PLS-CADD DRAWING

BIG STONE SOUTH - ELLENDALE 345 KV TRANSMISSION LINE

ELLENDALE SUB - STR 195

PRELIMINARY SUBJECT TO FINAL REVIEW

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REVISIONS					
Q	V26: REVISED PER REVIEW	GMD	GMD		05/05/16
P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15
REV	DESCRIPTION	DWN	DGN	CHK	DATE

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA

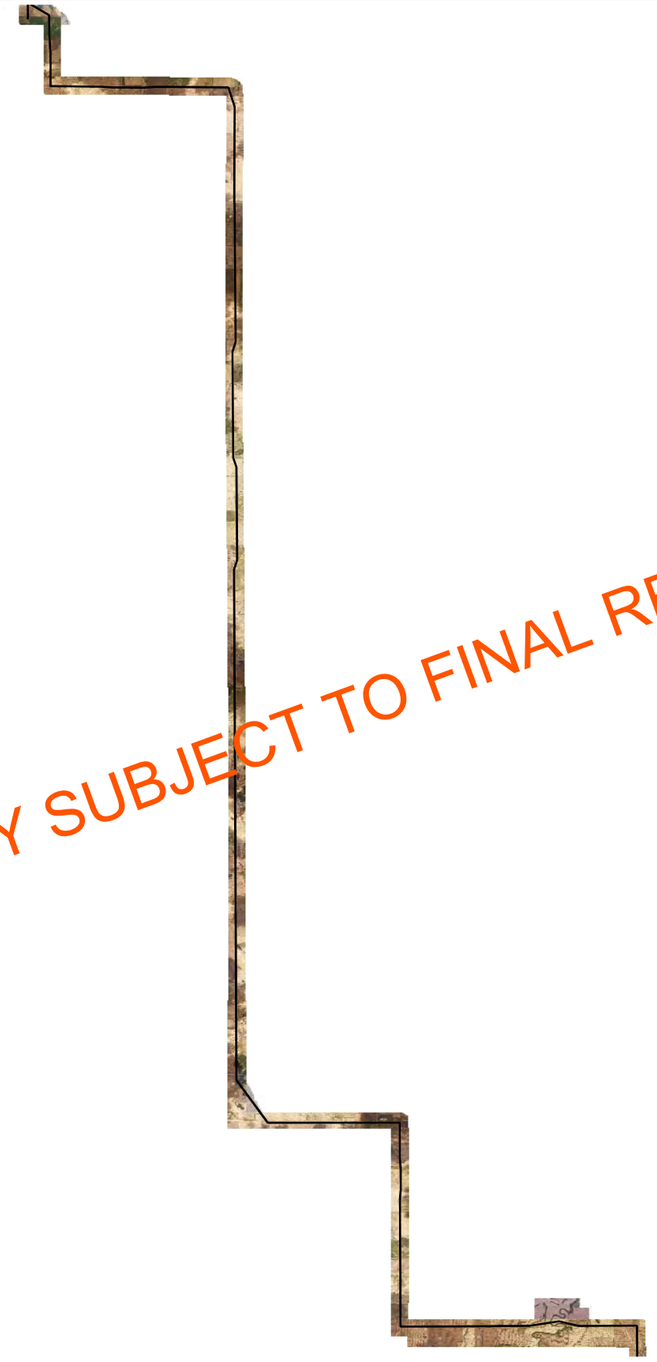
CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSS+E
Big Stone South to Ellendale

BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

DWG. NO.
BSSE-PP-101-1
REVISION: Q
136508

EXHIBIT 1



PRELIMINARY SUBJECT TO FINAL REVIEW

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REVISIONS					
Q	V26: REVISED PER REVIEW	GMD	GMD		05/05/16
P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15
REV	DESCRIPTION	DWN	DGN	CHK	DATE

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA

CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

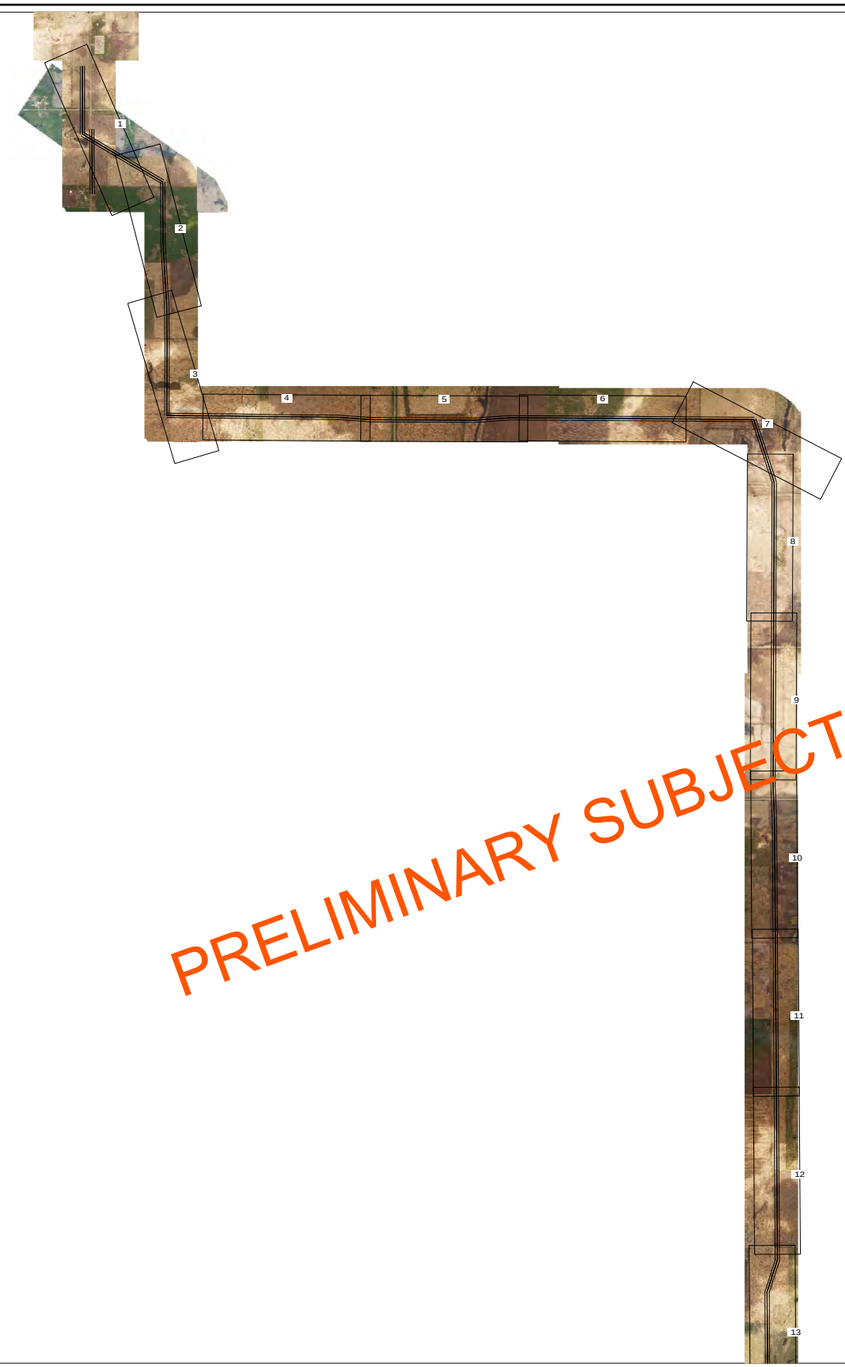
BSS+E
Big Stone South to Ellendale

BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

DWG. NO.
BSSE-PP-101-2
REVISION: Q
136508

EXHIBIT 1

PLS-CADD DRAWING



PRELIMINARY SUBJECT TO FINAL REVIEW

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REVISIONS					
Q	V26: REVISED PER REVIEW	GMD	GMD		05/05/16
P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15
REV	DESCRIPTION	DWN	DGN	CHK	DATE

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA

CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSS+E
Big Stone South to Ellendale

BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

NORTH

DWG. NO.
BSSE-PP-101-3
REVISION: Q
136508

EXHIBIT 1

PRELIMINARY SUBJECT TO FINAL REVIEW

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REVISIONS					
Q	V26: REVISED PER REVIEW	GMD	GMD		05/05/16
P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15
REV	DESCRIPTION	DWN	DGN	CHK	DATE

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA

CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSSE
Big Stone South to Ellendale

BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

NORTH

DWG. NO.
BSSE-PP-101-4
REVISION: Q
136508

EXHIBIT 1

PRELIMINARY SUBJECT TO FINAL REVIEW

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REVISIONS					
Q	V26: REVISED PER REVIEW	GMD	GMD		05/05/16
P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15
REV	DESCRIPTION	DWN	DGN	CHK	DATE

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA

CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSS+E
Big Stone South to Ellendale

BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

NORTH

DWG. NO.
BSSE-PP-101-5
REVISION: Q
136508

EXHIBIT 1

PRELIMINARY SUBJECT TO FINAL REVIEW

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REVISIONS					
Q	V26: REVISED PER REVIEW	GMD	GMD		05/05/16
P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15
REV	DESCRIPTION	DWN	DGN	CHK	DATE

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA
CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSS+E
Big Stone South to Ellendale

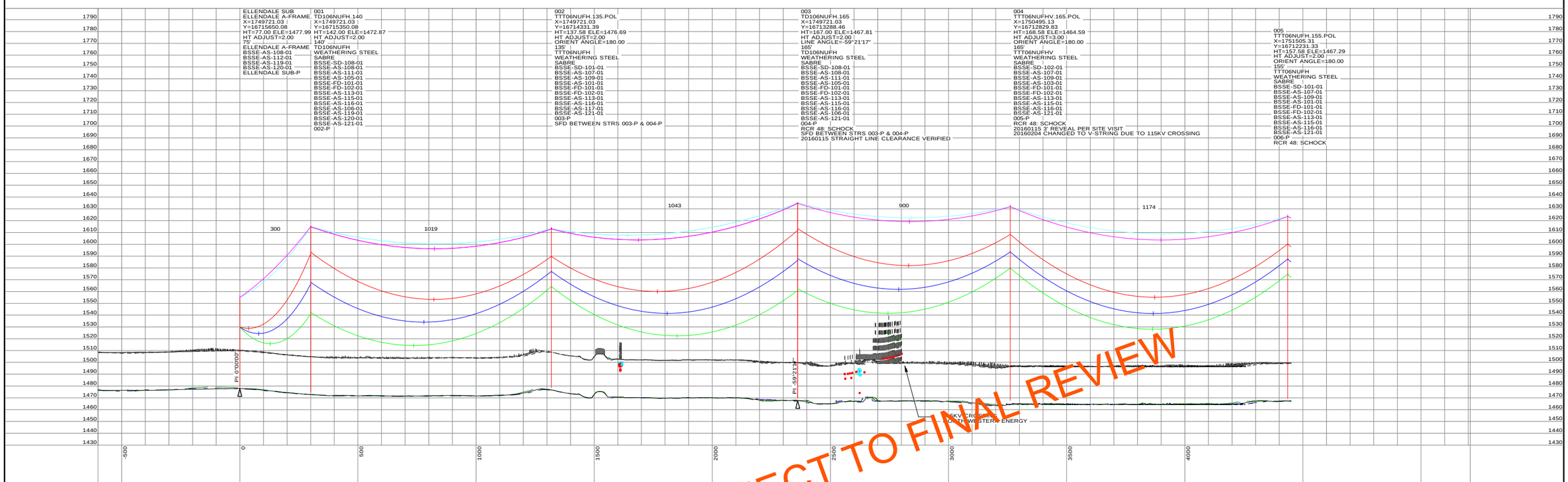
BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

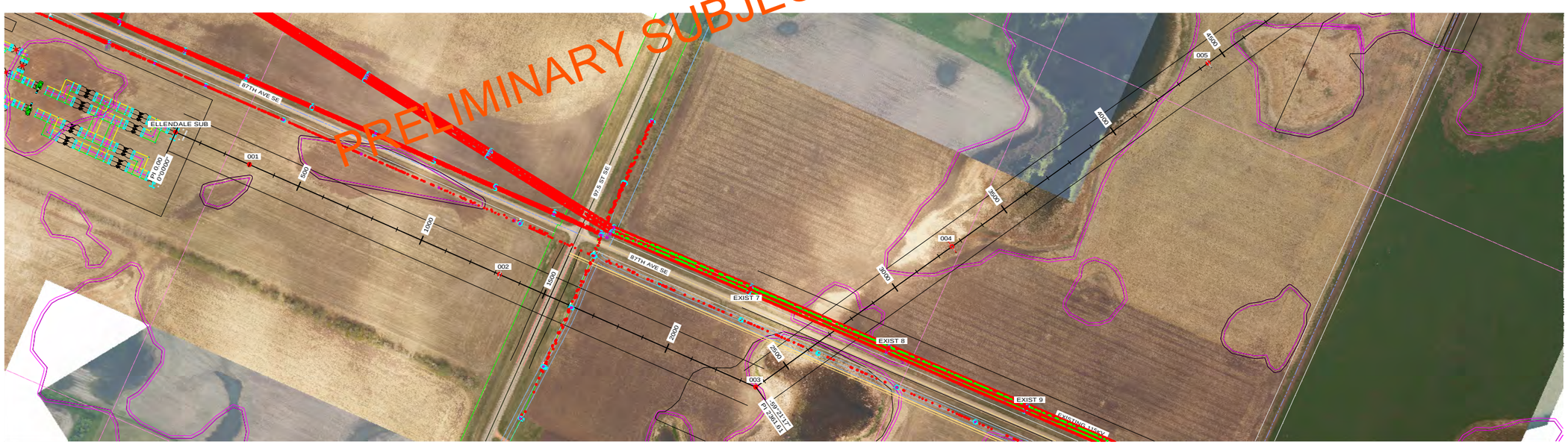
NORTH

DWG. NO.
BSSE-PP-101-6
REVISION: Q
136508

EXHIBIT 1

PLS-CADD DRAWING





STRS: ELLENDALE SUB - 005

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REVISIONS					
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P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15
REV	DESCRIPTION	DWN	DGN	CHK	DATE

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA
CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSSE
Big Stone South to Ellendale

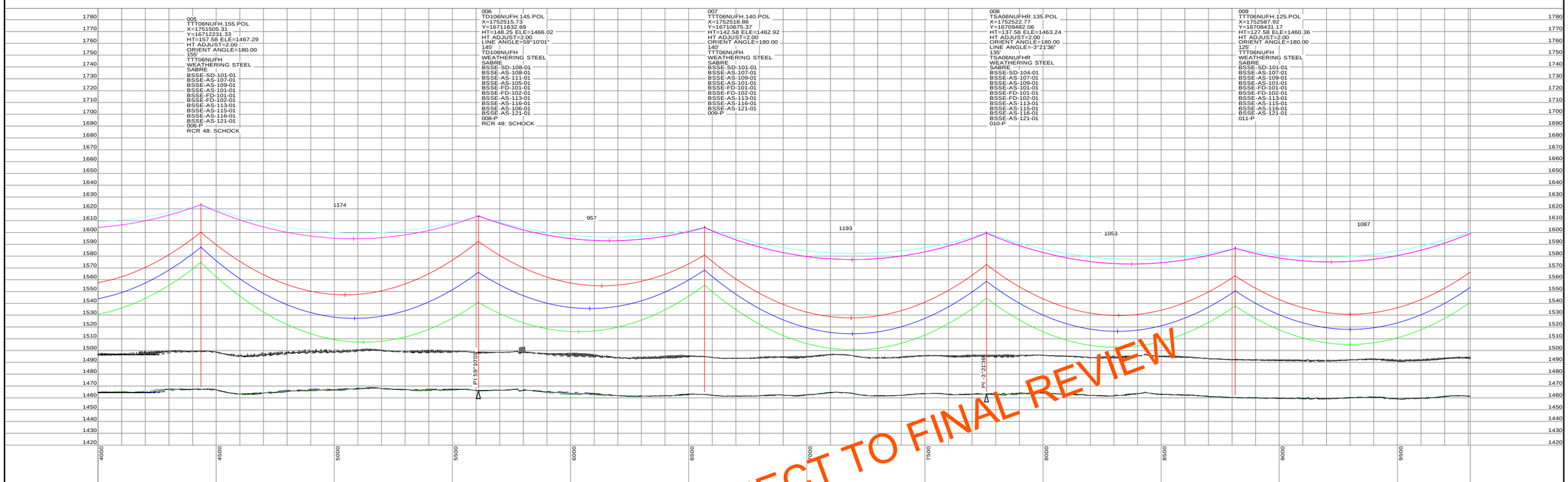
BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

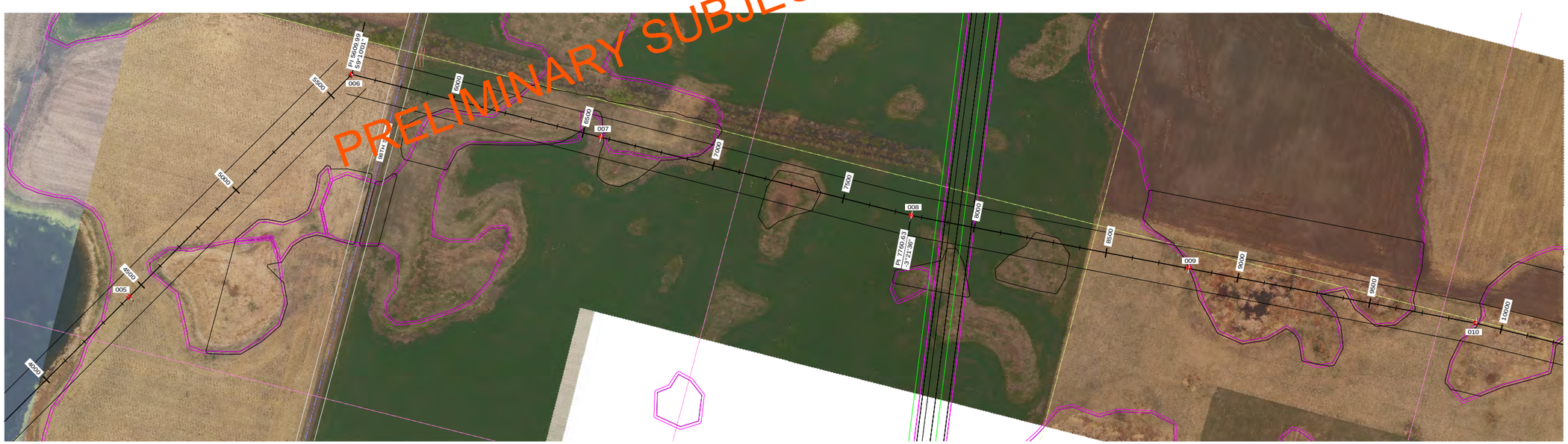
200.0 FT. HORIZ. SCALE
40.0 FT. VERT. SCALE
NORTH

DWG. NO.
BSSE-PP-101-7
REVISION: Q
136508

EXHIBIT 1

PLS-CADD DRAWING





STRS: 005 - 009

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REVISIONS					
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P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15
REV	DESCRIPTION	DWN	DGN	CHK	DATE

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA
CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSS+E
Big Stone South to Ellendale

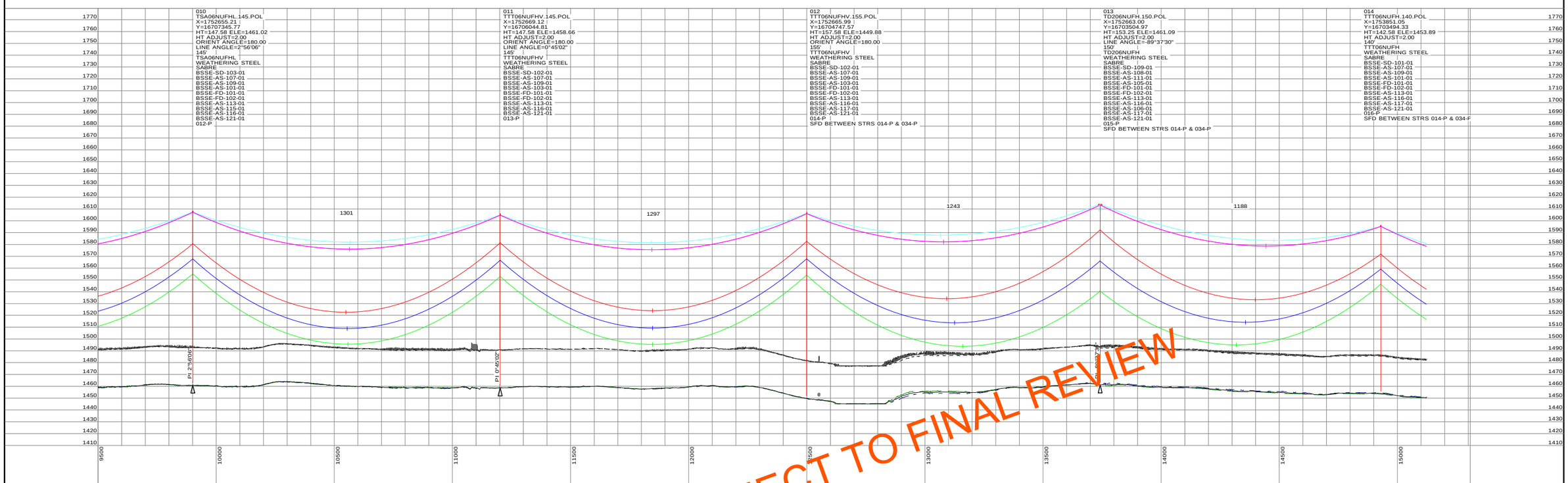
BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

200.0 FT. HORIZ. SCALE
40.0 FT. VERT. SCALE
NORTH

DWG. NO.
BSSE-PP-101-8
REVISION: Q
136508

EXHIBIT 1

PLS-CADD DRAWING



STRS: 010 - 014

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REVISIONS					
Q	V26: REVISED PER REVIEW	GMD	GMD		05/05/16
P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15
REV	DESCRIPTION	DWN	DGN	CHK	DATE

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA
CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSSE
Big Stone South to Ellendale

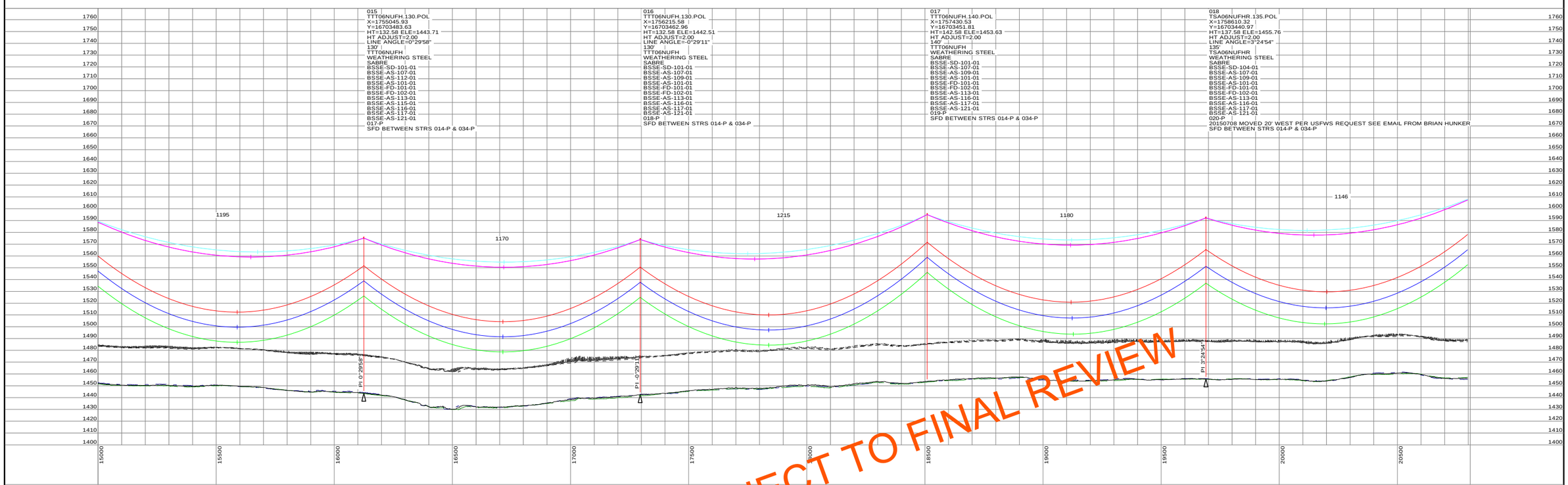
BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

200.0 FT. HORIZ. SCALE
40.0 FT. VERT. SCALE
NORTH

DWG. NO.
BSSE-PP-101-9
REVISION: Q
136508

EXHIBIT 1

PLS-CADD DRAWING



STRS: 015 - 018

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REVISIONS					
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P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15
REV	DESCRIPTION	DWN	DGN	CHK	DATE

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA
CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSS+E
Big Stone South to Ellendale

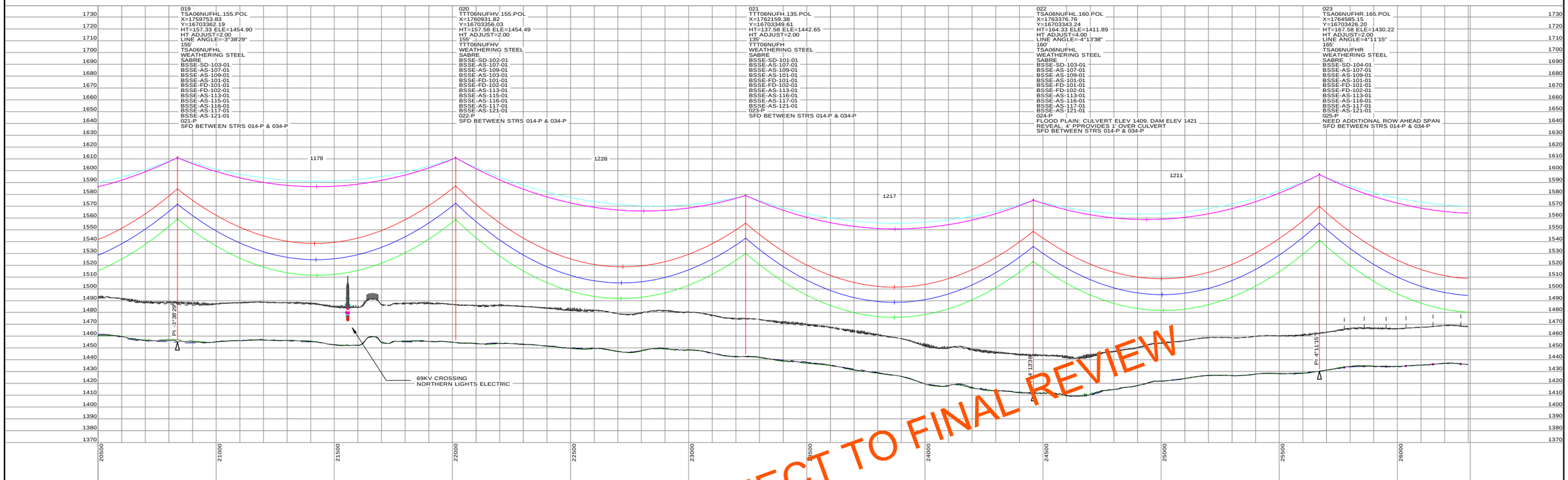
BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

200.0 FT. HORIZ. SCALE
40.0 FT. VERT. SCALE
NORTH

DWG. NO.
BSSE-PP-101-10
REVISION: Q
136508

EXHIBIT 1

PLS-CADD DRAWING



STRS: 019 - 023

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REVISIONS					
Q	V26: REVISED PER REVIEW	GMD	GMD		05/05/16
P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15
REV	DESCRIPTION	DWN	DGN	CHK	DATE

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA

CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSS+E
Big Stone South to Ellendale

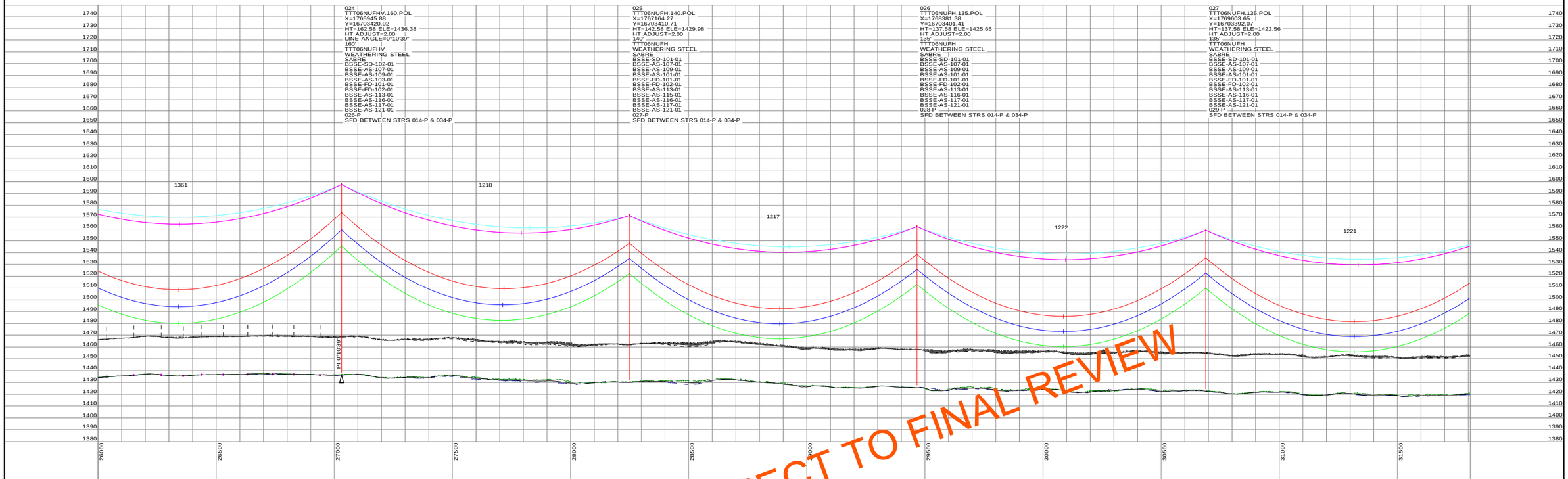
BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

200.0 FT. HORIZ. SCALE
40.0 FT. VERT. SCALE
NORTH

DWG. NO.
BSSE-PP-101-11
REVISION: Q
136508

EXHIBIT 1

PLS-CADD DRAWING



STRS: 024 - 027

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REVISIONS					
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P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15
REV	DESCRIPTION	DWN	DGN	CHK	DATE

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA

CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSS+E
Big Stone South to Ellendale

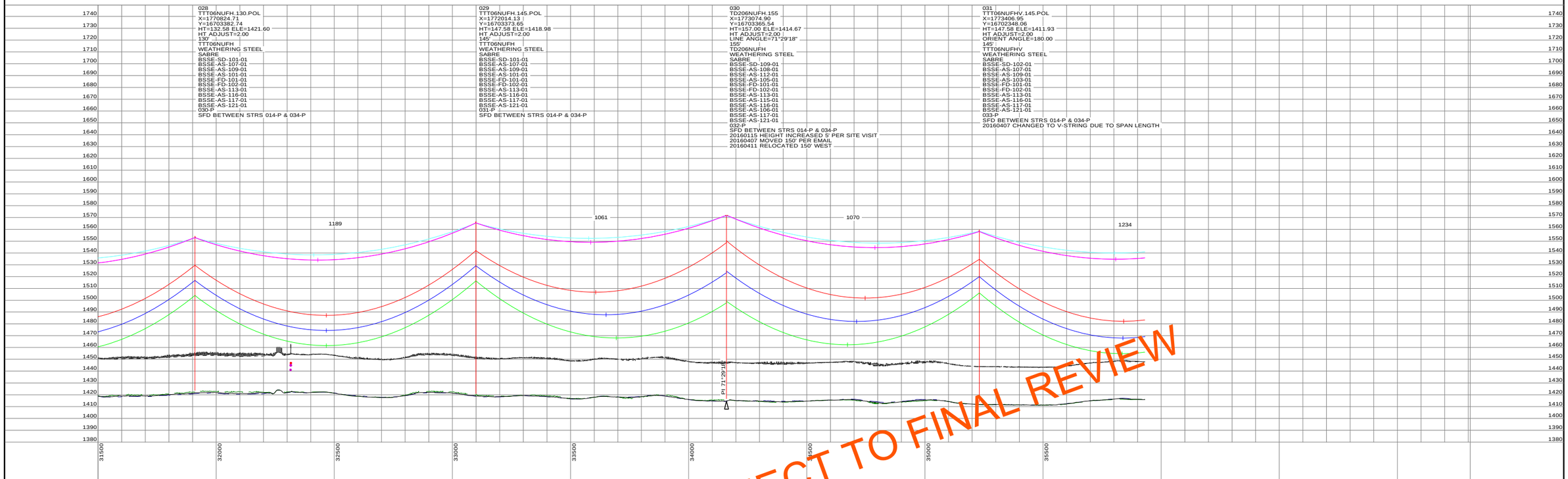
BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

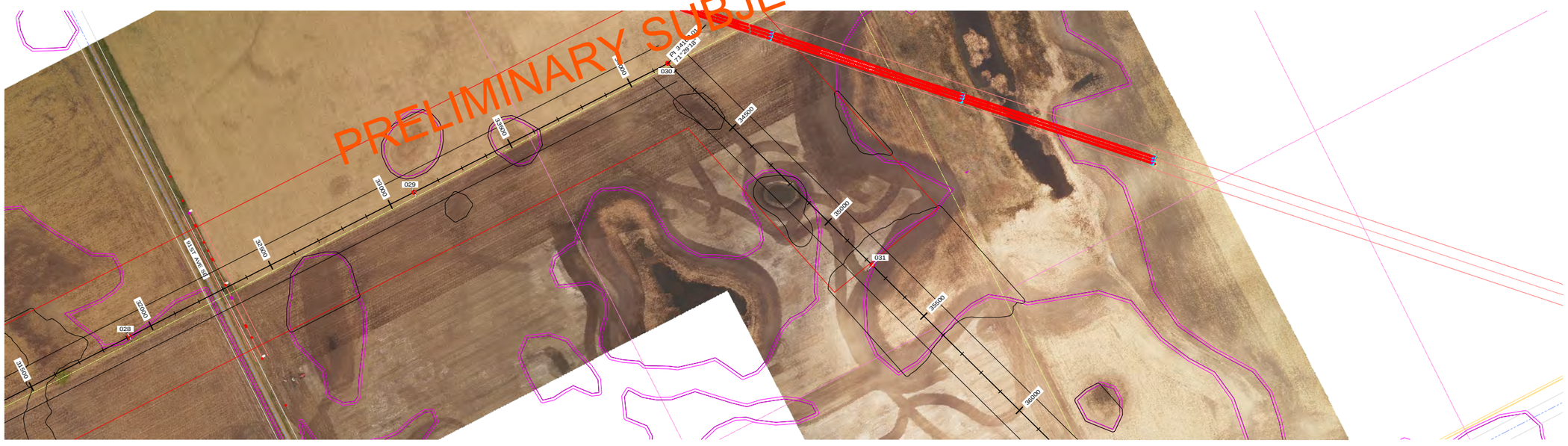
200.0 FT. HORIZ. SCALE
40.0 FT. VERT. SCALE
NORTH

DWG. NO.
BSSE-PP-101-12
REVISION: Q
136508

EXHIBIT 1

PLS-CADD DRAWING





STRS: 028 - 031

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REVISIONS					
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P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15
REV	DESCRIPTION	DWN	DGN	CHK	DATE

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA
CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSS+E
Big Stone South to Ellendale

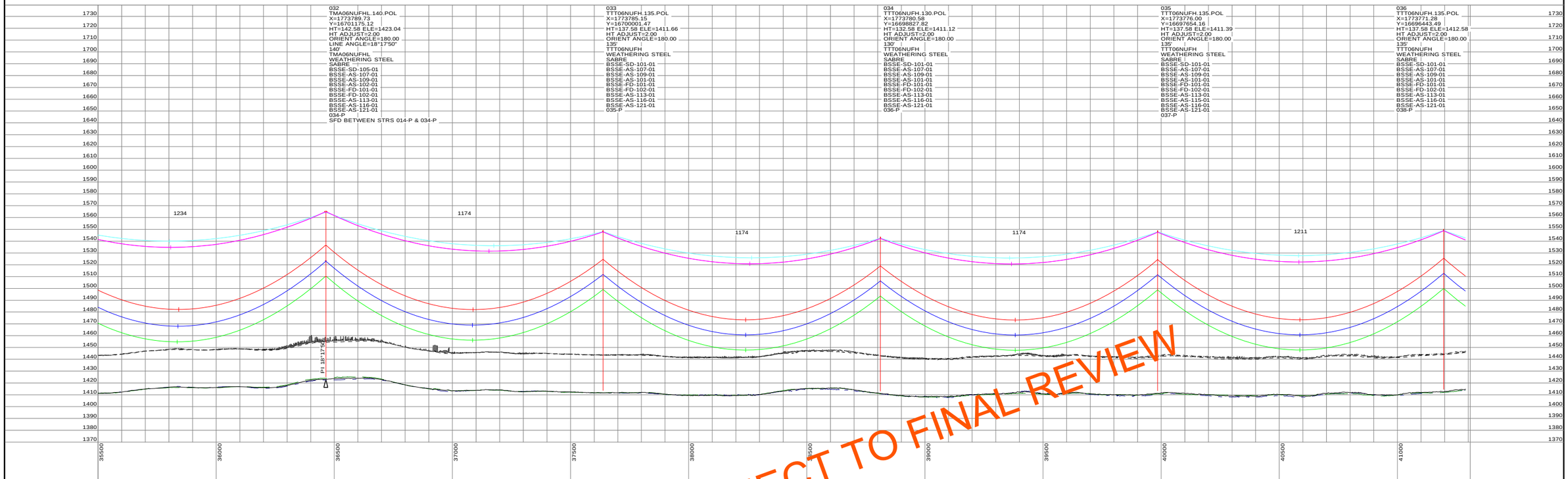
BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

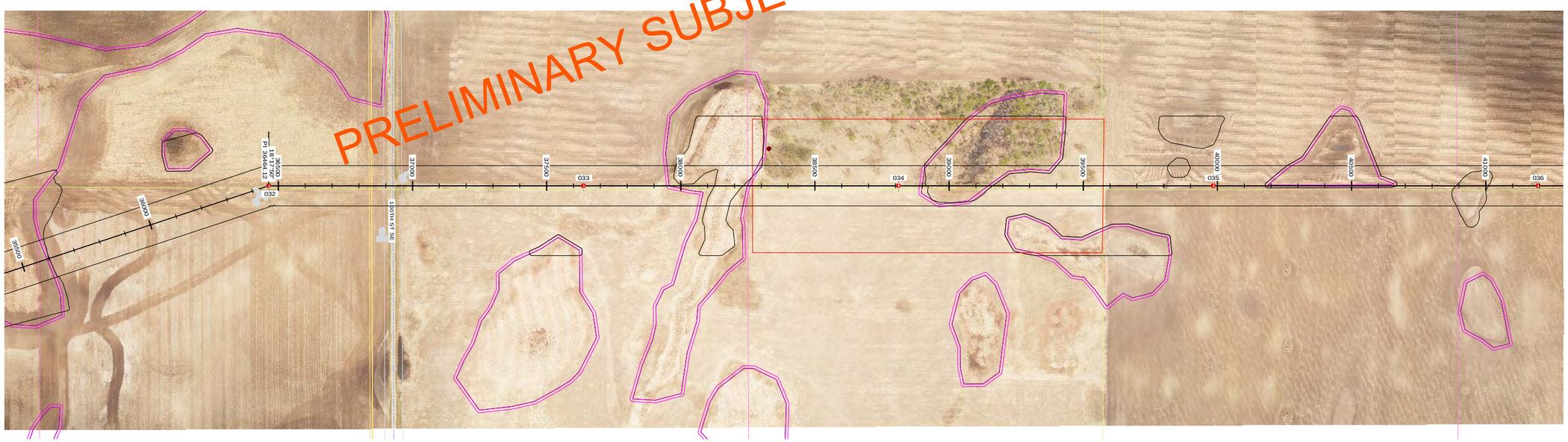
200.0 FT. HORIZ. SCALE
40.0 FT. VERT. SCALE
NORTH

DWG. NO.
BSSE-PP-101-13
REVISION: Q
136508

EXHIBIT 1

PLS-CADD DRAWING





PRELIMINARY SUBJECT TO FINAL REVIEW

STRS: 032 - 036

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REVISIONS					
Q	V26: REVISED PER REVIEW	GMD	GMD		05/05/16
P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15
REV	DESCRIPTION	DWN	DGN	CHK	DATE

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA
CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSS+E
Big Stone South to Ellendale

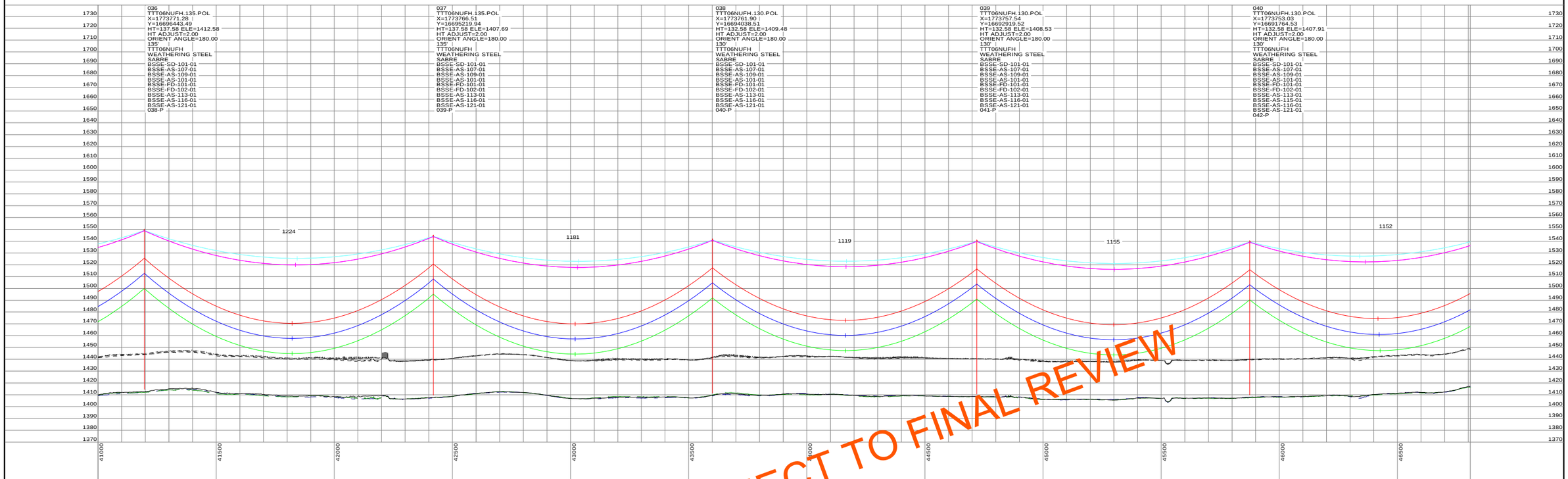
BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

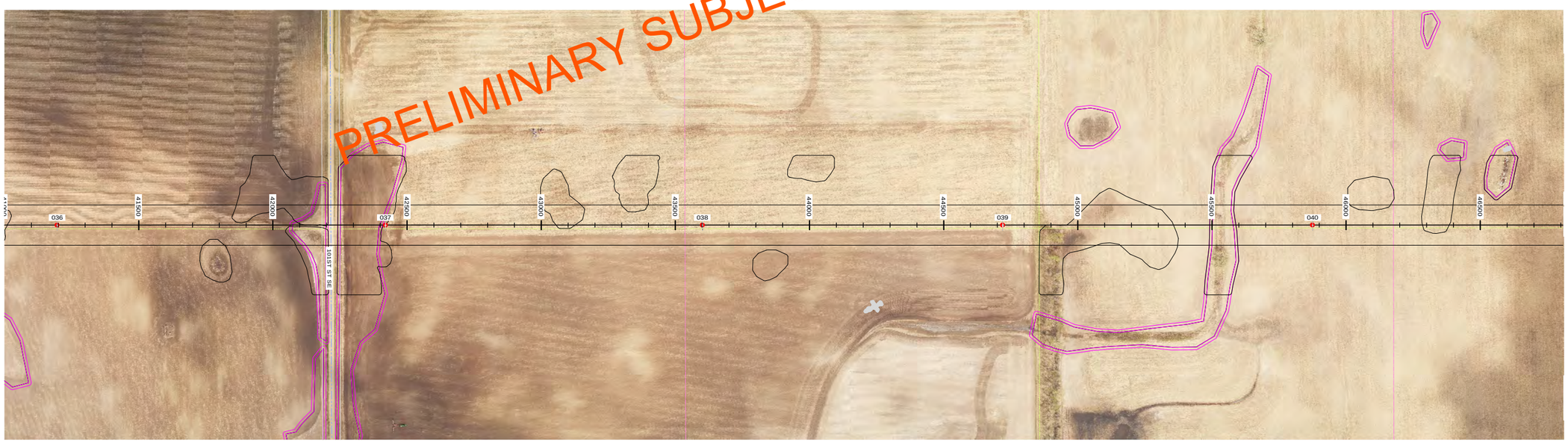
200.0 FT. HORIZ. SCALE
40.0 FT. VERT. SCALE
NORTH

DWG. NO.
BSSE-PP-101-14
REVISION: Q
136508

EXHIBIT 1

PLS-CADD DRAWING





PRELIMINARY SUBJECT TO FINAL REVIEW

STRS: 036 - 040

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REVISIONS					
Q	V26: REVISED PER REVIEW	GMD	GMD		05/05/16
P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15
REV	DESCRIPTION	DWN	DGN	CHK	DATE

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA
CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSS+E
Big Stone South to Ellendale

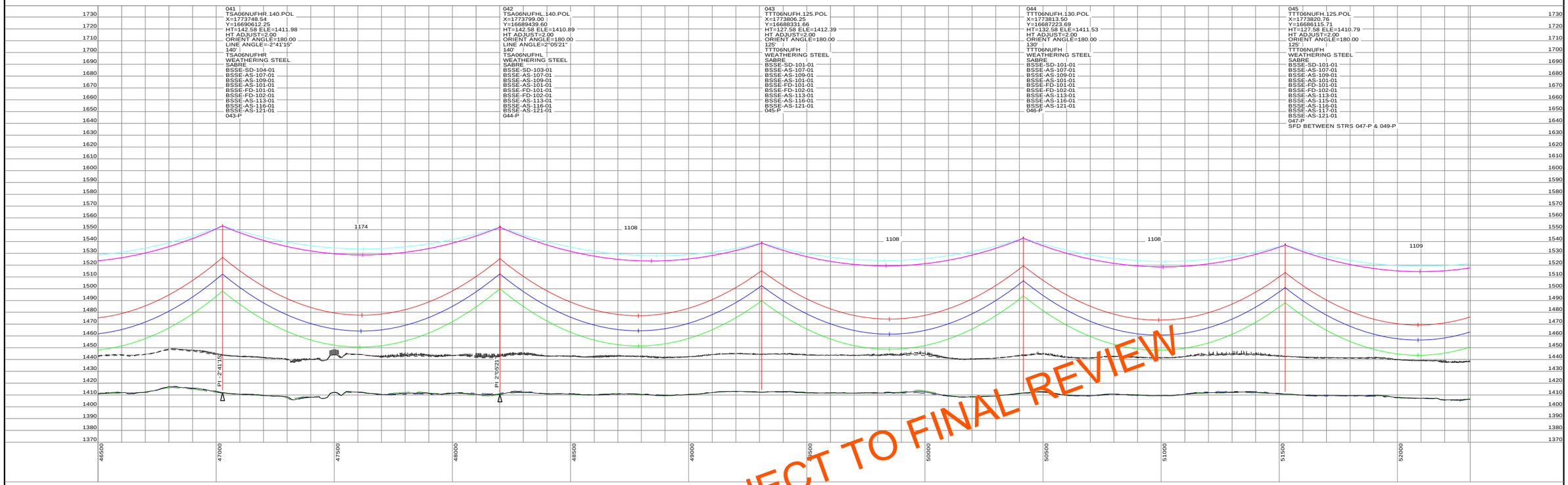
BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

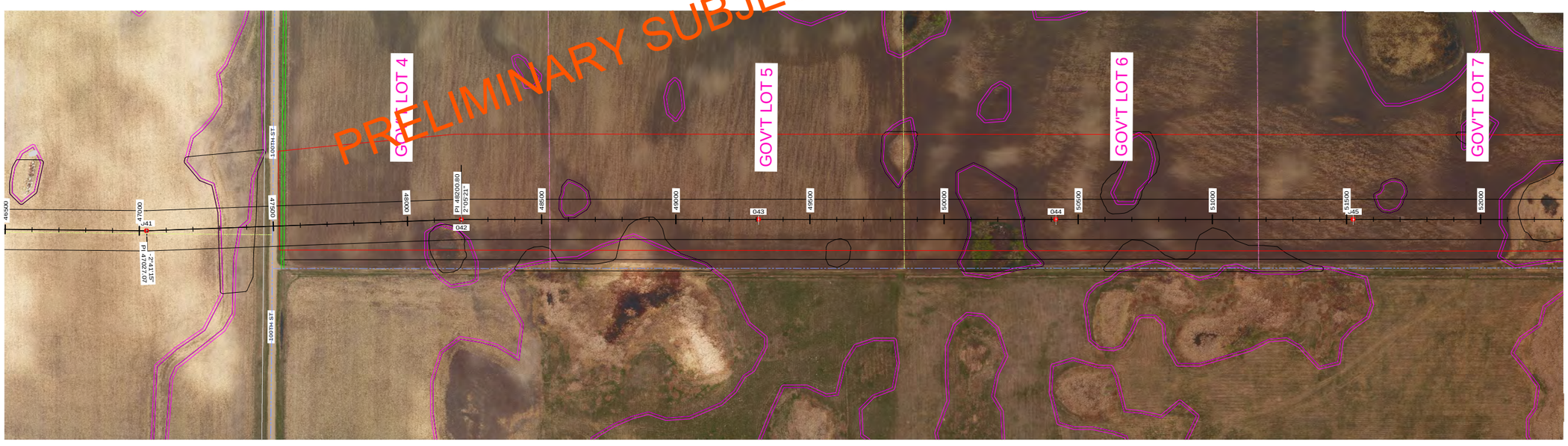
200.0 FT. HORIZ. SCALE
40.0 FT. VERT. SCALE
NORTH

DWG. NO.
BSSE-PP-101-15
REVISION: Q
136508

EXHIBIT 1

PLS-CADD DRAWING





STRS: 041 - 045

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REV	DESCRIPTION	DWN	DGN	CHK	DATE
Q	V26: REVISED PER REVIEW	GMD	GMD		05/05/16
P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA
CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSS+E
Big Stone South to Ellendale

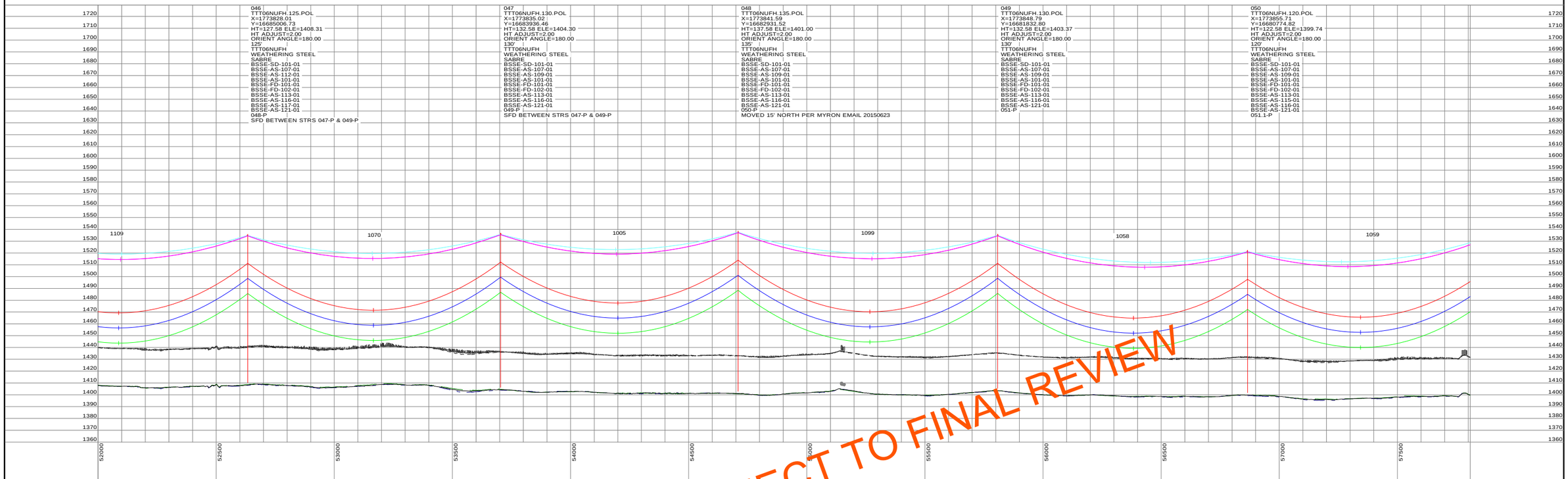
BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

200.0 FT. HORIZ. SCALE
40.0 FT. VERT. SCALE
NORTH

DWG. NO.
BSSE-PP-101-16
REVISION: Q
136508

EXHIBIT 1

PLS-CADD DRAWING



STRS: 046 - 050

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REVISIONS					
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P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15
REV	DESCRIPTION	DWN	DGN	CHK	DATE

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA
CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSS+E
Big Stone South to Ellendale

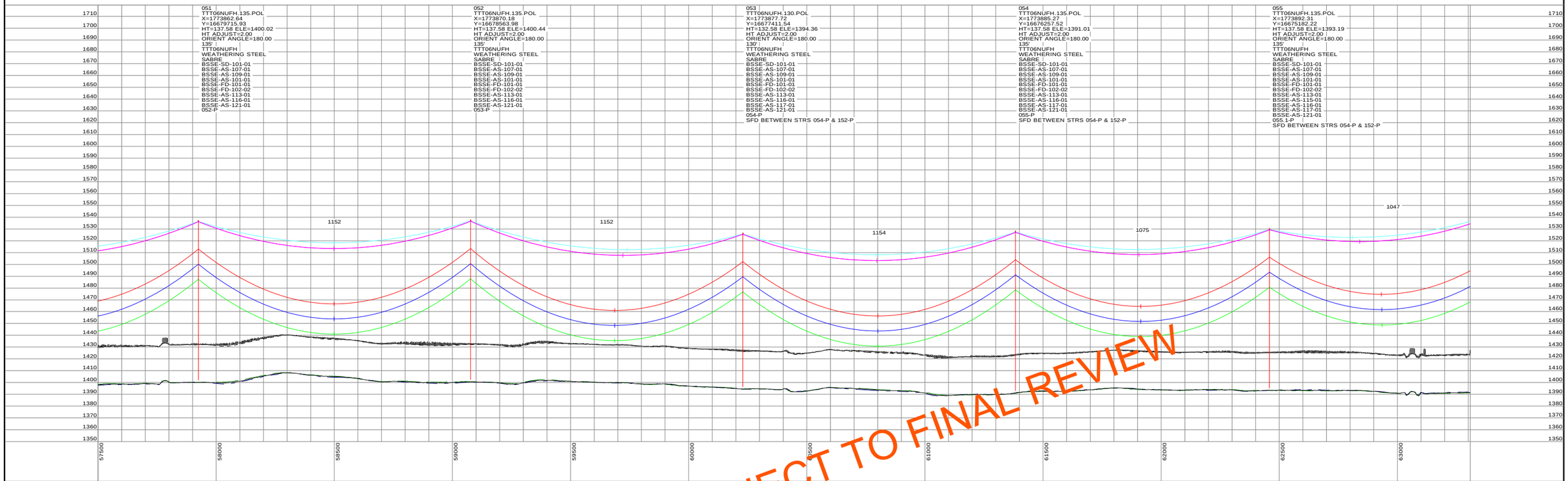
BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

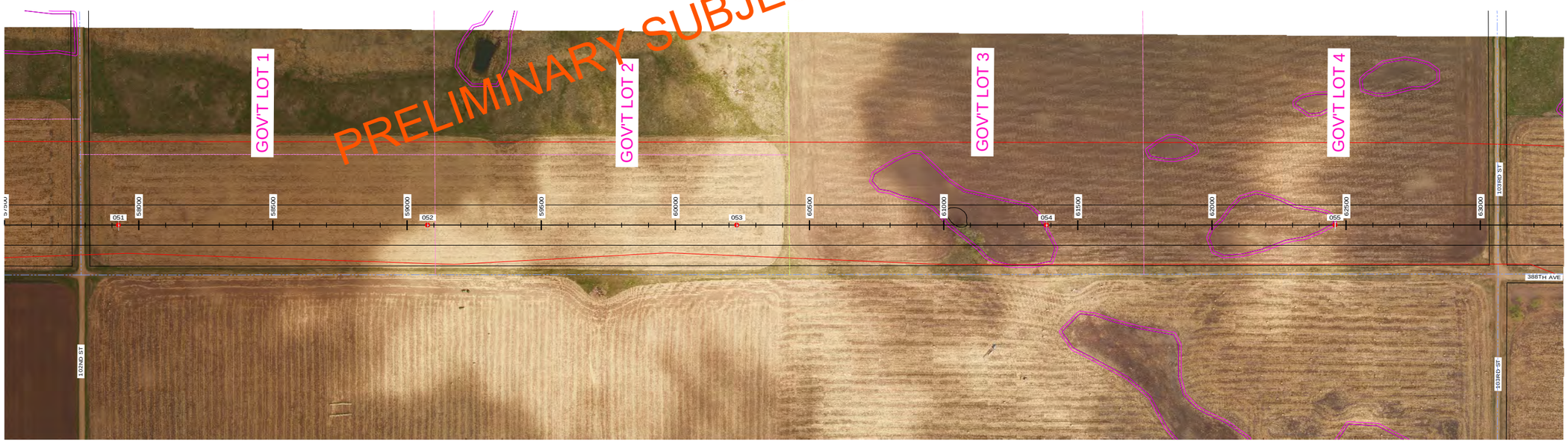
200.0 FT. HORIZ. SCALE
40.0 FT. VERT. SCALE
NORTH

DWG. NO.
BSSE-PP-101-17
REVISION: Q
136508

EXHIBIT 1

PLS-CADD DRAWING





PRELIMINARY SUBJECT TO FINAL REVIEW

STRS: 051 - 055

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REVISIONS					
Q	V26: REVISED PER REVIEW	GMD	GMD		05/05/16
P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15
REV	DESCRIPTION	DWN	DGN	CHK	DATE

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA
CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSS+E
Big Stone South to Ellendale

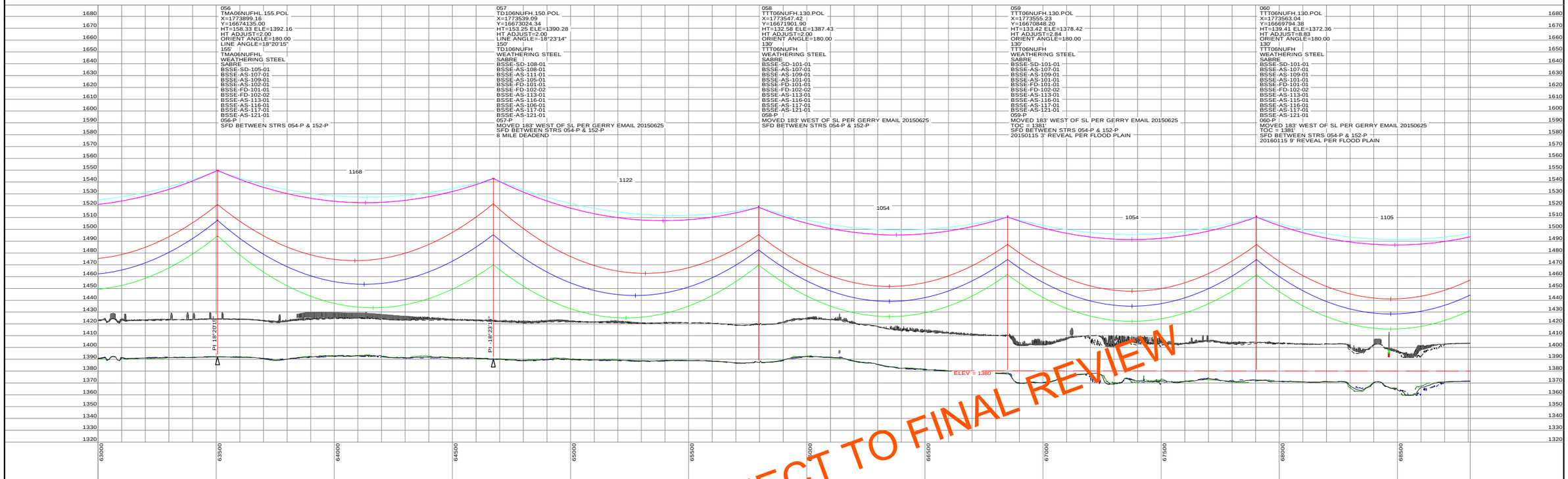
BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

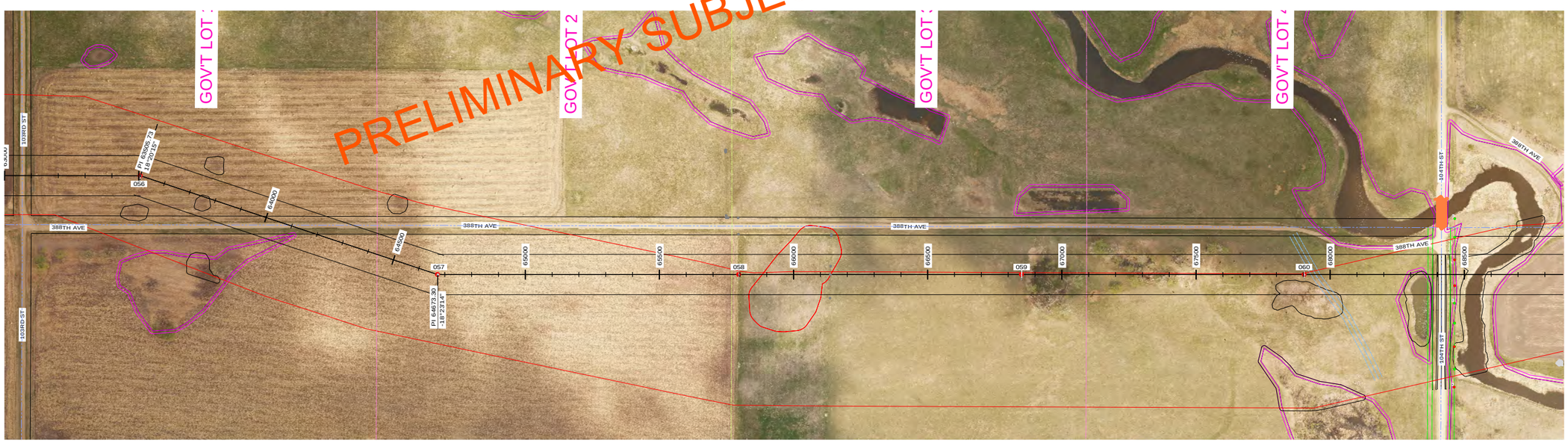
200.0 FT. HORIZ. SCALE
40.0 FT. VERT. SCALE
NORTH

DWG. NO.
BSSE-PP-101-18
REVISION: Q
136508

EXHIBIT 1

PLS-CADD DRAWING





STRS: 056 - 060

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REVISIONS					
Q	V26: REVISED PER REVIEW	GMD	GMD		05/05/16
P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15
REV	DESCRIPTION	DWN	DGN	CHK	DATE

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA
CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSS+E
Big Stone South to Ellendale

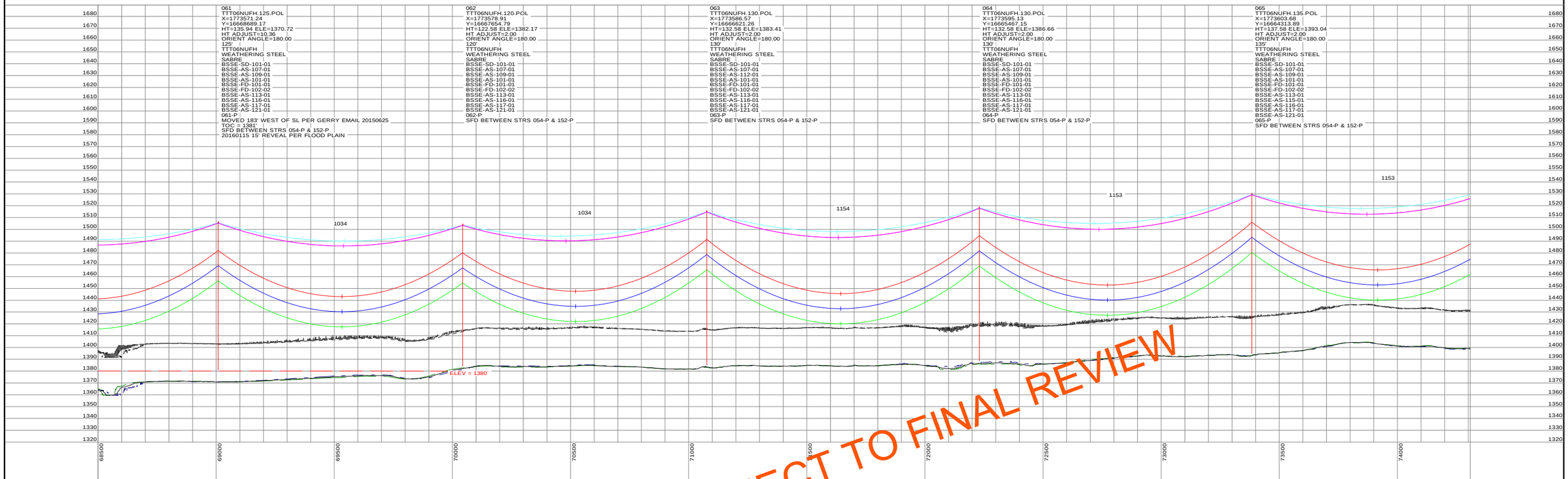
BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

200.0 FT. HORIZ. SCALE
40.0 FT. VERT. SCALE
NORTH

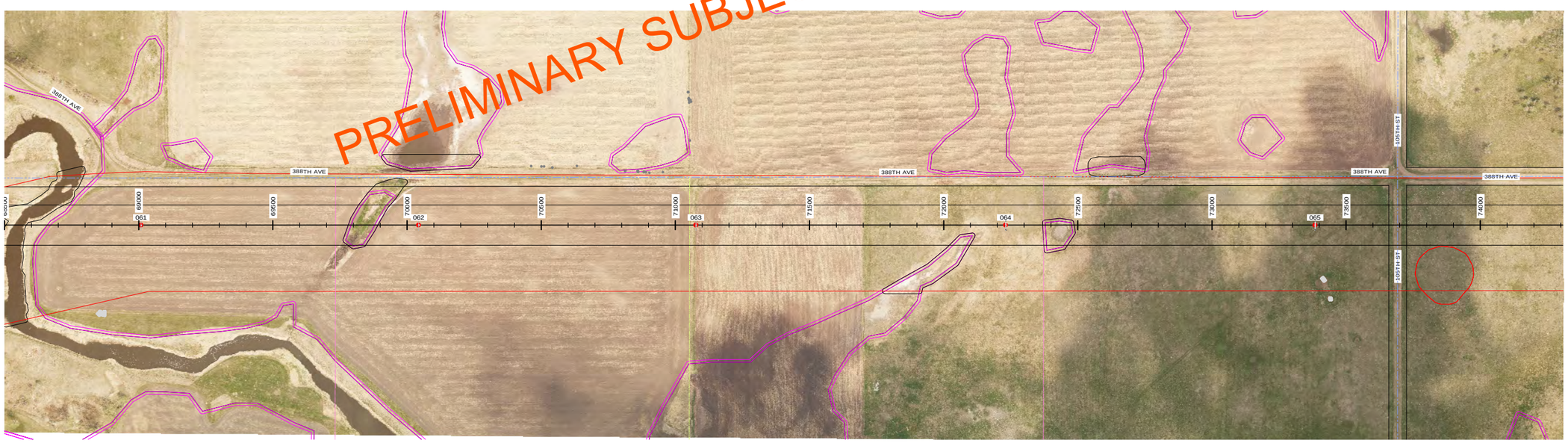
DWG. NO.
BSSE-PP-101-19
REVISION: Q
136508

EXHIBIT 1

PLS-CADD DRAWING



PRELIMINARY SUBJECT TO FINAL REVIEW



STRS: 061 - 065

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REVISIONS					
Q	V26: REVISED PER REVIEW	GMD	GMD		05/05/16
P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15
REV	DESCRIPTION	DWN	DGN	CHK	DATE

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA

CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSS+E
Big Stone South to Ellendale

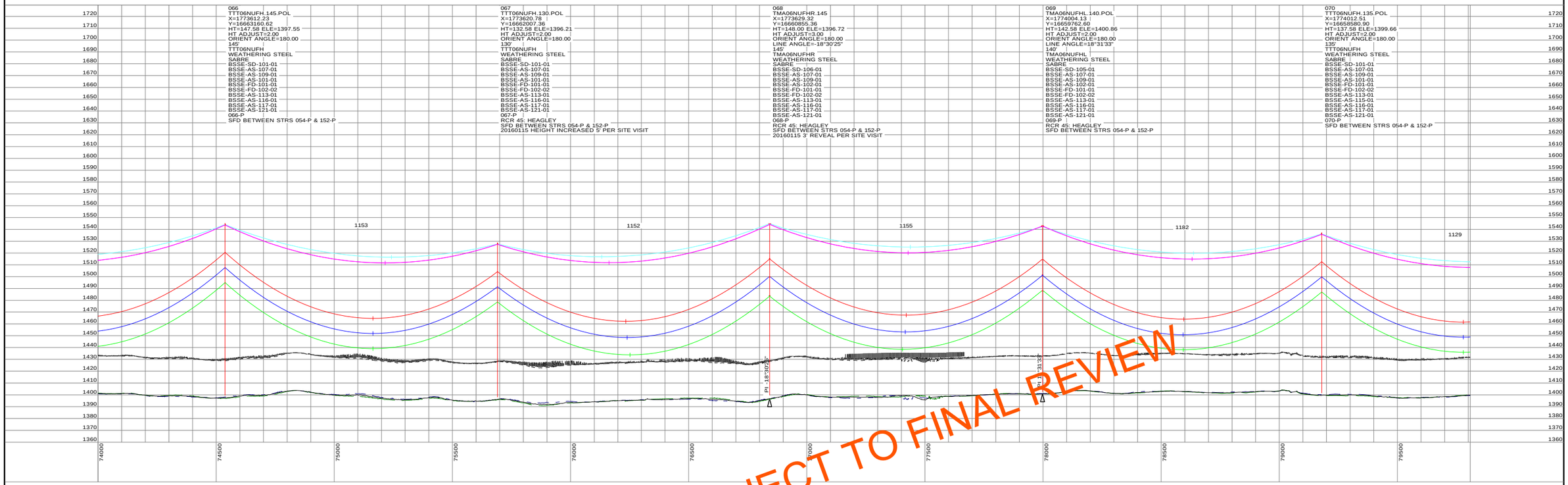
BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

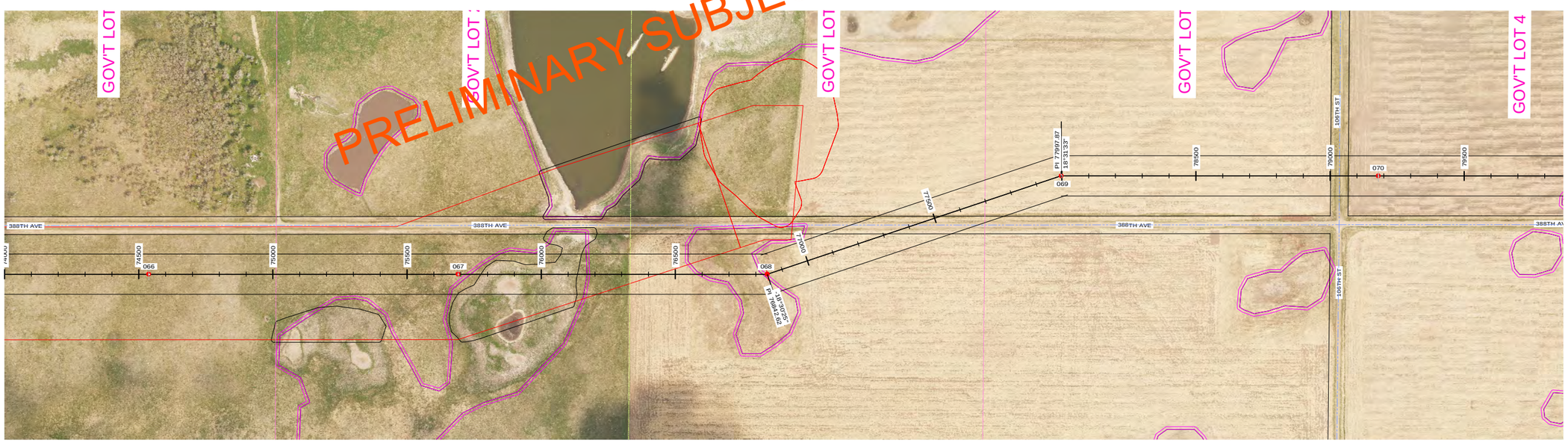
200.0 FT. HORIZ. SCALE
40.0 FT. VERT. SCALE
NORTH

DWG. NO.
BSSE-PP-101-20
REVISION: Q
136508

EXHIBIT 1

PLS-CADD DRAWING





STRS: 066 - 070

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REVISIONS					
Q	V26: REVISED PER REVIEW	GMD	GMD		05/05/16
P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15
REV	DESCRIPTION	DWN	DGN	CHK	DATE

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA

CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSS+E
Big Stone South to Ellendale

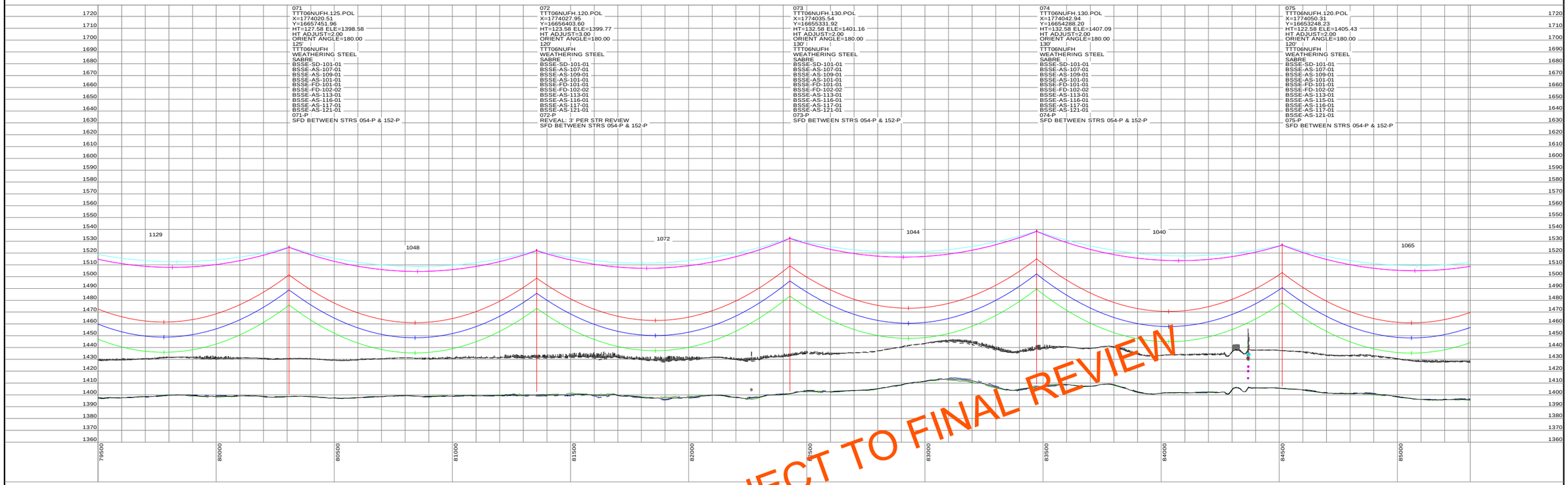
BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

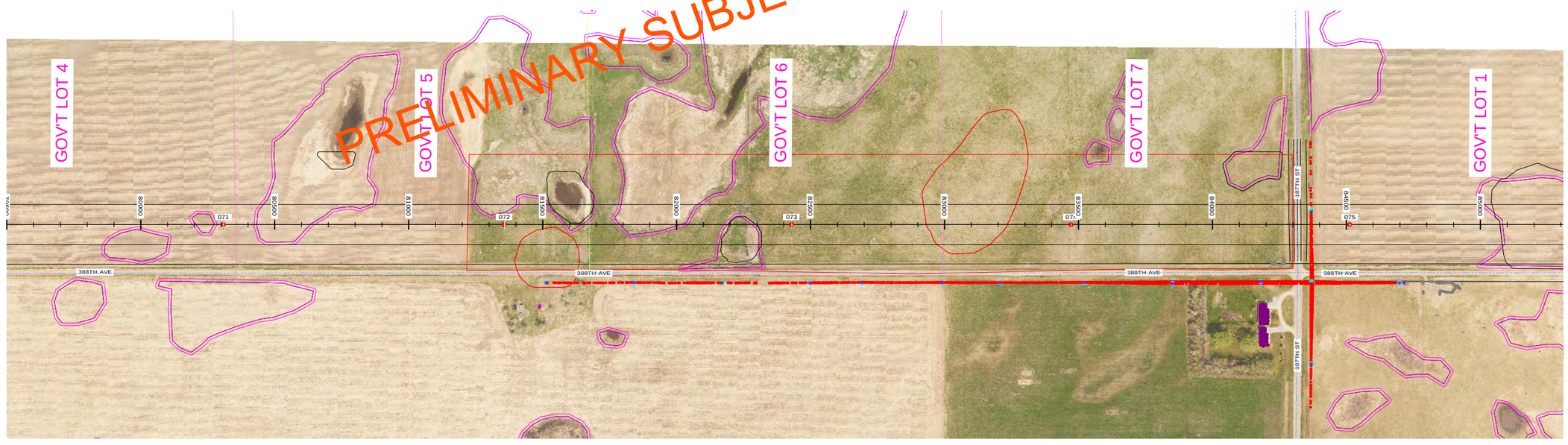
200.0 FT. HORIZ. SCALE
40.0 FT. VERT. SCALE
NORTH

DWG. NO.
BSSE-PP-101-21
REVISION: Q
136508

EXHIBIT 1

PLS-CADD DRAWING





STRS: 071 - 075

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REVISIONS					
Q	V26: REVISED PER REVIEW	GMD	GMD		05/05/16
P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15
REV	DESCRIPTION	DWN	DGN	CHK	DATE

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA

CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSS+E
Big Stone South to Ellendale

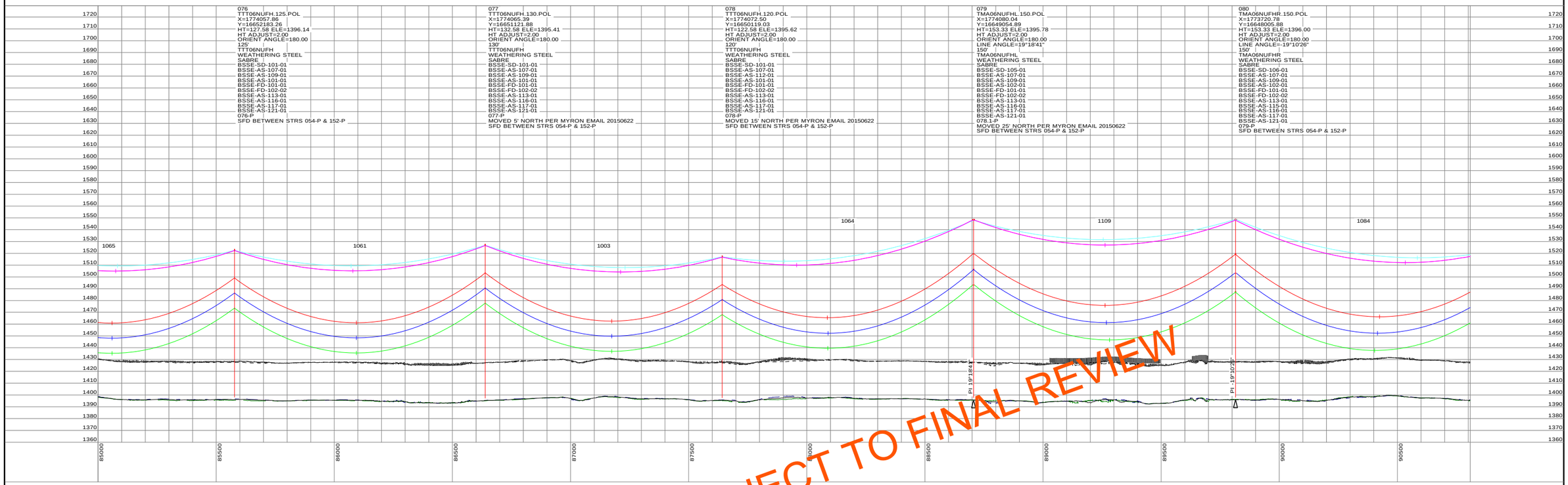
BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

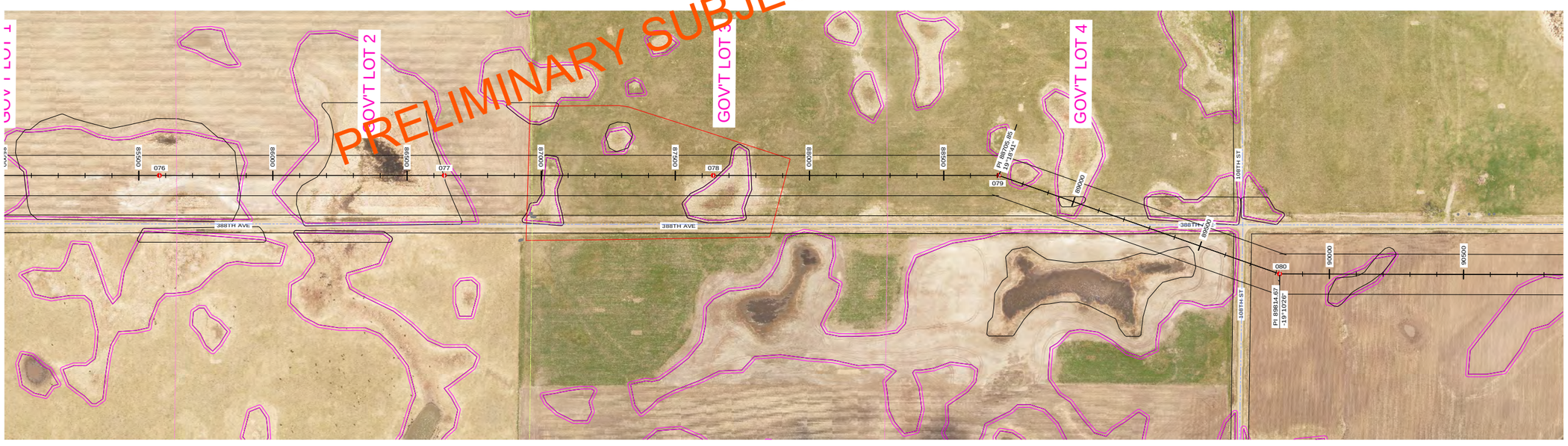
200.0 FT. HORIZ. SCALE
40.0 FT. VERT. SCALE
NORTH

DWG. NO.
BSSE-PP-101-22
REVISION: Q
136508

EXHIBIT 1

PLS-CADD DRAWING





STRS: 076 - 080

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REVISIONS					
Q	V26: REVISED PER REVIEW	GMD	GMD		05/05/16
P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15
REV	DESCRIPTION	DWN	DGN	CHK	DATE

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA
CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSS+E
Big Stone South to Ellendale

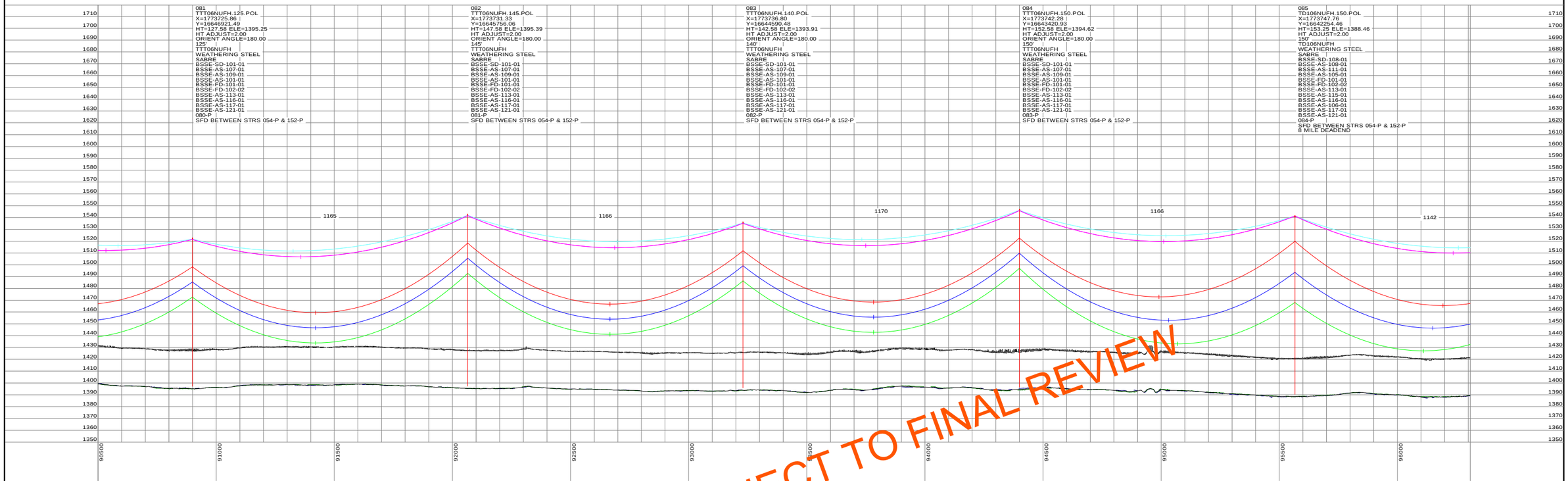
BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

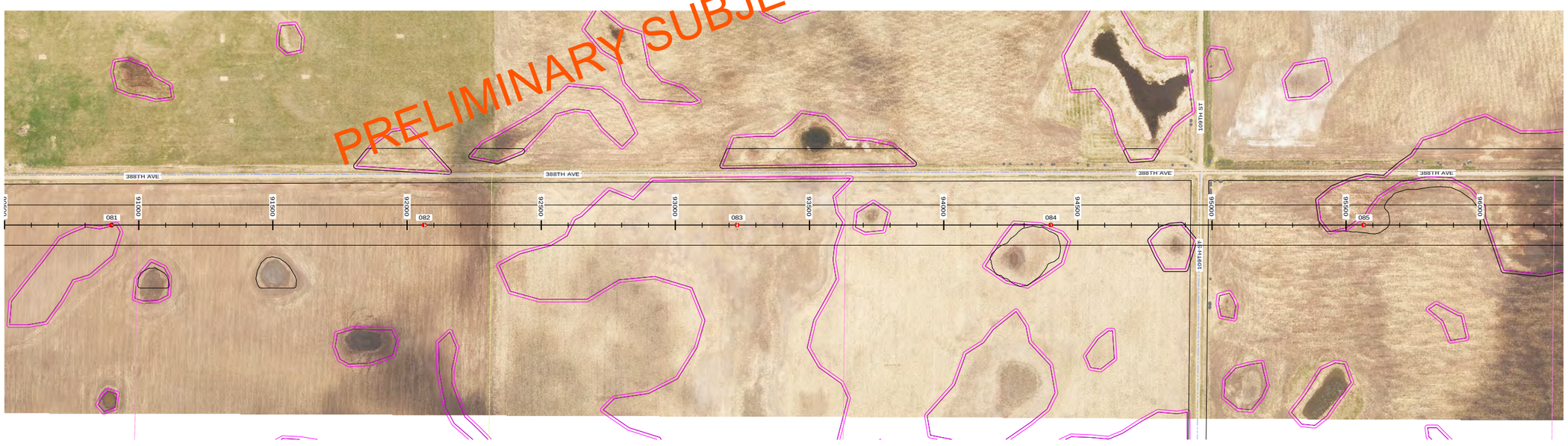
200.0 FT. HORIZ. SCALE
40.0 FT. VERT. SCALE
NORTH

DWG. NO.
BSSE-PP-101-23
REVISION: Q
136508

EXHIBIT 1

PLS-CADD DRAWING





PRELIMINARY SUBJECT TO FINAL REVIEW

STRS: 081 - 085

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REVISIONS					
Q	V26: REVISED PER REVIEW	GMD	GMD		05/05/16
P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15
REV	DESCRIPTION	DWN	DGN	CHK	DATE

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA

CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSS+E
Big Stone South to Ellendale

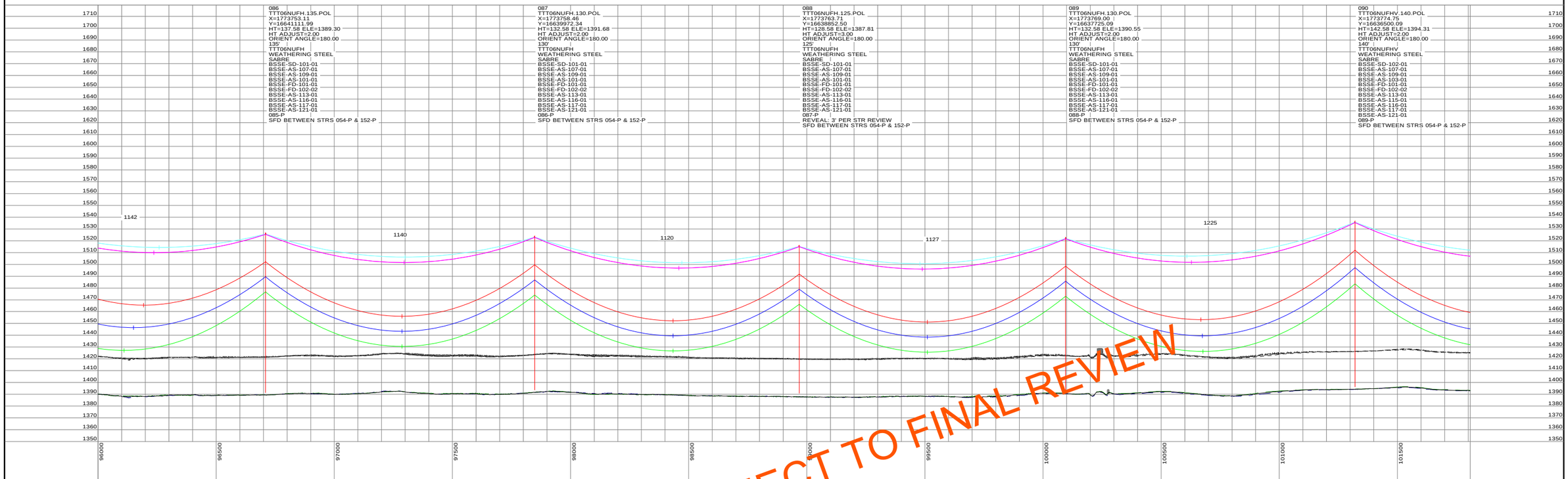
BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

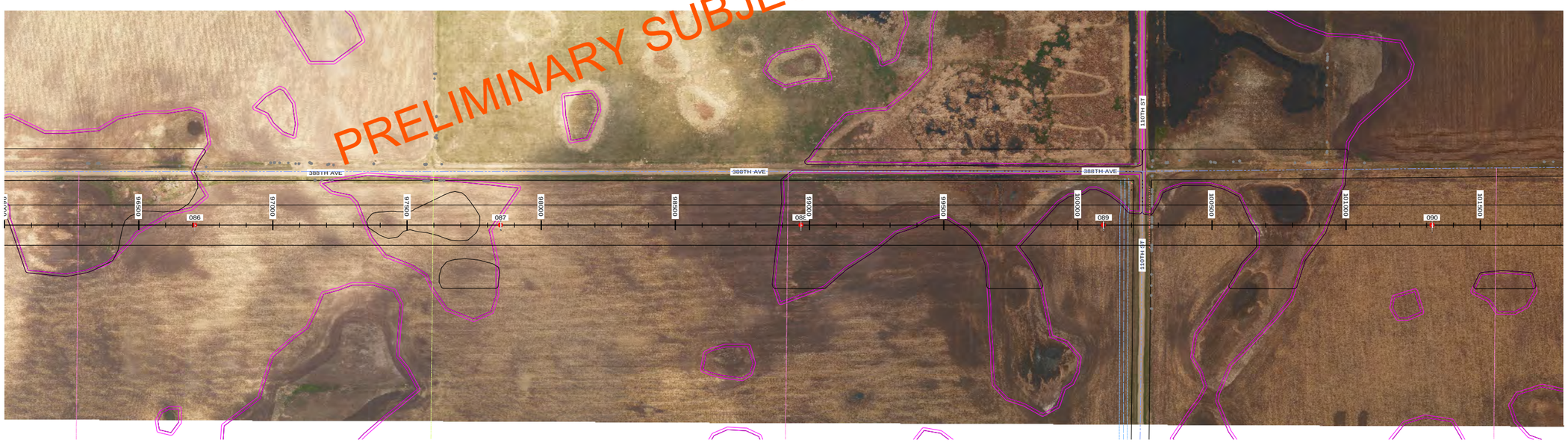
200.0 FT. HORIZ. SCALE
40.0 FT. VERT. SCALE
NORTH

DWG. NO.
BSSE-PP-101-24
REVISION: Q
136508

EXHIBIT 1

PLS-CADD DRAWING





PRELIMINARY SUBJECT TO FINAL REVIEW

STRS: 086 - 090

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REVISIONS					
Q	V26: REVISED PER REVIEW	GMD	GMD		05/05/16
P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15
REV	DESCRIPTION	DWN	DGN	CHK	DATE

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA
CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSS+E
Big Stone South to Ellendale

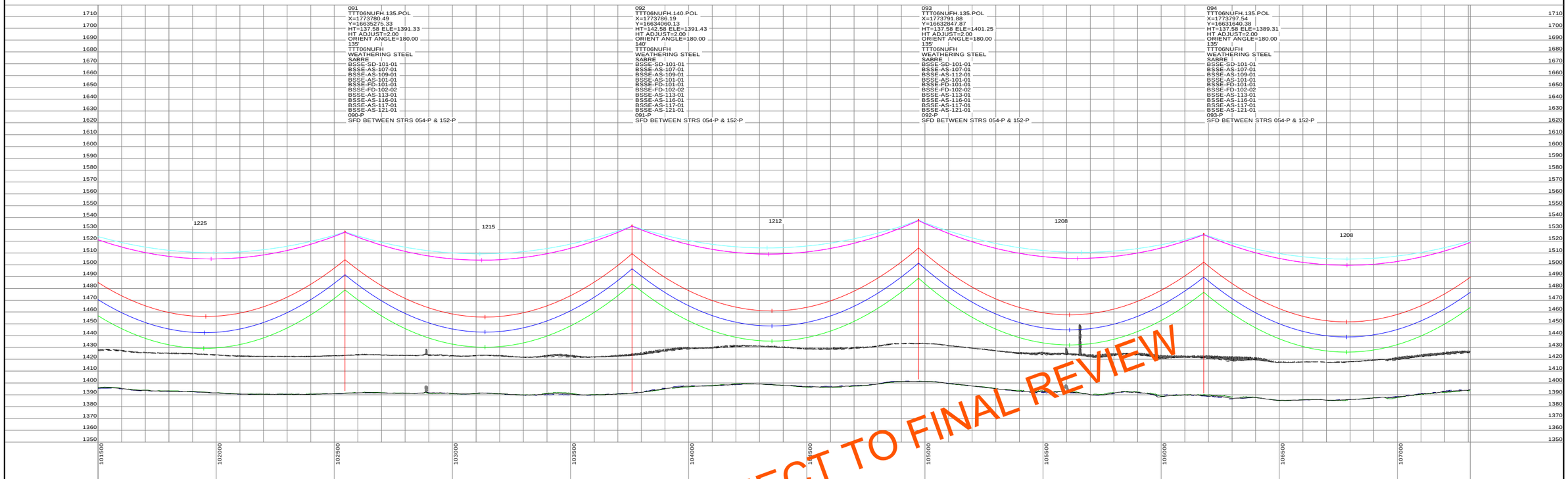
BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

200.0 FT. HORIZ. SCALE
40.0 FT. VERT. SCALE
NORTH

DWG. NO.
BSSE-PP-101-25
REVISION: Q
136508

EXHIBIT 1

PLS-CADD DRAWING



STRS: 091 - 094

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REVISIONS					
Q	V26: REVISED PER REVIEW	GMD	GMD		05/05/16
P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15
REV	DESCRIPTION	DWN	DGN	CHK	DATE

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA

CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSS+E
Big Stone South to Ellendale

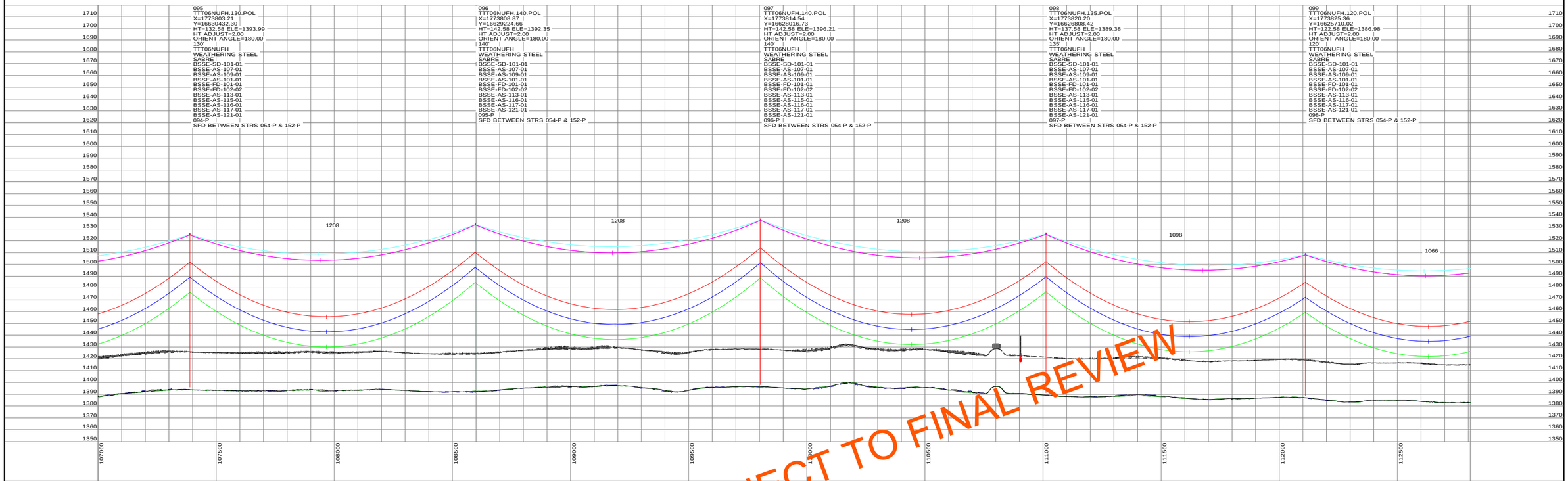
BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

200.0 FT. HORIZ. SCALE
40.0 FT. VERT. SCALE
NORTH

DWG. NO.
BSSE-PP-101-26
REVISION: Q
136508

EXHIBIT 1

PLS-CADD DRAWING



STRS: 095 - 099

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REVISIONS					
Q	V26: REVISED PER REVIEW	GMD	GMD		05/05/16
P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15
REV	DESCRIPTION	DWN	DGN	CHK	DATE

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA
CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSS+E
Big Stone South to Ellendale

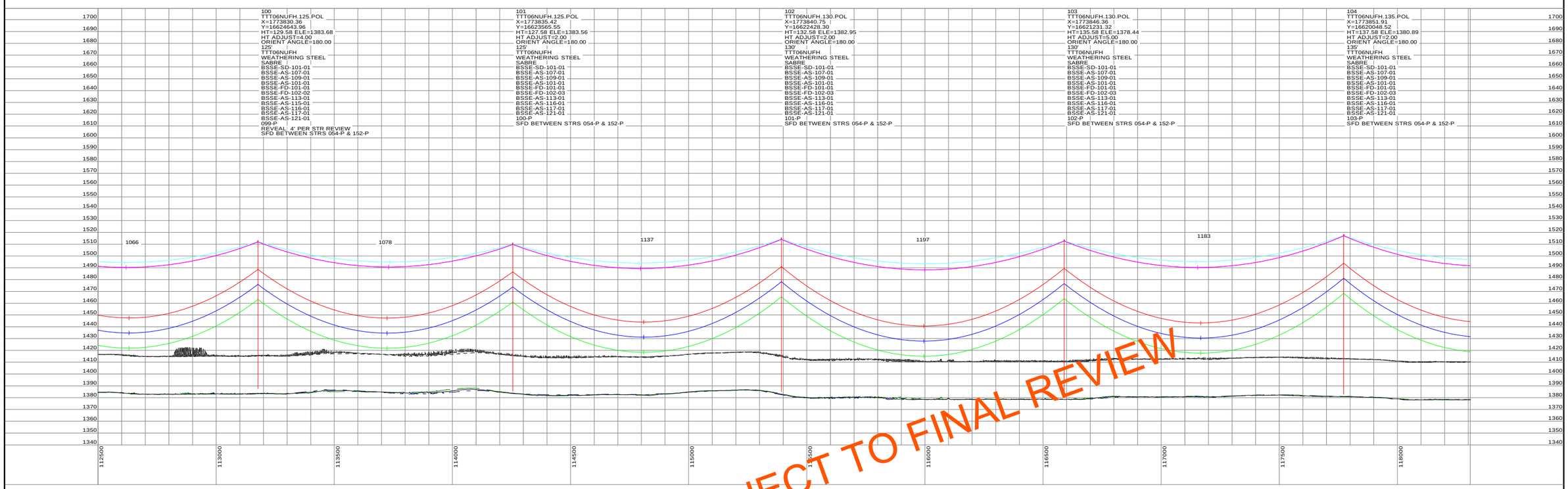
BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

200.0 FT. HORIZ. SCALE
40.0 FT. VERT. SCALE
NORTH

DWG. NO.
BSSE-PP-101-27
REVISION: Q
136508

EXHIBIT 1

PLS-CADD DRAWING



STRS: 100 - 104

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REVISIONS					
Q	V26: REVISED PER REVIEW	GMD	GMD		05/05/16
P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15
REV	DESCRIPTION	DWN	DGN	CHK	DATE

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA
CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSS+E
Big Stone South to Ellendale

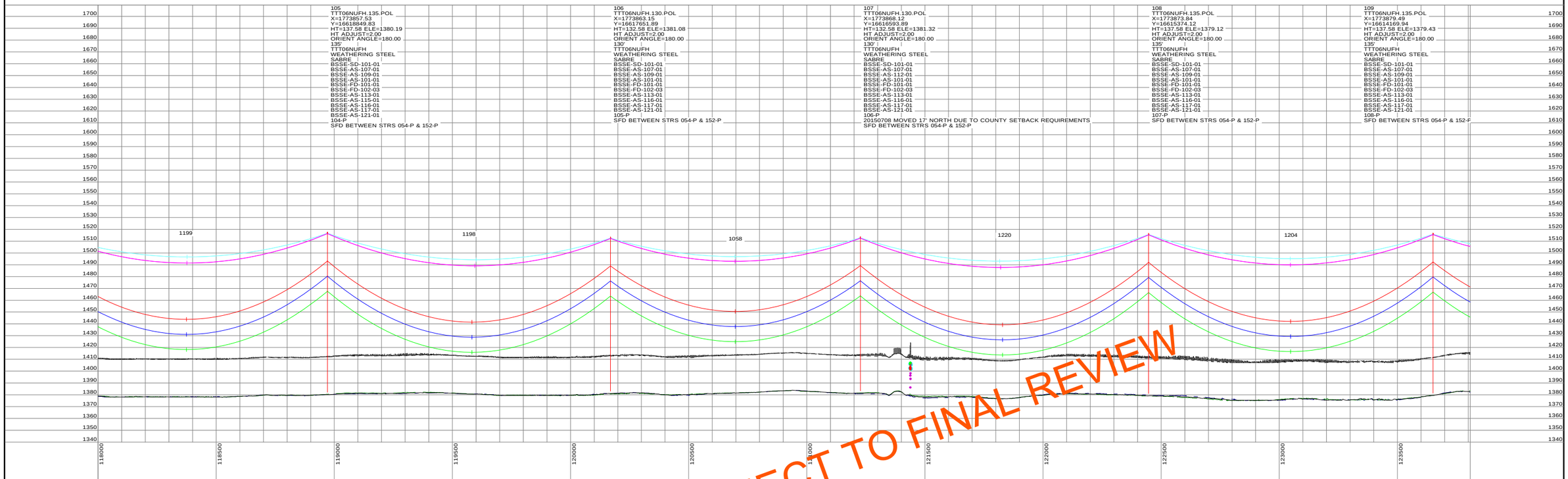
BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

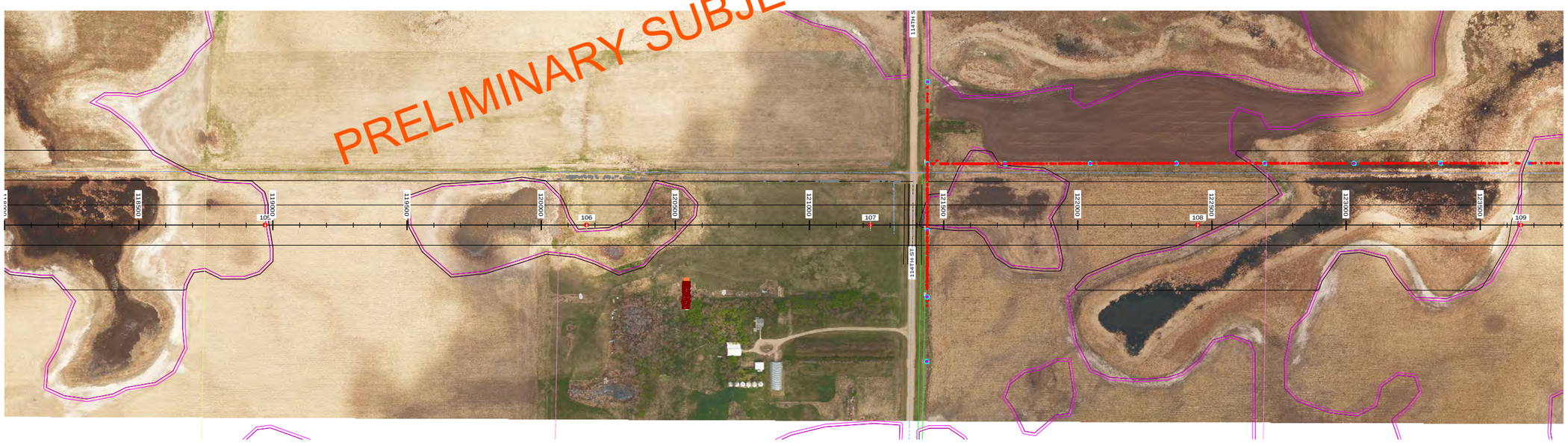
200.0 FT. HORIZ. SCALE
40.0 FT. VERT. SCALE
NORTH

DWG. NO.
BSSE-PP-101-28
REVISION: Q
136508

EXHIBIT 1

PLS-CADD DRAWING





STRS: 105 - 109

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REVISIONS					
Q	V26: REVISED PER REVIEW	GMD	GMD		05/05/16
P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15
REV	DESCRIPTION	DWN	DGN	CHK	DATE

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA
CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSS+E
Big Stone South to Ellendale

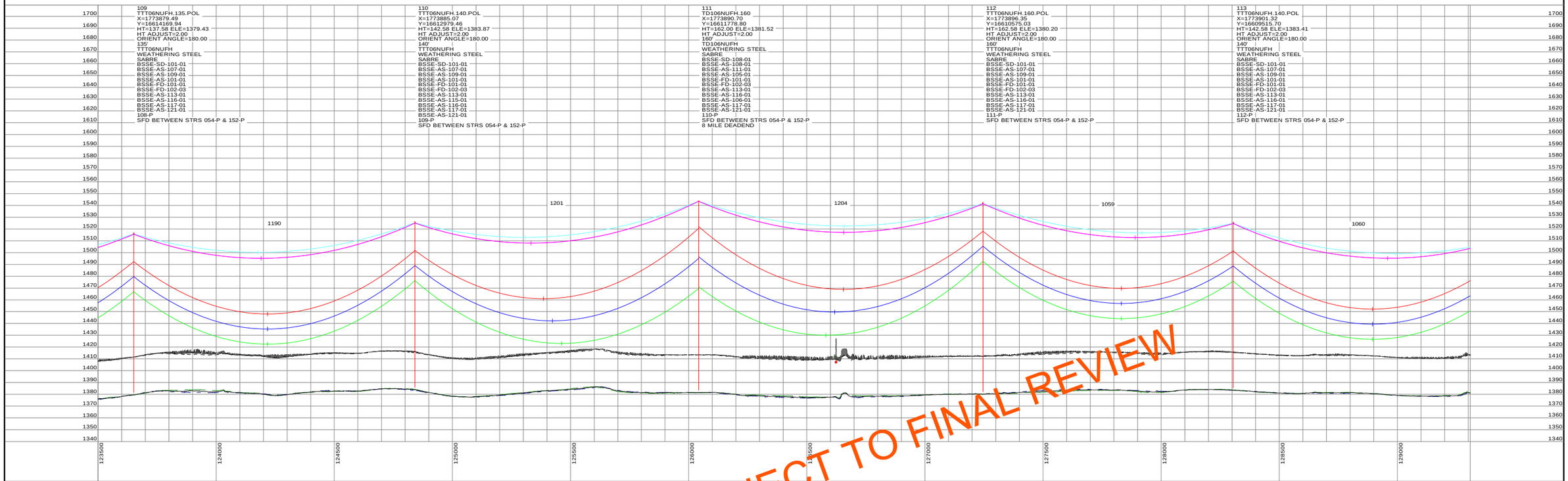
BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

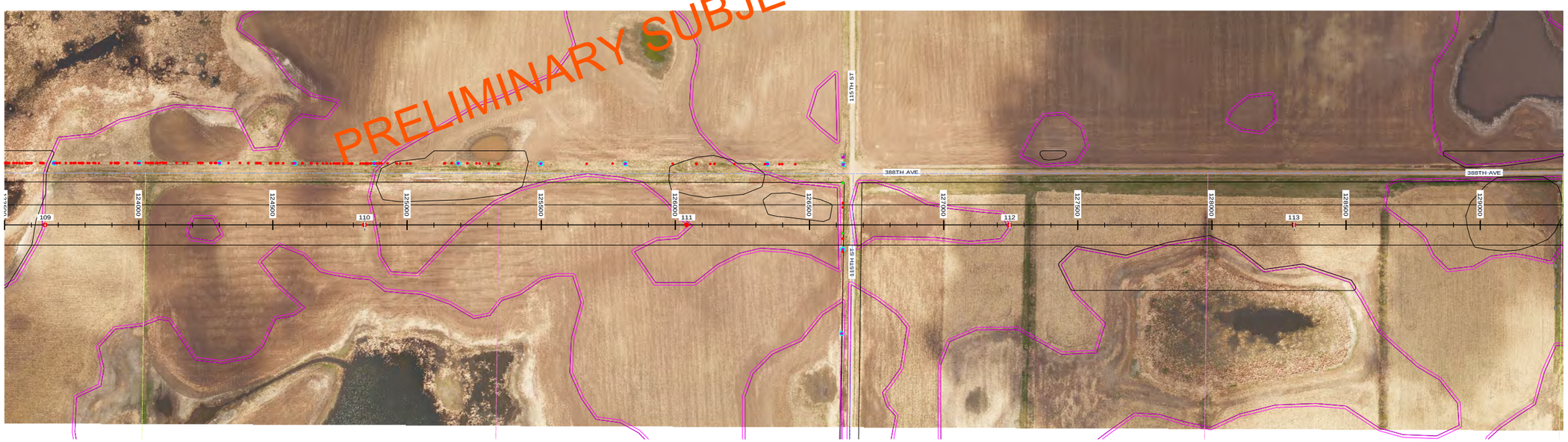
200.0 FT. HORIZ. SCALE
40.0 FT. VERT. SCALE
NORTH

DWG. NO.
BSSE-PP-101-29
REVISION: Q
136508

EXHIBIT 1

PLS-CADD DRAWING





STRS: 109 - 113

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REVISIONS					
Q	V26: REVISED PER REVIEW	GMD	GMD		05/05/16
P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15
REV	DESCRIPTION	DWN	DGN	CHK	DATE

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA
CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSS+E
Big Stone South to Ellendale

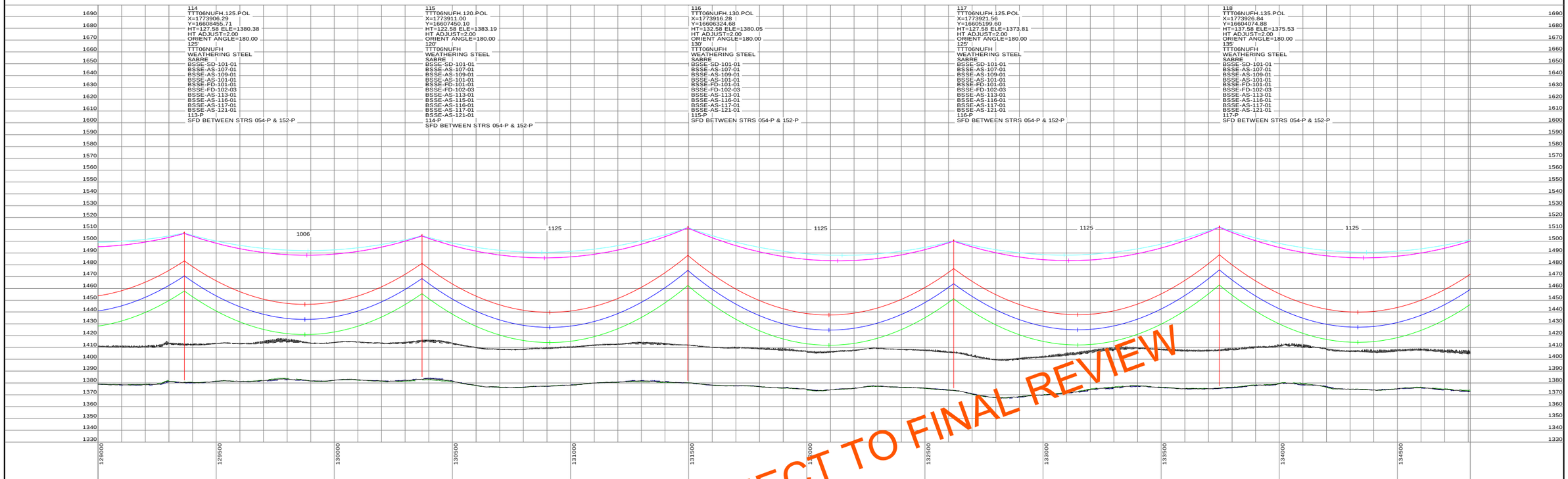
BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

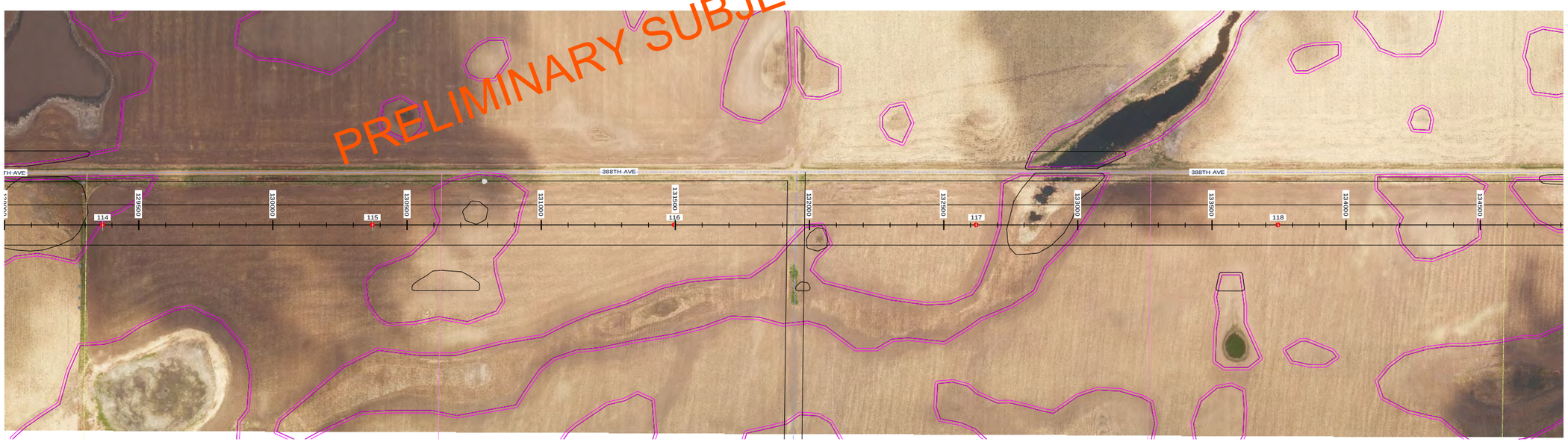
200.0 FT. HORIZ. SCALE
40.0 FT. VERT. SCALE
NORTH

DWG. NO.
BSSE-PP-101-30
REVISION: Q
136508

EXHIBIT 1

PLS-CADD DRAWING





PRELIMINARY SUBJECT TO FINAL REVIEW

STRS: 114 - 118

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REVISIONS					
Q	V26: REVISED PER REVIEW	GMD	GMD		05/05/16
P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15
REV	DESCRIPTION	DWN	DGN	CHK	DATE

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA

CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSS+E
Big Stone South to Ellendale

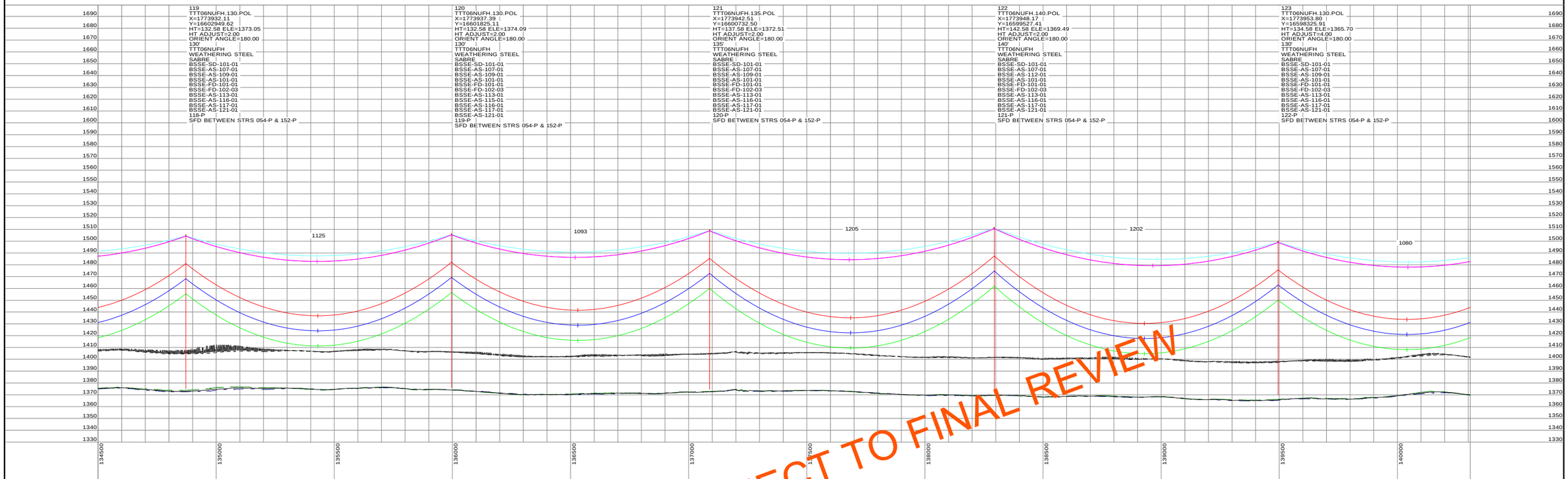
BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

200.0 FT. HORIZ. SCALE
40.0 FT. VERT. SCALE
NORTH

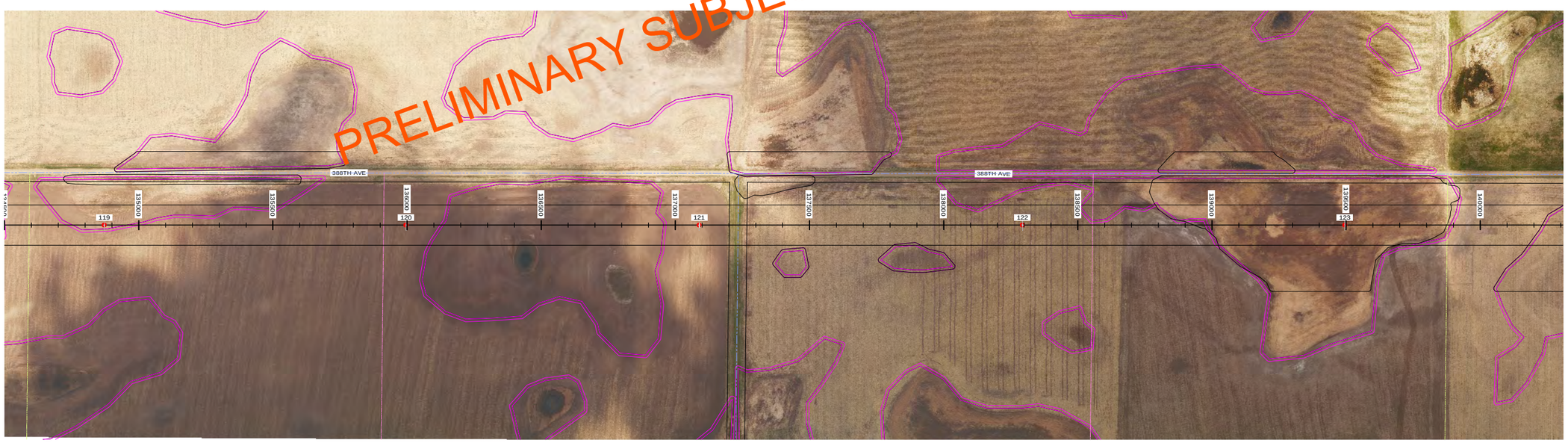
DWG. NO.
BSSE-PP-101-31
REVISION: Q
136508

EXHIBIT 1

PLS-CADD DRAWING



PRELIMINARY SUBJECT TO FINAL REVIEW



STRS: 119 - 123

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REV	DESCRIPTION	DWN	DGN	CHK	DATE
Q	V26: REVISED PER REVIEW	GMD	GMD		05/05/16
P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA
CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSS+E
Big Stone South to Ellendale

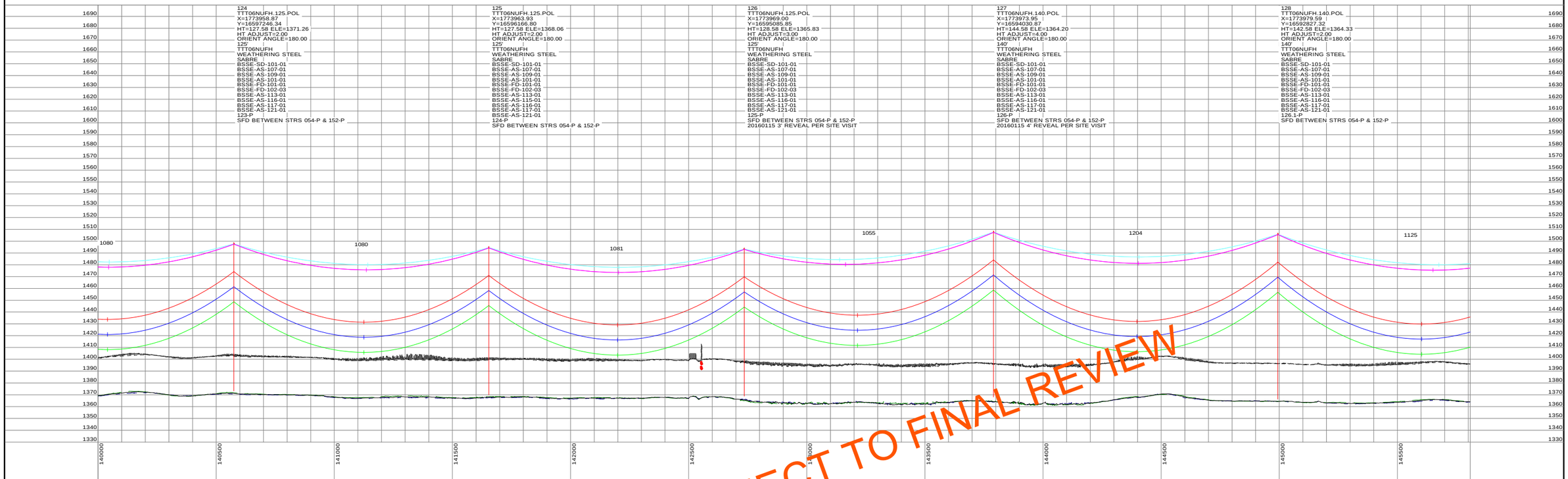
BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

200.0 FT. HORIZ. SCALE
40.0 FT. VERT. SCALE
NORTH

DWG. NO.
BSSE-PP-101-32
REVISION: Q
136508

EXHIBIT 1

PLS-CADD DRAWING



STRS: 124 - 128

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REV	DESCRIPTION	DWN	DGN	CHK	DATE
Q	V26: REVISED PER REVIEW	GMD	GMD		05/05/16
P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA
CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSS+E
Big Stone South to Ellendale

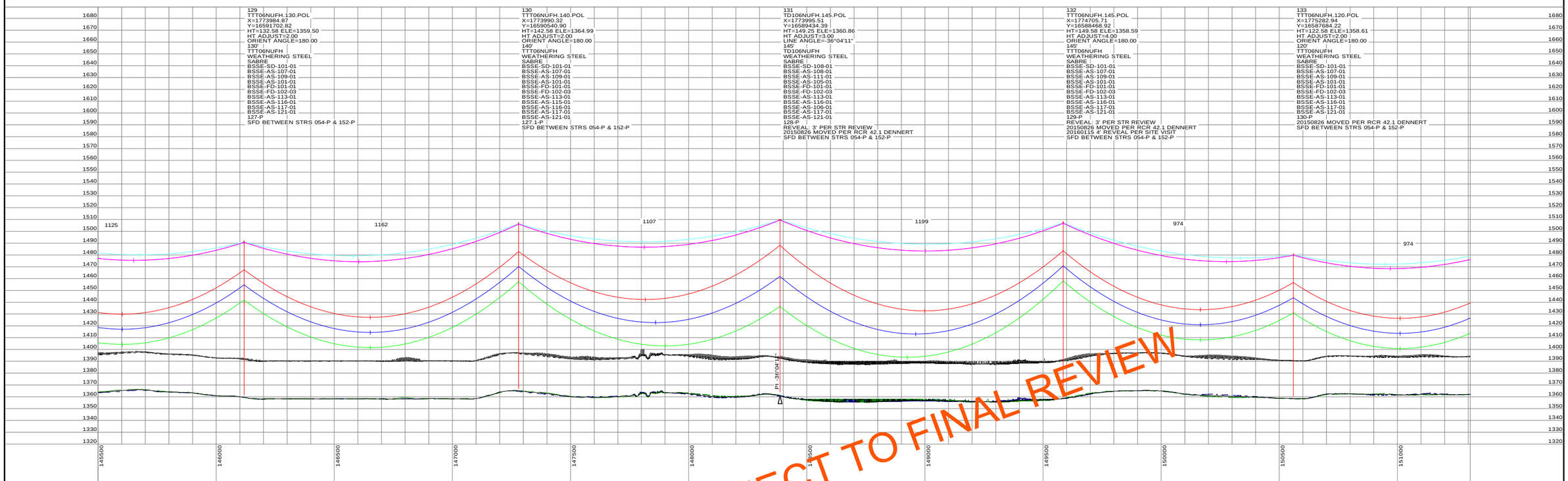
BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

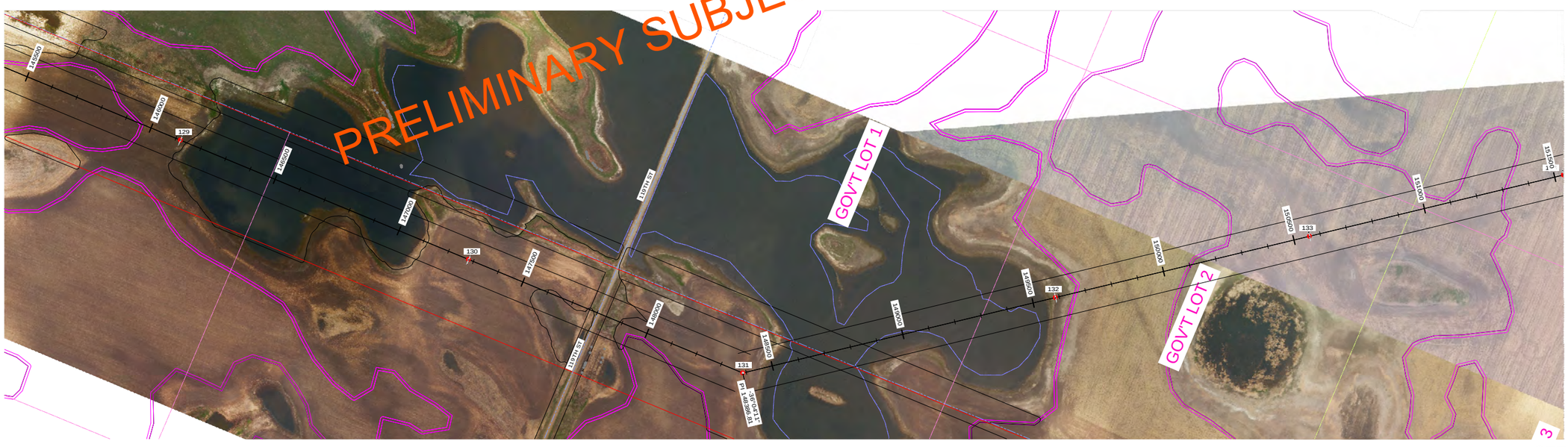
200.0 FT. HORIZ. SCALE
40.0 FT. VERT. SCALE
NORTH

DWG. NO.
BSSE-PP-101-33
REVISION: Q
136508

EXHIBIT 1

PLS-CADD DRAWING





STRS: 129 - 133

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REV	DESCRIPTION	DWN	DGN	CHK	DATE
Q	V26: REVISED PER REVIEW	GMD	GMD		05/05/16
P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15

REVISIONS

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA
CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSS+E
Big Stone South to Ellendale

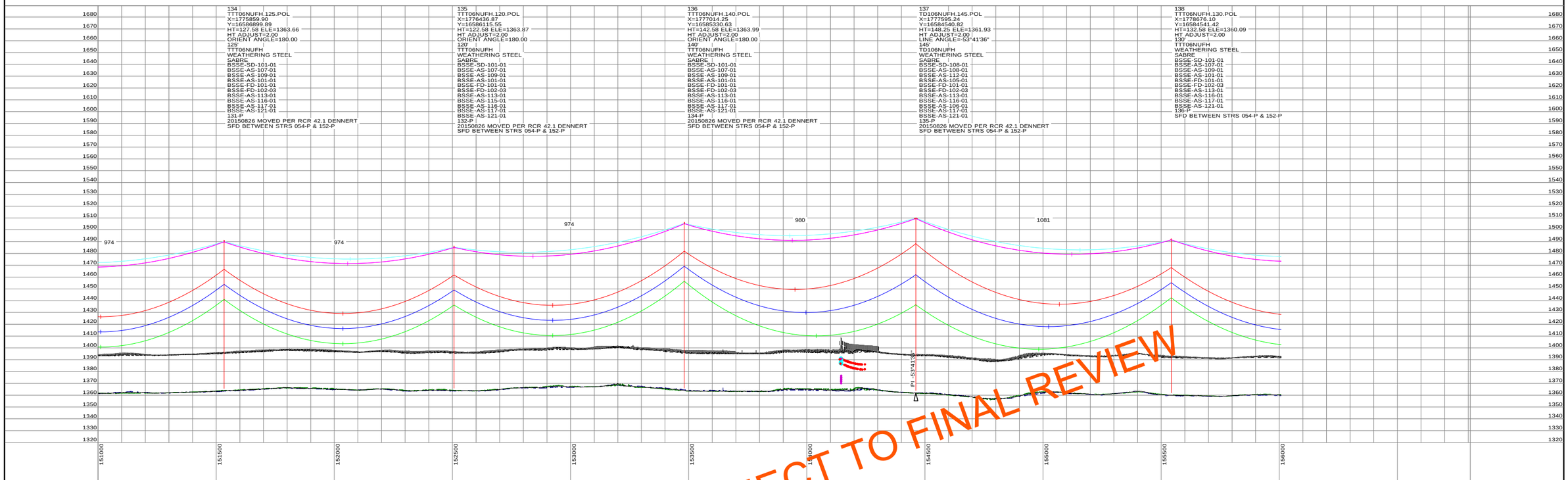
BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

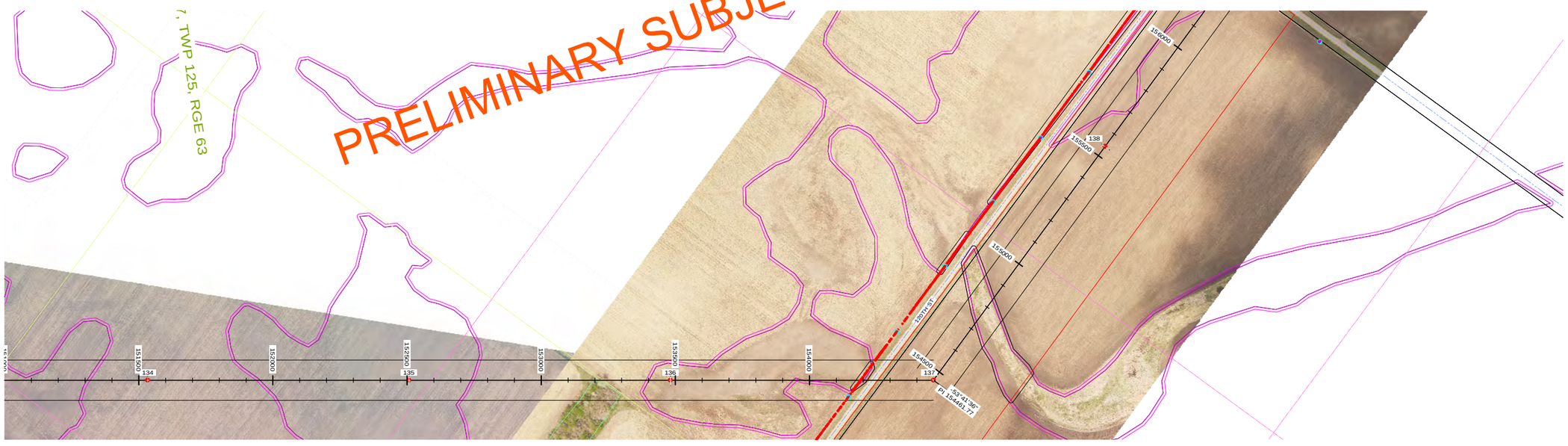
200.0 FT. HORIZ. SCALE
40.0 FT. VERT. SCALE
NORTH

DWG. NO.
BSSE-PP-101-34
REVISION: Q
136508

EXHIBIT 1

PLS-CADD DRAWING





STRS: 134 - 138

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REVISIONS					
Q	V26: REVISED PER REVIEW	GMD	GMD		05/05/16
P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15
REV	DESCRIPTION	DWN	DGN	CHK	DATE

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA
CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSS+E
Big Stone South to Ellendale

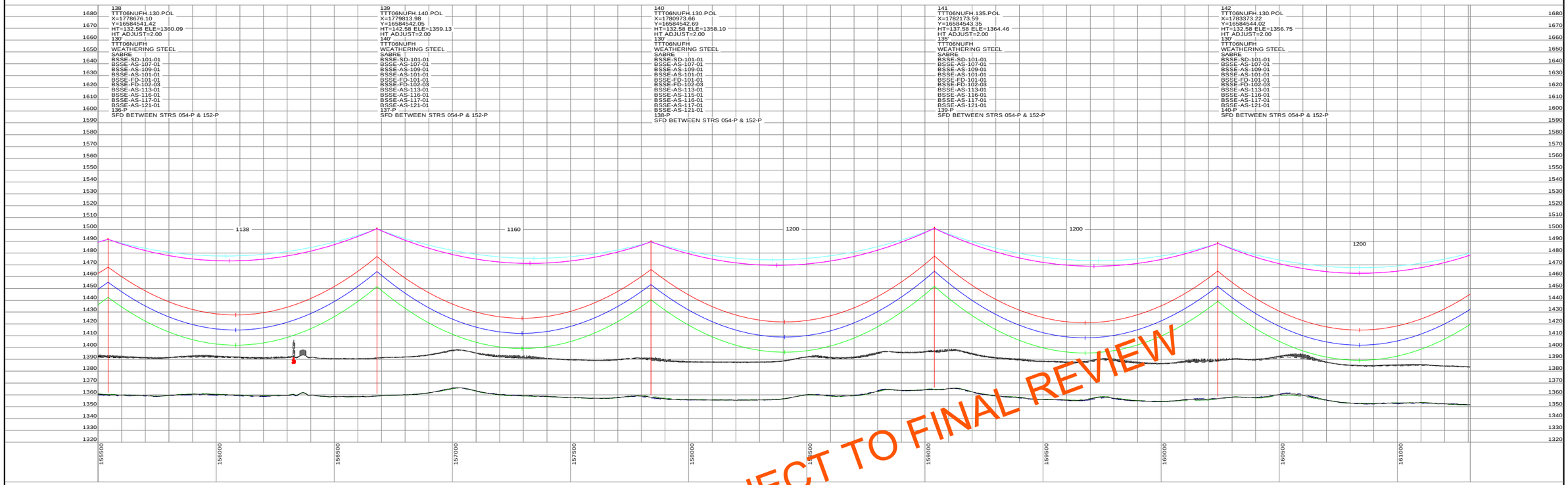
BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

200.0 FT. HORIZ. SCALE
40.0 FT. VERT. SCALE
NORTH

DWG. NO.
BSSE-PP-101-35
REVISION: Q
136508

EXHIBIT 1

PLS-CADD DRAWING



STRS: 138 - 142

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REVISIONS					
Q	V26: REVISED PER REVIEW	GMD	GMD		05/05/16
P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15
REV	DESCRIPTION	DWN	DGN	CHK	DATE

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA

CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSS+E
Big Stone South to Ellendale

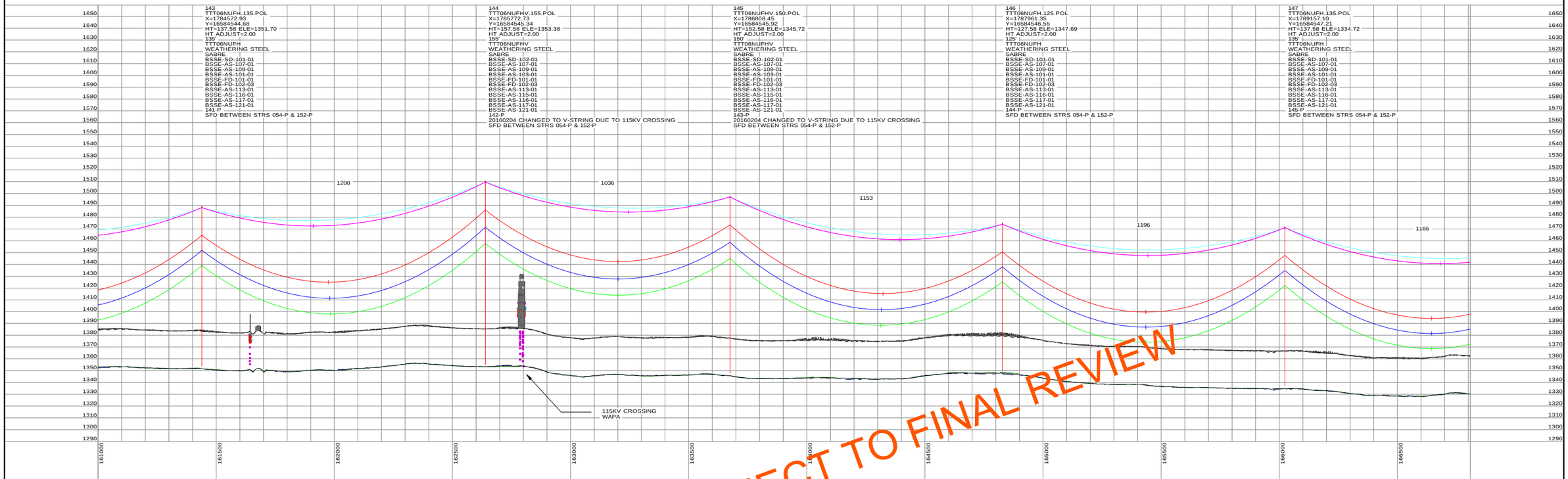
BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

200.0 FT. HORIZ. SCALE
40.0 FT. VERT. SCALE
NORTH

DWG. NO.
BSSE-PP-101-36
REVISION: Q
136508

EXHIBIT 1

PLS-CADD DRAWING



STRS: 143 - 147

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REVISIONS					
Q	V26: REVISED PER REVIEW	GMD	GMD		05/05/16
P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15
REV	DESCRIPTION	DWN	DGN	CHK	DATE

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA
CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSS+E
Big Stone South to Ellendale

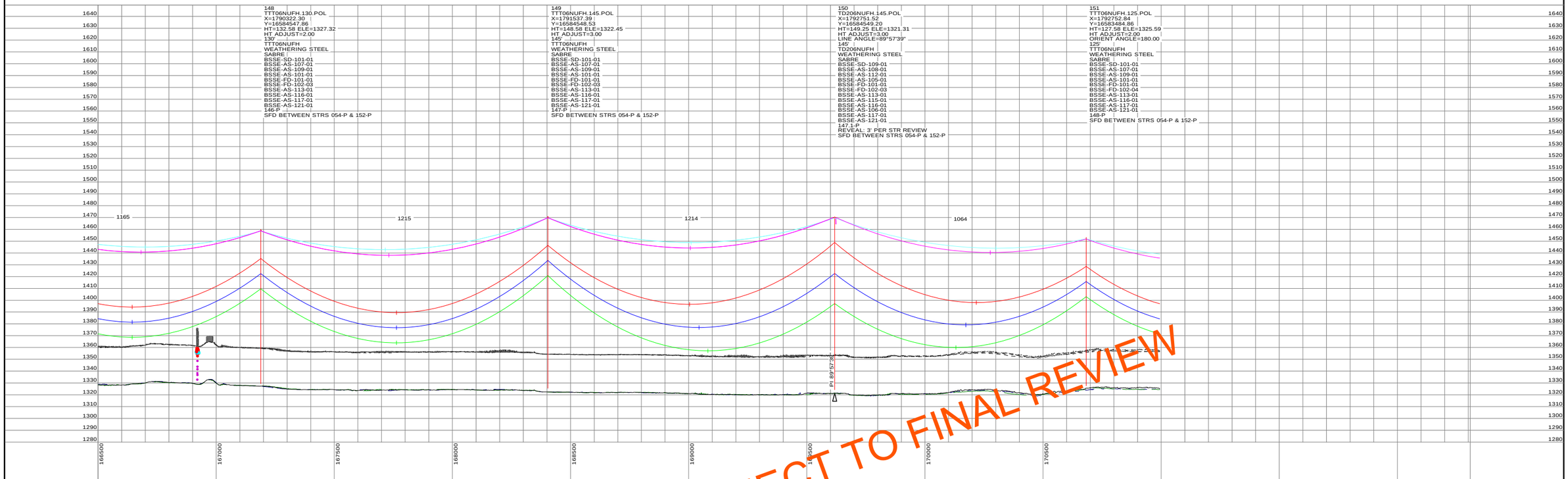
BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

200.0 FT. HORIZ. SCALE
40.0 FT. VERT. SCALE
NORTH

DWG. NO.
BSSE-PP-101-37
REVISION: Q
136508

EXHIBIT 1

PLS-CADD DRAWING



PRELIMINARY SUBJECT TO FINAL REVIEW

STRS: 148 - 151

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REVISIONS					
Q	V26: REVISED PER REVIEW	GMD	GMD		05/05/16
P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15
REV	DESCRIPTION	DWN	DGN	CHK	DATE

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA
CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSS+E
Big Stone South to Ellendale

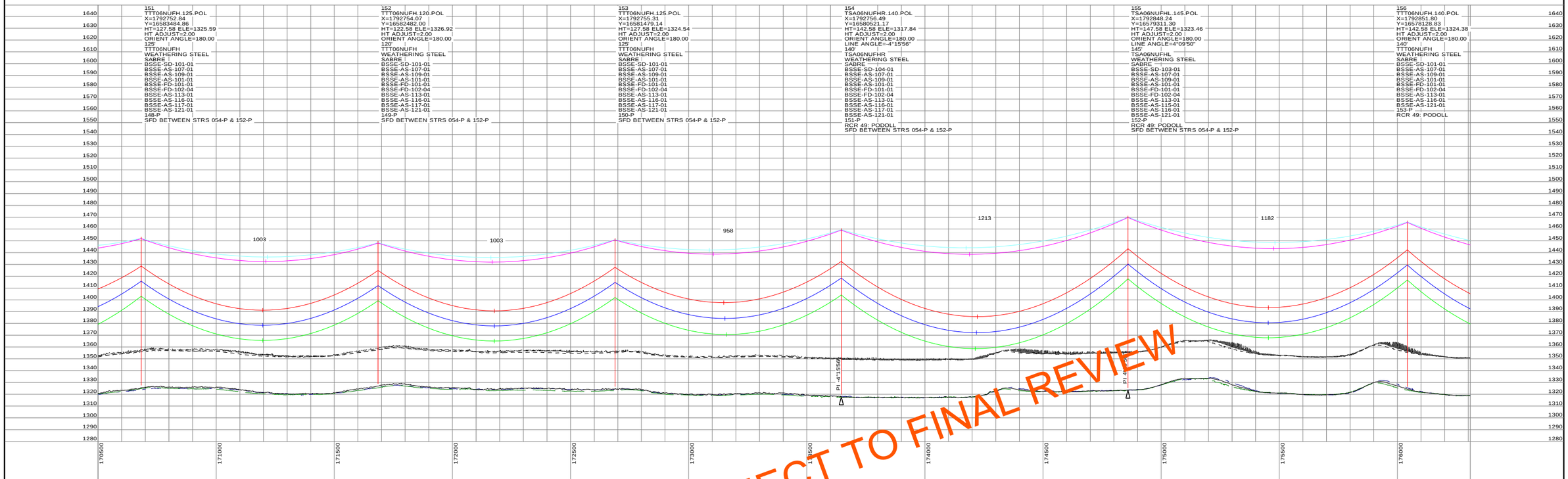
BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

200.0 FT. HORIZ. SCALE
40.0 FT. VERT. SCALE
NORTH

DWG. NO.
BSSE-PP-101-38
REVISION: Q
136508

EXHIBIT 1

PLS-CADD DRAWING



STRS: 151 - 156

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REVISIONS					
Q	V26: REVISED PER REVIEW	GMD	GMD		05/05/16
P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15
REV	DESCRIPTION	DWN	DGN	CHK	DATE

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA

CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSS+E
Big Stone South to Ellendale

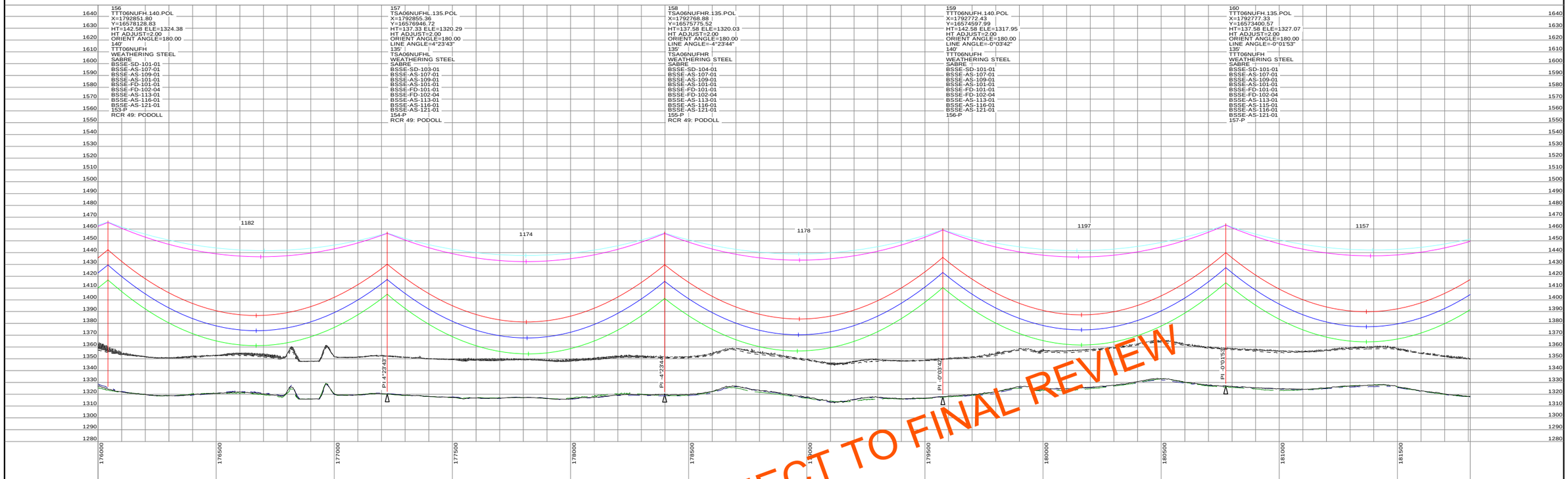
BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

200.0 FT. HORIZ. SCALE
40.0 FT. VERT. SCALE
NORTH

DWG. NO.
BSSE-PP-101-39
REVISION: Q
136508

EXHIBIT 1

PLS-CADD DRAWING



STRS: 156 - 160

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REVISIONS					
Q	V26: REVISED PER REVIEW	GMD	GMD		05/05/16
P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15
REV	DESCRIPTION	DWN	DGN	CHK	DATE

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA

CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSS+E
Big Stone South to Ellendale

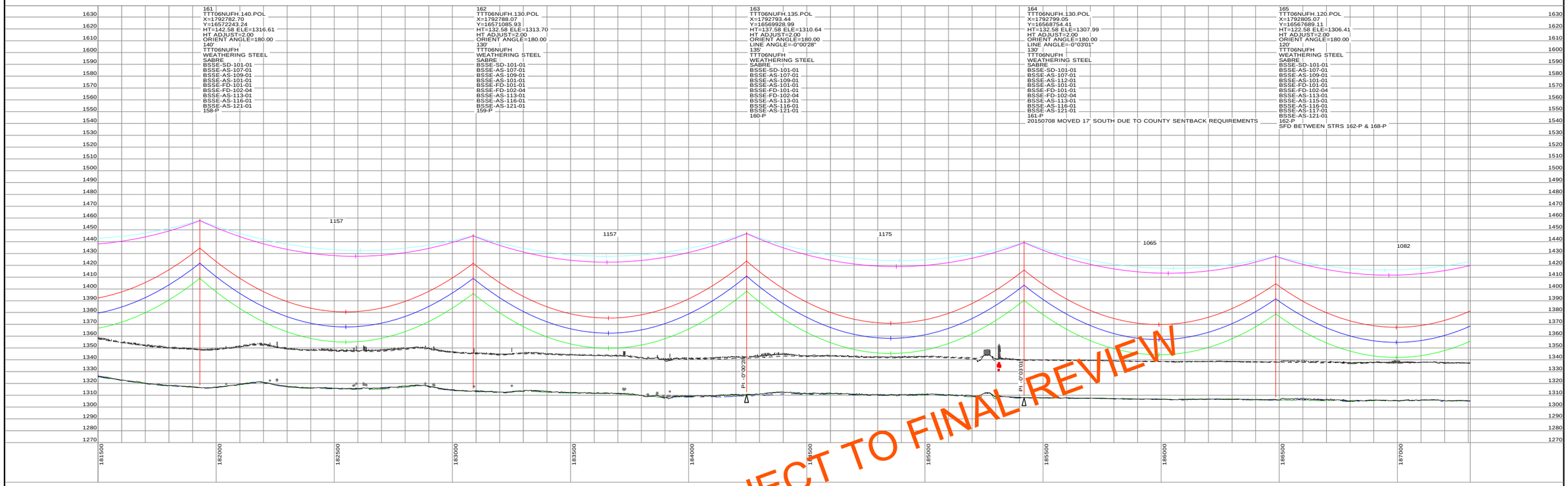
BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

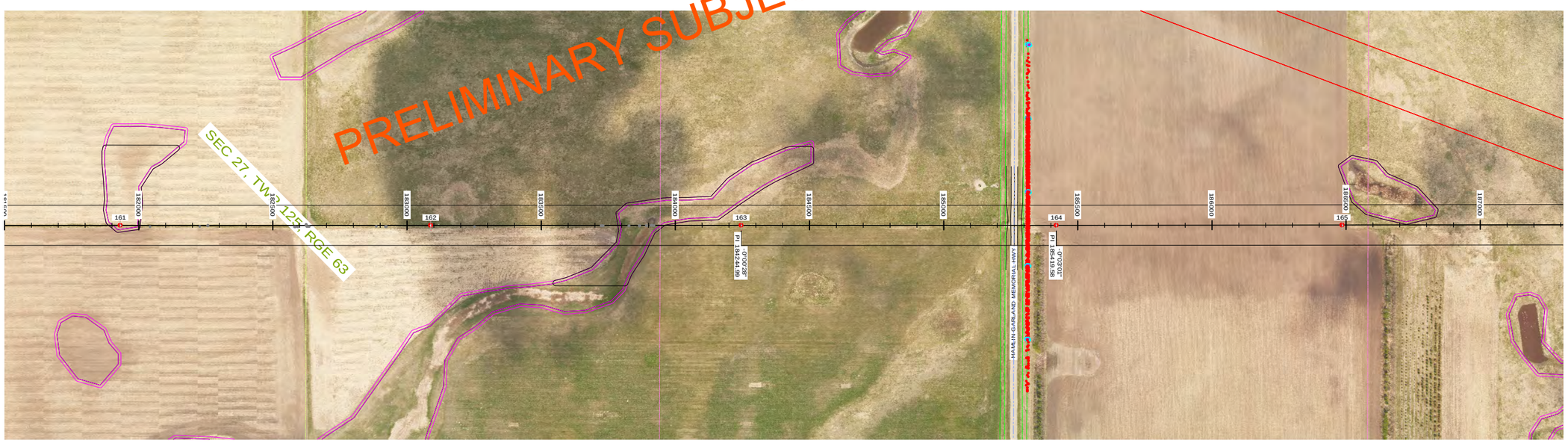
200.0 FT. HORIZ. SCALE
40.0 FT. VERT. SCALE
NORTH

DWG. NO.
BSSE-PP-101-40
REVISION: Q
136508

EXHIBIT 1

PLS-CADD DRAWING





STRS: 161 - 165

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REVISIONS					
Q	V26: REVISED PER REVIEW	GMD	GMD		05/05/16
P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15
REV	DESCRIPTION	DWN	DGN	CHK	DATE

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA

CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSS+E
Big Stone South to Ellendale

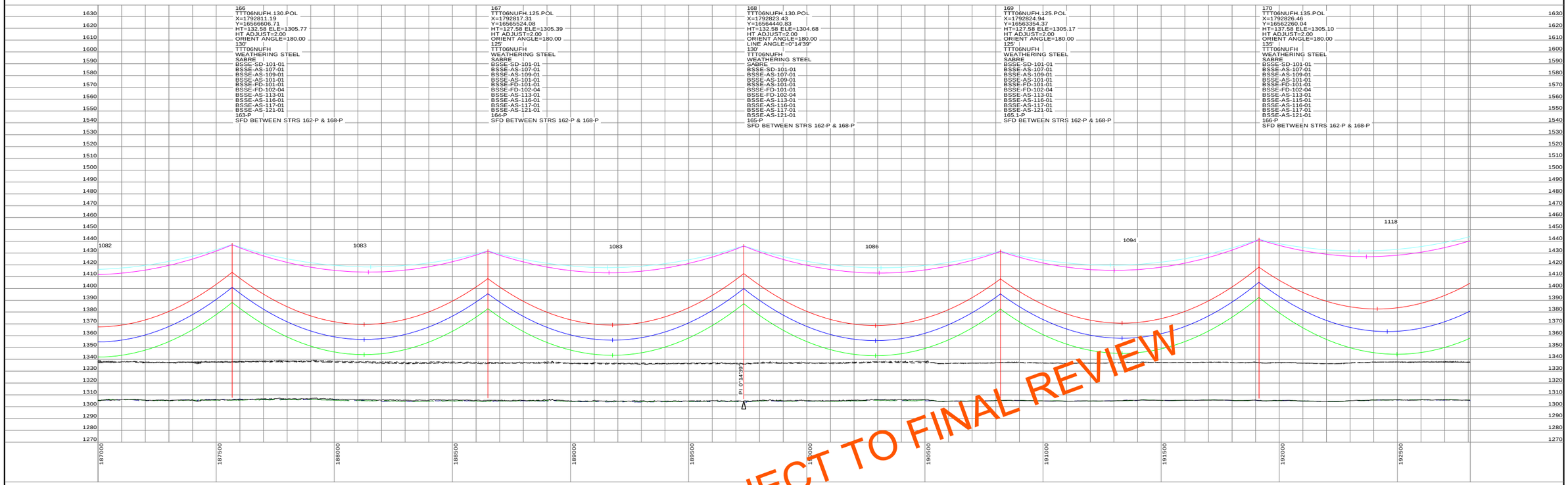
BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

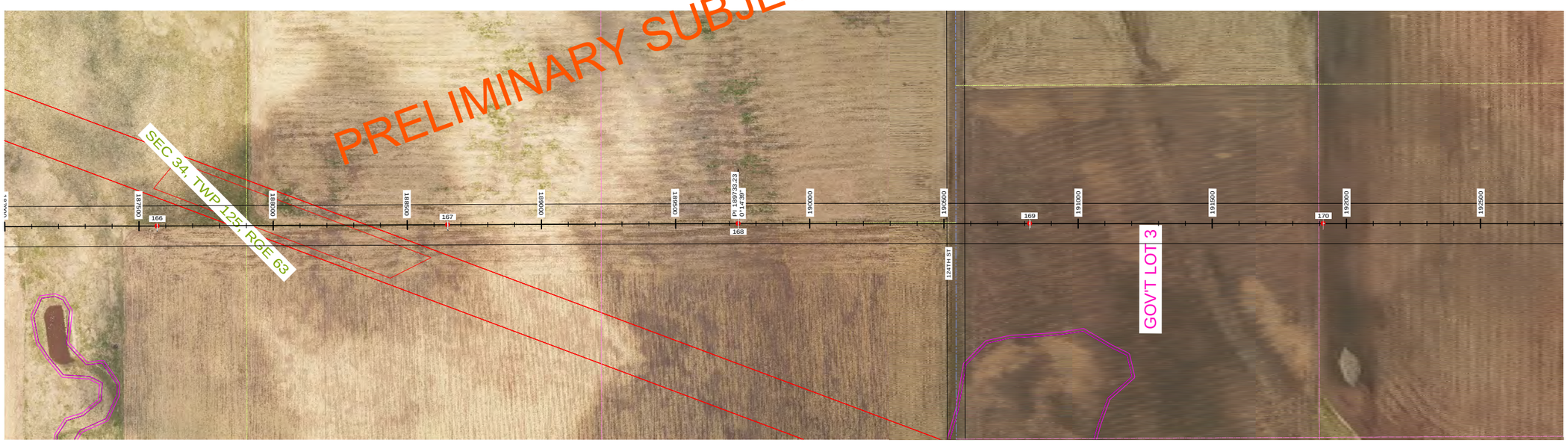
200.0 FT. HORIZ. SCALE
40.0 FT. VERT. SCALE
NORTH

DWG. NO.
BSSE-PP-101-41
REVISION: Q
136508

EXHIBIT 1

PLS-CADD DRAWING





STRS: 166 - 170

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REVISIONS					
Q	V26: REVISED PER REVIEW	GMD	GMD		05/05/16
P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15
REV	DESCRIPTION	DWN	DGN	CHK	DATE

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA
CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSS+E
Big Stone South to Ellendale

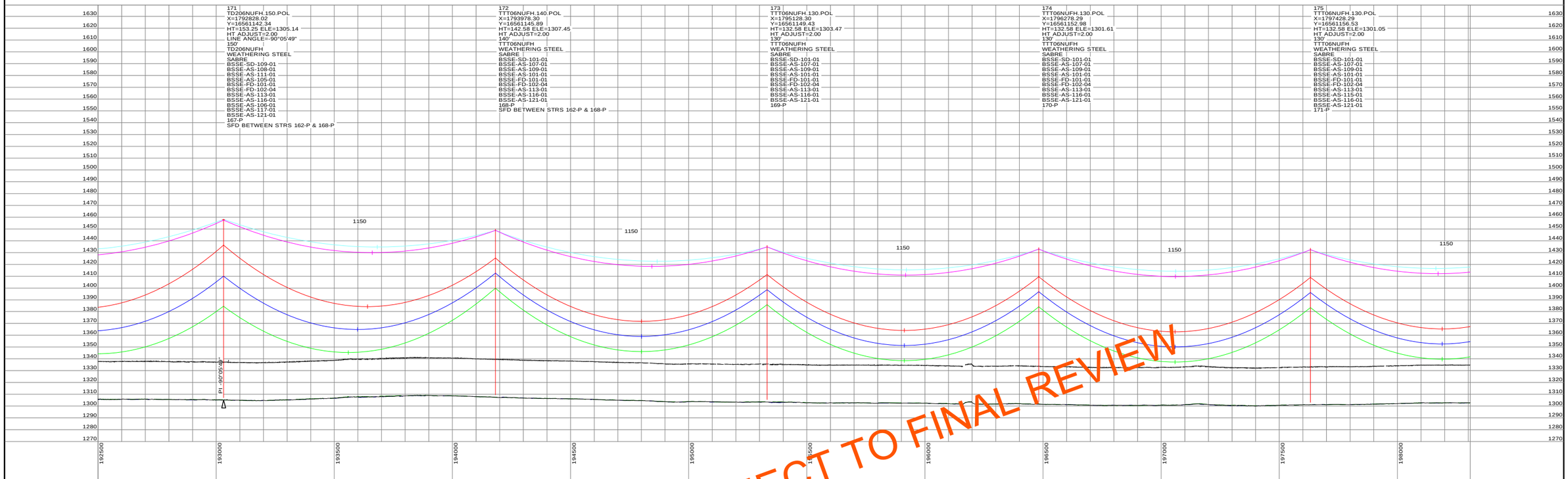
BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

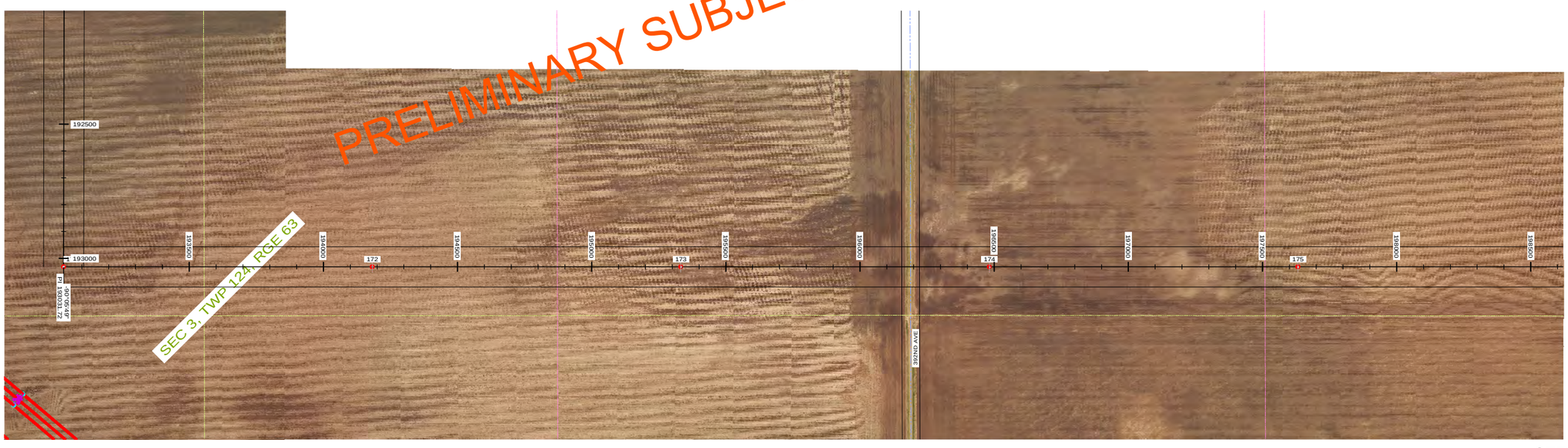
200.0 FT. HORIZ. SCALE
40.0 FT. VERT. SCALE
NORTH

DWG. NO.
BSSE-PP-101-42
REVISION: Q
136508

EXHIBIT 1

PLS-CADD DRAWING





PRELIMINARY SUBJECT TO FINAL REVIEW

STRS: 171 - 175

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REVISIONS					
Q	V26: REVISED PER REVIEW	GMD	GMD		05/05/16
P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15
REV	DESCRIPTION	DWN	DGN	CHK	DATE

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA
CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSS+E
Big Stone South to Ellendale

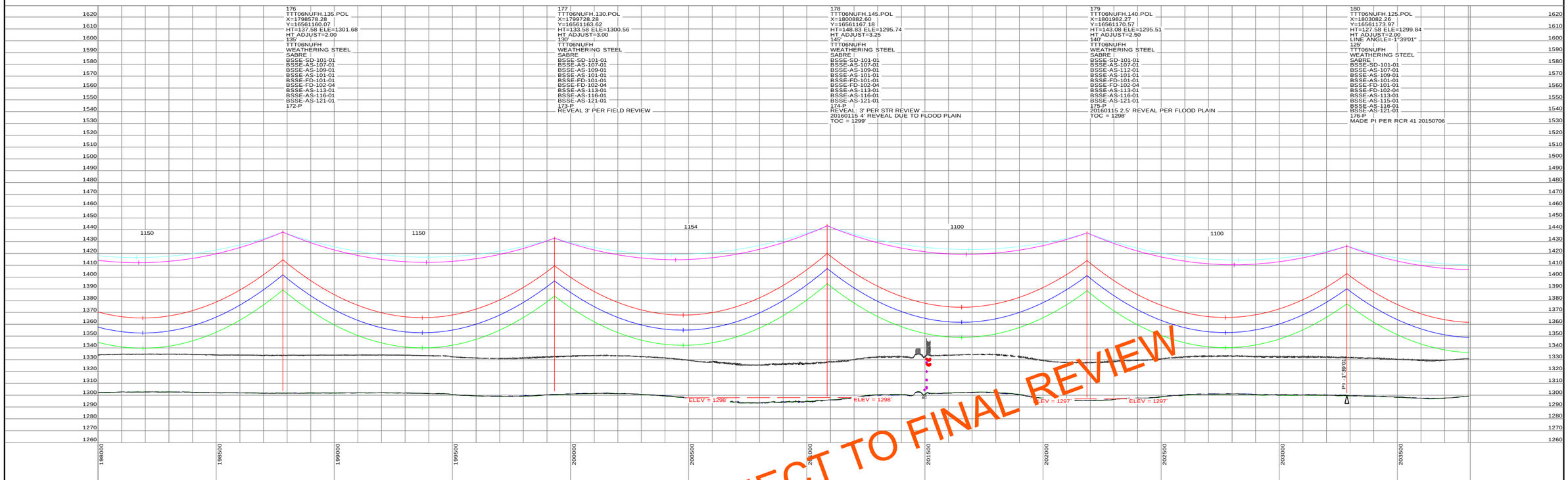
BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

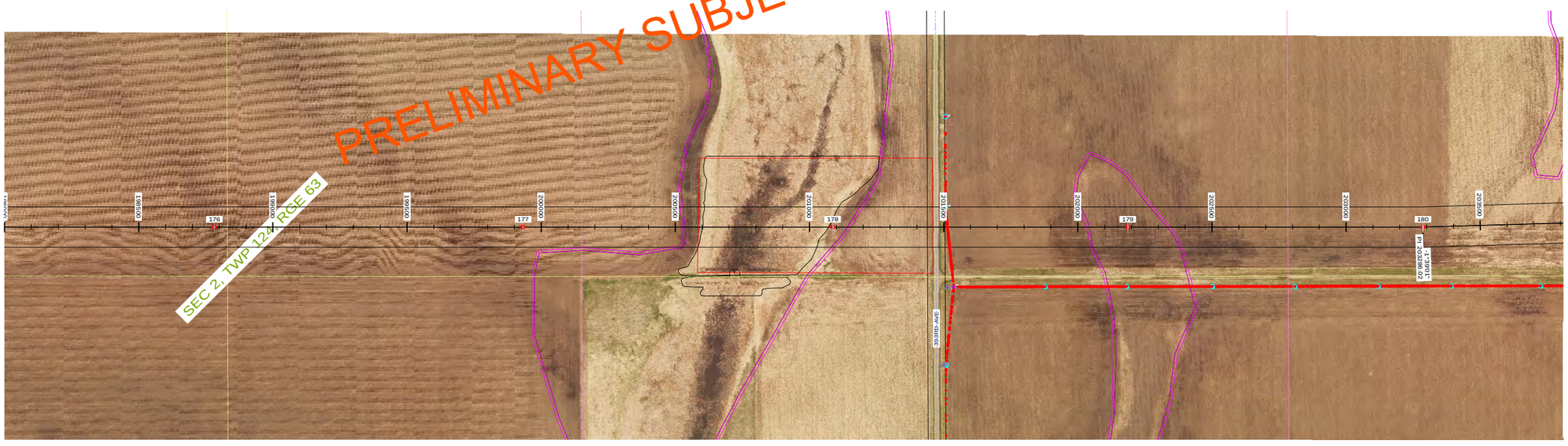
200.0 FT. HORIZ. SCALE
40.0 FT. VERT. SCALE
NORTH

DWG. NO.
BSSE-PP-101-43
REVISION: Q
136508

EXHIBIT 1

PLS-CADD DRAWING





STRS: 176 - 180

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REVISIONS					
Q	V26: REVISED PER REVIEW	GMD	GMD		05/05/16
P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15
REV	DESCRIPTION	DWN	DGN	CHK	DATE

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA
CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSS+E
Big Stone South to Ellendale

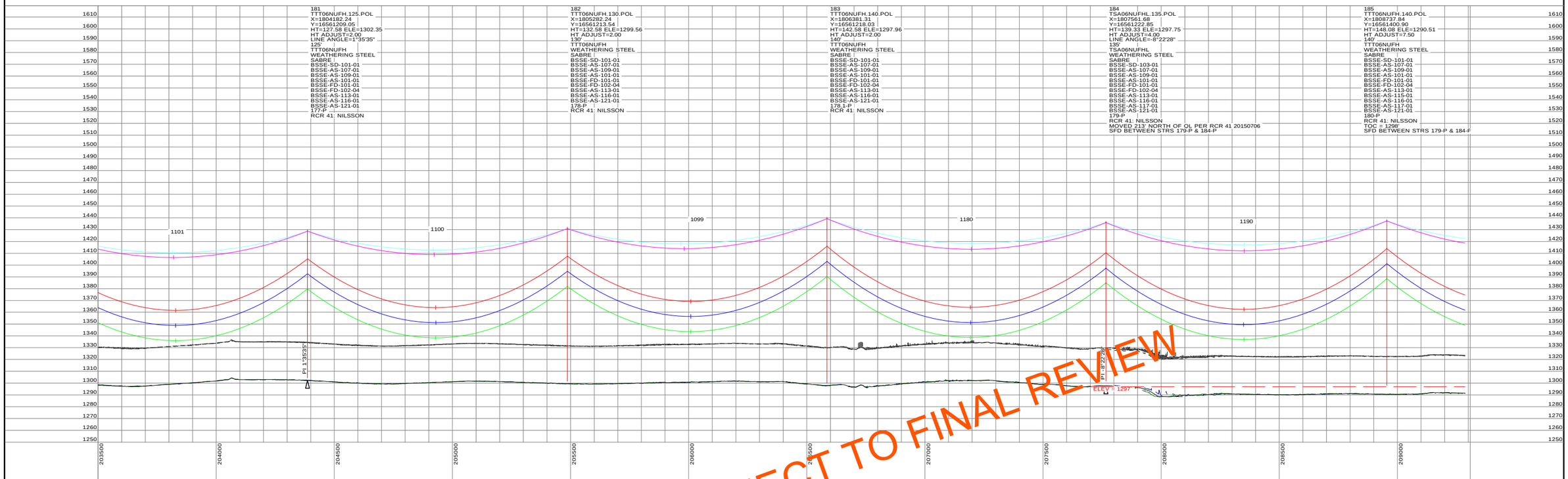
BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

200.0 FT. HORIZ. SCALE
40.0 FT. VERT. SCALE
NORTH

DWG. NO.
BSSE-PP-101-44
REVISION: Q
136508

EXHIBIT 1

PLS-CADD DRAWING



STRS: 181 - 185

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REVISIONS					
Q	V26: REVISED PER REVIEW	GMD	GMD		05/05/16
P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15
REV	DESCRIPTION	DWN	DGN	CHK	DATE

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA

CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSS+E
Big Stone South to Ellendale

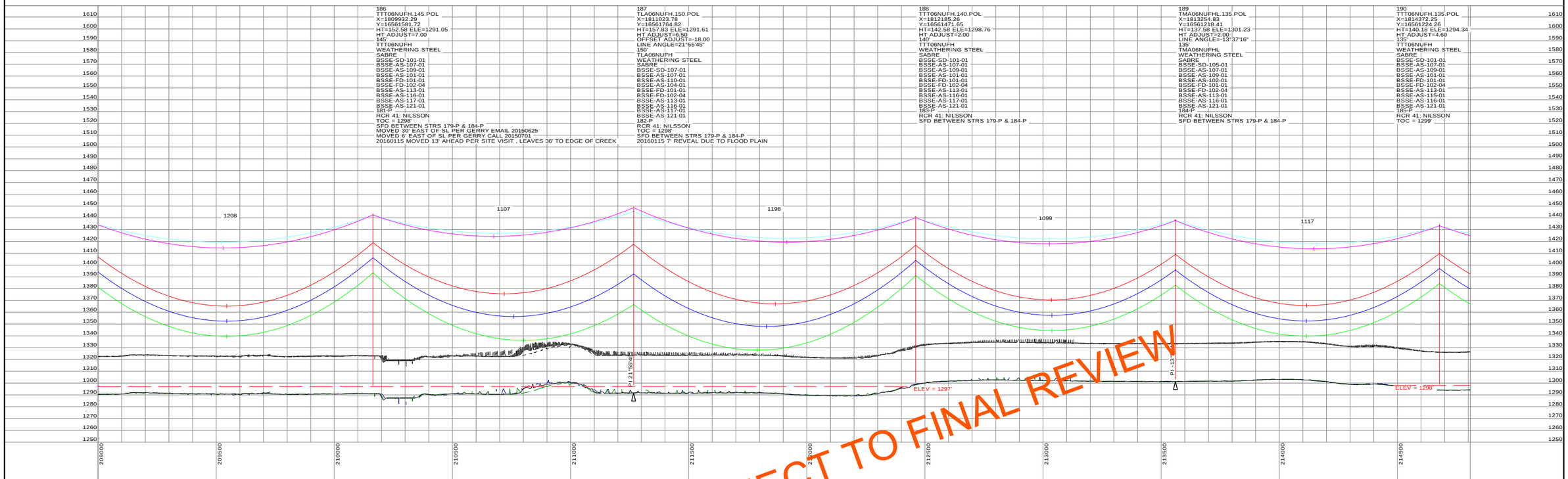
BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

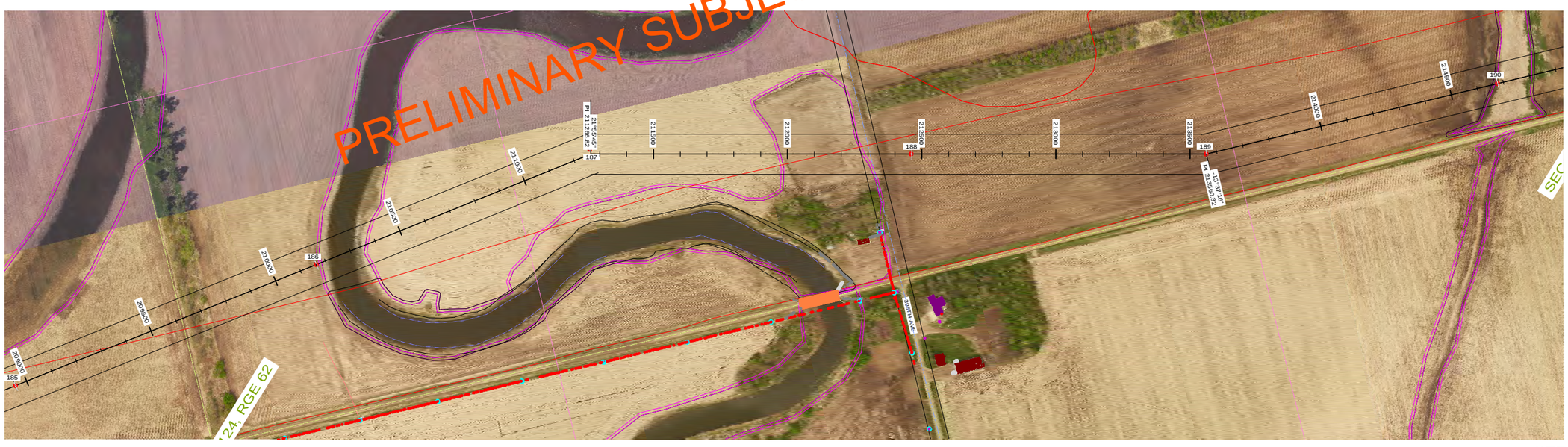
200.0 FT. HORIZ. SCALE
40.0 FT. VERT. SCALE
NORTH

DWG. NO.
BSSE-PP-101-45
REVISION: Q
136508

EXHIBIT 1

PLS-CADD DRAWING





STRS: 186 - 190

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REVISIONS					
Q	V26: REVISED PER REVIEW	GMD	GMD		05/05/16
P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15
REV	DESCRIPTION	DWN	DGN	CHK	DATE

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA

CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSS+E
Big Stone South to Ellendale

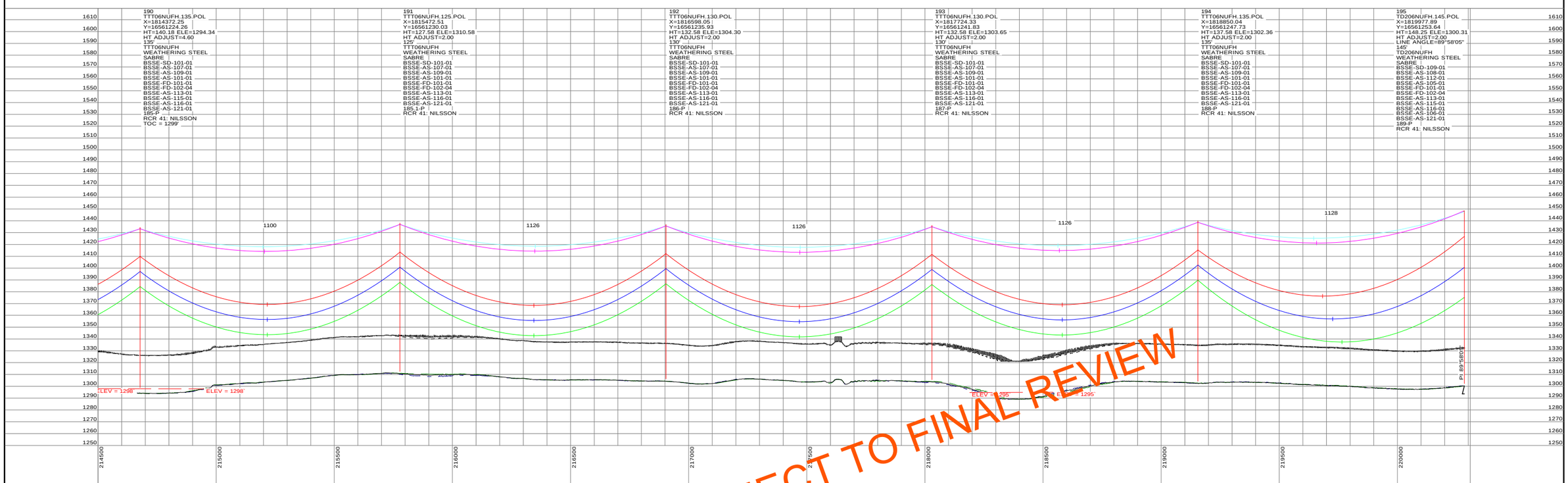
BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

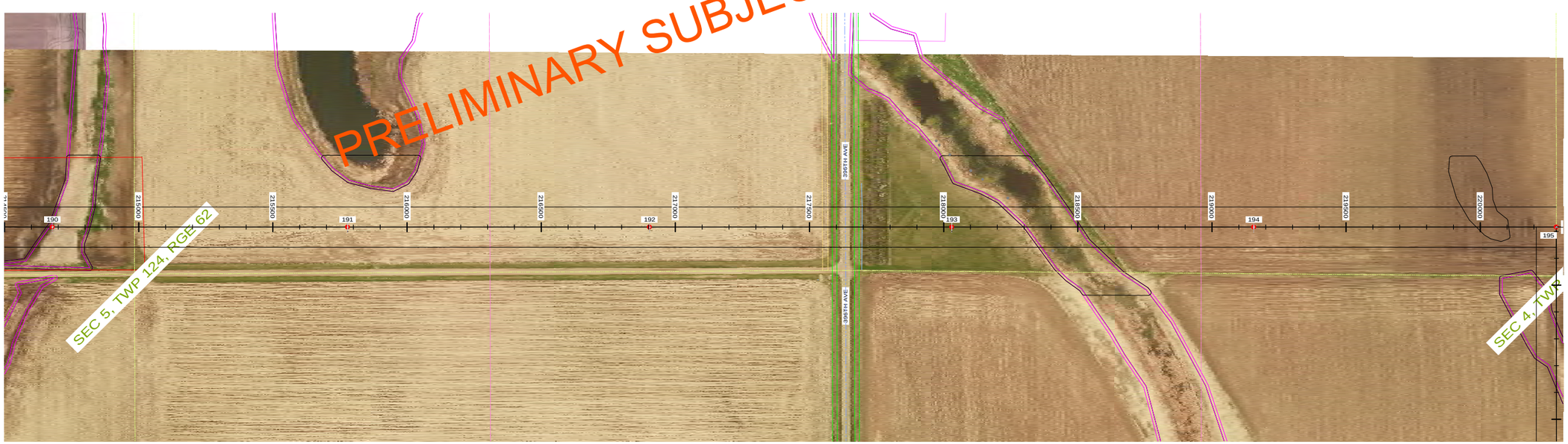
200.0 FT. HORIZ. SCALE
40.0 FT. VERT. SCALE
NORTH

DWG. NO.
BSSE-PP-101-46
REVISION: Q
136508

EXHIBIT 1

PLS-CADD DRAWING





PRELIMINARY SUBJECT TO FINAL REVIEW

STRS: 190 - 195

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REVISIONS					
Q	V26: REVISED PER REVIEW	GMD	GMD		05/05/16
P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15
REV	DESCRIPTION	DWN	DGN	CHK	DATE

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA

CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
DESIGN TENSION: 18% @ 0 F, CREEP
SHIELD WIRE: 1-3/8" 7 STRAND EHS STEEL
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
OPGW: 1-DN0-10523
DESIGN TENSION: 75% SAG MATCH @ 60 F CREEP
GROUND CLEARANCE LINE: 30 FT
COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSS+E
Big Stone South to Ellendale

BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

200.0 FT. HORIZ. SCALE
40.0 FT. VERT. SCALE
NORTH

DWG. NO.
BSSE-PP-101-47
REVISION: Q
136508

EXHIBIT 1

PLS-CADD DRAWING

PRELIMINARY SUBJECT TO FINAL REVIEW

STRS: 195 - 195

20160505
PRELIMINARY
SUBJECT TO
FINAL REVIEW

POWER ENGINEERS

REVISIONS					
Q	V26: REVISED PER REVIEW	GMD	GMD		05/05/16
P	V23: ISSUED FOR ELECTRICAL BID	GMD	GMD	DJF	02/18/16
O	V22: REVISED PER FIELD REVIEW	GMD	GMD		08/28/15
N	V21: REVISED PER FIELD REVIEW	GMD	GMD		08/14/15
M	V19: REVISED PER STR REVIEW MTG	GMD	GMD		07/07/15
REV	DESCRIPTION	DWN	DGN	CHK	DATE

APPROVALS	DATE
DRAWN BY: ---	
DESIGN BY: ---	
CHECKED BY: ---	
APPROVED BY: ---	

DESIGN DATA

CONDUCTOR: (2X) 477 KCMIL 26/7 TP HAWK ACSR
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COORDINATE SYSTEM: UTM ZONE 14N, US FT

BSSE
Big Stone South to Ellendale

BIG STONE SOUTH - ELLENDALE
345 KV TRANSMISSION LINE

200.0 FT. HORIZ. SCALE
40.0 FT. VERT. SCALE
NORTH

DWG. NO.
BSSE-PP-101-48
REVISION: Q
136508

EXHIBIT 1