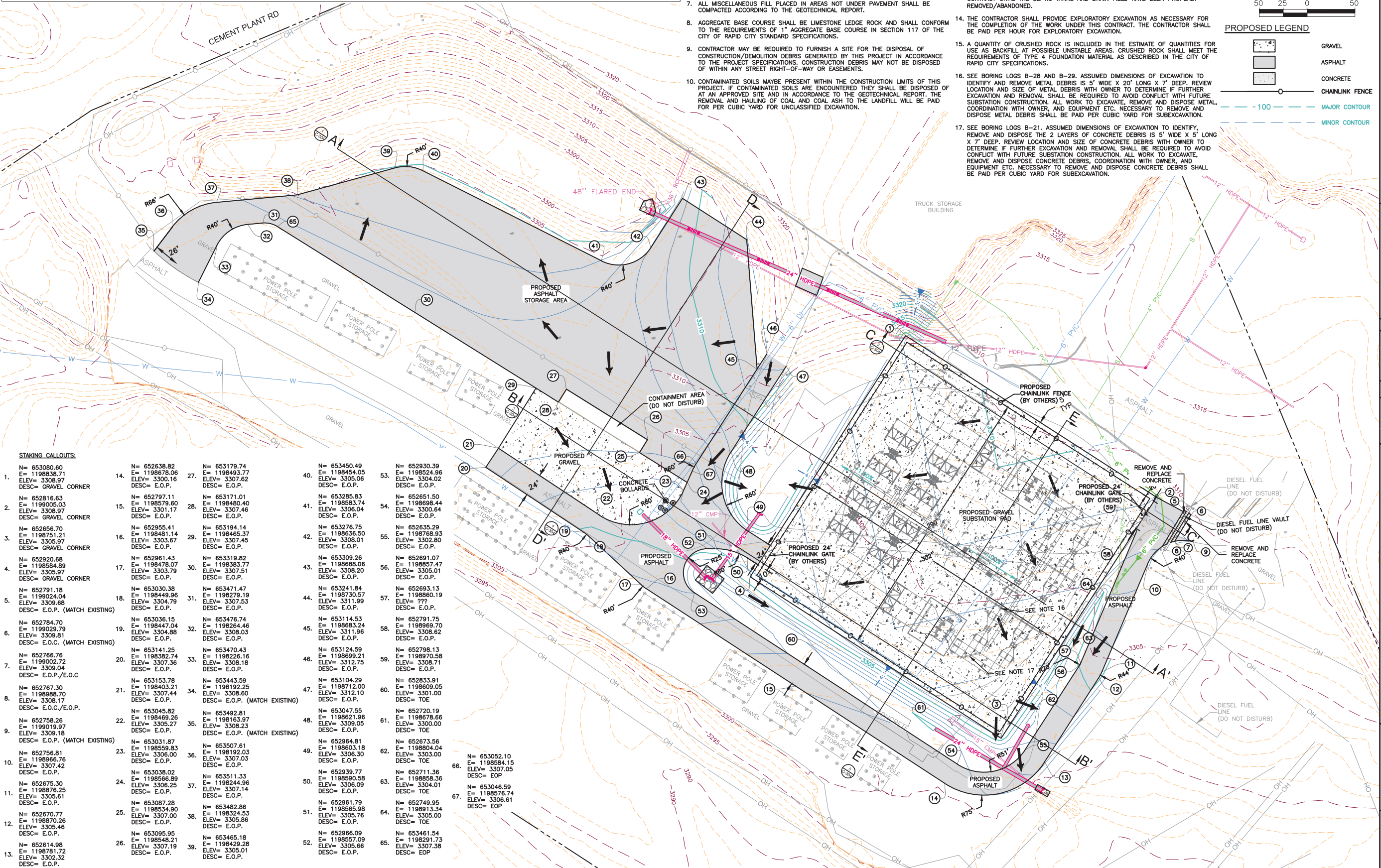
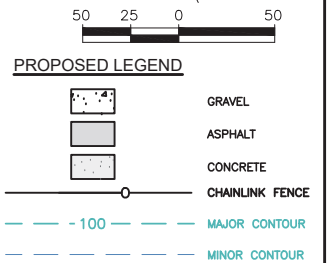
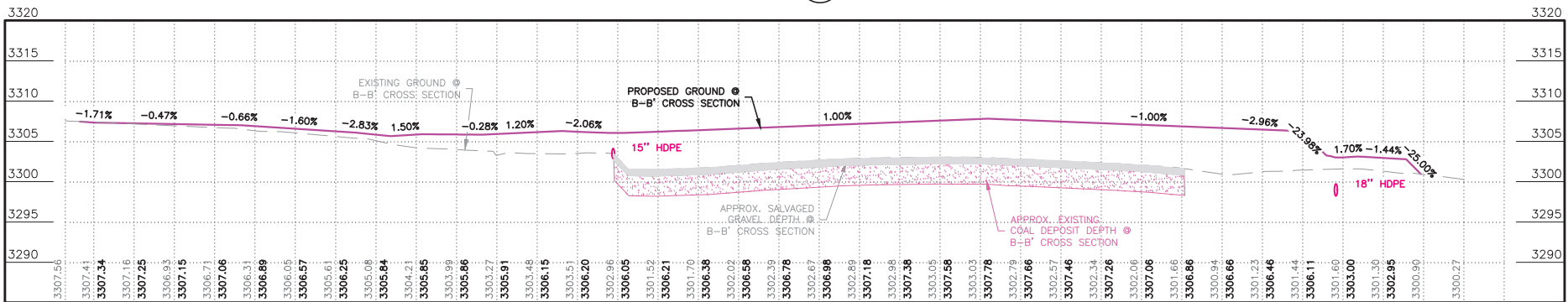
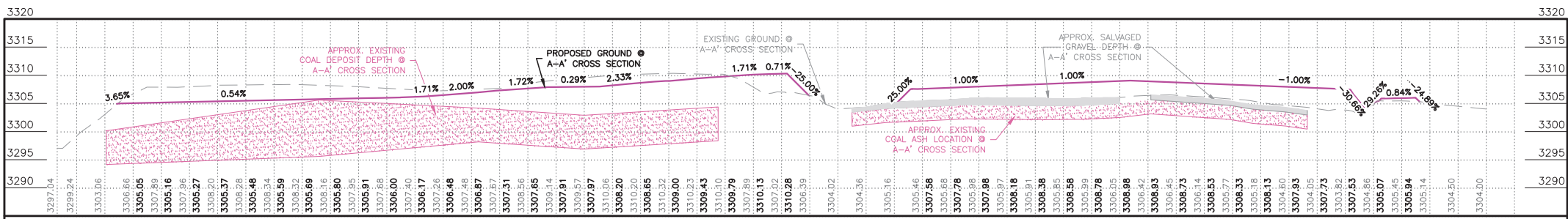
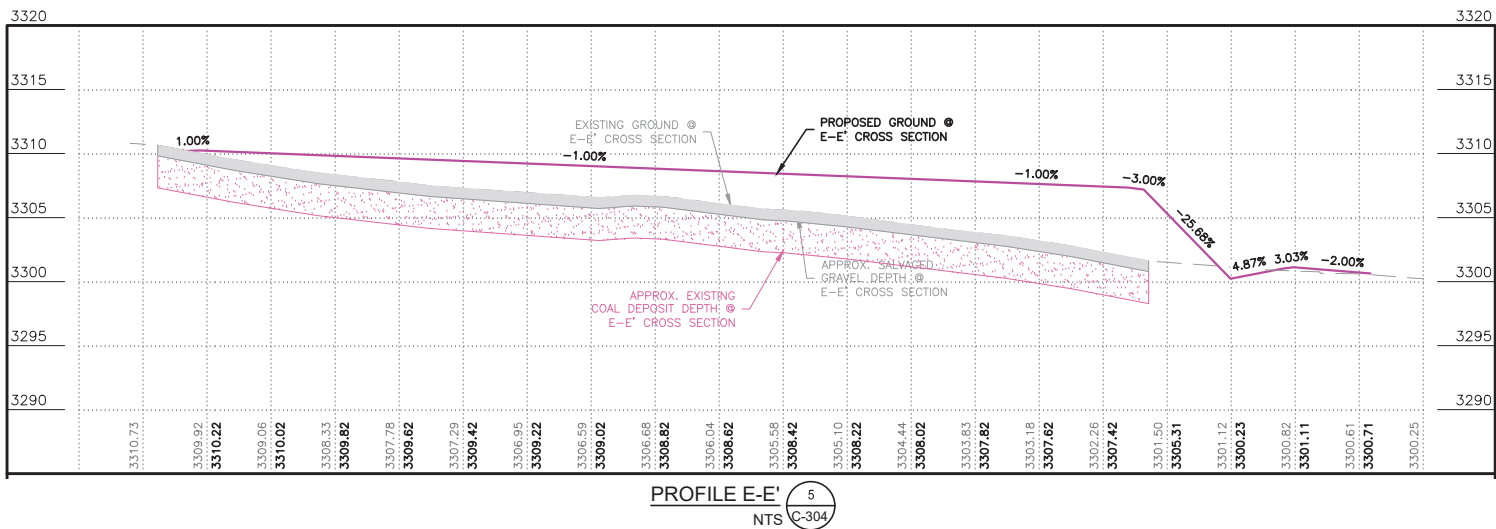
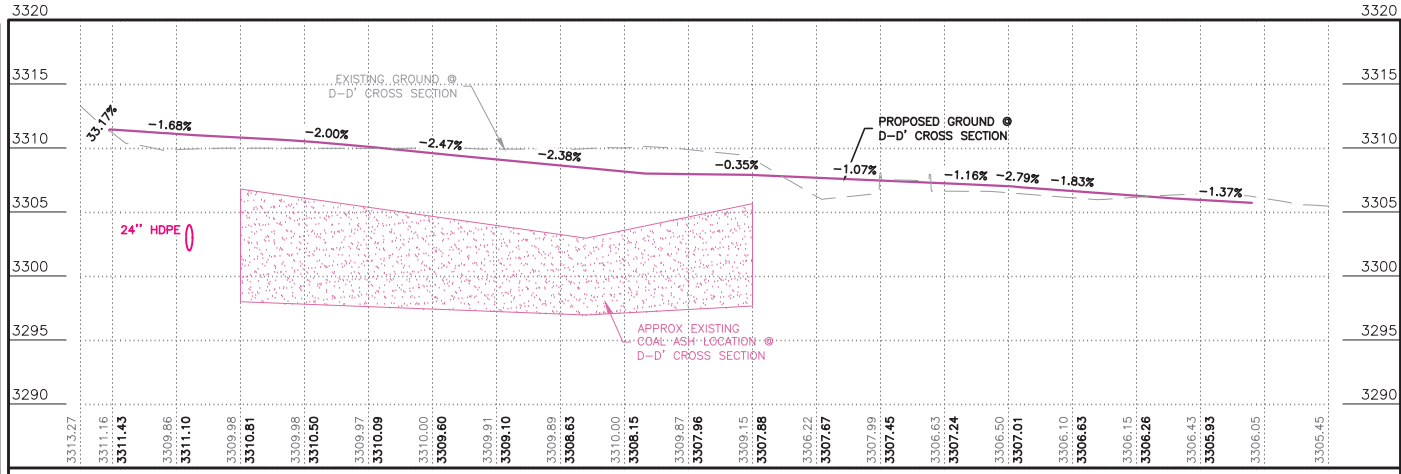
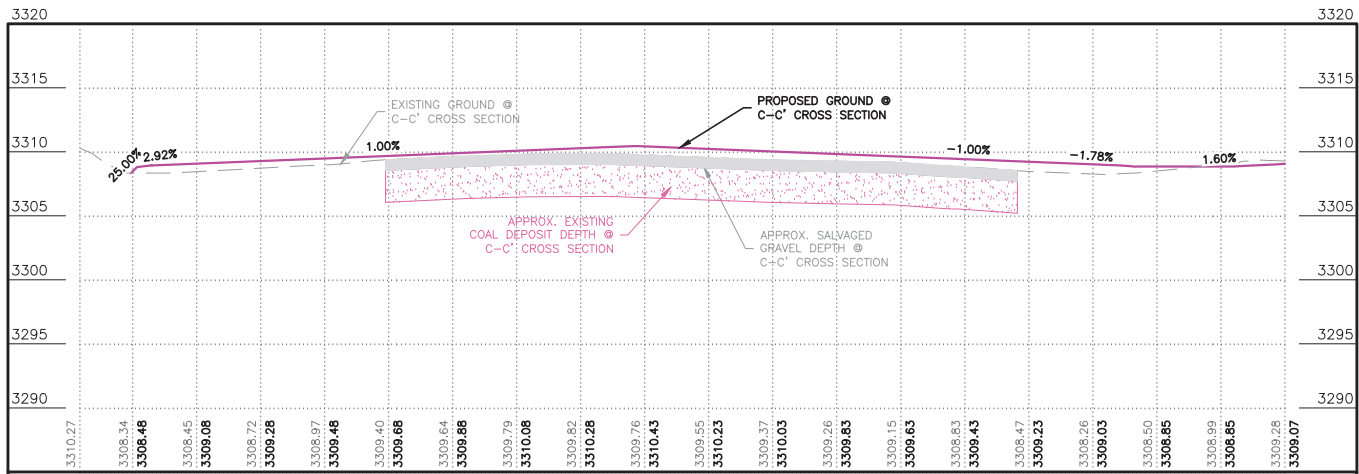


NOTES:

1. CONSTRUCTION STAKING SHALL BE COMPLETED BY THE OWNER OR ITS REPRESENTATIVE.
2. CONTOUR INTERVALS SHOWN FOR EXISTING AND PROPOSED SURFACES ARE 1-FOOT, UNLESS OTHERWISE NOTED.
3. CONTOURS SHOWN ARE FINISHED GRADE. CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING SUBGRADE ELEVATIONS.
4. SPOT ELEVATION CALLOUTS ARE TO THE EDGE OF PAVEMENT UNLESS OTHERWISE NOTED.
5. ALL DISTURBED AREAS NOT COVERED WITH PAVEMENT SHALL BE SEEDDED USING THE NON-IRRIGATED LAWN MIX SPECIFIED IN THE CITY OF RAPID CITY STANDARD SPECIFICATIONS.
6. ALL FILL PLACED UNDER PAVEMENT SHALL BE COMPACTED AND MOISTURE CONDITIONED ACCORDING TO THE GEOTECHNICAL REPORT.
7. ALL MISCELLANEOUS FILL PLACED IN AREAS NOT UNDER PAVEMENT SHALL BE COMPACTED ACCORDING TO THE GEOTECHNICAL REPORT.
8. AGGREGATE BASE COURSE SHALL BE LIMESTONE LEDGE ROCK AND SHALL CONFORM TO THE REQUIREMENTS OF 1" AGGREGATE BASE COURSE IN SECTION 117 OF THE CITY OF RAPID CITY STANDARD SPECIFICATIONS.
9. CONTRACTOR MAY BE REQUIRED TO FURNISH A SITE FOR THE DISPOSAL OF CONSTRUCTION/DEMOLITION DEBRIS GENERATED BY THIS PROJECT IN ACCORDANCE TO THE PROJECT SPECIFICATIONS. CONSTRUCTION DEBRIS MAY NOT BE DISPOSED OF WITHIN ANY STREET RIGHT-OF-WAY OR EASEMENTS.
10. CONTAMINATED SOILS MAYBE PRESENT WITHIN THE CONSTRUCTION LIMITS OF THIS PROJECT. IF CONTAMINATED SOILS ARE ENCOUNTERED THEY SHALL BE DISPOSED OF AT AN APPROVED SITE AND IN ACCORDANCE TO THE GEOTECHNICAL REPORT. THE REMOVAL AND HAULING OF COAL AND COAL ASH TO THE LANDFILL WILL BE PAID FOR PER CUBIC YARD FOR UNCLASSIFIED EXCAVATION.

1. COAL AND COAL ASH ARE PRESENT WITHIN THE PROJECT LIMITS. COAL IS SPORADICALLY LOCATED BENEATH THE AGGREGATE BASE COURSE IN THE PROPOSED SUBSTATION AREA. COAL SHALL BE REMOVED IN ITS ENTIRETY AND DEPTH OF AT LEAST 2' BELOW THE PROPOSED GRAVEL LAYER. WHEN DETERMINING REMOVAL OF COAL AND IMPORTED BORROW MATERIAL, WE ASSUMED A DEPTH OF 2.5' OVER THE APPROXIMATE AREA SHOWN IN THE GEOTECHNICAL REPORT TO BE REMOVED AND REPLACED WITH IMPORTED BORROW. COAL ASH IS PRESENT BENEATH THE PROPOSED STORAGE AREA. IF COAL ASH IS ENCOUNTERED IT SHALL BE REMOVED TO A DEPTH OF 1' BELOW THE PROPOSED PAVEMENT SECTION AND BACKFILLED WITH IMPORTED MATERIAL.
2. CONTRACTOR SHALL SALVAGE AND STOCKPILE THE EXISTING GRAVEL WITHIN THE CONSTRUCTION LIMITS. THE STOCKPILED GRAVEL SHALL BE UTILIZED IN SURFACING SECTIONS SHOWN WITHIN THESE PLANS.
3. A PROJECT IS CURRENTLY IN THE DESIGN PHASE TO EXTEND SANITARY SEWER FROM W. CHICAGO STREET AREA TO THE BH ENERGY SITE TO ELIMINATE THE EXISTING SEPTIC TANKS AND DRAIN FIELD SOUTH OF THE FUTURE SUBSTATION SITE. DEPENDING ON SCHEDULING FINAL SURFACING MAYBE REMOVED FROM THIS CONTRACT UNTIL THE SEPTIC TANKS AND DRAIN FIELD HAVE BEEN PROPERLY REMOVED/ABANDONED.
4. THE CONTRACTOR SHALL PROVIDE EXPLORATORY EXCAVATION AS NECESSARY FOR THE COMPLETION OF THE WORK UNDER THIS CONTRACT. THE CONTRACTOR SHALL BE PAID PER HOUR FOR EXPLORATORY EXCAVATION.
5. A QUANTITY OF CRUSHED ROCK IS INCLUDED IN THE ESTIMATE OF QUANTITIES FOR USE AS BACKFILL AT POSSIBLE UNSTABLE AREAS. CRUSHED ROCK SHALL MEET THE REQUIREMENTS OF THE FOUNDATION MATERIAL AS DESCRIBED IN THE CITY OF RAPID CITY SPECIFICATIONS.
6. SEE BORING LOGS B-28 AND B-29. ASSUMED DIMENSIONS OF EXCAVATION TO IDENTIFY AND REMOVE METAL DEBRIS IS 5' WIDE X 20' LONG X 4' DEEP. REVIEW LOCATION AND SIZE OF METAL DEBRIS WITH OWNER TO DETERMINE IF FURTHER EXCAVATION AND REMOVAL SHALL BE REQUIRED TO AVOID CONFLICT WITH FUTURE SUBSTATION CONSTRUCTION. ALL WORK TO EXCAVATE, REMOVE AND DISPOSE METAL, CRUSHED ROCK, OR DEBRIS NECESSARY TO REMOVE AND DISPOSE CONCRETE DEBRIS SHALL BE PAID PER CUBIC YARD FOR SUBEXCAVATION.
7. SEE BORING LOGS B-21. ASSUMED DIMENSIONS OF EXCAVATION TO IDENTIFY, EXCAVATE AND DISPOSE THE 2 LAYERS OF CONCRETE DEBRIS IS 5' WIDE X 5' LONG X 7' DEEP. REVIEW LOCATION AND SIZE OF CONCRETE DEBRIS WITH OWNER TO DETERMINE IF FURTHER EXCAVATION AND REMOVAL SHALL BE REQUIRED TO AVOID CONFLICT WITH FUTURE SUBSTATION CONSTRUCTION. ALL WORK TO EXCAVATE, REMOVE AND DISPOSE CONCRETE DEBRIS, COORDINATION WITH OWNER, AND ETC. SHALL BE NECESSARY TO REMOVE AND DISPOSE CONCRETE DEBRIS SHALL BE PAID PER CUBIC YARD FOR SUBEXCAVATION.





Prepared For:

Prepared By:

729 East Watertown St. Rapid City, SD 57701 ~ Phone: (605) 343-3311

Prepared By:

Scale:

Designed By: DAL
Design Date: JUNE 2018
Internal Job No: 18-123
Surveyed By: JUB/KQH
Revisions:

Drawn By: BDH/ERK
Print Date: 08-31-18
Survey Date: MAY 2018

WEST RAPID CITY SUBSTATION
SITE DEVELOPMENT

BLACK HILLS ENERGY
RAPID CITY, SD

Sheet Title:

GRADING SECTIONS

Sheet:

C-304



SUPPORT STRUCTURE

SUBSTATION DEAD-END

WEST RAPID CITY 230KV TRANSMISSION LINE

LANGE-SOUTH RAPID CITY 230KV TRANSMISSION LINE

BHE 69KV TRANSMISSION LINES

ELECTRIC EASEMENT

GAS EASEMENT

UTILITY EASEMENT

PROPERTY LINE

QUARTER LINE

SECTION LINE

LEADER LINE

PROJECT MANAGER	J. ELLSWORTH
PROJECT ENGINEER	J. PANKRATZ
DESIGN ENGINEER	J. PANKRATZ
CADD TECHNICIAN	Z. JANSEN
GIS TECHNICIAN	S.GRIFFIN
PROJECT NUMBER	10114217

C	09/01/2019	ISSUED FOR 90% REVIEW
B	12/18/2018	ISSUED FOR 75% REVIEW
A	10/12/2018	ISSUED FOR 60% REVIEW
ISSUE	DATE	DESCRIPTION

BLACK HILLS POWER
RAPID CITY, SOUTH DAKOTA

WEST RAPID CITY
230KV TRANSMISSION LINE

ROUTE MAP

070140280

Feet

FILENAME West Rapid City 230kV Line 22x34

SCALE 1 inch = 150 feet

SHEET RM-01



PLAN NOTES:

- NEW STRUCTURE
- EXISTING STRUCTURE
- ⊗ RETIREMENT STRUCTURE
- ALIGNMENT
- - - ALIGNMENT OF ANOTHER LINE

PROFILE NOTES:

- CONDUCTOR DAMPER
- SHIELD DAMPER
- OPGW SPLICE

NOTES:

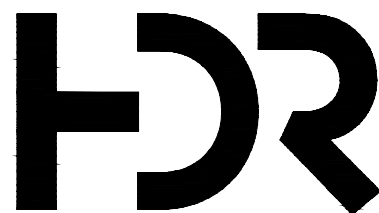
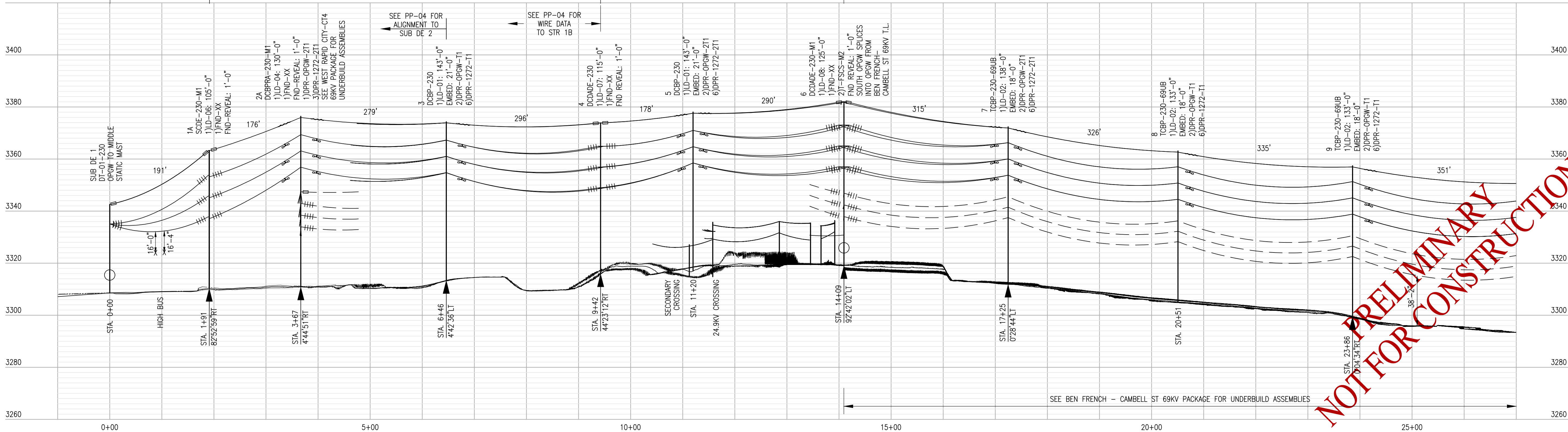
- [xxx] - EXISTING ASSEMBLY
- *xxx - RETIREMENT ASSEMBLY
- T[xxx] - TRANSFER UNIT ASSEMBLY
- SHIELD WIRE SHOWN AT 60°F (CREEP)
- CONDUCTOR SHOWN AT 212°F (MAX SAG)

SHIELD: (1) AFL CC-55/443 "DNO-4748" OPGW, D.T. @ H.L.= 1000#, R.S.= 191'
SHIELD: (1) 3/8" 7 STRAND EHS, D.T. @ H.L.= 930#, R.S.= 191'
COND: (3) 1272 KCMIL 45/7 ACSR "BITTERN", D.T. @ H.L.= 2000#, R.S.= 191'

SHIELD: (2) AFL CC-55/443 "DNO-4748" OPGW, D.T. @ H.L.= 2780#, R.S.= 250'
COND: (6) 1272 KCMIL 45/7 ACSR "BITTERN", D.T. @ H.L.= 11180#, R.S.= 250'

SHIELD: (1) AFL CC-55/443 "DNO-4748" OPGW, D.T. @ H.L.= 2840#, R.S.= 260'
COND: (3) 1272 KCMIL 45/7 ACSR "BITTERN", D.T. @ H.L.= 11345#, R.S.= 260'

SHIELD: (2) AFL CC-55/443 "DNO-4748" OPGW, D.T. @ H.L.= 2995#, R.S.= 290'
COND: (6) 1272 KCMIL 45/7 ACSR "BITTERN", D.T. @ H.L.= 11620#, R.S.= 290'



C	2/1/2019	ISSUED FOR 90% REVIEW
B	12/14/2018	ISSUED FOR 75% REVIEW
A	10/12/2018	ISSUED FOR 60% REVIEW

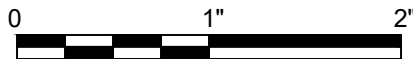
ISSUE DATE DESCRIPTION

PROJECT MANAGER	J. ELLSWORTH
PROJECT ENGINEER	J. PANKRATZ
DESIGN ENGINEER	J. PANKRATZ
CAD TECHNICIAN	Z. JANSEN
E. O. R.	
PROJECT NUMBER	10114217

BLACK HILLS ENERGY
RAPID CITY, SOUTH DAKOTA

WEST RAPID CITY
230KV TRANSMISSION LINE

PLAN AND PROFILE



FILENAME | BHE-PP-01-D-1.DWG
SCALE | H:1"=100' V:1"=20'

SHEET
PP-01



PLAN NOTES:

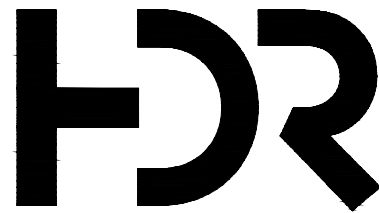
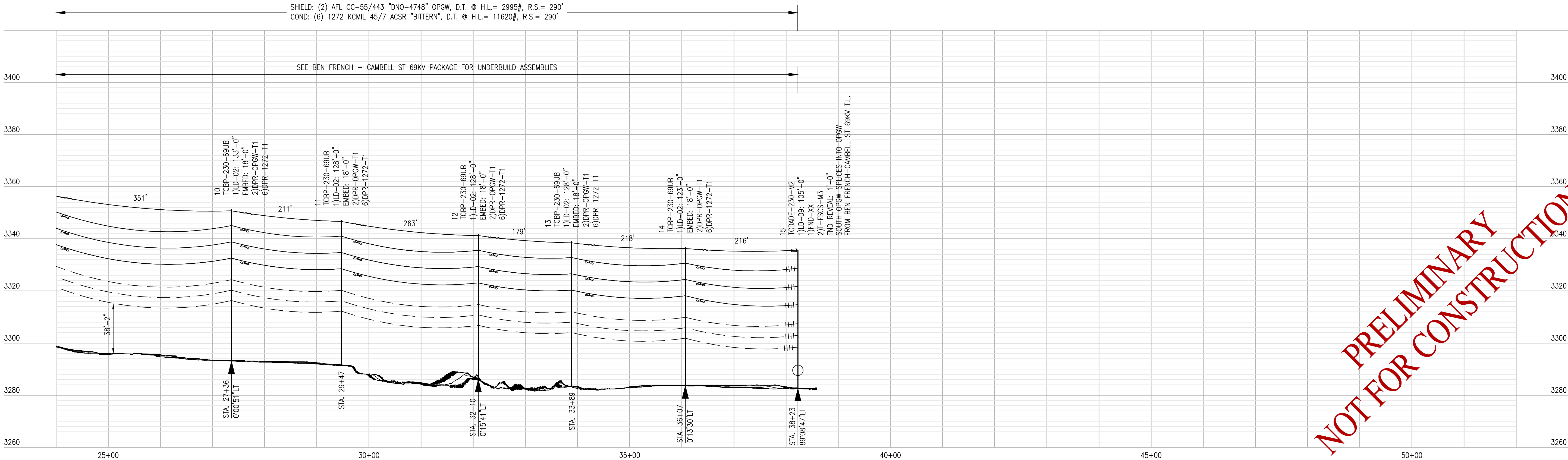
- NEW STRUCTURE
- EXISTING STRUCTURE
- ⊠ RETIREMENT STRUCTURE
- ALIGNMENT
- - - ALIGNMENT OF ANOTHER LINE

PROFILE NOTES:

- CONDUCTOR DAMPER
- SHIELD DAMPER
- OPGW SPLICE

NOTES:

- [xxx] - EXISTING ASSEMBLY
- *xxx - RETIREMENT ASSEMBLY
- T[xxx] - TRANSFER UNIT ASSEMBLY
- SHIELD WIRE SHOWN AT 60°F (CREEP)
- CONDUCTOR SHOWN AT 212°F (MAX SAG)



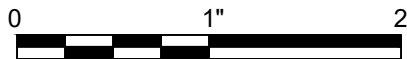
C	2/1/2019	ISSUED FOR 90% REVIEW
B	12/14/2018	ISSUED FOR 75% REVIEW
A	10/12/2018	ISSUED FOR 60% REVIEW
ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	J. ELLSWORTH
PROJECT ENGINEER	J. PANKRATZ
DESIGN ENGINEER	J. PANKRATZ
CAD TECHNICIAN	Z. JANSEN
E. O. R.	
PROJECT NUMBER	10114217

BLACK HILLS ENERGY
RAPID CITY, SOUTH DAKOTA

WEST RAPID CITY
230KV TRANSMISSION LINE

PLAN AND PROFILE



FILENAME | BHE-PP-01-D-1.DWG
SCALE | H:1"=100' V:1"=20'

SHEET
PP-02



PLAN NOTES:

- NEW STRUCTURE
- EXISTING STRUCTURE
- ⊗ RETIREMENT STRUCTURE
- ALIGNMENT
- - ALIGNMENT OF ANOTHER LINE

PROFILE NOTES:

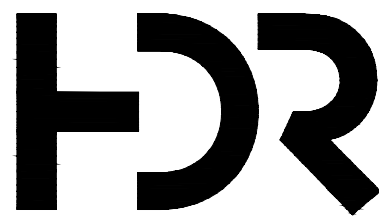
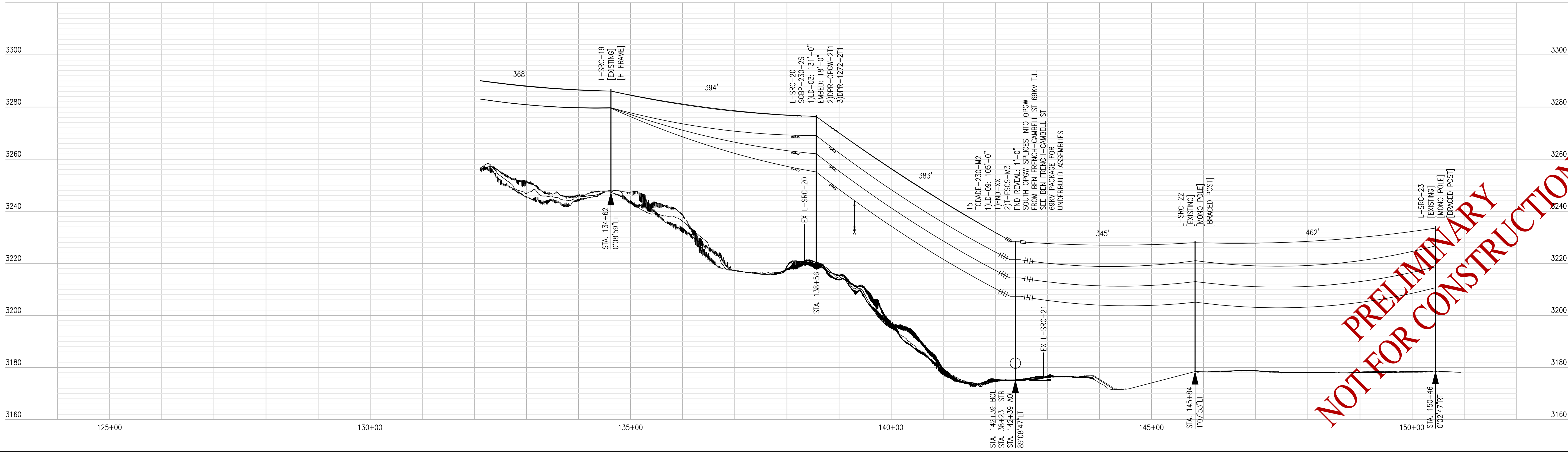
- CONDUCTOR DAMPER
- SHIELD DAMPER
- OPGW SPLICE

NOTES:

- [xxx] - EXISTING ASSEMBLY
- *xxx - RETIREMENT ASSEMBLY
- T[xxx] - TRANSFER UNIT ASSEMBLY
- SHIELD WIRE SHOWN AT 60°F (CREEP)
- CONDUCTOR SHOWN AT 212°F (MAX SAG)

SHIELD: (1) 3/8" 7 STRAND HS, D.T. @ H.L.= 4555#, R.S.= 922' (WEST)
SHIELD: (1) 3/8" 7 STRAND HS, D.T. @ H.L.= 4780#, R.S.= 922' (EAST)
COND: (3) 1272 KCMIL 45/7 ACSR "BITTERN", D.T. @ H.L.= 12910#, R.S.= 922'

SHIELD: (1) 3/8" 7 STRAND HS, D.T. @ H.L.= 3685#, R.S.= 448'
COND: (3) 1272 KCMIL 45/7 ACSR "BITTERN", D.T. @ H.L.= 12690#, R.S.= 448'



C	2/1/2019	ISSUED FOR 90% REVIEW
B	12/14/2018	ISSUED FOR 75% REVIEW
A	10/12/2018	ISSUED FOR 60% REVIEW

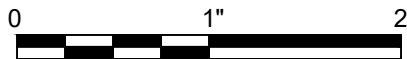
ISSUE DATE DESCRIPTION

PROJECT MANAGER	J. ELLSWORTH
PROJECT ENGINEER	J. PANKRATZ
DESIGN ENGINEER	J. PANKRATZ
CAD TECHNICIAN	Z. JANSEN
E. O. R.	
PROJECT NUMBER	10114217

BLACK HILLS ENERGY
RAPID CITY, SOUTH DAKOTA

WEST RAPID CITY
230KV TRANSMISSION LINE

PLAN AND PROFILE



FILENAME | BHE-PP-01-D-1.DWG
SCALE | H:1"=100' V:1"=20'

SHEET
PP-03



PLAN NOTES:

- NEW STRUCTURE
- EXISTING STRUCTURE
- ⊗ RETIREMENT STRUCTURE
- ALIGNMENT
- - - ALIGNMENT OF ANOTHER LINE

PROFILE NOTES:

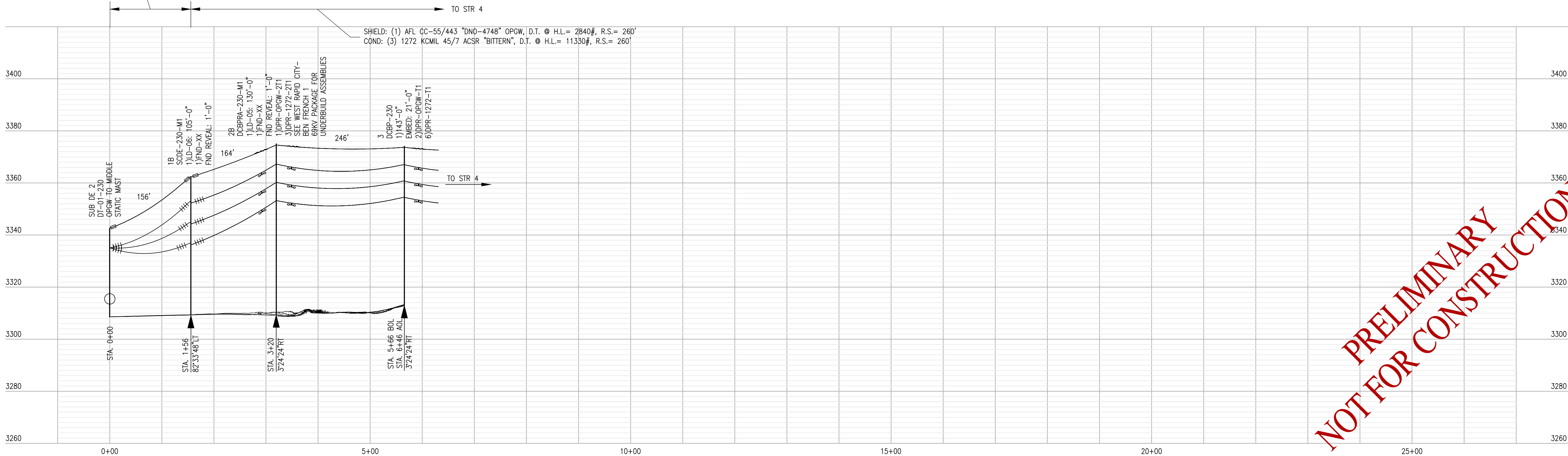
- CONDUCTOR DAMPER
- SHIELD DAMPER
- OPGW SPLICE

NOTES:

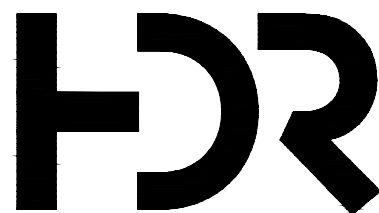
- [xxx] - EXISTING ASSEMBLY
- *xxx - RETIREMENT ASSEMBLY
- T[xxx] - TRANSFER UNIT ASSEMBLY
- SHIELD WIRE SHOWN AT 60°F (CREEP)
- CONDUCTOR SHOWN AT 212°F (MAX SAG)

SHIELD: (1) AFL CC-55/443 "DNO-4748" OPGW, D.T. @ H.L.= 1000#, R.S.= 156'
SHIELD: (1) 3/8" 7 STRAND EHS, D.T. @ H.L.= 925#, R.S.= 156'
COND: (3) 1272 KCMIL 45/7 ACSR "BITTERN", D.T. @ H.L.= 2000#, R.S.= 156'

SHIELD: (1) AFL CC-55/443 "DNO-4748" OPGW, D.T. @ H.L.= 2840#, R.S.= 260'
COND: (3) 1272 KCMIL 45/7 ACSR "BITTERN", D.T. @ H.L.= 11330#, R.S.= 260'



PRELIMINARY
NOT FOR CONSTRUCTION



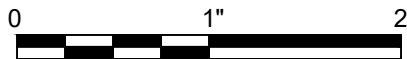
ISSUE	DATE	DESCRIPTION
C	2/1/2019	ISSUED FOR 90% REVIEW
B	12/14/2018	ISSUED FOR 75% REVIEW
A	10/12/2018	ISSUED FOR 60% REVIEW

PROJECT MANAGER	J. ELLSWORTH
PROJECT ENGINEER	J. PANKRATZ
DESIGN ENGINEER	J. PANKRATZ
CAD TECHNICIAN	Z. JANSEN
E. O. R.	
PROJECT NUMBER	10114217

BLACK HILLS ENERGY
RAPID CITY, SOUTH DAKOTA

WEST RAPID CITY
230KV TRANSMISSION LINE

PLAN AND PROFILE



FILENAME | BHE-PP-01-D-1.DWG
SCALE | H:1"=100' V:1"=20'

SHEET
PP-04