER. ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL ENGINEERING REPORT AND RECOMMENDATIONS.
13. FIELD SURVEY WETLAND INFORMATION HAS BEEN PROVIDED BY THE OWNER. ALL WETLAND DELINEATIONS AND PERMITTING SHALL BE THE RESPONSIBILITY OF OTHERS AND BE COMPLETED PRIOR TO CONSTRUCTION COMMENCING. THE OWNER AND GENERAL CONTRACTOR SHALL VERIFY THAT ALL WETLAND PERMITS HAVE BEEN SUBMITTED AND APPROVED PRIOR TO CONSTRUCTION COMMENCING.
14. CULTURAL RESOURCE REPORTS HAVE NOT BEEN PROVIDED. CULTURAL RESOURCE LOCATIONS ARE NOT SHOWN ON THE PLANS. INFORMATION WILL BE THE RESPONSIBILITY OF THE OWNER AND GENERAL CONTRACTOR. THE LOCATIONS OF CULTURAL RESOURCE SITES MAY BE CONFIDENTIAL AND PROTECTED BY STATE OR FEDERAL LAW. PUBLIC RELEASE OF SPECIFIC INFORMATION REGARDING THESE RESOURCES MAY BE RESTRICTED.
15. AN ENVIRONMENTAL ASSESSMENT HAS NOT BEEN PROVIDED. THE CONTRACTOR SHALL BE FAMILIAR WITH THE REPORT AND REVIEW ALL RECOMMENDATIONS.
16. ELECTRICAL INFORMATION SHOWN ON THE PLANS IS FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSULTANT'S PLANS FOR SPECIFIC LOCATIONS AND CONSTRUCTION DETAILS FOR THE UNDERGROUND POWER COLLECTION SYSTEM AND SUBSTATION.
17. CRANE PATHS ARE SHOWN ON THE CONSTRUCTION PLANS. IF THE CONTRACTOR PROPOSES ALTERNATE CRANE PATHS, THEY SHALL ENSURE THAT WETLAND AND CULTURAL RESOURCE CORRIDORS ARE NOT DISTURBED. FINAL CRANE PATH ALIGNMENTS SHALL BE DETERMINED BY THE CONTRACTOR BASED ON FIELD CONDITIONS WITHIN THE WETLAND AND CULTURAL RESOURCE CORRIDORS, SPECIAL LANDOWNER AGREEMENTS AND THE PROJECT BOUNDARY.
18. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. DISTURBANCE SHALL BE LIMITED TO 50 LF WIDTH FOR PROPOSED ACCESS ROADS AND 50 LF FOR CRANE PATHS, AND SHALL BE LIMITED TO A 250 LF RADIUS FOR PROPOSED WIND TURBINE GENERATORS. THE GRADING LIMITS SHALL BE CENTERED ON THE ROADWAYS AND WIND TURBINES. THE CONTRACTOR SHALL MAKE ALL EFFORTS TO KEEP ACTIVITIES WITHIN THE ERECTION AREAS SHOWN ON THE PLANS BUT IT IS UNDERSTOOD THAT SOME ACTIVITIES THAT WILL NOT REQUIRE GRADING OR SOIL DISTURBANCE MAY EXTEND BEYOND THE DEFINED LIMITS. DURING ERECTION OF THE ROTOR, TRUCKS AND/OR FORKLIFTS MAY EXTEND BEYOND THESE LIMITS. SEE DETAIL TS01 FOR TYPICAL ERECTION AREAS.
19. AN ALTA SURVEY HAS BEEN PROVIDED BY WESTWOOD. CONTRACTOR AND OWNER ARE RESPONSIBLE FOR LOCATING ALL UTILITIES AND VERIFYING LOCATION OF CONSTRUCTION ACTIVITIES PRIOR TO COMMENCING WORK.

STORMWATER POLLUTION PREVENTION PLAN (SWPPP):

1. THE CONTRACTOR SHALL PROVIDE EROSION CONTROL MEASURES AS PLANNED AND SPECIFIED FOLLOWING BEST MANAGEMENT PRACTICES AS OUTLINED BY THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND BEING IN CONFORMANCE WITH THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL STORMWATER PERMIT.
2. REFER TO THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR THE TRIPLE H WIND FARM, PREPARED BY WESTWOOD PROFESSIONAL SERVICES, FOR EROSION CONTROL AND RESTORATION SPECIFICATIONS, SEDIMENT AND EROSION CONTROL PROCEDURES, LOCATIONS OF BMPs, DETAILS, AND INSPECTION INFORMATION.
3. ALL PASTURES AND DRAINAGE SWALES DISTURBED DURING CONSTRUCTION ACTIVITIES AND NOT COVERED BY ROAD SURFACING MATERIALS, SHALL BE SEEDED IN ACCORDANCE WITH THE SWPP PLAN.
4. TEMPORARY EROSION CONTROL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE TEMPORARY EROSION CONTROL PLAN SHALL BE IN ACCORDANCE WITH THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND THE TRIPLE H WIND FARM STORMWATER POLLUTION PREVENTION PLAN ON FILE.

TABLE 1: SDDOT AGGREGATE BASE COURSE – LOCALLY SOURCED

SIEVE SIZE	PERCENT PASSING
1"	100
3/4"	80–100
1/2"	68–91
NO. 4	46–70
NO. 8	34–58
NO. 40	13–35
NO. 200	3–12

MEET FOLLOWING REQUIREMENTS PER 882.2

LIQUID LIMIT (MAX) = 25
PLASTICITY INDEX = 0–6
L.A ABRASION (% MAX) = 40%

GRADATION HAS BEEN OBTAINED FROM THE 2015 SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION BOOK.

TABLE 2: TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
FILL PLACEMENT	PROCTOR	1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER LIFT PER 5000 SF OF FILL PLACED OR 1 PER 500 LF OF ROAD OR CRANE WALK
COMPACTED SUBGRADE (CEMENT STABILIZED):	SEE SHEET 13	SEE SHEET 13
COMPACTED SUBGRADE (NON-CEMENT STABILIZED):	PROOF-ROLL	ENTIRE AREA
	DCP	1 PER 1,000 FT OR MIN. 3 PER ROAD
AGGREGATE BASE	PROOF-ROLL	ENTIRE AREA
	SIEVE ANALYSIS, LL, PL, AND L.A ABRASION	1 PER 2,500 CY

PROJECT CONTACT INFORMATION:

TITLE	COMPANY	NAME	CONTACT NUMBER
OWNER (PRIMARY)	ENGIE	CASEY WILLIS	805-569-6185
PROJECT MANAGER	WESTWOOD	DANI NYGREN	952-906-7493
ENGINEER OF RECORD	WESTWOOD	ROB COPOULS	952-906-7470
CONTRACTOR	WANZEK	JASON HELLERUD	701-893-3685

Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: DJH
Drawn: BMK
As-Built Drawing:

Revisions #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 12 OF 57

001444001P.dwg

© 2019 Westwood Professional Services, Inc.

CEMENT STABILIZATION - PROCEDURE

THE SPECIFICATIONS BELOW ARE GENERAL RECOMMENDATIONS/GUIDELINES FOR CEMENT STABILIZATION OF SUBGRADES FOR THE PROJECT. ACTUAL FIELD CONDITIONS MAY ALTER APPLICATION RATE. CONSULT GEOTECHNICAL ENGINEER FOR FURTHER RECOMMENDATIONS.

1. STRIP THE TOP ±4 INCHES OF TOPSOIL (THROUGH THE ROOT ZONE) FROM THE AREA TO BE STABILIZED. ROOTS SMALLER THAN 1/4" DIAMETER ARE CONSIDERED INSIGNIFICANT.
2. PERFORM A PROCTOR (ASTM D 698) TEST TO DETERMINE THE OPTIMUM MOISTURE CONTENT IF THE MATERIAL TO BE STABILIZED DOES NOT MATCH A PREVIOUSLY PERFORMED PROCTOR.
3. DETERMINE THE IN-SITU MOISTURE CONTENT USING A NUCLEAR DENSITY GAUGE (OR EQUIVALENT MOISTURE CONTENT TEST) DAILY, PRIOR TO INCORPORATION OF THE CEMENT. PROVIDE ADDITIONAL MOISTURE CONTENT TESTING AS NEEDED BASED ON WEATHER CONDITIONS.
   - 3.1. THE CONTRACTOR WILL BE ADVISED OF IN-SITU MOISTURE CONTENT, AND MOISTURE ADJUSTMENTS SHOULD BE MADE IF IN-SITU MOISTURE IS LESS THAN OPTIMUM MOISTURE CONTENT AS DETERMINED BY THE PROCTOR (ASTM D 698).
4. SOIL AND CEMENT BLENDING:
   - 4.1. COMPLETELY BLEND SUBGRADE SOIL WITH THE APPROPRIATE AMOUNT OF CEMENT BY WEIGHT. FIELD RESULTS FROM TEST STRIPS WILL DICTATE THE CEMENT APPLICATION RATE.
   - 4.2. IN AREAS OF HIGH MOISTURE OR POOR SOILS, THE CONTRACTOR MAY INCREASE THE PERCENT OF CEMENT IN ORDER TO MEET THE MINIMUM SUBGRADE STRENGTH REQUIREMENTS.
   - 4.3. THE USE OF A RECLAIMER IS AN ADEQUATE BLENDING METHOD. DISCING IS NOT AN ADEQUATE BLENDING METHOD.
   - 4.4. A STABILIZATION DEPTH OF 12" WAS USED FOR DESIGN PURPOSES. STABILIZATION DEPTH MAY NEED TO INCREASE TO 16" IN AREAS OF EXTREME MOISTURE OR POOR SOILS IN ORDER TO MEET THE STRENGTH AND PROOF ROLL REQUIREMENTS.
5. COMPACTION:
   - 5.1. A ROLLING PATTERN WILL BE ESTABLISHED USING A NUCLEAR DENSITY GAUGE DURING COMPACTION.
     - 5.1.1. COMPACTION WILL BE PERFORMED UNTIL THE STABILIZED MATERIAL REACHES THE "BREAK POINT" AFTER WHICH ADDITIONAL PASSES WITH A ROLLER RESULTS IN A LOSS OF DENSITY AS MEASURED BY A NUCLEAR DENSITY GAUGE.
     - 5.1.2. COMPACTION IS TYPICALLY ACHIEVED BY MULTIPLE PASSES OF A PADFOOT ROLLER UNTIL THE ROLLER "WALKS" OUT OF THE RECLAIMED MATERIAL (SPACE IS VISIBLE BETWEEN THE DRUM AND THE RECLAIMED MATERIAL). THIS IS FOLLOWED BY BLADING AND SHAPING THE RECLAIMED MATERIAL TO FINAL PROFILE AND CROSS SECTION, REMOVING HIGH AND LOW POINTS. SMOOTH DRUM OR RUBBER TIRE ROLLERS ARE THEN USED TO FINISH ROLLING (THIS IS WHEN THE DENSITY TESTS ARE PERFORMED) UNTIL THE DENSITY OF THE MATERIAL REACHES THE "BREAK POINT."
     - 5.1.3. THE NUMBER OF PASSES AND EQUIPMENT USED TO REACH THE "BREAK POINT" IS CONSIDERED THE ROLLING PATTERN.
     - 5.1.4. A NEW ROLLING PATTERN MAY NEED TO BE ESTABLISHED IF THE PERFORMANCE REQUIREMENTS ARE NOT BEING MET. THIS MAY BE DUE TO CHANGES IN THE MOISTURE CONTENT, THE SOIL TYPE, OR THE CEMENT RATE.
   - 5.2. THE TARGET DENSITY IS 98% OF THE MAXIMUM DENSITY DETERMINED FROM THE ROLLING PATTERN.
     - 5.2.1. DENSITY TESTS SHALL BE TAKEN AT THE RATE OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER TO CONFIRM THE DENSITY IS MATCHING THE TARGET. ONCE THE ROLLING PATTERN HAS BEEN CONFIRMED IT IS RECOMMENDED THAT TESTING CONTINUE AT 1 TEST PER 1,000 LF IN EACH PASS OF THE RECLAIMER.
     - 5.2.2. IF IT IS NOT POSSIBLE TO ATTAIN THE TARGET DENSITY, AND ADDITIONAL COMPACTION DOES NOT IMPROVE THE DENSITY, A NEW ROLLING PATTERN SHOULD BE ESTABLISHED.
   - 5.3. THE AIR TEMPERATURE SHALL BE ABOVE 40 DEGREES (F) DURING THE CEMENT STABILIZATION PROCESS. MIXING CEMENT INTO FROZEN GROUND IS NOT ACCEPTABLE.
6. THE STABILIZED MATERIAL SHALL BE CONTINUOUSLY WET CURED FOR A MINIMUM OF 24 HOURS (WET CURED IS IDENTIFIED VISUALLY AS DAMP SURFACE).
7. PERFORM SUBGRADE TESTING IN ACCORDANCE WITH TESTING SCHEDULE.
8. AGGREGATE PLACEMENT:
   - 8.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 8.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 8.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

CEMENT STABILIZATION - DESIGN BASIS

1. DURING INITIAL CONSTRUCTION, CONTRACTOR SHALL CONSTRUCT MINIMUM 300 LF TEST STRIPS CONTAINING 4%, 5% AND 6% CEMENT IN ACCORDANCE WITH CEMENT STABILIZATION PROCEDURES.
2. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 3 FOR ANTICIPATED RESULTS):
   - 2.1. PERFORM INITIAL SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M BETWEEN 4 TO 6 HOURS AFTER FINAL COMPACTION.
   - 2.2. PERFORM ADDITIONAL DCP TESTING AT 24 AND 48 HOURS AFTER FINAL COMPACTION.
   - 2.3. PERFORM SUBSEQUENT DCP TESTS AT 7 DAYS AFTER FINAL COMPACTION AS VERIFICATION OF STRENGTH CURVE.
   - 2.4. A MINIMUM OF 3 TESTS PER TEST SECTION PER TIMEFRAME IS REQUIRED. TESTS SHALL BE TAKEN AT THE CENTERLINE AND 2' FROM EACH SHOULDER.
   - 2.5. RECORD DCP TEST RESULTS EVERY 6 INCHES TO TOTAL DEPTH OF 12 INCHES.

TABLE 3: TEST STRIP CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	COMPRESSIVE STRENGTH (PSF)
4 – 6 HOURS	6	5	1,800
24 HOURS	10	7	2,500
48 HOURS	15	10	3,200
7 DAYS	30	21	5,200

CEMENT STABILIZATION - PRODUCTION

1. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 5 FOR SUMMARY OF TESTING REQUIREMENTS):
   - 1.1. PERFORM SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M NO SOONER THAN 24 HOURS AFTER FINAL COMPACTION.
   - 1.2. DCP TESTING FREQUENCY SHALL BE WITH A RANDOM SPACING AND A MINIMUM OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER. A MINIMUM OF 3 TESTS PER ROAD IS REQUIRED.
   - 1.3. THE CBR OF THE STABILIZED SUBGRADE SHOULD BE CALCULATED IN 6" INCREMENTS THROUGH THE ENTIRE DEPTH OF THE STABILIZED LAYER.
   - 1.4. THE MINIMUM REQUIRED CBR PRIOR TO PROOF-ROLLING IS PROVIDED IN TABLE 4 BELOW:

TABLE 4: FINAL CEMENT STABILIZED CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	UNCONFINED SHEAR STRENGTH (PSF)	BEARING CAPACITY (PSF)
24 – 48 HOURS	15	10	3,500	9,800
3 – 7 DAYS	30	21	7,000	18,000
28 DAYS	50	33	12,000	28,500

NOTE: UNCONFINED SHEAR STRENGTH WAS CALCULATED USING THE BLACK (1961) EQUATION. BEARING CAPACITY WAS CALCULATED USING THE VESIC EQUATION MODIFIED FOR TWO LAYERS (12" CEMENT STABILIZED SUBGRADE OVER A NATURAL SUBGRADE WITH A CBR OF 1.5)

   - 1.5. ONCE THE MINIMUM REQUIRED CBR IS ACHIEVED AT ANY CORRESPONDING TIME PERIOD, THE SUBGRADE IS CONSIDERED ADEQUATE AND THE CONTRACTOR MAY PROCEED WITH PROOF-ROLL TESTING. FUTURE DCP TESTING ON THAT SEGMENT OF SUBGRADE IS NOT REQUIRED.
   - 1.6. IF TESTING DOES NOT INDICATE A CBR OF 30 WITHIN 7 DAYS, ADDITIONAL GRAVEL SURFACING AND/OR THE ADDITION OF GEOTEXTILE FABRIC MAY BE REQUIRED. FOR FUTURE SUBGRADE STABILIZATION AREAS, CONTACT THE ENGINEER AND OWNER VIA RFI FOR RECOMMENDATIONS AND APPROVAL.
2. SUBGRADE PROOF-ROLL TESTING AND ACCEPTANCE:
   - 2.1. ONCE THE REQUIRED DCP VALUE HAS BEEN OBTAINED BUT PRIOR TO PLACING AGGREGATE, THE SUBGRADE SHALL BE PROOF-ROLLED. REFER TO THE PROJECT TESTING REQUIREMENTS FOR PROOF-ROLL DEFINITION.
   - 2.2. PROOF-ROLLING SHOULD BE PERFORMED WITH ONE PASS DOWN THE CENTER AND NOT BE PERFORMED WITHIN 12 INCHES OF THE EDGE OF THE STABILIZED SECTION.
   - 2.3. IF PROOF-ROLLING FAILS, RE-STABILIZATION MAY BE REQUIRED AND A NEW ROLLING PATTERN OR ADDITIONAL CEMENT MAY BE REQUIRED.
3. AGGREGATE PLACEMENT:
   - 3.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 3.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 3.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

TABLE 5: CEMENT STABILIZATION PRODUCTION TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
COMPACTED SUBGRADE (CEMENT STABILIZED)	PROCTOR	MINIMUM 1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER 1000 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
NOTE: SEE ABOVE FOR INITIAL TESTING REQUIREMENTS	DCP TEST	1 PER 500 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
	PROOF-ROLL (AFTER PASSING DCP TESTS)	ENTIRE LENGTH

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (866) 937-5150 westwoodps.com

Westwood Professional Services, Inc.

Designed: BMC
Checked: DBM
Drawn: BMC
As-Built Drawing:

Revision #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2000 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 13 OF 57

001444GDTP.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 327th Street in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 900' South of 327th Ave & 205th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.24'29.65" W Long. -99.37'24.83" W
4. Width of entrance: 16' access road
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001153 NW4 21-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Taya L Lar
Signature of Applicant

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

Access Road 50W

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 327th Street in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 900' South of 327th Ave & 205th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.24'29.65" W Long. -99.37'24.83" W
4. Width of entrance: 16' access road
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001153 NW4 21-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: _____

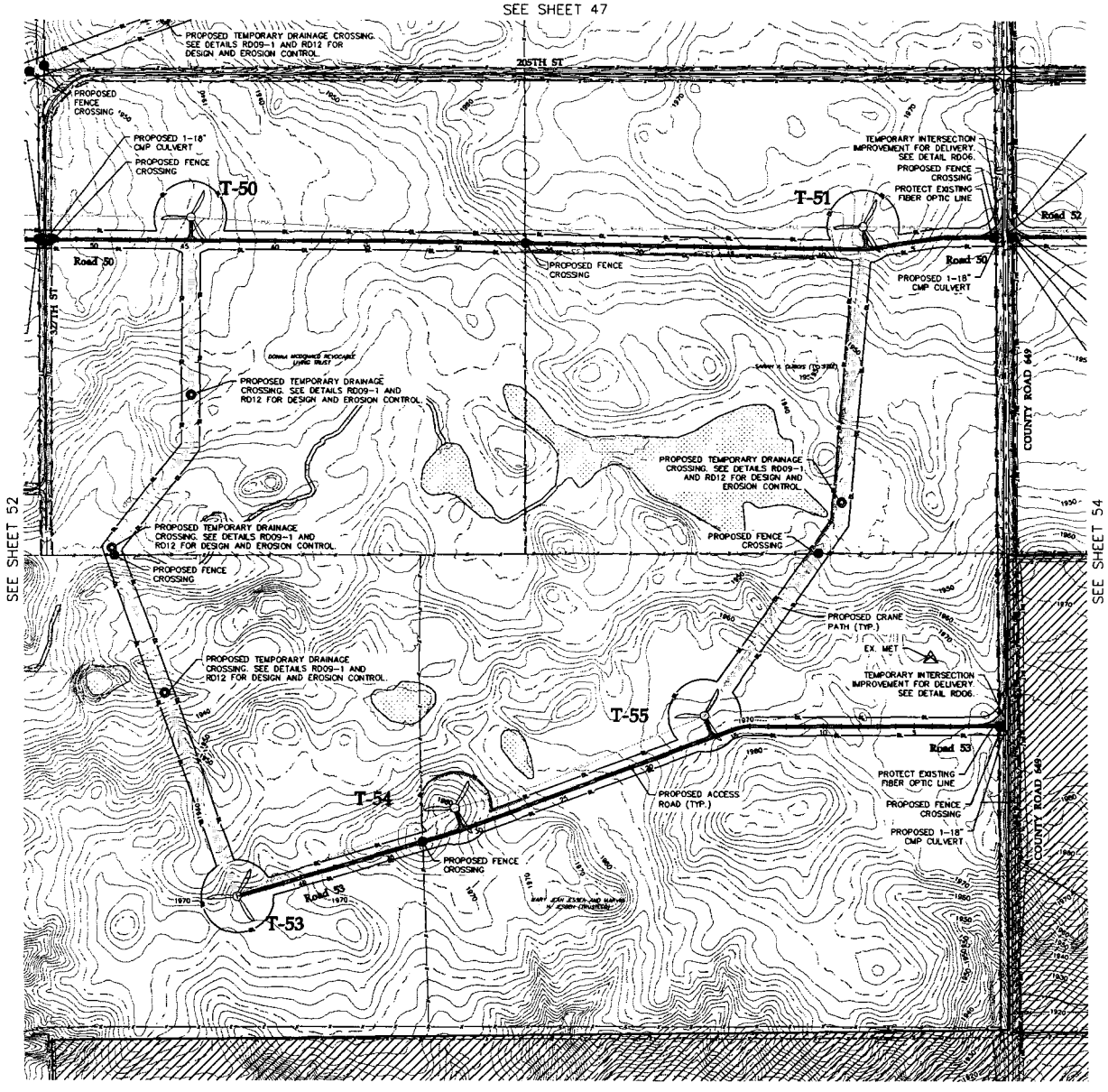
Tanya L Lar
Signature of Applicant

Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

© 2019 Westwood Professional Services, Inc.



LEGEND:

- PROPOSED TURBINE LOCATION
- T-XX PROPOSED TURBINE NUMBER
- PROPOSED ALTERNATE TURBINE LOCATION
- ALT-XX PROPOSED ALTERNATE TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED ALTERNATE ACCESS ROAD
- PROPOSED CRANE PATH
- PROPOSED UNDERGROUND COLLECTION*
- PROPOSED DISTURBANCE LIMITS
- PROPOSED PERIMETER SEDIMENT CONTROL
- EXISTING 10' CONTOURS
- EXISTING 2' CONTOURS
- EXISTING GRAVEL EDGE
- EXISTING BITUMINUS EDGE
- EXISTING RIGHT-OF-WAY
- EXISTING PARCEL LINE
- EXISTING BUILDING
- EXISTING FENCE
- EXISTING OVERHEAD POWER
- EXISTING HIGH VOLTAGE OVERHEAD POWER
- EXISTING UNDERGROUND POWER LINE
- EXISTING FIBER OPTIC LINE
- EXISTING WATER LINE
- DELINEATED WETLAND
- ARCHAEOLOGICAL AVOIDANCE AREA
- EXISTING USFWS EASEMENT
- PROJECT BOUNDARY
- 1900 EXISTING GROUND ELEVATION
- PROPOSED DRAINAGE CROSSING**
- PROPOSED TEMPORARY DRAINAGE CROSSING**
- PROPOSED FENCE CROSSING***
- PROPOSED UTILITY CROSSING
- PROPOSED CULVERT

* PROVIDED BY OTHERS AND SHOWN FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSTRUCTION PLANS FOR DETAILS.

** SEE SHEET 11 FOR DRAINAGE CROSSING TYPE AND SIZING. DRAINAGE CROSSINGS SHALL CONSIST OF LOW WATER CROSSING OR CULVERT. DRAINAGE CROSSINGS ALONG CRANE PATH SHALL CONSIST OF CRANE MATS OR TEMPORARY CULVERT.

*** ALL GATE INSTALLATIONS SHALL BE FIELD DETERMINED AND AGREED UPON BY THE CONTRACTOR AND OWNER.

						14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31
				32	33	34	35	36	37	38
			39	40	41	42	43	44	45	46
		47	48	49	50	51				
	52	53	54	55						

KEY MAP

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-Free (888) 937-5150 westwoodps.com

Westwood Professional Services, Inc.

Designed: BMK
Checked: DEN
Drawn: BMK
As-Built Drawing:

Revisions		
#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	50% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2200 3rd Avenue NW
West Fargo, ND 58078

N

0' 300' 600' 900'

Triple H Wind Farm

Hyde County, South Dakota

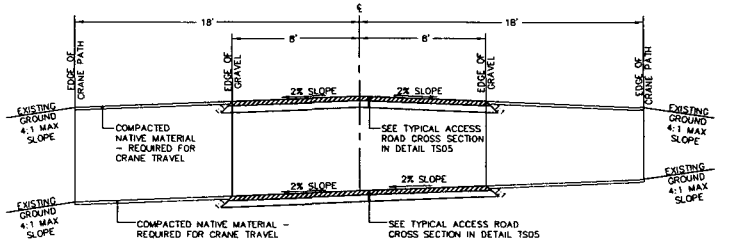
Site Plan T-50 - T-51, T-53 - T-55

90% COMPLETE NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 53 OF 57

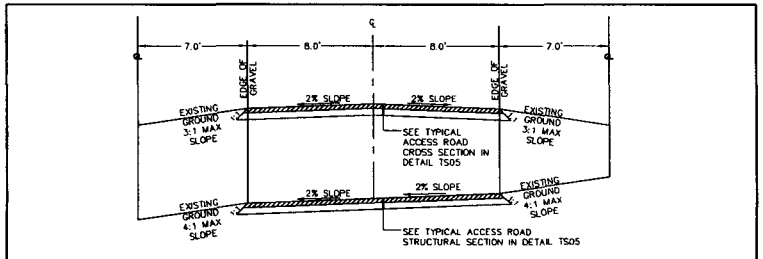
0014440SP01.dwg

© 2019 Westwood Professional Services, Inc.



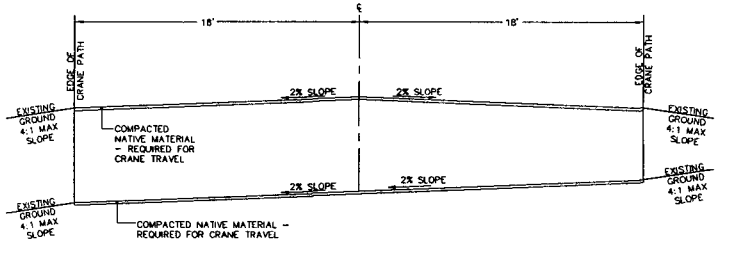
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE ACCESS ROAD DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

Westwood | TYPICAL TURBINE ACCESS ROAD AND CRANE PATH | LAST REVISED: 04/29/01 | RD01-A



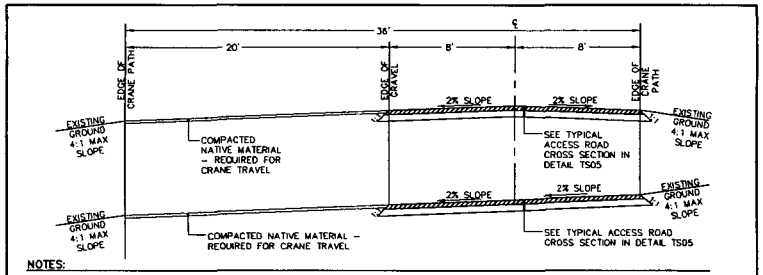
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

Westwood | TYPICAL TURBINE ACCESS ROAD SECTION | LAST REVISED: 3/28/12 | RD01-B



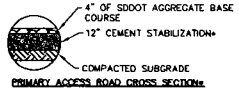
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE WHERE CRANE PATHS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT CRANE PATH REMAINS WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%

Westwood | TYPICAL CRANE PATH | LAST REVISED: 04/29/01 | RD01-C

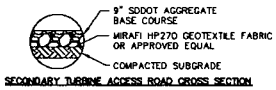


NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE EDGE OF COMPACTED SHOULDER DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

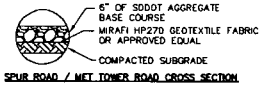
Westwood | TYPICAL TURBINE ACCESS ROAD AND OFFSET CRANE PATH | LAST REVISED: 04/29/01 | RD01-D



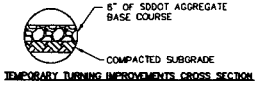
PRIMARY ACCESS ROAD CROSS SECTION*



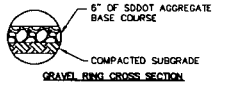
SECONDARY TURBINE ACCESS ROAD CROSS SECTION



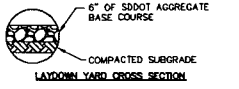
SPUR ROAD / MET TOWER ROAD CROSS SECTION



TEMPORARY TURNING IMPROVEMENTS CROSS SECTION



GRAVEL RING CROSS SECTION



LAYDOWN YARD CROSS SECTION

* CEMENT APPLICATION RATE MAY VARY BASED ON TEST STRIPS AND FIELD PERFORMANCE. SEE SHEET 13 FOR CEMENT STABILIZATION PROCEDURE AND DESIGN BASIS.

NOTES:
STRUCTURAL SECTIONS SHOWN ARE THE MINIMUM THICKNESS REQUIREMENTS DURING NORMAL FIELD CONDITIONS. THE SECTIONS MAY NEED TO BE INCREASED BASED ON ACTUAL FIELD CONDITIONS AT THE TIME OF CONSTRUCTION. CONDITIONS INCLUDE BUT ARE NOT LIMITED TO CONSTRUCTION DURING THE FREEZE/THAW CYCLE, UNUSUALLY WET PERIODS, OR IN LOW/WET AREAS. SEE SHEET 12 FOR TESTING REQUIREMENTS AND SPECIFICATIONS.

Westwood | TYPICAL STRUCTURAL CROSS SECTIONS

Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed: BMC
Checked: BJH
Drawn: BMC
As-Built Drawing:

Revisions #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:
WANZEK
2028 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 4 OF 57

001444DTP.dwg

©2019 Westwood Professional Services, Inc.

ROAD DESIGN PARAMETERS

1. ACCESS ROADS HAVE BEEN DESIGNED TO ACCOMMODATE LIGHT DUTY TRUCKS (PICKUP TRUCKS AND MAINTENANCE VEHICLES) FOR LOW VOLUME USE IN NORMAL OPERATING CONDITIONS AS WELL AS HEAVY DUTY CONSTRUCTION TRAFFIC UNDER DRY CONDITIONS. THE ROAD DESIGN SPECIFIED IS NOT INTENDED FOR ALL WEATHER USE FOR HEAVY DUTY CONSTRUCTION LOADS.
2. ROAD MAINTENANCE CAN BE EXPECTED OVER THE LIFE OF THE PERMANENT FACILITY.

PRODUCTS

1. AGGREGATE BASE SHALL CONSIST OF SDDOT AGGREGATE BASE COURSE (AND IN CONFORMANCE WITH THE GRADATION TABLE 1). AGGREGATE MAY BE CRUSHER RUN UPON ENGINEERS APPROVAL. AGGREGATE GRADATIONS SHALL BE SUBMITTED TO ENGINEER FOR REVIEW.
2. ROAD SHOULDERS AND CRANE PADS SHALL CONSIST OF COMPACTED NATIVE SOILS.
3. CULVERTS: ACCESS ROAD CULVERTS SHALL MEET THE MINIMUM SPECIFICATIONS SET FORTH BY THE SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION AND/OR HYDE COUNTY. ALL CULVERTS ARE PLANNED TO BE A MINIMUM 18" DIAMETER AND MANUFACTURED OF 16-GAGE CORRUGATED METAL PIPE WITH NO END TREATMENTS UNLESS NOTED OTHERWISE. ACTUAL SIZE WILL BE DETERMINED THROUGH HYDRAULIC ANALYSIS.
4. GEOTEXTILE FABRIC: MIRAFI HP270 OR APPROVED EQUAL.

EXECUTION

1. CLEARING AND GRUBBING
   A. THE CONTRACTOR SHALL BE REQUIRED TO GRUB ALL TREES, STUMPS, BRUSH, AND DEBRIS WITHIN THE GRADING AREAS SHOWN ON THE PLANS. GRUBBING INCLUDES REMOVAL OF ALL PLANT MATERIAL GREATER THAN 2" INCLUDING STUMPS, BRANCHES, ROOTS, ETC. TO A DEPTH BELOW THE FINAL SUBGRADE. THE CONTRACTOR IS TO REMOVE ONLY THOSE TREES WHICH ARE DESIGNATED BY THE OWNER'S REPRESENTATIVE FOR REMOVAL, AND SHALL EXERCISE EXTREME CARE AROUND EXISTING TREES TO BE SAVED.
2. TOPSOIL STRIPPING
   A. TOPSOIL, INCLUDING ROOTS LARGER THAN 2" AND LARGE ROOT MASSES, SHALL BE STRIPPED FROM ALL ROADWAY AND FOUNDATION AREAS UP TO 10'. TOPSOIL SHALL NOT BE STRIPPED OUTSIDE OF THE DESIGNATED DISTURBANCE AREAS.
   B. ANY TOPSOIL THAT HAS BEEN STRIPPED SHALL BE STOCKPILED FOR POST CONSTRUCTION REVEGETATION. ALL TOPSOIL SHALL BE REDISTRIBUTED TO THE LAND OWNER'S PROPERTY OF WHERE IT ORIGINATED FROM.
3. FILL PLACEMENT
   A. FILL PLACEMENT SHALL CONSIST OF THE PLACING OF SUITABLE FILL MATERIAL, AFTER TOPSOIL STRIPPING, ABOVE THE EXISTING GRADE. GENERALLY, SIDE SLOPES SHALL BE CONSTRUCTED AT FOUR FOOT HORIZONTAL TO ONE FOOT VERTICAL, WITH SOME LOCATIONS THROUGHOUT THE PROJECT WITH SLOPES OF TWO FEET HORIZONTAL TO ONE FOOT VERTICAL. THE MATERIAL FOR FILL CONSTRUCTION SHALL BE OBTAINED FROM THE ACCESS ROAD/TURBINE EXCAVATION (SEE GEOTECHNICAL REPORT FOR RESTRICTIONS), OR ANY SUITABLE, APPROVED SOIL OBTAINED ONSITE/OFFSITE BY CONTRACTOR, AS DIRECTED OR APPROVED BY THE ENGINEER. THIS MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 12" AND CONSTRUCTED TO 95% OF THE MAXIMUM DRY DENSITY AND WITHIN 2% OF OPTIMUM MOISTURE CONTENT, AS DETERMINED BY THE STANDARD PROCTOR (AASHTO T99).
   B. SIDE SLOPES GREATER THAN 4:1 WILL NOT BE PERMITTED, UNLESS OTHERWISE NOTED ON THE PLAN.
   C. FILL SLOPES SHALL BE BENCHED INTO THE EXISTING SLOPE TO PREVENT MOVEMENT BETWEEN THE FILL AND NATIVE SOILS. BENCHES SHOULD BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO FILL PLACEMENT. POSITIVE DRAINAGE IS REQUIRED AT BENCHED AREAS AND AT THE TOE OF FILL SLOPES TO REMOVE SURFACE WATER.
4. SUBGRADE
   A. SUBGRADE PREPARED AT GRADE OR IN CUT REQUIRES SCARIFICATION AND RECOMPACTION TO A DEPTH OF 12" OR MORE.
   B. ACCESS ROAD CROSS SLOPES SHOWN IN THE PLANS ARE MEANT AS A GUIDE. ACCESS ROAD CROSS SLOPES MAY RANGE FROM 1% - 2%, CHECK WITH THE ENGINEER IF THE CROSS SLOPE FALLS OUTSIDE OF THIS RANGE. ACCESS ROADS BEING UTILIZED FOR CRANE TRAVEL SHOULD HAVE A MAX CROSS SLOPE OF 2%.

TABLE 1: SDDOT AGGREGATE BASE COURSE - LOCALLY SOURCED	
SIEVE SIZE	PERCENT PASSING
1"	100
3/4"	80-100
1/2"	68-91
NO. 4	46-70
NO. 8	34-58
NO. 40	13-35
NO. 200	3-12

MEET FOLLOWING REQUIREMENTS PER 882.2

LIQUID LIMIT (MAX) = 25
PLASTICITY INDEX = 0-6
L.A ABRASION (% MAX) = 40%

GRADATION HAS BEEN OBTAINED FROM THE 2015 SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION BOOK.

STORM WATER DESIGN PARAMETERS

1. SEE SHEET 6 FOR CULVERT SIZING AND DESIGN PARAMETERS. SEE HYDROLOGY MEMO FOR FURTHER DESIGN CALCULATIONS. CULVERTS SHALL BE MINIMUM 18" CORRUGATED METAL PIPE. ALL TEMPORARY PORTIONS OF THE INSTALLED CULVERTS SHALL BE REMOVED UPON COMPLETION OF THE PROJECT.
2. IT IS EXPECTED THAT CULVERTS WILL BE OVERTOPPED DURING SOME STORMS AND MAINTENANCE WILL BE REQUIRED THROUGH THE LIFE OF THE PROJECT.
3. WHEN INSTALLING DRAINAGE CULVERTS THE CONTRACTOR SHALL USE JUDGMENT IN SETTING THE FLOW LINE ELEVATIONS AND CULVERT LONGITUDINAL SLOPE. TYPICALLY THE FLOW LINE ELEVATIONS AND LONGITUDINAL SLOPE OF THE CULVERT SHOULD MATCH THE NATURAL GROUND ELEVATIONS AND SLOPE TO ENSURE POSITIVE DRAINAGE. WHEN POSSIBLE, ALL CULVERTS SHOULD BE PLACED AT A MINIMUM 0.5% GRADE.
4. ANTICIPATED CULVERT CROSSINGS ARE SHOWN ON THE CONSTRUCTION PLAN, ADDITIONAL CULVERTS MAY NEED TO BE INSTALLED IN AREAS WHERE CONCENTRATED FLOW IS EXPECTED DUE TO CONSTRUCTION ACTIVITIES.
5. CONSTRUCTION DRAINAGE CROSSINGS TO MAINTAIN EXISTING FLOW CHARACTERISTICS OF THE FEATURES. FEATURES SHALL BE GRADED TO PRECONSTRUCTION CONTOURS.

TESTING

1. TESTING SHALL BE PERFORMED BY A DESIGNATED INDEPENDENT TESTING AGENCY.
2. SUBMIT ONE SET OF TESTING AND INSPECTION RECORDS SPECIFIED TO THE CIVIL ENGINEER OF RECORD.

DEFINITIONS:

1. PROOF ROLLING:
   SHALL BE PERFORMED IN THE PRESENCE OF THE GEOTECHNICAL ENGINEER OR QUALIFIED GEOTECHNICAL REPRESENTATIVE USING A FULLY LOADED TANDEM AXLE DUMP TRUCK OR WATER TRUCK WITH A MINIMUM GROSS WEIGHT OF 25 TONS OR A FULLY LOADED BELLY DUMP WITH AN EQUIVALENT AXLE LOADING. PROOF-ROLLING ACCEPTANCE STANDARDS INCLUDE NO RUTTING GREATER THAN 1.5 INCHES, AND NO "PUMPING" OF THE SOIL BEHIND THE LOADED TRUCK.
2. SIEVE ANALYSIS:
   SHALL BE CONDUCTED IN ACCORDANCE WITH AASHTO T27
3. PROCTORS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T99
4. ATTERBERG LIMITS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T89 AND T90
5. MOISTURE DENSITY (NUCLEAR DENSITY):
   SHALL BE DONE IN ACCORDANCE WITH AASHTO T310
6. DYNAMIC CONE PENETROMETER (DCP) TESTING:
   SHALL BE DONE IN ACCORDANCE WITH ASTM D6951-03

REQUIREMENTS:

1. FILL PLACEMENT:
   A. SOILS USED AS FILL MATERIAL SHALL BE TESTED FOR MOISTURE CONTENT AND PROCTOR TESTS.
   B. WHERE FILL CONSTRUCTION REQUIRES MORE THAN 12 INCHES OF FILL PLACEMENT, COMPACT EACH LIFT TO A MINIMUM OF 95 PERCENT OF THE MATERIAL'S MAXIMUM STANDARD PROCTOR DRY DENSITY.
2. COMPACTED SUBGRADE (CEMENT STABILIZED):
   A. SEE SHEET 13 FOR TESTING REQUIREMENTS AND PROCEDURE.
3. COMPACTED SUBGRADE (NON-CEMENT STABILIZED):
   A. THE ENTIRE SUBGRADE SHALL BE PROOF-ROLLED PRIOR TO THE PLACEMENT OF THE AGGREGATE BASE TO IDENTIFY AREAS OF UNSTABLE SUBGRADE.
   B. PERFORM A MINIMUM OF 3 DYNAMIC CONE PENETROMETER (DCP) TESTS PER ACCESS ROAD OR ONE FOR EVERY 1,000 LF OF ROAD, WHICHEVER IS GREATER. SUBGRADE MUST MEET A MINIMUM DCP OF 3 BLOWS PER 6" TO A TOTAL DEPTH OF 2' (MINIMUM CBR=1.5).
   C. IF A PASSING PROOF-ROLL OR DCP REQUIREMENTS CANNOT BE ACHIEVED THE FOLLOWING ALTERNATIVES MAY BE IMPLEMENTED:
      a. SCARIFY, DRY, AND RECOMPACT SUBGRADE
      b. REMOVE UNSUITABLE MATERIAL AND REPLACE WITH SUITABLE MATERIAL
      c. INCREASE AGGREGATE BASE THICKNESS
4. AGGREGATE BASE:
   A. AGGREGATE BASE SHALL BE PROOF-ROLLED OVER THE ENTIRE LENGTH. IF PROOF ROLLING DETERMINES THAT THE ROAD IS UNSTABLE, ADDITIONAL AGGREGATE SHALL BE ADDED UNTIL THE UNSTABLE SECTION IS ABLE TO PASS A PROOF ROLL.
   B. PROVIDE 1 SIEVE ANALYSIS (PROJECT MAX OF 20) PER 2500 CY OF ROAD BASE PLACED.
5. CRANE PAD AND CRANE PATHS / CRANE TRAVEL SHOULDERS:
   A. TESTING REQUIREMENTS ARE PENDING BASED ON CRANE PICK PLANS PROVIDED BY THE CONTRACTOR.

TABLE 2: TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
FILL PLACEMENT	PROCTOR	1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER LIFT PER 5000 SF OF FILL PLACED OR 1 PER 500 LF OF ROAD OR CRANE WALK
COMPACTED SUBGRADE (CEMENT STABILIZED):	SEE SHEET 13	SEE SHEET 13
COMPACTED SUBGRADE (NON-CEMENT STABILIZED):	PROOF-ROLL	ENTIRE AREA
	DCP	1 PER 1,000 FT OR MIN. 3 PER ROAD
AGGREGATE BASE	PROOF-ROLL	ENTIRE AREA
	SIEVE ANALYSIS, LL, PL, AND L.A ABRASION	1 PER 2,500 CY

GENERAL NOTES:

1. GROUND SURFACE CONTOURS (AT TWO-FOOT VERTICAL INTERVALS) AND ELEVATIONS ARE BASED ON A PHOTOGRAMMETRY SURFACE PROVIDED BY GEOTERRA. IF MAJOR DISCREPANCIES ARE FOUND IN THE GROUND ELEVATIONS DURING FIELD STAKING TO THE GROUND ELEVATIONS SHOWN ON THE PLANS, THE OWNER AND ENGINEER SHALL BE NOTIFIED.
2. WHERE SECTION OR SUBSECTION MONUMENTS ARE ENCOUNTERED, THE OWNER SHALL BE NOTIFIED BEFORE SUCH MONUMENTS ARE REMOVED. THE CONTRACTOR SHALL PROTECT AND CAREFULLY PRESERVE ALL PROPERTY MARKERS AND MONUMENTS UNTIL THE OWNER, AN AUTHORIZED SURVEYOR OR AGENT HAS WITNESSED OR OTHERWISE REFERENCED THEIR LOCATION.
3. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. TYPICAL DISTURBANCE SHALL BE LIMITED TO 10 LF FROM THE EDGE OF PROPOSED GRADING.
4. FINALIZE GRADING AROUND THE BASE OF TURBINES IN ACCORDANCE WITH DETAIL TS-03 AND TS-04.
5. GRADE ALL PROPOSED ROADS TO A MAXIMUM SLOPE OF 8%. IF 8% SLOPE CANNOT BE ACHIEVED, THE CONTRACTOR MAY UTILIZE ASSIST VEHICLES FOR THE PURPOSE OF DELIVERIES. GRADE ALL PROPOSED CRANE PATHS TO A MAXIMUM OF 8% UNLESS OTHERWISE NOTED IN PLAN SHEETS.
6. ANY FACILITIES REMOVED TO ALLOW FOR CONSTRUCTION (MAILBOXES, SIGNS, FENCES, ETC.) SHALL BE REPLACED BY THE CONTRACTOR IN A CONDITION AS GOOD AS EXISTING.
7. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING DRAINAGE THROUGHOUT THE CONSTRUCTION OF THIS PROJECT. CONSTRUCTION ACTIVITIES SHALL NOT BLOCK THE NATURAL OR MANMADE CREEKS OR DRAINAGE SWALES CAUSING RAINWATER TO POND. DEPENDING ON FIELD CONDITIONS, ADDITIONAL CULVERTS IN EXCESS OF THOSE ON THE PLANS MAY BE REQUIRED.
8. WHILE BUILDING THE ROADS AND EXCAVATING THE TURBINE FOUNDATIONS, EXCESS SOIL WILL RESULT. THE CONTRACTOR SHALL DISPOSE OF THIS EXCESS SOIL IN AN APPROVED MANNER. EXCESS TOPSOIL SHALL BE DISTRIBUTED INTO A THIN LAYER ON LAND IMMEDIATELY ADJACENT TO WHERE THE TOPSOIL ORIGINATED. ALL EXCESS TOPSOIL TO BE WASTED ONSITE. WHILE DOING SO THE CONTRACTOR SHALL AVOID CAUSING RIDGES OR MOUNDS THAT WOULD MAKE IT DIFFICULT FOR STORM WATER RUNOFF TO DRAIN. THE FINAL SURFACE OF THE DISTURBED TOPSOIL SHALL BE SMOOTH AND FOLLOW THE NATURAL CONTOUR OF THE LAND.
9. THE CONTRACTOR SHALL NOTIFY SOUTH DAKOTA 811 AT LEAST 48 HOURS BEFORE EXCAVATION ACTIVITIES COMMENCE.
10. TEMPORARY INTERSECTION WIDENING SHALL, UPON COMPLETION OF ALL PROJECT CONSTRUCTION OR UPON NOTIFICATION OF THE ENGINEER, BE REMOVED AND THE AREA RESTORED TO ITS ORIGINAL LINES AND GRADES WITH TOPSOIL REPLACED, EXCEPT WHERE REQUESTED BY THE TOWNSHIP OR COUNTY TO PERMANENTLY REMAIN. DISTURBED AREAS OUTSIDE OF THE FINAL ROADWAY SHALL BE SEEDED AND MULCHED.
11. TURBINE SETBACKS ARE NOT IDENTIFIED ON THE CONSTRUCTION PLANS. IT SHALL BE THE RESPONSIBILITY OF THE OWNER AND CONTRACTOR TO ENSURE THAT ALL TURBINE SETBACKS MEET PROJECT REQUIREMENTS.
12. GEOTECHNICAL REPORTS WITH RECOMMENDATIONS HAVE BEEN PROVIDED BY THE OWNER. ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL ENGINEERING REPORT AND RECOMMENDATIONS.
13. FIELD SURVEY WETLAND INFORMATION HAS BEEN PROVIDED BY THE OWNER. ALL WETLAND DELINEATIONS AND PERMITTING SHALL BE THE RESPONSIBILITY OF OTHERS AND BE COMPLETED PRIOR TO CONSTRUCTION COMMENCING. THE OWNER AND GENERAL CONTRACTOR SHALL VERIFY THAT ALL WETLAND PERMITS HAVE BEEN SUBMITTED AND APPROVED PRIOR TO CONSTRUCTION COMMENCING.
14. CULTURAL RESOURCE REPORTS HAVE NOT BEEN PROVIDED. CULTURAL RESOURCE LOCATIONS ARE NOT SHOWN ON THE PLANS. INFORMATION WILL BE THE RESPONSIBILITY OF THE OWNER AND GENERAL CONTRACTOR. THE LOCATIONS OF CULTURAL RESOURCE SITES MAY BE CONFIDENTIAL AND PROTECTED BY STATE OR FEDERAL LAW. PUBLIC RELEASE OF SPECIFIC INFORMATION REGARDING THESE RESOURCES MAY BE RESTRICTED.
15. AN ENVIRONMENTAL ASSESSMENT HAS NOT BEEN PROVIDED. THE CONTRACTOR SHALL BE FAMILIAR WITH THE REPORT AND REVIEW ALL RECOMMENDATIONS.
16. ELECTRICAL INFORMATION SHOWN ON THE PLANS IS FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSULTANT'S PLANS FOR SPECIFIC LOCATIONS AND CONSTRUCTION DETAILS FOR THE UNDERGROUND POWER COLLECTION SYSTEM AND SUBSTATION.
17. CRANE PATHS ARE SHOWN ON THE CONSTRUCTION PLANS. IF THE CONTRACTOR PROPOSES ALTERNATE CRANE PATHS, THEY SHALL ENSURE THAT WETLAND AND CULTURAL RESOURCE CORRIDORS ARE NOT DISTURBED. FINAL CRANE PATH ALIGNMENTS SHALL BE DETERMINED BY THE CONTRACTOR BASED ON FIELD CONDITIONS WITHIN THE WETLAND AND CULTURAL RESOURCE CORRIDORS, SPECIAL LANDOWNER AGREEMENTS AND THE PROJECT BOUNDARY.
18. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. DISTURBANCE SHALL BE LIMITED TO 50 LF WIDTH FOR PROPOSED ACCESS ROADS AND 50 LF FOR CRANE PATHS, AND SHALL BE LIMITED TO A 250 LF RADIUS FOR PROPOSED WIND TURBINE GENERATORS. THE GRADING LIMITS SHALL BE CENTERED ON THE ROADWAYS AND WIND TURBINES. THE CONTRACTOR SHALL MAKE ALL EFFORTS TO KEEP ACTIVITIES WITHIN THE ERECTION AREAS SHOWN ON THE PLANS BUT IT IS UNDERSTOOD THAT SOME ACTIVITIES THAT WILL NOT REQUIRE GRADING OR SOIL DISTURBANCE MAY EXTEND BEYOND THE DEFINED LIMITS. DURING ERECTION OF THE ROTOR, TRUCKS AND/OR FORKLIFTS MAY EXTEND BEYOND THESE LIMITS. SEE DETAIL TSD1 FOR TYPICAL ERECTION AREAS.
19. AN ALTA SURVEY HAS BEEN PROVIDED BY WESTWOOD. CONTRACTOR AND OWNER ARE RESPONSIBLE FOR LOCATING ALL UTILITIES AND VERIFYING LOCATION OF CONSTRUCTION ACTIVITIES PRIOR TO COMMENCING WORK.

STORMWATER POLLUTION PREVENTION PLAN (SWPPP):

1. THE CONTRACTOR SHALL PROVIDE EROSION CONTROL MEASURES AS PLANNED AND SPECIFIED FOLLOWING BEST MANAGEMENT PRACTICES AS OUTLINED BY THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND BEING IN CONFORMANCE WITH THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL STORMWATER PERMIT.
2. REFER TO THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR THE TRIPLE H WIND FARM, PREPARED BY WESTWOOD PROFESSIONAL SERVICES, FOR EROSION CONTROL AND RESTORATION SPECIFICATIONS, SEDIMENT AND EROSION CONTROL PROCEDURES, LOCATIONS OF BMPs, DETAILS, AND INSPECTION INFORMATION.
3. ALL PASTURES AND DRAINAGE SWALES DISTURBED DURING CONSTRUCTION ACTIVITIES AND NOT COVERED BY ROAD SURFACING MATERIALS, SHALL BE SEEDED IN ACCORDANCE WITH THE SWPP PLAN.
4. TEMPORARY EROSION CONTROL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE TEMPORARY EROSION CONTROL PLAN SHALL BE IN ACCORDANCE WITH THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND THE TRIPLE H WIND FARM STORMWATER POLLUTION PREVENTION PLAN ON FILE.

PROJECT CONTACT INFORMATION:

TITLE	COMPANY	NAME	CONTACT NUMBER
OWNER (PRIMARY)	ENGIE	CASEY WILLIS	805-569-6185
PROJECT MANAGER	WESTWOOD	DANI NYGREN	952-906-7493
ENGINEER OF RECORD	WESTWOOD	ROB COPOULS	952-906-7470
CONTRACTOR	WANZEK	JASON HELLERUD	701-893-3685

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #300
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: DDV
Drawn: BMK
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK
a MasTec company

2028 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19

00144400TP.dwg

©2019 Westwood Professional Services, Inc.

CEMENT STABILIZATION - PROCEDURE

THE SPECIFICATIONS BELOW ARE GENERAL RECOMMENDATIONS/GUIDELINES FOR CEMENT STABILIZATION OF SUBGRADES FOR THE PROJECT. ACTUAL FIELD CONDITIONS MAY ALTER APPLICATION RATE. CONSULT GEOTECHNICAL ENGINEER FOR FURTHER RECOMMENDATIONS.

1. STRIP THE TOP ±4 INCHES OF TOPSOIL (THROUGH THE ROOT ZONE) FROM THE AREA TO BE STABILIZED. ROOTS SMALLER THAN 1/4" DIAMETER ARE CONSIDERED INSIGNIFICANT.
2. PERFORM A PROCTOR (ASTM D 698) TEST TO DETERMINE THE OPTIMUM MOISTURE CONTENT IF THE MATERIAL TO BE STABILIZED DOES NOT MATCH A PREVIOUSLY PERFORMED PROCTOR.
3. DETERMINE THE IN-SITU MOISTURE CONTENT USING A NUCLEAR DENSITY GAUGE (OR EQUIVALENT MOISTURE CONTENT TEST) DAILY, PRIOR TO INCORPORATION OF THE CEMENT. PROVIDE ADDITIONAL MOISTURE CONTENT TESTING AS NEEDED BASED ON WEATHER CONDITIONS.
   - 3.1. THE CONTRACTOR WILL BE ADVISED OF IN-SITU MOISTURE CONTENT, AND MOISTURE ADJUSTMENTS SHOULD BE MADE IF IN-SITU MOISTURE IS LESS THAN OPTIMUM MOISTURE CONTENT AS DETERMINED BY THE PROCTOR (ASTM D 698).
4. SOIL AND CEMENT BLENDING:
   - 4.1. COMPLETELY BLEND SUBGRADE SOIL WITH THE APPROPRIATE AMOUNT OF CEMENT BY WEIGHT. FIELD RESULTS FROM TEST STRIPS WILL DICTATE THE CEMENT APPLICATION RATE.
   - 4.2. IN AREAS OF HIGH MOISTURE OR POOR SOILS, THE CONTRACTOR MAY INCREASE THE PERCENT OF CEMENT IN ORDER TO MEET THE MINIMUM SUBGRADE STRENGTH REQUIREMENTS.
   - 4.3. THE USE OF A RECLAIMER IS AN ADEQUATE BLENDING METHOD. DISCING IS NOT AN ADEQUATE BLENDING METHOD.
   - 4.4. A STABILIZATION DEPTH OF 12" WAS USED FOR DESIGN PURPOSES. STABILIZATION DEPTH MAY NEED TO INCREASE TO 16" IN AREAS OF EXTREME MOISTURE OR POOR SOILS IN ORDER TO MEET THE STRENGTH AND PROOF ROLL REQUIREMENTS.
5. COMPACTION:
   - 5.1. A ROLLING PATTERN WILL BE ESTABLISHED USING A NUCLEAR DENSITY GAUGE DURING COMPACTION.
     - 5.1.1. COMPACTION WILL BE PERFORMED UNTIL THE STABILIZED MATERIAL REACHES THE "BREAK POINT" AFTER WHICH ADDITIONAL PASSES WITH A ROLLER RESULTS IN A LOSS OF DENSITY AS MEASURED BY A NUCLEAR DENSITY GAUGE.
     - 5.1.2. COMPACTION IS TYPICALLY ACHIEVED BY MULTIPLE PASSES OF A PADFOOT ROLLER UNTIL THE ROLLER "WALKS" OUT OF THE RECLAIMED MATERIAL (SPACE IS VISIBLE BETWEEN THE DRUM AND THE RECLAIMED MATERIAL). THIS IS FOLLOWED BY BLADING AND SHAPING THE RECLAIMED MATERIAL TO FINAL PROFILE AND CROSS SECTION, REMOVING HIGH AND LOW POINTS. SMOOTH DRUM OR RUBBER TIRE ROLLERS ARE THEN USED TO FINISH ROLLING (THIS IS WHEN THE DENSITY TESTS ARE PERFORMED) UNTIL THE DENSITY OF THE MATERIAL REACHES THE "BREAK POINT."
     - 5.1.3. THE NUMBER OF PASSES AND EQUIPMENT USED TO REACH THE "BREAK POINT" IS CONSIDERED THE ROLLING PATTERN.
     - 5.1.4. A NEW ROLLING PATTERN MAY NEED TO BE ESTABLISHED IF THE PERFORMANCE REQUIREMENTS ARE NOT BEING MET. THIS MAY BE DUE TO CHANGES IN THE MOISTURE CONTENT, THE SOIL TYPE, OR THE CEMENT RATE.
   - 5.2. THE TARGET DENSITY IS 98% OF THE MAXIMUM DENSITY DETERMINED FROM THE ROLLING PATTERN.
     - 5.2.1. DENSITY TESTS SHALL BE TAKEN AT THE RATE OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER TO CONFIRM THE DENSITY IS MATCHING THE TARGET. ONCE THE ROLLING PATTERN HAS BEEN CONFIRMED IT IS RECOMMENDED THAT TESTING CONTINUE AT 1 TEST PER 1,000 LF IN EACH PASS OF THE RECLAIMER.
     - 5.2.2. IF IT IS NOT POSSIBLE TO ATTAIN THE TARGET DENSITY, AND ADDITIONAL COMPACTION DOES NOT IMPROVE THE DENSITY, A NEW ROLLING PATTERN SHOULD BE ESTABLISHED.
   - 5.3. THE AIR TEMPERATURE SHALL BE ABOVE 40 DEGREES (F) DURING THE CEMENT STABILIZATION PROCESS. MIXING CEMENT INTO FROZEN GROUND IS NOT ACCEPTABLE.
6. THE STABILIZED MATERIAL SHALL BE CONTINUOUSLY WET CURED FOR A MINIMUM OF 24 HOURS (WET CURED IS IDENTIFIED VISUALLY AS DAMP SURFACE).
7. PERFORM SUBGRADE TESTING IN ACCORDANCE WITH TESTING SCHEDULE.
8. AGGREGATE PLACEMENT:
   - 8.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 8.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 8.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

CEMENT STABILIZATION - DESIGN BASIS

1. DURING INITIAL CONSTRUCTION, CONTRACTOR SHALL CONSTRUCT MINIMUM 300 LF TEST STRIPS CONTAINING 4%, 5%, AND 6% CEMENT IN ACCORDANCE WITH CEMENT STABILIZATION PROCEDURES.
2. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 3 FOR ANTICIPATED RESULTS):
   - 2.1. PERFORM INITIAL SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M BETWEEN 4 TO 6 HOURS AFTER FINAL COMPACTION.
   - 2.2. PERFORM ADDITIONAL DCP TESTING AT 24 AND 48 HOURS AFTER FINAL COMPACTION.
   - 2.3. PERFORM SUBSEQUENT DCP TESTS AT 7 DAYS AFTER FINAL COMPACTION AS VERIFICATION OF STRENGTH CURVE.
   - 2.4. A MINIMUM OF 3 TESTS PER TEST SECTION PER TIMEFRAME IS REQUIRED. TESTS SHALL BE TAKEN AT THE CENTERLINE AND 2' FROM EACH SHOULDER.
   - 2.5. RECORD DCP TEST RESULTS EVERY 6 INCHES TO TOTAL DEPTH OF 12 INCHES.

TABLE 3: TEST STRIP CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	COMPRESSIVE STRENGTH (PSF)
4 – 6 HOURS	6	5	1,600
24 HOURS	10	7	2,500
48 HOURS	15	10	3,200
7 DAYS	30	21	5,200

CEMENT STABILIZATION - PRODUCTION

1. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 5 FOR SUMMARY OF TESTING REQUIREMENTS):
   - 1.1. PERFORM SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M NO SOONER THAN 24 HOURS AFTER FINAL COMPACTION.
   - 1.2. DCP TESTING FREQUENCY SHALL BE WITH A RANDOM SPACING AND A MINIMUM OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER. A MINIMUM OF 3 TESTS PER ROAD IS REQUIRED.
   - 1.3. THE CBR OF THE STABILIZED SUBGRADE SHOULD BE CALCULATED IN 6" INCREMENTS THROUGH THE ENTIRE DEPTH OF THE STABILIZED LAYER.
   - 1.4. THE MINIMUM REQUIRED CBR PRIOR TO PROOF-ROLLING IS PROVIDED IN TABLE 4 BELOW:

TABLE 4: FINAL CEMENT STABILIZED CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	UNDRAINED SHEAR STRENGTH (PSF)	BEARING CAPACITY (PSF)
24 – 48 HOURS	15	10	3,500	8,800
3 – 7 DAYS	30	21	7,000	18,000
28 DAYS	50	33	12,000	28,500

NOTE: UNDRAINED SHEAR STRENGTH WAS CALCULATED USING THE BLACK (1961) EQUATION. BEARING CAPACITY WAS CALCULATED USING THE VESIC EQUATION MODIFIED FOR TWO LAYERS (12" CEMENT STABILIZED SUBGRADE OVER A NATURAL SUBGRADE WITH A CBR OF 1.5)

   - 1.5. ONCE THE MINIMUM REQUIRED CBR IS ACHIEVED AT ANY CORRESPONDING TIME PERIOD, THE SUBGRADE IS CONSIDERED ADEQUATE AND THE CONTRACTOR MAY PROCEED WITH PROOF-ROLL TESTING. FUTURE DCP TESTING ON THAT SEGMENT OF SUBGRADE IS NOT REQUIRED.
   - 1.6. IF TESTING DOES NOT INDICATE A CBR OF 30 WITHIN 7 DAYS, ADDITIONAL GRAVEL SURFACING AND/OR THE ADDITION OF GEOTEXTILE FABRIC MAY BE REQUIRED. FOR FUTURE SUBGRADE STABILIZATION AREAS, CONTACT THE ENGINEER AND OWNER VIA RFI FOR RECOMMENDATIONS AND APPROVAL.
2. SUBGRADE PROOF-ROLL TESTING AND ACCEPTANCE:
   - 2.1. ONCE THE REQUIRED DCP VALUE HAS BEEN OBTAINED BUT PRIOR TO PLACING AGGREGATE, THE SUBGRADE SHALL BE PROOF-ROLLED. REFER TO THE PROJECT TESTING REQUIREMENTS FOR PROOF-ROLL DEFINITION.
   - 2.2. PROOF-ROLLING SHOULD BE PERFORMED WITH ONE PASS DOWN THE CENTER AND NOT BE PERFORMED WITHIN 12 INCHES OF THE EDGE OF THE STABILIZED SECTION.
   - 2.3. IF PROOF-ROLLING FAILS, RE-STABILIZATION MAY BE REQUIRED AND A NEW ROLLING PATTERN OR ADDITIONAL CEMENT MAY BE REQUIRED.
3. AGGREGATE PLACEMENT:
   - 3.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 3.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 3.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

TABLE 5: CEMENT STABILIZATION PRODUCTION TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
COMPACTED SUBGRADE (CEMENT STABILIZED) NOTE: SEE ABOVE FOR INITIAL TESTING REQUIREMENTS	PROCTOR	MINIMUM 1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER 1000 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
	DCP TEST	1 PER 500 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
	PROOF-ROLL (AFTER PASSING DCP TESTS)	ENTIRE LENGTH

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (866) 937-5150 twistwood@w.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: DJH
Drawn: BMK
As-Built Drawing:

Revisions: #	DATE	DESCRIPTION
A	12/05/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK MasTec

2200 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 13 OF 57

0014440DTP.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. County Road 649 in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 900' South of County Road 649 & 205th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.24'26.60" W Long. -99.36'12.11" W
4. Width of entrance: 16' access road & 25' temporary intersection modification
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001157 NW4 22-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Signature of Applicant

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. County Road 649 in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 900' South of County Road 649 & 205th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.24'26.60" W Long. -99.36'12.11" W
4. Width of entrance: 16' access road & 25' temporary intersection modification
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001157 NW4 22-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: _____

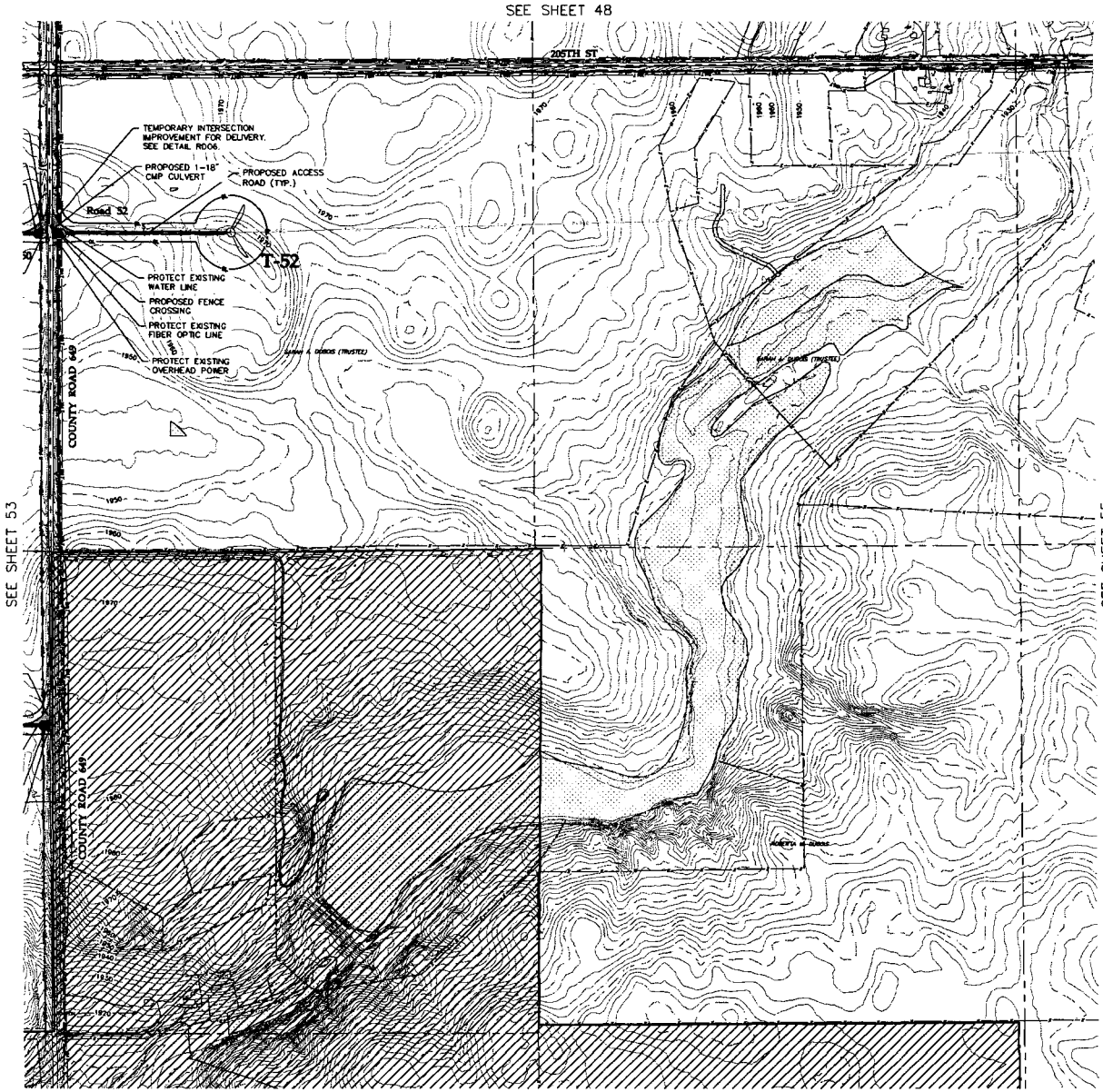
Signature of Applicant

Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

© 2019 Westwood Professional Services, Inc.



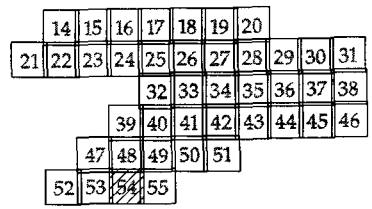
LEGEND:

- PROPOSED TURBINE LOCATION
- T-XX PROPOSED TURBINE NUMBER
- PROPOSED ALTERNATE TURBINE LOCATION
- ALT-XX PROPOSED ALTERNATE TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED ALTERNATE ACCESS ROAD
- PROPOSED CRANE PATH
- PROPOSED UNDERGROUND COLLECTION*
- PROPOSED DISTURBANCE LIMITS
- PROPOSED PERIMETER SEDIMENT CONTROL
- 980 EXISTING 10' CONTOURS
- EXISTING 2' CONTOURS
- EXISTING GRAVEL EDGE
- EXISTING BITUMINUS EDGE
- EXISTING RIGHT-OF-WAY
- EXISTING PARCEL LINE
- EXISTING BUILDING
- EXISTING FENCE
- EXISTING OVERHEAD POWER
- EXISTING HIGH VOLTAGE OVERHEAD POWER
- EXISTING UNDERGROUND POWER LINE
- EXISTING FIBER OPTIC LINE
- EXISTING WATER LINE
- DELINEATED WETLAND
- ARCHAEOLOGICAL AVOIDANCE AREA
- EXISTING USFWS EASEMENT
- PROJECT BOUNDARY
- 1900 EXISTING GROUND ELEVATION
- PROPOSED DRAINAGE CROSSING**
- PROPOSED TEMPORARY DRAINAGE CROSSING**
- PROPOSED FENCE CROSSING***
- PROPOSED UTILITY CROSSING
- PROPOSED CULVERT

* PROVIDED BY OTHERS AND SHOWN FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSTRUCTION PLANS FOR DETAILS.

** SEE SHEET 11 FOR DRAINAGE CROSSING TYPE AND SIZING. DRAINAGE CROSSINGS SHALL CONSIST OF LOW WATER CROSSING OR CULVERT. DRAINAGE CROSSINGS ALONG CRANE PATH SHALL CONSIST OF CRANE MATS OR TEMPORARY CULVERT.

*** ALL GATE INSTALLATIONS SHALL BE FIELD DETERMINED AND AGREED UPON BY THE CONTRACTOR AND OWNER.



KEY MAP

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (866) 937-5150
Westwood Professional Services, Inc.

Designed: BME
Checked: DEH
Drawn: BME
As-Built Drawing:

Revisions #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2026 2nd Avenue NW
West Fargo, ND 58078

N

0' 300' 600' 900'

Triple H Wind Farm

Hyde County, South Dakota

Site Plan T-52

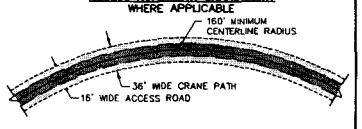
90% COMPLETE NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 54 OF 57

001444OSP01.dwg

© 2019 Westwood Professional Services, Inc.

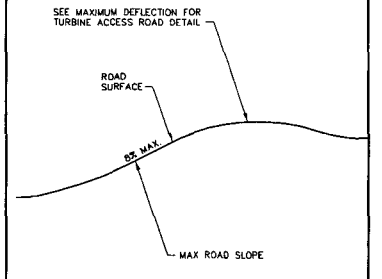
ACCESS ROAD WITH CRANE PATH WHERE APPLICABLE



ACCESS ROAD WITHOUT CRANE PATH

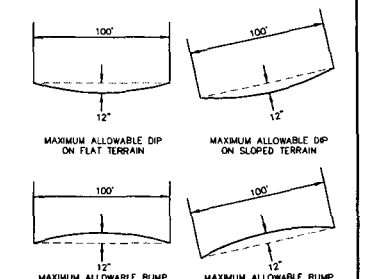
NOTE:
1. SOME RADII MAY REQUIRE ADDITIONAL SOIL COMPACTION OR GRAVEL OUTSIDE OF THE WIDTH SHOWN ABOVE TO ACCOMMODATE TRACTORS OR TRAILERS TRACKING OFF THE ACCESS ROAD.

Westwood	MINIMUM RADIUS FOR TURBINE ACCESS ROAD	LAST REVISED 06/26/13
		RD02

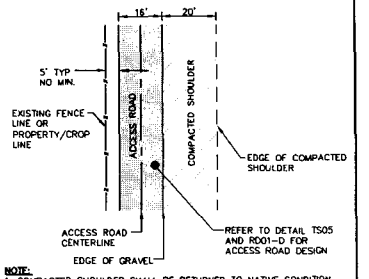


NOTES:
1. ROAD SLOPE SHALL NOT EXCEED 8% WITHOUT OWNER APPROVAL

Westwood	MAXIMUM VERT. SLOPE FOR TURBINE ACCESS ROAD/CRANE TRAVEL PATH	LAST REVISED 3/28/12
		RD03

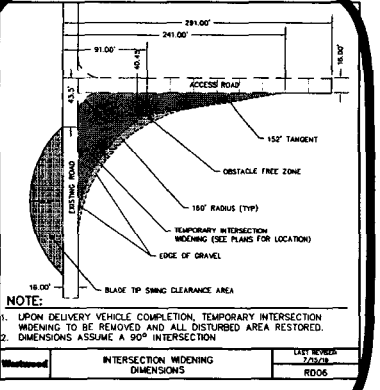


Westwood	MAXIMUM DEFLECTION FOR TURBINE ACCESS ROAD	LAST REVISED 01/31/08
		RD04



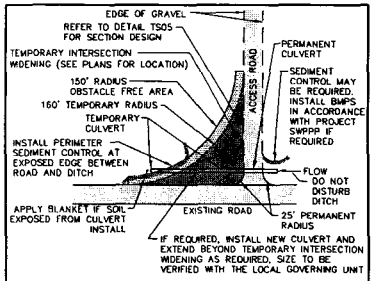
NOTE:
1. COMPACTED SHOULDER SHALL BE RETURNED TO NATIVE CONDITION FOLLOWING TURBINE GENERATOR CONSTRUCTION.
2. THE ACCESS ROAD MAY NEED TO BE CONSTRUCTED FARTHER FROM THE PROPERTY LINE IF OBSTRUCTIONS SUCH AS TREES FOLLOW THE PROPERTY LINE.

Westwood	TURBINE ACCESS ROAD ALONG FENCE/PROPERTY/CROP LINE	LAST REVISED 3/28/12
		RD05



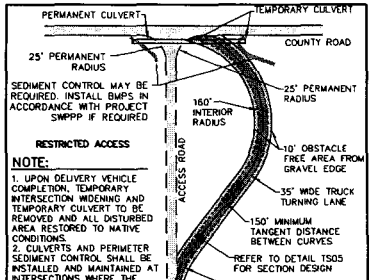
NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING TO BE REMOVED AND ALL DISTURBED AREA RESTORED.
2. DIMENSIONS ASSUME A 90° INTERSECTION

Westwood	INTERSECTION WIDENING DIMENSIONS	LAST REVISED 7/19/19
		RD06



1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.

	TURBINE ACCESS ROAD TYPICAL INTERSECTION WIDENING	LAST REVISED 3/2/17
		RD07

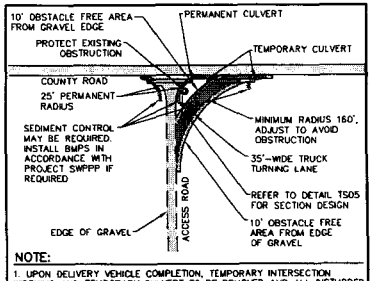


RESTRICTED ACCESS

NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

NOT TO SCALE

Westwood	TRUCK TRAFFIC TURNING LANE A	LAST REVISED 3/2/17
		RD08-A



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

Westwood	TRUCK TRAFFIC TURNING LANE B	LAST REVISED 12/3/15
		RD08-B

Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (866) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed:	BMC
Checked:	TJH
Drawn:	BMC
As-Built Drawing:	

Revisions #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

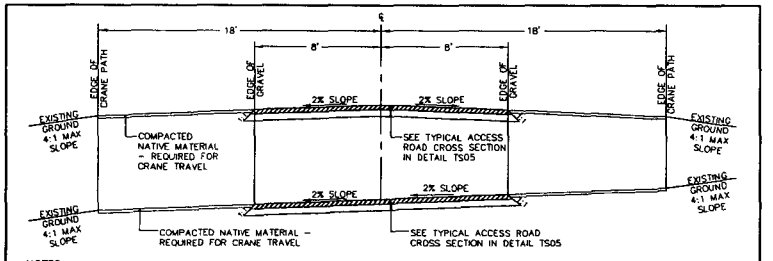
Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 5 OF 57

0014440DTP.dwg

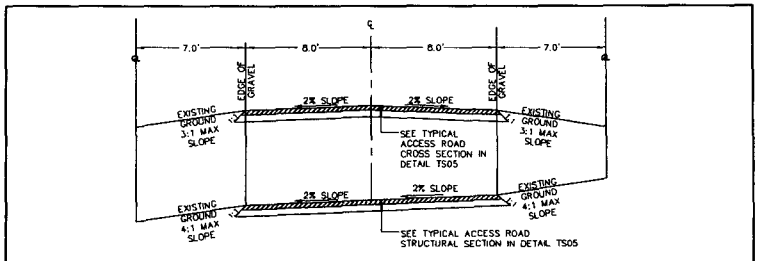
©2019 Westwood Professional Services, Inc.



NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE ACCESS ROAD DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

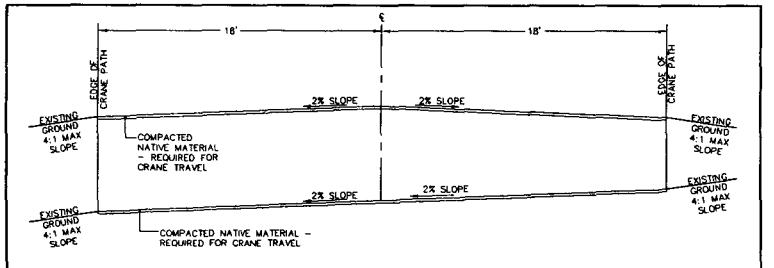
Westwood | TYPICAL TURBINE ACCESS ROAD AND CRANE PATH | LAST REVISED: 05/28/19 | RD01-A



NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

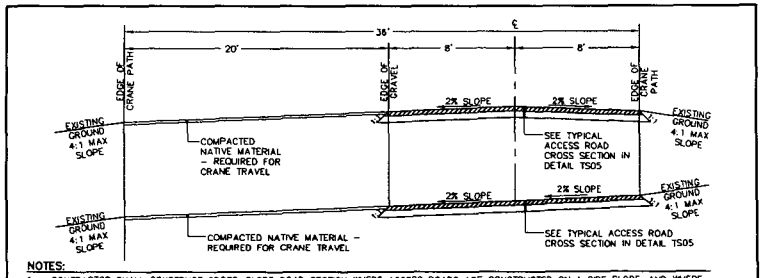
Westwood | TYPICAL TURBINE ACCESS ROAD SECTION | LAST REVISED: 05/28/19 | RD01-B



NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE WHERE CRANE PATHS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT CRANE PATH REMAINS WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%

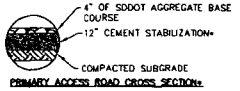
Westwood | TYPICAL CRANE PATH | LAST REVISED: 05/28/19 | RD01-C



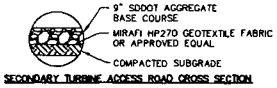
NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE EDGE OF COMPACTED SHOULDER DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

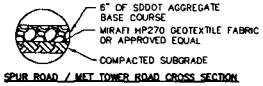
Westwood | TYPICAL TURBINE ACCESS ROAD AND OFFSET CRANE PATH | LAST REVISED: 05/28/19 | RD01-D



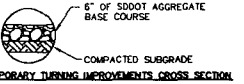
PRIMARY ACCESS ROAD CROSS SECTION*



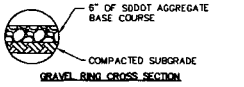
SECONDARY TURBINE ACCESS ROAD CROSS SECTION



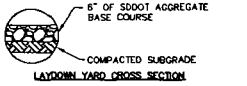
SPUR ROAD / MET TOWER ROAD CROSS SECTION



TEMPORARY TURNING IMPROVEMENTS CROSS SECTION



GRAVEL RING CROSS SECTION



LAYDOWN YARD CROSS SECTION

* CEMENT APPLICATION RATE MAY VARY BASED ON TEST STRIPS AND FIELD PERFORMANCE. SEE SHEET 13 FOR CEMENT STABILIZATION PROCEDURE AND DESIGN BASIS.

NOTES:

STRUCTURAL SECTIONS SHOWN ARE THE MINIMUM THICKNESS REQUIREMENTS DURING NORMAL FIELD CONDITIONS. THE SECTIONS MAY NEED TO BE INCREASED BASED ON ACTUAL FIELD CONDITIONS AT THE TIME OF CONSTRUCTION. CONDITIONS INCLUDE BUT ARE NOT LIMITED TO CONSTRUCTION DURING THE FREEZE/THAW CYCLE, UNUSUALLY WET PERIODS, OR IN LOW/WET AREAS. SEE SHEET 12 FOR TESTING REQUIREMENTS AND SPECIFICATIONS.

Westwood | TYPICAL STRUCTURAL CROSS SECTIONS

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (866) 937-5150 westwoodps.com

Westwood Professional Services, Inc.

Designed: SMK
Checked: RJH
Drawn: SMK
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

3020 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date 07/19/19

Sheet 4 OF 57

0014440D1P.dwg

© 2019 Westwood Professional Services, Inc.

ROAD DESIGN PARAMETERS

1. ACCESS ROADS HAVE BEEN DESIGNED TO ACCOMMODATE LIGHT DUTY TRUCKS (PICKUP TRUCKS AND MAINTENANCE VEHICLES) FOR LOW VOLUME USE IN NORMAL OPERATING CONDITIONS AS WELL AS HEAVY DUTY CONSTRUCTION TRAFFIC UNDER DRY CONDITIONS. THE ROAD DESIGN SPECIFIED IS NOT INTENDED FOR ALL WEATHER USE FOR HEAVY DUTY CONSTRUCTION LOADS.
2. ROAD MAINTENANCE CAN BE EXPECTED OVER THE LIFE OF THE PERMANENT FACILITY.

PRODUCTS

1. AGGREGATE BASE SHALL CONSIST OF SDDOT AGGREGATE BASE COURSE (AND IN CONFORMANCE WITH THE GRADATION TABLE 1). AGGREGATE MAY BE CRUSHER RUN UPON ENGINEERS APPROVAL. AGGREGATE GRADATIONS SHALL BE SUBMITTED TO ENGINEER FOR REVIEW.
2. ROAD SHOULDERS AND CRANE PADS SHALL CONSIST OF COMPACTED NATIVE SOILS.
3. CULVERTS: ACCESS ROAD CULVERTS SHALL MEET THE MINIMUM SPECIFICATIONS SET FORTH BY THE SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION AND/OR HYDE COUNTY. ALL CULVERTS ARE PLANNED TO BE A MINIMUM 18" DIAMETER AND MANUFACTURED OF 16-GAGE CORRUGATED METAL PIPE WITH NO END TREATMENTS UNLESS NOTED OTHERWISE. ACTUAL SIZE WILL BE DETERMINED THROUGH HYDRAULIC ANALYSIS.
4. GEOTEXTILE FABRIC: MIRAFI HP270 OR APPROVED EQUAL.

EXECUTION

1. CLEARING AND GRUBBING
   - A. THE CONTRACTOR SHALL BE REQUIRED TO GRUB ALL TREES, STUMPS, BRUSH, AND DEBRIS WITHIN THE GRADING AREAS SHOWN ON THE PLANS. GRUBBING INCLUDES REMOVAL OF ALL PLANT MATERIAL GREATER THAN 2" INCLUDING STUMPS, BRANCHES, ROOTS, ETC. TO A DEPTH BELOW THE FINAL SUBGRADE. THE CONTRACTOR IS TO REMOVE ONLY THOSE TREES WHICH ARE DESIGNATED BY THE OWNER'S REPRESENTATIVE FOR REMOVAL, AND SHALL EXERCISE EXTREME CARE AROUND EXISTING TREES TO BE SAVED.
2. TOPSOIL STRIPPING
   - A. TOPSOIL, INCLUDING ROOTS LARGER THAN 2" AND LARGE ROOT MASSES, SHALL BE STRIPPED FROM ALL ROADWAY AND FOUNDATION AREAS UP TO 10". TOPSOIL SHALL NOT BE STRIPPED OUTSIDE OF THE DESIGNATED DISTURBANCE AREAS.
   - B. ANY TOPSOIL THAT HAS BEEN STRIPPED SHALL BE STOCKPILED FOR POST CONSTRUCTION REVEGETATION. ALL TOPSOIL SHALL BE REDISTRIBUTED TO THE LAND OWNER'S PROPERTY OF WHERE IT ORIGINATED FROM.
3. FILL PLACEMENT
   - A. FILL PLACEMENT SHALL CONSIST OF THE PLACING OF SUITABLE FILL MATERIAL, AFTER TOPSOIL STRIPPING, ABOVE THE EXISTING GRADE. GENERALLY, SIDE SLOPES SHALL BE CONSTRUCTED AT FOUR FOOT HORIZONTAL TO ONE FOOT VERTICAL, WITH SOME LOCATIONS THROUGHOUT THE PROJECT WITH SLOPES OF TWO FEET HORIZONTAL TO ONE FOOT VERTICAL. THE MATERIAL FOR FILL CONSTRUCTION SHALL BE OBTAINED FROM THE ACCESS ROAD/TURBINE EXCAVATION (SEE GEOTECHNICAL REPORT FOR RESTRICTIONS), OR ANY SUITABLE, APPROVED SOIL OBTAINED ONSITE/OFFSITE BY CONTRACTOR, AS DIRECTED OR APPROVED BY THE ENGINEER. THIS MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 12" AND CONSTRUCTED TO 95% OF THE MAXIMUM DRY DENSITY AND WITHIN 2% OF OPTIMUM MOISTURE CONTENT, AS DETERMINED BY THE STANDARD PROCTOR (AASHTO T99).
   - B. SIDE SLOPES GREATER THAN 4:1 WILL NOT BE PERMITTED, UNLESS OTHERWISE NOTED ON THE PLAN.
   - C. FILL SLOPES SHALL BE BENCHED INTO THE EXISTING SLOPE TO PREVENT MOVEMENT BETWEEN THE FILL AND NATIVE SOILS. BENCHES SHOULD BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO FILL PLACEMENT. POSITIVE DRAINAGE IS REQUIRED AT BENCHED AREAS AND AT THE TOE OF FILL SLOPES TO REMOVE SURFACE WATER.
4. SUBGRADE
   - A. SUBGRADE PREPARED AT GRADE OR IN CUT REQUIRES SCARIFICATION AND RECOMPACTION TO A DEPTH OF 12" OR MORE.
   - B. ACCESS ROAD CROSS SLOPES SHOWN IN THE PLANS ARE MEANT AS A GUIDE. ACCESS ROAD CROSS SLOPES MAY RANGE FROM 1% - 2%, CHECK WITH THE ENGINEER IF THE CROSS SLOPE FALLS OUTSIDE OF THIS RANGE. ACCESS ROADS BEING UTILIZED FOR CRANE TRAVEL SHOULD HAVE A MAX CROSS SLOPE OF 2%

TABLE 1: SDDOT AGGREGATE BASE COURSE - LOCALLY SOURCED	
SIEVE SIZE	PERCENT PASSING
1"	100
3/4"	80-100
1/2"	68-91
NO. 4	46-70
NO. 8	34-58
NO. 40	13-35
NO. 200	3-12
MEET FOLLOWING REQUIREMENTS PER 882.2 LIQUID LIMIT (MAX) = 25 PLASTICITY INDEX = 0-6 L.A ABRASION (% MAX) = 40% GRADATION HAS BEEN OBTAINED FROM THE 2015 SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION BOOK.	

STORM WATER DESIGN PARAMETERS

1. SEE SHEET 6 FOR CULVERT SIZING AND DESIGN PARAMETERS. SEE HYDROLOGY MEMO FOR FURTHER DESIGN CALCULATIONS. CULVERTS SHALL BE MINIMUM 18" CORRUGATED METAL PIPE. ALL TEMPORARY PORTIONS OF THE INSTALLED CULVERTS SHALL BE REMOVED UPON COMPLETION OF THE PROJECT.
2. IT IS EXPECTED THAT CULVERTS WILL BE OVERTOPPED DURING SOME STORMS AND MAINTENANCE WILL BE REQUIRED THROUGH THE LIFE OF THE PROJECT.
3. WHEN INSTALLING DRAINAGE CULVERTS THE CONTRACTOR SHALL USE JUDGMENT IN SETTING THE FLOW LINE ELEVATIONS AND CULVERT LONGITUDINAL SLOPE. TYPICALLY THE FLOW LINE ELEVATIONS AND LONGITUDINAL SLOPE OF THE CULVERT SHOULD MATCH THE NATURAL GROUND ELEVATIONS AND SLOPE TO ENSURE POSITIVE DRAINAGE. WHEN POSSIBLE, ALL CULVERTS SHOULD BE PLACED AT A MINIMUM 0.5% GRADE.
4. ANTICIPATED CULVERT CROSSINGS ARE SHOWN ON THE CONSTRUCTION PLAN, ADDITIONAL CULVERTS MAY NEED TO BE INSTALLED IN AREAS WHERE CONCENTRATED FLOW IS EXPECTED DUE TO CONSTRUCTION ACTIVITIES.
5. CONSTRUCTION DRAINAGE CROSSINGS TO MAINTAIN EXISTING FLOW CHARACTERISTICS OF THE FEATURES. FEATURES SHALL BE GRADED TO PRECONSTRUCTION CONTOURS.

TESTING:

1. TESTING SHALL BE PERFORMED BY A DESIGNATED INDEPENDENT TESTING AGENCY.
2. SUBMIT ONE SET OF TESTING AND INSPECTION RECORDS SPECIFIED TO THE CIVIL ENGINEER OF RECORD.

DEFINITIONS:

1. PROOF ROLLING:
   SHALL BE PERFORMED IN THE PRESENCE OF THE GEOTECHNICAL ENGINEER OR QUALIFIED GEOTECHNICAL REPRESENTATIVE USING A FULLY LOADED TANDEM AXLE DUMP TRUCK OR WATER TRUCK WITH A MINIMUM GROSS WEIGHT OF 25 TONS OR A FULLY LOADED BELLY DUMP WITH AN EQUIVALENT AXLE LOADING. PROOF-ROLLING ACCEPTANCE STANDARDS INCLUDE NO RUTTING GREATER THAN 1.5 INCHES, AND NO "PUMPING" OF THE SOIL BEHIND THE LOADED TRUCK.
2. SIEVE ANALYSIS:
   SHALL BE CONDUCTED IN ACCORDANCE WITH AASHTO T27
3. PROCTORS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T99
4. ATTERBERG LIMITS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T89 AND T90
5. MOISTURE DENSITY (NUCLEAR DENSITY):
   SHALL BE DONE IN ACCORDANCE WITH AASHTO T310
6. DYNAMIC CONE PENETROMETER (DCP) TESTING:
   SHALL BE DONE IN ACCORDANCE WITH ASTM D6951-03

REQUIREMENTS:

1. FILL PLACEMENT:
   - A. SOILS USED AS FILL MATERIAL SHALL BE TESTED FOR MOISTURE CONTENT AND PROCTOR TESTS.
   - B. WHERE FILL CONSTRUCTION REQUIRES MORE THAN 12 INCHES OF FILL PLACEMENT, COMPACT EACH LIFT TO A MINIMUM OF 95 PERCENT OF THE MATERIAL'S MAXIMUM STANDARD PROCTOR DRY DENSITY.
2. COMPACTED SUBGRADE (CEMENT STABILIZED):
   - A. SEE SHEET 13 FOR TESTING REQUIREMENTS AND PROCEDURE.
3. COMPACTED SUBGRADE (NON-CEMENT STABILIZED):
   - A. THE ENTIRE SUBGRADE SHALL BE PROOF-ROLLED PRIOR TO THE PLACEMENT OF THE AGGREGATE BASE TO IDENTIFY AREAS OF UNSTABLE SUBGRADE.
   - B. PERFORM A MINIMUM OF 3 DYNAMIC CONE PENETROMETER (DCP) TESTS PER ACCESS ROAD OR ONE FOR EVERY 1,000 LF OF ROAD, WHICHEVER IS GREATER. SUBGRADE MUST MEET A MINIMUM DCP OF 3 BLOWS PER 6" TO A TOTAL DEPTH OF 2' (MINIMUM CBR=1.5).
   - C. IF A PASSING PROOF-ROLL OR DCP REQUIREMENTS CANNOT BE ACHIEVED THE FOLLOWING ALTERNATIVES MAY BE IMPLEMENTED:
     - a. SCARIFY, DRY, AND RECOMPACT SUBGRADE
     - b. REMOVE UNSUITABLE MATERIAL AND REPLACE WITH SUITABLE MATERIAL
     - c. INCREASE AGGREGATE BASE THICKNESS
4. AGGREGATE BASE:
   - A. AGGREGATE BASE SHALL BE PROOF-ROLLED OVER THE ENTIRE LENGTH. IF PROOF ROLLING DETERMINES THAT THE ROAD IS UNSTABLE, ADDITIONAL AGGREGATE SHALL BE ADDED UNTIL THE UNSTABLE SECTION IS ABLE TO PASS A PROOF ROLL.
   - B. PROVIDE 1 SIEVE ANALYSIS (PROJECT MAX OF 20) PER 2500 CY OF ROAD BASE PLACED.
5. CRANE PAD AND CRANE PATHS / CRANE TRAVEL SHOULDERS:
   - A. TESTING REQUIREMENTS ARE PENDING BASED ON CRANE PICK PLANS PROVIDED BY THE CONTRACTOR.

TABLE 2: TESTING SCHEDULE SUMMARY		
LOCATION	TEST	FREQUENCY
FILL PLACEMENT	PROCTOR	1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER LIFT PER 5000 SF OF FILL PLACED OR 1 PER 500 LF OF ROAD OR CRANE WALK
COMPACTED SUBGRADE (CEMENT STABILIZED):	SEE SHEET 13	SEE SHEET 13
COMPACTED SUBGRADE (NON-CEMENT STABILIZED):	PROOF-ROLL	ENTIRE AREA
	DCP	1 PER 1,000 FT OR MIN. 3 PER ROAD
AGGREGATE BASE	PROOF-ROLL	ENTIRE AREA
	SIEVE ANALYSIS, LL, PL, AND L.A ABRASION	1 PER 2,500 CY

GENERAL NOTES:

1. GROUND SURFACE CONTOURS (AT TWO-FOOT VERTICAL INTERVALS) AND ELEVATIONS ARE BASED ON A PHOTOGRAMMETRY SURFACE PROVIDED BY GEOTERRA. IF MAJOR DISCREPANCIES ARE FOUND IN THE GROUND ELEVATIONS DURING FIELD STAKING TO THE GROUND ELEVATIONS SHOWN ON THE PLANS, THE OWNER AND ENGINEER SHALL BE NOTIFIED.
2. WHERE SECTION OR SUBSECTION MONUMENTS ARE ENCOUNTERED, THE OWNER SHALL BE NOTIFIED BEFORE SUCH MONUMENTS ARE REMOVED. THE CONTRACTOR SHALL PROTECT AND CAREFULLY PRESERVE ALL PROPERTY MARKERS AND MONUMENTS UNTIL THE OWNER, AN AUTHORIZED SURVEYOR OR AGENT HAS WITNESSED OR OTHERWISE REFERENCED THEIR LOCATION.
3. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. TYPICAL DISTURBANCE SHALL BE LIMITED TO 10 LF FROM THE EDGE OF PROPOSED GRADING.
4. FINALIZE GRADING AROUND THE BASE OF TURBINES IN ACCORDANCE WITH DETAIL TS-03 AND TS-04.
5. GRADE ALL PROPOSED ROADS TO A MAXIMUM SLOPE OF 8%. IF 8% SLOPE CANNOT BE ACHIEVED, THE CONTRACTOR MAY UTILIZE ASSIST VEHICLES FOR THE PURPOSE OF DELIVERIES. GRADE ALL PROPOSED CRANE PATHS TO A MAXIMUM OF 8% UNLESS OTHERWISE NOTED IN PLAN SHEETS.
6. ANY FACILITIES REMOVED TO ALLOW FOR CONSTRUCTION (MAILBOXES, SIGNS, FENCES, ETC.) SHALL BE REPLACED BY THE CONTRACTOR IN A CONDITION AS GOOD AS EXISTING.
7. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING DRAINAGE THROUGHOUT THE CONSTRUCTION OF THIS PROJECT. CONSTRUCTION ACTIVITIES SHALL NOT BLOCK THE NATURAL OR MANMADE CREEKS OR DRAINAGE SWALES CAUSING RAINWATER TO POND. DEPENDING ON FIELD CONDITIONS, ADDITIONAL CULVERTS IN EXCESS OF THOSE ON THE PLANS MAY BE REQUIRED.
8. WHILE BUILDING THE ROADS AND EXCAVATING THE TURBINE FOUNDATIONS, EXCESS SOIL WILL RESULT. THE CONTRACTOR SHALL DISPOSE OF THIS EXCESS SOIL IN AN APPROVED MANNER. EXCESS TOPSOIL SHALL BE DISTRIBUTED INTO A THIN LAYER ON LAND IMMEDIATELY ADJACENT TO WHERE THE TOPSOIL ORIGINATED. ALL EXCESS TOPSOIL TO BE WASTED ONSITE. WHILE DOING SO THE CONTRACTOR SHALL AVOID CAUSING RIDGES OR MOUNDS THAT WOULD MAKE IT DIFFICULT FOR STORM WATER RUNOFF TO DRAIN. THE FINAL SURFACE OF THE DISTURBED TOPSOIL SHALL BE SMOOTH AND FOLLOW THE NATURAL CONTOUR OF THE LAND.
9. THE CONTRACTOR SHALL NOTIFY SOUTH DAKOTA 811 AT LEAST 48 HOURS BEFORE EXCAVATION ACTIVITIES COMMENCE.
10. TEMPORARY INTERSECTION WIDENING SHALL, UPON COMPLETION OF ALL PROJECT CONSTRUCTION OR UPON NOTIFICATION OF THE ENGINEER, BE REMOVED AND THE AREA RESTORED TO ITS ORIGINAL LINES AND GRADES WITH TOPSOIL REPLACED, EXCEPT WHERE REQUESTED BY THE TOWNSHIP OR COUNTY TO PERMANENTLY REMAIN. DISTURBED AREAS OUTSIDE OF THE FINAL ROADWAY SHALL BE SEEDED AND MULCHED.
11. TURBINE SETBACKS ARE NOT IDENTIFIED ON THE CONSTRUCTION PLANS. IT SHALL BE THE RESPONSIBILITY OF THE OWNER AND CONTRACTOR TO ENSURE THAT ALL TURBINE SETBACKS MEET PROJECT REQUIREMENTS.
12. GEOTECHNICAL REPORTS WITH RECOMMENDATIONS HAVE BEEN PROVIDED BY THE OWNER. ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL ENGINEERING REPORT AND RECOMMENDATIONS.
13. FIELD SURVEY WETLAND INFORMATION HAS BEEN PROVIDED BY THE OWNER. ALL WETLAND DELINEATIONS AND PERMITTING SHALL BE THE RESPONSIBILITY OF OTHERS AND BE COMPLETED PRIOR TO CONSTRUCTION COMMENCING. THE OWNER AND GENERAL CONTRACTOR SHALL VERIFY THAT ALL WETLAND PERMITS HAVE BEEN SUBMITTED AND APPROVED PRIOR TO CONSTRUCTION COMMENCING.
14. CULTURAL RESOURCE REPORTS HAVE NOT BEEN PROVIDED. CULTURAL RESOURCE LOCATIONS ARE NOT SHOWN ON THE PLANS. INFORMATION WILL BE THE RESPONSIBILITY OF THE OWNER AND GENERAL CONTRACTOR. THE LOCATIONS OF CULTURAL RESOURCE SITES MAY BE CONFIDENTIAL AND PROTECTED BY STATE OR FEDERAL LAW. PUBLIC RELEASE OF SPECIFIC INFORMATION REGARDING THESE RESOURCES MAY BE RESTRICTED.
15. AN ENVIRONMENTAL ASSESSMENT HAS NOT BEEN PROVIDED. THE CONTRACTOR SHALL BE FAMILIAR WITH THE REPORT AND REVIEW ALL RECOMMENDATIONS.
16. ELECTRICAL INFORMATION SHOWN ON THE PLANS IS FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSULTANT'S PLANS FOR SPECIFIC LOCATIONS AND CONSTRUCTION DETAILS FOR THE UNDERGROUND POWER COLLECTION SYSTEM AND SUBSTATION.
17. CRANE PATHS ARE SHOWN ON THE CONSTRUCTION PLANS. IF THE CONTRACTOR PROPOSES ALTERNATE CRANE PATHS, THEY SHALL ENSURE THAT WETLAND AND CULTURAL RESOURCE CORRIDORS ARE NOT DISTURBED. FINAL CRANE PATH ALIGNMENTS SHALL BE DETERMINED BY THE CONTRACTOR BASED ON FIELD CONDITIONS WITHIN THE WETLAND AND CULTURAL RESOURCE CORRIDORS, SPECIAL LANDOWNER AGREEMENTS AND THE PROJECT BOUNDARY.
18. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. DISTURBANCE SHALL BE LIMITED TO 50 LF WIDTH FOR PROPOSED ACCESS ROADS AND 50 LF FOR CRANE PATHS, AND SHALL BE LIMITED TO A 250 LF RADIUS FOR PROPOSED WIND TURBINE GENERATORS. THE GRADING LIMITS SHALL BE CENTERED ON THE ROADWAYS AND WIND TURBINES. THE CONTRACTOR SHALL MAKE ALL EFFORTS TO KEEP ACTIVITIES WITHIN THE ERECTION AREAS SHOWN ON THE PLANS BUT IT IS UNDERSTOOD THAT SOME ACTIVITIES THAT WILL NOT REQUIRE GRADING OR SOIL DISTURBANCE MAY EXTEND BEYOND THE DEFINED LIMITS. DURING ERECTION OF THE ROTOR, TRUCKS AND/OR FORKLIFTS MAY EXTEND BEYOND THESE LIMITS. SEE DETAIL TS01 FOR TYPICAL ERECTION AREAS.
19. AN ALTA SURVEY HAS BEEN PROVIDED BY WESTWOOD. CONTRACTOR AND OWNER ARE RESPONSIBLE FOR LOCATING ALL UTILITIES AND VERIFYING LOCATION OF CONSTRUCTION ACTIVITIES PRIOR TO COMMENCING WORK.

STORMWATER POLLUTION PREVENTION PLAN (SWPPP):

1. THE CONTRACTOR SHALL PROVIDE EROSION CONTROL MEASURES AS PLANNED AND SPECIFIED FOLLOWING BEST MANAGEMENT PRACTICES AS OUTLINED BY THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND BEING IN CONFORMANCE WITH THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL STORMWATER PERMIT.
2. REFER TO THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR THE TRIPLE H WIND FARM, PREPARED BY WESTWOOD PROFESSIONAL SERVICES, FOR EROSION CONTROL AND RESTORATION SPECIFICATIONS, SEDIMENT AND EROSION CONTROL PROCEDURES, LOCATIONS OF BMPs, DETAILS, AND INSPECTION INFORMATION.
3. ALL PASTURES AND DRAINAGE SWALES DISTURBED DURING CONSTRUCTION ACTIVITIES AND NOT COVERED BY ROAD SURFACING MATERIALS, SHALL BE SEEDED IN ACCORDANCE WITH THE SWPP PLAN.
4. TEMPORARY EROSION CONTROL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE TEMPORARY EROSION CONTROL PLAN SHALL BE IN ACCORDANCE WITH THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND THE TRIPLE H WIND FARM STORMWATER POLLUTION PREVENTION PLAN ON FILE.

PROJECT CONTACT INFORMATION:

TITLE	COMPANY	NAME	CONTACT NUMBER
OWNER (PRIMARY)	ENGIE	CASEY WILLIS	805-569-6185
PROJECT MANAGER	WESTWOOD	DANI NYGREN	952-906-7493
ENGINEER OF RECORD	WESTWOOD	ROB COPOULS	952-906-7470
CONTRACTOR	WANZEK	JASON HELLERUD	701-893-3685

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #300
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 [illegible]
Westwood Professional Services, Inc.

Designed: [illegible]
Checked: [illegible]
Drawn: [illegible]
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2028 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 12 OF 57

0014440DTP.dwg

©2019 Westwood Professional Services, Inc.

CEMENT STABILIZATION - PROCEDURE

THE SPECIFICATIONS BELOW ARE GENERAL RECOMMENDATIONS/GUIDELINES FOR CEMENT STABILIZATION OF SUBGRADES FOR THE PROJECT. ACTUAL FIELD CONDITIONS MAY ALTER APPLICATION RATE. CONSULT GEOTECHNICAL ENGINEER FOR FURTHER RECOMMENDATIONS.

1. STRIP THE TOP ±4 INCHES OF TOPSOIL (THROUGH THE ROOT ZONE) FROM THE AREA TO BE STABILIZED. ROOTS SMALLER THAN 1/4" DIAMETER ARE CONSIDERED INSIGNIFICANT.
2. PERFORM A PROCTOR (ASTM D 698) TEST TO DETERMINE THE OPTIMUM MOISTURE CONTENT IF THE MATERIAL TO BE STABILIZED DOES NOT MATCH A PREVIOUSLY PERFORMED PROCTOR.
3. DETERMINE THE IN-SITU MOISTURE CONTENT USING A NUCLEAR DENSITY GAUGE (OR EQUIVALENT MOISTURE CONTENT TEST) DAILY, PRIOR TO INCORPORATION OF THE CEMENT. PROVIDE ADDITIONAL MOISTURE CONTENT TESTING AS NEEDED BASED ON WEATHER CONDITIONS.
   - 3.1. THE CONTRACTOR WILL BE ADVISED OF IN-SITU MOISTURE CONTENT, AND MOISTURE ADJUSTMENTS SHOULD BE MADE IF IN-SITU MOISTURE IS LESS THAN OPTIMUM MOISTURE CONTENT AS DETERMINED BY THE PROCTOR (ASTM D 698).
4. SOIL AND CEMENT BLENDING:
   - 4.1. COMPLETELY BLEND SUBGRADE SOIL WITH THE APPROPRIATE AMOUNT OF CEMENT BY WEIGHT. FIELD RESULTS FROM TEST STRIPS WILL DICTATE THE CEMENT APPLICATION RATE.
   - 4.2. IN AREAS OF HIGH MOISTURE OR POOR SOILS, THE CONTRACTOR MAY INCREASE THE PERCENT OF CEMENT IN ORDER TO MEET THE MINIMUM SUBGRADE STRENGTH REQUIREMENTS.
   - 4.3. THE USE OF A RECLAIMER IS AN ADEQUATE BLENDING METHOD. DISCING IS NOT AN ADEQUATE BLENDING METHOD.
   - 4.4. A STABILIZATION DEPTH OF 12" WAS USED FOR DESIGN PURPOSES. STABILIZATION DEPTH MAY NEED TO INCREASE TO 18" IN AREAS OF EXTREME MOISTURE OR POOR SOILS IN ORDER TO MEET THE STRENGTH AND PROOF ROLL REQUIREMENTS.
5. COMPACTION:
   - 5.1. A ROLLING PATTERN WILL BE ESTABLISHED USING A NUCLEAR DENSITY GAUGE DURING COMPACTION.
     - 5.1.1. COMPACTION WILL BE PERFORMED UNTIL THE STABILIZED MATERIAL REACHES THE "BREAK POINT" AFTER WHICH ADDITIONAL PASSES WITH A ROLLER RESULTS IN A LOSS OF DENSITY AS MEASURED BY A NUCLEAR DENSITY GAUGE.
     - 5.1.2. COMPACTION IS TYPICALLY ACHIEVED BY MULTIPLE PASSES OF A PADFOOT ROLLER UNTIL THE ROLLER "WALKS" OUT OF THE RECLAIMED MATERIAL (SPACE IS VISIBLE BETWEEN THE DRUM AND THE RECLAIMED MATERIAL). THIS IS FOLLOWED BY BLADING AND SHAPING THE RECLAIMED MATERIAL TO FINAL PROFILE AND CROSS SECTION, REMOVING HIGH AND LOW POINTS. SMOOTH DRUM OR RUBBER TIRE ROLLERS ARE THEN USED TO FINISH ROLLING (THIS IS WHEN THE DENSITY TESTS ARE PERFORMED) UNTIL THE DENSITY OF THE MATERIAL REACHES THE "BREAK POINT."
     - 5.1.3. THE NUMBER OF PASSES AND EQUIPMENT USED TO REACH THE "BREAK POINT" IS CONSIDERED THE ROLLING PATTERN.
     - 5.1.4. A NEW ROLLING PATTERN MAY NEED TO BE ESTABLISHED IF THE PERFORMANCE REQUIREMENTS ARE NOT BEING MET. THIS MAY BE DUE TO CHANGES IN THE MOISTURE CONTENT, THE SOIL TYPE, OR THE CEMENT RATE.
   - 5.2. THE TARGET DENSITY IS 98% OF THE MAXIMUM DENSITY DETERMINED FROM THE ROLLING PATTERN.
     - 5.2.1. DENSITY TESTS SHALL BE TAKEN AT THE RATE OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER TO CONFIRM THE DENSITY IS MATCHING THE TARGET. ONCE THE ROLLING PATTERN HAS BEEN CONFIRMED IT IS RECOMMENDED THAT TESTING CONTINUE AT 1 TEST PER 1,000 LF IN EACH PASS OF THE RECLAIMER.
     - 5.2.2. IF IT IS NOT POSSIBLE TO ATTAIN THE TARGET DENSITY, AND ADDITIONAL COMPACTION DOES NOT IMPROVE THE DENSITY, A NEW ROLLING PATTERN SHOULD BE ESTABLISHED.
   - 5.3. THE AIR TEMPERATURE SHALL BE ABOVE 40 DEGREES (F) DURING THE CEMENT STABILIZATION PROCESS. MIXING CEMENT INTO FROZEN GROUND IS NOT ACCEPTABLE.
6. THE STABILIZED MATERIAL SHALL BE CONTINUOUSLY WET CURED FOR A MINIMUM OF 24 HOURS (WET CURED IS IDENTIFIED VISUALLY AS DAMP SURFACE).
7. PERFORM SUBGRADE TESTING IN ACCORDANCE WITH TESTING SCHEDULE.
8. AGGREGATE PLACEMENT:
   - 8.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 8.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 8.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

CEMENT STABILIZATION - DESIGN BASIS

1. DURING INITIAL CONSTRUCTION, CONTRACTOR SHALL CONSTRUCT MINIMUM 300 LF TEST STRIPS CONTAINING 4%, 5%, AND 6% CEMENT IN ACCORDANCE WITH CEMENT STABILIZATION PROCEDURES.
2. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 3 FOR ANTICIPATED RESULTS):
   - 2.1. PERFORM INITIAL SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M BETWEEN 4 TO 8 HOURS AFTER FINAL COMPACTION.
   - 2.2. PERFORM ADDITIONAL DCP TESTING AT 24 AND 48 HOURS AFTER FINAL COMPACTION.
   - 2.3. PERFORM SUBSEQUENT DCP TESTS AT 7 DAYS AFTER FINAL COMPACTION AS VERIFICATION OF STRENGTH CURVE.
   - 2.4. A MINIMUM OF 3 TESTS PER TEST SECTION PER TIMEFRAME IS REQUIRED. TESTS SHALL BE TAKEN AT THE CENTERLINE AND 2' FROM EACH SHOULDER.
   - 2.5. RECORD DCP TEST RESULTS EVERY 6 INCHES TO TOTAL DEPTH OF 12 INCHES.

TABLE 3: TEST STRIP CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	COMPRESSIVE STRENGTH (PSF)
4 – 6 HOURS	6	5	1,800
24 HOURS	10	7	2,500
48 HOURS	15	10	3,200
7 DAYS	30	21	5,200

CEMENT STABILIZATION - PRODUCTION

1. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 5 FOR SUMMARY OF TESTING REQUIREMENTS):
   - 1.1. PERFORM SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M NO SOONER THAN 24 HOURS AFTER FINAL COMPACTION.
   - 1.2. DCP TESTING FREQUENCY SHALL BE WITH A RANDOM SPACING AND A MINIMUM OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER. A MINIMUM OF 3 TESTS PER ROAD IS REQUIRED.
   - 1.3. THE CBR OF THE STABILIZED SUBGRADE SHOULD BE CALCULATED IN 6" INCREMENTS THROUGH THE ENTIRE DEPTH OF THE STABILIZED LAYER.
   - 1.4. THE MINIMUM REQUIRED CBR PRIOR TO PROOF-ROLLING IS PROVIDED IN TABLE 4 BELOW:

TABLE 4: FINAL CEMENT STABILIZED CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	UNDRAINED SHEAR STRENGTH (PSF)	BEARING CAPACITY (PSF)
24 – 48 HOURS	15	10	3,500	9,800
3 – 7 DAYS	30	21	7,000	18,000
28 DAYS	50	33	12,000	28,500

NOTE: UNDRAINED SHEAR STRENGTH WAS CALCULATED USING THE BLACK (1961) EQUATION. BEARING CAPACITY WAS CALCULATED USING THE VESIC EQUATION MODIFIED FOR TWO LAYERS (12" CEMENT STABILIZED SUBGRADE OVER A NATURAL SUBGRADE WITH A CBR OF 1.5)

   - 1.5. ONCE THE MINIMUM REQUIRED CBR IS ACHIEVED AT ANY CORRESPONDING TIME PERIOD, THE SUBGRADE IS CONSIDERED ADEQUATE AND THE CONTRACTOR MAY PROCEED WITH PROOF-ROLL TESTING. FUTURE DCP TESTING ON THAT SEGMENT OF SUBGRADE IS NOT REQUIRED.
   - 1.6. IF TESTING DOES NOT INDICATE A CBR OF 30 WITHIN 7 DAYS, ADDITIONAL GRAVEL SURFACING AND/OR THE ADDITION OF GEOTEXTILE FABRIC MAY BE REQUIRED. FOR FUTURE SUBGRADE STABILIZATION AREAS, CONTACT THE ENGINEER AND OWNER VIA RFI FOR RECOMMENDATIONS AND APPROVAL.
2. SUBGRADE PROOF-ROLL TESTING AND ACCEPTANCE:
   - 2.1. ONCE THE REQUIRED DCP VALUE HAS BEEN OBTAINED BUT PRIOR TO PLACING AGGREGATE, THE SUBGRADE SHALL BE PROOF-ROLLED. REFER TO THE PROJECT TESTING REQUIREMENTS FOR PROOF-ROLL DEFINITION.
   - 2.2. PROOF-ROLLING SHOULD BE PERFORMED WITH ONE PASS DOWN THE CENTER AND NOT BE PERFORMED WITHIN 12 INCHES OF THE EDGE OF THE STABILIZED SECTION.
   - 2.3. IF PROOF-ROLLING FAILS, RE-STABILIZATION MAY BE REQUIRED AND A NEW ROLLING PATTERN OR ADDITIONAL CEMENT MAY BE REQUIRED.
3. AGGREGATE PLACEMENT:
   - 3.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 3.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 3.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

TABLE 5: CEMENT STABILIZATION PRODUCTION TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
COMPACTED SUBGRADE (CEMENT STABILIZED)	PROCTOR	MINIMUM 1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER 1000 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
NOTE: SEE ABOVE FOR INITIAL TESTING REQUIREMENTS	DCP TEST	1 PER 500 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
	PROOF-ROLL (AFTER PASSING DCP TESTS)	ENTIRE LENGTH

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (866) 937-5150
Westwood Professional Services, Inc.

Designed: BMK
Checked: DJH
Drawn: BMK
As-Built Drawings:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2028 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 13 OF 57

00144400.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. County Road 649 in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 3585' South of County Road 649 & 205th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.24'03.10" W Long. -99.36'12.37" W
4. Width of entrance: 16' access road & 25' temporary intersection modification
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001155 SE4 21-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Tanya Lane
Signature of Applicant

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. County Road 649 in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 3585' South of County Road 649 & 205th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.24'03.10" W Long. -99.36'12.37" W
4. Width of entrance: 16' access road & 25' temporary intersection modification
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001155 SE4 21-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: _____

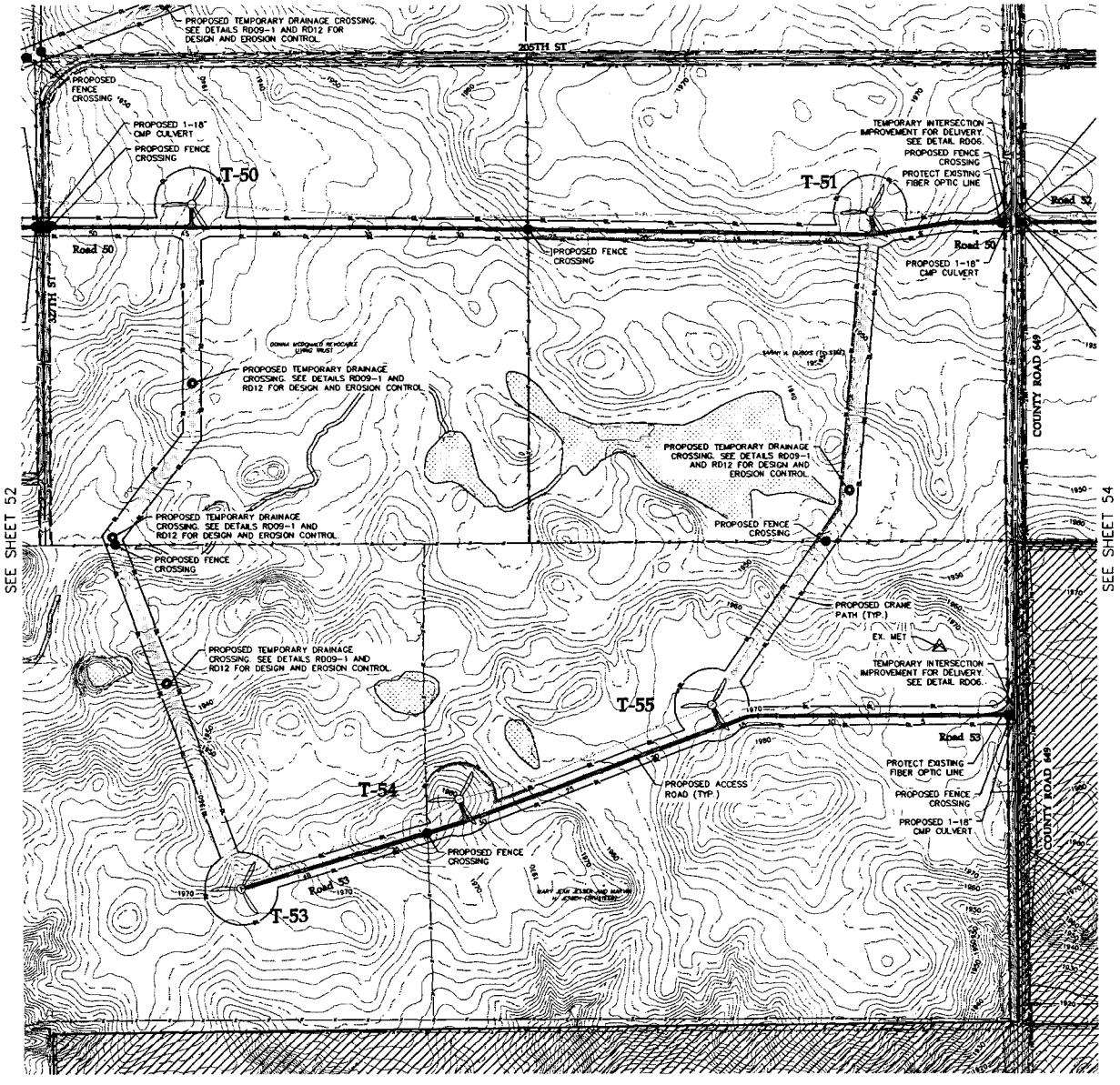
Signature of Applicant

Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

©2019 Westwood Professional Services, Inc.



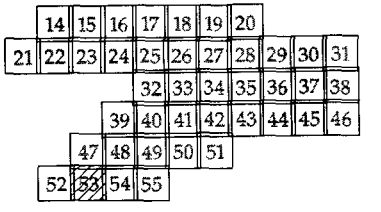
LEGEND:

- PROPOSED TURBINE LOCATION
- T-XX PROPOSED TURBINE NUMBER
- PROPOSED ALTERNATE TURBINE LOCATION
- ALT-XX PROPOSED ALTERNATE TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED ALTERNATE ACCESS ROAD
- PROPOSED CRANE PATH
- PROPOSED UNDERGROUND COLLECTION*
- PROPOSED DISTURBANCE LIMITS
- PROPOSED PERIMETER SEDIMENT CONTROL
- 980 EXISTING 10' CONTOURS
- EXISTING 2' CONTOURS
- EXISTING GRAVEL EDGE
- EXISTING BITUMINUS EDGE
- EXISTING RIGHT-OF-WAY
- EXISTING PARCEL LINE
- EXISTING BUILDING
- EXISTING FENCE
- EXISTING OVERHEAD POWER
- EXISTING HIGH VOLTAGE OVERHEAD POWER
- EXISTING UNDERGROUND POWER LINE
- EXISTING FIBER OPTIC LINE
- EXISTING WATER LINE
- DELINEATED WETLAND
- ARCHAEOLOGICAL AVOIDANCE AREA
- EXISTING USFWS EASEMENT
- PROJECT BOUNDARY
- 1900 EXISTING GROUND ELEVATION
- PROPOSED DRAINAGE CROSSING**
- PROPOSED TEMPORARY DRAINAGE CROSSING**
- PROPOSED FENCE CROSSING***
- PROPOSED UTILITY CROSSING
- PROPOSED CULVERT

* PROVIDED BY OTHERS AND SHOWN FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSTRUCTION PLANS FOR DETAILS.

** SEE SHEET 11 FOR DRAINAGE CROSSING TYPE AND SIZING. DRAINAGE CROSSINGS SHALL CONSIST OF LOW WATER CROSSING OR CULVERT. DRAINAGE CROSSINGS ALONG CRANE PATH SHALL CONSIST OF CRANE MATS OR TEMPORARY CULVERT.

*** ALL GATE INSTALLATIONS SHALL BE FIELD DETERMINED AND AGREED UPON BY THE CONTRACTOR AND OWNER.



KEY MAP

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com

Westwood Professional Services, Inc.

Designed:	BMK
Checked:	DJH
Drawn:	BMK
As-Built Drawing:	

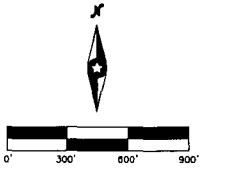
Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2008 2nd Avenue NW
West Fargo, ND 58078



Triple H Wind Farm

Hyde County, South Dakota

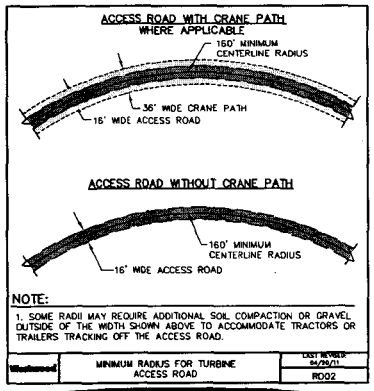
Site Plan T-50 - T-51, T-53 - T-55

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 53 OF 57

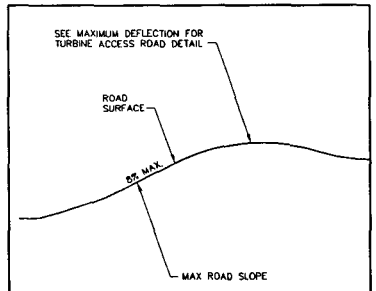
0014440SP01.dwg

© 2019 Westwood Professional Services, Inc.



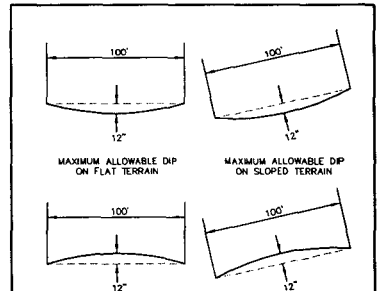
NOTE:
1. SOME RADII MAY REQUIRE ADDITIONAL SOIL COMPACTION OR GRAVEL OUTSIDE OF THE WIDTH SHOWN ABOVE TO ACCOMMODATE TRACTORS OR TRAILERS TRACKING OFF THE ACCESS ROAD.

Westwood	MINIMUM RADIUS FOR TURBINE ACCESS ROAD	LAST REVISED: 04/29/11 RD02

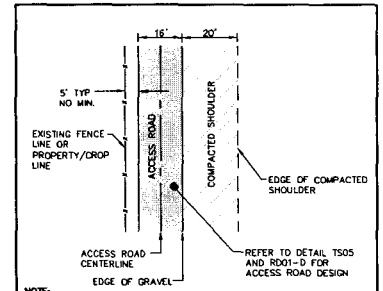


NOTES:
1. ROAD SLOPE SHALL NOT EXCEED 8% WITHOUT OWNER APPROVAL

Westwood	MAXIMUM VERT. SLOPE FOR TURBINE ACCESS ROAD/CRANE TRAVEL PATH	LAST REVISED: 3/29/12 RD03

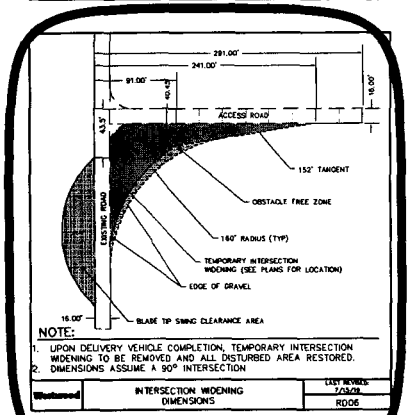


Westwood	MAXIMUM DEFLECTION FOR TURBINE ACCESS ROAD	LAST REVISED: 01/09/08 RD04



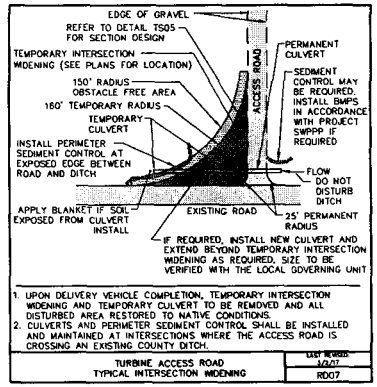
NOTE:
1. COMPACTED SHOULDER SHALL BE RETURNED TO NATIVE CONDITION FOLLOWING TURBINE GENERATOR CONSTRUCTION.
2. THE ACCESS ROAD MAY NEED TO BE CONSTRUCTED FARTHER FROM THE PROPERTY LINE IF OBSTRUCTIONS SUCH AS TREES FOLLOW THE PROPERTY LINE.

Westwood	TURBINE ACCESS ROAD ALONG FENCE/PROPERTY/CROP LINE	LAST REVISED: 3/29/12 RD05



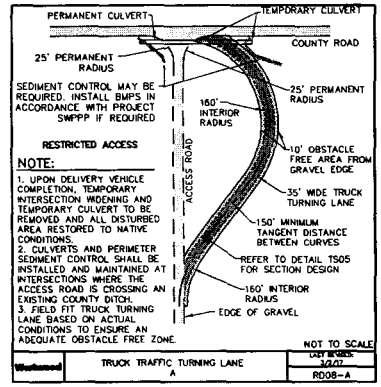
NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING TO BE REMOVED AND ALL DISTURBED AREA RESTORED.
2. DIMENSIONS ASSUME A 90° INTERSECTION

Westwood	INTERSECTION WIDENING DIMENSIONS	LAST REVISED: 7/13/18 RD06



1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.

Westwood	TURBINE ACCESS ROAD TYPICAL INTERSECTION WIDENING	LAST REVISED: 3/2/07 RD07

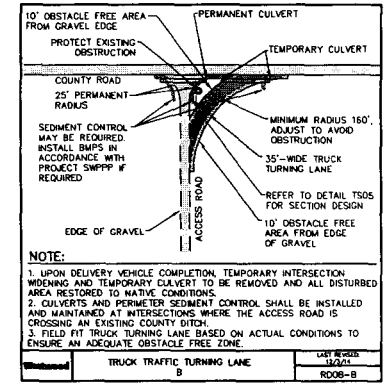


RESTRICTED ACCESS

NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

NOT TO SCALE

Westwood	TRUCK TRAFFIC TURNING LANE A	LAST REVISED: 3/2/07 RD08-A



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

Westwood	TRUCK TRAFFIC TURNING LANE B	LAST REVISED: 12/3/01 RD08-B

Westwood

Phone (952) 937-5150 | 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 | Minnetonka, MN 55343
Toll Free (888) 937-5150 | westwoodps.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: DBH
Drawn: BMK
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2028 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

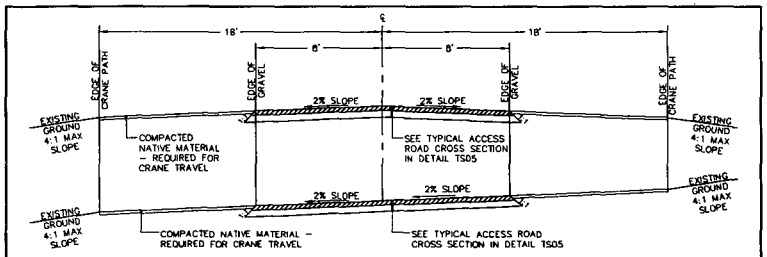
Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 5 OF 57

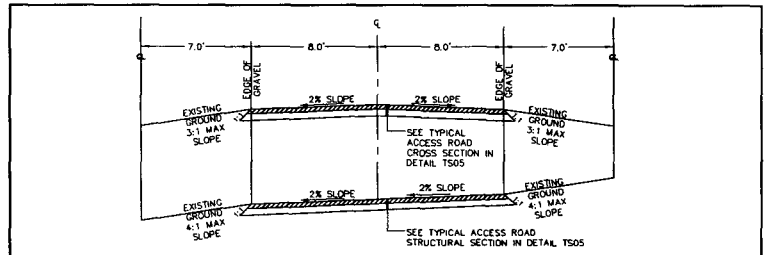
0014440DTP.dwg

©2019 Westwood Professional Services, Inc.



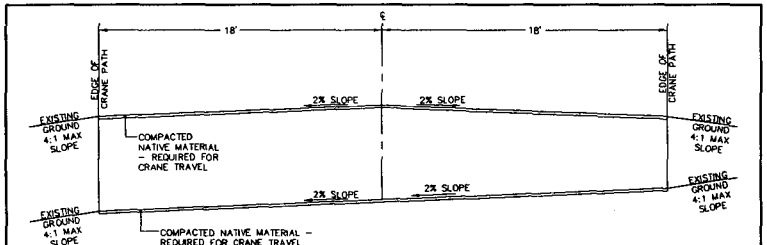
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE ACCESS ROAD DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

Westwood | TYPICAL TURBINE ACCESS ROAD AND CRANE PATH | LAST REVISED 04/29/21 | RD01-A



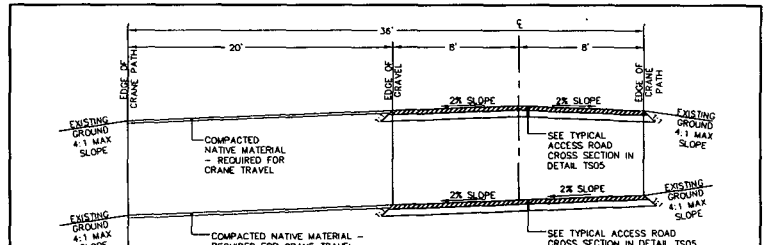
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

Westwood | TYPICAL TURBINE ACCESS ROAD SECTION | LAST REVISED 3/04/21 | RD01-B



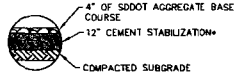
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE WHERE CRANE PATHS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT CRANE PATH REMAINS WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%

Westwood | TYPICAL CRANE PATH | LAST REVISED 04/29/21 | RD01-C

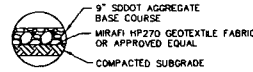


NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE EDGE OF COMPACTED SHOULDER DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

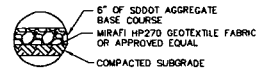
Westwood | TYPICAL TURBINE ACCESS ROAD AND OFFSET CRANE PATH | LAST REVISED 04/29/21 | RD01-D



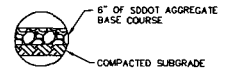
PRIMARY ACCESS ROAD CROSS SECTION*



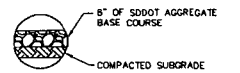
SECONDARY TURBINE ACCESS ROAD CROSS SECTION



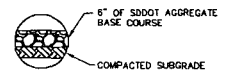
SPUR ROAD / MET TOWER ROAD CROSS SECTION



TEMPORARY TURNING IMPROVEMENTS CROSS SECTION



GRAVEL RING CROSS SECTION



LAYDOWN YARD CROSS SECTION

* CEMENT APPLICATION RATE MAY VARY BASED ON TEST STRIPS AND FIELD PERFORMANCE. SEE SHEET 13 FOR CEMENT STABILIZATION PROCEDURE AND DESIGN BASIS.

NOTES:
STRUCTURAL SECTIONS SHOWN ARE THE MINIMUM THICKNESS REQUIREMENTS DURING NORMAL FIELD CONDITIONS. THE SECTIONS MAY NEED TO BE INCREASED BASED ON ACTUAL FIELD CONDITIONS AT THE TIME OF CONSTRUCTION. CONDITIONS INCLUDE BUT ARE NOT LIMITED TO CONSTRUCTION DURING THE FREEZE/THAW CYCLE, UNUSUALLY WET PERIODS, OR IN LOW/WET AREAS. SEE SHEET 12 FOR TESTING REQUIREMENTS AND SPECIFICATIONS.

Westwood | TYPICAL STRUCTURAL CROSS SECTIONS

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-Free (866) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed: BMC
Checked: BJH
Drawn: BMC
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2038 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 4 OF 57

0014440DTP.dwg

©2019 Westwood Professional Services, Inc.

ROAD DESIGN PARAMETERS

1. ACCESS ROADS HAVE BEEN DESIGNED TO ACCOMMODATE LIGHT DUTY TRUCKS (PICKUP TRUCKS AND MAINTENANCE VEHICLES) FOR LOW VOLUME USE IN NORMAL OPERATING CONDITIONS AS WELL AS HEAVY DUTY CONSTRUCTION TRAFFIC UNDER DRY CONDITIONS. THE ROAD DESIGN SPECIFIED IS NOT INTENDED FOR ALL WEATHER USE FOR HEAVY DUTY CONSTRUCTION LOADS.
2. ROAD MAINTENANCE CAN BE EXPECTED OVER THE LIFE OF THE PERMANENT FACILITY.

PRODUCTS

1. AGGREGATE BASE SHALL CONSIST OF SDDOT AGGREGATE BASE COURSE (AND IN CONFORMANCE WITH THE GRADATION TABLE 1). AGGREGATE MAY BE CRUSHER RUN UPON ENGINEERS APPROVAL. AGGREGATE GRADATIONS SHALL BE SUBMITTED TO ENGINEER FOR REVIEW.
2. ROAD SHOULDERS AND CRANE PADS SHALL CONSIST OF COMPACTED NATIVE SOILS.
3. CULVERTS: ACCESS ROAD CULVERTS SHALL MEET THE MINIMUM SPECIFICATIONS SET FORTH BY THE SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION AND/OR HYDE COUNTY. ALL CULVERTS ARE PLANNED TO BE A MINIMUM 18" DIAMETER AND MANUFACTURED OF 16-GAGE CORRUGATED METAL PIPE WITH NO END TREATMENTS UNLESS NOTED OTHERWISE. ACTUAL SIZE WILL BE DETERMINED THROUGH HYDRAULIC ANALYSIS.
4. GEOTEXTILE FABRIC: MIRAFI HP270 OR APPROVED EQUAL.

EXECUTION

1. CLEARING AND GRUBBING
   A. THE CONTRACTOR SHALL BE REQUIRED TO GRUB ALL TREES, STUMPS, BRUSH, AND DEBRIS WITHIN THE GRADING AREAS SHOWN ON THE PLANS. GRUBBING INCLUDES REMOVAL OF ALL PLANT MATERIAL GREATER THAN 2" INCLUDING STUMPS, BRANCHES, ROOTS, ETC. TO A DEPTH BELOW THE FINAL SUBGRADE. THE CONTRACTOR IS TO REMOVE ONLY THOSE TREES WHICH ARE DESIGNATED BY THE OWNER'S REPRESENTATIVE FOR REMOVAL, AND SHALL EXERCISE EXTREME CARE AROUND EXISTING TREES TO BE SAVED.
2. TOPSOIL STRIPPING
   A. TOPSOIL, INCLUDING ROOTS LARGER THAN 2" AND LARGE ROOT MASSES, SHALL BE STRIPPED FROM ALL ROADWAY AND FOUNDATION AREAS UP TO 10'. TOPSOIL SHALL NOT BE STRIPPED OUTSIDE OF THE DESIGNATED DISTURBANCE AREAS.
   B. ANY TOPSOIL THAT HAS BEEN STRIPPED SHALL BE STOCKPILED FOR POST CONSTRUCTION REVEGETATION. ALL TOPSOIL SHALL BE REDISTRIBUTED TO THE LAND OWNER'S PROPERTY OF WHERE IT ORIGINATED FROM.
3. FILL PLACEMENT
   A. FILL PLACEMENT SHALL CONSIST OF THE PLACING OF SUITABLE FILL MATERIAL, AFTER TOPSOIL STRIPPING, ABOVE THE EXISTING GRADE. GENERALLY, SIDE SLOPES SHALL BE CONSTRUCTED AT FOUR FOOT HORIZONTAL TO ONE FOOT VERTICAL, WITH SOME LOCATIONS THROUGHOUT THE PROJECT WITH SLOPES OF TWO FEET HORIZONTAL TO ONE FOOT VERTICAL. THE MATERIAL FOR FILL CONSTRUCTION SHALL BE OBTAINED FROM THE ACCESS ROAD/TURBINE EXCAVATION (SEE GEOTECHNICAL REPORT FOR RESTRICTIONS), OR ANY SUITABLE, APPROVED SOIL OBTAINED ONSITE/OFFSITE BY CONTRACTOR, AS DIRECTED OR APPROVED BY THE ENGINEER. THIS MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 12" AND CONSTRUCTED TO 95% OF THE MAXIMUM DRY DENSITY AND WITHIN 2% OF OPTIMUM MOISTURE CONTENT, AS DETERMINED BY THE STANDARD PROCTOR (AASHTO T99).
   B. SIDE SLOPES GREATER THAN 4:1 WILL NOT BE PERMITTED, UNLESS OTHERWISE NOTED ON THE PLAN.
   C. FILL SLOPES SHALL BE BENCHED INTO THE EXISTING SLOPE TO PREVENT MOVEMENT BETWEEN THE FILL AND NATIVE SOILS. BENCHES SHOULD BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO FILL PLACEMENT. POSITIVE DRAINAGE IS REQUIRED AT BENCHED AREAS AND AT THE TOE OF FILL SLOPES TO REMOVE SURFACE WATER.
4. SUBGRADE
   A. SUBGRADE PREPARED AT GRADE OR IN CUT REQUIRES SCARIFICATION AND RECOMPACTION TO A DEPTH OF 12" OR MORE.
   B. ACCESS ROAD CROSS SLOPES SHOWN IN THE PLANS ARE MEANT AS A GUIDE. ACCESS ROAD CROSS SLOPES MAY RANGE FROM 1% – 2%, CHECK WITH THE ENGINEER IF THE CROSS SLOPE FALLS OUTSIDE OF THIS RANGE. ACCESS ROADS BEING UTILIZED FOR CRANE TRAVEL SHOULD HAVE A MAX CROSS SLOPE OF 2%.

TABLE 1: SDDOT AGGREGATE BASE COURSE – LOCALLY SOURCED	
SIEVE SIZE	PERCENT PASSING
1"	100
3/4"	80–100
1/2"	68–91
NO. 4	46–70
NO. 8	34–58
NO. 40	13–35
NO. 200	3–12
MEET FOLLOWING REQUIREMENTS PER 882.2 LIQUID LIMIT (MAX) = 25 PLASTICITY INDEX = 0–6 L.A ABRASION (% MAX) = 40% GRADATION HAS BEEN OBTAINED FROM THE 2015 SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION BOOK.	

STORM WATER DESIGN PARAMETERS

1. SEE SHEET 6 FOR CULVERT SIZING AND DESIGN PARAMETERS. SEE HYDROLOGY MEMO FOR FURTHER DESIGN CALCULATIONS. CULVERTS SHALL BE MINIMUM 18" CORRUGATED METAL PIPE. ALL TEMPORARY PORTIONS OF THE INSTALLED CULVERTS SHALL BE REMOVED UPON COMPLETION OF THE PROJECT.
2. IT IS EXPECTED THAT CULVERTS WILL BE OVERTOPPED DURING SOME STORMS AND MAINTENANCE WILL BE REQUIRED THROUGH THE LIFE OF THE PROJECT.
3. WHEN INSTALLING DRAINAGE CULVERTS THE CONTRACTOR SHALL USE JUDGMENT IN SETTING THE FLOW LINE ELEVATIONS AND CULVERT LONGITUDINAL SLOPE. TYPICALLY THE FLOW LINE ELEVATIONS AND LONGITUDINAL SLOPE OF THE CULVERT SHOULD MATCH THE NATURAL GROUND ELEVATIONS AND SLOPE TO ENSURE POSITIVE DRAINAGE. WHEN POSSIBLE, ALL CULVERTS SHOULD BE PLACED AT A MINIMUM 0.5% GRADE.
4. ANTICIPATED CULVERT CROSSINGS ARE SHOWN ON THE CONSTRUCTION PLAN, ADDITIONAL CULVERTS MAY NEED TO BE INSTALLED IN AREAS WHERE CONCENTRATED FLOW IS EXPECTED DUE TO CONSTRUCTION ACTIVITIES.
5. CONSTRUCTION DRAINAGE CROSSINGS TO MAINTAIN EXISTING FLOW CHARACTERISTICS OF THE FEATURES. FEATURES SHALL BE GRADED TO PRECONSTRUCTION CONTOURS.

TESTING:

1. TESTING SHALL BE PERFORMED BY A DESIGNATED INDEPENDENT TESTING AGENCY.
2. SUBMIT ONE SET OF TESTING AND INSPECTION RECORDS SPECIFIED TO THE CIVIL ENGINEER OF RECORD.

DEFINITIONS:

1. PROOF ROLLING:
   SHALL BE PERFORMED IN THE PRESENCE OF THE GEOTECHNICAL ENGINEER OR QUALIFIED GEOTECHNICAL REPRESENTATIVE USING A FULLY LOADED TANDEM AXLE DUMP TRUCK OR WATER TRUCK WITH A MINIMUM GROSS WEIGHT OF 25 TONS OR A FULLY LOADED BELLY DUMP WITH AN EQUIVALENT AXLE LOADING. PROOF-ROLLING ACCEPTANCE STANDARDS INCLUDE NO RUTTING GREATER THAN 1.5 INCHES, AND NO "PUMPING" OF THE SOIL BEHIND THE LOADED TRUCK.
2. SIEVE ANALYSIS:
   SHALL BE CONDUCTED IN ACCORDANCE WITH AASHTO T27
3. PROCTORS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T99
4. ATTERBERG LIMITS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T89 AND T90
5. MOISTURE DENSITY (NUCLEAR DENSITY):
   SHALL BE DONE IN ACCORDANCE WITH AASHTO T310
6. DYNAMIC CONE PENETROMETER (DCP) TESTING:
   SHALL BE DONE IN ACCORDANCE WITH ASTM D6951-03

REQUIREMENTS:

1. FILL PLACEMENT:
   A. SOILS USED AS FILL MATERIAL SHALL BE TESTED FOR MOISTURE CONTENT AND PROCTOR TESTS.
   B. WHERE FILL CONSTRUCTION REQUIRES MORE THAN 12 INCHES OF FILL PLACEMENT, COMPACT EACH LIFT TO A MINIMUM OF 95 PERCENT OF THE MATERIAL'S MAXIMUM STANDARD PROCTOR DRY DENSITY.
2. COMPACTED SUBGRADE (CEMENT STABILIZED):
   A. SEE SHEET 13 FOR TESTING REQUIREMENTS AND PROCEDURE.
3. COMPACTED SUBGRADE (NON-CEMENT STABILIZED):
   A. THE ENTIRE SUBGRADE SHALL BE PROOF-ROLLED PRIOR TO THE PLACEMENT OF THE AGGREGATE BASE TO IDENTIFY AREAS OF UNSTABLE SUBGRADE.
   B. PERFORM A MINIMUM OF 3 DYNAMIC CONE PENETROMETER (DCP) TESTS PER ACCESS ROAD OR ONE FOR EVERY 1,000 LF OF ROAD, WHICHEVER IS GREATER. SUBGRADE MUST MEET A MINIMUM DCP OF 3 BLOWS PER 6" TO A TOTAL DEPTH OF 2' (MINIMUM CBR=1.5).
   C. IF A PASSING PROOF-ROLL OR DCP REQUIREMENTS CANNOT BE ACHIEVED THE FOLLOWING ALTERNATIVES MAY BE IMPLEMENTED:
      a. SCARIFY, DRY, AND RECOMPACT SUBGRADE
      b. REMOVE UNSUITABLE MATERIAL AND REPLACE WITH SUITABLE MATERIAL
      c. INCREASE AGGREGATE BASE THICKNESS
4. AGGREGATE BASE:
   A. AGGREGATE BASE SHALL BE PROOF-ROLLED OVER THE ENTIRE LENGTH. IF PROOF ROLLING DETERMINES THAT THE ROAD IS UNSTABLE, ADDITIONAL AGGREGATE SHALL BE ADDED UNTIL THE UNSTABLE SECTION IS ABLE TO PASS A PROOF ROLL.
   B. PROVIDE 1 SIEVE ANALYSIS (PROJECT MAX OF 20) PER 2500 CY OF ROAD BASE PLACED.
5. CRANE PAD AND CRANE PATHS / CRANE TRAVEL SHOULDERS:
   A. TESTING REQUIREMENTS ARE PENDING BASED ON CRANE PICK PLANS PROVIDED BY THE CONTRACTOR.

TABLE 2: TESTING SCHEDULE SUMMARY		
LOCATION	TEST	FREQUENCY
FILL PLACEMENT	PROCTOR	1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER LIFT PER 5000 SF OF FILL PLACED OR 1 PER 500 LF OF ROAD OR CRANE WALK
COMPACTED SUBGRADE (CEMENT STABILIZED):	SEE SHEET 13	SEE SHEET 13
COMPACTED SUBGRADE (NON-CEMENT STABILIZED):	PROOF-ROLL	ENTIRE AREA
	DCP	1 PER 1,000 FT OR MIN. 3 PER ROAD
AGGREGATE BASE	PROOF-ROLL	ENTIRE AREA
	SIEVE ANALYSIS, LL, PL, AND LA ABRASION	1 PER 2,500 CY

GENERAL NOTES:

1. GROUND SURFACE CONTOURS (AT TWO-FOOT VERTICAL INTERVALS) AND ELEVATIONS ARE BASED ON A PHOTOGRAMMETRY SURFACE PROVIDED BY GEOTERRA. IF MAJOR DISCREPANCIES ARE FOUND IN THE GROUND ELEVATIONS DURING FIELD STAKING TO THE GROUND ELEVATIONS SHOWN ON THE PLANS, THE OWNER AND ENGINEER SHALL BE NOTIFIED.
2. WHERE SECTION OR SUBSECTION MONUMENTS ARE ENCOUNTERED, THE OWNER SHALL BE NOTIFIED BEFORE SUCH MONUMENTS ARE REMOVED. THE CONTRACTOR SHALL PROTECT AND CAREFULLY PRESERVE ALL PROPERTY MARKERS AND MONUMENTS UNTIL THE OWNER, AN AUTHORIZED SURVEYOR OR AGENT HAS WITNESSED OR OTHERWISE REFERENCED THEIR LOCATION.
3. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. TYPICAL DISTURBANCE SHALL BE LIMITED TO 10 LF FROM THE EDGE OF PROPOSED GRADING.
4. FINALIZE GRADING AROUND THE BASE OF TURBINES IN ACCORDANCE WITH DETAIL TS-03 AND TS-04.
5. GRADE ALL PROPOSED ROADS TO A MAXIMUM SLOPE OF 8%. IF 8% SLOPE CANNOT BE ACHIEVED, THE CONTRACTOR MAY UTILIZE ASSIST VEHICLES FOR THE PURPOSE OF DELIVERIES. GRADE ALL PROPOSED CRANE PATHS TO A MAXIMUM OF 8% UNLESS OTHERWISE NOTED IN PLAN SHEETS.
6. ANY FACILITIES REMOVED TO ALLOW FOR CONSTRUCTION (MAILBOXES, SIGNS, FENCES, ETC.) SHALL BE REPLACED BY THE CONTRACTOR IN A CONDITION AS GOOD AS EXISTING.
7. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING DRAINAGE THROUGHOUT THE CONSTRUCTION OF THIS PROJECT. CONSTRUCTION ACTIVITIES SHALL NOT BLOCK THE NATURAL OR MANMADE CREEKS OR DRAINAGE SWALES CAUSING RAINWATER TO POND. DEPENDING ON FIELD CONDITIONS, ADDITIONAL CULVERTS IN EXCESS OF THOSE ON THE PLANS MAY BE REQUIRED.
8. WHILE BUILDING THE ROADS AND EXCAVATING THE TURBINE FOUNDATIONS, EXCESS SOIL WILL RESULT. THE CONTRACTOR SHALL DISPOSE OF THIS EXCESS SOIL IN AN APPROVED MANNER. EXCESS TOPSOIL SHALL BE DISTRIBUTED INTO A THIN LAYER ON LAND IMMEDIATELY ADJACENT TO WHERE THE TOPSOIL ORIGINATED. ALL EXCESS TOPSOIL TO BE WASTED ONSITE. WHILE DOING SO THE CONTRACTOR SHALL AVOID CAUSING RIDGES OR MOUNDS THAT WOULD MAKE IT DIFFICULT FOR STORM WATER RUNOFF TO DRAIN. THE FINAL SURFACE OF THE DISTURBED TOPSOIL SHALL BE SMOOTH AND FOLLOW THE NATURAL CONTOUR OF THE LAND.
9. THE CONTRACTOR SHALL NOTIFY SOUTH DAKOTA 811 AT LEAST 48 HOURS BEFORE EXCAVATION ACTIVITIES COMMENCE.
10. TEMPORARY INTERSECTION WIDENING SHALL, UPON COMPLETION OF ALL PROJECT CONSTRUCTION OR UPON NOTIFICATION OF THE ENGINEER, BE REMOVED AND THE AREA RESTORED TO ITS ORIGINAL LINES AND GRADES WITH TOPSOIL REPLACED, EXCEPT WHERE REQUESTED BY THE TOWNSHIP OR COUNTY TO PERMANENTLY REMAIN. DISTURBED AREAS OUTSIDE OF THE FINAL ROADWAY SHALL BE SEEDED AND MULCHED.
11. TURBINE SETBACKS ARE NOT IDENTIFIED ON THE CONSTRUCTION PLANS. IT SHALL BE THE RESPONSIBILITY OF THE OWNER AND CONTRACTOR TO ENSURE THAT ALL TURBINE SETBACKS MEET PROJECT REQUIREMENTS.
12. GEOTECHNICAL REPORTS WITH RECOMMENDATIONS HAVE BEEN PROVIDED BY THE OWNER. ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL ENGINEERING REPORT AND RECOMMENDATIONS.
13. FIELD SURVEY WETLAND INFORMATION HAS BEEN PROVIDED BY THE OWNER. ALL WETLAND DELINEATIONS AND PERMITTING SHALL BE THE RESPONSIBILITY OF OTHERS AND BE COMPLETED PRIOR TO CONSTRUCTION COMMENCING. THE OWNER AND GENERAL CONTRACTOR SHALL VERIFY THAT ALL WETLAND PERMITS HAVE BEEN SUBMITTED AND APPROVED PRIOR TO CONSTRUCTION COMMENCING.
14. CULTURAL RESOURCE REPORTS HAVE NOT BEEN PROVIDED. CULTURAL RESOURCE LOCATIONS ARE NOT SHOWN ON THE PLANS. INFORMATION WILL BE THE RESPONSIBILITY OF THE OWNER AND GENERAL CONTRACTOR. THE LOCATIONS OF CULTURAL RESOURCE SITES MAY BE CONFIDENTIAL AND PROTECTED BY STATE OR FEDERAL LAW. PUBLIC RELEASE OF SPECIFIC INFORMATION REGARDING THESE RESOURCES MAY BE RESTRICTED.
15. AN ENVIRONMENTAL ASSESSMENT HAS NOT BEEN PROVIDED. THE CONTRACTOR SHALL BE FAMILIAR WITH THE REPORT AND REVIEW ALL RECOMMENDATIONS.
16. ELECTRICAL INFORMATION SHOWN ON THE PLANS IS FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSULTANT'S PLANS FOR SPECIFIC LOCATIONS AND CONSTRUCTION DETAILS FOR THE UNDERGROUND POWER COLLECTION SYSTEM AND SUBSTATION.
17. CRANE PATHS ARE SHOWN ON THE CONSTRUCTION PLANS. IF THE CONTRACTOR PROPOSES ALTERNATE CRANE PATHS, THEY SHALL ENSURE THAT WETLAND AND CULTURAL RESOURCE CORRIDORS ARE NOT DISTURBED. FINAL CRANE PATH ALIGNMENTS SHALL BE DETERMINED BY THE CONTRACTOR BASED ON FIELD CONDITIONS WITHIN THE WETLAND AND CULTURAL RESOURCE CORRIDORS, SPECIAL LANDOWNER AGREEMENTS AND THE PROJECT BOUNDARY.
18. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. DISTURBANCE SHALL BE LIMITED TO 50 LF WIDTH FOR PROPOSED ACCESS ROADS AND 50 LF FOR CRANE PATHS, AND SHALL BE LIMITED TO A 250 LF RADIUS FOR PROPOSED WIND TURBINE GENERATORS. THE GRADING LIMITS SHALL BE CENTERED ON THE ROADWAYS AND WIND TURBINES. THE CONTRACTOR SHALL MAKE ALL EFFORTS TO KEEP ACTIVITIES WITHIN THE ERECTION AREAS SHOWN ON THE PLANS BUT IT IS UNDERSTOOD THAT SOME ACTIVITIES THAT WILL NOT REQUIRE GRADING OR SOIL DISTURBANCE MAY EXTEND BEYOND THE DEFINED LIMITS. DURING ERECTION OF THE ROTOR, TRUCKS AND/OR FORKLIFTS MAY EXTEND BEYOND THESE LIMITS. SEE DETAIL TS01 FOR TYPICAL ERECTION AREAS.
19. AN ALTA SURVEY HAS BEEN PROVIDED BY WESTWOOD. CONTRACTOR AND OWNER ARE RESPONSIBLE FOR LOCATING ALL UTILITIES AND VERIFYING LOCATION OF CONSTRUCTION ACTIVITIES PRIOR TO COMMENCING WORK.

STORMWATER POLLUTION PREVENTION PLAN (SWPPP):

1. THE CONTRACTOR SHALL PROVIDE EROSION CONTROL MEASURES AS PLANNED AND SPECIFIED FOLLOWING BEST MANAGEMENT PRACTICES AS OUTLINED BY THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND BEING IN CONFORMANCE WITH THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL STORMWATER PERMIT.
2. REFER TO THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR THE TRIPLE H WIND FARM, PREPARED BY WESTWOOD PROFESSIONAL SERVICES, FOR EROSION CONTROL AND RESTORATION SPECIFICATIONS, SEDIMENT AND EROSION CONTROL PROCEDURES, LOCATIONS OF BMPs, DETAILS, AND INSPECTION INFORMATION.
3. ALL PASTURES AND DRAINAGE SWALES DISTURBED DURING CONSTRUCTION ACTIVITIES AND NOT COVERED BY ROAD SURFACING MATERIALS, SHALL BE SEEDED IN ACCORDANCE WITH THE SWPP PLAN.
4. TEMPORARY EROSION CONTROL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE TEMPORARY EROSION CONTROL PLAN SHALL BE IN ACCORDANCE WITH THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND THE TRIPLE H WIND FARM STORMWATER POLLUTION PREVENTION PLAN ON FILE.

PROJECT CONTACT INFORMATION:

TITLE	COMPANY	NAME	CONTACT NUMBER
OWNER (PRIMARY)	ENGIE	CASEY WILLIS	805-569-6185
PROJECT MANAGER	WESTWOOD	DANI NYGREN	952-906-7493
ENGINEER OF RECORD	WESTWOOD	ROB COPOULS	952-906-7470
CONTRACTOR	WANZEK	JASON HELLERUD	701-893-3685

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 300
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com

Westwood Professional Services, Inc.

Designed:	BMK
Checked:	DBN
Drawn:	BMK
As-Built Drawing:	

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

MasTec

2028 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19

Sheet: 12 OF 57

0014440DTP.dwg

© 2019 Westwood Professional Services, Inc.

CEMENT STABILIZATION - PROCEDURE

THE SPECIFICATIONS BELOW ARE GENERAL RECOMMENDATIONS/GUIDELINES FOR CEMENT STABILIZATION OF SUBGRADES FOR THE PROJECT. ACTUAL FIELD CONDITIONS MAY ALTER APPLICATION RATE. CONSULT GEOTECHNICAL ENGINEER FOR FURTHER RECOMMENDATIONS.

1. STRIP THE TOP ±4 INCHES OF TOPSOIL (THROUGH THE ROOT ZONE) FROM THE AREA TO BE STABILIZED. ROOTS SMALLER THAN 1/4" DIAMETER ARE CONSIDERED INSIGNIFICANT.
2. PERFORM A PROCTOR (ASTM D 698) TEST TO DETERMINE THE OPTIMUM MOISTURE CONTENT IF THE MATERIAL TO BE STABILIZED DOES NOT MATCH A PREVIOUSLY PERFORMED PROCTOR.
3. DETERMINE THE IN-SITU MOISTURE CONTENT USING A NUCLEAR DENSITY GAUGE (OR EQUIVALENT MOISTURE CONTENT TEST) DAILY, PRIOR TO INCORPORATION OF THE CEMENT. PROVIDE ADDITIONAL MOISTURE CONTENT TESTING AS NEEDED BASED ON WEATHER CONDITIONS.
   - 3.1. THE CONTRACTOR WILL BE ADVISED OF IN-SITU MOISTURE CONTENT, AND MOISTURE ADJUSTMENTS SHOULD BE MADE IF IN-SITU MOISTURE IS LESS THAN OPTIMUM MOISTURE CONTENT AS DETERMINED BY THE PROCTOR (ASTM D 698).
4. SOIL AND CEMENT BLENDING:
   - 4.1. COMPLETELY BLEND SUBGRADE SOIL WITH THE APPROPRIATE AMOUNT OF CEMENT BY WEIGHT. FIELD RESULTS FROM TEST STRIPS WILL DICTATE THE CEMENT APPLICATION RATE.
   - 4.2. IN AREAS OF HIGH MOISTURE OR POOR SOILS, THE CONTRACTOR MAY INCREASE THE PERCENT OF CEMENT IN ORDER TO MEET THE MINIMUM SUBGRADE STRENGTH REQUIREMENTS.
   - 4.3. THE USE OF A RECLAIMER IS AN ADEQUATE BLENDING METHOD. DISCING IS NOT AN ADEQUATE BLENDING METHOD.
   - 4.4. A STABILIZATION DEPTH OF 12" WAS USED FOR DESIGN PURPOSES. STABILIZATION DEPTH MAY NEED TO INCREASE TO 16" IN AREAS OF EXTREME MOISTURE OR POOR SOILS IN ORDER TO MEET THE STRENGTH AND PROOF ROLL REQUIREMENTS.
5. COMPACTION:
   - 5.1. A ROLLING PATTERN WILL BE ESTABLISHED USING A NUCLEAR DENSITY GAUGE DURING COMPACTION.
     - 5.1.1. COMPACTION WILL BE PERFORMED UNTIL THE STABILIZED MATERIAL REACHES THE "BREAK POINT" AFTER WHICH ADDITIONAL PASSES WITH A ROLLER RESULTS IN A LOSS OF DENSITY AS MEASURED BY A NUCLEAR DENSITY GAUGE.
     - 5.1.2. COMPACTION IS TYPICALLY ACHIEVED BY MULTIPLE PASSES OF A PADFOOT ROLLER UNTIL THE ROLLER "WALKS" OUT OF THE RECLAIMED MATERIAL (SPACE IS VISIBLE BETWEEN THE DRUM AND THE RECLAIMED MATERIAL). THIS IS FOLLOWED BY BLADING AND SHAPING THE RECLAIMED MATERIAL TO FINAL PROFILE AND CROSS SECTION, REMOVING HIGH AND LOW POINTS. SMOOTH DRUM OR RUBBER TIRE ROLLERS ARE THEN USED TO FINISH ROLLING (THIS IS WHEN THE DENSITY TESTS ARE PERFORMED) UNTIL THE DENSITY OF THE MATERIAL REACHES THE "BREAK POINT."
     - 5.1.3. THE NUMBER OF PASSES AND EQUIPMENT USED TO REACH THE "BREAK POINT" IS CONSIDERED THE ROLLING PATTERN.
     - 5.1.4. A NEW ROLLING PATTERN MAY NEED TO BE ESTABLISHED IF THE PERFORMANCE REQUIREMENTS ARE NOT BEING MET. THIS MAY BE DUE TO CHANGES IN THE MOISTURE CONTENT, THE SOIL TYPE, OR THE CEMENT RATE.
   - 5.2. THE TARGET DENSITY IS 98% OF THE MAXIMUM DENSITY DETERMINED FROM THE ROLLING PATTERN.
     - 5.2.1. DENSITY TESTS SHALL BE TAKEN AT THE RATE OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER TO CONFIRM THE DENSITY IS MATCHING THE TARGET. ONCE THE ROLLING PATTERN HAS BEEN CONFIRMED IT IS RECOMMENDED THAT TESTING CONTINUE AT 1 TEST PER 1,000 LF IN EACH PASS OF THE RECLAIMER.
     - 5.2.2. IF IT IS NOT POSSIBLE TO ATTAIN THE TARGET DENSITY, AND ADDITIONAL COMPACTION DOES NOT IMPROVE THE DENSITY, A NEW ROLLING PATTERN SHOULD BE ESTABLISHED.
   - 5.3. THE AIR TEMPERATURE SHALL BE ABOVE 40 DEGREES (F) DURING THE CEMENT STABILIZATION PROCESS. MIXING CEMENT INTO FROZEN GROUND IS NOT ACCEPTABLE.
6. THE STABILIZED MATERIAL SHALL BE CONTINUOUSLY WET CURED FOR A MINIMUM OF 24 HOURS (WET CURED IS IDENTIFIED VISUALLY AS DAMP SURFACE).
7. PERFORM SUBGRADE TESTING IN ACCORDANCE WITH TESTING SCHEDULE.
8. AGGREGATE PLACEMENT:
   - 8.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 8.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 8.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

CEMENT STABILIZATION - DESIGN BASIS

1. DURING INITIAL CONSTRUCTION, CONTRACTOR SHALL CONSTRUCT MINIMUM 300 LF TEST STRIPS CONTAINING 4%, 5%, AND 6% CEMENT IN ACCORDANCE WITH CEMENT STABILIZATION PROCEDURES.
2. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 3 FOR ANTICIPATED RESULTS):
   - 2.1. PERFORM INITIAL SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M BETWEEN 4 TO 6 HOURS AFTER FINAL COMPACTION.
   - 2.2. PERFORM ADDITIONAL DCP TESTING AT 24 AND 48 HOURS AFTER FINAL COMPACTION.
   - 2.3. PERFORM SUBSEQUENT DCP TESTS AT 7 DAYS AFTER FINAL COMPACTION AS VERIFICATION OF STRENGTH CURVE.
   - 2.4. A MINIMUM OF 3 TESTS PER TEST SECTION PER TIMEFRAME IS REQUIRED. TESTS SHALL BE TAKEN AT THE CENTERLINE AND 2' FROM EACH SHOULDER.
   - 2.5. RECORD DCP TEST RESULTS EVERY 6 INCHES TO TOTAL DEPTH OF 12 INCHES.

TABLE 3: TEST STRIP CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	COMPRESSIVE STRENGTH (PSF)
4 – 6 HOURS	6	3	1,800
24 HOURS	10	7	2,500
48 HOURS	15	10	3,200
7 DAYS	30	21	5,200

CEMENT STABILIZATION - PRODUCTION

1. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 5 FOR SUMMARY OF TESTING REQUIREMENTS):
   - 1.1. PERFORM SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M NO SOONER THAN 24 HOURS AFTER FINAL COMPACTION.
   - 1.2. DCP TESTING FREQUENCY SHALL BE WITH A RANDOM SPACING AND A MINIMUM OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER. A MINIMUM OF 3 TESTS PER ROAD IS REQUIRED.
   - 1.3. THE CBR OF THE STABILIZED SUBGRADE SHOULD BE CALCULATED IN 6" INCREMENTS THROUGH THE ENTIRE DEPTH OF THE STABILIZED LAYER.
   - 1.4. THE MINIMUM REQUIRED CBR PRIOR TO PROOF-ROLLING IS PROVIDED IN TABLE 4 BELOW:

TABLE 4: FINAL CEMENT STABILIZED CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	UNDRAINED SHEAR STRENGTH (PSF)	BEARING CAPACITY (PSF)
24 – 48 HOURS	15	10	3,500	9,800
3 – 7 DAYS	30	21	7,000	18,000
28 DAYS	50	33	12,000	28,500

NOTE: UNDRAINED SHEAR STRENGTH WAS CALCULATED USING THE BLACK (1961) EQUATION. BEARING CAPACITY WAS CALCULATED USING THE VESIC EQUATION MODIFIED FOR TWO LAYERS (12" CEMENT STABILIZED SUBGRADE OVER A NATURAL SUBGRADE WITH A CBR OF 1.5)

   - 1.5. ONCE THE MINIMUM REQUIRED CBR IS ACHIEVED AT ANY CORRESPONDING TIME PERIOD, THE SUBGRADE IS CONSIDERED ADEQUATE AND THE CONTRACTOR MAY PROCEED WITH PROOF-ROLL TESTING. FUTURE DCP TESTING ON THAT SEGMENT OF SUBGRADE IS NOT REQUIRED.
   - 1.6. IF TESTING DOES NOT INDICATE A CBR OF 30 WITHIN 7 DAYS, ADDITIONAL GRAVEL SURFACING AND/OR THE ADDITION OF GEOTEXTILE FABRIC MAY BE REQUIRED. FOR FUTURE SUBGRADE STABILIZATION AREAS, CONTACT THE ENGINEER AND OWNER VIA RFI FOR RECOMMENDATIONS AND APPROVAL.
2. SUBGRADE PROOF-ROLL TESTING AND ACCEPTANCE:
   - 2.1. ONCE THE REQUIRED DCP VALUE HAS BEEN OBTAINED BUT PRIOR TO PLACING AGGREGATE, THE SUBGRADE SHALL BE PROOF-ROLLED. REFER TO THE PROJECT TESTING REQUIREMENTS FOR PROOF-ROLL DEFINITION.
   - 2.2. PROOF-ROLLING SHOULD BE PERFORMED WITH ONE PASS DOWN THE CENTER AND NOT BE PERFORMED WITHIN 12 INCHES OF THE EDGE OF THE STABILIZED SECTION.
   - 2.3. IF PROOF-ROLLING FAILS, RE-STABILIZATION MAY BE REQUIRED AND A NEW ROLLING PATTERN OR ADDITIONAL CEMENT MAY BE REQUIRED.
3. AGGREGATE PLACEMENT:
   - 3.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 3.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 3.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

TABLE 5: CEMENT STABILIZATION PRODUCTION TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
COMPACTED SUBGRADE (CEMENT STABILIZED) NOTE: SEE ABOVE FOR INITIAL TESTING REQUIREMENTS	PROCTOR	MINIMUM 1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER 1000 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
	DCP TEST	1 PER 500 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
	PROOF-ROLL (AFTER PASSING DCP TESTS)	ENTIRE LENGTH

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwood@pss.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: TJN
Drawn: BMK
As-Built Drawing:

Revisions: #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2888 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 13 OF 57

0014440DTP.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 205th Street in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 2845' West of 330th Ave & 205th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.24'38.50" W Long. -99.34'25.94" W
4. Width of entrance: 16' access road & 25' temporary intersection modification
   (Check attached spec sheet)
5. Size & length of culvert: (2) 24"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001160 NE4 23-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Tanya Lorenz
Signature of Applicant

Robert Bawdon
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 205th Street in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 2845' West of 330th Ave & 205th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.24'38.50" W Long. -99.34'25.94" W
4. Width of entrance: 16' access road & 25' temporary intersection modification
   (Check attached spec sheet)
5. Size & length of culvert: (2) 24"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001160 NE4 23-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: _____

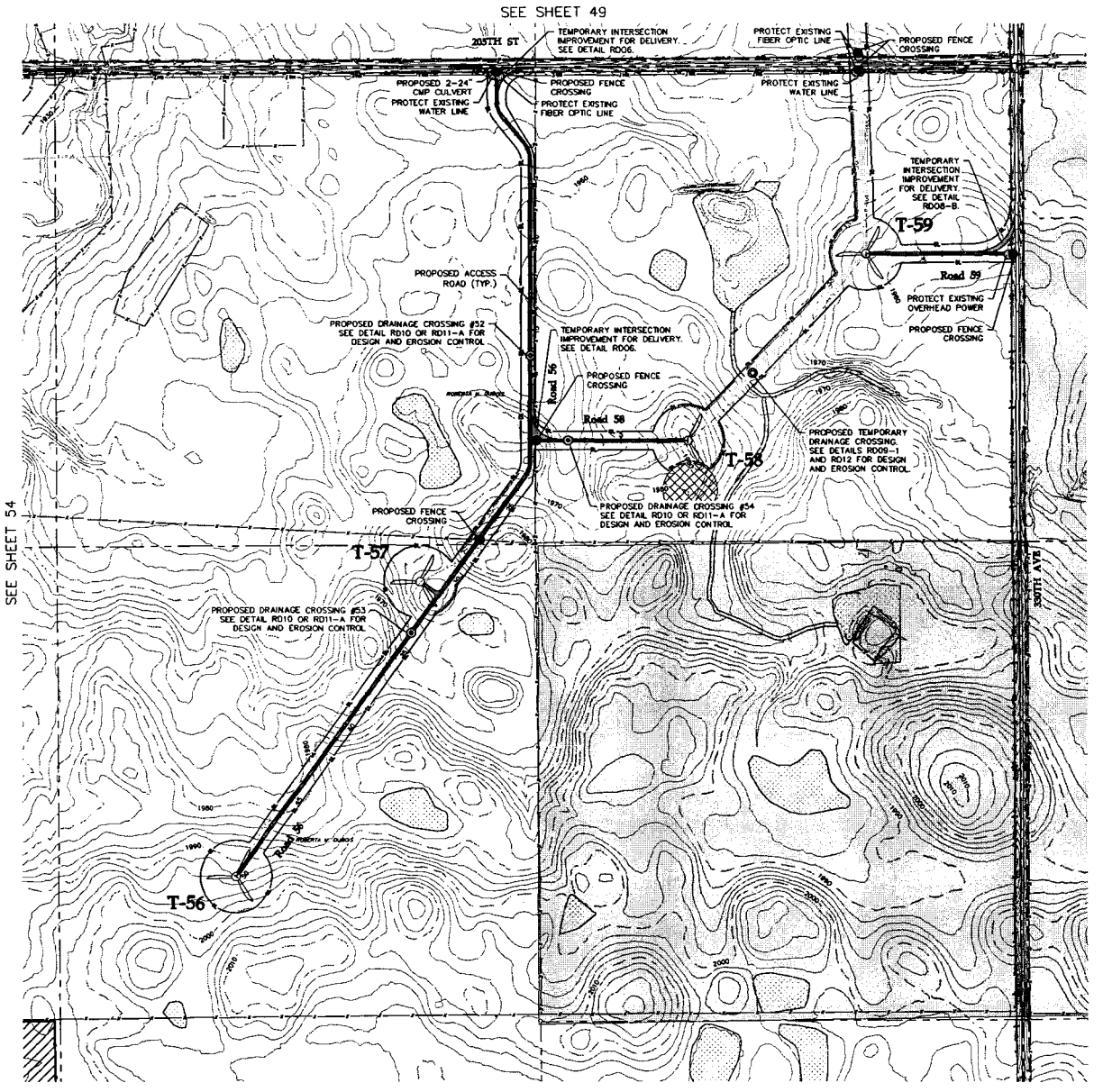
Signature of Applicant

Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

©2019 Westwood Professional Services, Inc.



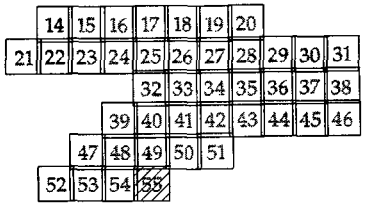
LEGEND:

- PROPOSED TURBINE LOCATION
- T-XX PROPOSED TURBINE NUMBER
- PROPOSED ALTERNATE TURBINE LOCATION
- ALT-XX PROPOSED ALTERNATE TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED ALTERNATE ACCESS ROAD
- PROPOSED CRANE PATH
- PROPOSED UNDERGROUND COLLECTION*
- PROPOSED DISTURBANCE LIMITS
- PROPOSED PERIMETER SEDIMENT CONTROL
- EXISTING 10' CONTOURS
- EXISTING 2' CONTOURS
- EXISTING GRAVEL EDGE
- EXISTING BITUMINUS EDGE
- EXISTING RIGHT-OF-WAY
- EXISTING PARCEL LINE
- EXISTING BUILDING
- EXISTING FENCE
- EXISTING OVERHEAD POWER
- EXISTING HIGH VOLTAGE OVERHEAD POWER
- EXISTING UNDERGROUND POWER LINE
- EXISTING FIBER OPTIC LINE
- EXISTING WATER LINE
- DELINEATED WETLAND
- ARCHAEOLOGICAL AVOIDANCE AREA
- EXISTING USFWS EASEMENT
- PROJECT BOUNDARY
- EXISTING GROUND ELEVATION
- PROPOSED DRAINAGE CROSSING**
- PROPOSED TEMPORARY DRAINAGE CROSSING**
- PROPOSED FENCE CROSSING***
- PROPOSED UTILITY CROSSING
- PROPOSED CULVERT

* PROVIDED BY OTHERS AND SHOWN FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSTRUCTION PLANS FOR DETAILS.

** SEE SHEET 11 FOR DRAINAGE CROSSING TYPE AND SIZING. DRAINAGE CROSSINGS SHALL CONSIST OF LOW WATER CROSSING OR CULVERT. DRAINAGE CROSSINGS ALONG CRANE PATH SHALL CONSIST OF CRANE MATS OR TEMPORARY CULVERT.

*** ALL GATE INSTALLATIONS SHALL BE FIELD DETERMINED AND AGREED UPON BY THE CONTRACTOR AND OWNER.



KEY MAP

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 www.westwoodps.com

Westwood Professional Services, Inc.

Designed: BMC
Checked: DJH
Drawn: BMC
As-Built Drawing:

Revisions: #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078

0' 300' 600' 900'

Triple H Wind Farm

Hyde County, South Dakota

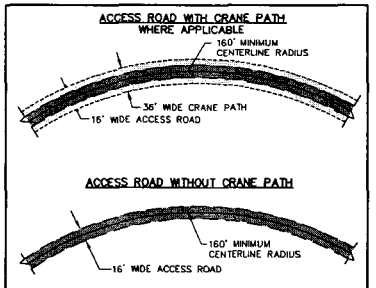
Site Plan T-56 - T-59

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 55 OF 57

0014440SP01.dwg

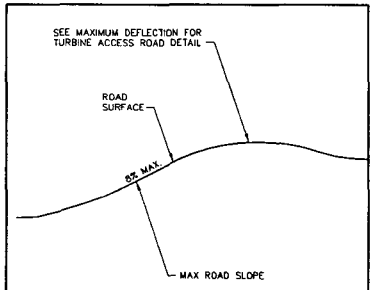
© 2019 Westwood Professional Services, Inc.



NOTE:

1. SOME RADII MAY REQUIRE ADDITIONAL SOIL COMPACTION OR GRAVEL OUTSIDE OF THE WIDTH SHOWN ABOVE TO ACCOMMODATE TRACTORS OR TRAILERS TRACKING OFF THE ACCESS ROAD.

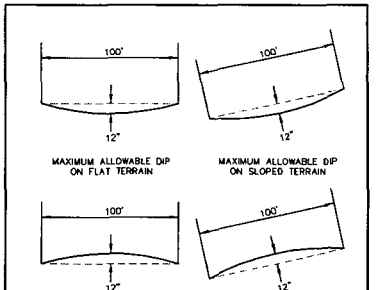
Westwood	MINIMUM RADIUS FOR TURBINE ACCESS ROAD	LAST REVISED: 04/29/11 RD02



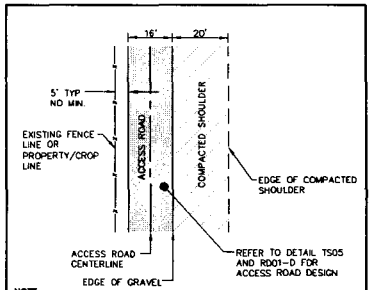
NOTES:

1. ROAD SLOPE SHALL NOT EXCEED 8% WITHOUT OWNER APPROVAL

Westwood	MAXIMUM VERT. SLOPE FOR TURBINE ACCESS ROAD/CRANE TRAVEL PATH	LAST REVISED: 3/19/12 RD03



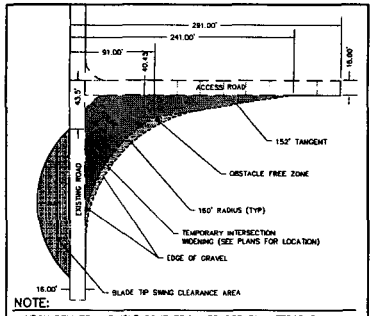
Westwood	MAXIMUM DEFLECTION FOR TURBINE ACCESS ROAD	LAST REVISED: 01/02/08 RD04



NOTE:

1. COMPACTED SHOULDER SHALL BE RETURNED TO NATIVE CONDITION FOLLOWING TURBINE GENERATOR CONSTRUCTION.
2. THE ACCESS ROAD MAY NEED TO BE CONSTRUCTED FARTHER FROM THE PROPERTY LINE IF OBSTRUCTIONS SUCH AS TREES FOLLOW THE PROPERTY LINE.

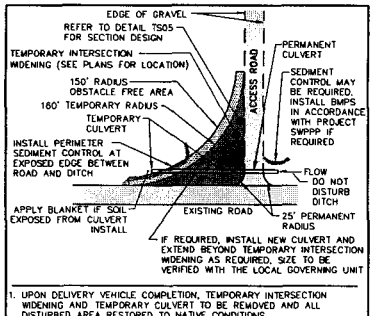
Westwood	TURBINE ACCESS ROAD ALONG FENCE/PROPERTY/CROP LINE	LAST REVISED: 3/19/08 RD05



NOTE:

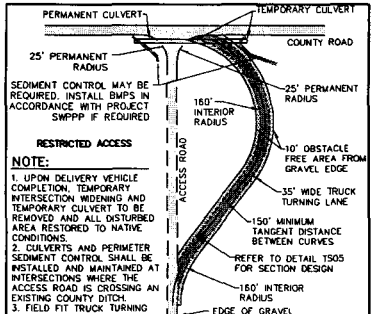
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING TO BE REMOVED AND ALL DISTURBED AREA RESTORED.
2. DIMENSIONS ASSUME A 90° INTERSECTION

Westwood	INTERSECTION WIDENING DIMENSIONS	LAST REVISED: 7/13/18 RD06



1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.

Westwood	TURBINE ACCESS ROAD TYPICAL INTERSECTION WIDENING	LAST REVISED: 3/3/17 RD07

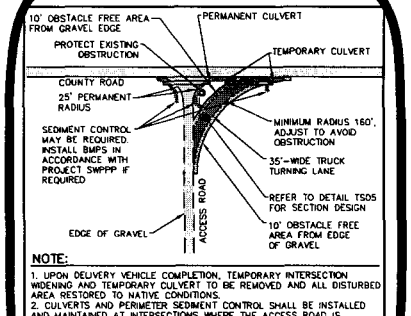


NOTE:

1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

NOT TO SCALE

Westwood	TRUCK TRAFFIC TURNING LANE A	LAST REVISED: 3/3/17 RD08-A



NOTE:

1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

Westwood	TRUCK TRAFFIC TURNING LANE B	LAST REVISED: 12/3/01 RD08-B

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-free (866) 937-5150 www.westwoodps.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: TJN
Drawn: BMK
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

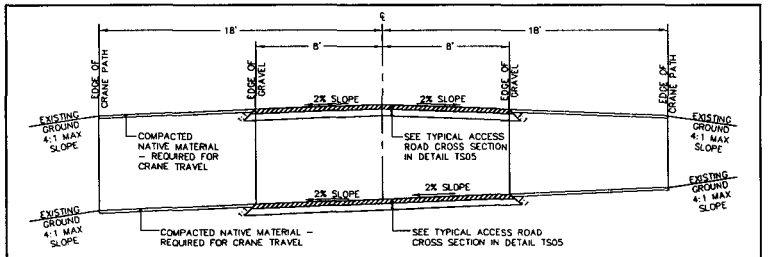
Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 5 OF 57

0014440DTP.dwg

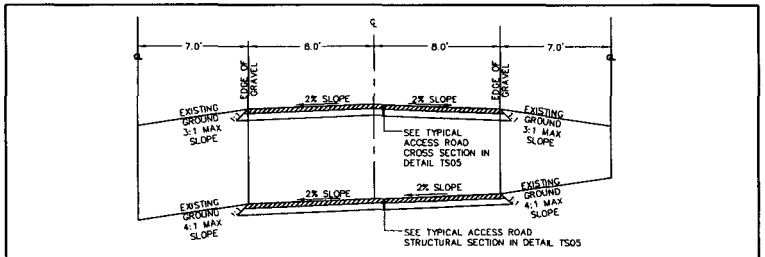
© 2019 Westwood Professional Services, Inc.



NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE ACCESS ROAD DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES. IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

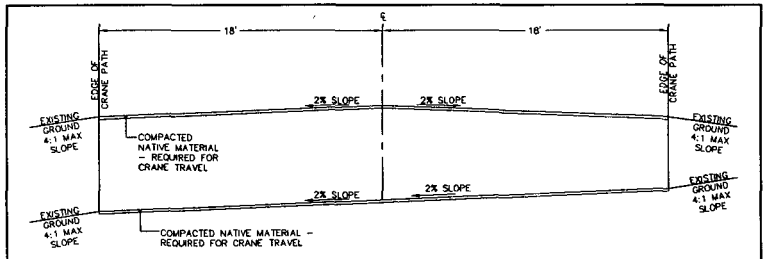
Westwood | TYPICAL TURBINE ACCESS ROAD AND CRANE PATH | LAST REVISED: 05/28/19 | RD01-A



NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES. IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

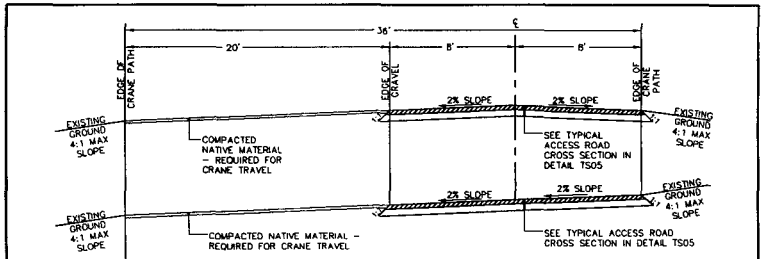
Westwood | TYPICAL TURBINE ACCESS ROAD SECTION | LAST REVISED: 5/28/19 | RD01-B



NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE WHERE CRANE PATHS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT CRANE PATH REMAINS WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%

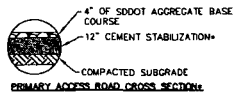
Westwood | TYPICAL CRANE PATH | LAST REVISED: 05/28/19 | RD01-C



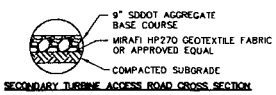
NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE EDGE OF COMPACTED SHOULDER DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES. IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

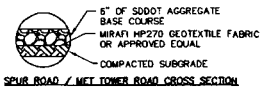
Westwood | TYPICAL TURBINE ACCESS ROAD AND OFFSET CRANE PATH | LAST REVISED: 05/28/19 | RD01-D



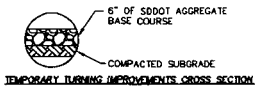
PRIMARY ACCESS ROAD CROSS SECTION*



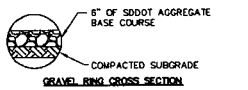
SECONDARY TURBINE ACCESS ROAD CROSS SECTION



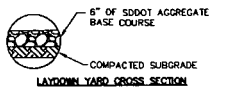
SPUR ROAD / MET TOWER ROAD CROSS SECTION



TEMPORARY TURNING IMPROVEMENTS CROSS SECTION



GRAVEL RING CROSS SECTION



LAYDOWN YARD CROSS SECTION

* CEMENT APPLICATION RATE MAY VARY BASED ON TEST STRIPS AND FIELD PERFORMANCE. SEE SHEET 13 FOR CEMENT STABILIZATION PROCEDURE AND DESIGN BASIS.

NOTES:

STRUCTURAL SECTIONS SHOWN ARE THE MINIMUM THICKNESS REQUIREMENTS DURING NORMAL FIELD CONDITIONS. THE SECTIONS MAY NEED TO BE INCREASED BASED ON ACTUAL FIELD CONDITIONS AT THE TIME OF CONSTRUCTION. CONDITIONS INCLUDE BUT ARE NOT LIMITED TO CONSTRUCTION DURING THE FREEZE/THAW CYCLE, UNUSUALLY WET PERIODS, OR IN LOW/WET AREAS. SEE SHEET 12 FOR TESTING REQUIREMENTS AND SPECIFICATIONS.

Westwood | TYPICAL STRUCTURAL CROSS SECTIONS

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (866) 937-5150 westwoodps.com

Westwood Professional Services, Inc.

Project: BMK
Checked: DJH
Drawn: BMK
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 4 OF 57

0014440DP.dwg

©2019 Westwood Professional Services, Inc.

ROAD DESIGN PARAMETERS

1. ACCESS ROADS HAVE BEEN DESIGNED TO ACCOMMODATE LIGHT DUTY TRUCKS (PICKUP TRUCKS AND MAINTENANCE VEHICLES) FOR LOW VOLUME USE IN NORMAL OPERATING CONDITIONS AS WELL AS HEAVY DUTY CONSTRUCTION TRAFFIC UNDER DRY CONDITIONS. THE ROAD DESIGN SPECIFIED IS NOT INTENDED FOR ALL WEATHER USE FOR HEAVY DUTY CONSTRUCTION LOADS.
2. ROAD MAINTENANCE CAN BE EXPECTED OVER THE LIFE OF THE PERMANENT FACILITY.

PRODUCTS

1. AGGREGATE BASE SHALL CONSIST OF SDDOT AGGREGATE BASE COURSE (AND IN CONFORMANCE WITH THE GRADATION TABLE 1). AGGREGATE MAY BE CRUSHER RUN UPON ENGINEERS APPROVAL. AGGREGATE GRADATIONS SHALL BE SUBMITTED TO ENGINEER FOR REVIEW.
2. ROAD SHOULDERS AND CRANE PADS SHALL CONSIST OF COMPACTED NATIVE SOILS.
3. CULVERTS: ACCESS ROAD CULVERTS SHALL MEET THE MINIMUM SPECIFICATIONS SET FORTH BY THE SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION AND/OR HYDE COUNTY. ALL CULVERTS ARE PLANNED TO BE A MINIMUM 18" DIAMETER AND MANUFACTURED OF 16-GAGE CORRUGATED METAL PIPE WITH NO END TREATMENTS UNLESS NOTED OTHERWISE. ACTUAL SIZE WILL BE DETERMINED THROUGH HYDRAULIC ANALYSIS.
4. GEOTEXTILE FABRIC: MIRAFI HP270 OR APPROVED EQUAL.

EXECUTION

1. CLEARING AND GRUBBING
   A. THE CONTRACTOR SHALL BE REQUIRED TO GRUB ALL TREES, STUMPS, BRUSH, AND DEBRIS WITHIN THE GRADING AREAS SHOWN ON THE PLANS. GRUBBING INCLUDES REMOVAL OF ALL PLANT MATERIAL GREATER THAN 2" INCLUDING STUMPS, BRANCHES, ROOTS, ETC. TO A DEPTH BELOW THE FINAL SUBGRADE. THE CONTRACTOR IS TO REMOVE ONLY THOSE TREES WHICH ARE DESIGNATED BY THE OWNER'S REPRESENTATIVE FOR REMOVAL, AND SHALL EXERCISE EXTREME CARE AROUND EXISTING TREES TO BE SAVED.
2. TOPSOIL STRIPPING
   A. TOPSOIL, INCLUDING ROOTS LARGER THAN 2" AND LARGE ROOT MASSES, SHALL BE STRIPPED FROM ALL ROADWAY AND FOUNDATION AREAS UP TO 10". TOPSOIL SHALL NOT BE STRIPPED OUTSIDE OF THE DESIGNATED DISTURBANCE AREAS.
   B. ANY TOPSOIL THAT HAS BEEN STRIPPED SHALL BE STOCKPILED FOR POST CONSTRUCTION REVEGETATION. ALL TOPSOIL SHALL BE REDISTRIBUTED TO THE LAND OWNER'S PROPERTY OF WHERE IT ORIGINATED FROM.
3. FILL PLACEMENT
   A. FILL PLACEMENT SHALL CONSIST OF THE PLACING OF SUITABLE FILL MATERIAL, AFTER TOPSOIL STRIPPING, ABOVE THE EXISTING GRADE. GENERALLY, SIDE SLOPES SHALL BE CONSTRUCTED AT FOUR FOOT HORIZONTAL TO ONE FOOT VERTICAL, WITH SOME LOCATIONS THROUGHOUT THE PROJECT WITH SLOPES OF TWO FEET HORIZONTAL TO ONE FOOT VERTICAL. THE MATERIAL FOR FILL CONSTRUCTION SHALL BE OBTAINED FROM THE ACCESS ROAD/TURBINE EXCAVATION (SEE GEOTECHNICAL REPORT FOR RESTRICTIONS), OR ANY SUITABLE, APPROVED SOIL OBTAINED ONSITE/OFFSITE BY CONTRACTOR, AS DIRECTED OR APPROVED BY THE ENGINEER. THIS MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 12" AND CONSTRUCTED TO 95% OF THE MAXIMUM DRY DENSITY AND WITHIN 2% OF OPTIMUM MOISTURE CONTENT, AS DETERMINED BY THE STANDARD PROCTOR (AASHTO T99).
   B. SIDE SLOPES GREATER THAN 4:1 WILL NOT BE PERMITTED, UNLESS OTHERWISE NOTED ON THE PLAN.
   C. FILL SLOPES SHALL BE BENCHED INTO THE EXISTING SLOPE TO PREVENT MOVEMENT BETWEEN THE FILL AND NATIVE SOILS. BENCHES SHOULD BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO FILL PLACEMENT. POSITIVE DRAINAGE IS REQUIRED AT BENCHED AREAS AND AT THE TOE OF FILL SLOPES TO REMOVE SURFACE WATER.
4. SUBGRADE
   A. SUBGRADE PREPARED AT GRADE OR IN CUT REQUIRES SCARIFICATION AND RECOMPACTION TO A DEPTH OF 12" OR MORE.
   B. ACCESS ROAD CROSS SLOPES SHOWN IN THE PLANS ARE MEANT AS A GUIDE. ACCESS ROAD CROSS SLOPES MAY RANGE FROM 1% - 2%, CHECK WITH THE ENGINEER IF THE CROSS SLOPE FALLS OUTSIDE OF THIS RANGE. ACCESS ROADS BEING UTILIZED FOR CRANE TRAVEL SHOULD HAVE A MAX CROSS SLOPE OF 2%

TABLE 1: SDDOT AGGREGATE BASE COURSE - LOCALLY SOURCED	
SIEVE SIZE	PERCENT PASSING
1"	100
3/4"	80-100
1/2"	68-91
NO. 4	46-70
NO. 8	34-58
NO. 40	13-35
NO. 200	3-12

MEET FOLLOWING REQUIREMENTS PER 882.2

LIQUID LIMIT (MAX) = 25
PLASTICITY INDEX = 0-6
L.A ABRASION (% MAX) = 40%

GRADATION HAS BEEN OBTAINED FROM THE 2015 SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION BOOK.

STORM WATER DESIGN PARAMETERS

1. SEE SHEET 6 FOR CULVERT SIZING AND DESIGN PARAMETERS. SEE HYDROLOGY MEMO FOR FURTHER DESIGN CALCULATIONS. CULVERTS SHALL BE MINIMUM 18" CORRUGATED METAL PIPE. ALL TEMPORARY PORTIONS OF THE INSTALLED CULVERTS SHALL BE REMOVED UPON COMPLETION OF THE PROJECT.
2. IT IS EXPECTED THAT CULVERTS WILL BE OVERTOPPED DURING SOME STORMS AND MAINTENANCE WILL BE REQUIRED THROUGH THE LIFE OF THE PROJECT.
3. WHEN INSTALLING DRAINAGE CULVERTS THE CONTRACTOR SHALL USE JUDGMENT IN SETTING THE FLOW LINE ELEVATIONS AND CULVERT LONGITUDINAL SLOPE. TYPICALLY THE FLOW LINE ELEVATIONS AND LONGITUDINAL SLOPE OF THE CULVERT SHOULD MATCH THE NATURAL GROUND ELEVATIONS AND SLOPE TO ENSURE POSITIVE DRAINAGE. WHEN POSSIBLE, ALL CULVERTS SHOULD BE PLACED AT A MINIMUM 0.5% GRADE.
4. ANTICIPATED CULVERT CROSSINGS ARE SHOWN ON THE CONSTRUCTION PLAN, ADDITIONAL CULVERTS MAY NEED TO BE INSTALLED IN AREAS WHERE CONCENTRATED FLOW IS EXPECTED DUE TO CONSTRUCTION ACTIVITIES.
5. CONSTRUCTION DRAINAGE CROSSINGS TO MAINTAIN EXISTING FLOW CHARACTERISTICS OF THE FEATURES. FEATURES SHALL BE GRADED TO PRECONSTRUCTION CONTOURS.

TESTING:

1. TESTING SHALL BE PERFORMED BY A DESIGNATED INDEPENDENT TESTING AGENCY.
2. SUBMIT ONE SET OF TESTING AND INSPECTION RECORDS SPECIFIED TO THE CIVIL ENGINEER OF RECORD.

DEFINITIONS:

1. PROOF ROLLING:
   SHALL BE PERFORMED IN THE PRESENCE OF THE GEOTECHNICAL ENGINEER OR QUALIFIED GEOTECHNICAL REPRESENTATIVE USING A FULLY LOADED TANDEM AXLE DUMP TRUCK OR WATER TRUCK WITH A MINIMUM GROSS WEIGHT OF 25 TONS OR A FULLY LOADED BELLY DUMP WITH AN EQUIVALENT AXLE LOADING. PROOF-ROLLING ACCEPTANCE STANDARDS INCLUDE NO RUTTING GREATER THAN 1.5 INCHES, AND NO "PUMPING" OF THE SOIL BEHIND THE LOADED TRUCK.
2. SIEVE ANALYSIS:
   SHALL BE CONDUCTED IN ACCORDANCE WITH AASHTO T27
3. PROCTORS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T99
4. ATTERBERG LIMITS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T89 AND T90
5. MOISTURE DENSITY (NUCLEAR DENSITY):
   SHALL BE DONE IN ACCORDANCE WITH AASHTO T310
6. DYNAMIC CONE PENETROMETER (DCP) TESTING:
   SHALL BE DONE IN ACCORDANCE WITH ASTM D6951-03

REQUIREMENTS:

1. FILL PLACEMENT:
   A. SOILS USED AS FILL MATERIAL SHALL BE TESTED FOR MOISTURE CONTENT AND PROCTOR TESTS.
   B. WHERE FILL CONSTRUCTION REQUIRES MORE THAN 12 INCHES OF FILL PLACEMENT, COMPACT EACH LIFT TO A MINIMUM OF 95 PERCENT OF THE MATERIAL'S MAXIMUM STANDARD PROCTOR DRY DENSITY.
2. COMPACTED SUBGRADE (CEMENT STABILIZED):
   A. SEE SHEET 13 FOR TESTING REQUIREMENTS AND PROCEDURE.
3. COMPACTED SUBGRADE (NON-CEMENT STABILIZED):
   A. THE ENTIRE SUBGRADE SHALL BE PROOF-ROLLED PRIOR TO THE PLACEMENT OF THE AGGREGATE BASE TO IDENTIFY AREAS OF UNSTABLE SUBGRADE.
   B. PERFORM A MINIMUM OF 3 DYNAMIC CONE PENETROMETER (DCP) TESTS PER ACCESS ROAD OR ONE FOR EVERY 1,000 LF OF ROAD, WHICHEVER IS GREATER. SUBGRADE MUST MEET A MINIMUM DCP OF 3 BLOWS PER 6" TO A TOTAL DEPTH OF 2' (MINIMUM CBR=1.5).
   C. IF A PASSING PROOF-ROLL OR DCP REQUIREMENTS CANNOT BE ACHIEVED THE FOLLOWING ALTERNATIVES MAY BE IMPLEMENTED:
      a. SCARIFY, DRY, AND RECOMPACT SUBGRADE
      b. REMOVE UNSUITABLE MATERIAL AND REPLACE WITH SUITABLE MATERIAL
      c. INCREASE AGGREGATE BASE THICKNESS
4. AGGREGATE BASE:
   A. AGGREGATE BASE SHALL BE PROOF-ROLLED OVER THE ENTIRE LENGTH. IF PROOF ROLLING DETERMINES THAT THE ROAD IS UNSTABLE, ADDITIONAL AGGREGATE SHALL BE ADDED UNTIL THE UNSTABLE SECTION IS ABLE TO PASS A PROOF ROLL.
   B. PROVIDE 1 SIEVE ANALYSIS (PROJECT MAX OF 20) PER 2500 CY OF ROAD BASE PLACED.
5. CRANE PAD AND CRANE PATHS / CRANE TRAVEL SHOULDERS:
   A. TESTING REQUIREMENTS ARE PENDING BASED ON CRANE PICK PLANS PROVIDED BY THE CONTRACTOR.

TABLE 2: TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
FILL PLACEMENT	PROCTOR	1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER LIFT PER 5000 SF OF FILL PLACED OR 1 PER 500 LF OF ROAD OR CRANE WALK
COMPACTED SUBGRADE (CEMENT STABILIZED):	SEE SHEET 13	SEE SHEET 13
COMPACTED SUBGRADE (NON-CEMENT STABILIZED):	PROOF-ROLL	ENTIRE AREA
	DCP	1 PER 1,000 FT OR MIN. 3 PER ROAD
AGGREGATE BASE	PROOF-ROLL	ENTIRE AREA
	SIEVE ANALYSIS, LL, PL, AND L.A ABRASION	1 PER 2,500 CY

GENERAL NOTES:

1. GROUND SURFACE CONTOURS (AT TWO-FOOT VERTICAL INTERVALS) AND ELEVATIONS ARE BASED ON A PHOTOGRAMMETRY SURFACE PROVIDED BY GEOTERRA. IF MAJOR DISCREPANCIES ARE FOUND IN THE GROUND ELEVATIONS DURING FIELD STAKING TO THE GROUND ELEVATIONS SHOWN ON THE PLANS, THE OWNER AND ENGINEER SHALL BE NOTIFIED.
2. WHERE SECTION OR SUBSECTION MONUMENTS ARE ENCOUNTERED, THE OWNER SHALL BE NOTIFIED BEFORE SUCH MONUMENTS ARE REMOVED. THE CONTRACTOR SHALL PROTECT AND CAREFULLY PRESERVE ALL PROPERTY MARKERS AND MONUMENTS UNTIL THE OWNER, AN AUTHORIZED SURVEYOR OR AGENT HAS WITNESSED OR OTHERWISE REFERENCED THEIR LOCATION.
3. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. TYPICAL DISTURBANCE SHALL BE LIMITED TO 10 LF FROM THE EDGE OF PROPOSED GRADING.
4. FINALIZE GRADING AROUND THE BASE OF TURBINES IN ACCORDANCE WITH DETAIL TS-03 AND TS-04.
5. GRADE ALL PROPOSED ROADS TO A MAXIMUM SLOPE OF 8%. IF 8% SLOPE CANNOT BE ACHIEVED, THE CONTRACTOR MAY UTILIZE ASSIST VEHICLES FOR THE PURPOSE OF DELIVERIES. GRADE ALL PROPOSED CRANE PATHS TO A MAXIMUM OF 8% UNLESS OTHERWISE NOTED IN PLAN SHEETS.
6. ANY FACILITIES REMOVED TO ALLOW FOR CONSTRUCTION (MAILBOXES, SIGNS, FENCES, ETC.) SHALL BE REPLACED BY THE CONTRACTOR IN A CONDITION AS GOOD AS EXISTING.
7. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING DRAINAGE THROUGHOUT THE CONSTRUCTION OF THIS PROJECT. CONSTRUCTION ACTIVITIES SHALL NOT BLOCK THE NATURAL OR MANMADE CREEKS OR DRAINAGE SWALES CAUSING RAINWATER TO POND. DEPENDING ON FIELD CONDITIONS, ADDITIONAL CULVERTS IN EXCESS OF THOSE ON THE PLANS MAY BE REQUIRED.
8. WHILE BUILDING THE ROADS AND EXCAVATING THE TURBINE FOUNDATIONS, EXCESS SOIL WILL RESULT. THE CONTRACTOR SHALL DISPOSE OF THIS EXCESS SOIL IN AN APPROVED MANNER. EXCESS TOPSOIL SHALL BE DISTRIBUTED INTO A THIN LAYER ON LAND IMMEDIATELY ADJACENT TO WHERE THE TOPSOIL ORIGINATED. ALL EXCESS TOPSOIL TO BE WASTED ONSITE. WHILE DOING SO THE CONTRACTOR SHALL AVOID CAUSING RIDGES OR MOUNDS THAT WOULD MAKE IT DIFFICULT FOR STORM WATER RUNOFF TO DRAIN. THE FINAL SURFACE OF THE DISTURBED TOPSOIL SHALL BE SMOOTH AND FOLLOW THE NATURAL CONTOUR OF THE LAND.
9. THE CONTRACTOR SHALL NOTIFY SOUTH DAKOTA 811 AT LEAST 48 HOURS BEFORE EXCAVATION ACTIVITIES COMMENCE.
10. TEMPORARY INTERSECTION WIDENING SHALL, UPON COMPLETION OF ALL PROJECT CONSTRUCTION OR UPON NOTIFICATION OF THE ENGINEER, BE REMOVED AND THE AREA RESTORED TO ITS ORIGINAL LINES AND GRADES WITH TOPSOIL REPLACED, EXCEPT WHERE REQUESTED BY THE TOWNSHIP OR COUNTY TO PERMANENTLY REMAIN. DISTURBED AREAS OUTSIDE OF THE FINAL ROADWAY SHALL BE SEEDED AND MULCHED.
11. TURBINE SETBACKS ARE NOT IDENTIFIED ON THE CONSTRUCTION PLANS. IT SHALL BE THE RESPONSIBILITY OF THE OWNER AND CONTRACTOR TO ENSURE THAT ALL TURBINE SETBACKS MEET PROJECT REQUIREMENTS.
12. GEOTECHNICAL REPORTS WITH RECOMMENDATIONS HAVE BEEN PROVIDED BY THE OWNER. ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL ENGINEERING REPORT AND RECOMMENDATIONS.
13. FIELD SURVEY WETLAND INFORMATION HAS BEEN PROVIDED BY THE OWNER. ALL WETLAND DELINEATIONS AND PERMITTING SHALL BE THE RESPONSIBILITY OF OTHERS AND BE COMPLETED PRIOR TO CONSTRUCTION COMMENCING. THE OWNER AND GENERAL CONTRACTOR SHALL VERIFY THAT ALL WETLAND PERMITS HAVE BEEN SUBMITTED AND APPROVED PRIOR TO CONSTRUCTION COMMENCING.
14. CULTURAL RESOURCE REPORTS HAVE NOT BEEN PROVIDED. CULTURAL RESOURCE LOCATIONS ARE NOT SHOWN ON THE PLANS. INFORMATION WILL BE THE RESPONSIBILITY OF THE OWNER AND GENERAL CONTRACTOR. THE LOCATIONS OF CULTURAL RESOURCE SITES MAY BE CONFIDENTIAL AND PROTECTED BY STATE OR FEDERAL LAW. PUBLIC RELEASE OF SPECIFIC INFORMATION REGARDING THESE RESOURCES MAY BE RESTRICTED.
15. AN ENVIRONMENTAL ASSESSMENT HAS NOT BEEN PROVIDED. THE CONTRACTOR SHALL BE FAMILIAR WITH THE REPORT AND REVIEW ALL RECOMMENDATIONS.
16. ELECTRICAL INFORMATION SHOWN ON THE PLANS IS FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSULTANT'S PLANS FOR SPECIFIC LOCATIONS AND CONSTRUCTION DETAILS FOR THE UNDERGROUND POWER COLLECTION SYSTEM AND SUBSTATION.
17. CRANE PATHS ARE SHOWN ON THE CONSTRUCTION PLANS. IF THE CONTRACTOR PROPOSES ALTERNATE CRANE PATHS, THEY SHALL ENSURE THAT WETLAND AND CULTURAL RESOURCE CORRIDORS ARE NOT DISTURBED. FINAL CRANE PATH ALIGNMENTS SHALL BE DETERMINED BY THE CONTRACTOR BASED ON FIELD CONDITIONS WITHIN THE WETLAND AND CULTURAL RESOURCE CORRIDORS, SPECIAL LANDOWNER AGREEMENTS AND THE PROJECT BOUNDARY.
18. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. DISTURBANCE SHALL BE LIMITED TO 50 LF WIDTH FOR PROPOSED ACCESS ROADS AND 50 LF FOR CRANE PATHS, AND SHALL BE LIMITED TO A 250 LF RADIUS FOR PROPOSED WIND TURBINE GENERATORS. THE GRADING LIMITS SHALL BE CENTERED ON THE ROADWAYS AND WIND TURBINES. THE CONTRACTOR SHALL MAKE ALL EFFORTS TO KEEP ACTIVITIES WITHIN THE ERECTION AREAS SHOWN ON THE PLANS BUT IT IS UNDERSTOOD THAT SOME ACTIVITIES THAT WILL NOT REQUIRE GRADING OR SOIL DISTURBANCE MAY EXTEND BEYOND THE DEFINED LIMITS. DURING ERECTION OF THE ROTOR, TRUCKS AND/OR FORKLIFTS MAY EXTEND BEYOND THESE LIMITS. SEE DETAIL TS01 FOR TYPICAL ERECTION AREAS.
19. AN ALTA SURVEY HAS BEEN PROVIDED BY WESTWOOD. CONTRACTOR AND OWNER ARE RESPONSIBLE FOR LOCATING ALL UTILITIES AND VERIFYING LOCATION OF CONSTRUCTION ACTIVITIES PRIOR TO COMMENCING WORK.

STORMWATER POLLUTION PREVENTION PLAN (SWPPP):

1. THE CONTRACTOR SHALL PROVIDE EROSION CONTROL MEASURES AS PLANNED AND SPECIFIED FOLLOWING BEST MANAGEMENT PRACTICES AS OUTLINED BY THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND BEING IN CONFORMANCE WITH THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL STORMWATER PERMIT.
2. REFER TO THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR THE TRIPLE H WIND FARM, PREPARED BY WESTWOOD PROFESSIONAL SERVICES, FOR EROSION CONTROL AND RESTORATION SPECIFICATIONS, SEDIMENT AND EROSION CONTROL PROCEDURES, LOCATIONS OF BMPs, DETAILS, AND INSPECTION INFORMATION.
3. ALL PASTURES AND DRAINAGE SWALES DISTURBED DURING CONSTRUCTION ACTIVITIES AND NOT COVERED BY ROAD SURFACING MATERIALS, SHALL BE SEEDED IN ACCORDANCE WITH THE SWPP PLAN.
4. TEMPORARY EROSION CONTROL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE TEMPORARY EROSION CONTROL PLAN SHALL BE IN ACCORDANCE WITH THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND THE TRIPLE H WIND FARM STORMWATER POLLUTION PREVENTION PLAN ON FILE.

PROJECT CONTACT INFORMATION:

TITLE	COMPANY	NAME	CONTACT NUMBER
OWNER (PRIMARY)	ENGIE	CASEY WILLIS	805-569-6185
PROJECT MANAGER	WESTWOOD	DANI NYGREN	952-906-7493
ENGINEER OF RECORD	WESTWOOD	ROB COPOULS	952-906-7470
CONTRACTOR	WANZEK	JASON HELLERUD	701-893-3685

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #300
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com

Westwood Professional Services, Inc.

Designed:	MAK
Checked:	DDN
Drawn:	MAK
As-Built Drawing:	

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK
MasTec

2028 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19

0014440OTP.dwg

©2019 Westwood Professional Services, Inc.

CEMENT STABILIZATION - PROCEDURE

THE SPECIFICATIONS BELOW ARE GENERAL RECOMMENDATIONS/GUIDELINES FOR CEMENT STABILIZATION OF SUBGRADES FOR THE PROJECT. ACTUAL FIELD CONDITIONS MAY ALTER APPLICATION RATE. CONSULT GEOTECHNICAL ENGINEER FOR FURTHER RECOMMENDATIONS.

1. STRIP THE TOP ±4 INCHES OF TOPSOIL (THROUGH THE ROOT ZONE) FROM THE AREA TO BE STABILIZED. ROOTS SMALLER THAN 1/4" DIAMETER ARE CONSIDERED INSIGNIFICANT.
2. PERFORM A PROCTOR (ASTM D 698) TEST TO DETERMINE THE OPTIMUM MOISTURE CONTENT IF THE MATERIAL TO BE STABILIZED DOES NOT MATCH A PREVIOUSLY PERFORMED PROCTOR.
3. DETERMINE THE IN-SITU MOISTURE CONTENT USING A NUCLEAR DENSITY GAUGE (OR EQUIVALENT MOISTURE CONTENT TEST) DAILY, PRIOR TO INCORPORATION OF THE CEMENT. PROVIDE ADDITIONAL MOISTURE CONTENT TESTING AS NEEDED BASED ON WEATHER CONDITIONS.
   - 3.1. THE CONTRACTOR WILL BE ADVISED OF IN-SITU MOISTURE CONTENT, AND MOISTURE ADJUSTMENTS SHOULD BE MADE IF IN-SITU MOISTURE IS LESS THAN OPTIMUM MOISTURE CONTENT AS DETERMINED BY THE PROCTOR (ASTM D 698).
4. SOIL AND CEMENT BLENDING:
   - 4.1. COMPLETELY BLEND SUBGRADE SOIL WITH THE APPROPRIATE AMOUNT OF CEMENT BY WEIGHT. FIELD RESULTS FROM TEST STRIPS WILL DICTATE THE CEMENT APPLICATION RATE.
   - 4.2. IN AREAS OF HIGH MOISTURE OR POOR SOILS, THE CONTRACTOR MAY INCREASE THE PERCENT OF CEMENT IN ORDER TO MEET THE MINIMUM SUBGRADE STRENGTH REQUIREMENTS.
   - 4.3. THE USE OF A RECLAIMER IS AN ADEQUATE BLENDING METHOD. DISCING IS NOT AN ADEQUATE BLENDING METHOD.
   - 4.4. A STABILIZATION DEPTH OF 12" WAS USED FOR DESIGN PURPOSES. STABILIZATION DEPTH MAY NEED TO INCREASE TO 16" IN AREAS OF EXTREME MOISTURE OR POOR SOILS IN ORDER TO MEET THE STRENGTH AND PROOF ROLL REQUIREMENTS.
5. COMPACTION:
   - 5.1. A ROLLING PATTERN WILL BE ESTABLISHED USING A NUCLEAR DENSITY GAUGE DURING COMPACTION.
     - 5.1.1. COMPACTION WILL BE PERFORMED UNTIL THE STABILIZED MATERIAL REACHES THE "BREAK POINT" AFTER WHICH ADDITIONAL PASSES WITH A ROLLER RESULTS IN A LOSS OF DENSITY AS MEASURED BY A NUCLEAR DENSITY GAUGE.
     - 5.1.2. COMPACTION IS TYPICALLY ACHIEVED BY MULTIPLE PASSES OF A PADFOOT ROLLER UNTIL THE ROLLER "WALKS" OUT OF THE RECLAIMED MATERIAL (SPACE IS VISIBLE BETWEEN THE DRUM AND THE RECLAIMED MATERIAL). THIS IS FOLLOWED BY BLADING AND SHAPING THE RECLAIMED MATERIAL TO FINAL PROFILE AND CROSS SECTION, REMOVING HIGH AND LOW POINTS. SMOOTH DRUM OR RUBBER TIRE ROLLERS ARE THEN USED TO FINISH ROLLING (THIS IS WHEN THE DENSITY TESTS ARE PERFORMED) UNTIL THE DENSITY OF THE MATERIAL REACHES THE "BREAK POINT."
     - 5.1.3. THE NUMBER OF PASSES AND EQUIPMENT USED TO REACH THE "BREAK POINT" IS CONSIDERED THE ROLLING PATTERN.
     - 5.1.4. A NEW ROLLING PATTERN MAY NEED TO BE ESTABLISHED IF THE PERFORMANCE REQUIREMENTS ARE NOT BEING MET. THIS MAY BE DUE TO CHANGES IN THE MOISTURE CONTENT, THE SOIL TYPE, OR THE CEMENT RATE.
   - 5.2. THE TARGET DENSITY IS 98% OF THE MAXIMUM DENSITY DETERMINED FROM THE ROLLING PATTERN.
     - 5.2.1. DENSITY TESTS SHALL BE TAKEN AT THE RATE OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER TO CONFIRM THE DENSITY IS MATCHING THE TARGET. ONCE THE ROLLING PATTERN HAS BEEN CONFIRMED IT IS RECOMMENDED THAT TESTING CONTINUE AT 1 TEST PER 1,000 LF IN EACH PASS OF THE RECLAIMER.
     - 5.2.2. IF IT IS NOT POSSIBLE TO ATTAIN THE TARGET DENSITY, AND ADDITIONAL COMPACTION DOES NOT IMPROVE THE DENSITY, A NEW ROLLING PATTERN SHOULD BE ESTABLISHED.
   - 5.3. THE AIR TEMPERATURE SHALL BE ABOVE 40 DEGREES (F) DURING THE CEMENT STABILIZATION PROCESS. MIXING CEMENT INTO FROZEN GROUND IS NOT ACCEPTABLE.
6. THE STABILIZED MATERIAL SHALL BE CONTINUOUSLY WET CURED FOR A MINIMUM OF 24 HOURS (WET CURED IS IDENTIFIED VISUALLY AS DAMP SURFACE).
7. PERFORM SUBGRADE TESTING IN ACCORDANCE WITH TESTING SCHEDULE.
8. AGGREGATE PLACEMENT:
   - 8.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 8.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 8.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

CEMENT STABILIZATION - DESIGN BASIS

1. DURING INITIAL CONSTRUCTION, CONTRACTOR SHALL CONSTRUCT MINIMUM 300 LF TEST STRIPS CONTAINING 4%, 5%, AND 6% CEMENT IN ACCORDANCE WITH CEMENT STABILIZATION PROCEDURES.
2. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 3 FOR ANTICIPATED RESULTS):
   - 2.1. PERFORM INITIAL SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M BETWEEN 4 TO 6 HOURS AFTER FINAL COMPACTION.
   - 2.2. PERFORM ADDITIONAL DCP TESTING AT 24 AND 48 HOURS AFTER FINAL COMPACTION.
   - 2.3. PERFORM SUBSEQUENT DCP TESTS AT 7 DAYS AFTER FINAL COMPACTION AS VERIFICATION OF STRENGTH CURVE.
   - 2.4. A MINIMUM OF 3 TESTS PER TEST SECTION PER TIMEFRAME IS REQUIRED. TESTS SHALL BE TAKEN AT THE CENTERLINE AND 2' FROM EACH SHOULDER.
   - 2.5. RECORD DCP TEST RESULTS EVERY 6 INCHES TO TOTAL DEPTH OF 12 INCHES.

TABLE 3: TEST STRIP CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	COMPRESSIVE STRENGTH (PSF)
4 – 6 HOURS	6	5	1,800
24 HOURS	10	7	2,500
48 HOURS	15	10	3,200
7 DAYS	30	21	5,200

CEMENT STABILIZATION - PRODUCTION

1. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 5 FOR SUMMARY OF TESTING REQUIREMENTS):
   - 1.1. PERFORM SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M NO SOONER THAN 24 HOURS AFTER FINAL COMPACTION.
   - 1.2. DCP TESTING FREQUENCY SHALL BE WITH A RANDOM SPACING AND A MINIMUM OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER. A MINIMUM OF 3 TESTS PER ROAD IS REQUIRED.
   - 1.3. THE CBR OF THE STABILIZED SUBGRADE SHOULD BE CALCULATED IN 6" INCREMENTS THROUGH THE ENTIRE DEPTH OF THE STABILIZED LAYER.
   - 1.4. THE MINIMUM REQUIRED CBR PRIOR TO PROOF-ROLLING IS PROVIDED IN TABLE 4 BELOW:

TABLE 4: FINAL CEMENT STABILIZED CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	UNDRAINED SHEAR STRENGTH (PSF)	BEARING CAPACITY (PSF)
24 – 48 HOURS	15	10	3,500	9,800
3 – 7 DAYS	30	21	7,000	16,000
28 DAYS	50	33	12,000	28,500

NOTE: UNDRAINED SHEAR STRENGTH WAS CALCULATED USING THE BLACK (1961) EQUATION. BEARING CAPACITY WAS CALCULATED USING THE VESIC EQUATION MODIFIED FOR TWO LAYERS (12" CEMENT STABILIZED SUBGRADE OVER A NATURAL SUBGRADE WITH A CBR OF 1.5)

   - 1.5. ONCE THE MINIMUM REQUIRED CBR IS ACHIEVED AT ANY CORRESPONDING TIME PERIOD, THE SUBGRADE IS CONSIDERED ADEQUATE AND THE CONTRACTOR MAY PROCEED WITH PROOF-ROLL TESTING. FUTURE DCP TESTING ON THAT SEGMENT OF SUBGRADE IS NOT REQUIRED.
   - 1.6. IF TESTING DOES NOT INDICATE A CBR OF 30 WITHIN 7 DAYS, ADDITIONAL GRAVEL SURFACING AND/OR THE ADDITION OF GEOTEXTILE FABRIC MAY BE REQUIRED. FOR FUTURE SUBGRADE STABILIZATION AREAS, CONTACT THE ENGINEER AND OWNER VIA RFI FOR RECOMMENDATIONS AND APPROVAL.
2. SUBGRADE PROOF-ROLL TESTING AND ACCEPTANCE:
   - 2.1. ONCE THE REQUIRED DCP VALUE HAS BEEN OBTAINED BUT PRIOR TO PLACING AGGREGATE, THE SUBGRADE SHALL BE PROOF-ROLLED. REFER TO THE PROJECT TESTING REQUIREMENTS FOR PROOF-ROLL DEFINITION.
   - 2.2. PROOF-ROLLING SHOULD BE PERFORMED WITH ONE PASS DOWN THE CENTER AND NOT BE PERFORMED WITHIN 12 INCHES OF THE EDGE OF THE STABILIZED SECTION.
   - 2.3. IF PROOF-ROLLING FAILS, RE-STABILIZATION MAY BE REQUIRED AND A NEW ROLLING PATTERN OR ADDITIONAL CEMENT MAY BE REQUIRED.
3. AGGREGATE PLACEMENT:
   - 3.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 3.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 3.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

TABLE 5: CEMENT STABILIZATION PRODUCTION TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
COMPACTED SUBGRADE (CEMENT STABILIZED)	PROCTOR	MINIMUM 1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER 1000 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
NOTE: SEE ABOVE FOR INITIAL TESTING REQUIREMENTS	DCP TEST	1 PER 500 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
	PROOF-ROLL (AFTER PASSING DCP TESTS)	ENTIRE LENGTH

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-Free (866) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: DDN
Drawn: BMK
As-Built Drawing:

Revisions #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	50% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 13 OF 57

0014440DP.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 205th Street in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 1050' South of 330th Ave & 205th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.24'28.25" W Long. -99.33'46.82" W
4. Width of entrance: 16' access road & 35' temporary intersection modification RD08-B
   (Check attached spec sheet)
5. Size & length of culvert: (2) 24"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001160 NE4 23-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Signature of Applicant

Robert Bawdon
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 205th Street in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 1050' South of 330th Ave & 205th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.24'28.25" W Long. -99.33'46.82" W
4. Width of entrance: 16' access road & 35' temporary intersection modification RD08-B
   (Check attached spec sheet)
5. Size & length of culvert: (2) 24"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001160 NE4 23-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

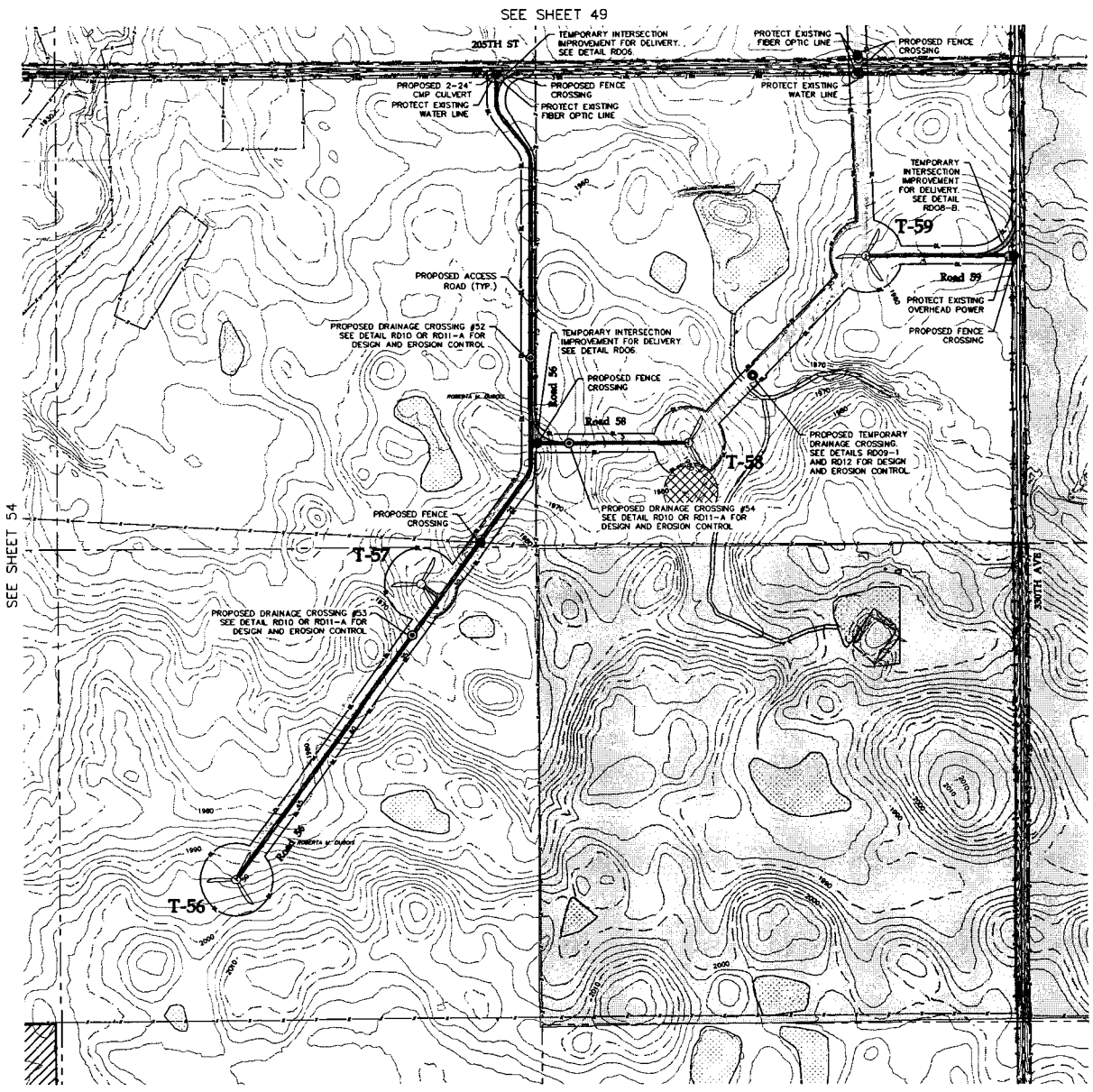
Submitted August 1, 20 19 Date Approved: _____

_____ _____
Signature of Applicant Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date_____ Hwy. Supt's Signature_____

© 2019 Westwood Professional Services, Inc.



LEGEND:

- PROPOSED TURBINE LOCATION
- T-XX — PROPOSED TURBINE NUMBER
- PROPOSED ALTERNATE TURBINE LOCATION
- ALT-XX — PROPOSED ALTERNATE TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED ALTERNATE ACCESS ROAD
- PROPOSED CRANE PATH
- PROPOSED UNDERGROUND COLLECTION*
- PROPOSED DISTURBANCE LIMITS
- PROPOSED PERIMETER SEDIMENT CONTROL
- EXISTING 10' CONTOURS
- EXISTING 2' CONTOURS
- EXISTING GRAVEL EDGE
- EXISTING BITUMINUS EDGE
- EXISTING RIGHT-OF-WAY
- EXISTING PARCEL LINE
- EXISTING BUILDING
- EXISTING FENCE
- EXISTING OVERHEAD POWER
- EXISTING HIGH VOLTAGE OVERHEAD POWER
- EXISTING UNDERGROUND POWER LINE
- EXISTING FIBER OPTIC LINE
- EXISTING WATER LINE
- DELINEATED WETLAND
- ARCHAEOLOGICAL AVOIDANCE AREA
- EXISTING USFWS EASEMENT
- PROJECT BOUNDARY
- 1900 — EXISTING GROUND ELEVATION
- PROPOSED DRAINAGE CROSSING**
- PROPOSED TEMPORARY DRAINAGE CROSSING**
- PROPOSED FENCE CROSSING***
- PROPOSED UTILITY CROSSING
- PROPOSED CULVERT

* PROVIDED BY OTHERS AND SHOWN FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSTRUCTION PLANS FOR DETAILS.

** SEE SHEET 11 FOR DRAINAGE CROSSING TYPE AND SIZING. DRAINAGE CROSSINGS SHALL CONSIST OF LOW WATER CROSSING OR CULVERT. DRAINAGE CROSSINGS ALONG CRANE PATH SHALL CONSIST OF CRANE MATS OR TEMPORARY CULVERT.

*** ALL GATE INSTALLATIONS SHALL BE FIELD DETERMINED AND AGREED UPON BY THE CONTRACTOR AND OWNER.

	14	15	16	17	18	19	20			
21	22	23	24	25	26	27	28	29	30	31
				32	33	34	35	36	37	38
			39	40	41	42	43	44	45	46
		47	48	49	50	51				
52	53	54	55							

KEY MAP

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: DJH
Drawn: BMK
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2035 3rd Avenue NW
West Fargo, ND 58078

N

0' 300' 600' 900'

Triple H Wind Farm

Hyde County, South Dakota

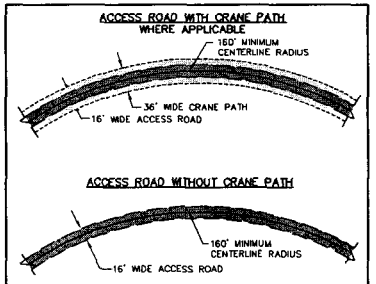
Site Plan T-56 - T-59

90% COMPLETE NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 55 OF 57

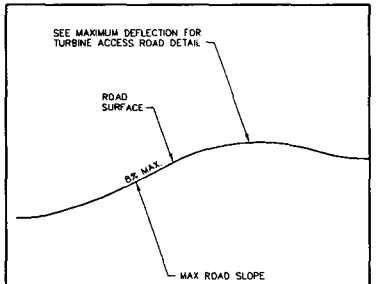
0014440SP01.dwg

©2019 Westwood Professional Services, Inc.



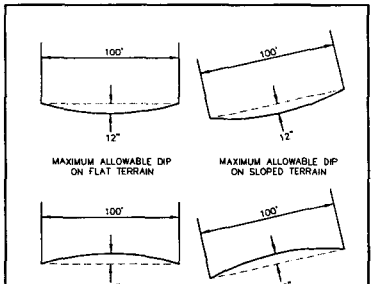
NOTE:
1. SOME RADII MAY REQUIRE ADDITIONAL SOIL COMPACTION OR GRAVEL OUTSIDE OF THE WIDTH SHOWN ABOVE TO ACCOMMODATE TRACTORS OR TRAILERS TRACKING OFF THE ACCESS ROAD.

Westwood	MINIMUM RADIUS FOR TURBINE ACCESS ROAD	LAST REVISED: 04/29/11
		RD02

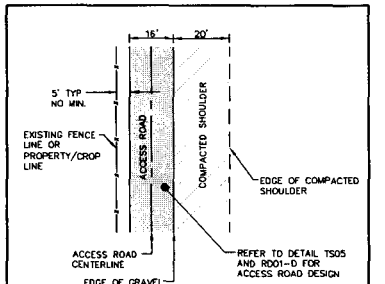


NOTES:
1. ROAD SLOPE SHALL NOT EXCEED 8% WITHOUT OWNER APPROVAL

Westwood	MAXIMUM VERT. SLOPE FOR TURBINE ACCESS ROAD/CRANE TRAVEL PATH	LAST REVISED: 3/29/11
		RD03

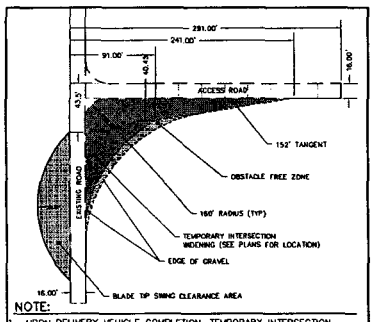


Westwood	MAXIMUM DEFLECTION FOR TURBINE ACCESS ROAD	LAST REVISED: 10/26/09
		RD04



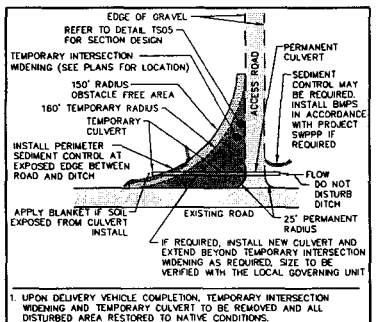
NOTE:
1. COMPACTED SHOULDER SHALL BE RETURNED TO NATIVE CONDITION FOLLOWING TURBINE GENERATOR CONSTRUCTION.
2. THE ACCESS ROAD MAY NEED TO BE CONSTRUCTED FARTHER FROM THE PROPERTY LINE IF OBSTRUCTIONS SUCH AS TREES FOLLOW THE PROPERTY LINE.

Westwood	TURBINE ACCESS ROAD ALONG FENCE/PROPERTY/CROP LINE	LAST REVISED: 3/29/11
		RD05



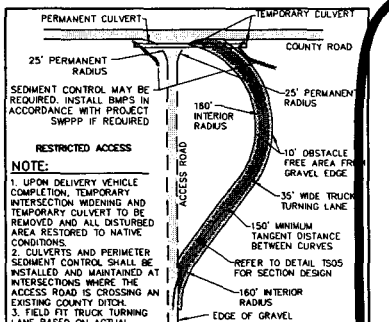
NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING TO BE REMOVED AND ALL DISTURBED AREA RESTORED.
2. DIMENSIONS ASSUME A 90° INTERSECTION

Westwood	INTERSECTION WIDENING DIMENSIONS	LAST REVISED: 7/25/19
		RD06



1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.

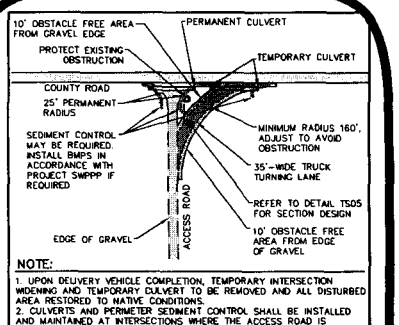
	TURBINE ACCESS ROAD TYPICAL INTERSECTION WIDENING	LAST REVISED: 3/2/17
		RD07



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

NOT TO SCA

Westwood	TRUCK TRAFFIC TURNING LANE A	LAST REVISED: 3/2/17
		RD08-A



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

Westwood	TRUCK TRAFFIC TURNING LANE B	LAST REVISED: 12/2/15
		RD08-B

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com

Westwood Professional Services, Inc.

Designed:	GMC
Checked:	DJH
Drawn:	GMC
As-Built Drawing:	

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2200 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

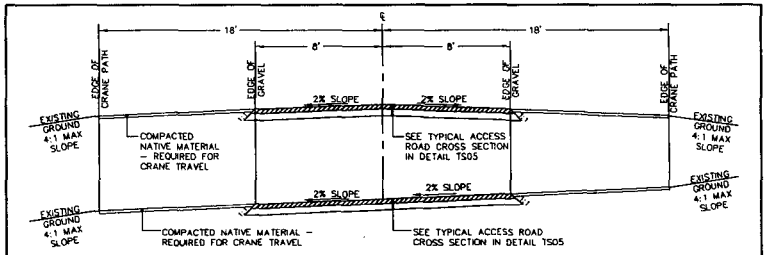
Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 5 OF 57

0014440DTP.dwg

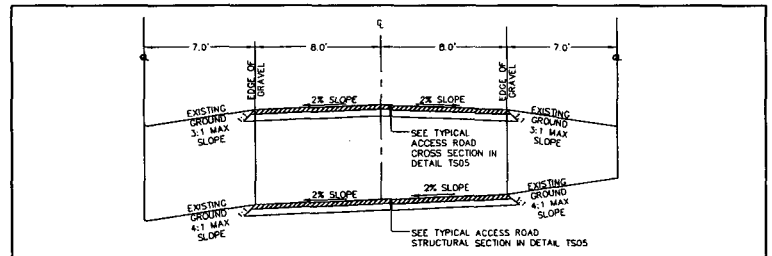
© 2019 Westwood Professional Services, Inc.



NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE ACCESS ROAD DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

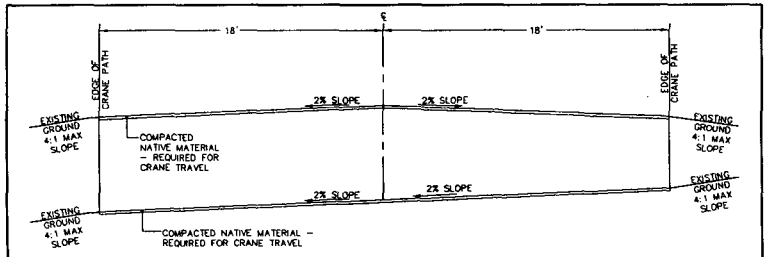
Westwood | TYPICAL TURBINE ACCESS ROAD AND CRANE PATH | LAST REVISED: 06/28/21 | RD01-A



NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

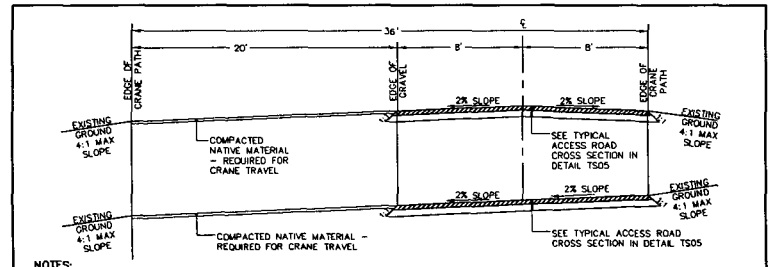
Westwood | TYPICAL TURBINE ACCESS ROAD SECTION | LAST REVISED: 3/24/21 | RD01-B



NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE WHERE CRANE PATHS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT CRANE PATH REMAINS WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%

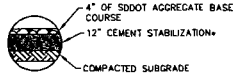
Westwood | TYPICAL CRANE PATH | LAST REVISED: 06/28/21 | RD01-C



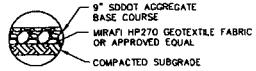
NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE EDGE OF COMPACTED SHOULDER DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

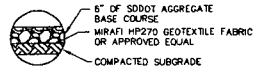
Westwood | TYPICAL TURBINE ACCESS ROAD AND OFFSET CRANE PATH | LAST REVISED: 06/28/21 | RD01-D



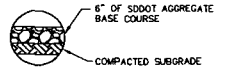
PRIMARY ACCESS ROAD CROSS SECTION*



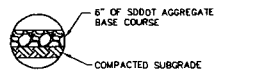
SECONDARY TURBINE ACCESS ROAD CROSS SECTION



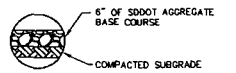
SPUR ROAD / MET TOWER ROAD CROSS SECTION



TEMPORARY TURNING IMPROVEMENTS CROSS SECTION



GRAVEL RING CROSS SECTION



LAYDOWN YARD CROSS SECTION

* CEMENT APPLICATION RATE MAY VARY BASED ON TEST STRIPS AND FIELD PERFORMANCE. SEE SHEET 13 FOR CEMENT STABILIZATION PROCEDURE AND DESIGN BASIS.

NOTES:

STRUCTURAL SECTIONS SHOWN ARE THE MINIMUM THICKNESS REQUIREMENTS DURING NORMAL FIELD CONDITIONS. THE SECTIONS MAY NEED TO BE INCREASED BASED ON ACTUAL FIELD CONDITIONS AT THE TIME OF CONSTRUCTION. CONDITIONS INCLUDE BUT ARE NOT LIMITED TO CONSTRUCTION DURING THE FREEZE/THAW CYCLE, UNUSUALLY WET PERIODS, OR IN LOW/WET AREAS. SEE SHEET 12 FOR TESTING REQUIREMENTS AND SPECIFICATIONS.

Westwood | TYPICAL STRUCTURAL CROSS SECTIONS

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150
Westwood Professional Services, Inc.

Designed: BMC
Checked: BJH
Drawn: BMC
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK MasTec

2028 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 4 OF 57

0014440DTP.dwg

©2019 Westwood Professional Services, Inc.

ROAD DESIGN PARAMETERS

1. ACCESS ROADS HAVE BEEN DESIGNED TO ACCOMMODATE LIGHT DUTY TRUCKS (PICKUP TRUCKS AND MAINTENANCE VEHICLES) FOR LOW VOLUME USE IN NORMAL OPERATING CONDITIONS AS WELL AS HEAVY DUTY CONSTRUCTION TRAFFIC UNDER DRY CONDITIONS. THE ROAD DESIGN SPECIFIED IS NOT INTENDED FOR ALL WEATHER USE FOR HEAVY DUTY CONSTRUCTION LOADS.
2. ROAD MAINTENANCE CAN BE EXPECTED OVER THE LIFE OF THE PERMANENT FACILITY.

PRODUCTS

1. AGGREGATE BASE SHALL CONSIST OF SDDOT AGGREGATE BASE COURSE (AND IN CONFORMANCE WITH THE GRADATION TABLE 1). AGGREGATE MAY BE CRUSHER RUN UPON ENGINEERS APPROVAL. AGGREGATE GRADATIONS SHALL BE SUBMITTED TO ENGINEER FOR REVIEW.
2. ROAD SHOULDERS AND CRANE PADS SHALL CONSIST OF COMPACTED NATIVE SOILS.
3. CULVERTS: ACCESS ROAD CULVERTS SHALL MEET THE MINIMUM SPECIFICATIONS SET FORTH BY THE SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION AND/OR HYDE COUNTY. ALL CULVERTS ARE PLANNED TO BE A MINIMUM 18" DIAMETER AND MANUFACTURED OF 16-GAGE CORRUGATED METAL PIPE WITH NO END TREATMENTS UNLESS NOTED OTHERWISE. ACTUAL SIZE WILL BE DETERMINED THROUGH HYDRAULIC ANALYSIS.
4. GEOTEXTILE FABRIC: MIRAFI HP270 OR APPROVED EQUAL.

EXECUTION

1. CLEARING AND GRUBBING
   A. THE CONTRACTOR SHALL BE REQUIRED TO GRUB ALL TREES, STUMPS, BRUSH, AND DEBRIS WITHIN THE GRADING AREAS SHOWN ON THE PLANS. GRUBBING INCLUDES REMOVAL OF ALL PLANT MATERIAL GREATER THAN 2" INCLUDING STUMPS, BRANCHES, ROOTS, ETC. TO A DEPTH BELOW THE FINAL SUBGRADE. THE CONTRACTOR IS TO REMOVE ONLY THOSE TREES WHICH ARE DESIGNATED BY THE OWNER'S REPRESENTATIVE FOR REMOVAL, AND SHALL EXERCISE EXTREME CARE AROUND EXISTING TREES TO BE SAVED.
2. TOPSOIL STRIPPING
   A. TOPSOIL, INCLUDING ROOTS LARGER THAN 2" AND LARGE ROOT MASSES, SHALL BE STRIPPED FROM ALL ROADWAY AND FOUNDATION AREAS UP TO 10'. TOPSOIL SHALL NOT BE STRIPPED OUTSIDE OF THE DESIGNATED DISTURBANCE AREAS.
   B. ANY TOPSOIL THAT HAS BEEN STRIPPED SHALL BE STOCKPILED FOR POST CONSTRUCTION REVEGETATION. ALL TOPSOIL SHALL BE REDISTRIBUTED TO THE LAND OWNER'S PROPERTY OF WHERE IT ORIGINATED FROM.
3. FILL PLACEMENT
   A. FILL PLACEMENT SHALL CONSIST OF THE PLACING OF SUITABLE FILL MATERIAL, AFTER TOPSOIL STRIPPING, ABOVE THE EXISTING GRADE. GENERALLY, SIDE SLOPES SHALL BE CONSTRUCTED AT FOUR FOOT HORIZONTAL TO ONE FOOT VERTICAL, WITH SOME LOCATIONS THROUGHOUT THE PROJECT WITH SLOPES OF TWO FEET HORIZONTAL TO ONE FOOT VERTICAL. THE MATERIAL FOR FILL CONSTRUCTION SHALL BE OBTAINED FROM THE ACCESS ROAD/TURBINE EXCAVATION (SEE GEOTECHNICAL REPORT FOR RESTRICTIONS), OR ANY SUITABLE, APPROVED SOIL OBTAINED ONSITE/OFFSITE BY CONTRACTOR, AS DIRECTED OR APPROVED BY THE ENGINEER. THIS MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 12" AND CONSTRUCTED TO 95% OF THE MAXIMUM DRY DENSITY AND WITHIN 2% OF OPTIMUM MOISTURE CONTENT, AS DETERMINED BY THE STANDARD PROCTOR (AASHTO T99).
   B. SIDE SLOPES GREATER THAN 4:1 WILL NOT BE PERMITTED, UNLESS OTHERWISE NOTED ON THE PLAN.
   C. FILL SLOPES SHALL BE BENCHED INTO THE EXISTING SLOPE TO PREVENT MOVEMENT BETWEEN THE FILL AND NATIVE SOILS. BENCHES SHOULD BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO FILL PLACEMENT. POSITIVE DRAINAGE IS REQUIRED AT BENCHED AREAS AND AT THE TOE OF FILL SLOPES TO REMOVE SURFACE WATER.
4. SUBGRADE
   A. SUBGRADE PREPARED AT GRADE OR IN CUT REQUIRES SCARIFICATION AND RECOMPACTION TO A DEPTH OF 12" OR MORE.
   B. ACCESS ROAD CROSS SLOPES SHOWN IN THE PLANS ARE MEANT AS A GUIDE. ACCESS ROAD CROSS SLOPES MAY RANGE FROM 1% - 2%, CHECK WITH THE ENGINEER IF THE CROSS SLOPE FALLS OUTSIDE OF THIS RANGE. ACCESS ROADS BEING UTILIZED FOR CRANE TRAVEL SHOULD HAVE A MAX CROSS SLOPE OF 2%.

TABLE 1: SDDOT AGGREGATE BASE COURSE - LOCALLY SOURCED	
SIEVE SIZE	PERCENT PASSING
1"	100
3/4"	80-100
1/2"	68-91
NO. 4	46-70
NO. 8	34-58
NO. 40	13-35
NO. 200	3-12

MEET FOLLOWING REQUIREMENTS PER 882.2

LIQUID LIMIT (MAX) = 25
PLASTICITY INDEX = 0-6
L.A ABRASION (% MAX) = 40%

GRADATION HAS BEEN OBTAINED FROM THE 2015 SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION BOOK.

STORM WATER DESIGN PARAMETERS

1. SEE SHEET 6 FOR CULVERT SIZING AND DESIGN PARAMETERS. SEE HYDROLOGY MEMO FOR FURTHER DESIGN CALCULATIONS. CULVERTS SHALL BE MINIMUM 18" CORRUGATED METAL PIPE. ALL TEMPORARY PORTIONS OF THE INSTALLED CULVERTS SHALL BE REMOVED UPON COMPLETION OF THE PROJECT.
2. IT IS EXPECTED THAT CULVERTS WILL BE OVERTOPPED DURING SOME STORMS AND MAINTENANCE WILL BE REQUIRED THROUGH THE LIFE OF THE PROJECT.
3. WHEN INSTALLING DRAINAGE CULVERTS THE CONTRACTOR SHALL USE JUDGMENT IN SETTING THE FLOW LINE ELEVATIONS AND CULVERT LONGITUDINAL SLOPE. TYPICALLY THE FLOW LINE ELEVATIONS AND LONGITUDINAL SLOPE OF THE CULVERT SHOULD MATCH THE NATURAL GROUND ELEVATIONS AND SLOPE TO ENSURE POSITIVE DRAINAGE. WHEN POSSIBLE, ALL CULVERTS SHOULD BE PLACED AT A MINIMUM 0.5% GRADE.
4. ANTICIPATED CULVERT CROSSINGS ARE SHOWN ON THE CONSTRUCTION PLAN, ADDITIONAL CULVERTS MAY NEED TO BE INSTALLED IN AREAS WHERE CONCENTRATED FLOW IS EXPECTED DUE TO CONSTRUCTION ACTIVITIES.
5. CONSTRUCTION DRAINAGE CROSSINGS TO MAINTAIN EXISTING FLOW CHARACTERISTICS OF THE FEATURES. FEATURES SHALL BE GRADED TO PRECONSTRUCTION CONTOURS.

TESTING:

1. TESTING SHALL BE PERFORMED BY A DESIGNATED INDEPENDENT TESTING AGENCY.
2. SUBMIT ONE SET OF TESTING AND INSPECTION RECORDS SPECIFIED TO THE CIVIL ENGINEER OF RECORD.

DEFINITIONS:

1. PROOF ROLLING:
   SHALL BE PERFORMED IN THE PRESENCE OF THE GEOTECHNICAL ENGINEER OR QUALIFIED GEOTECHNICAL REPRESENTATIVE USING A FULLY LOADED TANDEM AXLE DUMP TRUCK OR WATER TRUCK WITH A MINIMUM GROSS WEIGHT OF 25 TONS OR A FULLY LOADED BELLY DUMP WITH AN EQUIVALENT AXLE LOADING. PROOF-ROLLING ACCEPTANCE STANDARDS INCLUDE NO RUTTING GREATER THAN 1.5 INCHES, AND NO "PUMPING" OF THE SOIL BEHIND THE LOADED TRUCK.
2. SIEVE ANALYSIS:
   SHALL BE CONDUCTED IN ACCORDANCE WITH AASHTO T27
3. PROCTORS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T99
4. ATTERBERG LIMITS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T89 AND T90
5. MOISTURE DENSITY (NUCLEAR DENSITY):
   SHALL BE DONE IN ACCORDANCE WITH AASHTO T310
6. DYNAMIC CONE PENETROMETER (DCP) TESTING:
   SHALL BE DONE IN ACCORDANCE WITH ASTM D6951-03

REQUIREMENTS:

1. FILL PLACEMENT:
   A. SOILS USED AS FILL MATERIAL SHALL BE TESTED FOR MOISTURE CONTENT AND PROCTOR TESTS.
   B. WHERE FILL CONSTRUCTION REQUIRES MORE THAN 12 INCHES OF FILL PLACEMENT, COMPACT EACH LIFT TO A MINIMUM OF 95 PERCENT OF THE MATERIAL'S MAXIMUM STANDARD PROCTOR DRY DENSITY.
2. COMPACTED SUBGRADE (CEMENT STABILIZED):
   A. SEE SHEET 13 FOR TESTING REQUIREMENTS AND PROCEDURE.
3. COMPACTED SUBGRADE (NON-CEMENT STABILIZED):
   A. THE ENTIRE SUBGRADE SHALL BE PROOF-ROLLED PRIOR TO THE PLACEMENT OF THE AGGREGATE BASE TO IDENTIFY AREAS OF UNSTABLE SUBGRADE.
   B. PERFORM A MINIMUM OF 3 DYNAMIC CONE PENETROMETER (DCP) TESTS PER ACCESS ROAD OR ONE FOR EVERY 1,000 LF OF ROAD, WHICHEVER IS GREATER. SUBGRADE MUST MEET A MINIMUM DCP OF 3 BLOWS PER 6" TO A TOTAL DEPTH OF 2' (MINIMUM CBR=1.5).
   C. IF A PASSING PROOF-ROLL OR DCP REQUIREMENTS CANNOT BE ACHIEVED THE FOLLOWING ALTERNATIVES MAY BE IMPLEMENTED:
      a. SCARIFY, DRY, AND RECOMPACT SUBGRADE
      b. REMOVE UNSUITABLE MATERIAL AND REPLACE WITH SUITABLE MATERIAL
      c. INCREASE AGGREGATE BASE THICKNESS
4. AGGREGATE BASE:
   A. AGGREGATE BASE SHALL BE PROOF-ROLLED OVER THE ENTIRE LENGTH. IF PROOF ROLLING DETERMINES THAT THE ROAD IS UNSTABLE, ADDITIONAL AGGREGATE SHALL BE ADDED UNTIL THE UNSTABLE SECTION IS ABLE TO PASS A PROOF ROLL.
   B. PROVIDE 1 SIEVE ANALYSIS (PROJECT MAX OF 20) PER 2500 CY OF ROAD BASE PLACED.
5. CRANE PAD AND CRANE PATHS / CRANE TRAVEL SHOULDERS:
   A. TESTING REQUIREMENTS ARE PENDING BASED ON CRANE PICK PLANS PROVIDED BY THE CONTRACTOR.

TABLE 2: TESTING SCHEDULE SUMMARY		
LOCATION	TEST	FREQUENCY
FILL PLACEMENT	PROCTOR	1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER LIFT PER 5000 SF OF FILL PLACED OR 1 PER 500 LF OF ROAD OR CRANE WALK
COMPACTED SUBGRADE (CEMENT STABILIZED):	SEE SHEET 13	SEE SHEET 13
COMPACTED SUBGRADE (NON-CEMENT STABILIZED):	PROOF-ROLL	ENTIRE AREA
	DCP	1 PER 1,000 FT OR MIN. 3 PER ROAD
AGGREGATE BASE	PROOF-ROLL	ENTIRE AREA
	SIEVE ANALYSIS, LL, PL, AND L.A ABRASION	1 PER 2,500 CY

GENERAL NOTES:

1. GROUND SURFACE CONTOURS (AT TWO-FOOT VERTICAL INTERVALS) AND ELEVATIONS ARE BASED ON A PHOTOGRAMMETRY SURFACE PROVIDED BY GEOTERRA. IF MAJOR DISCREPANCIES ARE FOUND IN THE GROUND ELEVATIONS DURING FIELD STAKING TO THE GROUND ELEVATIONS SHOWN ON THE PLANS, THE OWNER AND ENGINEER SHALL BE NOTIFIED.
2. WHERE SECTION OR SUBSECTION MONUMENTS ARE ENCOUNTERED, THE OWNER SHALL BE NOTIFIED BEFORE SUCH MONUMENTS ARE REMOVED. THE CONTRACTOR SHALL PROTECT AND CAREFULLY PRESERVE ALL PROPERTY MARKERS AND MONUMENTS UNTIL THE OWNER, AN AUTHORIZED SURVEYOR OR AGENT HAS WITNESSED OR OTHERWISE REFERENCED THEIR LOCATION.
3. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. TYPICAL DISTURBANCE SHALL BE LIMITED TO 10 LF FROM THE EDGE OF PROPOSED GRADING.
4. FINALIZE GRADING AROUND THE BASE OF TURBINES IN ACCORDANCE WITH DETAIL TS-03 AND TS-04.
5. GRADE ALL PROPOSED ROADS TO A MAXIMUM SLOPE OF 8%. IF 8% SLOPE CANNOT BE ACHIEVED, THE CONTRACTOR MAY UTILIZE ASSIST VEHICLES FOR THE PURPOSE OF DELIVERIES. GRADE ALL PROPOSED CRANE PATHS TO A MAXIMUM OF 8% UNLESS OTHERWISE NOTED IN PLAN SHEETS.
6. ANY FACILITIES REMOVED TO ALLOW FOR CONSTRUCTION (MAILBOXES, SIGNS, FENCES, ETC.) SHALL BE REPLACED BY THE CONTRACTOR IN A CONDITION AS GOOD AS EXISTING.
7. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING DRAINAGE THROUGHOUT THE CONSTRUCTION OF THIS PROJECT. CONSTRUCTION ACTIVITIES SHALL NOT BLOCK THE NATURAL OR MANMADE CREEKS OR DRAINAGE SWALES CAUSING RAINWATER TO POND. DEPENDING ON FIELD CONDITIONS, ADDITIONAL CULVERTS IN EXCESS OF THOSE ON THE PLANS MAY BE REQUIRED.
8. WHILE BUILDING THE ROADS AND EXCAVATING THE TURBINE FOUNDATIONS, EXCESS SOIL WILL RESULT. THE CONTRACTOR SHALL DISPOSE OF THIS EXCESS SOIL IN AN APPROVED MANNER. EXCESS TOPSOIL SHALL BE DISTRIBUTED INTO A THIN LAYER ON LAND IMMEDIATELY ADJACENT TO WHERE THE TOPSOIL ORIGINATED. ALL EXCESS TOPSOIL TO BE WASTED ONSITE. WHILE DOING SO THE CONTRACTOR SHALL AVOID CAUSING RIDGES OR MOUNDS THAT WOULD MAKE IT DIFFICULT FOR STORM WATER RUNOFF TO DRAIN. THE FINAL SURFACE OF THE DISTURBED TOPSOIL SHALL BE SMOOTH AND FOLLOW THE NATURAL CONTOUR OF THE LAND.
9. THE CONTRACTOR SHALL NOTIFY SOUTH DAKOTA 811 AT LEAST 48 HOURS BEFORE EXCAVATION ACTIVITIES COMMENCE.
10. TEMPORARY INTERSECTION WIDENING SHALL, UPON COMPLETION OF ALL PROJECT CONSTRUCTION OR UPON NOTIFICATION OF THE ENGINEER, BE REMOVED AND THE AREA RESTORED TO ITS ORIGINAL LINES AND GRADES WITH TOPSOIL REPLACED, EXCEPT WHERE REQUESTED BY THE TOWNSHIP OR COUNTY TO PERMANENTLY REMAIN. DISTURBED AREAS OUTSIDE OF THE FINAL ROADWAY SHALL BE SEEDED AND MULCHED.
11. TURBINE SETBACKS ARE NOT IDENTIFIED ON THE CONSTRUCTION PLANS. IT SHALL BE THE RESPONSIBILITY OF THE OWNER AND CONTRACTOR TO ENSURE THAT ALL TURBINE SETBACKS MEET PROJECT REQUIREMENTS.
12. GEOTECHNICAL REPORTS WITH RECOMMENDATIONS HAVE BEEN PROVIDED BY THE OWNER. ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL ENGINEERING REPORT AND RECOMMENDATIONS.
13. FIELD SURVEY WETLAND INFORMATION HAS BEEN PROVIDED BY THE OWNER. ALL WETLAND DELINEATIONS AND PERMITTING SHALL BE THE RESPONSIBILITY OF OTHERS AND BE COMPLETED PRIOR TO CONSTRUCTION COMMENCING. THE OWNER AND GENERAL CONTRACTOR SHALL VERIFY THAT ALL WETLAND PERMITS HAVE BEEN SUBMITTED AND APPROVED PRIOR TO CONSTRUCTION COMMENCING.
14. CULTURAL RESOURCE REPORTS HAVE NOT BEEN PROVIDED. CULTURAL RESOURCE LOCATIONS ARE NOT SHOWN ON THE PLANS. INFORMATION WILL BE THE RESPONSIBILITY OF THE OWNER AND GENERAL CONTRACTOR. THE LOCATIONS OF CULTURAL RESOURCE SITES MAY BE CONFIDENTIAL AND PROTECTED BY STATE OR FEDERAL LAW. PUBLIC RELEASE OF SPECIFIC INFORMATION REGARDING THESE RESOURCES MAY BE RESTRICTED.
15. AN ENVIRONMENTAL ASSESSMENT HAS NOT BEEN PROVIDED. THE CONTRACTOR SHALL BE FAMILIAR WITH THE REPORT AND REVIEW ALL RECOMMENDATIONS.
16. ELECTRICAL INFORMATION SHOWN ON THE PLANS IS FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSULTANT'S PLANS FOR SPECIFIC LOCATIONS AND CONSTRUCTION DETAILS FOR THE UNDERGROUND POWER COLLECTION SYSTEM AND SUBSTATION.
17. CRANE PATHS ARE SHOWN ON THE CONSTRUCTION PLANS. IF THE CONTRACTOR PROPOSES ALTERNATE CRANE PATHS, THEY SHALL ENSURE THAT WETLAND AND CULTURAL RESOURCE CORRIDORS ARE NOT DISTURBED. FINAL CRANE PATH ALIGNMENTS SHALL BE DETERMINED BY THE CONTRACTOR BASED ON FIELD CONDITIONS WITHIN THE WETLAND AND CULTURAL RESOURCE CORRIDORS, SPECIAL LANDOWNER AGREEMENTS AND THE PROJECT BOUNDARY.
18. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. DISTURBANCE SHALL BE LIMITED TO 50 LF WIDTH FOR PROPOSED ACCESS ROADS AND 50 LF FOR CRANE PATHS, AND SHALL BE LIMITED TO A 250 LF RADIUS FOR PROPOSED WIND TURBINE GENERATORS. THE GRADING LIMITS SHALL BE CENTERED ON THE ROADWAYS AND WIND TURBINES. THE CONTRACTOR SHALL MAKE ALL EFFORTS TO KEEP ACTIVITIES WITHIN THE ERECTION AREAS SHOWN ON THE PLANS BUT IT IS UNDERSTOOD THAT SOME ACTIVITIES THAT WILL NOT REQUIRE GRADING OR SOIL DISTURBANCE MAY EXTEND BEYOND THE DEFINED LIMITS. DURING ERECTION OF THE ROTOR, TRUCKS AND/OR FORKLIFTS MAY EXTEND BEYOND THESE LIMITS. SEE DETAIL TS01 FOR TYPICAL ERECTION AREAS.
19. AN ALTA SURVEY HAS BEEN PROVIDED BY WESTWOOD. CONTRACTOR AND OWNER ARE RESPONSIBLE FOR LOCATING ALL UTILITIES AND VERIFYING LOCATION OF CONSTRUCTION ACTIVITIES PRIOR TO COMMENCING WORK.

STORMWATER POLLUTION PREVENTION PLAN (SWPPP):

1. THE CONTRACTOR SHALL PROVIDE EROSION CONTROL MEASURES AS PLANNED AND SPECIFIED FOLLOWING BEST MANAGEMENT PRACTICES AS OUTLINED BY THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND BEING IN CONFORMANCE WITH THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL STORMWATER PERMIT.
2. REFER TO THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR THE TRIPLE H WIND FARM, PREPARED BY WESTWOOD PROFESSIONAL SERVICES, FOR EROSION CONTROL AND RESTORATION SPECIFICATIONS, SEDIMENT AND EROSION CONTROL PROCEDURES, LOCATIONS OF BMPs, DETAILS, AND INSPECTION INFORMATION.
3. ALL PASTURES AND DRAINAGE SWALES DISTURBED DURING CONSTRUCTION ACTIVITIES AND NOT COVERED BY ROAD SURFACING MATERIALS, SHALL BE SEEDED IN ACCORDANCE WITH THE SWPP PLAN.
4. TEMPORARY EROSION CONTROL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE TEMPORARY EROSION CONTROL PLAN SHALL BE IN ACCORDANCE WITH THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND THE TRIPLE H WIND FARM STORMWATER POLLUTION PREVENTION PLAN ON FILE.

PROJECT CONTACT INFORMATION:

TITLE	COMPANY	NAME	CONTACT NUMBER
OWNER (PRIMARY)	ENGIE	CASEY WILLIS	805-569-6185
PROJECT MANAGER	WESTWOOD	DANI NYGREN	952-906-7493
ENGINEER OF RECORD	WESTWOOD	ROB COPOULS	952-906-7470
CONTRACTOR	WANZEK	JASON HELLERUD	701-893-3685

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #300
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com

Westwood Professional Services, Inc.

Designed: BMK
Checked: DBW
Drawn: BMK
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2028 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 12 OF 57

0014440DTP.dwg

©2019 Westwood Professional Services, Inc.

CEMENT STABILIZATION - PROCEDURE

THE SPECIFICATIONS BELOW ARE GENERAL RECOMMENDATIONS/GUIDELINES FOR CEMENT STABILIZATION OF SUBGRADES FOR THE PROJECT. ACTUAL FIELD CONDITIONS MAY ALTER APPLICATION RATE. CONSULT GEOTECHNICAL ENGINEER FOR FURTHER RECOMMENDATIONS.

1. STRIP THE TOP ±4 INCHES OF TOPSOIL (THROUGH THE ROOT ZONE) FROM THE AREA TO BE STABILIZED. ROOTS SMALLER THAN 1/4" DIAMETER ARE CONSIDERED INSIGNIFICANT.
2. PERFORM A PROCTOR (ASTM D 698) TEST TO DETERMINE THE OPTIMUM MOISTURE CONTENT IF THE MATERIAL TO BE STABILIZED DOES NOT MATCH A PREVIOUSLY PERFORMED PROCTOR.
3. DETERMINE THE IN-SITU MOISTURE CONTENT USING A NUCLEAR DENSITY GAUGE (OR EQUIVALENT MOISTURE CONTENT TEST) DAILY, PRIOR TO INCORPORATION OF THE CEMENT. PROVIDE ADDITIONAL MOISTURE CONTENT TESTING AS NEEDED BASED ON WEATHER CONDITIONS.
   - 3.1. THE CONTRACTOR WILL BE ADVISED OF IN-SITU MOISTURE CONTENT, AND MOISTURE ADJUSTMENTS SHOULD BE MADE IF IN-SITU MOISTURE IS LESS THAN OPTIMUM MOISTURE CONTENT AS DETERMINED BY THE PROCTOR (ASTM D 698).
4. SOIL AND CEMENT BLENDING:
   - 4.1. COMPLETELY BLEND SUBGRADE SOIL WITH THE APPROPRIATE AMOUNT OF CEMENT BY WEIGHT. FIELD RESULTS FROM TEST STRIPS WILL DICTATE THE CEMENT APPLICATION RATE.
   - 4.2. IN AREAS OF HIGH MOISTURE OR POOR SOILS, THE CONTRACTOR MAY INCREASE THE PERCENT OF CEMENT IN ORDER TO MEET THE MINIMUM SUBGRADE STRENGTH REQUIREMENTS.
   - 4.3. THE USE OF A RECLAIMER IS AN ADEQUATE BLENDING METHOD. DISCING IS NOT AN ADEQUATE BLENDING METHOD.
   - 4.4. A STABILIZATION DEPTH OF 12" WAS USED FOR DESIGN PURPOSES. STABILIZATION DEPTH MAY NEED TO INCREASE TO 16" IN AREAS OF EXTREME MOISTURE OR POOR SOILS IN ORDER TO MEET THE STRENGTH AND PROOF ROLL REQUIREMENTS.
5. COMPACTION:
   - 5.1. A ROLLING PATTERN WILL BE ESTABLISHED USING A NUCLEAR DENSITY GAUGE DURING COMPACTION.
     - 5.1.1. COMPACTION WILL BE PERFORMED UNTIL THE STABILIZED MATERIAL REACHES THE "BREAK POINT" AFTER WHICH ADDITIONAL PASSES WITH A ROLLER RESULTS IN A LOSS OF DENSITY AS MEASURED BY A NUCLEAR DENSITY GAUGE.
     - 5.1.2. COMPACTION IS TYPICALLY ACHIEVED BY MULTIPLE PASSES OF A PADFOOT ROLLER UNTIL THE ROLLER "WALKS" OUT OF THE RECLAIMED MATERIAL (SPACE IS VISIBLE BETWEEN THE DRUM AND THE RECLAIMED MATERIAL). THIS IS FOLLOWED BY BLADING AND SHAPING THE RECLAIMED MATERIAL TO FINAL PROFILE AND CROSS SECTION, REMOVING HIGH AND LOW POINTS. SMOOTH DRUM OR RUBBER TIRE ROLLERS ARE THEN USED TO FINISH ROLLING (THIS IS WHEN THE DENSITY TESTS ARE PERFORMED) UNTIL THE DENSITY OF THE MATERIAL REACHES THE "BREAK POINT."
     - 5.1.3. THE NUMBER OF PASSES AND EQUIPMENT USED TO REACH THE "BREAK POINT" IS CONSIDERED THE ROLLING PATTERN.
     - 5.1.4. A NEW ROLLING PATTERN MAY NEED TO BE ESTABLISHED IF THE PERFORMANCE REQUIREMENTS ARE NOT BEING MET. THIS MAY BE DUE TO CHANGES IN THE MOISTURE CONTENT, THE SOIL TYPE, OR THE CEMENT RATE.
   - 5.2. THE TARGET DENSITY IS 98% OF THE MAXIMUM DENSITY DETERMINED FROM THE ROLLING PATTERN.
     - 5.2.1. DENSITY TESTS SHALL BE TAKEN AT THE RATE OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER TO CONFIRM THE DENSITY IS MATCHING THE TARGET. ONCE THE ROLLING PATTERN HAS BEEN CONFIRMED IT IS RECOMMENDED THAT TESTING CONTINUE AT 1 TEST PER 1,000 LF IN EACH PASS OF THE RECLAIMER.
     - 5.2.2. IF IT IS NOT POSSIBLE TO ATTAIN THE TARGET DENSITY, AND ADDITIONAL COMPACTION DOES NOT IMPROVE THE DENSITY, A NEW ROLLING PATTERN SHOULD BE ESTABLISHED.
   - 5.3. THE AIR TEMPERATURE SHALL BE ABOVE 40 DEGREES (F) DURING THE CEMENT STABILIZATION PROCESS. MIXING CEMENT INTO FROZEN GROUND IS NOT ACCEPTABLE.
6. THE STABILIZED MATERIAL SHALL BE CONTINUOUSLY WET CURED FOR A MINIMUM OF 24 HOURS (WET CURED IS IDENTIFIED VISUALLY AS DAMP SURFACE).
7. PERFORM SUBGRADE TESTING IN ACCORDANCE WITH TESTING SCHEDULE.
8. AGGREGATE PLACEMENT:
   - 8.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 8.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 8.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

CEMENT STABILIZATION - DESIGN BASIS

1. DURING INITIAL CONSTRUCTION, CONTRACTOR SHALL CONSTRUCT MINIMUM 300 LF TEST STRIPS CONTAINING 4%, 5%, AND 6% CEMENT IN ACCORDANCE WITH CEMENT STABILIZATION PROCEDURES.
2. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 3 FOR ANTICIPATED RESULTS):
   - 2.1. PERFORM INITIAL SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M BETWEEN 4 TO 6 HOURS AFTER FINAL COMPACTION.
   - 2.2. PERFORM ADDITIONAL DCP TESTING AT 24 AND 48 HOURS AFTER FINAL COMPACTION.
   - 2.3. PERFORM SUBSEQUENT DCP TESTS AT 7 DAYS AFTER FINAL COMPACTION AS VERIFICATION OF STRENGTH CURVE.
   - 2.4. A MINIMUM OF 3 TESTS PER TEST SECTION PER TIMEFRAME IS REQUIRED. TESTS SHALL BE TAKEN AT THE CENTERLINE AND 2' FROM EACH SHOULDER.
   - 2.5. RECORD DCP TEST RESULTS EVERY 6 INCHES TO TOTAL DEPTH OF 12 INCHES.

TABLE 3: TEST STRIP CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	COMPRESSIVE STRENGTH (PSF)
4 – 6 HOURS	6	5	1,500
24 HOURS	10	7	2,500
48 HOURS	15	10	3,200
7 DAYS	30	21	5,200

CEMENT STABILIZATION - PRODUCTION

1. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 5 FOR SUMMARY OF TESTING REQUIREMENTS):
   - 1.1. PERFORM SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M NO SOONER THAN 24 HOURS AFTER FINAL COMPACTION.
   - 1.2. DCP TESTING FREQUENCY SHALL BE WITH A RANDOM SPACING AND A MINIMUM OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER. A MINIMUM OF 3 TESTS PER ROAD IS REQUIRED.
   - 1.3. THE CBR OF THE STABILIZED SUBGRADE SHOULD BE CALCULATED IN 6" INCREMENTS THROUGH THE ENTIRE DEPTH OF THE STABILIZED LAYER.
   - 1.4. THE MINIMUM REQUIRED CBR PRIOR TO PROOF-ROLLING IS PROVIDED IN TABLE 4 BELOW:

TABLE 4: FINAL CEMENT STABILIZED CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	UNDRAINED SHEAR STRENGTH (PSF)	BEARING CAPACITY (PSF)
24 – 48 HOURS	15	10	3,500	9,800
3 – 7 DAYS	30	21	7,000	18,000
28 DAYS	50	33	12,000	28,500

NOTE: UNDRAINED SHEAR STRENGTH WAS CALCULATED USING THE BLACK (1961) EQUATION. BEARING CAPACITY WAS CALCULATED USING THE VESIC EQUATION MODIFIED FOR TWO LAYERS (12" CEMENT STABILIZED SUBGRADE OVER A NATURAL SUBGRADE WITH A CBR OF 1.5)

   - 1.5. ONCE THE MINIMUM REQUIRED CBR IS ACHIEVED AT ANY CORRESPONDING TIME PERIOD, THE SUBGRADE IS CONSIDERED ADEQUATE AND THE CONTRACTOR MAY PROCEED WITH PROOF-ROLL TESTING. FUTURE DCP TESTING ON THAT SEGMENT OF SUBGRADE IS NOT REQUIRED.
   - 1.6. IF TESTING DOES NOT INDICATE A CBR OF 30 WITHIN 7 DAYS, ADDITIONAL GRAVEL SURFACING AND/OR THE ADDITION OF GEOTEXTILE FABRIC MAY BE REQUIRED. FOR FUTURE SUBGRADE STABILIZATION AREAS, CONTACT THE ENGINEER AND OWNER VIA RFI FOR RECOMMENDATIONS AND APPROVAL.
2. SUBGRADE PROOF-ROLL TESTING AND ACCEPTANCE:
   - 2.1. ONCE THE REQUIRED DCP VALUE HAS BEEN OBTAINED BUT PRIOR TO PLACING AGGREGATE, THE SUBGRADE SHALL BE PROOF-ROLLED. REFER TO THE PROJECT TESTING REQUIREMENTS FOR PROOF-ROLL DEFINITION.
   - 2.2. PROOF-ROLLING SHOULD BE PERFORMED WITH ONE PASS DOWN THE CENTER AND NOT BE PERFORMED WITHIN 12 INCHES OF THE EDGE OF THE STABILIZED SECTION.
   - 2.3. IF PROOF-ROLLING FAILS, RE-STABILIZATION MAY BE REQUIRED AND A NEW ROLLING PATTERN OR ADDITIONAL CEMENT MAY BE REQUIRED.
3. AGGREGATE PLACEMENT:
   - 3.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 3.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 3.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

TABLE 5: CEMENT STABILIZATION PRODUCTION TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
COMPACTED SUBGRADE (CEMENT STABILIZED)	PROCTOR	MINIMUM 1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER 1000 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
NOTE: SEE ABOVE FOR INITIAL TESTING REQUIREMENTS	DCP TEST	1 PER 500 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
	PROOF-ROLL (AFTER PASSING DCP TESTS)	ENTIRE LENGTH

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-Free (866) 937-5150
Westwood Professional Services, Inc.

Designed: BMK
Checked: DJH
Drawn: BMK
As-Built Drawing

Revisions #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK
MinnTec

2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 13 OF 57

0014440DTP.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 330th Ave in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 1570' North of 330th Ave & 205th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.24'54.19" W Long. -99.33'46.87" W
4. Width of entrance: 16' access road with 35' temporary intersection imporvement RD08-B
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001127 SE4 14-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Tanya Hoe
Signature of Applicant

Robert Bawdon
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 330th Ave in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 1570' North of 330th Ave & 205th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.24'54.19" W Long. -99.33'46.87" W
4. Width of entrance: 16' access road with 35' temporary intersection imporvement RD08-B
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001127 SE4 14-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: _____

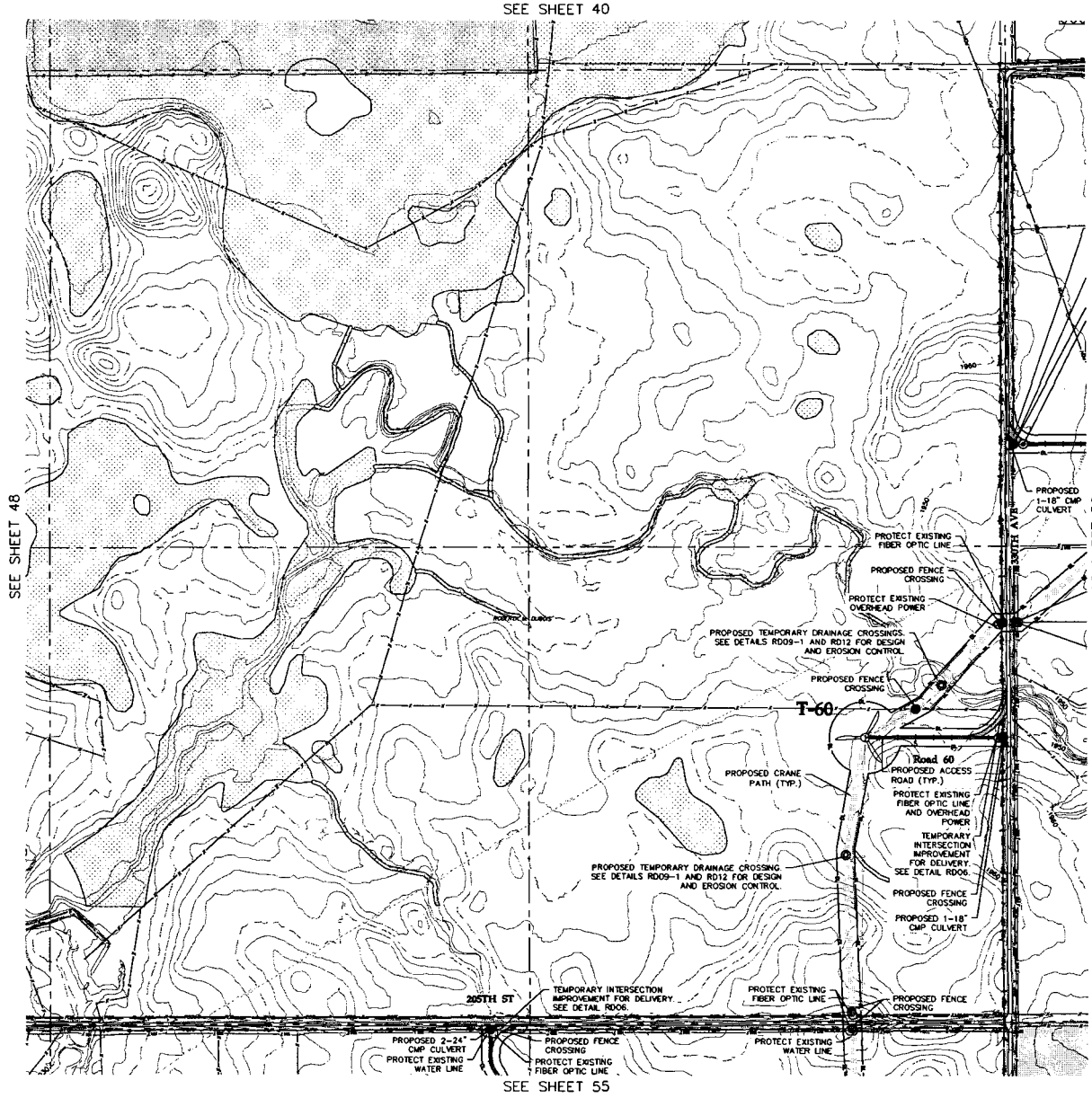
Signature of Applicant

Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

© 2019 Westwood Professional Services, Inc.



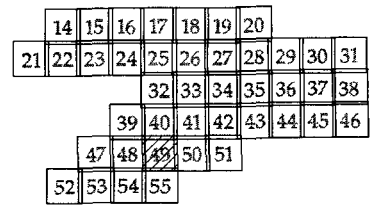
LEGEND:

- PROPOSED TURBINE LOCATION
- T-XX PROPOSED TURBINE NUMBER
- PROPOSED ALTERNATE TURBINE LOCATION
- ALT-XX PROPOSED ALTERNATE TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED ALTERNATE ACCESS ROAD
- PROPOSED CRANE PATH
- PROPOSED UNDERGROUND COLLECTION*
- PROPOSED DISTURBANCE LIMITS
- SF PROPOSED PERIMETER SEDIMENT CONTROL
- 980 EXISTING 10' CONTOURS
- EXISTING 2' CONTOURS
- EXISTING GRAVEL EDGE
- EXISTING BITUMINUS EDGE
- EXISTING RIGHT-OF-WAY
- EXISTING PARCEL LINE
- EXISTING BUILDING
- EXISTING FENCE
- EXISTING OVERHEAD POWER
- EXISTING HIGH VOLTAGE OVERHEAD POWER
- EXISTING UNDERGROUND POWER LINE
- EXISTING FIBER OPTIC LINE
- EXISTING WATER LINE
- DELINEATED WETLAND
- ARCHAEOLOGICAL AVOIDANCE AREA
- EXISTING USFWS EASEMENT
- PROJECT BOUNDARY
- 1900 EXISTING GROUND ELEVATION
- PROPOSED DRAINAGE CROSSING**
- PROPOSED TEMPORARY DRAINAGE CROSSING**
- PROPOSED FENCE CROSSING***
- PROPOSED UTILITY CROSSING
- PROPOSED CULVERT

* PROVIDED BY OTHERS AND SHOWN FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSTRUCTION PLANS FOR DETAILS.

** SEE SHEET 11 FOR DRAINAGE CROSSING TYPE AND SIZING. DRAINAGE CROSSINGS SHALL CONSIST OF LOW WATER CROSSING OR CULVERT. DRAINAGE CROSSINGS ALONG CRANE PATH SHALL CONSIST OF CRANE MATS OR TEMPORARY CULVERT.

*** ALL GATE INSTALLATIONS SHALL BE FIELD DETERMINED AND AGREED UPON BY THE CONTRACTOR AND OWNER.



KEY MAP

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-free (866) 937-9150 westwoodps.com
Westwood Professional Services, Inc.

Designed:	BMK
Checked:	DJN
Drawn:	BMK
As-Built Drawing:	

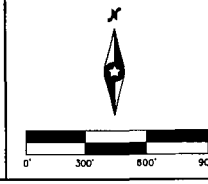
Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2020 2nd Avenue NW
West Fargo, ND 58078



Triple H Wind Farm

Hyde County, South Dakota

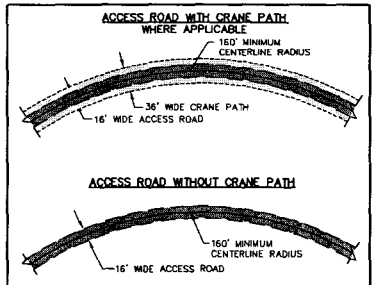
Site Plan T-60

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 49 OF 57

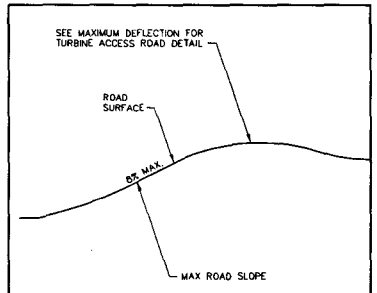
001444OSP01.dwg

© 2019 Westwood Professional Services, Inc.



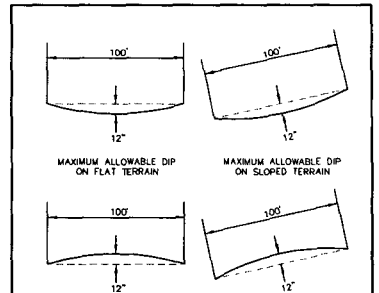
NOTE:
1. SOME RADII MAY REQUIRE ADDITIONAL SOIL COMPACTION OR GRAVEL OUTSIDE OF THE WIDTH SHOWN ABOVE TO ACCOMMODATE TRACTORS OR TRAILERS TRACKING OFF THE ACCESS ROAD.

MINIMUM RADIUS FOR TURBINE ACCESS ROAD — LAST REVISED: 04/29/11 — RD02

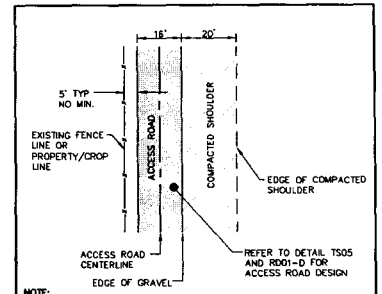


NOTES:
1. ROAD SLOPE SHALL NOT EXCEED 8% WITHOUT OWNER APPROVAL

MAXIMUM VERT. SLOPE FOR TURBINE ACCESS ROAD/CRANE TRAVEL PATH — LAST REVISED: 3/28/07 — RD03

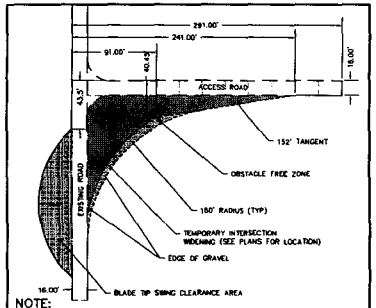


MAXIMUM DEFLECTION FOR TURBINE ACCESS ROAD — LAST REVISED: 01/22/19 — RD04



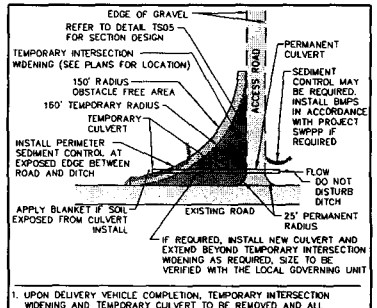
NOTE:
1. COMPACTED SHOULDER SHALL BE RETURNED TO NATIVE CONDITION FOLLOWING TURBINE GENERATOR CONSTRUCTION.
2. THE ACCESS ROAD MAY NEED TO BE CONSTRUCTED FARTHER FROM THE PROPERTY LINE IF OBSTRUCTIONS SUCH AS TREES FOLLOW THE PROPERTY LINE.

TURBINE ACCESS ROAD ALONG FENCE/PROPERTY/CROP LINE — LAST REVISED: 3/28/07 — RD05



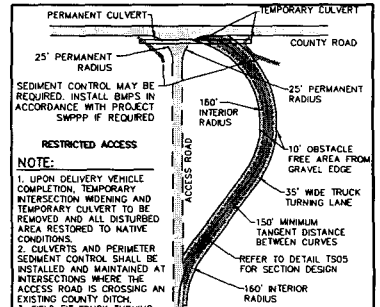
NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING TO BE REMOVED AND ALL DISTURBED AREA RESTORED.
2. DIMENSIONS ASSUME A 90° INTERSECTION

INTERSECTION WIDENING DIMENSIONS — LAST REVISED: 7/09/19 — RD06



1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.

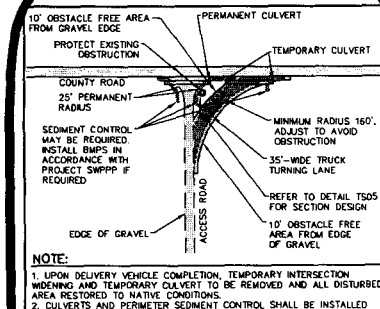
TURBINE ACCESS ROAD TYPICAL INTERSECTION WIDENING — LAST REVISED: 3/28/07 — RD07



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

NOT TO SCALE

TRUCK TRAFFIC TURNING LANE A — LAST REVISED: 3/28/07 — RD08-A



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

TRUCK TRAFFIC TURNING LANE B — LAST REVISED: 12/0/04 — RD08-B

Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 www.westwoodps.com
Westwood Professional Services, Inc.

Designed	BMK
Checked	BJH
Drawn	BMK
As-Built Drawing	

Revisions		
#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	50% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2035 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

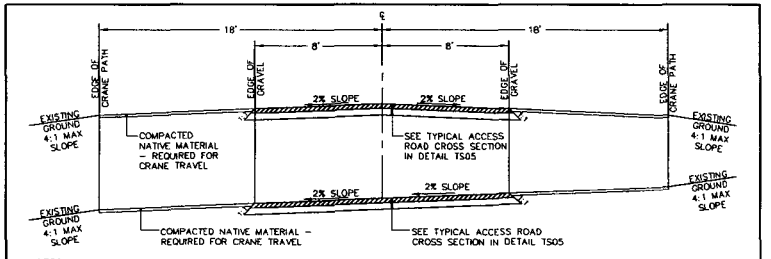
Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 5 OF 57

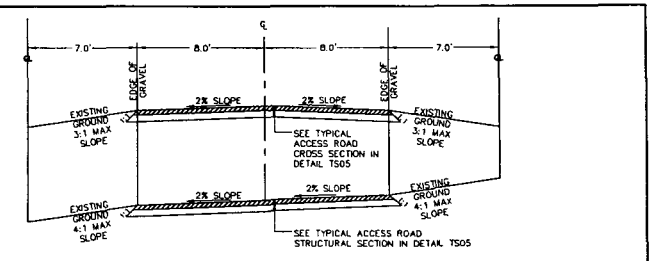
0014440D1P.dwg

© 2019 Westwood Professional Services, Inc.



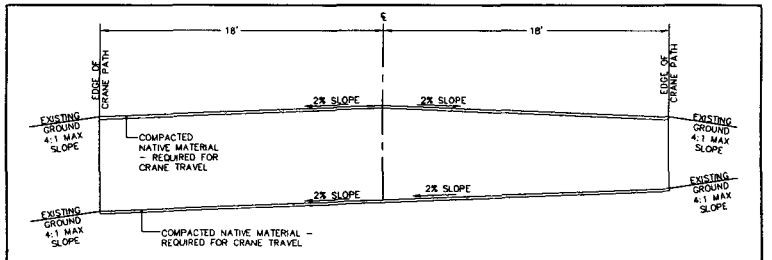
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE ACCESS ROAD DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

Westwood | TYPICAL TURBINE ACCESS ROAD AND CRANE PATH | LAST REVISED: 01/28/21 | RD01-A



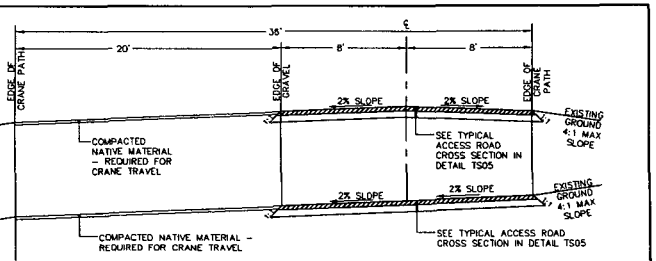
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

Westwood | TYPICAL TURBINE ACCESS ROAD SECTION | LAST REVISED: 1/28/21 | RD01-B



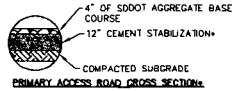
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE WHERE CRANE PATHS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT CRANE PATH REMAINS WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%

Westwood | TYPICAL CRANE PATH | LAST REVISED: 01/28/21 | RD01-C

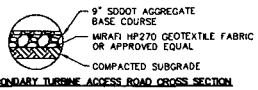


NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE EDGE OF COMPACTED SHOULDER DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

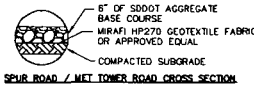
Westwood | TYPICAL TURBINE ACCESS ROAD AND OFFSET CRANE PATH | LAST REVISED: 01/28/21 | RD01-D



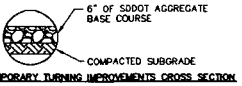
PRIMARY ACCESS ROAD CROSS SECTION*



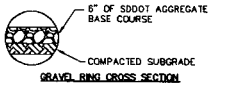
SECONDARY TURBINE ACCESS ROAD CROSS SECTION



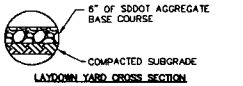
SPUR ROAD / MET TOWER ROAD CROSS SECTION



TEMPORARY TURNING IMPROVEMENTS CROSS SECTION



GRAVEL RING CROSS SECTION



LAYDOWN YARD CROSS SECTION

* CEMENT APPLICATION RATE MAY VARY BASED ON TEST STRIPS AND FIELD PERFORMANCE. SEE SHEET 13 FOR CEMENT STABILIZATION PROCEDURE AND DESIGN BASIS.

NOTES:
STRUCTURAL SECTIONS SHOWN ARE THE MINIMUM THICKNESS REQUIREMENTS DURING NORMAL FIELD CONDITIONS. THE SECTIONS MAY NEED TO BE INCREASED BASED ON ACTUAL FIELD CONDITIONS AT THE TIME OF CONSTRUCTION. CONDITIONS INCLUDE BUT ARE NOT LIMITED TO CONSTRUCTION DURING THE FREEZE/THAW CYCLE, UNUSUALLY WET PERIODS, OR IN LOW/WET AREAS. SEE SHEET 12 FOR TESTING REQUIREMENTS AND SPECIFICATIONS.

Westwood | TYPICAL STRUCTURAL CROSS SECTIONS

Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150
Westwood Professional Services, Inc.

Designed: BMK
Checked: DDH
Drawn: BMK
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/08/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:
WANZEK
2028 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 4 OF 57

001444DTP.dwg

© 2019 Westwood Professional Services, Inc.

ROAD DESIGN PARAMETERS

1. ACCESS ROADS HAVE BEEN DESIGNED TO ACCOMMODATE LIGHT DUTY TRUCKS (PICKUP TRUCKS AND MAINTENANCE VEHICLES) FOR LOW VOLUME USE IN NORMAL OPERATING CONDITIONS AS WELL AS HEAVY DUTY CONSTRUCTION TRAFFIC UNDER DRY CONDITIONS. THE ROAD DESIGN SPECIFIED IS NOT INTENDED FOR ALL WEATHER USE FOR HEAVY DUTY CONSTRUCTION LOADS.
2. ROAD MAINTENANCE CAN BE EXPECTED OVER THE LIFE OF THE PERMANENT FACILITY.

PRODUCTS

1. AGGREGATE BASE SHALL CONSIST OF SDDOT AGGREGATE BASE COURSE (AND IN CONFORMANCE WITH THE GRADATION TABLE 1), AGGREGATE MAY BE CRUSHER RUN UPON ENGINEERS APPROVAL. AGGREGATE GRADATIONS SHALL BE SUBMITTED TO ENGINEER FOR REVIEW.
2. ROAD SHOULDERS AND CRANE PADS SHALL CONSIST OF COMPACTED NATIVE SOILS.
3. CULVERTS: ACCESS ROAD CULVERTS SHALL MEET THE MINIMUM SPECIFICATIONS SET FORTH BY THE SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION AND/OR HYDE COUNTY. ALL CULVERTS ARE PLANNED TO BE A MINIMUM 18" DIAMETER AND MANUFACTURED OF 16-GAGE CORRUGATED METAL PIPE WITH NO END TREATMENTS,UNLESS NOTED OTHERWISE. ACTUAL SIZE WILL BE DETERMINED THROUGH HYDRAULIC ANALYSIS.
4. GEOTEXTILE FABRIC: MIRAFI HP270 OR APPROVED EQUAL.

EXECUTION

1. CLEARING AND GRUBBING
   A. THE CONTRACTOR SHALL BE REQUIRED TO GRUB ALL TREES, STUMPS, BRUSH, AND DEBRIS WITHIN THE GRADING AREAS SHOWN ON THE PLANS. GRUBBING INCLUDES REMOVAL OF ALL PLANT MATERIAL GREATER THAN 2" INCLUDING STUMPS, BRANCHES, ROOTS, ETC. TO A DEPTH BELOW THE FINAL SUBGRADE. THE CONTRACTOR IS TO REMOVE ONLY THOSE TREES WHICH ARE DESIGNATED BY THE OWNER'S REPRESENTATIVE FOR REMOVAL, AND SHALL EXERCISE EXTREME CARE AROUND EXISTING TREES TO BE SAVED.
2. TOPSOIL STRIPPING
   A. TOPSOIL INCLUDING ROOTS LARGER THAN 2" AND LARGE ROOT MASSES, SHALL BE STRIPPED FROM ALL ROADWAY AND FOUNDATION AREAS UP TO 10". TOPSOIL SHALL NOT BE STRIPPED OUTSIDE OF THE DESIGNATED DISTURBANCE AREAS.
   B. ANY TOPSOIL THAT HAS BEEN STRIPPED SHALL BE STOCKPILED FOR POST CONSTRUCTION REVEGETATION. ALL TOPSOIL SHALL BE REDISTRIBUTED TO THE LAND OWNER'S PROPERTY OF WHERE IT ORIGINATED FROM.
3. FILL PLACEMENT
   A. FILL PLACEMENT SHALL CONSIST OF THE PLACING OF SUITABLE FILL MATERIAL, AFTER TOPSOIL STRIPPING, ABOVE THE EXISTING GRADE. GENERALLY, SIDE SLOPES SHALL BE CONSTRUCTED AT FOUR FOOT HORIZONTAL TO ONE FOOT VERTICAL, WITH SOME LOCATIONS THROUGHOUT THE PROJECT WITH SLOPES OF TWO FEET HORIZONTAL TO ONE FOOT VERTICAL. THE MATERIAL FOR FILL CONSTRUCTION SHALL BE OBTAINED FROM THE ACCESS ROAD/TURBINE EXCAVATION (SEE GEOTECHNICAL REPORT FOR RESTRICTIONS), OR ANY SUITABLE, APPROVED SOIL OBTAINED ONSITE/OFFSITE BY CONTRACTOR, AS DIRECTED OR APPROVED BY THE ENGINEER. THIS MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 12" AND CONSTRUCTED TO 95% OF THE MAXIMUM DRY DENSITY AND WITHIN 2% OF OPTIMUM MOISTURE CONTENT, AS DETERMINED BY THE STANDARD PROCTOR (AASHTO T99).
   B. SIDE SLOPES GREATER THAN 4:1 WILL NOT BE PERMITTED, UNLESS OTHERWISE NOTED ON THE PLAN.
   C. FILL SLOPES SHALL BE BENCHED INTO THE EXISTING SLOPE TO PREVENT MOVEMENT BETWEEN THE FILL AND NATIVE SOILS. BENCHES SHOULD BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO FILL PLACEMENT. POSITIVE DRAINAGE IS REQUIRED AT BENCHED AREAS AND AT THE TOE OF FILL SLOPES TO REMOVE SURFACE WATER.
4. SUBGRADE
   A. SUBGRADE PREPARED AT GRADE OR IN CUT REQUIRES SCARIFICATION AND RECOMPACTION TO A DEPTH OF 12" OR MORE.
   B. ACCESS ROAD CROSS SLOPES SHOWN IN THE PLANS ARE MEANT AS A GUIDE. ACCESS ROAD CROSS SLOPES MAY RANGE FROM 1% – 2%, CHECK WITH THE ENGINEER IF THE CROSS SLOPE FALLS OUTSIDE OF THIS RANGE. ACCESS ROADS BEING UTILIZED FOR CRANE TRAVEL SHOULD HAVE A MAX CROSS SLOPE OF 2%

TABLE 1: SDDOT AGGREGATE BASE COURSE – LOCALLY SOURCED	
SIEVE SIZE	PERCENT PASSING
1"	100
3/4"	80–100
1/2"	68–91
NO. 4	46–70
NO. 8	34–58
NO. 40	13–35
NO. 200	3–12

MEET FOLLOWING REQUIREMENTS PER 882.2

LIQUID LIMIT (MAX) = 25
PLASTICITY INDEX = 0–6
L.A ABRASION (% MAX) = 40%

GRADATION HAS BEEN OBTAINED FROM THE 2015 SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION BOOK.

STORM WATER DESIGN PARAMETERS

1. SEE SHEET 6 FOR CULVERT SIZING AND DESIGN PARAMETERS. SEE HYDROLOGY MEMO FOR FURTHER DESIGN CALCULATIONS. CULVERTS SHALL BE MINIMUM 18" CORRUGATED METAL PIPE. ALL TEMPORARY PORTIONS OF THE INSTALLED CULVERTS SHALL BE REMOVED UPON COMPLETION OF THE PROJECT.
2. IT IS EXPECTED THAT CULVERTS WILL BE OVERTOPPED DURING SOME STORMS AND MAINTENANCE WILL BE REQUIRED THROUGH THE LIFE OF THE PROJECT.
3. WHEN INSTALLING DRAINAGE CULVERTS THE CONTRACTOR SHALL USE JUDGMENT IN SETTING THE FLOW LINE ELEVATIONS AND CULVERT LONGITUDINAL SLOPE. TYPICALLY THE FLOW LINE ELEVATIONS AND LONGITUDINAL SLOPE OF THE CULVERT SHOULD MATCH THE NATURAL GROUND ELEVATIONS AND SLOPE TO ENSURE POSITIVE DRAINAGE. WHEN POSSIBLE, ALL CULVERTS SHOULD BE PLACED AT A MINIMUM 0.5% GRADE.
4. ANTICIPATED CULVERT CROSSINGS ARE SHOWN ON THE CONSTRUCTION PLAN, ADDITIONAL CULVERTS MAY NEED TO BE INSTALLED IN AREAS WHERE CONCENTRATED FLOW IS EXPECTED DUE TO CONSTRUCTION ACTIVITIES.
5. CONSTRUCTION DRAINAGE CROSSINGS TO MAINTAIN EXISTING FLOW CHARACTERISTICS OF THE FEATURES. FEATURES SHALL BE GRADED TO PRECONSTRUCTION CONTOURS.

TESTING:

1. TESTING SHALL BE PERFORMED BY A DESIGNATED INDEPENDENT TESTING AGENCY.
2. SUBMIT ONE SET OF TESTING AND INSPECTION RECORDS SPECIFIED TO THE CIVIL ENGINEER OF RECORD.

DEFINITIONS:

1. PROOF ROLLING:
   SHALL BE PERFORMED IN THE PRESENCE OF THE GEOTECHNICAL ENGINEER OR QUALIFIED GEOTECHNICAL REPRESENTATIVE USING A FULLY LOADED TANDEM AXLE DUMP TRUCK OR WATER TRUCK WITH A MINIMUM GROSS WEIGHT OF 25 TONS OR A FULLY LOADED BELLY DUMP WITH AN EQUIVALENT AXLE LOADING. PROOF-ROLLING ACCEPTANCE STANDARDS INCLUDE NO RUTTING GREATER THAN 1.5 INCHES, AND NO "PUMPING" OF THE SOIL BEHIND THE LOADED TRUCK.
2. SIEVE ANALYSIS:
   SHALL BE CONDUCTED IN ACCORDANCE WITH AASHTO T27
3. PROCTORS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T99
4. ATTERBERG LIMITS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T89 AND T90
5. MOISTURE DENSITY (NUCLEAR DENSITY):
   SHALL BE DONE IN ACCORDANCE WITH AASHTO T310
6. DYNAMIC CONE PENETROMETER (DCP) TESTING:
   SHALL BE DONE IN ACCORDANCE WITH ASTM D6951-03

REQUIREMENTS:

1. FILL PLACEMENT:
   A. SOILS USED AS FILL MATERIAL SHALL BE TESTED FOR MOISTURE CONTENT AND PROCTOR TESTS.
   B. WHERE FILL CONSTRUCTION REQUIRES MORE THAN 12 INCHES OF FILL PLACEMENT, COMPACT EACH LIFT TO A MINIMUM OF 95 PERCENT OF THE MATERIAL'S MAXIMUM STANDARD PROCTOR DRY DENSITY.
2. COMPACTED SUBGRADE (CEMENT STABILIZED):
   A. SEE SHEET 13 FOR TESTING REQUIREMENTS AND PROCEDURE.
3. COMPACTED SUBGRADE (NON-CEMENT STABILIZED):
   A. THE ENTIRE SUBGRADE SHALL BE PROOF-ROLLED PRIOR TO THE PLACEMENT OF THE AGGREGATE BASE TO IDENTIFY AREAS OF UNSTABLE SUBGRADE.
   B. PERFORM A MINIMUM OF 3 DYNAMIC CONE PENETROMETER (DCP) TESTS PER ACCESS ROAD OR ONE FOR EVERY 1,000 LF OF ROAD, WHICHEVER IS GREATER. SUBGRADE MUST MEET A MINIMUM DCP OF 3 BLOWS PER 6" TO A TOTAL DEPTH OF 2' (MINIMUM CBR=1.5).
   C. IF A PASSING PROOF-ROLL OR DCP REQUIREMENTS CANNOT BE ACHIEVED THE FOLLOWING ALTERNATIVES MAY BE IMPLEMENTED:
      a. SCARIFY, DRY, AND RECOMPACT SUBGRADE
      b. REMOVE UNSUITABLE MATERIAL AND REPLACE WITH SUITABLE MATERIAL
      c. INCREASE AGGREGATE BASE THICKNESS
4. AGGREGATE BASE:
   A. AGGREGATE BASE SHALL BE PROOF-ROLLED OVER THE ENTIRE LENGTH. IF PROOF ROLLING DETERMINES THAT THE ROAD IS UNSTABLE, ADDITIONAL AGGREGATE SHALL BE ADDED UNTIL THE UNSTABLE SECTION IS ABLE TO PASS A PROOF ROLL.
   B. PROVIDE 1 SIEVE ANALYSIS (PROJECT MAX OF 20) PER 2500 CY OF ROAD BASE PLACED.
5. CRANE PAD AND CRANE PATHS / CRANE TRAVEL SHOULDERS:
   A. TESTING REQUIREMENTS ARE PENDING BASED ON CRANE PICK PLANS PROVIDED BY THE CONTRACTOR.

TABLE 2: TESTING SCHEDULE SUMMARY		
LOCATION	TEST	FREQUENCY
FILL PLACEMENT	PROCTOR	1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER LIFT PER 5000 SF OF FILL PLACED OR 1 PER 500 LF OF ROAD OR CRANE WALK
COMPACTED SUBGRADE (CEMENT STABILIZED):	SEE SHEET 13	SEE SHEET 13
COMPACTED SUBGRADE (NON-CEMENT STABILIZED):	PROOF-ROLL	ENTIRE AREA
	DCP	1 PER 1,000 FT OR MIN. 3 PER ROAD
AGGREGATE BASE	PROOF-ROLL	ENTIRE AREA
	SIEVE ANALYSIS, LL, PL, AND L.A ABRASION	1 PER 2,500 CY

GENERAL NOTES:

1. GROUND SURFACE CONTOURS (AT TWO-FOOT VERTICAL INTERVALS) AND ELEVATIONS ARE BASED ON A PHOTOGRAMMETRY SURFACE PROVIDED BY GEOTERRA. IF MAJOR DISCREPANCIES ARE FOUND IN THE GROUND ELEVATIONS DURING FIELD STAKING TO THE GROUND ELEVATIONS SHOWN ON THE PLANS, THE OWNER AND ENGINEER SHALL BE NOTIFIED.
2. WHERE SECTION OR SUBSECTION MONUMENTS ARE ENCOUNTERED, THE OWNER SHALL BE NOTIFIED BEFORE SUCH MONUMENTS ARE REMOVED. THE CONTRACTOR SHALL PROTECT AND CAREFULLY PRESERVE ALL PROPERTY MARKERS AND MONUMENTS UNTIL THE OWNER, AN AUTHORIZED SURVEYOR OR AGENT HAS WITNESSED OR OTHERWISE REFERENCED THEIR LOCATION.
3. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. TYPICAL DISTURBANCE SHALL BE LIMITED TO 10 LF FROM THE EDGE OF PROPOSED GRADING.
4. FINALIZE GRADING AROUND THE BASE OF TURBINES IN ACCORDANCE WITH DETAIL TS-03 AND TS-04.
5. GRADE ALL PROPOSED ROADS TO A MAXIMUM SLOPE OF 8%. IF 8% SLOPE CANNOT BE ACHIEVED, THE CONTRACTOR MAY UTILIZE ASSIST VEHICLES FOR THE PURPOSE OF DELIVERIES. GRADE ALL PROPOSED CRANE PATHS TO A MAXIMUM OF 8% UNLESS OTHERWISE NOTED IN PLAN SHEETS.
6. ANY FACILITIES REMOVED TO ALLOW FOR CONSTRUCTION (MAILBOXES, SIGNS, FENCES, ETC.) SHALL BE REPLACED BY THE CONTRACTOR IN A CONDITION AS GOOD AS EXISTING.
7. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING DRAINAGE THROUGHOUT THE CONSTRUCTION OF THIS PROJECT. CONSTRUCTION ACTIVITIES SHALL NOT BLOCK THE NATURAL OR MANMADE CREEKS OR DRAINAGE SWALES CAUSING RAINWATER TO POND. DEPENDING ON FIELD CONDITIONS, ADDITIONAL CULVERTS IN EXCESS OF THOSE ON THE PLANS MAY BE REQUIRED.
8. WHILE BUILDING THE ROADS AND EXCAVATING THE TURBINE FOUNDATIONS, EXCESS SOIL WILL RESULT. THE CONTRACTOR SHALL DISPOSE OF THIS EXCESS SOIL IN AN APPROVED MANNER. EXCESS TOPSOIL SHALL BE DISTRIBUTED INTO A THIN LAYER ON LAND IMMEDIATELY ADJACENT TO WHERE THE TOPSOIL ORIGINATED. ALL EXCESS TOPSOIL TO BE WASTED ONSITE. WHILE DOING SO THE CONTRACTOR SHALL AVOID CAUSING RIDGES OR MOUNDS THAT WOULD MAKE IT DIFFICULT FOR STORM WATER RUNOFF TO DRAIN. THE FINAL SURFACE OF THE DISTURBED TOPSOIL SHALL BE SMOOTH AND FOLLOW THE NATURAL CONTOUR OF THE LAND.
9. THE CONTRACTOR SHALL NOTIFY SOUTH DAKOTA 811 AT LEAST 48 HOURS BEFORE EXCAVATION ACTIVITIES COMMENCE.
10. TEMPORARY INTERSECTION WIDENING SHALL, UPON COMPLETION OF ALL PROJECT CONSTRUCTION OR UPON NOTIFICATION OF THE ENGINEER, BE REMOVED AND THE AREA RESTORED TO ITS ORIGINAL LINES AND GRADES WITH TOPSOIL REPLACED, EXCEPT WHERE REQUESTED BY THE TOWNSHIP OR COUNTY TO PERMANENTLY REMAIN. DISTURBED AREAS OUTSIDE OF THE FINAL ROADWAY SHALL BE SEEDED AND MULCHED.
11. TURBINE SETBACKS ARE NOT IDENTIFIED ON THE CONSTRUCTION PLANS. IT SHALL BE THE RESPONSIBILITY OF THE OWNER AND CONTRACTOR TO ENSURE THAT ALL TURBINE SETBACKS MEET PROJECT REQUIREMENTS.
12. GEOTECHNICAL REPORTS WITH RECOMMENDATIONS HAVE BEEN PROVIDED BY THE OWNER. ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL ENGINEERING REPORT AND RECOMMENDATIONS.
13. FIELD SURVEY WETLAND INFORMATION HAS BEEN PROVIDED BY THE OWNER. ALL WETLAND DELINEATIONS AND PERMITTING SHALL BE THE RESPONSIBILITY OF OTHERS AND BE COMPLETED PRIOR TO CONSTRUCTION COMMENCING. THE OWNER AND GENERAL CONTRACTOR SHALL VERIFY THAT ALL WETLAND PERMITS HAVE BEEN SUBMITTED AND APPROVED PRIOR TO CONSTRUCTION COMMENCING.
14. CULTURAL RESOURCE REPORTS HAVE NOT BEEN PROVIDED. CULTURAL RESOURCE LOCATIONS ARE NOT SHOWN ON THE PLANS. INFORMATION WILL BE THE RESPONSIBILITY OF THE OWNER AND GENERAL CONTRACTOR. THE LOCATIONS OF CULTURAL RESOURCE SITES MAY BE CONFIDENTIAL AND PROTECTED BY STATE OR FEDERAL LAW. PUBLIC RELEASE OF SPECIFIC INFORMATION REGARDING THESE RESOURCES MAY BE RESTRICTED.
15. AN ENVIRONMENTAL ASSESSMENT HAS NOT BEEN PROVIDED. THE CONTRACTOR SHALL BE FAMILIAR WITH THE REPORT AND REVIEW ALL RECOMMENDATIONS.
16. ELECTRICAL INFORMATION SHOWN ON THE PLANS IS FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSULTANT'S PLANS FOR SPECIFIC LOCATIONS AND CONSTRUCTION DETAILS FOR THE UNDERGROUND POWER COLLECTION SYSTEM AND SUBSTATION.
17. CRANE PATHS ARE SHOWN ON THE CONSTRUCTION PLANS. IF THE CONTRACTOR PROPOSES ALTERNATE CRANE PATHS, THEY SHALL ENSURE THAT WETLAND AND CULTURAL RESOURCE CORRIDORS ARE NOT DISTURBED. FINAL CRANE PATH ALIGNMENTS SHALL BE DETERMINED BY THE CONTRACTOR BASED ON FIELD CONDITIONS WITHIN THE WETLAND AND CULTURAL RESOURCE CORRIDORS, SPECIAL LANDOWNER AGREEMENTS AND THE PROJECT BOUNDARY.
18. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. DISTURBANCE SHALL BE LIMITED TO 50 LF WIDTH FOR PROPOSED ACCESS ROADS AND 50 LF FOR CRANE PATHS, AND SHALL BE LIMITED TO A 250 LF RADIUS FOR PROPOSED WIND TURBINE GENERATORS. THE GRADING LIMITS SHALL BE CENTERED ON THE ROADWAYS AND WIND TURBINES. THE CONTRACTOR SHALL MAKE ALL EFFORTS TO KEEP ACTIVITIES WITHIN THE ERECTION AREAS SHOWN ON THE PLANS BUT IT IS UNDERSTOOD THAT SOME ACTIVITIES THAT WILL NOT REQUIRE GRADING OR SOIL DISTURBANCE MAY EXTEND BEYOND THE DEFINED LIMITS. DURING ERECTION OF THE ROTOR, TRUCKS AND/OR FORKLIFTS MAY EXTEND BEYOND THESE LIMITS. SEE DETAIL TS01 FOR TYPICAL ERECTION AREAS.
19. AN ALTA SURVEY HAS BEEN PROVIDED BY WESTWOOD. CONTRACTOR AND OWNER ARE RESPONSIBLE FOR LOCATING ALL UTILITIES AND VERIFYING LOCATION OF CONSTRUCTION ACTIVITIES PRIOR TO COMMENCING WORK.

STORMWATER POLLUTION PREVENTION PLAN (SWPPP):

1. THE CONTRACTOR SHALL PROVIDE EROSION CONTROL MEASURES AS PLANNED AND SPECIFIED FOLLOWING BEST MANAGEMENT PRACTICES AS OUTLINED BY THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND BEING IN CONFORMANCE WITH THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL STORMWATER PERMIT.
2. REFER TO THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR THE TRIPLE H WIND FARM, PREPARED BY WESTWOOD PROFESSIONAL SERVICES, FOR EROSION CONTROL AND RESTORATION SPECIFICATIONS, SEDIMENT AND EROSION CONTROL PROCEDURES, LOCATIONS OF BMPs, DETAILS, AND INSPECTION INFORMATION.
3. ALL PASTURES AND DRAINAGE SWALES DISTURBED DURING CONSTRUCTION ACTIVITIES AND NOT COVERED BY ROAD SURFACING MATERIALS, SHALL BE SEEDED IN ACCORDANCE WITH THE SWPP PLAN.
4. TEMPORARY EROSION CONTROL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE TEMPORARY EROSION CONTROL PLAN SHALL BE IN ACCORDANCE WITH THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND THE TRIPLE H WIND FARM STORMWATER POLLUTION PREVENTION PLAN ON FILE.

PROJECT CONTACT INFORMATION:

TITLE	COMPANY	NAME	CONTACT NUMBER
OWNER (PRIMARY)	ENGIE	CASEY WILLIS	805-569-6185
PROJECT MANAGER	WESTWOOD	DANI NYGREN	952-906-7493
ENGINEER OF RECORD	WESTWOOD	ROB COPOULS	952-906-7470
CONTRACTOR	WANZEK	JASON HELLERUD	701-893-3685

Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite #300
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: DJN
Drawn: BMK
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK
a MasTec company

2028 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 12 OF 57

00144400TP.dwg

© 2019 Westwood Professional Services, Inc.

CEMENT STABILIZATION - PROCEDURE

THE SPECIFICATIONS BELOW ARE GENERAL RECOMMENDATIONS/GUIDELINES FOR CEMENT STABILIZATION OF SUBGRADES FOR THE PROJECT. ACTUAL FIELD CONDITIONS MAY ALTER APPLICATION RATE. CONSULT GEOTECHNICAL ENGINEER FOR FURTHER RECOMMENDATIONS.

1. STRIP THE TOP ±4 INCHES OF TOPSOIL (THROUGH THE ROOT ZONE) FROM THE AREA TO BE STABILIZED. ROOTS SMALLER THAN 1/4" DIAMETER ARE CONSIDERED INSIGNIFICANT.
2. PERFORM A PROCTOR (ASTM D 698) TEST TO DETERMINE THE OPTIMUM MOISTURE CONTENT IF THE MATERIAL TO BE STABILIZED DOES NOT MATCH A PREVIOUSLY PERFORMED PROCTOR.
3. DETERMINE THE IN-SITU MOISTURE CONTENT USING A NUCLEAR DENSITY GAUGE (OR EQUIVALENT MOISTURE CONTENT TEST) DAILY, PRIOR TO INCORPORATION OF THE CEMENT. PROVIDE ADDITIONAL MOISTURE CONTENT TESTING AS NEEDED BASED ON WEATHER CONDITIONS.
   - 3.1. THE CONTRACTOR WILL BE ADVISED OF IN-SITU MOISTURE CONTENT, AND MOISTURE ADJUSTMENTS SHOULD BE MADE IF IN-SITU MOISTURE IS LESS THAN OPTIMUM MOISTURE CONTENT AS DETERMINED BY THE PROCTOR (ASTM D 698).
4. SOIL AND CEMENT BLENDING:
   - 4.1. COMPLETELY BLEND SUBGRADE SOIL WITH THE APPROPRIATE AMOUNT OF CEMENT BY WEIGHT. FIELD RESULTS FROM TEST STRIPS WILL DICTATE THE CEMENT APPLICATION RATE.
   - 4.2. IN AREAS OF HIGH MOISTURE OR POOR SOILS, THE CONTRACTOR MAY INCREASE THE PERCENT OF CEMENT IN ORDER TO MEET THE MINIMUM SUBGRADE STRENGTH REQUIREMENTS.
   - 4.3. THE USE OF A RECLAIMER IS AN ADEQUATE BLENDING METHOD. DISCING IS NOT AN ADEQUATE BLENDING METHOD.
   - 4.4. A STABILIZATION DEPTH OF 12" WAS USED FOR DESIGN PURPOSES. STABILIZATION DEPTH MAY NEED TO INCREASE TO 16" IN AREAS OF EXTREME MOISTURE OR POOR SOILS IN ORDER TO MEET THE STRENGTH AND PROOF ROLL REQUIREMENTS.
5. COMPACTION:
   - 5.1. A ROLLING PATTERN WILL BE ESTABLISHED USING A NUCLEAR DENSITY GAUGE DURING COMPACTION.
     - 5.1.1. COMPACTION WILL BE PERFORMED UNTIL THE STABILIZED MATERIAL REACHES THE "BREAK POINT" AFTER WHICH ADDITIONAL PASSES WITH A ROLLER RESULTS IN A LOSS OF DENSITY AS MEASURED BY A NUCLEAR DENSITY GAUGE.
     - 5.1.2. COMPACTION IS TYPICALLY ACHIEVED BY MULTIPLE PASSES OF A PADFOOT ROLLER UNTIL THE ROLLER "WALKS" OUT OF THE RECLAIMED MATERIAL (SPACE IS VISIBLE BETWEEN THE DRUM AND THE RECLAIMED MATERIAL). THIS IS FOLLOWED BY BLADING AND SHAPING THE RECLAIMED MATERIAL TO FINAL PROFILE AND CROSS SECTION, REMOVING HIGH AND LOW POINTS. SMOOTH DRUM OR RUBBER TIRE ROLLERS ARE THEN USED TO FINISH ROLLING (THIS IS WHEN THE DENSITY TESTS ARE PERFORMED) UNTIL THE DENSITY OF THE MATERIAL REACHES THE "BREAK POINT."
     - 5.1.3. THE NUMBER OF PASSES AND EQUIPMENT USED TO REACH THE "BREAK POINT" IS CONSIDERED THE ROLLING PATTERN.
     - 5.1.4. A NEW ROLLING PATTERN MAY NEED TO BE ESTABLISHED IF THE PERFORMANCE REQUIREMENTS ARE NOT BEING MET. THIS MAY BE DUE TO CHANGES IN THE MOISTURE CONTENT, THE SOIL TYPE, OR THE CEMENT RATE.
   - 5.2. THE TARGET DENSITY IS 98% OF THE MAXIMUM DENSITY DETERMINED FROM THE ROLLING PATTERN.
     - 5.2.1. DENSITY TESTS SHALL BE TAKEN AT THE RATE OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER TO CONFIRM THE DENSITY IS MATCHING THE TARGET. ONCE THE ROLLING PATTERN HAS BEEN CONFIRMED IT IS RECOMMENDED THAT TESTING CONTINUE AT 1 TEST PER 1,000 LF IN EACH PASS OF THE RECLAIMER.
     - 5.2.2. IF IT IS NOT POSSIBLE TO ATTAIN THE TARGET DENSITY, AND ADDITIONAL COMPACTION DOES NOT IMPROVE THE DENSITY, A NEW ROLLING PATTERN SHOULD BE ESTABLISHED.
   - 5.3. THE AIR TEMPERATURE SHALL BE ABOVE 40 DEGREES (F) DURING THE CEMENT STABILIZATION PROCESS. MIXING CEMENT INTO FROZEN GROUND IS NOT ACCEPTABLE.
6. THE STABILIZED MATERIAL SHALL BE CONTINUOUSLY WET CURED FOR A MINIMUM OF 24 HOURS (WET CURED IS IDENTIFIED VISUALLY AS DAMP SURFACE).
7. PERFORM SUBGRADE TESTING IN ACCORDANCE WITH TESTING SCHEDULE.
8. AGGREGATE PLACEMENT:
   - 8.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 8.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 8.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

CEMENT STABILIZATION - DESIGN BASIS

1. DURING INITIAL CONSTRUCTION, CONTRACTOR SHALL CONSTRUCT MINIMUM 300 LF TEST STRIPS CONTAINING 4%, 5%, AND 6% CEMENT IN ACCORDANCE WITH CEMENT STABILIZATION PROCEDURES.
2. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 3 FOR ANTICIPATED RESULTS):
   - 2.1. PERFORM INITIAL SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M BETWEEN 4 TO 6 HOURS AFTER FINAL COMPACTION.
   - 2.2. PERFORM ADDITIONAL DCP TESTING AT 24 AND 48 HOURS AFTER FINAL COMPACTION.
   - 2.3. PERFORM SUBSEQUENT DCP TESTS AT 7 DAYS AFTER FINAL COMPACTION AS VERIFICATION OF STRENGTH CURVE.
   - 2.4. A MINIMUM OF 3 TESTS PER TEST SECTION PER TIMEFRAME IS REQUIRED. TESTS SHALL BE TAKEN AT THE CENTERLINE AND 2' FROM EACH SHOULDER.
   - 2.5. RECORD DCP TEST RESULTS EVERY 6 INCHES TO TOTAL DEPTH OF 12 INCHES.

TABLE 3: TEST STRIP CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	COMPRESSIVE STRENGTH (PSF)
4 – 6 HOURS	6	5	1,600
24 HOURS	10	7	2,500
48 HOURS	15	10	3,200
7 DAYS	30	21	5,200

CEMENT STABILIZATION - PRODUCTION

1. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 5 FOR SUMMARY OF TESTING REQUIREMENTS):
   - 1.1. PERFORM SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M NO SOONER THAN 24 HOURS AFTER FINAL COMPACTION.
   - 1.2. DCP TESTING FREQUENCY SHALL BE WITH A RANDOM SPACING AND A MINIMUM OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER. A MINIMUM OF 3 TESTS PER ROAD IS REQUIRED.
   - 1.3. THE CBR OF THE STABILIZED SUBGRADE SHOULD BE CALCULATED IN 6" INCREMENTS THROUGH THE ENTIRE DEPTH OF THE STABILIZED LAYER.
   - 1.4. THE MINIMUM REQUIRED CBR PRIOR TO PROOF-ROLLING IS PROVIDED IN TABLE 4 BELOW:

TABLE 4: FINAL CEMENT STABILIZED CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	UNDRAINED SHEAR STRENGTH (PSF)	BEARING CAPACITY (PSF)
24 – 48 HOURS	15	10	3,500	9,800
3 – 7 DAYS	30	21	7,000	18,000
28 DAYS	50	33	12,000	28,500

NOTE: UNDRAINED SHEAR STRENGTH WAS CALCULATED USING THE BLACK (1961) EQUATION. BEARING CAPACITY WAS CALCULATED USING THE VESIC EQUATION MODIFIED FOR TWO LAYERS (12" CEMENT STABILIZED SUBGRADE OVER A NATURAL SUBGRADE WITH A CBR OF 1.5)

   - 1.5. ONCE THE MINIMUM REQUIRED CBR IS ACHIEVED AT ANY CORRESPONDING TIME PERIOD, THE SUBGRADE IS CONSIDERED ADEQUATE AND THE CONTRACTOR MAY PROCEED WITH PROOF-ROLL TESTING. FUTURE DCP TESTING ON THAT SEGMENT OF SUBGRADE IS NOT REQUIRED.
   - 1.6. IF TESTING DOES NOT INDICATE A CBR OF 30 WITHIN 7 DAYS, ADDITIONAL GRAVEL SURFACING AND/OR THE ADDITION OF GEOTEXTILE FABRIC MAY BE REQUIRED. FOR FUTURE SUBGRADE STABILIZATION AREAS, CONTACT THE ENGINEER AND OWNER VIA RFI FOR RECOMMENDATIONS AND APPROVAL.
2. SUBGRADE PROOF-ROLL TESTING AND ACCEPTANCE:
   - 2.1. ONCE THE REQUIRED DCP VALUE HAS BEEN OBTAINED BUT PRIOR TO PLACING AGGREGATE, THE SUBGRADE SHALL BE PROOF-ROLLED. REFER TO THE PROJECT TESTING REQUIREMENTS FOR PROOF-ROLL DEFINITION.
   - 2.2. PROOF-ROLLING SHOULD BE PERFORMED WITH ONE PASS DOWN THE CENTER AND NOT BE PERFORMED WITHIN 12 INCHES OF THE EDGE OF THE STABILIZED SECTION.
   - 2.3. IF PROOF-ROLLING FAILS, RE-STABILIZATION MAY BE REQUIRED AND A NEW ROLLING PATTERN OR ADDITIONAL CEMENT MAY BE REQUIRED.
3. AGGREGATE PLACEMENT:
   - 3.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 3.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 3.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

TABLE 5: CEMENT STABILIZATION PRODUCTION TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
COMPACTED SUBGRADE (CEMENT STABILIZED)	PROCTOR	MINIMUM 1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER 1000 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
NOTE: SEE ABOVE FOR INITIAL TESTING REQUIREMENTS	DCP TEST	1 PER 500 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
	PROOF-ROLL (AFTER PASSING DCP TESTS)	ENTIRE LENGTH

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (866) 937-5150
Westwood Professional Services, Inc.

Designed: BMK
Checked: TJH
Drawn: BMK
As-Built Drawing

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2028 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 13 OF 57

0014440DTP.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 330th Ave in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 1995' South of 330th Ave & 204th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.25'10.97" W Long. -99.33'46.56" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001121 NW4 13-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19

Tayla Rae
Signature of Applicant

Date Approved: 08-06-2019

Robert Bawdon
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 330th Ave in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 1995' South of 330th Ave & 204th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.25'10.97" W Long. -99.33'46.56" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001121 NW4 13-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: _____

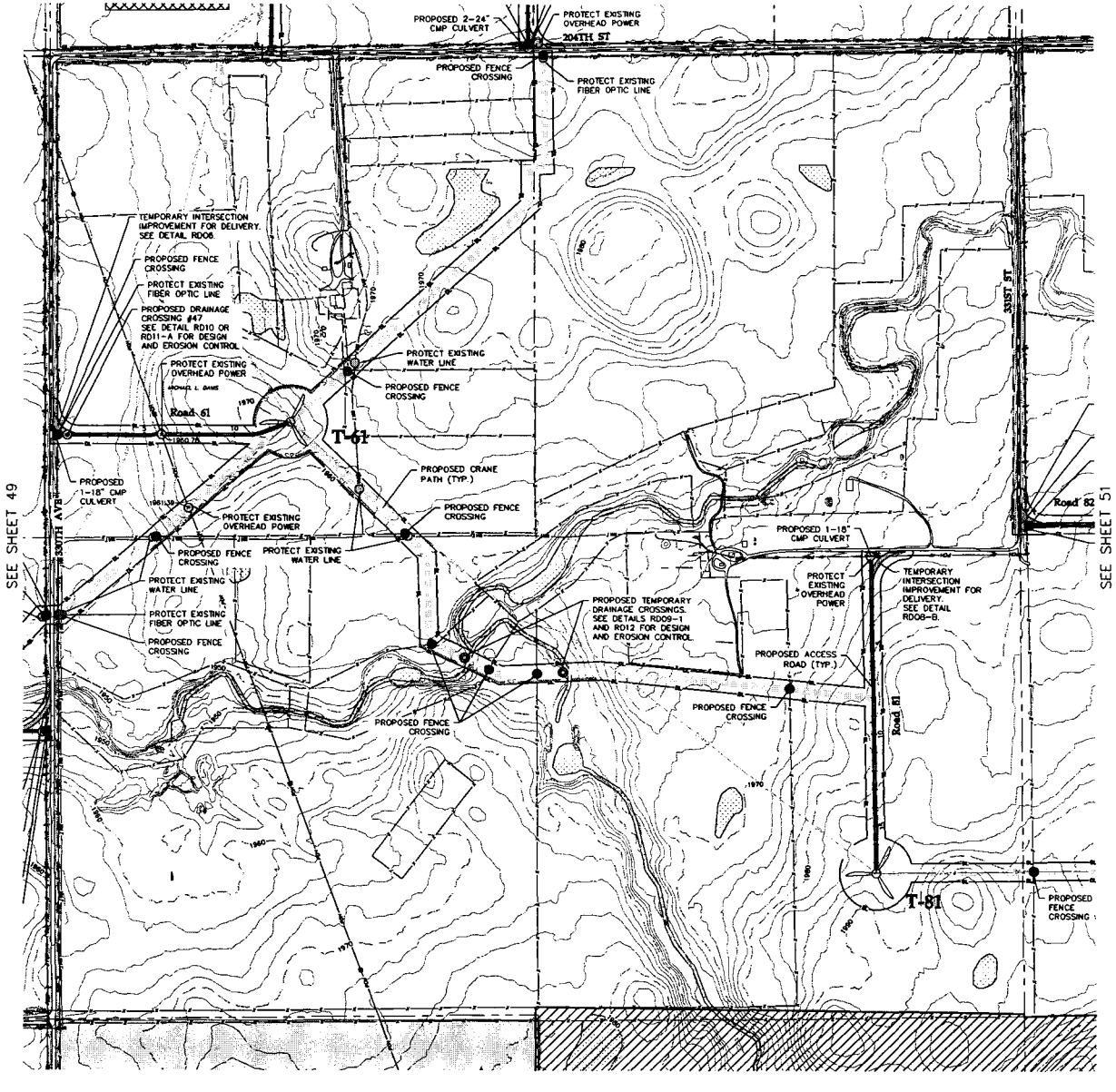
Signature of Applicant

Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

©2019 Westwood Professional Services, Inc.



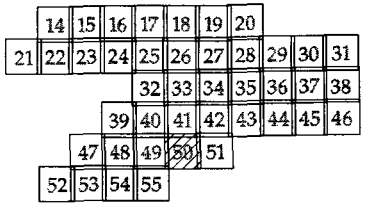
LEGEND:

- PROPOSED TURBINE LOCATION
- T-XX PROPOSED TURBINE NUMBER
- PROPOSED ALTERNATE TURBINE LOCATION
- ALT-XX PROPOSED ALTERNATE TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED ALTERNATE ACCESS ROAD
- PROPOSED CRANE PATH
- PROPOSED UNDERGROUND COLLECTION*
- PROPOSED DISTURBANCE LIMITS
- PROPOSED PERIMETER SEDIMENT CONTROL
- 980 EXISTING 10' CONTOURS
- EXISTING 2' CONTOURS
- EXISTING GRAVEL EDGE
- EXISTING BITUMINUS EDGE
- EXISTING RIGHT-OF-WAY
- EXISTING PARCEL LINE
- EXISTING BUILDING
- EXISTING FENCE
- EXISTING OVERHEAD POWER
- EXISTING HIGH VOLTAGE OVERHEAD POWER
- EXISTING UNDERGROUND POWER LINE
- EXISTING FIBER OPTIC LINE
- EXISTING WATER LINE
- DELINEATED WETLAND
- ARCHAEOLOGICAL AVOIDANCE AREA
- EXISTING USFWS EASEMENT
- PROJECT BOUNDARY
- 1900 EXISTING GROUND ELEVATION
- PROPOSED DRAINAGE CROSSING**
- PROPOSED TEMPORARY DRAINAGE CROSSING**
- PROPOSED FENCE CROSSING***
- PROPOSED UTILITY CROSSING
- PROPOSED CULVERT

* PROVIDED BY OTHERS AND SHOWN FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSTRUCTION PLANS FOR DETAILS.

** SEE SHEET 11 FOR DRAINAGE CROSSING TYPE AND SIZING. DRAINAGE CROSSINGS SHALL CONSIST OF LOW WATER CROSSING OR CULVERT. DRAINAGE CROSSINGS ALONG CRANE PATH SHALL CONSIST OF CRANE MATS OR TEMPORARY CULVERT.

*** ALL GATE INSTALLATIONS SHALL BE FIELD DETERMINED AND AGREED UPON BY THE CONTRACTOR AND OWNER.



KEY MAP

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (866) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed:	SMK
Checked:	DJH
Drawn:	SMK
As-Built Drawing:	

Revisions		
#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2035 2nd Avenue NW
West Fargo, ND 58078

0' 300' 600' 900'

Triple H Wind Farm

Hyde County, South Dakota

Site Plan T-61, T-81

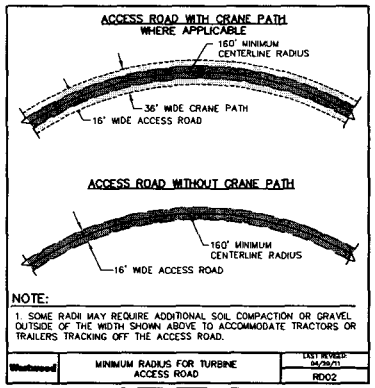
90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19

Sheet: 50 OF 57

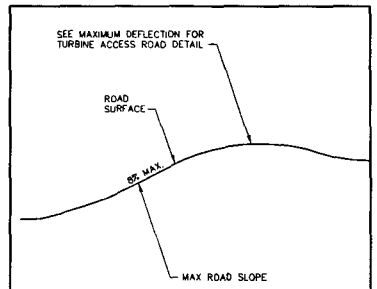
0014440SP01.dwg

© 2019 Westwood Professional Services, Inc.



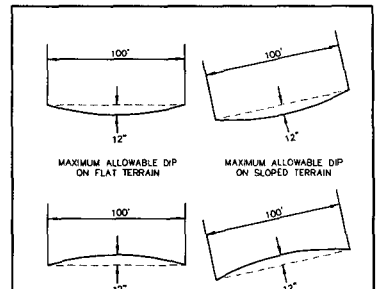
NOTE:
1. SOME RADII MAY REQUIRE ADDITIONAL SOIL COMPACTION OR GRAVEL OUTSIDE OF THE WIDTH SHOWN ABOVE TO ACCOMMODATE TRACTORS OR TRAILERS TRACKING OFF THE ACCESS ROAD.

Westwood	MINIMUM RADIUS FOR TURBINE ACCESS ROAD	LAST REVISED: 04/29/11 RD02

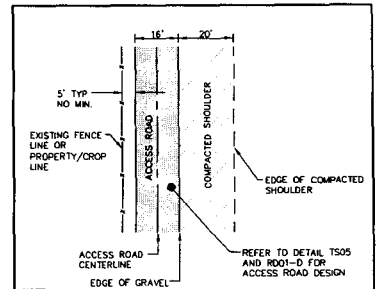


NOTES:
1. ROAD SLOPE SHALL NOT EXCEED 8% WITHOUT OWNER APPROVAL

Westwood	MAXIMUM VERT. SLOPE FOR TURBINE ACCESS ROAD/CRANE TRAVEL PATH	LAST REVISED: 3/18/19 RD03

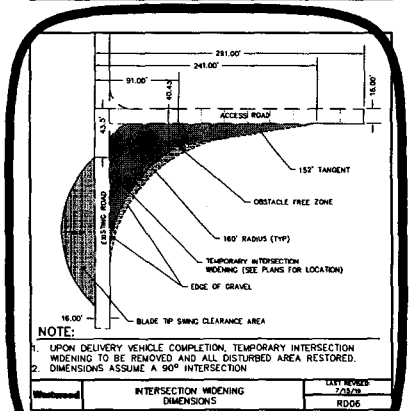


Westwood	MAXIMUM DEFLECTION FOR TURBINE ACCESS ROAD	LAST REVISED: 01/02/08 RD04



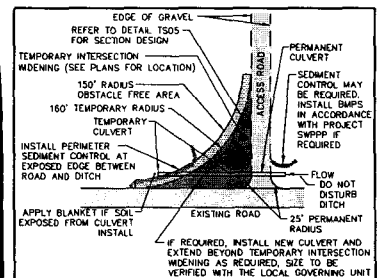
NOTE:
1. COMPACTED SHOULDER SHALL BE RETURNED TO NATIVE CONDITION FOLLOWING TURBINE GENERATOR CONSTRUCTION.
2. THE ACCESS ROAD MAY NEED TO BE CONSTRUCTED FARTHER FROM THE PROPERTY LINE IF OBSTRUCTIONS SUCH AS TREES FOLLOW THE PROPERTY LINE.

Westwood	TURBINE ACCESS ROAD ALONG FENCE/PROPERTY/CROP LINE	LAST REVISED: 3/18/19 RD05



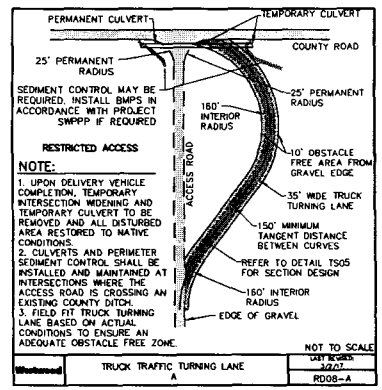
NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING TO BE REMOVED AND ALL DISTURBED AREA RESTORED.
2. DIMENSIONS ASSUME A 90° INTERSECTION

Westwood	INTERSECTION WIDENING DIMENSIONS	LAST REVISED: 7/19/19 RD06



1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.

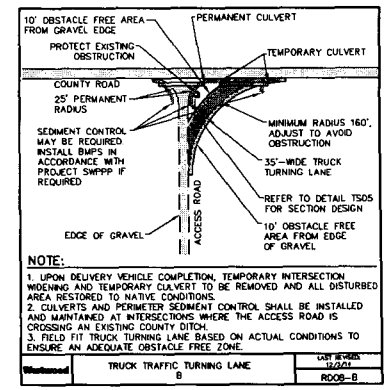
Westwood	TURBINE ACCESS ROAD TYPICAL INTERSECTION WIDENING	LAST REVISED: 3/3/17 RD07



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

NOT TO SCALE

Westwood	TRUCK TRAFFIC TURNING LANE A	LAST REVISED: 3/2/17 RD08-A



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

Westwood	TRUCK TRAFFIC TURNING LANE B	LAST REVISED: 12/3/01 RD08-B

Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite 0350
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 www.westwoodps.com
Westwood Professional Services, Inc.

Designed: BMC
Checked: TSH
Drawn: BMC
As-Built Drawing:

Revisions: #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:
WANZEK
MinoTex
2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

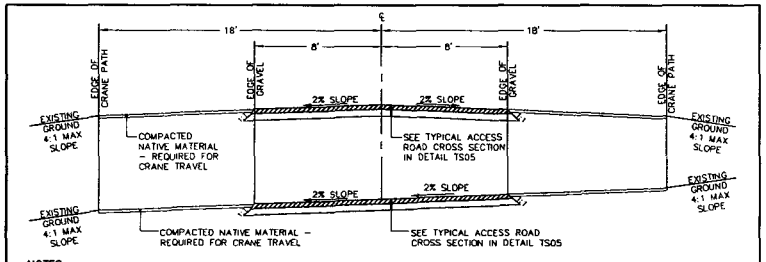
Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 5 OF 57

0014400TP.dwg

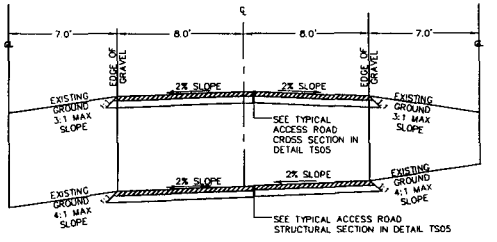
© 2019 Westwood Professional Services, Inc.



NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%.
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE ACCESS ROAD DIRECTLY INTO EXISTING GROUND SURFACE.
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

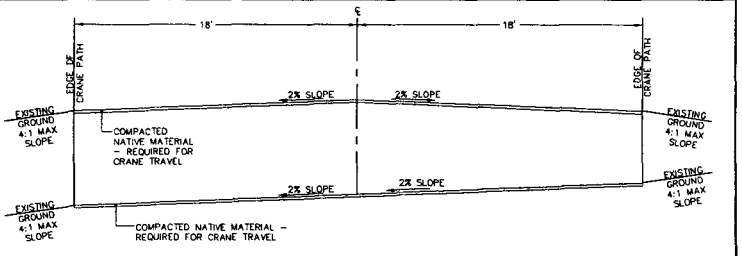
Westwood	TYPICAL TURBINE ACCESS ROAD AND CRANE PATH	LAST REVISED: 05/29/19
		RD01–A



NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

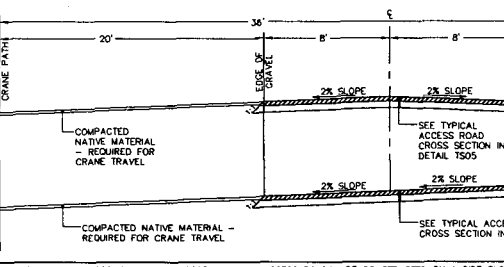
Westwood	TYPICAL TURBINE ACCESS ROAD SECTION	LAST REVISED: 5/29/19
		RD01–B



NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE WHERE CRANE PATHS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT CRANE PATH REMAINS WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%.

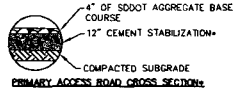
Westwood	TYPICAL CRANE PATH	LAST REVISED: 05/29/19
		RD01–C



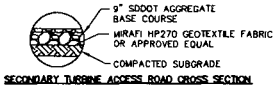
NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%.
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE EDGE OF COMPACTED SHOULDER DIRECTLY INTO EXISTING GROUND SURFACE.
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

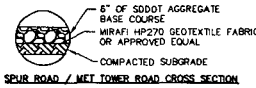
Westwood	TYPICAL TURBINE ACCESS ROAD AND OFFSET CRANE PATH	LAST REVISED: 05/29/19
		RD01–D



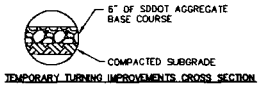
PRIMARY ACCESS ROAD CROSS SECTION*



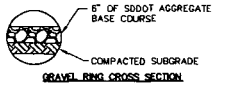
SECONDARY TURBINE ACCESS ROAD CROSS SECTION



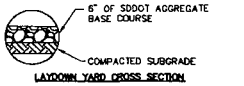
SPUR ROAD / WET TOWER ROAD CROSS SECTION



TEMPORARY TURNING IMPROVEMENTS CROSS SECTION



GRAVEL RING CROSS SECTION



LAYDOWN YARD CROSS SECTION

* CEMENT APPLICATION RATE MAY VARY BASED ON TEST STRIPS AND FIELD PERFORMANCE. SEE SHEET 13 FOR CEMENT STABILIZATION PROCEDURE AND DESIGN BASIS.

NOTES:

STRUCTURAL SECTIONS SHOWN ARE THE MINIMUM THICKNESS REQUIREMENTS DURING NORMAL FIELD CONDITIONS. THE SECTIONS MAY NEED TO BE INCREASED BASED ON ACTUAL FIELD CONDITIONS AT THE TIME OF CONSTRUCTION. CONDITIONS INCLUDE BUT ARE NOT LIMITED TO CONSTRUCTION DURING THE FREEZE/THAW CYCLE, UNUSUALLY WET PERIODS, OR IN LOW/WET AREAS. SEE SHEET 12 FOR TESTING REQUIREMENTS AND SPECIFICATIONS.

Westwood	TYPICAL STRUCTURAL CROSS SECTIONS

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 www.westwoodps.com

Westwood Professional Services, Inc.

Designed: BME
Checked: DJH
Drawn: BME
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	05/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 4 OF 57

DD1444DTP.dwg

© 2019 Westwood Professional Services, Inc.

ROAD DESIGN PARAMETERS

1. ACCESS ROADS HAVE BEEN DESIGNED TO ACCOMMODATE LIGHT DUTY TRUCKS (PICKUP TRUCKS AND MAINTENANCE VEHICLES) FOR LOW VOLUME USE IN NORMAL OPERATING CONDITIONS AS WELL AS HEAVY DUTY CONSTRUCTION TRAFFIC UNDER DRY CONDITIONS. THE ROAD DESIGN SPECIFIED IS NOT INTENDED FOR ALL WEATHER USE FOR HEAVY DUTY CONSTRUCTION LOADS.
2. ROAD MAINTENANCE CAN BE EXPECTED OVER THE LIFE OF THE PERMANENT FACILITY.

PRODUCTS

1. AGGREGATE BASE SHALL CONSIST OF SDDOT AGGREGATE BASE COURSE (AND IN CONFORMANCE WITH THE GRADATION TABLE 1), AGGREGATE MAY BE CRUSHER RUN UPON ENGINEERS APPROVAL. AGGREGATE GRADATIONS SHALL BE SUBMITTED TO ENGINEER FOR REVIEW.
2. ROAD SHOULDERS AND CRANE PADS SHALL CONSIST OF COMPACTED NATIVE SOILS.
3. CULVERTS: ACCESS ROAD CULVERTS SHALL MEET THE MINIMUM SPECIFICATIONS SET FORTH BY THE SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION AND/OR HYDE COUNTY. ALL CULVERTS ARE PLANNED TO BE A MINIMUM 18" DIAMETER AND MANUFACTURED OF 16-GAGE CORRUGATED METAL PIPE WITH NO END TREATMENTS UNLESS NOTED OTHERWISE. ACTUAL SIZE WILL BE DETERMINED THROUGH HYDRAULIC ANALYSIS.
4. GEOTEXTILE FABRIC: MIRAFI HP270 OR APPROVED EQUAL.

EXECUTION

1. CLEARING AND GRUBBING
   A. THE CONTRACTOR SHALL BE REQUIRED TO GRUB ALL TREES, STUMPS, BRUSH, AND DEBRIS WITHIN THE GRADING AREAS SHOWN ON THE PLANS. GRUBBING INCLUDES REMOVAL OF ALL PLANT MATERIAL GREATER THAN 2" INCLUDING STUMPS, BRANCHES, ROOTS, ETC. TO A DEPTH BELOW THE FINAL SUBGRADE. THE CONTRACTOR IS TO REMOVE ONLY THOSE TREES WHICH ARE DESIGNATED BY THE OWNER'S REPRESENTATIVE FOR REMOVAL, AND SHALL EXERCISE EXTREME CARE AROUND EXISTING TREES TO BE SAVED.
2. TOPSOIL STRIPPING
   A. TOPSOIL, INCLUDING ROOTS LARGER THAN 2" AND LARGE ROOT MASSES, SHALL BE STRIPPED FROM ALL ROADWAY AND FOUNDATION AREAS UP TO 10". TOPSOIL SHALL NOT BE STRIPPED OUTSIDE OF THE DESIGNATED DISTURBANCE AREAS.
   B. ANY TOPSOIL THAT HAS BEEN STRIPPED SHALL BE STOCKPILED FOR POST CONSTRUCTION REVEGETATION. ALL TOPSOIL SHALL BE REDISTRIBUTED TO THE LAND OWNER'S PROPERTY OF WHERE IT ORIGINATED FROM.
3. FILL PLACEMENT
   A. FILL PLACEMENT SHALL CONSIST OF THE PLACING OF SUITABLE FILL MATERIAL, AFTER TOPSOIL STRIPPING, ABOVE THE EXISTING GRADE. GENERALLY, SIDE SLOPES SHALL BE CONSTRUCTED AT FOUR FOOT HORIZONTAL TO ONE FOOT VERTICAL, WITH SOME LOCATIONS THROUGHOUT THE PROJECT WITH SLOPES OF TWO FEET HORIZONTAL TO ONE FOOT VERTICAL. THE MATERIAL FOR FILL CONSTRUCTION SHALL BE OBTAINED FROM THE ACCESS ROAD/TURBINE EXCAVATION (SEE GEOTECHNICAL REPORT FOR RESTRICTIONS), OR ANY SUITABLE, APPROVED SOIL OBTAINED ONSITE/OFFSITE BY CONTRACTOR, AS DIRECTED OR APPROVED BY THE ENGINEER. THIS MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 12" AND CONSTRUCTED TO 95% OF THE MAXIMUM DRY DENSITY AND WITHIN 2% OF OPTIMUM MOISTURE CONTENT, AS DETERMINED BY THE STANDARD PROCTOR (AASHTO T99).
   B. SIDE SLOPES GREATER THAN 4:1 WILL NOT BE PERMITTED, UNLESS OTHERWISE NOTED ON THE PLAN.
   C. FILL SLOPES SHALL BE BENCHED INTO THE EXISTING SLOPE TO PREVENT MOVEMENT BETWEEN THE FILL AND NATIVE SOILS. BENCHES SHOULD BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO FILL PLACEMENT. POSITIVE DRAINAGE IS REQUIRED AT BENCHED AREAS AND AT THE TOE OF FILL SLOPES TO REMOVE SURFACE WATER.
4. SUBGRADE
   A. SUBGRADE PREPARED AT GRADE OR IN CUT REQUIRES SCARIFICATION AND RECOMPACTION TO A DEPTH OF 12" OR MORE.
   B. ACCESS ROAD CROSS SLOPES SHOWN IN THE PLANS ARE MEANT AS A GUIDE. ACCESS ROAD CROSS SLOPES MAY RANGE FROM 1% - 2%, CHECK WITH THE ENGINEER IF THE CROSS SLOPE FALLS OUTSIDE OF THIS RANGE. ACCESS ROADS BEING UTILIZED FOR CRANE TRAVEL SHOULD HAVE A MAX CROSS SLOPE OF 2%

TABLE 1: SDDOT AGGREGATE BASE COURSE - LOCALLY SOURCED	
SIEVE SIZE	PERCENT PASSING
1"	100
3/4"	80-100
1/2"	68-91
NO. 4	46-70
NO. 8	34-58
NO. 40	13-35
NO. 200	3-12

MEET FOLLOWING REQUIREMENTS PER 882.2

LIQUID LIMIT (MAX) = 25
PLASTICITY INDEX = 0-6
L.A ABRASION (% MAX) = 40%

GRADATION HAS BEEN OBTAINED FROM THE 2015 SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION BOOK.

STORM WATER DESIGN PARAMETERS

1. SEE SHEET 6 FOR CULVERT SIZING AND DESIGN PARAMETERS. SEE HYDROLOGY MEMO FOR FURTHER DESIGN CALCULATIONS. CULVERTS SHALL BE MINIMUM 18" CORRUGATED METAL PIPE. ALL TEMPORARY PORTIONS OF THE INSTALLED CULVERTS SHALL BE REMOVED UPON COMPLETION OF THE PROJECT.
2. IT IS EXPECTED THAT CULVERTS WILL BE OVERTOPPED DURING SOME STORMS AND MAINTENANCE WILL BE REQUIRED THROUGH THE LIFE OF THE PROJECT.
3. WHEN INSTALLING DRAINAGE CULVERTS THE CONTRACTOR SHALL USE JUDGMENT IN SETTING THE FLOW LINE ELEVATIONS AND CULVERT LONGITUDINAL SLOPE. TYPICALLY THE FLOW LINE ELEVATIONS AND LONGITUDINAL SLOPE OF THE CULVERT SHOULD MATCH THE NATURAL GROUND ELEVATIONS AND SLOPE TO ENSURE POSITIVE DRAINAGE. WHEN POSSIBLE, ALL CULVERTS SHOULD BE PLACED AT A MINIMUM 0.5% GRADE.
4. ANTICIPATED CULVERT CROSSINGS ARE SHOWN ON THE CONSTRUCTION PLAN, ADDITIONAL CULVERTS MAY NEED TO BE INSTALLED IN AREAS WHERE CONCENTRATED FLOW IS EXPECTED DUE TO CONSTRUCTION ACTIVITIES.
5. CONSTRUCTION DRAINAGE CROSSINGS TO MAINTAIN EXISTING FLOW CHARACTERISTICS OF THE FEATURES. FEATURES SHALL BE GRADED TO PRECONSTRUCTION CONTOURS.

TESTING:

1. TESTING SHALL BE PERFORMED BY A DESIGNATED INDEPENDENT TESTING AGENCY.
2. SUBMIT ONE SET OF TESTING AND INSPECTION RECORDS SPECIFIED TO THE CIVIL ENGINEER OF RECORD.

DEFINITIONS:

1. PROOF ROLLING:
   SHALL BE PERFORMED IN THE PRESENCE OF THE GEOTECHNICAL ENGINEER OR QUALIFIED GEOTECHNICAL REPRESENTATIVE USING A FULLY LOADED TANDEM AXLE DUMP TRUCK OR WATER TRUCK WITH A MINIMUM GROSS WEIGHT OF 25 TONS OR A FULLY LOADED BELLY DUMP WITH AN EQUIVALENT AXLE LOADING. PROOF-ROLLING ACCEPTANCE STANDARDS INCLUDE NO RUTTING GREATER THAN 1.5 INCHES, AND NO "PUMPING" OF THE SOIL BEHIND THE LOADED TRUCK.
2. SIEVE ANALYSIS:
   SHALL BE CONDUCTED IN ACCORDANCE WITH AASHTO T27
3. PROCTORS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T99
4. ATTERBERG LIMITS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T89 AND T90
5. MOISTURE DENSITY (NUCLEAR DENSITY):
   SHALL BE DONE IN ACCORDANCE WITH AASHTO T310
6. DYNAMIC CONE PENETROMETER (DCP) TESTING:
   SHALL BE DONE IN ACCORDANCE WITH ASTM D6951-03

REQUIREMENTS:

1. FILL PLACEMENT:
   A. SOILS USED AS FILL MATERIAL SHALL BE TESTED FOR MOISTURE CONTENT AND PROCTOR TESTS.
   B. WHERE FILL CONSTRUCTION REQUIRES MORE THAN 12 INCHES OF FILL PLACEMENT, COMPACT EACH LIFT TO A MINIMUM OF 95 PERCENT OF THE MATERIAL'S MAXIMUM STANDARD PROCTOR DRY DENSITY.
2. COMPACTED SUBGRADE (CEMENT STABILIZED):
   A. SEE SHEET 13 FOR TESTING REQUIREMENTS AND PROCEDURE.
3. COMPACTED SUBGRADE (NON-CEMENT STABILIZED):
   A. THE ENTIRE SUBGRADE SHALL BE PROOF-ROLLED PRIOR TO THE PLACEMENT OF THE AGGREGATE BASE TO IDENTIFY AREAS OF UNSTABLE SUBGRADE.
   B. PERFORM A MINIMUM OF 3 DYNAMIC CONE PENETROMETER (DCP) TESTS PER ACCESS ROAD OR ONE FOR EVERY 1,000 LF OF ROAD, WHICHEVER IS GREATER. SUBGRADE MUST MEET A MINIMUM DCP OF 3 BLOWS PER 6" TO A TOTAL DEPTH OF 2' (MINIMUM CBR=1.5).
   C. IF A PASSING PROOF-ROLL OR DCP REQUIREMENTS CANNOT BE ACHIEVED THE FOLLOWING ALTERNATIVES MAY BE IMPLEMENTED:
      a. SCARIFY, DRY, AND RECOMPACT SUBGRADE
      b. REMOVE UNSUITABLE MATERIAL AND REPLACE WITH SUITABLE MATERIAL
      c. INCREASE AGGREGATE BASE THICKNESS
4. AGGREGATE BASE:
   A. AGGREGATE BASE SHALL BE PROOF-ROLLED OVER THE ENTIRE LENGTH. IF PROOF ROLLING DETERMINES THAT THE ROAD IS UNSTABLE, ADDITIONAL AGGREGATE SHALL BE ADDED UNTIL THE UNSTABLE SECTION IS ABLE TO PASS A PROOF ROLL.
   B. PROVIDE 1 SIEVE ANALYSIS (PROJECT MAX OF 20) PER 2500 CY OF ROAD BASE PLACED.
5. CRANE PAD AND CRANE PATHS / CRANE TRAVEL SHOULDERS:
   A. TESTING REQUIREMENTS ARE PENDING BASED ON CRANE PICK PLANS PROVIDED BY THE CONTRACTOR.

TABLE 2: TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
FILL PLACEMENT	PROCTOR	1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER LIFT PER 5000 SF OF FILL PLACED OR 1 PER 500 LF OF ROAD OR CRANE WALK
COMPACTED SUBGRADE (CEMENT STABILIZED):	SEE SHEET 13	SEE SHEET 13
COMPACTED SUBGRADE (NON-CEMENT STABILIZED):	PROOF-ROLL	ENTIRE AREA
	DCP	1 PER 1,000 FT OR MIN. 3 PER ROAD
AGGREGATE BASE	PROOF-ROLL	ENTIRE AREA
	SIEVE ANALYSIS, LL, PL, AND L.A ABRASION	1 PER 2,500 CY

GENERAL NOTES:

1. GROUND SURFACE CONTOURS (AT TWO-FOOT VERTICAL INTERVALS) AND ELEVATIONS ARE BASED ON A PHOTOGRAMMETRY SURFACE PROVIDED BY GEOTERRA. IF MAJOR DISCREPANCIES ARE FOUND IN THE GROUND ELEVATIONS DURING FIELD STAKING TO THE GROUND ELEVATIONS SHOWN ON THE PLANS, THE OWNER AND ENGINEER SHALL BE NOTIFIED.
2. WHERE SECTION OR SUBSECTION MONUMENTS ARE ENCOUNTERED, THE OWNER SHALL BE NOTIFIED BEFORE SUCH MONUMENTS ARE REMOVED. THE CONTRACTOR SHALL PROTECT AND CAREFULLY PRESERVE ALL PROPERTY MARKERS AND MONUMENTS UNTIL THE OWNER, AN AUTHORIZED SURVEYOR OR AGENT HAS WITNESSED OR OTHERWISE REFERENCED THEIR LOCATION.
3. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. TYPICAL DISTURBANCE SHALL BE LIMITED TO 10 LF FROM THE EDGE OF PROPOSED GRADING.
4. FINALIZE GRADING AROUND THE BASE OF TURBINES IN ACCORDANCE WITH DETAIL TS-03 AND TS-04.
5. GRADE ALL PROPOSED ROADS TO A MAXIMUM SLOPE OF 8% IF 8% SLOPE CANNOT BE ACHIEVED, THE CONTRACTOR MAY UTILIZE ASSIST VEHICLES FOR THE PURPOSE OF DELIVERIES. GRADE ALL PROPOSED CRANE PATHS TO A MAXIMUM OF 8% UNLESS OTHERWISE NOTED IN PLAN SHEETS.
6. ANY FACILITIES REMOVED TO ALLOW FOR CONSTRUCTION (MAILBOXES, SIGNS, FENCES, ETC.) SHALL BE REPLACED BY THE CONTRACTOR IN A CONDITION AS GOOD AS EXISTING.
7. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING DRAINAGE THROUGHOUT THE CONSTRUCTION OF THIS PROJECT. CONSTRUCTION ACTIVITIES SHALL NOT BLOCK THE NATURAL OR MANMADE CREEKS OR DRAINAGE SWALES CAUSING RAINWATER TO POND. DEPENDING ON FIELD CONDITIONS, ADDITIONAL CULVERTS IN EXCESS OF THOSE ON THE PLANS MAY BE REQUIRED.
8. WHILE BUILDING THE ROADS AND EXCAVATING THE TURBINE FOUNDATIONS, EXCESS SOIL WILL RESULT. THE CONTRACTOR SHALL DISPOSE OF THIS EXCESS SOIL IN AN APPROVED MANNER. EXCESS TOPSOIL SHALL BE DISTRIBUTED INTO A THIN LAYER ON LAND IMMEDIATELY ADJACENT TO WHERE THE TOPSOIL ORIGINATED. ALL EXCESS TOPSOIL TO BE WASTED ONSITE. WHILE DOING SO THE CONTRACTOR SHALL AVOID CAUSING RIDGES OR MOUNDS THAT WOULD MAKE IT DIFFICULT FOR STORM WATER RUNOFF TO DRAIN. THE FINAL SURFACE OF THE DISTURBED TOPSOIL SHALL BE SMOOTH AND FOLLOW THE NATURAL CONTOUR OF THE LAND.
9. THE CONTRACTOR SHALL NOTIFY SOUTH DAKOTA 811 AT LEAST 48 HOURS BEFORE EXCAVATION ACTIVITIES COMMENCE.
10. TEMPORARY INTERSECTION WIDENING SHALL, UPON COMPLETION OF ALL PROJECT CONSTRUCTION OR UPON NOTIFICATION OF THE ENGINEER, BE REMOVED AND THE AREA RESTORED TO ITS ORIGINAL LINES AND GRADES WITH TOPSOIL REPLACED, EXCEPT WHERE REQUESTED BY THE TOWNSHIP OR COUNTY TO PERMANENTLY REMAIN. DISTURBED AREAS OUTSIDE OF THE FINAL ROADWAY SHALL BE SEEDED AND MULCHED.
11. TURBINE SETBACKS ARE NOT IDENTIFIED ON THE CONSTRUCTION PLANS. IT SHALL BE THE RESPONSIBILITY OF THE OWNER AND CONTRACTOR TO ENSURE THAT ALL TURBINE SETBACKS MEET PROJECT REQUIREMENTS.
12. GEOTECHNICAL REPORTS WITH RECOMMENDATIONS HAVE BEEN PROVIDED BY THE OWNER. ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL ENGINEERING REPORT AND RECOMMENDATIONS.
13. FIELD SURVEY WETLAND INFORMATION HAS BEEN PROVIDED BY THE OWNER. ALL WETLAND DELINEATIONS AND PERMITTING SHALL BE THE RESPONSIBILITY OF OTHERS AND BE COMPLETED PRIOR TO CONSTRUCTION COMMENCING. THE OWNER AND GENERAL CONTRACTOR SHALL VERIFY THAT ALL WETLAND PERMITS HAVE BEEN SUBMITTED AND APPROVED PRIOR TO CONSTRUCTION COMMENCING.
14. CULTURAL RESOURCE REPORTS HAVE NOT BEEN PROVIDED. CULTURAL RESOURCE LOCATIONS ARE NOT SHOWN ON THE PLANS. INFORMATION WILL BE THE RESPONSIBILITY OF THE OWNER AND GENERAL CONTRACTOR. THE LOCATIONS OF CULTURAL RESOURCE SITES MAY BE CONFIDENTIAL AND PROTECTED BY STATE OR FEDERAL LAW. PUBLIC RELEASE OF SPECIFIC INFORMATION REGARDING THESE RESOURCES MAY BE RESTRICTED.
15. AN ENVIRONMENTAL ASSESSMENT HAS NOT BEEN PROVIDED. THE CONTRACTOR SHALL BE FAMILIAR WITH THE REPORT AND REVIEW ALL RECOMMENDATIONS.
16. ELECTRICAL INFORMATION SHOWN ON THE PLANS IS FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSULTANT'S PLANS FOR SPECIFIC LOCATIONS AND CONSTRUCTION DETAILS FOR THE UNDERGROUND POWER COLLECTION SYSTEM AND SUBSTATION.
17. CRANE PATHS ARE SHOWN ON THE CONSTRUCTION PLANS. IF THE CONTRACTOR PROPOSES ALTERNATE CRANE PATHS, THEY SHALL ENSURE THAT WETLAND AND CULTURAL RESOURCE CORRIDORS ARE NOT DISTURBED. FINAL CRANE PATH ALIGNMENTS SHALL BE DETERMINED BY THE CONTRACTOR BASED ON FIELD CONDITIONS WITHIN THE WETLAND AND CULTURAL RESOURCE CORRIDORS, SPECIAL LANDOWNER AGREEMENTS AND THE PROJECT BOUNDARY.
18. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. DISTURBANCE SHALL BE LIMITED TO 50 LF WIDTH FOR PROPOSED ACCESS ROADS AND 50 LF FOR CRANE PATHS, AND SHALL BE LIMITED TO A 250 LF RADIUS FOR PROPOSED WIND TURBINE GENERATORS. THE GRADING LIMITS SHALL BE CENTERED ON THE ROADWAYS AND WIND TURBINES. THE CONTRACTOR SHALL MAKE ALL EFFORTS TO KEEP ACTIVITIES WITHIN THE ERECTION AREAS SHOWN ON THE PLANS BUT IT IS UNDERSTOOD THAT SOME ACTIVITIES THAT WILL NOT REQUIRE GRADING OR SOIL DISTURBANCE MAY EXTEND BEYOND THE DEFINED LIMITS. DURING ERECTION OF THE ROTOR, TRUCKS AND/OR FORKLIFTS MAY EXTEND BEYOND THESE LIMITS. SEE DETAIL TS01 FOR TYPICAL ERECTION AREAS.
19. AN ALTA SURVEY HAS BEEN PROVIDED BY WESTWOOD. CONTRACTOR AND OWNER ARE RESPONSIBLE FOR LOCATING ALL UTILITIES AND VERIFYING LOCATION OF CONSTRUCTION ACTIVITIES PRIOR TO COMMENCING WORK.

STORMWATER POLLUTION PREVENTION PLAN (SWPPP):

1. THE CONTRACTOR SHALL PROVIDE EROSION CONTROL MEASURES AS PLANNED AND SPECIFIED FOLLOWING BEST MANAGEMENT PRACTICES AS OUTLINED BY THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND BEING IN CONFORMANCE WITH THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL STORMWATER PERMIT.
2. REFER TO THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR THE TRIPLE H WIND FARM, PREPARED BY WESTWOOD PROFESSIONAL SERVICES, FOR EROSION CONTROL AND RESTORATION SPECIFICATIONS, SEDIMENT AND EROSION CONTROL PROCEDURES, LOCATIONS OF BMPs, DETAILS, AND INSPECTION INFORMATION.
3. ALL PASTURES AND DRAINAGE SWALES DISTURBED DURING CONSTRUCTION ACTIVITIES AND NOT COVERED BY ROAD SURFACING MATERIALS, SHALL BE SEEDED IN ACCORDANCE WITH THE SWPP PLAN.
4. TEMPORARY EROSION CONTROL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE TEMPORARY EROSION CONTROL PLAN SHALL BE IN ACCORDANCE WITH THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND THE TRIPLE H WIND FARM STORMWATER POLLUTION PREVENTION PLAN ON FILE.

PROJECT CONTACT INFORMATION:

TITLE	COMPANY	NAME	CONTACT NUMBER
OWNER (PRIMARY)	ENGIE	CASEY WILLIS	805-569-6185
PROJECT MANAGER	WESTWOOD	DANI NYGREN	952-906-7493
ENGINEER OF RECORD	WESTWOOD	ROB COPOULS	952-906-7470
CONTRACTOR	WANZEK	JASON HELLERUD	701-893-3685

Westwood
Westwood Professional Services, Inc.

Designed:	GMK
Checked:	DPN
Drawn:	GMK
As-Built Drawing:	

Revisions:

#	DATE	DESCRIPTION
A	12/08/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2028 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 12 OF 57

0014440DTP.dwg

©2019 Westwood Professional Services, Inc.

CEMENT STABILIZATION - PROCEDURE

THE SPECIFICATIONS BELOW ARE GENERAL RECOMMENDATIONS/GUIDELINES FOR CEMENT STABILIZATION OF SUBGRADES FOR THE PROJECT. ACTUAL FIELD CONDITIONS MAY ALTER APPLICATION RATE. CONSULT GEOTECHNICAL ENGINEER FOR FURTHER RECOMMENDATIONS.

1. STRIP THE TOP ±4 INCHES OF TOPSOIL (THROUGH THE ROOT ZONE) FROM THE AREA TO BE STABILIZED. ROOTS SMALLER THAN 1/4" DIAMETER ARE CONSIDERED INSIGNIFICANT.
2. PERFORM A PROCTOR (ASTM D 698) TEST TO DETERMINE THE OPTIMUM MOISTURE CONTENT IF THE MATERIAL TO BE STABILIZED DOES NOT MATCH A PREVIOUSLY PERFORMED PROCTOR.
3. DETERMINE THE IN-SITU MOISTURE CONTENT USING A NUCLEAR DENSITY GAUGE (OR EQUIVALENT MOISTURE CONTENT TEST) DAILY, PRIOR TO INCORPORATION OF THE CEMENT. PROVIDE ADDITIONAL MOISTURE CONTENT TESTING AS NEEDED BASED ON WEATHER CONDITIONS.
   - 3.1. THE CONTRACTOR WILL BE ADVISED OF IN-SITU MOISTURE CONTENT, AND MOISTURE ADJUSTMENTS SHOULD BE MADE IF IN-SITU MOISTURE IS LESS THAN OPTIMUM MOISTURE CONTENT AS DETERMINED BY THE PROCTOR (ASTM D 698).
4. SOIL AND CEMENT BLENDING:
   - 4.1. COMPLETELY BLEND SUBGRADE SOIL WITH THE APPROPRIATE AMOUNT OF CEMENT BY WEIGHT. FIELD RESULTS FROM TEST STRIPS WILL DICTATE THE CEMENT APPLICATION RATE.
   - 4.2. IN AREAS OF HIGH MOISTURE OR POOR SOILS, THE CONTRACTOR MAY INCREASE THE PERCENT OF CEMENT IN ORDER TO MEET THE MINIMUM SUBGRADE STRENGTH REQUIREMENTS.
   - 4.3. THE USE OF A RECLAIMER IS AN ADEQUATE BLENDING METHOD. DISCING IS NOT AN ADEQUATE BLENDING METHOD.
   - 4.4. A STABILIZATION DEPTH OF 12" WAS USED FOR DESIGN PURPOSES. STABILIZATION DEPTH MAY NEED TO INCREASE TO 16" IN AREAS OF EXTREME MOISTURE OR POOR SOILS IN ORDER TO MEET THE STRENGTH AND PROOF ROLL REQUIREMENTS.
5. COMPACTION:
   - 5.1. A ROLLING PATTERN WILL BE ESTABLISHED USING A NUCLEAR DENSITY GAUGE DURING COMPACTION.
     - 5.1.1. COMPACTION WILL BE PERFORMED UNTIL THE STABILIZED MATERIAL REACHES THE "BREAK POINT" AFTER WHICH ADDITIONAL PASSES WITH A ROLLER RESULTS IN A LOSS OF DENSITY AS MEASURED BY A NUCLEAR DENSITY GAUGE.
     - 5.1.2. COMPACTION IS TYPICALLY ACHIEVED BY MULTIPLE PASSES OF A PADFOOT ROLLER UNTIL THE ROLLER "WALKS" OUT OF THE RECLAIMED MATERIAL (SPACE IS VISIBLE BETWEEN THE DRUM AND THE RECLAIMED MATERIAL). THIS IS FOLLOWED BY BLADING AND SHAPING THE RECLAIMED MATERIAL TO FINAL PROFILE AND CROSS SECTION, REMOVING HIGH AND LOW POINTS. SMOOTH DRUM OR RUBBER TIRE ROLLERS ARE THEN USED TO FINISH ROLLING (THIS IS WHEN THE DENSITY TESTS ARE PERFORMED) UNTIL THE DENSITY OF THE MATERIAL REACHES THE "BREAK POINT."
     - 5.1.3. THE NUMBER OF PASSES AND EQUIPMENT USED TO REACH THE "BREAK POINT" IS CONSIDERED THE ROLLING PATTERN.
     - 5.1.4. A NEW ROLLING PATTERN MAY NEED TO BE ESTABLISHED IF THE PERFORMANCE REQUIREMENTS ARE NOT BEING MET. THIS MAY BE DUE TO CHANGES IN THE MOISTURE CONTENT, THE SOIL TYPE, OR THE CEMENT RATE.
   - 5.2. THE TARGET DENSITY IS 98% OF THE MAXIMUM DENSITY DETERMINED FROM THE ROLLING PATTERN.
     - 5.2.1. DENSITY TESTS SHALL BE TAKEN AT THE RATE OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER TO CONFIRM THE DENSITY IS MATCHING THE TARGET. ONCE THE ROLLING PATTERN HAS BEEN CONFIRMED IT IS RECOMMENDED THAT TESTING CONTINUE AT 1 TEST PER 1,000 LF IN EACH PASS OF THE RECLAIMER.
     - 5.2.2. IF IT IS NOT POSSIBLE TO ATTAIN THE TARGET DENSITY, AND ADDITIONAL COMPACTION DOES NOT IMPROVE THE DENSITY, A NEW ROLLING PATTERN SHOULD BE ESTABLISHED.
   - 5.3. THE AIR TEMPERATURE SHALL BE ABOVE 40 DEGREES (F) DURING THE CEMENT STABILIZATION PROCESS. MIXING CEMENT INTO FROZEN GROUND IS NOT ACCEPTABLE.
6. THE STABILIZED MATERIAL SHALL BE CONTINUOUSLY WET CURED FOR A MINIMUM OF 24 HOURS (WET CURED IS IDENTIFIED VISUALLY AS DAMP SURFACE).
7. PERFORM SUBGRADE TESTING IN ACCORDANCE WITH TESTING SCHEDULE.
8. AGGREGATE PLACEMENT:
   - 8.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 8.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 8.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

CEMENT STABILIZATION - DESIGN BASIS

1. DURING INITIAL CONSTRUCTION, CONTRACTOR SHALL CONSTRUCT MINIMUM 300 LF TEST STRIPS CONTAINING 4%, 5%, AND 6% CEMENT IN ACCORDANCE WITH CEMENT STABILIZATION PROCEDURES.
2. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 3 FOR ANTICIPATED RESULTS):
   - 2.1. PERFORM INITIAL SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M BETWEEN 4 TO 6 HOURS AFTER FINAL COMPACTION.
   - 2.2. PERFORM ADDITIONAL DCP TESTING AT 24 AND 48 HOURS AFTER FINAL COMPACTION.
   - 2.3. PERFORM SUBSEQUENT DCP TESTS AT 7 DAYS AFTER FINAL COMPACTION AS VERIFICATION OF STRENGTH CURVE.
   - 2.4. A MINIMUM OF 3 TESTS PER TEST SECTION PER TIMEFRAME IS REQUIRED. TESTS SHALL BE TAKEN AT THE CENTERLINE AND 2' FROM EACH SHOULDER.
   - 2.5. RECORD DCP TEST RESULTS EVERY 6 INCHES TO TOTAL DEPTH OF 12 INCHES.

TABLE 3: TEST STRIP CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	COMPRESSIVE STRENGTH (PSF)
4 – 6 HOURS	6	5	1,600
24 HOURS	10	7	2,500
48 HOURS	15	10	3,200
7 DAYS	30	21	5,200

CEMENT STABILIZATION - PRODUCTION

1. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 5 FOR SUMMARY OF TESTING REQUIREMENTS):
   - 1.1. PERFORM SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M NO SOONER THAN 24 HOURS AFTER FINAL COMPACTION.
   - 1.2. DCP TESTING FREQUENCY SHALL BE WITH A RANDOM SPACING AND A MINIMUM OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER. A MINIMUM OF 3 TESTS PER ROAD IS REQUIRED.
   - 1.3. THE CBR OF THE STABILIZED SUBGRADE SHOULD BE CALCULATED IN 6" INCREMENTS THROUGH THE ENTIRE DEPTH OF THE STABILIZED LAYER.
   - 1.4. THE MINIMUM REQUIRED CBR PRIOR TO PROOF-ROLLING IS PROVIDED IN TABLE 4 BELOW:

TABLE 4: FINAL CEMENT STABILIZED CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	UNDRAINED SHEAR STRENGTH (PSF)	BEARING CAPACITY (PSF)
24 – 48 HOURS	15	10	3,500	9,800
3 – 7 DAYS	30	21	7,000	18,000
28 DAYS	50	33	12,000	28,500

NOTE: UNDRAINED SHEAR STRENGTH WAS CALCULATED USING THE BLACK (1961) EQUATION. BEARING CAPACITY WAS CALCULATED USING THE VESIC EQUATION MODIFIED FOR TWO LAYERS (12" CEMENT STABILIZED SUBGRADE OVER A NATURAL SUBGRADE WITH A CBR OF 1.5)

   - 1.5. ONCE THE MINIMUM REQUIRED CBR IS ACHIEVED AT ANY CORRESPONDING TIME PERIOD, THE SUBGRADE IS CONSIDERED ADEQUATE AND THE CONTRACTOR MAY PROCEED WITH PROOF-ROLL TESTING. FUTURE DCP TESTING ON THAT SEGMENT OF SUBGRADE IS NOT REQUIRED.
   - 1.6. IF TESTING DOES NOT INDICATE A CBR OF 30 WITHIN 7 DAYS, ADDITIONAL GRAVEL SURFACING AND/OR THE ADDITION OF GEOTEXTILE FABRIC MAY BE REQUIRED. FOR FUTURE SUBGRADE STABILIZATION AREAS, CONTACT THE ENGINEER AND OWNER VIA RFI FOR RECOMMENDATIONS AND APPROVAL.
2. SUBGRADE PROOF-ROLL TESTING AND ACCEPTANCE:
   - 2.1. ONCE THE REQUIRED DCP VALUE HAS BEEN OBTAINED BUT PRIOR TO PLACING AGGREGATE, THE SUBGRADE SHALL BE PROOF-ROLLED. REFER TO THE PROJECT TESTING REQUIREMENTS FOR PROOF-ROLL DEFINITION.
   - 2.2. PROOF-ROLLING SHOULD BE PERFORMED WITH ONE PASS DOWN THE CENTER AND NOT BE PERFORMED WITHIN 12 INCHES OF THE EDGE OF THE STABILIZED SECTION.
   - 2.3. IF PROOF-ROLLING FAILS, RE-STABILIZATION MAY BE REQUIRED AND A NEW ROLLING PATTERN OR ADDITIONAL CEMENT MAY BE REQUIRED.
3. AGGREGATE PLACEMENT:
   - 3.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 3.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 3.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

TABLE 5: CEMENT STABILIZATION PRODUCTION TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
COMPACTED SUBGRADE (CEMENT STABILIZED)	PROCTOR	MINIMUM 1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER 1000 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
NOTE: SEE ABOVE FOR INITIAL TESTING REQUIREMENTS	DCP TEST	1 PER 500 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
	PROOF-ROLL (AFTER PASSING DCP TESTS)	ENTIRE LENGTH

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (866) 937-5150
Westwood Professional Services, Inc.

Designed: SMC
Checked: TEH
Drawn: SMC
As-Built Drawing:

Revisions #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 13 OF 57

00144400TP.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 204th Street in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 2615' East of 330th Ave & 204th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.25'31.00" W Long. -99.33'10.84" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: ~~N/A~~ As determined by Hyde County Highway Superintendent
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001118 SW4 4-111-73 & Parcel 001119 SE4 12-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Taye L Lane
Signature of Applicant

Robert Bawdon
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 204th Street in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 2615' East of 330th Ave & 204th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.25'31.00" W Long. -99.33'10.84" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: N/A
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001118 SW4 4-111-73 & Parcel 001119 SE4 12-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: _____

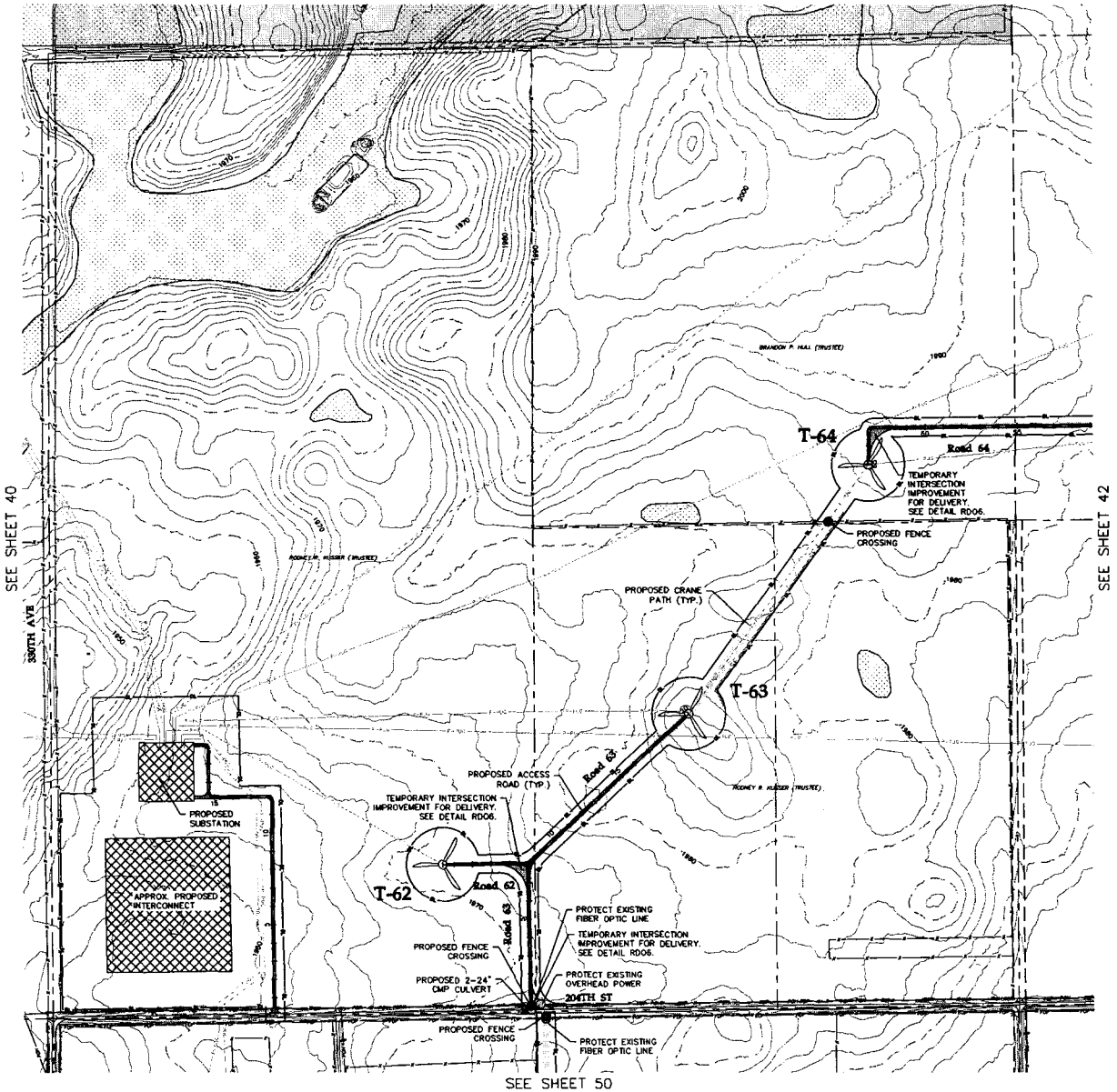
Taye A Stave
Signature of Applicant

_____
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

© 2019 Westwood Professional Services, Inc.



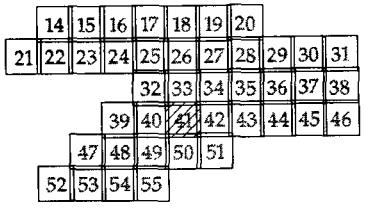
LEGEND:

- PROPOSED TURBINE LOCATION
- T-XX PROPOSED TURBINE NUMBER
- PROPOSED ALTERNATE TURBINE LOCATION
- ALT-XX PROPOSED ALTERNATE TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED ALTERNATE ACCESS ROAD
- PROPOSED CRANE PATH
- PROPOSED UNDERGROUND COLLECTION*
- PROPOSED DISTURBANCE LIMITS
- PROPOSED PERIMETER SEDIMENT CONTROL
- EXISTING 10' CONTOURS
- EXISTING 2' CONTOURS
- EXISTING GRAVEL EDGE
- EXISTING BITUMINUS EDGE
- EXISTING RIGHT-OF-WAY
- EXISTING PARCEL LINE
- EXISTING BUILDING
- EXISTING FENCE
- EXISTING OVERHEAD POWER
- EXISTING HIGH VOLTAGE OVERHEAD POWER
- EXISTING UNDERGROUND POWER LINE
- EXISTING FIBER OPTIC LINE
- EXISTING WATER LINE
- DELINEATED WETLAND
- ARCHAEOLOGICAL AVOIDANCE AREA
- EXISTING USFWS EASEMENT
- PROJECT BOUNDARY
- 1900 EXISTING GROUND ELEVATION
- PROPOSED DRAINAGE CROSSING**
- PROPOSED TEMPORARY DRAINAGE CROSSING**
- PROPOSED FENCE CROSSING***
- PROPOSED UTILITY CROSSING
- PROPOSED CULVERT

* PROVIDED BY OTHERS AND SHOWN FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSTRUCTION PLANS FOR DETAILS.

** SEE SHEET 11 FOR DRAINAGE CROSSING TYPE AND SIZING. DRAINAGE CROSSINGS SHALL CONSIST OF LOW WATER CROSSING OR CULVERT. DRAINAGE CROSSINGS ALONG CRANE PATH SHALL CONSIST OF CRANE MATS OR TEMPORARY CULVERT.

*** ALL GATE INSTALLATIONS SHALL BE FIELD DETERMINED AND AGREED UPON BY THE CONTRACTOR AND OWNER.



KEY MAP

Westwood

Phone: (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax: (952) 937-5822 Minnetonka, MN 55343
Toll Free: (800) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: TJH
Drawn: BMK
As-Built Drawing:

Revisions		
#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	05/07/19	50% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2035 2nd Avenue NW
West Fargo, ND 58078

0' 300' 600' 900'

Triple H Wind Farm

Hyde County, South Dakota

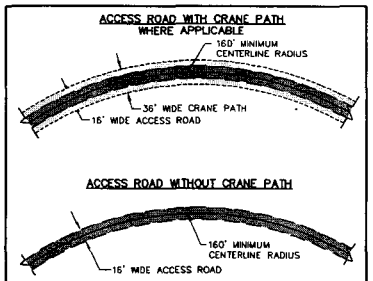
Site Plan T-62 - T-64

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 41 OF 57

0014440SP01.dwg

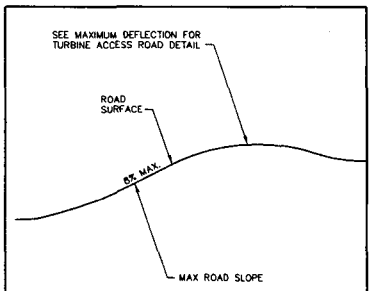
©2019 Westwood Professional Services, Inc.



NOTE:

1. SOME RADII MAY REQUIRE ADDITIONAL SOIL COMPACTION OR GRAVEL OUTSIDE OF THE WIDTH SHOWN ABOVE TO ACCOMMODATE TRACTORS OR TRAILERS TRACKING OFF THE ACCESS ROAD.

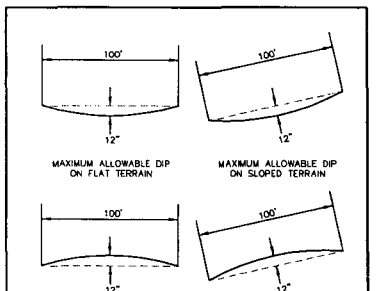
	MINIMUM RADIUS FOR TURBINE ACCESS ROAD	LAST REVISED: 04/29/21 RD02



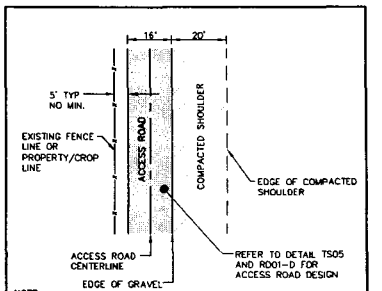
NOTES:

1. ROAD SLOPE SHALL NOT EXCEED 8% WITHOUT OWNER APPROVAL

	MAXIMUM VERT. SLOPE FOR TURBINE ACCESS ROAD/CRANE TRAVEL PATH	LAST REVISED: 3/8/21 RD03



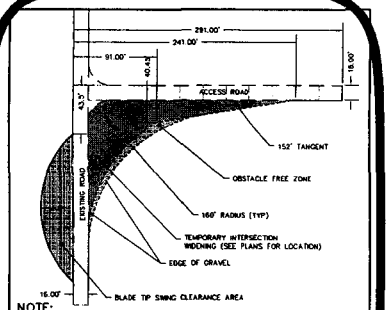
	MAXIMUM DEFLECTION FOR TURBINE ACCESS ROAD	LAST REVISED: 11/01/08 RD04



NOTE:

1. COMPACTED SHOULDER SHALL BE RETURNED TO NATIVE CONDITION FOLLOWING TURBINE GENERATOR CONSTRUCTION.
2. THE ACCESS ROAD MAY NEED TO BE CONSTRUCTED FARTHER FROM THE PROPERTY LINE IF OBSTRUCTIONS SUCH AS TREES FOLLOW THE PROPERTY LINE.

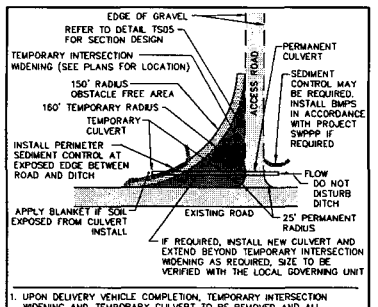
	TURBINE ACCESS ROAD ALONG FENCE/PROPERTY/CROP LINE	LAST REVISED: 3/08/21 RD05



NOTE:

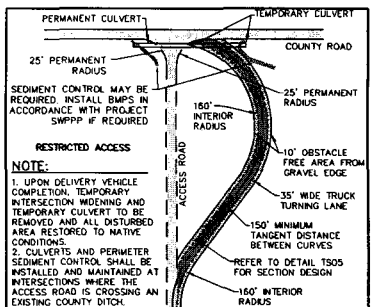
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING TO BE REMOVED AND ALL DISTURBED AREA RESTORED.
2. DIMENSIONS ASSUME A 90° INTERSECTION

	INTERSECTION WIDENING DIMENSIONS	LAST REVISED: 7/08/19 RD06



1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.

	TURBINE ACCESS ROAD TYPICAL INTERSECTION WIDENING	LAST REVISED: 3/8/17 RD07



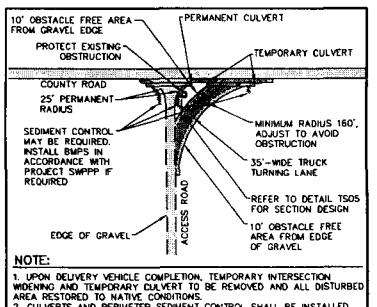
RESTRICTED ACCESS

NOTE:

1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

NOT TO SCALE

	TRUCK TRAFFIC TURNING LANE A	LAST REVISED: 3/2/17 RD08-A



NOTE:

1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

	TRUCK TRAFFIC TURNING LANE B	LAST REVISED: 12/2/24 RD08-B

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-Free (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed: BME
Checked: DBH
Drawn: BME
As-Built Drawing:

Revisions #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2200 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

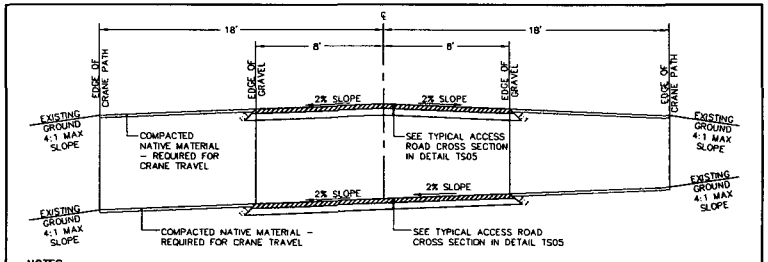
Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 5 OF 57

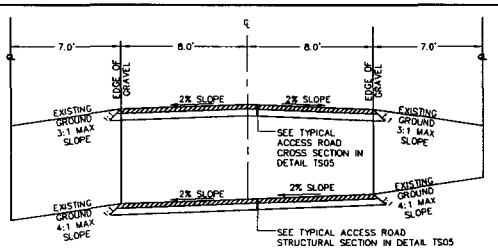
00144400TP.dwg

©2019 Westwood Professional Services, Inc.



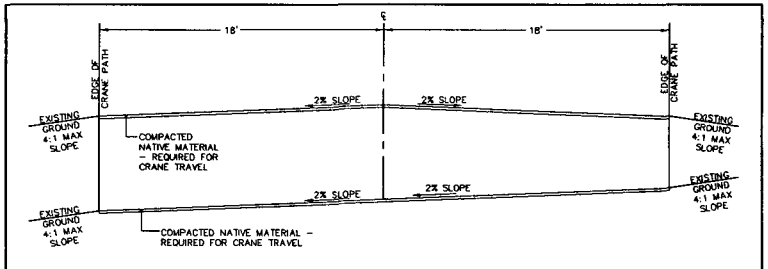
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE ACCESS ROAD DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

Westwood	TYPICAL TURBINE ACCESS ROAD AND CRANE PATH	LAST REVISED: 04/29/11 RD01-A



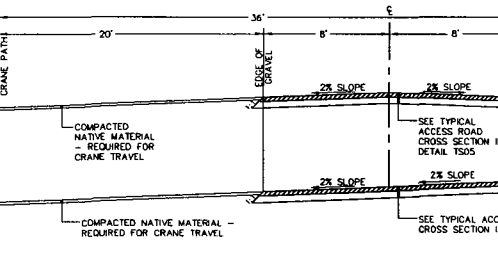
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

Westwood	TYPICAL TURBINE ACCESS ROAD SECTION	LAST REVISED: 3/29/12 RD01-B



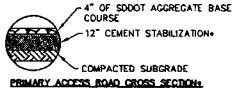
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE WHERE CRANE PATHS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT CRANE PATH REMAINS WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%

Westwood	TYPICAL CRANE PATH	LAST REVISED: 04/29/11 RD01-C

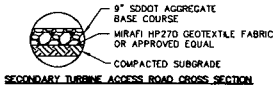


NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE EDGE OF COMPACTED SHOULDER DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

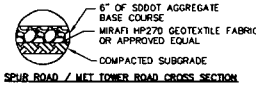
Westwood	TYPICAL TURBINE ACCESS ROAD AND OFFSET CRANE PATH	LAST REVISED: 04/29/11 RD01-D



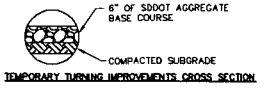
PRIMARY ACCESS ROAD CROSS SECTION*



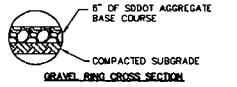
SECONDARY TURBINE ACCESS ROAD CROSS SECTION



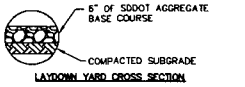
SPUR ROAD / MET TOWER ROAD CROSS SECTION



TEMPORARY TURNING IMPROVEMENTS CROSS SECTION



GRAVEL RING CROSS SECTION



LAYDOWN YARD CROSS SECTION

* CEMENT APPLICATION RATE MAY VARY BASED ON TEST STRIPS AND FIELD PERFORMANCE. SEE SHEET 13 FOR CEMENT STABILIZATION PROCEDURE AND DESIGN BASIS.

NOTES:
STRUCTURAL SECTIONS SHOWN ARE THE MINIMUM THICKNESS REQUIREMENTS DURING NORMAL FIELD CONDITIONS. THE SECTIONS MAY NEED TO BE INCREASED BASED ON ACTUAL FIELD CONDITIONS AT THE TIME OF CONSTRUCTION. CONDITIONS INCLUDE BUT ARE NOT LIMITED TO CONSTRUCTION DURING THE FREEZE/THAW CYCLE, UNUSUALLY WET PERIODS, OR IN LOW/WET AREAS. SEE SHEET 12 FOR TESTING REQUIREMENTS AND SPECIFICATIONS.

Westwood	TYPICAL STRUCTURAL CROSS SECTIONS

Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
TollFree (866) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed: BMC
Checked: DJM
Drawn: BMC
As-Built Drawing:

Revisions:

#	Date	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2035 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 4 OF 57

0014440DTP.dwg

©2019 Westwood Professional Services, Inc.

ROAD DESIGN PARAMETERS

1. ACCESS ROADS HAVE BEEN DESIGNED TO ACCOMMODATE LIGHT DUTY TRUCKS (PICKUP TRUCKS AND MAINTENANCE VEHICLES) FOR LOW VOLUME USE IN NORMAL OPERATING CONDITIONS AS WELL AS HEAVY DUTY CONSTRUCTION TRAFFIC UNDER DRY CONDITIONS. THE ROAD DESIGN SPECIFIED IS NOT INTENDED FOR ALL WEATHER USE FOR HEAVY DUTY CONSTRUCTION LOADS.
2. ROAD MAINTENANCE CAN BE EXPECTED OVER THE LIFE OF THE PERMANENT FACILITY.

PRODUCTS

1. AGGREGATE BASE SHALL CONSIST OF SDDOT AGGREGATE BASE COURSE (AND IN CONFORMANCE WITH THE GRADATION TABLE 1). AGGREGATE MAY BE CRUSHER RUN UPON ENGINEERS APPROVAL. AGGREGATE GRADATIONS SHALL BE SUBMITTED TO ENGINEER FOR REVIEW.
2. ROAD SHOULDERS AND CRANE PADS SHALL CONSIST OF COMPACTED NATIVE SOILS.
3. CULVERTS: ACCESS ROAD CULVERTS SHALL MEET THE MINIMUM SPECIFICATIONS SET FORTH BY THE SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION AND/OR HYDE COUNTY. ALL CULVERTS ARE PLANNED TO BE A MINIMUM 18" DIAMETER AND MANUFACTURED OF 16-GAGE CORRUGATED METAL PIPE WITH NO END TREATMENTS UNLESS NOTED OTHERWISE. ACTUAL SIZE WILL BE DETERMINED THROUGH HYDRAULIC ANALYSIS.
4. GEOTEXTILE FABRIC: MIRAFI HP270 OR APPROVED EQUAL.

EXECUTION

1. CLEARING AND GRUBBING
   A. THE CONTRACTOR SHALL BE REQUIRED TO GRUB ALL TREES, STUMPS, BRUSH, AND DEBRIS WITHIN THE GRADING AREAS SHOWN ON THE PLANS. GRUBBING INCLUDES REMOVAL OF ALL PLANT MATERIAL GREATER THAN 2" INCLUDING STUMPS, BRANCHES, ROOTS, ETC. TO A DEPTH BELOW THE FINAL SUBGRADE. THE CONTRACTOR IS TO REMOVE ONLY THOSE TREES WHICH ARE DESIGNATED BY THE OWNER'S REPRESENTATIVE FOR REMOVAL, AND SHALL EXERCISE EXTREME CARE AROUND EXISTING TREES TO BE SAVED.
2. TOPSOIL STRIPPING
   A. TOPSOIL, INCLUDING ROOTS LARGER THAN 2" AND LARGE ROOT MASSES, SHALL BE STRIPPED FROM ALL ROADWAY AND FOUNDATION AREAS UP TO 10". TOPSOIL SHALL NOT BE STRIPPED OUTSIDE OF THE DESIGNATED DISTURBANCE AREAS.
   B. ANY TOPSOIL THAT HAS BEEN STRIPPED SHALL BE STOCKPILED FOR POST CONSTRUCTION REVEGETATION. ALL TOPSOIL SHALL BE REDISTRIBUTED TO THE LAND OWNER'S PROPERTY OF WHERE IT ORIGINATED FROM.
3. FILL PLACEMENT
   A. FILL PLACEMENT SHALL CONSIST OF THE PLACING OF SUITABLE FILL MATERIAL, AFTER TOPSOIL STRIPPING, ABOVE THE EXISTING GRADE. GENERALLY, SIDE SLOPES SHALL BE CONSTRUCTED AT FOUR FOOT HORIZONTAL TO ONE FOOT VERTICAL, WITH SOME LOCATIONS THROUGHOUT THE PROJECT WITH SLOPES OF TWO FEET HORIZONTAL TO ONE FOOT VERTICAL. THE MATERIAL FOR FILL CONSTRUCTION SHALL BE OBTAINED FROM THE ACCESS ROAD/TURBINE EXCAVATION (SEE GEOTECHNICAL REPORT FOR RESTRICTIONS), OR ANY SUITABLE, APPROVED SOIL OBTAINED ONSITE/OFFSITE BY CONTRACTOR, AS DIRECTED OR APPROVED BY THE ENGINEER. THIS MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 12" AND CONSTRUCTED TO 95% OF THE MAXIMUM DRY DENSITY AND WITHIN 2% OF OPTIMUM MOISTURE CONTENT, AS DETERMINED BY THE STANDARD PROCTOR (AASHTO T99).
   B. SIDE SLOPES GREATER THAN 4:1 WILL NOT BE PERMITTED, UNLESS OTHERWISE NOTED ON THE PLAN.
   C. FILL SLOPES SHALL BE BENCHED INTO THE EXISTING SLOPE TO PREVENT MOVEMENT BETWEEN THE FILL AND NATIVE SOILS. BENCHES SHOULD BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO FILL PLACEMENT. POSITIVE DRAINAGE IS REQUIRED AT BENCHED AREAS AND AT THE TOE OF FILL SLOPES TO REMOVE SURFACE WATER.
4. SUBGRADE
   A. SUBGRADE PREPARED AT GRADE OR IN CUT REQUIRES SCARIFICATION AND RECOMPACTION TO A DEPTH OF 12" OR MORE.
   B. ACCESS ROAD CROSS SLOPES SHOWN IN THE PLANS ARE MEANT AS A GUIDE. ACCESS ROAD CROSS SLOPES MAY RANGE FROM 1% - 2%, CHECK WITH THE ENGINEER IF THE CROSS SLOPE FALLS OUTSIDE OF THIS RANGE. ACCESS ROADS BEING UTILIZED FOR CRANE TRAVEL SHOULD HAVE A MAX CROSS SLOPE OF 2%

TABLE 1: SDDOT AGGREGATE BASE COURSE - LOCALLY SOURCED	
SIEVE SIZE	PERCENT PASSING
1"	100
3/4"	80-100
1/2"	68-91
NO. 4	46-70
NO. 8	34-58
NO. 40	13-35
NO. 200	3-12

MEET FOLLOWING REQUIREMENTS PER 882.2

LIQUID LIMIT (MAX) = 25
PLASTICITY INDEX = 0-6
L.A ABRASION (% MAX) = 40%

GRADATION HAS BEEN OBTAINED FROM THE 2015 SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION BOOK.

STORM WATER DESIGN PARAMETERS

1. SEE SHEET 6 FOR CULVERT SIZING AND DESIGN PARAMETERS. SEE HYDROLOGY MEMO FOR FURTHER DESIGN CALCULATIONS. CULVERTS SHALL BE MINIMUM 18" CORRUGATED METAL PIPE. ALL TEMPORARY PORTIONS OF THE INSTALLED CULVERTS SHALL BE REMOVED UPON COMPLETION OF THE PROJECT.
2. IT IS EXPECTED THAT CULVERTS WILL BE OVERTOPPED DURING SOME STORMS AND MAINTENANCE WILL BE REQUIRED THROUGH THE LIFE OF THE PROJECT.
3. WHEN INSTALLING DRAINAGE CULVERTS THE CONTRACTOR SHALL USE JUDGMENT IN SETTING THE FLOW LINE ELEVATIONS AND CULVERT LONGITUDINAL SLOPE. TYPICALLY THE FLOW LINE ELEVATIONS AND LONGITUDINAL SLOPE OF THE CULVERT SHOULD MATCH THE NATURAL GROUND ELEVATIONS AND SLOPE TO ENSURE POSITIVE DRAINAGE. WHEN POSSIBLE, ALL CULVERTS SHOULD BE PLACED AT A MINIMUM 0.5% GRADE.
4. ANTICIPATED CULVERT CROSSINGS ARE SHOWN ON THE CONSTRUCTION PLAN, ADDITIONAL CULVERTS MAY NEED TO BE INSTALLED IN AREAS WHERE CONCENTRATED FLOW IS EXPECTED DUE TO CONSTRUCTION ACTIVITIES.
5. CONSTRUCTION DRAINAGE CROSSINGS TO MAINTAIN EXISTING FLOW CHARACTERISTICS OF THE FEATURES. FEATURES SHALL BE GRADED TO PRECONSTRUCTION CONTOURS.

TESTING:

1. TESTING SHALL BE PERFORMED BY A DESIGNATED INDEPENDENT TESTING AGENCY.
2. SUBMIT ONE SET OF TESTING AND INSPECTION RECORDS SPECIFIED TO THE CIVIL ENGINEER OF RECORD.

DEFINITIONS:

1. PROOF ROLLING:
   SHALL BE PERFORMED IN THE PRESENCE OF THE GEOTECHNICAL ENGINEER OR QUALIFIED GEOTECHNICAL REPRESENTATIVE USING A FULLY LOADED TANDEM AXLE DUMP TRUCK OR WATER TRUCK WITH A MINIMUM GROSS WEIGHT OF 25 TONS OR A FULLY LOADED BELLY DUMP WITH AN EQUIVALENT AXLE LOADING. PROOF-ROLLING ACCEPTANCE STANDARDS INCLUDE NO RUTTING GREATER THAN 1.5 INCHES, AND NO "PUMPING" OF THE SOIL BEHIND THE LOADED TRUCK.
2. SIEVE ANALYSIS:
   SHALL BE CONDUCTED IN ACCORDANCE WITH AASHTO T27
3. PROCTORS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T99
4. ATTERBERG LIMITS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T89 AND T90
5. MOISTURE DENSITY (NUCLEAR DENSITY):
   SHALL BE DONE IN ACCORDANCE WITH AASHTO T310
6. DYNAMIC CONE PENETROMETER (DCP) TESTING:
   SHALL BE DONE IN ACCORDANCE WITH ASTM D6951-03

REQUIREMENTS:

1. FILL PLACEMENT:
   A. SOILS USED AS FILL MATERIAL SHALL BE TESTED FOR MOISTURE CONTENT AND PROCTOR TESTS.
   B. WHERE FILL CONSTRUCTION REQUIRES MORE THAN 12 INCHES OF FILL PLACEMENT, COMPACT EACH LIFT TO A MINIMUM OF 95 PERCENT OF THE MATERIAL'S MAXIMUM STANDARD PROCTOR DRY DENSITY.
2. COMPACTED SUBGRADE (CEMENT STABILIZED):
   A. SEE SHEET 13 FOR TESTING REQUIREMENTS AND PROCEDURE.
3. COMPACTED SUBGRADE (NON-CEMENT STABILIZED):
   A. THE ENTIRE SUBGRADE SHALL BE PROOF-ROLLED PRIOR TO THE PLACEMENT OF THE AGGREGATE BASE TO IDENTIFY AREAS OF UNSTABLE SUBGRADE.
   B. PERFORM A MINIMUM OF 3 DYNAMIC CONE PENETROMETER (DCP) TESTS PER ACCESS ROAD OR ONE FOR EVERY 1,000 LF OF ROAD, WHICHEVER IS GREATER. SUBGRADE MUST MEET A MINIMUM DCP OF 3 BLOWS PER 6" TO A TOTAL DEPTH OF 2' (MINIMUM CBR=1.5).
   C. IF A PASSING PROOF-ROLL OR DCP REQUIREMENTS CANNOT BE ACHIEVED THE FOLLOWING ALTERNATIVES MAY BE IMPLEMENTED:
      a. SCARIFY, DRY, AND RECOMPACT SUBGRADE
      b. REMOVE UNSUITABLE MATERIAL AND REPLACE WITH SUITABLE MATERIAL
      c. INCREASE AGGREGATE BASE THICKNESS
4. AGGREGATE BASE:
   A. AGGREGATE BASE SHALL BE PROOF-ROLLED OVER THE ENTIRE LENGTH. IF PROOF ROLLING DETERMINES THAT THE ROAD IS UNSTABLE, ADDITIONAL AGGREGATE SHALL BE ADDED UNTIL THE UNSTABLE SECTION IS ABLE TO PASS A PROOF ROLL.
   B. PROVIDE 1 SIEVE ANALYSIS (PROJECT MAX OF 20) PER 2500 CY OF ROAD BASE PLACED.
5. CRANE PAD AND CRANE PATHS / CRANE TRAVEL SHOULDERS:
   A. TESTING REQUIREMENTS ARE PENDING BASED ON CRANE PICK PLANS PROVIDED BY THE CONTRACTOR.

TABLE 2: TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
FILL PLACEMENT	PROCTOR	1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER LIFT PER 5000 SF OF FILL PLACED OR 1 PER 500 LF OF ROAD OR CRANE WALK
COMPACTED SUBGRADE (CEMENT STABILIZED):	SEE SHEET 13	SEE SHEET 13
COMPACTED SUBGRADE (NON-CEMENT STABILIZED):	PROOF-ROLL	ENTIRE AREA
	DCP	1 PER 1,000 FT OR MIN. 3 PER ROAD
AGGREGATE BASE	PROOF-ROLL	ENTIRE AREA
	SIEVE ANALYSIS, LL, PL, AND L.A ABRASION	1 PER 2,500 CY

GENERAL NOTES:

1. GROUND SURFACE CONTOURS (AT TWO-FOOT VERTICAL INTERVALS) AND ELEVATIONS ARE BASED ON A PHOTOGRAMMETRY SURFACE PROVIDED BY GEOTERRA. IF MAJOR DISCREPANCIES ARE FOUND IN THE GROUND ELEVATIONS DURING FIELD STAKING TO THE GROUND ELEVATIONS SHOWN ON THE PLANS, THE OWNER AND ENGINEER SHALL BE NOTIFIED.
2. WHERE SECTION OR SUBSECTION MONUMENTS ARE ENCOUNTERED, THE OWNER SHALL BE NOTIFIED BEFORE SUCH MONUMENTS ARE REMOVED. THE CONTRACTOR SHALL PROTECT AND CAREFULLY PRESERVE ALL PROPERTY MARKERS AND MONUMENTS UNTIL THE OWNER, AN AUTHORIZED SURVEYOR OR AGENT HAS WITNESSED OR OTHERWISE REFERENCED THEIR LOCATION.
3. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. TYPICAL DISTURBANCE SHALL BE LIMITED TO 10 LF FROM THE EDGE OF PROPOSED GRADING.
4. FINALIZE GRADING AROUND THE BASE OF TURBINES IN ACCORDANCE WITH DETAIL TS-03 AND TS-04.
5. GRADE ALL PROPOSED ROADS TO A MAXIMUM SLOPE OF 8%. IF 8% SLOPE CANNOT BE ACHIEVED, THE CONTRACTOR MAY UTILIZE ASSIST VEHICLES FOR THE PURPOSE OF DELIVERIES. GRADE ALL PROPOSED CRANE PATHS TO A MAXIMUM OF 8% UNLESS OTHERWISE NOTED IN PLAN SHEETS.
6. ANY FACILITIES REMOVED TO ALLOW FOR CONSTRUCTION (MAILBOXES, SIGNS, FENCES, ETC.) SHALL BE REPLACED BY THE CONTRACTOR IN A CONDITION AS GOOD AS EXISTING.
7. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING DRAINAGE THROUGHOUT THE CONSTRUCTION OF THIS PROJECT. CONSTRUCTION ACTIVITIES SHALL NOT BLOCK THE NATURAL OR MANMADE CREEKS OR DRAINAGE SWALES CAUSING RAINWATER TO POND. DEPENDING ON FIELD CONDITIONS, ADDITIONAL CULVERTS IN EXCESS OF THOSE ON THE PLANS MAY BE REQUIRED.
8. WHILE BUILDING THE ROADS AND EXCAVATING THE TURBINE FOUNDATIONS, EXCESS SOIL WILL RESULT. THE CONTRACTOR SHALL DISPOSE OF THIS EXCESS SOIL IN AN APPROVED MANNER. EXCESS TOPSOIL SHALL BE DISTRIBUTED INTO A THIN LAYER ON LAND IMMEDIATELY ADJACENT TO WHERE THE TOPSOIL ORIGINATED. ALL EXCESS TOPSOIL TO BE WASTED ONSITE. WHILE DOING SO THE CONTRACTOR SHALL AVOID CAUSING RIDGES OR MOUNDS THAT WOULD MAKE IT DIFFICULT FOR STORM WATER RUNOFF TO DRAIN. THE FINAL SURFACE OF THE DISTURBED TOPSOIL SHALL BE SMOOTH AND FOLLOW THE NATURAL CONTOUR OF THE LAND.
9. THE CONTRACTOR SHALL NOTIFY SOUTH DAKOTA 811 AT LEAST 48 HOURS BEFORE EXCAVATION ACTIVITIES COMMENCE.
10. TEMPORARY INTERSECTION WIDENING SHALL, UPON COMPLETION OF ALL PROJECT CONSTRUCTION OR UPON NOTIFICATION OF THE ENGINEER, BE REMOVED AND THE AREA RESTORED TO ITS ORIGINAL LINES AND GRADES WITH TOPSOIL REPLACED, EXCEPT WHERE REQUESTED BY THE TOWNSHIP OR COUNTY TO PERMANENTLY REMAIN. DISTURBED AREAS OUTSIDE OF THE FINAL ROADWAY SHALL BE SEEDED AND MULCHED.
11. TURBINE SETBACKS ARE NOT IDENTIFIED ON THE CONSTRUCTION PLANS. IT SHALL BE THE RESPONSIBILITY OF THE OWNER AND CONTRACTOR TO ENSURE THAT ALL TURBINE SETBACKS MEET PROJECT REQUIREMENTS.
12. GEOTECHNICAL REPORTS WITH RECOMMENDATIONS HAVE BEEN PROVIDED BY THE OWNER. ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL ENGINEERING REPORT AND RECOMMENDATIONS.
13. FIELD SURVEY WETLAND INFORMATION HAS BEEN PROVIDED BY THE OWNER. ALL WETLAND DELINEATIONS AND PERMITTING SHALL BE THE RESPONSIBILITY OF OTHERS AND BE COMPLETED PRIOR TO CONSTRUCTION COMMENCING. THE OWNER AND GENERAL CONTRACTOR SHALL VERIFY THAT ALL WETLAND PERMITS HAVE BEEN SUBMITTED AND APPROVED PRIOR TO CONSTRUCTION COMMENCING.
14. CULTURAL RESOURCE REPORTS HAVE NOT BEEN PROVIDED. CULTURAL RESOURCE LOCATIONS ARE NOT SHOWN ON THE PLANS. INFORMATION WILL BE THE RESPONSIBILITY OF THE OWNER AND GENERAL CONTRACTOR. THE LOCATIONS OF CULTURAL RESOURCE SITES MAY BE CONFIDENTIAL AND PROTECTED BY STATE OR FEDERAL LAW. PUBLIC RELEASE OF SPECIFIC INFORMATION REGARDING THESE RESOURCES MAY BE RESTRICTED.
15. AN ENVIRONMENTAL ASSESSMENT HAS NOT BEEN PROVIDED. THE CONTRACTOR SHALL BE FAMILIAR WITH THE REPORT AND REVIEW ALL RECOMMENDATIONS.
16. ELECTRICAL INFORMATION SHOWN ON THE PLANS IS FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSULTANT'S PLANS FOR SPECIFIC LOCATIONS AND CONSTRUCTION DETAILS FOR THE UNDERGROUND POWER COLLECTION SYSTEM AND SUBSTATION.
17. CRANE PATHS ARE SHOWN ON THE CONSTRUCTION PLANS. IF THE CONTRACTOR PROPOSES ALTERNATE CRANE PATHS, THEY SHALL ENSURE THAT WETLAND AND CULTURAL RESOURCE CORRIDORS ARE NOT DISTURBED. FINAL CRANE PATH ALIGNMENTS SHALL BE DETERMINED BY THE CONTRACTOR BASED ON FIELD CONDITIONS WITHIN THE WETLAND AND CULTURAL RESOURCE CORRIDORS, SPECIAL LANDOWNER AGREEMENTS AND THE PROJECT BOUNDARY.
18. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. DISTURBANCE SHALL BE LIMITED TO 50 LF WIDTH FOR PROPOSED ACCESS ROADS AND 50 LF FOR CRANE PATHS, AND SHALL BE LIMITED TO A 250 LF RADIUS FOR PROPOSED WIND TURBINE GENERATORS. THE GRADING LIMITS SHALL BE CENTERED ON THE ROADWAYS AND WIND TURBINES. THE CONTRACTOR SHALL MAKE ALL EFFORTS TO KEEP ACTIVITIES WITHIN THE ERECTION AREAS SHOWN ON THE PLANS BUT IT IS UNDERSTOOD THAT SOME ACTIVITIES THAT WILL NOT REQUIRE GRADING OR SOIL DISTURBANCE MAY EXTEND BEYOND THE DEFINED LIMITS. DURING ERECTION OF THE ROTOR, TRUCKS AND/OR FORKLIFTS MAY EXTEND BEYOND THESE LIMITS. SEE DETAIL TS01 FOR TYPICAL ERECTION AREAS.
19. AN ALTA SURVEY HAS BEEN PROVIDED BY WESTWOOD. CONTRACTOR AND OWNER ARE RESPONSIBLE FOR LOCATING ALL UTILITIES AND VERIFYING LOCATION OF CONSTRUCTION ACTIVITIES PRIOR TO COMMENCING WORK.

STORMWATER POLLUTION PREVENTION PLAN (SWPPP):

1. THE CONTRACTOR SHALL PROVIDE EROSION CONTROL MEASURES AS PLANNED AND SPECIFIED FOLLOWING BEST MANAGEMENT PRACTICES AS OUTLINED BY THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND BEING IN CONFORMANCE WITH THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL STORMWATER PERMIT.
2. REFER TO THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR THE TRIPLE H WIND FARM, PREPARED BY WESTWOOD PROFESSIONAL SERVICES, FOR EROSION CONTROL AND RESTORATION SPECIFICATIONS, SEDIMENT AND EROSION CONTROL PROCEDURES, LOCATIONS OF BMPs, DETAILS, AND INSPECTION INFORMATION.
3. ALL PASTURES AND DRAINAGE SWALES DISTURBED DURING CONSTRUCTION ACTIVITIES AND NOT COVERED BY ROAD SURFACING MATERIALS, SHALL BE SEEDED IN ACCORDANCE WITH THE SWPP PLAN.
4. TEMPORARY EROSION CONTROL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE TEMPORARY EROSION CONTROL PLAN SHALL BE IN ACCORDANCE WITH THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND THE TRIPLE H WIND FARM STORMWATER POLLUTION PREVENTION PLAN ON FILE.

PROJECT CONTACT INFORMATION:

TITLE	COMPANY	NAME	CONTACT NUMBER
OWNER (PRIMARY)	ENGIE	CASEY WILLIS	805-569-6185
PROJECT MANAGER	WESTWOOD	DANI NYGREN	952-906-7493
ENGINEER OF RECORD	WESTWOOD	ROB COPOULS	952-906-7470
CONTRACTOR	WANZEK	JASON HELLERUD	701-893-3685

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 300
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com

Westwood Professional Services, Inc.

Designed: BMK
Checked: DDN
Drawn: BMK
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK
a MasTec company

2020 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 12 OF 57

0014440DTP.dwg

©2019 Westwood Professional Services, Inc.

CEMENT STABILIZATION - PROCEDURE

THE SPECIFICATIONS BELOW ARE GENERAL RECOMMENDATIONS/GUIDELINES FOR CEMENT STABILIZATION OF SUBGRADES FOR THE PROJECT. ACTUAL FIELD CONDITIONS MAY ALTER APPLICATION RATE. CONSULT GEOTECHNICAL ENGINEER FOR FURTHER RECOMMENDATIONS.

1. STRIP THE TOP ±4 INCHES OF TOPSOIL (THROUGH THE ROOT ZONE) FROM THE AREA TO BE STABILIZED. ROOTS SMALLER THAN 1/4" DIAMETER ARE CONSIDERED INSIGNIFICANT.
2. PERFORM A PROCTOR (ASTM D 698) TEST TO DETERMINE THE OPTIMUM MOISTURE CONTENT IF THE MATERIAL TO BE STABILIZED DOES NOT MATCH A PREVIOUSLY PERFORMED PROCTOR.
3. DETERMINE THE IN-SITU MOISTURE CONTENT USING A NUCLEAR DENSITY GAUGE (OR EQUIVALENT MOISTURE CONTENT TEST) DAILY, PRIOR TO INCORPORATION OF THE CEMENT. PROVIDE ADDITIONAL MOISTURE CONTENT TESTING AS NEEDED BASED ON WEATHER CONDITIONS.
   - 3.1. THE CONTRACTOR WILL BE ADVISED OF IN-SITU MOISTURE CONTENT, AND MOISTURE ADJUSTMENTS SHOULD BE MADE IF IN-SITU MOISTURE IS LESS THAN OPTIMUM MOISTURE CONTENT AS DETERMINED BY THE PROCTOR (ASTM D 698).
4. SOIL AND CEMENT BLENDING:
   - 4.1. COMPLETELY BLEND SUBGRADE SOIL WITH THE APPROPRIATE AMOUNT OF CEMENT BY WEIGHT. FIELD RESULTS FROM TEST STRIPS WILL DICTATE THE CEMENT APPLICATION RATE.
   - 4.2. IN AREAS OF HIGH MOISTURE OR POOR SOILS, THE CONTRACTOR MAY INCREASE THE PERCENT OF CEMENT IN ORDER TO MEET THE MINIMUM SUBGRADE STRENGTH REQUIREMENTS.
   - 4.3. THE USE OF A RECLAIMER IS AN ADEQUATE BLENDING METHOD. DISCING IS NOT AN ADEQUATE BLENDING METHOD.
   - 4.4. A STABILIZATION DEPTH OF 12" WAS USED FOR DESIGN PURPOSES. STABILIZATION DEPTH MAY NEED TO INCREASE TO 16" IN AREAS OF EXTREME MOISTURE OR POOR SOILS IN ORDER TO MEET THE STRENGTH AND PROOF ROLL REQUIREMENTS.
5. COMPACTION:
   - 5.1. A ROLLING PATTERN WILL BE ESTABLISHED USING A NUCLEAR DENSITY GAUGE DURING COMPACTION.
     - 5.1.1. COMPACTION WILL BE PERFORMED UNTIL THE STABILIZED MATERIAL REACHES THE "BREAK POINT" AFTER WHICH ADDITIONAL PASSES WITH A ROLLER RESULTS IN A LOSS OF DENSITY AS MEASURED BY A NUCLEAR DENSITY GAUGE.
     - 5.1.2. COMPACTION IS TYPICALLY ACHIEVED BY MULTIPLE PASSES OF A PADFOOT ROLLER UNTIL THE ROLLER "WALKS" OUT OF THE RECLAIMED MATERIAL (SPACE IS VISIBLE BETWEEN THE DRUM AND THE RECLAIMED MATERIAL). THIS IS FOLLOWED BY BLADING AND SHAPING THE RECLAIMED MATERIAL TO FINAL PROFILE AND CROSS SECTION, REMOVING HIGH AND LOW POINTS. SMOOTH DRUM OR RUBBER TIRE ROLLERS ARE THEN USED TO FINISH ROLLING (THIS IS WHEN THE DENSITY TESTS ARE PERFORMED) UNTIL THE DENSITY OF THE MATERIAL REACHES THE "BREAK POINT."
     - 5.1.3. THE NUMBER OF PASSES AND EQUIPMENT USED TO REACH THE "BREAK POINT" IS CONSIDERED THE ROLLING PATTERN.
     - 5.1.4. A NEW ROLLING PATTERN MAY NEED TO BE ESTABLISHED IF THE PERFORMANCE REQUIREMENTS ARE NOT BEING MET. THIS MAY BE DUE TO CHANGES IN THE MOISTURE CONTENT, THE SOIL TYPE, OR THE CEMENT RATE.
   - 5.2. THE TARGET DENSITY IS 98% OF THE MAXIMUM DENSITY DETERMINED FROM THE ROLLING PATTERN.
     - 5.2.1. DENSITY TESTS SHALL BE TAKEN AT THE RATE OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER TO CONFIRM THE DENSITY IS MATCHING THE TARGET. ONCE THE ROLLING PATTERN HAS BEEN CONFIRMED IT IS RECOMMENDED THAT TESTING CONTINUE AT 1 TEST PER 1,000 LF IN EACH PASS OF THE RECLAIMER.
     - 5.2.2. IF IT IS NOT POSSIBLE TO ATTAIN THE TARGET DENSITY, AND ADDITIONAL COMPACTION DOES NOT IMPROVE THE DENSITY, A NEW ROLLING PATTERN SHOULD BE ESTABLISHED.
   - 5.3. THE AIR TEMPERATURE SHALL BE ABOVE 40 DEGREES (F) DURING THE CEMENT STABILIZATION PROCESS. MIXING CEMENT INTO FROZEN GROUND IS NOT ACCEPTABLE.
6. THE STABILIZED MATERIAL SHALL BE CONTINUOUSLY WET CURED FOR A MINIMUM OF 24 HOURS (WET CURED IS IDENTIFIED VISUALLY AS DAMP SURFACE).
7. PERFORM SUBGRADE TESTING IN ACCORDANCE WITH TESTING SCHEDULE.
8. AGGREGATE PLACEMENT:
   - 8.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 8.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 8.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

CEMENT STABILIZATION - DESIGN BASIS

1. DURING INITIAL CONSTRUCTION, CONTRACTOR SHALL CONSTRUCT MINIMUM 300 LF TEST STRIPS CONTAINING 4%, 5%, AND 6% CEMENT IN ACCORDANCE WITH CEMENT STABILIZATION PROCEDURES.
2. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 3 FOR ANTICIPATED RESULTS):
   - 2.1. PERFORM INITIAL SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M BETWEEN 4 TO 6 HOURS AFTER FINAL COMPACTION.
   - 2.2. PERFORM ADDITIONAL DCP TESTING AT 24 AND 48 HOURS AFTER FINAL COMPACTION.
   - 2.3. PERFORM SUBSEQUENT DCP TESTS AT 7 DAYS AFTER FINAL COMPACTION AS VERIFICATION OF STRENGTH CURVE.
   - 2.4. A MINIMUM OF 3 TESTS PER TEST SECTION PER TIMEFRAME IS REQUIRED. TESTS SHALL BE TAKEN AT THE CENTERLINE AND 2' FROM EACH SHOULDER.
   - 2.5. RECORD DCP TEST RESULTS EVERY 6 INCHES TO TOTAL DEPTH OF 12 INCHES.

TABLE 3: TEST STRIP CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	COMPRESSIVE STRENGTH (PSF)
4 - 6 HOURS	6	5	1,800
24 HOURS	10	7	2,500
48 HOURS	15	10	3,900
7 DAYS	30	21	5,200

CEMENT STABILIZATION - PRODUCTION

1. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 5 FOR SUMMARY OF TESTING REQUIREMENTS):
   - 1.1. PERFORM SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M NO SOONER THAN 24 HOURS AFTER FINAL COMPACTION.
   - 1.2. DCP TESTING FREQUENCY SHALL BE WITH A RANDOM SPACING AND A MINIMUM OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER. A MINIMUM OF 3 TESTS PER ROAD IS REQUIRED.
   - 1.3. THE CBR OF THE STABILIZED SUBGRADE SHOULD BE CALCULATED IN 6" INCREMENTS THROUGH THE ENTIRE DEPTH OF THE STABILIZED LAYER.
   - 1.4. THE MINIMUM REQUIRED CBR PRIOR TO PROOF-ROLLING IS PROVIDED IN TABLE 4 BELOW:

TABLE 4: FINAL CEMENT STABILIZED CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	UNDRAINED SHEAR STRENGTH (PSF)	BEARING CAPACITY (PSF)
24 - 48 HOURS	15	10	3,500	9,800
3 - 7 DAYS	30	21	7,000	18,000
28 DAYS	50	33	12,000	28,500

NOTE: UNDRAINED SHEAR STRENGTH WAS CALCULATED USING THE BLACK (1981) EQUATION. BEARING CAPACITY WAS CALCULATED USING THE VESIC EQUATION MODIFIED FOR TWO LAYERS (12" CEMENT STABILIZED SUBGRADE OVER A NATURAL SUBGRADE WITH A CBR OF 1.5)

   - 1.5. ONCE THE MINIMUM REQUIRED CBR IS ACHIEVED AT ANY CORRESPONDING TIME PERIOD, THE SUBGRADE IS CONSIDERED ADEQUATE AND THE CONTRACTOR MAY PROCEED WITH PROOF-ROLL TESTING. FUTURE DCP TESTING ON THAT SEGMENT OF SUBGRADE IS NOT REQUIRED.
   - 1.6. IF TESTING DOES NOT INDICATE A CBR OF 30 WITHIN 7 DAYS, ADDITIONAL GRAVEL SURFACING AND/OR THE ADDITION OF GEOTEXTILE FABRIC MAY BE REQUIRED. FOR FUTURE SUBGRADE STABILIZATION AREAS, CONTACT THE ENGINEER AND OWNER VIA RFI FOR RECOMMENDATIONS AND APPROVAL.
2. SUBGRADE PROOF-ROLL TESTING AND ACCEPTANCE:
   - 2.1. ONCE THE REQUIRED DCP VALUE HAS BEEN OBTAINED BUT PRIOR TO PLACING AGGREGATE, THE SUBGRADE SHALL BE PROOF-ROLLED. REFER TO THE PROJECT TESTING REQUIREMENTS FOR PROOF-ROLL DEFINITION.
   - 2.2. PROOF-ROLLING SHOULD BE PERFORMED WITH ONE PASS DOWN THE CENTER AND NOT BE PERFORMED WITHIN 12 INCHES OF THE EDGE OF THE STABILIZED SECTION.
   - 2.3. IF PROOF-ROLLING FAILS, RE-STABILIZATION MAY BE REQUIRED AND A NEW ROLLING PATTERN OR ADDITIONAL CEMENT MAY BE REQUIRED.
3. AGGREGATE PLACEMENT:
   - 3.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 3.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 3.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

TABLE 5: CEMENT STABILIZATION PRODUCTION TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
COMPACTED SUBGRADE (CEMENT STABILIZED) NOTE: SEE ABOVE FOR INITIAL TESTING REQUIREMENTS	PROCTOR	MINIMUM 1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER 1000 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
	DCP TEST	1 PER 500 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
	PROOF-ROLL (AFTER PASSING DCP TESTS)	ENTIRE LENGTH

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com

Westwood Professional Services, Inc.

Designed: SMK
Checked: DJH
Drawn: SMK
As-Built Drawing:

Revisions #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 13 OF 57

0014440DTP.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 333rd Ave in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field ____ business ____ Residence ____ Wind Farm Access Rd
3. Exact location: Approximately 3950' North of 333rd Ave & 204th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.26'10.48" W Long. -99.31'21.05" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: ~~N/A~~ As determined by Hyde County Highway Superintendent
   (Check attached spec sheet)
6. Location by legal description: Parcel # 000949 NE4 7-111-72
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Signature of Applicant

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date ____ Hwy. Supt's Signature ____

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 333rd Ave in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 3950' North of 333rd Ave & 204th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.26'10.48" W Long. -99.31'21.05" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: N/A
   (Check attached spec sheet)
6. Location by legal description: Parcel # 000949 NE4 7-111-72
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: _____

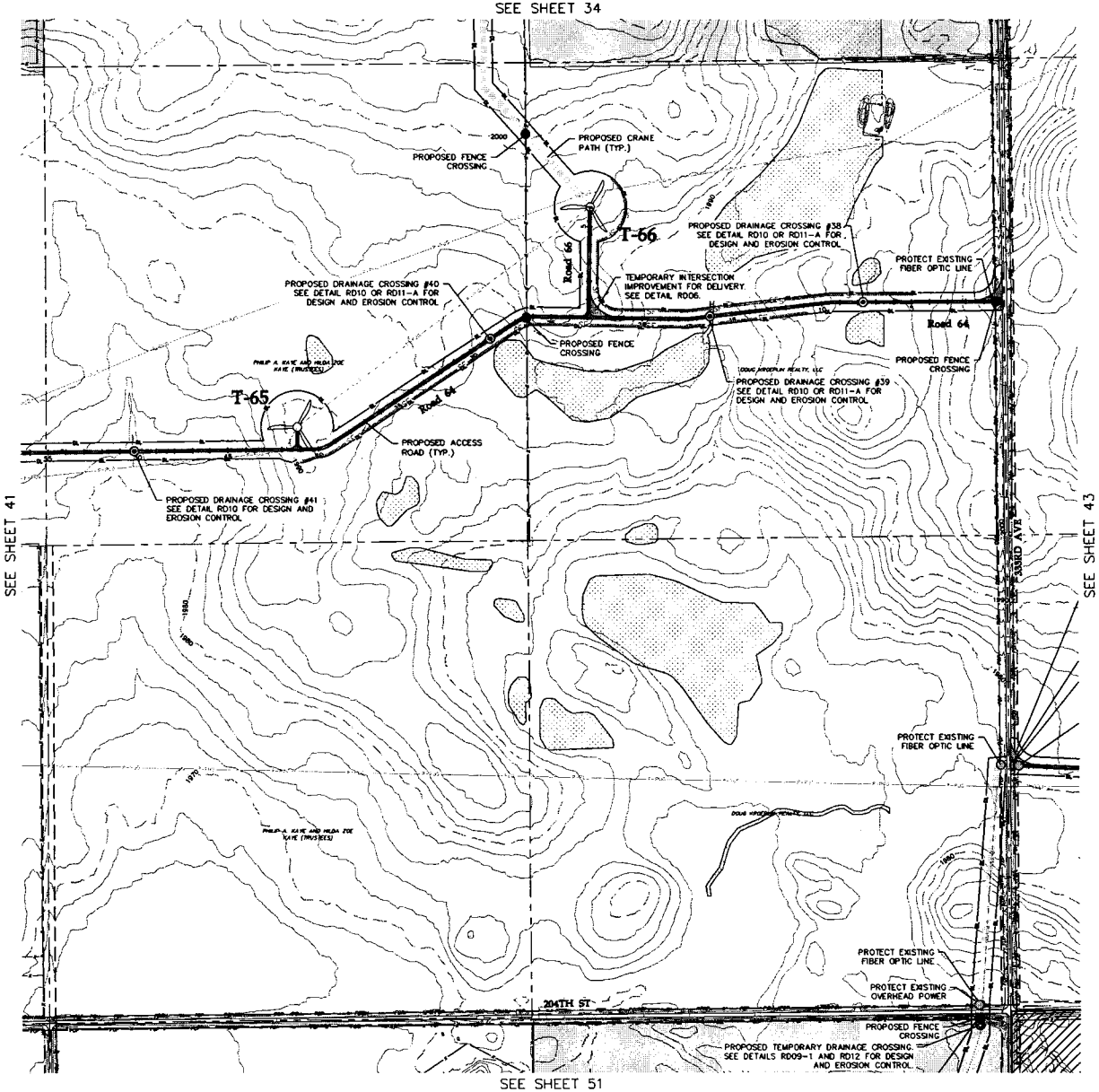
Signature of Applicant

Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

©2019 Westwood Professional Services, Inc.



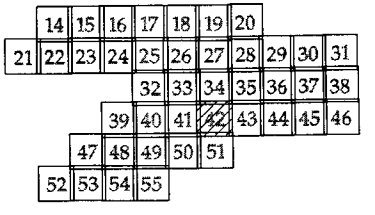
LEGEND:

- PROPOSED TURBINE LOCATION
- T-XX PROPOSED TURBINE NUMBER
- PROPOSED ALTERNATE TURBINE LOCATION
- ALT-XX PROPOSED ALTERNATE TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED ALTERNATE ACCESS ROAD
- PROPOSED CRANE PATH
- PROPOSED UNDERGROUND COLLECTION*
- PROPOSED DISTURBANCE LIMITS
- PROPOSED PERIMETER SEDIMENT CONTROL
- EXISTING 10' CONTOURS
- EXISTING 2' CONTOURS
- EXISTING GRAVEL EDGE
- EXISTING BITUMINUS EDGE
- EXISTING RIGHT-OF-WAY
- EXISTING PARCEL LINE
- EXISTING BUILDING
- EXISTING FENCE
- EXISTING OVERHEAD POWER
- EXISTING HIGH VOLTAGE OVERHEAD POWER
- EXISTING UNDERGROUND POWER LINE
- EXISTING FIBER OPTIC LINE
- EXISTING WATER LINE
- DELINEATED WETLAND
- ARCHAEOLOGICAL AVOIDANCE AREA
- EXISTING USFWS EASEMENT
- PROJECT BOUNDARY
- 1900 EXISTING GROUND ELEVATION
- PROPOSED DRAINAGE CROSSING**
- PROPOSED TEMPORARY DRAINAGE CROSSING**
- PROPOSED FENCE CROSSING***
- PROPOSED UTILITY CROSSING
- PROPOSED CULVERT

* PROVIDED BY OTHERS AND SHOWN FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSTRUCTION PLANS FOR DETAILS.

** SEE SHEET 11 FOR DRAINAGE CROSSING TYPE AND SIZING. DRAINAGE CROSSINGS SHALL CONSIST OF LOW WATER CROSSING OR CULVERT. DRAINAGE CROSSINGS ALONG CRANE PATH SHALL CONSIST OF CRANE MATS OR TEMPORARY CULVERT.

*** ALL GATE INSTALLATIONS SHALL BE FIELD DETERMINED AND AGREED UPON BY THE CONTRACTOR AND OWNER.



KEY MAP

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-Free (866) 937-5150 westwoodps.com

Westwood Professional Services, Inc.

Designed:	SMC
Checked:	RJH
Drawn:	SMC

As-Built Drawing:

Revision #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2888 2nd Avenue NW
West Fargo, ND 58078

0' 300' 600' 900'

Triple H Wind Farm

Hyde County, South Dakota

Site Plan T-65 - T-66

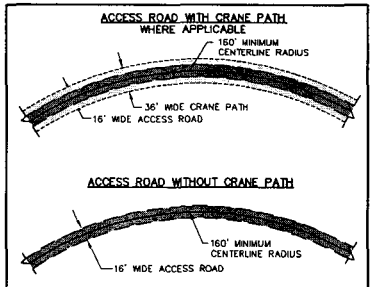
90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19

Sheet: 42 OF 57

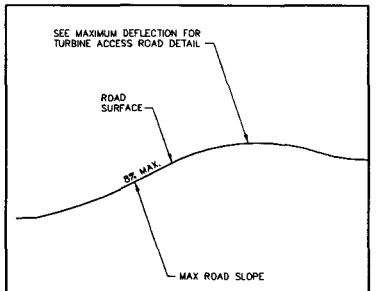
0014440SP01.dwg

©2019 Westwood Professional Services, Inc.



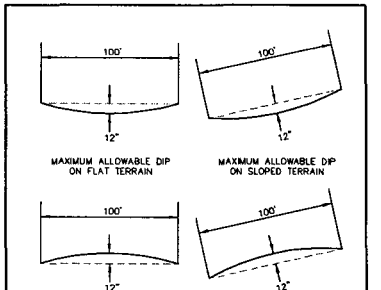
NOTE:
1. SOME RADII MAY REQUIRE ADDITIONAL SOIL COMPACTION OR GRAVEL OUTSIDE OF THE WIDTH SHOWN ABOVE TO ACCOMMODATE TRACTORS OR TRAILERS TRACKING OFF THE ACCESS ROAD.

	MINIMUM RADIUS FOR TURBINE ACCESS ROAD	LAST REVISED 04/05/11
Westwood		RD02

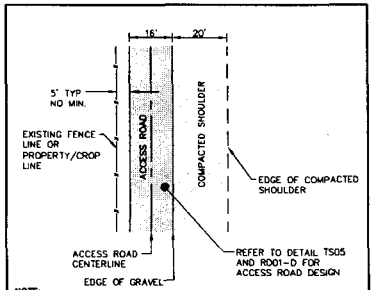


NOTES:
1. ROAD SLOPE SHALL NOT EXCEED 8% WITHOUT OWNER APPROVAL

	MAXIMUM VERT. SLOPE FOR TURBINE ACCESS ROAD/CRANE TRAVEL PATH	LAST REVISED 3/19/07
Westwood		RD03

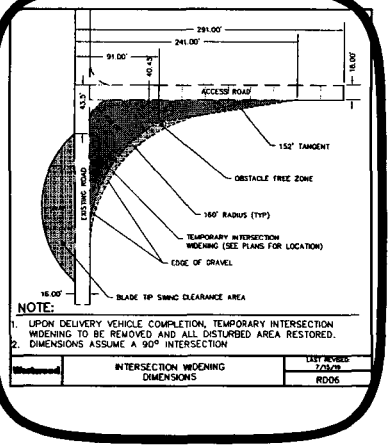


	MAXIMUM DEFLECTION FOR TURBINE ACCESS ROAD	LAST REVISED 01/30/08
Westwood		RD04



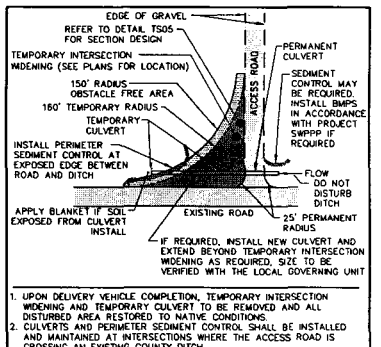
NOTE:
1. COMPACTED SHOULDER SHALL BE RETURNED TO NATIVE CONDITION FOLLOWING TURBINE GENERATOR CONSTRUCTION.
2. THE ACCESS ROAD MAY NEED TO BE CONSTRUCTED FARTHER FROM THE PROPERTY LINE IF OBSTRUCTIONS SUCH AS TREES FOLLOW THE PROPERTY LINE.

	TURBINE ACCESS ROAD ALONG FENCE/PROPERTY/CROP LINE	LAST REVISED 3/19/19
Westwood		RD05



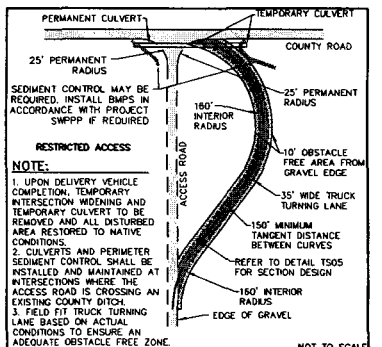
NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING TO BE REMOVED AND ALL DISTURBED AREA RESTORED.
2. DIMENSIONS ASSUME A 90° INTERSECTION

	INTERSECTION WIDENING DIMENSIONS	LAST REVISED 7/19/19
Westwood		RD06



1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.

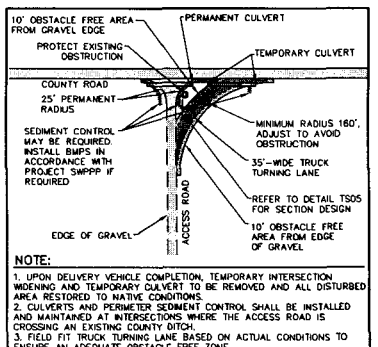
	TURBINE ACCESS ROAD TYPICAL INTERSECTION WIDENING	LAST REVISED 3/2/07
Westwood		RD07



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

NOT TO SCALE

	TRUCK TRAFFIC TURNING LANE A	LAST REVISED 3/2/07
Westwood		RD08-A



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

	TRUCK TRAFFIC TURNING LANE B	LAST REVISED 12/3/14
Westwood		RD08-B

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (866) 937-5150 westwood@pwsinc.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: DJH
Drawn: BMK
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

3200 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

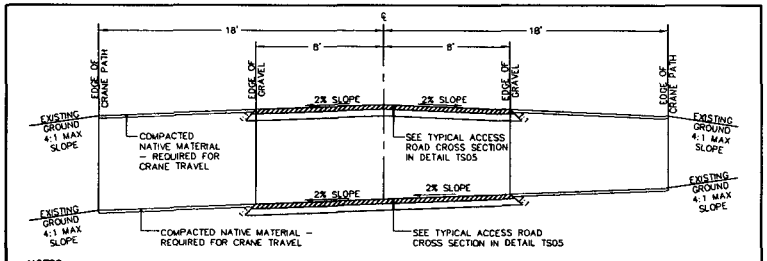
Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 5 of 57

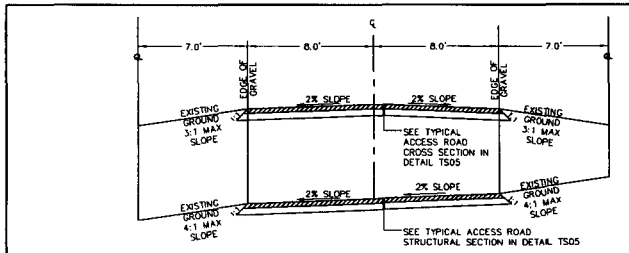
0014400TP.dwg

©2019 Westwood Professional Services, Inc.



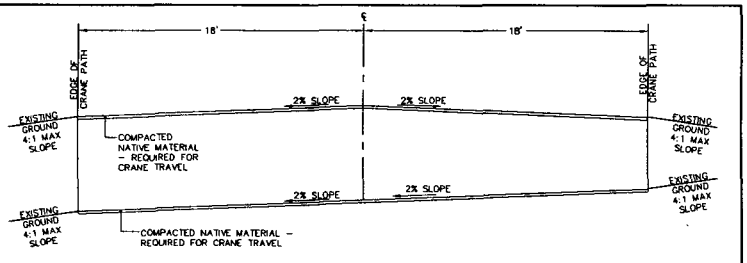
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE ACCESS ROAD DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

Westwood | TYPICAL TURBINE ACCESS ROAD AND CRANE PATH | LAST REVISED: 04/29/19 | RD01-A



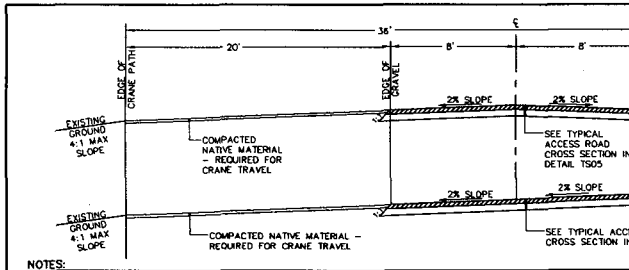
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

Westwood | TYPICAL TURBINE ACCESS ROAD SECTION | LAST REVISED: 3/29/19 | RD01-B



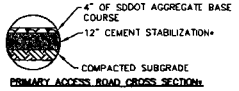
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE WHERE CRANE PATHS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT CRANE PATH REMAINS WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%

Westwood | TYPICAL CRANE PATH | LAST REVISED: 04/29/19 | RD01-C

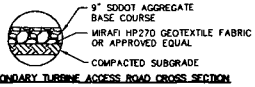


NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE EDGE OF COMPACTED SHOULDER DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

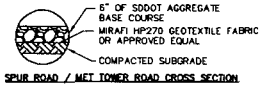
Westwood | TYPICAL TURBINE ACCESS ROAD AND OFFSET CRANE PATH | LAST REVISED: 04/29/19 | RD01-D



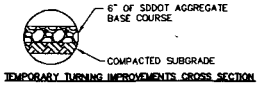
PRIMARY ACCESS ROAD CROSS SECTION*



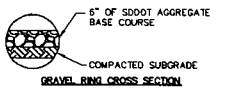
SECONDARY TURBINE ACCESS ROAD CROSS SECTION



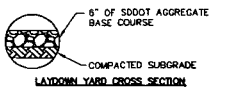
SPUR ROAD / MET TOWER ROAD CROSS SECTION



TEMPORARY TURNING IMPROVEMENTS CROSS SECTION



GRAVEL RING CROSS SECTION



LAYDOWN YARD CROSS SECTION

* CEMENT APPLICATION RATE MAY VARY BASED ON TEST STRIPS AND FIELD PERFORMANCE. SEE SHEET 13 FOR CEMENT STABILIZATION PROCEDURE AND DESIGN BASIS.

NOTES:
STRUCTURAL SECTIONS SHOWN ARE THE MINIMUM THICKNESS REQUIREMENTS DURING NORMAL FIELD CONDITIONS. THE SECTIONS MAY NEED TO BE INCREASED BASED ON ACTUAL FIELD CONDITIONS AT THE TIME OF CONSTRUCTION. CONDITIONS INCLUDE BUT ARE NOT LIMITED TO CONSTRUCTION DURING THE FREEZE/THAW CYCLE, UNUSUALLY WET PERIODS, OR IN LOW/WET AREAS. SEE SHEET 12 FOR TESTING REQUIREMENTS AND SPECIFICATIONS.

Westwood | TYPICAL STRUCTURAL CROSS SECTIONS

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (866) 937-5150 westwood@us.com
Westwood Professional Services, Inc.

Designed: BME
Checked: DBN
Drawn: BME
As-Built Drawing:

Revisions #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2888 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 4 OF 57

0014440TP.dwg

© 2019 Westwood Professional Services, Inc.

ROAD DESIGN PARAMETERS

1. ACCESS ROADS HAVE BEEN DESIGNED TO ACCOMMODATE LIGHT DUTY TRUCKS (PICKUP TRUCKS AND MAINTENANCE VEHICLES) FOR LOW VOLUME USE IN NORMAL OPERATING CONDITIONS AS WELL AS HEAVY DUTY CONSTRUCTION TRAFFIC UNDER DRY CONDITIONS. THE ROAD DESIGN SPECIFIED IS NOT INTENDED FOR ALL WEATHER USE FOR HEAVY DUTY CONSTRUCTION LOADS.
2. ROAD MAINTENANCE CAN BE EXPECTED OVER THE LIFE OF THE PERMANENT FACILITY.

PRODUCTS

1. AGGREGATE BASE SHALL CONSIST OF SDDOT AGGREGATE BASE COURSE (AND IN CONFORMANCE WITH THE GRADATION TABLE 1). AGGREGATE MAY BE CRUSHER RUN UPON ENGINEERS APPROVAL. AGGREGATE GRADATIONS SHALL BE SUBMITTED TO ENGINEER FOR REVIEW.
2. ROAD SHOULDERS AND CRANE PADS SHALL CONSIST OF COMPACTED NATIVE SOILS.
3. CULVERTS: ACCESS ROAD CULVERTS SHALL MEET THE MINIMUM SPECIFICATIONS SET FORTH BY THE SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION AND/OR HYDE COUNTY. ALL CULVERTS ARE PLANNED TO BE A MINIMUM 18" DIAMETER AND MANUFACTURED OF 16-GAGE CORRUGATED METAL PIPE WITH NO END TREATMENTS UNLESS NOTED OTHERWISE. ACTUAL SIZE WILL BE DETERMINED THROUGH HYDRAULIC ANALYSIS.
4. GEOTEXTILE FABRIC: MIRAFI HP270 OR APPROVED EQUAL.

EXECUTION

1. CLEARING AND GRUBBING
   - A. THE CONTRACTOR SHALL BE REQUIRED TO GRUB ALL TREES, STUMPS, BRUSH, AND DEBRIS WITHIN THE GRADING AREAS SHOWN ON THE PLANS. GRUBBING INCLUDES REMOVAL OF ALL PLANT MATERIAL GREATER THAN 2" INCLUDING STUMPS, BRANCHES, ROOTS, ETC. TO A DEPTH BELOW THE FINAL SUBGRADE. THE CONTRACTOR IS TO REMOVE ONLY THOSE TREES WHICH ARE DESIGNATED BY THE OWNER'S REPRESENTATIVE FOR REMOVAL, AND SHALL EXERCISE EXTREME CARE AROUND EXISTING TREES TO BE SAVED.
2. TOPSOIL STRIPPING
   - A. TOPSOIL, INCLUDING ROOTS LARGER THAN 2" AND LARGE ROOT MASSES, SHALL BE STRIPPED FROM ALL ROADWAY AND FOUNDATION AREAS UP TO 10". TOPSOIL SHALL NOT BE STRIPPED OUTSIDE OF THE DESIGNATED DISTURBANCE AREAS.
   - B. ANY TOPSOIL THAT HAS BEEN STRIPPED SHALL BE STOCKPILED FOR POST CONSTRUCTION REVEGETATION. ALL TOPSOIL SHALL BE REDISTRIBUTED TO THE LAND OWNER'S PROPERTY OF WHERE IT ORIGINATED FROM.
3. FILL PLACEMENT
   - A. FILL PLACEMENT SHALL CONSIST OF THE PLACING OF SUITABLE FILL MATERIAL, AFTER TOPSOIL STRIPPING, ABOVE THE EXISTING GRADE. GENERALLY, SIDE SLOPES SHALL BE CONSTRUCTED AT FOUR FOOT HORIZONTAL TO ONE FOOT VERTICAL, WITH SOME LOCATIONS THROUGHOUT THE PROJECT WITH SLOPES OF TWO FEET HORIZONTAL TO ONE FOOT VERTICAL. THE MATERIAL FOR FILL CONSTRUCTION SHALL BE OBTAINED FROM THE ACCESS ROAD/TURBINE EXCAVATION (SEE GEOTECHNICAL REPORT FOR RESTRICTIONS), OR ANY SUITABLE, APPROVED SOIL OBTAINED ONSITE/OFFSITE BY CONTRACTOR, AS DIRECTED OR APPROVED BY THE ENGINEER. THIS MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 12" AND CONSTRUCTED TO 95% OF THE MAXIMUM DRY DENSITY AND WITHIN 2% OF OPTIMUM MOISTURE CONTENT, AS DETERMINED BY THE STANDARD PROCTOR (AASHTO T99).
   - B. SIDE SLOPES GREATER THAN 4:1 WILL NOT BE PERMITTED, UNLESS OTHERWISE NOTED ON THE PLAN.
   - C. FILL SLOPES SHALL BE BENCHED INTO THE EXISTING SLOPE TO PREVENT MOVEMENT BETWEEN THE FILL AND NATIVE SOILS. BENCHES SHOULD BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO FILL PLACEMENT. POSITIVE DRAINAGE IS REQUIRED AT BENCHED AREAS AND AT THE TOE OF FILL SLOPES TO REMOVE SURFACE WATER.
4. SUBGRADE
   - A. SUBGRADE PREPARED AT GRADE OR IN CUT REQUIRES SCARIFICATION AND RECOMPACTION TO A DEPTH OF 12" OR MORE.
   - B. ACCESS ROAD CROSS SLOPES SHOWN IN THE PLANS ARE MEANT AS A GUIDE. ACCESS ROAD CROSS SLOPES MAY RANGE FROM 1% – 2%, CHECK WITH THE ENGINEER IF THE CROSS SLOPE FALLS OUTSIDE OF THIS RANGE. ACCESS ROADS BEING UTILIZED FOR CRANE TRAVEL SHOULD HAVE A MAX CROSS SLOPE OF 2%.

TABLE 1: SDDOT AGGREGATE BASE COURSE – LOCALLY SOURCED	
SIEVE SIZE	PERCENT PASSING
1"	100
3/4"	80–100
1/2"	68–91
NO. 4	46–70
NO. 8	34–58
NO. 40	13–35
NO. 200	3–12

MEET FOLLOWING REQUIREMENTS PER 882.2

LIQUID LIMIT (MAX) = 25
PLASTICITY INDEX = 0–6
L.A ABRASION (% MAX) = 40%

GRADATION HAS BEEN OBTAINED FROM THE 2015 SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION BOOK.

STORM WATER DESIGN PARAMETERS

1. SEE SHEET 6 FOR CULVERT SIZING AND DESIGN PARAMETERS. SEE HYDROLOGY MEMO FOR FURTHER DESIGN CALCULATIONS. CULVERTS SHALL BE MINIMUM 18" CORRUGATED METAL PIPE. ALL TEMPORARY PORTIONS OF THE INSTALLED CULVERTS SHALL BE REMOVED UPON COMPLETION OF THE PROJECT.
2. IT IS EXPECTED THAT CULVERTS WILL BE OVERTOPPED DURING SOME STORMS AND MAINTENANCE WILL BE REQUIRED THROUGH THE LIFE OF THE PROJECT.
3. WHEN INSTALLING DRAINAGE CULVERTS THE CONTRACTOR SHALL USE JUDGMENT IN SETTING THE FLOW LINE ELEVATIONS AND CULVERT LONGITUDINAL SLOPE. TYPICALLY THE FLOW LINE ELEVATIONS AND LONGITUDINAL SLOPE OF THE CULVERT SHOULD MATCH THE NATURAL GROUND ELEVATIONS AND SLOPE TO ENSURE POSITIVE DRAINAGE. WHEN POSSIBLE, ALL CULVERTS SHOULD BE PLACED AT A MINIMUM 0.5% GRADE.
4. ANTICIPATED CULVERT CROSSINGS ARE SHOWN ON THE CONSTRUCTION PLAN, ADDITIONAL CULVERTS MAY NEED TO BE INSTALLED IN AREAS WHERE CONCENTRATED FLOW IS EXPECTED DUE TO CONSTRUCTION ACTIVITIES.
5. CONSTRUCTION DRAINAGE CROSSINGS TO MAINTAIN EXISTING FLOW CHARACTERISTICS OF THE FEATURES. FEATURES SHALL BE GRADED TO PRECONSTRUCTION CONTOURS.

TESTING:

1. TESTING SHALL BE PERFORMED BY A DESIGNATED INDEPENDENT TESTING AGENCY.
2. SUBMIT ONE SET OF TESTING AND INSPECTION RECORDS SPECIFIED TO THE CIVIL ENGINEER OF RECORD.

DEFINITIONS:

1. PROOF ROLLING:
   SHALL BE PERFORMED IN THE PRESENCE OF THE GEOTECHNICAL ENGINEER OR QUALIFIED GEOTECHNICAL REPRESENTATIVE USING A FULLY LOADED TANDEM AXLE DUMP TRUCK OR WATER TRUCK WITH A MINIMUM GROSS WEIGHT OF 25 TONS OR A FULLY LOADED BELLY DUMP WITH AN EQUIVALENT AXLE LOADING. PROOF-ROLLING ACCEPTANCE STANDARDS INCLUDE NO RUTTING GREATER THAN 1.5 INCHES, AND NO "PUMPING" OF THE SOIL BEHIND THE LOADED TRUCK.
2. SIEVE ANALYSIS:
   SHALL BE CONDUCTED IN ACCORDANCE WITH AASHTO T27
3. PROCTORS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T99
4. ATTERBERG LIMITS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T89 AND T90
5. MOISTURE DENSITY (NUCLEAR DENSITY):
   SHALL BE DONE IN ACCORDANCE WITH AASHTO T310
6. DYNAMIC CONE PENETROMETER (DCP) TESTING:
   SHALL BE DONE IN ACCORDANCE WITH ASTM D6951-03

REQUIREMENTS:

1. FILL PLACEMENT:
   - A. SOILS USED AS FILL MATERIAL SHALL BE TESTED FOR MOISTURE CONTENT AND PROCTOR TESTS.
   - B. WHERE FILL CONSTRUCTION REQUIRES MORE THAN 12 INCHES OF FILL PLACEMENT, COMPACT EACH LIFT TO A MINIMUM OF 95 PERCENT OF THE MATERIAL'S MAXIMUM STANDARD PROCTOR DRY DENSITY.
2. COMPACTED SUBGRADE (CEMENT STABILIZED):
   - A. SEE SHEET 13 FOR TESTING REQUIREMENTS AND PROCEDURE.
3. COMPACTED SUBGRADE (NON-CEMENT STABILIZED):
   - A. THE ENTIRE SUBGRADE SHALL BE PROOF-ROLLED PRIOR TO THE PLACEMENT OF THE AGGREGATE BASE TO IDENTIFY AREAS OF UNSTABLE SUBGRADE.
   - B. PERFORM A MINIMUM OF 3 DYNAMIC CONE PENETROMETER (DCP) TESTS PER ACCESS ROAD OR ONE FOR EVERY 1,000 LF OF ROAD, WHICHEVER IS GREATER. SUBGRADE MUST MEET A MINIMUM DCP OF 3 BLOWS PER 6" TO A TOTAL DEPTH OF 2' (MINIMUM CBR=1.5).
   - C. IF A PASSING PROOF-ROLL OR DCP REQUIREMENTS CANNOT BE ACHIEVED THE FOLLOWING ALTERNATIVES MAY BE IMPLEMENTED:
     - a. SCARIFY, DRY, AND RECOMPACT SUBGRADE
     - b. REMOVE UNSUITABLE MATERIAL AND REPLACE WITH SUITABLE MATERIAL
     - c. INCREASE AGGREGATE BASE THICKNESS
4. AGGREGATE BASE:
   - A. AGGREGATE BASE SHALL BE PROOF-ROLLED OVER THE ENTIRE LENGTH. IF PROOF ROLLING DETERMINES THAT THE ROAD IS UNSTABLE, ADDITIONAL AGGREGATE SHALL BE ADDED UNTIL THE UNSTABLE SECTION IS ABLE TO PASS A PROOF ROLL.
   - B. PROVIDE 1 SIEVE ANALYSIS (PROJECT MAX OF 20) PER 2500 CY OF ROAD BASE PLACED.
5. CRANE PAD AND CRANE PATHS / CRANE TRAVEL SHOULDERS:
   - A. TESTING REQUIREMENTS ARE PENDING BASED ON CRANE PICK PLANS PROVIDED BY THE CONTRACTOR.

TABLE 2: TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
FILL PLACEMENT	PROCTOR	1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER LIFT PER 5000 SF OF FILL PLACED OR 1 PER 500 LF OF ROAD OR CRANE WALK
COMPACTED SUBGRADE (CEMENT STABILIZED):	SEE SHEET 13	SEE SHEET 13
COMPACTED SUBGRADE (NON-CEMENT STABILIZED):	PROOF-ROLL	ENTIRE AREA
	DCP	1 PER 1,000 FT OR MIN. 3 PER ROAD
AGGREGATE BASE	PROOF-ROLL	ENTIRE AREA
	SIEVE ANALYSIS, LL, PL, AND L.A ABRASION	1 PER 2,500 CY

GENERAL NOTES:

1. GROUND SURFACE CONTOURS (AT TWO-FOOT VERTICAL INTERVALS) AND ELEVATIONS ARE BASED ON A PHOTOGRAMMETRY SURFACE PROVIDED BY GEOTERRA. IF MAJOR DISCREPANCIES ARE FOUND IN THE GROUND ELEVATIONS DURING FIELD STAKING TO THE GROUND ELEVATIONS SHOWN ON THE PLANS. THE OWNER AND ENGINEER SHALL BE NOTIFIED.
2. WHERE SECTION OR SUBSECTION MONUMENTS ARE ENCOUNTERED, THE OWNER SHALL BE NOTIFIED BEFORE SUCH MONUMENTS ARE REMOVED. THE CONTRACTOR SHALL PROTECT AND CAREFULLY PRESERVE ALL PROPERTY MARKERS AND MONUMENTS UNTIL THE OWNER, AN AUTHORIZED SURVEYOR OR AGENT HAS WITNESSED OR OTHERWISE REFERENCED THEIR LOCATION.
3. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. TYPICAL DISTURBANCE SHALL BE LIMITED TO 10 LF FROM THE EDGE OF PROPOSED GRADING.
4. FINALIZE GRADING AROUND THE BASE OF TURBINES IN ACCORDANCE WITH DETAIL TS-03 AND TS-04.
5. GRADE ALL PROPOSED ROADS TO A MAXIMUM SLOPE OF 8%. IF 8% SLOPE CANNOT BE ACHIEVED, THE CONTRACTOR MAY UTILIZE ASSIST VEHICLES FOR THE PURPOSE OF DELIVERIES. GRADE ALL PROPOSED CRANE PATHS TO A MAXIMUM OF 8% UNLESS OTHERWISE NOTED IN PLAN SHEETS.
6. ANY FACILITIES REMOVED TO ALLOW FOR CONSTRUCTION (MAILBOXES, SIGNS, FENCES, ETC.) SHALL BE REPLACED BY THE CONTRACTOR IN A CONDITION AS GOOD AS EXISTING.
7. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING DRAINAGE THROUGHOUT THE CONSTRUCTION OF THIS PROJECT. CONSTRUCTION ACTIVITIES SHALL NOT BLOCK THE NATURAL OR MANMADE CREEKS OR DRAINAGE SWALES CAUSING RAINWATER TO POND. DEPENDING ON FIELD CONDITIONS, ADDITIONAL CULVERTS IN EXCESS OF THOSE ON THE PLANS MAY BE REQUIRED.
8. WHILE BUILDING THE ROADS AND EXCAVATING THE TURBINE FOUNDATIONS, EXCESS SOIL WILL RESULT. THE CONTRACTOR SHALL DISPOSE OF THIS EXCESS SOIL IN AN APPROVED MANNER. EXCESS TOPSOIL SHALL BE DISTRIBUTED INTO A THIN LAYER ON LAND IMMEDIATELY ADJACENT TO WHERE THE TOPSOIL ORIGINATED. ALL EXCESS TOPSOIL TO BE WASTED ONSITE. WHILE DOING SO THE CONTRACTOR SHALL AVOID CAUSING RIDGES OR MOUNDS THAT WOULD MAKE IT DIFFICULT FOR STORM WATER RUNOFF TO DRAIN. THE FINAL SURFACE OF THE DISTURBED TOPSOIL SHALL BE SMOOTH AND FOLLOW THE NATURAL CONTOUR OF THE LAND.
9. THE CONTRACTOR SHALL NOTIFY SOUTH DAKOTA 811 AT LEAST 48 HOURS BEFORE EXCAVATION ACTIVITIES COMMENCE.
10. TEMPORARY INTERSECTION WIDENING SHALL, UPON COMPLETION OF ALL PROJECT CONSTRUCTION OR UPON NOTIFICATION OF THE ENGINEER, BE REMOVED AND THE AREA RESTORED TO ITS ORIGINAL LINES AND GRADES WITH TOPSOIL REPLACED, EXCEPT WHERE REQUESTED BY THE TOWNSHIP OR COUNTY TO PERMANENTLY REMAIN. DISTURBED AREAS OUTSIDE OF THE FINAL ROADWAY SHALL BE SEEDED AND MULCHED.
11. TURBINE SETBACKS ARE NOT IDENTIFIED ON THE CONSTRUCTION PLANS. IT SHALL BE THE RESPONSIBILITY OF THE OWNER AND CONTRACTOR TO ENSURE THAT ALL TURBINE SETBACKS MEET PROJECT REQUIREMENTS.
12. GEOTECHNICAL REPORTS WITH RECOMMENDATIONS HAVE BEEN PROVIDED BY THE OWNER. ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL ENGINEERING REPORT AND RECOMMENDATIONS.
13. FIELD SURVEY WETLAND INFORMATION HAS BEEN PROVIDED BY THE OWNER. ALL WETLAND DELINEATIONS AND PERMITTING SHALL BE THE RESPONSIBILITY OF OTHERS AND BE COMPLETED PRIOR TO CONSTRUCTION COMMENCING. THE OWNER AND GENERAL CONTRACTOR SHALL VERIFY THAT ALL WETLAND PERMITS HAVE BEEN SUBMITTED AND APPROVED PRIOR TO CONSTRUCTION COMMENCING.
14. CULTURAL RESOURCE REPORTS HAVE NOT BEEN PROVIDED. CULTURAL RESOURCE LOCATIONS ARE NOT SHOWN ON THE PLANS. INFORMATION WILL BE THE RESPONSIBILITY OF THE OWNER AND GENERAL CONTRACTOR. THE LOCATIONS OF CULTURAL RESOURCE SITES MAY BE CONFIDENTIAL AND PROTECTED BY STATE OR FEDERAL LAW. PUBLIC RELEASE OF SPECIFIC INFORMATION REGARDING THESE RESOURCES MAY BE RESTRICTED.
15. AN ENVIRONMENTAL ASSESSMENT HAS NOT BEEN PROVIDED. THE CONTRACTOR SHALL BE FAMILIAR WITH THE REPORT AND REVIEW ALL RECOMMENDATIONS.
16. ELECTRICAL INFORMATION SHOWN ON THE PLANS IS FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSULTANT'S PLANS FOR SPECIFIC LOCATIONS AND CONSTRUCTION DETAILS FOR THE UNDERGROUND POWER COLLECTION SYSTEM AND SUBSTATION.
17. CRANE PATHS ARE SHOWN ON THE CONSTRUCTION PLANS. IF THE CONTRACTOR PROPOSES ALTERNATE CRANE PATHS, THEY SHALL ENSURE THAT WETLAND AND CULTURAL RESOURCE CORRIDORS ARE NOT DISTURBED. FINAL CRANE PATH ALIGNMENTS SHALL BE DETERMINED BY THE CONTRACTOR BASED ON FIELD CONDITIONS WITHIN THE WETLAND AND CULTURAL RESOURCE CORRIDORS, SPECIAL LANDOWNER AGREEMENTS AND THE PROJECT BOUNDARY.
18. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. DISTURBANCE SHALL BE LIMITED TO 50 LF WIDTH FOR PROPOSED ACCESS ROADS AND 50 LF FOR CRANE PATHS, AND SHALL BE LIMITED TO A 250 LF RADIUS FOR PROPOSED WIND TURBINE GENERATORS. THE GRADING LIMITS SHALL BE CENTERED ON THE ROADWAYS AND WIND TURBINES. THE CONTRACTOR SHALL MAKE ALL EFFORTS TO KEEP ACTIVITIES WITHIN THE ERECTION AREAS SHOWN ON THE PLANS BUT IT IS UNDERSTOOD THAT SOME ACTIVITIES THAT WILL NOT REQUIRE GRADING OR SOIL DISTURBANCE MAY EXTEND BEYOND THE DEFINED LIMITS. DURING ERECTION OF THE ROTOR, TRUCKS AND/OR FORKLIFTS MAY EXTEND BEYOND THESE LIMITS. SEE DETAIL TS01 FOR TYPICAL ERECTION AREAS.
19. AN ALTA SURVEY HAS BEEN PROVIDED BY WESTWOOD. CONTRACTOR AND OWNER ARE RESPONSIBLE FOR LOCATING ALL UTILITIES AND VERIFYING LOCATION OF CONSTRUCTION ACTIVITIES PRIOR TO COMMENCING WORK.

STORMWATER POLLUTION PREVENTION PLAN (SWPPP):

1. THE CONTRACTOR SHALL PROVIDE EROSION CONTROL MEASURES AS PLANNED AND SPECIFIED FOLLOWING BEST MANAGEMENT PRACTICES AS OUTLINED BY THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND BEING IN CONFORMANCE WITH THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL STORMWATER PERMIT.
2. REFER TO THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR THE TRIPLE H WIND FARM, PREPARED BY WESTWOOD PROFESSIONAL SERVICES, FOR EROSION CONTROL AND RESTORATION SPECIFICATIONS, SEDIMENT AND EROSION CONTROL PROCEDURES, LOCATIONS OF BMPs, DETAILS, AND INSPECTION INFORMATION.
3. ALL PASTURES AND DRAINAGE SWALES DISTURBED DURING CONSTRUCTION ACTIVITIES AND NOT COVERED BY ROAD SURFACING MATERIALS, SHALL BE SEEDED IN ACCORDANCE WITH THE SWPP PLAN.
4. TEMPORARY EROSION CONTROL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE TEMPORARY EROSION CONTROL PLAN SHALL BE IN ACCORDANCE WITH THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND THE TRIPLE H WIND FARM STORMWATER POLLUTION PREVENTION PLAN ON FILE.

PROJECT CONTACT INFORMATION:

TITLE	COMPANY	NAME	CONTACT NUMBER
OWNER (PRIMARY)	ENGIE	CASEY WILLIS	805-569-6185
PROJECT MANAGER	WESTWOOD	DANI NYGREN	952-906-7493
ENGINEER OF RECORD	WESTWOOD	ROB COPOULS	952-906-7470
CONTRACTOR	WANZEK	JASON HELLERUD	701-893-3685

Westwood

Phone (952) 937-5150 12701 [illegible] Drive, Suite #300
Fax (952) 937-5822 [illegible], MN 55343
Toll Free [illegible] 937-5150 [illegible]

Westwood Professional Services, Inc.

Designed: [illegible]
Checked: DJN
Drawn: [illegible]
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2028 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 12 OF 57

0014440DTP.dwg

©2019 Westwood Professional Services, Inc.

CEMENT STABILIZATION - PROCEDURE

THE SPECIFICATIONS BELOW ARE GENERAL RECOMMENDATIONS/GUIDELINES FOR CEMENT STABILIZATION OF SUBGRADES FOR THE PROJECT. ACTUAL FIELD CONDITIONS MAY ALTER APPLICATION RATE. CONSULT GEOTECHNICAL ENGINEER FOR FURTHER RECOMMENDATIONS.

1. STRIP THE TOP ±4 INCHES OF TOPSOIL (THROUGH THE ROOT ZONE) FROM THE AREA TO BE STABILIZED. ROOTS SMALLER THAN 1/4" DIAMETER ARE CONSIDERED INSIGNIFICANT.
2. PERFORM A PROCTOR (ASTM D 698) TEST TO DETERMINE THE OPTIMUM MOISTURE CONTENT IF THE MATERIAL TO BE STABILIZED DOES NOT MATCH A PREVIOUSLY PERFORMED PROCTOR.
3. DETERMINE THE IN-SITU MOISTURE CONTENT USING A NUCLEAR DENSITY GAUGE (OR EQUIVALENT MOISTURE CONTENT TEST) DAILY, PRIOR TO INCORPORATION OF THE CEMENT. PROVIDE ADDITIONAL MOISTURE CONTENT TESTING AS NEEDED BASED ON WEATHER CONDITIONS.
   - 3.1. THE CONTRACTOR WILL BE ADVISED OF IN-SITU MOISTURE CONTENT, AND MOISTURE ADJUSTMENTS SHOULD BE MADE IF IN-SITU MOISTURE IS LESS THAN OPTIMUM MOISTURE CONTENT AS DETERMINED BY THE PROCTOR (ASTM D 698).
4. SOIL AND CEMENT BLENDING:
   - 4.1. COMPLETELY BLEND SUBGRADE SOIL WITH THE APPROPRIATE AMOUNT OF CEMENT BY WEIGHT. FIELD RESULTS FROM TEST STRIPS WILL DICTATE THE CEMENT APPLICATION RATE.
   - 4.2. IN AREAS OF HIGH MOISTURE OR POOR SOILS, THE CONTRACTOR MAY INCREASE THE PERCENT OF CEMENT IN ORDER TO MEET THE MINIMUM SUBGRADE STRENGTH REQUIREMENTS.
   - 4.3. THE USE OF A RECLAIMER IS AN ADEQUATE BLENDING METHOD. DISCING IS NOT AN ADEQUATE BLENDING METHOD.
   - 4.4. A STABILIZATION DEPTH OF 12" WAS USED FOR DESIGN PURPOSES. STABILIZATION DEPTH MAY NEED TO INCREASE TO 16" IN AREAS OF EXTREME MOISTURE OR POOR SOILS IN ORDER TO MEET THE STRENGTH AND PROOF ROLL REQUIREMENTS.
5. COMPACTION:
   - 5.1. A ROLLING PATTERN WILL BE ESTABLISHED USING A NUCLEAR DENSITY GAUGE DURING COMPACTION.
     - 5.1.1. COMPACTION WILL BE PERFORMED UNTIL THE STABILIZED MATERIAL REACHES THE "BREAK POINT" AFTER WHICH ADDITIONAL PASSES WITH A ROLLER RESULTS IN A LOSS OF DENSITY AS MEASURED BY A NUCLEAR DENSITY GAUGE.
     - 5.1.2. COMPACTION IS TYPICALLY ACHIEVED BY MULTIPLE PASSES OF A PADFOOT ROLLER UNTIL THE ROLLER "WALKS" OUT OF THE RECLAIMED MATERIAL (SPACE IS VISIBLE BETWEEN THE DRUM AND THE RECLAIMED MATERIAL). THIS IS FOLLOWED BY BLADING AND SHAPING THE RECLAIMED MATERIAL TO FINAL PROFILE AND CROSS SECTION, REMOVING HIGH AND LOW POINTS. SMOOTH DRUM OR RUBBER TIRE ROLLERS ARE THEN USED TO FINISH ROLLING (THIS IS WHEN THE DENSITY TESTS ARE PERFORMED) UNTIL THE DENSITY OF THE MATERIAL REACHES THE "BREAK POINT."
     - 5.1.3. THE NUMBER OF PASSES AND EQUIPMENT USED TO REACH THE "BREAK POINT" IS CONSIDERED THE ROLLING PATTERN.
     - 5.1.4. A NEW ROLLING PATTERN MAY NEED TO BE ESTABLISHED IF THE PERFORMANCE REQUIREMENTS ARE NOT BEING MET. THIS MAY BE DUE TO CHANGES IN THE MOISTURE CONTENT, THE SOIL TYPE, OR THE CEMENT RATE.
   - 5.2. THE TARGET DENSITY IS 98% OF THE MAXIMUM DENSITY DETERMINED FROM THE ROLLING PATTERN.
     - 5.2.1. DENSITY TESTS SHALL BE TAKEN AT THE RATE OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER TO CONFIRM THE DENSITY IS MATCHING THE TARGET. ONCE THE ROLLING PATTERN HAS BEEN CONFIRMED IT IS RECOMMENDED THAT TESTING CONTINUE AT 1 TEST PER 1,000 LF IN EACH PASS OF THE RECLAIMER.
     - 5.2.2. IF IT IS NOT POSSIBLE TO ATTAIN THE TARGET DENSITY, AND ADDITIONAL COMPACTION DOES NOT IMPROVE THE DENSITY, A NEW ROLLING PATTERN SHOULD BE ESTABLISHED.
   - 5.3. THE AIR TEMPERATURE SHALL BE ABOVE 40 DEGREES (F) DURING THE CEMENT STABILIZATION PROCESS. MIXING CEMENT INTO FROZEN GROUND IS NOT ACCEPTABLE.
6. THE STABILIZED MATERIAL SHALL BE CONTINUOUSLY WET CURED FOR A MINIMUM OF 24 HOURS (WET CURED IS IDENTIFIED VISUALLY AS DAMP SURFACE).
7. PERFORM SUBGRADE TESTING IN ACCORDANCE WITH TESTING SCHEDULE.
8. AGGREGATE PLACEMENT:
   - 8.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 8.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 8.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

CEMENT STABILIZATION - DESIGN BASIS

1. DURING INITIAL CONSTRUCTION, CONTRACTOR SHALL CONSTRUCT MINIMUM 300 LF TEST STRIPS CONTAINING 4%, 5% AND 6% CEMENT IN ACCORDANCE WITH CEMENT STABILIZATION PROCEDURES.
2. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 3 FOR ANTICIPATED RESULTS):
   - 2.1. PERFORM INITIAL SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M BETWEEN 4 TO 6 HOURS AFTER FINAL COMPACTION.
   - 2.2. PERFORM ADDITIONAL DCP TESTING AT 24 AND 48 HOURS AFTER FINAL COMPACTION.
   - 2.3. PERFORM SUBSEQUENT DCP TESTS AT 7 DAYS AFTER FINAL COMPACTION AS VERIFICATION OF STRENGTH CURVE.
   - 2.4. A MINIMUM OF 3 TESTS PER TEST SECTION PER TIMEFRAME IS REQUIRED. TESTS SHALL BE TAKEN AT THE CENTERLINE AND 2' FROM EACH SHOULDER.
   - 2.5. RECORD DCP TEST RESULTS EVERY 6 INCHES TO TOTAL DEPTH OF 12 INCHES.

TABLE 3: TEST STRIP CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	COMPRESSIVE STRENGTH (PSF)
4 – 6 HOURS	6	5	1,600
24 HOURS	10	7	2,500
48 HOURS	15	10	3,200
7 DAYS	30	21	5,200

CEMENT STABILIZATION - PRODUCTION

1. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 5 FOR SUMMARY OF TESTING REQUIREMENTS):
   - 1.1. PERFORM SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M NO SOONER THAN 24 HOURS AFTER FINAL COMPACTION.
   - 1.2. DCP TESTING FREQUENCY SHALL BE WITH A RANDOM SPACING AND A MINIMUM OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER. A MINIMUM OF 3 TESTS PER ROAD IS REQUIRED.
   - 1.3. THE CBR OF THE STABILIZED SUBGRADE SHOULD BE CALCULATED IN 6" INCREMENTS THROUGH THE ENTIRE DEPTH OF THE STABILIZED LAYER.
   - 1.4. THE MINIMUM REQUIRED CBR PRIOR TO PROOF-ROLLING IS PROVIDED IN TABLE 4 BELOW:

TABLE 4: FINAL CEMENT STABILIZED CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	UNDRAINED SHEAR STRENGTH (PSF)	BEARING CAPACITY (PSF)
24 – 48 HOURS	15	10	3,500	9,800
3 – 7 DAYS	30	21	7,000	18,000
28 DAYS	50	33	12,000	28,500

NOTE: UNDRAINED SHEAR STRENGTH WAS CALCULATED USING THE BLACK (1961) EQUATION. BEARING CAPACITY WAS CALCULATED USING THE VESIC EQUATION MODIFIED FOR TWO LAYERS (12" CEMENT STABILIZED SUBGRADE OVER A NATURAL SUBGRADE WITH A CBR OF 1.5)

   - 1.5. ONCE THE MINIMUM REQUIRED CBR IS ACHIEVED AT ANY CORRESPONDING TIME PERIOD, THE SUBGRADE IS CONSIDERED ADEQUATE AND THE CONTRACTOR MAY PROCEED WITH PROOF-ROLL TESTING. FUTURE DCP TESTING ON THAT SEGMENT OF SUBGRADE IS NOT REQUIRED.
   - 1.6. IF TESTING DOES NOT INDICATE A CBR OF 30 WITHIN 7 DAYS, ADDITIONAL GRAVEL SURFACING AND/OR THE ADDITION OF GEOTEXTILE FABRIC MAY BE REQUIRED. FOR FUTURE SUBGRADE STABILIZATION AREAS, CONTACT THE ENGINEER AND OWNER VIA RFI FOR RECOMMENDATIONS AND APPROVAL.
2. SUBGRADE PROOF-ROLL TESTING AND ACCEPTANCE:
   - 2.1. ONCE THE REQUIRED DCP VALUE HAS BEEN OBTAINED BUT PRIOR TO PLACING AGGREGATE, THE SUBGRADE SHALL BE PROOF-ROLLED. REFER TO THE PROJECT TESTING REQUIREMENTS FOR PROOF-ROLL DEFINITION.
   - 2.2. PROOF-ROLLING SHOULD BE PERFORMED WITH ONE PASS DOWN THE CENTER AND NOT BE PERFORMED WITHIN 12 INCHES OF THE EDGE OF THE STABILIZED SECTION.
   - 2.3. IF PROOF-ROLLING FAILS, RE-STABILIZATION MAY BE REQUIRED AND A NEW ROLLING PATTERN OR ADDITIONAL CEMENT MAY BE REQUIRED.
3. AGGREGATE PLACEMENT:
   - 3.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 3.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 3.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

TABLE 5: CEMENT STABILIZATION PRODUCTION TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
COMPACTED SUBGRADE (CEMENT STABILIZED)	PROCTOR	MINIMUM 1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER 1000 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
NOTE: SEE ABOVE FOR INITIAL TESTING REQUIREMENTS	DCP TEST	1 PER 500 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
	PROOF-ROLL (AFTER PASSING DCP TESTS)	ENTIRE LENGTH

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150

Westwood Professional Services, Inc.

Designed: BMK
Checked: DEH
Drawn: BMK
As-Built Drawing:

Revisions: #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2888 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 13 OF 57

0014440DTP.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 334th Ave in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 1005' North of 334th Ave & 202nd Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.27'26.66" W Long. -99.30'08.70" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: ~~N/A~~ As determined by Hyde County Highway Superintendent
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001533 SW4 3-112-72
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Tonya Lane
Signature of Applicant

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 334th Ave in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 1005' North of 334th Ave & 202nd Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.27'26.66" W Long. -99.30'08.70" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: N/A
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001533 SW4 3-112-72
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: _____

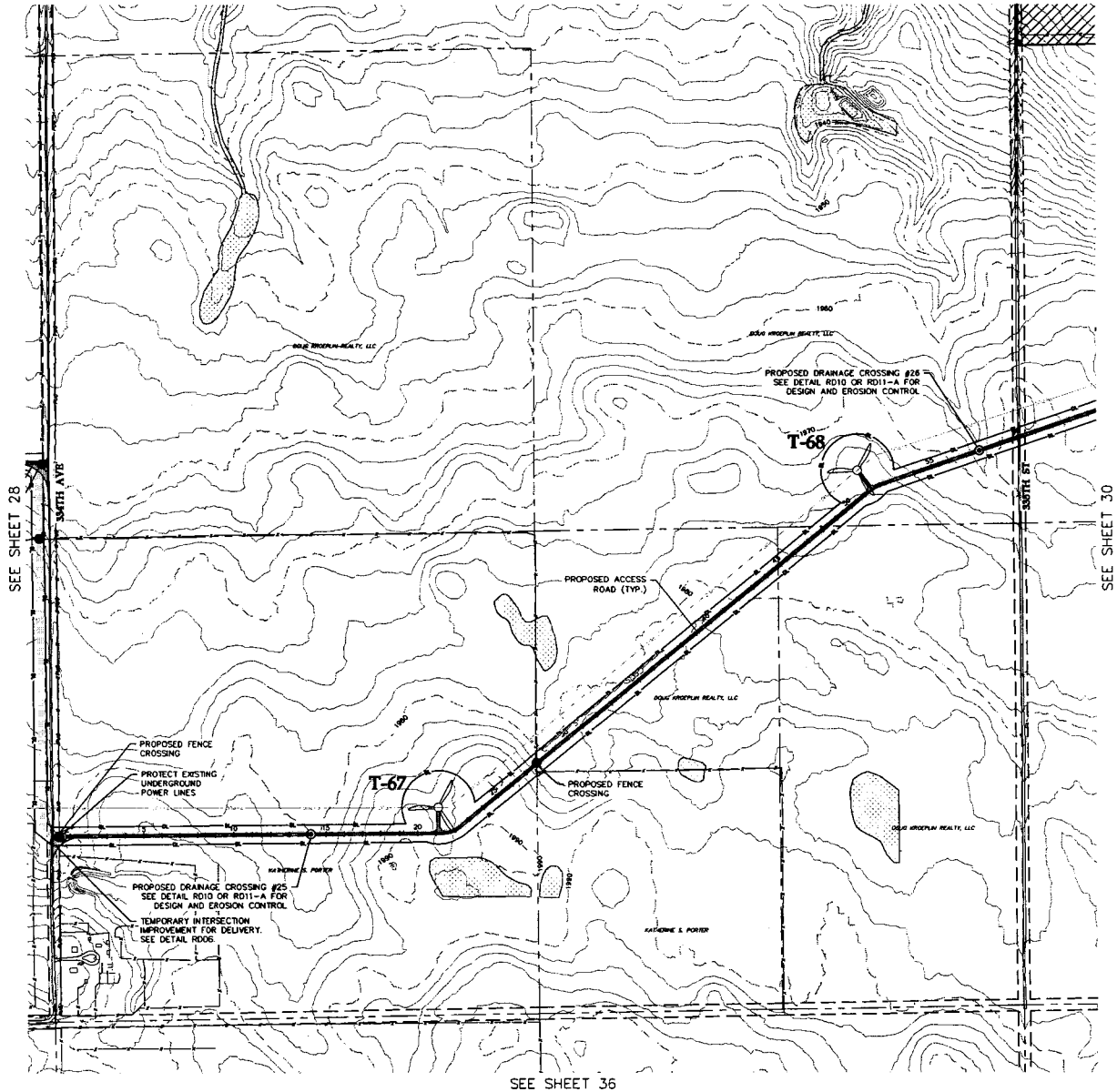
Tonya L Lane
Signature of Applicant

_____
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

© 2019 Westwood Professional Services, Inc.



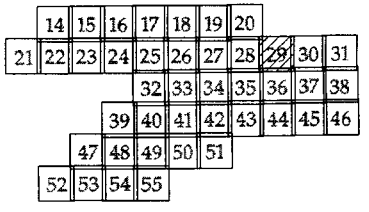
LEGEND:

- PROPOSED TURBINE LOCATION
- T-XX PROPOSED TURBINE NUMBER
- PROPOSED ALTERNATE TURBINE LOCATION
- ALT-XX PROPOSED ALTERNATE TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED ALTERNATE ACCESS ROAD
- PROPOSED CRANE PATH
- PROPOSED UNDERGROUND COLLECTION*
- PROPOSED DISTURBANCE LIMITS
- PROPOSED PERIMETER SEDIMENT CONTROL
- EXISTING 10' CONTOURS
- EXISTING 2' CONTOURS
- EXISTING GRAVEL EDGE
- EXISTING BITUMINUS EDGE
- EXISTING RIGHT-OF-WAY
- EXISTING PARCEL LINE
- EXISTING BUILDING
- EXISTING FENCE
- EXISTING OVERHEAD POWER
- EXISTING HIGH VOLTAGE OVERHEAD POWER
- EXISTING UNDERGROUND POWER LINE
- EXISTING FIBER OPTIC LINE
- EXISTING WATER LINE
- DELINEATED WETLAND
- ARCHAEOLOGICAL AVOIDANCE AREA
- EXISTING USFWS EASEMENT
- PROJECT BOUNDARY
- 1900 EXISTING GROUND ELEVATION
- PROPOSED DRAINAGE CROSSING**
- PROPOSED TEMPORARY DRAINAGE CROSSING**
- PROPOSED FENCE CROSSING***
- PROPOSED UTILITY CROSSING
- PROPOSED CULVERT

* PROVIDED BY OTHERS AND SHOWN FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSTRUCTION PLANS FOR DETAILS.

** SEE SHEET 11 FOR DRAINAGE CROSSING TYPE AND SIZING. DRAINAGE CROSSINGS SHALL CONSIST OF LOW WATER CROSSING OR CULVERT. DRAINAGE CROSSINGS ALONG CRANE PATH SHALL CONSIST OF CRANE MATS OR TEMPORARY CULVERT.

*** ALL GATE INSTALLATIONS SHALL BE FIELD DETERMINED AND AGREED UPON BY THE CONTRACTOR AND OWNER.



KEY MAP

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (866) 937-5150 www.westwoodps.com
Westwood Professional Services, Inc.

Designed:	SME
Checked:	BEH
Drawn:	SME
As-Built Drawing:	

Revisions #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2200 2nd Avenue NW
West Fargo, ND 58078

0' 300' 600' 900'

Triple H Wind Farm

Hyde County, South Dakota

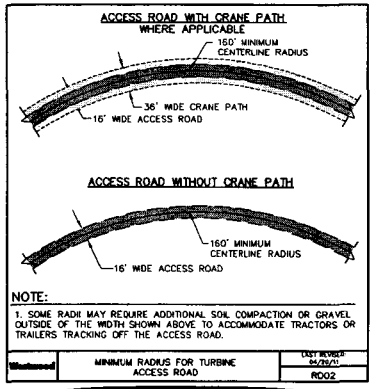
Site Plan T-67 - T-68

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 29 OF 57

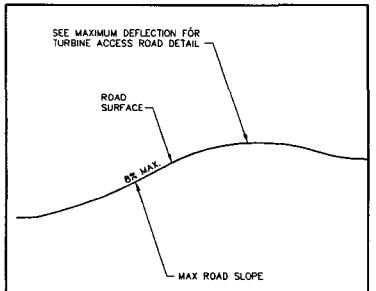
001444SP01.dwg

© 2019 Westwood Professional Services, Inc.



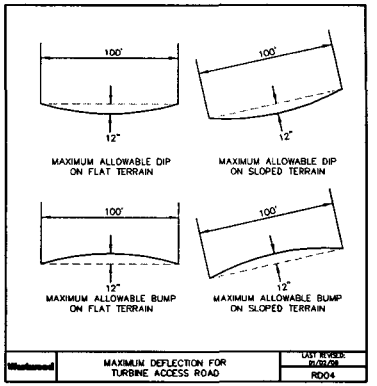
NOTE:
1. SOME RADII MAY REQUIRE ADDITIONAL SOIL COMPACTION OR GRAVEL OUTSIDE OF THE WIDTH SHOWN ABOVE TO ACCOMMODATE TRACTORS OR TRAILERS TRACKING OFF THE ACCESS ROAD.

Westwood	MINIMUM RADIUS FOR TURBINE ACCESS ROAD	LAST REVISED: 04/09/07
		RD02

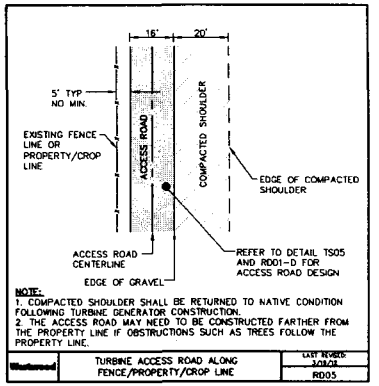


NOTES:
1. ROAD SLOPE SHALL NOT EXCEED 8% WITHOUT OWNER APPROVAL

Westwood	MAXIMUM VERT. SLOPE FOR TURBINE ACCESS ROAD/CRANE TRAVEL PATH	LAST REVISED: 3/28/07
		RD03

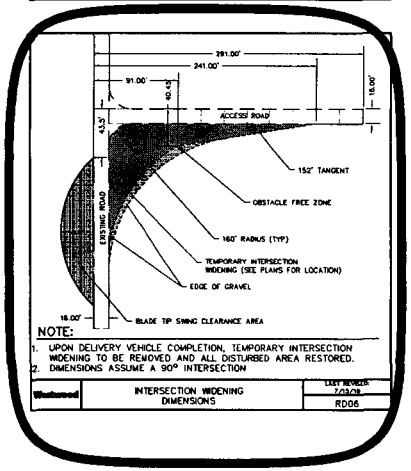


Westwood	MAXIMUM DEFLECTION FOR TURBINE ACCESS ROAD	LAST REVISED: 11/20/08
		RD04



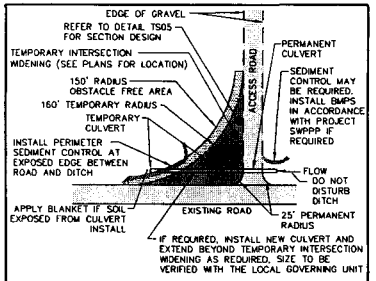
NOTE:
1. COMPACTED SHOULDER SHALL BE RETURNED TO NATIVE CONDITION FOLLOWING TURBINE GENERATOR CONSTRUCTION.
2. THE ACCESS ROAD MAY NEED TO BE CONSTRUCTED FARTHER FROM THE PROPERTY LINE IF OBSTRUCTIONS SUCH AS TREES FOLLOW THE PROPERTY LINE.

Westwood	TURBINE ACCESS ROAD ALONG FENCE/PROPERTY/CROP LINE	LAST REVISED: 3/28/08
		RD05



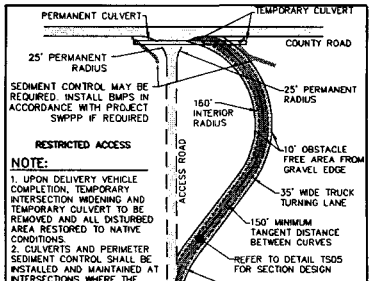
NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING TO BE REMOVED AND ALL DISTURBED AREA RESTORED.
2. DIMENSIONS ASSUME A 90° INTERSECTION

Westwood	INTERSECTION WIDENING DIMENSIONS	LAST REVISED: 7/03/08
		RD06



1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.

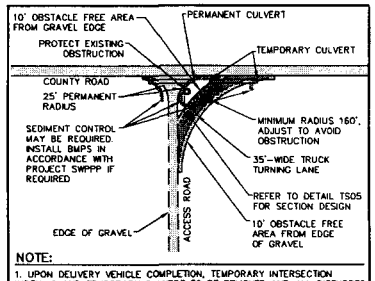
Westwood	TURBINE ACCESS ROAD TYPICAL INTERSECTION WIDENING	LAST REVISED: 3/2/07
		RD07



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

NOT TO SCALE

Westwood	TRUCK TRAFFIC TURNING LANE A	LAST REVISED: 3/2/07
		RD08-A



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

Westwood	TRUCK TRAFFIC TURNING LANE B	LAST REVISED: 12/3/14
		RD08-B

Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (800) 937-5150 westwood@gt.com
Westwood Professional Services, Inc.

Designed: BMC
Checked: RJM
Drawn: BMC
As-Built Drawing:

Revisions #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

3025 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

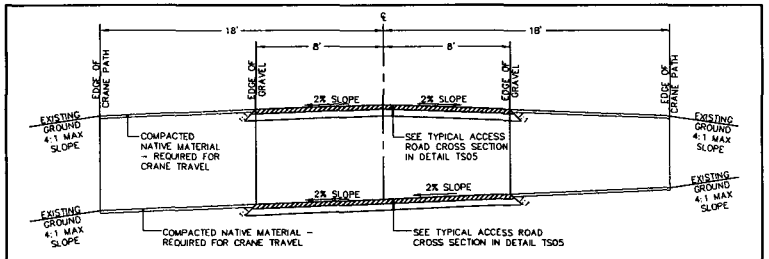
Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 5 OF 57

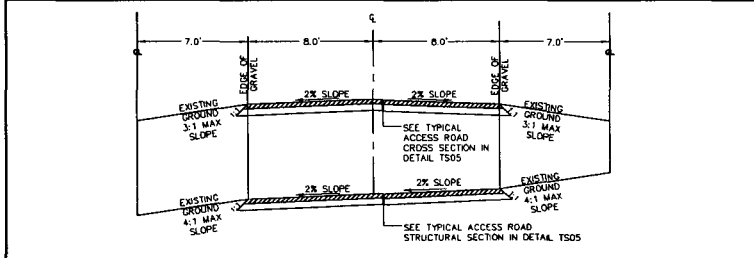
0014440TP.dwg

©2019 Westwood Professional Services, Inc.



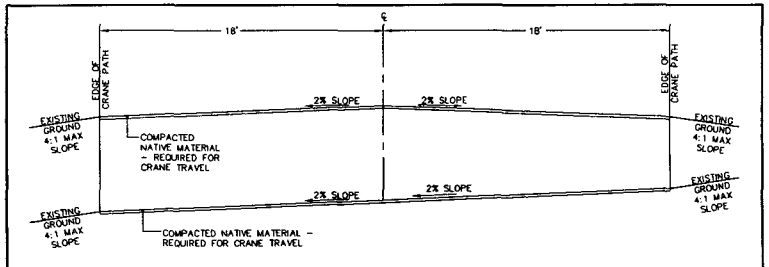
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%.
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE ACCESS ROAD DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

Westwood | TYPICAL TURBINE ACCESS ROAD AND CRANE PATH | LAST REVISED: 01/29/01 | RD01-A



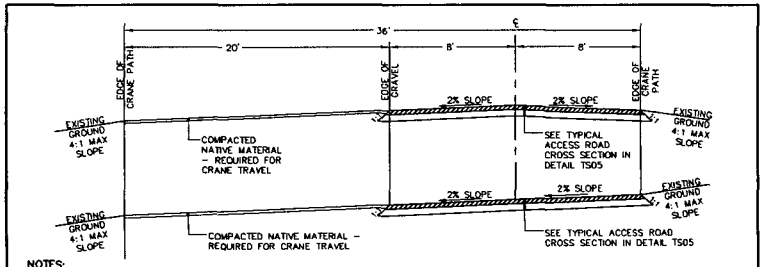
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

Westwood | TYPICAL TURBINE ACCESS ROAD SECTION | LAST REVISED: 3/19/19 | RD01-B



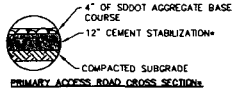
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE WHERE CRANE PATHS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT CRANE PATH REMAINS WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%.

Westwood | TYPICAL CRANE PATH | LAST REVISED: 01/29/01 | RD01-C

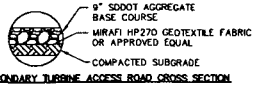


NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%.
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE EDGE OF COMPACTED SHOULDER DIRECTLY INTO EXISTING GROUND SURFACE.
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE.

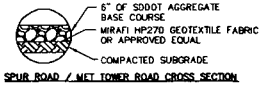
Westwood | TYPICAL TURBINE ACCESS ROAD AND OFFSET CRANE PATH | LAST REVISED: 01/29/01 | RD01-D



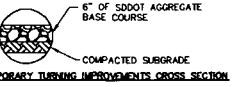
PRIMARY ACCESS ROAD CROSS SECTION*



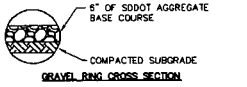
SECONDARY TURBINE ACCESS ROAD CROSS SECTION



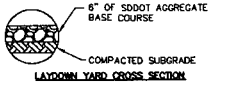
SPUR ROAD / MET TOWER ROAD CROSS SECTION



TEMPORARY TURNING IMPROVEMENTS CROSS SECTION



GRAVEL RING CROSS SECTION



LAYDOWN YARD CROSS SECTION

* CEMENT APPLICATION RATE MAY VARY BASED ON TEST STRIPS AND FIELD PERFORMANCE. SEE SHEET 13 FOR CEMENT STABILIZATION PROCEDURE AND DESIGN BASIS.

NOTES:
STRUCTURAL SECTIONS SHOWN ARE THE MINIMUM THICKNESS REQUIREMENTS DURING NORMAL FIELD CONDITIONS. THE SECTIONS MAY NEED TO BE INCREASED BASED ON ACTUAL FIELD CONDITIONS AT THE TIME OF CONSTRUCTION. CONDITIONS INCLUDE BUT ARE NOT LIMITED TO CONSTRUCTION DURING THE FREEZE/THAW CYCLE, UNUSUALLY WET PERIODS, OR IN LOW/WET AREAS. SEE SHEET 12 FOR TESTING REQUIREMENTS AND SPECIFICATIONS.

Westwood | TYPICAL STRUCTURAL CROSS SECTIONS

Westwood

(952) 937-5150 | 12701 Whitewater Drive, Suite #200
Fax: (952) 937-5822 | Minnetonka, MN 55343
Toll-Free: (866) 937-5150 | westwoodps.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: DJH
Drawn: BMK
As-Built Drawing:

Revisions: #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2200 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 4 OF 57

0014440DTP.dwg

©2019 Westwood Professional Services, Inc.

ROAD DESIGN PARAMETERS

1. ACCESS ROADS HAVE BEEN DESIGNED TO ACCOMMODATE LIGHT DUTY TRUCKS (PICKUP TRUCKS AND MAINTENANCE VEHICLES) FOR LOW VOLUME USE IN NORMAL OPERATING CONDITIONS AS WELL AS HEAVY DUTY CONSTRUCTION TRAFFIC UNDER DRY CONDITIONS. THE ROAD DESIGN SPECIFIED IS NOT INTENDED FOR ALL WEATHER USE FOR HEAVY DUTY CONSTRUCTION LOADS.
2. ROAD MAINTENANCE CAN BE EXPECTED OVER THE LIFE OF THE PERMANENT FACILITY.

PRODUCTS

1. AGGREGATE BASE SHALL CONSIST OF SDDOT AGGREGATE BASE COURSE (AND IN CONFORMANCE WITH THE GRADATION TABLE 1). AGGREGATE MAY BE CRUSHER RUN UPON ENGINEERS APPROVAL. AGGREGATE GRADATIONS SHALL BE SUBMITTED TO ENGINEER FOR REVIEW.
2. ROAD SHOULDERS AND CRANE PADS SHALL CONSIST OF COMPACTED NATIVE SOILS.
3. CULVERTS: ACCESS ROAD CULVERTS SHALL MEET THE MINIMUM SPECIFICATIONS SET FORTH BY THE SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION AND/OR HYDE COUNTY. ALL CULVERTS ARE PLANNED TO BE A MINIMUM 18" DIAMETER AND MANUFACTURED OF 16-GAGE CORRUGATED METAL PIPE WITH NO END TREATMENTS UNLESS NOTED OTHERWISE. ACTUAL SIZE WILL BE DETERMINED THROUGH HYDRAULIC ANALYSIS.
4. GEOTEXTILE FABRIC: MIRAFI HP270 OR APPROVED EQUAL.

EXECUTION

1. CLEARING AND GRUBBING
   A. THE CONTRACTOR SHALL BE REQUIRED TO GRUB ALL TREES, STUMPS, BRUSH, AND DEBRIS WITHIN THE GRADING AREAS SHOWN ON THE PLANS. GRUBBING INCLUDES REMOVAL OF ALL PLANT MATERIAL GREATER THAN 2" INCLUDING STUMPS, BRANCHES, ROOTS, ETC. TO A DEPTH BELOW THE FINAL SUBGRADE. THE CONTRACTOR IS TO REMOVE ONLY THOSE TREES WHICH ARE DESIGNATED BY THE OWNER'S REPRESENTATIVE FOR REMOVAL, AND SHALL EXERCISE EXTREME CARE AROUND EXISTING TREES TO BE SAVED.
2. TOPSOIL STRIPPING
   A. TOPSOIL, INCLUDING ROOTS LARGER THAN 2" AND LARGE ROOT MASSES, SHALL BE STRIPPED FROM ALL ROADWAY AND FOUNDATION AREAS UP TO 10". TOPSOIL SHALL NOT BE STRIPPED OUTSIDE OF THE DESIGNATED DISTURBANCE AREAS.
   B. ANY TOPSOIL THAT HAS BEEN STRIPPED SHALL BE STOCKPILED FOR POST CONSTRUCTION REVEGETATION. ALL TOPSOIL SHALL BE REDISTRIBUTED TO THE LAND OWNER'S PROPERTY OF WHERE IT ORIGINATED FROM.
3. FILL PLACEMENT
   A. FILL PLACEMENT SHALL CONSIST OF THE PLACING OF SUITABLE FILL MATERIAL, AFTER TOPSOIL STRIPPING, ABOVE THE EXISTING GRADE. GENERALLY, SIDE SLOPES SHALL BE CONSTRUCTED AT FOUR FOOT HORIZONTAL TO ONE FOOT VERTICAL, WITH SONE LOCATIONS THROUGHOUT THE PROJECT WITH SLOPES OF TWO FEET HORIZONTAL TO ONE FOOT VERTICAL. THE MATERIAL FOR FILL CONSTRUCTION SHALL BE OBTAINED FROM THE ACCESS ROAD/TURBINE EXCAVATION (SEE GEOTECHNICAL REPORT FOR RESTRICTIONS), OR ANY SUITABLE, APPROVED SOIL OBTAINED ONSITE/OFFSITE BY CONTRACTOR, AS DIRECTED OR APPROVED BY THE ENGINEER. THIS MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 12" AND CONSTRUCTED TO 95% OF THE MAXIMUM DRY DENSITY AND WITHIN 2% OF OPTIMUM MOISTURE CONTENT, AS DETERMINED BY THE STANDARD PROCTOR (AASHTO T99).
   B. SIDE SLOPES GREATER THAN 4:1 WILL NOT BE PERMITTED, UNLESS OTHERWISE NOTED ON THE PLAN.
   C. FILL SLOPES SHALL BE BENCHED INTO THE EXISTING SLOPE TO PREVENT MOVEMENT BETWEEN THE FILL AND NATIVE SOILS. BENCHES SHOULD BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO FILL PLACEMENT. POSITIVE DRAINAGE IS REQUIRED AT BENCHED AREAS AND AT THE TOE OF FILL SLOPES TO REMOVE SURFACE WATER.
4. SUBGRADE
   A. SUBGRADE PREPARED AT GRADE OR IN CUT REQUIRES SCARIFICATION AND RECOMPACTION TO A DEPTH OF 12" OR MORE.
   B. ACCESS ROAD CROSS SLOPES SHOWN IN THE PLANS ARE MEANT AS A GUIDE. ACCESS ROAD CROSS SLOPES MAY RANGE FROM 1% - 2%. CHECK WITH THE ENGINEER IF THE CROSS SLOPE FALLS OUTSIDE OF THIS RANGE. ACCESS ROADS BEING UTILIZED FOR CRANE TRAVEL SHOULD HAVE A MAX CROSS SLOPE OF 2%.

TABLE 1: SDDOT AGGREGATE BASE COURSE - LOCALLY SOURCED	
SIEVE SIZE	PERCENT PASSING
1"	100
3/4"	80-100
1/2"	68-91
NO. 4	46-70
NO. 8	34-58
NO. 40	13-35
NO. 200	3-12

MEET FOLLOWING REQUIREMENTS PER 882.2

LIQUID LIMIT (MAX) = 25
PLASTICITY INDEX = 0-6
L.A ABRASION (% MAX) = 40%

GRADATION HAS BEEN OBTAINED FROM THE 2015 SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION BOOK.

STORM WATER DESIGN PARAMETERS

1. SEE SHEET 6 FOR CULVERT SIZING AND DESIGN PARAMETERS. SEE HYDROLOGY MEMO FOR FURTHER DESIGN CALCULATIONS. CULVERTS SHALL BE MINIMUM 18" CORRUGATED METAL PIPE. ALL TEMPORARY PORTIONS OF THE INSTALLED CULVERTS SHALL BE REMOVED UPON COMPLETION OF THE PROJECT.
2. IT IS EXPECTED THAT CULVERTS WILL BE OVERTOPPED DURING SOME STORMS AND MAINTENANCE WILL BE REQUIRED THROUGH THE LIFE OF THE PROJECT.
3. WHEN INSTALLING DRAINAGE CULVERTS THE CONTRACTOR SHALL USE JUDGMENT IN SETTING THE FLOW LINE ELEVATIONS AND CULVERT LONGITUDINAL SLOPE. TYPICALLY THE FLOW LINE ELEVATIONS AND LONGITUDINAL SLOPE OF THE CULVERT SHOULD MATCH THE NATURAL GROUND ELEVATIONS AND SLOPE TO ENSURE POSITIVE DRAINAGE. WHEN POSSIBLE, ALL CULVERTS SHOULD BE PLACED AT A MINIMUM 0.5% GRADE.
4. ANTICIPATED CULVERT CROSSINGS ARE SHOWN ON THE CONSTRUCTION PLAN, ADDITIONAL CULVERTS MAY NEED TO BE INSTALLED IN AREAS WHERE CONCENTRATED FLOW IS EXPECTED DUE TO CONSTRUCTION ACTIVITIES.
5. CONSTRUCTION DRAINAGE CROSSINGS TO MAINTAIN EXISTING FLOW CHARACTERISTICS OF THE FEATURES. FEATURES SHALL BE GRADED TO PRECONSTRUCTION CONTOURS.

TESTING

1. TESTING SHALL BE PERFORMED BY A DESIGNATED INDEPENDENT TESTING AGENCY.
2. SUBMIT ONE SET OF TESTING AND INSPECTION RECORDS SPECIFIED TO THE CIVIL ENGINEER OF RECORD.

DEFINITIONS:

1. PROOF ROLLING:
   SHALL BE PERFORMED IN THE PRESENCE OF THE GEOTECHNICAL ENGINEER OR QUALIFIED GEOTECHNICAL REPRESENTATIVE USING A FULLY LOADED TANDEM AXLE DUMP TRUCK OR WATER TRUCK WITH A MINIMUM GROSS WEIGHT OF 25 TONS OR A FULLY LOADED BELLY DUMP WITH AN EQUIVALENT AXLE LOADING. PROOF-ROLLING ACCEPTANCE STANDARDS INCLUDE NO RUTTING GREATER THAN 1.5 INCHES, AND NO "PUMPING" OF THE SOIL BEHIND THE LOADED TRUCK.
2. SIEVE ANALYSIS:
   SHALL BE CONDUCTED IN ACCORDANCE WITH AASHTO T27
3. PROCTORS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T99
4. ATTERBERG LIMITS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T89 AND T90
5. MOISTURE DENSITY (NUCLEAR DENSITY):
   SHALL BE DONE IN ACCORDANCE WITH AASHTO T310
6. DYNAMIC CONE PENETROMETER (DCP) TESTING:
   SHALL BE DONE IN ACCORDANCE WITH ASTM D6951-03

REQUIREMENTS:

1. FILL PLACEMENT:
   A. SOILS USED AS FILL MATERIAL SHALL BE TESTED FOR MOISTURE CONTENT AND PROCTOR TESTS.
   B. WHERE FILL CONSTRUCTION REQUIRES MORE THAN 12 INCHES OF FILL PLACEMENT, COMPACT EACH LIFT TO A MINIMUM OF 95 PERCENT OF THE MATERIAL'S MAXIMUM STANDARD PROCTOR DRY DENSITY.
2. COMPACTED SUBGRADE (CEMENT STABILIZED):
   A. SEE SHEET 13 FOR TESTING REQUIREMENTS AND PROCEDURE.
3. COMPACTED SUBGRADE (NON-CEMENT STABILIZED):
   A. THE ENTIRE SUBGRADE SHALL BE PROOF-ROLLED PRIOR TO THE PLACEMENT OF THE AGGREGATE BASE TO IDENTIFY AREAS OF UNSTABLE SUBGRADE.
   B. PERFORM A MINIMUM OF 3 DYNAMIC CONE PENETROMETER (DCP) TESTS PER ACCESS ROAD OR ONE FOR EVERY 1,000 LF OF ROAD, WHICHEVER IS GREATER. SUBGRADE MUST MEET A MINIMUM DCP OF 3 BLOWS PER 6" TO A TOTAL DEPTH OF 2' (MINIMUM CBR=1.5).
   C. IF A PASSING PROOF-ROLL OR DCP REQUIREMENTS CANNOT BE ACHIEVED THE FOLLOWING ALTERNATIVES MAY BE IMPLEMENTED:
      a. SCARIFY, DRY, AND RECOMPACT SUBGRADE
      b. REMOVE UNSUITABLE MATERIAL AND REPLACE WITH SUITABLE MATERIAL
      c. INCREASE AGGREGATE BASE THICKNESS
4. AGGREGATE BASE:
   A. AGGREGATE BASE SHALL BE PROOF-ROLLED OVER THE ENTIRE LENGTH. IF PROOF ROLLING DETERMINES THAT THE ROAD IS UNSTABLE, ADDITIONAL AGGREGATE SHALL BE ADDED UNTIL THE UNSTABLE SECTION IS ABLE TO PASS A PROOF ROLL.
   B. PROVIDE 1 SIEVE ANALYSIS (PROJECT MAX OF 20) PER 2500 CY OF ROAD BASE PLACED.
5. CRANE PAD AND CRANE PATHS / CRANE TRAVEL SHOULDERS:
   A. TESTING REQUIREMENTS ARE PENDING BASED ON CRANE PICK PLANS PROVIDED BY THE CONTRACTOR.

TABLE 2: TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
FILL PLACEMENT	PROCTOR	1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER LIFT PER 5000 SF OF FILL PLACED OR 1 PER 500 LF OF ROAD OR CRANE WALK
COMPACTED SUBGRADE (CEMENT STABILIZED):	SEE SHEET 13	SEE SHEET 13
COMPACTED SUBGRADE (NON-CEMENT STABILIZED):	PROOF-ROLL	ENTIRE AREA
	DCP	1 PER 1,000 FT OR MIN. 3 PER ROAD
AGGREGATE BASE	PROOF-ROLL	ENTIRE AREA
	SIEVE ANALYSIS, LL, PL, AND L.A ABRASION	1 PER 2,500 CY

GENERAL NOTES:

1. GROUND SURFACE CONTOURS (AT TWO-FOOT VERTICAL INTERVALS) AND ELEVATIONS ARE BASED ON A PHOTOGRAMMETRY SURFACE PROVIDED BY GEOTERRA. IF MAJOR DISCREPANCIES ARE FOUND IN THE GROUND ELEVATIONS DURING FIELD STAKING TO THE GROUND ELEVATIONS SHOWN ON THE PLANS, THE OWNER AND ENGINEER SHALL BE NOTIFIED.
2. WHERE SECTION OR SUBSECTION MONUMENTS ARE ENCOUNTERED, THE OWNER SHALL BE NOTIFIED BEFORE SUCH MONUMENTS ARE REMOVED. THE CONTRACTOR SHALL PROTECT AND CAREFULLY PRESERVE ALL PROPERTY MARKERS AND MONUMENTS UNTIL THE OWNER, AN AUTHORIZED SURVEYOR OR AGENT HAS WITNESSED OR OTHERWISE REFERENCED THEIR LOCATION.
3. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. TYPICAL DISTURBANCE SHALL BE LIMITED TO 10 LF FROM THE EDGE OF PROPOSED GRADING.
4. FINALIZE GRADING AROUND THE BASE OF TURBINES IN ACCORDANCE WITH DETAIL TS-03 AND TS-04.
5. GRADE ALL PROPOSED ROADS TO A MAXIMUM SLOPE OF 8%. IF 8% SLOPE CANNOT BE ACHIEVED, THE CONTRACTOR MAY UTILIZE ASSIST VEHICLES FOR THE PURPOSE OF DELIVERIES. GRADE ALL PROPOSED CRANE PATHS TO A MAXIMUM OF 8% UNLESS OTHERWISE NOTED IN PLAN SHEETS.
6. ANY FACILITIES REMOVED TO ALLOW FOR CONSTRUCTION (MAILBOXES, SIGNS, FENCES, ETC.) SHALL BE REPLACED BY THE CONTRACTOR IN A CONDITION AS GOOD AS EXISTING.
7. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING DRAINAGE THROUGHOUT THE CONSTRUCTION OF THIS PROJECT. CONSTRUCTION ACTIVITIES SHALL NOT BLOCK THE NATURAL OR MANMADE CREEKS OR DRAINAGE SWALES CAUSING RAINWATER TO POND. DEPENDING ON FIELD CONDITIONS, ADDITIONAL CULVERTS IN EXCESS OF THOSE ON THE PLANS MAY BE REQUIRED.
8. WHILE BUILDING THE ROADS AND EXCAVATING THE TURBINE FOUNDATIONS, EXCESS SOIL WILL RESULT. THE CONTRACTOR SHALL DISPOSE OF THIS EXCESS SOIL IN AN APPROVED MANNER. EXCESS TOPSOIL SHALL BE DISTRIBUTED INTO A THIN LAYER ON LAND IMMEDIATELY ADJACENT TO WHERE THE TOPSOIL ORIGINATED. ALL EXCESS TOPSOIL TO BE WASTED ONSITE. WHILE DOING SO THE CONTRACTOR SHALL AVOID CAUSING RIDGES OR MOUNDS THAT WOULD MAKE IT DIFFICULT FOR STORM WATER RUNOFF TO DRAIN. THE FINAL SURFACE OF THE DISTURBED TOPSOIL SHALL BE SMOOTH AND FOLLOW THE NATURAL CONTOUR OF THE LAND.
9. THE CONTRACTOR SHALL NOTIFY SOUTH DAKOTA 811 AT LEAST 48 HOURS BEFORE EXCAVATION ACTIVITIES COMMENCE.
10. TEMPORARY INTERSECTION WIDENING SHALL, UPON COMPLETION OF ALL PROJECT CONSTRUCTION OR UPON NOTIFICATION OF THE ENGINEER, BE REMOVED AND THE AREA RESTORED TO ITS ORIGINAL LINES AND GRADES WITH TOPSOIL REPLACED, EXCEPT WHERE REQUESTED BY THE TOWNSHIP OR COUNTY TO PERMANENTLY REMAIN. DISTURBED AREAS OUTSIDE OF THE FINAL ROADWAY SHALL BE SEEDED AND MULCHED.
11. TURBINE SETBACKS ARE NOT IDENTIFIED ON THE CONSTRUCTION PLANS. IT SHALL BE THE RESPONSIBILITY OF THE OWNER AND CONTRACTOR TO ENSURE THAT ALL TURBINE SETBACKS MEET PROJECT REQUIREMENTS.
12. GEOTECHNICAL REPORTS WITH RECOMMENDATIONS HAVE BEEN PROVIDED BY THE OWNER. ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL ENGINEERING REPORT AND RECOMMENDATIONS.
13. FIELD SURVEY WETLAND INFORMATION HAS BEEN PROVIDED BY THE OWNER. ALL WETLAND DELINEATIONS AND PERMITTING SHALL BE THE RESPONSIBILITY OF OTHERS AND BE COMPLETED PRIOR TO CONSTRUCTION COMMENCING. THE OWNER AND GENERAL CONTRACTOR SHALL VERIFY THAT ALL WETLAND PERMITS HAVE BEEN SUBMITTED AND APPROVED PRIOR TO CONSTRUCTION COMMENCING.
14. CULTURAL RESOURCE REPORTS HAVE NOT BEEN PROVIDED. CULTURAL RESOURCE LOCATIONS ARE NOT SHOWN ON THE PLANS. INFORMATION WILL BE THE RESPONSIBILITY OF THE OWNER AND GENERAL CONTRACTOR. THE LOCATIONS OF CULTURAL RESOURCE SITES MAY BE CONFIDENTIAL AND PROTECTED BY STATE OR FEDERAL LAW. PUBLIC RELEASE OF SPECIFIC INFORMATION REGARDING THESE RESOURCES MAY BE RESTRICTED.
15. AN ENVIRONMENTAL ASSESSMENT HAS NOT BEEN PROVIDED. THE CONTRACTOR SHALL BE FAMILIAR WITH THE REPORT AND REVIEW ALL RECOMMENDATIONS.
16. ELECTRICAL INFORMATION SHOWN ON THE PLANS IS FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSULTANT'S PLANS FOR SPECIFIC LOCATIONS AND CONSTRUCTION DETAILS FOR THE UNDERGROUND POWER COLLECTION SYSTEM AND SUBSTATION.
17. CRANE PATHS ARE SHOWN ON THE CONSTRUCTION PLANS. IF THE CONTRACTOR PROPOSES ALTERNATE CRANE PATHS, THEY SHALL ENSURE THAT WETLAND AND CULTURAL RESOURCE CORRIDORS ARE NOT DISTURBED. FINAL CRANE PATH ALIGNMENTS SHALL BE DETERMINED BY THE CONTRACTOR BASED ON FIELD CONDITIONS WITHIN THE WETLAND AND CULTURAL RESOURCE CORRIDORS, SPECIAL LANDOWNER AGREEMENTS AND THE PROJECT BOUNDARY.
18. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. DISTURBANCE SHALL BE LIMITED TO 50 LF WIDTH FOR PROPOSED ACCESS ROADS AND 50 LF FOR CRANE PATHS, AND SHALL BE LIMITED TO A 250 LF RADIUS FOR PROPOSED WIND TURBINE GENERATORS. THE GRADING LIMITS SHALL BE CENTERED ON THE ROADWAYS AND WIND TURBINES. THE CONTRACTOR SHALL MAKE ALL EFFORTS TO KEEP ACTIVITIES WITHIN THE ERECTION AREAS SHOWN ON THE PLANS BUT IT IS UNDERSTOOD THAT SOME ACTIVITIES THAT WILL NOT REQUIRE GRADING OR SOIL DISTURBANCE MAY EXTEND BEYOND THE DEFINED LIMITS. DURING ERECTION OF THE ROTOR, TRUCKS AND/OR FORKLIFTS MAY EXTEND BEYOND THESE LIMITS. SEE DETAIL TS01 FOR TYPICAL ERECTION AREAS.
19. AN ALTA SURVEY HAS BEEN PROVIDED BY WESTWOOD. CONTRACTOR AND OWNER ARE RESPONSIBLE FOR LOCATING ALL UTILITIES AND VERIFYING LOCATION OF CONSTRUCTION ACTIVITIES PRIOR TO COMMENCING WORK.

STORMWATER POLLUTION PREVENTION PLAN (SWPPP):

1. THE CONTRACTOR SHALL PROVIDE EROSION CONTROL MEASURES AS PLANNED AND SPECIFIED FOLLOWING BEST MANAGEMENT PRACTICES AS OUTLINED BY THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND BEING IN CONFORMANCE WITH THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL STORMWATER PERMIT.
2. REFER TO THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR THE TRIPLE H WIND FARM, PREPARED BY WESTWOOD PROFESSIONAL SERVICES, FOR EROSION CONTROL AND RESTORATION SPECIFICATIONS, SEDIMENT AND EROSION CONTROL PROCEDURES, LOCATIONS OF BMPs, DETAILS, AND INSPECTION INFORMATION.
3. ALL PASTURES AND DRAINAGE SWALES DISTURBED DURING CONSTRUCTION ACTIVITIES AND NOT COVERED BY ROAD SURFACING MATERIALS, SHALL BE SEEDED IN ACCORDANCE WITH THE SWPP PLAN.
4. TEMPORARY EROSION CONTROL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE TEMPORARY EROSION CONTROL PLAN SHALL BE IN ACCORDANCE WITH THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND THE TRIPLE H WIND FARM STORMWATER POLLUTION PREVENTION PLAN ON FILE.

PROJECT CONTACT INFORMATION:

TITLE	COMPANY	NAME	CONTACT NUMBER
OWNER (PRIMARY)	ENGIE	CASEY WILLIS	805-569-6185
PROJECT MANAGER	WESTWOOD	DANI NYGREN	952-906-7493
ENGINEER OF RECORD	WESTWOOD	ROB COPOULS	952-906-7470
CONTRACTOR	WANZEK	JASON HELLERUD	701-893-3685

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #300
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com

Westwood Professional Services, Inc.

Designed: BMK
Checked: DPN
Drawn: BMK
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK
A MasTec Company

2028 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 12 OF 57

0014440DTP.dwg

©2019 Westwood Professional Services, Inc.

CEMENT STABILIZATION - PROCEDURE

THE SPECIFICATIONS BELOW ARE GENERAL RECOMMENDATIONS/GUIDELINES FOR CEMENT STABILIZATION OF SUBGRADES FOR THE PROJECT. ACTUAL FIELD CONDITIONS MAY ALTER APPLICATION RATE. CONSULT GEOTECHNICAL ENGINEER FOR FURTHER RECOMMENDATIONS.

1. STRIP THE TOP ±4 INCHES OF TOPSOIL (THROUGH THE ROOT ZONE) FROM THE AREA TO BE STABILIZED. ROOTS SMALLER THAN 1/4" DIAMETER ARE CONSIDERED INSIGNIFICANT.
2. PERFORM A PROCTOR (ASTM D 698) TEST TO DETERMINE THE OPTIMUM MOISTURE CONTENT IF THE MATERIAL TO BE STABILIZED DOES NOT MATCH A PREVIOUSLY PERFORMED PROCTOR.
3. DETERMINE THE IN-SITU MOISTURE CONTENT USING A NUCLEAR DENSITY GAUGE (OR EQUIVALENT MOISTURE CONTENT TEST) DAILY, PRIOR TO INCORPORATION OF THE CEMENT. PROVIDE ADDITIONAL MOISTURE CONTENT TESTING AS NEEDED BASED ON WEATHER CONDITIONS.
   - 3.1. THE CONTRACTOR WILL BE ADVISED OF IN-SITU MOISTURE CONTENT, AND MOISTURE ADJUSTMENTS SHOULD BE MADE IF IN-SITU MOISTURE IS LESS THAN OPTIMUM MOISTURE CONTENT AS DETERMINED BY THE PROCTOR (ASTM D 698).
4. SOIL AND CEMENT BLENDING:
   - 4.1. COMPLETELY BLEND SUBGRADE SOIL WITH THE APPROPRIATE AMOUNT OF CEMENT BY WEIGHT. FIELD RESULTS FROM TEST STRIPS WILL DICTATE THE CEMENT APPLICATION RATE.
   - 4.2. IN AREAS OF HIGH MOISTURE OR POOR SOILS, THE CONTRACTOR MAY INCREASE THE PERCENT OF CEMENT IN ORDER TO MEET THE MINIMUM SUBGRADE STRENGTH REQUIREMENTS.
   - 4.3. THE USE OF A RECLAIMER IS AN ADEQUATE BLENDING METHOD. DISCING IS NOT AN ADEQUATE BLENDING METHOD.
   - 4.4. A STABILIZATION DEPTH OF 12" WAS USED FOR DESIGN PURPOSES. STABILIZATION DEPTH MAY NEED TO INCREASE TO 16" IN AREAS OF EXTREME MOISTURE OR POOR SOILS IN ORDER TO MEET THE STRENGTH AND PROOF ROLL REQUIREMENTS.
5. COMPACTION:
   - 5.1. A ROLLING PATTERN WILL BE ESTABLISHED USING A NUCLEAR DENSITY GAUGE DURING COMPACTION.
     - 5.1.1. COMPACTION WILL BE PERFORMED UNTIL THE STABILIZED MATERIAL REACHES THE "BREAK POINT" AFTER WHICH ADDITIONAL PASSES WITH A ROLLER RESULTS IN A LOSS OF DENSITY AS MEASURED BY A NUCLEAR DENSITY GAUGE.
     - 5.1.2. COMPACTION IS TYPICALLY ACHIEVED BY MULTIPLE PASSES OF A PADFOOT ROLLER UNTIL THE ROLLER "WALKS" OUT OF THE RECLAIMED MATERIAL (SPACE IS VISIBLE BETWEEN THE DRUM AND THE RECLAIMED MATERIAL). THIS IS FOLLOWED BY BLADING AND SHAPING THE RECLAIMED MATERIAL TO FINAL PROFILE AND CROSS SECTION, REMOVING HIGH AND LOW POINTS. SMOOTH DRUM OR RUBBER TIRE ROLLERS ARE THEN USED TO FINISH ROLLING (THIS IS WHEN THE DENSITY TESTS ARE PERFORMED) UNTIL THE DENSITY OF THE MATERIAL REACHES THE "BREAK POINT."
     - 5.1.3. THE NUMBER OF PASSES AND EQUIPMENT USED TO REACH THE "BREAK POINT" IS CONSIDERED THE ROLLING PATTERN.
     - 5.1.4. A NEW ROLLING PATTERN MAY NEED TO BE ESTABLISHED IF THE PERFORMANCE REQUIREMENTS ARE NOT BEING MET. THIS MAY BE DUE TO CHANGES IN THE MOISTURE CONTENT, THE SOIL TYPE, OR THE CEMENT RATE.
   - 5.2. THE TARGET DENSITY IS 98% OF THE MAXIMUM DENSITY DETERMINED FROM THE ROLLING PATTERN.
     - 5.2.1. DENSITY TESTS SHALL BE TAKEN AT THE RATE OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER TO CONFIRM THE DENSITY IS MATCHING THE TARGET. ONCE THE ROLLING PATTERN HAS BEEN CONFIRMED IT IS RECOMMENDED THAT TESTING CONTINUE AT 1 TEST PER 1,000 LF IN EACH PASS OF THE RECLAIMER.
     - 5.2.2. IF IT IS NOT POSSIBLE TO ATTAIN THE TARGET DENSITY, AND ADDITIONAL COMPACTION DOES NOT IMPROVE THE DENSITY, A NEW ROLLING PATTERN SHOULD BE ESTABLISHED.
   - 5.3. THE AIR TEMPERATURE SHALL BE ABOVE 40 DEGREES (F) DURING THE CEMENT STABILIZATION PROCESS. MIXING CEMENT INTO FROZEN GROUND IS NOT ACCEPTABLE.
6. THE STABILIZED MATERIAL SHALL BE CONTINUOUSLY WET CURED FOR A MINIMUM OF 24 HOURS (WET CURED IS IDENTIFIED VISUALLY AS DAMP SURFACE).
7. PERFORM SUBGRADE TESTING IN ACCORDANCE WITH TESTING SCHEDULE.
8. AGGREGATE PLACEMENT:
   - 8.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 8.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 8.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

CEMENT STABILIZATION - DESIGN BASIS

1. DURING INITIAL CONSTRUCTION, CONTRACTOR SHALL CONSTRUCT MINIMUM 300 LF TEST STRIPS CONTAINING 4%, 5%, AND 6% CEMENT IN ACCORDANCE WITH CEMENT STABILIZATION PROCEDURES.
2. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 3 FOR ANTICIPATED RESULTS):
   - 2.1. PERFORM INITIAL SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M BETWEEN 4 TO 6 HOURS AFTER FINAL COMPACTION.
   - 2.2. PERFORM ADDITIONAL DCP TESTING AT 24 AND 48 HOURS AFTER FINAL COMPACTION.
   - 2.3. PERFORM SUBSEQUENT DCP TESTS AT 7 DAYS AFTER FINAL COMPACTION AS VERIFICATION OF STRENGTH CURVE.
   - 2.4. A MINIMUM OF 3 TESTS PER TEST SECTION PER TIMEFRAME IS REQUIRED. TESTS SHALL BE TAKEN AT THE CENTERLINE AND 2' FROM EACH SHOULDER.
   - 2.5. RECORD DCP TEST RESULTS EVERY 6 INCHES TO TOTAL DEPTH OF 12 INCHES.

TABLE 3: TEST STRIP CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	COMPRESSIVE STRENGTH (PSF)
4 – 6 HOURS	6	3	1,800
24 HOURS	10	7	2,300
48 HOURS	15	10	3,300
7 DAYS	30	21	5,200

CEMENT STABILIZATION - PRODUCTION

1. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 5 FOR SUMMARY OF TESTING REQUIREMENTS):
   - 1.1. PERFORM SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M NO SOONER THAN 24 HOURS AFTER FINAL COMPACTION.
   - 1.2. DCP TESTING FREQUENCY SHALL BE WITH A RANDOM SPACING AND A MINIMUM OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER. A MINIMUM OF 3 TESTS PER ROAD IS REQUIRED.
   - 1.3. THE CBR OF THE STABILIZED SUBGRADE SHOULD BE CALCULATED IN 6" INCREMENTS THROUGH THE ENTIRE DEPTH OF THE STABILIZED LAYER.
   - 1.4. THE MINIMUM REQUIRED CBR PRIOR TO PROOF-ROLLING IS PROVIDED IN TABLE 4 BELOW:

TABLE 4: FINAL CEMENT STABILIZED CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	UNDRAINED SHEAR STRENGTH (PSF)	BEARING CAPACITY (PSF)
24 – 48 HOURS	15	10	3,500	9,800
3 – 7 DAYS	30	21	7,000	18,000
28 DAYS	50	33	12,000	28,500

NOTE: UNDRAINED SHEAR STRENGTH WAS CALCULATED USING THE BLACK (1961) EQUATION. BEARING CAPACITY WAS CALCULATED USING THE HEISE EQUATION MODIFIED FOR TWO LAYERS (12" CEMENT STABILIZED SUBGRADE OVER A NATURAL SUBGRADE WITH A CBR OF 1.5)

   - 1.5. ONCE THE MINIMUM REQUIRED CBR IS ACHIEVED AT ANY CORRESPONDING TIME PERIOD, THE SUBGRADE IS CONSIDERED ADEQUATE AND THE CONTRACTOR MAY PROCEED WITH PROOF-ROLL TESTING. FUTURE DCP TESTING ON THAT SEGMENT OF SUBGRADE IS NOT REQUIRED.
   - 1.6. IF TESTING DOES NOT INDICATE A CBR OF 30 WITHIN 7 DAYS, ADDITIONAL GRAVEL SURFACING AND/OR THE ADDITION OF GEOTEXTILE FABRIC MAY BE REQUIRED. FOR FUTURE SUBGRADE STABILIZATION AREAS, CONTACT THE ENGINEER AND OWNER VIA RFI FOR RECOMMENDATIONS AND APPROVAL.
2. SUBGRADE PROOF-ROLL TESTING AND ACCEPTANCE:
   - 2.1. ONCE THE REQUIRED DCP VALUE HAS BEEN OBTAINED BUT PRIOR TO PLACING AGGREGATE, THE SUBGRADE SHALL BE PROOF-ROLLED. REFER TO THE PROJECT TESTING REQUIREMENTS FOR PROOF-ROLL DEFINITION.
   - 2.2. PROOF-ROLLING SHOULD BE PERFORMED WITH ONE PASS DOWN THE CENTER AND NOT BE PERFORMED WITHIN 12 INCHES OF THE EDGE OF THE STABILIZED SECTION.
   - 2.3. IF PROOF-ROLLING FAILS, RE-STABILIZATION MAY BE REQUIRED AND A NEW ROLLING PATTERN OR ADDITIONAL CEMENT MAY BE REQUIRED.
3. AGGREGATE PLACEMENT:
   - 3.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 3.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 3.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

TABLE 5: CEMENT STABILIZATION PRODUCTION TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
COMPACTED SUBGRADE (CEMENT STABILIZED)	PROCTOR	MINIMUM 1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER 1000 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
NOTE: SEE ABOVE FOR INITIAL TESTING REQUIREMENTS	DCP TEST	1 PER 500 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
	PROOF-ROLL (AFTER PASSING DCP TESTS)	ENTIRE LENGTH

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (866) 937-5150 westwoodps.com

Westwood Professional Services, Inc.

Designed: SMC
Checked: DJH
Drawn: SMC
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	50% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 13 OF 57

0014440DP.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 331st Street in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 2627' South of 331st Street & 204th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.25'05.25" W Long. -99.32'33.88" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 000998 NW4 18-111-72
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Taya L Lane — Robert Bawdon

Signature of Applicant — Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 331st Street in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 2627' South of 331st Street & 204th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.25'05.25" W Long. -99.32'33.88" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 000998 NW4 18-111-72
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: _____

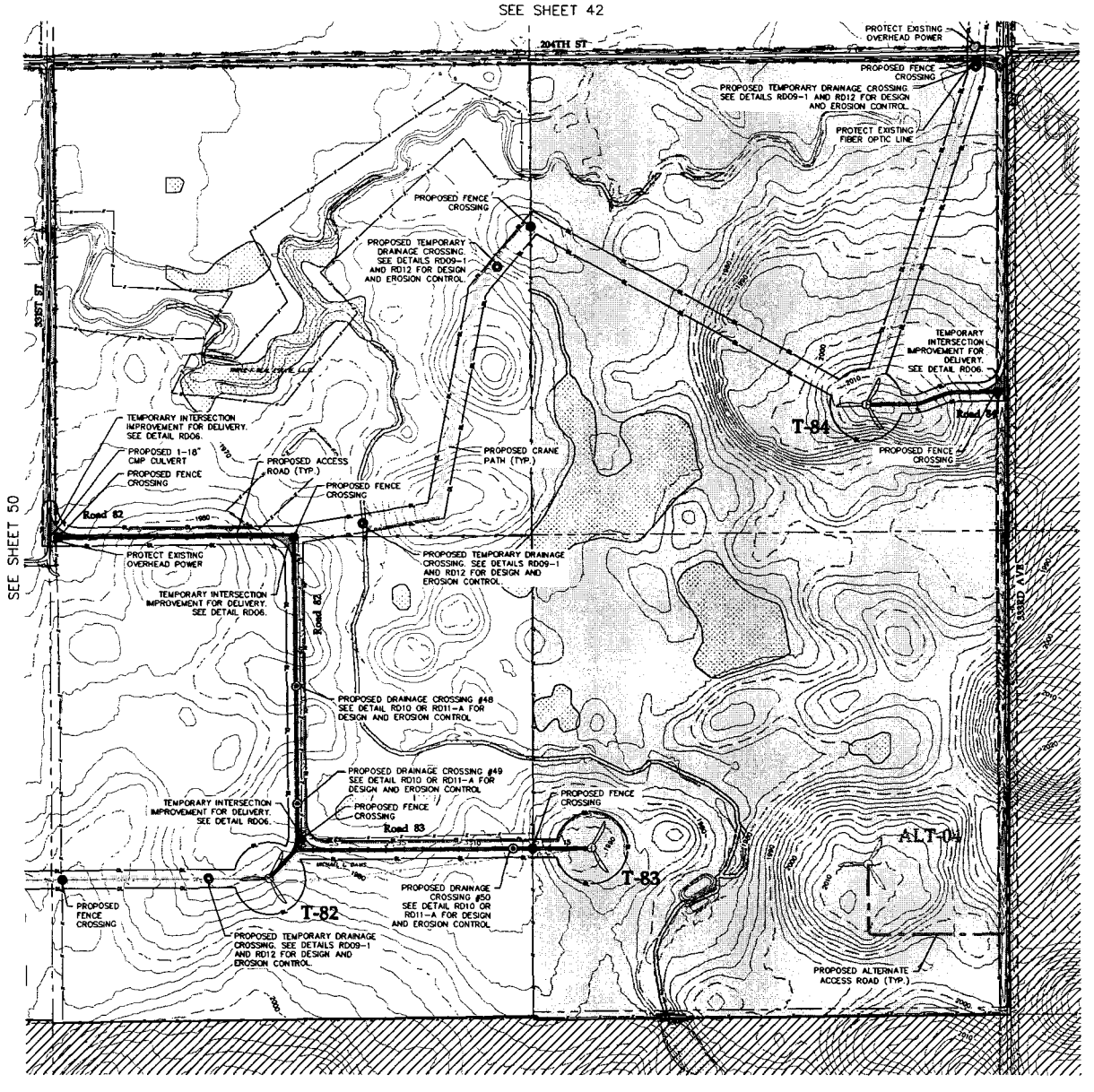
Tayja L Lane
Signature of Applicant

Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

©2019 Westwood Professional Services, Inc.



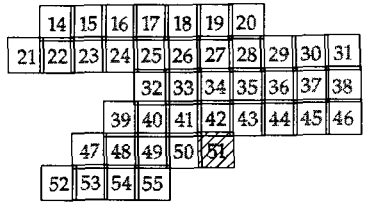
LEGEND:

- PROPOSED TURBINE LOCATION
- T-XX — PROPOSED TURBINE NUMBER
- PROPOSED ALTERNATE TURBINE LOCATION
- ALT-XX — PROPOSED ALTERNATE TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED ALTERNATE ACCESS ROAD
- PROPOSED CRANE PATH
- PROPOSED UNDERGROUND COLLECTION*
- PROPOSED DISTURBANCE LIMITS
- PROPOSED PERIMETER SEDIMENT CONTROL
- EXISTING 10' CONTOURS
- EXISTING 2' CONTOURS
- EXISTING GRAVEL EDGE
- EXISTING BITUMINUS EDGE
- EXISTING RIGHT-OF-WAY
- EXISTING PARCEL LINE
- EXISTING BUILDING
- EXISTING FENCE
- EXISTING OVERHEAD POWER
- EXISTING HIGH VOLTAGE OVERHEAD POWER
- EXISTING UNDERGROUND POWER LINE
- EXISTING FIBER OPTIC LINE
- EXISTING WATER LINE
- DELINEATED WETLAND
- ARCHAEOLOGICAL AVOIDANCE AREA
- EXISTING USFWS EASEMENT
- PROJECT BOUNDARY
- 1900 — EXISTING GROUND ELEVATION
- PROPOSED DRAINAGE CROSSING**
- PROPOSED TEMPORARY DRAINAGE CROSSING**
- PROPOSED FENCE CROSSING***
- PROPOSED UTILITY CROSSING
- PROPOSED CULVERT

* PROVIDED BY OTHERS AND SHOWN FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSTRUCTION PLANS FOR DETAILS.

** SEE SHEET 11 FOR DRAINAGE CROSSING TYPE AND SIZING. DRAINAGE CROSSINGS SHALL CONSIST OF LOW WATER CROSSING OR CULVERT. DRAINAGE CROSSINGS ALONG CRANE PATH SHALL CONSIST OF CRANE MATS OR TEMPORARY CULVERT.

*** ALL GATE INSTALLATIONS SHALL BE FIELD DETERMINED AND AGREED UPON BY THE CONTRACTOR AND OWNER.



KEY MAP

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwood@westwoodps.com
Westwood Professional Services, Inc.

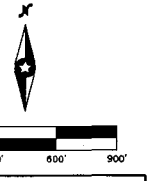
Designed:	SMK
Checked:	RJH
Drawn:	SMK
As-Built Drawing:	

Revision #	Date	Description
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2028 2nd Avenue NW
West Fargo, ND 58078



Triple H Wind Farm

Hyde County, South Dakota

Site Plan T-82 - T-84, A04

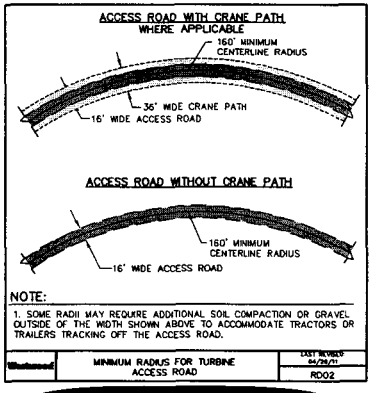
90% COMPLETE NOT FOR CONSTRUCTION

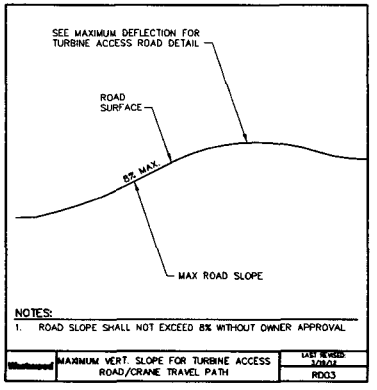
Date: 07/19/19

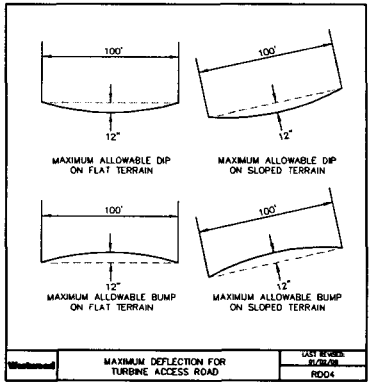
Sheet: 51 OF 57

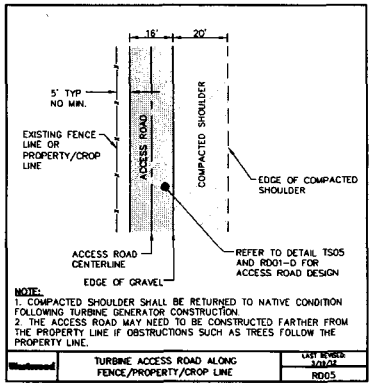
001444SP01.dwg

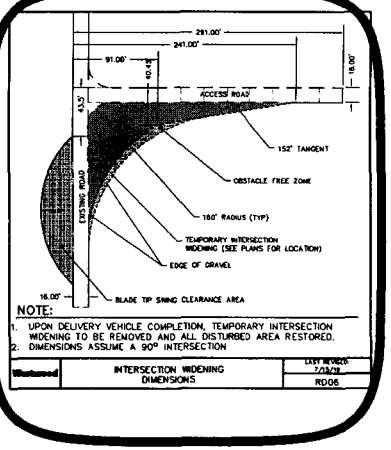
©2019 Westwood Professional Services, Inc.

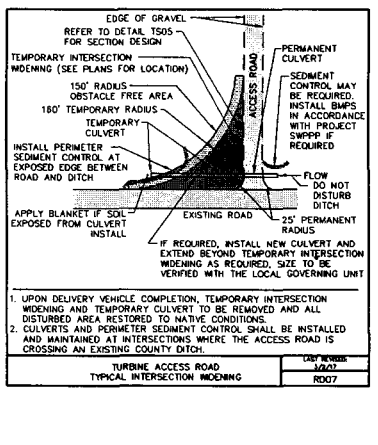


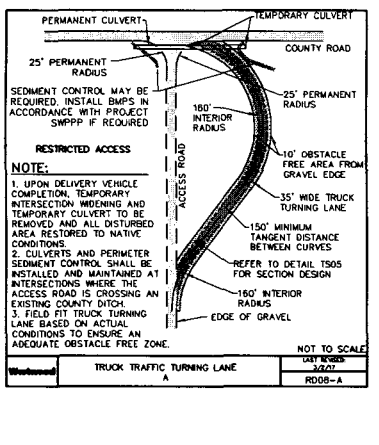


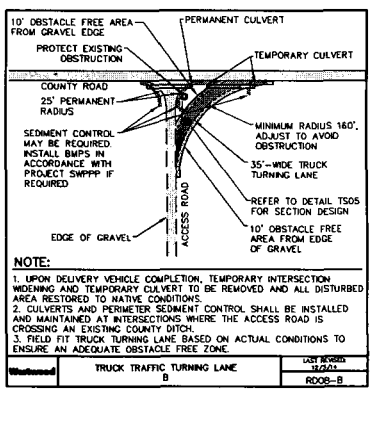












Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 info@westwoodps.com
Westwood Professional Services, Inc.

Designed: BMC
Checked: DJH
Drawn: BMC
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/08/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

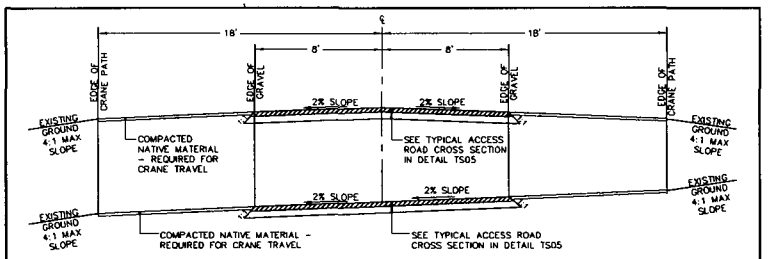
Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 5 OF 57

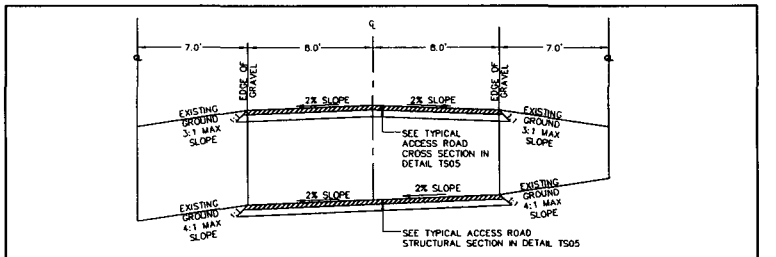
0014440DTP.dwg

© 2019 Westwood Professional Services, Inc.



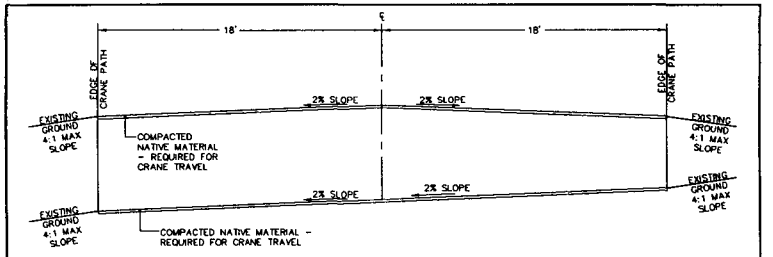
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE ACCESS ROAD DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

Westwood | TYPICAL TURBINE ACCESS ROAD AND CRANE PATH | LAST REVISED: 04/29/19 | RD01-A



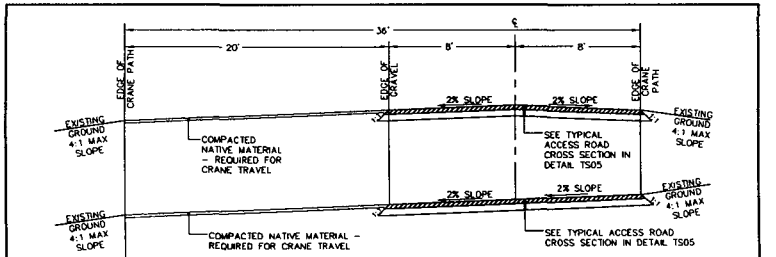
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

Westwood | TYPICAL TURBINE ACCESS ROAD SECTION | LAST REVISED: 3/15/19 | RD01-B



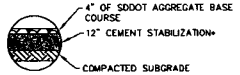
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE WHERE CRANE PATHS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT CRANE PATH REMAINS WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%

Westwood | TYPICAL CRANE PATH | LAST REVISED: 04/29/19 | RD01-C

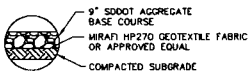


NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE EDGE OF COMPACTED SHOULDER DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

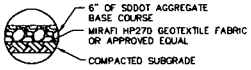
Westwood | TYPICAL TURBINE ACCESS ROAD AND OFFSET CRANE PATH | LAST REVISED: 04/29/19 | RD01-D



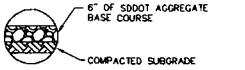
PRIMARY ACCESS ROAD CROSS SECTION*



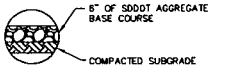
SECONDARY TURBINE ACCESS ROAD CROSS SECTION



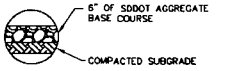
SPUR ROAD / MET TOWER ROAD CROSS SECTION



TEMPORARY TURNING IMPROVEMENTS CROSS SECTION



GRAVEL RING CROSS SECTION



LAYDOWN YARD CROSS SECTION

* CEMENT APPLICATION RATE MAY VARY BASED ON TEST STRIPS AND FIELD PERFORMANCE. SEE SHEET 13 FOR CEMENT STABILIZATION PROCEDURE AND DESIGN BASIS.

NOTES:
STRUCTURAL SECTIONS SHOWN ARE THE MINIMUM THICKNESS REQUIREMENTS DURING NORMAL FIELD CONDITIONS. THE SECTIONS MAY NEED TO BE INCREASED BASED ON ACTUAL FIELD CONDITIONS AT THE TIME OF CONSTRUCTION. CONDITIONS INCLUDE BUT ARE NOT LIMITED TO CONSTRUCTION DURING THE FREEZE/THAW CYCLE, UNUSUALLY WET PERIODS, OR IN LOW/WET AREAS. SEE SHEET 12 FOR TESTING REQUIREMENTS AND SPECIFICATIONS.

Westwood | TYPICAL STRUCTURAL CROSS SECTIONS

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-free (800) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: DJH
Drawn: BMK
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2338 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 4 OF 57

001444DTP.dwg

©2019 Westwood Professional Services, Inc.

ROAD DESIGN PARAMETERS

1. ACCESS ROADS HAVE BEEN DESIGNED TO ACCOMMODATE LIGHT DUTY TRUCKS (PICKUP TRUCKS AND MAINTENANCE VEHICLES) FOR LOW VOLUME USE IN NORMAL OPERATING CONDITIONS AS WELL AS HEAVY DUTY CONSTRUCTION TRAFFIC UNDER DRY CONDITIONS. THE ROAD DESIGN SPECIFIED IS NOT INTENDED FOR ALL WEATHER USE FOR HEAVY DUTY CONSTRUCTION LOADS.
2. ROAD MAINTENANCE CAN BE EXPECTED OVER THE LIFE OF THE PERMANENT FACILITY.

PRODUCTS

1. AGGREGATE BASE SHALL CONSIST OF SDDOT AGGREGATE BASE COURSE (AND IN CONFORMANCE WITH THE GRADATION TABLE 1), AGGREGATE MAY BE CRUSHER RUN UPON ENGINEERS APPROVAL. AGGREGATE GRADATIONS SHALL BE SUBMITTED TO ENGINEER FOR REVIEW.
2. ROAD SHOULDERS AND CRANE PADS SHALL CONSIST OF COMPACTED NATIVE SOILS.
3. CULVERTS: ACCESS ROAD CULVERTS SHALL MEET THE MINIMUM SPECIFICATIONS SET FORTH BY THE SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION AND/OR HYDE COUNTY. ALL CULVERTS ARE PLANNED TO BE A MINIMUM 18" DIAMETER AND MANUFACTURED OF 16-GAGE CORRUGATED METAL PIPE WITH NO END TREATMENTS UNLESS NOTED OTHERWISE. ACTUAL SIZE WILL BE DETERMINED THROUGH HYDRAULIC ANALYSIS.
4. GEOTEXTILE FABRIC: MIRAFI HP270 OR APPROVED EQUAL.

EXECUTION

1. CLEARING AND GRUBBING
   A. THE CONTRACTOR SHALL BE REQUIRED TO GRUB ALL TREES, STUMPS, BRUSH, AND DEBRIS WITHIN THE GRADING AREAS SHOWN ON THE PLANS. GRUBBING INCLUDES REMOVAL OF ALL PLANT MATERIAL GREATER THAN 2" INCLUDING STUMPS, BRANCHES, ROOTS, ETC. TO A DEPTH BELOW THE FINAL SUBGRADE. THE CONTRACTOR IS TO REMOVE ONLY THOSE TREES WHICH ARE DESIGNATED BY THE OWNER'S REPRESENTATIVE FOR REMOVAL, AND SHALL EXERCISE EXTREME CARE AROUND EXISTING TREES TO BE SAVED.
2. TOPSOIL STRIPPING
   A. TOPSOIL, INCLUDING ROOTS LARGER THAN 2" AND LARGE ROOT MASSES, SHALL BE STRIPPED FROM ALL ROADWAY AND FOUNDATION AREAS UP TO 10". TOPSOIL SHALL NOT BE STRIPPED OUTSIDE OF THE DESIGNATED DISTURBANCE AREAS.
   B. ANY TOPSOIL THAT HAS BEEN STRIPPED SHALL BE STOCKPILED FOR POST CONSTRUCTION REVEGETATION. ALL TOPSOIL SHALL BE REDISTRIBUTED TO THE LAND OWNER'S PROPERTY OF WHERE IT ORIGINATED FROM.
3. FILL PLACEMENT
   A. FILL PLACEMENT SHALL CONSIST OF THE PLACING OF SUITABLE FILL MATERIAL, AFTER TOPSOIL STRIPPING, ABOVE THE EXISTING GRADE. GENERALLY, SIDE SLOPES SHALL BE CONSTRUCTED AT FOUR FOOT HORIZONTAL TO ONE FOOT VERTICAL, WITH SOME LOCATIONS THROUGHOUT THE PROJECT WITH SLOPES OF TWO FEET HORIZONTAL TO ONE FOOT VERTICAL. THE MATERIAL FOR FILL CONSTRUCTION SHALL BE OBTAINED FROM THE ACCESS ROAD/TURBINE EXCAVATION (SEE GEOTECHNICAL REPORT FOR RESTRICTIONS), OR ANY SUITABLE, APPROVED SOIL OBTAINED ONSITE/OFFSITE BY CONTRACTOR, AS DIRECTED OR APPROVED BY THE ENGINEER. THIS MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 12" AND CONSTRUCTED TO 95% OF THE MAXIMUM DRY DENSITY AND WITHIN 2% OF OPTIMUM MOISTURE CONTENT, AS DETERMINED BY THE STANDARD PROCTOR (AASHTO T99).
   B. SIDE SLOPES GREATER THAN 4:1 WILL NOT BE PERMITTED, UNLESS OTHERWISE NOTED ON THE PLAN.
   C. FILL SLOPES SHALL BE BENCHED INTO THE EXISTING SLOPE TO PREVENT MOVEMENT BETWEEN THE FILL AND NATIVE SOILS. BENCHES SHOULD BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO FILL PLACEMENT. POSITIVE DRAINAGE IS REQUIRED AT BENCHED AREAS AND AT THE TOE OF FILL SLOPES TO REMOVE SURFACE WATER.
4. SUBGRADE
   A. SUBGRADE PREPARED AT GRADE OR IN CUT REQUIRES SCARIFICATION AND RECOMPACTION TO A DEPTH OF 12" OR MORE.
   B. ACCESS ROAD CROSS SLOPES SHOWN IN THE PLANS ARE MEANT AS A GUIDE. ACCESS ROAD CROSS SLOPES MAY RANGE FROM 1% - 2%, CHECK WITH THE ENGINEER IF THE CROSS SLOPE FALLS OUTSIDE OF THIS RANGE. ACCESS ROADS BEING UTILIZED FOR CRANE TRAVEL SHOULD HAVE A MAX CROSS SLOPE OF 2%.

TABLE 1: SDDOT AGGREGATE BASE COURSE - LOCALLY SOURCED	
SIEVE SIZE	PERCENT PASSING
1"	100
3/4"	80-100
1/2"	68-91
NO. 4	46-70
NO. 8	34-58
NO. 40	13-35
NO. 200	3-12

MEET FOLLOWING REQUIREMENTS PER 882.2

LIQUID LIMIT (MAX) = 25
PLASTICITY INDEX = 0-6
L.A ABRASION (% MAX) = 40%

GRADATION HAS BEEN OBTAINED FROM THE 2015 SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION BOOK.

STORM WATER DESIGN PARAMETERS

1. SEE SHEET 6 FOR CULVERT SIZING AND DESIGN PARAMETERS. SEE HYDROLOGY MEMO FOR FURTHER DESIGN CALCULATIONS. CULVERTS SHALL BE MINIMUM 18" CORRUGATED METAL PIPE. ALL TEMPORARY PORTIONS OF THE INSTALLED CULVERTS SHALL BE REMOVED UPON COMPLETION OF THE PROJECT.
2. IT IS EXPECTED THAT CULVERTS WILL BE OVERTOPPED DURING SOME STORMS AND MAINTENANCE WILL BE REQUIRED THROUGH THE LIFE OF THE PROJECT.
3. WHEN INSTALLING DRAINAGE CULVERTS THE CONTRACTOR SHALL USE JUDGMENT IN SETTING THE FLOW LINE ELEVATIONS AND CULVERT LONGITUDINAL SLOPE. TYPICALLY THE FLOW LINE ELEVATIONS AND LONGITUDINAL SLOPE OF THE CULVERT SHOULD MATCH THE NATURAL GROUND ELEVATIONS AND SLOPE TO ENSURE POSITIVE DRAINAGE. WHEN POSSIBLE, ALL CULVERTS SHOULD BE PLACED AT A MINIMUM 0.5% GRADE.
4. ANTICIPATED CULVERT CROSSINGS ARE SHOWN ON THE CONSTRUCTION PLAN, ADDITIONAL CULVERTS MAY NEED TO BE INSTALLED IN AREAS WHERE CONCENTRATED FLOW IS EXPECTED DUE TO CONSTRUCTION ACTIVITIES.
5. CONSTRUCTION DRAINAGE CROSSINGS TO MAINTAIN EXISTING FLOW CHARACTERISTICS OF THE FEATURES. FEATURES SHALL BE GRADED TO PRECONSTRUCTION CONTOURS.

TESTING:

1. TESTING SHALL BE PERFORMED BY A DESIGNATED INDEPENDENT TESTING AGENCY.
2. SUBMIT ONE SET OF TESTING AND INSPECTION RECORDS SPECIFIED TO THE CIVIL ENGINEER OF RECORD.

DEFINITIONS:

1. PROOF ROLLING:
   SHALL BE PERFORMED IN THE PRESENCE OF THE GEOTECHNICAL ENGINEER OR QUALIFIED GEOTECHNICAL REPRESENTATIVE USING A FULLY LOADED TANDEM AXLE DUMP TRUCK OR WATER TRUCK WITH A MINIMUM GROSS WEIGHT OF 25 TONS OR A FULLY LOADED BELLY DUMP WITH AN EQUIVALENT AXLE LOADING. PROOF-ROLLING ACCEPTANCE STANDARDS INCLUDE NO RUTTING GREATER THAN 1.5 INCHES, AND NO "PUMPING" OF THE SOIL BEHIND THE LOADED TRUCK.
2. SIEVE ANALYSIS:
   SHALL BE CONDUCTED IN ACCORDANCE WITH AASHTO T27
3. PROCTORS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T99
4. ATTERBERG LIMITS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T89 AND T90
5. MOISTURE DENSITY (NUCLEAR DENSITY):
   SHALL BE DONE IN ACCORDANCE WITH AASHTO T310
6. DYNAMIC CONE PENETROMETER (DCP) TESTING:
   SHALL BE DONE IN ACCORDANCE WITH ASTM D6951-03

REQUIREMENTS:

1. FILL PLACEMENT:
   A. SOILS USED AS FILL MATERIAL SHALL BE TESTED FOR MOISTURE CONTENT AND PROCTOR TESTS.
   B. WHERE FILL CONSTRUCTION REQUIRES MORE THAN 12 INCHES OF FILL PLACEMENT, COMPACT EACH LIFT TO A MINIMUM OF 95 PERCENT OF THE MATERIAL'S MAXIMUM STANDARD PROCTOR DRY DENSITY.
2. COMPACTED SUBGRADE (CEMENT STABILIZED):
   A. SEE SHEET 13 FOR TESTING REQUIREMENTS AND PROCEDURE.
3. COMPACTED SUBGRADE (NON-CEMENT STABILIZED):
   A. THE ENTIRE SUBGRADE SHALL BE PROOF-ROLLED PRIOR TO THE PLACEMENT OF THE AGGREGATE BASE TO IDENTIFY AREAS OF UNSTABLE SUBGRADE.
   B. PERFORM A MINIMUM OF 3 DYNAMIC CONE PENETROMETER (DCP) TESTS PER ACCESS ROAD OR ONE FOR EVERY 1,000 LF OF ROAD, WHICHEVER IS GREATER. SUBGRADE MUST MEET A MINIMUM DCP OF 3 BLOWS PER 6" TO A TOTAL DEPTH OF 2' (MINIMUM CBR=1.5).
   C. IF A PASSING PROOF-ROLL OR DCP REQUIREMENTS CANNOT BE ACHIEVED THE FOLLOWING ALTERNATIVES MAY BE IMPLEMENTED:
      a. SCARIFY, DRY, AND RECOMPACT SUBGRADE
      b. REMOVE UNSUITABLE MATERIAL AND REPLACE WITH SUITABLE MATERIAL
      c. INCREASE AGGREGATE BASE THICKNESS
4. AGGREGATE BASE:
   A. AGGREGATE BASE SHALL BE PROOF-ROLLED OVER THE ENTIRE LENGTH. IF PROOF ROLLING DETERMINES THAT THE ROAD IS UNSTABLE, ADDITIONAL AGGREGATE SHALL BE ADDED UNTIL THE UNSTABLE SECTION IS ABLE TO PASS A PROOF ROLL.
   B. PROVIDE 1 SIEVE ANALYSIS (PROJECT MAX OF 20) PER 2500 CY OF ROAD BASE PLACED.
5. CRANE PAD AND CRANE PATHS / CRANE TRAVEL SHOULDERS:
   A. TESTING REQUIREMENTS ARE PENDING BASED ON CRANE PICK PLANS PROVIDED BY THE CONTRACTOR.

TABLE 2: TESTING SCHEDULE SUMMARY		
LOCATION	TEST	FREQUENCY
FILL PLACEMENT	PROCTOR	1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER LIFT PER 5000 SF OF FILL PLACED OR 1 PER 500 LF OF ROAD OR CRANE WALK
COMPACTED SUBGRADE (CEMENT STABILIZED):	SEE SHEET 13	SEE SHEET 13
COMPACTED SUBGRADE (NON-CEMENT STABILIZED):	PROOF-ROLL	ENTIRE AREA
	DCP	1 PER 1,000 FT OR MIN. 3 PER ROAD
AGGREGATE BASE	PROOF-ROLL	ENTIRE AREA
	SIEVE ANALYSIS, LL, PL, AND L.A ABRASION	1 PER 2,500 CY

GENERAL NOTES:

1. GROUND SURFACE CONTOURS (AT TWO-FOOT VERTICAL INTERVALS) AND ELEVATIONS ARE BASED ON A PHOTOGRAMMETRY SURFACE PROVIDED BY GEOTERRA. IF MAJOR DISCREPANCIES ARE FOUND IN THE GROUND ELEVATIONS DURING FIELD STAKING TO THE GROUND ELEVATIONS SHOWN ON THE PLANS, THE OWNER AND ENGINEER SHALL BE NOTIFIED.
2. WHERE SECTION OR SUBSECTION MONUMENTS ARE ENCOUNTERED, THE OWNER SHALL BE NOTIFIED BEFORE SUCH MONUMENTS ARE REMOVED. THE CONTRACTOR SHALL PROTECT AND CAREFULLY PRESERVE ALL PROPERTY MARKERS AND MONUMENTS UNTIL THE OWNER, AN AUTHORIZED SURVEYOR OR AGENT HAS WITNESSED OR OTHERWISE REFERENCED THEIR LOCATION.
3. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. TYPICAL DISTURBANCE SHALL BE LIMITED TO 10 LF FROM THE EDGE OF PROPOSED GRADING.
4. FINALIZE GRADING AROUND THE BASE OF TURBINES IN ACCORDANCE WITH DETAIL TS-03 AND TS-04.
5. GRADE ALL PROPOSED ROADS TO A MAXIMUM SLOPE OF 8%. IF 8% SLOPE CANNOT BE ACHIEVED, THE CONTRACTOR MAY UTILIZE ASSIST VEHICLES FOR THE PURPOSE OF DELIVERIES. GRADE ALL PROPOSED CRANE PATHS TO A MAXIMUM OF 8% UNLESS OTHERWISE NOTED IN PLAN SHEETS.
6. ANY FACILITIES REMOVED TO ALLOW FOR CONSTRUCTION (MAILBOXES, SIGNS, FENCES, ETC.) SHALL BE REPLACED BY THE CONTRACTOR IN A CONDITION AS GOOD AS EXISTING.
7. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING DRAINAGE THROUGHOUT THE CONSTRUCTION OF THIS PROJECT. CONSTRUCTION ACTIVITIES SHALL NOT BLOCK THE NATURAL OR MANMADE CREEKS OR DRAINAGE SWALES CAUSING RAINWATER TO POND. DEPENDING ON FIELD CONDITIONS, ADDITIONAL CULVERTS IN EXCESS OF THOSE ON THE PLANS MAY BE REQUIRED.
8. WHILE BUILDING THE ROADS AND EXCAVATING THE TURBINE FOUNDATIONS, EXCESS SOIL WILL RESULT. THE CONTRACTOR SHALL DISPOSE OF THIS EXCESS SOIL IN AN APPROVED MANNER. EXCESS TOPSOIL SHALL BE DISTRIBUTED INTO A THIN LAYER ON LAND IMMEDIATELY ADJACENT TO WHERE THE TOPSOIL ORIGINATED. ALL EXCESS TOPSOIL TO BE WASTED ONSITE. WHILE DOING SO THE CONTRACTOR SHALL AVOID CAUSING RIDGES OR MOUNDS THAT WOULD MAKE IT DIFFICULT FOR STORM WATER RUNOFF TO DRAIN. THE FINAL SURFACE OF THE DISTURBED TOPSOIL SHALL BE SMOOTH AND FOLLOW THE NATURAL CONTOUR OF THE LAND.
9. THE CONTRACTOR SHALL NOTIFY SOUTH DAKOTA 811 AT LEAST 48 HOURS BEFORE EXCAVATION ACTIVITIES COMMENCE.
10. TEMPORARY INTERSECTION WIDENING SHALL, UPON COMPLETION OF ALL PROJECT CONSTRUCTION OR UPON NOTIFICATION OF THE ENGINEER, BE REMOVED AND THE AREA RESTORED TO ITS ORIGINAL LINES AND GRADES WITH TOPSOIL REPLACED, EXCEPT WHERE REQUESTED BY THE TOWNSHIP OR COUNTY TO PERMANENTLY REMAIN. DISTURBED AREAS OUTSIDE OF THE FINAL ROADWAY SHALL BE SEEDED AND MULCHED.
11. TURBINE SETBACKS ARE NOT IDENTIFIED ON THE CONSTRUCTION PLANS. IT SHALL BE THE RESPONSIBILITY OF THE OWNER AND CONTRACTOR TO ENSURE THAT ALL TURBINE SETBACKS MEET PROJECT REQUIREMENTS.
12. GEOTECHNICAL REPORTS WITH RECOMMENDATIONS HAVE BEEN PROVIDED BY THE OWNER. ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL ENGINEERING REPORT AND RECOMMENDATIONS.
13. FIELD SURVEY WETLAND INFORMATION HAS BEEN PROVIDED BY THE OWNER. ALL WETLAND DELINEATIONS AND PERMITTING SHALL BE THE RESPONSIBILITY OF OTHERS AND BE COMPLETED PRIOR TO CONSTRUCTION COMMENCING. THE OWNER AND GENERAL CONTRACTOR SHALL VERIFY THAT ALL WETLAND PERMITS HAVE BEEN SUBMITTED AND APPROVED PRIOR TO CONSTRUCTION COMMENCING.
14. CULTURAL RESOURCE REPORTS HAVE NOT BEEN PROVIDED. CULTURAL RESOURCE LOCATIONS ARE NOT SHOWN ON THE PLANS. INFORMATION WILL BE THE RESPONSIBILITY OF THE OWNER AND GENERAL CONTRACTOR. THE LOCATIONS OF CULTURAL RESOURCE SITES MAY BE CONFIDENTIAL AND PROTECTED BY STATE OR FEDERAL LAW. PUBLIC RELEASE OF SPECIFIC INFORMATION REGARDING THESE RESOURCES MAY BE RESTRICTED.
15. AN ENVIRONMENTAL ASSESSMENT HAS NOT BEEN PROVIDED. THE CONTRACTOR SHALL BE FAMILIAR WITH THE REPORT AND REVIEW ALL RECOMMENDATIONS.
16. ELECTRICAL INFORMATION SHOWN ON THE PLANS IS FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSULTANT'S PLANS FOR SPECIFIC LOCATIONS AND CONSTRUCTION DETAILS FOR THE UNDERGROUND POWER COLLECTION SYSTEM AND SUBSTATION.
17. CRANE PATHS ARE SHOWN ON THE CONSTRUCTION PLANS. IF THE CONTRACTOR PROPOSES ALTERNATE CRANE PATHS, THEY SHALL ENSURE THAT WETLAND AND CULTURAL RESOURCE CORRIDORS ARE NOT DISTURBED. FINAL CRANE PATH ALIGNMENTS SHALL BE DETERMINED BY THE CONTRACTOR BASED ON FIELD CONDITIONS WITHIN THE WETLAND AND CULTURAL RESOURCE CORRIDORS, SPECIAL LANDOWNER AGREEMENTS AND THE PROJECT BOUNDARY.
18. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. DISTURBANCE SHALL BE LIMITED TO 50 LF WIDTH FOR PROPOSED ACCESS ROADS AND 50 LF FOR CRANE PATHS, AND SHALL BE LIMITED TO A 250 LF RADIUS FOR PROPOSED WIND TURBINE GENERATORS. THE GRADING LIMITS SHALL BE CENTERED ON THE ROADWAYS AND WIND TURBINES. THE CONTRACTOR SHALL MAKE ALL EFFORTS TO KEEP ACTIVITIES WITHIN THE ERECTION AREAS SHOWN ON THE PLANS BUT IT IS UNDERSTOOD THAT SOME ACTIVITIES THAT WILL NOT REQUIRE GRADING OR SOIL DISTURBANCE MAY EXTEND BEYOND THE DEFINED LIMITS. DURING ERECTION OF THE ROTOR, TRUCKS AND/OR FORKLIFTS MAY EXTEND BEYOND THESE LIMITS. SEE DETAIL TS01 FOR TYPICAL ERECTION AREAS.
19. AN ALTA SURVEY HAS BEEN PROVIDED BY WESTWOOD. CONTRACTOR AND OWNER ARE RESPONSIBLE FOR LOCATING ALL UTILITIES AND VERIFYING LOCATION OF CONSTRUCTION ACTIVITIES PRIOR TO COMMENCING WORK.

STORMWATER POLLUTION PREVENTION PLAN (SWPPP):

1. THE CONTRACTOR SHALL PROVIDE EROSION CONTROL MEASURES AS PLANNED AND SPECIFIED FOLLOWING BEST MANAGEMENT PRACTICES AS OUTLINED BY THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND BEING IN CONFORMANCE WITH THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL STORMWATER PERMIT.
2. REFER TO THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR THE TRIPLE H WIND FARM, PREPARED BY WESTWOOD PROFESSIONAL SERVICES, FOR EROSION CONTROL AND RESTORATION SPECIFICATIONS, SEDIMENT AND EROSION CONTROL PROCEDURES, LOCATIONS OF BMPs, DETAILS, AND INSPECTION INFORMATION.
3. ALL PASTURES AND DRAINAGE SWALES DISTURBED DURING CONSTRUCTION ACTIVITIES AND NOT COVERED BY ROAD SURFACING MATERIALS, SHALL BE SEEDED IN ACCORDANCE WITH THE SWPP PLAN.
4. TEMPORARY EROSION CONTROL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE TEMPORARY EROSION CONTROL PLAN SHALL BE IN ACCORDANCE WITH THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND THE TRIPLE H WIND FARM STORMWATER POLLUTION PREVENTION PLAN ON FILE.

PROJECT CONTACT INFORMATION:

TITLE	COMPANY	NAME	CONTACT NUMBER
OWNER (PRIMARY)	ENGIE	CASEY WILLIS	805-569-6185
PROJECT MANAGER	WESTWOOD	DANI NYGREN	952-906-7493
ENGINEER OF RECORD	WESTWOOD	ROB COPOULS	952-906-7470
CONTRACTOR	WANZEK	JASON HELLERUD	701-893-3685

Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite #300
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed: [illegible]
Checked: DSN
Drawn: [illegible]
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK
a MasTec company

2028 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 12 OF 57

00144400TP.dwg

© 2019 Westwood Professional Services, Inc.

CEMENT STABILIZATION - PROCEDURE

THE SPECIFICATIONS BELOW ARE GENERAL RECOMMENDATIONS/GUIDELINES FOR CEMENT STABILIZATION OF SUBGRADES FOR THE PROJECT. ACTUAL FIELD CONDITIONS MAY ALTER APPLICATION RATE. CONSULT GEOTECHNICAL ENGINEER FOR FURTHER RECOMMENDATIONS.

1. STRIP THE TOP ±4 INCHES OF TOPSOIL (THROUGH THE ROOT ZONE) FROM THE AREA TO BE STABILIZED. ROOTS SMALLER THAN 1/4" DIAMETER ARE CONSIDERED INSIGNIFICANT.
2. PERFORM A PROCTOR (ASTM D 698) TEST TO DETERMINE THE OPTIMUM MOISTURE CONTENT IF THE MATERIAL TO BE STABILIZED DOES NOT MATCH A PREVIOUSLY PERFORMED PROCTOR.
3. DETERMINE THE IN-SITU MOISTURE CONTENT USING A NUCLEAR DENSITY GAUGE (OR EQUIVALENT MOISTURE CONTENT TEST) DAILY, PRIOR TO INCORPORATION OF THE CEMENT. PROVIDE ADDITIONAL MOISTURE CONTENT TESTING AS NEEDED BASED ON WEATHER CONDITIONS.
   - 3.1. THE CONTRACTOR WILL BE ADVISED OF IN-SITU MOISTURE CONTENT, AND MOISTURE ADJUSTMENTS SHOULD BE MADE IF IN-SITU MOISTURE IS LESS THAN OPTIMUM MOISTURE CONTENT AS DETERMINED BY THE PROCTOR (ASTM D 698).
4. SOIL AND CEMENT BLENDING:
   - 4.1. COMPLETELY BLEND SUBGRADE SOIL WITH THE APPROPRIATE AMOUNT OF CEMENT BY WEIGHT. FIELD RESULTS FROM TEST STRIPS WILL DICTATE THE CEMENT APPLICATION RATE.
   - 4.2. IN AREAS OF HIGH MOISTURE OR POOR SOILS, THE CONTRACTOR MAY INCREASE THE PERCENT OF CEMENT IN ORDER TO MEET THE MINIMUM SUBGRADE STRENGTH REQUIREMENTS.
   - 4.3. THE USE OF A RECLAIMER IS AN ADEQUATE BLENDING METHOD. DISCING IS NOT AN ADEQUATE BLENDING METHOD.
   - 4.4. A STABILIZATION DEPTH OF 12" WAS USED FOR DESIGN PURPOSES. STABILIZATION DEPTH MAY NEED TO INCREASE TO 16" IN AREAS OF EXTREME MOISTURE OR POOR SOILS IN ORDER TO MEET THE STRENGTH AND PROOF ROLL REQUIREMENTS.
5. COMPACTION:
   - 5.1. A ROLLING PATTERN WILL BE ESTABLISHED USING A NUCLEAR DENSITY GAUGE DURING COMPACTION.
     - 5.1.1. COMPACTION WILL BE PERFORMED UNTIL THE STABILIZED MATERIAL REACHES THE "BREAK POINT" AFTER WHICH ADDITIONAL PASSES WITH A ROLLER RESULTS IN A LOSS OF DENSITY AS MEASURED BY A NUCLEAR DENSITY GAUGE.
     - 5.1.2. COMPACTION IS TYPICALLY ACHIEVED BY MULTIPLE PASSES OF A PADFOOT ROLLER UNTIL THE ROLLER "WALKS" OUT OF THE RECLAIMED MATERIAL (SPACE IS VISIBLE BETWEEN THE DRUM AND THE RECLAIMED MATERIAL). THIS IS FOLLOWED BY BLADING AND SHAPING THE RECLAIMED MATERIAL TO FINAL PROFILE AND CROSS SECTION, REMOVING HIGH AND LOW POINTS. SMOOTH DRUM OR RUBBER TIRE ROLLERS ARE THEN USED TO FINISH ROLLING (THIS IS WHEN THE DENSITY TESTS ARE PERFORMED) UNTIL THE DENSITY OF THE MATERIAL REACHES THE "BREAK POINT."
     - 5.1.3. THE NUMBER OF PASSES AND EQUIPMENT USED TO REACH THE "BREAK POINT" IS CONSIDERED THE ROLLING PATTERN.
     - 5.1.4. A NEW ROLLING PATTERN MAY NEED TO BE ESTABLISHED IF THE PERFORMANCE REQUIREMENTS ARE NOT BEING MET. THIS MAY BE DUE TO CHANGES IN THE MOISTURE CONTENT, THE SOIL TYPE, OR THE CEMENT RATE.
   - 5.2. THE TARGET DENSITY IS 98% OF THE MAXIMUM DENSITY DETERMINED FROM THE ROLLING PATTERN.
     - 5.2.1. DENSITY TESTS SHALL BE TAKEN AT THE RATE OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER TO CONFIRM THE DENSITY IS MATCHING THE TARGET. ONCE THE ROLLING PATTERN HAS BEEN CONFIRMED IT IS RECOMMENDED THAT TESTING CONTINUE AT 1 TEST PER 1,000 LF IN EACH PASS OF THE RECLAIMER.
     - 5.2.2. IF IT IS NOT POSSIBLE TO ATTAIN THE TARGET DENSITY, AND ADDITIONAL COMPACTION DOES NOT IMPROVE THE DENSITY, A NEW ROLLING PATTERN SHOULD BE ESTABLISHED.
   - 5.3. THE AIR TEMPERATURE SHALL BE ABOVE 40 DEGREES (F) DURING THE CEMENT STABILIZATION PROCESS. MIXING CEMENT INTO FROZEN GROUND IS NOT ACCEPTABLE.
6. THE STABILIZED MATERIAL SHALL BE CONTINUOUSLY WET CURED FOR A MINIMUM OF 24 HOURS (WET CURED IS IDENTIFIED VISUALLY AS DAMP SURFACE).
7. PERFORM SUBGRADE TESTING IN ACCORDANCE WITH TESTING SCHEDULE.
8. AGGREGATE PLACEMENT:
   - 8.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 8.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 8.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

CEMENT STABILIZATION - DESIGN BASIS

1. DURING INITIAL CONSTRUCTION, CONTRACTOR SHALL CONSTRUCT MINIMUM 300 LF TEST STRIPS CONTAINING 4%, 5%, AND 6% CEMENT IN ACCORDANCE WITH CEMENT STABILIZATION PROCEDURES.
2. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 3 FOR ANTICIPATED RESULTS):
   - 2.1. PERFORM INITIAL SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M BETWEEN 4 TO 6 HOURS AFTER FINAL COMPACTION.
   - 2.2. PERFORM ADDITIONAL DCP TESTING AT 24 AND 48 HOURS AFTER FINAL COMPACTION.
   - 2.3. PERFORM SUBSEQUENT DCP TESTS AT 7 DAYS AFTER FINAL COMPACTION AS VERIFICATION OF STRENGTH CURVE.
   - 2.4. A MINIMUM OF 3 TESTS PER TEST SECTION PER TIMEFRAME IS REQUIRED. TESTS SHALL BE TAKEN AT THE CENTERLINE AND 2' FROM EACH SHOULDER.
   - 2.5. RECORD DCP TEST RESULTS EVERY 6 INCHES TO TOTAL DEPTH OF 12 INCHES.

TABLE 3: TEST STRIP CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	COMPRESSIVE STRENGTH (PSF)
4 – 6 HOURS	8	5	1,800
24 HOURS	10	7	2,500
48 HOURS	15	10	3,900
7 DAYS	30	21	9,200

CEMENT STABILIZATION - PRODUCTION

1. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 5 FOR SUMMARY OF TESTING REQUIREMENTS):
   - 1.1. PERFORM SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M NO SOONER THAN 24 HOURS AFTER FINAL COMPACTION.
   - 1.2. DCP TESTING FREQUENCY SHALL BE WITH A RANDOM SPACING AND A MINIMUM OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER. A MINIMUM OF 3 TESTS PER ROAD IS REQUIRED.
   - 1.3. THE CBR OF THE STABILIZED SUBGRADE SHOULD BE CALCULATED IN 6" INCREMENTS THROUGH THE ENTIRE DEPTH OF THE STABILIZED LAYER.
   - 1.4. THE MINIMUM REQUIRED CBR PRIOR TO PROOF-ROLLING IS PROVIDED IN TABLE 4 BELOW:

TABLE 4: FINAL CEMENT STABILIZED CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	UNDRAINED SHEAR STRENGTH (PSF)	BEARING CAPACITY (PSF)
24 – 48 HOURS	15	10	3,500	9,800
3 – 7 DAYS	30	21	7,000	18,000
28 DAYS	50	33	12,000	28,500

NOTE: UNDRAINED SHEAR STRENGTH WAS CALCULATED USING THE BLACK (1961) EQUATION. BEARING CAPACITY WAS CALCULATED USING THE VESIC EQUATION MODIFIED FOR TWO LAYERS (12" CEMENT STABILIZED SUBGRADE OVER A NATURAL SUBGRADE WITH A CBR OF 1.5)

   - 1.5. ONCE THE MINIMUM REQUIRED CBR IS ACHIEVED AT ANY CORRESPONDING TIME PERIOD, THE SUBGRADE IS CONSIDERED ADEQUATE AND THE CONTRACTOR MAY PROCEED WITH PROOF-ROLL TESTING. FUTURE DCP TESTING ON THAT SEGMENT OF SUBGRADE IS NOT REQUIRED.
   - 1.6. IF TESTING DOES NOT INDICATE A CBR OF 30 WITHIN 7 DAYS, ADDITIONAL GRAVEL SURFACING AND/OR THE ADDITION OF GEOTEXTILE FABRIC MAY BE REQUIRED. FOR FUTURE SUBGRADE STABILIZATION AREAS, CONTACT THE ENGINEER AND OWNER VIA RFI FOR RECOMMENDATIONS AND APPROVAL.
2. SUBGRADE PROOF-ROLL TESTING AND ACCEPTANCE:
   - 2.1. ONCE THE REQUIRED DCP VALUE HAS BEEN OBTAINED BUT PRIOR TO PLACING AGGREGATE, THE SUBGRADE SHALL BE PROOF-ROLLED. REFER TO THE PROJECT TESTING REQUIREMENTS FOR PROOF-ROLL DEFINITION.
   - 2.2. PROOF-ROLLING SHOULD BE PERFORMED WITH ONE PASS DOWN THE CENTER AND NOT BE PERFORMED WITHIN 12 INCHES OF THE EDGE OF THE STABILIZED SECTION.
   - 2.3. IF PROOF-ROLLING FAILS, RE-STABILIZATION MAY BE REQUIRED AND A NEW ROLLING PATTERN OR ADDITIONAL CEMENT MAY BE REQUIRED.
3. AGGREGATE PLACEMENT:
   - 3.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 3.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 3.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

TABLE 5: CEMENT STABILIZATION PRODUCTION TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
COMPACTED SUBGRADE (CEMENT STABILIZED) NOTE: SEE ABOVE FOR INITIAL TESTING REQUIREMENTS	PROCTOR	MINIMUM 1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER 1000 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
	DCP TEST	1 PER 500 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
	PROOF-ROLL (AFTER PASSING DCP TESTS)	ENTIRE LENGTH

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-Free (888) 937-5150 westwoodps.com

Westwood Professional Services, Inc.

Designed: BMK
Checked: DBN
Drawn: BMK
As-Built Drawing:

Revisions #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2028 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 13 OF 57

0014440D1P.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 333rd Ave in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 1875' South of 333rd Ave & 204th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.25'12.86" W Long. -99.31'20.78" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 000996 NE4 18-111-72
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19

Tanya Olave
Signature of Applicant

Date Approved: 08-06-2019

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 333rd Ave in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 1875' South of 333rd Ave & 204th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.25'12.86" W Long. -99.31'20.78" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 000996 NE4 18-111-72
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: _____

Tanya L Love

Signature of Applicant

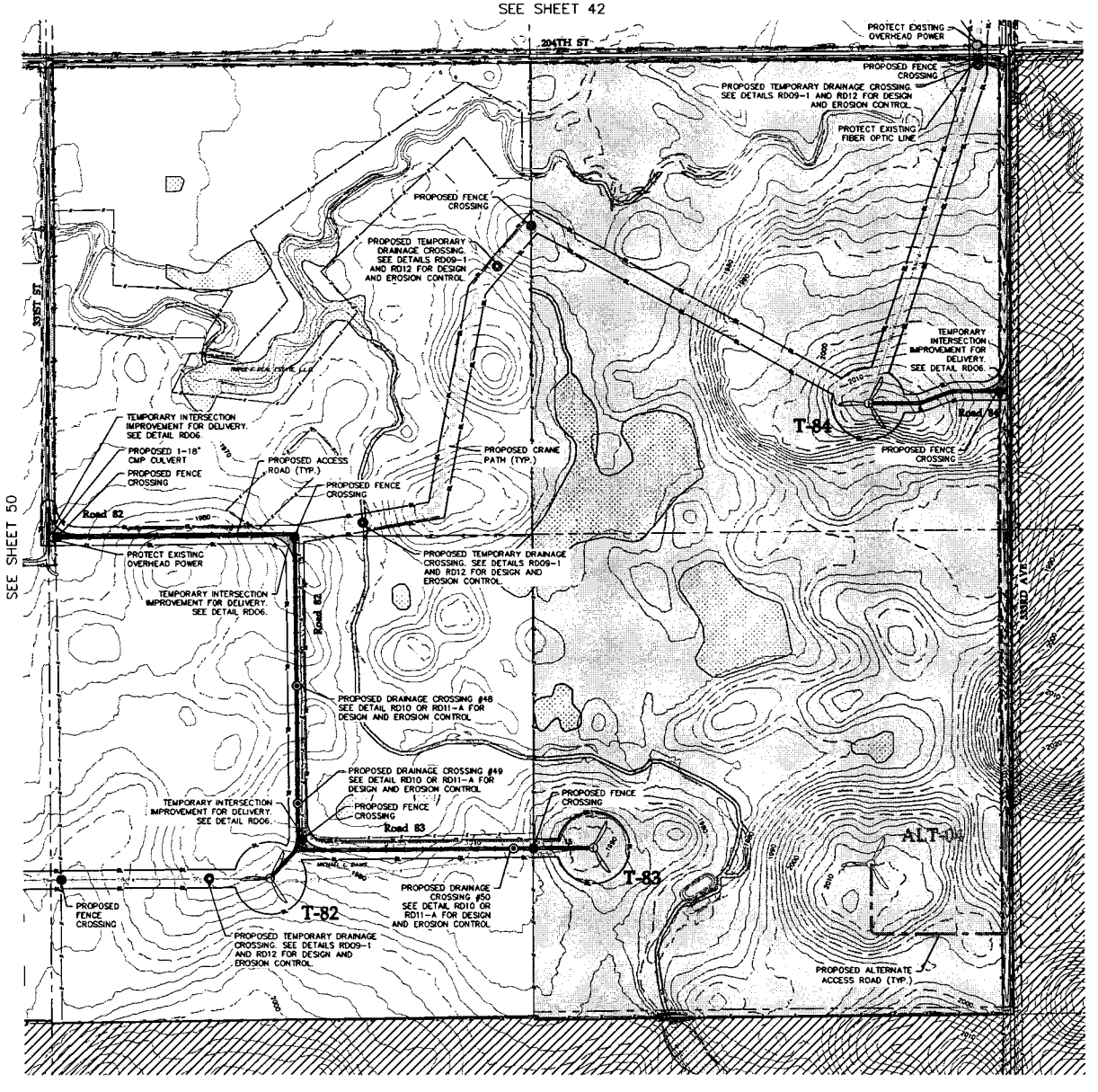
_____

Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

©2019 Westwood Professional Services, Inc.



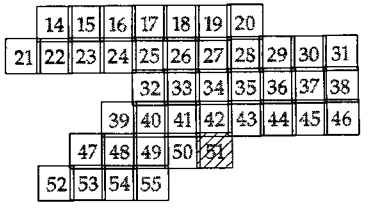
LEGEND:

- PROPOSED TURBINE LOCATION
- T-XX PROPOSED TURBINE NUMBER
- PROPOSED ALTERNATE TURBINE LOCATION
- ALT-XX PROPOSED ALTERNATE TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED ALTERNATE ACCESS ROAD
- PROPOSED CRANE PATH
- PROPOSED UNDERGROUND COLLECTION*
- PROPOSED DISTURBANCE LIMITS
- PROPOSED PERIMETER SEDIMENT CONTROL
- EXISTING 10' CONTOURS
- EXISTING 2' CONTOURS
- EXISTING GRAVEL EDGE
- EXISTING BITUMINUS EDGE
- EXISTING RIGHT-OF-WAY
- EXISTING PARCEL LINE
- EXISTING BUILDING
- EXISTING FENCE
- EXISTING OVERHEAD POWER
- EXISTING HIGH VOLTAGE OVERHEAD POWER
- EXISTING UNDERGROUND POWER LINE
- EXISTING FIBER OPTIC LINE
- EXISTING WATER LINE
- DELINEATED WETLAND
- ARCHAEOLOGICAL AVOIDANCE AREA
- EXISTING USFWS EASEMENT
- PROJECT BOUNDARY
- 1900 EXISTING GROUND ELEVATION
- PROPOSED DRAINAGE CROSSING**
- PROPOSED TEMPORARY DRAINAGE CROSSING**
- PROPOSED FENCE CROSSING***
- PROPOSED UTILITY CROSSING
- PROPOSED CULVERT

* PROVIDED BY OTHERS AND SHOWN FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSTRUCTION PLANS FOR DETAILS.

** SEE SHEET 11 FOR DRAINAGE CROSSING TYPE AND SIZING. DRAINAGE CROSSINGS SHALL CONSIST OF LOW WATER CROSSING OR CULVERT. DRAINAGE CROSSINGS ALONG CRANE PATH SHALL CONSIST OF CRANE MATS OR TEMPORARY CULVERT.

*** ALL GATE INSTALLATIONS SHALL BE FIELD DETERMINED AND AGREED UPON BY THE CONTRACTOR AND OWNER.



KEY MAP

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (866) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: DJH
Drawn: BMK
As-Built Drawing:

Revisions		
#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2200 2nd Avenue NW
West Fargo, ND 58078

0' 300' 600' 900'

Triple H Wind Farm

Hyde County, South Dakota

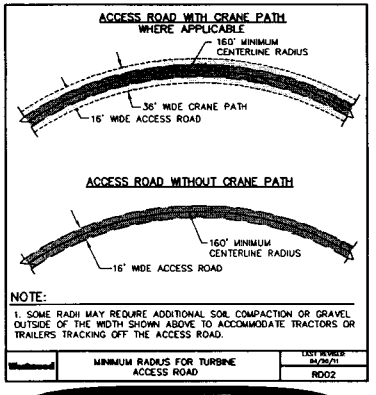
Site Plan T-82 - T-84, A04

90% COMPLETE NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 51 OF 57

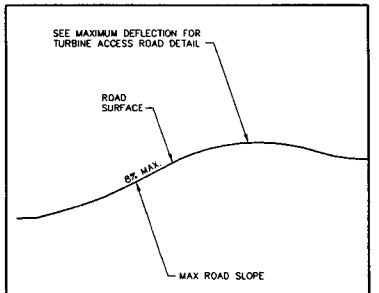
0014440SP01.dwg

©2019 Westwood Professional Services, Inc.



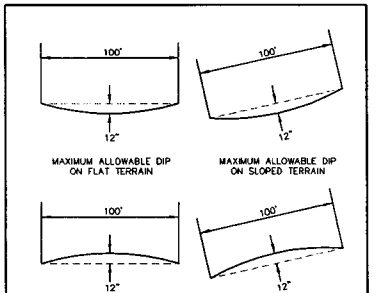
NOTE:
1. SOME RADII MAY REQUIRE ADDITIONAL SOIL COMPACTION OR GRAVEL OUTSIDE OF THE WIDTH SHOWN ABOVE TO ACCOMMODATE TRACTORS OR TRAILERS TRACKING OFF THE ACCESS ROAD.

Westwood	MINIMUM RADIUS FOR TURBINE ACCESS ROAD	LAST REVISED 04/30/11
		RD02

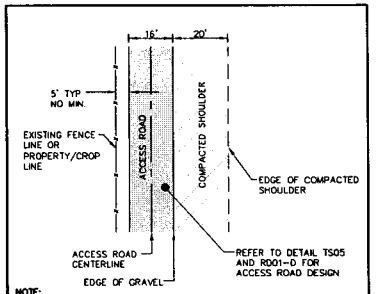


NOTES:
1. ROAD SLOPE SHALL NOT EXCEED 8% WITHOUT OWNER APPROVAL

Westwood	MAXIMUM VERT. SLOPE FOR TURBINE ACCESS ROAD/CRANE TRAVEL PATH	LAST REVISED 3/28/07
		RD03

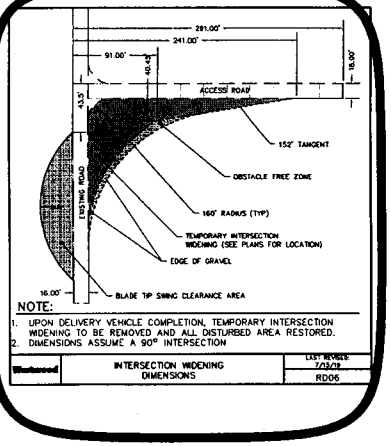


Westwood	MAXIMUM DEFLECTION FOR TURBINE ACCESS ROAD	LAST REVISED 01/29/08
		RD04



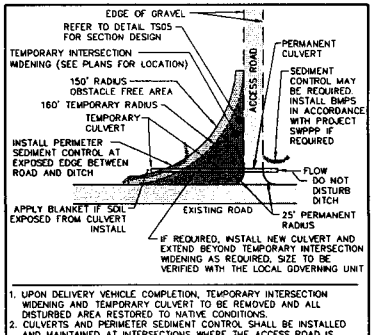
NOTE:
1. COMPACTED SHOULDER SHALL BE RETURNED TO NATIVE CONDITION FOLLOWING TURBINE GENERATOR CONSTRUCTION.
2. THE ACCESS ROAD MAY NEED TO BE CONSTRUCTED FARTHER FROM THE PROPERTY LINE IF OBSTRUCTIONS SUCH AS TREES FOLLOW THE PROPERTY LINE.

Westwood	TURBINE ACCESS ROAD ALONG FENCE/PROPERTY/CROP LINE	LAST REVISED 3/28/07
		RD05



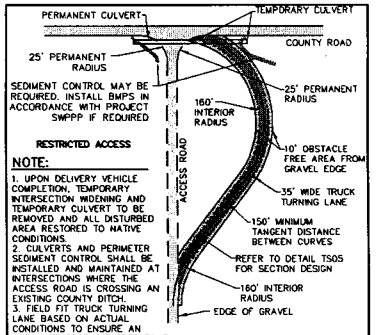
NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING TO BE REMOVED AND ALL DISTURBED AREA RESTORED.
2. DIMENSIONS ASSUME A 90° INTERSECTION

Westwood	INTERSECTION WIDENING DIMENSIONS	LAST REVISED 7/03/19
		RD06



1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.

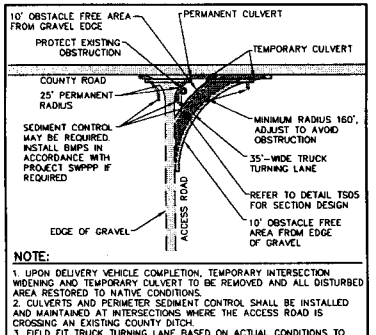
	TURBINE ACCESS ROAD TYPICAL INTERSECTION WIDENING	LAST REVISED 3/2/07
		RD07



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

NOT TO SCALE

Westwood	TRUCK TRAFFIC TURNING LANE A	LAST REVISED 3/2/07
		RD08-A



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

Westwood	TRUCK TRAFFIC TURNING LANE B	LAST REVISED 12/2/11
		RD08-B

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150
Westwood Professional Services, Inc.

Designed:	BMK
Checked:	DJH
Drawn:	BMK
As-Built Drawing:	

Revisions #	DATE	DESCRIPTION
A	12/08/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

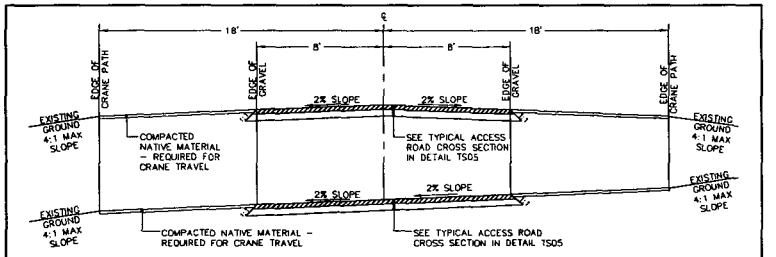
Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 5 OF 57

0014440079.dwg

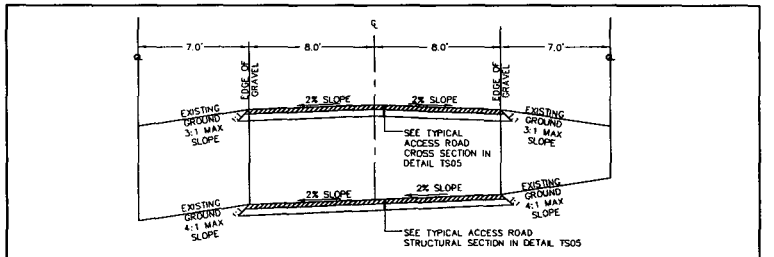
© 2019 Westwood Professional Services, Inc.



NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE ACCESS ROAD DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

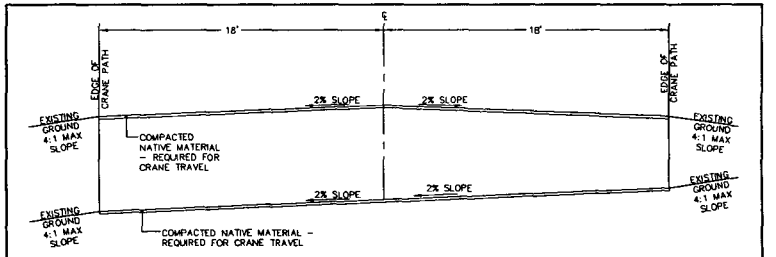
Westwood | TYPICAL TURBINE ACCESS ROAD AND CRANE PATH | LAST REVISED 04/29/11 | RD01-A



NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

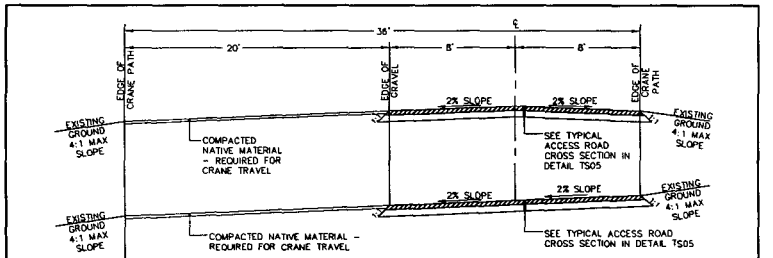
Westwood | TYPICAL TURBINE ACCESS ROAD SECTION | LAST REVISED 3/28/08 | RD01-B



NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE WHERE CRANE PATHS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT CRANE PATH REMAINS WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%

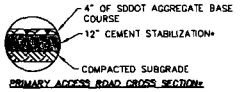
Westwood | TYPICAL CRANE PATH | LAST REVISED 04/29/11 | RD01-C



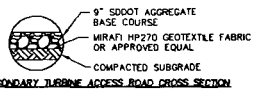
NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE EDGE OF COMPACTED SHOULDER DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

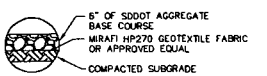
Westwood | TYPICAL TURBINE ACCESS ROAD AND OFFSET CRANE PATH | LAST REVISED 04/29/11 | RD01-D



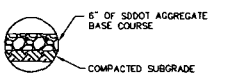
PRIMARY ACCESS ROAD CROSS SECTION*



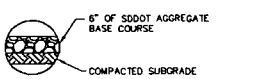
SECONDARY TURBINE ACCESS ROAD CROSS SECTION



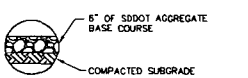
SPUR ROAD / MET TOWER ROAD CROSS SECTION



TEMPORARY TURNING IMPROVEMENTS CROSS SECTION



GRAVEL RING CROSS SECTION



LAYDOWN YARD CROSS SECTION

* CEMENT APPLICATION RATE MAY VARY BASED ON TEST STRIPS AND FIELD PERFORMANCE. SEE SHEET 13 FOR CEMENT STABILIZATION PROCEDURE AND DESIGN BASIS.

NOTES:

STRUCTURAL SECTIONS SHOWN ARE THE MINIMUM THICKNESS REQUIREMENTS DURING NORMAL FIELD CONDITIONS. THE SECTIONS MAY NEED TO BE INCREASED BASED ON ACTUAL FIELD CONDITIONS AT THE TIME OF CONSTRUCTION. CONDITIONS INCLUDE BUT ARE NOT LIMITED TO CONSTRUCTION DURING THE FREEZE/THAW CYCLE, UNUSUALLY WET PERIODS, OR IN LOW/WET AREAS. SEE SHEET 12 FOR TESTING REQUIREMENTS AND SPECIFICATIONS.

Westwood | TYPICAL STRUCTURAL CROSS SECTIONS

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-free (888) 937-5150
Westwood Professional Services, Inc.

Designed: BMK
Checked: BJH
Drawn: BMK
As-Built Drawing:

Revisions: #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2028 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 4 OF 57

0014440DTP.dwg

©2019 Westwood Professional Services, Inc.

ROAD DESIGN PARAMETERS

1. ACCESS ROADS HAVE BEEN DESIGNED TO ACCOMMODATE LIGHT DUTY TRUCKS (PICKUP TRUCKS AND MAINTENANCE VEHICLES) FOR LOW VOLUME USE IN NORMAL OPERATING CONDITIONS AS WELL AS HEAVY DUTY CONSTRUCTION TRAFFIC UNDER DRY CONDITIONS. THE ROAD DESIGN SPECIFIED IS NOT INTENDED FOR ALL WEATHER USE FOR HEAVY DUTY CONSTRUCTION LOADS.
2. ROAD MAINTENANCE CAN BE EXPECTED OVER THE LIFE OF THE PERMANENT FACILITY.

PRODUCTS

1. AGGREGATE BASE SHALL CONSIST OF SDDOT AGGREGATE BASE COURSE (AND IN CONFORMANCE WITH THE GRADATION TABLE 1). AGGREGATE MAY BE CRUSHER RUN UPON ENGINEERS APPROVAL. AGGREGATE GRADATIONS SHALL BE SUBMITTED TO ENGINEER FOR REVIEW.
2. ROAD SHOULDERS AND CRANE PADS SHALL CONSIST OF COMPACTED NATIVE SOILS.
3. CULVERTS: ACCESS ROAD CULVERTS SHALL MEET THE MINIMUM SPECIFICATIONS SET FORTH BY THE SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION AND/OR HYDE COUNTY. ALL CULVERTS ARE PLANNED TO BE A MINIMUM 18" DIAMETER AND MANUFACTURED OF 16-GAGE CORRUGATED METAL PIPE WITH NO END TREATMENTS UNLESS NOTED OTHERWISE. ACTUAL SIZE WILL BE DETERMINED THROUGH HYDRAULIC ANALYSIS.
4. GEOTEXTILE FABRIC: MIRAFI HP270 OR APPROVED EQUAL.

EXECUTION

1. CLEARING AND GRUBBING
   A. THE CONTRACTOR SHALL BE REQUIRED TO GRUB ALL TREES, STUMPS, BRUSH, AND DEBRIS WITHIN THE GRADING AREAS SHOWN ON THE PLANS. GRUBBING INCLUDES REMOVAL OF ALL PLANT MATERIAL GREATER THAN 2" INCLUDING STUMPS, BRANCHES, ROOTS, ETC. TO A DEPTH BELOW THE FINAL SUBGRADE. THE CONTRACTOR IS TO REMOVE ONLY THOSE TREES WHICH ARE DESIGNATED BY THE OWNER'S REPRESENTATIVE FOR REMOVAL, AND SHALL EXERCISE EXTREME CARE AROUND EXISTING TREES TO BE SAVED.
2. TOPSOIL STRIPPING
   A. TOPSOIL, INCLUDING ROOTS LARGER THAN 2" AND LARGE ROOT MASSES, SHALL BE STRIPPED FROM ALL ROADWAY AND FOUNDATION AREAS UP TO 10". TOPSOIL SHALL NOT BE STRIPPED OUTSIDE OF THE DESIGNATED DISTURBANCE AREAS.
   B. ANY TOPSOIL THAT HAS BEEN STRIPPED SHALL BE STOCKPILED FOR POST CONSTRUCTION REVEGETATION. ALL TOPSOIL SHALL BE REDISTRIBUTED TO THE LAND OWNER'S PROPERTY OF WHERE IT ORIGINATED FROM.
3. FILL PLACEMENT
   A. FILL PLACEMENT SHALL CONSIST OF THE PLACING OF SUITABLE FILL MATERIAL, AFTER TOPSOIL STRIPPING, ABOVE THE EXISTING GRADE. GENERALLY, SIDE SLOPES SHALL BE CONSTRUCTED AT FOUR FOOT HORIZONTAL TO ONE FOOT VERTICAL, WITH SOME LOCATIONS THROUGHOUT THE PROJECT WITH SLOPES OF TWO FEET HORIZONTAL TO ONE FOOT VERTICAL. THE MATERIAL FOR FILL CONSTRUCTION SHALL BE OBTAINED FROM THE ACCESS ROAD/TURBINE EXCAVATION (SEE GEOTECHNICAL REPORT FOR RESTRICTIONS), OR ANY SUITABLE, APPROVED SOIL OBTAINED ONSITE/OFFSITE BY CONTRACTOR, AS DIRECTED OR APPROVED BY THE ENGINEER. THIS MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 12" AND CONSTRUCTED TO 95% OF THE MAXIMUM DRY DENSITY AND WITHIN 2% OF OPTIMUM MOISTURE CONTENT, AS DETERMINED BY THE STANDARD PROCTOR (AASHTO T99).
   B. SIDE SLOPES GREATER THAN 4:1 WILL NOT BE PERMITTED, UNLESS OTHERWISE NOTED ON THE PLAN.
   C. FILL SLOPES SHALL BE BENCHED INTO THE EXISTING SLOPE TO PREVENT MOVEMENT BETWEEN THE FILL AND NATIVE SOILS. BENCHES SHOULD BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO FILL PLACEMENT. POSITIVE DRAINAGE IS REQUIRED AT BENCHED AREAS AND AT THE TOE OF FILL SLOPES TO REMOVE SURFACE WATER.
4. SUBGRADE
   A. SUBGRADE PREPARED AT GRADE OR IN CUT REQUIRES SCARIFICATION AND RECOMPACTION TO A DEPTH OF 12" OR MORE.
   B. ACCESS ROAD CROSS SLOPES SHOWN IN THE PLANS ARE MEANT AS A GUIDE. ACCESS ROAD CROSS SLOPES MAY RANGE FROM 1% - 2%, CHECK WITH THE ENGINEER IF THE CROSS SLOPE FALLS OUTSIDE OF THIS RANGE. ACCESS ROADS BEING UTILIZED FOR CRANE TRAVEL SHOULD HAVE A MAX CROSS SLOPE OF 2%.

TABLE 1: SDDOT AGGREGATE BASE COURSE – LOCALLY SOURCED	
SIEVE SIZE	PERCENT PASSING
1"	100
3/4"	80-100
1/2"	68-91
NO. 4	46-70
NO. 8	34-58
NO. 40	13-35
NO. 200	3-12

MEET FOLLOWING REQUIREMENTS PER 882.2

LIQUID LIMIT (MAX) = 25
PLASTICITY INDEX = 0-6
L.A ABRASION (% MAX) = 40%

GRADATION HAS BEEN OBTAINED FROM THE 2015 SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION BOOK.

STORM WATER DESIGN PARAMETERS

1. SEE SHEET 6 FOR CULVERT SIZING AND DESIGN PARAMETERS. SEE HYDROLOGY MEMO FOR FURTHER DESIGN CALCULATIONS. CULVERTS SHALL BE MINIMUM 18" CORRUGATED METAL PIPE. ALL TEMPORARY PORTIONS OF THE INSTALLED CULVERTS SHALL BE REMOVED UPON COMPLETION OF THE PROJECT.
2. IT IS EXPECTED THAT CULVERTS WILL BE OVERTOPPED DURING SOME STORMS AND MAINTENANCE WILL BE REQUIRED THROUGH THE LIFE OF THE PROJECT.
3. WHEN INSTALLING DRAINAGE CULVERTS THE CONTRACTOR SHALL USE JUDGMENT IN SETTING THE FLOW LINE ELEVATIONS AND CULVERT LONGITUDINAL SLOPE. TYPICALLY THE FLOW LINE ELEVATIONS AND LONGITUDINAL SLOPE OF THE CULVERT SHOULD MATCH THE NATURAL GROUND ELEVATIONS AND SLOPE TO ENSURE POSITIVE DRAINAGE. WHEN POSSIBLE, ALL CULVERTS SHOULD BE PLACED AT A MINIMUM 0.5% GRADE.
4. ANTICIPATED CULVERT CROSSINGS ARE SHOWN ON THE CONSTRUCTION PLAN. ADDITIONAL CULVERTS MAY NEED TO BE INSTALLED IN AREAS WHERE CONCENTRATED FLOW IS EXPECTED DUE TO CONSTRUCTION ACTIVITIES.
5. CONSTRUCTION DRAINAGE CROSSINGS TO MAINTAIN EXISTING FLOW CHARACTERISTICS OF THE FEATURES. FEATURES SHALL BE GRADED TO PRECONSTRUCTION CONTOURS.

TESTING:

1. TESTING SHALL BE PERFORMED BY A DESIGNATED INDEPENDENT TESTING AGENCY.
2. SUBMIT ONE SET OF TESTING AND INSPECTION RECORDS SPECIFIED TO THE CIVIL ENGINEER OF RECORD.

DEFINITIONS:

1. PROOF ROLLING:
   SHALL BE PERFORMED IN THE PRESENCE OF THE GEOTECHNICAL ENGINEER OR QUALIFIED GEOTECHNICAL REPRESENTATIVE USING A FULLY LOADED TANDEM AXLE DUMP TRUCK OR WATER TRUCK WITH A MINIMUM GROSS WEIGHT OF 25 TONS OR A FULLY LOADED BELLY DUMP WITH AN EQUIVALENT AXLE LOADING. PROOF-ROLLING ACCEPTANCE STANDARDS INCLUDE NO RUTTING GREATER THAN 1.5 INCHES, AND NO "PUMPING" OF THE SOIL BEHIND THE LOADED TRUCK.
2. SIEVE ANALYSIS:
   SHALL BE CONDUCTED IN ACCORDANCE WITH AASHTO T27
3. PROCTORS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T99
4. ATTERBERG LIMITS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T89 AND T90
5. MOISTURE DENSITY (NUCLEAR DENSITY):
   SHALL BE DONE IN ACCORDANCE WITH AASHTO T310
6. DYNAMIC CONE PENETROMETER (DCP) TESTING:
   SHALL BE DONE IN ACCORDANCE WITH ASTM D6951-03

REQUIREMENTS:

1. FILL PLACEMENT:
   A. SOILS USED AS FILL MATERIAL SHALL BE TESTED FOR MOISTURE CONTENT AND PROCTOR TESTS.
   B. WHERE FILL CONSTRUCTION REQUIRES MORE THAN 12 INCHES OF FILL PLACEMENT, COMPACT EACH LIFT TO A MINIMUM OF 95 PERCENT OF THE MATERIAL'S MAXIMUM STANDARD PROCTOR DRY DENSITY.
2. COMPACTED SUBGRADE (CEMENT STABILIZED):
   A. SEE SHEET 13 FOR TESTING REQUIREMENTS AND PROCEDURE.
3. COMPACTED SUBGRADE (NON-CEMENT STABILIZED):
   A. THE ENTIRE SUBGRADE SHALL BE PROOF-ROLLED PRIOR TO THE PLACEMENT OF THE AGGREGATE BASE TO IDENTIFY AREAS OF UNSTABLE SUBGRADE.
   B. PERFORM A MINIMUM OF 3 DYNAMIC CONE PENETROMETER (DCP) TESTS PER ACCESS ROAD OR ONE FOR EVERY 1,000 LF OF ROAD, WHICHEVER IS GREATER. SUBGRADE MUST MEET A MINIMUM DCP OF 3 BLOWS PER 6" TO A TOTAL DEPTH OF 2' (MINIMUM CBR=1.5).
   C. IF A PASSING PROOF-ROLL OR DCP REQUIREMENTS CANNOT BE ACHIEVED THE FOLLOWING ALTERNATIVES MAY BE IMPLEMENTED:
      a. SCARIFY, DRY, AND RECOMPACT SUBGRADE
      b. REMOVE UNSUITABLE MATERIAL AND REPLACE WITH SUITABLE MATERIAL
      c. INCREASE AGGREGATE BASE THICKNESS
4. AGGREGATE BASE:
   A. AGGREGATE BASE SHALL BE PROOF-ROLLED OVER THE ENTIRE LENGTH. IF PROOF ROLLING DETERMINES THAT THE ROAD IS UNSTABLE, ADDITIONAL AGGREGATE SHALL BE ADDED UNTIL THE UNSTABLE SECTION IS ABLE TO PASS A PROOF ROLL.
   B. PROVIDE 1 SIEVE ANALYSIS (PROJECT MAX OF 20) PER 2500 CY OF ROAD BASE PLACED.
5. CRANE PAD AND CRANE PATHS / CRANE TRAVEL SHOULDERS:
   A. TESTING REQUIREMENTS ARE PENDING BASED ON CRANE PICK PLANS PROVIDED BY THE CONTRACTOR.

TABLE 2: TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
FILL PLACEMENT	PROCTOR	1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER LIFT PER 5000 SF OF FILL PLACED OR 1 PER 500 LF OF ROAD OR CRANE WALK
COMPACTED SUBGRADE (CEMENT STABILIZED):	SEE SHEET 13	SEE SHEET 13
COMPACTED SUBGRADE (NON-CEMENT STABILIZED):	PROOF-ROLL	ENTIRE AREA
	DCP	1 PER 1,000 FT OR MIN. 3 PER ROAD
AGGREGATE BASE	PROOF-ROLL	ENTIRE AREA
	SIEVE ANALYSIS, LL, PL, AND L.A ABRASION	1 PER 2,500 CY

GENERAL NOTES:

1. GROUND SURFACE CONTOURS (AT TWO-FOOT VERTICAL INTERVALS) AND ELEVATIONS ARE BASED ON A PHOTOGRAMMETRY SURFACE PROVIDED BY GEOTERRA. IF MAJOR DISCREPANCIES ARE FOUND IN THE GROUND ELEVATIONS DURING FIELD STAKING TO THE GROUND ELEVATIONS SHOWN ON THE PLANS, THE OWNER AND ENGINEER SHALL BE NOTIFIED.
2. WHERE SECTION OR SUBSECTION MONUMENTS ARE ENCOUNTERED, THE OWNER SHALL BE NOTIFIED BEFORE SUCH MONUMENTS ARE REMOVED. THE CONTRACTOR SHALL PROTECT AND CAREFULLY PRESERVE ALL PROPERTY MARKERS AND MONUMENTS UNTIL THE OWNER, AN AUTHORIZED SURVEYOR OR AGENT HAS WITNESSED OR OTHERWISE REFERENCED THEIR LOCATION.
3. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. TYPICAL DISTURBANCE SHALL BE LIMITED TO 10 LF FROM THE EDGE OF PROPOSED GRADING.
4. FINALIZE GRADING AROUND THE BASE OF TURBINES IN ACCORDANCE WITH DETAIL TS-03 AND TS-04.
5. GRADE ALL PROPOSED ROADS TO A MAXIMUM SLOPE OF 8%. IF 8% SLOPE CANNOT BE ACHIEVED, THE CONTRACTOR MAY UTILIZE ASSIST VEHICLES FOR THE PURPOSE OF DELIVERIES. GRADE ALL PROPOSED CRANE PATHS TO A MAXIMUM OF 8% UNLESS OTHERWISE NOTED IN PLAN SHEETS.
6. ANY FACILITIES REMOVED TO ALLOW FOR CONSTRUCTION (MAILBOXES, SIGNS, FENCES, ETC.) SHALL BE REPLACED BY THE CONTRACTOR IN A CONDITION AS GOOD AS EXISTING.
7. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING DRAINAGE THROUGHOUT THE CONSTRUCTION OF THIS PROJECT. CONSTRUCTION ACTIVITIES SHALL NOT BLOCK THE NATURAL OR MANMADE CREEKS OR DRAINAGE SWALES CAUSING RAINWATER TO POND. DEPENDING ON FIELD CONDITIONS, ADDITIONAL CULVERTS IN EXCESS OF THOSE ON THE PLANS MAY BE REQUIRED.
8. WHILE BUILDING THE ROADS AND EXCAVATING THE TURBINE FOUNDATIONS, EXCESS SOIL WILL RESULT. THE CONTRACTOR SHALL DISPOSE OF THIS EXCESS SOIL IN AN APPROVED MANNER. EXCESS TOPSOIL SHALL BE DISTRIBUTED INTO A THIN LAYER ON LAND IMMEDIATELY ADJACENT TO WHERE THE TOPSOIL ORIGINATED. ALL EXCESS TOPSOIL TO BE WASTED ONSITE. WHILE DOING SO THE CONTRACTOR SHALL AVOID CAUSING RIDGES OR MOUNDS THAT WOULD MAKE IT DIFFICULT FOR STORM WATER RUNOFF TO DRAIN. THE FINAL SURFACE OF THE DISTURBED TOPSOIL SHALL BE SMOOTH AND FOLLOW THE NATURAL CONTOUR OF THE LAND.
9. THE CONTRACTOR SHALL NOTIFY SOUTH DAKOTA 811 AT LEAST 48 HOURS BEFORE EXCAVATION ACTIVITIES COMMENCE.
10. TEMPORARY INTERSECTION WIDENING SHALL, UPON COMPLETION OF ALL PROJECT CONSTRUCTION OR UPON NOTIFICATION OF THE ENGINEER, BE REMOVED AND THE AREA RESTORED TO ITS ORIGINAL LINES AND GRADES WITH TOPSOIL REPLACED, EXCEPT WHERE REQUESTED BY THE TOWNSHIP OR COUNTY TO PERMANENTLY REMAIN. DISTURBED AREAS OUTSIDE OF THE FINAL ROADWAY SHALL BE SEEDED AND MULCHED.
11. TURBINE SETBACKS ARE NOT IDENTIFIED ON THE CONSTRUCTION PLANS. IT SHALL BE THE RESPONSIBILITY OF THE OWNER AND CONTRACTOR TO ENSURE THAT ALL TURBINE SETBACKS MEET PROJECT REQUIREMENTS.
12. GEOTECHNICAL REPORTS WITH RECOMMENDATIONS HAVE BEEN PROVIDED BY THE OWNER. ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL ENGINEERING REPORT AND RECOMMENDATIONS.
13. FIELD SURVEY WETLAND INFORMATION HAS BEEN PROVIDED BY THE OWNER. ALL WETLAND DELINEATIONS AND PERMITTING SHALL BE THE RESPONSIBILITY OF OTHERS AND BE COMPLETED PRIOR TO CONSTRUCTION COMMENCING. THE OWNER AND GENERAL CONTRACTOR SHALL VERIFY THAT ALL WETLAND PERMITS HAVE BEEN SUBMITTED AND APPROVED PRIOR TO CONSTRUCTION COMMENCING.
14. CULTURAL RESOURCE REPORTS HAVE NOT BEEN PROVIDED. CULTURAL RESOURCE LOCATIONS ARE NOT SHOWN ON THE PLANS. INFORMATION WILL BE THE RESPONSIBILITY OF THE OWNER AND GENERAL CONTRACTOR. THE LOCATIONS OF CULTURAL RESOURCE SITES MAY BE CONFIDENTIAL AND PROTECTED BY STATE OR FEDERAL LAW. PUBLIC RELEASE OF SPECIFIC INFORMATION REGARDING THESE RESOURCES MAY BE RESTRICTED.
15. AN ENVIRONMENTAL ASSESSMENT HAS NOT BEEN PROVIDED. THE CONTRACTOR SHALL BE FAMILIAR WITH THE REPORT AND REVIEW ALL RECOMMENDATIONS.
16. ELECTRICAL INFORMATION SHOWN ON THE PLANS IS FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSULTANT'S PLANS FOR SPECIFIC LOCATIONS AND CONSTRUCTION DETAILS FOR THE UNDERGROUND POWER COLLECTION SYSTEM AND SUBSTATION.
17. CRANE PATHS ARE SHOWN ON THE CONSTRUCTION PLANS. IF THE CONTRACTOR PROPOSES ALTERNATE CRANE PATHS, THEY SHALL ENSURE THAT WETLAND AND CULTURAL RESOURCE CORRIDORS ARE NOT DISTURBED. FINAL CRANE PATH ALIGNMENTS SHALL BE DETERMINED BY THE CONTRACTOR BASED ON FIELD CONDITIONS WITHIN THE WETLAND AND CULTURAL RESOURCE CORRIDORS, SPECIAL LANDOWNER AGREEMENTS AND THE PROJECT BOUNDARY.
18. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. DISTURBANCE SHALL BE LIMITED TO 50 LF WIDTH FOR PROPOSED ACCESS ROADS AND 50 LF FOR CRANE PATHS, AND SHALL BE LIMITED TO A 250 LF RADIUS FOR PROPOSED WIND TURBINE GENERATORS. THE GRADING LIMITS SHALL BE CENTERED ON THE ROADWAYS AND WIND TURBINES. THE CONTRACTOR SHALL MAKE ALL EFFORTS TO KEEP ACTIVITIES WITHIN THE ERECTION AREAS SHOWN ON THE PLANS BUT IT IS UNDERSTOOD THAT SOME ACTIVITIES THAT WILL NOT REQUIRE GRADING OR SOIL DISTURBANCE MAY EXTEND BEYOND THE DEFINED LIMITS. DURING ERECTION OF THE ROTOR, TRUCKS AND/OR FORKLIFTS MAY EXTEND BEYOND THESE LIMITS. SEE DETAIL TS01 FOR TYPICAL ERECTION AREAS.
19. AN ALTA SURVEY HAS BEEN PROVIDED BY WESTWOOD. CONTRACTOR AND OWNER ARE RESPONSIBLE FOR LOCATING ALL UTILITIES AND VERIFYING LOCATION OF CONSTRUCTION ACTIVITIES PRIOR TO COMMENCING WORK.

STORMWATER POLLUTION PREVENTION PLAN (SWPPP):

1. THE CONTRACTOR SHALL PROVIDE EROSION CONTROL MEASURES AS PLANNED AND SPECIFIED FOLLOWING BEST MANAGEMENT PRACTICES AS OUTLINED BY THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND BEING IN CONFORMANCE WITH THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL STORMWATER PERMIT.
2. REFER TO THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR THE TRIPLE H WIND FARM, PREPARED BY WESTWOOD PROFESSIONAL SERVICES, FOR EROSION CONTROL AND RESTORATION SPECIFICATIONS, SEDIMENT AND EROSION CONTROL PROCEDURES, LOCATIONS OF BMPs, DETAILS, AND INSPECTION INFORMATION.
3. ALL PASTURES AND DRAINAGE SWALES DISTURBED DURING CONSTRUCTION ACTIVITIES AND NOT COVERED BY ROAD SURFACING MATERIALS, SHALL BE SEEDED IN ACCORDANCE WITH THE SWPP PLAN.
4. TEMPORARY EROSION CONTROL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE TEMPORARY EROSION CONTROL PLAN SHALL BE IN ACCORDANCE WITH THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND THE TRIPLE H WIND FARM STORMWATER POLLUTION PREVENTION PLAN ON FILE.

PROJECT CONTACT INFORMATION:

TITLE	COMPANY	NAME	CONTACT NUMBER
OWNER (PRIMARY)	ENGIE	CASEY WILLIS	805-569-6185
PROJECT MANAGER	WESTWOOD	DANI NYGREN	952-906-7493
ENGINEER OF RECORD	WESTWOOD	ROB COPOULS	952-906-7470
CONTRACTOR	WANZEK	JASON HELLERUD	701-893-3685

Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite #300
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed:	MMK
Checked:	DBN
Drawn:	MMK

As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK
a MasTec company

2028 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19

0014440DTP.dwg

©2019 Westwood Professional Services, Inc.

CEMENT STABILIZATION - PROCEDURE

THE SPECIFICATIONS BELOW ARE GENERAL RECOMMENDATIONS/GUIDELINES FOR CEMENT STABILIZATION OF SUBGRADES FOR THE PROJECT. ACTUAL FIELD CONDITIONS MAY ALTER APPLICATION RATE. CONSULT GEOTECHNICAL ENGINEER FOR FURTHER RECOMMENDATIONS.

1. STRIP THE TOP ±4 INCHES OF TOPSOIL (THROUGH THE ROOT ZONE) FROM THE AREA TO BE STABILIZED. ROOTS SMALLER THAN 1/4" DIAMETER ARE CONSIDERED INSIGNIFICANT.
2. PERFORM A PROCTOR (ASTM D 698) TEST TO DETERMINE THE OPTIMUM MOISTURE CONTENT IF THE MATERIAL TO BE STABILIZED DOES NOT MATCH A PREVIOUSLY PERFORMED PROCTOR.
3. DETERMINE THE IN-SITU MOISTURE CONTENT USING A NUCLEAR DENSITY GAUGE (OR EQUIVALENT MOISTURE CONTENT TEST) DAILY, PRIOR TO INCORPORATION OF THE CEMENT. PROVIDE ADDITIONAL MOISTURE CONTENT TESTING AS NEEDED BASED ON WEATHER CONDITIONS.
   - 3.1. THE CONTRACTOR WILL BE ADVISED OF IN-SITU MOISTURE CONTENT, AND MOISTURE ADJUSTMENTS SHOULD BE MADE IF IN-SITU MOISTURE IS LESS THAN OPTIMUM MOISTURE CONTENT AS DETERMINED BY THE PROCTOR (ASTM D 698).
4. SOIL AND CEMENT BLENDING:
   - 4.1. COMPLETELY BLEND SUBGRADE SOIL WITH THE APPROPRIATE AMOUNT OF CEMENT BY WEIGHT. FIELD RESULTS FROM TEST STRIPS WILL DICTATE THE CEMENT APPLICATION RATE.
   - 4.2. IN AREAS OF HIGH MOISTURE OR POOR SOILS, THE CONTRACTOR MAY INCREASE THE PERCENT OF CEMENT IN ORDER TO MEET THE MINIMUM SUBGRADE STRENGTH REQUIREMENTS.
   - 4.3. THE USE OF A RECLAIMER IS AN ADEQUATE BLENDING METHOD. DISCING IS NOT AN ADEQUATE BLENDING METHOD.
   - 4.4. A STABILIZATION DEPTH OF 12" WAS USED FOR DESIGN PURPOSES. STABILIZATION DEPTH MAY NEED TO INCREASE TO 16" IN AREAS OF EXTREME MOISTURE OR POOR SOILS IN ORDER TO MEET THE STRENGTH AND PROOF ROLL REQUIREMENTS.
5. COMPACTION:
   - 5.1. A ROLLING PATTERN WILL BE ESTABLISHED USING A NUCLEAR DENSITY GAUGE DURING COMPACTION.
     - 5.1.1. COMPACTION WILL BE PERFORMED UNTIL THE STABILIZED MATERIAL REACHES THE "BREAK POINT" AFTER WHICH ADDITIONAL PASSES WITH A ROLLER RESULTS IN A LOSS OF DENSITY AS MEASURED BY A NUCLEAR DENSITY GAUGE.
     - 5.1.2. COMPACTION IS TYPICALLY ACHIEVED BY MULTIPLE PASSES OF A PADFOOT ROLLER UNTIL THE ROLLER "WALKS" OUT OF THE RECLAIMED MATERIAL (SPACE IS VISIBLE BETWEEN THE DRUM AND THE RECLAIMED MATERIAL). THIS IS FOLLOWED BY BLADING AND SHAPING THE RECLAIMED MATERIAL TO FINAL PROFILE AND CROSS SECTION, REMOVING HIGH AND LOW POINTS. SMOOTH DRUM OR RUBBER TIRE ROLLERS ARE THEN USED TO FINISH ROLLING (THIS IS WHEN THE DENSITY TESTS ARE PERFORMED) UNTIL THE DENSITY OF THE MATERIAL REACHES THE "BREAK POINT."
     - 5.1.3. THE NUMBER OF PASSES AND EQUIPMENT USED TO REACH THE "BREAK POINT" IS CONSIDERED THE ROLLING PATTERN.
     - 5.1.4. A NEW ROLLING PATTERN MAY NEED TO BE ESTABLISHED IF THE PERFORMANCE REQUIREMENTS ARE NOT BEING MET. THIS MAY BE DUE TO CHANGES IN THE MOISTURE CONTENT, THE SOIL TYPE, OR THE CEMENT RATE.
   - 5.2. THE TARGET DENSITY IS 98% OF THE MAXIMUM DENSITY DETERMINED FROM THE ROLLING PATTERN.
     - 5.2.1. DENSITY TESTS SHALL BE TAKEN AT THE RATE OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER TO CONFIRM THE DENSITY IS MATCHING THE TARGET. ONCE THE ROLLING PATTERN HAS BEEN CONFIRMED IT IS RECOMMENDED THAT TESTING CONTINUE AT 1 TEST PER 1,000 LF IN EACH PASS OF THE RECLAIMER.
     - 5.2.2. IF IT IS NOT POSSIBLE TO ATTAIN THE TARGET DENSITY, AND ADDITIONAL COMPACTION DOES NOT IMPROVE THE DENSITY, A NEW ROLLING PATTERN SHOULD BE ESTABLISHED.
   - 5.3. THE AIR TEMPERATURE SHALL BE ABOVE 40 DEGREES (F) DURING THE CEMENT STABILIZATION PROCESS. MIXING CEMENT INTO FROZEN GROUND IS NOT ACCEPTABLE.
6. THE STABILIZED MATERIAL SHALL BE CONTINUOUSLY WET CURED FOR A MINIMUM OF 24 HOURS (WET CURED IS IDENTIFIED VISUALLY AS DAMP SURFACE).
7. PERFORM SUBGRADE TESTING IN ACCORDANCE WITH TESTING SCHEDULE.
8. AGGREGATE PLACEMENT:
   - 8.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 8.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 8.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

CEMENT STABILIZATION - DESIGN BASIS

1. DURING INITIAL CONSTRUCTION, CONTRACTOR SHALL CONSTRUCT MINIMUM 300 LF TEST STRIPS CONTAINING 4%, 5%, AND 6% CEMENT IN ACCORDANCE WITH CEMENT STABILIZATION PROCEDURES.
2. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 3 FOR ANTICIPATED RESULTS):
   - 2.1. PERFORM INITIAL SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M BETWEEN 4 TO 6 HOURS AFTER FINAL COMPACTION.
   - 2.2. PERFORM ADDITIONAL DCP TESTING AT 24 AND 48 HOURS AFTER FINAL COMPACTION.
   - 2.3. PERFORM SUBSEQUENT DCP TESTS AT 7 DAYS AFTER FINAL COMPACTION AS VERIFICATION OF STRENGTH CURVE.
   - 2.4. A MINIMUM OF 3 TESTS PER TEST SECTION PER TIMEFRAME IS REQUIRED. TESTS SHALL BE TAKEN AT THE CENTERLINE AND 2' FROM EACH SHOULDER.
   - 2.5. RECORD DCP TEST RESULTS EVERY 6 INCHES TO TOTAL DEPTH OF 12 INCHES.

TABLE 3: TEST STRIP CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	COMPRESSIVE STRENGTH (PSF)
4 - 6 HOURS	6	5	1,800
24 HOURS	10	7	2,500
48 HOURS	15	10	3,300
7 DAYS	30	21	5,300

CEMENT STABILIZATION - PRODUCTION

1. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 5 FOR SUMMARY OF TESTING REQUIREMENTS):
   - 1.1. PERFORM SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M NO SOONER THAN 24 HOURS AFTER FINAL COMPACTION.
   - 1.2. DCP TESTING FREQUENCY SHALL BE WITH A RANDOM SPACING AND A MINIMUM OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER. A MINIMUM OF 3 TESTS PER ROAD IS REQUIRED.
   - 1.3. THE CBR OF THE STABILIZED SUBGRADE SHOULD BE CALCULATED IN 6" INCREMENTS THROUGH THE ENTIRE DEPTH OF THE STABILIZED LAYER.
   - 1.4. THE MINIMUM REQUIRED CBR PRIOR TO PROOF-ROLLING IS PROVIDED IN TABLE 4 BELOW:

TABLE 4: FINAL CEMENT STABILIZED CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	UNDRAINED SHEAR STRENGTH (PSF)	BEARING CAPACITY (PSF)
24 - 48 HOURS	15	10	3,500	9,800
3 - 7 DAYS	30	21	7,000	18,000
28 DAYS	50	33	12,000	28,500

NOTE: UNDRAINED SHEAR STRENGTH WAS CALCULATED USING THE BLACK (1961) EQUATION. BEARING CAPACITY WAS CALCULATED USING THE VESIC EQUATION MODIFIED FOR TWO LAYERS (12" CEMENT STABILIZED SUBGRADE OVER A NATURAL SUBGRADE WITH A CBR OF 1.5)

   - 1.5. ONCE THE MINIMUM REQUIRED CBR IS ACHIEVED AT ANY CORRESPONDING TIME PERIOD, THE SUBGRADE IS CONSIDERED ADEQUATE AND THE CONTRACTOR MAY PROCEED WITH PROOF-ROLL TESTING. FUTURE DCP TESTING ON THAT SEGMENT OF SUBGRADE IS NOT REQUIRED.
   - 1.6. IF TESTING DOES NOT INDICATE A CBR OF 30 WITHIN 7 DAYS, ADDITIONAL GRAVEL SURFACING AND/OR THE ADDITION OF GEOTEXTILE FABRIC MAY BE REQUIRED. FOR FUTURE SUBGRADE STABILIZATION AREAS, CONTACT THE ENGINEER AND OWNER VIA RFI FOR RECOMMENDATIONS AND APPROVAL.
2. SUBGRADE PROOF-ROLL TESTING AND ACCEPTANCE:
   - 2.1. ONCE THE REQUIRED DCP VALUE HAS BEEN OBTAINED BUT PRIOR TO PLACING AGGREGATE, THE SUBGRADE SHALL BE PROOF-ROLLED. REFER TO THE PROJECT TESTING REQUIREMENTS FOR PROOF-ROLL DEFINITION.
   - 2.2. PROOF-ROLLING SHOULD BE PERFORMED WITH ONE PASS DOWN THE CENTER AND NOT BE PERFORMED WITHIN 12 INCHES OF THE EDGE OF THE STABILIZED SECTION.
   - 2.3. IF PROOF-ROLLING FAILS, RE-STABILIZATION MAY BE REQUIRED AND A NEW ROLLING PATTERN OR ADDITIONAL CEMENT MAY BE REQUIRED.
3. AGGREGATE PLACEMENT:
   - 3.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 3.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 3.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

TABLE 5: CEMENT STABILIZATION PRODUCTION TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
COMPACTED SUBGRADE (CEMENT STABILIZED)	PROCTOR	MINIMUM 1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER 1000 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
NOTE: SEE ABOVE FOR INITIAL TESTING REQUIREMENTS	DCP TEST	1 PER 500 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
	PROOF-ROLL (AFTER PASSING DCP TESTS)	ENTIRE LENGTH

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 1000
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-Free (888) 937-5150 www.westwoodps.com

Westwood Professional Services, Inc.

Designed: SMC
Checked: TBH
Drawn: SMC
As-Built Drawing:

Revisions #	Date	Description
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK
MasTec

2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 13 OF 57

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 333rd Ave in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 1360' North of 333rd Ave & 204th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.25'44.93" W Long. -99.31'20.67" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: ~~N/A~~ As determined by Hyde County Highway Superintendent
   (Check attached spec sheet)
6. Location by legal description: Parcel # 000956 SW4 8-111-72
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Taya Lowe
Signature of Applicant

Robert Bawdon
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 333rd Ave in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 1360' North of 333rd Ave & 204th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.25'44.93" W Long. -99.31'20.67" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: N/A
   (Check attached spec sheet)
6. Location by legal description: Parcel # 000956 SW4 8-111-72
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: _____

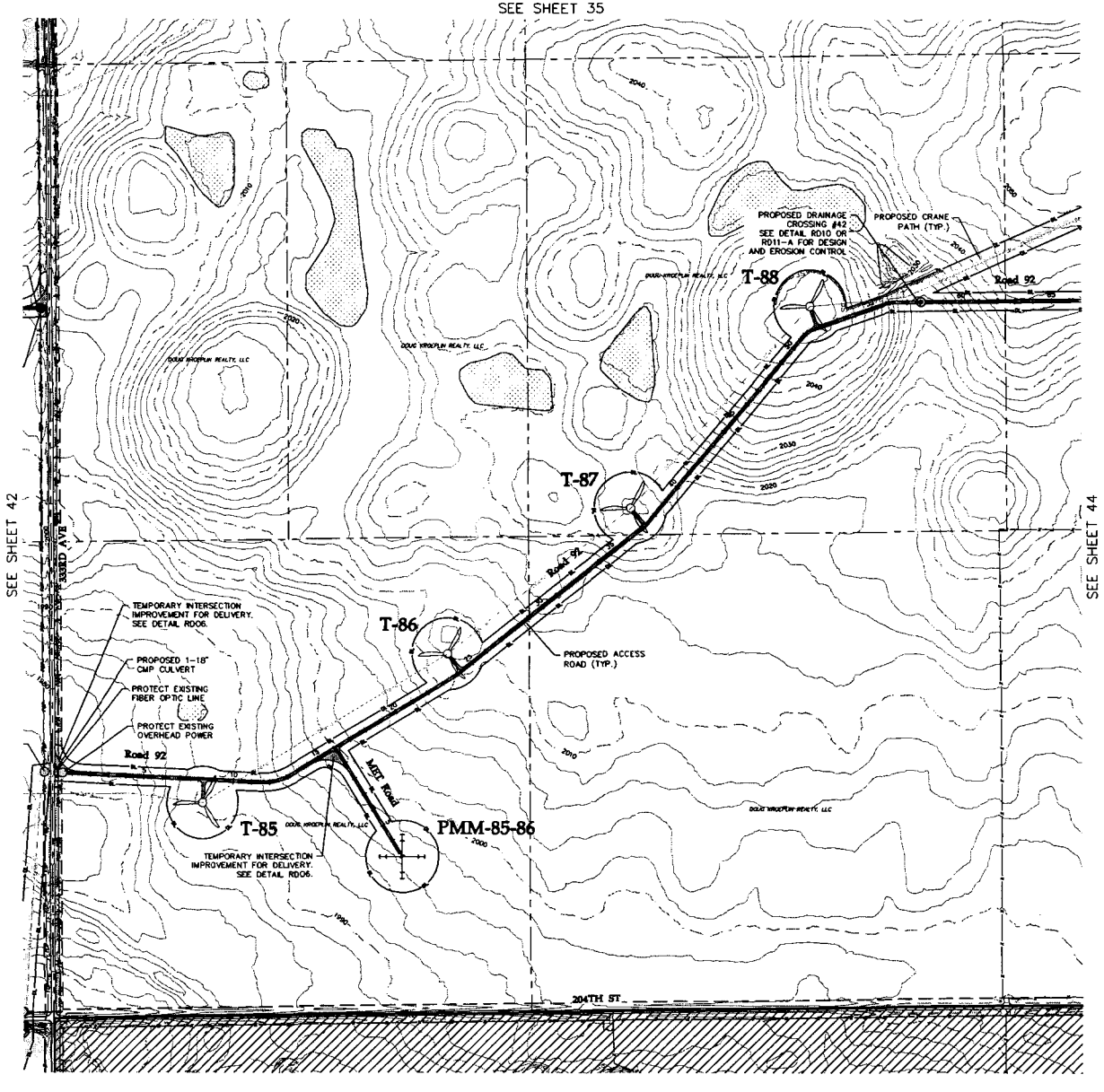
Signature of Applicant

Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

© 2019 Westwood Professional Services, Inc.



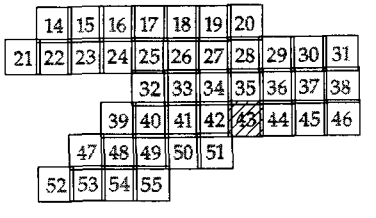
LEGEND:

- PROPOSED TURBINE LOCATION
- T-XX PROPOSED TURBINE NUMBER
- PROPOSED ALTERNATE TURBINE LOCATION
- ALT-XX PROPOSED ALTERNATE TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED ALTERNATE ACCESS ROAD
- PROPOSED CRANE PATH
- PROPOSED UNDERGROUND COLLECTION*
- PROPOSED DISTURBANCE LIMITS
- PROPOSED PERIMETER SEDIMENT CONTROL
- 980 EXISTING 10' CONTOURS
- EXISTING 2' CONTOURS
- EXISTING GRAVEL EDGE
- EXISTING BITUMINUS EDGE
- EXISTING RIGHT-OF-WAY
- EXISTING PARCEL LINE
- EXISTING BUILDING
- EXISTING FENCE
- EXISTING OVERHEAD POWER
- EXISTING HIGH VOLTAGE OVERHEAD POWER
- EXISTING UNDERGROUND POWER LINE
- EXISTING FIBER OPTIC LINE
- EXISTING WATER LINE
- DELINEATED WETLAND
- ARCHAEOLOGICAL AVOIDANCE AREA
- EXISTING USFWS EASEMENT
- PROJECT BOUNDARY
- 1900 EXISTING GROUND ELEVATION
- PROPOSED DRAINAGE CROSSING**
- PROPOSED TEMPORARY DRAINAGE CROSSING**
- PROPOSED FENCE CROSSING***
- PROPOSED UTILITY CROSSING
- PROPOSED CULVERT

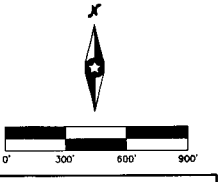
* PROVIDED BY OTHERS AND SHOWN FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSTRUCTION PLANS FOR DETAILS.

** SEE SHEET 11 FOR DRAINAGE CROSSING TYPE AND SIZING. DRAINAGE CROSSINGS SHALL CONSIST OF LOW WATER CROSSING OR CULVERT. DRAINAGE CROSSINGS ALONG CRANE PATH SHALL CONSIST OF CRANE MATS OR TEMPORARY CULVERT.

*** ALL GATE INSTALLATIONS SHALL BE FIELD DETERMINED AND AGREED UPON BY THE CONTRACTOR AND OWNER.



KEY MAP



Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150
Westwood Professional Services, Inc.

Designed:	BME
Checked:	DEH
Drawn:	BME
As-Built Drawn by:	

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Site Plan T-85 - T-88

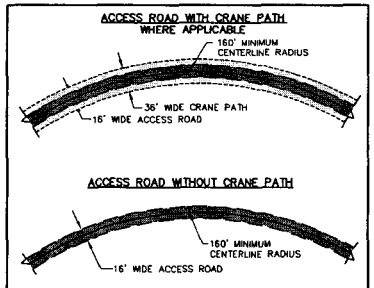
90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19

Sheet: 43 OF 57

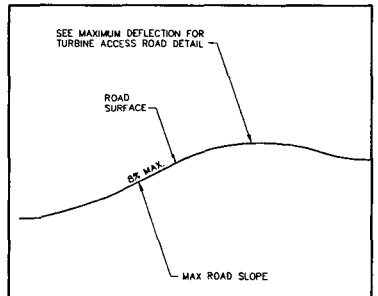
0014440SP01.dwg

© 2019 Westwood Professional Services, Inc.



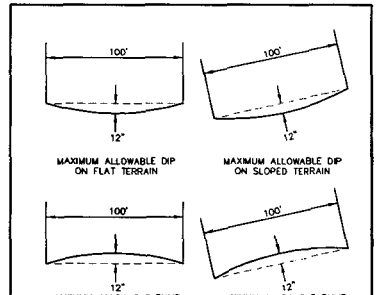
NOTE:
1. SOME RADII MAY REQUIRE ADDITIONAL SOIL COMPACTION OR GRAVEL OUTSIDE OF THE WIDTH SHOWN ABOVE TO ACCOMMODATE TRACTORS OR TRAILERS TRACKING OFF THE ACCESS ROAD.

	MINIMUM RADIUS FOR TURBINE ACCESS ROAD	LAST REVISED: 04/28/11 RD02

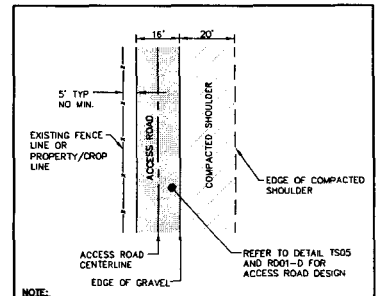


NOTES:
1. ROAD SLOPE SHALL NOT EXCEED 8% WITHOUT OWNER APPROVAL

	MAXIMUM VERT. SLOPE FOR TURBINE ACCESS ROAD/CRANE TRAVEL PATH	LAST REVISED: 3/28/11 RD03

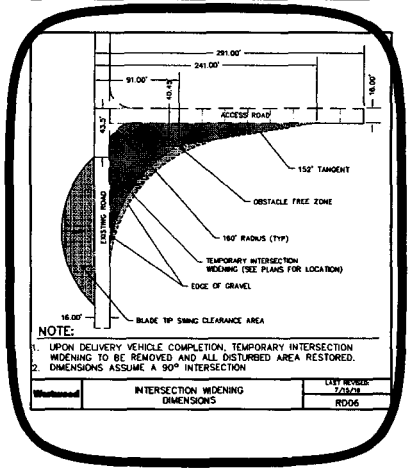


	MAXIMUM DEFLECTION FOR TURBINE ACCESS ROAD	LAST REVISED: 01/02/08 RD04



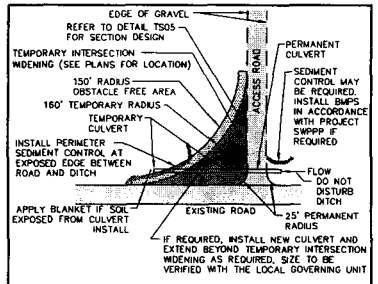
NOTE:
1. COMPACTED SHOULDER SHALL BE RETURNED TO NATIVE CONDITION FOLLOWING TURBINE GENERATOR CONSTRUCTION.
2. THE ACCESS ROAD MAY NEED TO BE CONSTRUCTED FARTHER FROM THE PROPERTY LINE IF OBSTRUCTIONS SUCH AS TREES FOLLOW THE PROPERTY LINE.

	TURBINE ACCESS ROAD ALONG FENCE/PROPERTY/CROP LINE	LAST REVISED: 3/28/12 RD05



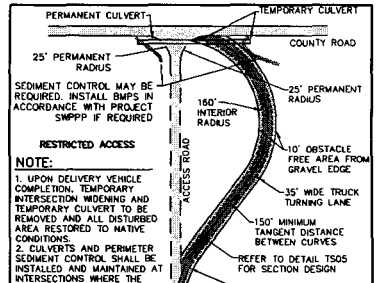
NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING TO BE REMOVED AND ALL DISTURBED AREA RESTORED.
2. DIMENSIONS ASSUME A 90° INTERSECTION

	INTERSECTION WIDENING DIMENSIONS	LAST REVISED: 7/19/19 RD06



1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.

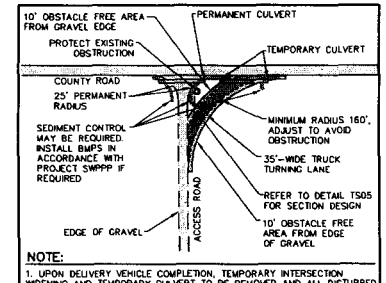
	TURBINE ACCESS ROAD TYPICAL INTERSECTION WIDENING	LAST REVISED: 3/8/07 RD07



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

NOT TO SCALE

	TRUCK TRAFFIC TURNING LANE A	LAST REVISED: 3/8/07 RD08-A



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

	TRUCK TRAFFIC TURNING LANE B	LAST REVISED: 10/2/14 RD08-B

Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwood@us.com
Westwood Professional Services, Inc.

Designed: BMC
Checked: RJM
Drawn: BMC
As-Built Drawing:

Revisions: #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:
WANZEK
MasTec
2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

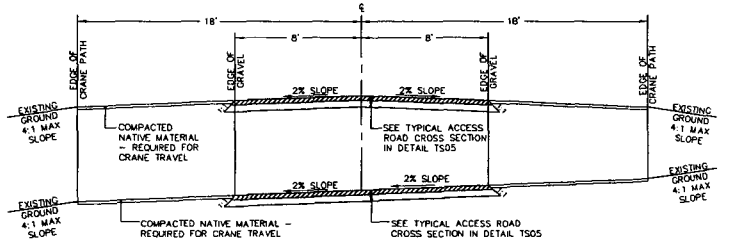
Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 5 OF 57

0014440DTP.dwg

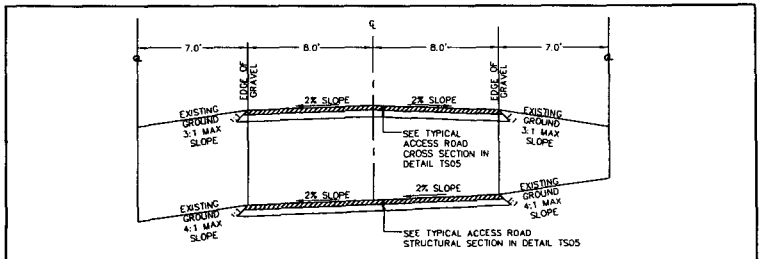
© 2019 Westwood Professional Services, Inc.



NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%.
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE ACCESS ROAD DIRECTLY INTO EXISTING GROUND SURFACE
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

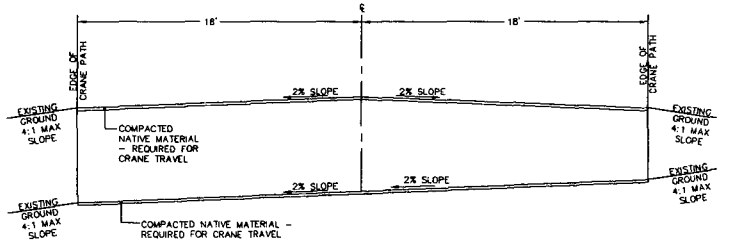
Westwood | TYPICAL TURBINE ACCESS ROAD AND CRANE PATH | LAST REVISED: 05/28/21 | RD01-A



NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

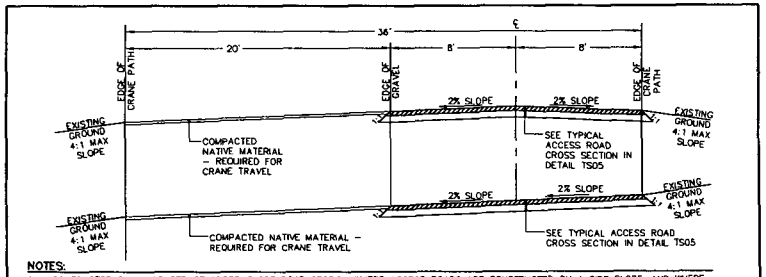
Westwood | TYPICAL TURBINE ACCESS ROAD SECTION | LAST REVISED: 7/19/19 | RD01-B



NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE WHERE CRANE PATHS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT CRANE PATH REMAINS WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%.

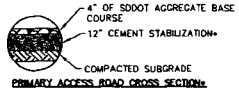
Westwood | TYPICAL CRANE PATH | LAST REVISED: 05/28/21 | RD01-C



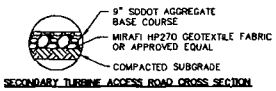
NOTES:

1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE, AND WHERE OTHERWISE NOTED ON PLANS, TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. MAXIMUM CROSS SLOPE FOR CRANE TRAVEL IS 2.0%.
3. WHEN CRANE PATH IS NOT NEEDED, MATCH THE EDGE OF COMPACTED SHOULDER DIRECTLY INTO EXISTING GROUND SURFACE.
4. ROADS TO GENERALLY FOLLOW EXISTING CONTOURS EXCEPT IF GRADES EXCEED TURBINE DELIVERY VEHICLE CAPABILITIES, IF THIS OCCURS GENERAL CONTRACTOR MAY PROVIDE ASSIST VEHICLE OR MODIFY GRADE

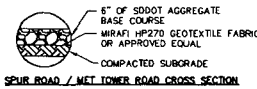
Westwood | TYPICAL TURBINE ACCESS ROAD AND OFFSET CRANE PATH | LAST REVISED: 05/28/21 | RD01-D



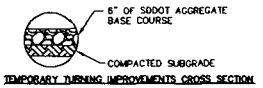
PRIMARY ACCESS ROAD CROSS SECTION*



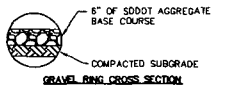
SECONDARY TURBINE ACCESS ROAD CROSS SECTION



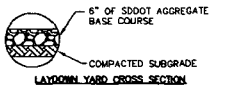
SPUR ROAD / MET TOWER ROAD CROSS SECTION



TEMPORARY TURNING IMPROVEMENTS CROSS SECTION



GRAVEL RING CROSS SECTION



LAYDOWN YARD CROSS SECTION

* CEMENT APPLICATION RATE MAY VARY BASED ON TEST STRIPS AND FIELD PERFORMANCE. SEE SHEET 13 FOR CEMENT STABILIZATION PROCEDURE AND DESIGN BASIS.

NOTES:

STRUCTURAL SECTIONS SHOWN ARE THE MINIMUM THICKNESS REQUIREMENTS DURING NORMAL FIELD CONDITIONS. THE SECTIONS MAY NEED TO BE INCREASED BASED ON ACTUAL FIELD CONDITIONS AT THE TIME OF CONSTRUCTION. CONDITIONS INCLUDE BUT ARE NOT LIMITED TO CONSTRUCTION DURING THE FREEZE/THAW CYCLE, UNUSUALLY WET PERIODS, OR IN LOW/WET AREAS. SEE SHEET 12 FOR TESTING REQUIREMENTS AND SPECIFICATIONS.

Westwood | TYPICAL STRUCTURAL CROSS SECTIONS

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
TollFree (866) 937-5150 www.westwoodps.com
Westwood Professional Services, Inc.

Designed: BMC
Checked: DBH
Drawn: BMC
As-Built Drawings:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 4 OF 57

001444DTP.dwg

©2019 Westwood Professional Services, Inc.

ROAD DESIGN PARAMETERS

1. ACCESS ROADS HAVE BEEN DESIGNED TO ACCOMMODATE LIGHT DUTY TRUCKS (PICKUP TRUCKS AND MAINTENANCE VEHICLES) FOR LOW VOLUME USE IN NORMAL OPERATING CONDITIONS AS WELL AS HEAVY DUTY CONSTRUCTION TRAFFIC UNDER DRY CONDITIONS. THE ROAD DESIGN SPECIFIED IS NOT INTENDED FOR ALL WEATHER USE FOR HEAVY DUTY CONSTRUCTION LOADS.
2. ROAD MAINTENANCE CAN BE EXPECTED OVER THE LIFE OF THE PERMANENT FACILITY.

PRODUCTS

1. AGGREGATE BASE SHALL CONSIST OF SDDOT AGGREGATE BASE COURSE (AND IN CONFORMANCE WITH THE GRADATION TABLE 1). AGGREGATE MAY BE CRUSHER RUN UPON ENGINEERS APPROVAL. AGGREGATE GRADATIONS SHALL BE SUBMITTED TO ENGINEER FOR REVIEW.
2. ROAD SHOULDERS AND CRANE PADS SHALL CONSIST OF COMPACTED NATIVE SOILS.
3. CULVERTS: ACCESS ROAD CULVERTS SHALL MEET THE MINIMUM SPECIFICATIONS SET FORTH BY THE SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION AND/OR HYDE COUNTY. ALL CULVERTS ARE PLANNED TO BE A MINIMUM 18" DIAMETER AND MANUFACTURED OF 16-GAGE CORRUGATED METAL PIPE WITH NO END TREATMENTS UNLESS NOTED OTHERWISE. ACTUAL SIZE WILL BE DETERMINED THROUGH HYDRAULIC ANALYSIS.
4. GEOTEXTILE FABRIC: MIRAFI HP270 OR APPROVED EQUAL.

EXECUTION

1. CLEARING AND GRUBBING
   A. THE CONTRACTOR SHALL BE REQUIRED TO GRUB ALL TREES, STUMPS, BRUSH, AND DEBRIS WITHIN THE GRADING AREAS SHOWN ON THE PLANS. GRUBBING INCLUDES REMOVAL OF ALL PLANT MATERIAL GREATER THAN 2" INCLUDING STUMPS, BRANCHES, ROOTS, ETC. TO A DEPTH BELOW THE FINAL SUBGRADE. THE CONTRACTOR IS TO REMOVE ONLY THOSE TREES WHICH ARE DESIGNATED BY THE OWNER'S REPRESENTATIVE FOR REMOVAL, AND SHALL EXERCISE EXTREME CARE AROUND EXISTING TREES TO BE SAVED.
2. TOPSOIL STRIPPING
   A. TOPSOIL, INCLUDING ROOTS LARGER THAN 2" AND LARGE ROOT MASSES, SHALL BE STRIPPED FROM ALL ROADWAY AND FOUNDATION AREAS UP TO 10". TOPSOIL SHALL NOT BE STRIPPED OUTSIDE OF THE DESIGNATED DISTURBANCE AREAS.
   B. ANY TOPSOIL THAT HAS BEEN STRIPPED SHALL BE STOCKPILED FOR POST CONSTRUCTION REVEGETATION. ALL TOPSOIL SHALL BE REDISTRIBUTED TO THE LAND OWNER'S PROPERTY OF WHERE IT ORIGINATED FROM.
3. FILL PLACEMENT
   A. FILL PLACEMENT SHALL CONSIST OF THE PLACING OF SUITABLE FILL MATERIAL, AFTER TOPSOIL STRIPPING, ABOVE THE EXISTING GRADE. GENERALLY, SIDE SLOPES SHALL BE CONSTRUCTED AT FOUR FOOT HORIZONTAL TO ONE FOOT VERTICAL, WITH SOME LOCATIONS THROUGHOUT THE PROJECT WITH SLOPES OF TWO FEET HORIZONTAL TO ONE FOOT VERTICAL. THE MATERIAL FOR FILL CONSTRUCTION SHALL BE OBTAINED FROM THE ACCESS ROAD/TURBINE EXCAVATION (SEE GEOTECHNICAL REPORT FOR RESTRICTIONS), OR ANY SUITABLE, APPROVED SOIL OBTAINED ONSITE/OFFSITE BY CONTRACTOR, AS DIRECTED OR APPROVED BY THE ENGINEER. THIS MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 12" AND CONSTRUCTED TO 95% OF THE MAXIMUM DRY DENSITY AND WITHIN 2% OF OPTIMUM MOISTURE CONTENT, AS DETERMINED BY THE STANDARD PROCTOR (AASHTO T99).
   B. SIDE SLOPES GREATER THAN 4:1 WILL NOT BE PERMITTED, UNLESS OTHERWISE NOTED ON THE PLAN.
   C. FILL SLOPES SHALL BE BENCHED INTO THE EXISTING SLOPE TO PREVENT MOVEMENT BETWEEN THE FILL AND NATIVE SOILS. BENCHES SHOULD BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO FILL PLACEMENT. POSITIVE DRAINAGE IS REQUIRED AT BENCHED AREAS AND AT THE TOE OF FILL SLOPES TO REMOVE SURFACE WATER.
4. SUBGRADE
   A. SUBGRADE PREPARED AT GRADE OR IN CUT REQUIRES SCARIFICATION AND RECOMPACTION TO A DEPTH OF 12" OR MORE.
   B. ACCESS ROAD CROSS SLOPES SHOWN IN THE PLANS ARE MEANT AS A GUIDE. ACCESS ROAD CROSS SLOPES MAY RANGE FROM 1% - 2%. CHECK WITH THE ENGINEER IF THE CROSS SLOPE FALLS OUTSIDE OF THIS RANGE. ACCESS ROADS BEING UTILIZED FOR CRANE TRAVEL SHOULD HAVE A MAX CROSS SLOPE OF 2%.

TABLE 1: SDDOT AGGREGATE BASE COURSE - LOCALLY SOURCED	
SIEVE SIZE	PERCENT PASSING
1"	100
3/4"	80-100
1/2"	68-91
NO. 4	46-70
NO. 8	34-58
NO. 40	13-35
NO. 200	3-12

MEET FOLLOWING REQUIREMENTS PER 882.2

LIQUID LIMIT (MAX) = 25
PLASTICITY INDEX = 0-6
L.A ABRASION (% MAX) = 40%

GRADATION HAS BEEN OBTAINED FROM THE 2015 SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION BOOK.

STORM WATER DESIGN PARAMETERS

1. SEE SHEET 6 FOR CULVERT SIZING AND DESIGN PARAMETERS. SEE HYDROLOGY MEMO FOR FURTHER DESIGN CALCULATIONS. CULVERTS SHALL BE MINIMUM 18" CORRUGATED METAL PIPE. ALL TEMPORARY PORTIONS OF THE INSTALLED CULVERTS SHALL BE REMOVED UPON COMPLETION OF THE PROJECT.
2. IT IS EXPECTED THAT CULVERTS WILL BE OVERTOPPED DURING SOME STORMS AND MAINTENANCE WILL BE REQUIRED THROUGH THE LIFE OF THE PROJECT.
3. WHEN INSTALLING DRAINAGE CULVERTS THE CONTRACTOR SHALL USE JUDGMENT IN SETTING THE FLOW LINE ELEVATIONS AND CULVERT LONGITUDINAL SLOPE. TYPICALLY THE FLOW LINE ELEVATIONS AND LONGITUDINAL SLOPE OF THE CULVERT SHOULD MATCH THE NATURAL GROUND ELEVATIONS AND SLOPE TO ENSURE POSITIVE DRAINAGE. WHEN POSSIBLE, ALL CULVERTS SHOULD BE PLACED AT A MINIMUM 0.5% GRADE.
4. ANTICIPATED CULVERT CROSSINGS ARE SHOWN ON THE CONSTRUCTION PLAN, ADDITIONAL CULVERTS MAY NEED TO BE INSTALLED IN AREAS WHERE CONCENTRATED FLOW IS EXPECTED DUE TO CONSTRUCTION ACTIVITIES.
5. CONSTRUCTION DRAINAGE CROSSINGS TO MAINTAIN EXISTING FLOW CHARACTERISTICS OF THE FEATURES. FEATURES SHALL BE GRADED TO PRECONSTRUCTION CONTOURS.

TESTING:

1. TESTING SHALL BE PERFORMED BY A DESIGNATED INDEPENDENT TESTING AGENCY.
2. SUBMIT ONE SET OF TESTING AND INSPECTION RECORDS SPECIFIED TO THE CIVIL ENGINEER OF RECORD.

DEFINITIONS:

1. PROOF ROLLING:
   SHALL BE PERFORMED IN THE PRESENCE OF THE GEOTECHNICAL ENGINEER OR QUALIFIED GEOTECHNICAL REPRESENTATIVE USING A FULLY LOADED TANDEM AXLE DUMP TRUCK OR WATER TRUCK WITH A MINIMUM GROSS WEIGHT OF 25 TONS OR A FULLY LOADED BELLY DUMP WITH AN EQUIVALENT AXLE LOADING. PROOF-ROLLING ACCEPTANCE STANDARDS INCLUDE NO RUTTING GREATER THAN 1.5 INCHES, AND NO "PUMPING" OF THE SOIL BEHIND THE LOADED TRUCK.
2. SIEVE ANALYSIS:
   SHALL BE CONDUCTED IN ACCORDANCE WITH AASHTO T27
3. PROCTORS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T99
4. ATTERBERG LIMITS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T89 AND T90
5. MOISTURE DENSITY (NUCLEAR DENSITY):
   SHALL BE DONE IN ACCORDANCE WITH AASHTO T310
6. DYNAMIC CONE PENETROMETER (DCP) TESTING:
   SHALL BE DONE IN ACCORDANCE WITH ASTM D6951-03

REQUIREMENTS:

1. FILL PLACEMENT:
   A. SOILS USED AS FILL MATERIAL SHALL BE TESTED FOR MOISTURE CONTENT AND PROCTOR TESTS.
   B. WHERE FILL CONSTRUCTION REQUIRES MORE THAN 12 INCHES OF FILL PLACEMENT, COMPACT EACH LIFT TO A MINIMUM OF 95 PERCENT OF THE MATERIAL'S MAXIMUM STANDARD PROCTOR DRY DENSITY.
2. COMPACTED SUBGRADE (CEMENT STABILIZED):
   A. SEE SHEET 13 FOR TESTING REQUIREMENTS AND PROCEDURE.
3. COMPACTED SUBGRADE (NON-CEMENT STABILIZED):
   A. THE ENTIRE SUBGRADE SHALL BE PROOF-ROLLED PRIOR TO THE PLACEMENT OF THE AGGREGATE BASE TO IDENTIFY AREAS OF UNSTABLE SUBGRADE.
   B. PERFORM A MINIMUM OF 3 DYNAMIC CONE PENETROMETER (DCP) TESTS PER ACCESS ROAD OR ONE FOR EVERY 1,000 LF OF ROAD, WHICHEVER IS GREATER. SUBGRADE MUST MEET A MINIMUM DCP OF 3 BLOWS PER 6" TO A TOTAL DEPTH OF 2' (MINIMUM CBR=1.5).
   C. IF A PASSING PROOF-ROLL OR DCP REQUIREMENTS CANNOT BE ACHIEVED THE FOLLOWING ALTERNATIVES MAY BE IMPLEMENTED:
      a. SCARIFY, DRY, AND RECOMPACT SUBGRADE
      b. REMOVE UNSUITABLE MATERIAL AND REPLACE WITH SUITABLE MATERIAL
      c. INCREASE AGGREGATE BASE THICKNESS
4. AGGREGATE BASE:
   A. AGGREGATE BASE SHALL BE PROOF-ROLLED OVER THE ENTIRE LENGTH. IF PROOF ROLLING DETERMINES THAT THE ROAD IS UNSTABLE, ADDITIONAL AGGREGATE SHALL BE ADDED UNTIL THE UNSTABLE SECTION IS ABLE TO PASS A PROOF ROLL.
   B. PROVIDE 1 SIEVE ANALYSIS (PROJECT MAX OF 20) PER 2500 CY OF ROAD BASE PLACED.
5. CRANE PAD AND CRANE PATHS / CRANE TRAVEL SHOULDERS:
   A. TESTING REQUIREMENTS ARE PENDING BASED ON CRANE PICK PLANS PROVIDED BY THE CONTRACTOR.

TABLE 2: TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
FILL PLACEMENT	PROCTOR	1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER LIFT PER 5000 SF OF FILL PLACED OR 1 PER 500 LF OF ROAD OR CRANE WALK
COMPACTED SUBGRADE (CEMENT STABILIZED):	SEE SHEET 13	SEE SHEET 13
COMPACTED SUBGRADE (NON-CEMENT STABILIZED):	PROOF-ROLL	ENTIRE AREA
	DCP	1 PER 1,000 FT OR MIN. 3 PER ROAD
AGGREGATE BASE	PROOF-ROLL	ENTIRE AREA
	SIEVE ANALYSIS, LL, PL, AND L.A ABRASION	1 PER 2,500 CY

GENERAL NOTES:

1. GROUND SURFACE CONTOURS (AT TWO-FOOT VERTICAL INTERVALS) AND ELEVATIONS ARE BASED ON A PHOTOGRAMMETRY SURFACE PROVIDED BY GEOTERRA. IF MAJOR DISCREPANCIES ARE FOUND IN THE GROUND ELEVATIONS DURING FIELD STAKING TO THE GROUND ELEVATIONS SHOWN ON THE PLANS, THE OWNER AND ENGINEER SHALL BE NOTIFIED.
2. WHERE SECTION OR SUBSECTION MONUMENTS ARE ENCOUNTERED, THE OWNER SHALL BE NOTIFIED BEFORE SUCH MONUMENTS ARE REMOVED. THE CONTRACTOR SHALL PROTECT AND CAREFULLY PRESERVE ALL PROPERTY MARKERS AND MONUMENTS UNTIL THE OWNER, AN AUTHORIZED SURVEYOR OR AGENT HAS WITNESSED OR OTHERWISE REFERENCED THEIR LOCATION.
3. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. TYPICAL DISTURBANCE SHALL BE LIMITED TO 10 LF FROM THE EDGE OF PROPOSED GRADING.
4. FINALIZE GRADING AROUND THE BASE OF TURBINES IN ACCORDANCE WITH DETAIL TS-03 AND TS-04.
5. GRADE ALL PROPOSED ROADS TO A MAXIMUM SLOPE OF 8%. IF 8% SLOPE CANNOT BE ACHIEVED, THE CONTRACTOR MAY UTILIZE ASSIST VEHICLES FOR THE PURPOSE OF DELIVERIES. GRADE ALL PROPOSED CRANE PATHS TO A MAXIMUM OF 8% UNLESS OTHERWISE NOTED IN PLAN SHEETS.
6. ANY FACILITIES REMOVED TO ALLOW FOR CONSTRUCTION (MAILBOXES, SIGNS, FENCES, ETC.) SHALL BE REPLACED BY THE CONTRACTOR IN A CONDITION AS GOOD AS EXISTING.
7. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING DRAINAGE THROUGHOUT THE CONSTRUCTION OF THIS PROJECT. CONSTRUCTION ACTIVITIES SHALL NOT BLOCK THE NATURAL OR MANMADE CREEKS OR DRAINAGE SWALES CAUSING RAINWATER TO POND. DEPENDING ON FIELD CONDITIONS, ADDITIONAL CULVERTS IN EXCESS OF THOSE ON THE PLANS MAY BE REQUIRED.
8. WHILE BUILDING THE ROADS AND EXCAVATING THE TURBINE FOUNDATIONS, EXCESS SOIL WILL RESULT. THE CONTRACTOR SHALL DISPOSE OF THIS EXCESS SOIL IN AN APPROVED MANNER. EXCESS TOPSOIL SHALL BE DISTRIBUTED INTO A THIN LAYER ON LAND IMMEDIATELY ADJACENT TO WHERE THE TOPSOIL ORIGINATED. ALL EXCESS TOPSOIL TO BE WASTED ONSITE. WHILE DOING SO THE CONTRACTOR SHALL AVOID CAUSING RIDGES OR MOUNDS THAT WOULD MAKE IT DIFFICULT FOR STORM WATER RUNOFF TO DRAIN. THE FINAL SURFACE OF THE DISTURBED TOPSOIL SHALL BE SMOOTH AND FOLLOW THE NATURAL CONTOUR OF THE LAND.
9. THE CONTRACTOR SHALL NOTIFY SOUTH DAKOTA 811 AT LEAST 48 HOURS BEFORE EXCAVATION ACTIVITIES COMMENCE.
10. TEMPORARY INTERSECTION WIDENING SHALL, UPON COMPLETION OF ALL PROJECT CONSTRUCTION OR UPON NOTIFICATION OF THE ENGINEER, BE REMOVED AND THE AREA RESTORED TO ITS ORIGINAL LINES AND GRADES WITH TOPSOIL REPLACED, EXCEPT WHERE REQUESTED BY THE TOWNSHIP OR COUNTY TO PERMANENTLY REMAIN. DISTURBED AREAS OUTSIDE OF THE FINAL ROADWAY SHALL BE SEEDED AND MULCHED.
11. TURBINE SETBACKS ARE NOT IDENTIFIED ON THE CONSTRUCTION PLANS. IT SHALL BE THE RESPONSIBILITY OF THE OWNER AND CONTRACTOR TO ENSURE THAT ALL TURBINE SETBACKS MEET PROJECT REQUIREMENTS.
12. GEOTECHNICAL REPORTS WITH RECOMMENDATIONS HAVE BEEN PROVIDED BY THE OWNER. ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL ENGINEERING REPORT AND RECOMMENDATIONS.
13. FIELD SURVEY WETLAND INFORMATION HAS BEEN PROVIDED BY THE OWNER. ALL WETLAND DELINEATIONS AND PERMITTING SHALL BE THE RESPONSIBILITY OF OTHERS AND BE COMPLETED PRIOR TO CONSTRUCTION COMMENCING. THE OWNER AND GENERAL CONTRACTOR SHALL VERIFY THAT ALL WETLAND PERMITS HAVE BEEN SUBMITTED AND APPROVED PRIOR TO CONSTRUCTION COMMENCING.
14. CULTURAL RESOURCE REPORTS HAVE NOT BEEN PROVIDED. CULTURAL RESOURCE LOCATIONS ARE NOT SHOWN ON THE PLANS. INFORMATION WILL BE THE RESPONSIBILITY OF THE OWNER AND GENERAL CONTRACTOR. THE LOCATIONS OF CULTURAL RESOURCE SITES MAY BE CONFIDENTIAL AND PROTECTED BY STATE OR FEDERAL LAW. PUBLIC RELEASE OF SPECIFIC INFORMATION REGARDING THESE RESOURCES MAY BE RESTRICTED.
15. AN ENVIRONMENTAL ASSESSMENT HAS NOT BEEN PROVIDED. THE CONTRACTOR SHALL BE FAMILIAR WITH THE REPORT AND REVIEW ALL RECOMMENDATIONS.
16. ELECTRICAL INFORMATION SHOWN ON THE PLANS IS FOR REFERENCE ONLY. REFER TO ELECTRICAL CONSULTANT'S PLANS FOR SPECIFIC LOCATIONS AND CONSTRUCTION DETAILS FOR THE UNDERGROUND POWER COLLECTION SYSTEM AND SUBSTATION.
17. CRANE PATHS ARE SHOWN ON THE CONSTRUCTION PLANS. IF THE CONTRACTOR PROPOSES ALTERNATE CRANE PATHS, THEY SHALL ENSURE THAT WETLAND AND CULTURAL RESOURCE CORRIDORS ARE NOT DISTURBED. FINAL CRANE PATH ALIGNMENTS SHALL BE DETERMINED BY THE CONTRACTOR BASED ON FIELD CONDITIONS WITHIN THE WETLAND AND CULTURAL RESOURCE CORRIDORS. SPECIAL LANDOWNER AGREEMENTS AND THE PROJECT BOUNDARY.
18. EFFORTS SHALL BE MADE TO MINIMIZE SOIL DISTURBANCE TO AREAS OUTSIDE OF THE ROAD GRADING LIMITS, CRANE PATHS, AND TURBINE SITES. DISTURBANCE SHALL BE LIMITED TO 50 LF WIDTH FOR PROPOSED ACCESS ROADS AND 50 LF FOR CRANE PATHS, AND SHALL BE LIMITED TO A 250 LF RADIUS FOR PROPOSED WIND TURBINE GENERATORS. THE GRADING LIMITS SHALL BE CENTERED ON THE ROADWAYS AND WIND TURBINES. THE CONTRACTOR SHALL MAKE ALL EFFORTS TO KEEP ACTIVITIES WITHIN THE ERECTION AREAS SHOWN ON THE PLANS BUT IT IS UNDERSTOOD THAT SOME ACTIVITIES THAT WILL NOT REQUIRE GRADING OR SOIL DISTURBANCE MAY EXTEND BEYOND THE DEFINED LIMITS. DURING ERECTION OF THE ROTOR, TRUCKS AND/OR FORKLIFTS MAY EXTEND BEYOND THESE LIMITS. SEE DETAIL TS01 FOR TYPICAL ERECTION AREAS.
19. AN ALTA SURVEY HAS BEEN PROVIDED BY WESTWOOD. CONTRACTOR AND OWNER ARE RESPONSIBLE FOR LOCATING ALL UTILITIES AND VERIFYING LOCATION OF CONSTRUCTION ACTIVITIES PRIOR TO COMMENCING WORK.

STORMWATER POLLUTION PREVENTION PLAN (SWPPP):

1. THE CONTRACTOR SHALL PROVIDE EROSION CONTROL MEASURES AS PLANNED AND SPECIFIED FOLLOWING BEST MANAGEMENT PRACTICES AS OUTLINED BY THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND BEING IN CONFORMANCE WITH THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL STORMWATER PERMIT.
2. REFER TO THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR THE TRIPLE H WIND FARM, PREPARED BY WESTWOOD PROFESSIONAL SERVICES, FOR EROSION CONTROL AND RESTORATION SPECIFICATIONS, SEDIMENT AND EROSION CONTROL PROCEDURES, LOCATIONS OF BMPs, DETAILS, AND INSPECTION INFORMATION.
3. ALL PASTURES AND DRAINAGE SWALES DISTURBED DURING CONSTRUCTION ACTIVITIES AND NOT COVERED BY ROAD SURFACING MATERIALS, SHALL BE SEEDED IN ACCORDANCE WITH THE SWPP PLAN.
4. TEMPORARY EROSION CONTROL SHALL BE THE RESPONSIBIUTY OF THE CONTRACTOR. THE TEMPORARY EROSION CONTROL PLAN SHALL BE IN ACCORDANCE WITH THE SOUTH DAKOTA DEPARTMENT OF HEALTH AND THE TRIPLE H WIND FARM STORMWATER POLLUTION PREVENTION PLAN ON FILE.

PROJECT CONTACT INFORMATION:

TITLE	COMPANY	NAME	CONTACT NUMBER
OWNER (PRIMARY)	ENGIE	CASEY WILLIS	805-569-6185
PROJECT MANAGER	WESTWOOD	DANI NYGREN	952-906-7493
ENGINEER OF RECORD	WESTWOOD	ROB COPOULS	952-906-7470
CONTRACTOR	WANZEK	JASON HELLERUD	701-893-3685

Westwood

Westwood Professional Services, Inc.

Designed: BMK
Checked: DPI
Drawn: BMK
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK
A MasTec Company

2028 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 12 OF 57

00144400TP.dwg

©2019 Westwood Professional Services, Inc.

CEMENT STABILIZATION - PROCEDURE

THE SPECIFICATIONS BELOW ARE GENERAL RECOMMENDATIONS/GUIDELINES FOR CEMENT STABILIZATION OF SUBGRADES FOR THE PROJECT. ACTUAL FIELD CONDITIONS MAY ALTER APPLICATION RATE. CONSULT GEOTECHNICAL ENGINEER FOR FURTHER RECOMMENDATIONS.

1. STRIP THE TOP ±6 INCHES OF TOPSOIL (THROUGH THE ROOT ZONE) FROM THE AREA TO BE STABILIZED. ROOTS SMALLER THAN 1/4" DIAMETER ARE CONSIDERED INSIGNIFICANT.
2. PERFORM A PROCTOR (ASTM D 698) TEST TO DETERMINE THE OPTIMUM MOISTURE CONTENT IF THE MATERIAL TO BE STABILIZED DOES NOT MATCH A PREVIOUSLY PERFORMED PROCTOR.
3. DETERMINE THE IN-SITU MOISTURE CONTENT USING A NUCLEAR DENSITY GAUGE (OR EQUIVALENT MOISTURE CONTENT TEST) DAILY, PRIOR TO INCORPORATION OF THE CEMENT. PROVIDE ADDITIONAL MOISTURE CONTENT TESTING AS NEEDED BASED ON WEATHER CONDITIONS.
   - 3.1. THE CONTRACTOR WILL BE ADVISED OF IN-SITU MOISTURE CONTENT, AND MOISTURE ADJUSTMENTS SHOULD BE MADE IF IN-SITU MOISTURE IS LESS THAN OPTIMUM MOISTURE CONTENT AS DETERMINED BY THE PROCTOR (ASTM D 698).
4. SOIL AND CEMENT BLENDING:
   - 4.1. COMPLETELY BLEND SUBGRADE SOIL WITH THE APPROPRIATE AMOUNT OF CEMENT BY WEIGHT. FIELD RESULTS FROM TEST STRIPS WILL DICTATE THE CEMENT APPLICATION RATE.
   - 4.2. IN AREAS OF HIGH MOISTURE OR POOR SOILS, THE CONTRACTOR MAY INCREASE THE PERCENT OF CEMENT IN ORDER TO MEET THE MINIMUM SUBGRADE STRENGTH REQUIREMENTS.
   - 4.3. THE USE OF A RECLAIMER IS AN ADEQUATE BLENDING METHOD. DISCING IS NOT AN ADEQUATE BLENDING METHOD.
   - 4.4. A STABILIZATION DEPTH OF 12" WAS USED FOR DESIGN PURPOSES. STABILIZATION DEPTH MAY NEED TO INCREASE TO 16" IN AREAS OF EXTREME MOISTURE OR POOR SOILS IN ORDER TO MEET THE STRENGTH AND PROOF ROLL REQUIREMENTS.
5. COMPACTION:
   - 5.1. A ROLLING PATTERN WILL BE ESTABLISHED USING A NUCLEAR DENSITY GAUGE DURING COMPACTION.
     - 5.1.1. COMPACTION WILL BE PERFORMED UNTIL THE STABILIZED MATERIAL REACHES THE "BREAK POINT" AFTER WHICH ADDITIONAL PASSES WITH A ROLLER RESULTS IN A LOSS OF DENSITY AS MEASURED BY A NUCLEAR DENSITY GAUGE.
     - 5.1.2. COMPACTION IS TYPICALLY ACHIEVED BY MULTIPLE PASSES OF A PADFOOT ROLLER UNTIL THE ROLLER "WALKS" OUT OF THE RECLAIMED MATERIAL (SPACE IS VISIBLE BETWEEN THE DRUM AND THE RECLAIMED MATERIAL). THIS IS FOLLOWED BY BLADING AND SHAPING THE RECLAIMED MATERIAL TO FINAL PROFILE AND CROSS SECTION, REMOVING HIGH AND LOW POINTS. SMOOTH DRUM OR RUBBER TIRE ROLLERS ARE THEN USED TO FINISH ROLLING (THIS IS WHEN THE DENSITY TESTS ARE PERFORMED) UNTIL THE DENSITY OF THE MATERIAL REACHES THE "BREAK POINT."
     - 5.1.3. THE NUMBER OF PASSES AND EQUIPMENT USED TO REACH THE "BREAK POINT" IS CONSIDERED THE ROLLING PATTERN.
     - 5.1.4. A NEW ROLLING PATTERN MAY NEED TO BE ESTABLISHED IF THE PERFORMANCE REQUIREMENTS ARE NOT BEING MET. THIS MAY BE DUE TO CHANGES IN THE MOISTURE CONTENT, THE SOIL TYPE, OR THE CEMENT RATE.
   - 5.2. THE TARGET DENSITY IS 98% OF THE MAXIMUM DENSITY DETERMINED FROM THE ROLLING PATTERN.
     - 5.2.1. DENSITY TESTS SHALL BE TAKEN AT THE RATE OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER TO CONFIRM THE DENSITY IS MATCHING THE TARGET. ONCE THE ROLLING PATTERN HAS BEEN CONFIRMED IT IS RECOMMENDED THAT TESTING CONTINUE AT 1 TEST PER 1,000 LF IN EACH PASS OF THE RECLAIMER.
     - 5.2.2. IF IT IS NOT POSSIBLE TO ATTAIN THE TARGET DENSITY, AND ADDITIONAL COMPACTION DOES NOT IMPROVE THE DENSITY, A NEW ROLLING PATTERN SHOULD BE ESTABLISHED.
   - 5.3. THE AIR TEMPERATURE SHALL BE ABOVE 40 DEGREES (F) DURING THE CEMENT STABILIZATION PROCESS. MIXING CEMENT INTO FROZEN GROUND IS NOT ACCEPTABLE.
6. THE STABILIZED MATERIAL SHALL BE CONTINUOUSLY WET CURED FOR A MINIMUM OF 24 HOURS (WET CURED IS IDENTIFIED VISUALLY AS DAMP SURFACE).
7. PERFORM SUBGRADE TESTING IN ACCORDANCE WITH TESTING SCHEDULE.
8. AGGREGATE PLACEMENT:
   - 8.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 8.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 8.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

CEMENT STABILIZATION - DESIGN BASIS

1. DURING INITIAL CONSTRUCTION, CONTRACTOR SHALL CONSTRUCT MINIMUM 300 LF TEST STRIPS CONTAINING 4%, 5% AND 6% CEMENT IN ACCORDANCE WITH CEMENT STABILIZATION PROCEDURES.
2. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 3 FOR ANTICIPATED RESULTS):
   - 2.1. PERFORM INITIAL SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M BETWEEN 4 TO 6 HOURS AFTER FINAL COMPACTION.
   - 2.2. PERFORM ADDITIONAL DCP TESTING AT 24 AND 48 HOURS AFTER FINAL COMPACTION.
   - 2.3. PERFORM SUBSEQUENT DCP TESTS AT 7 DAYS AFTER FINAL COMPACTION AS VERIFICATION OF STRENGTH CURVE.
   - 2.4. A MINIMUM OF 3 TESTS PER TEST SECTION PER TIMEFRAME IS REQUIRED. TESTS SHALL BE TAKEN AT THE CENTERLINE AND 2' FROM EACH SHOULDER.
   - 2.5. RECORD DCP TEST RESULTS EVERY 6 INCHES TO TOTAL DEPTH OF 12 INCHES.

TABLE 3: TEST STRIP CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	COMPRESSIVE STRENGTH (PSF)
4 – 6 HOURS	6	5	1,800
24 HOURS	10	7	2,500
48 HOURS	15	10	3,300
7 DAYS	30	21	5,200

CEMENT STABILIZATION - PRODUCTION

1. SUBGRADE DCP TESTING AND ACCEPTANCE (SEE TABLE 5 FOR SUMMARY OF TESTING REQUIREMENTS):
   - 1.1. PERFORM SUBGRADE STRENGTH TESTING BY DYNAMIC CONE PENETROMETER (DCP) PER ASTM D 6951/6951M NO SOONER THAN 24 HOURS AFTER FINAL COMPACTION.
   - 1.2. DCP TESTING FREQUENCY SHALL BE WITH A RANDOM SPACING AND A MINIMUM OF 1 TEST PER 500 LF IN EACH PASS OF THE RECLAIMER. A MINIMUM OF 3 TESTS PER ROAD IS REQUIRED.
   - 1.3. THE CBR OF THE STABILIZED SUBGRADE SHOULD BE CALCULATED IN 6" INCREMENTS THROUGH THE ENTIRE DEPTH OF THE STABILIZED LAYER.
   - 1.4. THE MINIMUM REQUIRED CBR PRIOR TO PROOF-ROLLING IS PROVIDED IN TABLE 4 BELOW:

TABLE 4: FINAL CEMENT STABILIZED CBR/DCP REQUIREMENTS TABLE

TIME ELAPSED BETWEEN FINAL COMPACTION AND DCP TEST	REQUIRED MINIMUM CBR	MINIMUM DCP (BLOWS PER 6")	UNDRAINED SHEAR STRENGTH (PSF)	BEARING CAPACITY (PSF)
24 – 48 HOURS	15	10	3,500	9,800
3 – 7 DAYS	30	21	7,000	18,000
28 DAYS	50	33	12,000	28,500

NOTE: UNDRAINED SHEAR STRENGTH WAS CALCULATED USING THE BLACK (1961) EQUATION. BEARING CAPACITY WAS CALCULATED USING THE MESYC EQUATION MODIFIED FOR TWO LAYERS (12" CEMENT STABILIZED SUBGRADE OVER A NATURAL SUBGRADE WITH A CBR OF 1.5)

   - 1.5. ONCE THE MINIMUM REQUIRED CBR IS ACHIEVED AT ANY CORRESPONDING TIME PERIOD, THE SUBGRADE IS CONSIDERED ADEQUATE AND THE CONTRACTOR MAY PROCEED WITH PROOF-ROLL TESTING. FUTURE DCP TESTING ON THAT SEGMENT OF SUBGRADE IS NOT REQUIRED.
   - 1.6. IF TESTING DOES NOT INDICATE A CBR OF 30 WITHIN 7 DAYS, ADDITIONAL GRAVEL SURFACING AND/OR THE ADDITION OF GEOTEXTILE FABRIC MAY BE REQUIRED. FOR FUTURE SUBGRADE STABILIZATION AREAS, CONTACT THE ENGINEER AND OWNER VIA RFI FOR RECOMMENDATIONS AND APPROVAL.
2. SUBGRADE PROOF-ROLL TESTING AND ACCEPTANCE:
   - 2.1. ONCE THE REQUIRED DCP VALUE HAS BEEN OBTAINED BUT PRIOR TO PLACING AGGREGATE, THE SUBGRADE SHALL BE PROOF-ROLLED. REFER TO THE PROJECT TESTING REQUIREMENTS FOR PROOF-ROLL DEFINITION.
   - 2.2. PROOF-ROLLING SHOULD BE PERFORMED WITH ONE PASS DOWN THE CENTER AND NOT BE PERFORMED WITHIN 12 INCHES OF THE EDGE OF THE STABILIZED SECTION.
   - 2.3. IF PROOF-ROLLING FAILS, RE-STABILIZATION MAY BE REQUIRED AND A NEW ROLLING PATTERN OR ADDITIONAL CEMENT MAY BE REQUIRED.
3. AGGREGATE PLACEMENT:
   - 3.1. SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE FOLLOWING PASSING PROOF-ROLL TESTS.
   - 3.2. THE AGGREGATE SURFACING IS INTENDED TO PROTECT THE SUBGRADE FROM WATER BEING PUMPED INTO THE SUBGRADE AND TO PROVIDE A TRACTION COURSE. WESTWOOD RECOMMENDS A MINIMUM OF 4 INCHES OF AGGREGATE INITIALLY PLACED OVER STABILIZED SUBGRADE. MAINTENANCE IS REQUIRED THROUGHOUT CONSTRUCTION AND MAY REQUIRE THE PLACEMENT OF ADDITIONAL AGGREGATE.
   - 3.3. REFER TO THE TESTING SCHEDULE FOR AGGREGATE PLACEMENT CRITERIA.

TABLE 5: CEMENT STABILIZATION PRODUCTION TESTING SCHEDULE SUMMARY

LOCATION	TEST	FREQUENCY
COMPACTED SUBGRADE (CEMENT STABILIZED)	PROCTOR	MINIMUM 1 PER MAJOR SOIL TYPE
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER 1000 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
NOTE: SEE ABOVE FOR INITIAL TESTING REQUIREMENTS	DCP TEST	1 PER 500 LF IN EACH PASS OF THE RECLAIMER, A MIN. 3 PER ROAD
	PROOF-ROLL (AFTER PASSING DCP TESTS)	ENTIRE LENGTH

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-Free (800) 627-3150 westwood@wwpsinc.com
Westwood Professional Services, Inc.

Designed: BMC
Checked: DJM
Drawn: BMC
As-Built Drawing:

Revisions #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	01/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Notes

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 13 OF 57

0014440D1P.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 200th St & Holabird GRDE in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: ~~$100.00~~
2. Type of entrance: farm x field _____ business _____ Residence _____
3. Exact location: Intersection of 200th Street and Holabird GRDE (SE)
   (Feet from nearest intersection or landmark)
   Lat. 44.29'00.19" N Long. -99.36'12.36" W
4. Width of entrance: Temporary Intersection Modificiation for deliver truck access - see detail RD08-A
   (Check attached spec sheet)
5. Size & length of culvert: _____
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001670 NW4 27-112-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Tanya LaLonde
Signature of Applicant

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 200th St & Holabird GRDE in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm __x__ field _____ business _____ Residence _____
3. Exact location: Intersection of 200th Street and Holabird GRDE (SE)
   (Feet from nearest intersection or landmark)
   Lat. 44.29'00.19" N Long. -99.36'12.36" W
4. Width of entrance: Temporary Intersection Modificiation for deliver truck access - see detail RD08-A
   (Check attached spec sheet)
5. Size & length of culvert: _____
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001670 NW4 27-112-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: _____

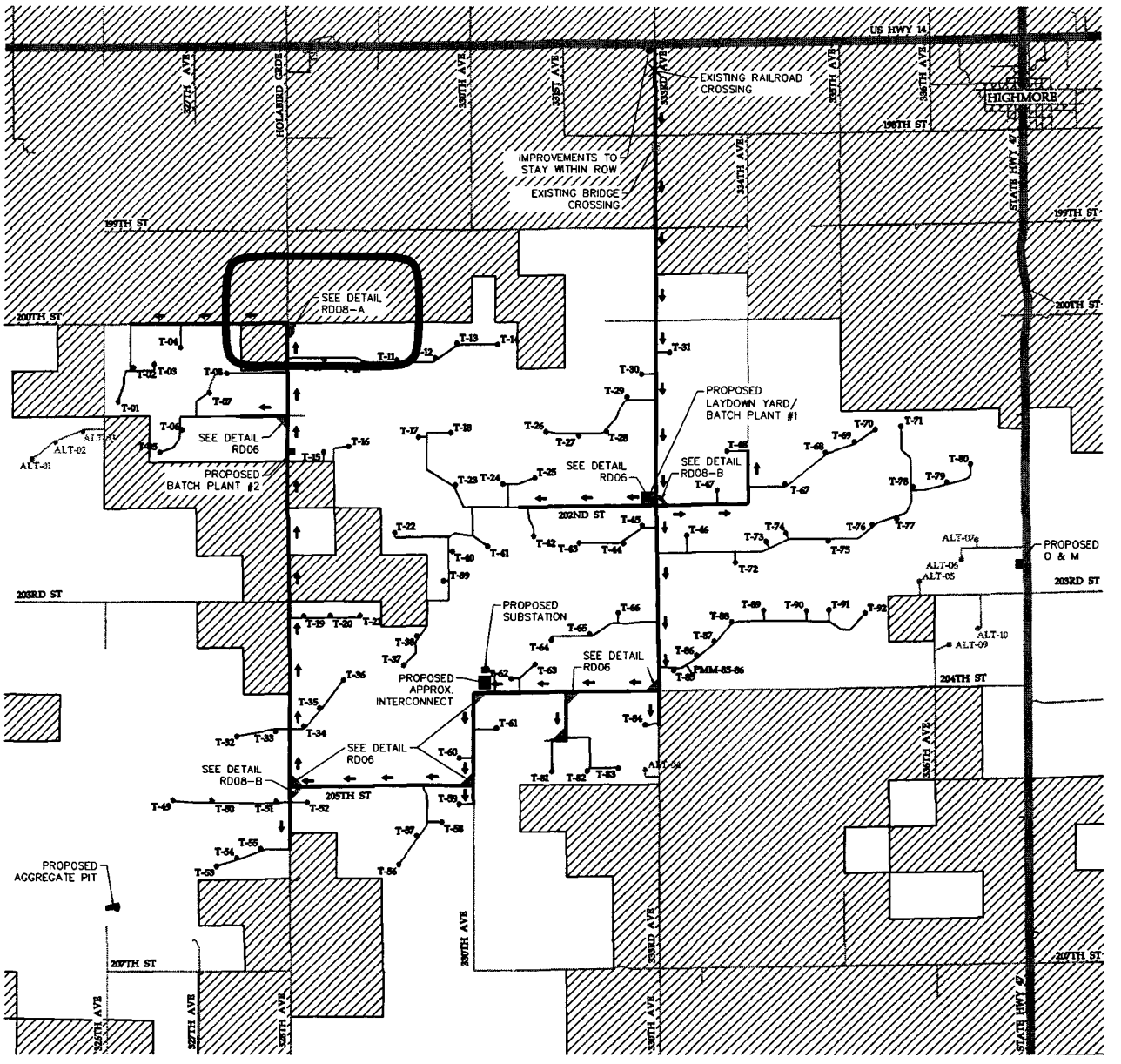
Tanya L Lance
Signature of Applicant

_____
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

©2019 Westwood Professional Services, Inc.



LEGEND:

- PROPOSED TURBINE LOCATION
- T-XX PROPOSED TURBINE NUMBER
- PROPOSED ALTERNATE TURBINE LOCATION
- AXX PROPOSED ALTERNATE TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED ALTERNATE ACCESS ROAD
- EXISTING ROAD
- EXISTING PUBLIC HIGHWAY
- PROJECT BOUNDARY
- GRAVEL DELIVERY ROUTE
- INTERSECTION IMPROVEMENTS
- TURBINE DELIVERY ROUTE DIRECTION

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-free (888) 937-5150 westwoodps.com

Westwood Professional Services, Inc.

Designed: BMC
Checked: DJH
Drawn: BMC
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078

N

0' 3000' 6000' 9000'

Triple H Wind Farm

Hyde County, South Dakota

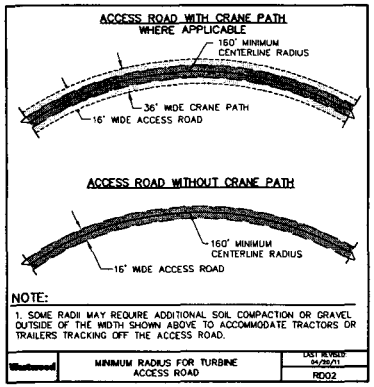
Delivery Flow Plan Exhibit

NOT FOR CONSTRUCTION

Date: 7/31/19
Sheet: 1 OF 1

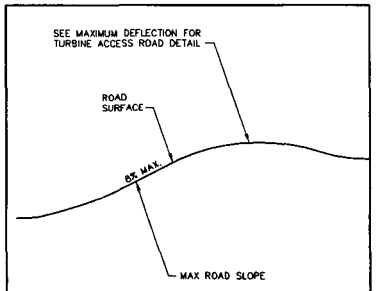
0014440EXH04.dwg

©2019 Westwood Professional Services, Inc.



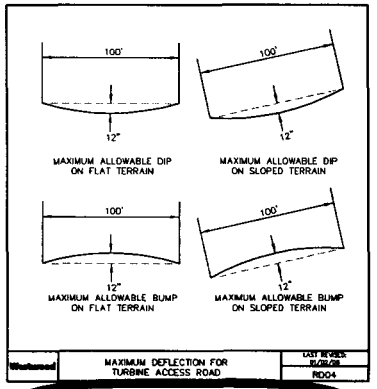
NOTE:
1. SOME RADII MAY REQUIRE ADDITIONAL SOIL COMPACTION OR GRAVEL OUTSIDE OF THE WIDTH SHOWN ABOVE TO ACCOMMODATE TRACTORS OR TRAILERS TRACKING OFF THE ACCESS ROAD.

Westwood	MINIMUM RADIUS FOR TURBINE ACCESS ROAD	LAST REVISED: 04/29/11 RD02

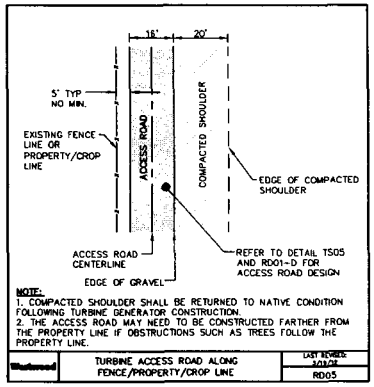


NOTES:
1. ROAD SLOPE SHALL NOT EXCEED 8% WITHOUT OWNER APPROVAL

Westwood	MAXIMUM VERT. SLOPE FOR TURBINE ACCESS ROAD/CRANE TRAVEL PATH	LAST REVISED: 3/9/07 RD03

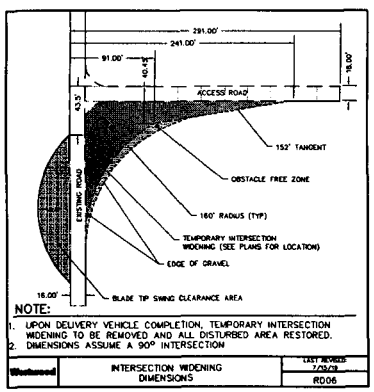


Westwood	MAXIMUM DEFLECTION FOR TURBINE ACCESS ROAD	LAST REVISED: 3/9/07 RD04



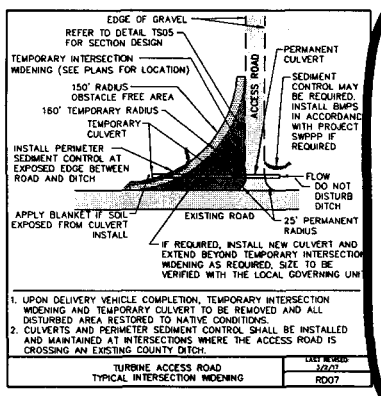
NOTE:
1. COMPACTED SHOULDER SHALL BE RETURNED TO NATIVE CONDITION FOLLOWING TURBINE GENERATOR CONSTRUCTION.
2. THE ACCESS ROAD MAY NEED TO BE CONSTRUCTED FARTHER FROM THE PROPERTY LINE IF OBSTRUCTIONS SUCH AS TREES FOLLOW THE PROPERTY LINE.

Westwood	TURBINE ACCESS ROAD ALONG FENCE/PROPERTY/CROP LINE	LAST REVISED: 3/9/07 RD05



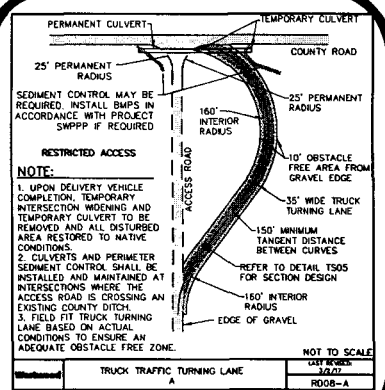
NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING TO BE REMOVED AND ALL DISTURBED AREA RESTORED.
2. DIMENSIONS ASSUME A 90° INTERSECTION

Westwood	INTERSECTION WIDENING DIMENSIONS	LAST REVISED: 7/13/09 RD06



1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.

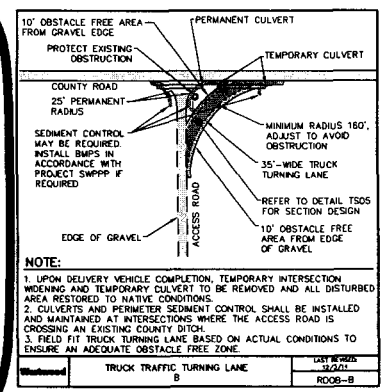
Westwood	TURBINE ACCESS ROAD TYPICAL INTERSECTION WIDENING	LAST REVISED: 3/2/07 RD07



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

NOT TO SCALE

Westwood	TRUCK TRAFFIC TURNING LANE A	LAST REVISED: 3/2/07 RD08-A



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

Westwood	TRUCK TRAFFIC TURNING LANE B	LAST REVISED: 3/2/07 RD08-B

Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-Free (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: DJH
Drawn: BMK
As-Built Drawing:

Revisions: #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK
MasTec

2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 5 OF 57

001444DTP.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 201st St & Holabird GRDE in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: ~~$100.00~~
2. Type of entrance: farm x field _____ business _____ Residence _____
3. Exact location: Intersection of 201st Street and Holabird GRDE (SW)
   (Feet from nearest intersection or landmark)
   Lat. 44.28'07.94" N Long. -99.36'12.57" W
4. Width of entrance: Temporary Intersection Modificiation for deliver truck access - see detail RD06
   (Check attached spec sheet)
5. Size & length of culvert: _____
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001675 SW4 28-112-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19

Tanya Bance
Signature of Applicant

Date Approved: 08-06-2019

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 201st St & Holabird GRDE in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____
3. Exact location: Intersection of 201st Street and Holabird GRDE (SW)
   (Feet from nearest intersection or landmark)
   Lat. 44.28'07.94" N Long. -99.36'12.57" W
4. Width of entrance: Temporary Intersection Modificiation for deliver truck access - see detail RD06
   (Check attached spec sheet)
5. Size & length of culvert: _____
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001675 SW4 28-112-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: _____

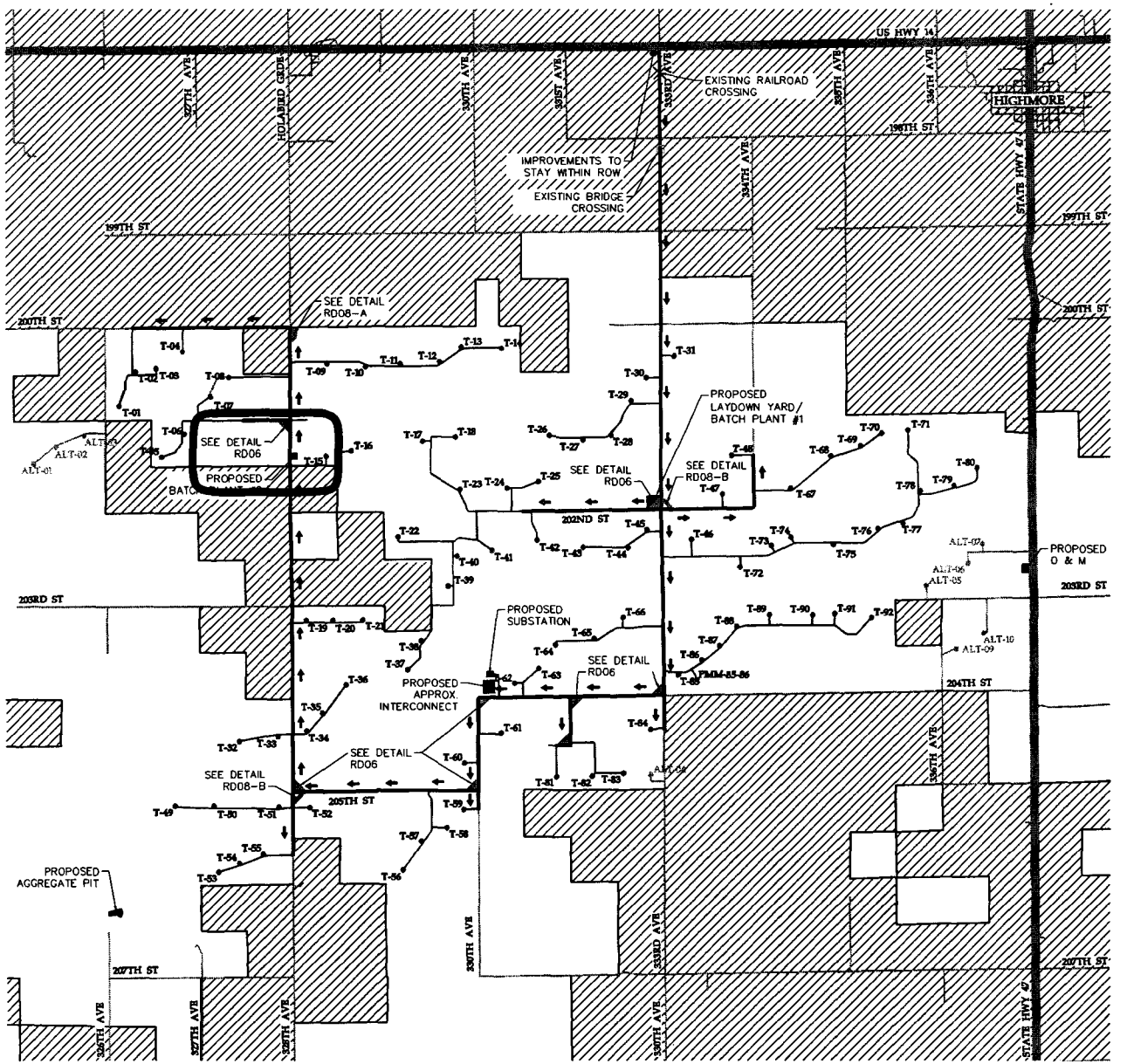
Tanya Blance
Signature of Applicant

_____
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

© 2019 Westwood Professional Services, Inc.



LEGEND:

- PROPOSED TURBINE LOCATION
- T-XX PROPOSED TURBINE NUMBER
- PROPOSED ALTERNATE TURBINE LOCATION
- AXX PROPOSED ALTERNATE TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED ALTERNATE ACCESS ROAD
- EXISTING ROAD
- EXISTING PUBLIC HIGHWAY
- PROJECT BOUNDARY
- GRAVEL DELIVERY ROUTE
- INTERSECTION IMPROVEMENTS
- TURBINE DELIVERY ROUTE DIRECTION

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwood@w-ols.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: BJH
Drawn: BMK
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION

Prepared for:

WANZEK

2028 2nd Avenue NW
West Fargo, ND 58078

0' 3000' 6000' 9000'

Triple H Wind Farm

Hyde County, South Dakota

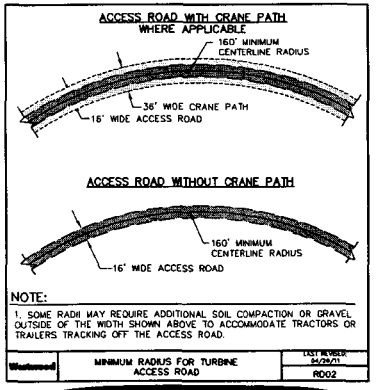
Delivery Flow Plan Exhibit

NOT FOR CONSTRUCTION

Date: 7/31/19
Sheet: 1 OF 1

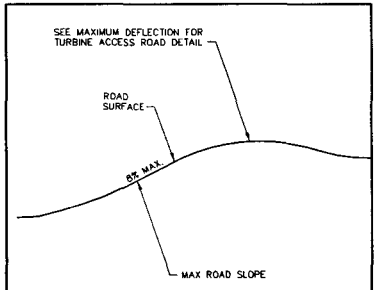
0014440EXH04.dwg

©2019 Westwood Professional Services, Inc.



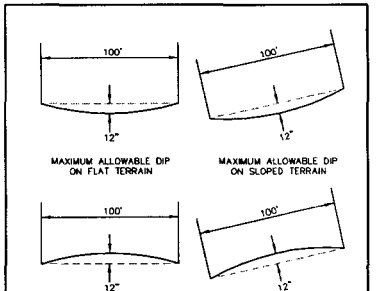
NOTE:
1. SOME RADII MAY REQUIRE ADDITIONAL SOIL COMPACTION OR GRAVEL OUTSIDE OF THE WIDTH SHOWN ABOVE TO ACCOMMODATE TRACTORS OR TRAILERS TRACKING OFF THE ACCESS ROAD.

Westwood	MINIMUM RADIUS FOR TURBINE ACCESS ROAD	LAST REVISED: 04/29/11 RD02

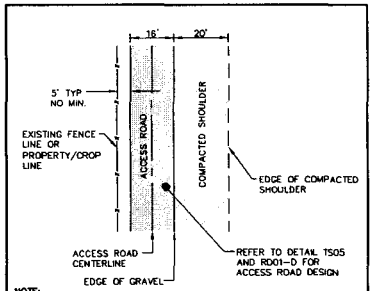


NOTES:
1. ROAD SLOPE SHALL NOT EXCEED 8% WITHOUT OWNER APPROVAL

Westwood	MAXIMUM VERT. SLOPE FOR TURBINE ACCESS ROAD/CRANE TRAVEL PATH	LAST REVISED: 8/28/08 RD03

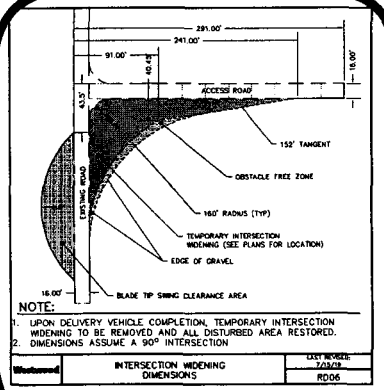


Westwood	MAXIMUM DEFLECTION FOR TURBINE ACCESS ROAD	LAST REVISED: 8/28/08 RD04



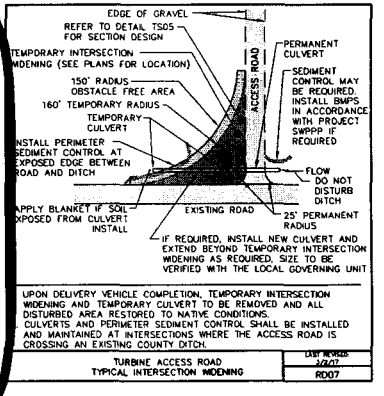
NOTE:
1. COMPACTED SHOULDER SHALL BE RETURNED TO NATIVE CONDITION FOLLOWING TURBINE GENERATOR CONSTRUCTION.
2. THE ACCESS ROAD MAY NEED TO BE CONSTRUCTED FARTHER FROM THE PROPERTY LINE IF OBSTRUCTIONS SUCH AS TREES FOLLOW THE PROPERTY LINE.

Westwood	TURBINE ACCESS ROAD ALONG FENCE/PROPERTY/CROP LINE	LAST REVISED: 8/28/08 RD05



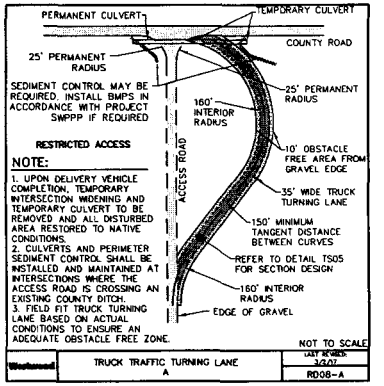
NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING TO BE REMOVED AND ALL DISTURBED AREA RESTORED.
2. DIMENSIONS ASSUME A 90° INTERSECTION

Westwood	INTERSECTION WIDENING DIMENSIONS	LAST REVISED: 7/23/19 RD06



UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.

Westwood	TURBINE ACCESS ROAD TYPICAL INTERSECTION WIDENING	LAST REVISED: 3/3/17 RD07

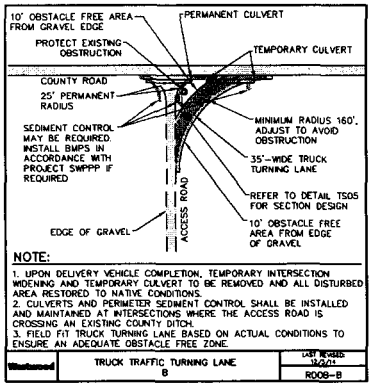


RESTRICTED ACCESS

NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

NOT TO SCALE

Westwood	TRUCK TRAFFIC TURNING LANE A	LAST REVISED: 3/3/17 RD08-A



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

Westwood	TRUCK TRAFFIC TURNING LANE B	LAST REVISED: 12/3/14 RD08-B

Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite #300
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-free (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed: SMK
Checked: TJH
Drawn: SMK
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:
WANZEK
MasTec
2038 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 5 OF 57

001444DTP.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 205th St & CR 649 in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: ~~$100.00~~
2. Type of entrance: farm x field _____ business _____ Residence _____
3. Exact location: Intersection of 205th Street and County Road 649 (NE)
   (Feet from nearest intersection or landmark)
   Lat. 44.24'38.57" N Long. -99.36'12.09" W
4. Width of entrance: Temporary Intersection Modificiation for deliver truck access - see detail RD06
   (Check attached spec sheet)
5. Size & length of culvert: _____
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001130 SW4 15-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

_____ Robert Bawden

Signature of Applicant Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 205th St & CR 649 in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm x field _____ business _____ Residence _____
3. Exact location: Intersection of 205th Street and County Road 649 (NE)
   (Feet from nearest intersection or landmark)
   Lat. 44.24'38.57" N Long. -99.36'12.09" W
4. Width of entrance: Temporary Intersection Modificiation for deliver truck access - see detail RD06
   (Check attached spec sheet)
5. Size & length of culvert: _____
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001130 SW4 15-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

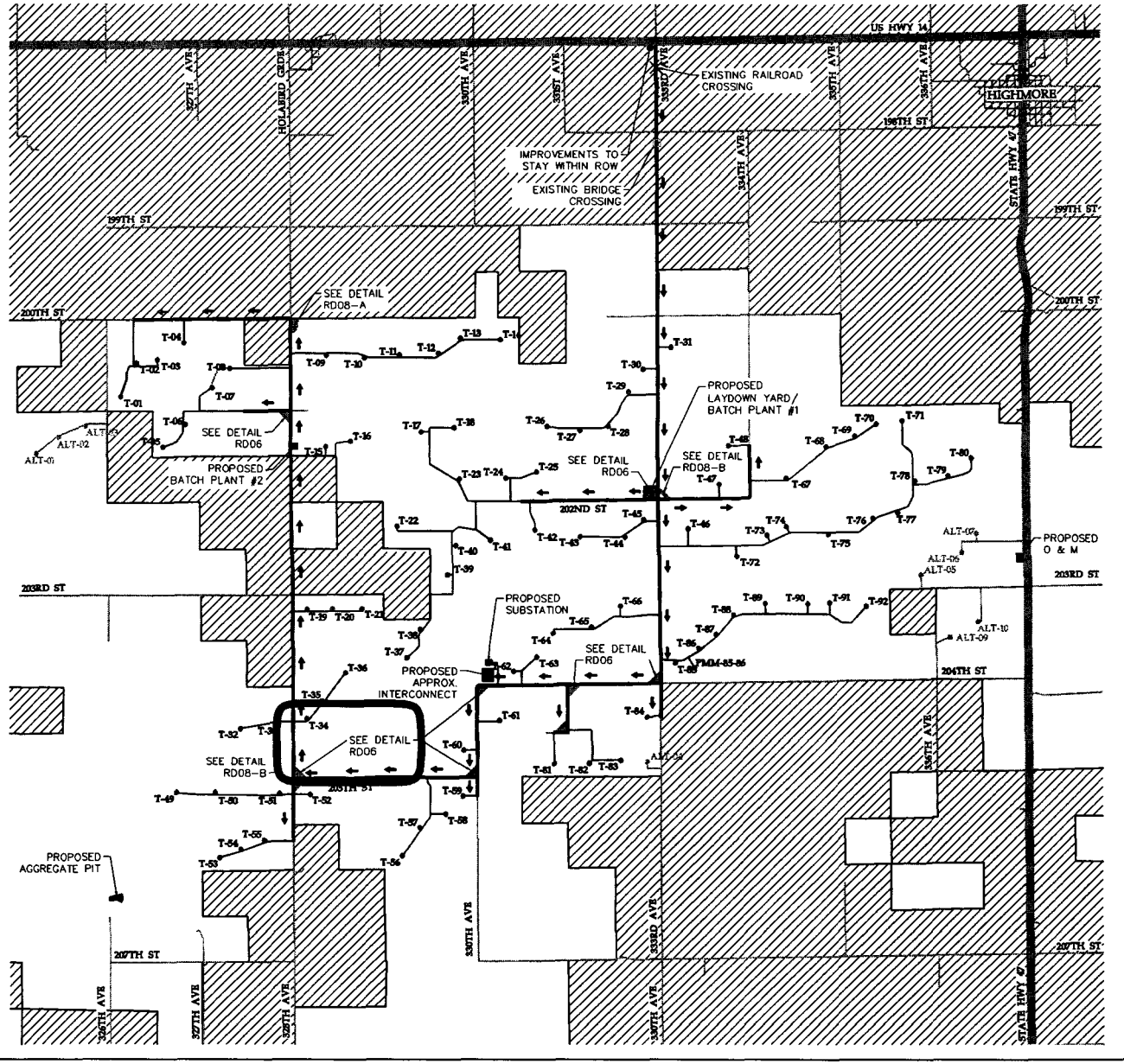
Submitted August 1, 20 19 Date Approved: _____

_____ _____
Signature of Applicant Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

© 2019 Westwood Professional Services, Inc.



LEGEND:

- PROPOSED TURBINE LOCATION
- T-XX PROPOSED TURBINE NUMBER
- PROPOSED ALTERNATE TURBINE LOCATION
- AXX PROPOSED ALTERNATE TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED ALTERNATE ACCESS ROAD
- EXISTING ROAD
- EXISTING PUBLIC HIGHWAY
- PROJECT BOUNDARY
- GRAVEL DELIVERY ROUTE
- INTERSECTION IMPROVEMENTS
- TURBINE DELIVERY ROUTE DIRECTION

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-Free (888) 937-5150 info@westwoodps.com
Westwood Professional Services, Inc.

Designed: BMC
Checked: BJH
Drawn: BMC
As-Built Drawing:

Revisions #	DATE	DESCRIPTION

Prepared for:

WANZEK

2028 2nd Avenue NW
West Fargo, ND 58078

0' 3000' 6000' 9000'

Triple H Wind Farm

Hyde County, South Dakota

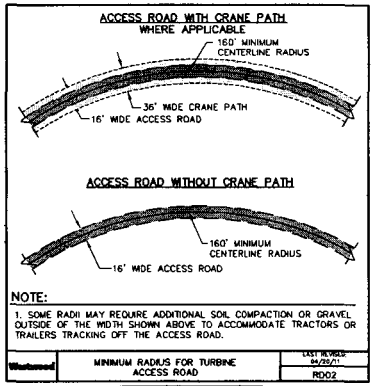
Delivery Flow Plan Exhibit

NOT FOR CONSTRUCTION

Date: 7/31/19
Sheet: 1 OF 1

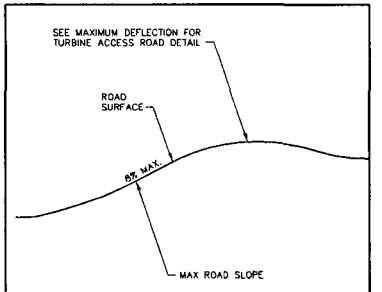
0014440E00A.dwg

© 2019 Westwood Professional Services, Inc.



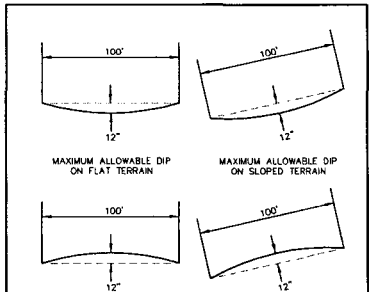
NOTE:
1. SOME RADII MAY REQUIRE ADDITIONAL SOIL COMPACTION OR GRAVEL OUTSIDE OF THE WIDTH SHOWN ABOVE TO ACCOMMODATE TRACTORS OR TRAILERS TRACKING OFF THE ACCESS ROAD.

Westwood	MINIMUM RADIUS FOR TURBINE ACCESS ROAD	LAST REVISED: 04/25/11 RD02

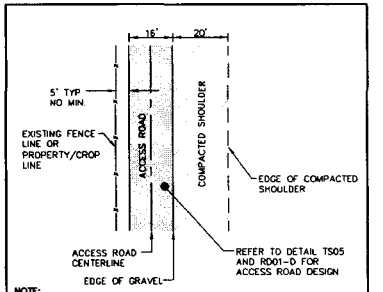


NOTES:
1. ROAD SLOPE SHALL NOT EXCEED 8% WITHOUT OWNER APPROVAL

Westwood	MAXIMUM VERT. SLOPE FOR TURBINE ACCESS ROAD/CRANE TRAVEL PATH	LAST REVISED: 3/29/07 RD03

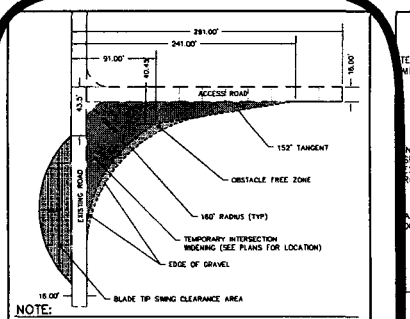


Westwood	MAXIMUM DEFLECTION FOR TURBINE ACCESS ROAD	LAST REVISED: 6/01/06 RD04



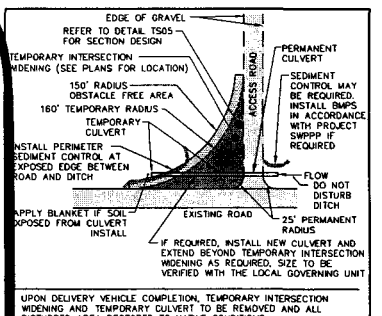
NOTE:
1. COMPACTED SHOULDER SHALL BE RETURNED TO NATIVE CONDITION FOLLOWING TURBINE GENERATOR CONSTRUCTION.
2. THE ACCESS ROAD MAY NEED TO BE CONSTRUCTED FARTHER FROM THE PROPERTY LINE IF OBSTRUCTIONS SUCH AS TREES FOLLOW THE PROPERTY LINE.

Westwood	TURBINE ACCESS ROAD ALONG FENCE/PROPERTY/CROP LINE	LAST REVISED: 3/29/07 RD05



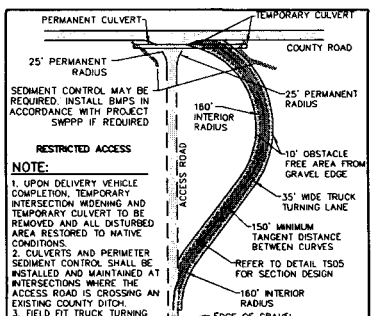
NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING TO BE REMOVED AND ALL DISTURBED AREA RESTORED.
2. DIMENSIONS ASSUME A 90° INTERSECTION

Westwood	INTERSECTION WIDENING DIMENSIONS	LAST REVISED: 7/24/19 RD06



UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.

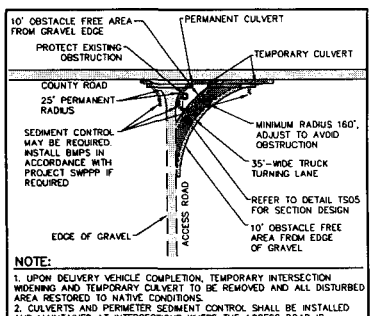
Westwood	TURBINE ACCESS ROAD TYPICAL INTERSECTION WIDENING	LAST REVISED: 3/2/07 RD07



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

NOT TO SCALE

Westwood	TRUCK TRAFFIC TURNING LANE A	LAST REVISED: 3/2/07 RD08-A



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

Westwood	TRUCK TRAFFIC TURNING LANE B	LAST REVISED: 3/2/07 RD08-B

Westwood
Phone (952) 937-5150 | 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 | Minnetonka, MN 55343
Toll Free (888) 937-5150 | westwoodps.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: DJH
Drawn: BMK
As-Built Drawing:

Revision #	Date	Description
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:
WANZEK
Mazeine
2028 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 5 OF 57

0014440DTP.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 205th St & CR 649 in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: ~~$100.00~~
2. Type of entrance: farm X field _____ business _____ Residence _____
3. Exact location: Intersection of 205th Street and County Road 649 (SE)
   (Feet from nearest intersection or landmark)
   Lat. 44.24'38.57" N Long. -99.36'12.09" W
4. Width of entrance: Temporary Intersection Modificiation for deliver truck access - see detail RD08-B
   (Check attached spec sheet)
5. Size & length of culvert: _____
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001157 NW4 22-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Tanya L Lance
Signature of Applicant

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 205th St & CR 649 in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm x field _____ business _____ Residence _____
3. Exact location: Intersection of 205th Street and County Road 649 (SE)
   (Feet from nearest intersection or landmark)
   Lat. 44.24'38.57" N Long. -99.36'12.09" W
4. Width of entrance: Temporary Intersection Modificiation for deliver truck access - see detail RD08-B
   (Check attached spec sheet)
5. Size & length of culvert: _____
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001157 NW4 22-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

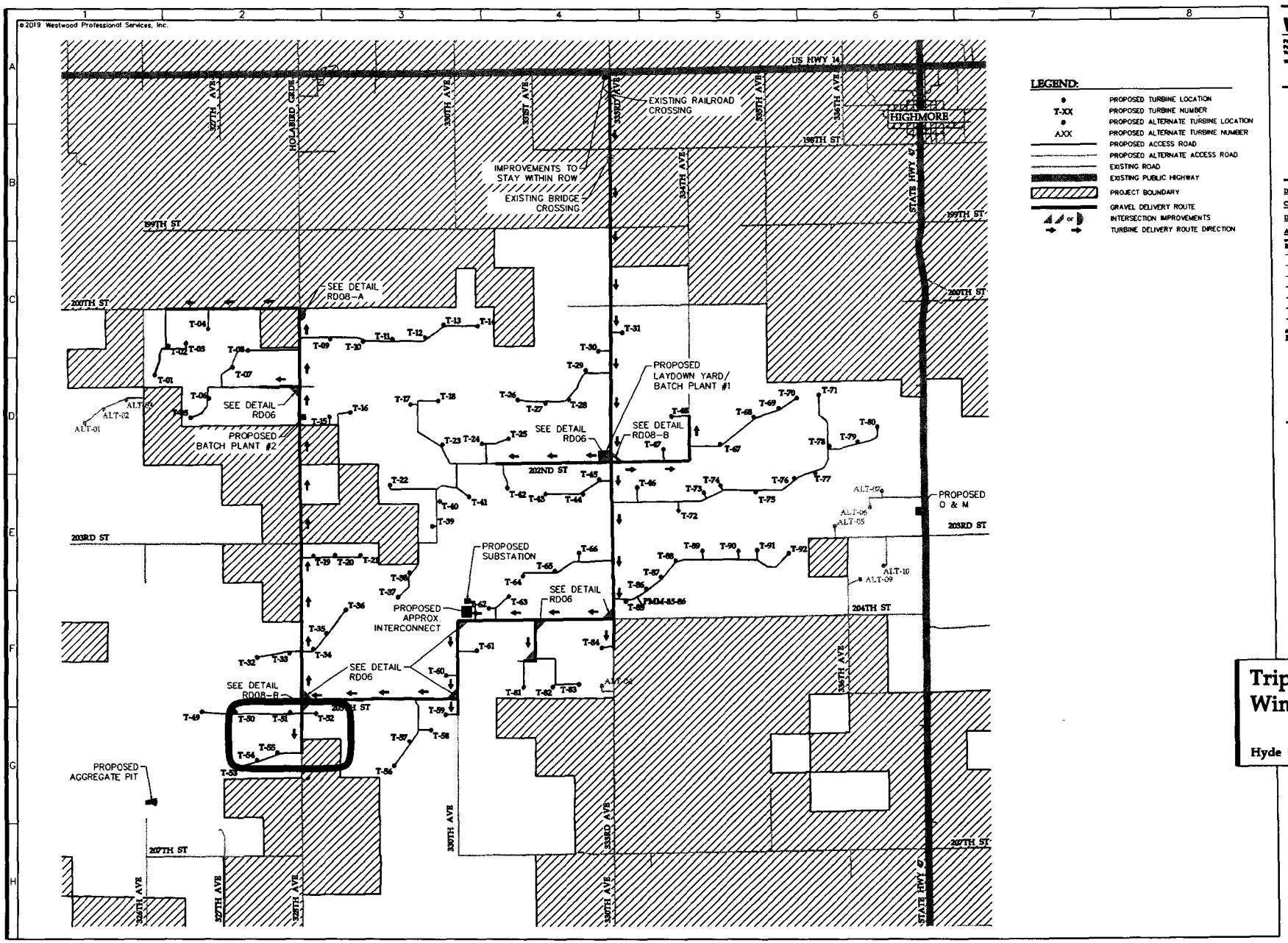
Submitted August 1, 20 19 Date Approved: _____

Tanya L Lance
Signature of Applicant

_____
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____



Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed: SMC
Checked: DJH
Drawn: SMC
As-Built Drawing:

Revisions #	DATE	DESCRIPTION

Prepared for:

WANZEK

2200 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Delivery Flow Plan Exhibit

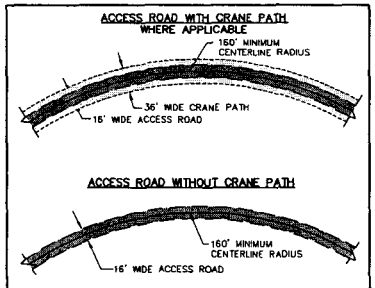
NOT FOR CONSTRUCTION

Date: 7/31/19

Sheet: 1 OF 1

0014440EXH04.dwg

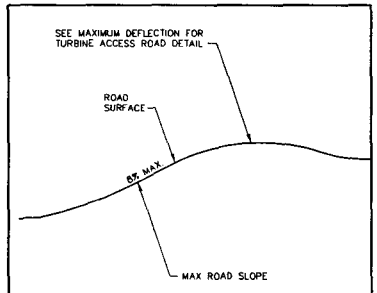
© 2019 Westwood Professional Services, Inc.



NOTE:

1. SOME RADII MAY REQUIRE ADDITIONAL SOIL COMPACTION OR GRAVEL OUTSIDE OF THE WIDTH SHOWN ABOVE TO ACCOMMODATE TRACTORS OR TRAILERS TRACKING OFF THE ACCESS ROAD.

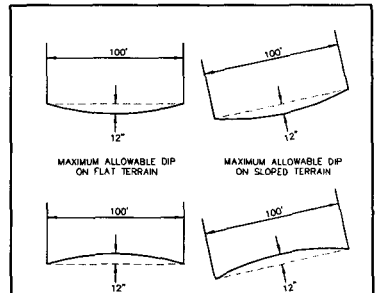
Westwood	MINIMUM RADIUS FOR TURBINE ACCESS ROAD	LAST REVISED 04/29/11 RD02



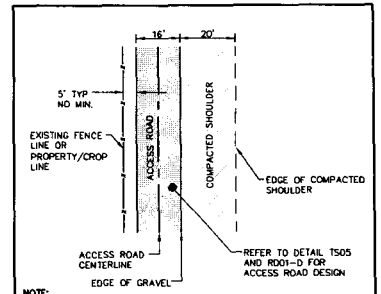
NOTES:

1. ROAD SLOPE SHALL NOT EXCEED 8% WITHOUT OWNER APPROVAL

Westwood	MAXIMUM VERT SLOPE FOR TURBINE ACCESS ROAD/CRANE TRAVEL PATH	LAST REVISED 3/19/07 RD03



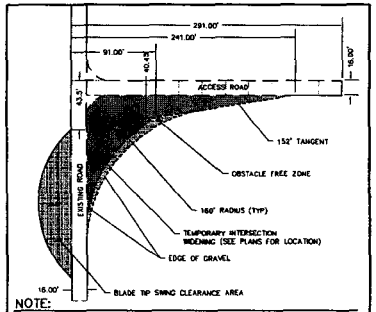
Westwood	MAXIMUM DEFLECTION FOR TURBINE ACCESS ROAD	LAST REVISED 11/22/08 RD04



NOTE:

1. COMPACTED SHOULDER SHALL BE RETURNED TO NATIVE CONDITION FOLLOWING TURBINE GENERATOR CONSTRUCTION.
2. THE ACCESS ROAD MAY NEED TO BE CONSTRUCTED FARTHER FROM THE PROPERTY LINE IF OBSTRUCTIONS SUCH AS TREES FOLLOW THE PROPERTY LINE.

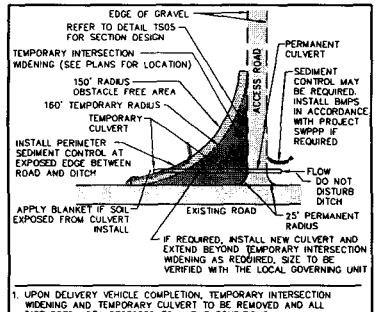
Westwood	TURBINE ACCESS ROAD ALONG FENCE/PROPERTY/CROP LINE	LAST REVISED 3/19/19 RD05



NOTE:

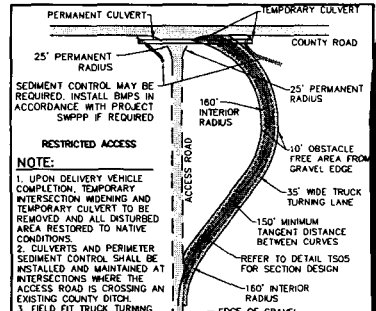
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING TO BE REMOVED AND ALL DISTURBED AREA RESTORED.
2. DIMENSIONS ASSUME A 90° INTERSECTION

Westwood	INTERSECTION WIDENING DIMENSIONS	LAST REVISED 7/19/19 RD06



1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.

Westwood	TURBINE ACCESS ROAD TYPICAL INTERSECTION WIDENING	LAST REVISED 3/1/07 RD07



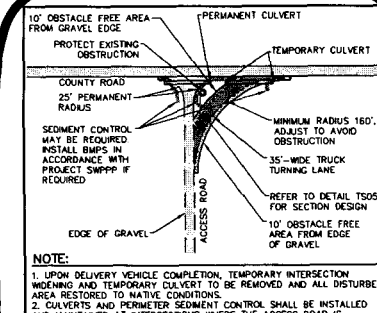
RESTRICTED ACCESS

NOTE:

1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

NOT TO SCALE

Westwood	TRUCK TRAFFIC TURNING LANE A	LAST REVISED 3/1/07 RD08-A



NOTE:

1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

Westwood	TRUCK TRAFFIC TURNING LANE B	LAST REVISED 12/3/14 RD08-B

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-free (888) 937-5150 westwoodps.com

Westwood Professional Services, Inc.

Designed: SMC
Checked: TJW
Drawn: SMC
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2888 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 5 OF 57

001444DTP.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 205th St & 330th Ave in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: ~~$100.00~~
2. Type of entrance: farm x field _____ business _____ Residence _____
3. Exact location: Intersection of 205th Street and 330th Ave (NW)
   (Feet from nearest intersection or landmark)
   Lat. 44.24'38.70" N Long. -99.33'46.85" W
4. Width of entrance: Temporary Intersection Modificiation for deliver truck access - see detail RD06
   (Check attached spec sheet)
5. Size & length of culvert: _____
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001127 SE4 14-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19

Tanya Blanco
Signature of Applicant

Date Approved: 08-06-2019

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 205th St & 330th Ave in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____
3. Exact location: Intersection of 205th Street and 330th Ave (NW)
   (Feet from nearest intersection or landmark)
   Lat. 44.24'38.70" N Long. -99.33'46.85" W
4. Width of entrance: Temporary Intersection Modificiation for deliver truck access - see detail RD06
   (Check attached spec sheet)
5. Size & length of culvert: _____
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001127 SE4 14-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: _____

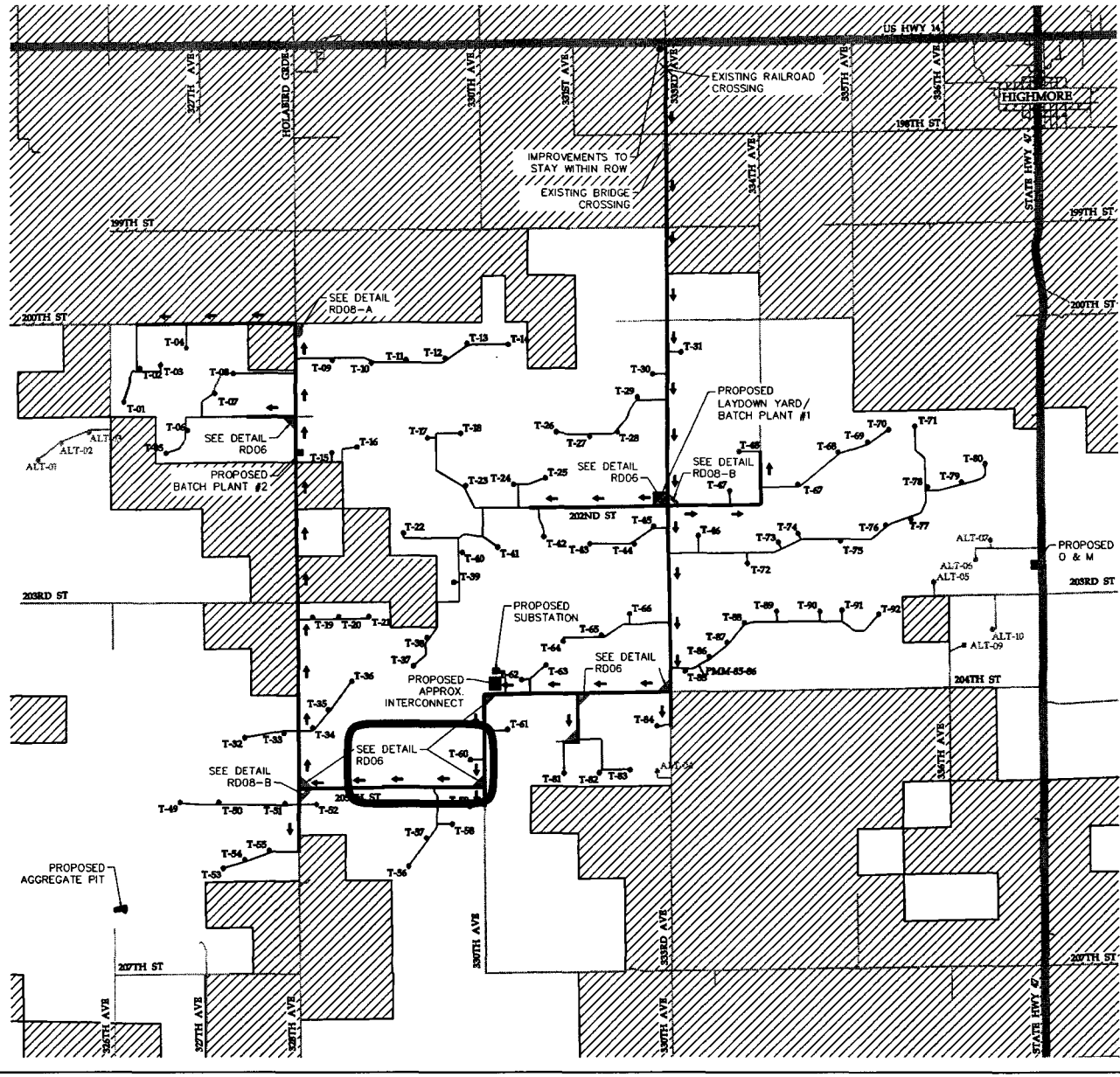
Tanya Blance
Signature of Applicant

_____
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

© 2019 Westwood Professional Services, Inc.



LEGEND:

- PROPOSED TURBINE LOCATION
- T-XX PROPOSED TURBINE NUMBER
- PROPOSED ALTERNATE TURBINE LOCATION
- AXX PROPOSED ALTERNATE TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED ALTERNATE ACCESS ROAD
- EXISTING ROAD
- EXISTING PUBLIC HIGHWAY
- PROJECT BOUNDARY
- GRAVEL DELIVERY ROUTE
- INTERSECTION IMPROVEMENTS
- TURBINE DELIVERY ROUTE DIRECTION

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 0000
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-Free (888) 937-5150
Westwood Professional Services, Inc.

Designed: BMK
Checked: DJH
Drawn: BMK
As-Built Drawing:

Revisions

#	DATE	DESCRIPTION

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078

N

0' 3000' 6000' 9000'

Triple H Wind Farm

Hyde County, South Dakota

Delivery Flow Plan Exhibit

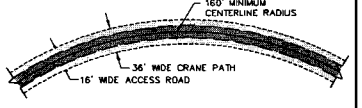
NOT FOR CONSTRUCTION

Date: 7/31/19
Sheet: 1 OF 1

0014444DE0404.dwg

©2019 Westwood Professional Services, Inc.

ACCESS ROAD WITH CRANE PATH WHERE APPLICABLE

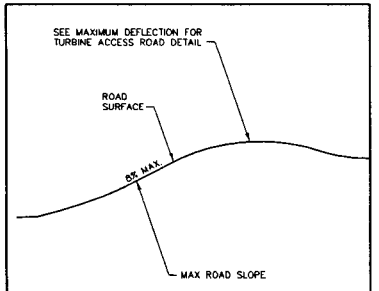


ACCESS ROAD WITHOUT CRANE PATH

NOTE:

1. SOME RADII MAY REQUIRE ADDITIONAL SOIL COMPACTION OR GRAVEL OUTSIDE OF THE WIDTH SHOWN ABOVE TO ACCOMMODATE TRACTORS OR TRAILERS TRACKING OFF THE ACCESS ROAD.

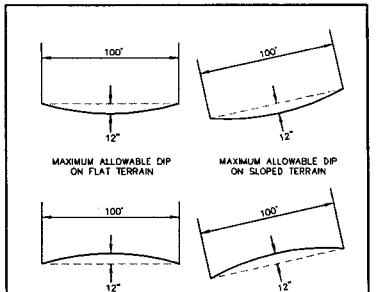
Westwood	MINIMUM RADIUS FOR TURBINE ACCESS ROAD	LAST REVISED: 05/09/01
		RD02



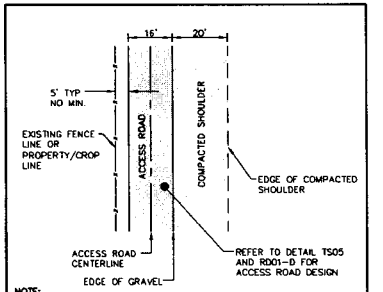
NOTES:

1. ROAD SLOPE SHALL NOT EXCEED 8% WITHOUT OWNER APPROVAL

Westwood	MAXIMUM VERT. SLOPE FOR TURBINE ACCESS ROAD/CRANE TRAVEL PATH	LAST REVISED: 3/2/21
		RD03



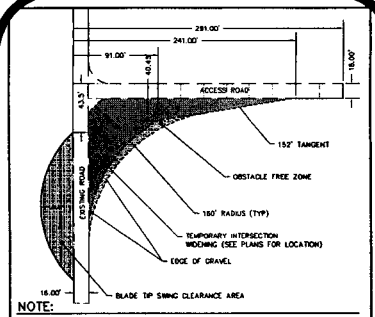
Westwood	MAXIMUM DEFLECTION FOR TURBINE ACCESS ROAD	LAST REVISED: 6/28/06
		RD04



NOTE:

1. COMPACTED SHOULDER SHALL BE RETURNED TO NATIVE CONDITION FOLLOWING TURBINE GENERATOR CONSTRUCTION.
2. THE ACCESS ROAD MAY NEED TO BE CONSTRUCTED FARTHER FROM THE PROPERTY LINE IF OBSTRUCTIONS SUCH AS TREES FOLLOW THE PROPERTY LINE.

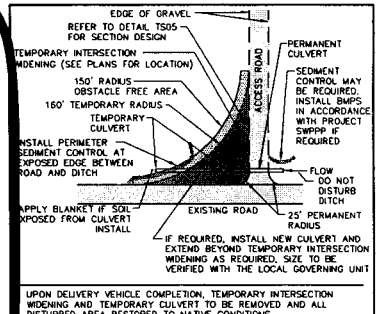
Westwood	TURBINE ACCESS ROAD ALONG FENCE/PROPERTY/CROP LINE	LAST REVISED: 3/2/21
		RD05



NOTE:

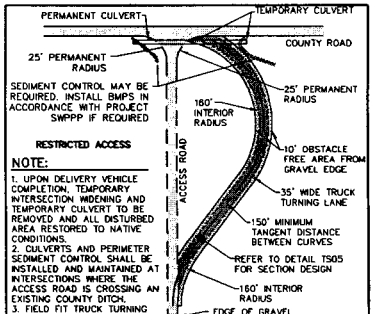
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING TO BE REMOVED AND ALL DISTURBED AREA RESTORED.
2. DIMENSIONS ASSUME A 90° INTERSECTION

Westwood	INTERSECTION WIDENING DIMENSIONS	LAST REVISED: 7/19/19
		RD06



UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.

Westwood	TURBINE ACCESS ROAD TYPICAL INTERSECTION WIDENING	LAST REVISED: 3/2/21
		RD07



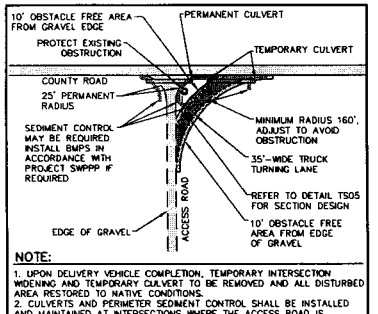
RESTRICTED ACCESS

NOTE:

1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

NOT TO SCALE

Westwood	TRUCK TRAFFIC TURNING LANE A	LAST REVISED: 3/2/21
		RD08-A



NOTE:

1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

Westwood	TRUCK TRAFFIC TURNING LANE B	LAST REVISED: 3/2/21
		RD08-B

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 www.westwoodps.com
Westwood Professional Services, Inc.

Designed: SMK
Checked: DJH
Drawn: SMK
As-Built Drawing:

Revisions: #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2020 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 5 OF 57

00144400WP.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 204th St & 330th Ave in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: ~~$100.00~~
2. Type of entrance: farm X field _____ business _____ Residence _____
3. Exact location: Intersection of 204th Street and 330th Ave (SE)
   (Feet from nearest intersection or landmark)
   Lat. 44.25'31.04" N Long. -99.33'46.70" W
4. Width of entrance: Temporary Intersection Modificiation for deliver truck access - see detail RD06
   (Check attached spec sheet)
5. Size & length of culvert: _____
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001121 NW4 13-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19

Tanya Kline
Signature of Applicant

Date Approved: 08-06-2019

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 204th St & 330th Ave in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____
3. Exact location: Intersection of 204th Street and 330th Ave (SE)
   (Feet from nearest intersection or landmark)
   Lat. 44.25'31.04" N Long. -99.33'46.70" W
4. Width of entrance: Temporary Intersection Modificiation for deliver truck access - see detail RD06
   (Check attached spec sheet)
5. Size & length of culvert: _____
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001121 NW4 13-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

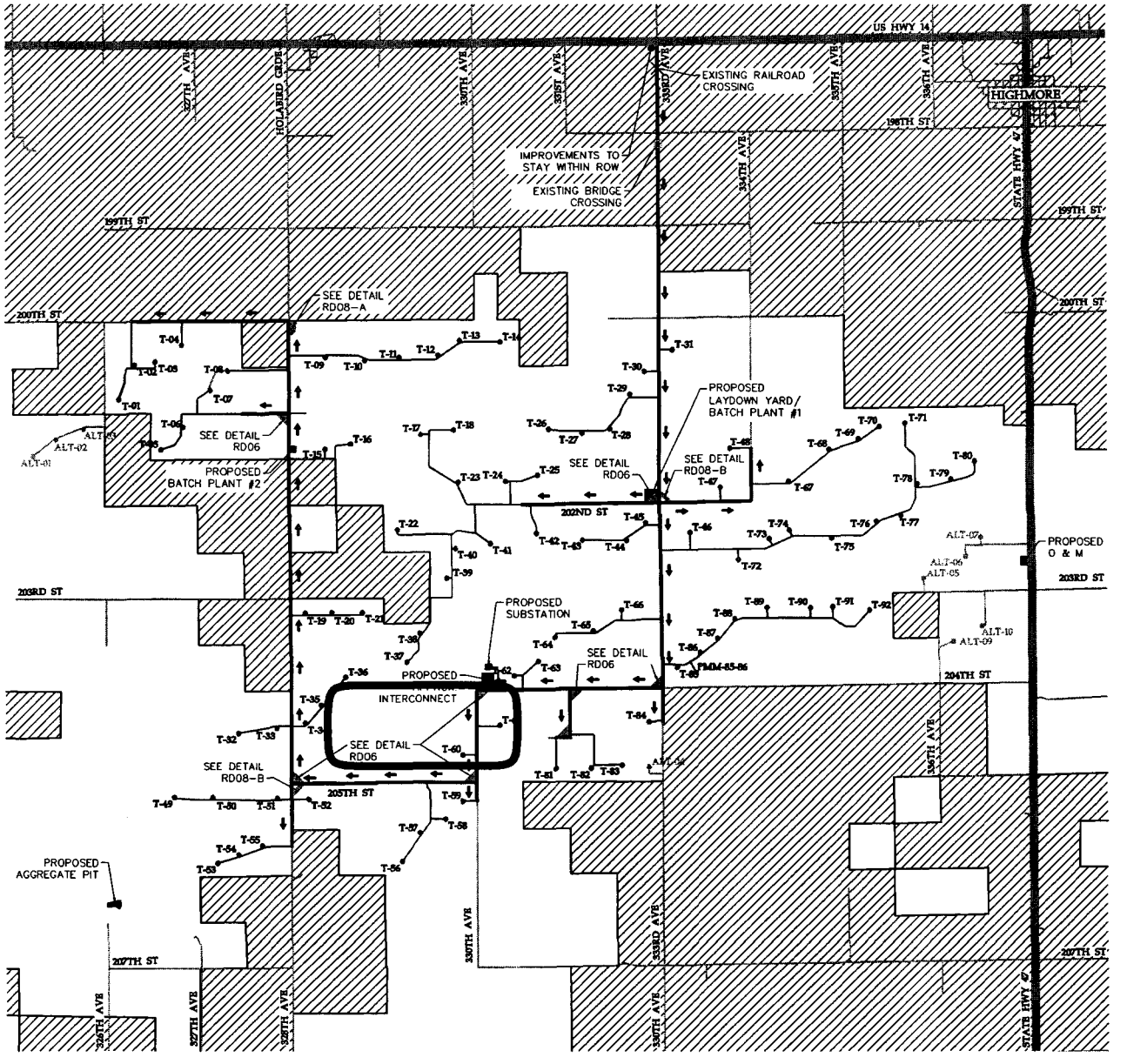
Submitted August 1, 20 19 Date Approved: _____

Tanya Lane
_____ _____
Signature of Applicant Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

©2019 Westwood Professional Services, Inc.



LEGEND:

- PROPOSED TURBINE LOCATION
- T-XX PROPOSED TURBINE NUMBER
- PROPOSED ALTERNATE TURBINE LOCATION
- AXX PROPOSED ALTERNATE TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED ALTERNATE ACCESS ROAD
- EXISTING ROAD
- EXISTING PUBLIC HIGHWAY
- PROJECT BOUNDARY
- GRAVEL DELIVERY ROUTE
- INTERSECTION IMPROVEMENTS
- TURBINE DELIVERY ROUTE DIRECTION

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (866) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed: SMK
Checked: TJH
Drawn: SMK
As-Built Drawing:

Revisions

#	DATE	DESCRIPTION

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Delivery Flow Plan Exhibit

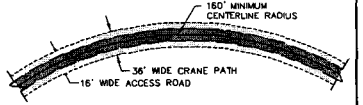
NOT FOR CONSTRUCTION

Date: 7/31/19
Sheet: 1 OF 1

0014440EXH04.dwg

© 2019 Westwood Professional Services, Inc.

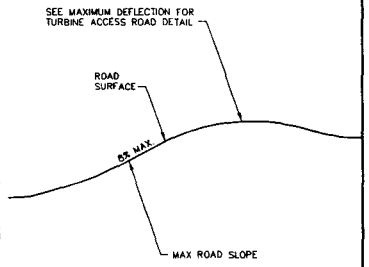
ACCESS ROAD WITH CRANE PATH WHERE APPLICABLE



ACCESS ROAD WITHOUT CRANE PATH

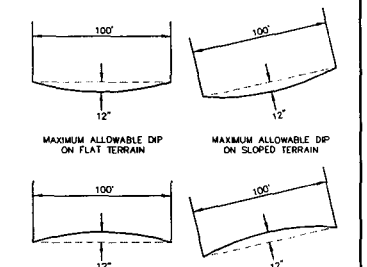
NOTE:
1. SOME RADII MAY REQUIRE ADDITIONAL SOIL COMPACTION OR GRAVEL OUTSIDE OF THE WIDTH SHOWN ABOVE TO ACCOMMODATE TRACTORS OR TRAILERS TRACKING OFF THE ACCESS ROAD.

Westwood	MINIMUM RADIUS FOR TURBINE ACCESS ROAD	LAST REVISED: 04/25/11 RD02

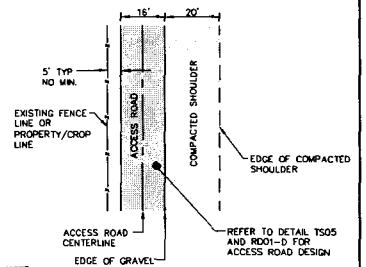


NOTES:
1. ROAD SLOPE SHALL NOT EXCEED 8% WITHOUT OWNER APPROVAL.

Westwood	MAXIMUM VERT. SLOPE FOR TURBINE ACCESS ROAD/CRANE TRAVEL PATH	LAST REVISED: 3/28/07 RD03

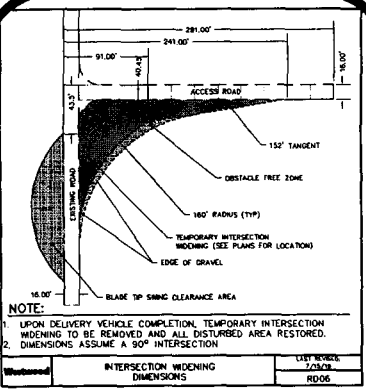


Westwood	MAXIMUM DEFLECTION FOR TURBINE ACCESS ROAD	LAST REVISED: 01/02/08 RD04



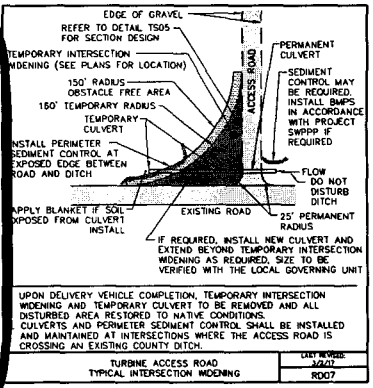
NOTE:
1. COMPACTED SHOULDER SHALL BE RETURNED TO NATIVE CONDITION FOLLOWING TURBINE GENERATOR CONSTRUCTION.
2. THE ACCESS ROAD MAY NEED TO BE CONSTRUCTED FARTHER FROM THE PROPERTY LINE IF OBSTRUCTIONS SUCH AS TREES FOLLOW THE PROPERTY LINE.

Westwood	TURBINE ACCESS ROAD ALONG FENCE/PROPERTY/CROP LINE	LAST REVISED: 3/28/08 RD05



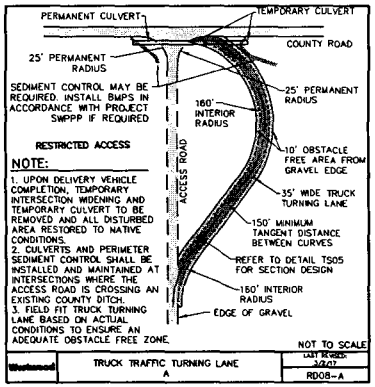
NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING TO BE REMOVED AND ALL DISTURBED AREA RESTORED.
2. DIMENSIONS ASSUME A 90° INTERSECTION

Westwood	INTERSECTION WIDENING DIMENSIONS	LAST REVISED: 7/25/08 RD06



UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.

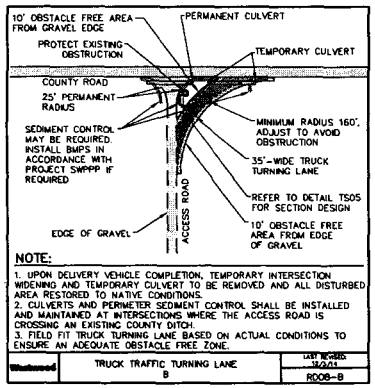
Westwood	TURBINE ACCESS ROAD TYPICAL INTERSECTION WIDENING	LAST REVISED: 3/2/17 RD07



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

NOT TO SCALE

Westwood	TRUCK TRAFFIC TURNING LANE A	LAST REVISED: 3/2/17 RD08-A



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

Westwood	TRUCK TRAFFIC TURNING LANE B	LAST REVISED: 10/2/14 RD08-B

Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite #300
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-free (800) 937-5150 twinfo@westwoodps.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: DJM
Drawn: BMK
As-Built Drawing:

Revisions: #	DATE	DESCRIPTION
A	12/05/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:
WANZEK
2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 5 OF 57

0014440DTP.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 204th St & 331st Ave in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: ~~$100.00~~
2. Type of entrance: farm X field _____ business _____ Residence _____
3. Exact location: Intersection of 204th Street and 331st Ave (SE)
   (Feet from nearest intersection or landmark)
   Lat. 44.25'31.44" N Long. -99.32'34.07" W
4. Width of entrance: Temporary Intersection Modificiation for deliver truck access - see detail RD06
   (Check attached spec sheet)
5. Size & length of culvert: _____
   (Check attached spec sheet)
6. Location by legal description: Parcel # 000997 NW4 18-111-72
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19

Tanya Klance
Signature of Applicant

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Date Approved: 08-06-2019

Robert Bawdon
Chairman, Hyde County Commissioners

Final Inspection Date _____ Hwy. Supt's Signature _____

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 204th St & 331st Ave in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____
3. Exact location: Intersection of 204th Street and 331st Ave (SE)
   (Feet from nearest intersection or landmark)
   Lat. 44.25'31.44" N Long. -99.32'34.07" W
4. Width of entrance: Temporary Intersection Modificiation for deliver truck access - see detail RD06
   (Check attached spec sheet)
5. Size & length of culvert: _____
   (Check attached spec sheet)
6. Location by legal description: Parcel # 000997 NW4 18-111-72
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: _____

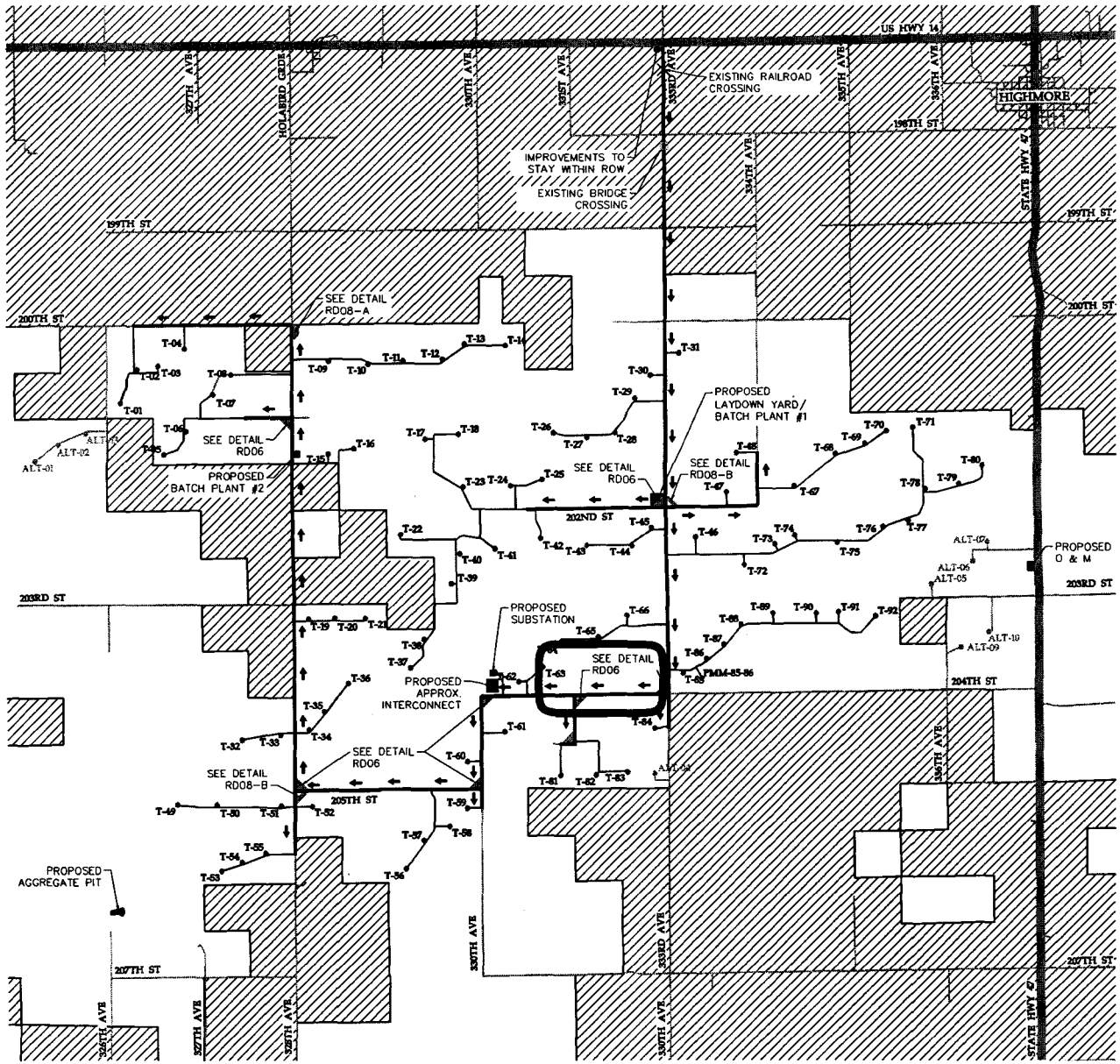
Tanya Klance
_____
Signature of Applicant

_____
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

© 2019 Westwood Professional Services, Inc.



LEGEND:

- PROPOSED TURBINE LOCATION
- T-XX PROPOSED TURBINE NUMBER
- PROPOSED ALTERNATE TURBINE LOCATION
- AXX PROPOSED ALTERNATE TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED ALTERNATE ACCESS ROAD
- EXISTING ROAD
- EXISTING PUBLIC HIGHWAY
- PROJECT BOUNDARY
- GRAVEL DELIVERY ROUTE
- INTERSECTION IMPROVEMENTS
- TURBINE DELIVERY ROUTE DIRECTION

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
TollFree (888) 937-5150 www.westwoodps.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: BDH
Drawn: BMK
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION

Prepared for:

WANZEK

2028 2nd Avenue NW
West Fargo, ND 58078

N

0' 3000' 6000' 9000'

Triple H Wind Farm

Hyde County, South Dakota

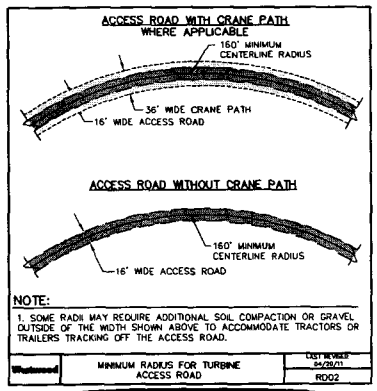
Delivery Flow Plan Exhibit

NOT FOR CONSTRUCTION

Date: 7/31/19
Sheet: 1 OF 1

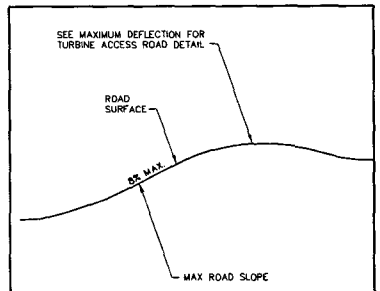
0014440E.0404.dwg

© 2019 Westwood Professional Services, Inc.



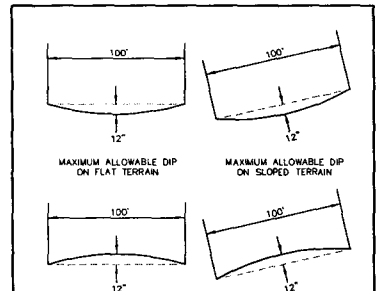
NOTE:
1. SOME RADII MAY REQUIRE ADDITIONAL SOIL COMPACTION OR GRAVEL OUTSIDE OF THE WIDTH SHOWN ABOVE TO ACCOMMODATE TRACTORS OR TRAILERS TRACKING OFF THE ACCESS ROAD.

Westwood	MINIMUM RADIUS FOR TURBINE ACCESS ROAD	LAST REVISED: 04/29/01 RD02

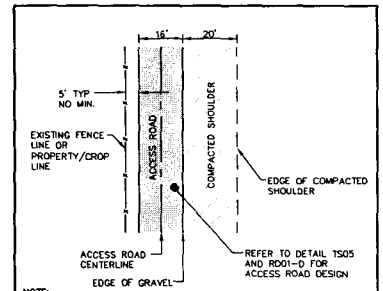


NOTES:
1. ROAD SLOPE SHALL NOT EXCEED 6% WITHOUT OWNER APPROVAL

Westwood	MAXIMUM VERT. SLOPE FOR TURBINE ACCESS ROAD/CRANE TRAVEL PATH	LAST REVISED: 3/9/07 RD03

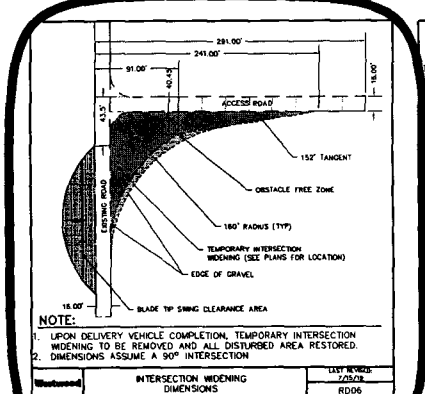


Westwood	MAXIMUM DEFLECTION FOR TURBINE ACCESS ROAD	LAST REVISED: 11/9/06 RD04



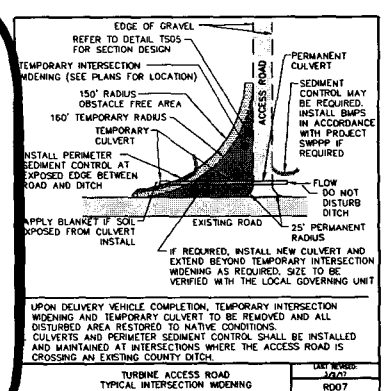
NOTE:
1. COMPACTED SHOULDER SHALL BE RETURNED TO NATIVE CONDITION FOLLOWING TURBINE GENERATOR CONSTRUCTION.
2. THE ACCESS ROAD MAY NEED TO BE CONSTRUCTED FARTHER FROM THE PROPERTY LINE IF OBSTRUCTIONS SUCH AS TREES FOLLOW THE PROPERTY LINE.

Westwood	TURBINE ACCESS ROAD ALONG FENCE/PROPERTY/CROP LINE	LAST REVISED: 3/9/07 RD05



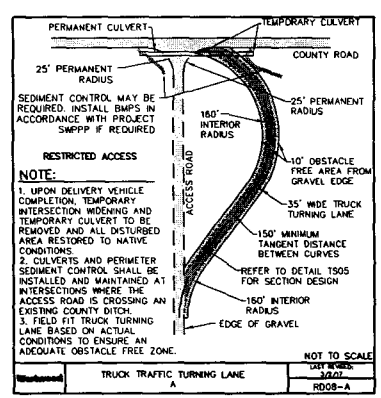
NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING TO BE REMOVED AND ALL DISTURBED AREA RESTORED.
2. DIMENSIONS ASSUME A 90° INTERSECTION

Westwood	INTERSECTION WIDENING DIMENSIONS	LAST REVISED: 7/15/19 RD06



UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.

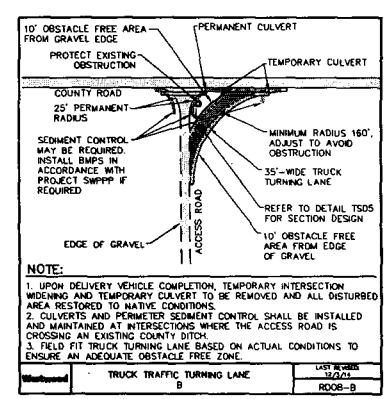
Westwood	TURBINE ACCESS ROAD TYPICAL INTERSECTION WIDENING	LAST REVISED: 3/9/07 RD07



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

NOT TO SCALE

Westwood	TRUCK TRAFFIC TURNING LANE A	LAST REVISED: 3/9/07 RD08-A



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

Westwood	TRUCK TRAFFIC TURNING LANE B	LAST REVISED: 12/3/14 RD08-B

Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-Free (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed: BMC
Checked: TBH
Drawn: BMC
As-Built Drawing:

Revisions
#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:
WANZEK
2888 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 5 OF 57

0014440DTP.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 204th St & 333rd Ave in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: ~~$100.00~~
2. Type of entrance: farm X field _____ business _____ Residence _____
3. Exact location: Intersection of 204th Street and 333rd Ave (NW)
   (Feet from nearest intersection or landmark)
   Lat. 44.25'31.56" N Long. -99.31'20.76" W
4. Width of entrance: Temporary Intersection Modificiation for deliver truck access - see detail RD06
   (Check attached spec sheet)
5. Size & length of culvert: _____
   (Check attached spec sheet)
6. Location by legal description: Parcel # 000952 SE4 7-111-72
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19

Tanya Adams
Signature of Applicant

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Date Approved: 08-06-2019

Robert Bawdon
Chairman, Hyde County Commissioners

Final Inspection Date _____ Hwy. Supt's Signature _____

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 204th St & 333rd Ave in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____
3. Exact location: Intersection of 204th Street and 333rd Ave (NW)
   (Feet from nearest intersection or landmark)
   Lat. 44.25'31.56" N Long. -99.31'20.76" W
4. Width of entrance: Temporary Intersection Modificiation for deliver truck access - see detail RD06
   (Check attached spec sheet)
5. Size & length of culvert: _____
   (Check attached spec sheet)
6. Location by legal description: Parcel # 000952 SE4 7-111-72
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: _____

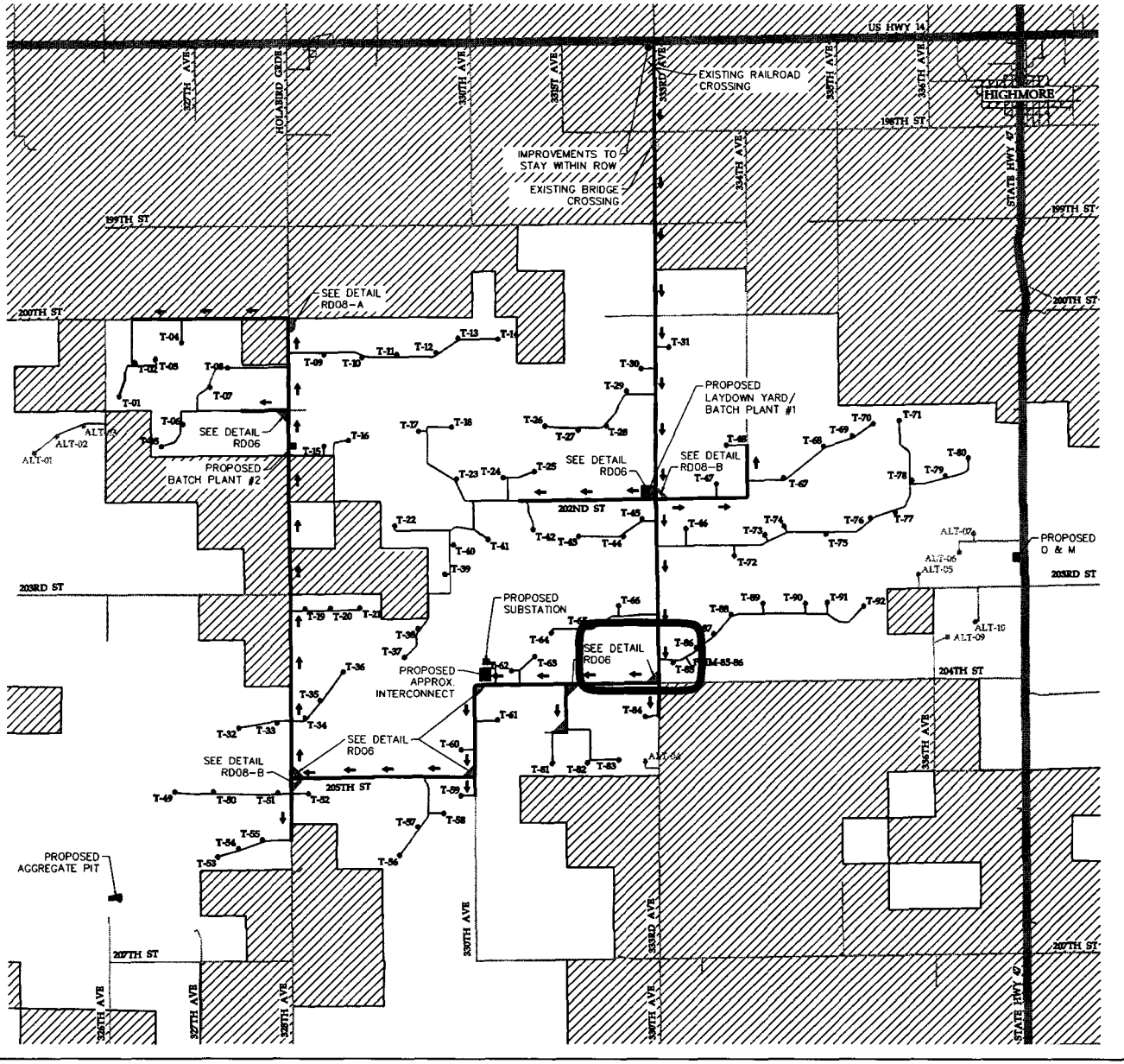
Tanya Schnee
Signature of Applicant

_____
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

© 2019 Westwood Professional Services, Inc.



LEGEND:

- PROPOSED TURBINE LOCATION
- T-XX PROPOSED TURBINE NUMBER
- PROPOSED ALTERNATE TURBINE LOCATION
- AXX PROPOSED ALTERNATE TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED ALTERNATE ACCESS ROAD
- EXISTING ROAD
- EXISTING PUBLIC HIGHWAY
- PROJECT BOUNDARY
- GRAVEL DELIVERY ROUTE
- INTERSECTION IMPROVEMENTS
- TURBINE DELIVERY ROUTE DIRECTION

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 0300
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (866) 937-5150 westwoodps.com

Westwood Professional Services, Inc.

Designed: BMC
Checked: BPH
Drawn: BMC
As-Built Drawing:

Revision #	DATE	DESCRIPTION

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078

0' 3000' 6000' 9000'

Triple H Wind Farm

Hyde County, South Dakota

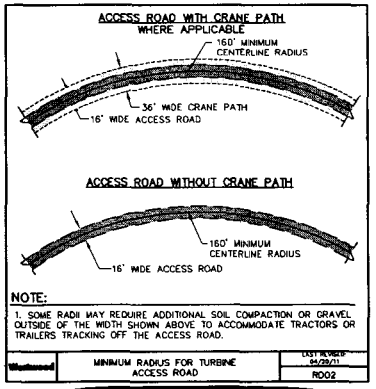
Delivery Flow Plan Exhibit

NOT FOR CONSTRUCTION

Date: 7/31/19
Sheet: 1 OF 1

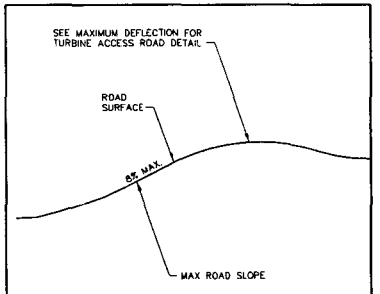
0014440E0H04.dwg

©2019 Westwood Professional Services, Inc.



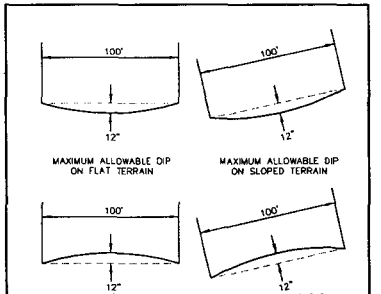
NOTE:
1. SOME RADII MAY REQUIRE ADDITIONAL SOIL COMPACTION OR GRAVEL OUTSIDE OF THE WIDTH SHOWN ABOVE TO ACCOMMODATE TRACTORS OR TRAILERS TRACKING OFF THE ACCESS ROAD.

Westwood	MINIMUM RADIUS FOR TURBINE ACCESS ROAD	LAST REVISED 04/09/11 RD02

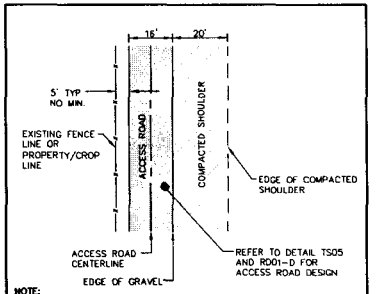


NOTES:
1. ROAD SLOPE SHALL NOT EXCEED 8% WITHOUT OWNER APPROVAL

Westwood	MAXIMUM VERT. SLOPE FOR TURBINE ACCESS ROAD/CRANE TRAVEL PATH	LAST REVISED 3/30/11 RD03

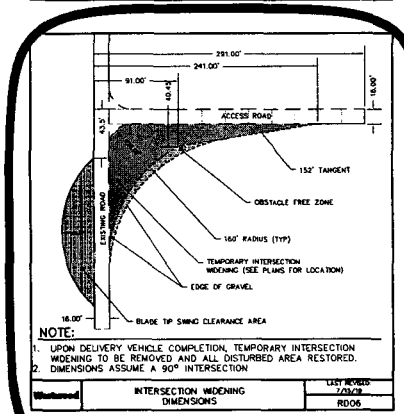


Westwood	MAXIMUM DEFLECTION FOR TURBINE ACCESS ROAD	LAST REVISED 01/01/08 RD04



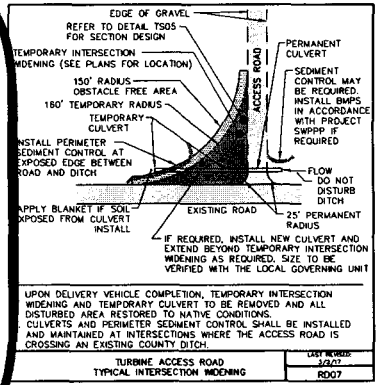
NOTE:
1. COMPACTED SHOULDER SHALL BE RETURNED TO NATIVE CONDITION FOLLOWING TURBINE GENERATOR CONSTRUCTION.
2. THE ACCESS ROAD MAY NEED TO BE CONSTRUCTED FARTHER FROM THE PROPERTY LINE IF OBSTRUCTIONS SUCH AS TREES FOLLOW THE PROPERTY LINE.

Westwood	TURBINE ACCESS ROAD ALONG FENCE/PROPERTY/CROP LINE	LAST REVISED 3/28/13 RD05



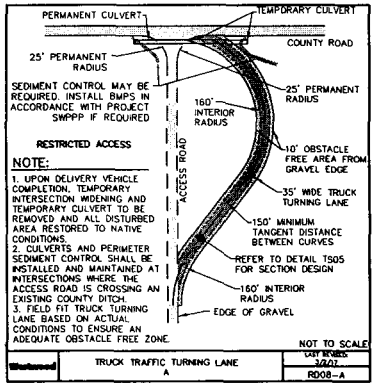
NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING TO BE REMOVED AND ALL DISTURBED AREA RESTORED.
2. DIMENSIONS ASSUME A 90° INTERSECTION

Westwood	INTERSECTION WIDENING DIMENSIONS	LAST REVISED 7/19/19 RD06



UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.

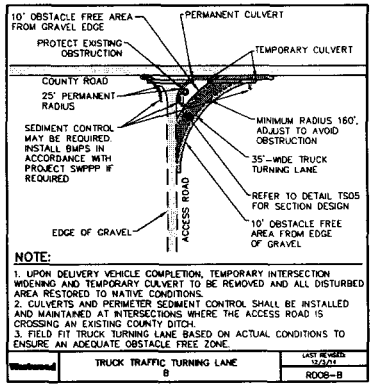
Westwood	TURBINE ACCESS ROAD TYPICAL INTERSECTION WIDENING	LAST REVISED 3/3/17 RD07



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

NOT TO SCALE

Westwood	TRUCK TRAFFIC TURNING LANE A	LAST REVISED 3/2/07 RD08-A



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

Westwood	TRUCK TRAFFIC TURNING LANE B	LAST REVISED 12/3/07 RD08-B

Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (866) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: DEN
Drawn: BMK
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK
MinnTec

2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 5 OF 57

0014440DTP.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 202nd St & 333rd Ave in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: ~~$100.00~~
2. Type of entrance: farm X field _____ business _____ Residence _____
3. Exact location: Intersection of 202nd Street and 333rd Ave (NW)
   (Feet from nearest intersection or landmark)
   Lat. 44.27'16.43" N Long. -99.31'21.91" W
4. Width of entrance: Temporary Intersection Modificiation for deliver truck access - see detail RD06
   (Check attached spec sheet)
5. Size & length of culvert: _____
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001525 SE4 31-112-72
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19

Tanya Adance
Signature of Applicant

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Date Approved: 08-06-2019

Robert Bawden
Chairman, Hyde County Commissioners

Final Inspection Date _____ Hwy. Supt's Signature _____

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 202nd St & 333rd Ave in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____
3. Exact location: Intersection of 202nd Street and 333rd Ave (NW)
   (Feet from nearest intersection or landmark)
   Lat. 44.27'16.43" N Long. -99.31'21.91" W
4. Width of entrance: Temporary Intersection Modificiation for deliver truck access - see detail RD06
   (Check attached spec sheet)
5. Size & length of culvert: _____
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001525 SE4 31-112-72
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: _____

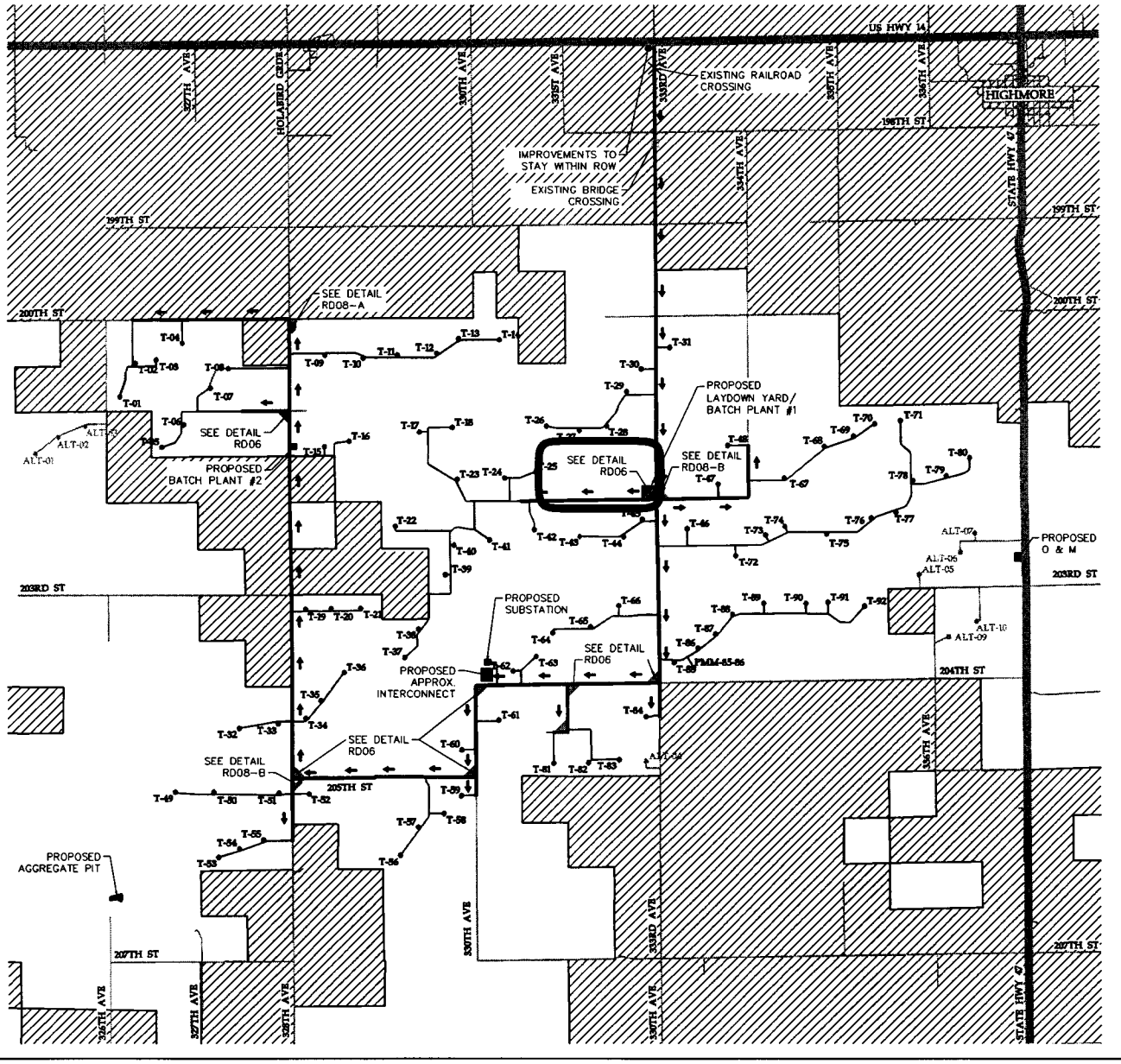
Tanya Adance
Signature of Applicant

_____
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

© 2019 Westwood Professional Services, Inc.



LEGEND:

- PROPOSED TURBINE LOCATION
- T-XX PROPOSED TURBINE NUMBER
- PROPOSED ALTERNATE TURBINE LOCATION
- AXX PROPOSED ALTERNATE TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED ALTERNATE ACCESS ROAD
- EXISTING ROAD
- EXISTING PUBLIC HIGHWAY
- PROJECT BOUNDARY
- GRAVEL DELIVERY ROUTE
- INTERSECTION IMPROVEMENTS
- TURBINE DELIVERY ROUTE DIRECTION

Westwood

Phone (952) 937-5150 | 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 | Minnetonka, MN 55343
Toll Free (888) 937-5150 | info@westwoodps.com
Westwood Professional Services, Inc.

Designed: SMC
Checked: DBH
Drawn: SMC
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078

0' 3000' 6000' 9000'

Triple H Wind Farm

Hyde County, South Dakota

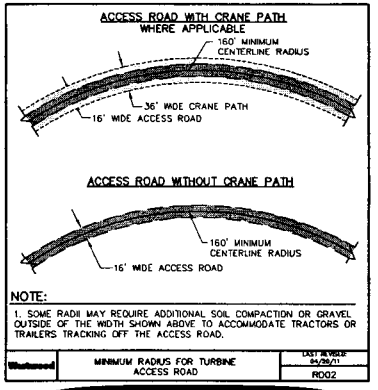
Delivery Flow Plan Exhibit

NOT FOR CONSTRUCTION

Date: 7/31/19
Sheet: 1 OF 1

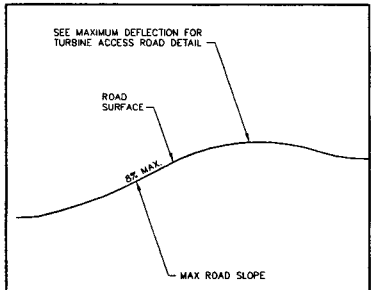
0014440E1H04.dwg

©2019 Westwood Professional Services, Inc.



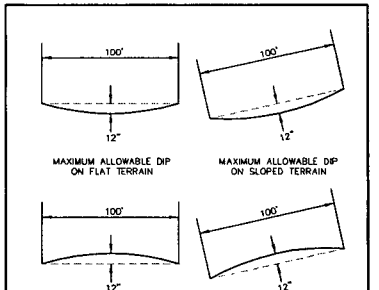
NOTE:
1. SOME RADII MAY REQUIRE ADDITIONAL SOIL COMPACTION OR GRAVEL OUTSIDE OF THE WIDTH SHOWN ABOVE TO ACCOMMODATE TRACTORS OR TRAILERS TRACKING OFF THE ACCESS ROAD.

Westwood	MINIMUM RADIUS FOR TURBINE ACCESS ROAD	LAST REVISED: 04/29/11 RD02

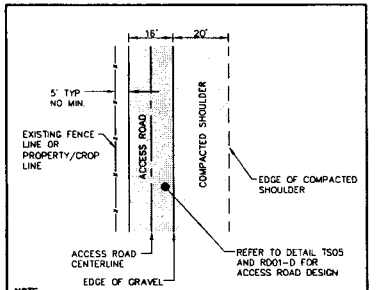


NOTES:
1. ROAD SLOPE SHALL NOT EXCEED 8% WITHOUT OWNER APPROVAL

Westwood	MAXIMUM VERT. SLOPE FOR TURBINE ACCESS ROAD/CRANE TRAVEL PATH	LAST REVISED: 3/28/08 RD03

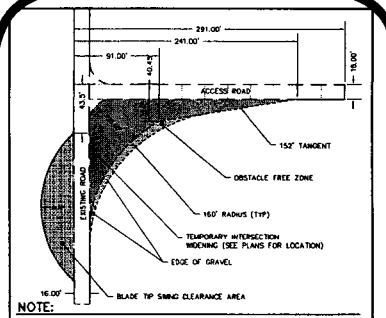


Westwood	MAXIMUM DEFLECTION FOR TURBINE ACCESS ROAD	LAST REVISED: 3/28/08 RD04



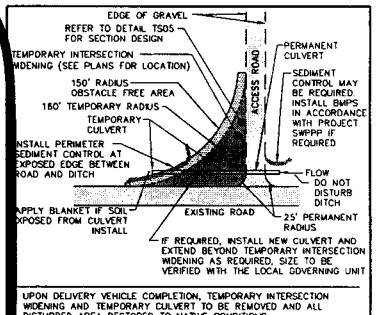
NOTE:
1. COMPACTED SHOULDER SHALL BE RETURNED TO NATIVE CONDITION FOLLOWING TURBINE GENERATOR CONSTRUCTION.
2. THE ACCESS ROAD MAY NEED TO BE CONSTRUCTED FARTHER FROM THE PROPERTY LINE IF OBSTRUCTIONS SUCH AS TREES FOLLOW THE PROPERTY LINE.

Westwood	TURBINE ACCESS ROAD ALONG FENCE/PROPERTY/CROP LINE	LAST REVISED: 3/28/08 RD05



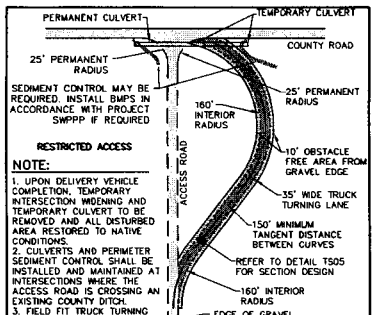
NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING TO BE REMOVED AND ALL DISTURBED AREA RESTORED.
2. DIMENSIONS ASSUME A 90° INTERSECTION

Westwood	INTERSECTION WIDENING DIMENSIONS	LAST REVISED: 7/03/19 RD06



UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.

Westwood	TURBINE ACCESS ROAD TYPICAL INTERSECTION WIDENING	LAST REVISED: 3/2/07 RD07

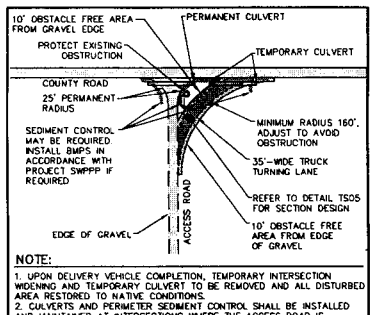


RESTRICTED ACCESS

NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

NOT TO SCALE

Westwood	TRUCK TRAFFIC TURNING LANE A	LAST REVISED: 3/2/07 RD08-A



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

Westwood	TRUCK TRAFFIC TURNING LANE B	LAST REVISED: 12/3/11 RD08-B

Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite 1500
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-free (866) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed: BMC
Checked: DJH
Drawn: BMC
As-Built Drawing:

Revisions: #	DATE	DESCRIPTION
A	12/08/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	05/07/19	50% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:
WANZEK
MasTec
2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 5 OF 57

0014440DTP.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 202nd St & 333rd Ave in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: ~~$100.00~~
2. Type of entrance: farm X field _____ business _____ Residence _____
3. Exact location: Intersection of 202nd Street and 333rd Ave (NE)
   (Feet from nearest intersection or landmark)
   Lat. 44.27'16.43" N Long. -99.31'21.91" W
4. Width of entrance: Temporary Intersection Modificiation for deliver truck access - see detail RD08-B
   (Check attached spec sheet)
5. Size & length of culvert: _____
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001528 SW4 32-112-72
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Tanya Lance
Signature of Applicant

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 202nd St & 333rd Ave in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____
3. Exact location: Intersection of 202nd Street and 333rd Ave (NE)
   (Feet from nearest intersection or landmark)
   Lat. 44.27'16.43" N Long. -99.31'21.91" W
4. Width of entrance: Temporary Intersection Modificiation for deliver truck access - see detail RD08-B
   (Check attached spec sheet)
5. Size & length of culvert: _____
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001528 SW4 32-112-72
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: _____

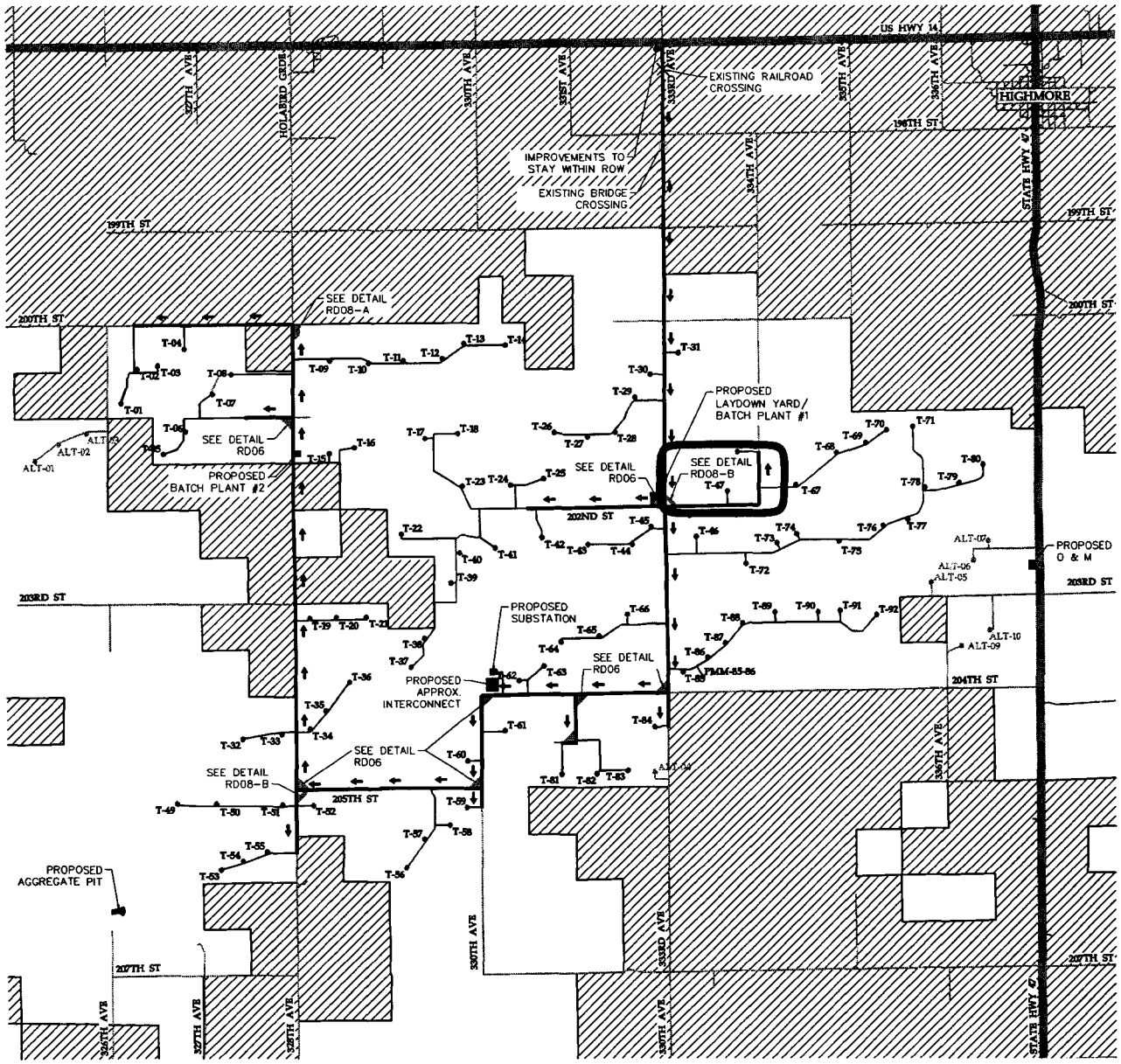
Tanya Hance
Signature of Applicant

Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date _____ Hwy. Supt's Signature _____

© 2019 Westwood Professional Services, Inc.



LEGEND:

- PROPOSED TURBINE LOCATION
- T-XX PROPOSED TURBINE NUMBER
- PROPOSED ALTERNATE TURBINE LOCATION
- AXX PROPOSED ALTERNATE TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED ALTERNATE ACCESS ROAD
- EXISTING ROAD
- EXISTING PUBLIC HIGHWAY
- PROJECT BOUNDARY
- GRAVEL DELIVERY ROUTE
- INTERSECTION IMPROVEMENTS
- TURBINE DELIVERY ROUTE DIRECTION

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-free (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: DJH
Drawn: BMK
As-Built Drawing:

Revisions

#	DATE	DESCRIPTION

Prepared for:

WANZEK

2028 2nd Avenue NW
West Fargo, ND 58078

0' 3000' 6000' 9000'

Triple H Wind Farm

Hyde County, South Dakota

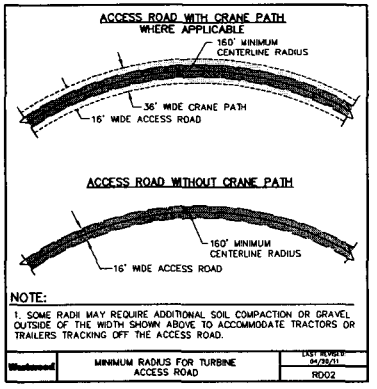
Delivery Flow Plan Exhibit

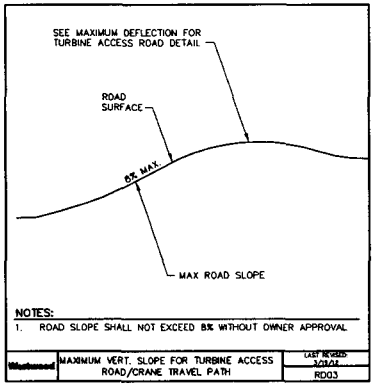
NOT FOR CONSTRUCTION

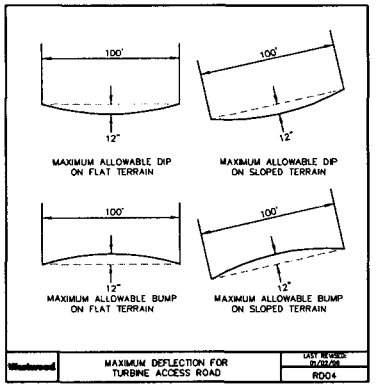
Date: 7/31/19
Sheet: 1 OF 1

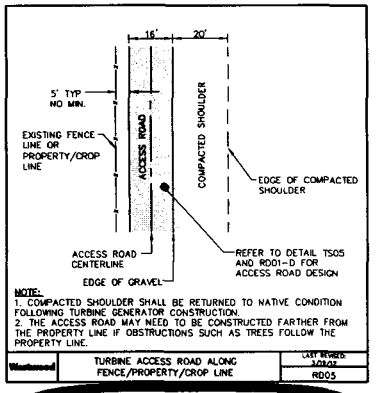
0014440EXH04.dwg

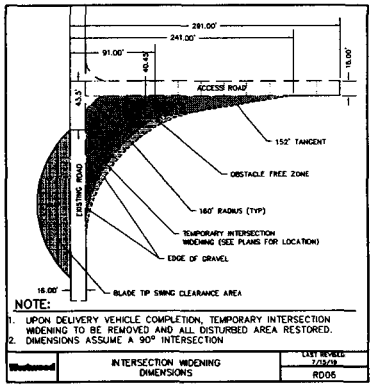
© 2019 Westwood Professional Services, Inc.

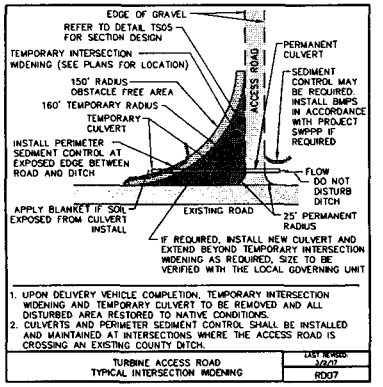


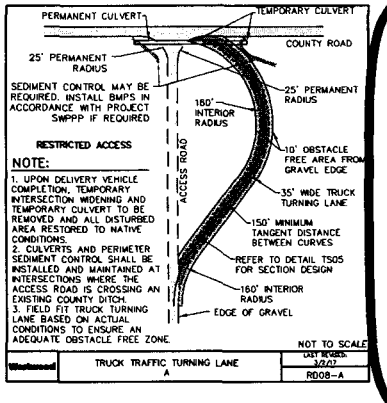


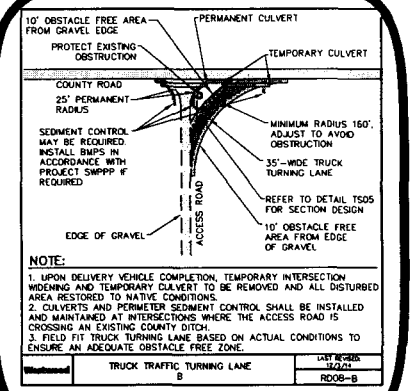












Westwood

Phone (952) 937-5150 | 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 | Minnetonka, MN 55343
Toll Free (888) 937-5150 | www.westwoodps.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: DJH
Drawn: BMK
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2323 3rd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 5 OF 57

0014440TP.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 200th Street in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 1545' East of 326th Ave & 200th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.28'59.73" W Long. -99.38'16.77"W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: ~~N/A~~ As determined by Hyde County Highway Superintendent
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001678 NW4 29-112-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Tanya Dance
Signature of Applicant

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date 12-29-2020 Hwy. Supt's Signature Michael Cowan

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 200th Street in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 855' East of 326th Ave & 200th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.29'00.02" W Long. -99.37'37.03"W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: ~~N/A~~ As determined by Hyde County Highway Superintendent
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001677 NE4 29-112-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 09-06-2019

Signature of Applicant

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date 12-29-2020 Hwy. Supt's Signature Michael Cowan

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. County Road 649 in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 2005' South of CR 649 & 200th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.28'40.22" W Long. -99.36'12.32" W
4. Width of entrance: 16' access road with 35' temporary intersection imporvement RD08-B
   (Check attached spec sheet)
5. Size & length of culvert: ~~16"~~ 18" Hyde County approach minimum
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001670 NW4 27-112-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Signature of Applicant

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date 12-29-2020 Hwy. Supt's Signature Michael Conner

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. County Road 649 in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 1755' South of CR 649 & 201st Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.27'50.59" W Long. -99.36'12.25" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD08-A
   (Check attached spec sheet)
5. Size & length of culvert: (2) 24"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001699 NW4 34-112-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Tony A Klance
Signature of Applicant

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date 12-29-2020 Hwy. Supt's Signature Michael Cowen

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. County Road 649 in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 935' South of County Road 649 & 203rd Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.26'13.35" W Long. -99.36'11.95" W
4. Width of entrance: 16' access road with 35' temporary intersection imporvement RD08-B
   (Check attached spec sheet)
5. Size & length of culvert: ~~N/A~~ As determined by Hyde County Highway Superintendent
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001109 NW4 10-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Signature of Applicant

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date 12-29-2020 Hwy. Supt's Signature Michael Couser

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 202nd Street in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 615' West of 204th Street & 202nd Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.27'15.88" W Long. -99.33'18.66" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001708 SW4 36-112-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Signature of Applicant

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date 12-29-2020 Hwy. Supt's Signature Michael Cowen

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. County Road 649 in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 2020' South of County Road 649 & 204th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.25'10.70" W Long. -99.36'12.05" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001132 NE4 16-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Signature of Applicant

Robert Bawdon
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date 12-29-2020 Hwy. Supt's Signature Michael Lowe

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. County Road 649 in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 2020' South of County Road 649 & 204th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.25'10.70" W Long. -99.36'12.05" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: 24"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001129 NW4 15-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Taya Stave — Robert Bawden

Signature of Applicant — Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date 12-29-2020 Hwy. Supt's Signature Michael Lowe

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 202nd Street in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 2640' West of 204th Street & 202nd Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.27'15.74" W Long. -99.33'46.40" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001073 NW4 41-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19

Tanya Lane
Signature of Applicant

Date Approved: 08-06-2019

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date 12-29-2020 Hwy. Supt's Signature Michael Lowe

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 202nd Street in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 540' East of 204th Street & 202nd Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.27'15.81" W Long. -99.33'02.70" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001072 NE4 Less Lot 2 1-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Signature of Applicant

Robert Bawdon
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date 12-29-2020 Hwy. Supt's Signature Michael Couve

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 333rd Ave in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 1245' South of 333rd Ave & 202nd Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.27'03.84" W Long. -99.31'21.64" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 000945 NE4 6-111-72
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Taye Love
Signature of Applicant

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date 12-29-2020 Hwy. Supt's Signature Michael Cowan

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 333rd Ave in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 1245' South of 333rd Ave & 202nd Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.27'03.84" W Long. -99.31'21.64" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: ~~N/A~~ As determined by Hyde County Highway Superintendent
   (Check attached spec sheet)
6. Location by legal description: Parcel # 000942 NW4 5-111-72
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Taylor Lee
Signature of Applicant

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date 12-29-2020 Hwy. Supt's Signature Michael Cowen

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 202nd Street in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 1775' West of 334th Ave & 202nd Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.27'16.63" W Long. -99.30'33.26" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001530 S2 of SE4 32-112-72
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19

Tanya L Lance
Signature of Applicant

Date Approved: 08-06-2019

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date 12-29-2020 Hwy. Supt's Signature Michael Corwin

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 334th Ave in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 3035' North of 334th Ave & 202nd Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.27'46.88" W Long. -99.30'08.99" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001526 NE4 32-112-72
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Signature of Applicant

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date 12-29-2020 Hwy. Supt's Signature Michael Cowan

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 327th Street in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 900' South of 327th Ave & 205th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.24'29.65" W Long. -99.37'24.83" W
4. Width of entrance: 16' access road
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001148 NE4 20-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Tanya Lore
Signature of Applicant

Robert Bawdon
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date 12-29-2020 Hwy. Supt's Signature Michael Cowan

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. County Road 649 in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 900' South of County Road 649 & 205th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.24'29.60" W Long. -99.36'12.11" W
4. Width of entrance: 16' access road & 25' temporary intersection modification
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001152 NE4 21-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Taya R Lane — Signature of Applicant

Robert Bawden — Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date 12-29-2020 Hwy. Supt's Signature Michael Cowen

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 327th Street in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 900' South of 327th Ave & 205th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.24'29.65" W Long. -99.37'24.83" W
4. Width of entrance: 16' access road
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001153 NW4 21-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Taya L Lar
Signature of Applicant

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date 12-29-2020 Hwy. Supt's Signature Michael Conway

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. County Road 649 in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 900' South of County Road 649 & 205th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.24'26.60" W Long. -99.36'12.11" W
4. Width of entrance: 16' access road & 25' temporary intersection modification
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001157 NW4 22-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Taylor Lee
Signature of Applicant

Robert Bawdon
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date 12-29-2020 Hwy. Supt's Signature Michael Conroy

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. County Road 649 in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 3585' South of County Road 649 & 205th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.24'03.10" W Long. -99.36'12.37" W
4. Width of entrance: 16' access road & 25' temporary intersection modification
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001155 SE4 21-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Taya Lowe
Signature of Applicant

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date 12-29-2020 Hwy. Supt's Signature Michael Cowan

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 205th Street in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 2845' West of 330th Ave & 205th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.24'38.50" W Long. -99.34'25.94" W
4. Width of entrance: 16' access road & 25' temporary intersection modification
   (Check attached spec sheet)
5. Size & length of culvert: (2) 24"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001160 NE4 23-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19

Signature of Applicant

Date Approved: 08-06-2019

Robert Bawdon
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date 12-29-2020 Hwy. Supt's Signature Michael Lowe

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 205th Street in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 1050' South of 330th Ave & 205th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.24'28.25" W Long. -99.33'46.82" W
4. Width of entrance: 16' access road & 35' temporary intersection modification RD08-B
   (Check attached spec sheet)
5. Size & length of culvert: (2) 24"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001160 NE4 23-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Signature of Applicant

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date 12-29-2020 Hwy. Supt's Signature Michael Cowen

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 330th Ave in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 1570' North of 330th Ave & 205th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.24'54.19" W Long. -99.33'46.87" W
4. Width of entrance: 16' access road with 35' temporary intersection imporvement RD08-B
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001127 SE4 14-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Tanya Lee
Signature of Applicant

Robert Bawdon
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date 12-29-2020 Hwy. Supt's Signature Michael Lowe

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 330th Ave in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 1995' South of 330th Ave & 204th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.25'10.97" W Long. -99.33'46.56" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001121 NW4 13-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19

Tayla Rae
Signature of Applicant

Date Approved: 08-06-2019

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date 12-29-2020 Hwy. Supt's Signature Michael Lower

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 204th Street in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 2615' East of 330th Ave & 204th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.25'31.00" W Long. -99.33'10.84" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: ~~N/A~~ As determined by Hyde County Highway Superintendent
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001118 SW4 4-111-73 & Parcel 001119 SE4 12-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Signature of Applicant

Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date 12-29-2020 Hwy. Supt's Signature

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 333rd Ave in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 3950' North of 333rd Ave & 204th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.26'10.48" W Long. -99.31'21.05" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: ~~N/A~~ As determined by Hyde County Highway Superintendent
   (Check attached spec sheet)
6. Location by legal description: Parcel # 000949 NE4 7-111-72
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Signature of Applicant

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date 12-29-2020 Hwy. Supt's Signature Michael Cowan

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 334th Ave in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 1005' North of 334th Ave & 202nd Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.27'26.66" W Long. -99.30'08.70" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: ~~N/A~~ As determined by Hyde County Highway Superintendent
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001533 SW4 3-112-72
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19

Signature of Applicant

Date Approved: 08-06-2019

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date 12-29-2020 Hwy. Supt's Signature Michael Conor

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 331st Street in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 2627' South of 331st Street & 204th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.25'05.25" W Long. -99.32'33.88" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 000998 NW4 18-111-72
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Taya K Lane — Robert Bawdon

Signature of Applicant — Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date 12-29-2020 Hwy. Supt's Signature Michael Lowen

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 333rd Ave in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 1875' South of 333rd Ave & 204th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.25'12.86" W Long. -99.31'20.78" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: 18"
   (Check attached spec sheet)
6. Location by legal description: Parcel # 000996 NE4 18-111-72
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19

Tanya Dave
Signature of Applicant

Date Approved: 08-06-2019

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date 12-29-2020 Hwy. Supt's Signature Michael Lower

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 333rd Ave in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm X field _____ business _____ Residence _____ Wind Farm Access Rd
3. Exact location: Approximately 1360' North of 333rd Ave & 204th Street intersection
   (Feet from nearest intersection or landmark)
   Lat. 44.25'44.93" W Long. -99.31'20.67" W
4. Width of entrance: 16' access road with 25' temporary intersection imporvement RD06
   (Check attached spec sheet)
5. Size & length of culvert: ~~N/A~~ As determined by Hyde County Highway Superintendent
   (Check attached spec sheet)
6. Location by legal description: Parcel # 000956 SW4 8-111-72
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 8/2/19 Receipt # 120796

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

Taya L Dave
Signature of Applicant

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date 12-29-2020 Hwy. Supt's Signature Michael Corwin

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Basin Electric Power Cooperative for an entrance to be located along Hyde County Highway No. 204th Street in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm _____ field _____ business X Residence _____
3. Exact location: Approximately 600 feet east of 204th & 330th
   (Feet from nearest intersection or landmark)
   Lat. 44° 25' 30.79" Long. 99° 33' 38.96"
4. Width of entrance: 40 Feet
   (Check attached spec sheet)
5. Size & length of culvert: As determined by County Highway Dept.
   (Check attached spec sheet)
6. Location by legal description: SW/4, SW/4 Sec. 12 Twn 111 Range 73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 7/22/19 Receipt # 120795

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted July 19, 2019 Date Approved: July 22, 2019

Signature of Applicant

Robert A Bawden
Chairman, Hyde County Commissioners

1717 East Interstate Ave, Bismarck, ND 58503
Address of Applicant

Final Inspection Date 12-29-2020 Hwy. Supt's Signature Michael Lowe

→ On behalf of Basin Electric

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Triple H Wind Land Holdings, LLC for an entrance to be located along Hyde County Highway No. 204th Street in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: $100.00
2. Type of entrance: farm _____ field _____ business ✓ Residence _____
3. Exact location: Approximately 1,200 feet east of 204th & 330th
   (Feet from nearest intersection or landmark)
   Lat. 44° 25' 30.85" Long. 99° 33' 29.91"
4. Width of entrance: 40 feet
   (Check attached spec sheet)
5. Size & length of culvert: As determined by County Highway Dept.
   (Check attached spec sheet)
6. Location by legal description: SW/4, SW/4, Sec. 12 Town 111 Range 73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid 7/22/19 Receipt # 120795

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted July 19, 2019 Date Approved: July 22, 2019

Signature of Applicant

Robert A Bawdon
Chairman, Hyde County Commissioners

Address of Applicant

Final Inspection Date 12-29-2020 Hwy. Supt's Signature Michael Lowe

→ On behalf of Triple H Wind Land Holdings, LLC

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 200th St & Holabird GRDE in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: ~~$100.00~~
2. Type of entrance: farm x field _____ business _____ Residence _____
3. Exact location: Intersection of 200th Street and Holabird GRDE (SE)
   (Feet from nearest intersection or landmark)
   Lat. 44.29'00.19" N Long. -99.36'12.36" W
4. Width of entrance: Temporary Intersection Modificiation for deliver truck access - see detail RD08-A
   (Check attached spec sheet)
5. Size & length of culvert: _____
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001670 NW4 27-112-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

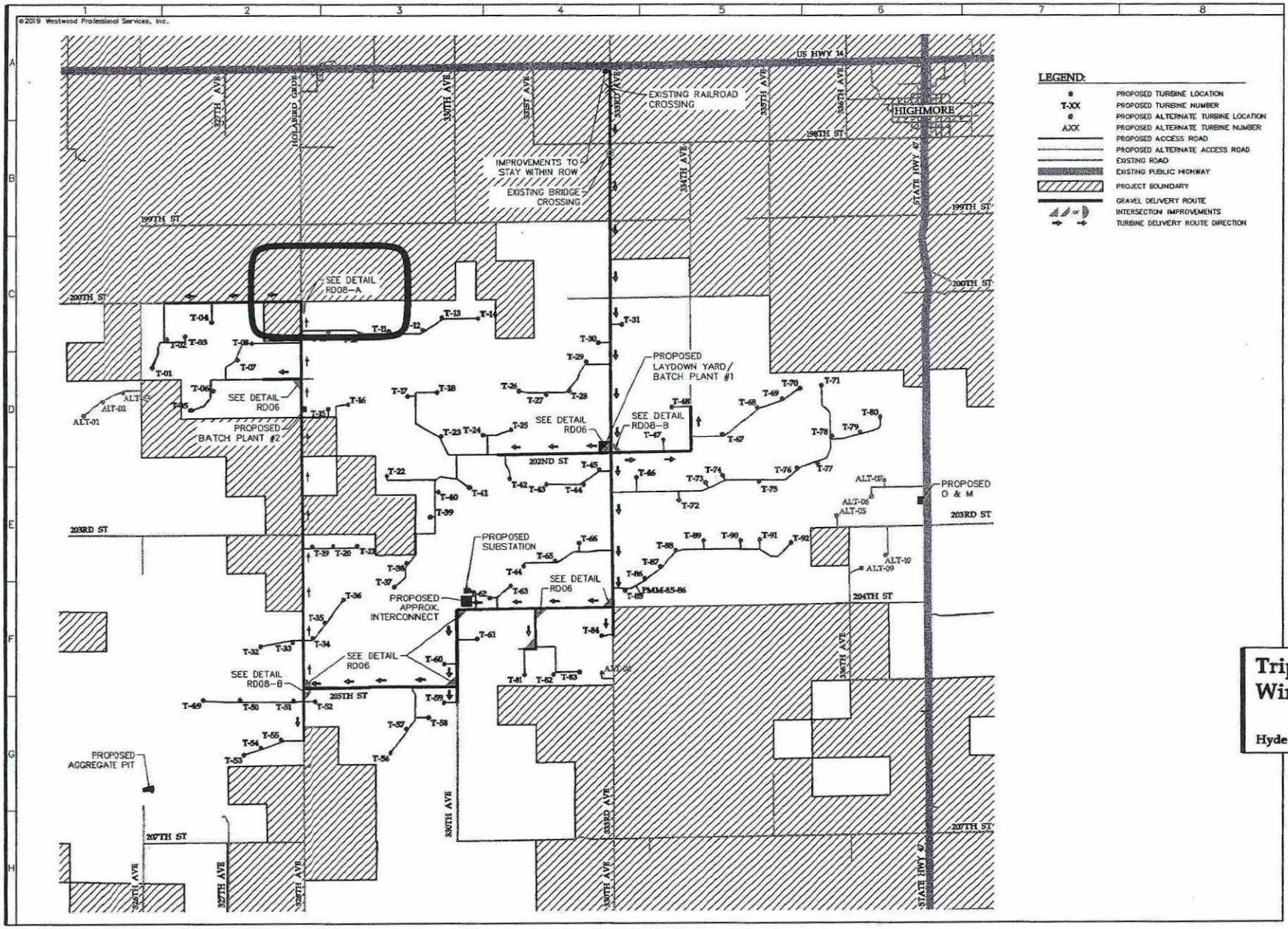
Tanya LaLonde
Signature of Applicant

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date 12-29-2020 Hwy. Supt's Signature Michael Lavin

©2019 Westwood Professional Services, Inc.



LEGEND:

⊕	PROPOSED TURBINE LOCATION
T-XX	PROPOSED TURBINE NUMBER
⊕	PROPOSED ALTERNATE TURBINE LOCATION
AXX	PROPOSED ALTERNATE TURBINE NUMBER
	PROPOSED ACCESS ROAD
	PROPOSED ALTERNATE ACCESS ROAD
	EXISTING ROAD
	EXISTING PUBLIC HIGHWAY
	PROJECT BOUNDARY
	GRAVEL DELIVERY ROUTE
	INTERSECTION IMPROVEMENTS
	TURBINE DELIVERY ROUTE DIRECTION

Westwood

Phone: (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax: (952) 937-5822 Minnetonka, MN 55343
Toll Free: (844) 937-5150 westwoodps.com

Westwood Professional Services, Inc.

Designed: SMC
Checked: DSF
Drawn: SMC
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION

Prepared for:

WANZEK

2028 2nd Avenue NW
West Fargo, ND 58078

N

0' 3000' 6000' 9000'

Triple H Wind Farm

Hyde County, South Dakota

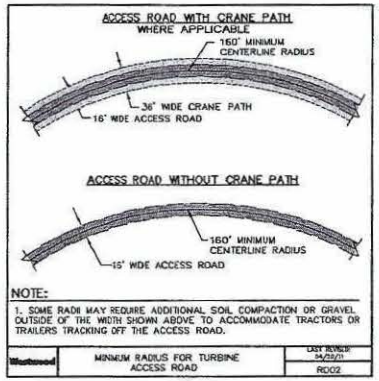
Delivery Flow Plan Exhibit

NOT FOR CONSTRUCTION

Date: 7/31/19
Sheet: 1 OF 1

0014440EH04.dwg

©2019 Westwood Professional Services, Inc.

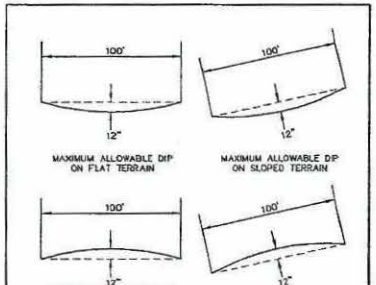


NOTE:
1. SOME RADII MAY REQUIRE ADDITIONAL SOIL COMPACTION OR GRAVEL OUTSIDE OF THE WIDTH SHOWN ABOVE TO ACCOMMODATE TRACTORS OR TRAILERS TRACKING OFF THE ACCESS ROAD.

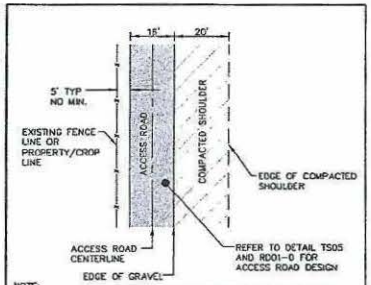
Westwood	MINIMUM RADIUS FOR TURBINE ACCESS ROAD	LAST REVISED: 04/25/19 RD02

NOTES:
1. ROAD SLOPE SHALL NOT EXCEED 8% WITHOUT OWNER APPROVAL

Westwood	MAXIMUM VERT. SLOPE FOR TURBINE ACCESS ROAD/CRANE TRAVEL PATH	LAST REVISED: 3/28/12 RD03

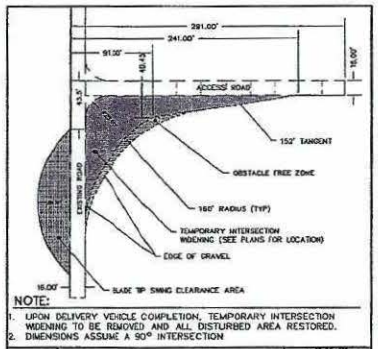


Westwood	MAXIMUM DEFLECTION FOR TURBINE ACCESS ROAD	LAST REVISED: 11/03/09 RD04



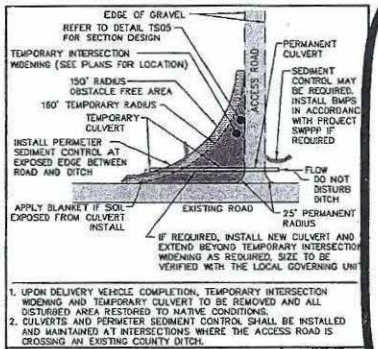
NOTE:
1. COMPACTED SHOULDER SHALL BE RETURNED TO NATIVE CONDITION FOLLOWING TURBINE GENERATOR CONSTRUCTION.
2. THE ACCESS ROAD MAY NEED TO BE CONSTRUCTED FARTHER FROM THE PROPERTY LINE IF OBSTRUCTIONS SUCH AS TREES FOLLOW THE PROPERTY LINE.

Westwood	TURBINE ACCESS ROAD ALONG FENCE/PROPERTY/CROP LINE	LAST REVISED: 3/03/08 RD05



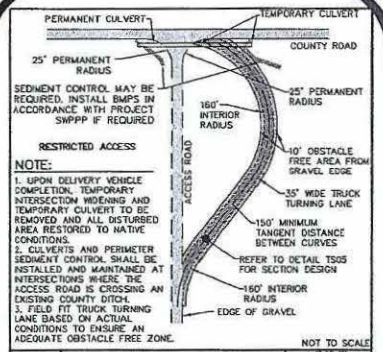
NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING TO BE REMOVED AND ALL DISTURBED AREA RESTORED.
2. DIMENSIONS ASSUME A 90° INTERSECTION

Westwood	INTERSECTION WIDENING DIMENSIONS	LAST REVISED: 7/15/19 RD06



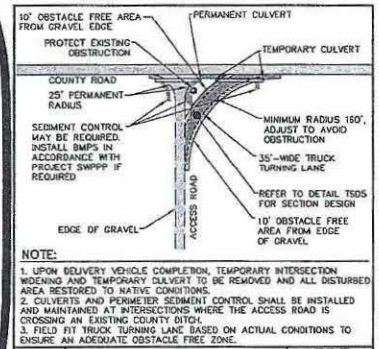
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.

Westwood	TURBINE ACCESS ROAD TYPICAL INTERSECTION WIDENING	LAST REVISED: 3/3/17 RD07



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

Westwood	TRUCK TRAFFIC TURNING LANE A	LAST REVISED: 3/3/17 RD08-A



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

Westwood	TRUCK TRAFFIC TURNING LANE B	LAST REVISED: 12/2/14 RD08-B

Westwood
Phone: (952) 937-5150 12701 Whitewater Drive, Suite #300
Fax: (952) 937-5822 Minnetonka, MN 55343
Toll Free: (888) 937-5150
Westwood Professional Services, Inc.

Designed: SNE
Checked: DEN
Drawn: SNE
As-Built Drawing:

Revisions: #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK
a Masonite company

2020 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 5 OF 57

0014440DTP.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 201st St & Holabird GRDE in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: ~~$100.00~~
2. Type of entrance: farm X field _____ business _____ Residence _____
3. Exact location: Intersection of 201st Street and Holabird GRDE (SW)
   (Feet from nearest intersection or landmark)
   Lat. 44.28'07.94" N Long. -99.36'12.57" W
4. Width of entrance: Temporary Intersection Modificiation for deliver truck access - see detail RD06
   (Check attached spec sheet)
5. Size & length of culvert: _____
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001675 SW4 28-112-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19

Tanya Blance
Signature of Applicant

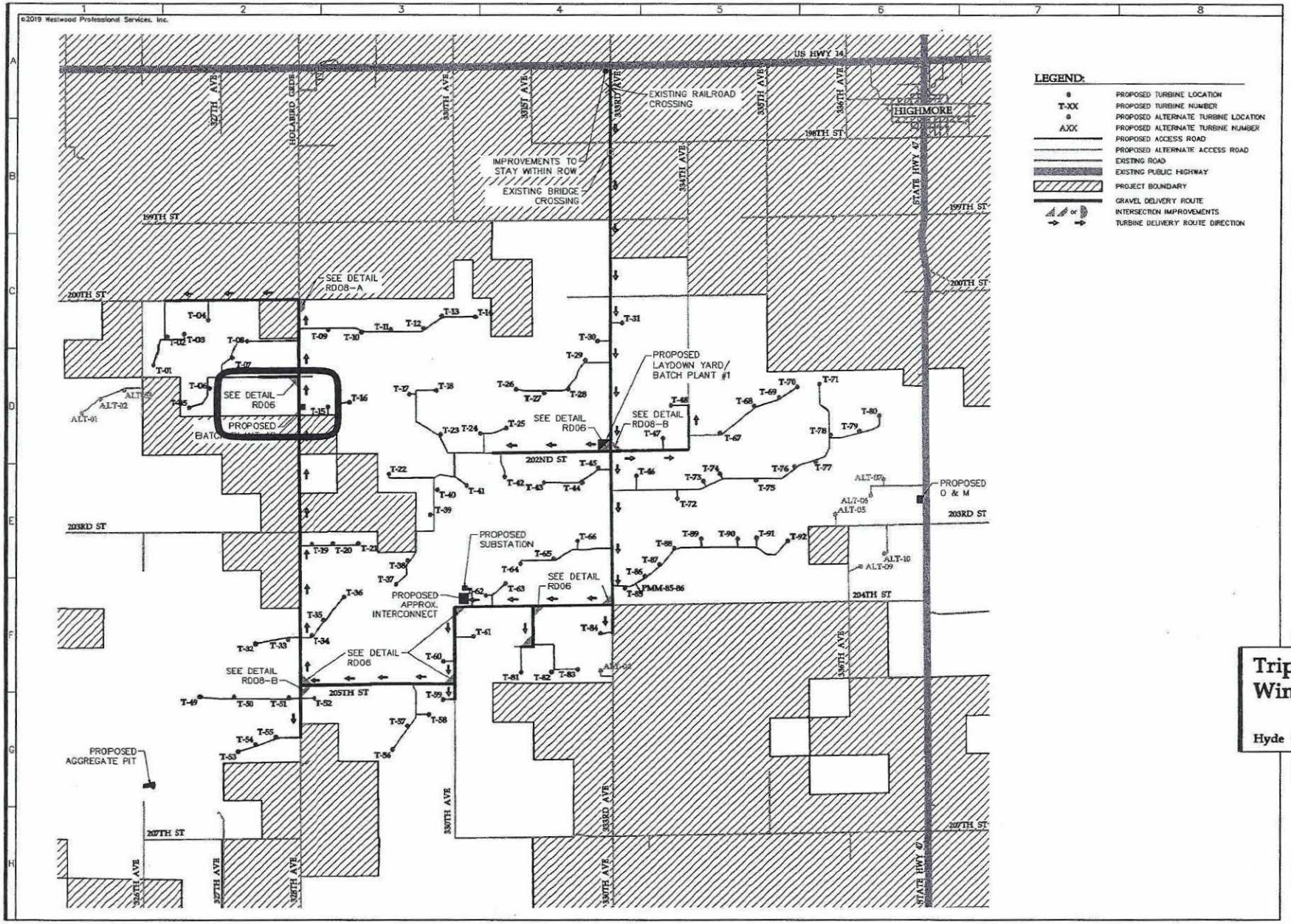
Date Approved: 08-06-2019

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date 12-29-2020 Hwy. Supt's Signature Michael Cowan

©2019 Westwood Professional Services, Inc.



LEGEND:

●	PROPOSED TURBINE LOCATION
T-XX	PROPOSED TURBINE NUMBER
◆	PROPOSED ALTERNATE TURBINE LOCATION
AXX	PROPOSED ALTERNATE TURBINE NUMBER
	PROPOSED ACCESS ROAD
	PROPOSED ALTERNATE ACCESS ROAD
	EXISTING ROAD
	EXISTING PUBLIC HIGHWAY
	PROJECT BOUNDARY
	GRAVEL DELIVERY ROUTE
	INTERSECTION IMPROVEMENTS
	TURBINE DELIVERY ROUTE DIRECTION

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwood@us.com
Westwood Professional Services, Inc.

Designed: BMC
Checked: DJH
Drawn: BMC
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION

Prepared for:

WANZEK

2028 2nd Avenue NW
West Fargo, ND 58078

N

0' 3000' 6000' 9000'

Triple H Wind Farm

Hyde County, South Dakota

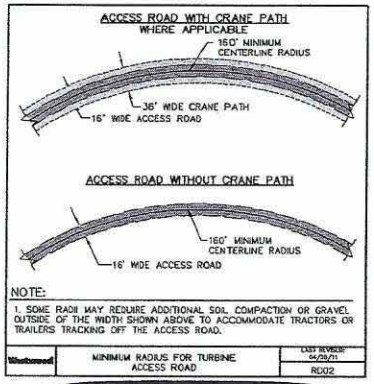
Delivery Flow Plan Exhibit

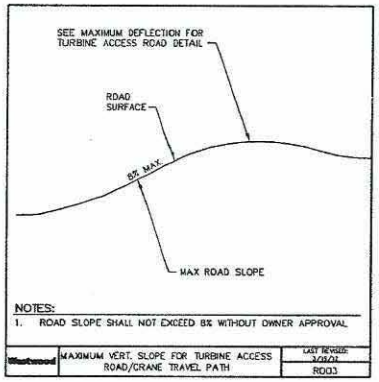
NOT FOR CONSTRUCTION

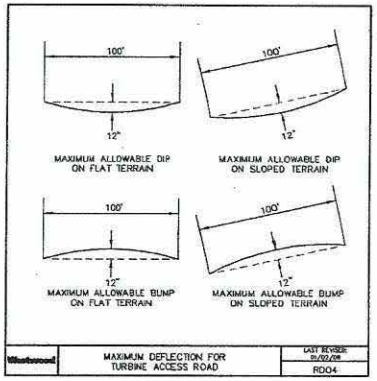
Date: 7/31/19
Sheet: 1 OF 1

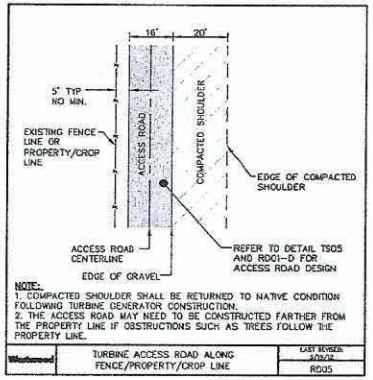
001444DEH04.dwg

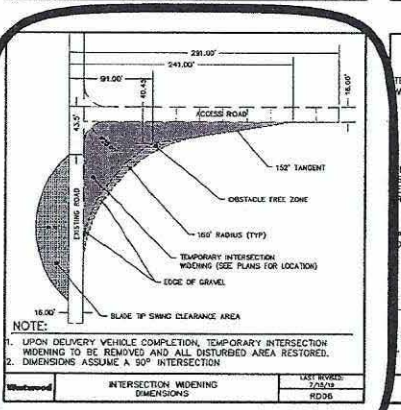
©2019 Westwood Professional Services, Inc.

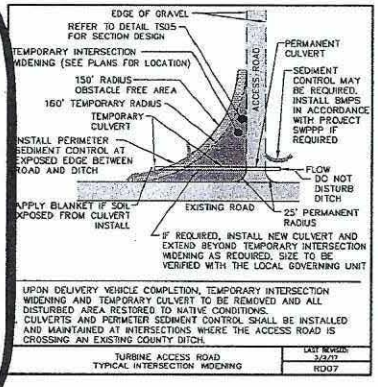


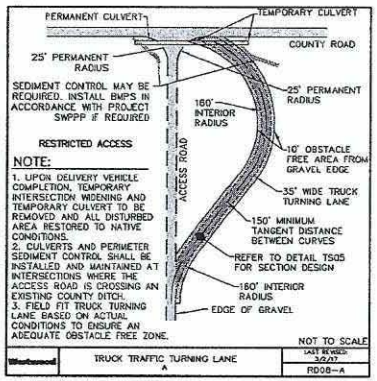


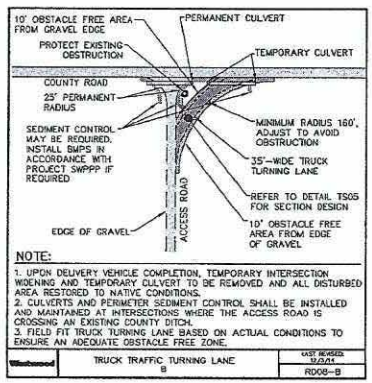












Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite 200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-Free (866) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed: SMK
Checked: DJH
Drawn: SMK
As-Built Drawing:

Revisions: #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2028 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 5 OF 57

001444007P.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 205th St & CR 649 in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: ~~$100.00~~
2. Type of entrance: farm x field _____ business _____ Residence _____
3. Exact location: Intersection of 205th Street and County Road 649 (NE)
   (Feet from nearest intersection or landmark)
   Lat. 44.24'38.57" N Long. -99.36'12.09" W
4. Width of entrance: Temporary Intersection Modificiation for deliver truck access - see detail RD06
   (Check attached spec sheet)
5. Size & length of culvert: _____
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001130 SW4 15-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

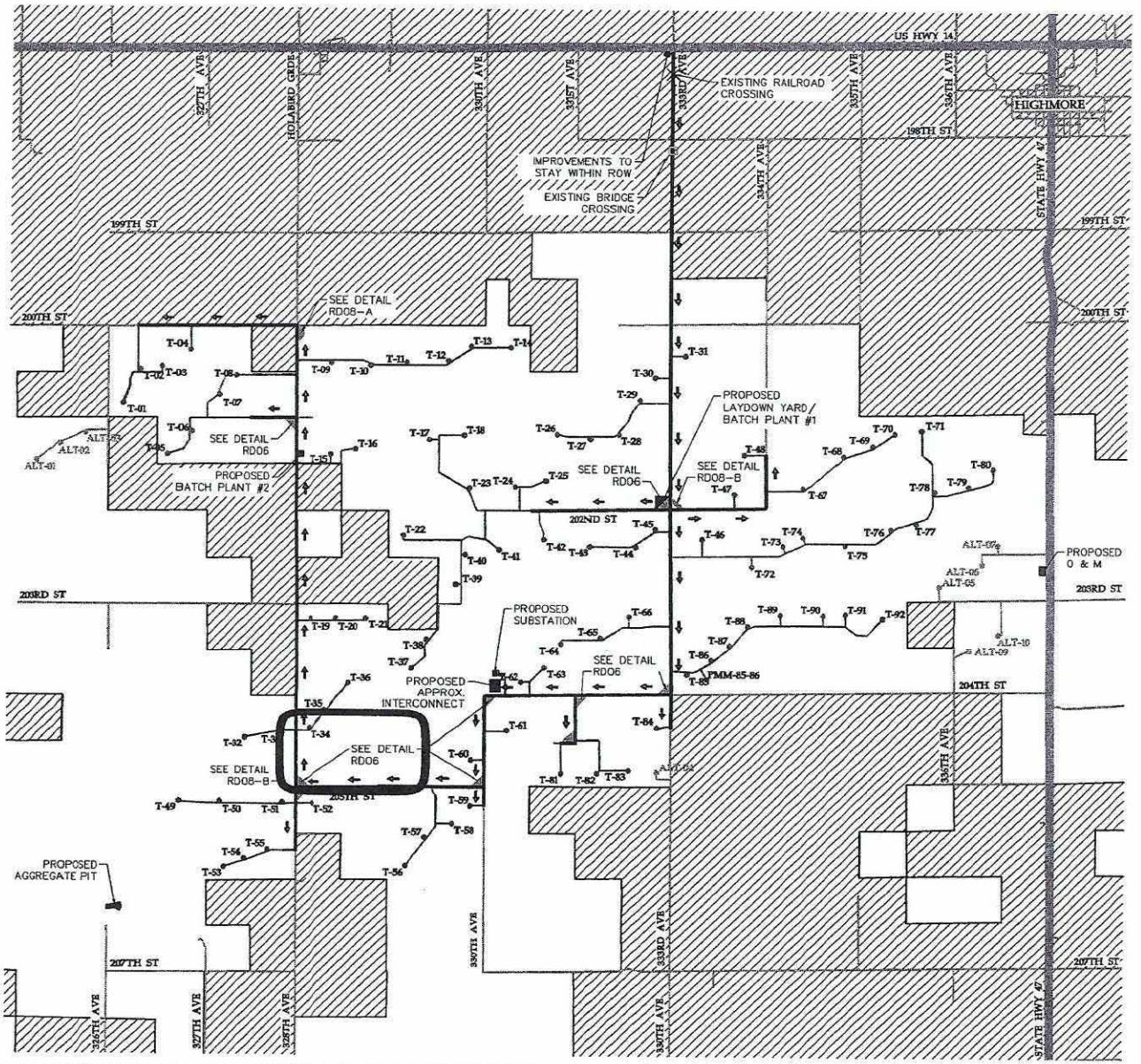
Robert Bawden

Signature of Applicant Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date 12-29-2020 Hwy. Supt's Signature Michael Lowe

©2019 Westwood Professional Services, Inc.



LEGEND:

- PROPOSED TURBINE LOCATION
- T-XX PROPOSED TURBINE NUMBER
- PROPOSED ALTERNATE TURBINE LOCATION
- AXX PROPOSED ALTERNATE TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED ALTERNATE ACCESS ROAD
- EXISTING ROAD
- EXISTING PUBLIC HIGHWAY
- PROJECT BOUNDARY
- GRAVEL DELIVERY ROUTE
- INTERSECTION IMPROVEMENTS
- TURBINE DELIVERY ROUTE DIRECTION

Westwood

Phone (952) 937-5150 | 12701 Whitewater Drive, Suite #300
Fax (952) 937-5822 | Minnetonka, MN 55343
Toll Free (888) 937-5150 | westwoodps.com

Westwood Professional Services, Inc.

Designed:	SMK
Checked:	DJN
Drawn:	SMK
As-Built Drawing:	

Revisions:

#	DATE	DESCRIPTION

Prepared for:

WANZEK

2025 2nd Avenue NW
West Fargo, ND 58078

0' 3000' 6000' 9000'

Triple H Wind Farm

Hyde County, South Dakota

Delivery Flow Plan Exhibit

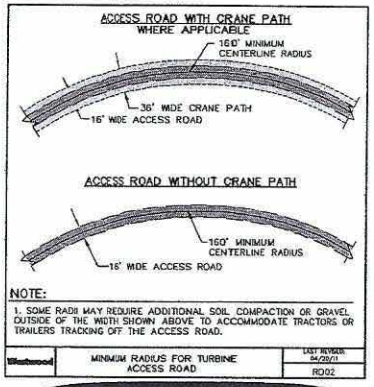
NOT FOR CONSTRUCTION

Date: 7/31/19

Sheet: 1 OF 1

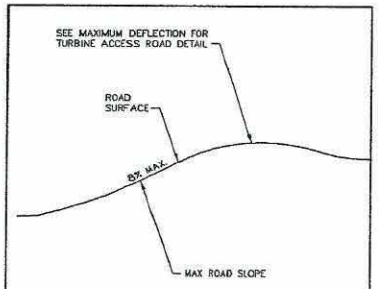
001444DEXH04.dwg

©2019 Westwood Professional Services, Inc.



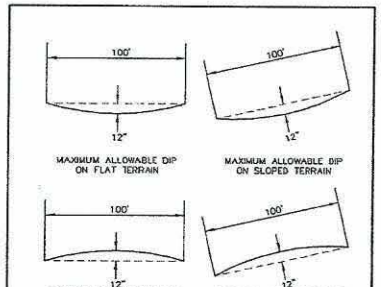
NOTE:
1. SOME RADII MAY REQUIRE ADDITIONAL SOIL COMPACTION OR GRAVEL OUTSIDE OF THE WIDTH SHOWN ABOVE TO ACCOMMODATE TRACTORS OR TRAILERS TRACKING OFF THE ACCESS ROAD.

Westwood	MINIMUM RADIUS FOR TURBINE ACCESS ROAD	LAST REVISED: 04/20/11 RD02

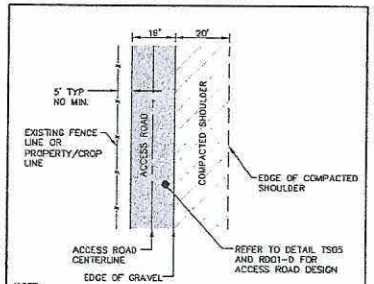


NOTES:
1. ROAD SLOPE SHALL NOT EXCEED 8% WITHOUT OWNER APPROVAL

Westwood	MAXIMUM VERT. SLOPE FOR TURBINE ACCESS ROAD/CRANE TRAVEL PATH	LAST REVISED: 3/13/12 RD03

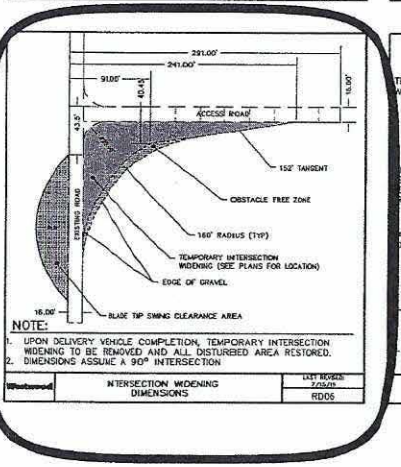


Westwood	MAXIMUM DEFLECTION FOR TURBINE ACCESS ROAD	LAST REVISED: 01/22/04 RD04



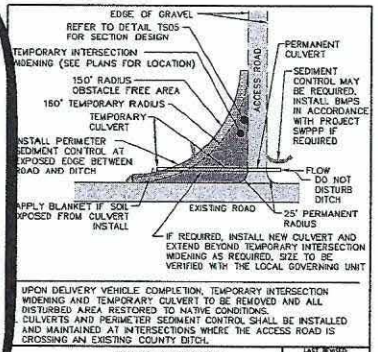
NOTE:
1. COMPACTED SHOULDER SHALL BE RETURNED TO NATIVE CONDITION FOLLOWING TURBINE GENERATOR CONSTRUCTION.
2. THE ACCESS ROAD MAY NEED TO BE CONSTRUCTED FARTHER FROM THE PROPERTY LINE IF OBSTRUCTIONS SUCH AS TREES FOLLOW THE PROPERTY LINE.

Westwood	TURBINE ACCESS ROAD ALONG FENCE/PROPERTY/CROP LINE	LAST REVISED: 3/13/12 RD05



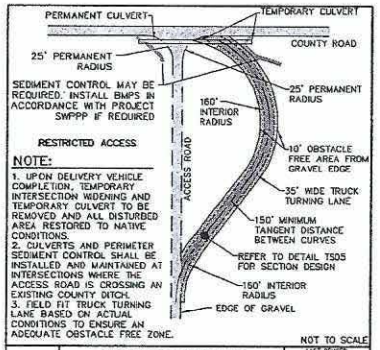
NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING TO BE REMOVED AND ALL DISTURBED AREA RESTORED.
2. DIMENSIONS ASSUME A 90° INTERSECTION

Westwood	INTERSECTION WIDENING DIMENSIONS	LAST REVISED: 7/25/19 RD06



UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.

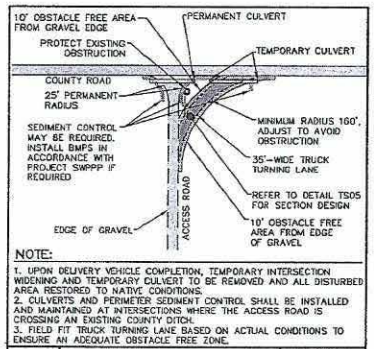
Westwood	TURBINE ACCESS ROAD TYPICAL INTERSECTION WIDENING	LAST REVISED: 3/5/07 RD07



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

NOT TO SCALE

Westwood	TRUCK TRAFFIC TURNING LANE A	LAST REVISED: 3/5/07 RD08-A



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

Westwood	TRUCK TRAFFIC TURNING LANE B	LAST REVISED: 12/3/14 RD08-B

Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed:	BMK
Checked:	DSN
Drawn:	BMK
As-Built Drawing:	

Revisions: #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2028 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 5 OF 57

001444007P.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 205th St & CR 649 in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: ~~$100.00~~
2. Type of entrance: farm X field _____ business _____ Residence _____
3. Exact location: Intersection of 205th Street and County Road 649 (SE)
   (Feet from nearest intersection or landmark)
   Lat. 44.24'38.57" N Long. -99.36'12.09" W
4. Width of entrance: Temporary Intersection Modificiation for deliver truck access - see detail RD08-B
   (Check attached spec sheet)
5. Size & length of culvert: _____
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001157 NW4 22-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19

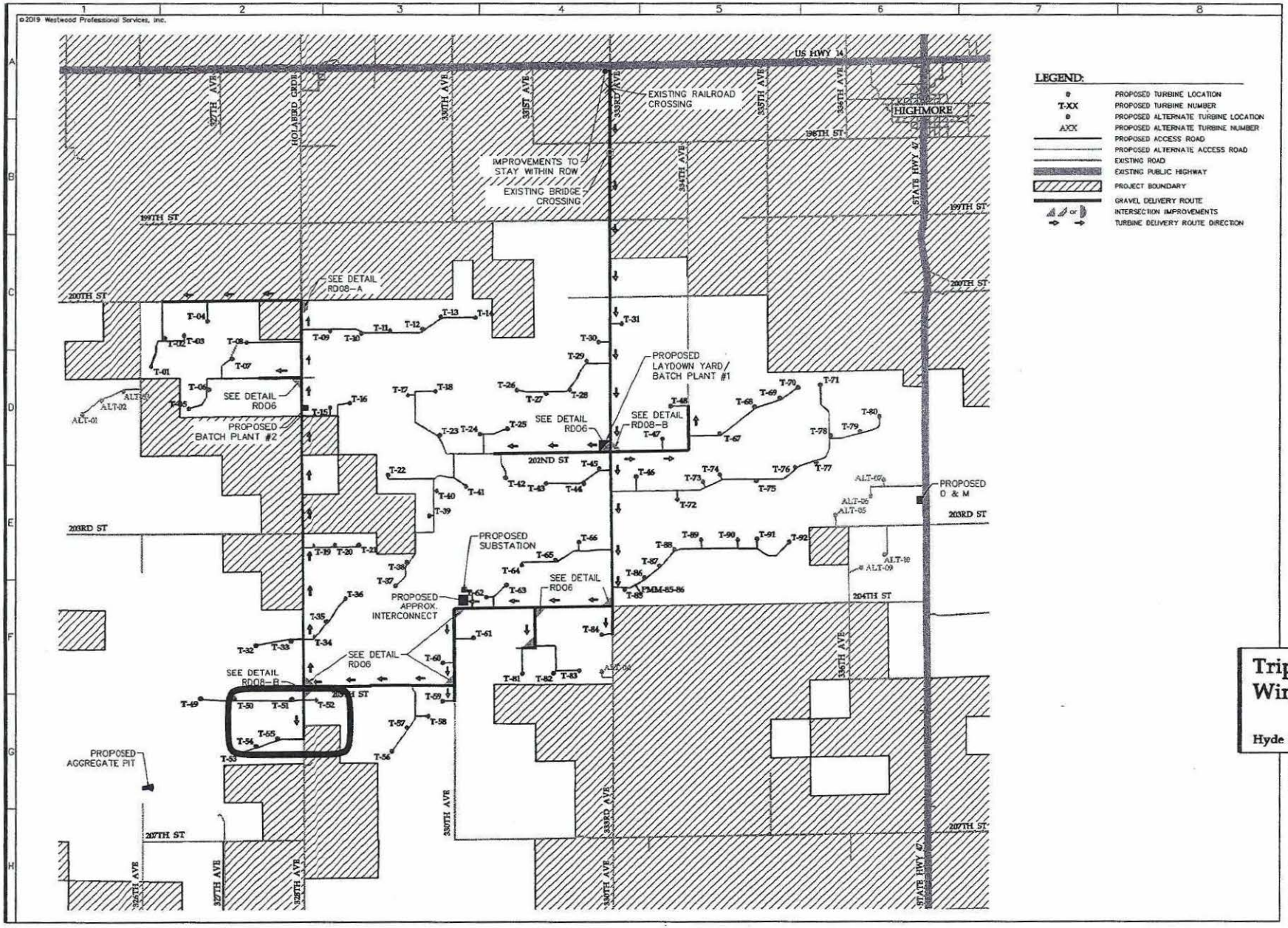
Tanya L Lance
Signature of Applicant

Date Approved: 08-06-2019

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date 12-29-2020 Hwy. Supt's Signature Michael Cowan



Westwood

Designed: BMC
Checked: DJN
Drawn: BMC
As-Built Drawing:

Revisions:
DATE DESCRIPTION

Prepared for:

WANZEK
a MasTec company
2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

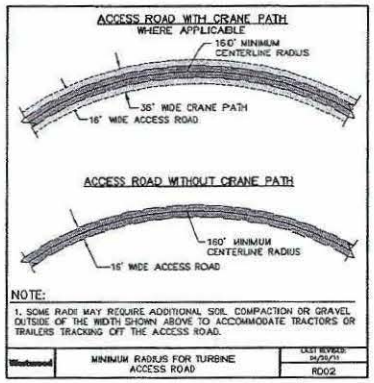
Delivery Flow Plan Exhibit

NOT FOR CONSTRUCTION

Date: 7/31/19
Sheet: 1 OF 1

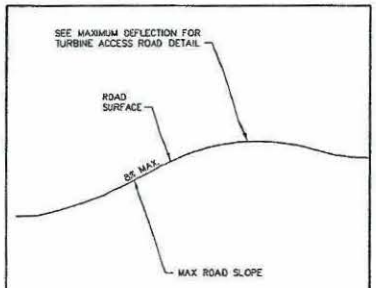
001444GEN04.dwg

©2019 Westwood Professional Services, Inc.



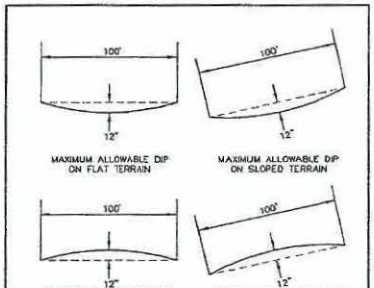
NOTE:
1. SOME RADII MAY REQUIRE ADDITIONAL SOIL COMPACTION OR GRAVEL OUTSIDE OF THE WIDTH SHOWN ABOVE TO ACCOMMODATE TRACTORS OR TRAILERS TRACKING OFF THE ACCESS ROAD.

Westwood	MINIMUM RADIUS FOR TURBINE ACCESS ROAD	LAST REVISED: 04/26/19 RD02

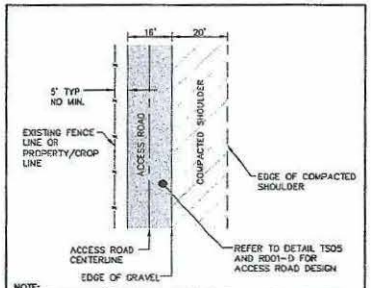


NOTES:
1. ROAD SLOPE SHALL NOT EXCEED 8% WITHOUT OWNER APPROVAL

Westwood	MAXIMUM VERT. SLOPE FOR TURBINE ACCESS ROAD/CRANE TRAVEL PATH	LAST REVISED: 3/28/13 RD03

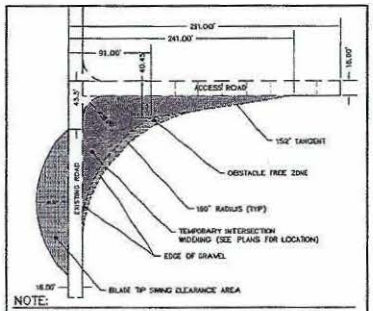


Westwood	MAXIMUM DEFLECTION FOR TURBINE ACCESS ROAD	LAST REVISED: 01/09/08 RD04



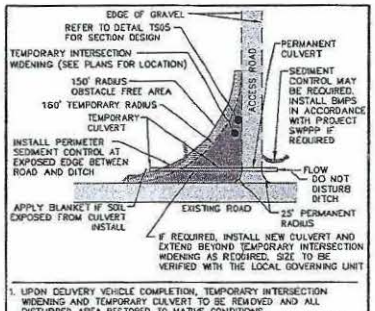
NOTE:
1. COMPACTED SHOULDER SHALL BE RETURNED TO NATIVE CONDITION FOLLOWING TURBINE GENERATOR CONSTRUCTION.
2. THE ACCESS ROAD MAY NEED TO BE CONSTRUCTED FARTHER FROM THE PROPERTY LINE IF OBSTRUCTIONS SUCH AS TREES FOLLOW THE PROPERTY LINE.

Westwood	TURBINE ACCESS ROAD ALONG FENCE/PROPERTY/CROP LINE	LAST REVISED: 3/28/13 RD05



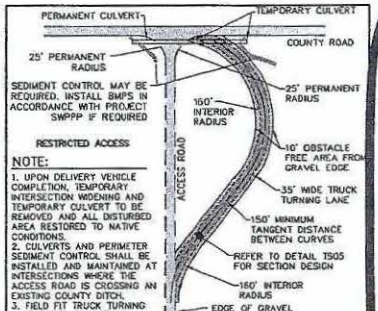
NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING TO BE REMOVED AND ALL DISTURBED AREA RESTORED.
2. DIMENSIONS ASSUME A 90° INTERSECTION

Westwood	INTERSECTION WIDENING DIMENSIONS	LAST REVISED: 7/25/19 RD06



1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.

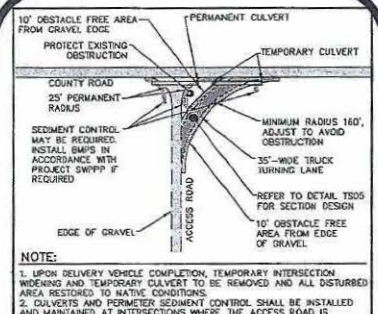
Westwood	TURBINE ACCESS ROAD TYPICAL INTERSECTION WIDENING	LAST REVISED: 3/28/13 RD07



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

NOT TO SCALE

Westwood	TRUCK TRAFFIC TURNING LANE A	LAST REVISED: 3/28/13 RD08-A



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

Westwood	TRUCK TRAFFIC TURNING LANE B	LAST REVISED: 3/28/13 RD08-B

Westwood
Phone (952) 930-0100 12701 Whitewater Drive, Suite #200
Fax (952) 930-0210 Minnetonka, MN 55343
Toll Free (866) 937-8150 westwoodps.com
Westwood Professional Services, Inc.

Designed:	BNK
Checked:	DEN
Drawn:	BNK
As-Built Drawing:	

Revisions: #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK
a MasTec company

2608 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 5 OF 57

0011440DTP.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 205th St & 330th Ave in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: ~~$100.00~~
2. Type of entrance: farm X field _____ business _____ Residence _____
3. Exact location: Intersection of 205th Street and 330th Ave (NW)
   (Feet from nearest intersection or landmark)
   Lat. 44.24'38.70" N Long. -99.33'46.85" W
4. Width of entrance: Temporary Intersection Modificiation for deliver truck access - see detail RD06
   (Check attached spec sheet)
5. Size & length of culvert: _____
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001127 SE4 14-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19

Tanya Blanco
Signature of Applicant

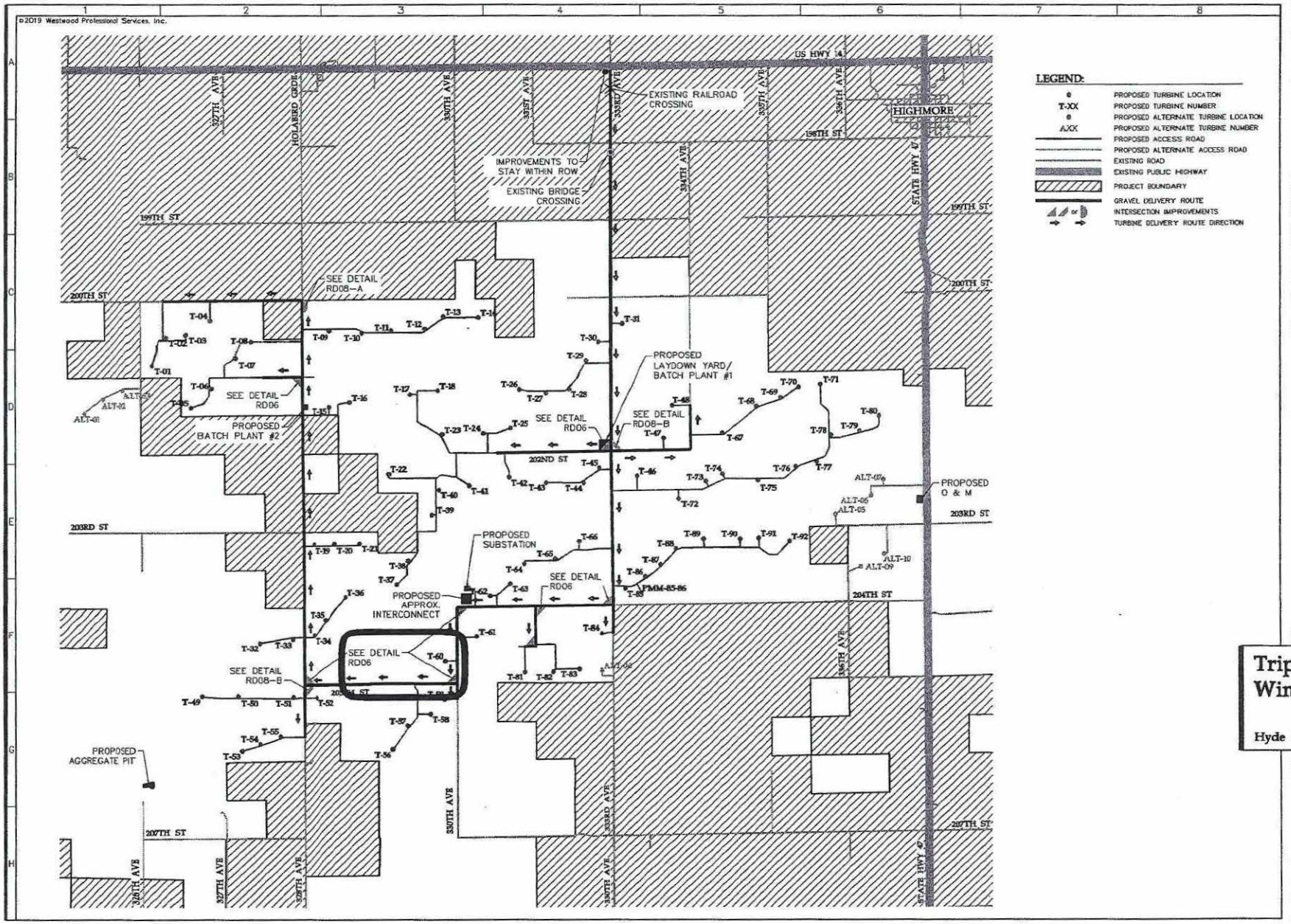
Date Approved: 08-06-2019

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date 12-29-2020 Hwy. Supt's Signature Michael Larson

©2019 Westwood Professional Services, Inc.



LEGEND:

⊕	PROPOSED TURBINE LOCATION
T-XX	PROPOSED TURBINE NUMBER
⊕	PROPOSED ALTERNATE TURBINE LOCATION
AXX	PROPOSED ALTERNATE TURBINE NUMBER
	PROPOSED ACCESS ROAD
	PROPOSED ALTERNATE ACCESS ROAD
	EXISTING ROAD
	EXISTING PUBLIC HIGHWAY
	PROJECT BOUNDARY
	GRAVEL DELIVERY ROUTE
or	INTERSECTION IMPROVEMENTS
	TURBINE DELIVERY ROUTE DIRECTION

Westwood

Phone: (952) 937-5150 12701 Whitewater Dr Ste., Suite #200
Fax: (952) 937-5822 Minnetonka, MN 55343
Toll Free: (888) 937-5150 www.westwoodps.com
Westwood Professional Services, Inc.

Designed: BKK
Checked: DBH
Drawn: BKK
As-Built Drawing:

Revisions: #	DATE	DESCRIPTION

Prepared for:

WANZEK

2028 2nd Avenue NW
West Fargo, ND 58078

N

0' 3000' 6000' 9000'

Triple H Wind Farm

Hyde County, South Dakota

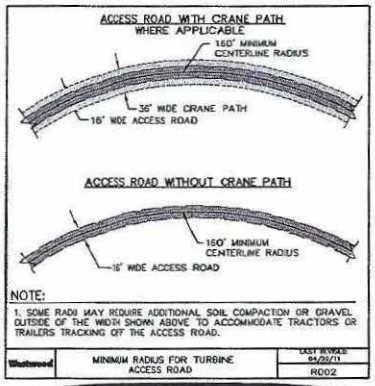
Delivery Flow Plan Exhibit

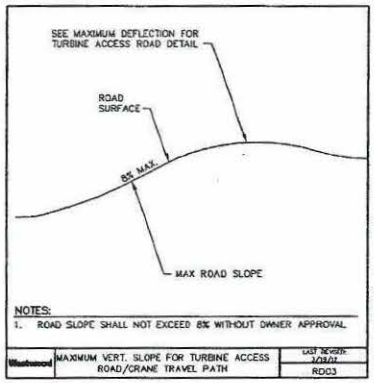
NOT FOR CONSTRUCTION

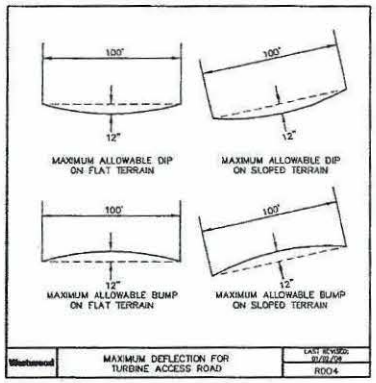
Date: 7/31/19
Sheet: 1 OF 1

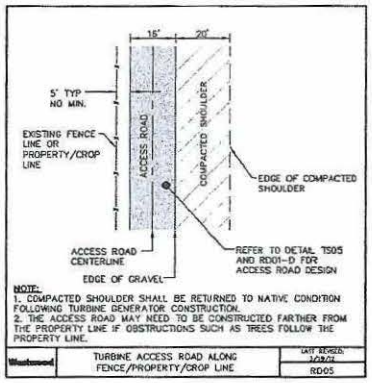
0014440E0104.dwg

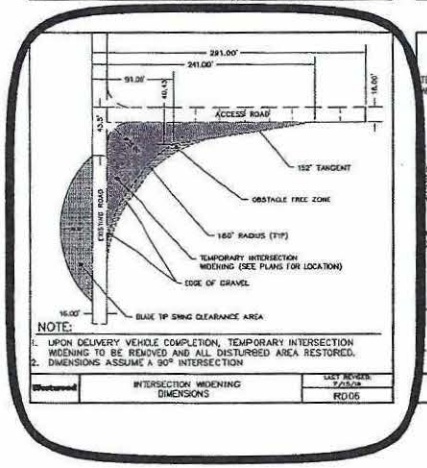
©2019 Westwood Professional Services, Inc.

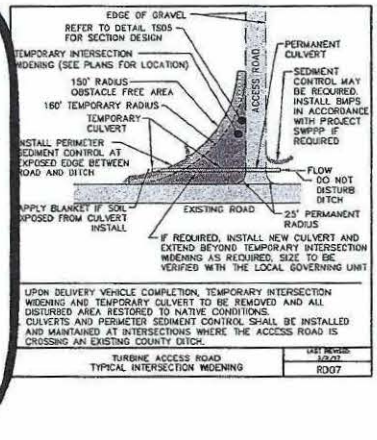


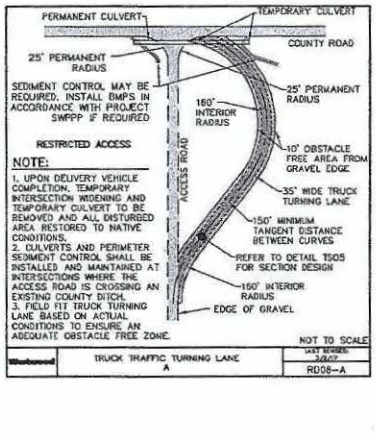


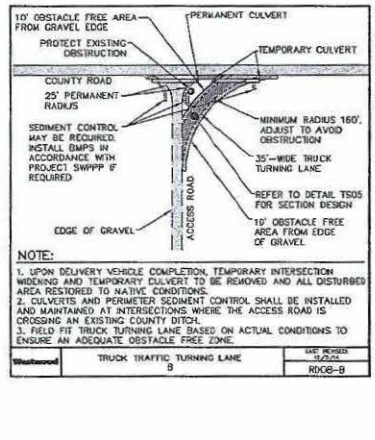












Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (866) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed:	BMC
Checked:	TJH
Drawn:	BMC
As-Built Drawing:	

Revisions #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 5 OF 57

0014400TP.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 204th St & 330th Ave in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: ~~$100.00~~
2. Type of entrance: farm X field _____ business _____ Residence _____
3. Exact location: Intersection of 204th Street and 330th Ave (SE)
   (Feet from nearest intersection or landmark)
   Lat. 44.25'31.04" N Long. -99.33'46.70" W
4. Width of entrance: Temporary Intersection Modificiation for deliver truck access - see detail RD06
   (Check attached spec sheet)
5. Size & length of culvert: _____
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001121 NW4 13-111-73
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19

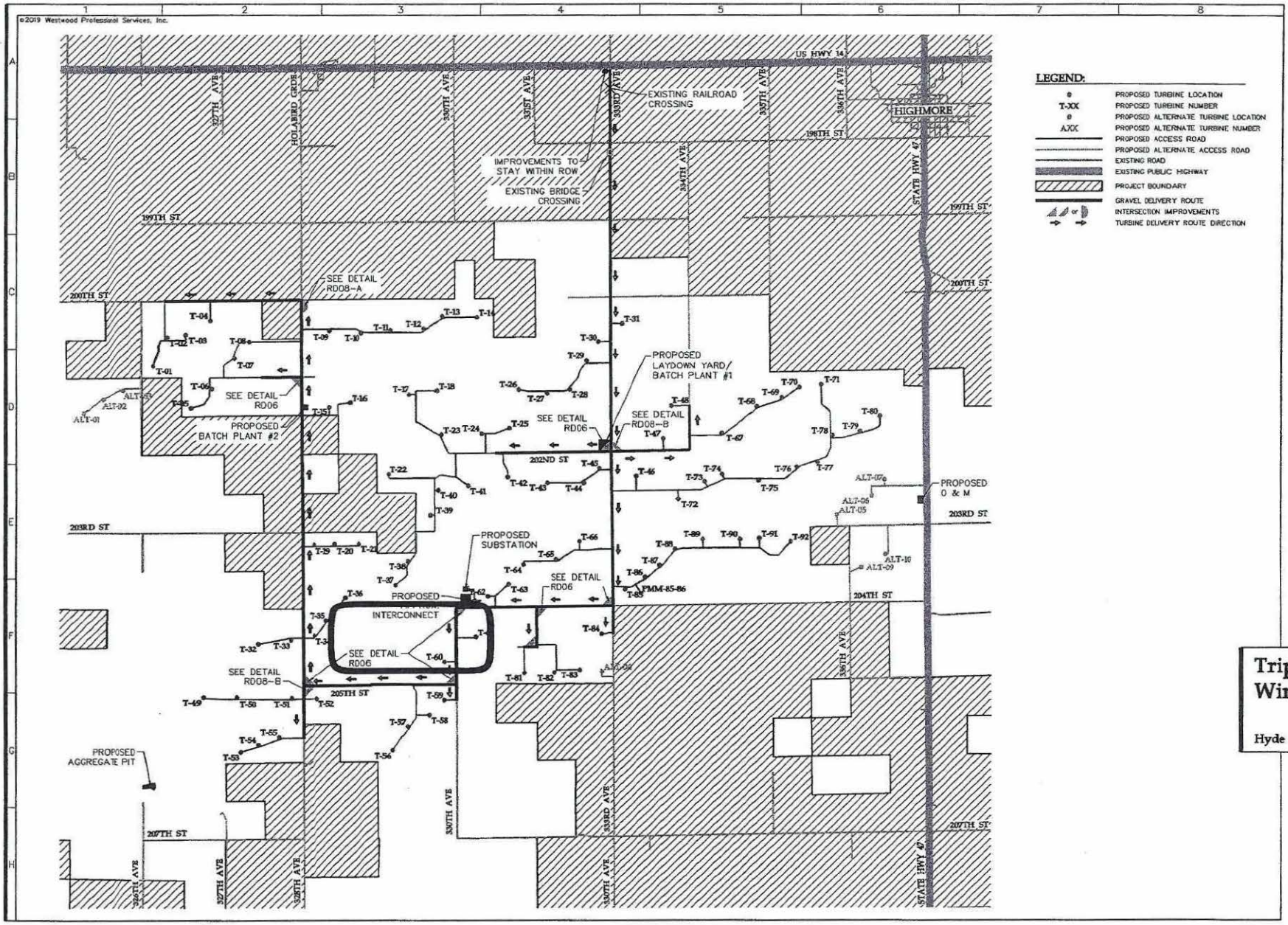
Tanya Kane
Signature of Applicant

Date Approved: 08-06-2019

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date 12-29-2020 Hwy. Supt's Signature Michael Lawson



Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (866) 937-5150 www.westwoodps.com
Westwood Professional Services, Inc.

Designed: BMC
Checked: DJH
Drawn: BMC
As-Built Drawing:

Revisions:
DATE DESCRIPTION

Prepared for:

WANZEK
a MasTec company

2626 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Delivery Flow Plan Exhibit

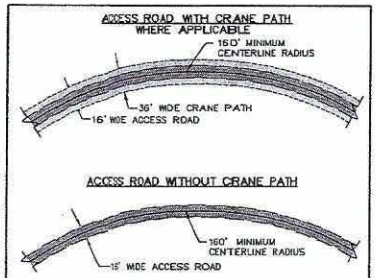
NOT FOR CONSTRUCTION

Date: 7/31/19

Sheet: 1 OF 1

001444GEXH04.dwg

©2019 Westwood Professional Services, Inc.

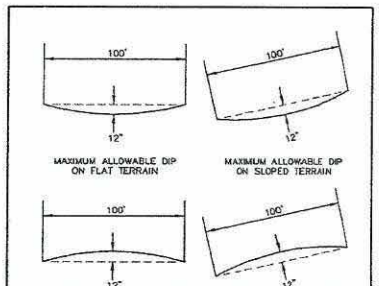


NOTE:
1. SOME RADII MAY REQUIRE ADDITIONAL SOIL COMPACTION OR GRAVEL OUTSIDE OF THE WIDTH SHOWN ABOVE TO ACCOMMODATE TRACTORS OR TRAILERS TRACKING OF THE ACCESS ROAD.

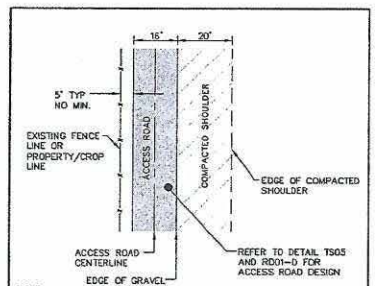
Westwood	MINIMUM RADIUS FOR TURBINE ACCESS ROAD	LAST REVISED: 04/29/13 RD02

NOTES:
1. ROAD SLOPE SHALL NOT EXCEED 8% WITHOUT OWNER APPROVAL

Westwood	MAXIMUM VERT. SLOPE FOR TURBINE ACCESS ROAD/CRANE TRAVEL PATH	LAST REVISED: 3/29/13 RD03

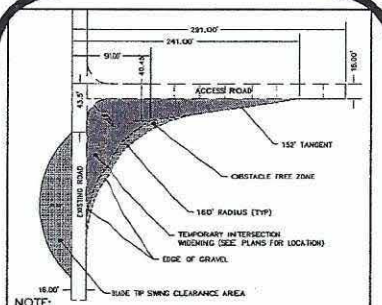


Westwood	MAXIMUM DEFLECTION FOR TURBINE ACCESS ROAD	LAST REVISED: 01/02/08 RD04



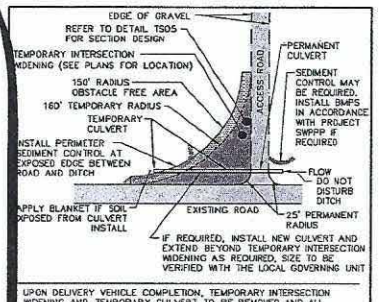
NOTE:
1. COMPACTED SHOULDER SHALL BE RETURNED TO NATIVE CONDITION FOLLOWING TURBINE GENERATOR CONSTRUCTION.
2. THE ACCESS ROAD MAY NEED TO BE CONSTRUCTED FARTHER FROM THE PROPERTY LINE IF OBSTRUCTIONS SUCH AS TREES FOLLOW THE PROPERTY LINE.

Westwood	TURBINE ACCESS ROAD ALONG FENCE/PROPERTY/CROP LINE	LAST REVISED: 3/13/19 RD05



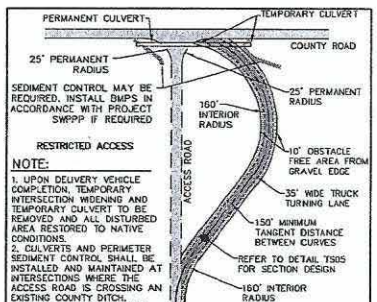
NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING TO BE REMOVED AND ALL DISTURBED AREA RESTORED.
2. DIMENSIONS ASSUME A 90° INTERSECTION

Westwood	INTERSECTION WIDENING DIMENSIONS	LAST REVISED: 12/5/19 RD06



UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.

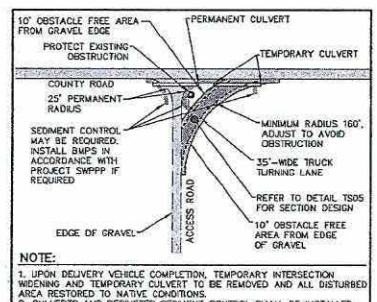
Westwood	TURBINE ACCESS ROAD TYPICAL INTERSECTION WIDENING	LAST REVISED: 3/8/07 RD07



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

NOT TO SCALE

Westwood	TRUCK TRAFFIC TURNING LANE A	LAST REVISED: 3/8/07 RD08-A



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

Westwood	TRUCK TRAFFIC TURNING LANE B	LAST REVISED: 12/2/19 RD08-B

Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-Free (888) 937-5150 westwood@pss.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: DSN
Drawn: BMK
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2028 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 5 OF 57

0014400DP.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 204th St & 331st Ave in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: ~~$100.00~~
2. Type of entrance: farm X field _____ business _____ Residence _____
3. Exact location: Intersection of 204th Street and 331st Ave (SE)
   (Feet from nearest intersection or landmark)
   Lat. 44.25'31.44" N Long. -99.32'34.07" W
4. Width of entrance: Temporary Intersection Modificiation for deliver truck access - see detail RD06
   (Check attached spec sheet)
5. Size & length of culvert: _____
   (Check attached spec sheet)
6. Location by legal description: Parcel # 000997 NW4 18-111-72
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

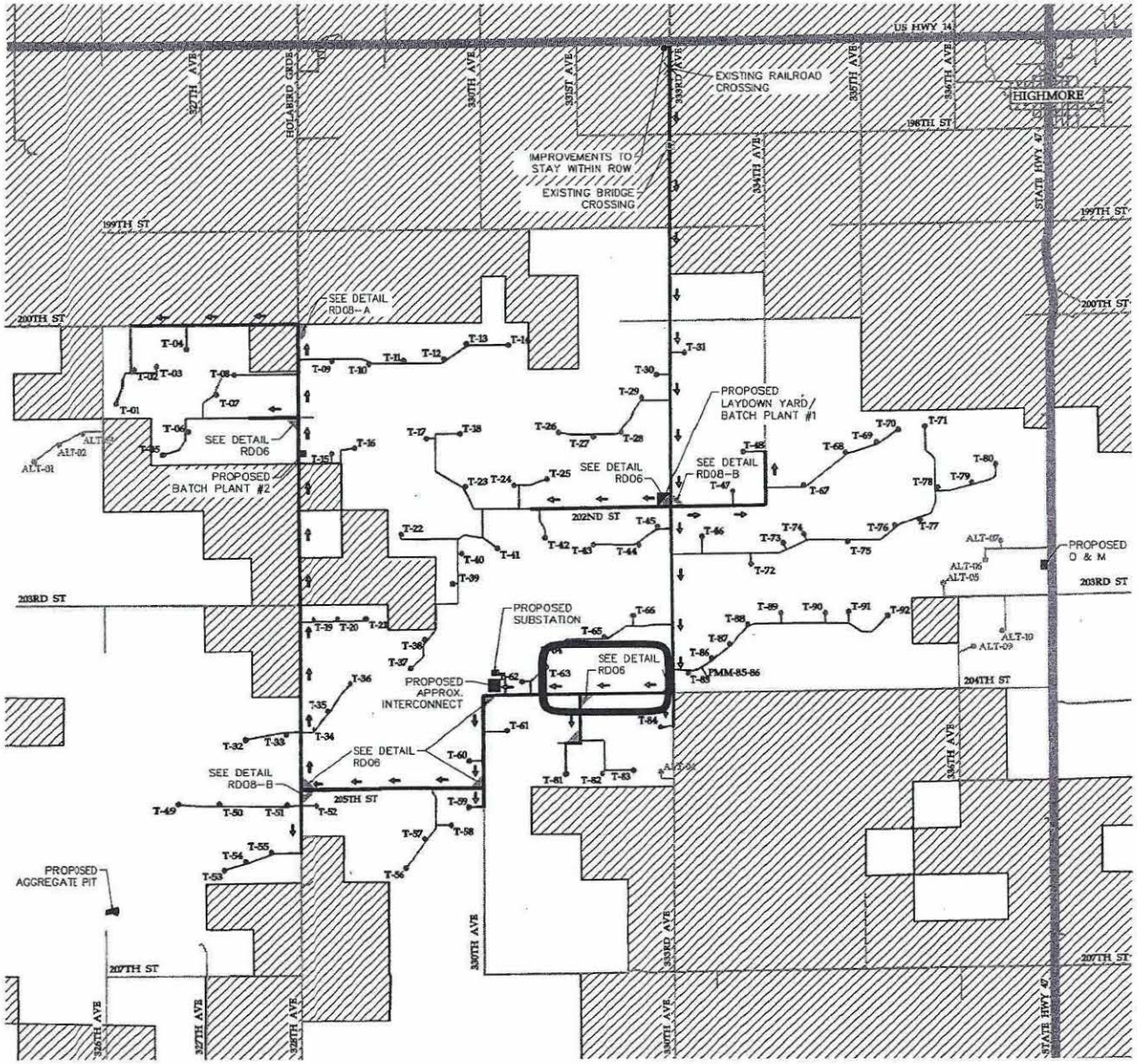
Tanya Klance
Signature of Applicant

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date 12-29-2020 Hwy. Supt's Signature Michael Conner

© 2019 Westwood Professional Services, Inc.



LEGEND:

- PROPOSED TURBINE LOCATION
- T-XX PROPOSED TURBINE NUMBER
- PROPOSED ALTERNATE TURBINE LOCATION
- AXX PROPOSED ALTERNATE TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED ALTERNATE ACCESS ROAD
- EXISTING ROAD
- EXISTING PUBLIC HIGHWAY
- PROJECT BOUNDARY
- GRAVEL DELIVERY ROUTE
- INTERSECTION IMPROVEMENTS
- TURBINE DELIVERY ROUTE DIRECTION

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #300
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed: GMC
Checked: DJH
Drawn: GMC
As-Built Drawing:

Revisions:
DATE DESCRIPTION

Prepared for:

WANZEK

2626 2nd Avenue NW
West Fargo, ND 58078

0' 3000' 6000' 9000'

Triple H Wind Farm

Hyde County, South Dakota

Delivery Flow Plan Exhibit

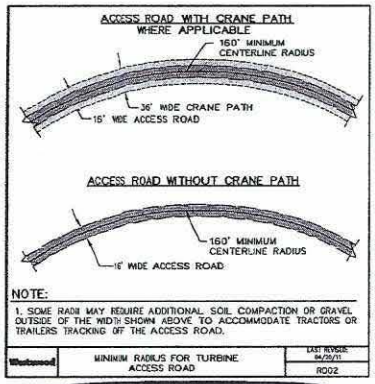
NOT FOR CONSTRUCTION

Date: 7/31/19

Sheet: 1 OF 1

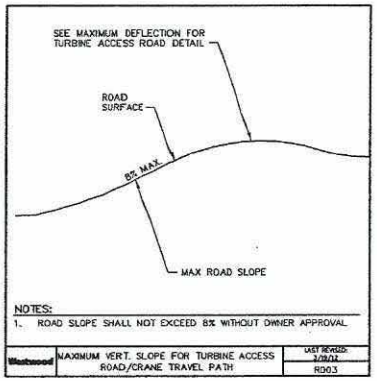
001444QEXH04.dwg

©2019 Westwood Professional Services, Inc.



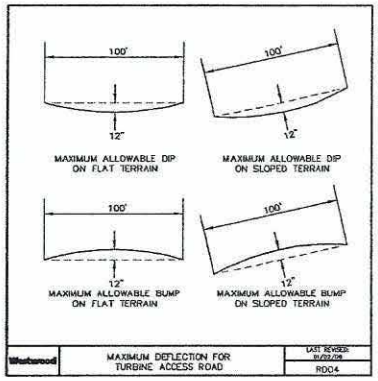
NOTE:
1. SOME RADII MAY REQUIRE ADDITIONAL SOIL COMPACTION OR GRAVEL OUTSIDE OF THE WIDTH SHOWN ABOVE TO ACCOMMODATE TRACTORS OR TRAILERS TRACKING OFF THE ACCESS ROAD.

Westwood	MINIMUM RADIUS FOR TURBINE ACCESS ROAD	LAST REVISED: 04/20/11 RD02

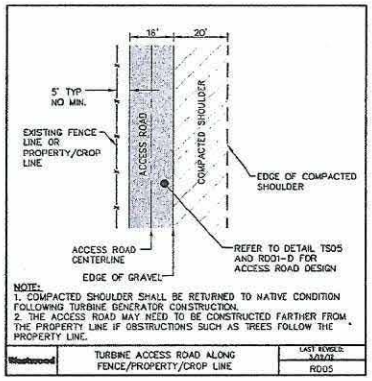


NOTES:
1. ROAD SLOPE SHALL NOT EXCEED 8% WITHOUT OWNER APPROVAL.

Westwood	MAXIMUM VERT. SLOPE FOR TURBINE ACCESS ROAD/CRANE TRAVEL PATH	LAST REVISED: 3/28/12 RD03

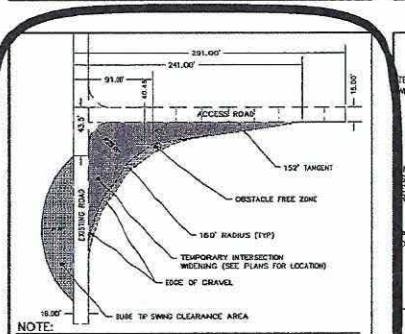


Westwood	MAXIMUM DEFLECTION FOR TURBINE ACCESS ROAD	LAST REVISED: 11/03/08 RD04



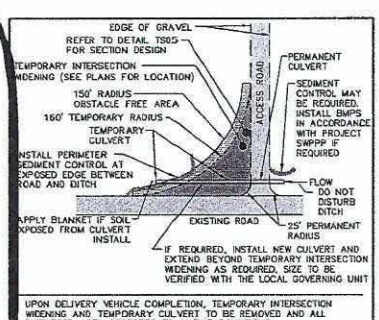
NOTE:
1. COMPACTED SHOULDER SHALL BE RETURNED TO NATIVE CONDITION FOLLOWING TURBINE GENERATOR CONSTRUCTION.
2. THE ACCESS ROAD MAY NEED TO BE CONSTRUCTED FARTHER FROM THE PROPERTY LINE IF OBSTRUCTIONS SUCH AS TREES FOLLOW THE PROPERTY LINE.

Westwood	TURBINE ACCESS ROAD ALONG FENCE/PROPERTY/CROP LINE	LAST REVISED: 3/01/18 RD05



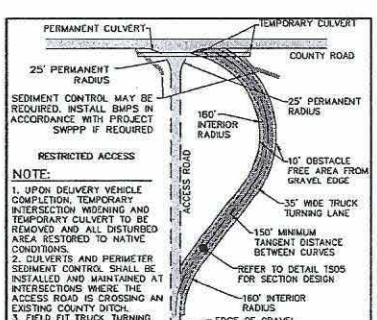
NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING TO BE REMOVED AND ALL DISTURBED AREA RESTORED.
2. DIMENSIONS ASSUME A 90° INTERSECTION

Westwood	INTERSECTION WIDENING DIMENSIONS	LAST REVISED: 7/20/18 RD06



UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.

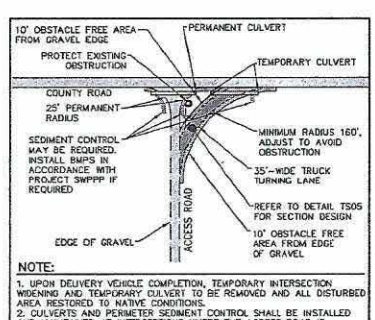
Westwood	TURBINE ACCESS ROAD TYPICAL INTERSECTION WIDENING	LAST REVISED: 3/2/07 RD07



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

NOT TO SCALE

Westwood	TRUCK TRAFFIC TURNING LANE A	LAST REVISED: 3/2/07 RD08-A



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

Westwood	TRUCK TRAFFIC TURNING LANE B	LAST REVISED: 11/2/15 RD08-B

Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
TollFree (866) 937-5150 twotheend@pi.com
Westwood Professional Services, Inc.

Designed: MDC
Checked: DJH
Drawn: MDC
As-Built Drawing:

Revisions: #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:
WANZEK
2028 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 5 OF 57

0014440D7P.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 204th St & 333rd Ave in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: ~~$100.00~~
2. Type of entrance: farm X field _____ business _____ Residence _____
3. Exact location: Intersection of 204th Street and 333rd Ave (NW)
   (Feet from nearest intersection or landmark)
   Lat. 44.25'31.56" N Long. -99.31'20.76" W
4. Width of entrance: Temporary Intersection Modificiation for deliver truck access - see detail RD06
   (Check attached spec sheet)
5. Size & length of culvert: _____
   (Check attached spec sheet)
6. Location by legal description: Parcel # 000952 SE4 7-111-72
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

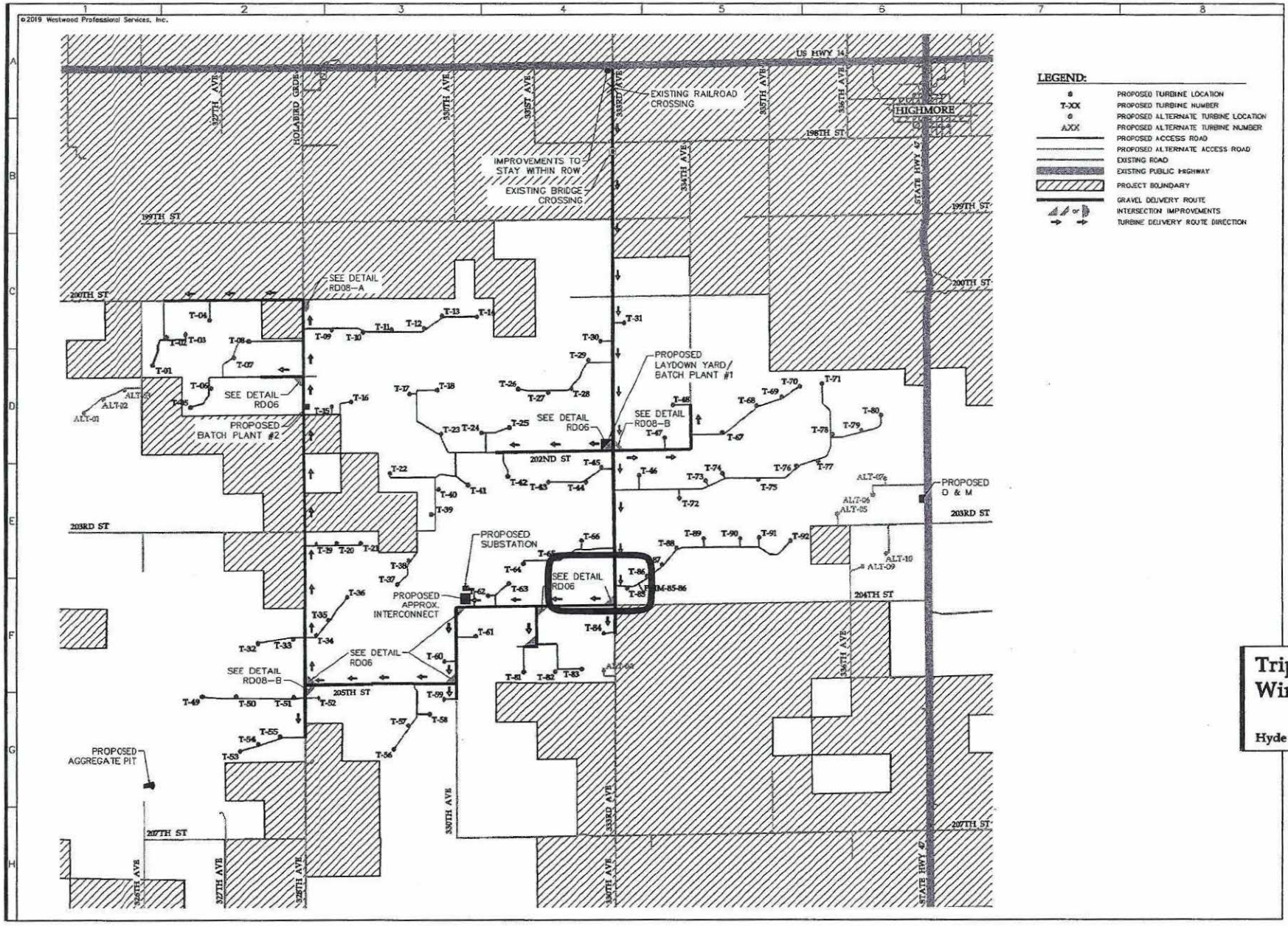
Tanya Adams
Signature of Applicant

Robert Bawdon
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date 12-29-2020 Hwy. Supt's Signature Michael Lowe

©2019 Westwood Professional Services, Inc.



LEGEND:

- PROPOSED TURBINE LOCATION
- T-XX PROPOSED TURBINE NUMBER
- PROPOSED ALTERNATE TURBINE LOCATION
- AXX PROPOSED ALTERNATE TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED ALTERNATE ACCESS ROAD
- EXISTING ROAD
- EXISTING PUBLIC HIGHWAY
- PROJECT BOUNDARY
- GRAVEL DELIVERY ROUTE
- INTERSECTION IMPROVEMENTS
- TURBINE DELIVERY ROUTE DIRECTION

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed: SMC
Checked: TJH
Drawn: SMC
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION

Prepared for:

WANZEK

3028 2nd Avenue NW
West Fargo, ND 58078

0' 3000' 6000' 9000'

Triple H Wind Farm

Hyde County, South Dakota

Delivery Flow Plan Exhibit

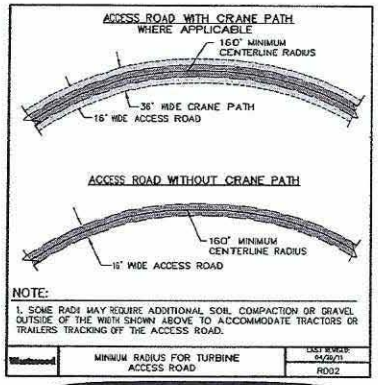
NOT FOR CONSTRUCTION

Date: 7/31/19

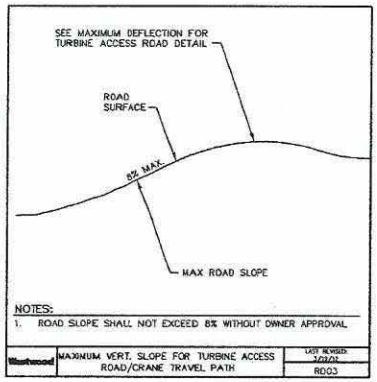
Sheet: 1 OF 1

0014440EXH04.dwg

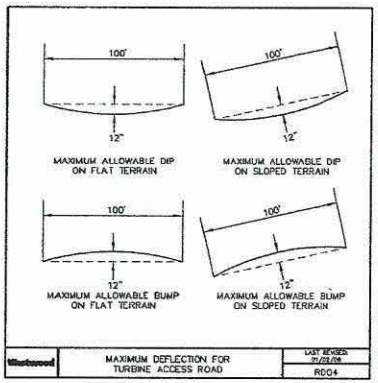
©2019 Westwood Professional Services, Inc.



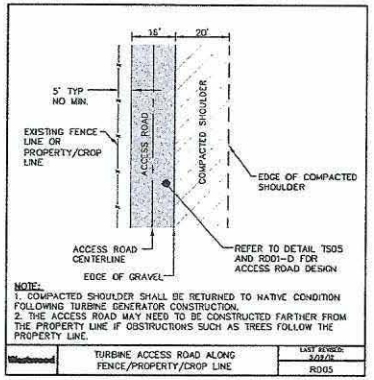
Westwood	MINIMUM RADIUS FOR TURBINE ACCESS ROAD	LAST REVISED: 04/09/19 RD02



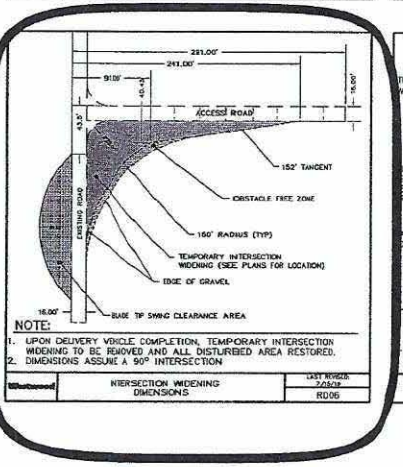
Westwood	MAXIMUM VERT. SLOPE FOR TURBINE ACCESS ROAD/CRANE TRAVEL PATH	LAST REVISED: 3/23/12 RD03



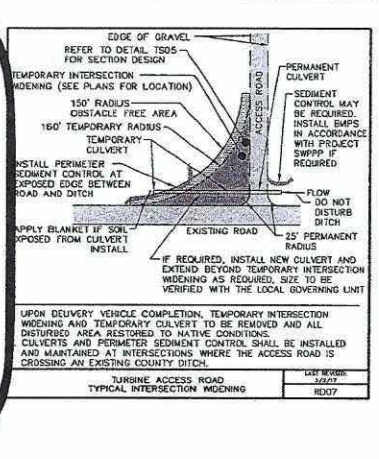
Westwood	MAXIMUM DEFLECTION FOR TURBINE ACCESS ROAD	LAST REVISED: 01/23/08 RD04



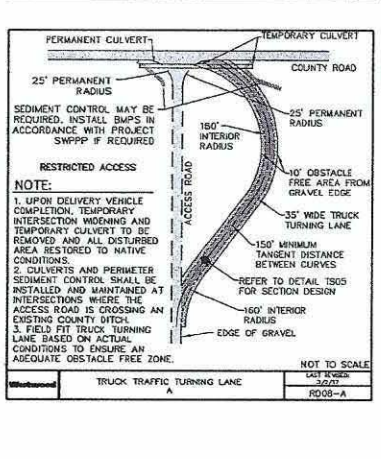
Westwood	TURBINE ACCESS ROAD ALONG FENCE/PROPERTY/CROP LINE	LAST REVISED: 3/23/12 RD05



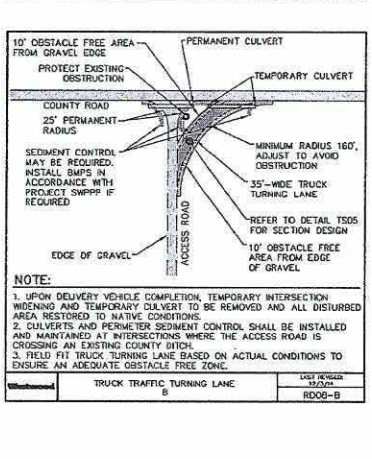
Westwood	INTERSECTION WIDENING DIMENSIONS	LAST REVISED: 3/05/18 RD06



Westwood	TURBINE ACCESS ROAD TYPICAL INTERSECTION WIDENING	LAST REVISED: 3/2/17 RD07



Westwood	TRUCK TRAFFIC TURNING LANE A	LAST REVISED: 3/2/17 RD08-A



Westwood	TRUCK TRAFFIC TURNING LANE B	LAST REVISED: 12/3/14 RD08-B

Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll-Free (866) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: DEN
Drawn: BMK
As-Built Drawing:

Revisions: #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:

WANZEK

2028 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 5 OF 57

0014440DTP.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 202nd St & 333rd Ave in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: ~~$100.00~~
2. Type of entrance: farm X field _____ business _____ Residence _____
3. Exact location: Intersection of 202nd Street and 333rd Ave (NW)
   (Feet from nearest intersection or landmark)
   Lat. 44.27'16.43" N Long. -99.31'21.91" W
4. Width of entrance: Temporary Intersection Modificiation for deliver truck access - see detail RD06
   (Check attached spec sheet)
5. Size & length of culvert: _____
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001525 SE4 31-112-72
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19

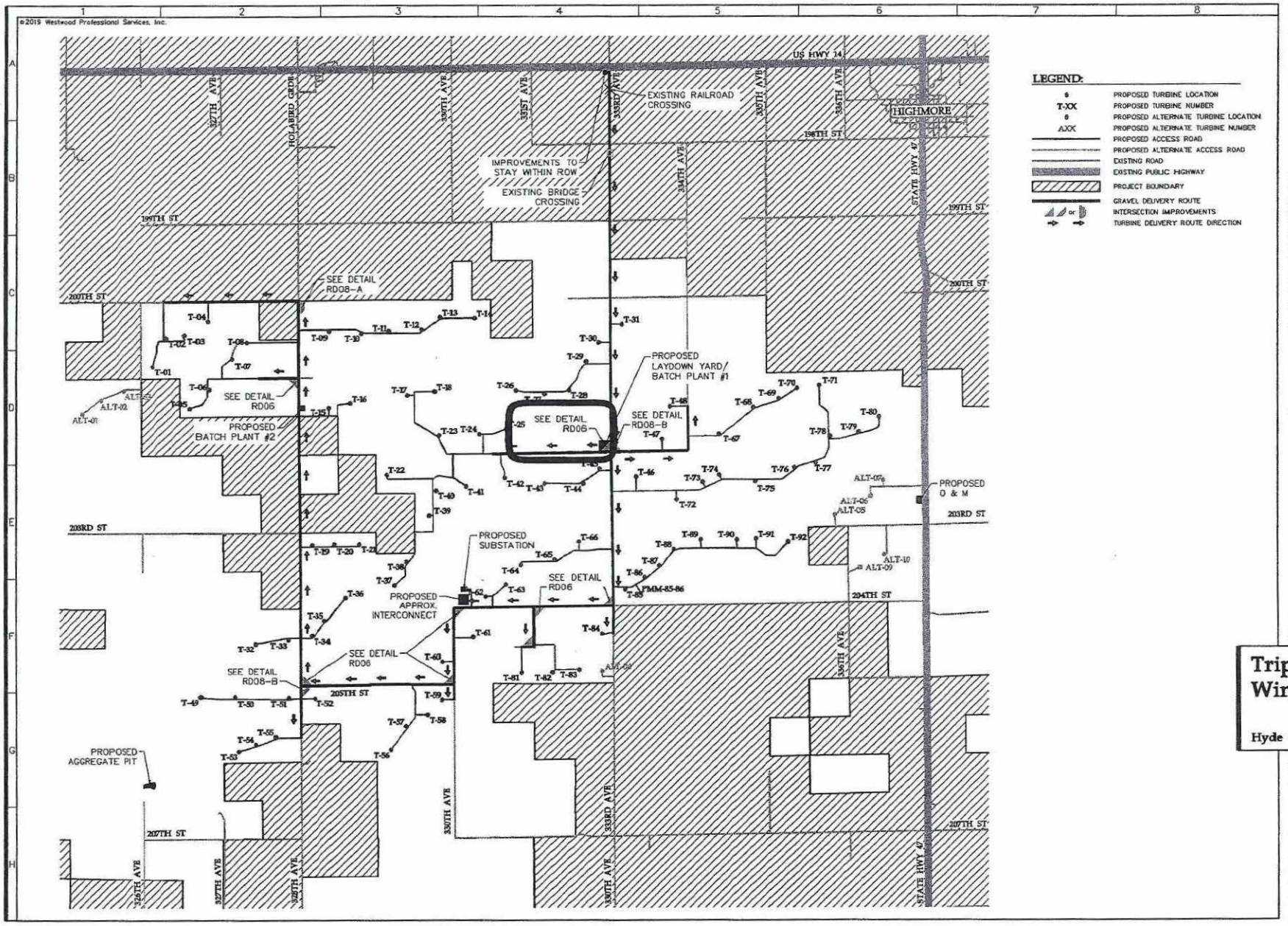
Tanya Adance
Signature of Applicant

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Date Approved: 08-06-2019

Robert Bawden
Chairman, Hyde County Commissioners

Final Inspection Date 12-29-2020 Hwy. Supt's Signature Michael Lowen



Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #300
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (866) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed: BMK
Checked: TBM
Drawn: BMK
As-Built Drawing:

Revisions:

#	DATE	DESCRIPTION

Prepared for:

WANZEK

2028 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Delivery Flow Plan Exhibit

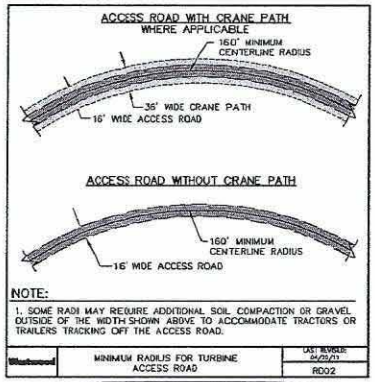
NOT FOR CONSTRUCTION

Date: 7/31/19

Sheet: 1 OF 1

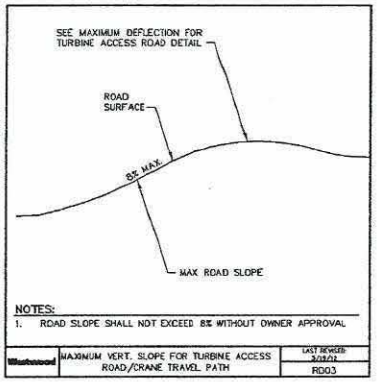
001444DEXH04.dwg

© 2019 Westwood Professional Services, Inc.



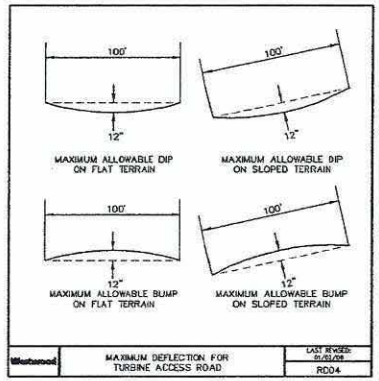
NOTE:
1. SOME RADII MAY REQUIRE ADDITIONAL SOIL COMPACTION OR GRAVEL OUTSIDE OF THE WIDTH SHOWN ABOVE TO ACCOMMODATE TRACTORS OR TRAILERS TRACKING OFF THE ACCESS ROAD.

Westwood	MINIMUM RADIUS FOR TURBINE ACCESS ROAD	LAST REVISED: 04/05/19 RD02

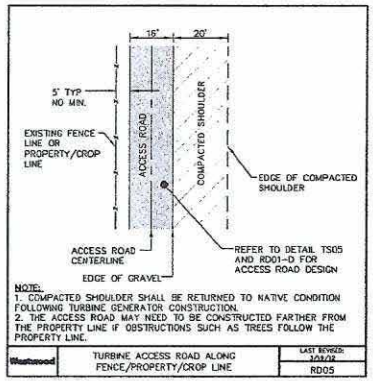


NOTES:
1. ROAD SLOPE SHALL NOT EXCEED 8% WITHOUT OWNER APPROVAL

Westwood	MAXIMUM VERT. SLOPE FOR TURBINE ACCESS ROAD/CRANE TRAVEL PATH	LAST REVISED: 3/28/01 RD03

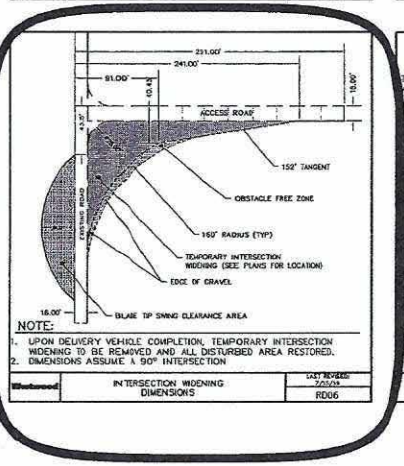


Westwood	MAXIMUM DEFLECTION FOR TURBINE ACCESS ROAD	LAST REVISED: 01/05/09 RD04



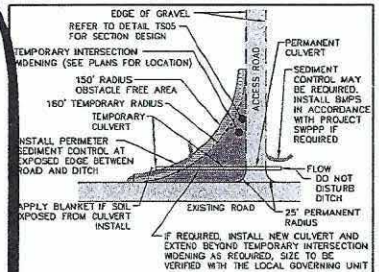
NOTE:
1. COMPACTED SHOULDER SHALL BE RETURNED TO NATIVE CONDITION FOLLOWING TURBINE GENERATOR CONSTRUCTION.
2. THE ACCESS ROAD MAY NEED TO BE CONSTRUCTED FARTHER FROM THE PROPERTY LINE IF OBSTRUCTIONS SUCH AS TREES FOLLOW THE PROPERTY LINE.

Westwood	TURBINE ACCESS ROAD ALONG FENCE/PROPERTY/CROP LINE	LAST REVISED: 3/28/02 RD05



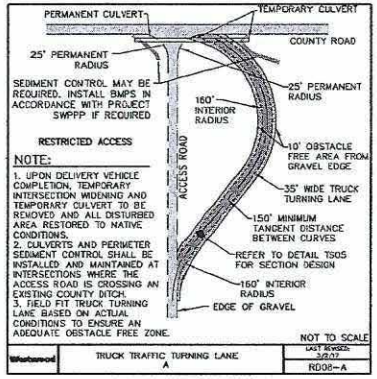
NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING TO BE REMOVED AND ALL DISTURBED AREA RESTORED.
2. DIMENSIONS ASSUME A 90° INTERSECTION

Westwood	INTERSECTION WIDENING DIMENSIONS	LAST REVISED: 7/01/19 RD06



UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.

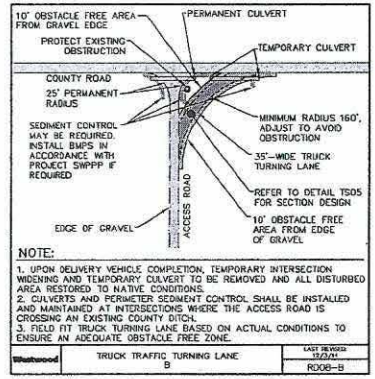
Westwood	TURBINE ACCESS ROAD TYPICAL INTERSECTION WIDENING	LAST REVISED: 3/01/17 RD07



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

NOT TO SCALE

Westwood	TRUCK TRAFFIC TURNING LANE A	LAST REVISED: 3/01/17 RD08-A



NOTE:
1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING AND TEMPORARY CULVERT TO BE REMOVED AND ALL DISTURBED AREA RESTORED TO NATIVE CONDITIONS.
2. CULVERTS AND PERIMETER SEDIMENT CONTROL SHALL BE INSTALLED AND MAINTAINED AT INTERSECTIONS WHERE THE ACCESS ROAD IS CROSSING AN EXISTING COUNTY DITCH.
3. FIELD FIT TRUCK TURNING LANE BASED ON ACTUAL CONDITIONS TO ENSURE AN ADEQUATE OBSTACLE FREE ZONE.

Westwood	TRUCK TRAFFIC TURNING LANE B	LAST REVISED: 10/01/19 RD08-B

Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite 300
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed: SMC
Checked: DJK
Drawn: SMC
As-Built Drawing:

Revisions #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	05/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:
WANZEK
2028 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 5 OF 57

001440017P.dwg

Hyde County Highway Department
Highmore, SD

Application for Entrance from a Hyde County Highway

Application made by Wanzek Construction, Inc. for an entrance to be located along Hyde County Highway No. 202nd St & 333rd Ave in Hyde County, South Dakota.

Pertinent information to the proposed entrance:

1. Fee: ~~$100.00~~
2. Type of entrance: farm x field _____ business _____ Residence _____
3. Exact location: Intersection of 202nd Street and 333rd Ave (NE)
   (Feet from nearest intersection or landmark)
   Lat. 44.27'16.43" N Long. -99.31'21.91" W
4. Width of entrance: Temporary Intersection Modificiation for deliver truck access - see detail RD08-B
   (Check attached spec sheet)
5. Size & length of culvert: _____
   (Check attached spec sheet)
6. Location by legal description: Parcel # 001528 SW4 32-112-72
7. To be placed at elevation specified by Highway Supt.
8. Date of installation to be no later than 90 days from approval date.
9. Must meet with Commissioners for extension.
10. Give County notice of at least four working days before installation.
11. No decorative rock, field rock, block, concrete, head walls or any other similar materials on the slope of entrance.
12. All entrances will be at landowner's expense unless otherwise stated.
13. After construction is completed area must be reseeded.
14. Maintenance of above culvert responsibility of Applicant.

Paid _____ Receipt # _____

Entrances to be built as directed and will be inspected during and after construction by the Hyde County Highway Superintendent. If entrance does not meet terms of the application and specifications, the applicant shall make the proper adjustments at their own expense.

Submitted August 1, 20 19 Date Approved: 08-06-2019

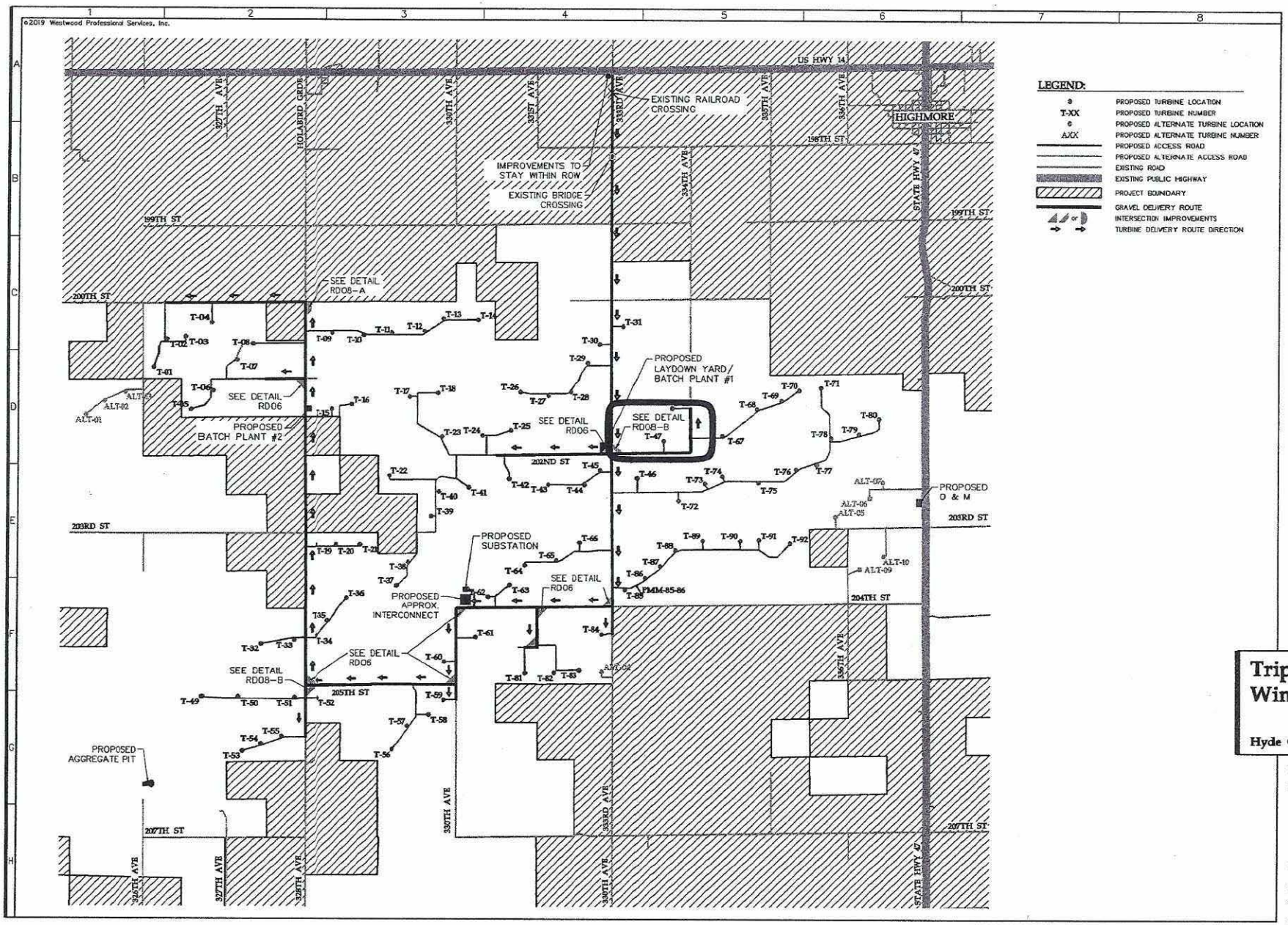
Tanya Lance
Signature of Applicant

Robert Bawden
Chairman, Hyde County Commissioners

4850 32nd Ave South, Fargo, ND 58104
Address of Applicant

Final Inspection Date 12-29-2020 Hwy. Supt's Signature Michael Cowan

©2019 Westwood Professional Services, Inc.



LEGEND:

⊕	PROPOSED TURBINE LOCATION
T-XX	PROPOSED TURBINE NUMBER
⊕	PROPOSED ALTERNATE TURBINE LOCATION
AXX	PROPOSED ALTERNATE TURBINE NUMBER
	PROPOSED ACCESS ROAD
	PROPOSED ALTERNATE ACCESS ROAD
	EXISTING ROAD
	EXISTING PUBLIC HIGHWAY
	PROJECT BOUNDARY
	GRAVEL DELIVERY ROUTE
	INTERSECTION IMPROVEMENTS
	TURBINE DELIVERY ROUTE DIRECTION

Westwood

Phone (952) 937-5150 12701 Whitewater Drive, Suite #300
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (866) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

Designed: BNC
Checked: DJH
Drawn: BNC
As-Built Drawing:

Revisions #	DATE	DESCRIPTION

Prepared for:

WANZEK
a MasTec company
2028 2nd Avenue NW
West Fargo, ND 58078

0' 3000' 6000' 9000'

Triple H Wind Farm

Hyde County, South Dakota

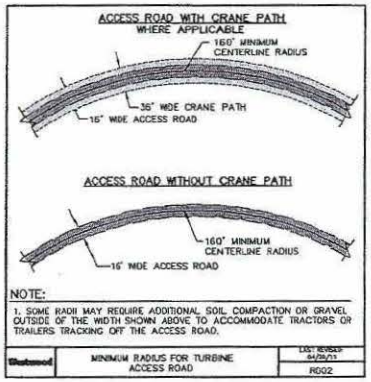
Delivery Flow Plan Exhibit

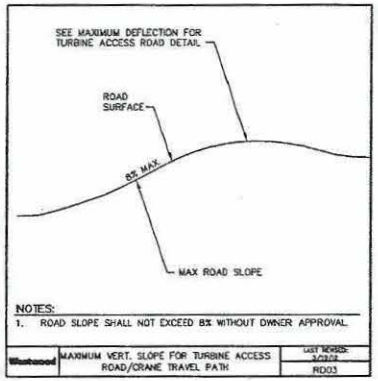
NOT FOR CONSTRUCTION

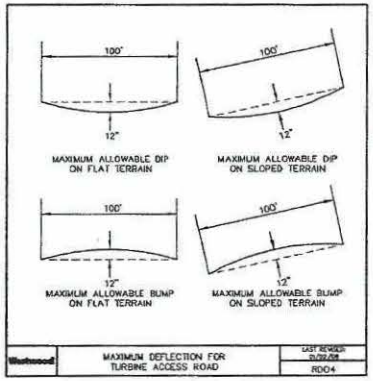
Date: 7/31/19
Sheet: 1 OF 1

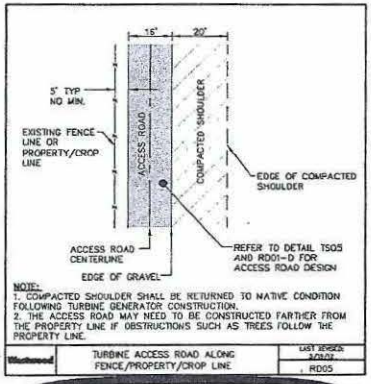
0014440E0604.dwg

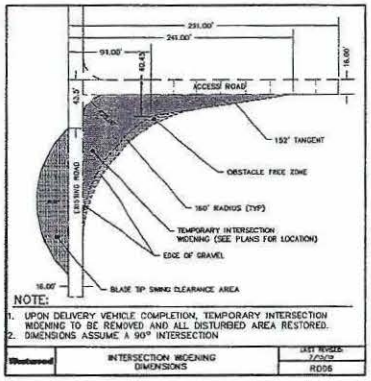
©2019 Westwood Professional Services, Inc.

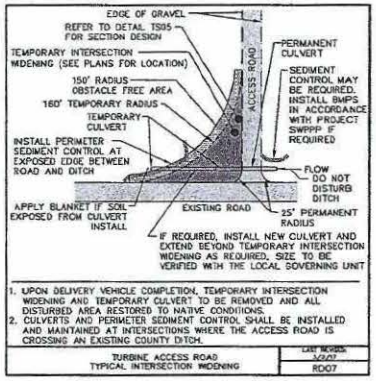


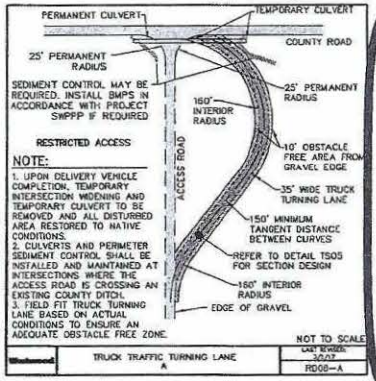


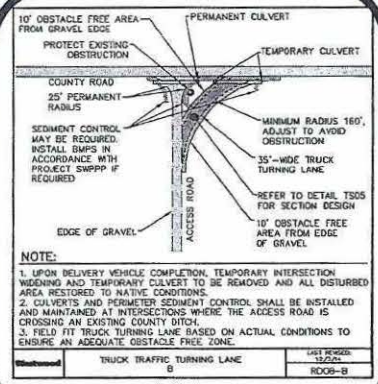












Westwood
Phone (952) 937-5150 12701 Whitewater Drive, Suite #200
Fax (952) 937-5822 Minnetonka, MN 55343
Toll Free (866) 937-9150 www.westwoodps.com
Westwood Professional Services, Inc.

Designed: BMC
Checked: DJH
Drawn: BMC
As-Built Drawing:

Revisions: #	DATE	DESCRIPTION
A	12/06/18	10% CIVIL PLANS
B	03/22/19	30% CIVIL PLANS
C	06/07/19	60% CIVIL PLANS
D	07/19/19	90% CIVIL PLANS

Prepared for:
WANZEK
3208 2nd Avenue NW
West Fargo, ND 58078

Triple H Wind Farm

Hyde County, South Dakota

Construction Details

90% COMPLETE
NOT FOR CONSTRUCTION

Date: 07/19/19
Sheet: 5 OF 57

0014400TP.dwg