PROJECT ID: WITH: **5488-00-60**

COUNTY: **VERNON**

STATE PROJECT	FEDERAL PROJECT	
	PROJECT	CONTRACT
5488-00-60		

ORDER OF SHEETS

Section No.	1	Title
Section No.	2	Typical Sections and Details
~~Section No.~~	~~3~~	~~Estimate of Quantities~~
~~Section No.~~	~~3~~	~~Miscellaneous Quantities~~
~~Section No.~~	~~4~~	~~Right of Way Plat~~
Section No.	5	Plan and Profile
Section No.	6	Standard Detail Drawings
~~Section No.~~	~~7~~	~~Sign Plates~~
Section No.	8	Structure Plans
~~Section No.~~	~~9~~	~~Computer Earthwork Data~~
Section No.	9	Cross Sections

TOTAL SHEETS =

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

PLAN OF PROPOSED IMPROVEMENT

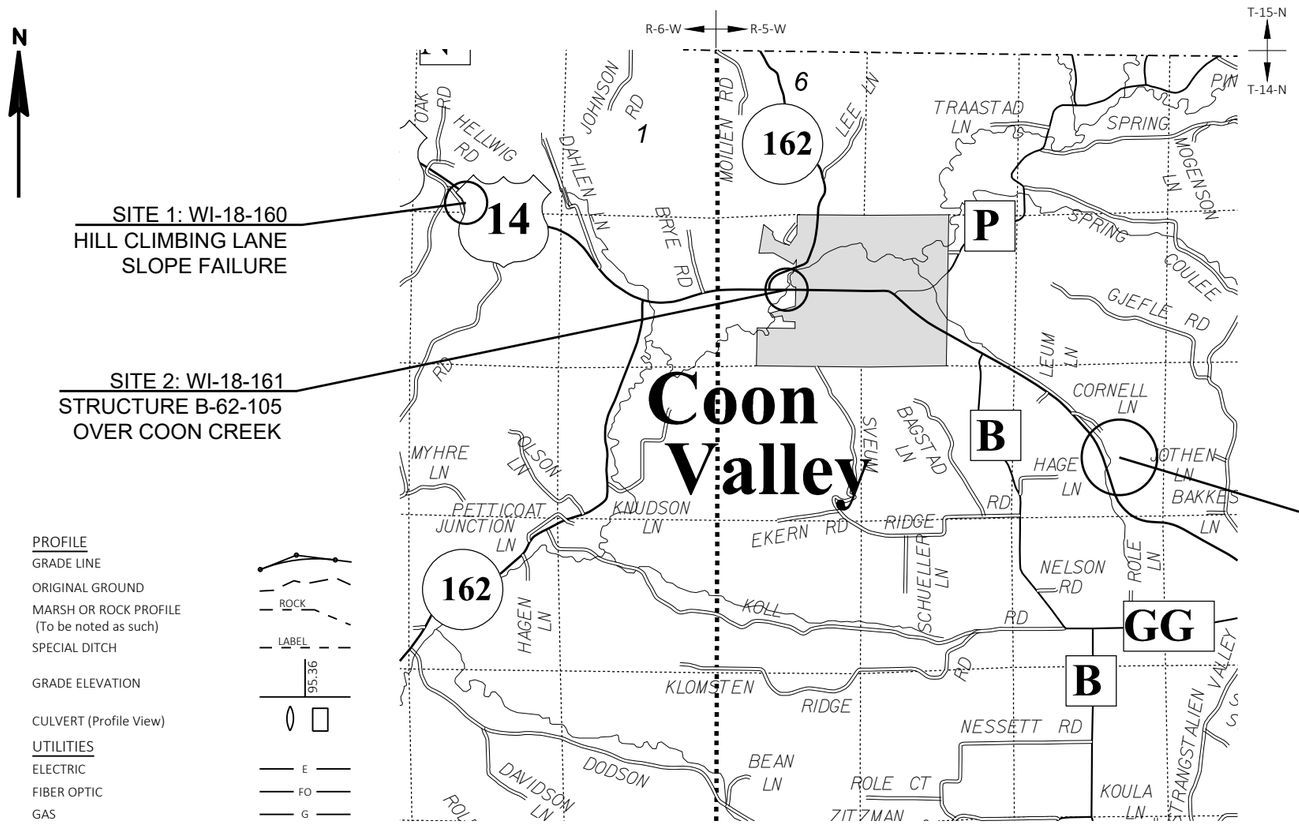
LA CROSSE - WESTBY

HOHLFELD ROAD TO CTH GG

USH 14

VERNON COUNTY

STATE PROJECT NUMBER
5488-00-60



LAYOUT

SCALE 0 2 MI

TOTAL NET LENGTH OF CENTERLINE =

HORIZONTAL POSITIONS SHOWN ON THIS PLAN ARE WISCONSIN COORDINATE REFERENCE SYSTEM (WISCRS), VERNON COUNTY, NAD83 (2011), IN U.S. SURVEY FEET. POSITIONS SHOWN ARE GRID COORDINATES, GRID BEARINGS, AND GRID DISTANCES. GRID DISTANCES ARE THE SAME AS GROUND DISTANCES. ELEVATIONS ARE REFERENCED TO NAVD 88 (2012). GPS DERIVED ELEVATIONS ARE BASED ON GEOID 12A.

DESIGN DESIGNATION

A.A.D.T.	=
A.A.D.T.	=
D.H.V.	=
D.D.	=
T.	=
DESIGN SPEED	=
ESALS	=

CONVENTIONAL SYMBOLS

PLAN

- CORPORATE LIMITS
- PROPERTY LINE
- LOT LINE
- LIMITED HIGHWAY EASEMENT
- EXISTING RIGHT OF WAY
- PROPOSED OR NEW R/W LINE
- SLOPE INTERCEPT
- REFERENCE LINE (300'EB')
- EXISTING CULVERT
- PROPOSED CULVERT (Box or Pipe)
- COMBUSTIBLE FLUIDS (CAUTION)
- MARSH AREA
- WOODED OR SHRUB AREA

PROFILE

- GRADE LINE
- ORIGINAL GROUND
- MARSH OR ROCK PROFILE (To be noted as such) (ROCK)
- SPECIAL DITCH (LABEL)
- GRADE ELEVATION (95.36)
- CULVERT (Profile View)

UTILITIES

- ELECTRIC (E)
- FIBER OPTIC (FO)
- GAS (G)
- SANITARY SEWER (SAN)
- STORM SEWER (SS)
- TELEPHONE (T)
- WATER (W)
- UTILITY PEDESTAL
- POWER POLE
- TELEPHONE POLE

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

PREPARED BY

Surveyor	WISDOT
Designer	SHANE PETERSON & CORY MIKSHOWSKY
Project Manager	TIM MAEDKE
Regional Examiner	REGIONAL EXAMINER
Regional Supervisor	REINY YAHNKE

APPROVED FOR THE DEPARTMENT

DATE: 9/27/18 (Signature)

E

FILE NAME : N:\PDS\C3D\54880030\SHEETSPLAN\010101_TI.DWG PLOT DATE : 9/27/2018 12:42 PM PLOT BY : PETERSON, SHANE J PLOT NAME :

GENERAL NOTES

- THE LOCATIONS OF EXISTING AND PROPOSED UTILITY INSTALLATIONS AS SHOWN ON THE PLANS ARE APPROXIMATE. THERE MAY BE OTHER UTILITY INSTALLATIONS WITHIN THE PROJECT AREA THAT ARE NOT SHOWN.
- THERE ARE UTILITY FACILITIES WITHIN THE PROJECT AREA THAT ARE NOT SHOWN ON THE PLANS. THE CONTRACTOR SHALL COORDINATE HIS CONSTRUCTION ACTIVITIES WITH A CALL TO DIGGERS HOTLINE AND/OR A DIRECT CALL TO THE UTILITIES THAT HAVE FACILITIES IN THE AREA. NOT ALL UTILITIES ARE MEMBERS OF DIGGERS HOTLINE.
- THE ENGINEER SHALL ADJUST THE LOCATIONS OF ITEMS UNDER THIS CONTRACT TO AVOID CONFLICT WITH THE EXISTING UTILITY FACILITIES.
- PRIOR TO THE PLACEMENT OF STEEL PLATE BEAM GUARD OR MGS GUARDRAIL, THE SHOULDERS SHALL BE IN PLACE, SHAPED AND COMPACTED UNLESS SHOWN OTHERWISE.
- ASPHALTIC SURFACE WEIGHT CALCULATIONS ARE BASED ON 112 LB/SY/IN.
- CONTRACTOR WILL BE RESPONSIBLE FOR RESHAPING AND SEEDING ANY PREVIOUSLY GRASSED AREAS WHICH ARE DISTURBED BY HIS OPERATION OUTSIDE OF THE NORMAL CONSTRUCTION LIMITS.
- DISTURBED AREAS WITHIN THE RIGHT OF WAY ARE TO BE TOPSOILED (SALVAGED), FERTILIZED, SEEDED, AND MULCHED OR SODDED AS DIRECTED BY THE ENGINEER.

UTILITY CONTACTS

Travis Fronk
Coon Valley Telecommunications Inc - Communication Line
105 Central Ave
Coon Valley, WI 54623
(608) 452-3101
cvt@mwt.net

Randy Risen
Midwest Natural Gas, Inc. - Gas/Petroleum
3600 State Highway 157
P.O. Box 429
La Crosse, WI 54602-0429
(608) 781-1011
randyr@midwestnaturalgas.com

Monty Parker
Centurylink – Communication Line
20 S Wilson Avenue
Rice Lake, WI 54868
(715) 234-5528
Monty.parker@centurylink.com

Craig Eggert
Mediacom Wisconsin LLC - Communication Line
207 W Pearle St
P.O. Box 226
Decorah, IA 52101-0226
(563) 419-5160
ceggert@mediacomcc.com

DIGGERS HOTLINE
Dial 811 or (800) 242-8511
www.DiggersHotline.com

DESIGN CONTACTS

TIMOTHY MAEDKE
PROJECT MANAGER
PROJECT DEVELOPMENT
WISDOT SW REGION
3550 MORMON COULEE ROAD
LA CROSSE, WI 54601
(608) 789-6317

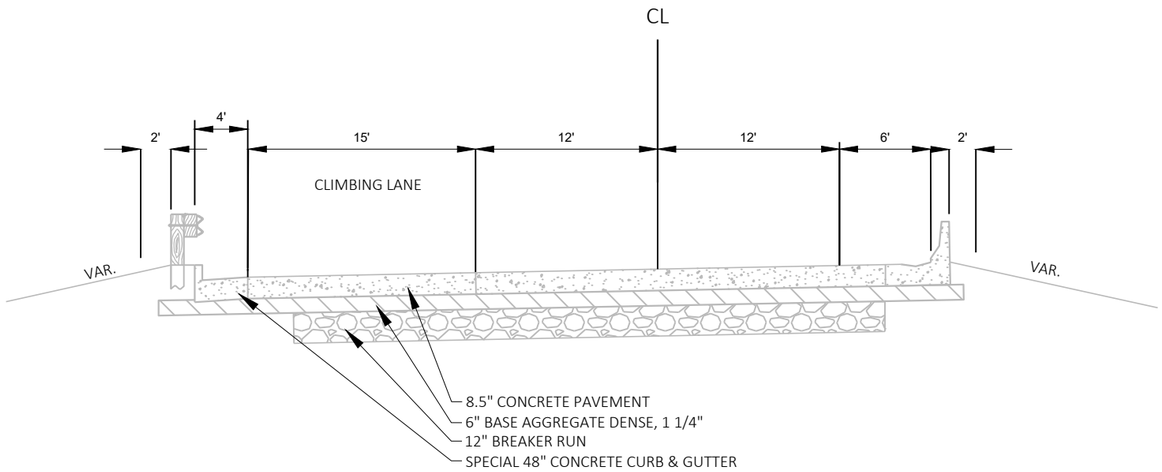
SHANE PETERSON
PROJECT DESIGNER
PROJECT DEVELOPMENT
WISDOT SW REGION
3550 MORMON COULEE ROAD
LA CROSSE, WI 54601
(608) 386-1898

CORY MIKSHOWSKY
PROJECT DESIGNER
PROJECT DEVELOPMENT
WISDOT SW REGION
3550 MORMON COULEE ROAD
LA CROSSE, WI 54601
(608) 397-1230

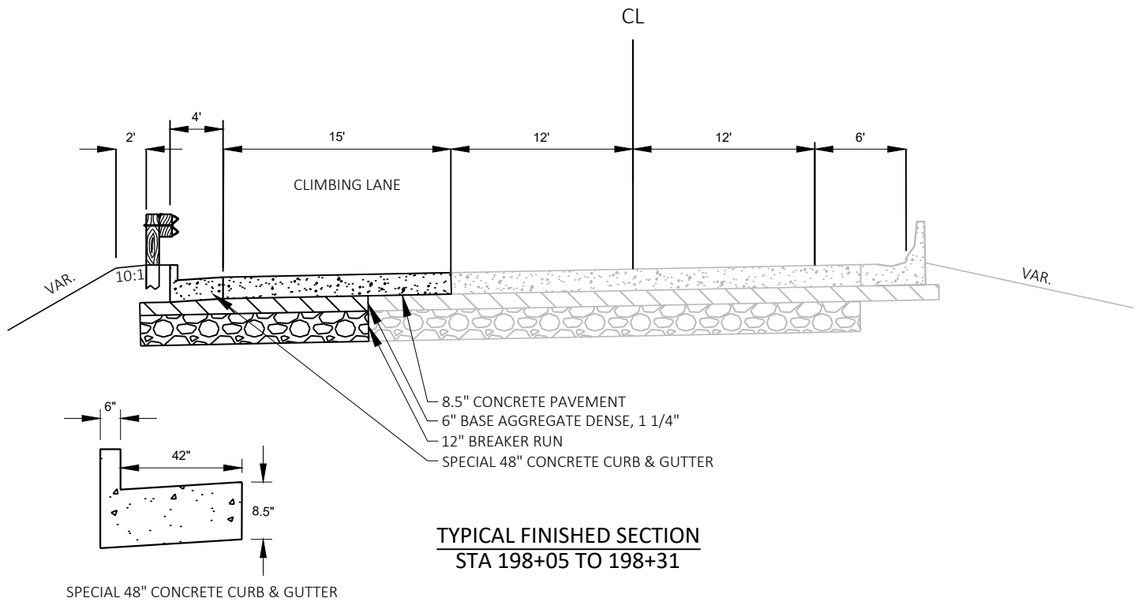
DNR LIAISON

KAREN KALVELAGE
ENVIRONMENTAL ANALYSIS & REVIEW SPECIALIST
WISCONSIN DEPT. OF NATURAL RESOURCES
WEST CENTRAL REGION
3550 MORMON COULEE ROAD
LA CROSSE, WI 54601
608-785-9115

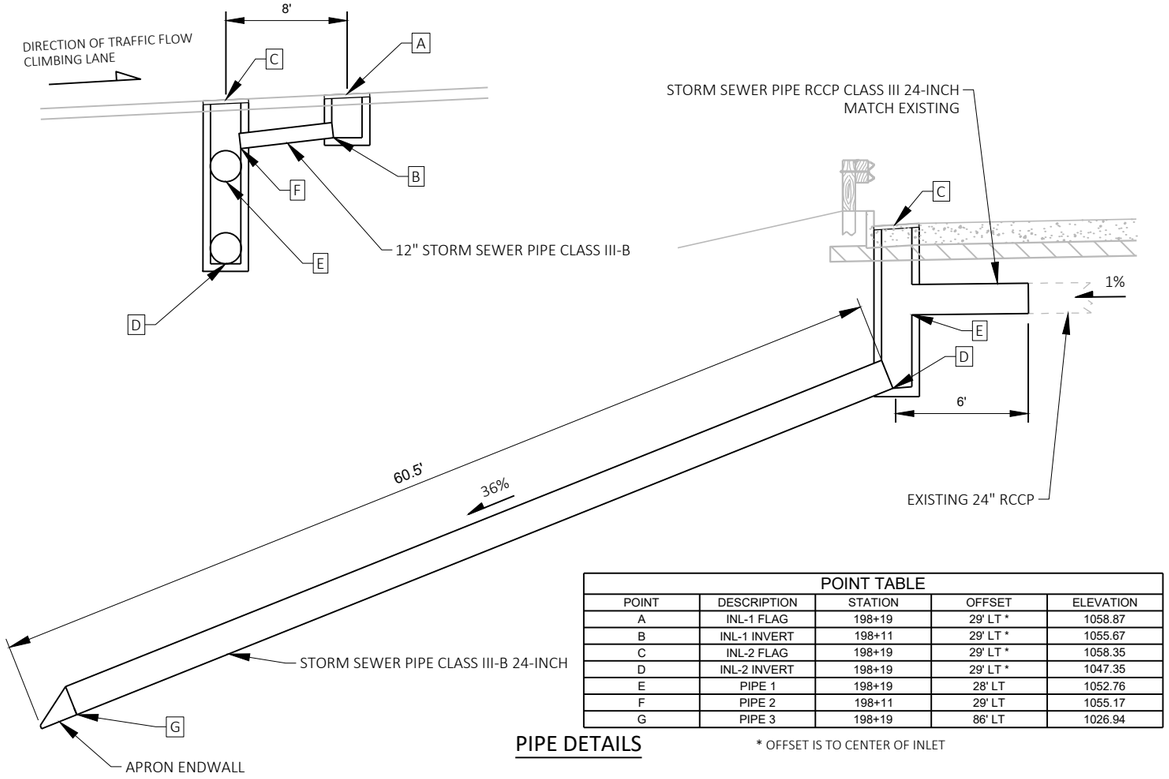
2



TYPICAL EXISTING SECTION
STA 197+86 TO 199+61



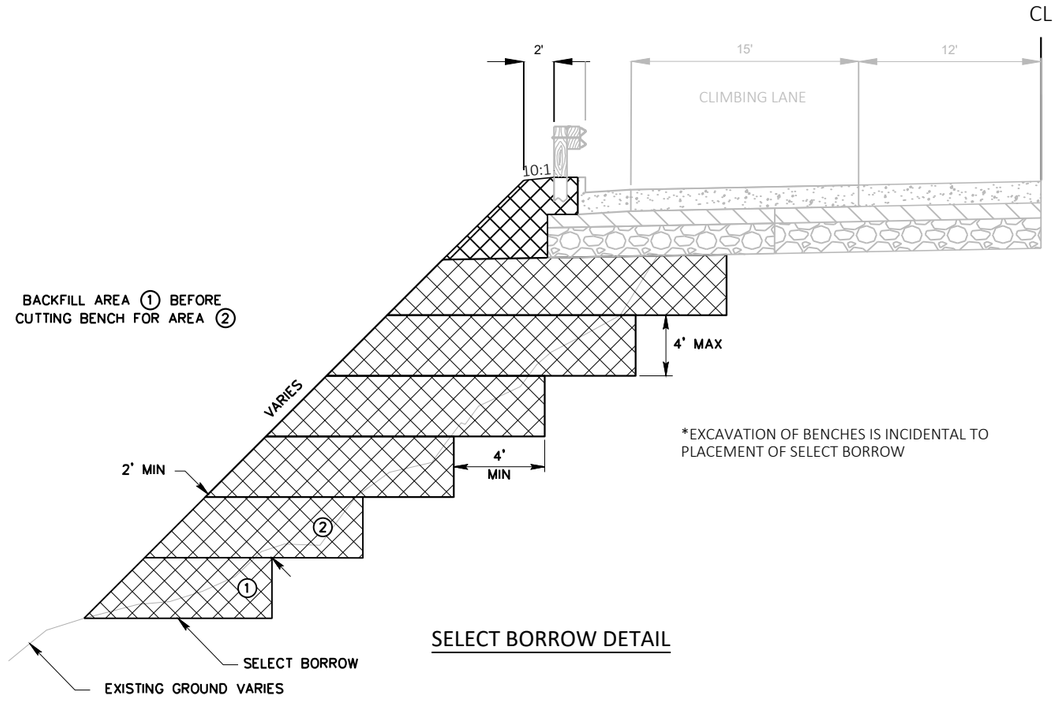
TYPICAL FINISHED SECTION
STA 198+05 TO 198+31



POINT TABLE				
POINT	DESCRIPTION	STATION	OFFSET	ELEVATION
A	INL-1 FLAG	198+19	29' LT *	1058.87
B	INL-1 INVERT	198+11	29' LT *	1055.67
C	INL-2 FLAG	198+19	29' LT *	1058.35
D	INL-2 INVERT	198+19	29' LT *	1047.35
E	PIPE 1	198+19	28' LT	1052.76
F	PIPE 2	198+11	29' LT	1055.17
G	PIPE 3	198+19	86' LT	1026.94

PIPE DETAILS

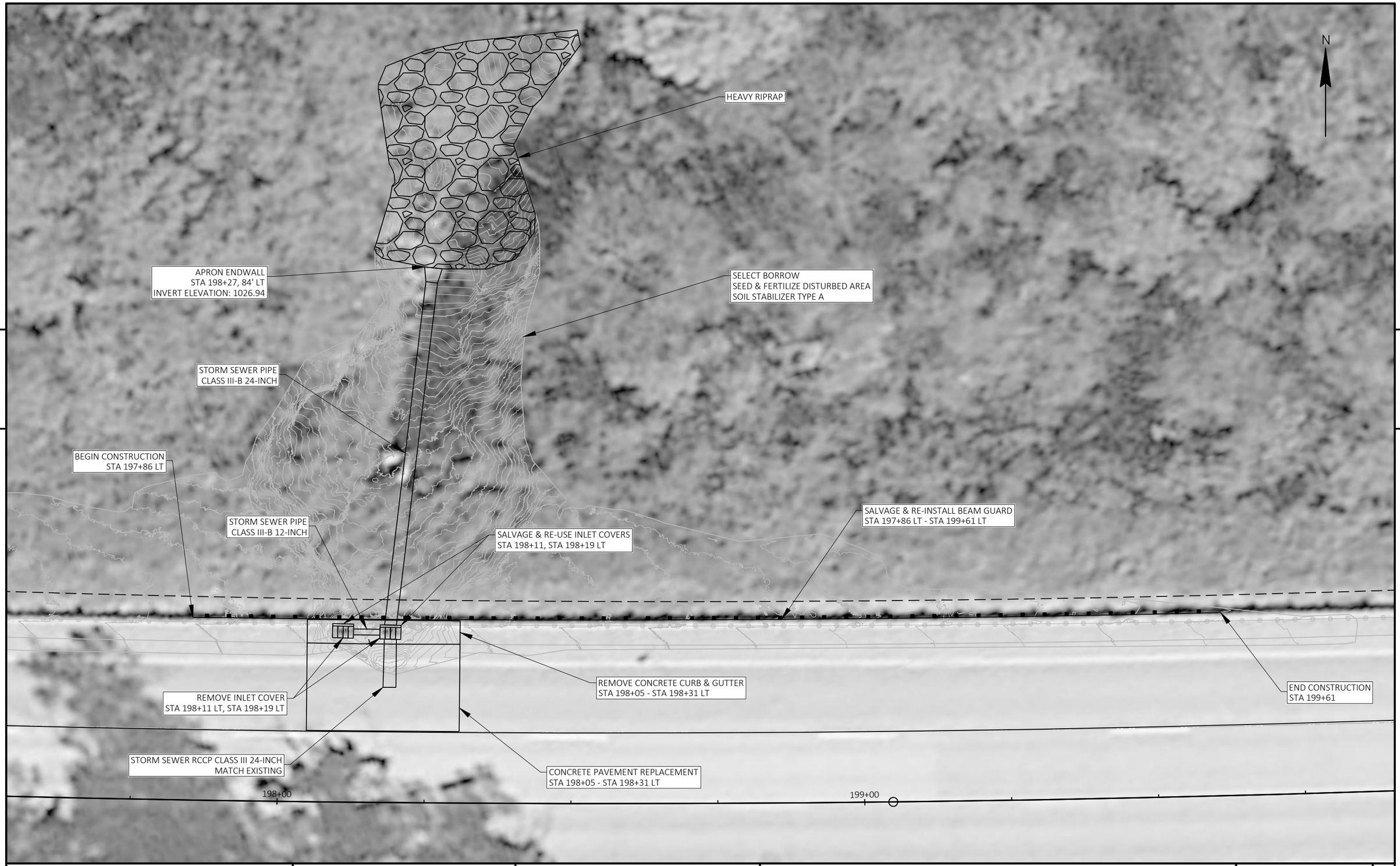
* OFFSET IS TO CENTER OF INLET



*EXCAVATION OF BENCHES IS INCIDENTAL TO PLACEMENT OF SELECT BORROW

SELECT BORROW DETAIL

PROJECT NO: 5488-00-60	HWY: USH 14	COUNTY: VERNON	CONSTRUCTION DETAILS: SITE 1	SHEET	E



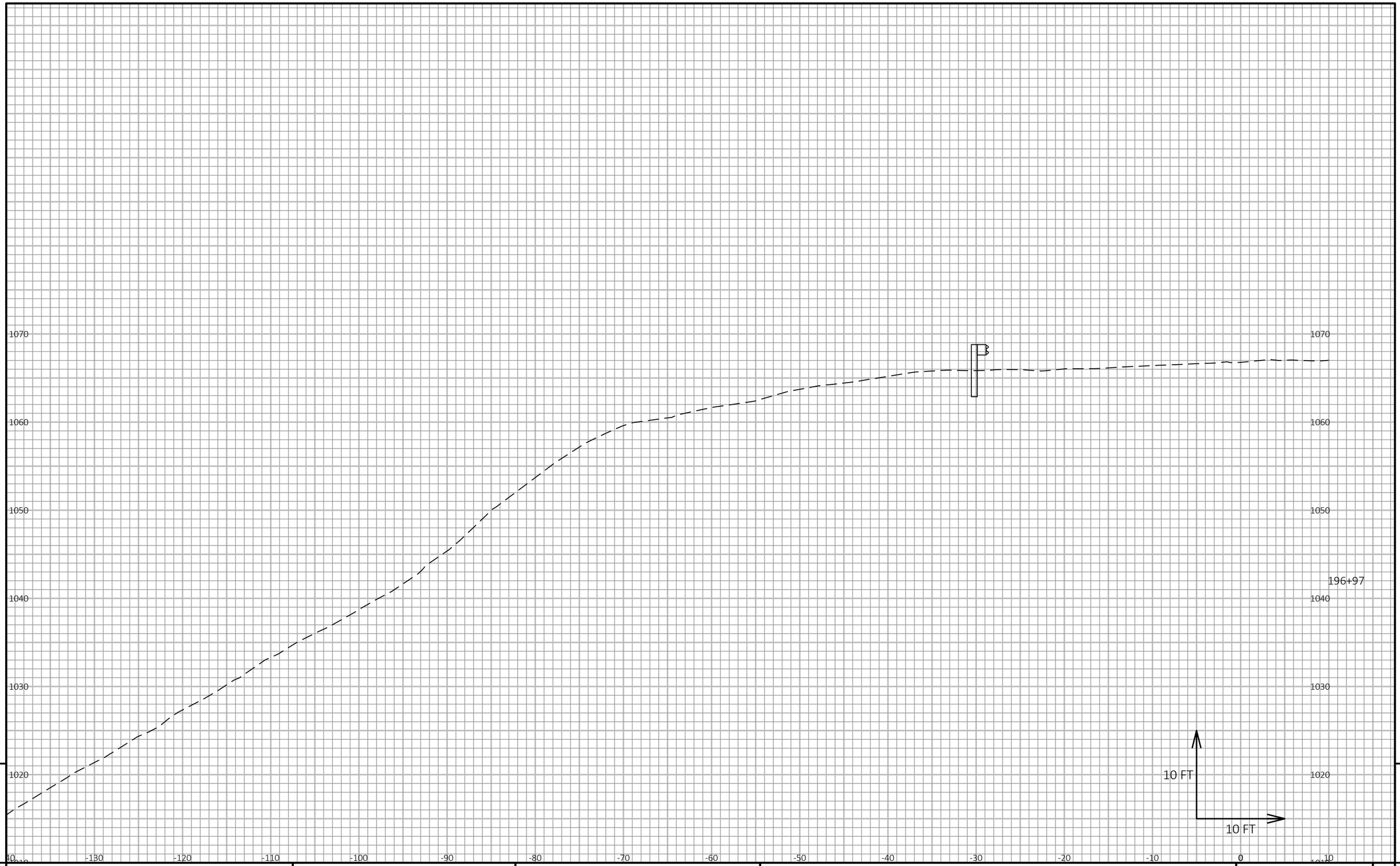
5

5

PROJECT NO: 5488-00-60	HWY: USH 14	COUNTY: VERNON	PLAN: SITE 1	SHEET	E

FILE NAME : N:\PDS\C3D\54880030\SHEETSPLAN\050201_PN.DWG
LAYOUT NAME - 050201_pn

PLOT DATE : 9/27/2018 4:28 PM PLOT BY : MIKSHOWSKY, CORY J PLOT NAME : PLOT SCALE : 1 IN:15 FT



9

9

PROJECT NO: 5488-00-60	HWY: USH 14	COUNTY: VERNON	CROSS SECTIONS: SITE 1	SHEET	E

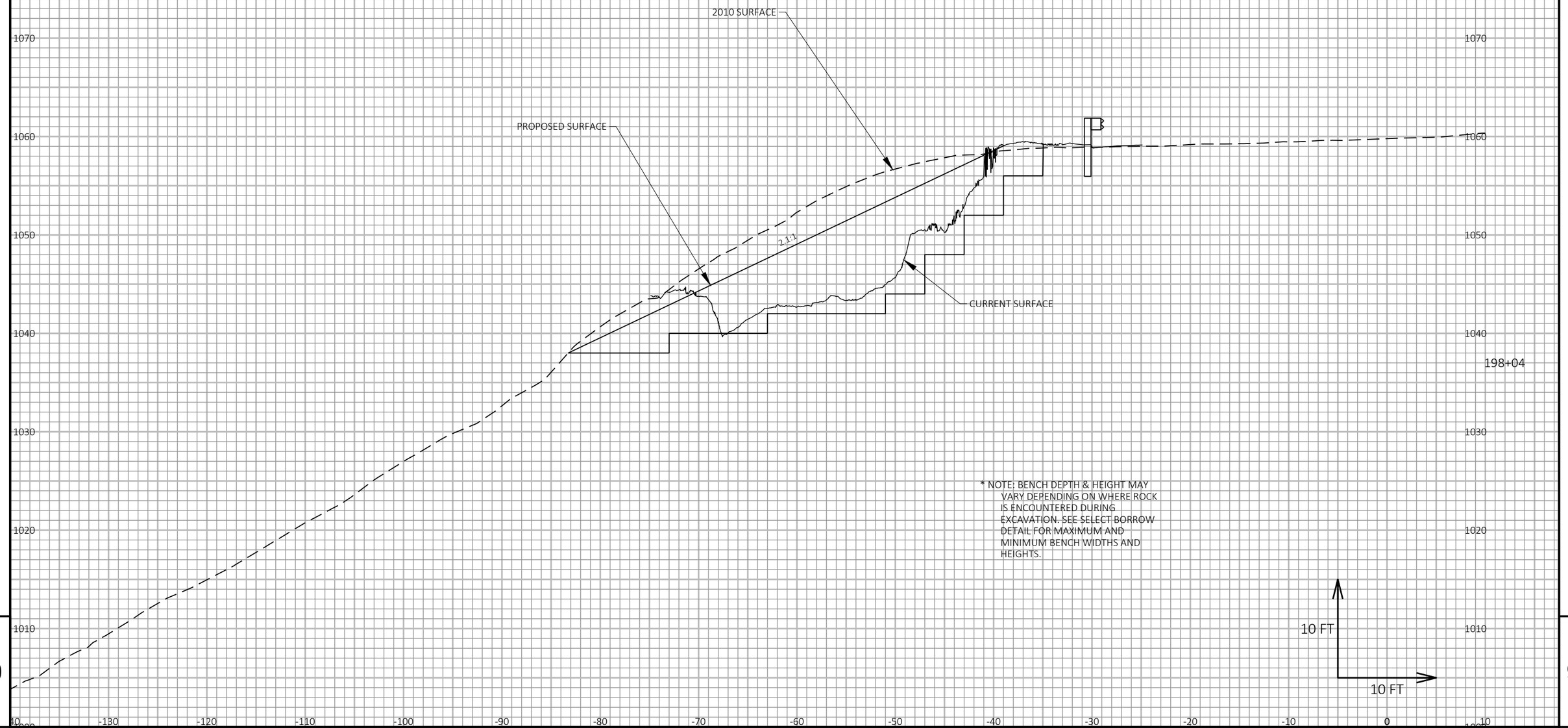
FILE NAME : N:\PDS\C3D\54880030\SHEETSPLAN\090201_XS.DWG
LAYOUT NAME - 1

PLOT DATE : 9/27/2018 8:20 AM

PLOT BY : MIKSHOWSKY, CORY J

PLOT NAME :

PLOT SCALE : 1 IN:10 FT HORZ. / 1 IN:10 FT VERT.



* NOTE: BENCH DEPTH & HEIGHT MAY VARY DEPENDING ON WHERE ROCK IS ENCOUNTERED DURING EXCAVATION. SEE SELECT BORROW DETAIL FOR MAXIMUM AND MINIMUM BENCH WIDTHS AND HEIGHTS.

9

PROJECT NO: 5488-00-60	HWY: USH 14	COUNTY: VERNON	CROSS SECTIONS: SITE 1	SHEET	E

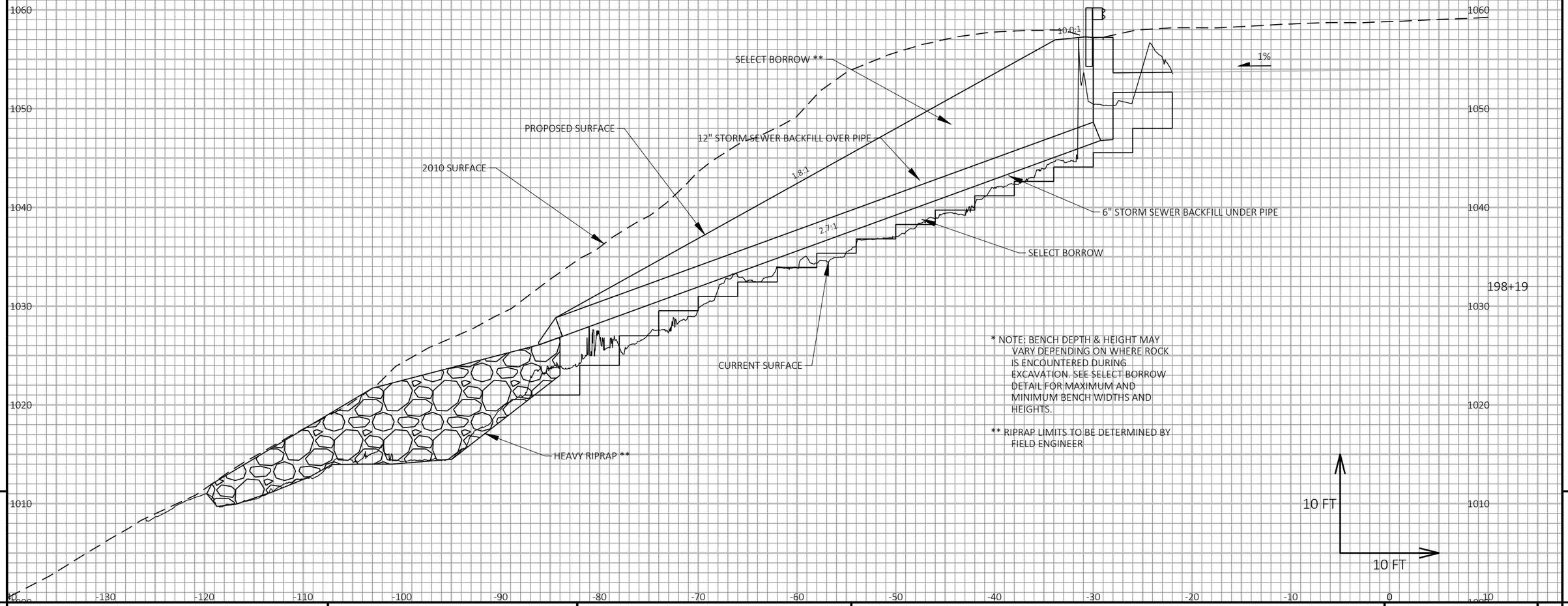
FILE NAME : N:\PDS\C3D\54880030\SHEETSPLAN\090201_XS.DWG
LAYOUT NAME - 2

PLOT DATE : 9/27/2018 8:20 AM

PLOT BY : MIKSHOWSKY, CORY J

PLOT NAME :

PLOT SCALE : 1 IN:10 FT HORZ. / 1 IN:10 FT VERT.



* NOTE: BENCH DEPTH & HEIGHT MAY VARY DEPENDING ON WHERE ROCK IS ENCOUNTERED DURING EXCAVATION. SEE SELECT BORROW DETAIL FOR MAXIMUM AND MINIMUM BENCH WIDTHS AND HEIGHTS.

** RIPRAP LIMITS TO BE DETERMINED BY FIELD ENGINEER

9

9

PROJECT NO: 5488-00-60	HWY: USH 14	COUNTY: VERNON	CROSS SECTIONS: SITE 1	SHEET	E

FILE NAME : N:\PDS\C3D\54880030\SHEETSPLAN\090201_XS.DWG
LAYOUT NAME - 3

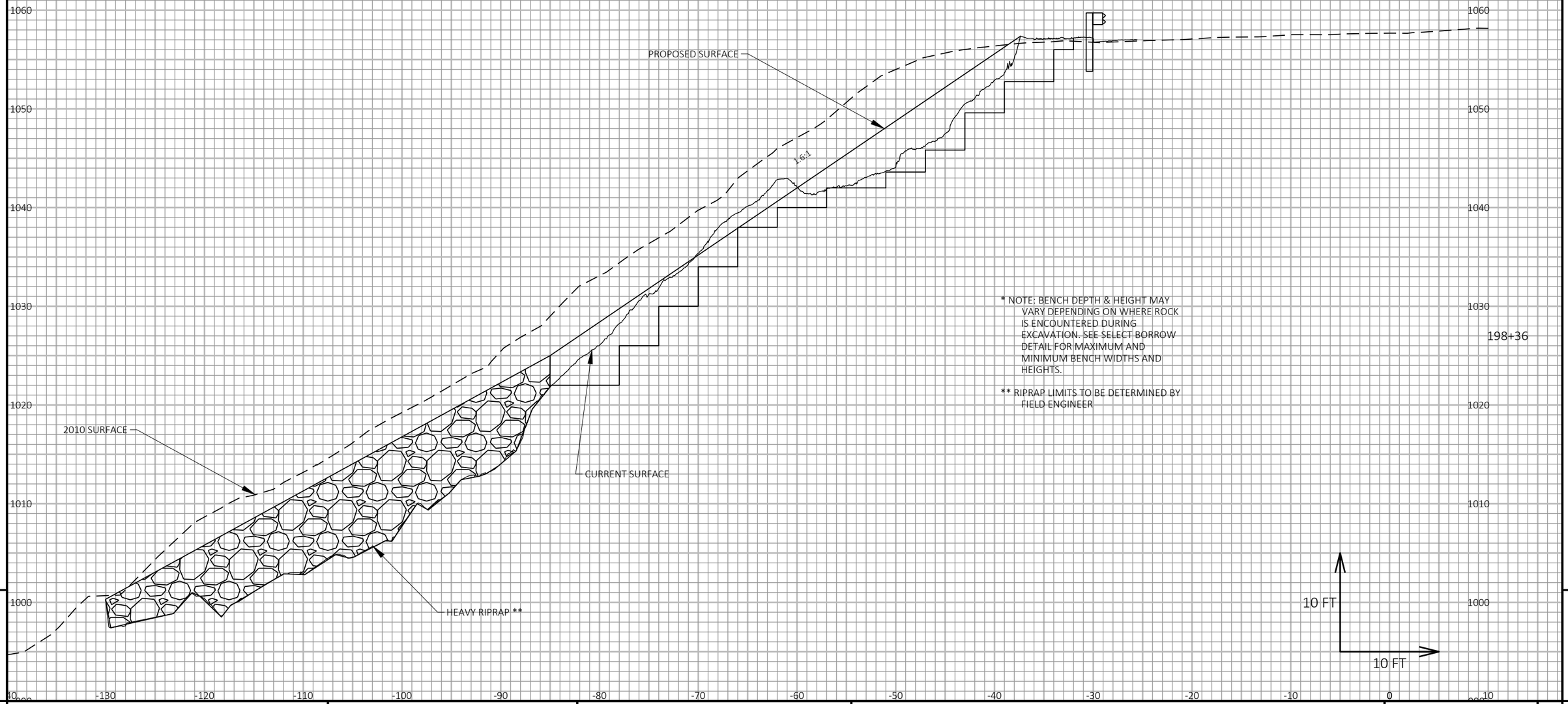
PLOT DATE : 9/27/2018 8:20 AM

PLOT BY : MIKSHOWSKY, CORY J

PLOT NAME :

PLOT SCALE : 1 IN:10 FT HORZ. / 1 IN:10 FT VERT.

WISDOT/CADDS SHEET 49



* NOTE: BENCH DEPTH & HEIGHT MAY VARY DEPENDING ON WHERE ROCK IS ENCOUNTERED DURING EXCAVATION. SEE SELECT BORROW DETAIL FOR MAXIMUM AND MINIMUM BENCH WIDTHS AND HEIGHTS.

** RIPRAP LIMITS TO BE DETERMINED BY FIELD ENGINEER

9

9

PROJECT NO: 5488-00-60	HWY: USH 14	COUNTY: VERNON	CROSS SECTIONS: SITE 1	SHEET	E

FILE NAME : N:\PDS\C3D\54880030\SHEETSPLAN\090201_XS.DWG
LAYOUT NAME - 4

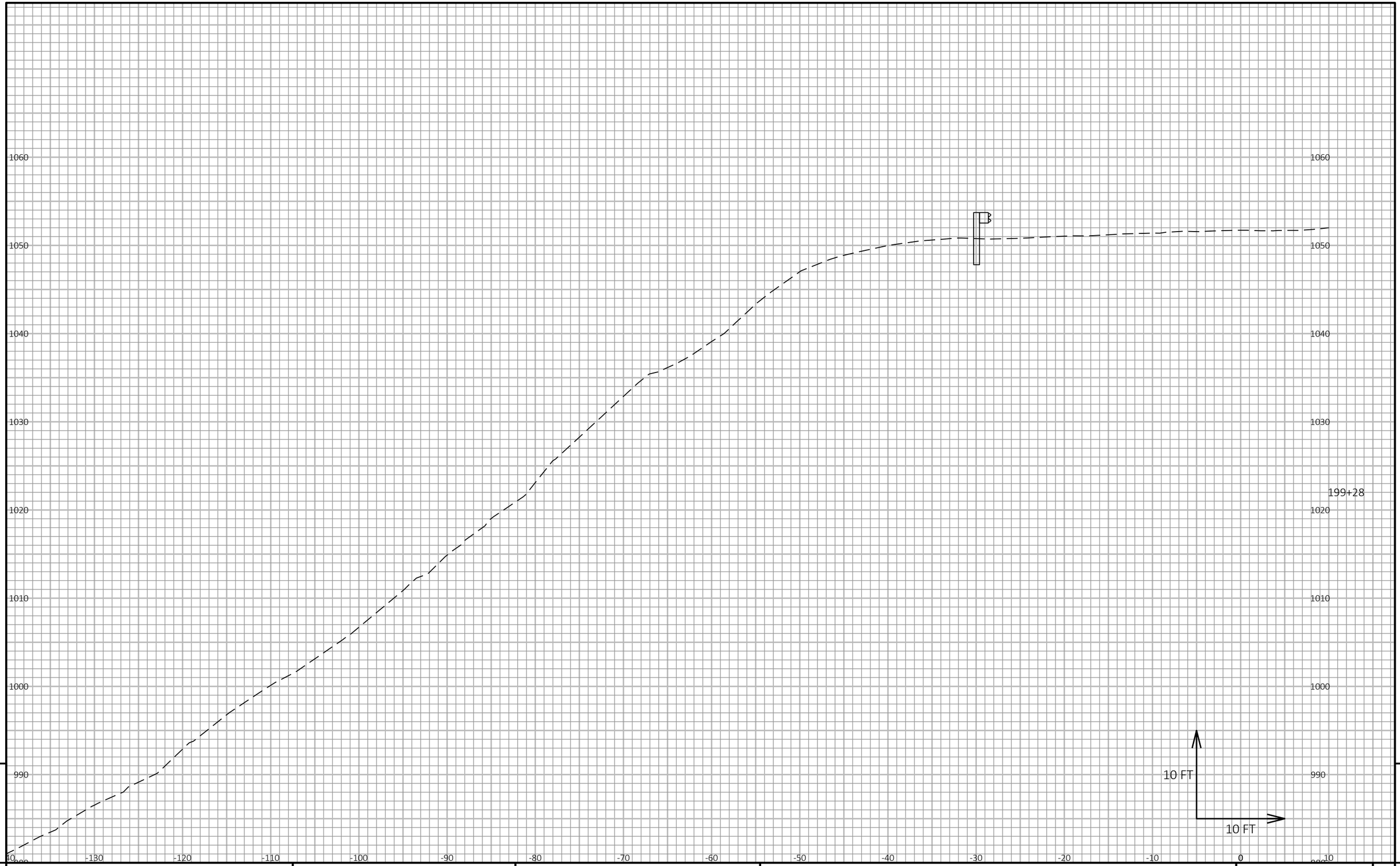
PLOT DATE : 9/27/2018 8:20 AM

PLOT BY : MIKSHOWSKY, CORY J

PLOT NAME :

PLOT SCALE : 1 IN:10 FT HORZ. / 1 IN:10 FT VERT.

WISDOT/CADDS SHEET 49



9

9

PROJECT NO: 5488-00-60	HWY: USH 14	COUNTY: VERNON	CROSS SECTIONS: SITE 1	SHEET	E

FILE NAME : N:\PDS\C3D\54880030\SHEETSPLAN\090201_XS.DWG
LAYOUT NAME - 5

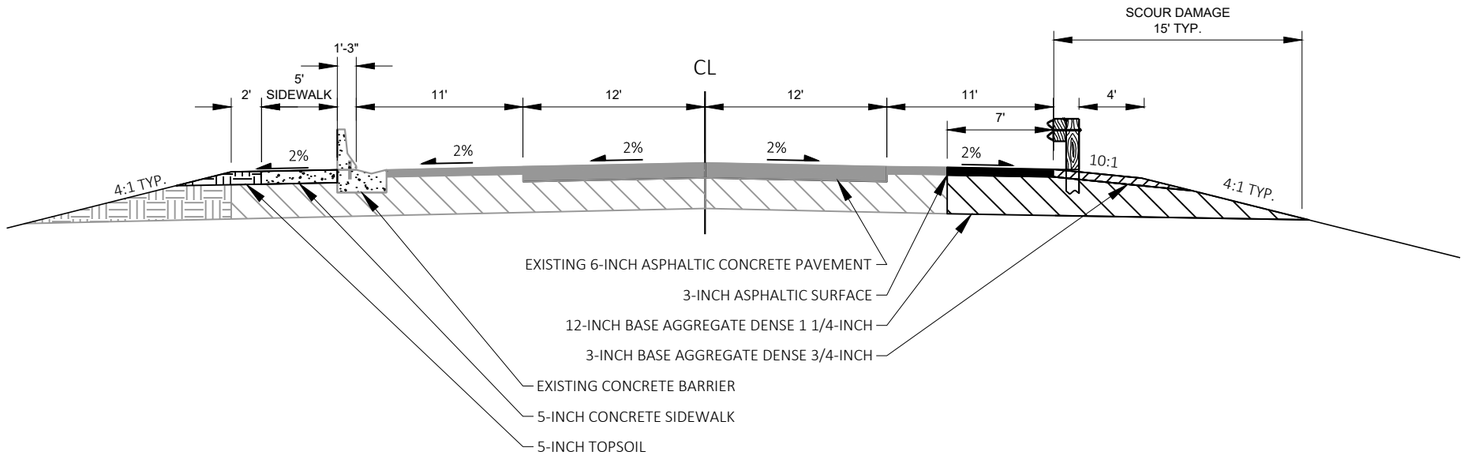
PLOT DATE : 9/27/2018 8:20 AM

PLOT BY : MIKSHOWSKY, CORY J

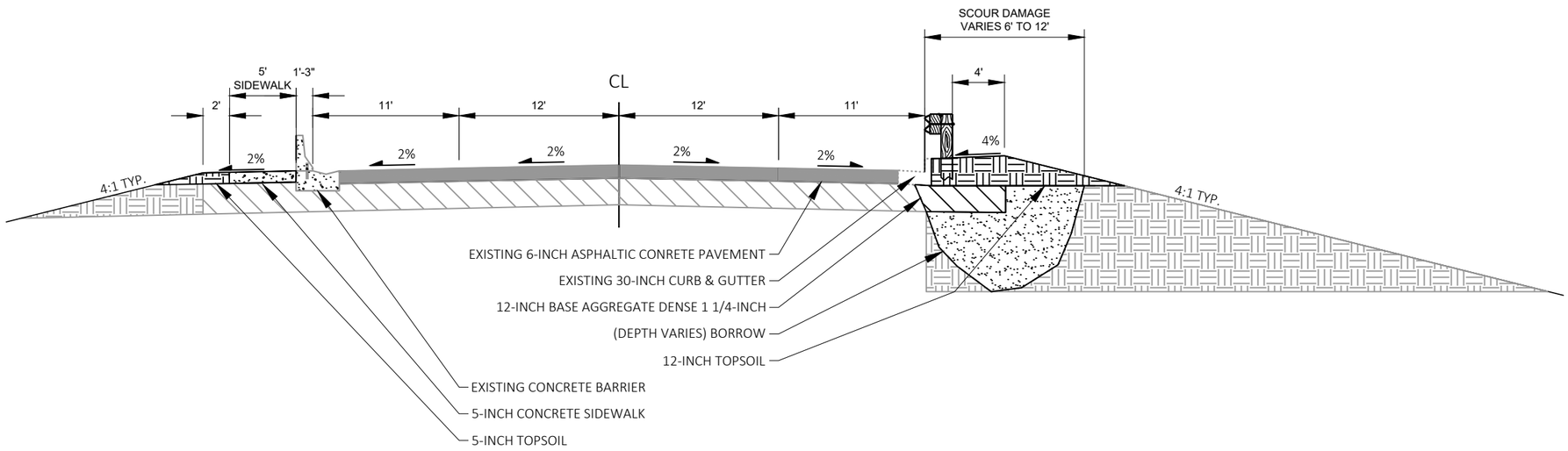
PLOT NAME :

PLOT SCALE : 1 IN:10 FT HORZ. / 1 IN:10 FT VERT.

2



TYPICAL FINISHED SECTION
STA 205+20 TO 206+10

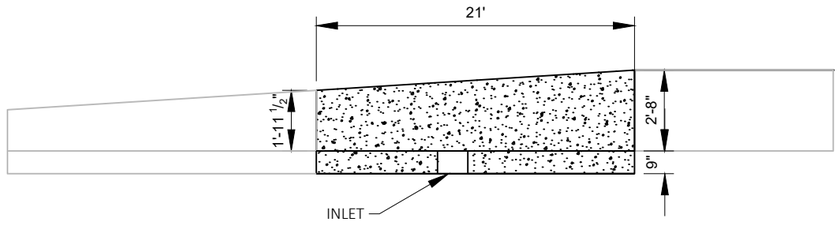


TYPICAL FINISHED SECTION
STA 207+30 TO 208+20

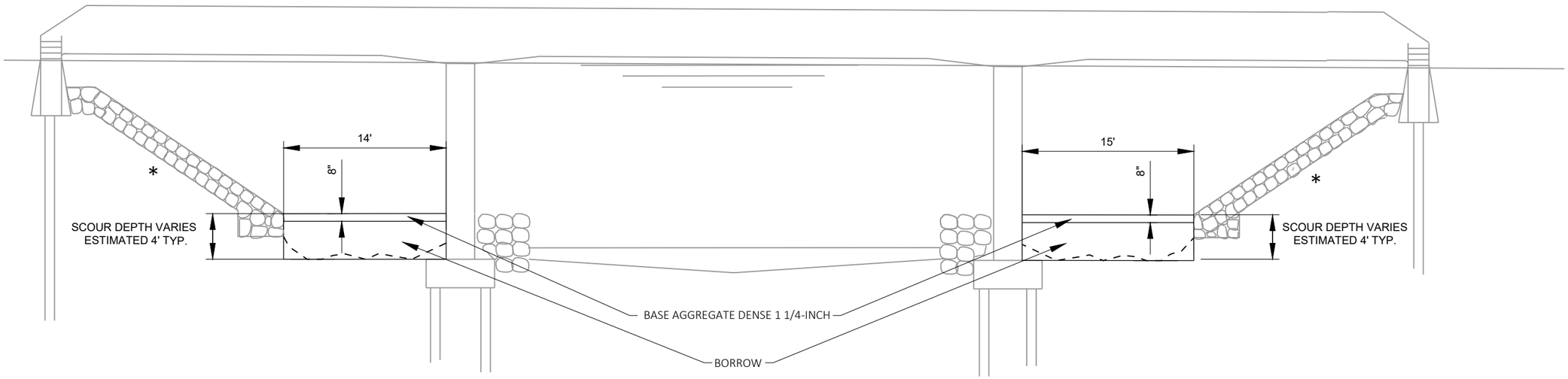
PROJECT NO: 5488-00-60	HWY: USH 14	COUNTY: VERNON	TYPICAL SECTIONS: SITE 2	SHEET	E

FILE NAME : N:\PDS\C3D\54880030\SHEETSPLAN\020302_TS.DWG
LAYOUT NAME - 020302_ts
PLOT DATE : 9/26/2018 3:06 PM
PLOT BY : PETERSON, SHANE J
PLOT NAME :
PLOT SCALE : 1 IN:10 FT
WISDOT/CADDS SHEET 42

2



CONCRETE BARRIER DETAIL
(SEE SDD 14B22-A FOR ADDITIONAL DETAILS)

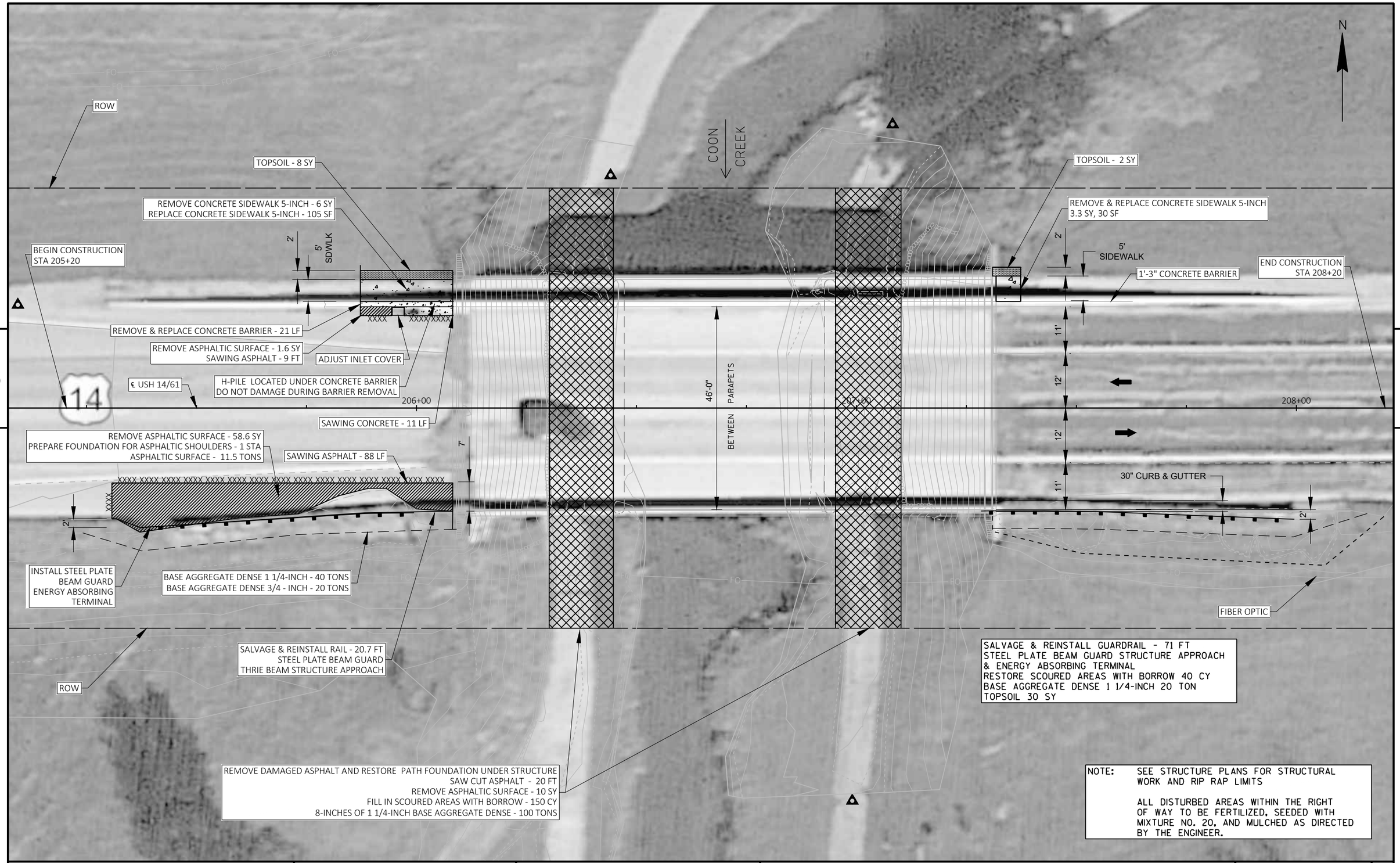


PATH RESTORATION DETAIL
(LOOKING NORTH)

*NOTE: SEE STRUCTURE PLANS FOR STRUCTURAL WORK AND RIP RAP LIMITS

PROJECT NO: 5488-00-60	HWY: USH 14	COUNTY: VERNON	CONSTRUCTION DETAILS: SITE 2	SHEET	E

FILE NAME : N:\PDS\C3D\54880030\SHEETSPLAN\021002_CD.DWG
LAYOUT NAME - 021002_cd
PLOT DATE : 9/25/2018 9:41 AM PLOT BY : PETERSON, SHANE J PLOT NAME : PLOT SCALE : 1 IN:10 FT
WISDOT/CADDS SHEET 42

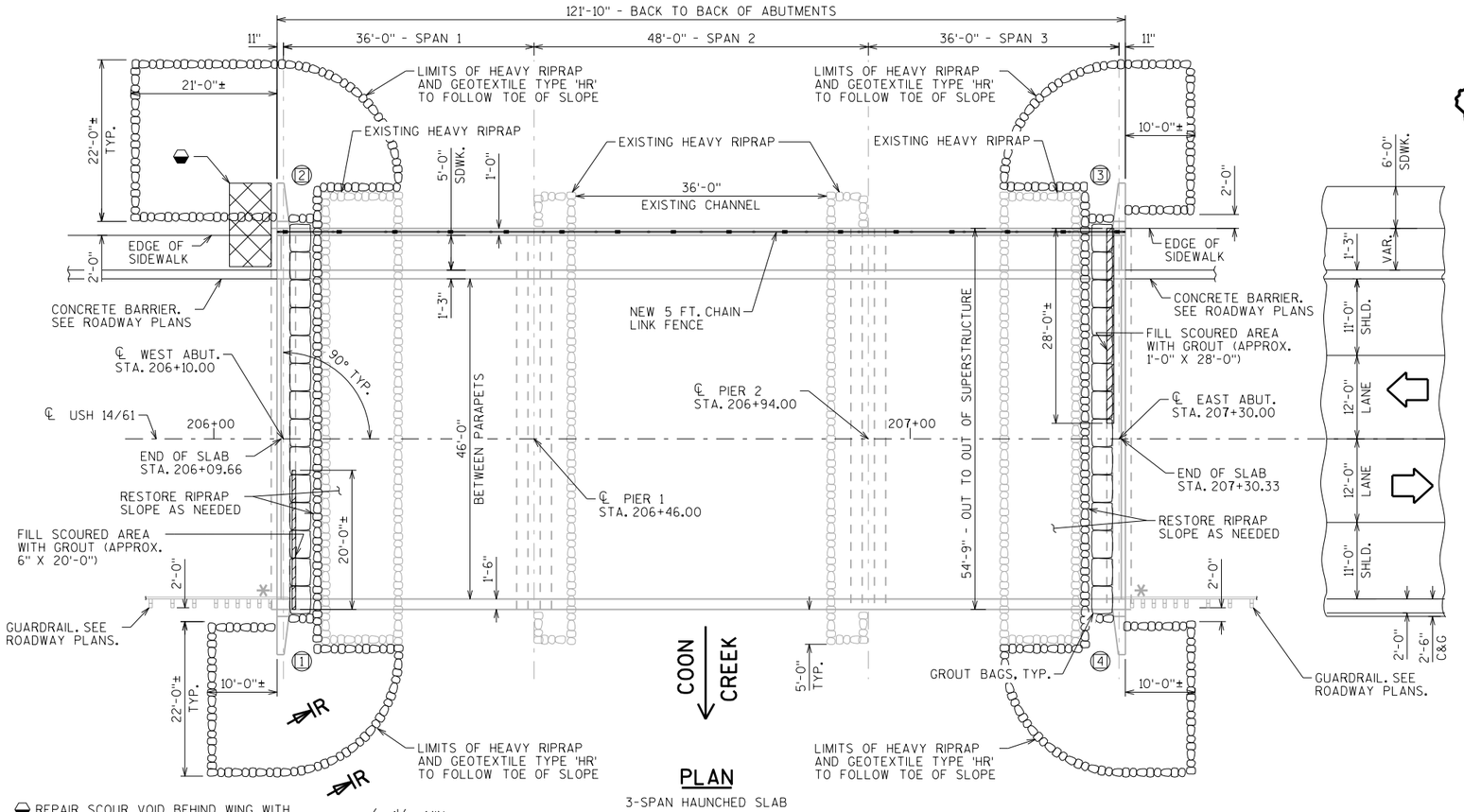


5 5

PROJECT NO: 5488-00-60	HWY: USH 14	COUNTY: VERNON	PLAN: SITE 2 (B-62-105)	SHEET	E

STATE PROJECT NUMBER

5488-00-60



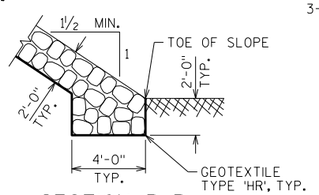
PLAN

3-SPAN HAUNCHED SLAB

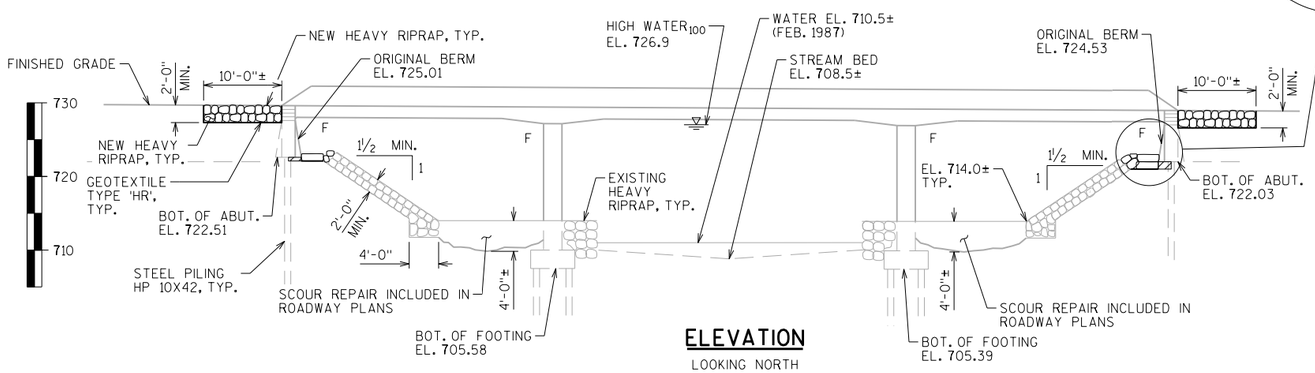
REPAIR SCOUR VOID BEHIND WING WITH BACKFILL STRUCTURE TYPE A. (APPROX. 7'-0" DEEP X 12'-0" WIDE X 6'-0" LONG)

✱ INDICATES LOCATIONS OF EXISTING BEAM GUARD ATTACHMENT

(#) INDICATES WING NUMBER

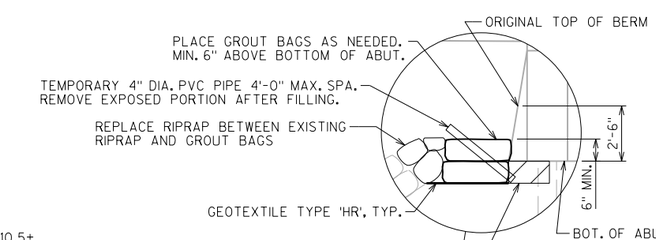


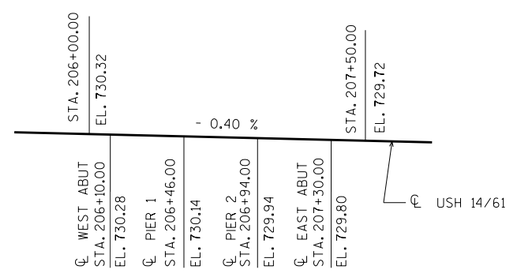
SECTION R-R



ELEVATION

LOOKING NORTH





PROFILE GRADE LINE, USH 14/61

FOR INFORMATION ONLY

GENERAL NOTES

DRAWINGS SHALL NOT BE SCALED.

DIMENSIONS SHOWN ARE BASED ON THE ORIGINAL STRUCTURE PLANS.

AT THE BACK FACE OF ABUTMENT ALL VOIDS SHALL BE BACKFILLED WITH STRUCTURE BACKFILL TYPE A.

THE SLOPE OF THE FILL IN FRONT OF THE ABUTMENTS SHALL BE COVERED WITH HEAVY RIPRAP AND GEOTEXTILE TYPE "HR" TO THE EXTENT SHOWN ON THIS SHEET.

ANY EXCAVATION NECESSARY TO COMPLETE THE SLOPE PAVING REPAIR IS TO BE CONSIDERED INCIDENTAL TO THE BID ITEM "RIPRAP HEAVY".

PARTIAL REMOVAL OF THE EXISTING FENCE POST SLEEVES IS PAID FOR UNDER BID ITEM "REMOVING OLD STRUCTURE STA. 206+70".

AS AN ALTERNATIVE TO "CONCRETE MASONRY DECK REPAIR", DECK PATCHING MAY BE COMPLETED USING A RAPID SETTING CONCRETE PATCH MATERIAL FROM THE APPROVED PRODUCTS LIST.

GROUT BAGS SHALL BE A MINIMUM OF 3'-0" WIDE X 4'-0" LONG X 1'-0" THICK, AND A MAXIMUM SIZE AS ALLOWED BY THE ENGINEER.

REMOVE OR CUT GROUT TUBE FLUSH WITH TOP OF BAGS AFTER FILLING CAVITY BELOW ABUTMENTS WITH GROUT.

GROUT BAGS ARE TO BE PLACED SO THAT THERE IS NO GAP BETWEEN THE BAGS AND THE ABUTMENT.

STACK GROUT BAGS AS REQUIRED TO COVER VOIDS BY 6" MIN. JOINTS BETWEEN BAGS IN SUCCESSIVE ROWS AND TIERS SHALL BE STAGGERED. PIN ROWS TOGETHER WITH #5 BARS @ 4'-0" SPACING. INCLUDED IN THE BID ITEM "SCOUR REPAIR, GROUT BAGS".

TOTAL ESTIMATED QUANTITIES

BID ITEM NUMBER	BID ITEMS	UNIT	TOTALS
203.0200	REMOVING OLD STRUCTURE STA. 206+70	LS	1
210.1500	BACKFILL STRUCTURE TYPE A	TON	40
509.0301	PREPARATION DECKS TYPE 1	SY	2
509.0310.S	SAWING PAVEMENT DECK PREPARATION AREAS	LF	68
509.2100.S	CONCRETE MASONRY DECK REPAIR	CY	1
606.0300	RIPRAP HEAVY	CY	321
616.0205	FENCE CHAIN LINK 5-FT.	LF	122
645.0120	GEOTEXTILE TYPE HR	SY	875
SPV.0035	SCOUR REPAIR, GROUT	CY	3
SPV.0035	SCOUR REPAIR, GROUT BAGS	CY	16

LIST OF DRAWINGS

1. GENERAL PLAN
2. CROSS SECTION & REPAIR DETAILS
3. FENCING DETAILS

STRUCTURE DESIGN CONTACTS:

ADAM SWIERCZEK (608) 267-4593

AARON BONK (608) 261-0261

NO.	DATE	REVISION	BY

BUREAU OF STRUCTURES

ACCEPTED William C. Dreher AMB 9/24/18

CHIEF STRUCTURES DESIGN ENGINEER — DATE

STRUCTURE B-62-105

USH 14/61 OVER COON CREEK

COUNTY	VILLAGE
VERNON	COON VALLEY

DESIGN SPEC. REHABILITATION N/A

DESIGNED BY	DESIGNED CK'D.	DRAWN BY	PLANS CK'D.
ABS	EMK	ABS	EMK

GENERAL PLAN

SHEET 1 OF 3

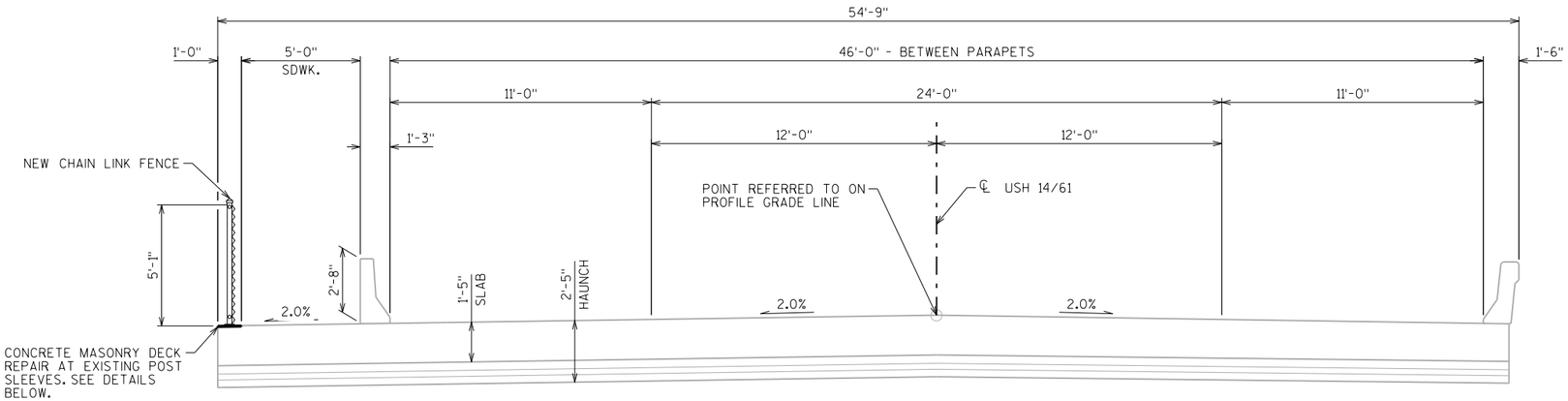
I.D. 5488-00-30A

DATE: SEPT. 2018

SCALE = 10.00

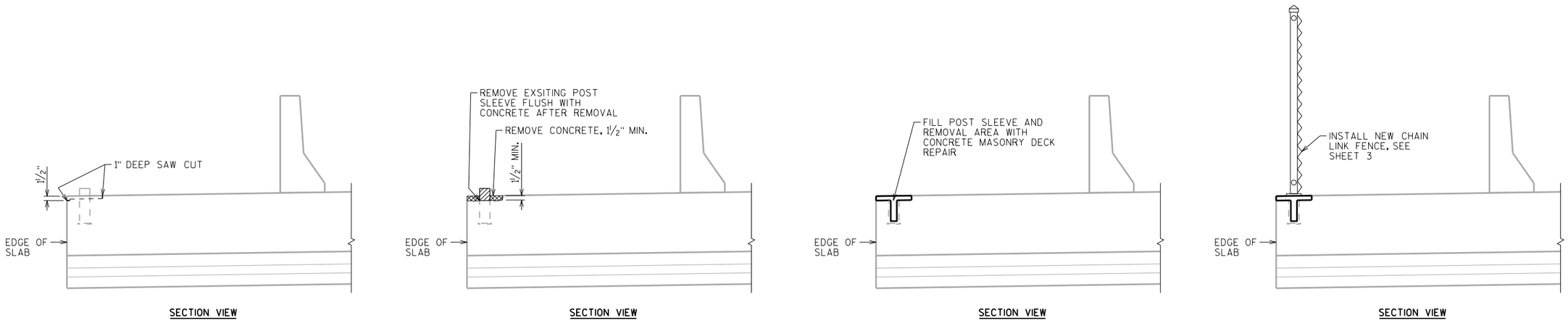
STATE PROJECT NUMBER

5488-00-60



SECTION THRU SLAB

LOOKING EAST



NOTE: CONCRETE REMOVAL TO BE DONE IN ACCORDANCE WITH BID ITEM "PREPARATION DECKS TYPE 1", WITH THE EXCEPTION THAT THE DEPTH OF REMOVAL NEED NOT BE MORE THAN 1½".

EXISTING FENCE POST SLEEVE REPAIR DETAILS

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE B-62-105

DRAWN BY ABS | PLANS CK'D. EMK

CROSS SECTION & REPAIR DETAILS

SHEET 2

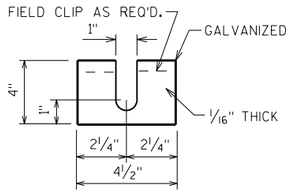
8

8

SCALE = 1.50

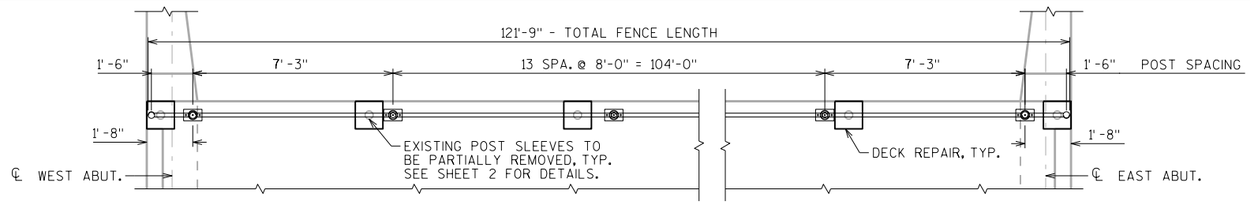
FENCE MEMBER SIZE & WEIGHT

STEEL FENCE MEMBER	OUTSIDE DIAMETER (INCHES)	WEIGHT (LB/FT)
RAILS	1.660	2.27
END POST	2.875	5.80
OVERHANG POST	2.875	5.80
LINE POST	2.375	3.65
POST SLEEVE	4.000	9.12

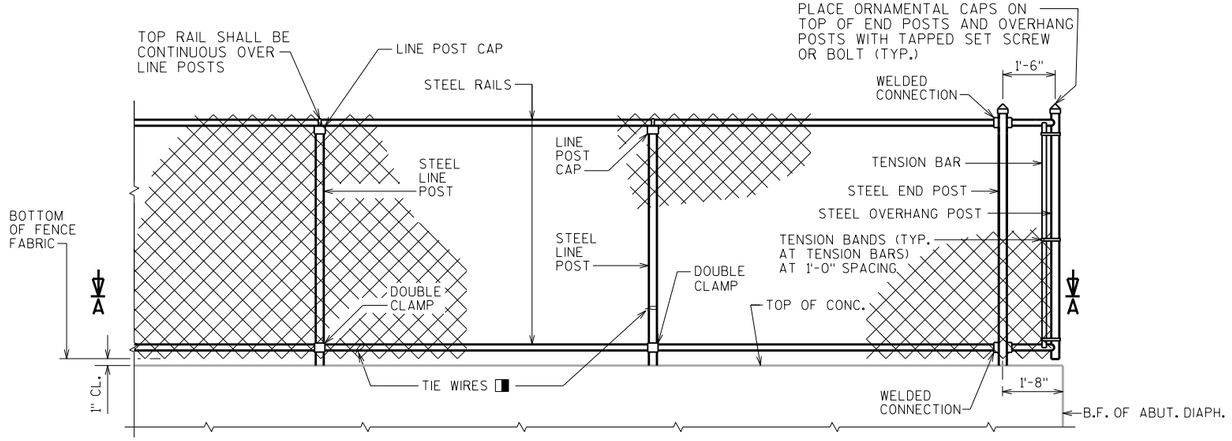


POST SHIM DETAILS

SHIMS REQUIRED ONLY WHEN END POSTS AND LINE POSTS ARE WELDED TO BASE PLATES. PROVIDE 4 SHIMS PER POST. USE WHERE REQUIRED FOR ALIGNMENT.

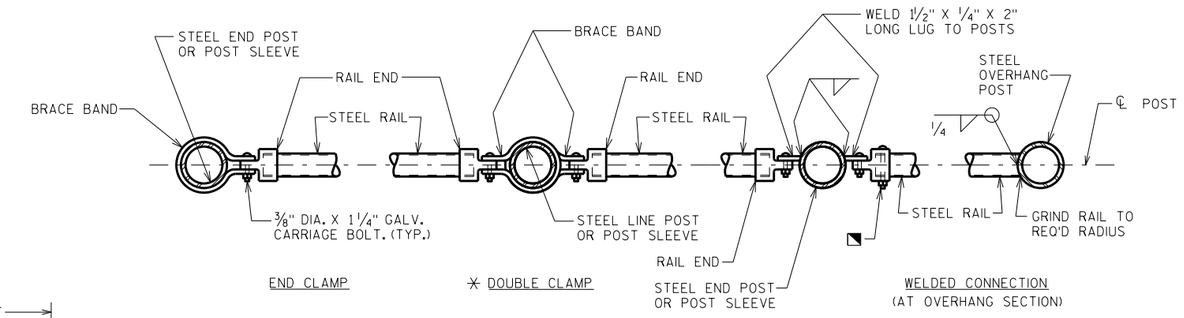


FENCE PART PLAN



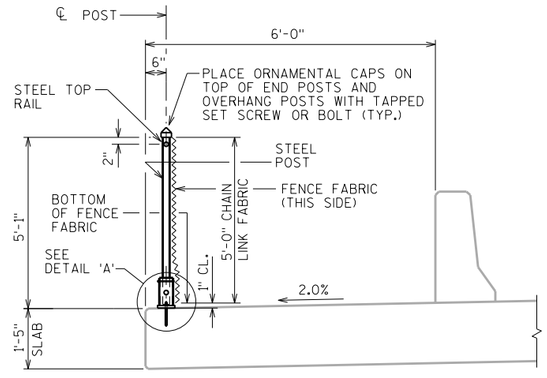
FENCE PART ELEVATION

VIEWING FABRIC SIDE

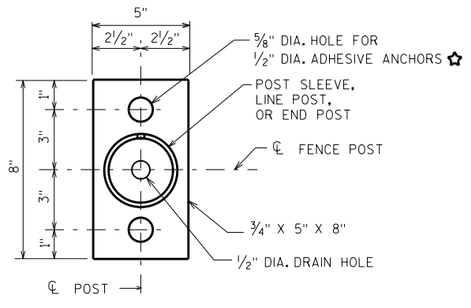


SECTION A-A

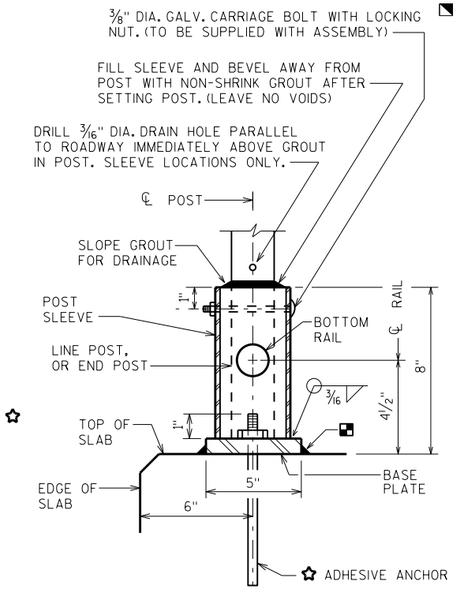
NOTE: PLACE ALL BOLT HEADS ON SIDE OF FENCE ADJACENT TO PEDESTRIANS



SECTION THRU FENCE



BASE PLATE



DETAIL 'A'

UNIT SHALL BE GALVANIZED AFTER FABRICATION

NOTE: IN LIEU OF USING THE POST SLEEVE, THE FENCE POST MAY BE WELDED TO THE BASE PLATE.

NOTES

POSTS ARE TO BE SET VERTICAL.

ALL FENCE COMPONENTS SHALL BE GALVANIZED STEEL, EXCEPT THE FENCE FABRIC WHICH MAY BE ALUMINUM-COATED STEEL OR GALVANIZED STEEL.

FABRIC SHALL CONFORM TO ASTM A491 OR A392, CLASS 2. STEEL RAILS, POSTS AND POST SLEEVES SHALL CONFORM TO ASTM F1083, STANDARD WEIGHT PIPE (SCHEDULE 40). FITTINGS SHALL CONFORM TO ASTM F626.

THE BID ITEM SHALL BE "FENCE CHAIN LINK 5- FT."

COMPLETE ANY REQUIRED WELDING OF COMPONENTS BEFORE GALVANIZING.

POST BASE PLATES SHALL BE FLAT WITH ALL SURFACES SMOOTH AND FREE FROM WARP AND ALL EDGES SMOOTH, STRAIGHT AND VERTICAL. ALL PLATE CUTS SHALL BE MACHINE OR MACHINE FLAME CUT.

BASE PLATES, ANCHOR PLATES AND SHIMS SHALL BE ASTM A709, GRADE 36.

ALL POST SPACINGS ARE MEASURED HORIZONTALLY ALONG THE C/L OF THE POST.

◪ CAULK AROUND PERIMETER OF BASE PLATE AND FILL PORTION OF SLOTTED HOLE AROUND ANCHOR BOLT IN SHIM WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER.

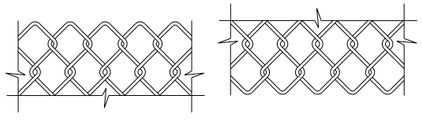
✳ ALTERNATE TO DOUBLE CLAMP: USE LINE RAIL CLAMP (BOULEVARD) OR 180° BRACE BAND, WHICH MAY BE USED WHEN THE POSTS ARE EITHER BOLTED TO THE POST SLEEVES OR DIRECTLY WELDED TO THE BASE PLATE.

✿ CONCRETE ADHESIVE ANCHORS 1/2-INCH. EMBED 7" IN CONCRETE. ADHESIVE ANCHORS SHALL CONFORM TO SECTION 502.2.12 OF THE STANDARD SPECIFICATIONS.

◨ ATTACH FABRIC TO RAILS, AND TO POSTS WITHOUT TENSION BANDS, WITH TIE WIRES (ROUND, 9-GAGE) SPACED AT 1'-0".

◥ BOLT RAIL TO RAIL END TO SECURE OVERHANG SECTION. ALTERNATE IS TO WELD RAIL DIRECTLY TO END POST.

MINIMUM LENGTH OF TOP RAIL BETWEEN SPLICES SHALL BE 20'-0". LOCATE SPLICES NEAR 1/4 POINT OF POST SPACING.



FENCE FABRIC

FENCE FABRIC WOVEN OF 9-GAGE WIRE IN 2" DIAMOND PATTERN MESH WITH BOTH THE TOP AND BOTTOM SELVAGES KNUCKLED.

STATE PROJECT NUMBER

5488-00-60

NO.	DATE	REVISION	BY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE B-62-105

DRAWN BY ABS | PLANS CK'D. EMK

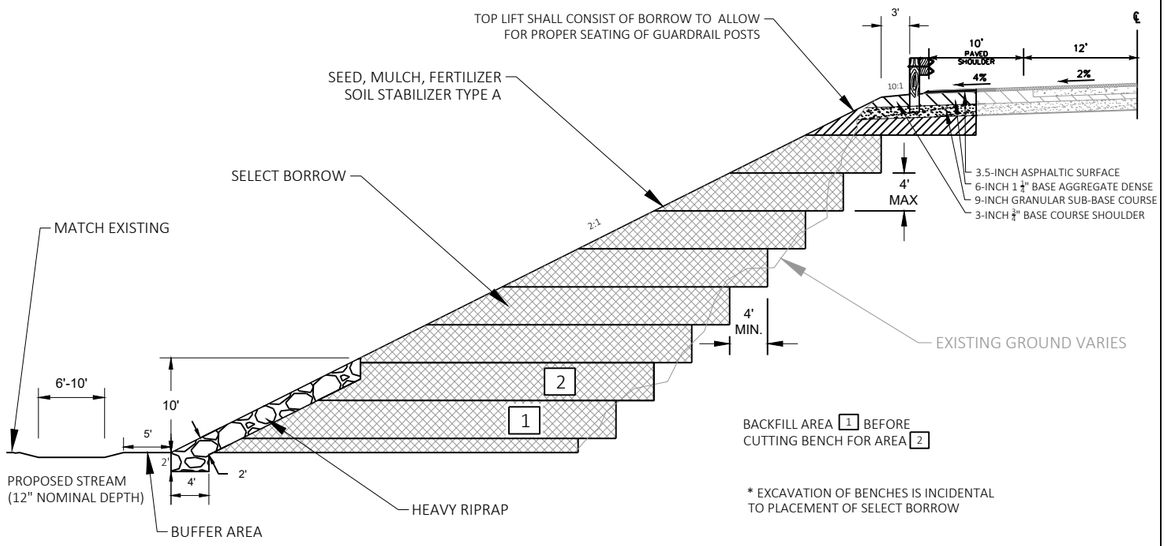
FENCING DETAILS

SHEET 3

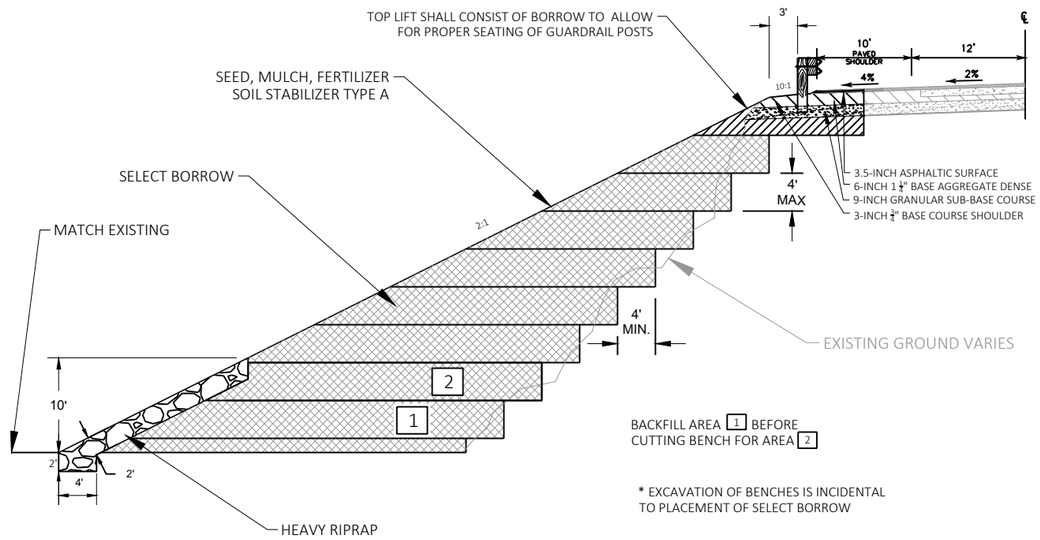
8

8

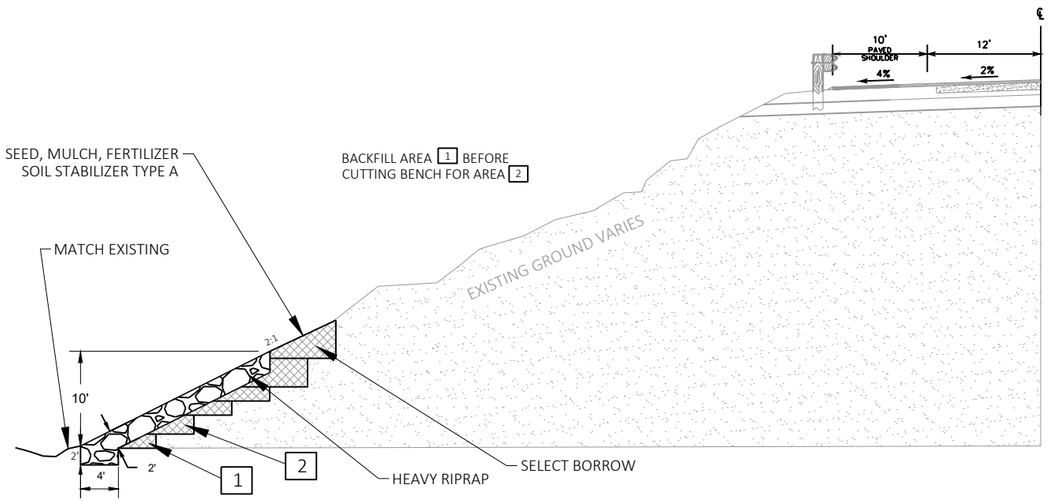
SCALE = 5.33



SLOPE REPAIR WITH STREAM REALIGNMENT

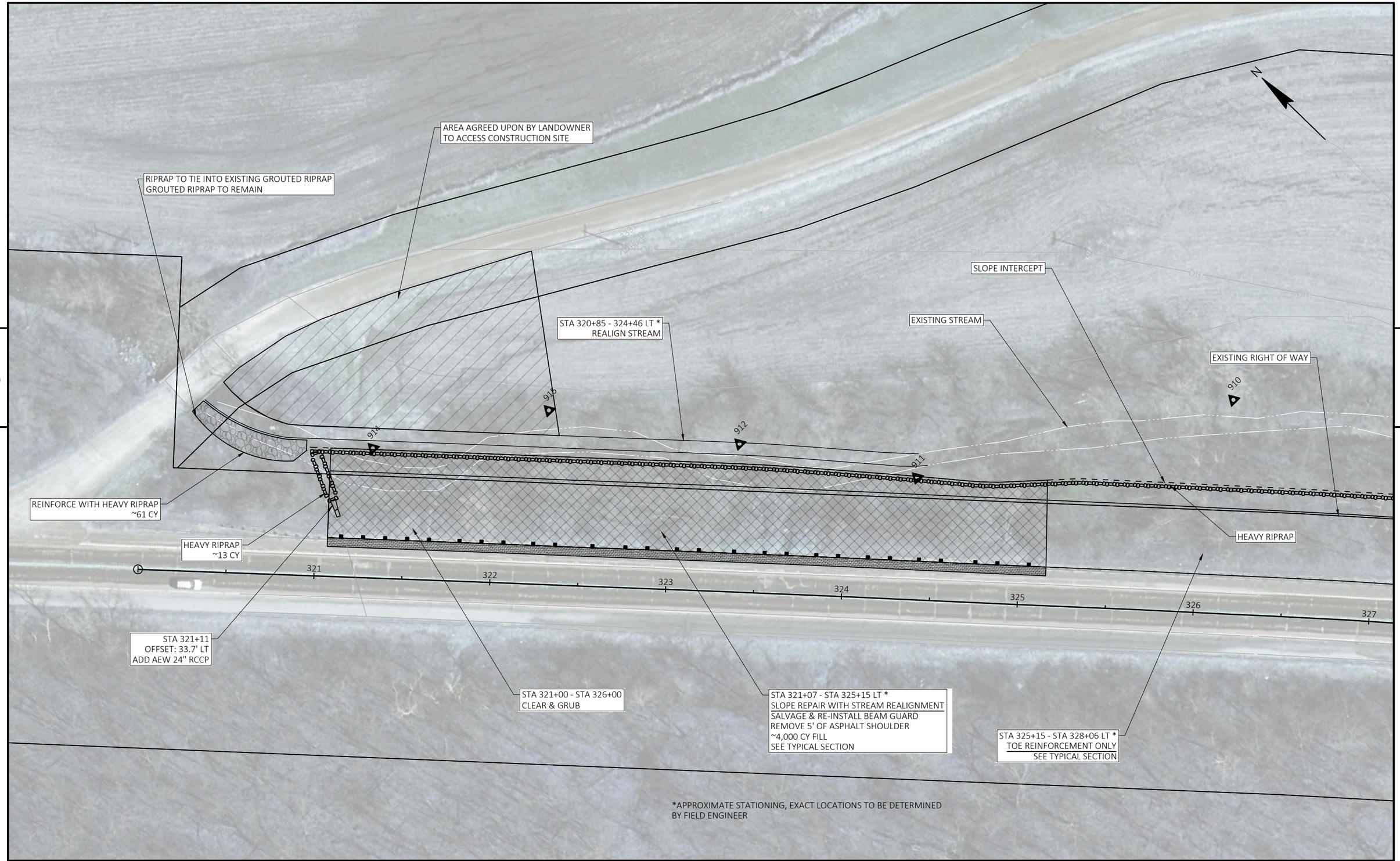


SLOPE REPAIR



TOE REINFORCEMENT ONLY

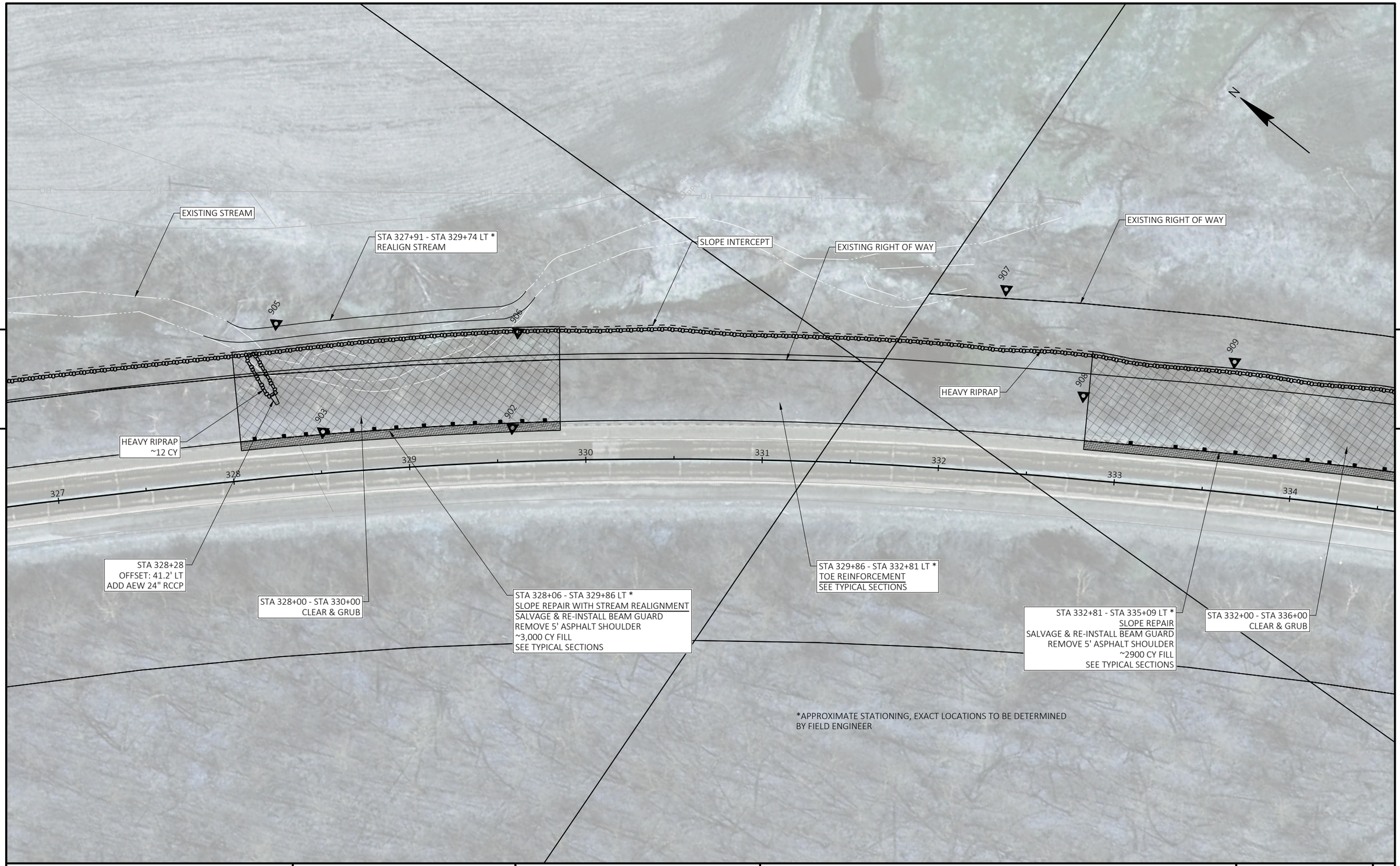
PROJECT NO: 5488-00-60	HWY: USH 14	COUNTY: VERNON	TYPICAL SECTIONS: SITE 3	SHEET	E



PROJECT NO: 5488-00-60	HWY: USH 14	COUNTY: VERNON	PLAN:SITE 3	SHEET	E

FILE NAME : N:\PDS\C3D\54880030-E\SHEETSPLAN\050203_PN.DWG
LAYOUT NAME - 050201_pn

PLOT DATE : 9/27/2018 3:08 PM PLOT BY : MIKSHOWSKY, CORY J PLOT NAME : PLOT SCALE : 1 IN:50 FT



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PROJECT NO: 5488-00-60	HWY: USH 14	COUNTY: VERNON	PLAN: SITE 3	SHEET	E

FILE NAME : N:\PDS\C3D\54880030-E\SHEETSPLAN\050203_PN.DWG
LAYOUT NAME - 050202_pn
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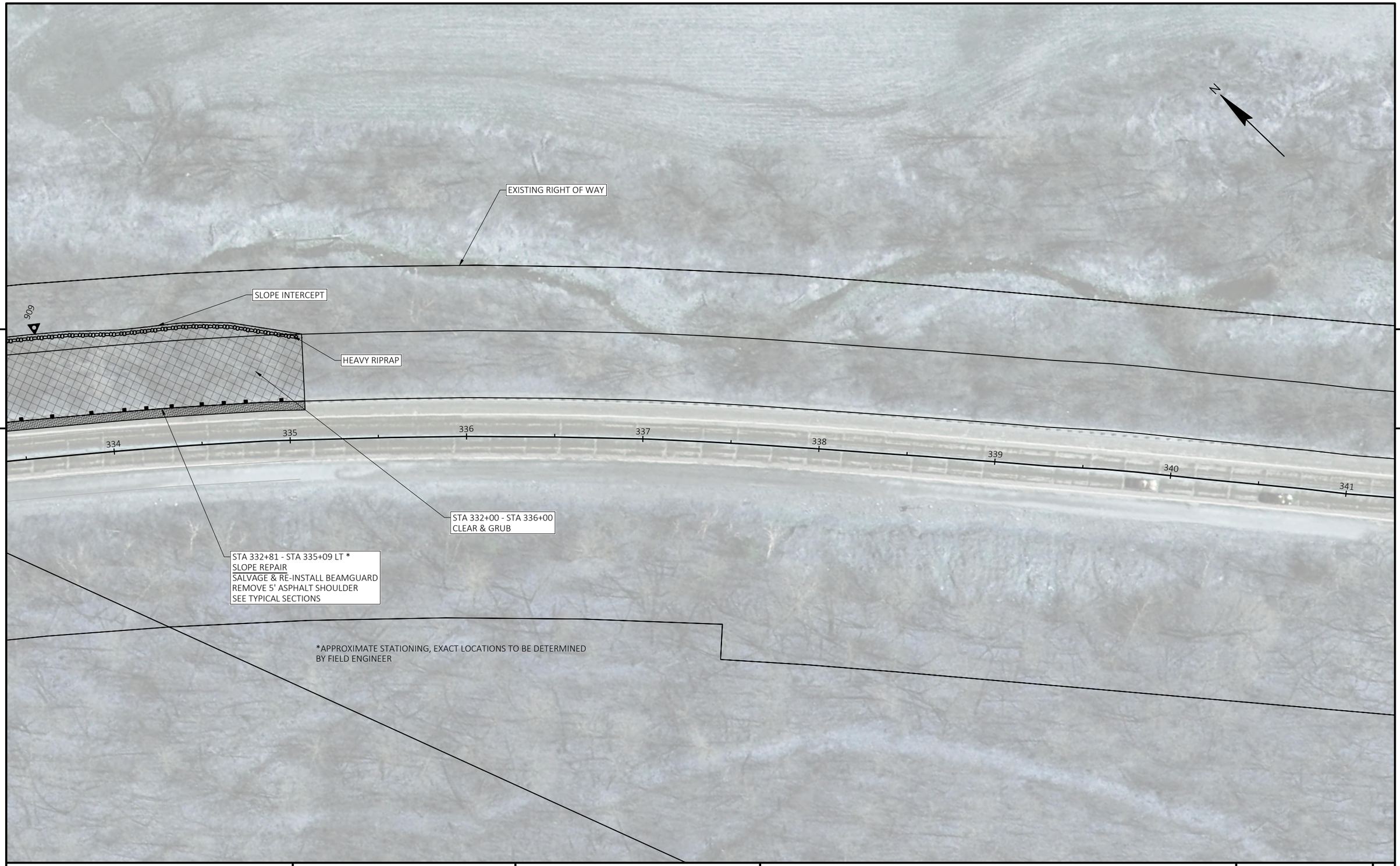
PLOT BY : MIKSHOWSKY, CORY J
PLOT NAME :
PLOT SCALE : 1 IN:50 FT



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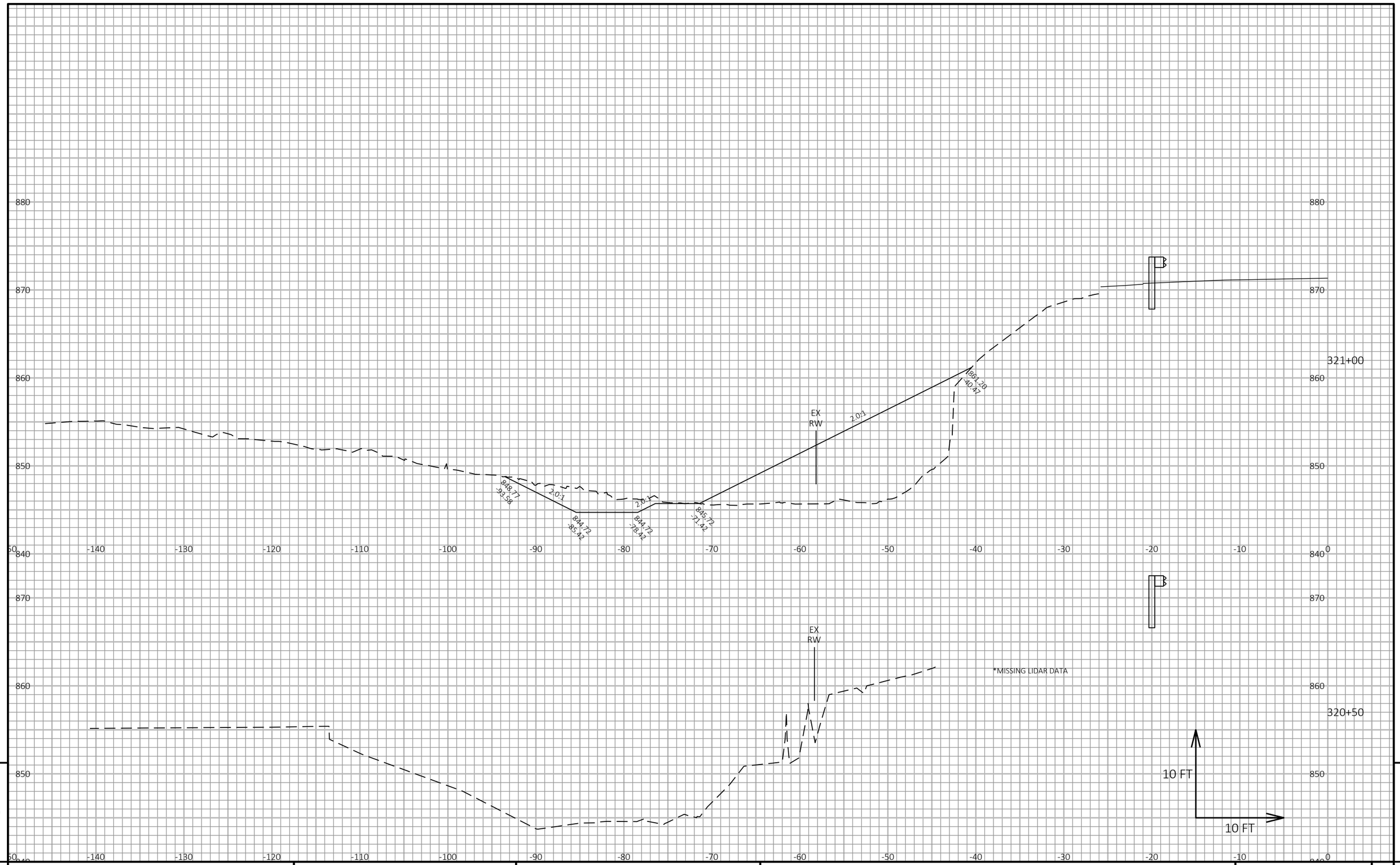
PROJECT NO: 5488-00-60	HWY: USH 14	COUNTY: VERNON	PLAN: SITE 3	SHEET	E



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PROJECT NO: 5488-00-60	HWY: USH 14	COUNTY: VERNON	CROSS SECTIONS: SITE 3	SHEET	E

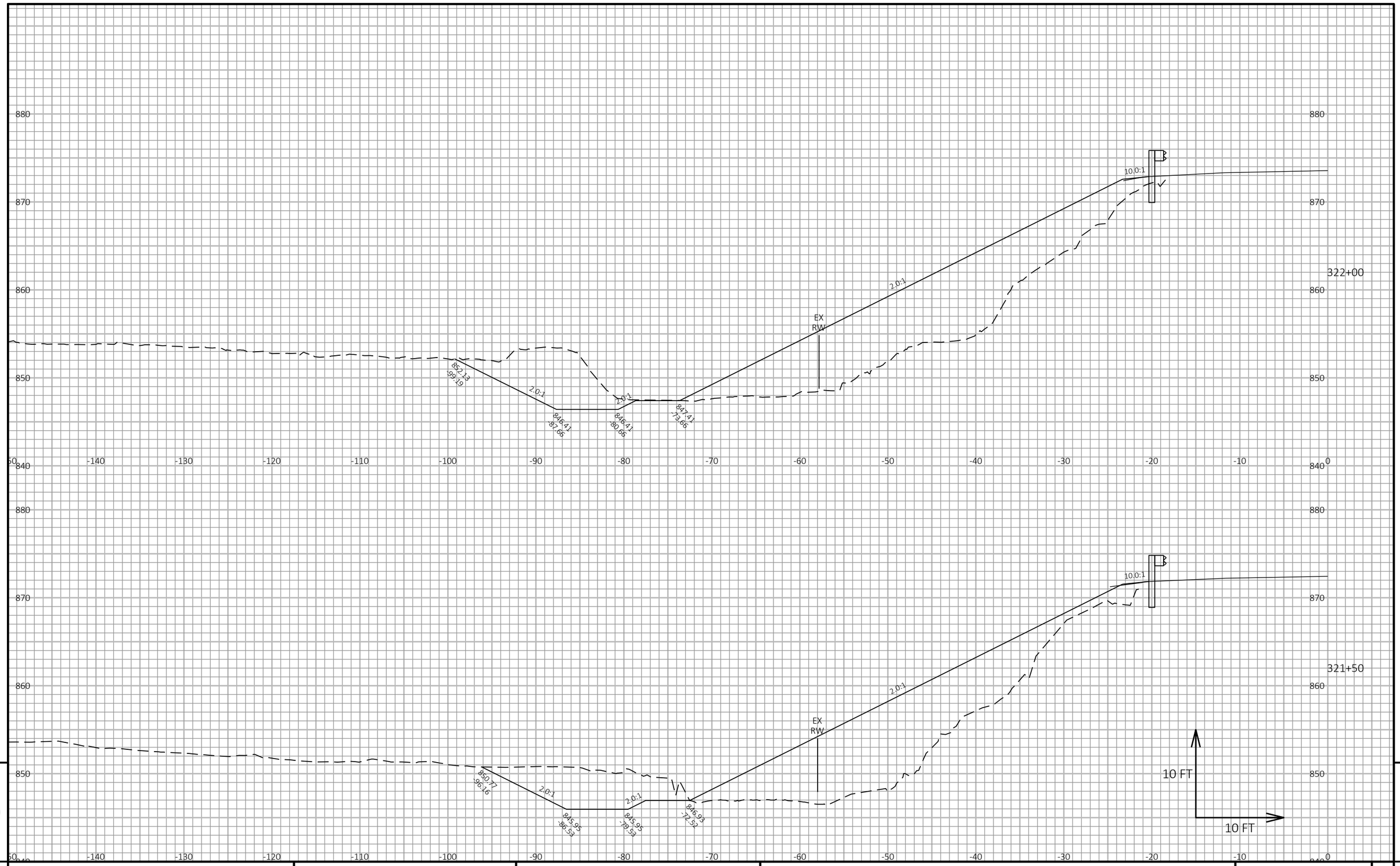
FILE NAME : N:\PDS\C3D\54880030-E\SHEETSPLAN\090203_XS.DWG
LAYOUT NAME - 6

PLOT DATE : 9/27/2018 3:00 PM

PLOT BY : MIKSHOWSKY, CORY J

PLOT NAME :

PLOT SCALE : 1 IN:10 FT HORZ. / 1 IN:10 FT VERT.



PROJECT NO: 5488-00-60	HWY: USH 14	COUNTY: VERNON	CROSS SECTIONS: SITE 3	SHEET E

FILE NAME : N:\PDS\C3D\54880030-E\SHEETSPLAN\090203_XS.DWG
LAYOUT NAME - 7

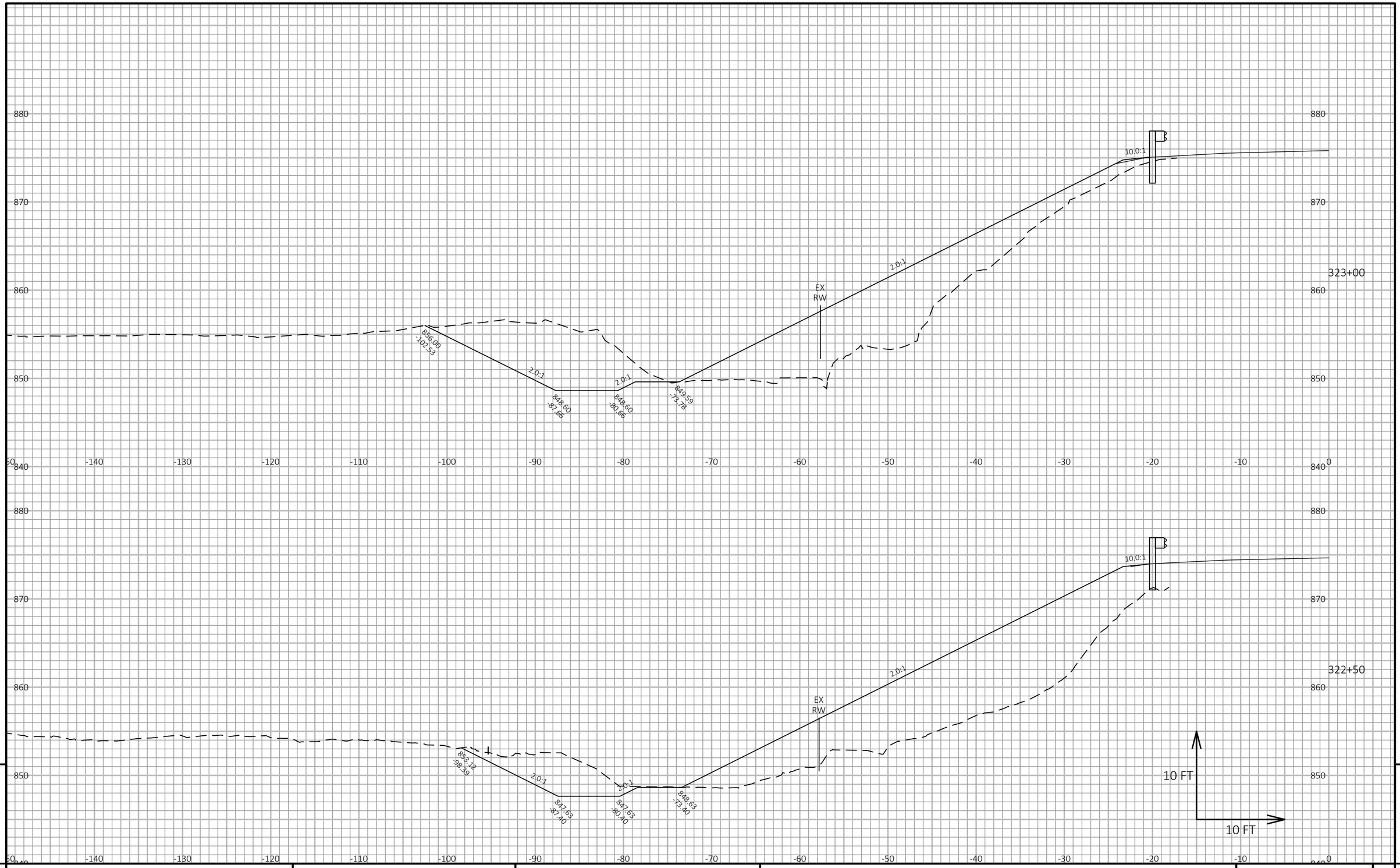
PLOT DATE : 9/27/2018 3:00 PM

PLOT BY : MIKSHOWSKY, CORY J

PLOT NAME :

PLOT SCALE : 1 IN:10 FT HORZ. / 1 IN:10 FT VERT.

WISDOT/CADDS SHEET 49



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PROJECT NO: 5488-00-60	HWY: USH 14	COUNTY: VERNON	CROSS SECTIONS: SITE 3	SHEET	E

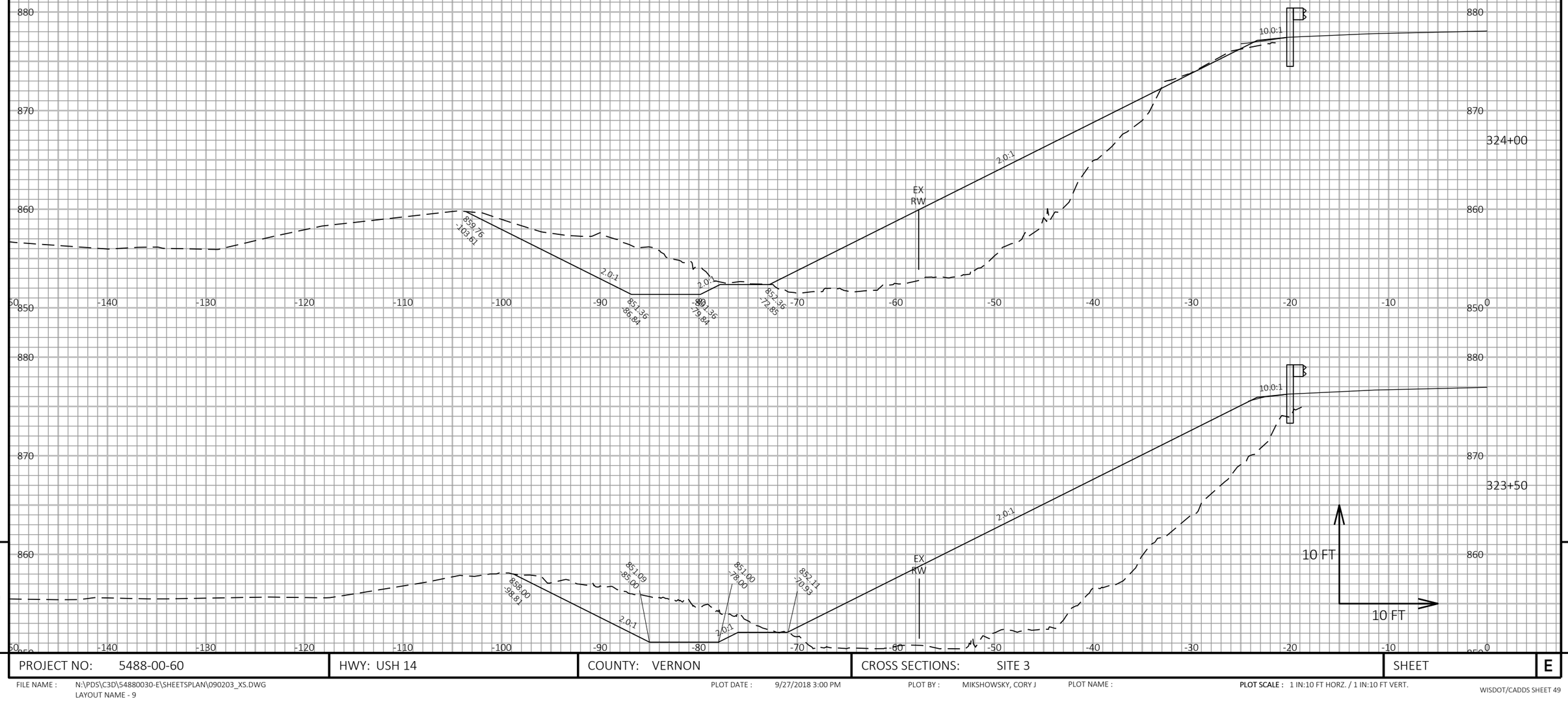
FILE NAME : N:\PDS\C3D\54880030-E\SHEETSPLAN\090203_XS.DWG
LAYOUT NAME - 8

PLOT DATE : 9/27/2018 3:00 PM

PLOT BY : MIKSHOWSKY, CORY J

PLOT NAME :

PLOT SCALE : 1 IN:10 FT HORZ. / 1 IN:10 FT VERT.



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PROJECT NO: 5488-00-60	HWY: USH 14	COUNTY: VERNON	CROSS SECTIONS: SITE 3	SHEET	E

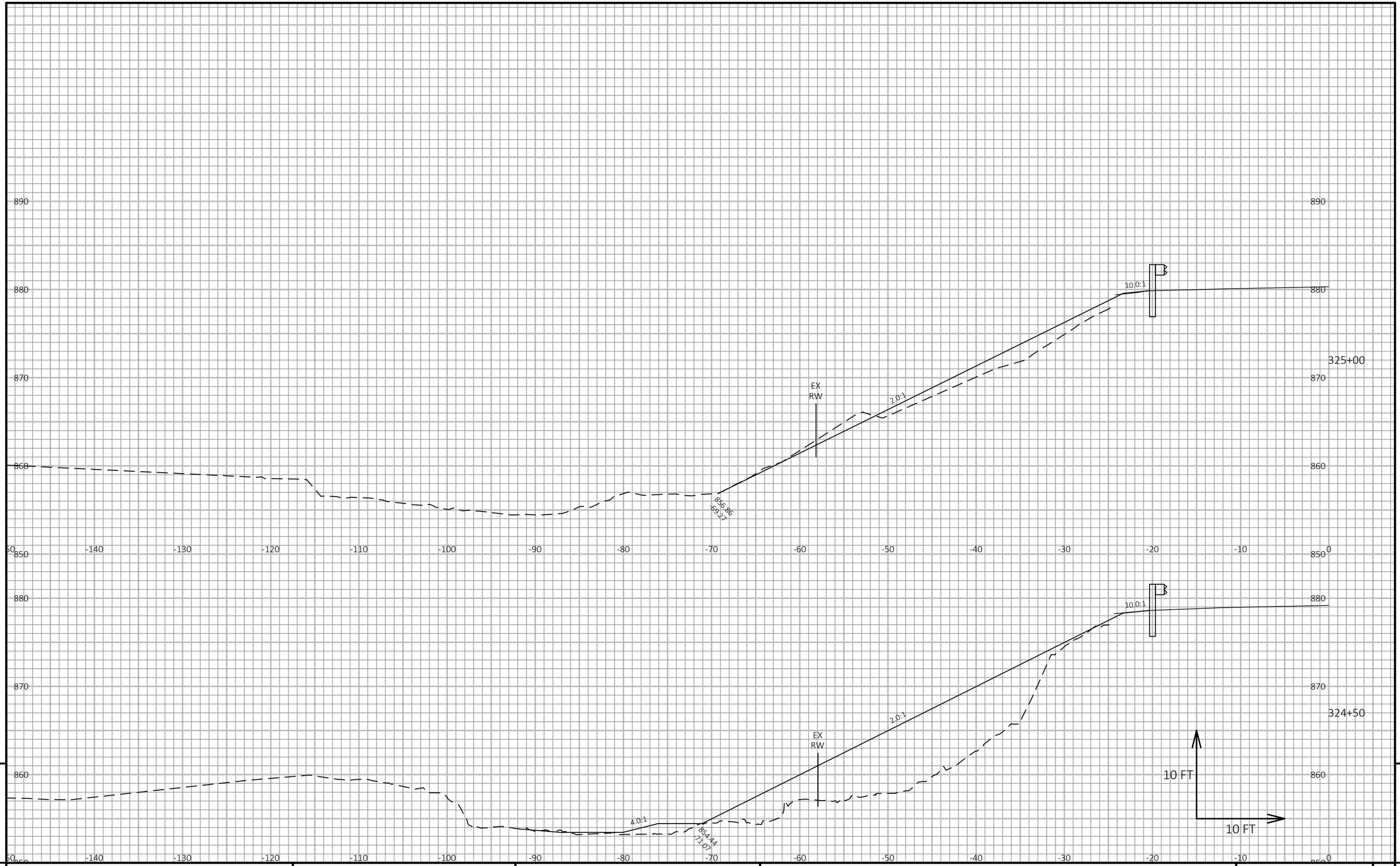
FILE NAME : N:\PDS\C3D\54880030-E\SHEETSPLAN\090203_XS.DWG
LAYOUT NAME - 9

PLOT DATE : 9/27/2018 3:00 PM

PLOT BY : MIKSHOWSKY, CORY J

PLOT NAME :

PLOT SCALE : 1 IN:10 FT HORZ. / 1 IN:10 FT VERT.



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PROJECT NO: 5488-00-60	HWY: USH 14	COUNTY: VERNON	CROSS SECTIONS: SITE 3	SHEET	E

FILE NAME : N:\PDS\C3D\54880030-E\SHEETSPLAN\090203_XS.DWG
LAYOUT NAME - 10

PLOT DATE : 9/27/2018 3:00 PM

PLOT BY : MIKSHOWSKY, CORY J

PLOT NAME :

PLOT SCALE : 1 IN:10 FT HORZ. / 1 IN:10 FT VERT.

WISDOT/CADDS SHEET 49

890
880
870
860
850
-140 -130 -120 -110 -100 -90 -80 -70 -60 -50 -40 -30 -20 -10 0

EX
RW

326+00

890
880
870
860
850

EX
RW

325+50

10 FT

10 FT

9

9

PROJECT NO: 5488-00-60	HWY: USH 14	COUNTY: VERNON	CROSS SECTIONS: SITE 3	SHEET	E

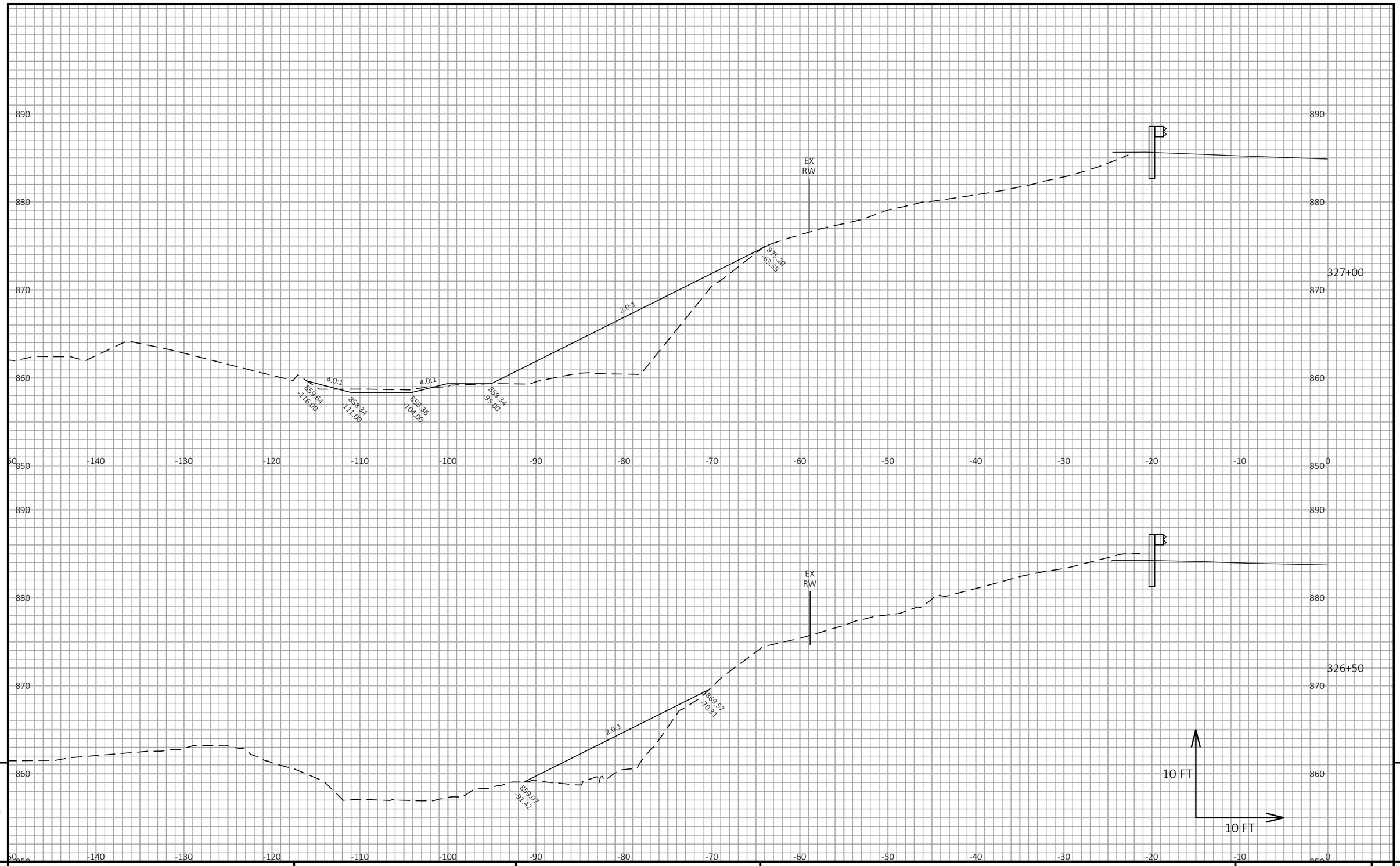
FILE NAME : N:\PDS\C3D\54880030-E\SHEETSPLAN\090203_XS.DWG
LAYOUT NAME - 11

PLOT DATE : 9/27/2018 3:00 PM

PLOT BY : MIKSHOWSKY, CORY J

PLOT NAME :

PLOT SCALE : 1 IN:10 FT HORZ. / 1 IN:10 FT VERT.



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PROJECT NO: 5488-00-60	HWY: USH 14	COUNTY: VERNON	CROSS SECTIONS: SITE 3	SHEET	E

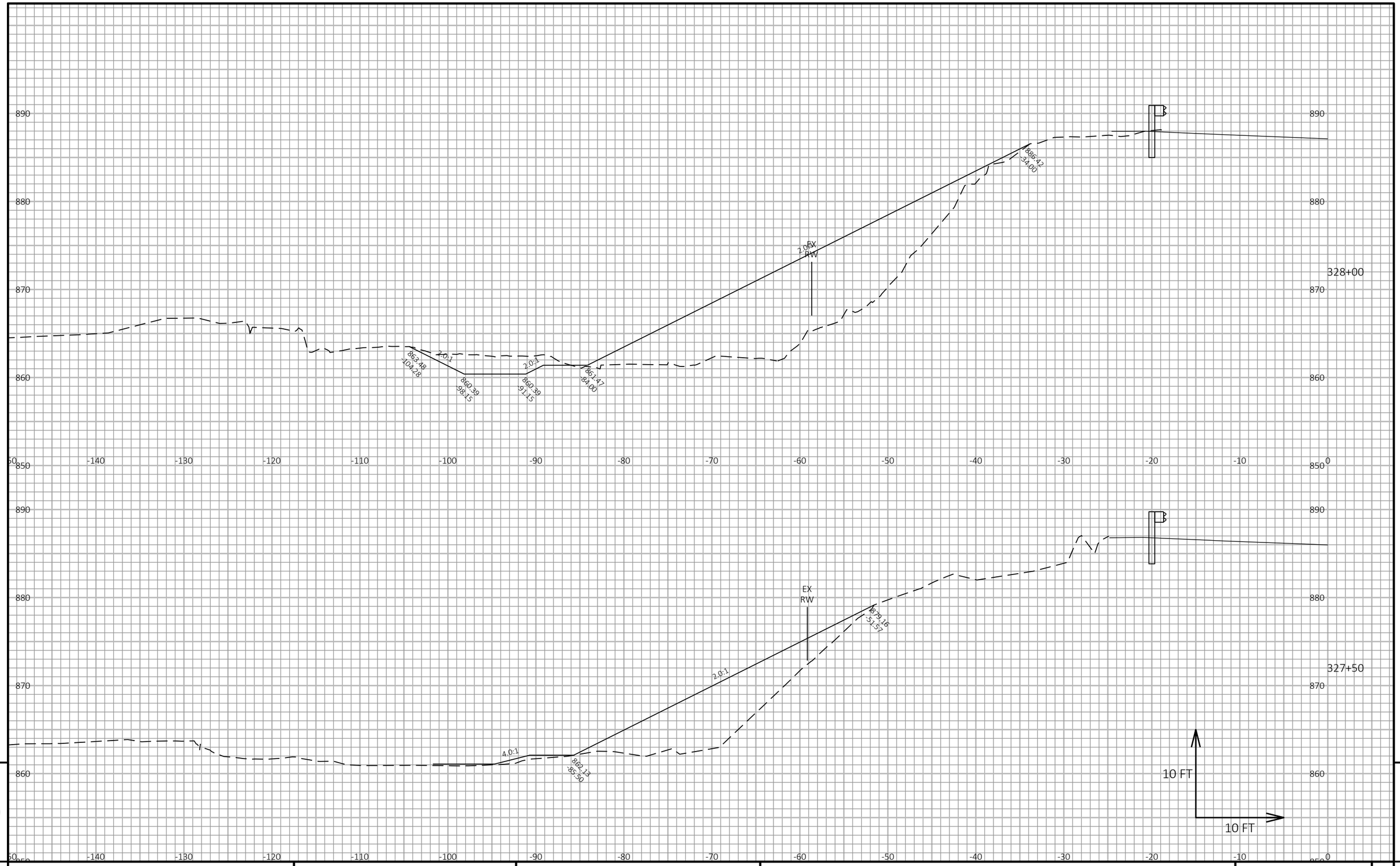
FILE NAME : N:\PDS\C3D\54880030-E\SHEETSPLAN\090203_XS.DWG
LAYOUT NAME - 12

PLOT DATE : 9/27/2018 3:00 PM

PLOT BY : MIKSHOWSKY, CORY J

PLOT NAME :

PLOT SCALE : 1 IN:10 FT HORZ. / 1 IN:10 FT VERT.



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PROJECT NO: 5488-00-60	HWY: USH 14	COUNTY: VERNON	CROSS SECTIONS: SITE 3	SHEET	E

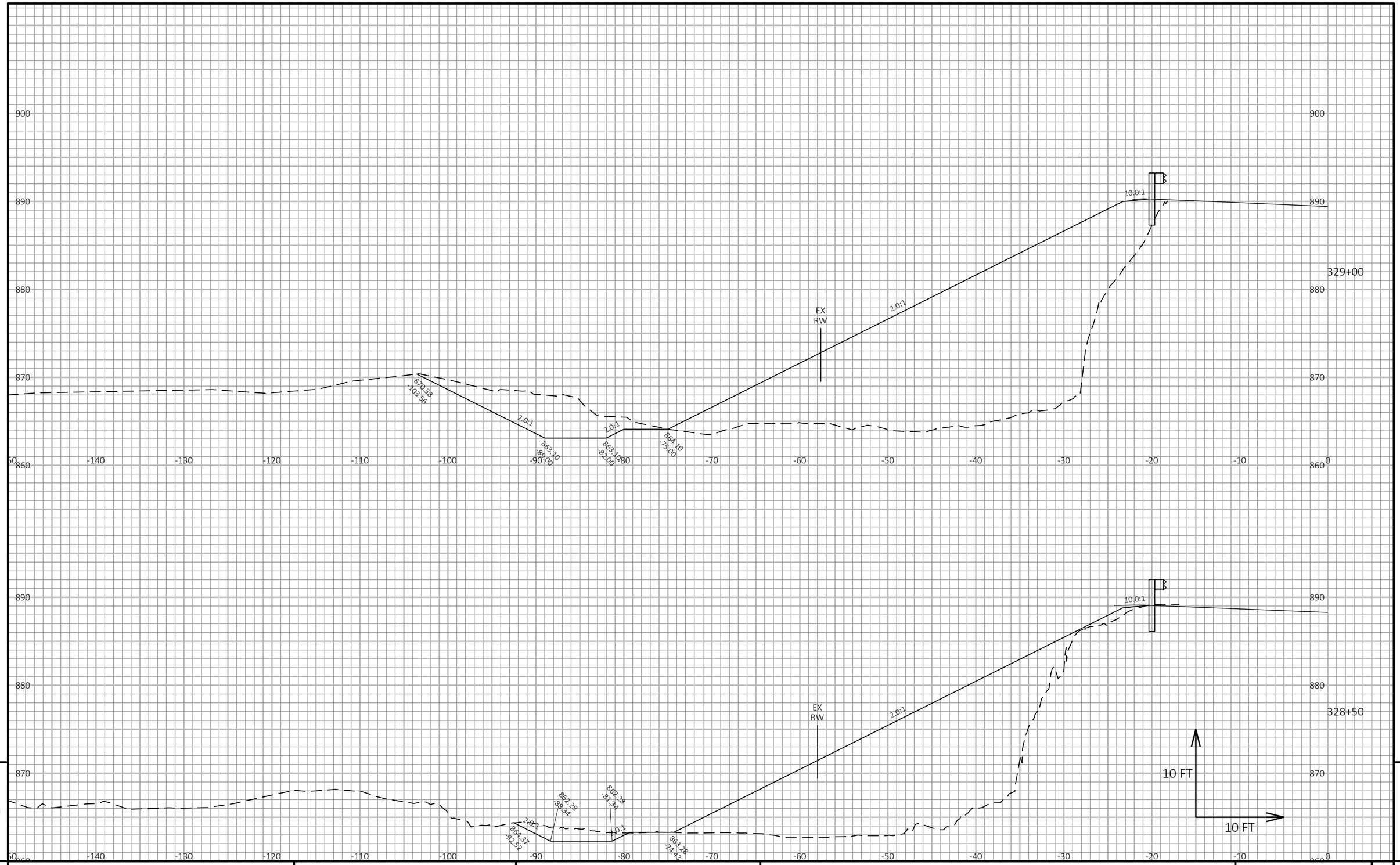
FILE NAME : N:\PDS\C3D\54880030-E\SHEETSPLAN\090203_XS.DWG
LAYOUT NAME - 13

PLOT DATE : 9/27/2018 3:00 PM

PLOT BY : MIKSHOWSKY, CORY J

PLOT NAME :

PLOT SCALE : 1 IN:10 FT HORZ. / 1 IN:10 FT VERT.



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PROJECT NO: 5488-00-60	HWY: USH 14	COUNTY: VERNON	CROSS SECTIONS: SITE 3	SHEET E

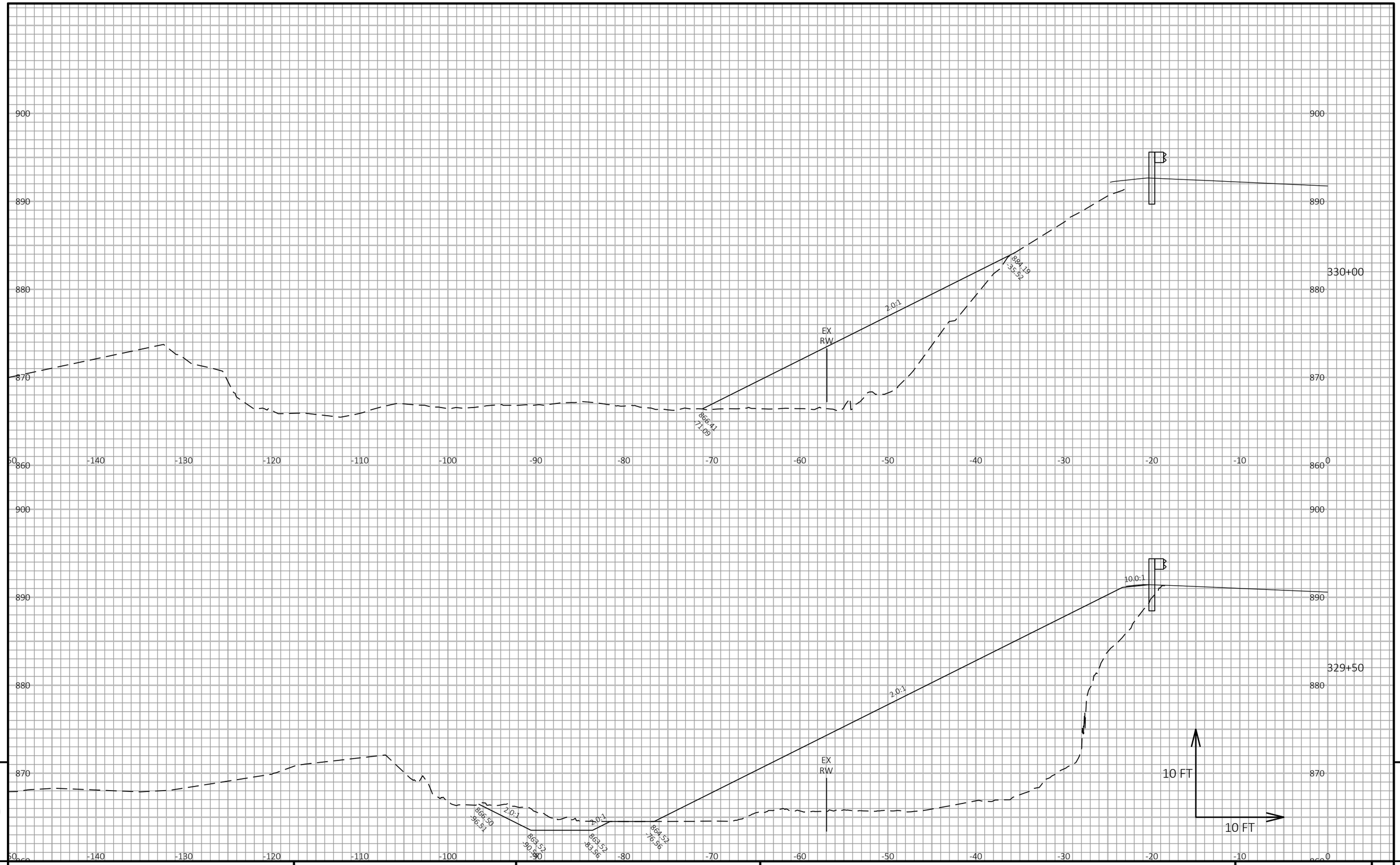
FILE NAME : N:\PDS\C3D\54880030-E\SHEETSPLAN\090203_XS.DWG
LAYOUT NAME - 14

PLOT DATE : 9/27/2018 3:00 PM

PLOT BY : MIKSHOWSKY, CORY J

PLOT NAME :

PLOT SCALE : 1 IN:10 FT HORZ. / 1 IN:10 FT VERT.



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PROJECT NO: 5488-00-60	HWY: USH 14	COUNTY: VERNON	CROSS SECTIONS: SITE 3	SHEET	E

FILE NAME : N:\PDS\C3D\54880030-E\SHEETSPLAN\090203_XS.DWG
LAYOUT NAME - 15

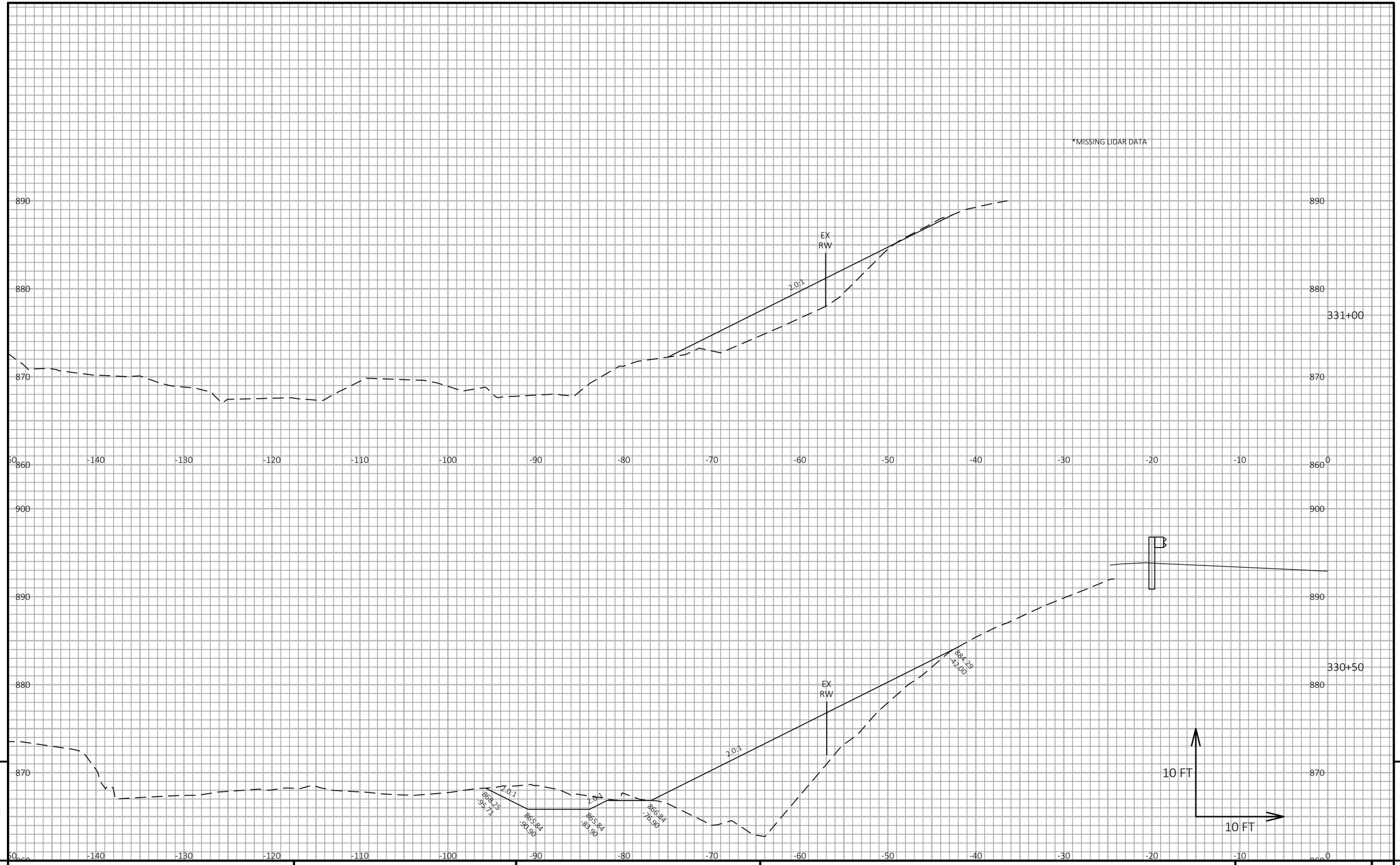
PLOT DATE : 9/27/2018 3:00 PM

PLOT BY : MIKSHOWSKY, CORY J

PLOT NAME :

PLOT SCALE : 1 IN:10 FT HORZ. / 1 IN:10 FT VERT.

*MISSING LIDAR DATA



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PROJECT NO: 5488-00-60	HWY: USH 14	COUNTY: VERNON	CROSS SECTIONS: SITE 3	SHEET	E

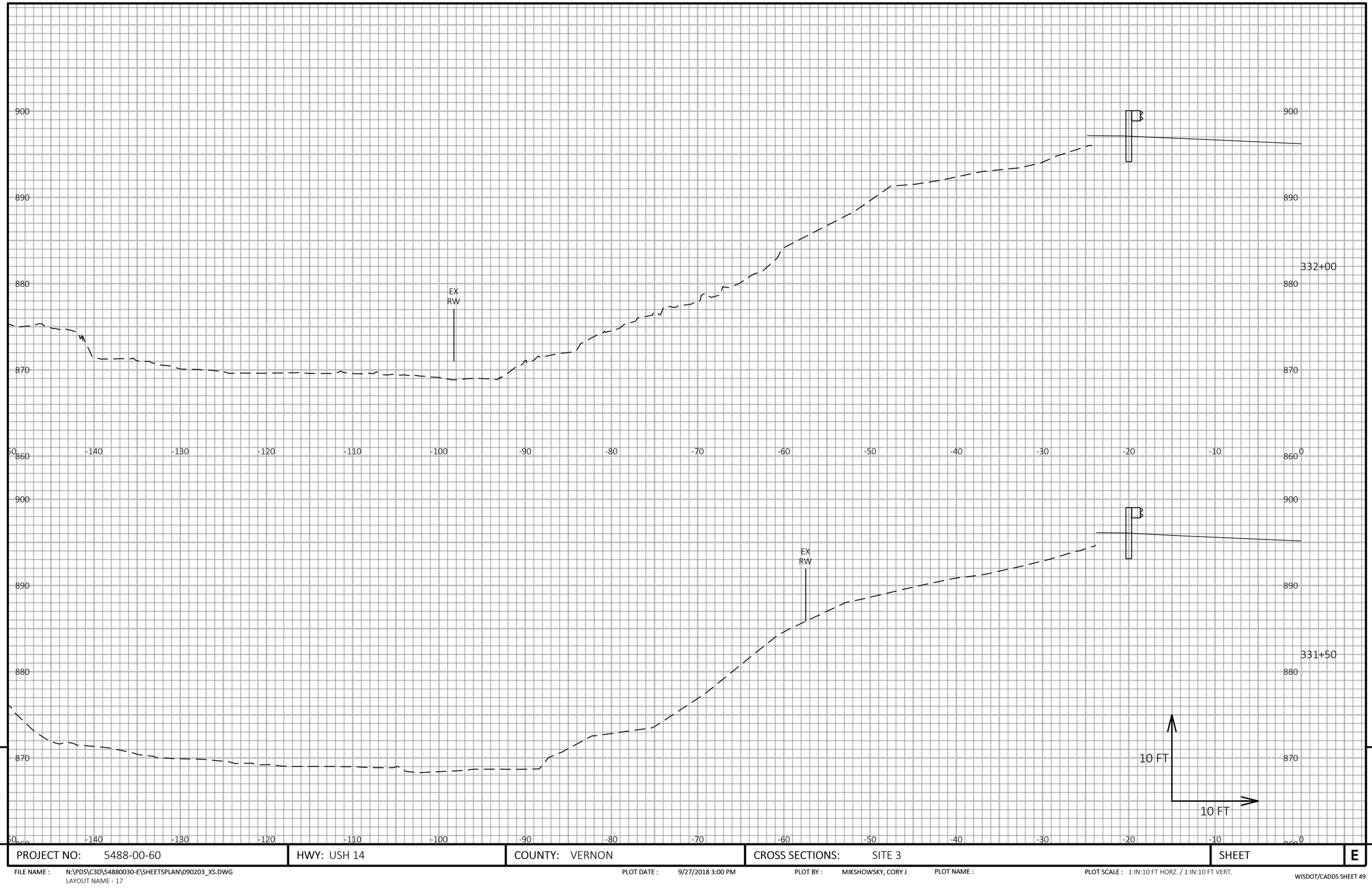
FILE NAME : N:\PDS\C3D\54880030-E\SHEETSPLAN\090203_XS.DWG
LAYOUT NAME - 16

PLOT DATE : 9/27/2018 3:00 PM

PLOT BY : MIKSHOWSKY, CORY J

PLOT NAME :

PLOT SCALE : 1 IN:10 FT HORZ. / 1 IN:10 FT VERT.



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PROJECT NO: 5488-00-60	HWY: USH 14	COUNTY: VERNON	CROSS SECTIONS: SITE 3	SHEET	E

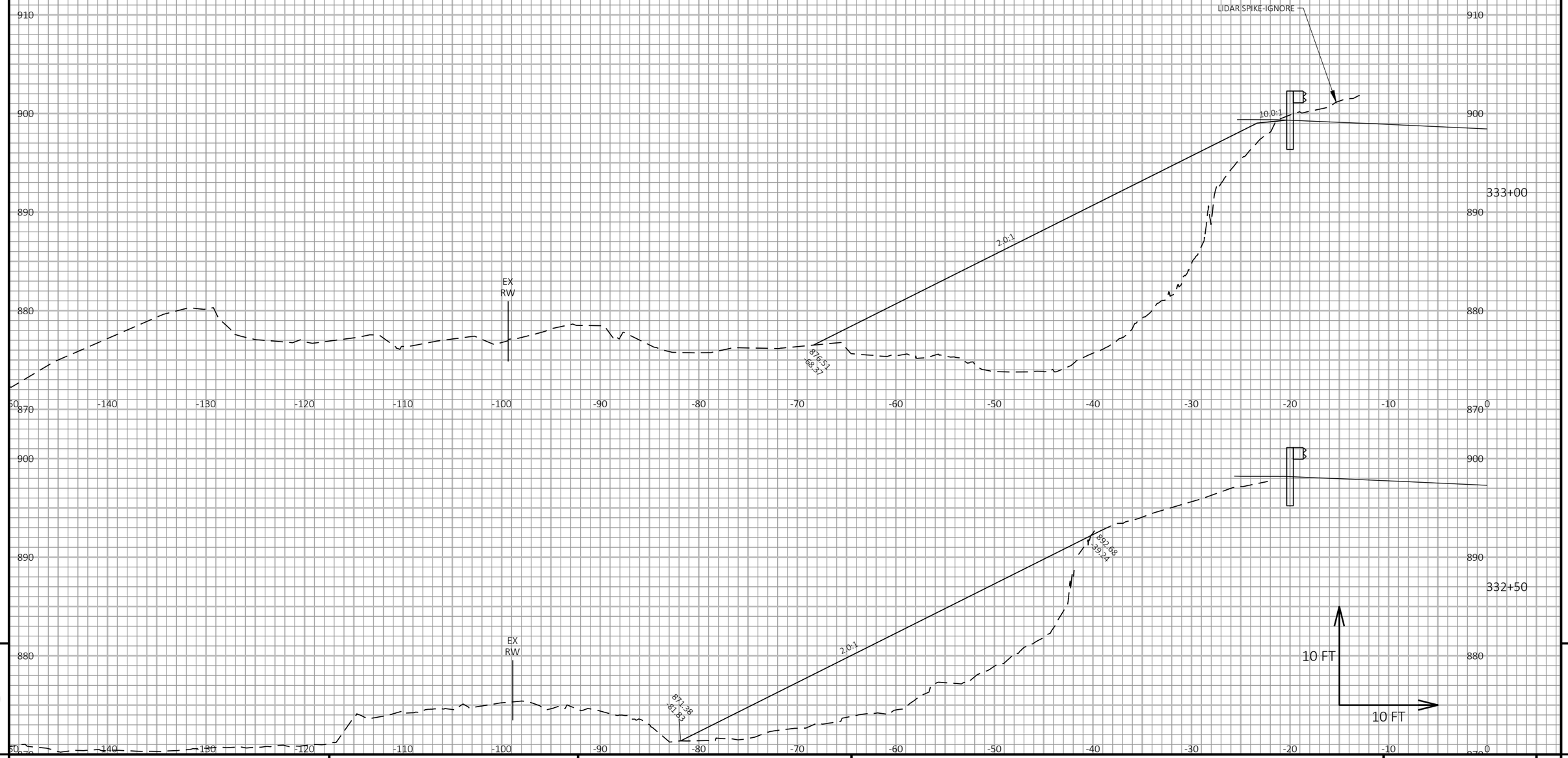
FILE NAME : N:\PDS\C3D\54880030-E\SHEETSPLAN\090203_XS.DWG
LAYOUT NAME - 17

PLOT DATE : 9/27/2018 3:00 PM

PLOT BY : MIKSHOWSKY, CORY J

PLOT NAME :

PLOT SCALE : 1 IN:10 FT HORZ. / 1 IN:10 FT VERT.



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PROJECT NO: 5488-00-60	HWY: USH 14	COUNTY: VERNON	CROSS SECTIONS: SITE 3	SHEET	E

FILE NAME : N:\PDS\C3D\54880030-E\SHEETSPLAN\090203_XS.DWG
LAYOUT NAME - 18

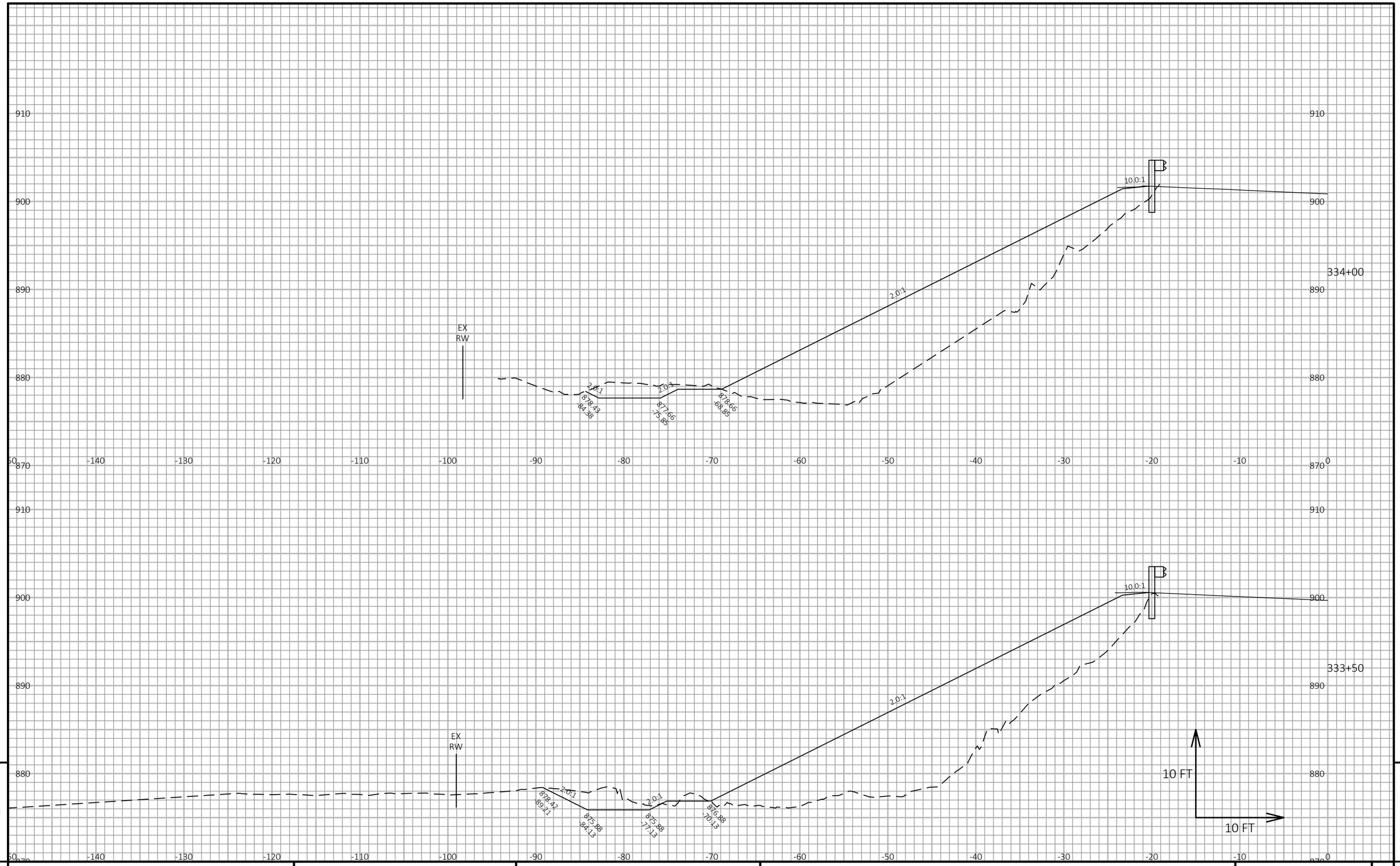
PLOT DATE : 9/27/2018 3:00 PM

PLOT BY : MIKSHOWSKY, CORY J

PLOT NAME :

PLOT SCALE : 1 IN:10 FT HORZ. / 1 IN:10 FT VERT.

WISDOT/CADDS SHEET 49



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PROJECT NO: 5488-00-60	HWY: USH 14	COUNTY: VERNON	CROSS SECTIONS: SITE 3	SHEET	E

FILE NAME : N:\PDS\C3D\54880030-E\SHEETSPLAN\090203_XS.DWG
LAYOUT NAME - 19

PLOT DATE : 9/27/2018 3:01 PM

PLOT BY : MIKSHOWSKY, CORY J

PLOT NAME :

PLOT SCALE : 1 IN:10 FT HORZ. / 1 IN:10 FT VERT.

910
900
890
880
870

-140 -130 -120 -110 -100 -90 -80 -70 -60 -50 -40 -30 -20 -10 0

*MISSING LIDAR DATA

10.0:1

2.0:1

881.68
-46.00

335+00

EX
RW

2.0:1

880.76
-89.00

878.26
-84.00

2.0:1

878.26
-77.00

879.26
-70.00

2.0:1

10.0:1

334+50

10 FT

10 FT

9

9

PROJECT NO: 5488-00-60	HWY: USH 14	COUNTY: VERNON	CROSS SECTIONS: SITE 3	SHEET	E

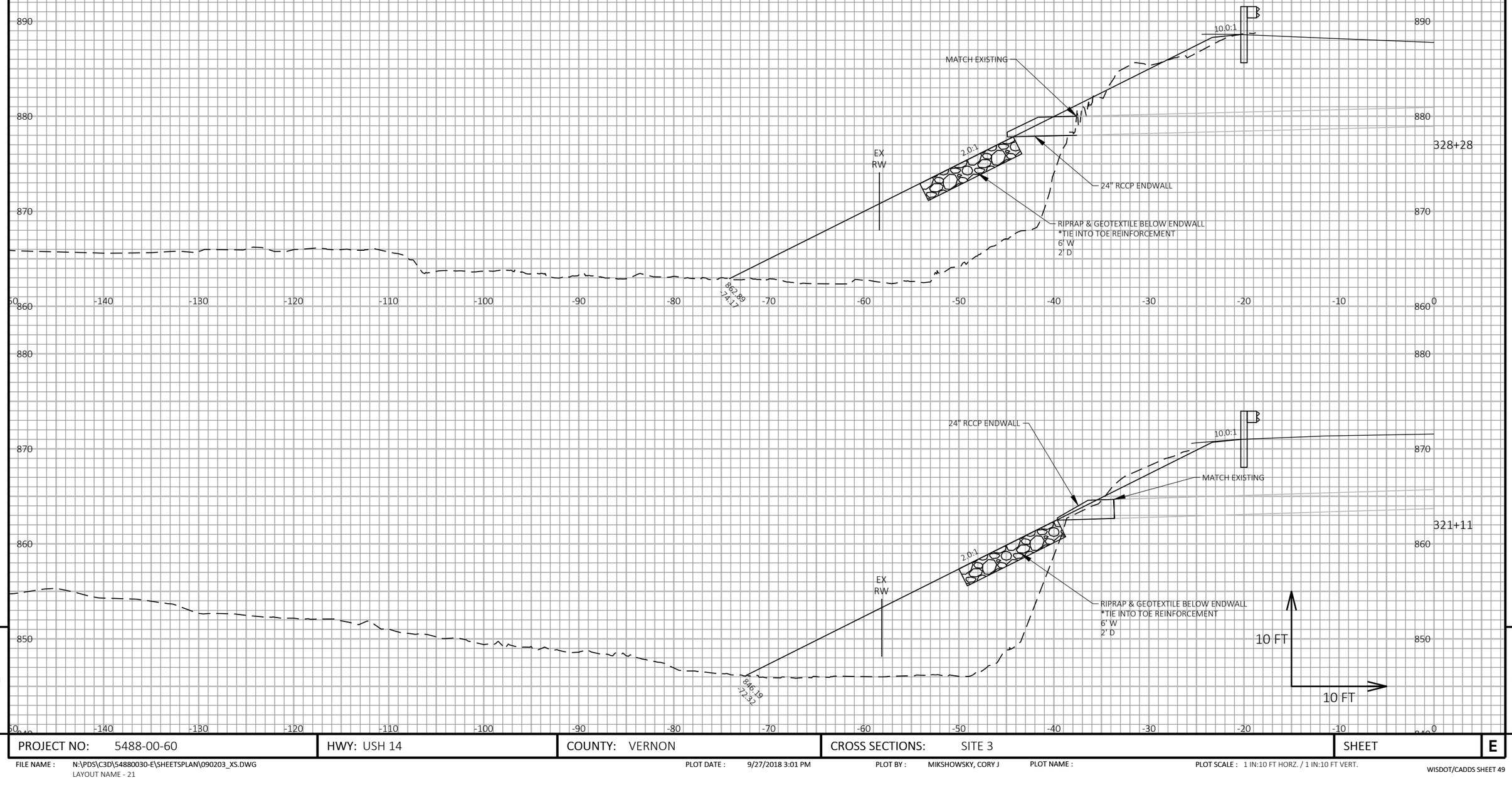
FILE NAME : N:\PDS\C3D\54880030-E\SHEETSPLAN\090203_XS.DWG
LAYOUT NAME - 20

PLOT DATE : 9/27/2018 3:01 PM

PLOT BY : MIKSHOWSKY, CORY J

PLOT NAME :

PLOT SCALE : 1 IN:10 FT HORZ. / 1 IN:10 FT VERT.

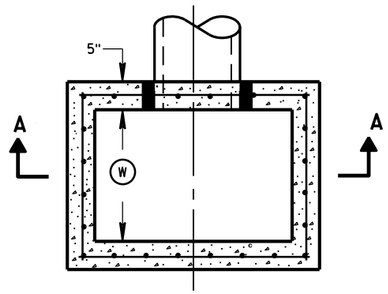


PROJECT NO: 5488-00-60	HWY: USH 14	COUNTY: VERNON	CROSS SECTIONS: SITE 3	SHEET E

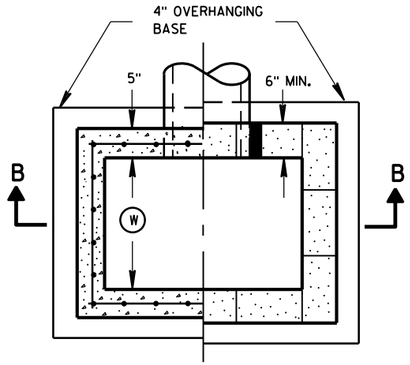
FILE NAME : N:\PDS\C3D\54880030-E\SHEETSPLAN\090203_XS.DWG
LAYOUT NAME - 21

PLOT DATE : 9/27/2018 3:01 PM PLOT BY : MIKSHOWSKY, CORY J PLOT NAME : PLOT SCALE : 1 IN:10 FT HORZ. / 1 IN:10 FT VERT.

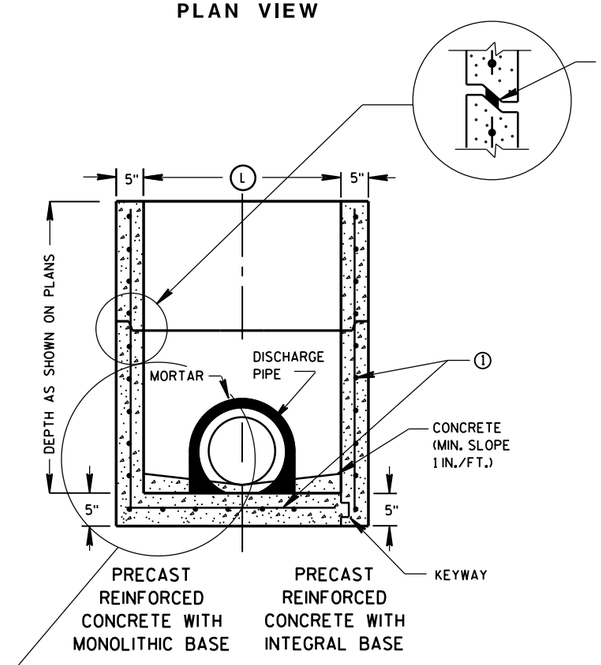
WISDOT/CADDS SHEET 49



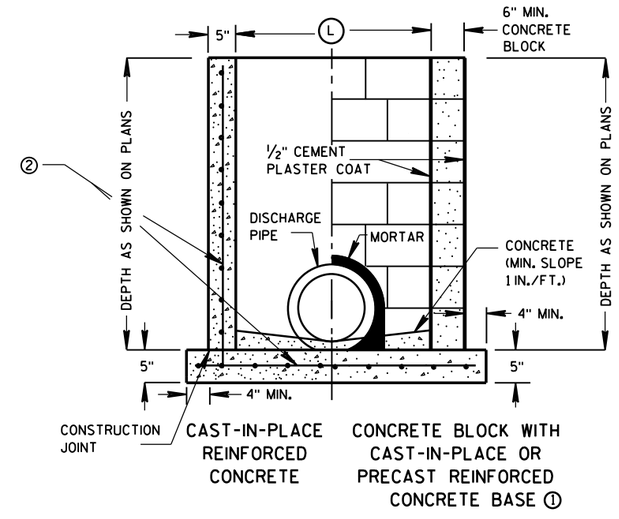
PLAN VIEW



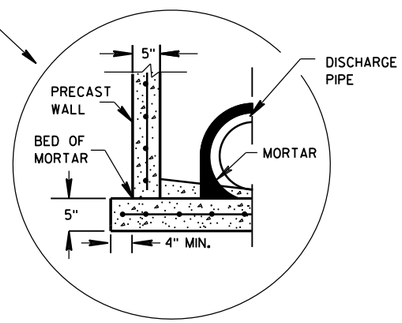
PLAN VIEW



SECTION A-A



SECTION B-B



SEPARATE PRECAST REINFORCED CONCRETE BASE OPTION

GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

UNLESS OTHERWISE AUTHORIZED IN WRITING BY THE ENGINEER, THE CONTRACTOR SHALL NOT ORDER AND DELIVER PRECAST INLET UNITS REQUIRED FOR THE PROJECT UNTIL A LIST OF SIZES IS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR PROPOSED ALTERNATE DESIGNS FOR UNDERGROUND DRAINAGE STRUCTURES SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PROVIDING THAT SUCH ALTERNATE DESIGNS MAKE PROVISION FOR EQUIVALENT CAPACITY AND STRENGTH.

ALL PRECAST INLET UNITS SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF ASTM C 913.

ALL DRAINAGE STRUCTURES ARE DESIGNATED ON THE PLANS AS "MANHOLES 3X3-L", "CATCH BASINS 4-B", "INLETS 2X3-H", ETC. THE FIRST NUMBERS DESIGNATES THE SIZE OF THE STRUCTURE, AND THE FOLLOWING LETTER DESIGNATES THE TYPE OF COVER TO BE USED TO COMPRISE THE COMPLETE UNIT.

BASES SHALL BE PLACED ON A BED OF MATERIAL AT LEAST 6 INCHES IN DEPTH, WHICH MEETS THE REQUIREMENTS OF FOUNDATION BACKFILL. THIS BEDDING SHALL BE COMPACTED AND PROVIDE UNIFORM SUPPORT FOR THE ENTIRE AREA OF THE BASE.

ALL BAR STEEL REINFORCEMENT SHALL BE EMBEDDED 2 INCHES CLEAR UNLESS OTHERWISE SHOWN OR NOTED.

PRECAST REINFORCED RISERS SHALL HAVE A TONGUE AND GROOVE JOINT WITH TONGUE UP OR DOWN.

4" OVERHANGING BASES ARE REQUIRED FOR CAST-IN-PLACE REINFORCED CONCRETE AND CONCRETE BLOCK INSTALLATIONS.
4" OVERHANG IS REQUIRED WHEN SEPARATE PRECAST BASE IS PROVIDED.
OVERHANG IS NOT REQUIRED ON PRECAST STRUCTURES WITH AN INTEGRAL OR MONOLITHIC BASE.

MAXIMUM INSIDE PIPE DIAMETER DETERMINED BY 3 INCH CLEARANCE ON EACH SIDE OF THE OUTSIDE WALL OF THE PIPE. SEE DETAIL "A". ASSUMES PIPE ENTERS PERPENDICULAR TO THE STRUCTURE.

① FOR PRECAST INLETS PROVIDE REINFORCING STEEL IN ACCORDANCE TO ASTM C 913.

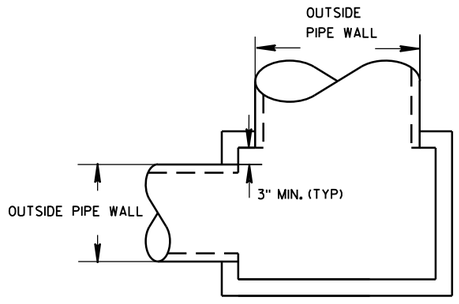
② CONTRACTOR TO PROVIDE DRAWING(S) STAMPED BY A PROFESSIONAL ENGINEER FOR STEEL REINFORCING DESIGN FOR CAST-IN-PLACE STRUCTURES.

INLET COVER MATRIX

INLET SIZE		INLET COVER TYPE	ALL A'S	ALL B'S	BW	F	ALL H'S	S	T	V	WM
	WIDTH (W) (FT)	LENGTH (L) (FT)									
2X2-FT	2	2	X	X				X		X	
2X2.5-FT	2	2.5			X			X	X	X	X
2X3-FT	2	3					X				
2.5X3-FT	2.5	3				X					

PIPE MATRIX

INLET SIZE	MAXIMUM INSIDE PIPE DIAMETER	
	WIDTH (IN)	LENGTH (IN)
2X2-FT	12	12
2X2.5-FT	12	18
2X3-FT	12	24
2.5X3-FT	18	24



DETAIL "A"

INLETS 2X2-FT, 2X2.5-FT, 2X3-FT AND 2.5X3-FT

INLETS 2X2-FT, 2X2.5-FT, 2X3-FT AND 2.5X3-FT

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
Sept., 2016
DATE
FHWA

/S/ Rodney Taylor
ROADWAY STANDARDS DEVELOPMENT UNIT SUPERVISOR

SDD 8f1 Apron Endwalls for Culvert Pipe

METAL APRON ENDWALLS

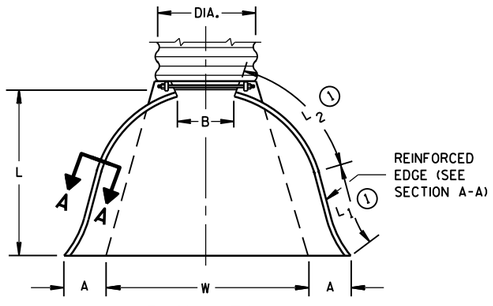
PIPE DIA. (IN.)	MIN. THICK. (inches)		DIMENSIONS (inches)							APPROX. SLOPE	BODY
	STEEL	ALUM.	A (±1")	B (MAX.)	H (±1")	L (±1 1/2")	L_1 ①	L_2 ①	W (±2")		
12	.064	.060	6	6	6	21	12	17 1/2	24	2 1/2 to 1	1 Pc.
15	.064	.060	7	8	6	26	14	21 3/4	30	2 1/2 to 1	1 Pc.
18	.064	.060	8	10	6	31	15	28 1/4	36	2 1/2 to 1	1 Pc.
21	.064	.060	9	12	6	36	18	29 5/8	42	2 1/2 to 1	1 Pc.
24	.064	.075	10	13	6	41	18	37 1/4	48	2 1/2 to 1	1 Pc.
30	.079	.075	12	16	8	51	18	52 1/4	60	2 1/2 to 1	1 Pc.
36	.079	.105	14	19	9	60	24	59 3/4	72	2 1/2 to 1	2 Pc.
42	.109	.105	16	22	11	69	24	75 5/8	84	2 1/2 to 1	2 Pc.
48	.109	.105	18	27	12	78	24	81	90	2 1/4 to 1	3 Pc.
54	.109	.105	18	30	12	84	30	85 1/2	102	2 1/4 to 1	3 Pc.
60	.109×	.105×	18	33	12	87	—	—	114	2 to 1	3 Pc.
66	.109×	.105×	18	36	12	87	—	—	120	2 to 1	3 Pc.
72	.109×	.105×	18	39	12	87	—	—	126	2 to 1	3 Pc.
78	.109×	.105×	18	42	12	87	—	—	132	1 1/2 to 1	3 Pc.
84	.109×	.105×	18	45	12	87	—	—	138	1 1/2 to 1	3 Pc.
90	.109×	.105×	18	37	12	87	—	—	144	1 1/2 to 1	3 Pc.
96	.109×	.105×	18	35	12	87	—	—	150	1 1/2 to 1	3 Pc.

× EXCEPT CENTER PANEL SEE GENERAL NOTES

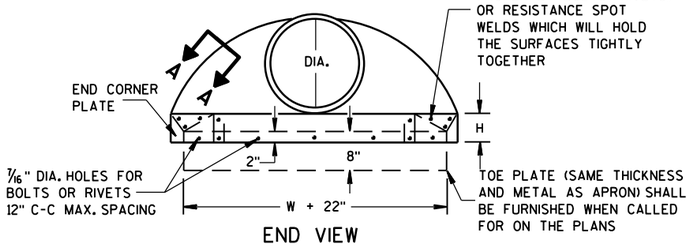
REINFORCED CONCRETE APRON ENDWALLS

PIPE DIA. (IN.)	DIMENSIONS (inches)							APPROX. SLOPE
	T	A	B	C	D	E	G	
12	2	4	24	48 7/8	72 7/8	24	2	3 to 1
15	2 1/4	6	27	46	73	30	2 1/4	3 to 1
18	2 1/2	9	27	46	73	36	2 1/2	3 to 1
21	2 3/4	9	36	37 1/2	73 1/2	42	2 3/4	3 to 1
24	3	9 1/2	43 1/2	30	73 1/2	48	3	3 to 1
27	3 1/4	10 1/2	49 1/2	24	73 1/2	54	3 1/4	3 to 1
30	3 1/2	12	54	19 3/4	73 1/2	60	3 1/2	3 to 1
36	4	15	63	34 3/4	97 3/4	72	4	3 to 1
42	4 1/2	21	63	35	98	78	4 1/2	3 to 1
48	5	24	72	26	98	84	5	3 to 1
54	5 1/2	27	65	* 33 1/4 - ** 35	* 98 1/4 - ** 100	90	5 1/2	2 2/5 to 1
60	6	* ** 30-35	60	39	99	96	5	2 to 1
66	6 1/2	* ** 24-30	* ** 72-78	* ** 21-27	99	102	5 1/2	2 to 1
72	7	* ** 24-36	78	21	99	108	6	2 to 1
78	7 1/2	* ** 24-36	78	21	99	114	6 1/2	2 to 1
84	8	36	90 1/2	21	111 1/2	120	6 1/2	1 1/2 to 1
90	8 1/2	41	87 1/2	24	111 1/2	132	6 1/2	1 1/2 to 1

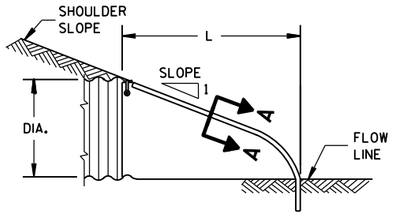
*MINIMUM
**MAXIMUM



PLAN VIEW

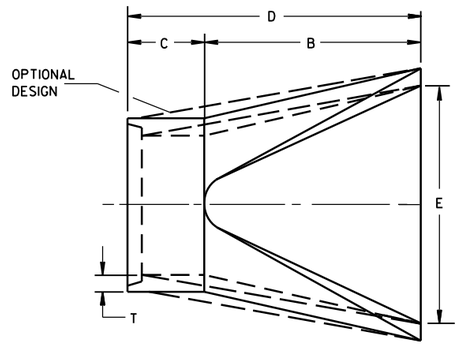


END VIEW

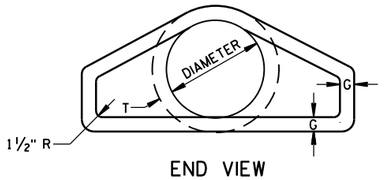


SIDE ELEVATION

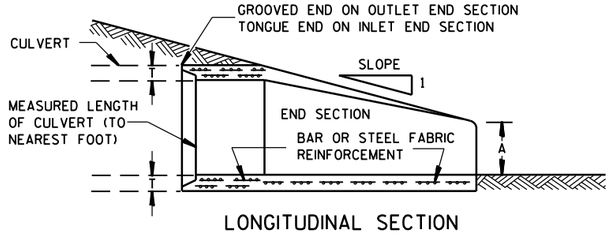
METAL ENDWALLS



PLAN

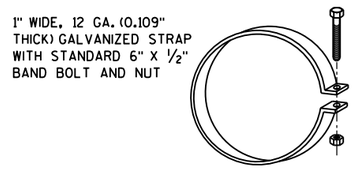


END VIEW



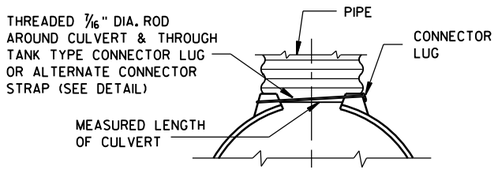
LONGITUDINAL SECTION

CONCRETE ENDWALLS

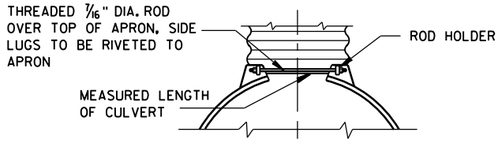


ALTERNATE FOR TYPE 1 CONNECTION

END SECTION CONNECTOR STRAP

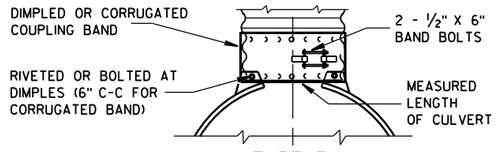


TYPE 1
FOR 12" THRU 24" CORR. PIPE



TYPE 2
FOR 30" THRU 96" CORR. PIPE

TYPE 3
FOR 42" THRU 96" CORR. PIPE



TYPE 5
ALTERNATE FOR:
ALL SIZES CORRUGATED CIRCULAR PIPE

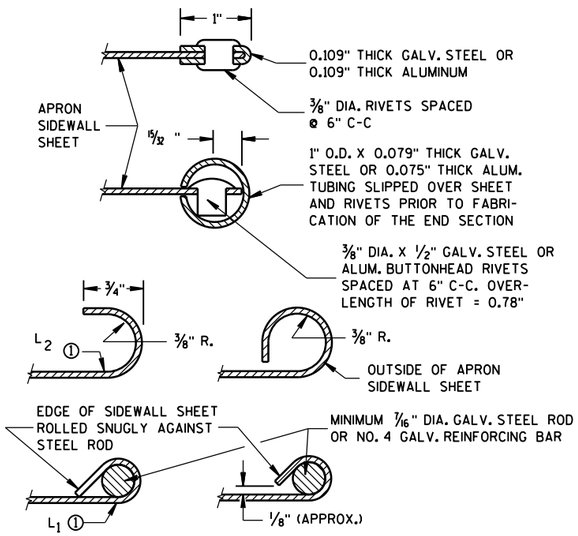
NOTE: DIMPLED BAND FITS OVER OUTSIDE OF ENDWALL, AND CORRUGATED BAND FITS INSIDE ENDWALL. DIMPLED BAND MAY BE USED WITH HELICALLY CORRUGATED PIPE.

FOR CIRCUMFERENTIALLY CORRUGATED PIPE USE ENDWALL CONNECTION DETAILS 1, 2, 3 OR 5 AS APPLICABLE.

FOR HELICALLY CORRUGATED PIPE USE ENDWALL CONNECTION DETAILS 1, 2 OR 5.

FOR HELICALLY CORRUGATED PIPES WITH TWO CIRCUMFERENTIAL CORRUGATIONS AT EACH END USE ENDWALL CONNECTION DETAILS 1, 2 OR 3.

CONNECTION DETAILS



SECTION A-A

GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

CONCRETE CULVERT ENDWALLS MAY NOT BE USED WITH GALVANIZED STEEL OR ALUMINUM CULVERT PIPE OR VISE VERSA. GALVANIZED STEEL OR ALUMINUM ENDWALLS SHALL NORMALLY BE INSTALLED ON CULVERT PIPE OF THE SAME METAL.

ALL THREE PIECE STEEL APRON ENDWALLS FOR 60" DIAMETER PIPE AND LARGER SHALL HAVE 0.109" SIDES AND 0.138" CENTER PANELS. ALL THREE PIECE ALUMINUM APRON ENDWALLS FOR 60" DIAMETER PIPE AND LARGER SHALL HAVE 0.105" SIDES AND 0.134" CENTER PANELS. THE WIDTH OF CENTER PANELS SHALL BE GREATER THAN 20 PERCENT OF THE PIPE PERIMETER.

LAP SEAMS SHALL BE TIGHTLY JOINED BY GALVANIZED RIVETS OR BOLTS FOR STEEL UNITS AND ALUMINUM RIVETS AND BOLTS FOR ALUMINUM UNITS. FOR THE 60" THROUGH 96" DIAMETER APRON ENDWALL SIZES, THE REINFORCED EDGES AND CENTER PANEL SEAMS SHALL BE FURTHER REINFORCED WITH GALVANIZED STEEL OR ALUMINUM STIFFENER ANGLES. THE ANGLES SHALL BE ATTACHED BY GALVANIZED NUTS AND BOLTS FOR STEEL UNITS AND ALUMINUM NUTS AND BOLTS FOR ALUMINUM UNITS.

WHERE TWO OR MORE PIPES WITH APRON ENDWALLS ARE LAID ADJACENT TO EACH OTHER, THEY SHALL BE SEPARATED BY A DISTANCE SUFFICIENT TO PROVIDE A MINIMUM CLEARANCE OF 6 INCHES BETWEEN APRON ENDWALLS.

① FOR PIPE SIZES UP TO 60" DIAMETER, A 180° ROLLED EDGE MAY BE USED INSTEAD OF STEEL ROD REINFORCEMENT. SEE SECTION A-A.

APRON ENDWALLS FOR CULVERT PIPE

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
8-30-94
DATE

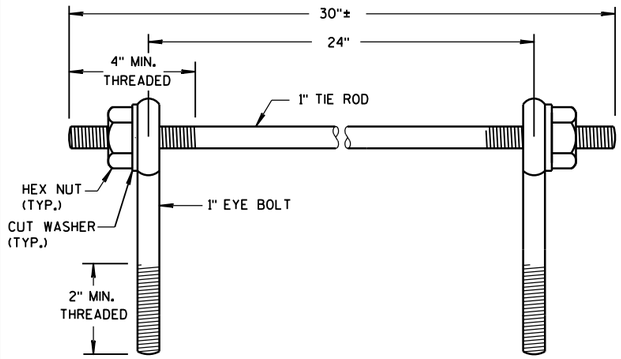
/S/ Rory L. Rhinesmith
CHIEF ROADWAY DEVELOPMENT ENGINEER

FHWA

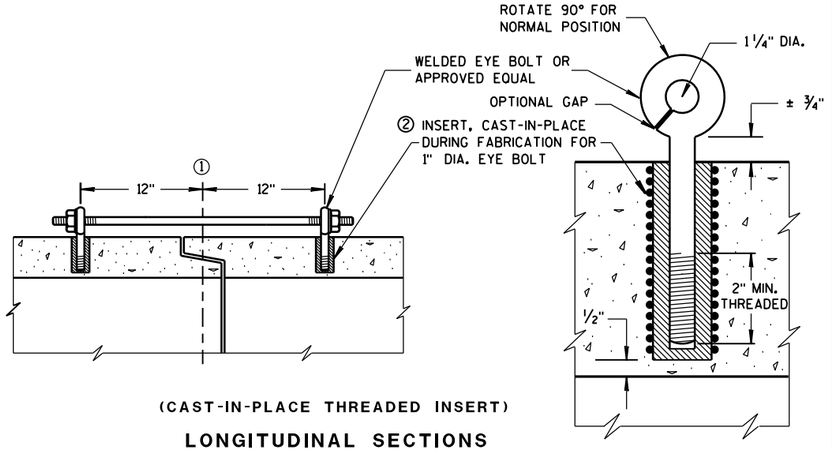
6

S.D.D. 8 F 1-11

SDD 8f4 Joint Ties for Concrete Pipe and Concrete Pipe Collars



EYE BOLTS AND TIE ROD



(CAST-IN-PLACE THREADED INSERT)

LONGITUDINAL SECTIONS

EYE BOLT AND TIE ROD ASSEMBLY (ALTERNATE NO. 1)

GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS, AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND APPLICABLE SPECIAL PROVISIONS.

CONCRETE CULVERT AND STORM SEWER PIPE SHALL BE TIED TOGETHER IN THE MANNER ILLUSTRATED BY THIS DETAIL AT LOCATIONS DESIGNATED IN THE STANDARD SPECIFICATIONS AND THE PLAN. THE CONTRACTOR MAY USE EITHER ALTERNATE 1, 2 OR 3 FOR DRAINAGE STRUCTURES. ONLY ALTERNATE 1 AND 3 MAY BE USED FOR CATTLE PASSES, UNLESS OTHERWISE STATED IN THE CONTRACT. THE MATERIALS, FABRICATION AND WORK NECESSARY TO TIE THE PIPE BY THIS DETAIL WILL BE CONSIDERED INCIDENTAL TO THE PIPE AND APRON ENDWALLS IF REQUIRED.

DETAILED DRAWINGS FOR PROPOSED ALTERNATE DESIGNS FOR JOINT TIES SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.

JOINT TIES TO BE HOT-DIP GALVANIZED PER ASTM A 153.

① ℄ OF TONGUE AND GROOVE OR BELL AND SPIGOT JOINTS.

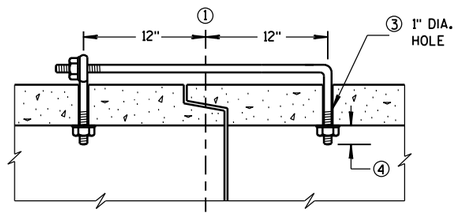
② THE INSIDE OF THE THREADED INSERTS SHALL BE CLEAN TO ALLOW THE INSERTION OF THREADED EYE BOLTS.

③ HOLES SHALL BE CAST-IN-PLACE OR DRILLED 12 INCHES FROM ℄ OF TONGUE AND GROOVE.

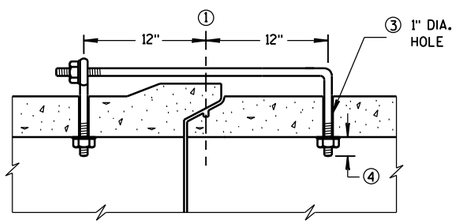
④ BOLT PROJECTION INSIDE OF PIPE SHALL NOT EXCEED 2 INCHES.

⑤ OPENING TO BE ROD DIAMETER PLUS 1 INCH.

⑥ LENGTH ADEQUATE TO EXTEND TO WITHIN 1/2 INCH OF THE INNER SURFACE OF THE PIPE.



(TONGUE & GROOVE PIPE)

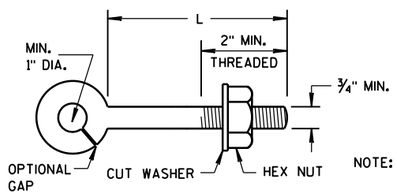


(MODIFIED BELL PIPE)

LONGITUDINAL SECTION

EYE BOLT DIMENSION TABLE

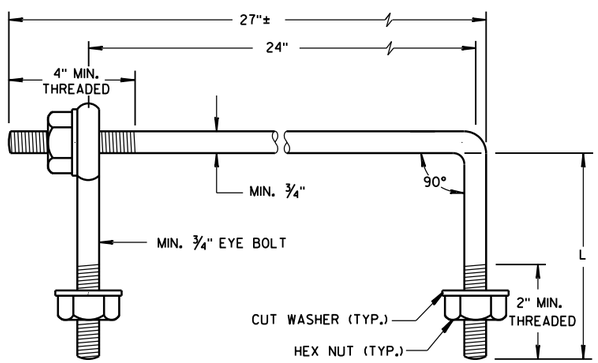
PIPE SIZE	L = LENGTH	
	TONGUE & GROOVE PIPE	MODIFIED BELL PIPE
18" TO 24"	4 1/2"	6 1/4"
30"	5"	7"
36"	5 1/2"	7"
42"	6"	
48"	6 1/2"	
60"	7 1/2"	
66"	8"	



NOTE:

EYE BOLT

NOTE: TWO EYE BOLTS MAY BE USED WITH A 30" LONG THREADED ROD IN LIEU OF THE 90° BENT TIE ROD.



EYE BOLT AND TIE ROD

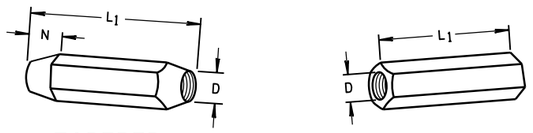
(JOINT TIES FOR 18" TO 66" DIA. CONCRETE PIPE)

EYE BOLT AND TIE ROD ASSEMBLY (ALTERNATE NO. 2)

ADJUSTABLE TIE ROD TABLE

PIPE DIAMETER	TIE ROD DIAMETER	D	L_1	N
12-60	5/8	5/8	5	1/2
66-84	3/4	3/4	5	1/2
90-108	1	1	7	1 1/16

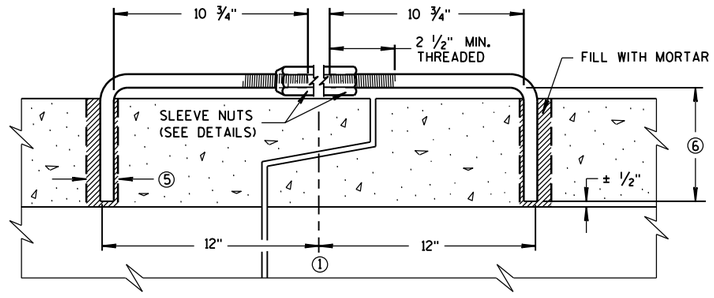
DIMENSIONS SHOWN ARE IN INCHES



TAPERED PLAIN

RIGHT AND LEFT THREADS

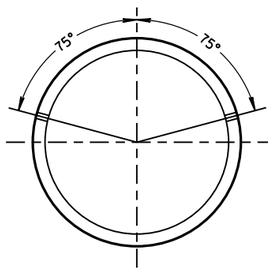
SLEEVE NUTS



LONGITUDINAL SECTION

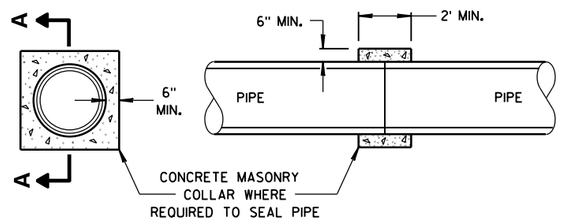
(JOINT TIES FOR 12" TO 108" DIA. CONCRETE PIPE)

ADJUSTABLE TIE ROD (ALTERNATE NO. 3)



PLACEMENT OF (2) CAST-IN-PLACE INSERTS OR HOLES DURING FABRICATION FOR PIPE SECTIONS REQUIRING TIE RODS

TRANSVERSE SECTION



SECTION A-A

CONCRETE COLLAR DETAIL

JOINT TIES FOR CONCRETE PIPE AND CONCRETE COLLAR DETAIL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
6-5-2012
DATE
/S/ Jerry H. Zogg
ROADWAY STANDARDS DEVELOPMENT ENGINEER
FHWA

6

S.D.D. 8 F 4-7

6

S.D.D. 8 F 4-7

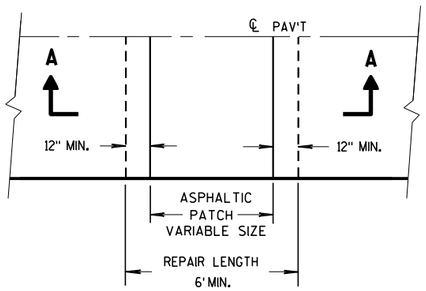
GENERAL NOTES

SAW CUT, DRILL, AND LIFT OUT EXISTING CONCRETE PAVEMENT WITHIN THE BOUNDARIES OF CONCRETE REPAIR AREAS. THE CONTRACTOR MAY MAKE ADDITIONAL SAW CUTS INSIDE THE REPAIR LIMITS TO REDUCE WEIGHT AND SIZE OF CONCRETE PIECES.

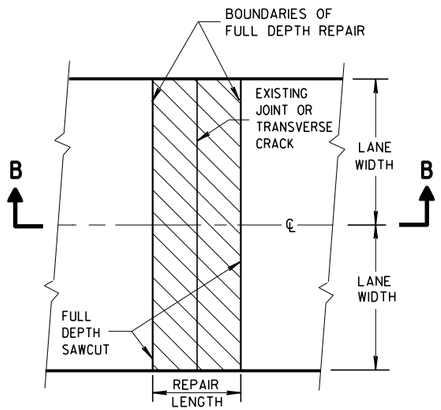
PROVIDE A 6-FOOT MINIMUM DISTANCE FROM BOUNDARIES OF CONCRETE REPAIR AREAS TO ADJACENT TRANSVERSE JOINT OR CRACK IN THE SAME LANE.

THE LENGTH OF THE REPAIRS MAY VARY FROM THE DIMENSIONS SHOWN IF THE EXISTING CONCRETE PAVEMENT IS NONDOWELED AND THE PAVEMENT IS TO BE OVERLAID AFTER REPAIRING.

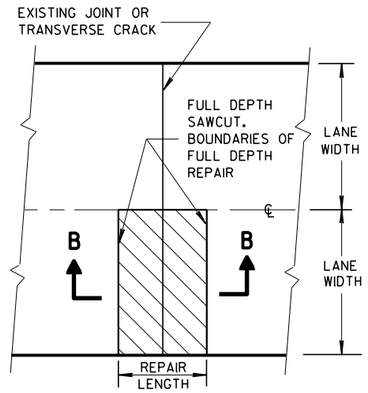
(1) DOWEL BARS MIGHT NOT EXIST.



PLAN VIEW

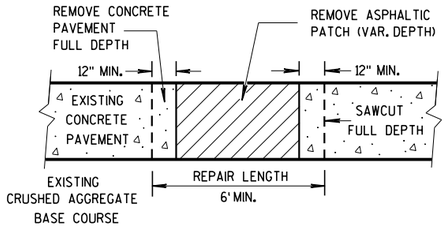


PLAN VIEW
(DOUBLE LANE REPAIR)



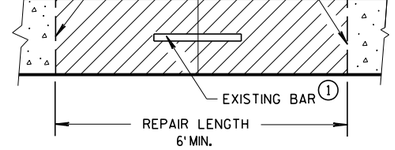
PLAN VIEW
(SINGLE LANE REPAIR)

FULL DEPTH CONCRETE PAVEMENT REMOVAL



SECTION A-A

HMA PATCH REMOVAL



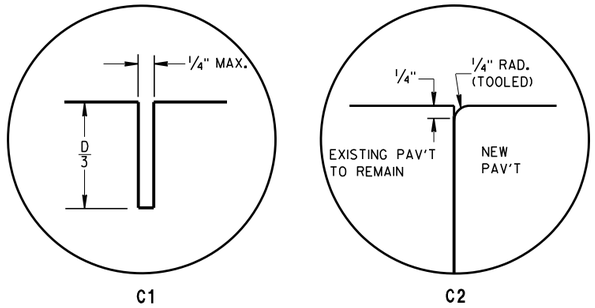
SECTION B-B

CONCRETE REMOVAL

CONCRETE PAVEMENT REPAIR AND REPLACEMENT

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

SDD 13c9-b Concrete Pavement Repair and Replacement



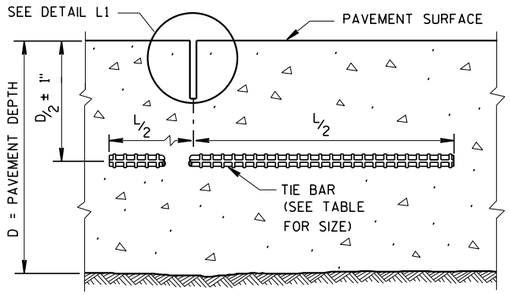
TRANSVERSE JOINTS

TIE BAR TABLE

PAVEMENT DEPTH (D)	TIE BAR SIZE	TIE BAR LENGTH (L)	MAX. TIE BAR SPACING
< 10 1/2"	NO. 4	30"	36"
≥ 10 1/2"	NO. 5	36"	36"
	NO. 4 *	30"	24"**

* SUBSTITUTE BENT BARS AT LONGITUDINAL JOINTS WHEN EQUIPMENT LIMITATIONS DURING CONSTRUCTION WARRANT (e.g. AUXILIARY LANES OR TURN LANES)

** CONFORM TO 15" MINUMUM SPACING FROM TRANSVERSE JOINTS; SPACING BETWEEN TIE BARS WILL BE 30" AT TRANSVERSE JOINTS.



SECTION C-C

SAWED LONGITUDINAL JOINT

GENERAL NOTES

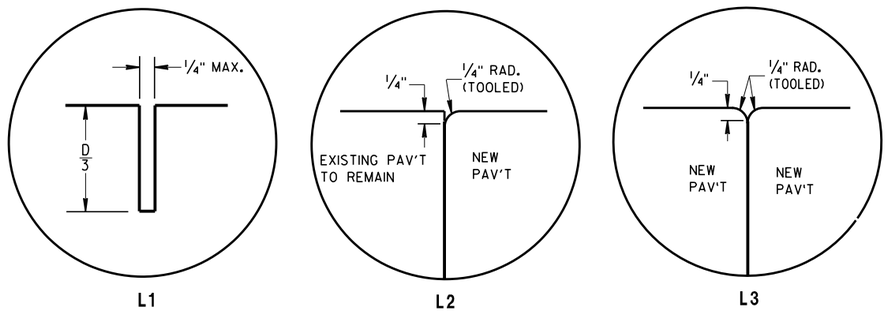
INSTALL DOWEL BARS PARALLEL TO THE PAVEMENT CENTERLINE AND PAVEMENT SURFACE.

CONCRETE PAVEMENT REPAIRS OF EXISTING NONDOWELED CONCRETE PAVEMENTS DO NOT NEED TO BE DOWELED.

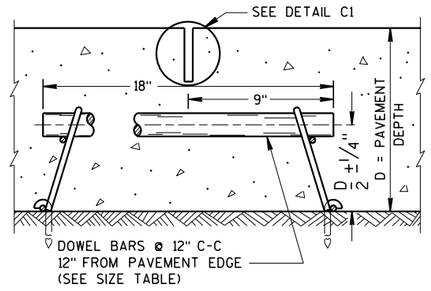
ANCHOR DOWEL BARS AND TIE BARS INTO DRILLED HOLES WITH AN EPOXY.

FOR MULTI-LANE CONCRETE PAVEMENT REPLACEMENTS, PROVIDE A MINIMUM DISTANCE OF 15 INCHES FROM ALL TRANSVERSE JOINTS OR EDGES OF REPLACEMENT TO THE CENTER OF THE TIE BAR NEAREST THAT JOINT OR EDGE.

(1) APPLY A THIN UNIFORM COATING OF SURFACE TREATMENT TO THE FREE END OF DOWEL BARS TO PREVENT BONDING.

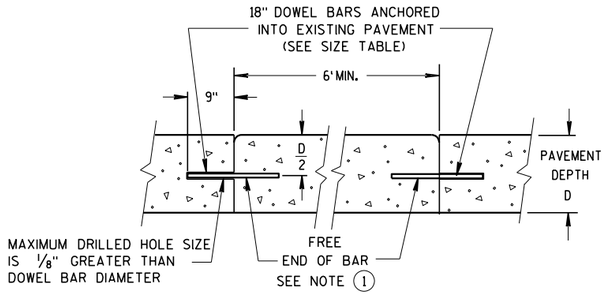


LONGITUDINAL JOINTS

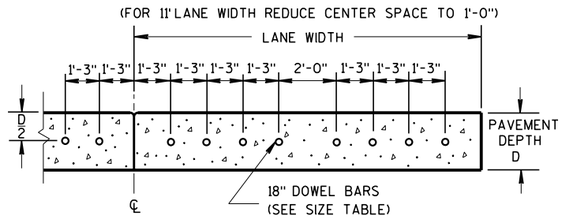


SECTION F-F

CONTRACTION JOINT



SECTION D-D

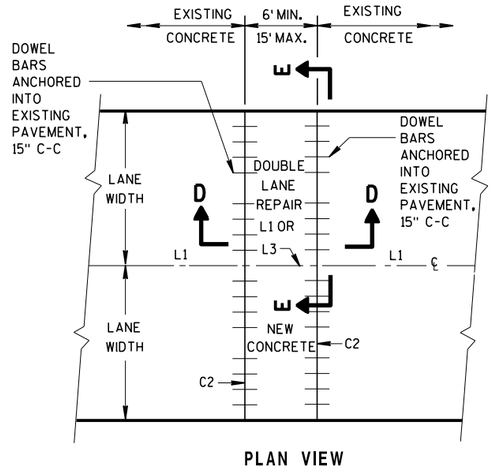


SECTION E-E

DRILLED DOWEL BAR CONSTRUCTION JOINT

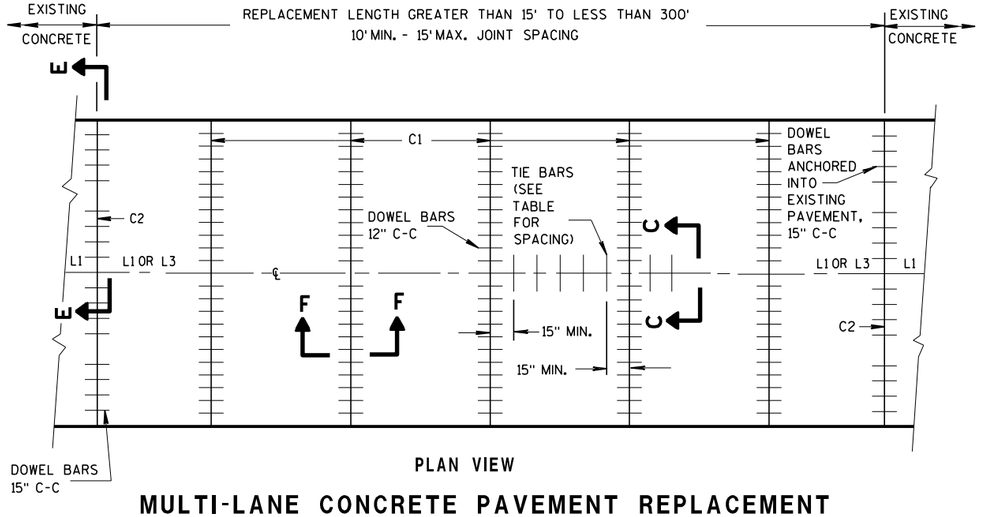
PAVEMENT DEPTH, DOWEL BAR SIZE AND JOINT SPACING TABLE

PAVEMENT DEPTH (D)	DOWEL BAR DIAMETER	DRILLED DOWEL BAR DIAMETER	CONTRACTION JOINT SPACING
5 1/2", 6", 6 1/2"	NONE	NONE	12'
7", 7 1/2"	1"	1"	14'
8", 8 1/2"	1 1/4"	1 1/4"	15'
9", 9 1/2"	1 1/4"	1 1/4"	15'
10" & ABOVE	1 1/2"	1 1/4"	15'



PLAN VIEW

MULTI-LANE CONCRETE PAVEMENT REPAIR



PLAN VIEW

MULTI-LANE CONCRETE PAVEMENT REPLACEMENT

CONCRETE PAVEMENT REPAIR AND REPLACEMENT

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

6

S.D.D. 13 C 9-15b

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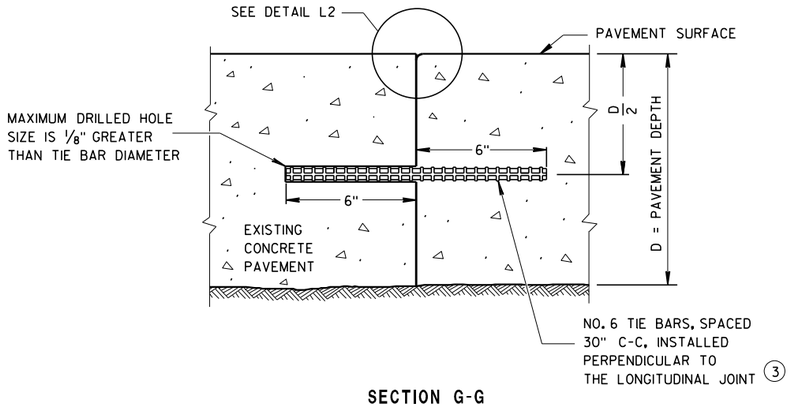
S.D.D. 13 C 9-15b



SECTION G-G

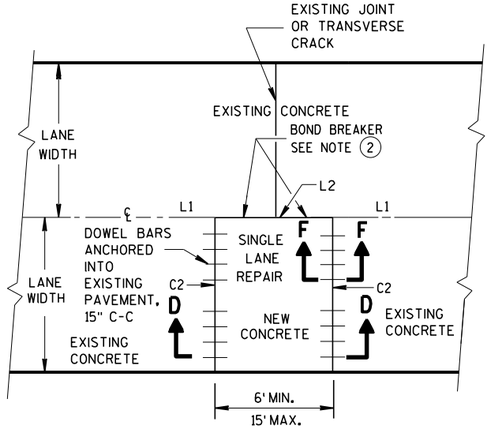
TIE BARS ANCHORED INTO EXISTING PAVEMENT

GENERAL NOTES

(1) WITH THE APPROVAL OF THE ENGINEER, FOR SINGLE LANE PAVEMENT REPLACEMENTS LESS THAN 30 FEET IN LENGTH, THE CONTRACTOR MAY INSTALL DRILLED TIE BARS ON 6:1 SKEW HORIZONTALLY, DIRECTION OF SKEW ALTERNATING WITH EACH SUCCESSIVE BAR. DRIVE SKEWED TIE BARS TO A DEPTH OF 6 INCHES IN A HOLE OF SUCH A DIAMETER AS TO PROVIDE A TIGHT DRIVEN FIT.

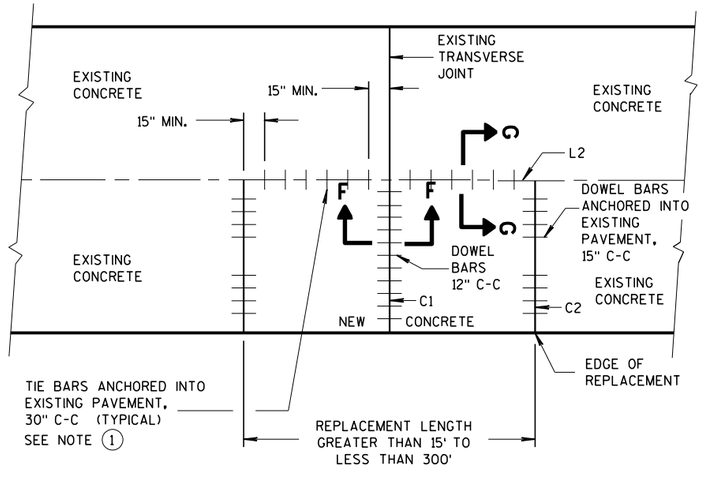
(2) USE AN ENGINEER-APPROVED BOND BREAKER (E.G. RELEASE AGENT, CURING COMPOUND) FOR SINGLE LANE REPAIRS UP TO 15 FEET IN LENGTH.

(3) ANCHOR TIE BARS INTO DRILLED HOLES WITH AN EPOXY.



PLAN VIEW

SINGLE LANE CONCRETE PAVEMENT REPAIR



PLAN VIEW

SINGLE LANE CONCRETE PAVEMENT REPLACEMENT

CONCRETE PAVEMENT REPAIR AND REPLACEMENT

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

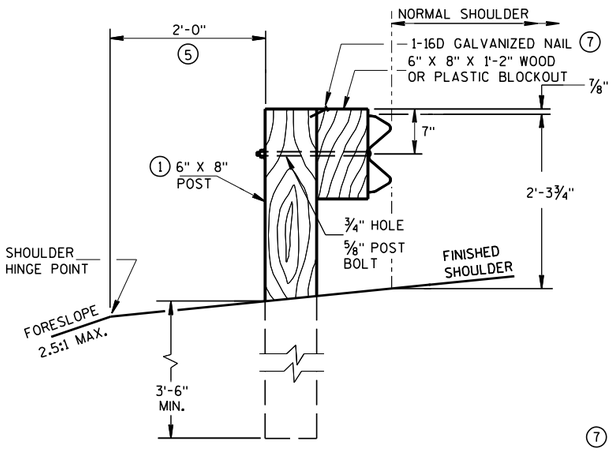
APPROVED
March 2018 — DATE
/S/ Peter Kemp, P.E. — PAVEMENT SUPERVISOR
FHWA

SDD 14b15-a Steel Plate Beam Guard, Class "A", Installation and Elements

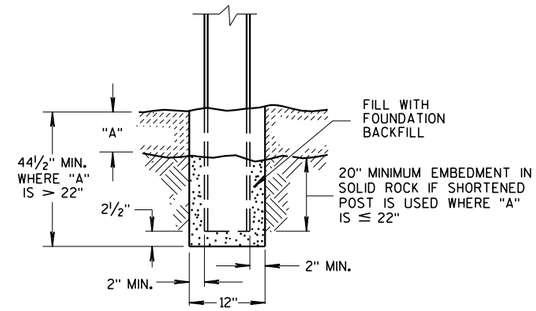
GENERAL NOTES

1. W6 X 9 OR W6 X 8.5 STEEL POSTS AND NOTCHED PLASTIC BLOCKOUTS ARE ACCEPTABLE ALTERNATIVES FOR 6" X 8" WOOD POSTS WITH WOOD OR PLASTIC BLOCKOUTS. USE APPROVED NOTCHED PLASTIC BLOCKOUTS WITH STEEL POSTS. APPROVED PLASTIC BLOCKOUT DESIGNS MAY VARY FROM THIS TYPICAL DETAIL WHEN USED IN CONJUNCTION WITH STEEL POSTS.
   DO NOT MIX STEEL POSTS AND WOOD POSTS IN A SINGLE INSTALLATION.
2. USE STRUCTURAL STEEL POSTS CONFORMING TO ASTM A 36. GALVANIZED POSTS ACCORDING TO AASHTO M 111. EITHER SET THE POSTS IN DRILLED HOLES OR DRIVE TO GRADE. REMOVE MUSHROOMING CAUSED BY DRIVING AND REPAIR DAMAGED SPELTER COATING ON GALVANIZED POSTS.
3. INSTALL STEEL POSTS WITH HOLES ON APPROACHING TRAFFIC SIDE.
4. USE EITHER WOOD OR APPROVED PLASTIC BLOCKOUTS ON WOOD POSTS.
5. IF THE DISTANCE FROM BACK OF POST TO SHOULDER HINGE POINT IS LESS THAN 2 FEET INSTALL LONGER POST AT HALF POST SPACING, W BEAM (LHW).
6. IF ROCK IS ENCOUNTERED DURING EXCAVATION, THE ENGINEER MAY APPROVE USING A 12 INCH DIAMETER POST HOLE EXTENDING 20 INCHES DEEP INTO THE ROCK. PLACE GRANULAR MATERIAL IN THE BOTTOM OF THE HOLE APPROXIMATELY 2½ INCHES DEEP. CUT THE POSTS TO LENGTH AND PLACE IN YHE HOLE. BACKFILL WITH MATERIAL EXCAVATED FROM THE HOLE AND COMPACT ADEQUATEY.
7. WHEN USING STEEL POSTS AND WOOD BLOCKOUTS INSTALL FOUR 16D GALVANIZED NAILS. INSTALL NAILS AT THE BACK CORNERS OF THE BLOCK AND BEND THE NAILS OVER THE FLANGE OF THE STEEL POST.

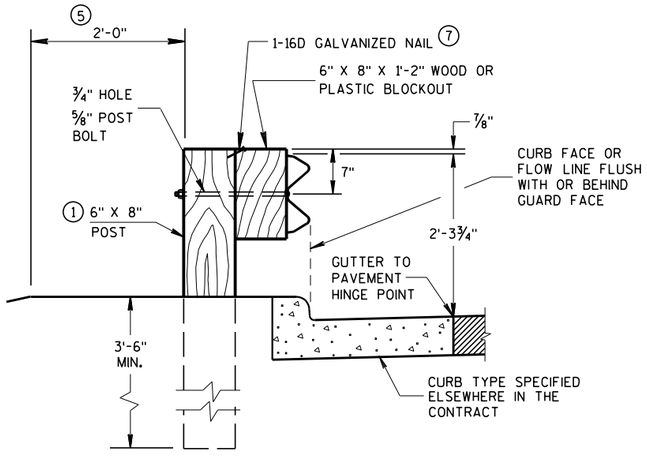
INSTALL BEAM GUARD SECTIONS AND ALL NECESSARY HARDWARE ACCORDING TO THE APPLICABLE PLAN AND CURRENT STANDARD AND SUPPLEMENTAL SPECIFICATIONS.
ALL DIMENSIONS ARE SUBJECT TO MANUFACTURER'S TOLERANCES EXCEPT WHERE ALLOWABLE TOLERANCES ARE SHOWN.



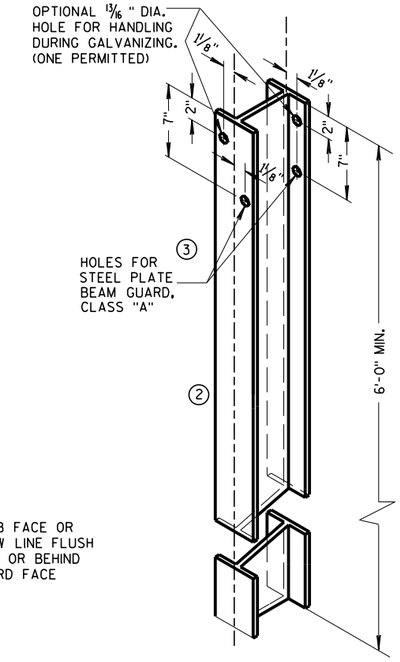
END VIEW
LOCATED ALONG A ROADWAY SHOULDER
STANDARD INSTALLATION



END VIEW
SETTING STEEL OR WOOD POST IN ROCK ⑥

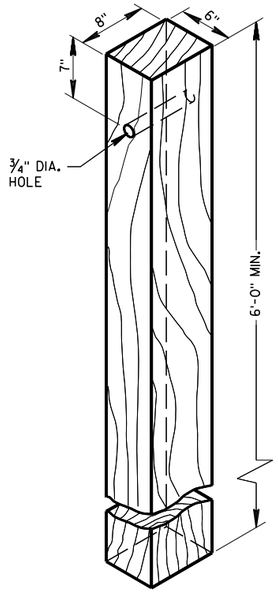


END VIEW
LOCATED ALONG A CURBED ROADWAY

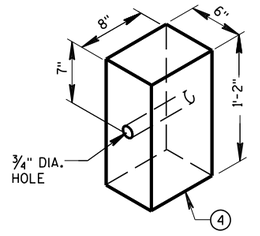


STEEL POST &
HOLE PUNCHING DETAIL
(W6 X 9) ①

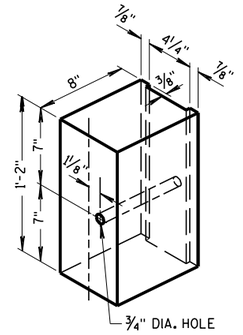
ALL HOLES 13/16 " DIAMETER EXCEPT AS NOTED



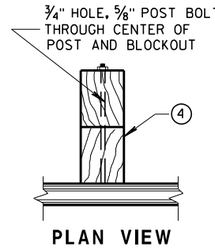
WOOD POST
(6"X8") NOMINAL



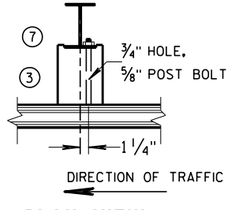
WOOD OR PLASTIC
BLOCKOUT FOR
WOOD POSTS



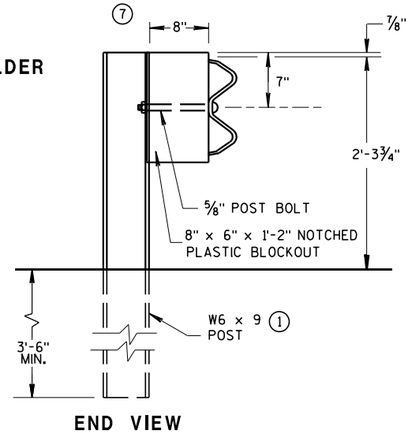
TYPICAL NOTCHED
PLASTIC BLOCKOUT
FOR STEEL POSTS ①



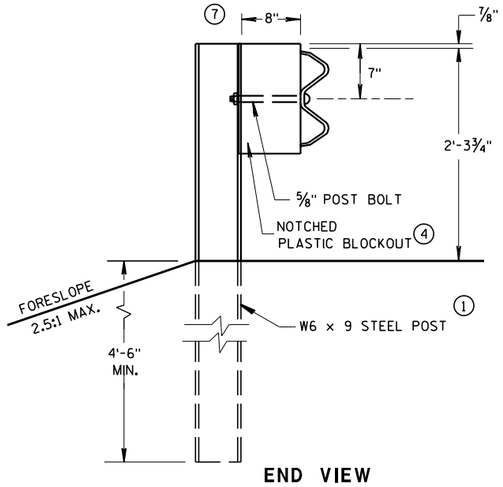
PLAN VIEW
WOOD POST, BLOCKOUT & BEAM



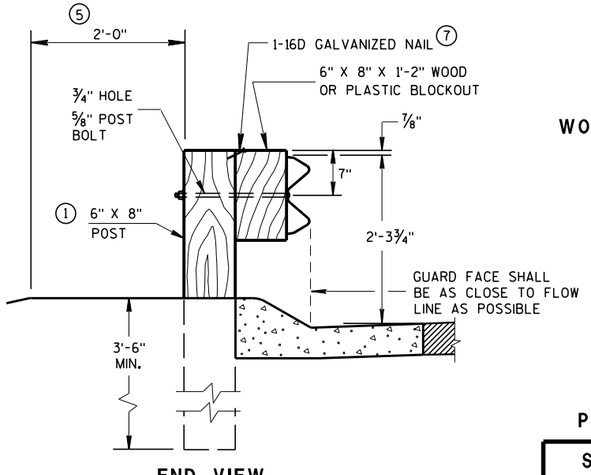
PLAN VIEW
STEEL POST, NOTCHED
PLASTIC BLOCKOUT & BEAM



END VIEW
STEEL POST & NOTCHED
PLASTIC BLOCKOUT ALTERNATIVE
STANDARD INSTALLATION



END VIEW
LONGER POST AT HALF
POST SPACING W BEAM
(LHW)



END VIEW
LOCATED ALONG A
MOUNTABLE CURBED ROADWAY

TYPICAL INSTALLATION OF STEEL PLATE BEAM GUARD

STEEL PLATE BEAM GUARD,
CLASS "A"
INSTALLATION & ELEMENTS

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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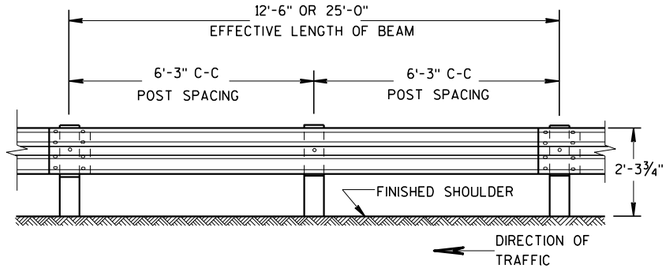
S.D.D. 14 B 15-11a

6

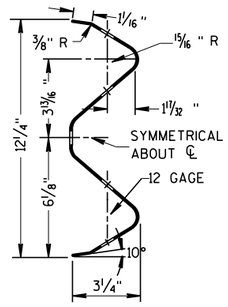
S.D.D. 14 B 15-11a

SDD 14b15-b Steel Plate Beam Guard, Class "A", Installation and Elements

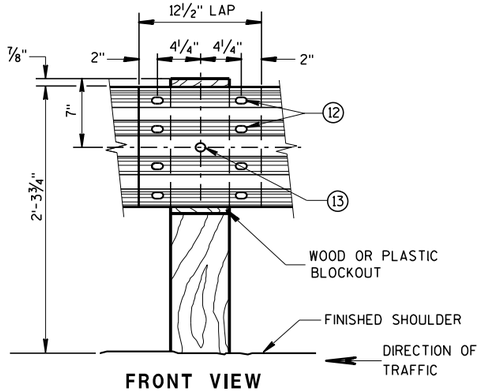


FRONT VIEW

POST SPACING STANDARD INSTALLATION



SECTION THRU W BEAM



FRONT VIEW

BEAM SPLICE AT WOOD POST AND POST MOUNTING DETAIL

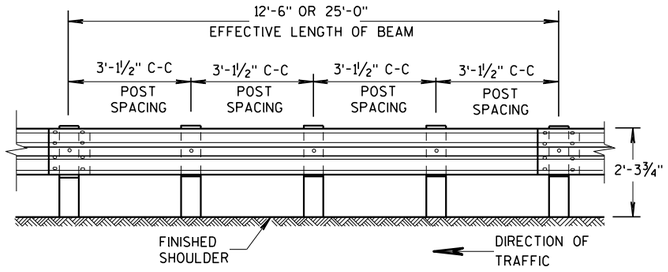
GENERAL NOTES

FURNISH GUARDRAIL DEFLECTORS FROM APPROVED PRODUCTS LIST.

(9) DO NOT INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINA. START REFLECTORS AT POST #9 AND SPACE EVENLY EVERY 100 FEET (MAX.) TO THE END OF GUARDRAIL RUN, USING A MINIMUM OF 3 REFLECTORS.

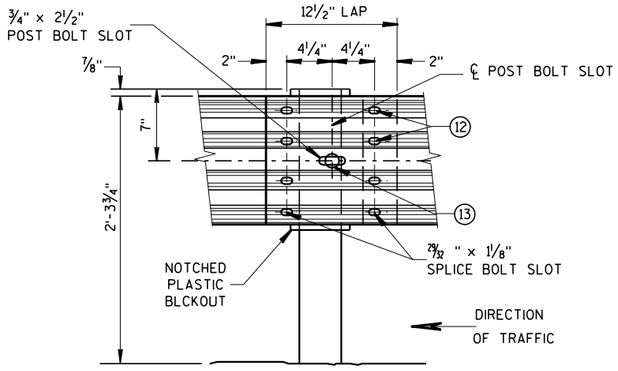
(12) 8 -⅝" ϕ X 2" BUTTON HEAD BOLTS WITH OVAL SHOULDERS & RECESS NUTS.

(13) ⅝" DIA. BUTTON HEAD BOLT AND RECESS NUT WITH ⅝" DIA. F844 FLAT WASHER UNDER NUT.



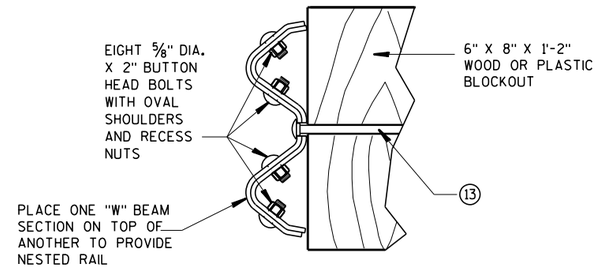
FRONT VIEW

POST SPACING FOR LONGER POST AT HALF POST SPACING W BEAM (LHW)



FRONT VIEW

BEAM SPLICE AT STEEL POST

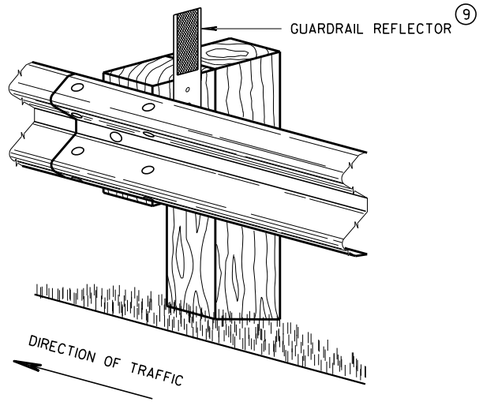


NESTED W BEAM (NW)

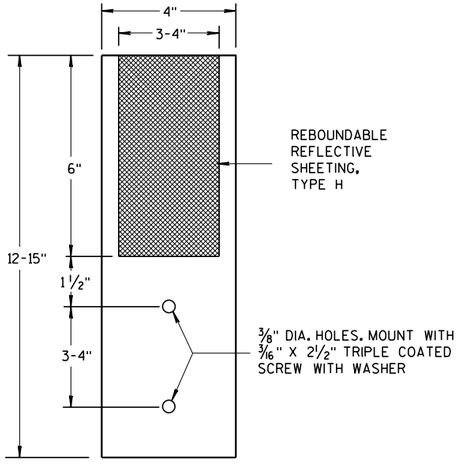
USE ALL OTHER STANDARD BEAM GUARD DETAILS FOR CONSTRUCTING NESTED W BEAM (NW)

TYPICAL SPLICING DETAILS OF STEEL PLATE BEAM GUARD

* USE DOUBLE SIDED WHITE GUADRAIL REFLECTORS ON ROADWAYS WITH BI-DIRECTIONAL TRAFFIC (NO MEDIAN). USE SINGLE SIDED WHITE (RIGHT SIDE) AND SINGLE SIDED YELLOW (LEFT SIDE) ON ROADWAYS WITH MEDIAN SEPARATION.



4" X 12" GUARDRAIL REFLECTOR DETAIL AND TYPICAL INSTALLATION *



4"x 12" GUARDRAIL REFLECTOR

STEEL PLATE BEAM GUARD, CLASS "A", INSTALLATION & ELEMENTS

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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S.D.D. 14 B 15-11b

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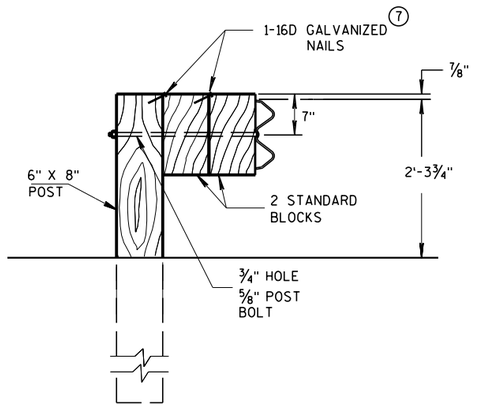
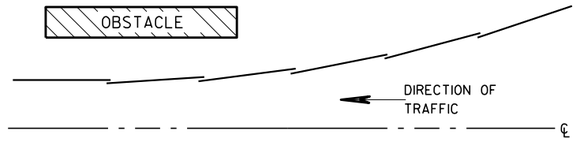
S.D.D. 14 B 15-11b

SDD 14b15-c Steel Plate Beam Guard, Class "A", Installation and Elements

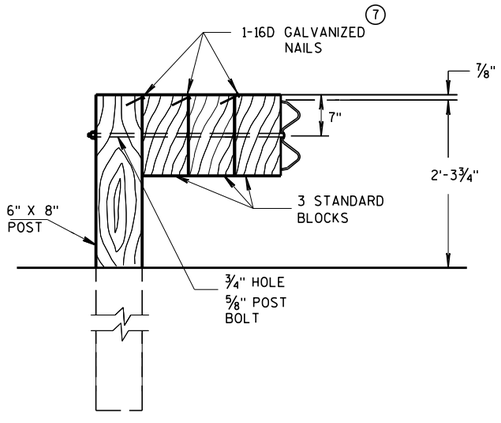


DETAIL FOR DOUBLE BLOCKS

THE NUMBER OF DOUBLE BLOCK POSTS WITHIN A BARRIER RUN IS UNLIMITED

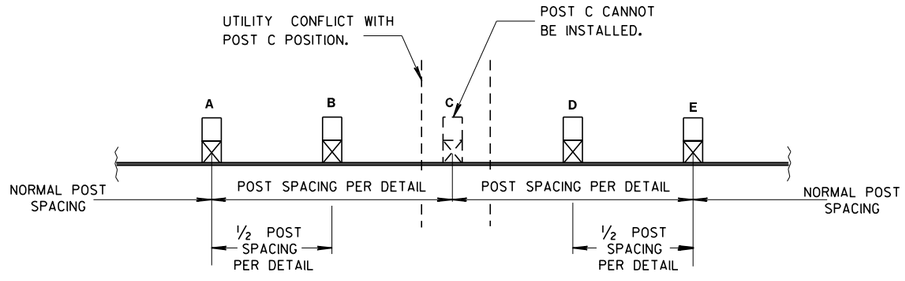


PLAN VIEW
BEAM LAPPING DETAIL



DETAIL FOR TRIPLE BLOCKS

TRIPLE BLOCK DETAIL IS LIMITED TO ONE LOCATION WITHIN A BEAM GUARD RUN.



POST DRIVING FOR CONTINUOUS UNDERGROUND OBSTRUCTION

NOTES: USE DOUBLE OR TRIPLE BLOCKS WHEN UNDERGROUND OBSTACLES PREVENT THE POST FROM BEING INSTALLED.

DO NOT USE EXTRA BLOCKOUTS IF IT CAUSES THE POST TO BE DRIVEN BEYOND SHOULDER HINGE POINT OR CAUSES A FIXED OBJECT TO BE WITHIN THE DEFLECTION DISTANCE OF THE BARRIER.

STEEL PLATE BEAM GUARD, CLASS "A", INSTALLATION & ELEMENTS

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
June 2017
DATE
FHWA

/S/ Rodney Taylor
ROADWAY STANDARDS DEVELOPMENT UNIT SUPERVISOR

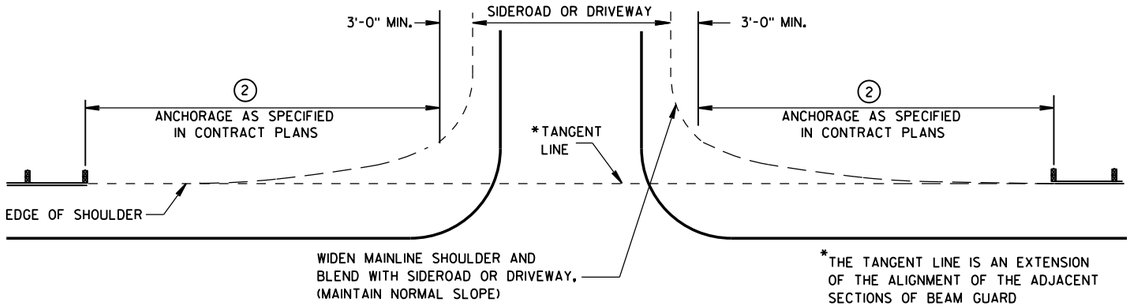
6

S.D.D. 14 B 15-11c

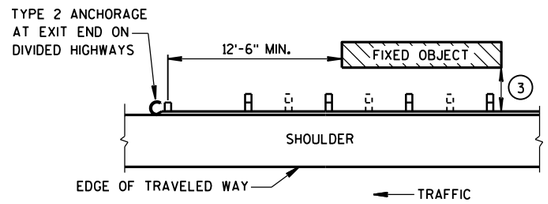
6

S.D.D. 14 B 15-11c

SDD 14b18-a Steel Plate Beam Guard, Class "A" (at Bridges, Obstacles and Sideroads/Driveways)



BEAM GUARD AT SIDEROADS OR DRIVEWAYS



BEAM GUARD AT OBSTACLES EXIT END - ONE WAY TRAFFIC

GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE PERTINENT STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

W6 X 9 OR W6 X 8.5 STEEL POSTS WITH NOTCHED PLASTIC BLOCKOUTS ARE ACCEPTABLE ALTERNATIVES FOR 6" X 8" WOOD POSTS WITH WOOD OR PLASTIC BLOCKOUTS. USE APPROVED NOTCHED PLASTIC BLOCKOUTS WITH STEEL POSTS.

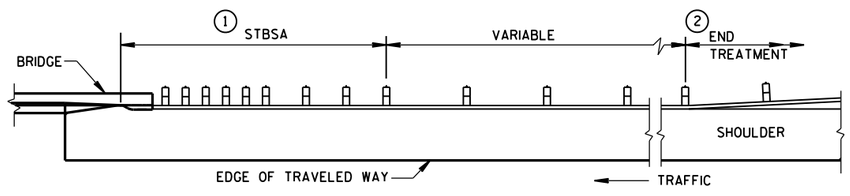
THE LOCATIONS AND LENGTHS OF BEAM GUARD ARE SHOWN ELSEWHERE IN THE PLAN.

(1) STEEL THRIE BEAM STRUCTURAL APPROACH (STBSA) - SEE CURRENT SDD 14B20.

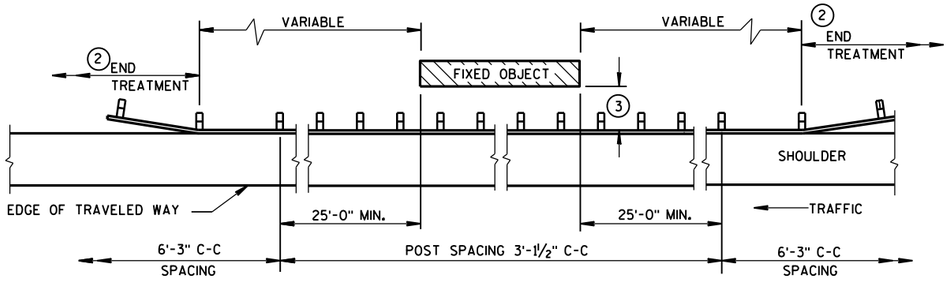
(2) USE AN APPROVED END TREATMENT FOR THE TRAFFIC APPROACH SIDE OF BRIDGE/OBSTACLES. USE TYPE 2 ANCHORAGE ONLY AT THE DOWNSTREAM ENDS OF BEAM GUARD LOCATED ALONG ROADWAYS WITH ONE WAY TRAFFIC.

(3)

MINIMUM LATERAL DISTANCE FROM FACE OF BEAM GUARD TO FIXED OBJECT	POST SPACING
3'-6"	3' - 1½"
4'-6"	6' - 3"

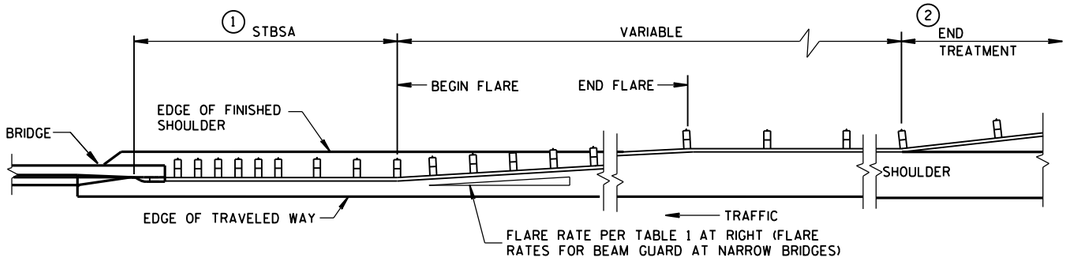


BEAM GUARD AT FULL WIDTH BRIDGES



BEAM GUARD AT OBSTACLES - TWO WAY TRAFFIC

(RAIL TO OBSTACLE CLEARANCE 3'-6" TO 4'-6")



BEAM GUARD AT NARROW BRIDGES

(FLARED TO SHOULDER EDGE, THEN PARALLEL TO ROADWAY)

TABLE 1
FLARE RATES FOR BEAM GUARD AT NARROW BRIDGES

POSTED SPEED (MPH)	FLARE RATE
25	13:1
30	15:1
35	16:1
40	18:1
45	21:1
50	24:1
55	26:1
65	30:1

STEEL PLATE BEAM GUARD CLASS "A" AT BRIDGES, OBSTACLES AND SIDEROADS/DRIVEWAYS

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
8-21-07
DATE
FHWA

/S/ Jerry H. Zogg
ROADWAY STANDARDS DEVELOPMENT ENGINEER

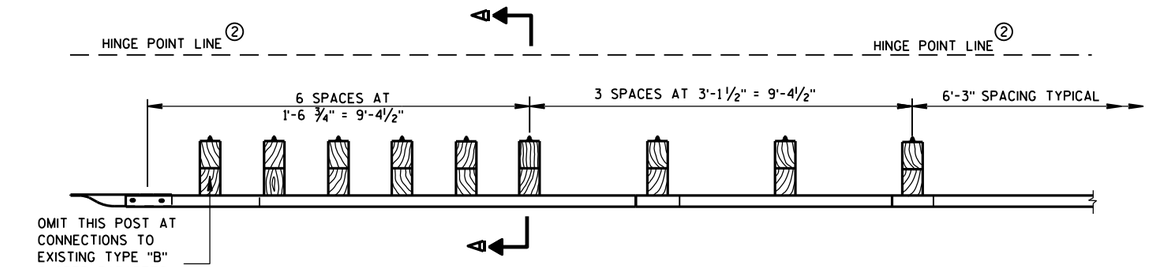
6

S.D.D. 14 B 18-6a

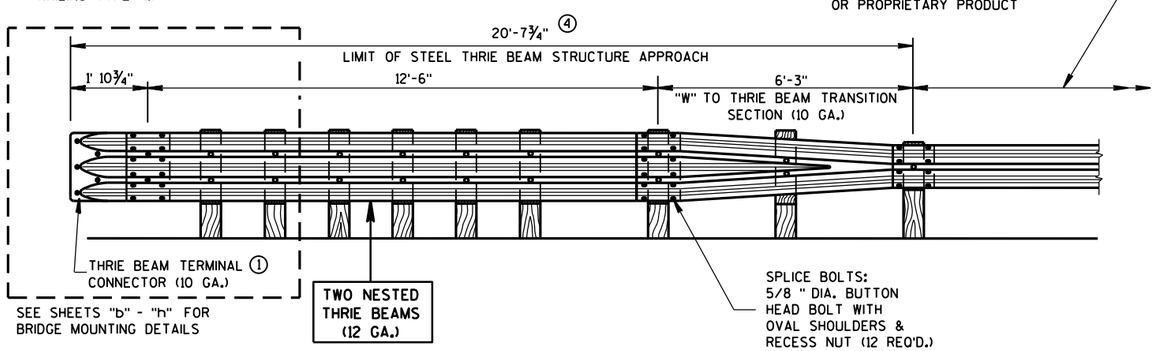
6

S.D.D. 14 B 18-6a

SDD 14b20-a Steel Thrie Beam Structure Approach



PLAN VIEW



FRONT VIEW

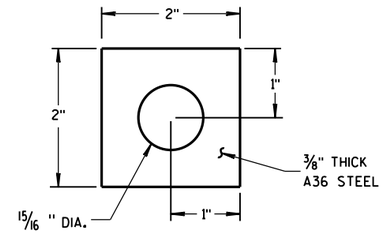


PLATE WASHER DETAIL

GENERAL NOTES

BOLT THE THRIE BEAM TO ALL POSTS AND BLOCKOUTS. DRILL OR PUNCH BOLT HOLES IN THE BEAM IF THE POST SPACING IS LESS THAN 6'-3".

DO NOT USE STEEL POSTS AND NOTCHED PLASTIC BLOCKOUTS IN THE STEEL THRIE BEAM STRUCTURAL APPROACH AND THE TRANSITION SECTION OF STEEL PLATE BEAM GUARD, CLASS "A" INSTALLATIONS.

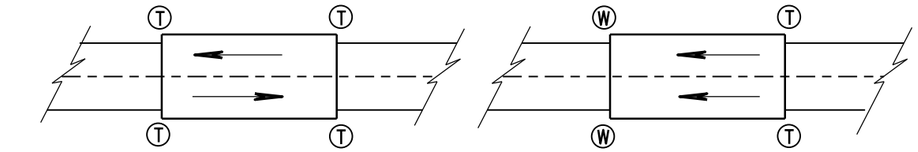
IF ROCK IS ENCOUNTERED, REMOVE ROCK TO FULL DEPTH OF POST PLUS 2½" , AND 12" DIAMETER AROUND POST. SEE 14B15 FOR MORE DETAILS.

① BRIDGE RAILING TYPE "W" DOES NOT REQUIRE A TERMINAL CONNECTOR.

② MINIMUM EMBEDMENT SHALL BE 4'-0". WHERE EXISTING CONDITIONS DO NOT PERMIT THE APPROPRIATE EARTHWORK SHOWN ON THE PLAN TYPICAL SECTIONS OR DETAILS, THE ENGINEER MAY ALLOW THE REDUCTION OR ELIMINATION OF THE 2 FOOT DISTANCE TO THE HINGE POINT. OTHERWISE BUILD AS THE PLAN SHOWS OR AS THE ENGINEER DIRECTS. IF THE 2 FOOT DISTANCE TO THE HINGE POINT IS REDUCED OR ELIMINATED, INCREASE THE POST EMBEDMENT DEPTH TO 4'-6" OR MORE.

③ POST BOLTS ARE ⅝" DIAMETER ASTM A307 BUTTON HEAD BOLT. A POST BOLT REQUIRES A ⅝" DIAMETER A563A DOUBLE RECESSED (DR) HEAVY HEX AND A ⅝" DIAMETER F844 FLAT WASHER. LENGTH OF POST BOLT MAY VARY.

④ ALL WOOD POSTS MUST BE 6" X 8" AND AT LEAST 7'-0" LONG.



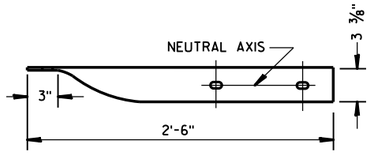
TWO WAY TRAFFIC

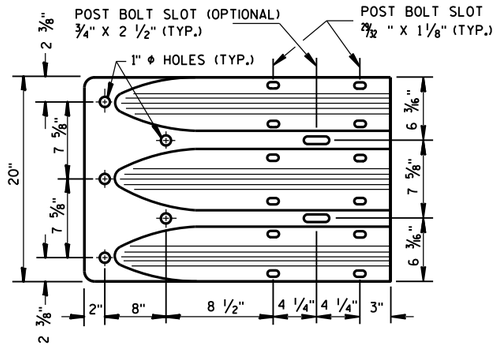
ONE WAY TRAFFIC

Ⓣ THRIE BEAM CONNECTION

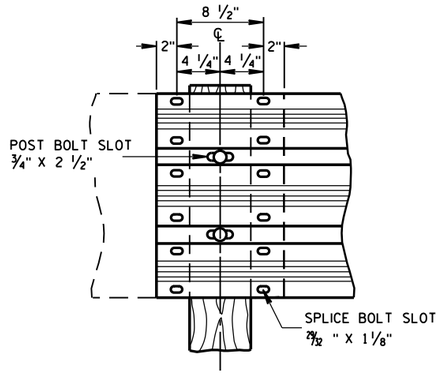
Ⓦ W-BEAM CONNECTION WHEN REQUIRED

TYPICAL LOCATIONS OF THRIE BEAM AND W-BEAM CONNECTIONS TO BRIDGE

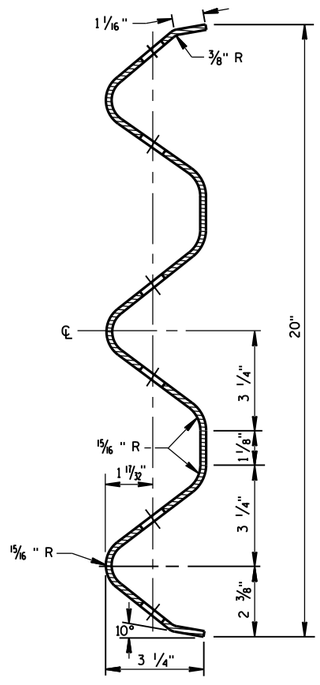




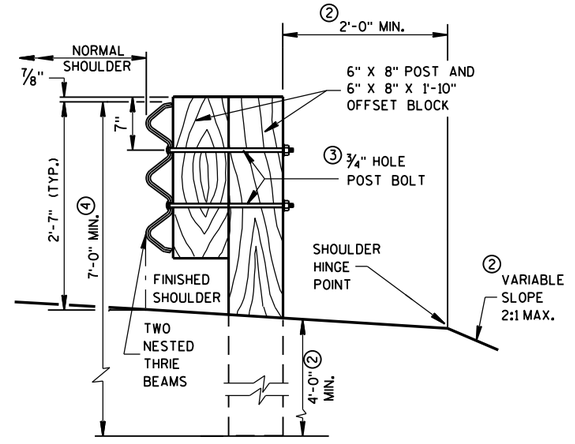
THRIE BEAM TERMINAL CONNECTOR



THRIE BEAM SPLICE



SECTION THRU THRIE BEAM RAIL ELEMENT



SECTION A-A

STEEL THRIE BEAM STRUCTURE APPROACH

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
8-31-2012
DATE
/S/ Jerry H. Zogg
ROADWAY STANDARDS DEVELOPMENT ENGINEER
FHWA

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S.D.D. 14 B 20-11a

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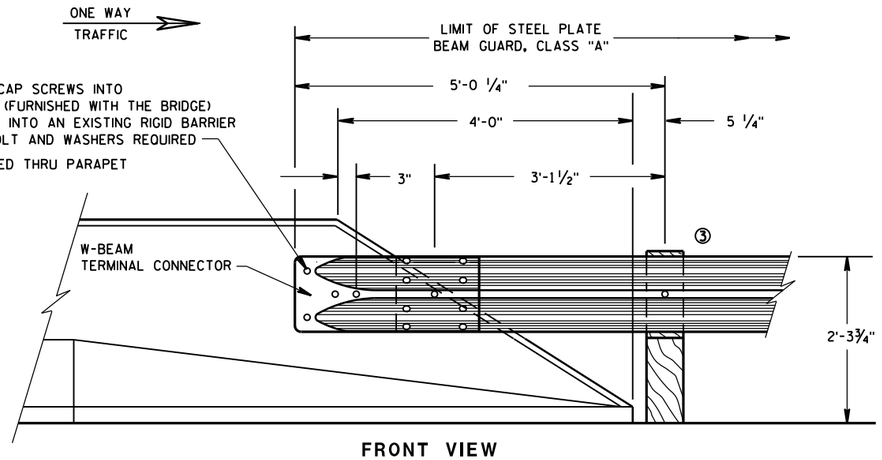
S.D.D. 14 B 20-11a

SDD 14b20-d Steel Thrie Beam Structure Approach, Connection to Sloped End Parapets



FRONT VIEW

W BEAM CONNECTION TO
PARAPETS WITH SLOPED ENDS

(USE ONLY AT TRAFFIC EXIT END OF ONE WAY BRIDGE)

GENERAL NOTES

THESE ARE TYPICAL CONNECTION DETAILS. ADJUST THE POSTION OF CONNECTIONS TO EXISTING BRIDGES TO FIT THE ACTUAL BRIDGE AND SITE DIMENSIONS.

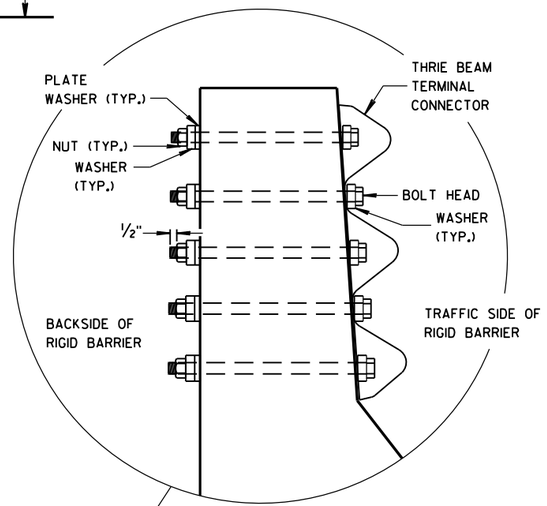
BOLTS, NUTS AND WASHERS SHALL CONFORM TO ASTM A325, A449 AND GALVANIZED PER STANDARD SPECIFICATIONS 614.

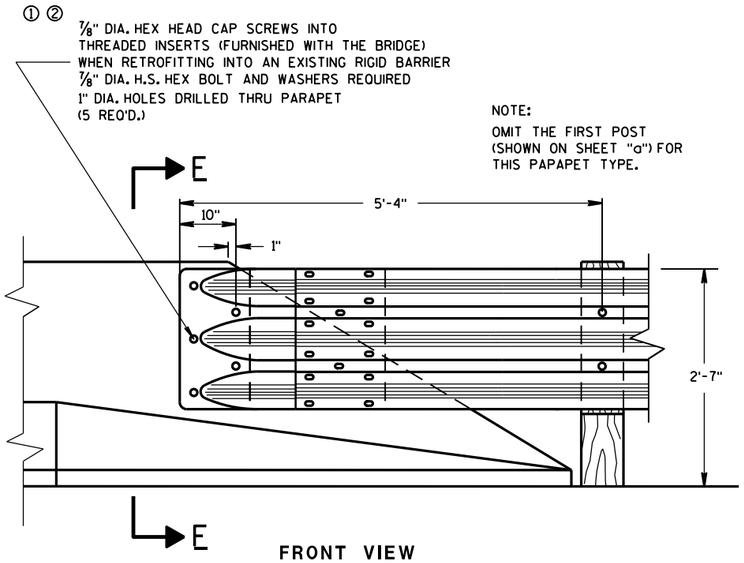
① DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.

② BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH AND THREADING LENGTH ARE TO ALLOW FOR A TIGHT CONNECTION BETWEEN RIGID BARRIER AND THRIE BEAM CONNECTION PLATE. CONTRACTOR IS TO FIELD VERIFY BOLT LENGTH AND THREAD LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THRIE BEAM TERMINAL CONNECTOR. BOLTS THAT EXTEND THROUGH THE PARAPET AND OUT THE BACK FACE REQUIRE A HARDENED ROUND STEEL WASHER THAT IS 2" O.D. X 5/8" THICK AND ONE PLATE WASHER. REPAIR ANY DAMAGED CONCRETE FROM BOLT INSTALLATION.

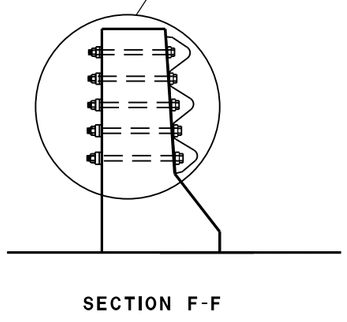
③ W6 X 9 OR W6 X 8.5 STEEL POSTS AND NOTCHED PLASTIC BLOCKOUTS ARE ACCEPTABLE ALTERNATIVES FOR 6" X 8" WOOD POST WITH WOOD OR PLASTIC BLOCKOUTS. USE APPROVED NOTCHED PLASTIC BLOCKOUTS WITH STEEL POSTS.

DO NOT USE STEEL POSTS AND NOTCHED PLASTIC BLOCKOUTS IN THE STEEL THRIE BEAM STRUCTURAL APPROACH AND THE TRANSITION SECTION OF STEEL PLATE BEAM GUARD, CLASS "A" INSTALLATIONS.



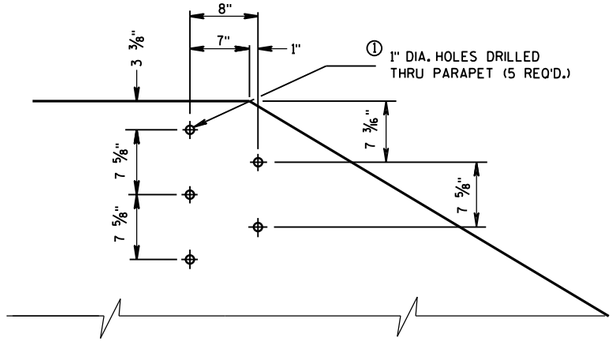


FRONT VIEW



SECTION F-F

THRIE BEAM CONNECTION TO BRIDGE
PARAPETS WITH SLOPED ENDS



DRILL HOLE LOCATION AND PATTERN
FOR THRIE BEAM CONNECTION

STEEL THRIE BEAM STRUCTURE APPROACH, CONNECTION TO SLOPED END PARAPETS

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
8/31/2012
DATE
/S/ Jerry H. Zogg
ROADWAY STANDARDS DEVELOPMENT ENGINEER
FHWA

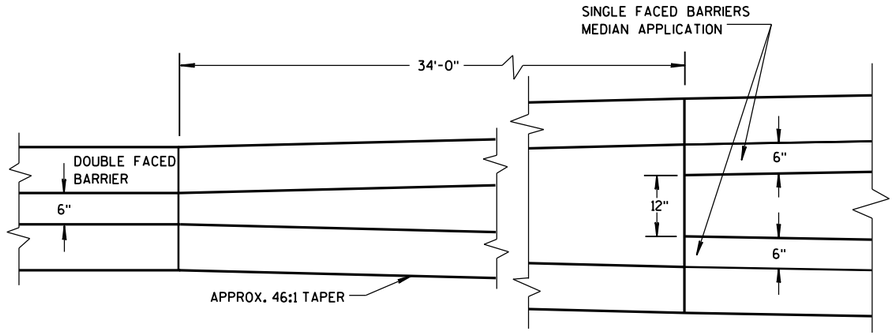
6

S.D.D. 14 B 20-11d

6

S.D.D. 14 B 20-11d

SDD 14b22-a Concrete Barrier, Single Faced (with Anchorage)



PLAN VIEW

TRANSITION DETAILS OF DOUBLE FACED TO SINGLE FACED CONCRETE MEDIAN BARRIER

(FOOTINGS ARE NOT SHOWN)

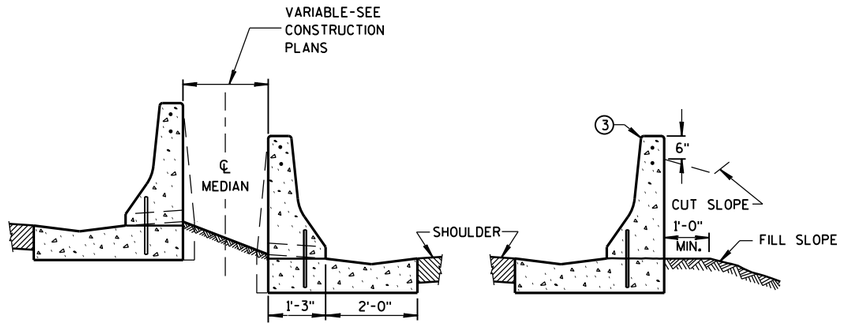
GENERAL NOTES

SPLICES OF LONGITUDINAL BARS SHALL BE MADE WITH BARS LAPPED AT LEAST 18-INCHES AND FIRMLY TIED OR FASTENED TOGETHER.

ALL BAR STEEL REINFORCEMENT SHALL CONFORM TO REQUIREMENTS OF AASHTO M31, GRADE 60.

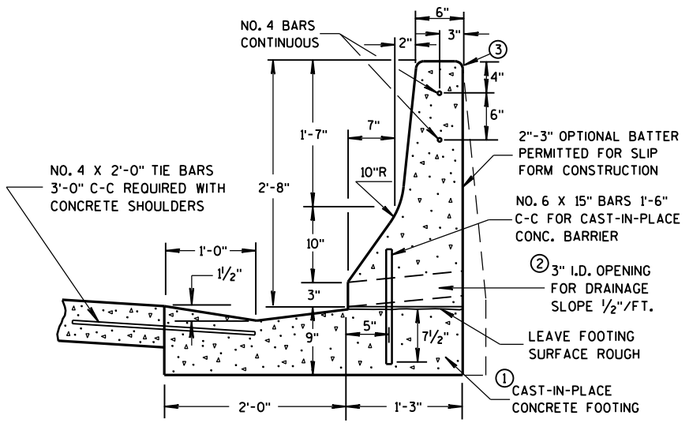
1. BARRIER SHALL BE INSTALLED ON A CONCRETE SHOULDER INSTEAD OF THE CONCRETE FOOTING WHEN SPECIFIED OR SHOWN ELSEWHERE IN CONTRACT.
2. OPENINGS FOR DRAINAGE SHALL BE PLACED AT LOW POINTS OF VERTICAL CURVES OR WHERE DIRECTED BY THE ENGINEER.
3. 3/4-INCH BEVEL OR 1-INCH RADIUS (TYPICAL).
4. NO. 4 BARS SHALL BE CONTINUED THROUGH CONSTRUCTION JOINTS.
5. EXPANSION JOINTS SHALL BE PLACED AT EXISTING EXPANSION JOINTS IN THE PAVEMENT AND AT STRUCTURES. SEE REINFORCEMENT AT BARRIER END DETAIL.
6. SAWED CONTRACTION JOINTS SHALL BE PROVIDED ACROSS THE FULL WIDTH OF THE BARRIER FOOTING, AND IN FRONT, TOP AND BACK FACE OF THE BARRIER AT EXISTING PAVEMENT JOINTS AND AT UNIFORM INTERVALS BETWEEN WITH A MAXIMUM SPACING OF 25 FEET.

HIGH SIDE CONCRETE BARRIER DETAIL

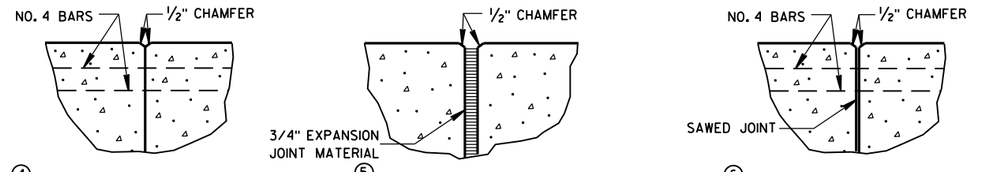


MEDIAN **SHOULDER**

TYPICAL APPLICATIONS



SECTION VIEW



JOINT DETAILS

CONCRETE BARRIER, SINGLE-FACED (WITH ANCHORAGE)
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION

6

S.D.D. 14 B 22-6a

6

S.D.D. 14 B 22-6a

SDD 14b24-a Steel Plate Beam Guard Energy Absorbing Terminal

BILL OF MATERIALS

NOTE NO.	DESCRIPTION
①	WOOD BREAKAWAY TERMINAL POST: 5½" X 7½" X 3'-9"
②	STEEL TUBE TS 8" X 6" X 0.188", 6'-0"
④	WOOD BREAKAWAY CRT POST: 6" X 8" X 6'-0"
⑤	WOOD OFFSET BLOCKS: 6'X 8" X 1'-2"
⑥	PIPE SLEEVE: 2" X 5 ½" STANDARD PIPE
⑦	BEARING PLATE
⑧	BCT CABLE ASSEMBLY
⑨	CABLE ANCHOR BOX
⑩	STRUT & YOKE
⑪	STEEL PLATE BEAM, END PANEL 12 GA.
⑫	STEEL PLATE BEAM: 12 GA. 13'-6½"
⑬	IMPACT HEAD
⑭	0.040" ALUMINUM SHEET WITH REFLECTIVE SHEETING TYPE F PER SECTION 637 OF THE STANDARD SPECIFICATIONS

GENERAL NOTES

FOLLOW MANUFACTURE'S BOLTING RECOMMENDATIONS.

(A) THE SLOPE IN THE AREA BOUNDED BY THE GRADELINE, THE HINGE POINT LINE (HPL), AND THE CLEAR ZONE LIMITS (CZL) SHALL BE 4:1 OR FLATTER.

(B) AFTER FINAL ASSEMBLY, RECHECK CABLE TO BE SURE IT IS TAUT AND HAS NOT RELAXED.

(D) THE TOP OF THE STEEL TUBE ON POSTS 1 AND 2 SHALL NOT BE MORE THAN 3" ABOVE THE FINISH GROUND ELEVATION.

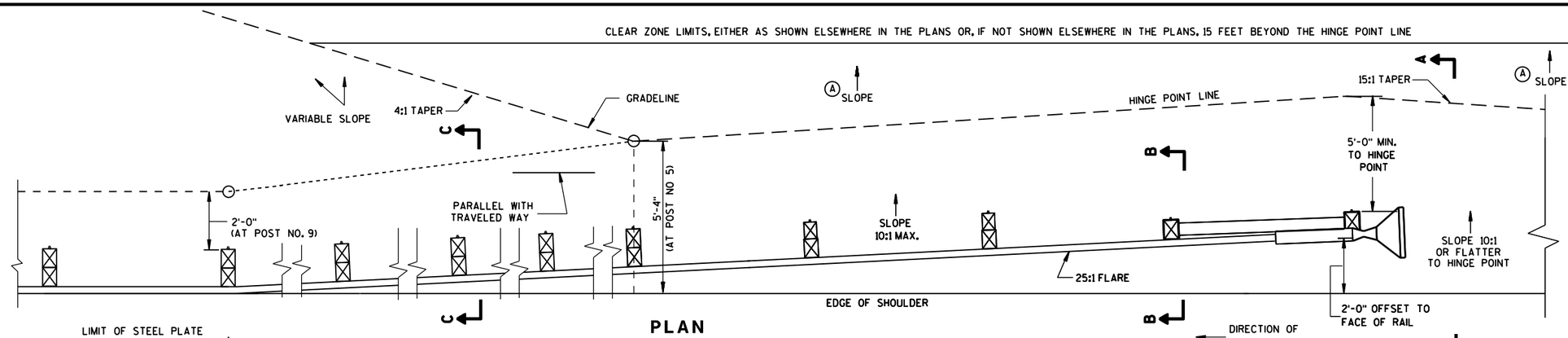
(E) THE CENTER OF THE UPPER 3½" DIAMETER HOLE ON POST 3 THROUGH 8 SHALL BE ¾" ABOVE THE FINISHED GROUND LINE.

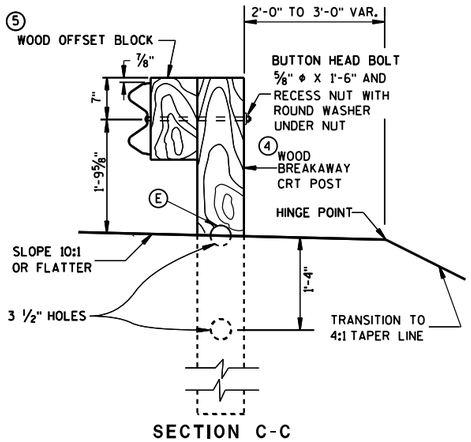
(F) ATTACH ALUMINUM SHEET TO E.A.T. HEAD USING 4 STAINLESS STEEL SELF-TAPPING SCREWS. ONE SCREW PER CORNER.

STEEL POSTS SHALL NOT BE ALLOWED FOR USE WITH ENERGY ABSORBING TERMINALS.

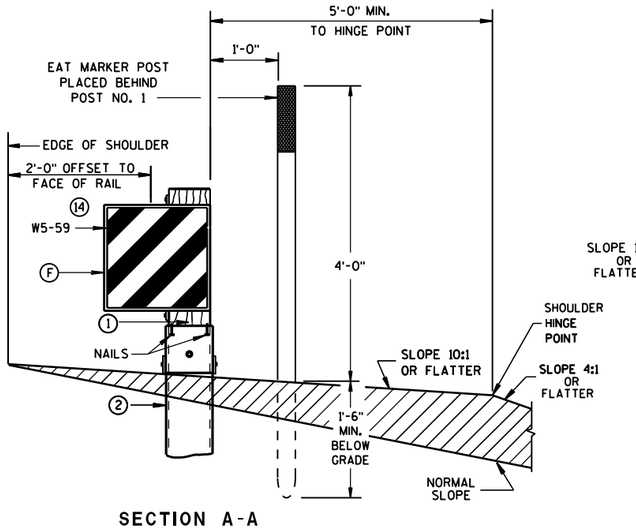
DO NOT INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINAL.

* DO NOT ATTACH BLOCKOUTS TO POSTS 1 AND 2.

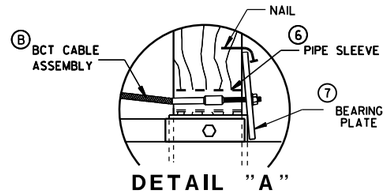




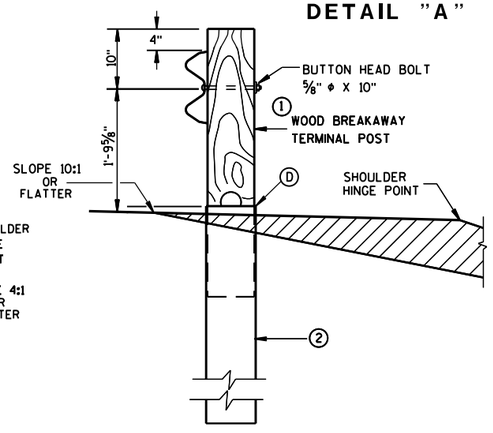
SECTION C-C
TYPICAL AT POST NOS. 6, 8



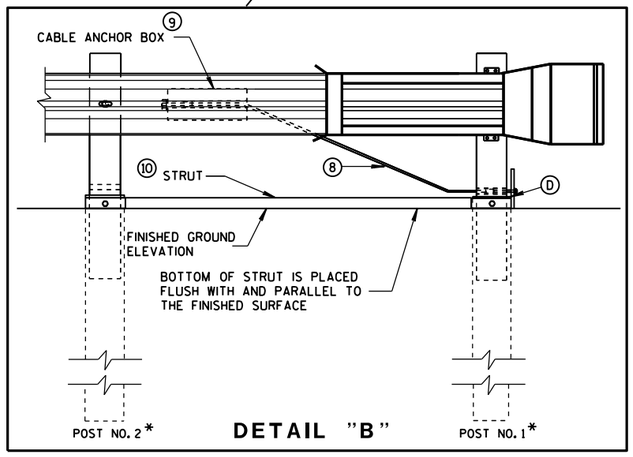
SECTION A-A
TYPICAL AT POST NO. 1*



DETAIL "A"



SECTION B-B
TYPICAL AT POST NO. 2*



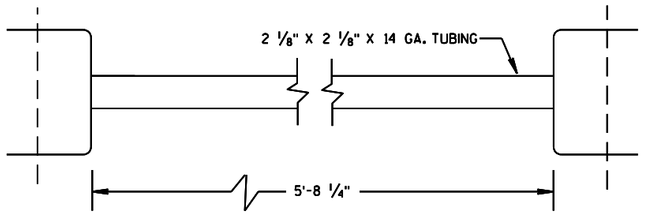
DETAIL "B"

STEEL PLATE BEAM GUARD ENERGY ABSORBING TERMINAL

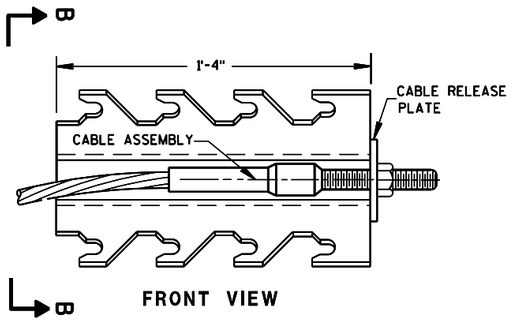
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

6

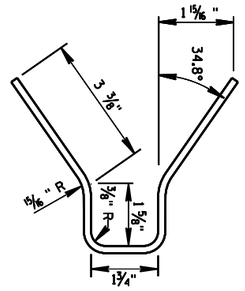
S.D.D. 14 B 24-9a



⑩ STRUT DETAIL

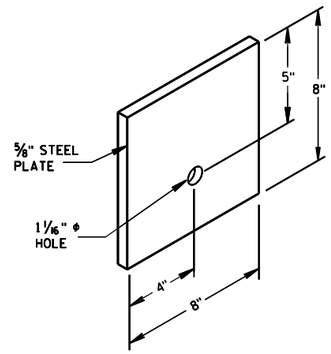


FRONT VIEW



SECTION B-B

⑨ CABLE ANCHOR BOX

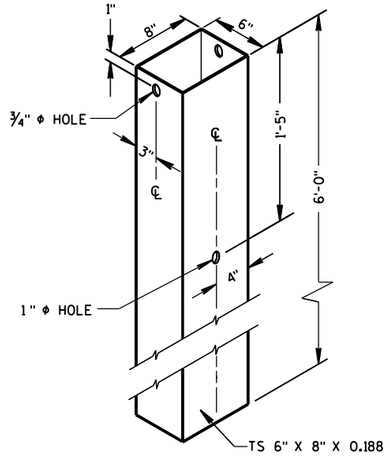


⑦ STEEL BEARING PLATE

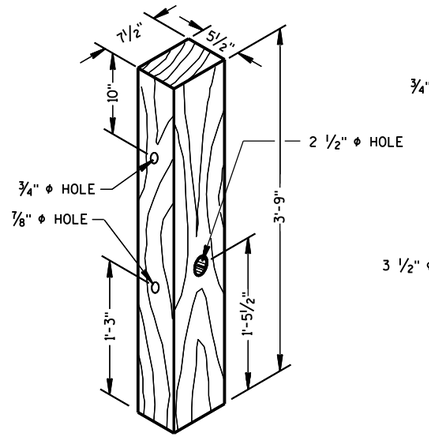
STEEL PLATE BEAM GUARD
ENERGY ABSORBING TERMINAL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

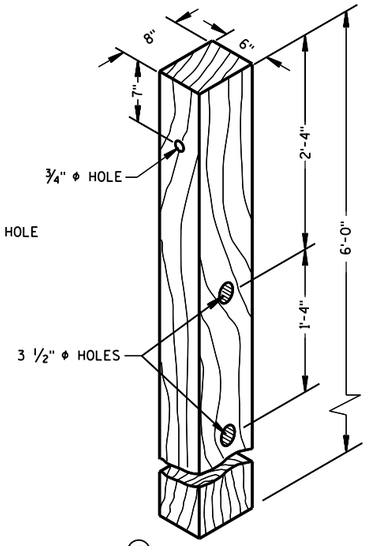
SDD 14b24-c Steel Plate Beam Guard Energy Absorbing Terminal



② 72" STEEL TUBE
(POSTS NO. 1-4



① TERMINAL POST

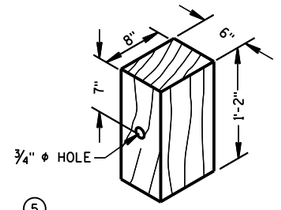


④ CRT POST
(POSTS NO'S 5-8

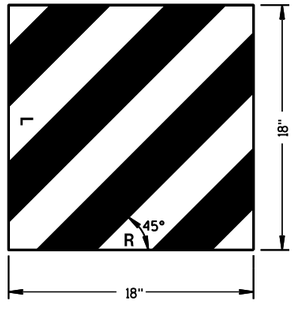
WOOD BREAKAWAY POSTS

GENERAL NOTES

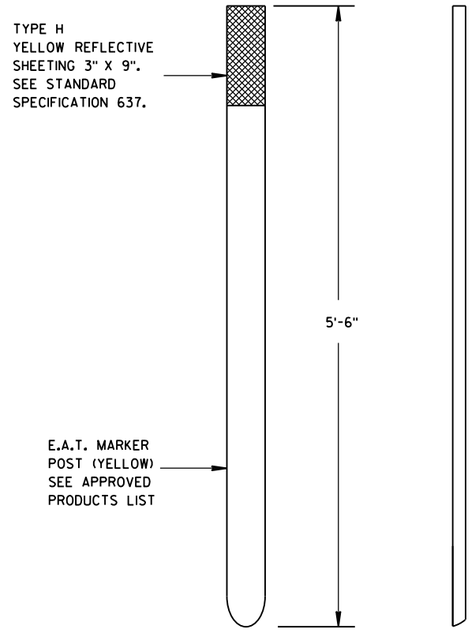
WHEN ROCK IS ENCOUNTERED DURING EXCAVATION, A 12 INCH DIA. POST HOLE EXTENDING 20 INCHES DEEP INTO THE ROCK MAY BE USED IF APPROVED BY THE ENGINEER. GRANULAR MATERIAL SHALL BE PLACED IN THE BOTTOM OF THE HOLE APPROXIMATELY 2 ½" INCHES DEEP TO PROVIDE DRAINAGE. THE SOIL TUBES SHALL BE FIELD CUT TO LENGTH, PLACED IN THE HOLE AND BACKFILLED WITH ADEQUATELY COMPACTED MATERIAL EXCAVATED FROM THE HOLE.



⑤ WOOD OFFSET BLOCK
REQ'D. AT ALL POSTS EXCEPT POST NO'S 1 & 2



⑭ REFLECTIVE SHEETING DETAILS



E.A.T. MARKER POST

STEEL PLATE BEAM GUARD
ENERGY ABSORBING TERMINAL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
June 2017
DATE
FHWA

/S/ Rodney Taylor
ROADWAY STANDARDS DEVELOPMENT
UNIT SUPERVISOR

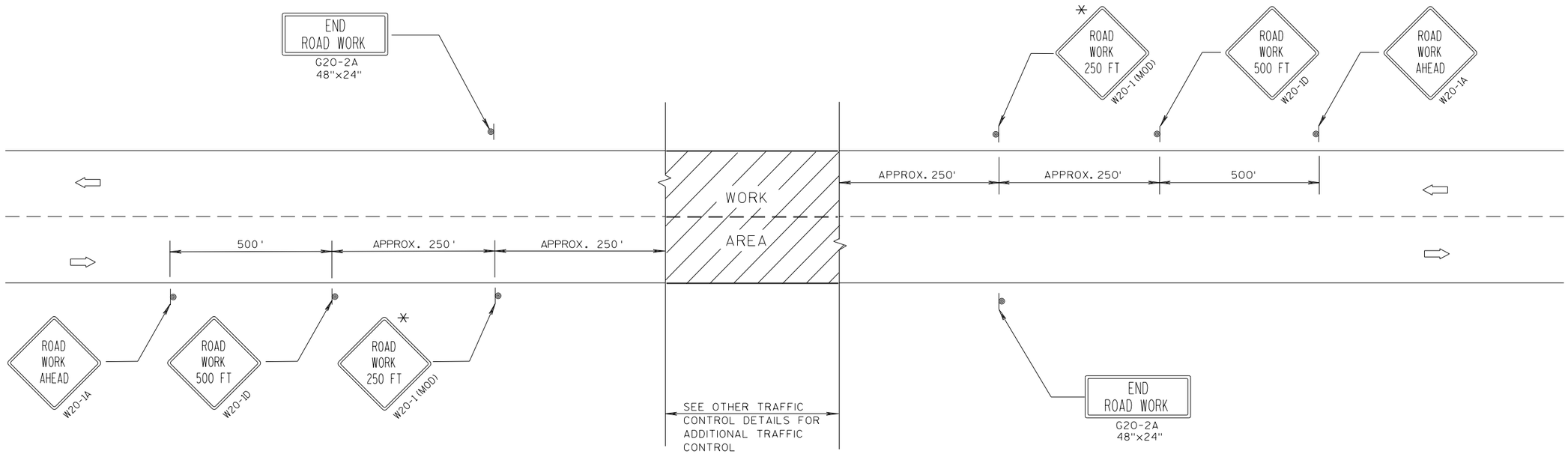
6

S.D.D. 14 B 24-9c

6

S.D.D. 14 B 24-9c

SDD 15c5 Traffic Control, Advance Warning Signs 40 M.P.H. or Less, Two Way Undivided Road Open to Traffic



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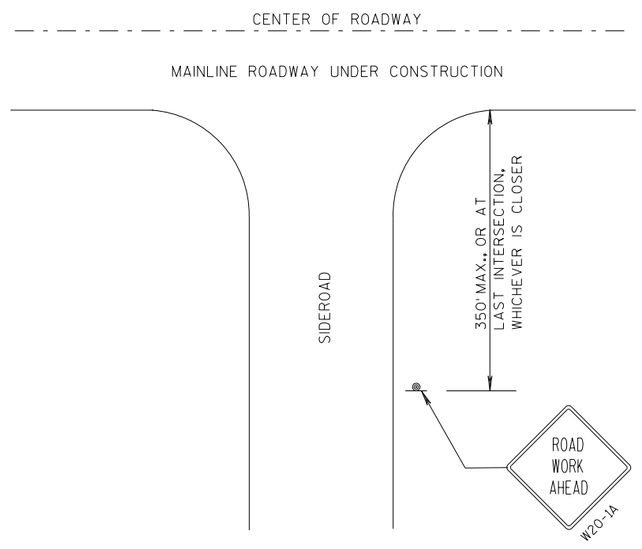
TYPICAL SIDEROAD APPROACH WARNING SIGN DETAIL



LEGEND

- SIGN ON PERMANENT SUPPORT
- DIRECTION OF TRAFFIC
- WORK AREA

GENERAL NOTES

THE EXACT NUMBER, LOCATION, AND SPACING OF ALL SIGNS AND DEVICES SHALL BE ADJUSTED TO FIT FIELD CONDITIONS.

THE SPACING BETWEEN TRAFFIC CONTROL SIGNS SHOULD BE ADJUSTED TO NOT CONFLICT WITH AND SHOULD PROVIDE A DESIRABLE MINIMUM OF 200 FEET CLEARANCE TO EXISTING SIGNS THAT WILL REMAIN IN PLACE.

ALL SIGNS ARE 48"x48" UNLESS OTHERWISE NOTED. IF NECESSARY DUE TO SPACE CONSTRAINTS, 36"x36" SIGNS MAY BE USED INSTEAD OF 48"x48" SIGNS.

SIGNS THAT WILL BE IN PLACE LESS THAN 7 CONTINUOUS DAYS AND NIGHTS MAY BE MOUNTED ON PORTABLE SUPPORTS.

IF A "STOP" SIGN MUST BE REMOVED FOR A WORK OPERATION, A TEMPORARY "STOP" SIGN SHALL BE PLACED PRIOR TO THE SIGN REMOVAL, OR A FLAGGER SHALL BE PROVIDED UNTIL THE SIGN IS RE-ESTABLISHED.

* THE THIRD W20-1 SIGN IS REQUIRED ONLY IF THERE IS AN INTERSECTION BETWEEN THE "ROAD WORK 500 FT" SIGN AND THE WORK ZONE. ADJUST THE PLACEMENT OF THIS SIGN BASED ON INTERSECTION LOCATION AND OTHER FIELD CONDITIONS.

TRAFFIC CONTROL, ADVANCE WARNING SIGNS 40 M.P.H. OR LESS TWO-WAY UNDIVIDED ROAD OPEN TO TRAFFIC

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
7/2018 — DATE
/S/ Andrew Heldtke — WORK ZONE ENGINEER
FHWA

6

S.D.D. 15 C 5-5

S.D.D. 15 C 5-5

SDD 15c12 Traffic Control for Lane Closure with Flagging Operation

LEGEND

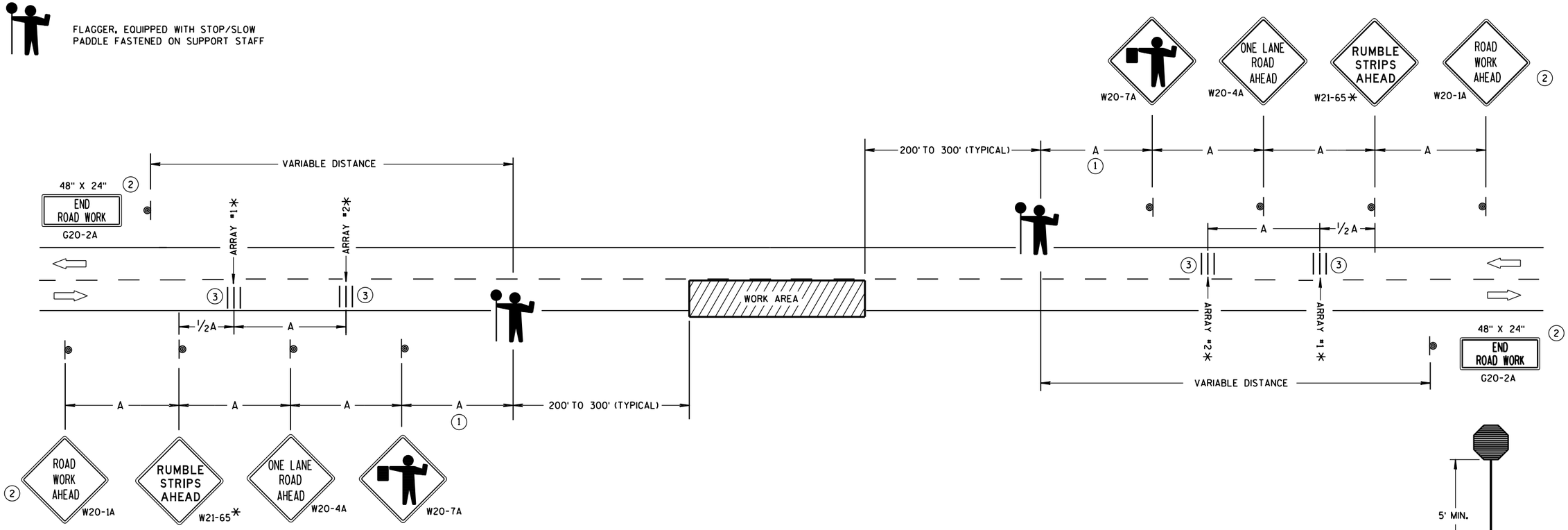
- SIGN ON PORTABLE OR PERMANENT SUPPORT
- DIRECTION OF TRAFFIC
- WORK AREA
- FLAGGER, EQUIPPED WITH STOP/SLOW PADDLE FASTENED ON SUPPORT STAFF

SIGN AND TEMPORARY RUMBLE STRIP ARRAY SPACING TABLE

SPEED LIMIT	SPACING A
25-35 MPH	200'
35-40 MPH	350'
45-55 MPH	500'

W03-4

USE OF THE "BE PREPARED TO STOP" SIGN IS OPTIONAL. WHEN USED, THIS SIGN SHALL BE LOCATED BETWEEN THE W20-7A AND W20-4A SIGNS, USING SPACING A.



STOP/SLOW PADDLE ON SUPPORT STAFF

TRAFFIC CONTROL FOR LANE CLOSURE WITH FLAGGING OPERATION

GENERAL NOTES

DETAILS OF TRAFFIC CONTROL DEVICES AND INSTALLATION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS, THE SPECIAL PROVISIONS, AND THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

THE EXACT NUMBER, LOCATION AND SPACING OF ALL SIGNS AND DEVICES (AND THE LOCATION OF ALL FLAGGERS) SHALL BE ADJUSTED TO FIT FIELD CONDITIONS AS APPROVED BY THE ENGINEER.

THE FIRST ADVANCE WARNING SIGN SHOULD TYPICALLY BE LOCATED IN ADVANCE OF THE ANTICIPATED TRAFFIC BACKUP OR QUEUE.

"WO" SIGNS ARE THE SAME AS "W" SIGNS EXCEPT THE BACKGROUND IS ORANGE.

WHEN A SIDE ROAD OR RAMP INTERSECTS THE FACILITY ON WHICH THE WORK IS BEING PERFORMED, ADDITIONAL TRAFFIC CONTROLS SHALL BE PROVIDED AS SPECIFIED IN THE PLANS AND/OR THE SPECIAL PROVISIONS OR AS APPROVED BY THE ENGINEER.

INSTALL TEMPORARY RUMBLE STRIPS PER MANUFACTURER'S RECOMMENDATIONS.

PLACE ADVANCE SIGNING PRIOR TO INSTALLING TEMPORARY RUMBLE STRIPS.

ALL SIGNS ARE 48" X 48" UNLESS OTHERWISE NOTED.

FLAGGERS SHALL BE IN SIGHT OF EACH OTHER OR IN DIRECT COMMUNICATION AT ALL TIMES. THEY SHALL BE EQUIPPED WITH STOP/SLOW PADDLES FASTENED ON SUPPORT STAFFS. WHEN THE FLAGGING OPERATION IS NOT IN EFFECT, REMOVE TEMPORARY RUMBLE STRIPS PRIOR TO COVERING OR REMOVING ALL ADVANCE SIGNING.

* UTILIZE TEMPORARY RUMBLE STRIPS WHEN FLAGGING OPERATION IS ANTICIPATED TO BE STATIONARY IN EXCESS OF TWO HOURS.

(1) FOR A MOVING WORK OPERATION, SIGNING AND TEMPORARY RUMBLE STRIPS (IF USED) SHALL BE REESTABLISHED (AS SIMULTANEOUSLY AS PRACTICAL) AT APPROXIMATELY 3,500 FOOT INTERVALS IN THE MOVING WORK OPERATION OR AS APPROVED BY THE ENGINEER.

(2) SIGN NOT REQUIRED IF FLAGGING OPERATION OCCURS WITHIN A SIGNED ROAD WORK ZONE AREA.

(3) EACH TEMPORARY RUMBLE STRIP ARRAY CONSISTS OF THREE RUMBLE STRIPS SPACED ACCORDING TO MANUFACTURER'S RECOMMENDATION, PLACED TRANSVERSE ACROSS THE LANE AT LOCATIONS SHOWN.

TRAFFIC CONTROL FOR LANE CLOSURE WITH FLAGGING OPERATION

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
June 2017 — DATE
/S/ Andrew Heldtke — WORK ZONE ENGINEER
FHWA

SDD 15d12-a Traffic Control, Lane Closure

LEGEND

- TYPE III BARRICADE WITH ATTACHED SIGN
- SIGN ON PERMENENT SUPPORT
- TRAFFIC CONTROL DRUM WITH TYPE "C" STEADY BURN LIGHT
- TRAFFIC CONTROL DRUM
- FLASHING ARROW BOARD
- (A) TYPE "A" WARNING LIGHT (FLASHING)
- REMOVING PAVEMENT MARKING
- DIRECTION OF TRAFFIC
- WORK AREA

GENERAL NOTES

THE EXACT NUMBER, LOCATION, AND SPACING OF ALL SIGNS AND DEVICES SHALL BE ADJUSTED TO FIT FIELD CONDITIONS AS APPROVED BY THE ENGINEER.

THE SPACING BETWEEN SIGNS SHOULD BE ADJUSTED TO NOT CONFLICT WITH AND TO PROVIDE A MINIMUM OF 200 FEET, (500 FEET DESIREABLE) DISTANCE TO EXISTING SIGNS.

THIS LANE CLOSURE IS TYPICAL FOR CLOSING RIGHT LANE - REVERSE FOR CLOSING LEFT LANE.

ALL SIGNS ARE 48"x48" UNLESS OTHERWISE NOTED.

"WO" IS THE SAME AS "W" EXCEPT THE BACKGROUND IS ORANGE.

ANY SIGNS TEMPORARY OR EXISTING, WHICH CONFLICT WITH TRAFFIC CONTROL "IN USE" SHALL BE REMOVED OR COVERED AS NEEDED AND AS APPROVED BY THE ENGINEER. NO WARNING LIGHTS SHALL BE WORKING ON "COVERED" OR "DOWNED" SIGNS.

CONSIDER GEOMETRICS WHEN LOCATING SIGNS AND ARROW BOARD SO THE DRIVER HAS A CLEAR VIEW OF THE ARROW BOARD AND LANE CLOSURE DRUMS FOR A MINIMUM 1500 FEET IN FRONT OF DRUMS.

FOR A LANE CLOSURE THAT IS IN PLACE LESS THAN 7 CONTINUOUS DAYS AND NIGHTS, THE ADVANCED WARNING SIGNS MAY BE MOUNTED ON PORTABLE SUPPORTS.

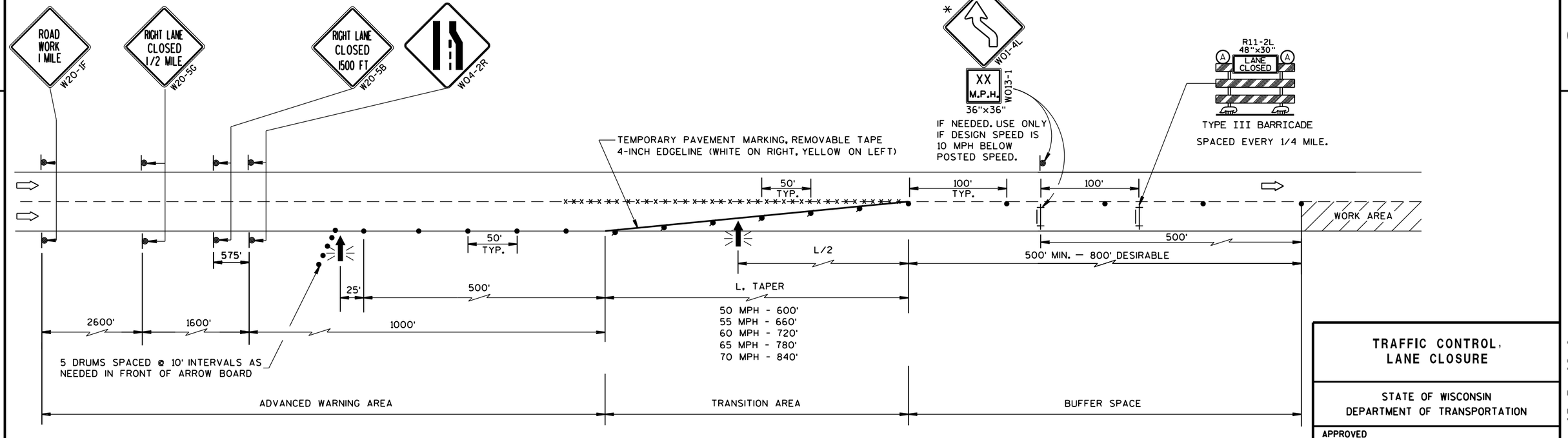
REMOVE PAVEMENT MARKINGS IF LANE CLOSURE IS TO BE IN PLACE FOR LONGER THAN 4 OR MORE DAYS AND NIGHTS.

WARNING LIGHTS ARE NOT REQUIRED IF THE LANE CLOSURE IS A DAYTIME ONLY OPERATION.

IF THE HORIZONTAL ALIGNMENT IS SUCH THAT A CURVE MAY REQUIRE ADDITIONAL DELINEATION, THE DEVICE SPACING MAY BE DECREASED TO 50 FEET.

ADJUSTMENTS IN BUFFER SPACE NEED TO BE INCORPORATED WHEN THE LANE CLOSURE OCCURS NEAR AN INTERCHANGE EXIT OR ENTRANCE RAMP. THE LANE CLOSURE MUST MUST TAKE PLACE FAR ENOUGH IN ADVANCE OF AN EXIT OR ENTRANCE RAMP TO STILL ALLOW FOR ADEQUATE BUFFER SPACE. THE MINIMUM LENGTH OF THE BUFFER SPACE BEFORE AN EXIT RAMP SHOULD BE 1/2 THE LENGTH OF THE TRANSITION AREA. THE ENTRANCE RAMP SHOULD BE FOLLOWED BY THE ORIGINAL BUFFER SPACE LENGTH OF 800 FEET DESIRABLE PRIOR TO ANOTHER TRAFFIC CONTROL CHANGE SUCH AS A CROSSOVER MANEUVER.

* THE LEFT REVERSE CURVE SIGN (WO1-4L) IS ONLY REQUIRED WHEN THIS DETAIL IS USED IN COMBINATION WITH "SINGLE LANE CROSSOVER" DETAIL.



TRAFFIC CONTROL, LANE CLOSURE

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
March 2016 — DATE
/S/ Peter Amakobe Atepe — STATEWIDE WORK ZONE TRAFFIC SAFETY ENGINEER
FHWA

6

S.D.D. 15 D 12-6a

6

S.D.D. 15 D 12-6a

SDD 15d28 Traffic Control, Work on Shoulder or Parking Lane, Undivided Roadway

GENERAL NOTES

THE EXACT NUMBER, LOCATION AND SPACING OF ALL SIGNS AND DEVICES SHALL BE ADJUSTED TO FIT FIELD CONDITIONS AS APPROVED BY THE ENGINEER.

ALL SIGNS ARE 48" X 48" UNLESS OTHERWISE NOTED. IF NECESSARY DUE TO SPACE CONSTRAINTS IN URBAN AREAS, 36" X 36" SIGNS MAY BE USED IF APPROVED BY DISTRICT TRAFFIC UNIT.

"WO" SIGNS ARE THE SAME AS "W" SIGNS EXCEPT THE BACKGROUND IS ORANGE.

SIGNS THAT WILL BE IN PLACE LESS THAN 7 CONTINUOUS DAYS AND NIGHTS MAY BE MOUNTED ON PORTABLE SUPPORTS.

ANY SIGNS TEMPORARY OR EXISTING, WHICH CONFLICT WITH TRAFFIC CONTROL "IN USE" SHALL BE REMOVED OR COVERED AS NEEDED AND AS APPROVED BY THE ENGINEER.

W20-1A AND G20-2A SIGNS ARE NOT REQUIRED IF THE WORK AREA IS WITHIN A LARGER WORK ZONE WHERE THESE SIGNS ARE ALREADY PRESENT. G20-2A SIGNS MAY ALSO BE OMITTED IF DURATION OF WORK IS LESS THAN 7 CONTINUOUS DAYS AND NIGHTS.

CHANNELIZING DEVICES PLACED ADJACENT TO THE WORK AREA SHALL BE PULLED BACK FROM THE TRAVEL LANE WHEN WORK IS NOT IN PROGRESS.

TABLE A

S \ W	SHOULDER TAPER LENGTH (FEET) 4	6	8	10	BUFFER SPACE (FEET)
30	20	30	40	50	200
35	30	45	55	70	250
40	40	55	75	90	305
45	60	90	120	150	360
50	70	100	135	170	425
55	75	110	150	185	495

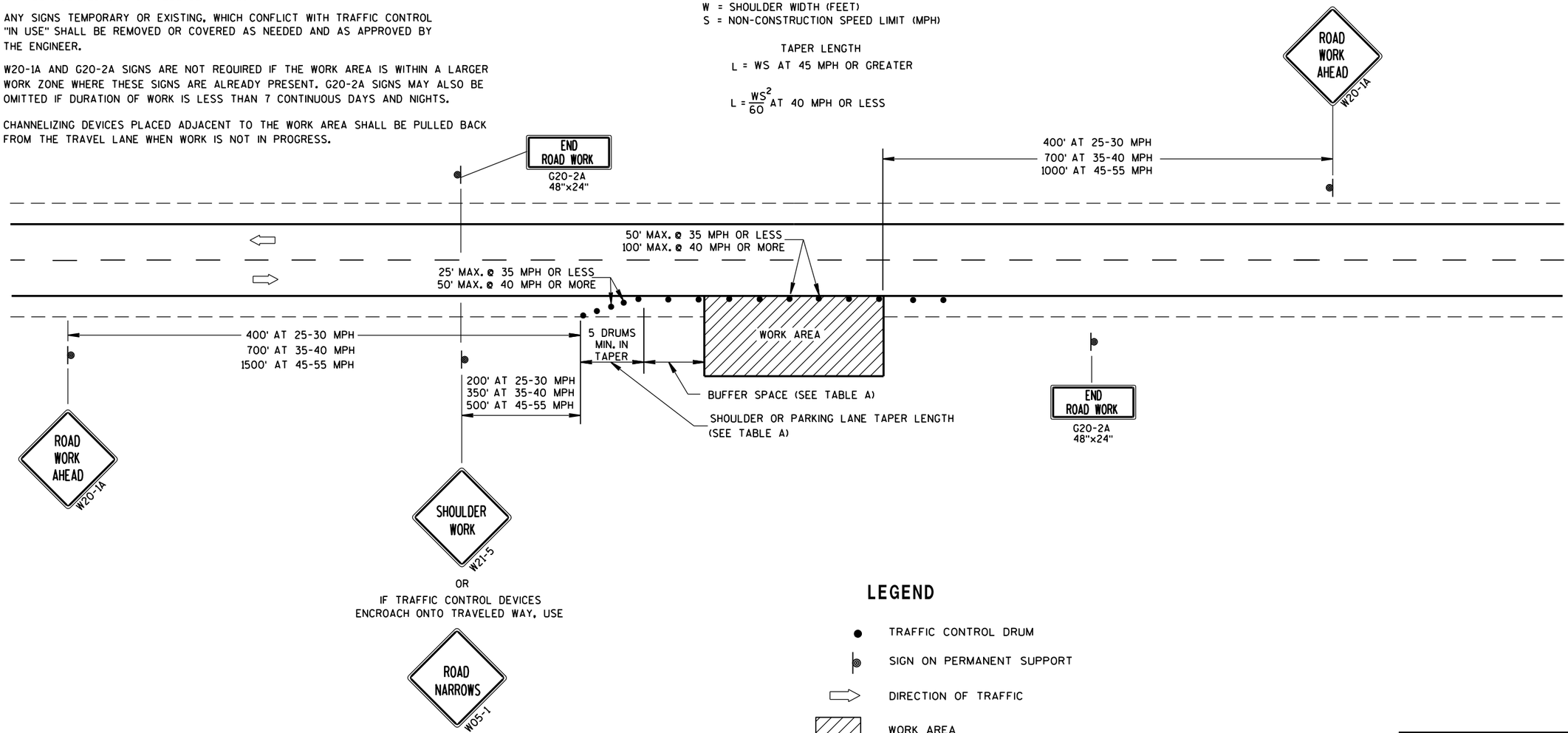
W = SHOULDER WIDTH (FEET)
S = NON-CONSTRUCTION SPEED LIMIT (MPH)

TAPER LENGTH

L = WS AT 45 MPH OR GREATER

$L = \frac{WS^2}{60}$ AT 40 MPH OR LESS

SHOULDER TAPER LENGTH = $\frac{1}{3}L$



LEGEND

- TRAFFIC CONTROL DRUM
- SIGN ON PERMANENT SUPPORT
- DIRECTION OF TRAFFIC
- WORK AREA

TRAFFIC CONTROL, WORK ON SHOULDER OR PARKING LANE, UNDIVIDED ROADWAY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

July 14, 2015 — DATE

/S/ Peter Amakobe Atepe — STATEWIDE WORK ZONE TRAFFIC SAFETY ENGINEER

FHWA

6

S.D.D. 15 D 28-3