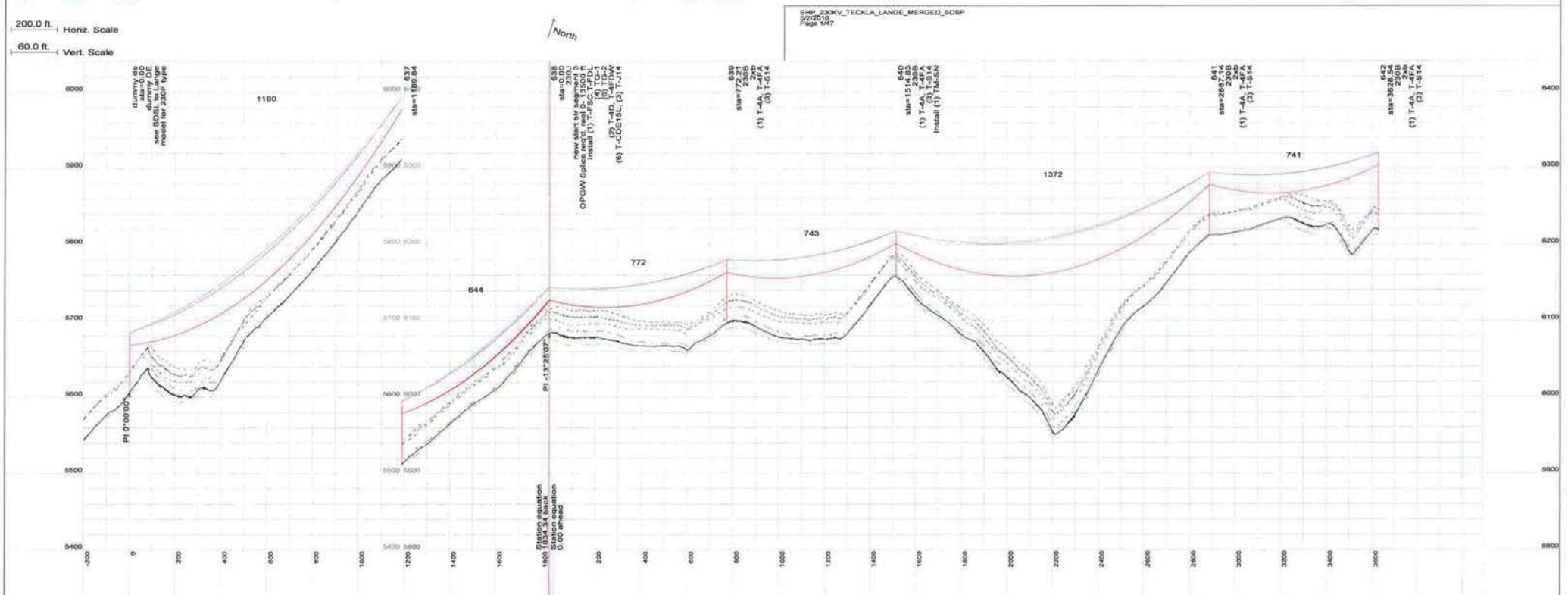
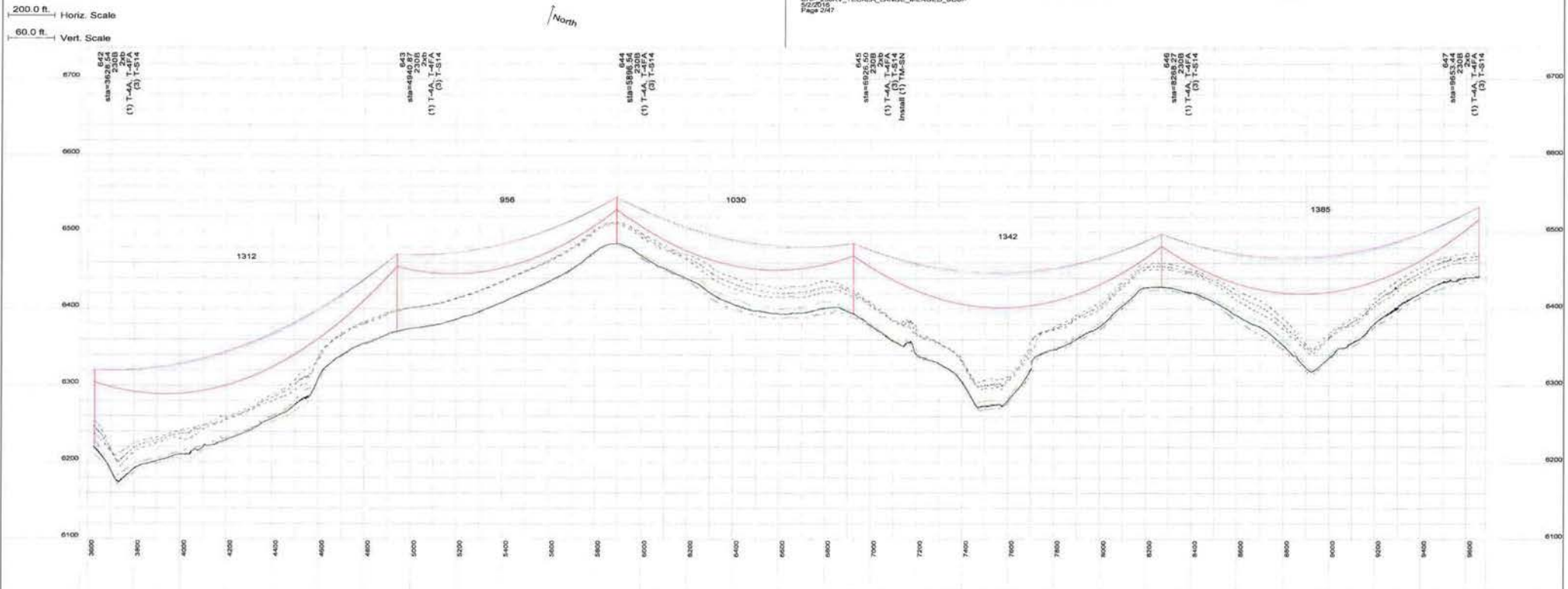
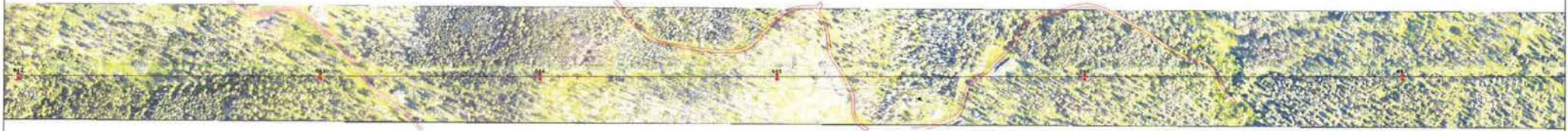




- | | |
|--|--|
| <p>NOTES:</p> <ol style="list-style-type: none"> 1. BHP has dictated that all wood poles will be embedded 2-2 ft. No geotechnical analysis will be available to determine hole condition or to confirm poles and anchor embedment design except per FMO 12/29/16 report for Hwy 44 and SM or larger. 2. No geotechnical or other analysis is available to confirm the effect of soft and rock layers that may require special embedments and anchor types, including rock anchors except per FMO report listed above. 3. Pull test all TA-P1 and TA-P2 anchors to 20 kips and 40 kips ultimate capacity respectively per BHP specifications and test method. Install alternate cut, helical or rock anchors as required. 4. Refer to BHP construction specifications for line erection and materials. Notify Engineer of any conflicts. | <ol style="list-style-type: none"> 5. Ground all TG-1 and TG-2 guys to wood and steel poles except where specifically insulated with strain rods. 6. Install guy strain rods on all 230H and J type structures strand wire guys. 7. Install 24" clevis links and guy strain rods on all 230H and J type structures with line angles less than 55 degrees. 8. Install fence grounding per BHP requirements. 9. Refer to structure and staking list for line erection information including assembly type, pole class / height, special notes and required anchor rod slopes. |
|--|--|



NOTES: 1. BHP has dictated that all wood poles will be embedded 10% + 2 ft. No geotechnical analysis will be available to determine type condition or to confirm pole and anchor embedment design except see FMG 1/25/16 report for Hwy 44 and 6M to Lange.

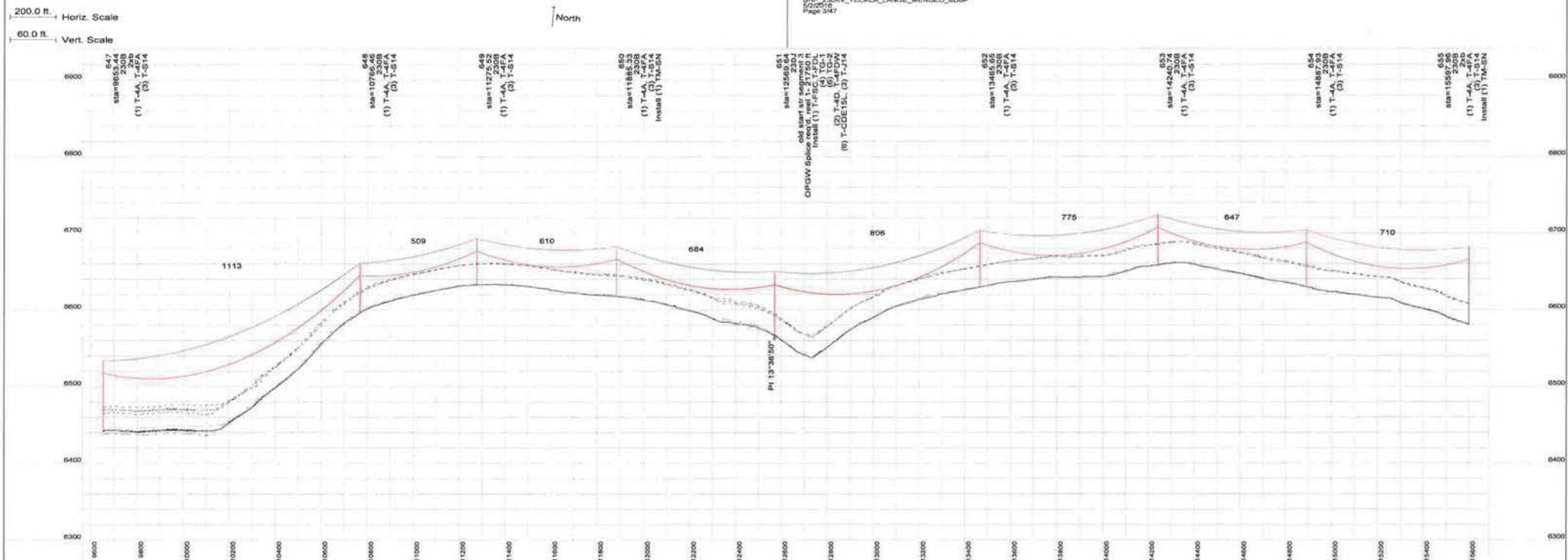
2. No geotechnical or other analysis is available to confirm the extent of soft or rock layers that may require special embedments and anchor types, including rock anchors. Except FMG report listed above.

3. Pull test at TA-P1 and TA-P2 anchors to 20 kips and 40 kips ultimate capacity respectively per BHP specifications and test method. Install alternate disk, helical or rock anchors as required.

4. Refer to BHP construction specifications for line erection and materials. Notify Engineer of any conflicts.

- Ground all TG-1 and TG-2 guys to wood and steel poles except where specifically insulated with strain rods.
- Install guy strain rods on all 230H and J type structure shield wire guys.
- Install 24" clevis links and guy strain rods on all 230H and J type structures with line angle less than 55 degrees.
- Install fence grounding per BHP requirements.
- Refer to structure and staking list for line erection information including assembly type, pole class / height, special notes and required anchor rod slopes.

BLACK HILLS POWER				ISSUED FOR CONSTRUCTION	
TECKLA TO LANGE 230 KV TRANSMISSION LINE				REVISION DESCRIPTION	
STATE LINE TO LANGE LINE SEGMENT					
PLAN AND PROFILE					
5/5/16	DZ	A	MW	DATE	BY
12/27/14	DZ	A	MW	DATE	BY
BHP-T-100				SHT. 2 OF 45	



NOTES: 1. BHP has dictated that all wood poles will be embedded 10% + 2 ft. No geotechnical analysis will be available to determine hole condition or to confirm pole and anchor embedment design except see FMG 1/25/16 report for Hwy 44 and SA to Lange.

2. No geotechnical or other analysis is available to confirm the extent of soft or rock layers that may require special embedments and anchor types, including rock anchors except FMG report listed above.

3. Pull test all TA-P1 and TA-P2 anchors to 20 kips and 40 kips ultimate capacity respectively per BHP specifications and test method. install alternate disk, helical or rock anchors as required.

4. Refer to BHP construction specifications for line erection and materials. Notify Engineer of any conflicts.

- Ground all TG-1 and TG-2 guys to wood and steel poles except where specifically insulated with strain rods.
- Install guy strain rods on all 230H and J type structure shield wire guys.
- Install 24" clevis links and guy strain rods on all 230H and J type structures with line angles less than 55 degrees.
- Install fence grounding per BHP requirements.
- Refer to structure and staking list for line erection information including assembly type, pole class / height, special notes and required anchor rod slopes.

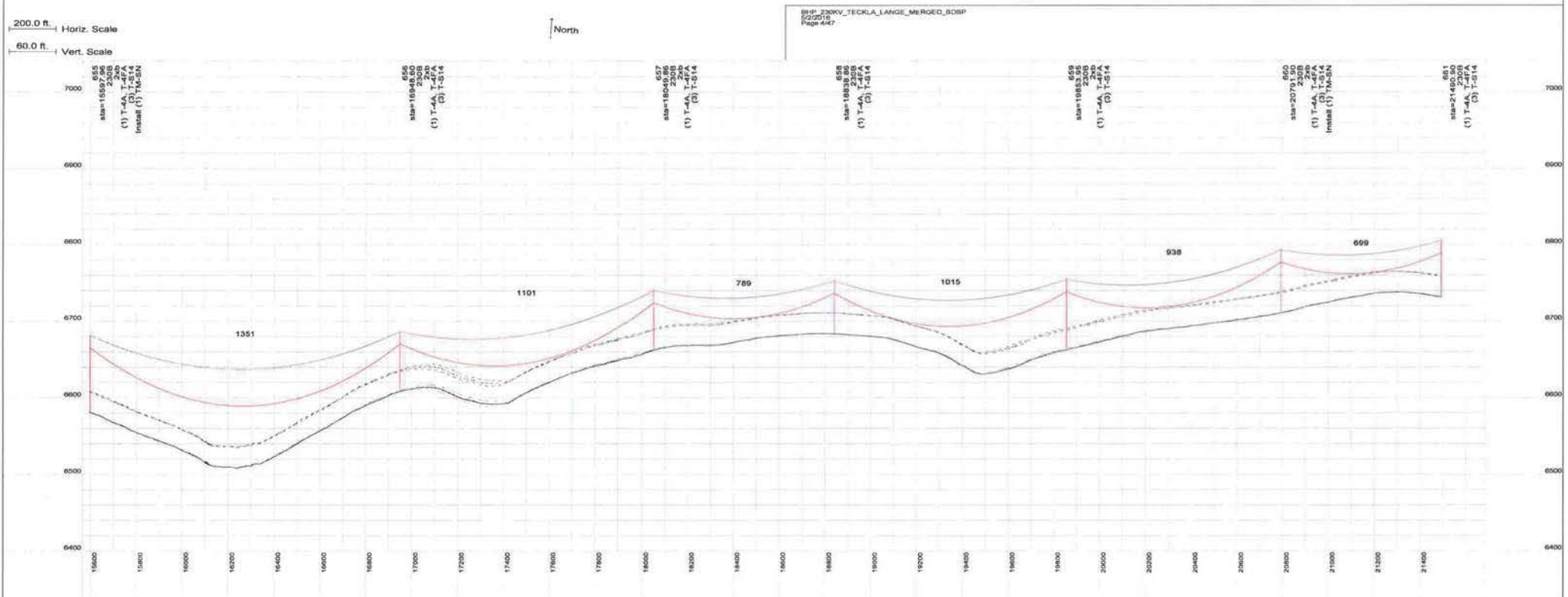
5/01/16 DZ A MW
DATE: 12/27/14 12/27/14

Issued for Construction
REVISION DESCRIPTION

BLACK HILLS POWER BHP

TECKLA TO LANGE 230 KV TRANSMISSION LINE
STATE LINE TO LANGE LINE SEGMENT
PLAN AND PROFILE

SHT. 3 OF 45
BHP-T-100 A



NOTES: 1. BHP has dictated that all wood poles will be embedded 10% + 2 ft. No geotechnical analysis will be available to determine tree condition or to confirm pole and anchor embedment design except see FMG 1/25/16 report for Hwy 44 and SM to Lange.

2. No geotechnical or other analysis is available to confirm the extent of soft or rock layers that may require special embedments and anchor types, including rock anchors except FMG report listed above.

3. Pull test all TA-P1 and TA-P2 anchors to 20 kips and 40 kips ultimate capacity respectively per BHP specifications and test method. Install alternate disk.

4. Refer to BHP construction specifications for line erection and materials. Notify Engineer of any conflicts.

- Ground all TQ-1 and TQ-2 guys to wood and steel poles except where specifically insulated with strain rods.
- Install guy strain rods on all 230H and J type structure shield wire guys.
- Install 24" clevis links and guy strain rods on all 230H and J type structures with line angles less than 55 degrees.
- Install fence grounding per BHP requirements.
- Refer to structure and staking list for line erection information including assembly type, pole class / height, special notes and required anchor rod slopes.

5/01/16				DZ	A	MW	Issued for Construction	
DATE				APPROVED BY	NO.	DATE	REVISION	DESCRIPTION
5/01/16				DZ	A	MW	Issued for Construction	
DATE				APPROVED BY	NO.	DATE	REVISION	DESCRIPTION

BLACK HILLS POWER & LIGHT

TECKLA TO LANGE 230 KV TRANSMISSION LINE

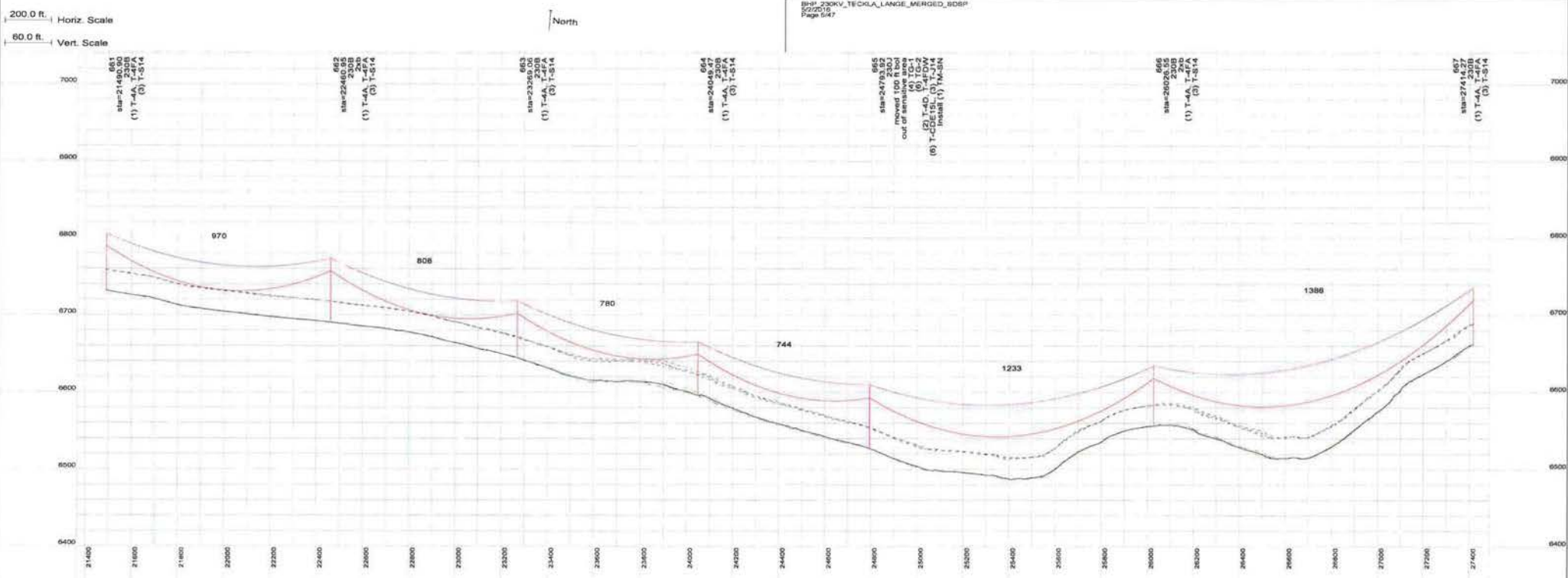
STATE LINE TO LANGE LINE SEGMENT

PLAN AND PROFILE

SHT. 4 OF 45

BHP-T-100

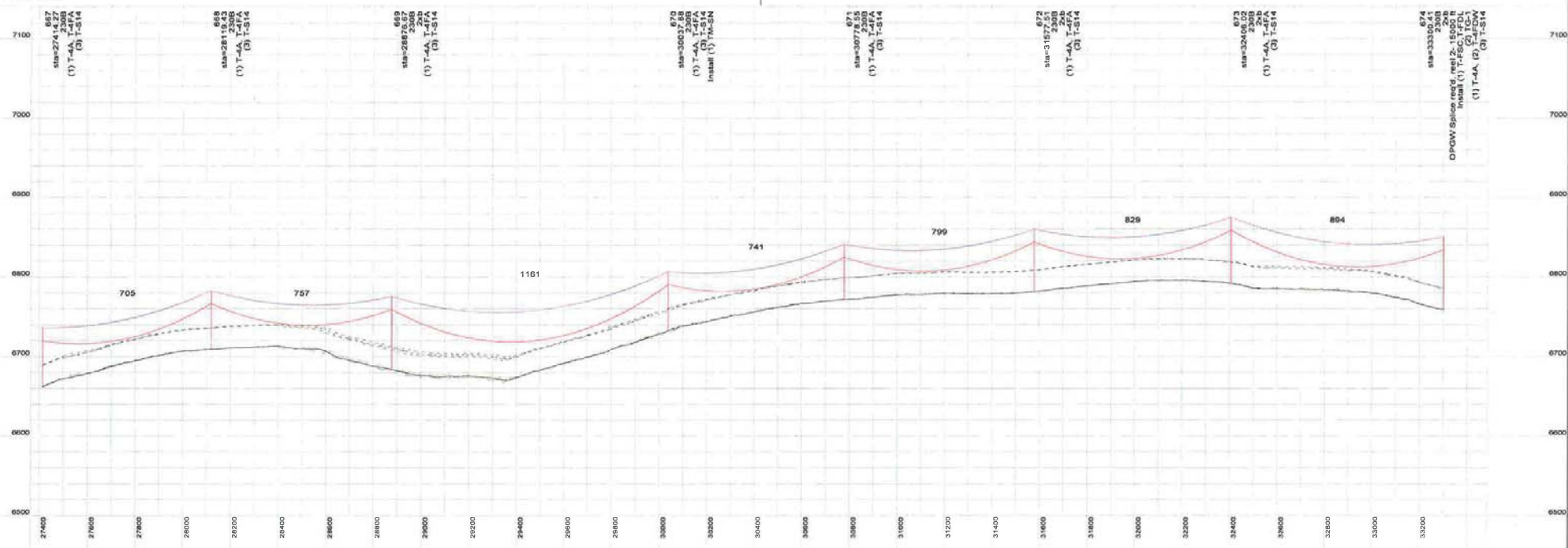
A



- | | | |
|-------|--|---|
| NOTES | <p>1. BHP has stated that all wood poles will be embedded 2 ft. No geotechnical analysis will be available to determine pole condition or to confirm pole and anchor embedment design except FMS 1025/16 report for Hwy 44 and 630 to longer.</p> <p>2. No geotechnical or other analysis is available to confirm the extent of soil or rock layers that may require special embedments and anchor types, including rock anchors except FMS report related above.</p> <p>3. Pull test all TA-1 and TA-2 anchors to 20 kips and 40 kips ultimate capacity respectively per BHP specifications and test method. Install alternate dead, helical or rock anchors as required.</p> <p>4. Refer to BHP construction specifications for line erection and materials. Notify Engineer of any conflicts.</p> | <p>5. Ground all TG-1 and TG-2 guys to wood and steel poles except where specifically insulated with strain rods.</p> <p>6. Install guy strain rods on all 230H and J type structure shield wire guys.</p> <p>7. Install 24" clevis lines and guy strain rods on all 230H and J type structures with line angles less than 55 degrees.</p> <p>8. Install fence grounding per BHP requirements.</p> <p>9. Refer to structure and staking list for line erection information including assembly type, pole class / height, special rods and required anchor rod slopes.</p> |
|-------|--|---|

↑ North

BHP_230KV_TECKLA_LANGE_MERGED_SDSP
5/2/2016
Page 6/47



NOTES:

1. BHP has declared that all welded joints will be embedded 10% + 2 R. No geotechnical analysis will be available to determine hole corrosion, so all corrosion pits and anchor-embedment design except as per FUG 1327/16 confirm for 14w 44 and 10w 44 to range.
2. No geotechnical or other analysis is available to confirm the extent of soft or rock layers that may require special embedments and anchor types, including rock anchors except FUG 1001 report listed above.
3. Pull test of all TAP-1 and TAP-2 anchors to 20 kips and 40 kips ultimate capacity respectively per BHP specifications and test method, install estimate did, install or rock anchors as required.
4. Refer to BHP construction specifications for line erection and materials. Notify Engineer of any conflicts.

5. Ground all TG-1 and TG-2 guys to wood and steel poles except where specifically insulated with strain rods.
6. Install guy strain rods on all 230H and J type structure shield wire guys.
7. Install 24" cleft links and guy strain rods on all 230H and J type structures with line angles less than 55 degrees.
8. Install fence grounding per BHP requirements.
9. Refer to structure and staking list for line erection information including assembly type, pole class / height, special notes and required anchor rod slopes.

BLACK HILLS POWER

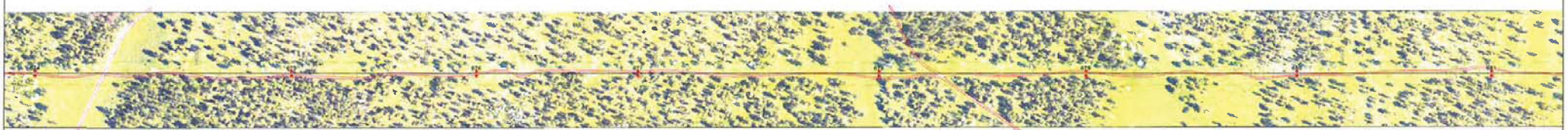
TECKLA TO LANGE 230 KV TRANSMISSION LINE
STATE LINE TO LANGE LINE SEGMENT
PLAN AND PROFILE

5/01/16	DZ	A	MW	Issued for Construction
DATE	DRAWN BY	NO	APPROVED BY	REVISION DESCRIPTION

Issued for Construction

REVISION DESCRIPTION

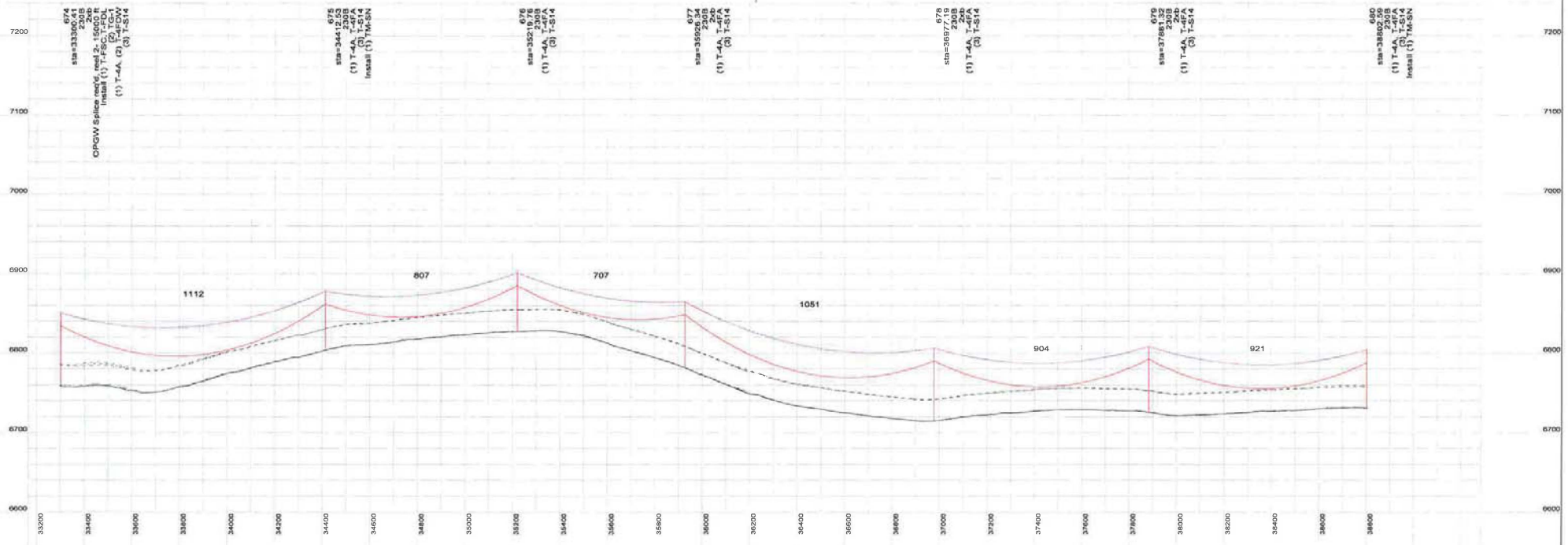
DRAWN BY: DZ DATE: 12/27/14 DWG NO: BHP-T-100
 APPROVED BY: MW DATE: 12/27/14



200.0 ft. Horiz. Scale
60.0 ft. Vert. Scale

North

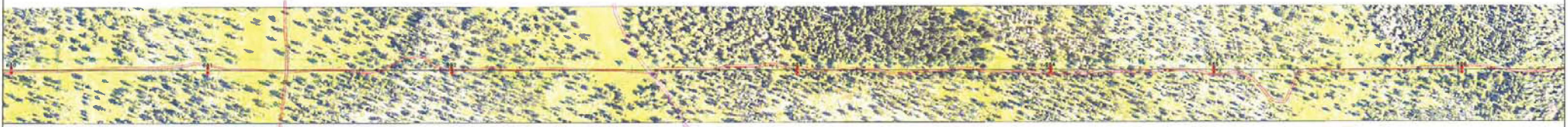
BHP_230KV_TECKLA_LANGE_MERGED_SDSP
5/2/2016
Page 7/47



NOTES: 1. BHP has dictated that all wood poles will be embedded 10% + 2 ft. No geotechnical analysis will be available to determine pole condition or to confirm pole and anchor embedment design except see FMD 1/25/16 report for they 4A and 5M to Lange.
2. No geotechnical or other analysis is available to confirm the extent of soft or rock layers that may require special embedments and anchor types, including rock anchors except FMD report listed above.
3. Pull test at TA-P1 and TA-P2 anchors to 20 kips and 40 kips ultimate capacity respectively per BHP specifications and test method. Install alternate disk, helical or rock anchors as required.
4. Refer to BHP construction specifications for line erection and materials. Notify Engineer of any conflicts.

5. Ground all TG-1 and TG-2 guys to wood and steel poles except where specifically insulated with strain rods.
6. Install guy strain rods on all 230H and J type structure shield wire guys.
7. Install 24" clevis links and guy strain rods on all 230H and J type structures with line angles less than 55 degrees.
8. Install fence grounding per BHP requirements.
9. Refer to structure and staking list for line erection information including assembly type, pole class / height, special notes and required anchor rod slopes.

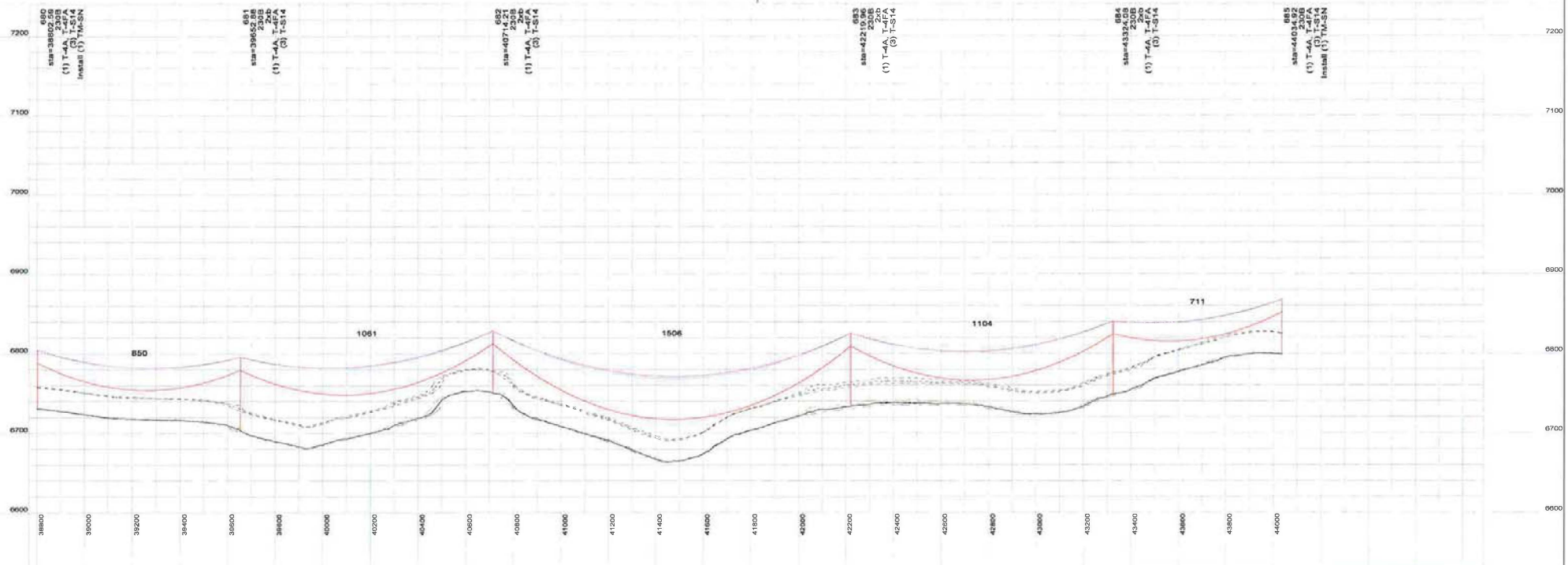
BLACK HILLS POWER				TECKLA TO LANGE 230 KV TRANSMISSION LINE STATE LINE TO LANGE LINE SEGMENT PLAN AND PROFILE			
5/1/16	DZ	A	MW	Issued for Construction	DATE: 12/27/14	DWG NO:	SHT. 7 OF 45
DATE:	DRAWN BY:	NO.	APPROVED BY:	REVISION DESCRIPTION	DATE: 12/27/14	BHP-T-100	A



200.0 ft. Horiz. Scale

60.0 ft. Vert. Scale

North

BHP 230KV_TECKLA_RANGE_MERGED_SD6P
12/2016
Page 8/47

NOTES: 1. BHP has stated that all wood poles will be embedded 10% + 2 ft. No geotechnical analysis will be available to determine hole condition or to confirm pole and anchor embedment design except see TMD 102516 report for they 44 and SM to range.

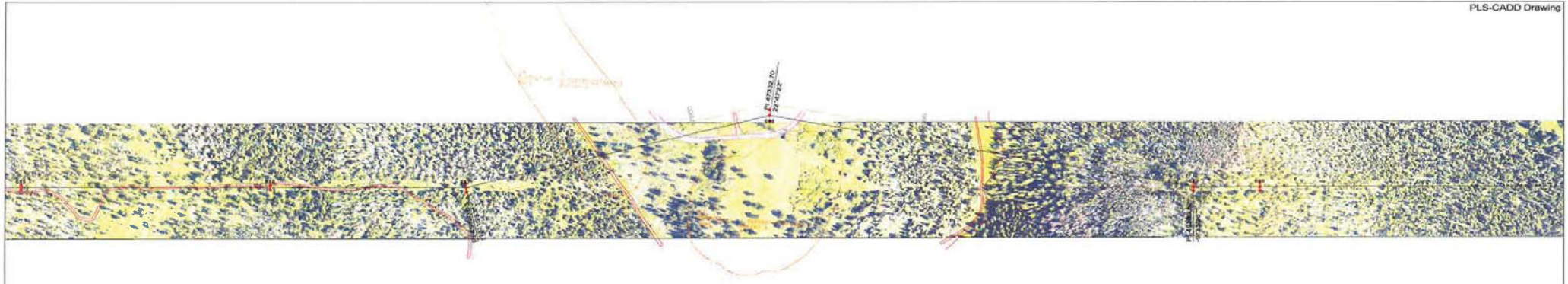
2. No geotechnical or other analysis is available to confirm the extent of soft or rock layers that may require special embedments and anchor types, including rock anchors except TMD report listed above.

3. Pull test all TA-P1 and TA-P2 anchors to 20 kips and 40 kips ultimate capacity respectively per BHP specifications and test method. Install alternate disk.

4. Refer to BHP construction specifications for line erection and materials. Notify Engineer of any conflicts.

- Ground all TG-1 and TG-2 guys to wood and steel poles except where specifically insulated with strain rods.
- Install guy strain rods on all 230H and J type structure shield wire guys.
- Install 24" clefts into and guy strain rods on all 230H and J type structures with line angles less than 65 degrees.
- Install fence grounding per BHP requirements.
- Refer to structure and staking list for line erection information including assembly type, pole class / height, special notes and required anchor rod slopes.

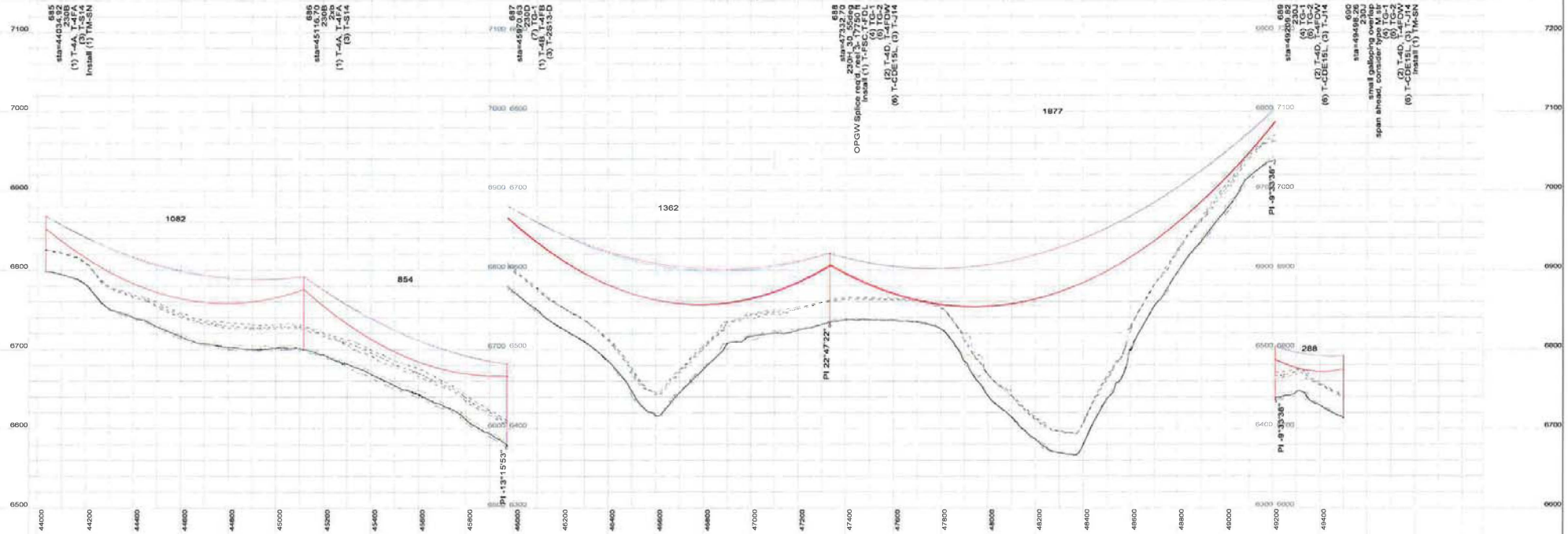
BLACK HILLS POWER BHP			
TECKLA TO RANGE 230 KV TRANSMISSION LINE			
STATE LINE TO RANGE LINE SEGMENT			
PLAN AND PROFILE			
5/01/16	DZ	A	MW
DATE	DESIGNED BY	NO.	APPROVED BY
Issued for Construction		REVISION DESCRIPTION	
12/27/14	DZ	12/27/14	MW
BHP-T-100		SHT. 8 OF 45	



200.0 ft. Horiz. Scale
60.0 ft. Vert. Scale

North

BHP_230KV_TECKLA_LANGE_MERGED_SD&P
5/2/2016
Page 6/47



NOTES: 1. BHP has dictated that all wood poles will be embedded 10% + 2 ft. No geotechnical analysis will be available to determine hole condition or to confirm pole and anchor embedment. Design except as per FMO 12/27/14 report for Hwy 44 and SA to Lange.
2. No geotechnical or other analysis is available to confirm the extent of soft or rock layers that may require special embedments and anchor types, including rock anchors except FMO report listed above.
3. Pull test all TA-P1 and TA-P2 anchors to 20 kips and 40 kips ultimate capacity respectively per BHP specifications and test method. Install alternate disk, helical or rock anchors as required.
4. Refer to BHP construction specifications for line erection and materials. Notify Engineer of any conflicts.

- Ground all TG-1 and TG-2 guys to wood and steel poles except where specifically insulated with strain rods.
- Install guy strain rods on all 230H and J type structure shield wire guys.
- Install 24" clevis links and guy strain rods on all 230H and J type structures with line angles less than 55 degrees.
- Install fence grounding per BHP requirements.
- Refer to structure and staking list for line erection information including assembly type, pole class / height, special notes and required anchor rod slopes.

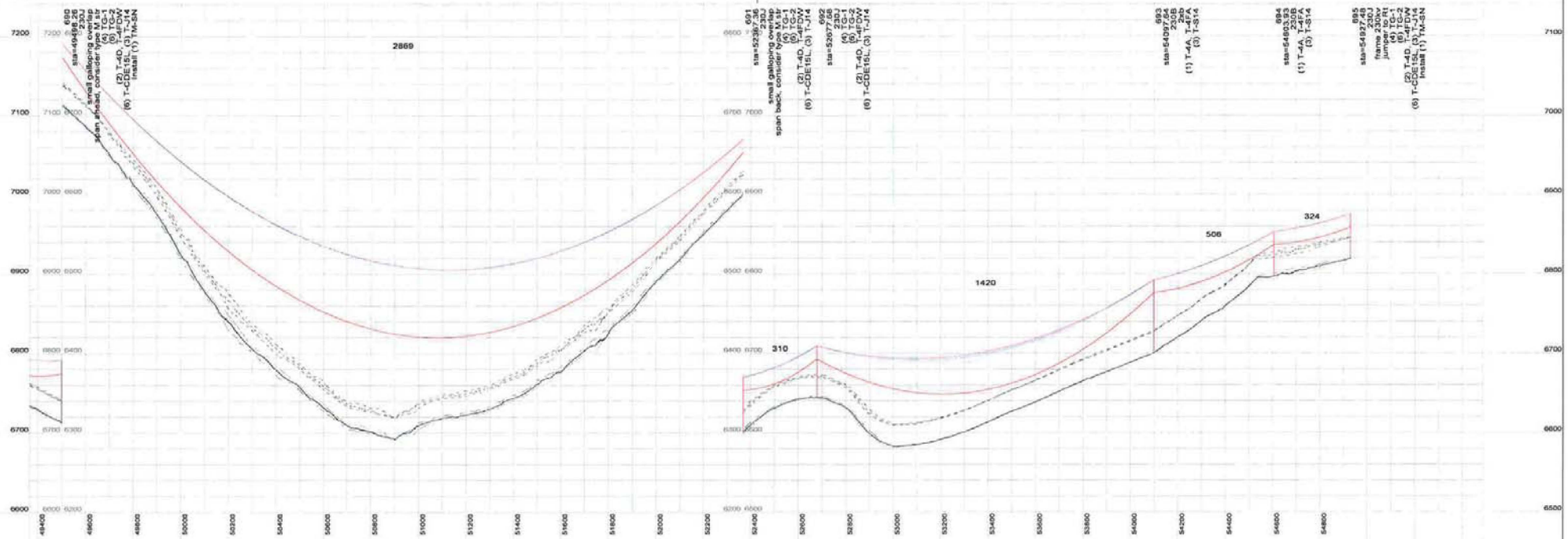
5/6/16 DZ A MW DATE DRAWN NO APPROVED BY				Issued for Construction REVISION DESCRIPTION		5/6/16 DZ A MW DATE DRAWN NO APPROVED BY	
						BLACK HILLS POWER TECKLA TO LANGE 230 KV TRANSMISSION LINE STATE LINE TO LANGE LINE SEGMENT PLAN AND PROFILE SHT. 9 OF 45 BHP-T-100	



200.0 ft. Horiz. Scale
60.0 ft. Vert. Scale

North

BHP 230KV_TECKLA_LANGE_MERGED_SDSP
5/2/2016
Page 10/47



NOTES: 1. BHP has stated that all wood poles will be embedded 10% + 2 ft. No geotechnical analysis will be available to determine hole condition or to confirm pole and anchor embedment design except see FMO 122016 report for they 44 and 54 to Lange.

2. No geotechnical or other analysis is available to confirm the extent of soft or rock layers that may require special embedments and anchor types, including rock anchors except FMO report listed above.

3. Pull test all TA-P1 and TA-P2 anchors to 20 kips and 40 kips ultimate capacity respectively per BHP specifications and test method. Install alternate disk, helical or rock anchors as required.

4. Refer to BHP construction specifications for line erection and materials. Notify Engineer of any conflicts.

- Ground all TG-1 and TG-2 guys to wood and steel poles except where specifically insulated with strain rods.
- Install guy strain rods on all 230H and J type structure shield wire guys.
- Install 24" clevis links and guy strain rods on all 230H and J type structures with line angles less than 65 degrees.
- Install fence grounding per BHP requirements.
- Refer to structure and staking list for line erection information including assembly type, pole class / height, special notes and required anchor rod slopes.

5/01/16 DZ A M/W
DATE DRAWN BY NO APPROVED BY

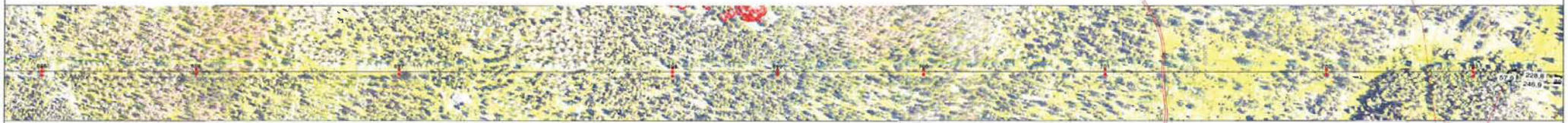
Issued for Construction
REVISION DESCRIPTION

APPROVED BY
DZ NW

DATE 12/27/14
DATE 12/27/14

BLACK HILLS POWER
TECKLA TO LANGE 230 KV TRANSMISSION LINE
STATE LINE TO LANGE LINE SEGMENT
PLAN AND PROFILE

SHT. 10 OF 45
BHP-T-100
A

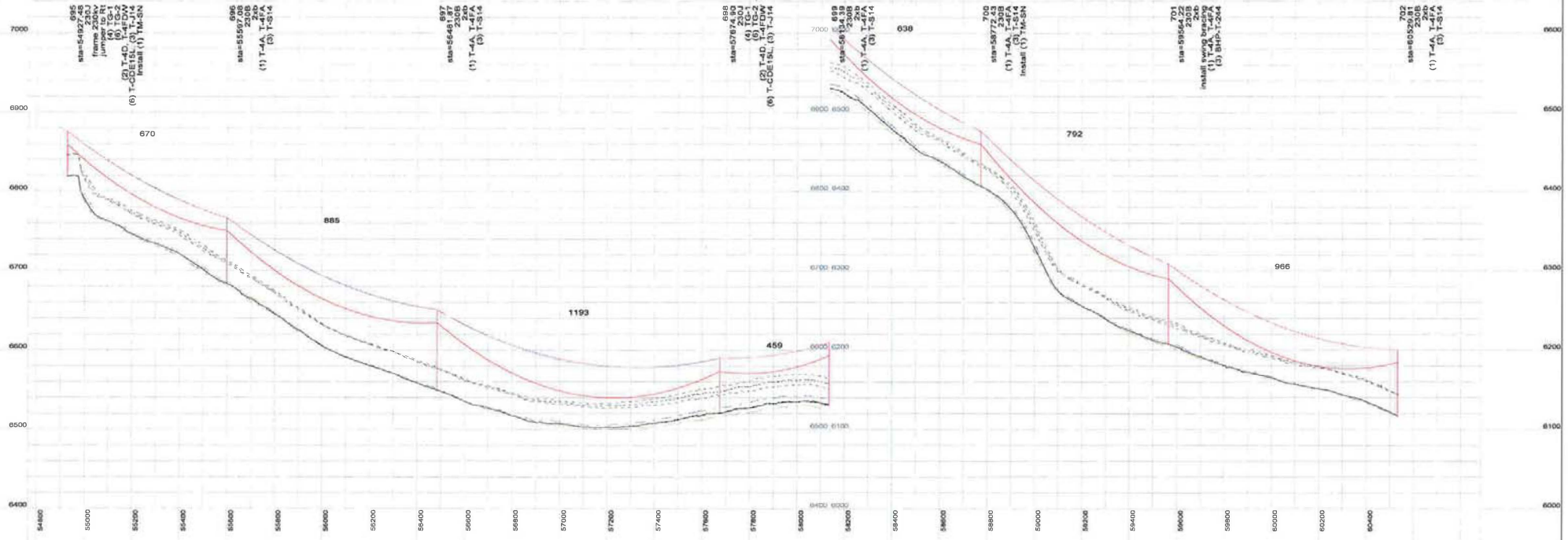


FLOETE L.
OWNER'S
PARCEL #

200.0 ft. Horiz. Scale
60.0 ft. Vert. Scale

North

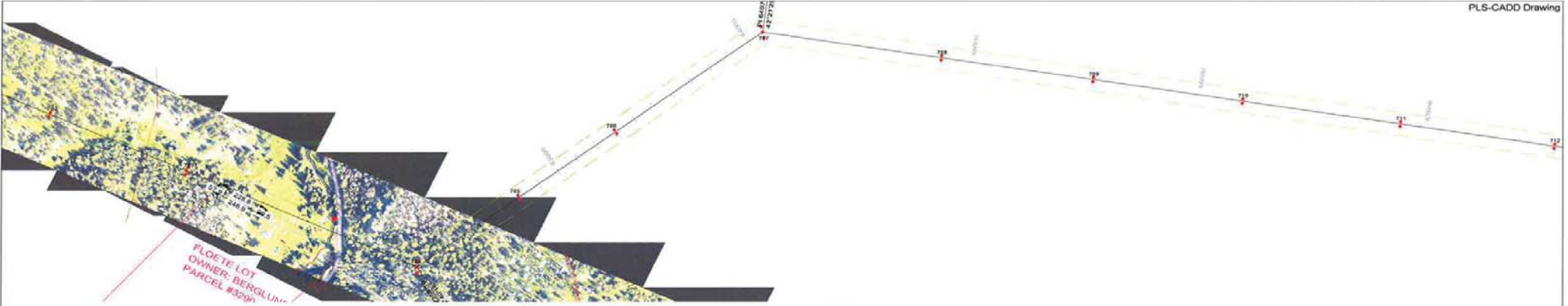
BHP 230KV_TECKLA_LANGE_MERGED_SDSP
12/20/19
Page 11/47



- NOTES: 1. BHP has dictated that all wood poles will be embedded 10% + 2 ft. No geotechnical analysis will be available to determine hole condition or to confirm pole and anchor embedment design except see FMO 12/20/19 report for they 44 and 58 to Lange.
2. No geotechnical or other analysis is available to confirm the extent of soft or rock layers that may require special embedments and anchor types, including rock anchors except FMO report listed above.
3. Pull test all TA-P1 and TA-P2 anchors to 20 kips and 40 kips ultimate capacity respectively per BHP specifications and test method. Install alternate disk, helical or rock anchors as required.
4. Refer to BHP construction specifications for line erection and materials. Notify Engineer of any conflicts.

5. Ground all TG-1 and TG-2 guys to wood and steel poles except where specifically insulated with strain rods.
6. Install guy strain rods on all 230H and J type structure shield wire guys.
7. Install 24" clevis links and guy strain rods on all 230H and J type structures with line angles less than 55 degrees.
8. Install fence grounding per BHP requirements.
9. Refer to structure and staking list for line erection information including assembly type, pole class / height, special notes and required anchor rod slopes.

5/01/16 DZ A MW DATE DRAWN BY NO. APPROVED BY				Issued for Construction REVISION DESCRIPTION	
BLACK HILLS POWER BHP TECKLA TO LANGE 230 KV TRANSMISSION LINE STATE LINE TO LANGE LINE SEGMENT PLAN AND PROFILE				SHT. 11 OF 45 BHP-T-100	

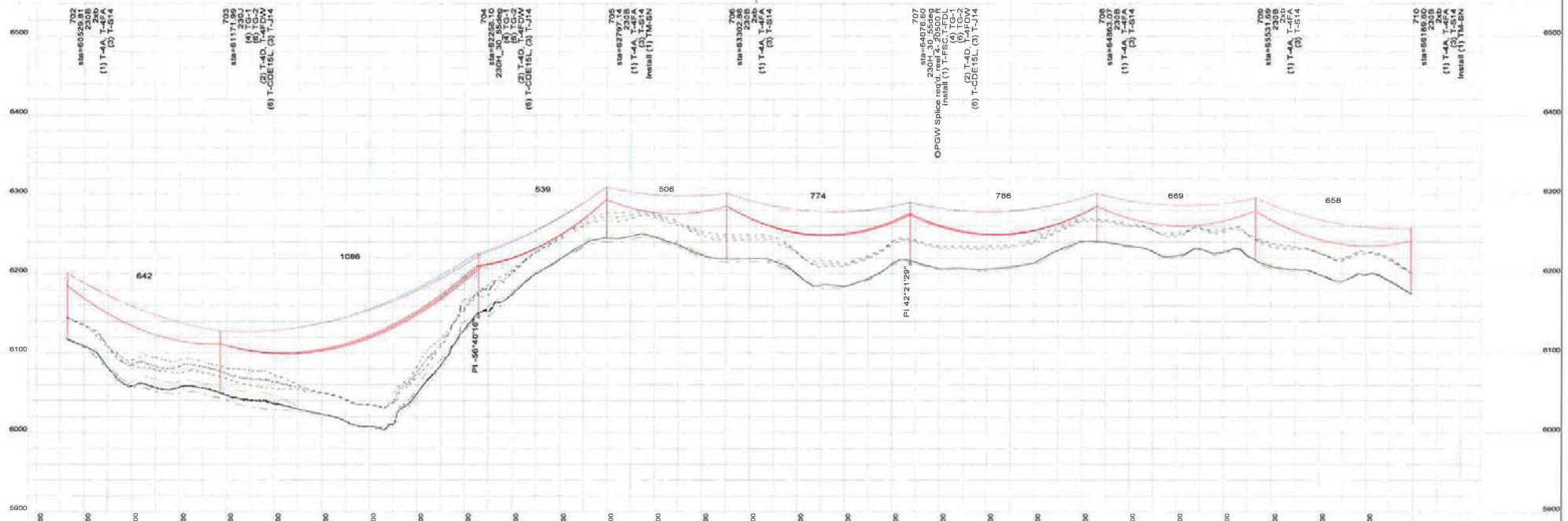


200.0 ft. Horiz. Scale

60.0 ft. Vert. Scale



BHP 230KV_TECKLA_LANGE_MERGED_SDSP
12/27/14
Page 12 of 47



- NOTES: 1. BHP has dictated that all wood poles will be embedded 10% + 2 ft. No geotechnical analysis will be available to determine pole condition or to confirm pole and anchor embedment design except see FMO 1/22/16 report for Hwy 44 and SM to Lange.
2. No geotechnical or other analysis is available to confirm the extent of soft or rock layers that may require special embedments and anchor types, including rock anchors except FMO report listed above.
3. Put test at T-4A and T-4A/P2 anchors to 20 kips and 40 kips ultimate capacity respectively per BHP specifications and test method. Install alternate disk, helical or rock anchors as required.
4. Refer to BHP construction specifications for line erection and materials. Notify Engineer of any conflicts.

5. Ground all TG-1 and TG-2 guys to wood and steel poles except where specifically insulated with strain rods.
6. Install guy strain rods on all 230H and J type structure shield wire guys.
7. Install 24" clevis links and guy strain rods on all 230H and J type structures with line angles less than 65 degrees.
8. Install fence grounding per BHP requirements.
9. Refer to structure and staking list for line erection information including assembly type, pole class / height, special notes and required anchor rod slopes.

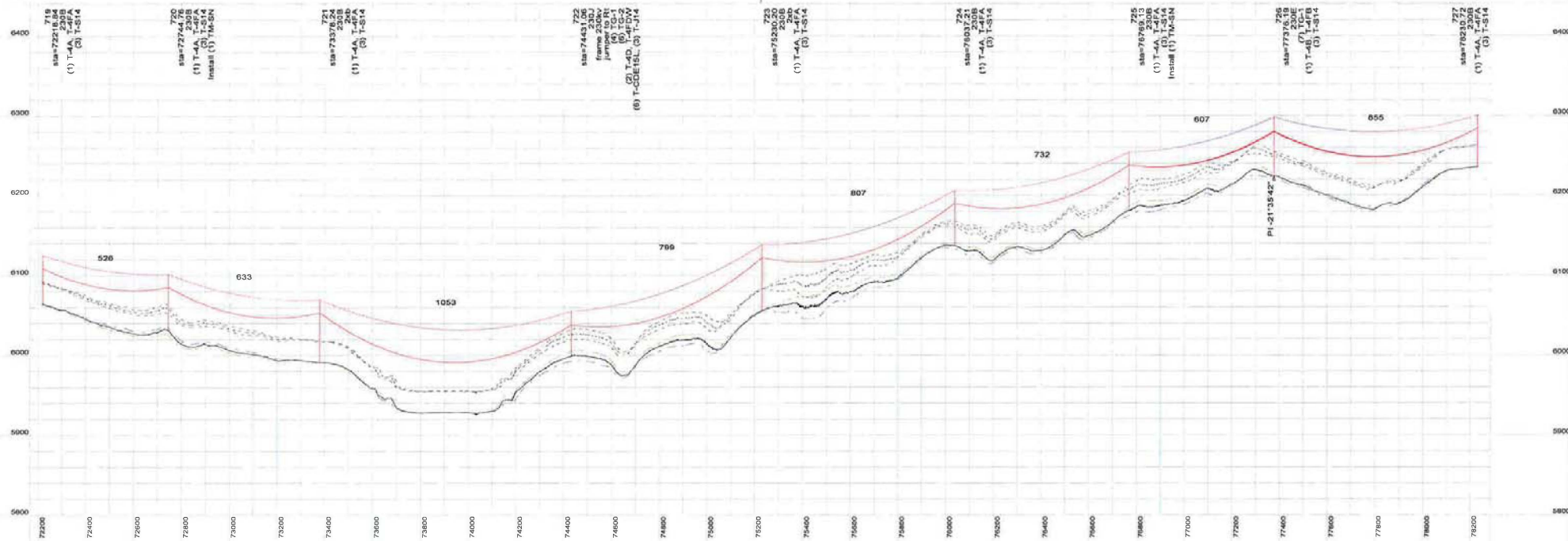
BLACK HILLS POWER				TECKLA TO LANGE 230 KV TRANSMISSION LINE STATE LINE TO LANGE LINE SEGMENT PLAN AND PROFILE				SHT. 12 OF 45	
5/01/16 DATE	DZ DRAWN BY	A NO	MW APPROVED BY	Issued for Construction REVISION DESCRIPTION	12/27/14 DATE	DZ DATE	12/27/14 DATE	BHP-T-100	A

						BLACK HILLS POWER							
						TECKLA TO LANGE 230 KV TRANSMISSION LINE STATE LINE TO LANGE LINE SEGMENT PLAN AND PROFILE							
Issued for Construction						SHT. 13 OF 45							
5/31/16	DZ	A	MW			DESIGN BY	DZ	DATE 12/27/14	CHECKED NO	BHP-T-100			
DATE	DRAWN BY	NO	APPROVED BY			APPROVED BY	MW	DATE 12/27/14		A			
REVISION DESCRIPTION													

60.0 ft. Vert. Scale

North

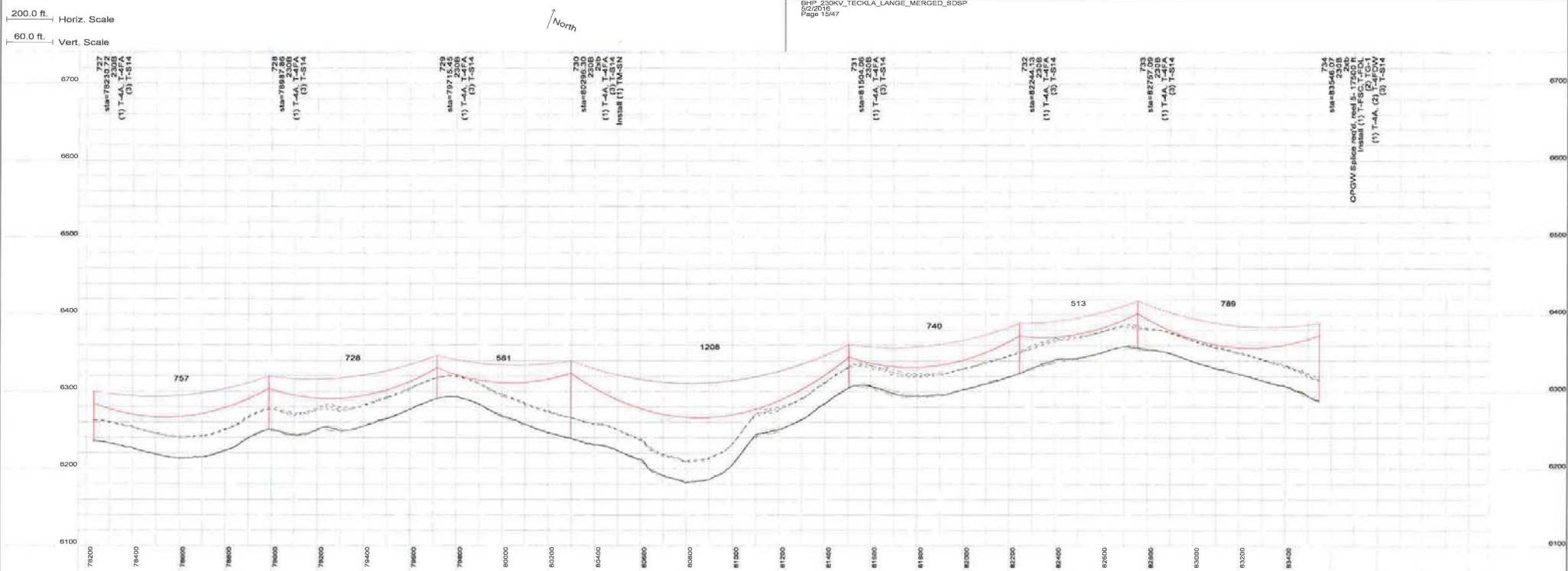
BHP_230KV_TECKLA_LANGE_MERGED_SDSP
5/2/2018
Page 14/47



- NOTES:**
1. BHP has data that all wood poles will be embedded 101% + 2 ft. No geotechnical analysis will be available to determine hole condition or to confirm pole and anchor embedment design except see FMC 122916 report for Hwy 44 and 5M to range.
 2. No geotechnical or other analysis is available to explain the extent of soil or rock layers that may require special embedments and anchor types, including rock anchors except FMA-07 report listed above.
 3. Pull test all TA-P1 and TA-P2 anchors to 20 kips and 40 kips ultimate capacity respectively per BHP specification and test method, install alternate rock, helical or rock anchors as required.
 4. Refer to BHP construction specifications for line erection and materials. Notify Engineer of any conflicts.

5. Ground all TG-1 and TG-2 guys to wood and steel poles except where specifically insulated with strain rods.
6. Install guy strain rods on all 230H and J type structure shield wire guys.
7. Install 24" clevis links and guy strain rods on all 230H and J type structures with line angles less than 55 degrees.
8. Install fence grounding per BHP requirements.
9. Refer to structure and staking list for line erection information including assembly type, pole class / height, special notes and required anchor rod slopes.

5/5/16 DZ A MW					Issued for Construction				
DATE ORIGIN NO APPROVED					REVISION DESCRIPTION				
ORIGIN DZ DATE: 12/27/14 DATE: 12/27/14					DATE: 12/27/14 DWY: NO DATE: 12/27/14				
APPROVED MW					SHT. 14 OF 45 BHP-T-100 A				



- NOTES:**
1. BH⁴ has decided that all steel piles will be embedded 10% ± 2% L. No geotechnical analysis will be available to determine hole conditions or to confirm pile and anchor embedment design except see FMS 12/25/16 report for Hwy 44 and S.M. to range.
 2. No geotechnical or other analysis is available to confirm the extent and soil to bore layers that may require special embedments and anchor types, including rock anchors (FMS report listed above).
 3. Pull test all TA-P1 and TA-P2 anchors to 20 kips and 40 kips (ultimate capacity respectively per BH⁴ specifications and test method, install alternate steel, helical or rock anchors as required).
 4. Refer to BH⁴ construction specifications for line erection and materials. Notify Engineer of any conflicts.

5. Ground all TG-1 and TG-2 guys to wood and steel poles except where specifically insulated with strain rods.
6. Install guy strain rods on all 230H and J type structure shield wire guys.
7. Install 24" clevis links and guy strain rods on all 230H and J type structures with line angles less than 55 degrees.
8. Install fence grounding per BHP requirements.
9. Refer to structure and staking list for line erection information including assembly type, pole class / height, special notes and required anchor rod slopes.

TECKLA TO LANGE 230 KV TRANSMISSION LINE
STATE LINE TO LANGE LINE SEGMENT
PLAN AND PROFILE

SHT, 15 OF 45

5/01/16	DZ	A	MW
DATE	DRAWN BY	NO	APPROVE BY

Issued for Construction

DRAWN BY: DZ DATE: 12/27/14 DWG NO:
APPROVED BY: M.W. DATE: 12/27/14

BHP-T-100