PROJECT ID: CTH MD

COUNTY: WASHBURN

ORDER OF SHEETS

TOTAL SHEETS = 66

WASHBURN COUNTY

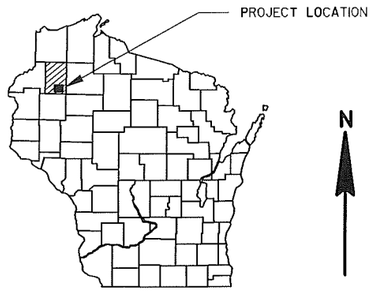
PLAN OF PROPOSED IMPROVEMENT

CTH M LONG LAKE, STORMWATER IMPROVEMENTS

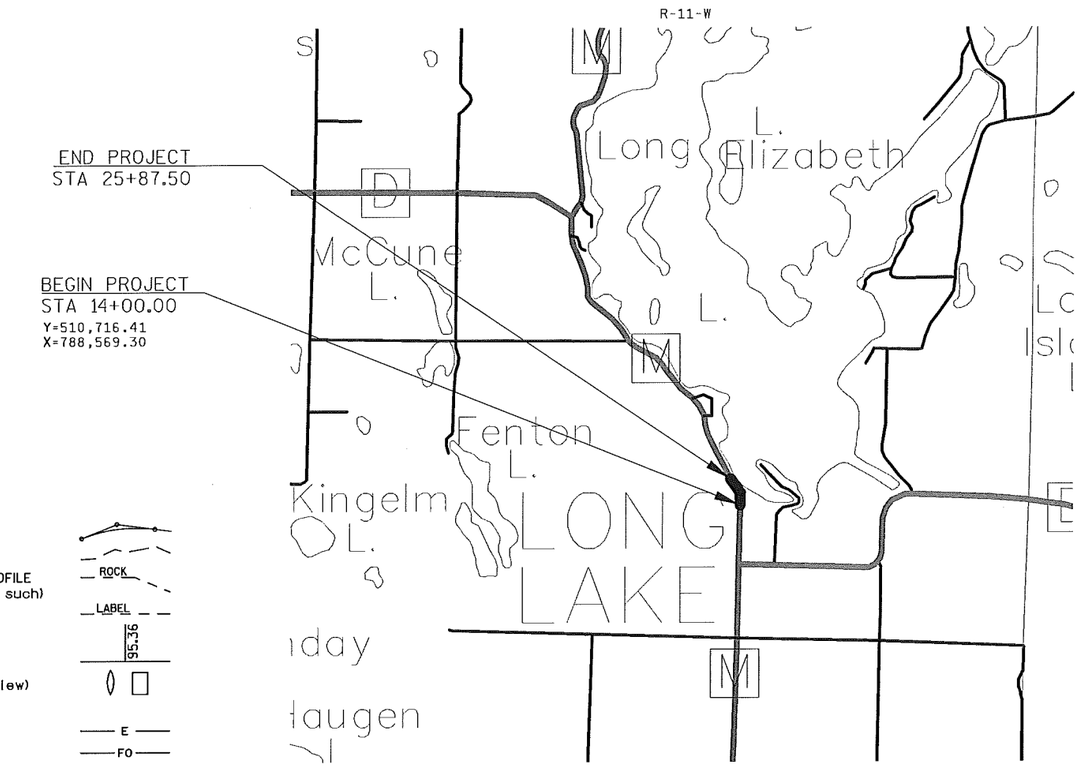
CTH D - LAUNDROMAT ROAD

CTH M

WASHBURN COUNTY



PROJECT NUMBER
CTH MD



LAYOUT
SCALE 0 0.5MI

TOTAL NET LENGTH OF CENTERLINE = 0.225

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
- 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)
- OVERHEAD LINE (OH)
- SANITARY SEWER (SAN)
- STORM SEWER (SS)
- TELEPHONE (T)
- WATER (W)
- UTILITY PEDESTAL
- POWER POLE
- TELEPHONE POLE

COORDINATES ON THIS PLAN ARE REFERENCED TO THE WISCONSIN COUNTY COORDINATE SYSTEM (WCCS), WASHBURN COUNTY.

APPROVED FOR WASHBURN COUNTY

DATE: 8/4/15 (Signature)

ORIGINAL PLANS PREPARED BY

CORRE ENGINEERING
1802 WARDEN STREET
EAU CLAIRE, WI 54703
(608)828-1011
www.correinc.com

WISCONSIN PROFESSIONAL ENGINEER
RAY A. POLKINGHORN
E-30177
MADISON
WI

DATE: 7/23/15 (Signature)

PREPARED BY

Surveyor	CORRE, INC.
Designer	CORRE, INC.

E

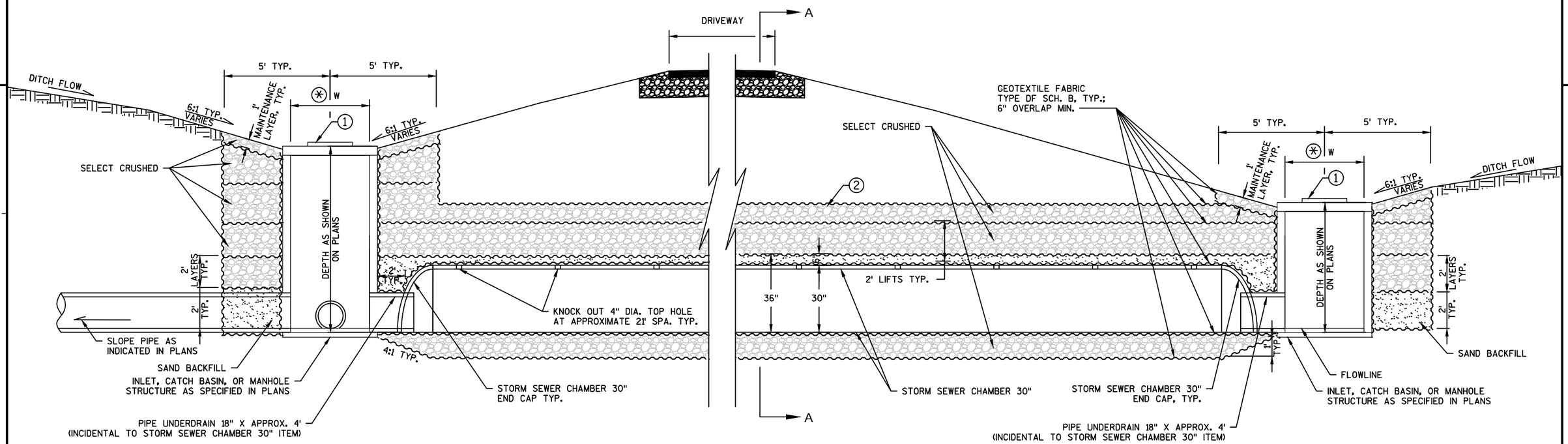
FILE NAME : S:\PROJECTS\NW\WASHBURN COUNTY\CTH M\DESIGN\CIVIL 3D CTH M\SHEETSPLAN\010101_TI.DWG

PLOT DATE : 6/11/2015 3:05 PM

PLOT BY : BOBBY

PLOT NAME :

WISDOT/CADDS SHEET 10



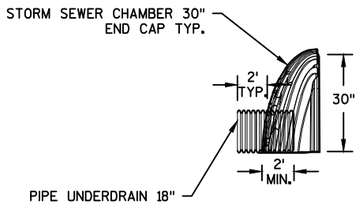
NOTES

(*) SEE PLAN FOR DIMENSIONS.

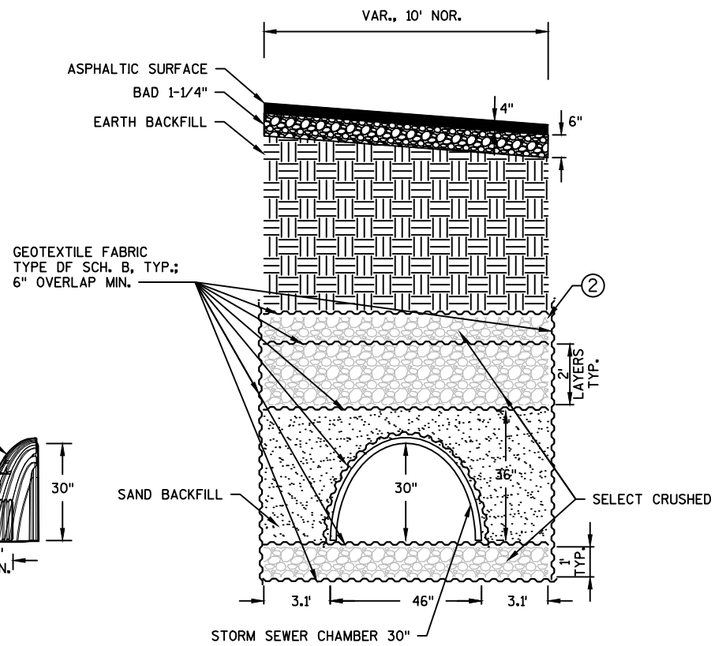
(1) TOP OF CASTING SHOULD NOT BE MORE THAN 4" ABOVE THE SURROUNDING ROCK BED, AND NOT LESS THAN 1' BELOW THE SUBGRADE DAYLIGHT POINT.

(2) TOP OF ROCK TRENCH ELEVATION SHOULD NOT BE MORE THAN 1'-0" ABOVE THE CASTING ELEVATION OF THE LOWEST STRUCTURE TOP.

STORM SEWER CHAMBER 30" / FILTER SYSTEM TYPICAL DETAIL



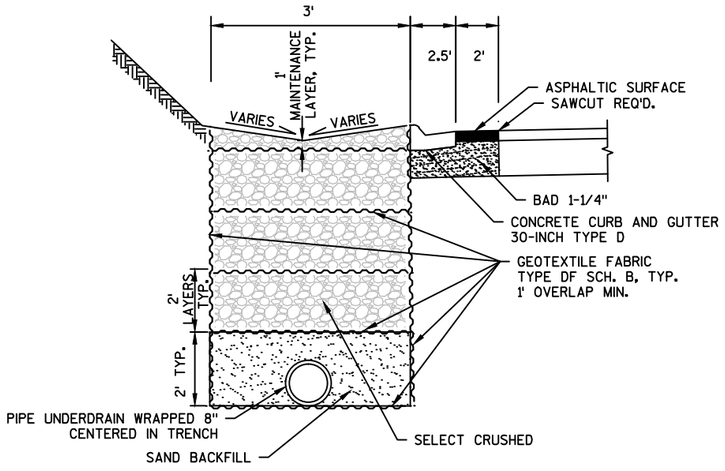
END CAP DETAIL



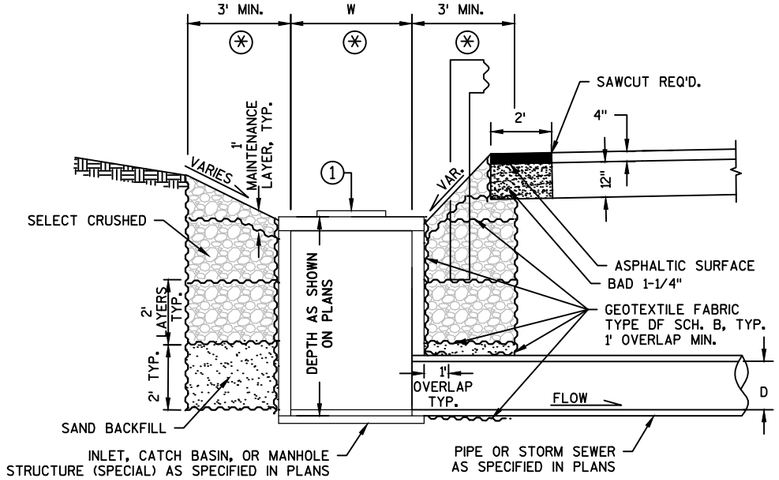
SECTION A-A DETAIL

PROJECT NO: CTH MD	HWY: CTH M	COUNTY: WASHBURN	STORM SEWER AND BEAMGUARD DETAILS	SHEET 2	E

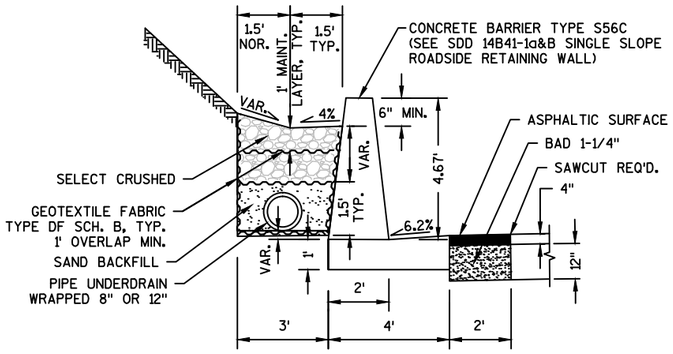
FILE NAME : S:\PROJECTS\NW\WASHBURN COUNTY\CTH M\DESIGN\CIVIL 3D CTH M\SHEETSPLAN\021001_CD_ALTERNATIVE.DWG PLOT DATE : 6/11/2015 10:56 AM PLOT BY : BOBBY PLOT NAME : PLOT SCALE : 1 IN:20 FT
WISDOT/CADDS SHEET 42



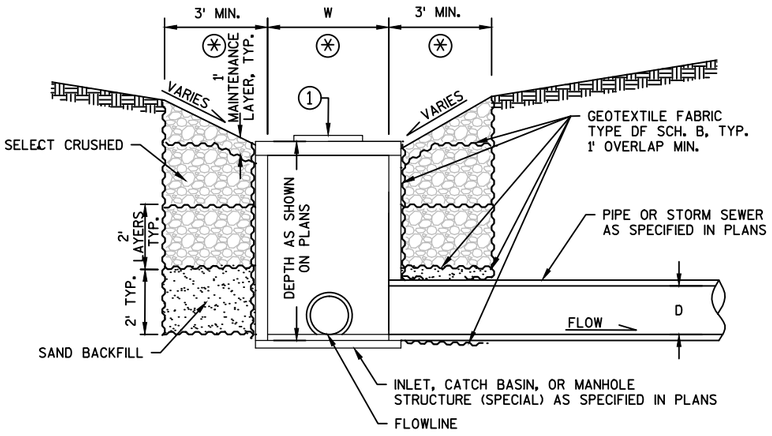
SECTION A-A



SECTION B-B



SECTION C-C



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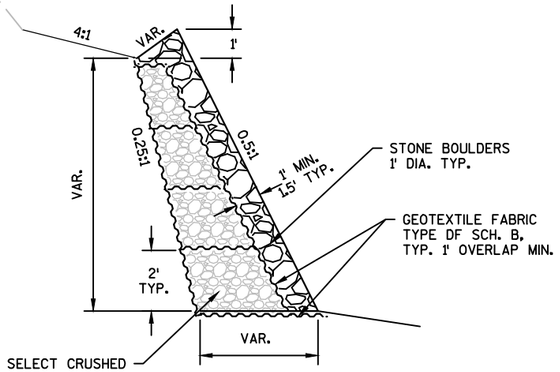
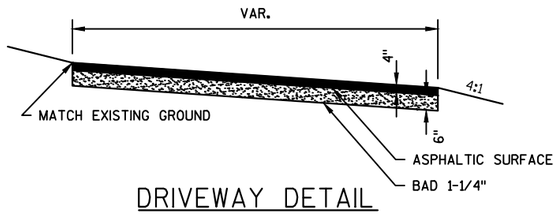
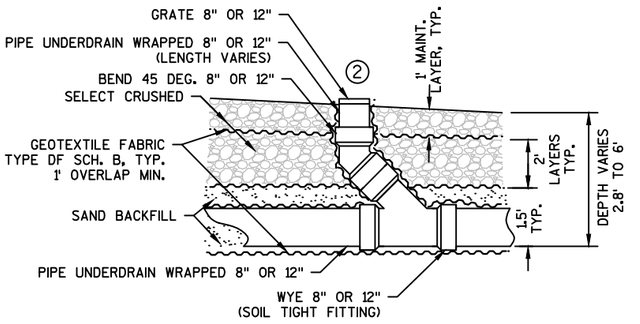


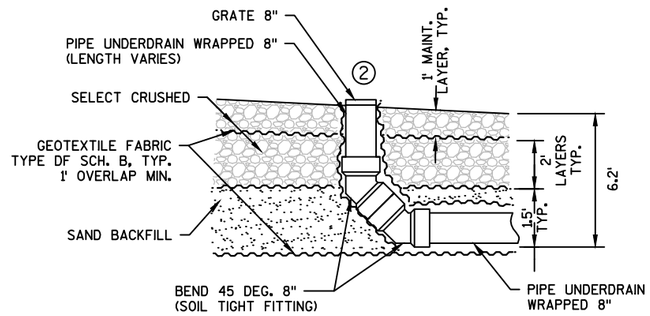
STONE BOULDER PLACEMENT DETAIL



DRIVEWAY DETAIL



CLEANOUT DETAIL



CLEANOUT END DETAIL

STA 14+13, 17.0' LT

NOTES

(*) SEE PLAN FOR DIMENSIONS.

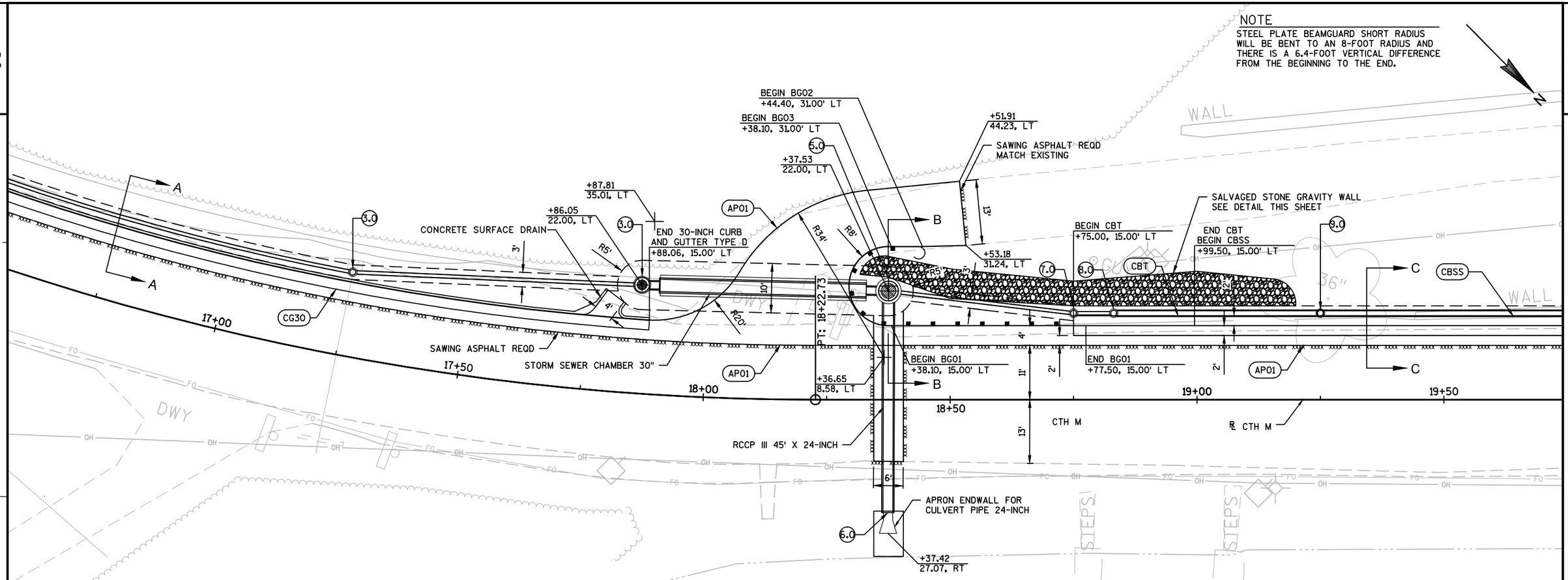
(1) TOP OF CASTING SHOULD NOT BE MORE THAN 4" ABOVE THE SURROUNDING ROCK BED, AND NOT LESS THAN 1' BELOW THE SUBGRADE DAYLIGHT POINT.

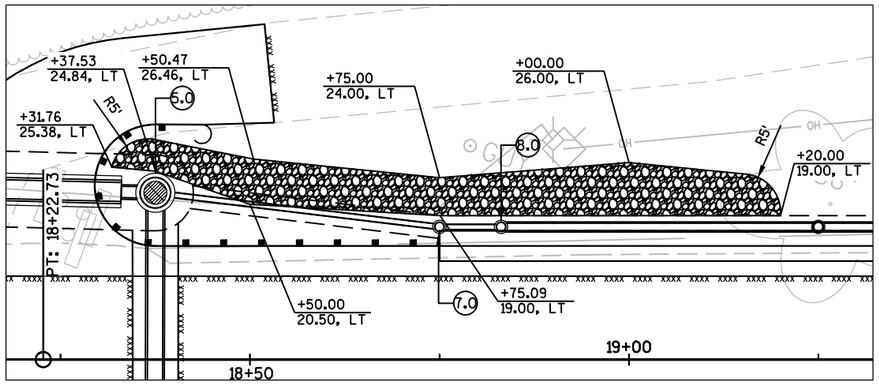
(2) PIPE UNDERDRAIN FITTINGS SHALL BE SOIL-TIGHT (CLEATED BELLS). SECURE GRATE COVER WITH TWO SCREWS #8 X 2".

PROJECT NO: CTH MD	HWY: CTH M	COUNTY: WASHBURN	STORM SEWER AND BEAMGUARD DETAILS	SHEET 3	E

NOTE

STEEL PLATE BEAMGUARD SHORT RADIUS WILL BE BENT TO AN 8-FOOT RADIUS AND THERE IS A 6.4-FOOT VERTICAL DIFFERENCE FROM THE BEGINNING TO THE END.





SALVAGED STONE GRAVITY WALL

STA 18+30 TO STA 19+20

LEGEND

AP01	4-INCH ASPHALTIC SURFACE
CG30	CONCRETE CURB AND GUTTER 30-INCH TYPE D (SDD 8D1-17)
CBSS	CONCRETE BARRIER SINGLE SLOPE TYPE S56C (SDD 14B1-1a,b 'SINGLE SLOPE ROADSIDE RETAINING WALL')
CBT	CONCRETE BARRIER TRANSITION TYPE S42 TO S56 (SDD 14B39-1e 42-INCH SINGLE SLOPE CONCRETE BARRIER TO 56-INCH SINGLE SLOPE CONCRETE BARRIER HEIGHT TRANSITION') AND (SDD 14B41-1a&b 'SINGLE SLOPE ROADSIDE RETAINING WALL')
CBTA	CONCRETE BARRIER SINGLE SLOPE THRIE BEAM ANCHORAGE (SDD 14B32-1g,h)
BG01	MGS THRIE BEAM TRANSITION (SDD 14B45-3a,b,c,l,J)
BG02	ANCHORAGE FOR STEEL PLATE BEAMGUARD TYPE 2 (SDD 14B16-4a)
BG03	STEEL PLATE BEAMGUARD SHORT RADIUS (SDD 14B27-1a,b,c)

PROJECT NO: CTH MD	HWY: CTH M	COUNTY: WASHBURN	WATER QUALITY SYSTEM AND BEAMGUARD DETAILS	SHEET 4	E

FILE NAME : S:\PROJECTS\NW\WASHBURN COUNTY\CTH M\DESIGN\CIVIL 3D CTH M\SHEETSPLAN\021001_CD.DWG
LAYOUT NAME - 021001_CD

PLOT DATE : 6/10/2015 4:21 PM PLOT BY : BOBBY PLOT NAME : PLOT SCALE : 1 IN:20 FT

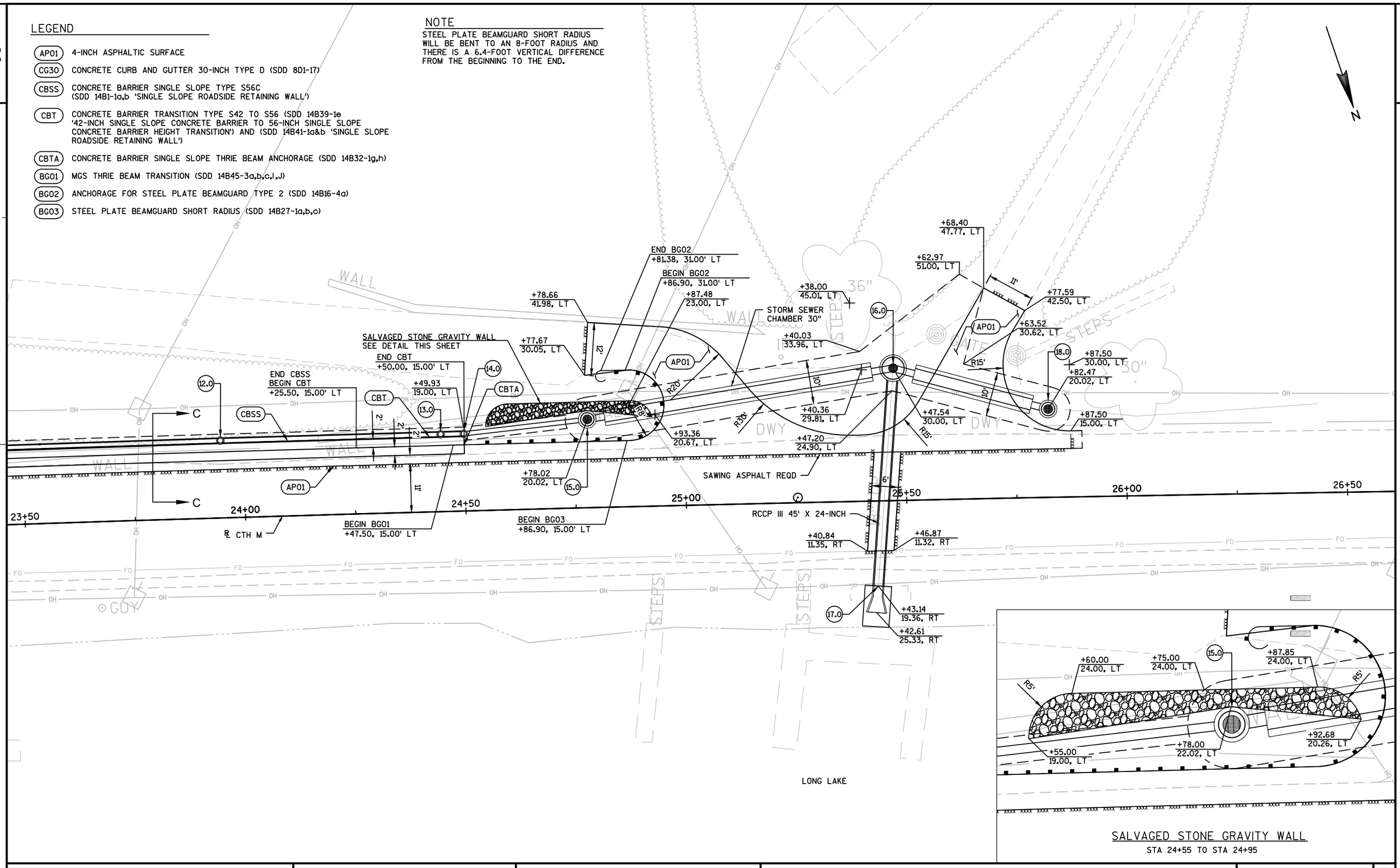
WISDOT/CADDS SHEET 42

LEGEND

- (AP01) 4-INCH ASPHALTIC SURFACE
- (CG30) CONCRETE CURB AND GUTTER 30-INCH TYPE D (SDD 8D1-17)
- (CBSS) CONCRETE BARRIER SINGLE SLOPE TYPE S56C (SDD 14B1-1a,b 'SINGLE SLOPE ROADSIDE RETAINING WALL')
- (CBT) CONCRETE BARRIER TRANSITION TYPE S42 TO S56 (SDD 14B39-1e '42-INCH SINGLE SLOPE CONCRETE BARRIER TO 56-INCH SINGLE SLOPE CONCRETE BARRIER HEIGHT TRANSITION') AND (SDD 14B41-1a&b 'SINGLE SLOPE ROADSIDE RETAINING WALL')
- (CBTA) CONCRETE BARRIER SINGLE SLOPE THRIE BEAM ANCHORAGE (SDD 14B32-1g,h)
- (BG01) MGS THRIE BEAM TRANSITION (SDD 14B45-3a,b,c,i,j)
- (BG02) ANCHORAGE FOR STEEL PLATE BEAMGUARD TYPE 2 (SDD 14B16-4a)
- (BG03) STEEL PLATE BEAMGUARD SHORT RADIUS (SDD 14B27-1a,b,c)

NOTE

STEEL PLATE BEAMGUARD SHORT RADIUS WILL BE BENT TO AN 8-FOOT RADIUS AND THERE IS A 6.4-FOOT VERTICAL DIFFERENCE FROM THE BEGINNING TO THE END.



SALVAGED STONE GRAVITY WALL

STA 24+55 TO STA 24+95

PROJECT NO: CTH MD	HWY: CTH M	COUNTY: WASHBURN	WATER QUALITY SYSTEM AND BEAMGUARD DETAILS	SHEET 5	E

3

CLEARING AND GRUBBING ITEMS

STATION	LOCATION	201.0120 CLEARING ID	201.0220 GRUBBING ID
19+26	20' LT	36	36
20+47	24' LT	36	36
21+34	27' LT	36	36
22+68	25' LT	36	36
	TOTALS	**144**	**144**

ROADSIDE CLEARING

STATION	-	STATION	LOCATION	202.0105 STA
14+00	-	25+00	LT	11
			TOTAL	**11**

REMOVALS

STATION	LOCATION	203.0100 REMOVING SMALL PIPE CULVERTS (EACH)	204.0185 REMOVING MASONRY (CY)	204.0220 REMOVING INLETS (EACH)	205.0270 ABANDONING CULVERTS (EACH)	SPV.0060.03 REMOVE AND RESET GATE (EACH)
17+25	LT	---	---	1	1	---
17+25	RT	---	1	---	---	---
25+45	MAINLINE	1	1	---	---	---
25+70	LT	---	---	---	---	1
	TOTAL	**1**	**2**	**1**	**1**	**1**

3

REMOVING ASPHALTIC SURFACE

STATION	LOCATION	204.0110 SY	COMMENTS
14+00 - 25+88	LT	265	
18+00	LT	75	DRIVEWAY
25+00	LT	60	DRIVEWAY
	TOTAL	**400**	

EXCAVATION COMMON

STATION	LOCATION	205.0100 CY	COMMENTS
14+00 - 25+88	LT	450	SALVAGE EXISTING STONES GREATER THAN 12" FOR USE IN GRAVITY WALLS
	TOTAL	**450**	

AGGREGATE ITEMS

STATION	-	STATION	LOCATION	305.0110 BASE AGG DENSE 3/4-INCH TON	305.0120 BASE AGG DENSE 1 1/4-INCH TON	SPV.0035.01 SAND BACKFILL CY	SPV.0195.01 SELECT CRUSHED TON	COMMENTS
14+12	-	25+88	LT	--	--	300	--	PIPE TRENCHES
		18+20	LT	15	--	--	--	DRIVEWAY
		25+70	LT	15	--	--	--	DRIVEWAY
14+00	-	25+88	LT	--	250	--	--	CURB & GUTTER
14+12	-	25+88	LT	--	--	--	880	PIPE TRENCHES
			TOTALS	**30**	**250**	**300**	**880**	

ASPHALTIC ITEMS

STATION	-	STATION	LOCATION	465.0105 ASPHALTIC SURFACE TON	COMMENTS
14+00	-	25+88	LT	110	DRIVEWAYS & ROADWAY
		17+80	LT	--	
			TOTALS	**110**	

PROJECT NO: CTH MD	HWY: CTH D	COUNTY: WASHBURN	MISCELLANEOUS QUANTITIES	SHEET NO:	E

FILE NAME : N:\pds\design_id\ PLOT DATE : _____ PLOT BY : _____ PLOT NAME : _____ ORG DATE : _Dec. 2003 ORIGINATOR : DIST 4_ PLOT SCALE : 1:1

3

CONCRETE CURB AND GUTTER

STATION	- STATION	LOCATION	416.1010 CONCRETE SURFACE DRAINS CY	601.0411 CONCRETE CURB & GUTTER 36-INCH TYPE D LF	650.5500 CONSTRUCTION STAKING CURB & GUTTER LF
17+80		LT	0.7		
14+00	- 17+88	LT		388	388
		TOTALS	**0.7**	**388**	**388**

RIPRAP AND GEOTEXTILE FABRIC ITEMS

STATION	LOCATION	606.0300 RIPRAP HEAVY CY	645.0112 GEOTEXTILE FABRIC TYPE DF SCHEDULE B SY	645.0120 GEOTEXTILE FABRIC TYPE HR SY	REMARKS
18+38	RT	8	---	15	ENDWALL OUTFALL
25+40	RT	8	---	15	ENDWALL OUTFALL
14+00 - 25+88	LT	---	2,080	---	PIPE TRENCHES
	TOTALS	**16**	**2,080**	**30**	

3

CONCRETE BARRIER ITEMS

STATION	- STATION	LOCATION	502.6500 PROTECTIVE COATING CLEAR GAL	SPV.0090.01 CONCRETE BARRIER TRANSITION TYPE S42 TO S56 LF	SPV.0090.02 CONCRETE BARRIER TYPE S56 LF	614.0150 ANCHOR ASSEMBLIES FOR BEAM GUARD EACH	650.7500 CONSTRUCTION STAKING CONCRETE BARRIER LF	COMMENTS
18+75	- 24+50	LT	20	--	--	--	575	
18+75	- 19+00	LT	--	25	--	1	--	BAR STEEL REINFORCEMENT IS INCIDENTAL
19+00	- 24+25	LT	--	--	525	--	--	BAR STEEL REINFORCEMENT IS INCIDENTAL
24+25	- 24+50	LT	--	25	--	1	--	BAR STEEL REINFORCEMENT IS INCIDENTAL
		TOTALS	**20**	**50**	**525**	**2**	**575**	

PROJECT NO: CTH MD	HWY: CTH D	COUNTY: WASHBURN	MISCELLANEOUS QUANTITIES	SHEET NO:	E

FILE NAME : N:\pds\design_id\ PLOT DATE : _____ PLOT BY : _____ PLOT NAME : _____ ORG DATE : _Dec. 2003 ORIGINATOR : DIST 4_ PLOT SCALE : 1:1

STORM SEWER STRUCTURE ITEMS

STRUCTURE	STATION	LOCATION	GRATE ELEVATION	T.O.S. ELEVATION	INVERT ELEVATION	B.O.S. ELEVATION	STRUCTURE DEPTH	522.1024 AEW CPRC 24-INCH EACH	611.0612 INLET COVERS TYPE C EACH	611.2003 MANHOLE 3-FT DIAMETER EACH	611.2004 MANHOLE 4-FT DIAMETER EACH	611.2005 MANHOLE 5-FT DIAMETER EACH	SPV.0060.01 UNDERDRAIN CLEANOUT 8" DIAMETER EACH	SPV.0060.02 UNDERDRAIN CLEANOUT 12" DIAMETER EACH	650.4000 CONSTRUCTION STAKING STORM SEWER EACH
1.0	14+13	17.0' LT	1258.70	1258.70	1254.72	1254.72	3.98	---	---	---	---	---	1	---	1
2.0	15+50	17.0' LT	1249.50	1249.50	1245.62	1245.62	3.88	---	---	---	---	---	1	---	1
3.0	17+25	17.0' LT	1238.00	1238.00	1234.00	1234.00	4.00	---	---	---	---	---	1	---	1
4.0	17+85	22.0' LT	1236.64	1235.90	1228.90	1228.70	7.20	---	1	1	---	---	---	---	1
5.0	18+37	22.0' LT	1234.64	1233.90	1227.54	1227.29	6.61	---	1	---	1	---	---	---	1
6.0	18+37	28.0' RT	---	---	1227.40	---	---	1	---	---	---	---	---	---	1
7.0	18+75	17.0' LT	1235.40	1235.40	1231.99	1231.99	3.41	---	---	---	---	---	1	---	1
8.0	18+83	17.0' LT	1238.30	1238.30	1234.97	1234.97	3.33	---	---	---	---	---	1	---	1
9.0	19+25	17.0' LT	1238.80	1238.80	1235.89	1235.89	2.91	---	---	---	---	---	---	1	1
10.0	20+20	17.0' LT	1238.20	1238.20	1235.33	1235.33	2.87	---	---	---	---	---	---	1	1
11.0	21+75	17.0' LT	1237.10	1237.10	1234.60	1234.60	2.50	---	---	---	---	---	---	1	1
12.0	24+00	17.0' LT	1235.60	1235.60	1232.51	1232.51	3.09	---	---	---	---	---	---	1	1
13.0	24+45	17.0' LT	1233.90	1233.90	1230.90	1230.90	3.00	---	---	---	---	---	---	1	1
14.0	24+50	17.0' LT	1231.50	1231.50	1227.50	1227.50	4.00	---	---	---	---	---	---	1	1
15.0	24+77	20.0' LT	1231.54	1230.80	1226.80	1226.60	4.20	---	1	1	---	---	---	---	1
16.0	25+47	25.0' LT	1232.49	1231.75	1226.10	1225.85	5.90	---	1	---	---	1	---	---	1
17.0	25+42	25.0' RT	---	---	1225.10	---	---	1	---	---	---	---	---	---	1
18.0	25+82	20.0' LT	1232.00	1231.26	1226.46	1226.26	5.00	---	1	1	---	---	---	---	1
							TOTALS	**2**	**5**	**3**	**1**	**1**	**5**	**6**	**18**

BEAM GUARD ITEMS

STATION	-	STATION	LOCATION	614.0345 STEEL PLATE BEAM GUARD SHORT RADIUS LF	614.0390 STEEL PLATE BEAM GUARD SHORT RADIUS TERMINAL EACH	614.2500 MGS THRIE BEAM TRANSITION LF
18+38.1		18+44.4	31.0' LT	--	1	--
18+38.1	-	18+38.1	15.0' LT - 31.0' LT	25.0	--	--
18+38.1	-	18+77.5	15.0' LT	--	--	39.4
24+47.5	-	24+86.9	15.0' LT	--	--	39.4
24+86.9	-	24+86.9	15.0' LT - 31.0' LT	25.0	--	--
24+80.7	-	24+86.9	31.0' LT	--	1	--
			TOTALS	**50**	**2**	**79**

DELINEATORS

STATION	-	STATION		LOCATION	633.0200 DELINEATORS FLEXIBLE (EACH)	633.0500 DELINEATOR BRACKETS (EACH)	633.1000 DELINEATOR REFLECTORS (EACH)
18+37				RT	1	---	---
18+75	-	24+50	*	LT	---	4	4
25+42				RT	1	---	---
				TOTAL	**2**	**4**	**4**

* PLACE AT BARRIER ENDS AND EVEN SPACING AT 190'

PROJECT NO: CTH MD	HWY: CTH D	COUNTY: WASHBURN	MISCELLANEOUS QUANTITIES	SHEET NO:	E

FILE NAME : N:\pds\design_id\ PLOT DATE : _____ PLOT BY : _____ PLOT NAME : _____ ORG DATE : _Dec. 2003 ORIGINATOR : DIST 4_ PLOT SCALE : 1:1

3

STORM SEWER PIPE ITEMS

FROM STRUCTURE	TO STRUCTURE	612.0408 PIPE UNDERDRAIN WRAPPED 8-INCH LF	612.0412 PIPE UNDERDRAIN WRAPPED 12-INCH LF	608.0324 CPRC CLASS III 24-INCH LF	SPV.0090.03 STORM SEWER CHAMBER 30-INCH LF
1.0	2.0	137	--	--	--
2.0	3.0	175	--	--	--
3.0	4.0	60	--	--	--
4.0	5.0	--	--	--	50
5.0	6.0	--	--	44	--
7.0	5.0	38	--	--	--
8.0	7.0	8	--	--	--
9.0	8.0	42	--	--	--
9.0	10.0	--	95	--	--
10.0	11.0	--	155	--	--
11.0	12.0	--	225	--	--
12.0	13.0	--	45	--	--
13.0	14.0	--	5	--	--
14.0	15.0	--	28	--	--
15.0	16.0	--	--	--	70
16.0	17.0	--	--	50	--
18.0	16.0	--	--	--	36
	TOTALS	**460**	**553**	**94**	**156**

SAWING PAVEMENT ITEMS

STATION	LOCATION	690.0150 ASPHALT LF	COMMENTS
14+00 - 25+88	LT	1,194	
18+37	MAINLINE	48	CROSS PIPE
18+55	LT	10	DRIVEWAY
24+75	LT	10	DRIVEWAY
25+45	MAINLINE	48	CROSS PIPE
25+75	LT	10	DRIVEWAY
	TOTALS	**1,320**	

EROSION CONTROL ITEMS

STATION - STATION	LOCATION	628.1504 SILT FENCE LF	628.6005 TURBIDITY BARRIER SY	628.7005 INLET PROTECTION TYPE A EACH	628.7570 ROCK BAGS EACH
18+40	RT		10		
25+40	RT		10		
UNDISTRIBUTED		1000		18	20
	TOTALS	**1,000**	**20**	**18**	**20**

LANDSCAPING ITEMS

STATION - STATION	LOC.	625.0105 TOPSOIL CY	628.2027 EROSION MAT CLASS II TYPE C SY	*SPV.0105.01 LANDSCAPING RESTORATION LS
14+00 - 25+88	LT	80	350	1
	TOTALS	**80**	**350**	**1**

* SEEDING #20, SEEDING TEMP, AND MULCHING QUANTITIES ARE INCIDENTAL, NO FERTILIZER TO BE USED

STONE GRAVITY WALL

STATION - STATION	LOCATION	SPV.0165.01 SF
18+35 - 18+80	LT	400
24+65 - 24+85	LT	180
	TOTAL	**580**

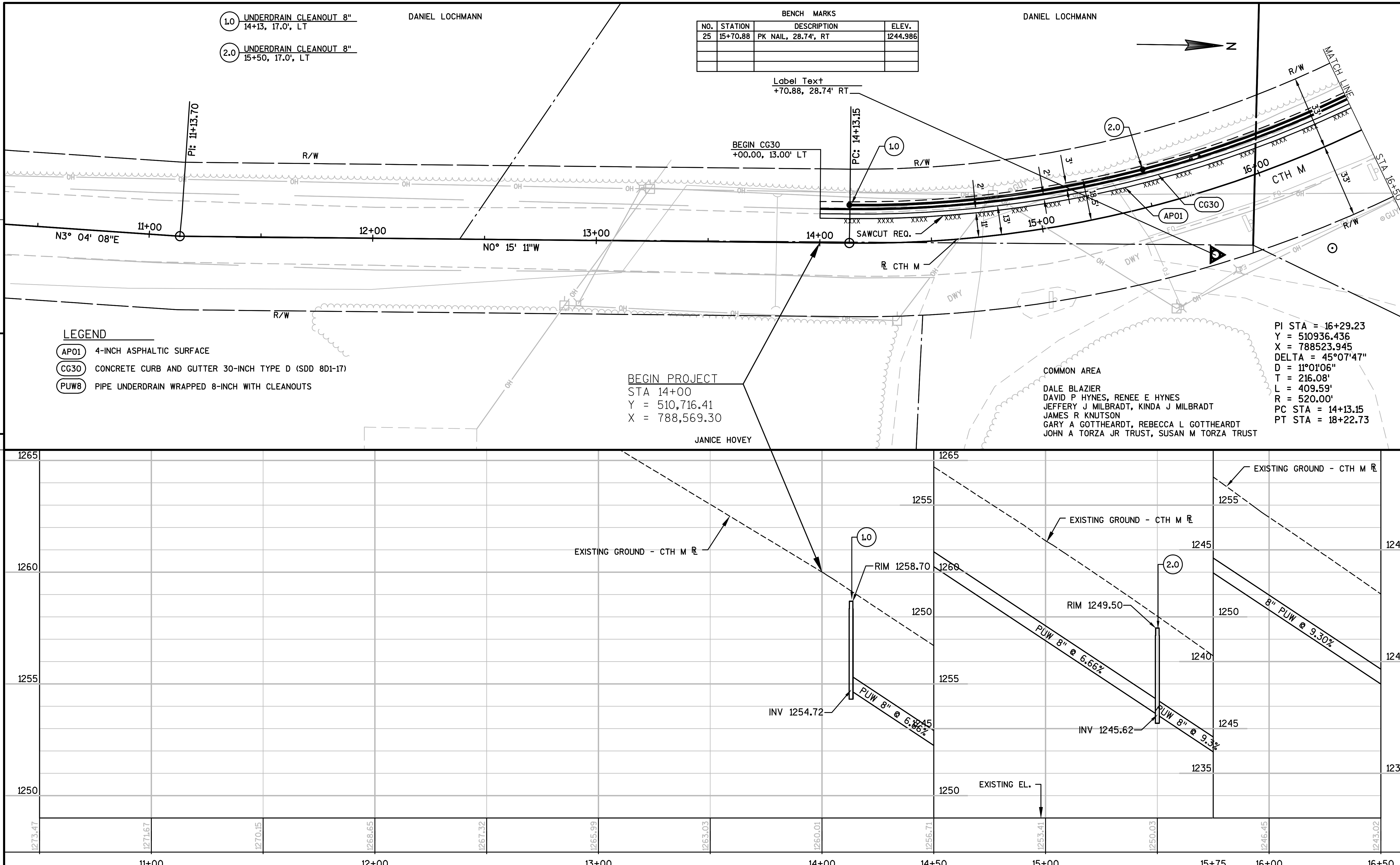
TRAFFIC CONTROL

PROJECT	*642.5001 EACH
CTH M	1
TOTAL	**1**

* ALL REQUIRED TRAFFIC CONTROL DEVICES ARE INCIDENTAL TO THIS ITEM

NO.	STATION	DESCRIPTION	ELEV.
25	15+70.88	PK NAIL, 28.74', RT	1244.986

BENCH MARKS



1.0 UNDERDRAIN CLEANOUT 8"
14+13, 17.0', LT
2.0 UNDERDRAIN CLEANOUT 8"
15+50, 17.0', LT
DANIEL LOCHMANN
DANIEL LOCHMANN
Label Text
+70.88, 28.74' RT
PI: 11+13.70
PC: 14+13.15
BEGIN CG30
+00.00, 13.00' LT
R/W
N3° 04' 08"E
N0° 15' 11"W
11+00
12+00
13+00
14+00
15+00
16+00
SAWCUT REQ.
CTH M
MATCH LINE
STA 16+50
LEGEND
AP01 4-INCH ASPHALTIC SURFACE
CG30 CONCRETE CURB AND GUTTER 30-INCH TYPE D (SDD 8D1-17)
PUW8 PIPE UNDERDRAIN WRAPPED 8-INCH WITH CLEANOUTS
BEGIN PROJECT
STA 14+00
Y = 510,716.41
X = 788,569.30
JANICE HOVEY
COMMON AREA
DALE BLAZIER
DAVID P HYNES, RENEE E HYNES
JEFFERY J MILBRADT, KINDA J MILBRADT
JAMES R KNUTSON
GARY A GOTTHEARDT, REBECCA L GOTTHEARDT
JOHN A TORZA JR TRUST, SUSAN M TORZA TRUST
PI STA = 16+29.23
Y = 510936.436
X = 788523.945
DELTA = 45°07'47"
D = 11°01'06"
T = 216.08'
L = 409.59'
R = 520.00'
PC STA = 14+13.15
PT STA = 18+22.73
EXISTING GROUND - CTH M
RIM 1258.70
INV 1254.72
PUW 8" @ 6.66%
RIM 1249.50
INV 1245.62
PUW 8" @ 9.3%
8" PUW @ 9.30%
EXISTING EL.
1273.47
1271.67
1270.15
1268.65
1267.32
1265.99
1263.03
1260.01
1256.71
1253.41
1250.03
1246.45
1243.02
11+00
12+00
13+00
14+00
14+50
15+00
15+75
16+00
16+50

PROJECT NO: CTH MD	HWY: CTH M	COUNTY: WASHBURN	PLAN AND PROFILE: WATER QUALITY SYSTEM	SHEET	E

FILE NAME : S:\PROJECTS\NW\WASHBURN COUNTY\CTH M\DESIGN\CIVIL 3D CTH M\SHEETSPLAN\050101_PP.DWG PLOT DATE : 12/30/2015 7:55 AM PLOT BY : AL PLOT NAME : PLOT SCALE : 1 IN:40 FT

P-1 S.S. PIPE R.C. CL III 24"
L=45', 2.38%, OUT=1227.40, IN=1228.40
6 PIPE TIES REQ'D.

P-2 S.S. CHAMBER 30"
L=50', 1.00%, OUT=1228.40, IN=1228.90

3.0 12" UNDERDRAIN CLEANOUT W/ GRATE COVER
STA 17+25, 17.0' LT

4.0 INLETS 3' DIA. SPECIAL; INLET COVERS TYPE C
STA 17+86.05, 22.00', LT

5.0 MANHOLES 4' DIA. SPECIAL; INLET COVERS TYPE C
STA 18+37.53, 22.00', LT

6.0 INLETS 3' DIA. SPECIAL; INLET COVERS TYPE C
STA 18+27.07, RT

7.0 12" UNDERDRAIN CLEANOUT W/ GRATE COVER
STA 18+75, 17.0' LT

8.0 12" UNDERDRAIN CLEANOUT W/ GRATE COVER
STA 18+85, 17.0' LT

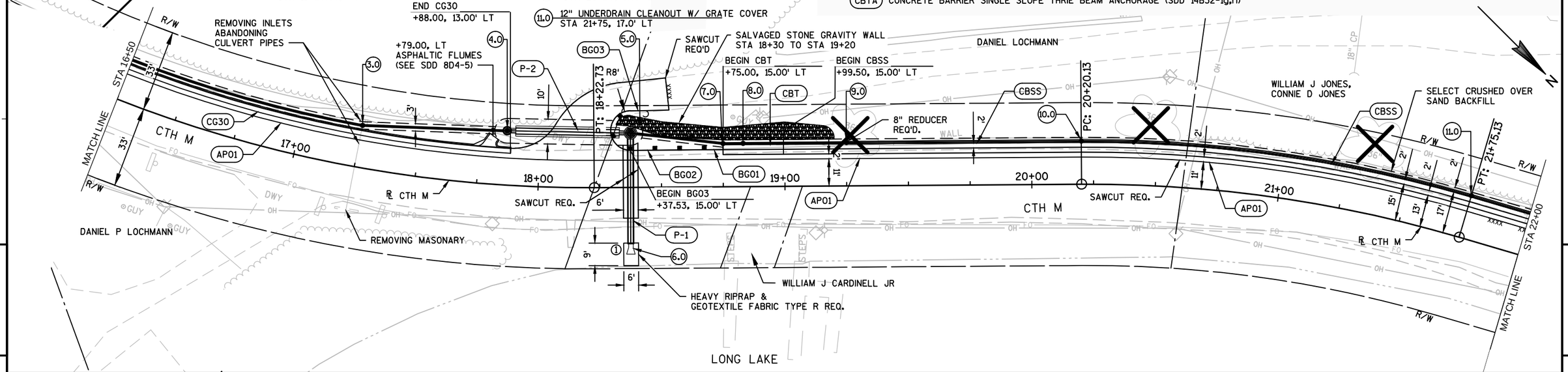
9.0 12" UNDERDRAIN CLEANOUT W/ GRATE COVER
STA 97+25, 17.0' LT

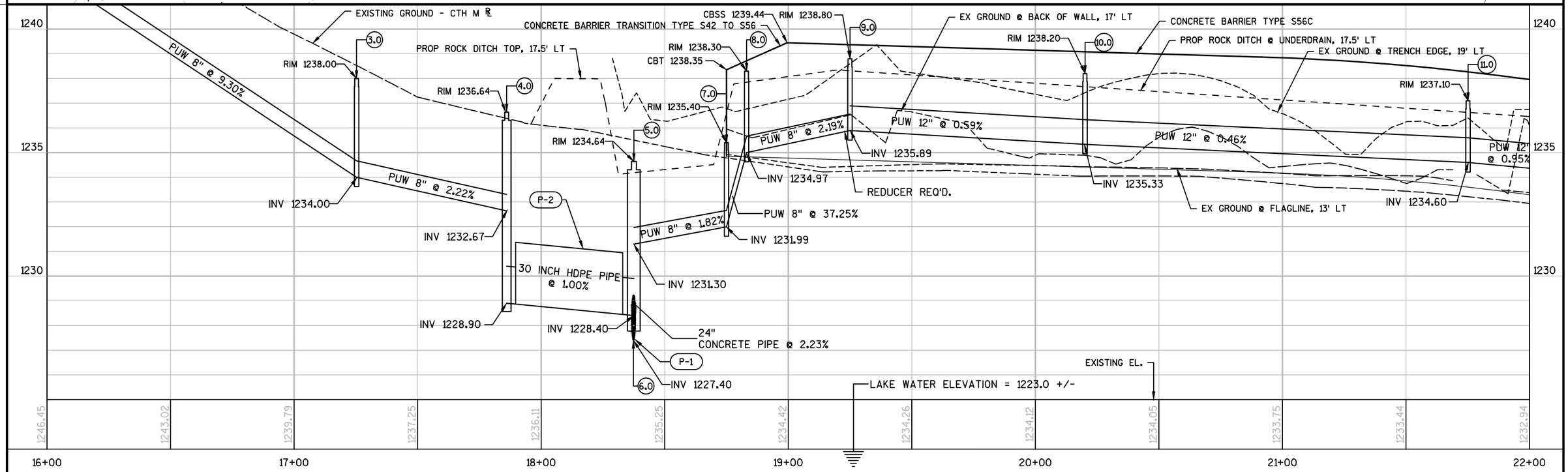
10.0 12" UNDERDRAIN CLEANOUT W/ GRATE COVER
STA 20+20, 17.0' LT

11.0 12" UNDERDRAIN CLEANOUT W/ GRATE COVER
STA 21+75, 17.0' LT

LEGEND

X TREE REMOVAL
APO1 4-INCH ASPHALT SURFACE
CG30 CONCRETE CURB AND GUTTER 30-INCH TYPE D (SDD 8D1-17)
CBSS CONCRETE BARRIER SINGLE SLOPE TYPE S56C (SDD 14B1-1a,b)
CBT CONCRETE BARRIER TRANSITION TYPE S42 TO S56 (SDD 14B39-1e)
CBTA CONCRETE BARRIER SINGLE SLOPE THRIE BEAM ANCHORAGE (SDD 14B32-1g,h)
PUW8" PIPE UNDERDRAIN WRAPPED 8-INCH
PUW12" PIPE UNDERDRAIN WRAPPED 12-INCH
BG01 MGS THRIE BEAM TRANSITION (SDD 14B45-3a,b,c,l,J)
BG02 MGS BEAMGUARD 3 (SDD 14B42-2a,b,c)
BG03 STEEL PLATE BEAMGUARD SHORT RADIUS (SDD 14B27-1a,b,c)





PROJECT NO: CTH MD	HWY: CTH M	COUNTY: WASHBURN	PLAN AND PROFILE: WATER QUALITY SYSTEM	SHEET	E

12.0 12" UNDERDRAIN CLEANOUT W/ GRATE COVER
STA 23+94.81, 17.50' LT

13.0 12" UNDERDRAIN CLEANOUT W/ GRATE COVER
STA 24+44.74, 17.50' LT

14.0 12" UNDERDRAIN CLEANOUT W/ GRATE COVER
STA 24+50.00, 17.50' LT

15.0 INLETS 3' DIA. INLET COVERS TYPE C
STA 24+78.02. 20.00' LT

16.0 MANHOLES 5' DIA. SPECIAL; INLET COVERS TYPE C
STA 25+47.54, 30.00' LT

17.0 APRON ENDWALLS FOR C.P.R.C. 24"
STA 25+43.12, 19.60 LT

18.0 INLETS 3' DIA. SPECIAL; INLET COVERS TYPE C
STA 25+82.47, 20.00' LT

P-3 S.S. PIPE R.C. CL III 24"
L=50', 2.40%, OUT=1125.10, IN=1126.30
6 PIPE TIES REQ'D.

P-4 S.S. CHAMBER 30"
L=70', 1.00%, OUT=1226.80, IN=1226.10

P-5 S.S. CHAMBER 30"
L=36', 1.00%, OUT=1226.46, IN=1226.10

LEGEND

- X — TREE REMOVAL
- AP01 — 4-INCH ASPHALT SURFACE
- CG30 — CONCRETE CURB AND GUTTER 30-INCH TYPE D (SDD 8D1-17)
- CBSS — CONCRETE BARRIER SINGLE SLOPE TYPE S56C (SDD 14B1-1a,b)
- CBT — CONCRETE BARRIER TRANSITION TYPE S42 TO S56 (SDD 14B39-1e)
- CBTA — CONCRETE BARRIER SINGLE SLOPE THRIE BEAM ANCHORAGE (SDD 14B32-1g,h)
- PUW8" — PIPE UNDERDRAIN WRAPPED 8-INCH
- PUW12" — PIPE UNDERDRAIN WRAPPED 12-INCH
- BG01 — MGS THRIE BEAM TRANSITION (SDD 14B45-3a,b,c,I,J)
- BG02 — MGS BEAMGUARD 3 (SDD 14B42-2a,b,c)
- BG03 — STEEL PLATE BEAMGUARD SHORT RADIUS (SDD 14B27-1a,b,c)

GREGG A STROHMEYER, JOAN M STROHMEYER
DONALD BRIAN HOVEY, NORA M HOVEY
CODY J WICKERSHEIM, MEGAN L WICKERSHEIM
DAVID P EISENHUTH, IVY BAUER, JEFFRY BAUER, BARBARA EISENHUTH
VERNON M JOHNSON, JANET M JOHNSON

MATCH LINE STA 22+00
SELECT CRUSHED OVER SAND BACKFILL
UNDERDRAIN WRAPPED 12" WITH CLEANOUTS
SALVAGED STONE GRAVITY WALL STA 24+55 TO STA 24+95
BEGIN CBT +44.74, 17.50' LT
END CBT +50.00, 17.50' LT
REMOVE AND RESET GATE
SAWCUT REQ.
SELECT CRUSHED OVER SAND BACKFILL, TYP.
PC: 23+23.76
PT: 27+26.89
SAWCUT REQ.D
REMOVING MASONARY
REMOVING CULVERT PIPE
HEAVY RIPRAP & GEOTEXTILE FABRIC TYPE R REQ.
CTH M
LONG LAKE
END PROJECT STA 26+00
+25.18 34.48, LT

BENCH MARKS

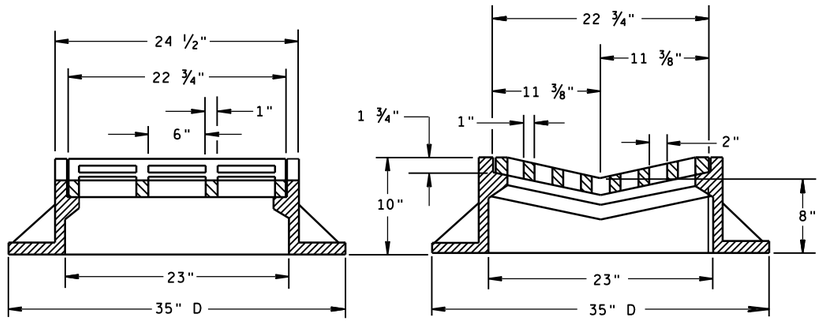
NO.	STATION	DESCRIPTION	ELEV.
26	27+25.18	REBAR, 34.48', LT	1242.808

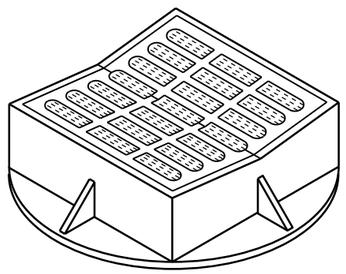
CONCRETE BARRIER TYPE S56C
PROP ROCK DITCH @ UNDERDRAIN, 17.5' LT
CBT 1235.90
CONCRETE BARRIER TRANSITION TYPE S42 TO S56
RIM 1235.60
PROPOSED ROCK TRENCH
RIM 1233.90
CBT 1234.14
PUW 12" @ 0.93%
RIM 1231.54
DWY
RIM 1232.49
DWY
RIM 1231.50
PUW 12" @ 3.58%
INV 1232.51
RIM 1232.00
EXISTING GROUND - CTH M ℄
INV 1230.90
PUW 12" @ 64.55%
PUW 12" @ 1.78%
SS CHAMBER - 30" @ 1.00%
SS CHAMBER 30" @ 1.00%
INV 1227.50
INV 1227.00
INV 1226.80
INV 1226.10
INV 1226.46
INV 1225.10
EXISTING EL.
LAKE WATER ELEVATION = 1223.0 +/-
1233.38 1232.80 1232.32 1232.02 1231.44 1230.90

PROJECT NO: CTH MD	HWY: CTH M	COUNTY: WASHBURN	PLAN AND PROFILE: WATER QUALITY SYSTEM	SHEET	E

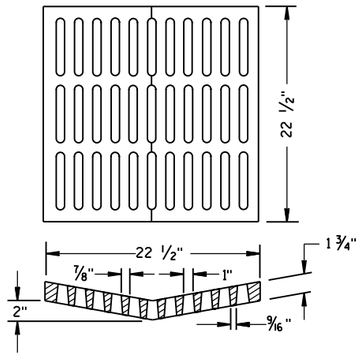
FILE NAME : S:\PROJECTS\NW\WASHBURN COUNTY\CTH M\DESIGN\CIVIL 3D CTH M\SHEETSPLAN\CTHM5_PP.DWG PLOT DATE : 12/30/2015 8:48 AM PLOT BY : AL PLOT NAME : PLOT SCALE : 1 IN:40 FT

8A5 sheet b: Inlet Covers Type B, B-A, C, MS, MS-A, & WM



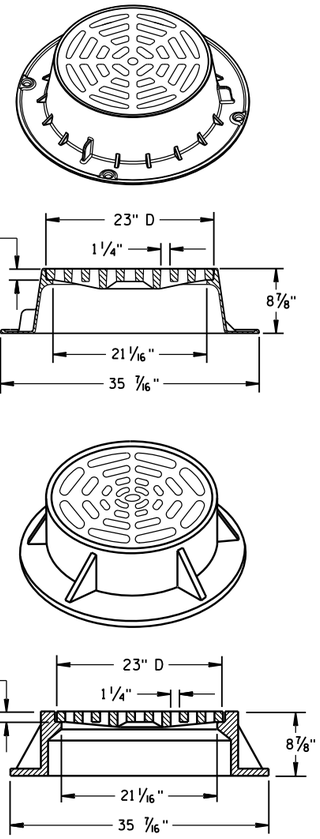


TYPE "B"



ALTERNATIVE GRATE FOR TYPE "B" COVER

USE WHERE PEDESTRIAN OR BICYCLE TRAFFIC IS POSSIBLE.
NOTED AS TYPE B-A ON THE DRAINAGE TABLE



TYPE "C"

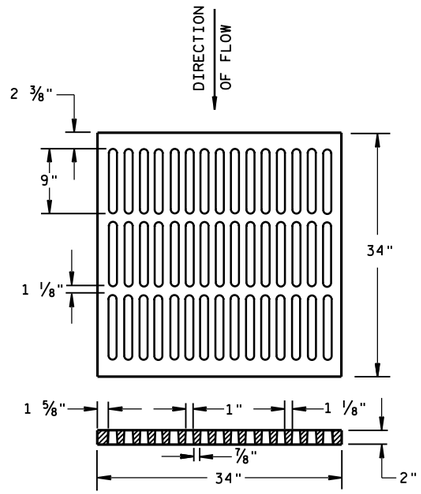
NOTE: EITHER CASTING IS ACCEPTABLE

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.

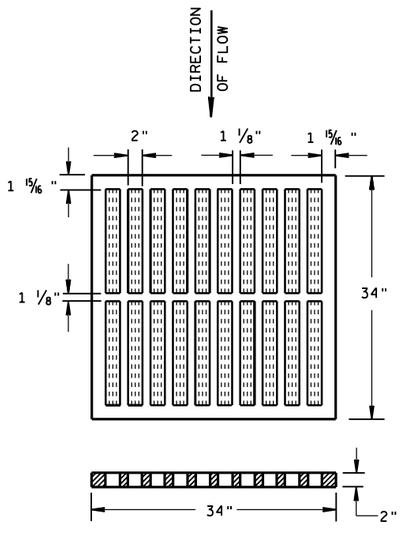
DETAIL DRAWINGS FOR PROPOSED ALTERNATE DESIGNS FOR CATCH BASIN, MANHOLE AND INLET COVERS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PROVIDING THAT SUCH ALTERNATE DESIGNS MAKE PROVISION FOR EQUIVALENT CAPACITY AND STRENGTH.

ROUND FRAMES AND COVERS SHALL HAVE CONTINUOUSLY MACHINED BEARING SURFACES TO PREVENT ROCKING AND RATTLING.



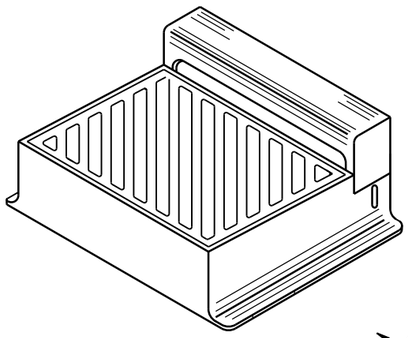
ALTERNATIVE TYPE "MS"

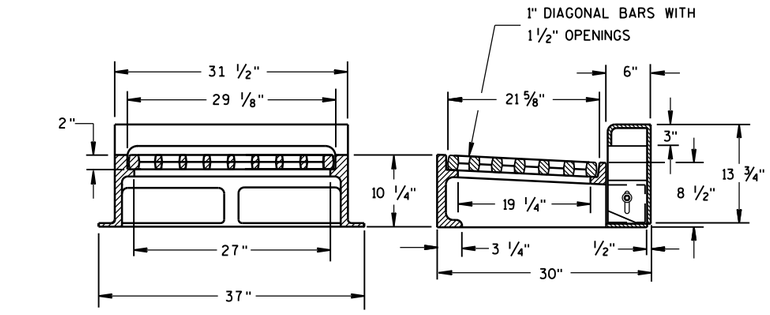
USE WHERE PEDESTRIAN OR BICYCLE TRAFFIC IS PERMITTED
NOTED AS TYPE MS-A ON THE DRAINAGE TABLE



TYPE "MS"

USE ON FREEWAYS AND EXPRESSWAYS
NOTED AS TYPE MS ON DRAINAGE TABLE





NOTE: CURB BOX HEIGHT ADJUSTABLE 6" TO 9"

TYPE "WM"

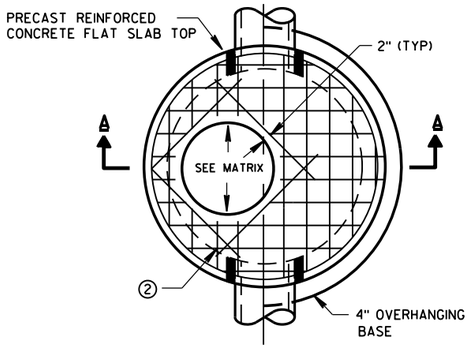
DIAGONAL SLOTS, SHALL BE ORIENTED TO THE DIRECTION OF FLOW AS ILLUSTRATED. GRATES ARE MANUFACTURED TO BE REVERSIBLE.

INLET COVERS TYPE B, B-A, C, MS, MS-A, & WM

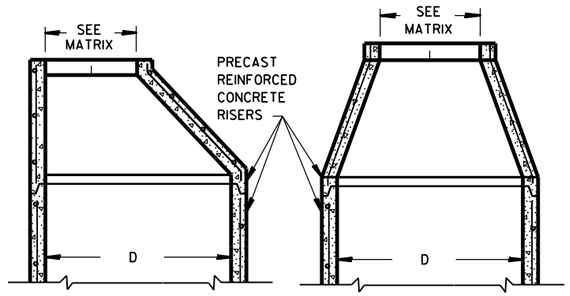
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
11/27/2013
DATE
/S/ Jerry H. Zogg
ROADWAY STANDARDS DEVELOPMENT ENGINEER
FHWA

6
S.D.D. 8 A 5-19b

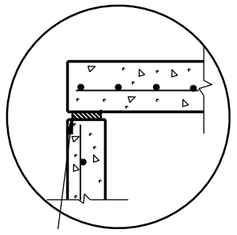


PLAN VIEW CIRCULAR OPENING

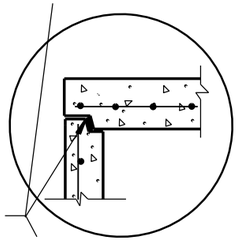


OPTIONAL PRECAST REINFORCED CONCRETE ECCENTRIC TOP

OPTIONAL PRECAST REINFORCED CONCRETE CONCENTRIC TOP

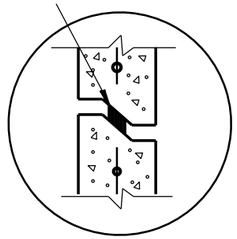


TOP WITH PLAIN END JOINT



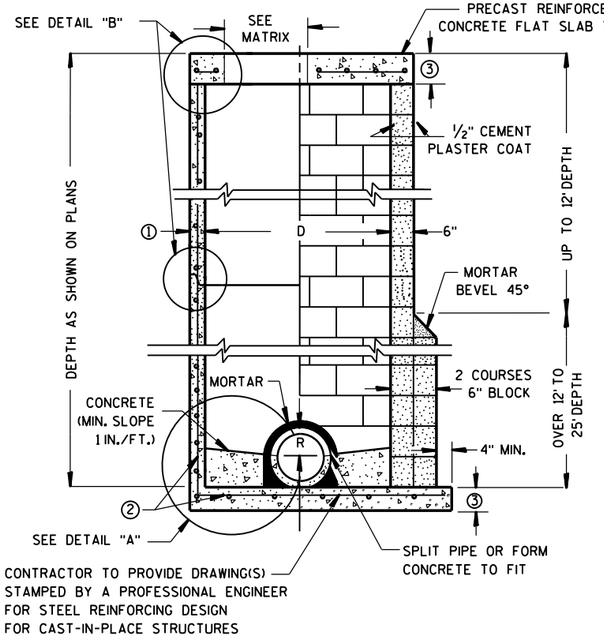
JOINTS TO BE SEALED WITH A BUTYL RUBBER SEAL PER SEALANT MANUFACTURERS RECOMMENDATIONS CONFORMING TO ASTM C990 (TYP)

TOP WITH TONGUE AND GROOVE JOINT



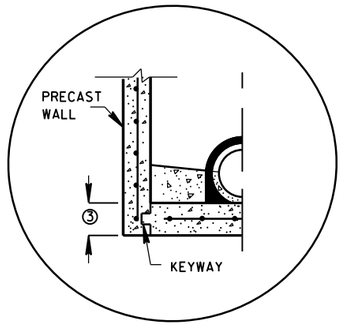
RISER WITH TONGUE AND GROOVE JOINT

DETAIL "B"

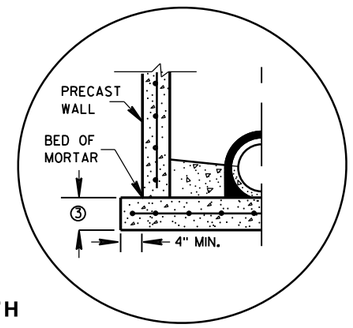


PRECAST REINFORCED CONCRETE WITH MONOLITHIC BASE

CONCRETE BLOCK WITH CAST-IN-PLACE OR PRECAST REINFORCED CONCRETE BASE ②

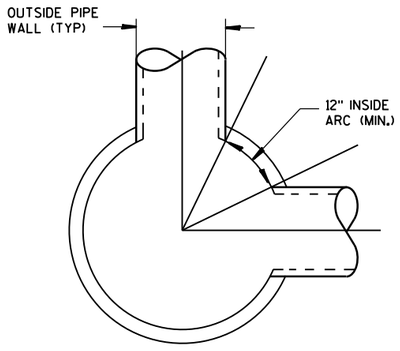


PRECAST REINFORCED CONCRETE WITH INTEGRAL BASE OPTION



SEPARATE PRECAST REINFORCED CONCRETE BASE OPTION

DETAIL "A"



DETAIL "C"

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 MANHOLE 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 DRAINAGE STRUCTURES ARE DESIGNATED ON THE PLANS AS "MANHOLES 3X3-L", "CATCH BASINS 4-B", "INLETS 2X3-H", ETC. THE FIRST NUMBERS DESIGNATE 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 GRANULAR BACKFILL. THIS BEDDING SHALL BE COMPACTED AND PROVIDE UNIFORM SUPPORT FOR THE ENTIRE AREA OF THE BASE.

PRECAST REINFORCED CONE TOPS (ECCENTRIC OR CONCENTRIC) OR PRECAST REINFORCED FLAT SLAB TOPS MAY BE USED ON CONCRETE BLOCK STRUCTURES. THE CONE TOPS SHALL BE INSTALLED ON A BED OF MORTAR.

ECCENTRIC CONE TOPS MAY BE USED ON ALL STRUCTURES, AND CONCENTRIC CONE TOPS SHALL BE USED ONLY ON STRUCTURES 5 FEET OR LESS IN DEPTH, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

STEPS MEETING AASHTO M199 AND THE FOLLOWING REQUIREMENTS SHALL BE INSTALLED IN ALL STRUCTURES OVER 5 FEET IN DEPTH: 16 INCH C-C MAXIMUM SPACING; PROJECT A MINIMUM CLEAR DISTANCE OF 4 INCHES FROM THE WALL AT THE POINT OF EMBEDMENT; MINIMUM LENGTH OF 10 INCHES; MINIMUM WALL EMBEDMENT OF 3 INCHES. FERROUS METAL STEPS NOT PAINTED OR TREATED TO RESIST CORROSION SHALL HAVE A MINIMUM CROSS SECTIONAL DIMENSION OF 1 INCH.

STEPS OF APPROVED POLYPROPYLENE PLASTIC COATED REINFORCEMENT BAR ARE ACCEPTABLE. REINFORCING BAR MUST BE A MINIMUM OF ½" AND MEET THE REQUIREMENTS OF ASTM A615.

CERTIFICATION SHALL BE PROVIDED THAT INSTALLED STEPS WHEN TESTED IN ACCORDANCE WITH SECTION 10 OF AASHTO T280 CAN WITHSTAND A VERTICAL LOAD OF 800 LBS. AND A HORIZONTAL LOAD OF 400 LBS.

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

CONCRETE BLOCK WILL NOT BE PERMITED FOR STRUCTURES GREATER THAN 4 FEET IN DIAMETER.

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

ALL PRECAST MANHOLE UNITS SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF AASHTO DESIGNATION M 199.

4" OVERHANGING BASES ARE REQUIRED FOR ALL 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.

FOR ADDITIONAL CONFIGURATIONS, MAINTAIN A MINIMUM OF 12 INCHES AS MEASURED FROM THE INSIDE OF THE STRUCTURE WALL BETWEEN THE OUTSIDE PIPE WALLS OF ADJACENT PIPES. SEE DETAIL "C".

① MINIMUM WALL THICKNESS SHALL BE 4 INCHES FOR 3-FT, 5 INCHES FOR 4-FT, 6 INCHES FOR 5-FT, 7 INCHES FOR 6-FT, 8 INCHES FOR 7-FT AND 9 INCHES FOR 8-FT DIAMETER PRECAST MANHOLES.

② FOR PRECAST MANHOLES PROVIDE REINFORCING STEEL IN ACCORDANCE TO AASHTO M199.

③ PRECAST FLAT SLAB TOPS AND BASES WITH A DIAMETER OF 48" AND LESS SHALL HAVE A MINIMUM THICKNESS OF 6". PRECAST FLAT SLAB TOPS AND BASES WITH A DIAMETER LARGER THAN 48" SHALL HAVE A MINIMUM THICKNESS OF 8".

MANHOLE COVER OPENING MATRIX

MANHOLE COVER TYPE	C	ALL J'S	K	L	M
OPENING SIZE (FT)					
2 DIA.	X	X		X	
3 DIA.			X		X

PIPE MATRIX

MANHOLE SIZE	MAXIMUM INSIDE PIPE DIAMETER FOR TWO PIPES	
	180° SEPARATION (IN)	90° SEPARATION (IN)
3-FT	15	12
4-FT	24	18
5-FT	36	24
6-FT	42	36
7-FT	48	36
8-FT	60	42

MANHOLES 3-FT, 4-FT, 5-FT, 6-FT, 7-FT AND 8-FT DIAMETER

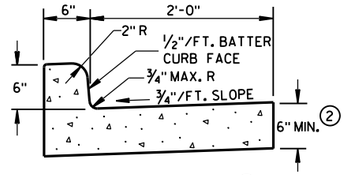
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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

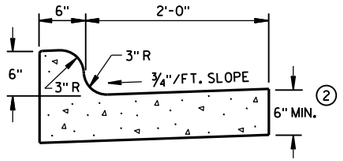
MANHOLES 3-FT, 4-FT, 5-FT, 6-FT, 7-FT AND 8-FT DIAMETER

S.D.D. 8 B 9-1

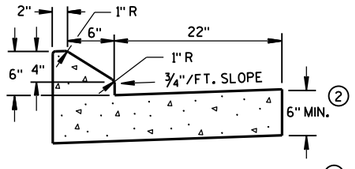
8D1: Concrete Curb, Concrete Curb & Gutter and Ties



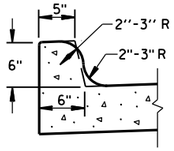
TYPES A & D ①



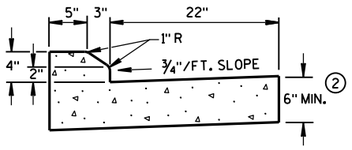
TYPES K & L ①



6" SLOPED CURB TYPES G & J ①

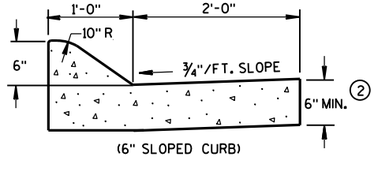


OPTIONAL CURB SHAPE FOR TYPES K & L ①

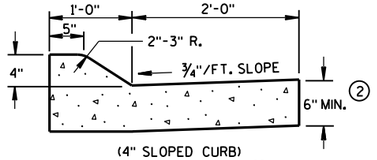


4" SLOPED CURB TYPES G & J ①

CONCRETE CURB & GUTTER 30"

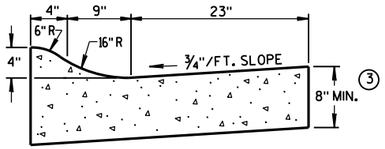


(6" SLOPED CURB)



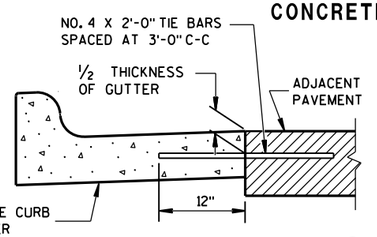
(4" SLOPED CURB)

TYPES A & D ①

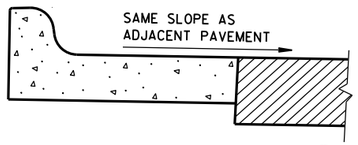


4" SLOPED CURB TYPES R & T ① ④

CONCRETE CURB & GUTTER 36"



TYPICAL TIE BAR LOCATION ①



REVERSE SLOPE GUTTER ⑤
(TYPICAL FOR ALL CURB & GUTTER TYPES)

GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE CONTRACT.

PAVEMENT TIES AND TIE BARS SHALL BE EPOXY COATED IN CONFORMANCE WITH SUBSECTION 505.2.6.2 OF THE STANDARD SPECIFICATIONS.

INTEGRAL CURB & GUTTER SHALL CONFORM TO THE DETAILS SHOWN FOR CONCRETE CURB & GUTTER INCLUDING THE TRANSVERSE GUTTER SLOPE. A LONGITUDINAL CONSTRUCTION JOINT IS NOT REQUIRED WITH INTEGRAL CURB AND GUTTER.

WHERE THE TRANSVERSE JOINTS IN THE PAVEMENT ARE REQUIRED TO BE SEALED, THE JOINTS IN THE INTEGRAL CURB AND GUTTER SHALL BE SEALED TO THE FACE OF CURB WITH THE SAME TYPE OF SEALANT. THE COST OF FURNISHING AND INSTALLING THIS SEALANT SHALL BE INCIDENTAL TO THE ITEM CONCRETE CURB AND GUTTER.

UNLESS OTHERWISE SHOWN ON THE TYPICAL CROSS SECTIONS, THE BASE AGGREGATE AND COMMON EXCAVATION LIMITS ARE 2'-0" BEHIND THE BACK OF CURBS.

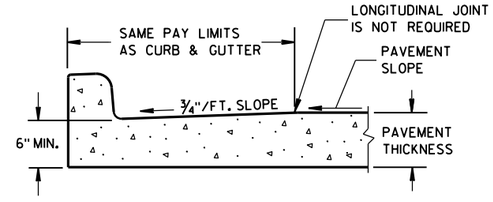
① TIE BARS ARE REQUIRED FOR CURB AND GUTTER TYPES A, G, K AND R.

② THE BOTTOM OF CURB AND GUTTER MAY BE CONSTRUCTED EITHER LEVEL OR PARALLEL TO THE SLOPE OF THE SUBGRADE OR BASE AGGREGATE PROVIDED A 6" MINIMUM GUTTER THICKNESS IS MAINTAINED.

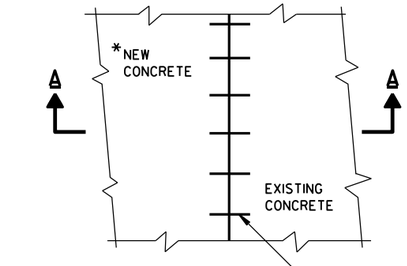
③ THE BOTTOM OF CURB AND GUTTER MAY BE CONSTRUCTED EITHER LEVEL OR PARALLEL TO THE SLOPE OF THE SUBGRADE OR BASE AGGREGATE PROVIDED A 8" MINIMUM GUTTER THICKNESS IS MAINTAINED.

④ THE FACE OF CURB IS 6" FROM THE BACK OF CURB.

⑤ WHEN REVERSE SLOPE GUTTER IS REQUIRED, THE LOCATION(S) WILL BE SHOWN ELSEWHERE IN THE PLAN.

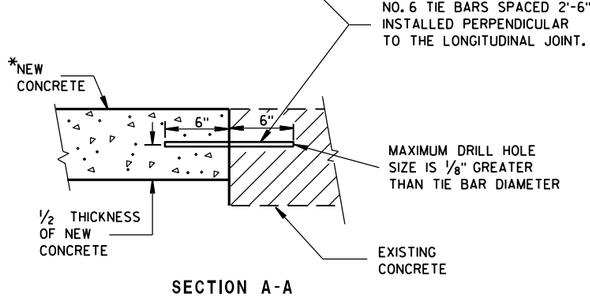


PARTIAL SECTION OF PAVEMENT WITH INTEGRAL CURB & GUTTER



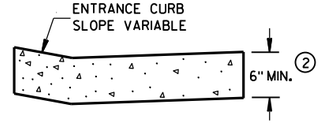
PLAN VIEW

*NEW CURB & GUTTER, SURFACE DRAINS, CONCRETE PAVEMENT OR OTHER NEW CONCRETE.

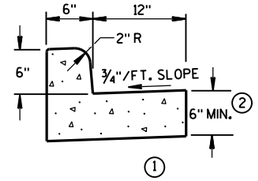


SECTION A-A

TIE BARS DRILLED INTO EXISTING PAVEMENT

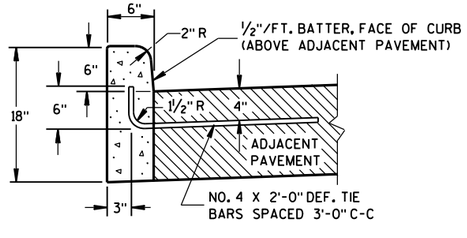


DRIVEWAY ENTRANCE CURB
(WHEN DIRECTED BY THE ENGINEER)

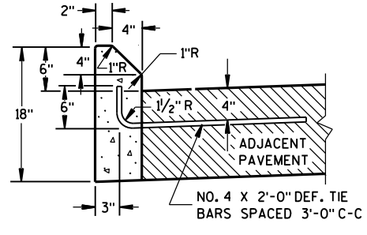


① TYPES A & D

CONCRETE CURB & GUTTER 18"

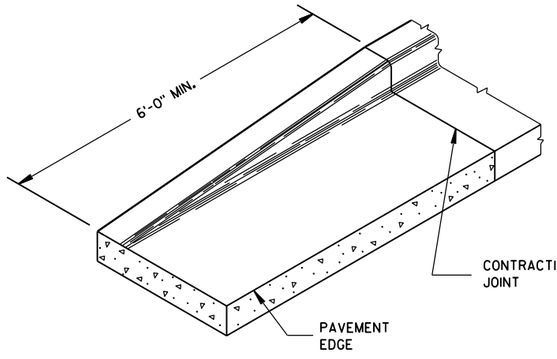


① TYPES A & D



① TYPES G & J

CONCRETE CURB



END SECTION CURB & GUTTER

CONCRETE CURB, CONCRETE CURB & GUTTER AND TIES

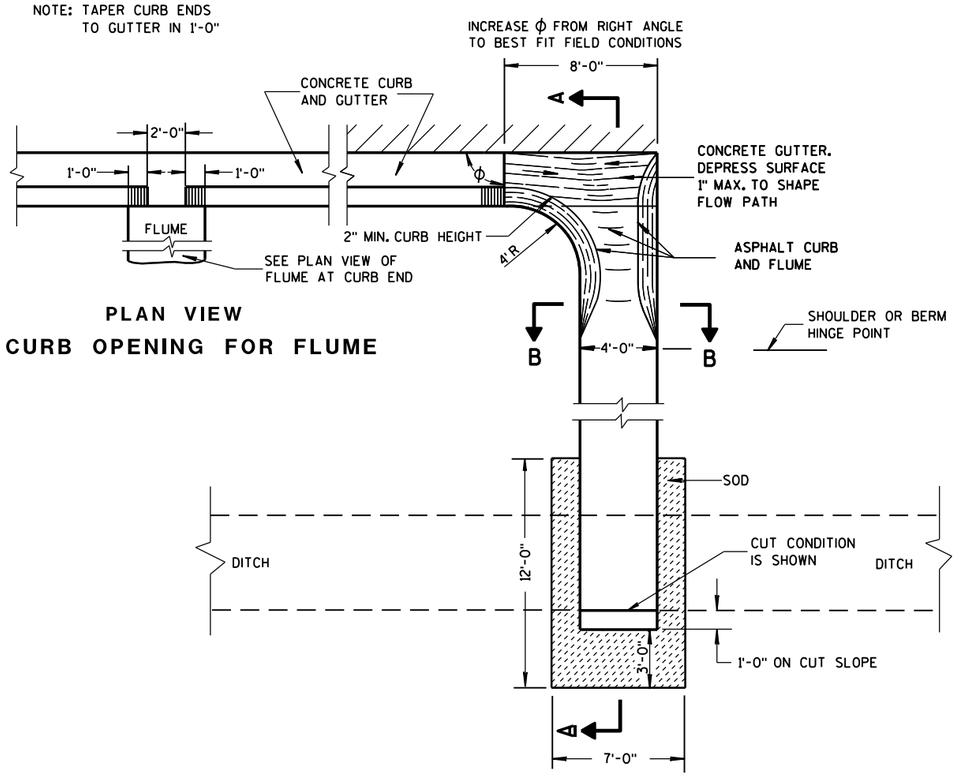
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
9/4/08
DATE
FHWA

/S/ Jerry H. Zogg
ROADWAY STANDARDS DEVELOPMENT ENGINEER

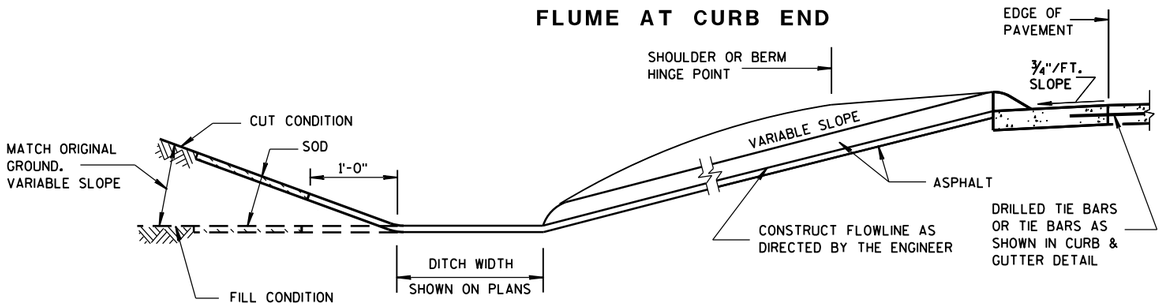
6
S.D.D. 8 D 1-17

ASPHALTIC FLUME

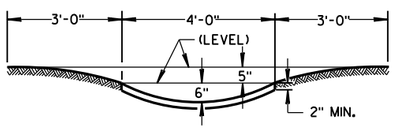


PLAN VIEW
CURB OPENING FOR FLUME

PLAN VIEW
FLUME AT CURB END



SECTION A-A



SECTION B-B

GENERAL NOTES

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

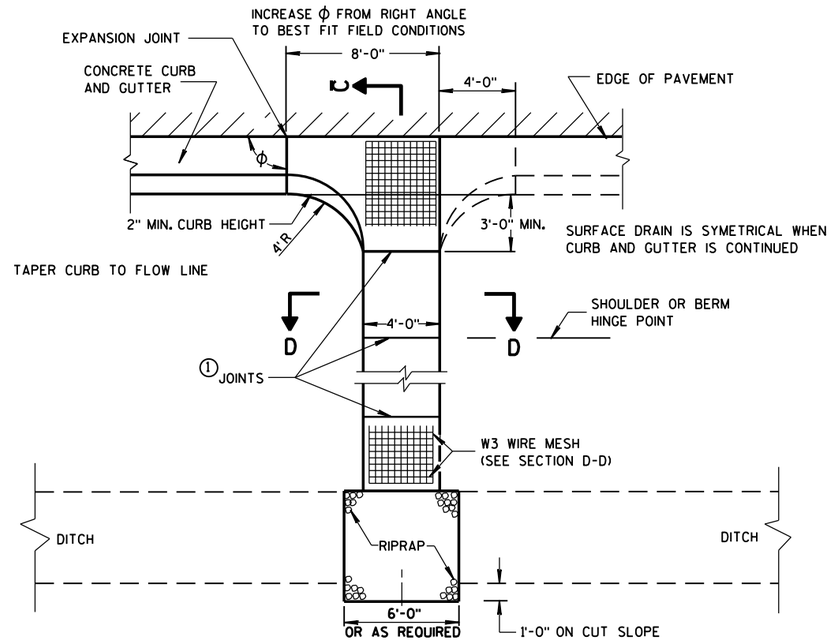
WELDED STEEL WIRE FABRIC SHALL BE IN ACCORDANCE WITH AASHTO SPECIFICATION M55.

① JOINTS SHALL BE ⅛ TO ¼ INCH WIDE BY 1½ INCHES DEEP AND SPACED AT UNIFORM INTERVALS OF APPROXIMATELY 4 FEET.

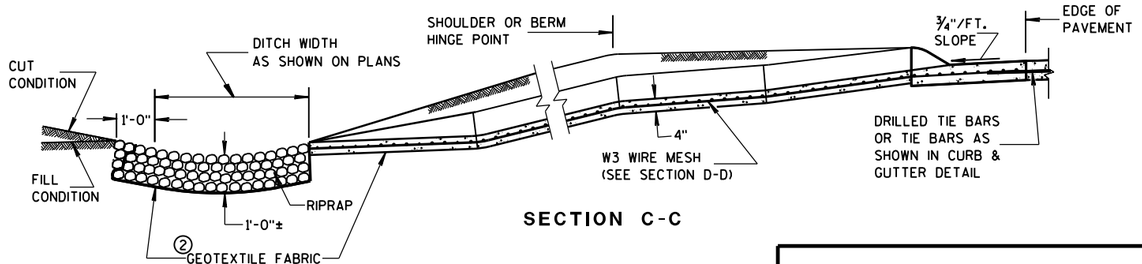
② GEOTEXTILE FABRIC TYPE "R" SHALL UNDERLAY THE FULL LENGTH AND WIDTH OF THE CONCRETE SURFACE DRAIN AND RIPRAP.

③ CONCRETE SURFACE DRAIN WITHOUT CURB AND GUTTER MAY BE USED ON BACKSLOPES WHEN SPECIFIED

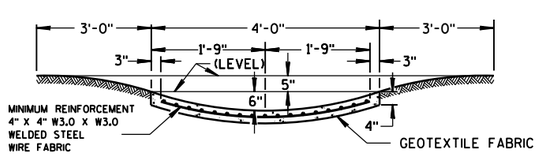
③ CONCRETE SURFACE DRAIN



PLAN VIEW



SECTION C-C



SECTION D-D

CONCRETE SURFACE DRAINS & ASPHALTIC FLUMES

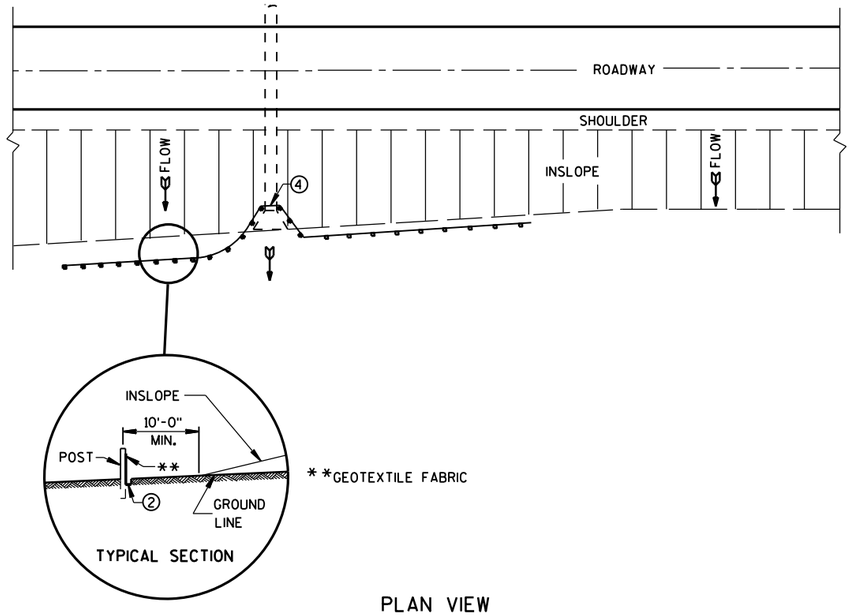
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

9/4/08 — DATE

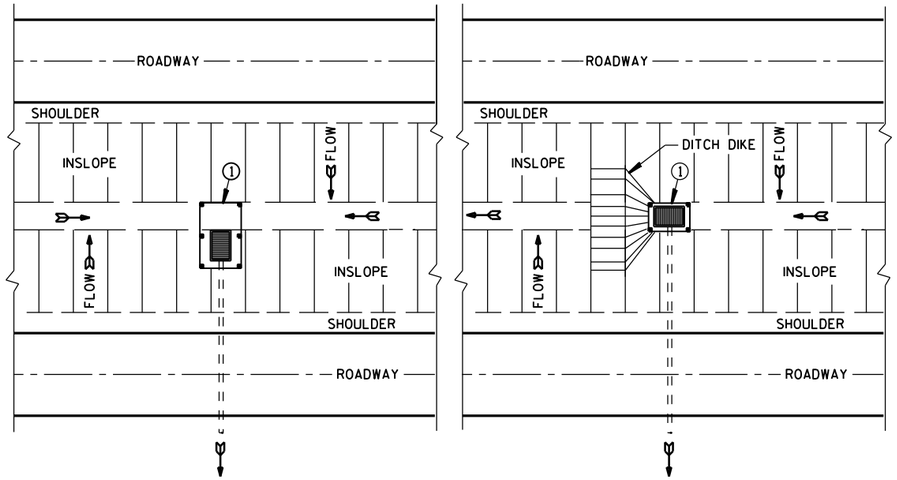
/S/ Jerry H. Zogg — ROADWAY STANDARDS DEVELOPMENT ENGINEER

FHWA



PLAN VIEW

TYPICAL APPLICATION OF SILT FENCE



PLAN VIEW

SILT FENCE AT MEDIAN SURFACE DRAINS

GENERAL NOTES

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

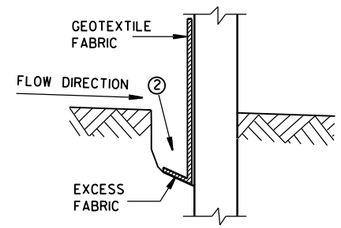
① HORIZONTAL BRACE REQUIRED WITH 2" X 4" WOODEN FRAME OR EQUIVALENT AT TOP OF POSTS.

② FOR MANUAL INSTALLATIONS THE TRENCH SHALL BE A MINIMUM OF 4" WIDE & 6" DEEP TO BURY AND ANCHOR THE GEOTEXTILE FABRIC. FOLD MATERIAL TO FIT TRENCH AND BACKFILL & COMPACT TRENCH WITH EXCAVATED SOIL.

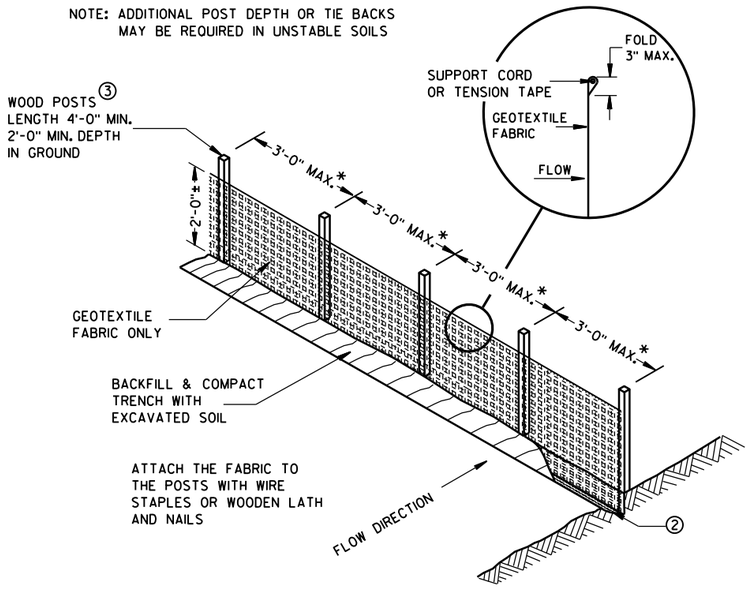
③ WOOD POSTS SHALL BE A MINIMUM SIZE OF 1⅛" X 1⅛" OF OAK OR HICKORY.

④ SILT FENCE TO EXTEND ACROSS THE TOP OF THE PIPE.

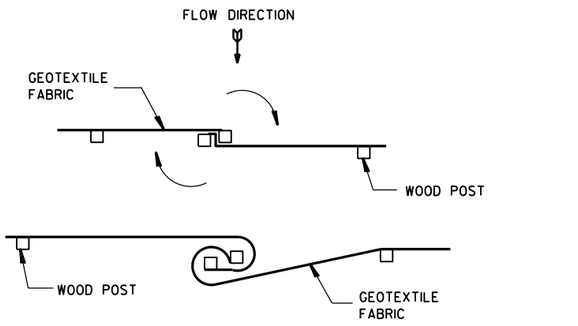
⑤ CONSTRUCT SILT FENCE FROM A CONTINUOUS ROLL IF POSSIBLE BY CUTTING LENGTHS TO AVOID JOINTS. IF A JOINT IS NECESSARY USE ONE OF THE FOLLOWING TWO METHODS; A) OVERLAP THE END POSTS AND TWIST, OR ROTATE, AT LEAST 180 DEGREES, B) HOOK THE END OF EACH SILT FENCE LENGTH.



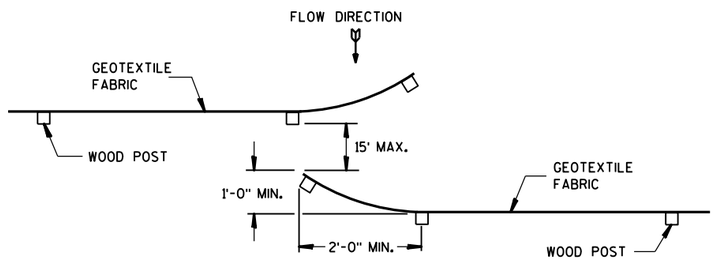
TRENCH DETAIL



SILT FENCE

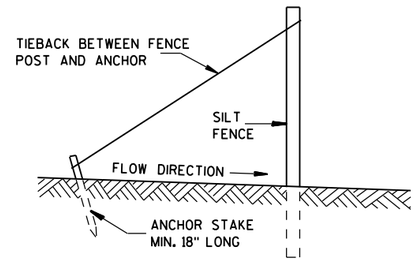


TWIST METHOD



HOOK METHOD

JOINING TWO LENGTHS OF SILT FENCE ⑤

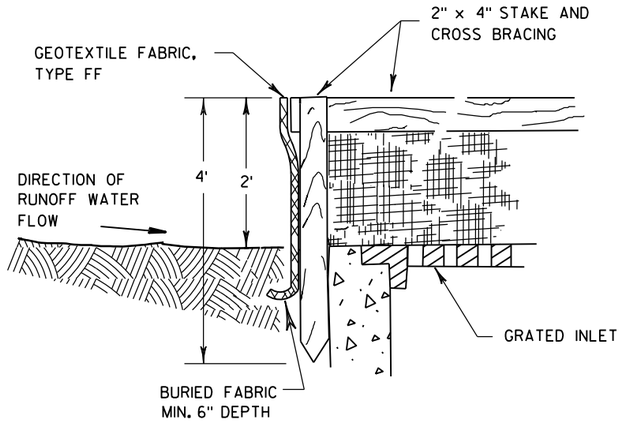


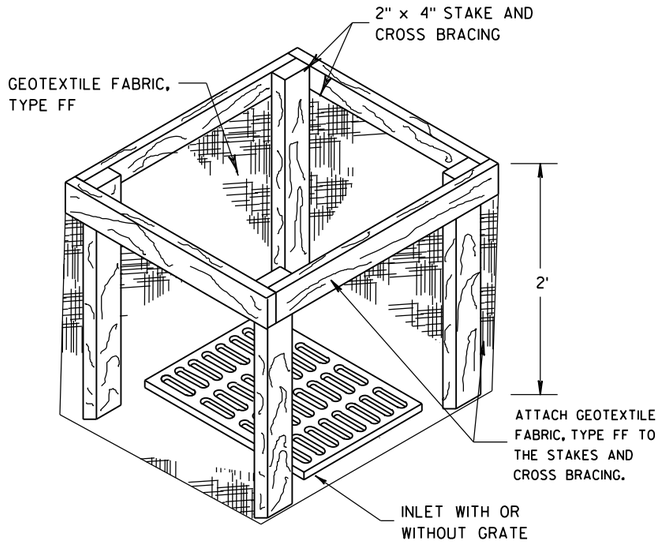
SILT FENCE TIE BACK

(WHEN REQUIRED BY THE ENGINEER)

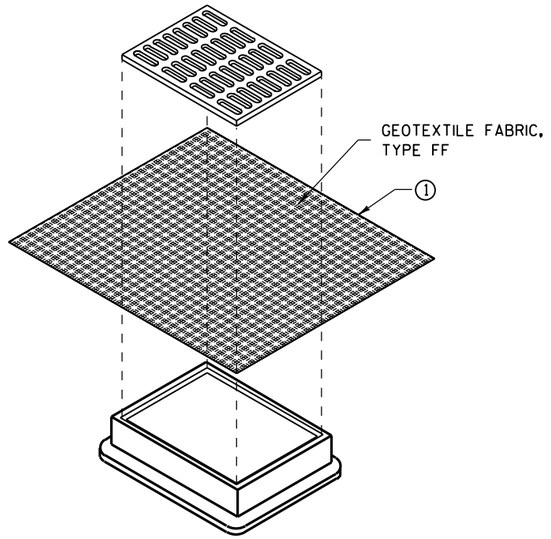
SILT FENCE	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED	
4-29-05 DATE	/S/ Beth Cannestra CHIEF ROADWAY DEVELOPMENT ENGINEER
FHWA	

8E10: Inlet Protection Type A, B, C and D

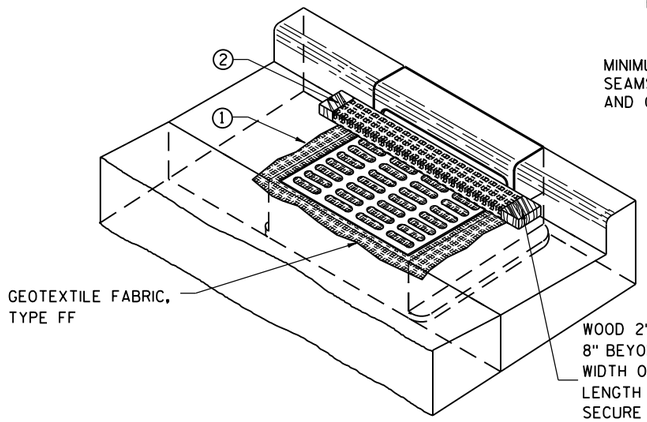




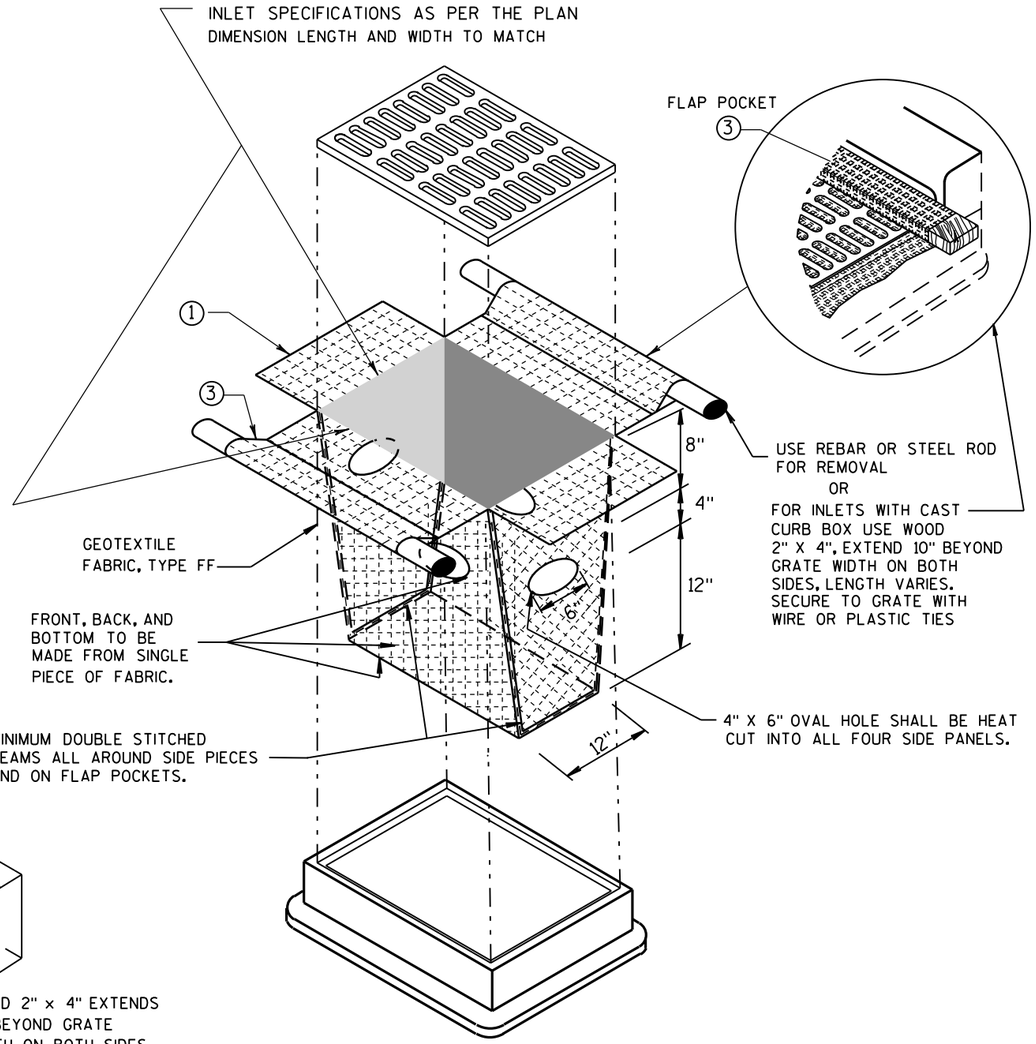
INLET PROTECTION, TYPE A



INLET PROTECTION, TYPE B
(WITHOUT CURB BOX)
(CAN BE INSTALLED IN ANY INLET WITHOUT A CURB BOX)



INLET PROTECTION, TYPE C (WITH CURB BOX)



INLET PROTECTION, TYPE D
(CAN BE INSTALLED IN ANY INLET TYPE WITH OR WITHOUT A CURB BOX AS PER NOTE ②)

GENERAL NOTES

INLET PROTECTION DEVICES SHALL BE MAINTAINED OR REPLACED AT THE DIRECTION OF THE ENGINEER.

MANUFACTURED ALTERNATIVES APPROVED AND LISTED ON THE DEPARTMENT'S EROSION CONTROL PRODUCT ACCEPTABILITY LIST MAY BE SUBSTITUTED.

WHEN REMOVING OR MAINTAINING INLET PROTECTION, CARE SHALL BE TAKEN SO THAT THE SEDIMENT TRAPPED ON THE GEOTEXTILE FABRIC DOES NOT FALL INTO THE INLET. ANY MATERIAL FALLING INTO THE INLET SHALL BE REMOVED IMMEDIATELY.

① FINISHED SIZE, INCLUDING FLAP POCKETS WHERE REQUIRED, SHALL EXTEND A MINIMUM OF 10" AROUND THE PERIMETER TO FACILITATE MAINTENANCE OR REMOVAL.

② FOR INLET PROTECTION, TYPE C (WITH CURB BOX), AN ADDITIONAL 18" OF FABRIC IS WRAPPED AROUND THE WOOD AND SECURED WITH STAPLES. THE WOOD SHALL NOT BLOCK THE ENTIRE HEIGHT OF THE CURB BOX OPENING.

③ FLAP POCKETS SHALL BE LARGE ENOUGH TO ACCEPT WOOD 2X4.

INSTALLATION NOTES

TYPE B & C

TRIM EXCESS FABRIC IN THE FLOW LINE TO WITHIN 3" OF THE GRATE.

THE CONTRACTOR SHALL DEMONSTRATE A METHOD OF MAINTENANCE, USING A SEWN FLAP, HAND HOLDS OR OTHER METHOD TO PREVENT ACCUMULATED SEDIMENT FROM ENTERING THE INLET.

TYPE D

DO NOT INSTALL INLET PROTECTION TYPE D IN INLETS SHALLOWER THAN 30", MEASURED FROM THE BOTTOM OF THE INLET TO THE TOP OF THE GRATE.

TRIM EXCESS FABRIC IN THE FLOW LINE TO WITHIN 3" OF THE GRATE.

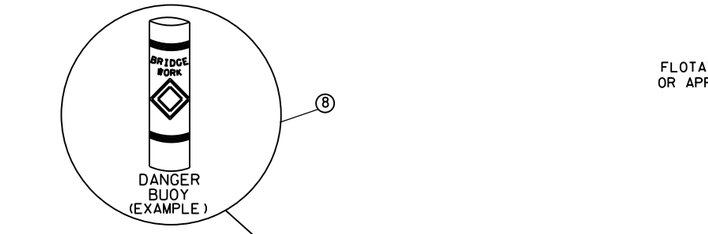
THE INSTALLED BAG SHALL HAVE A MINIMUM SIDE CLEARANCE, BETWEEN THE INLET WALLS AND THE BAG, MEASURED AT THE BOTTOM OF THE OVERFLOW HOLES, OF 3". WHERE NECESSARY THE CONTRACTOR SHALL CINCH THE BAG, USING PLASTIC ZIP TIES, TO ACHIEVE THE 3" CLEARANCE. THE TIES SHALL BE PLACED AT A MAXIMUM OF 4" FROM THE BOTTOM OF THE BAG.

INLET PROTECTION
TYPE A, B, C, AND D

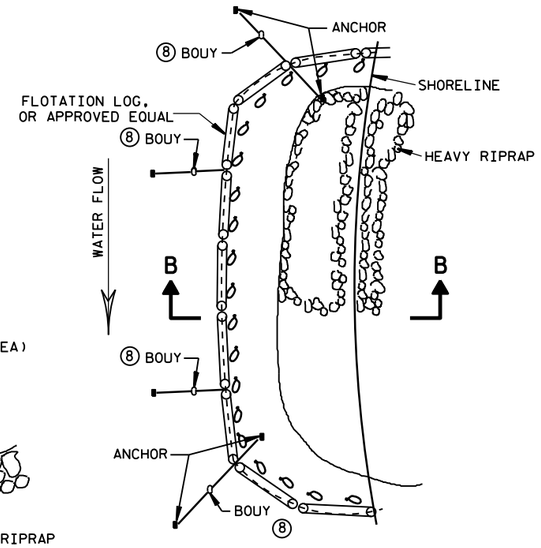
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

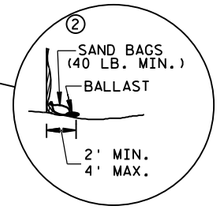
APPROVED
10-16-02
DATE
/S/ Beth Cannestra
CHIEF ROADWAY DEVELOPMENT ENGINEER
FHWA

8E11: Turbidity Barrier

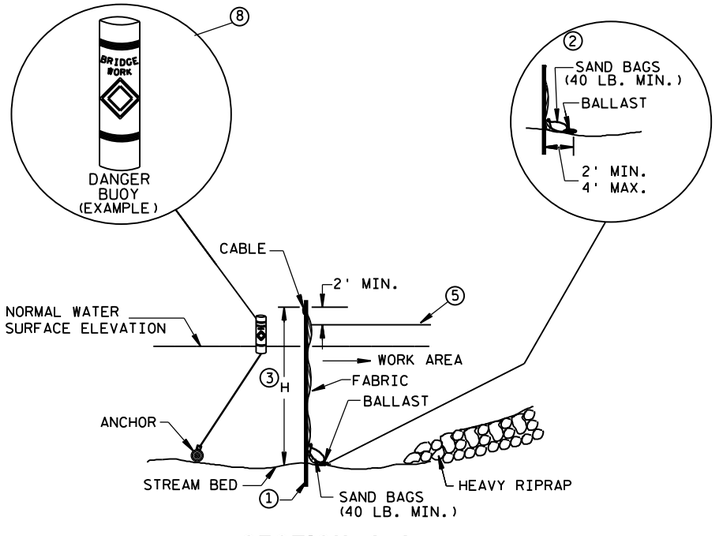


SECTION B-B

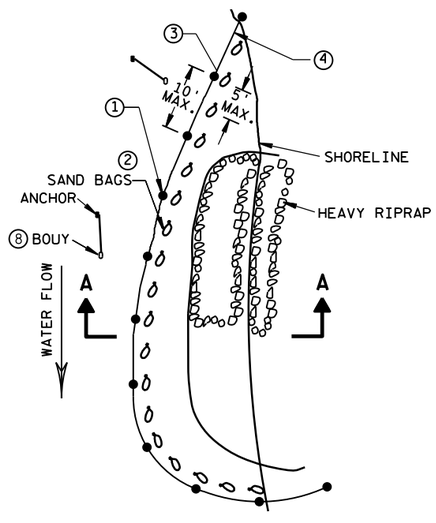




TURBIDITY BARRIER FLOAT ALTERNATIVE
CAUTION - SEE NOTE 6



SECTION A-A



PLAN VIEW

TURBIDITY BARRIER STANDARD POST INSTALLATION

TURBIDITY BARRIER PLACEMENT DETAILS

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.

TURBIDITY BARRIER MAY BE REMOVED AT THE ENGINEERS DISCRETION, WHEN PERMANENT EROSION CONTROL MEASURES HAVE BEEN ESTABLISHED.

① DRIVEN STEEL POSTS, PIPES, OR CHANNELS. LENGTH SHALL BE SUFFICIENT TO SECURELY SUPPORT BARRIER AT HIGH WATER ELEVATIONS.

② SANDBAGS TO BE USED AS ADDITIONAL BALLAST WHEN ORDERED BY THE ENGINEER TO MEET ADVERSE FIELD CONDITIONS. SPACE AS APPROPRIATE FOR SITE CONDITIONS.

③ WHEN BARRIER HEIGHT, H, EXCEEDS 8 FT., POST SPACING MAY NEED TO BE DECREASED.

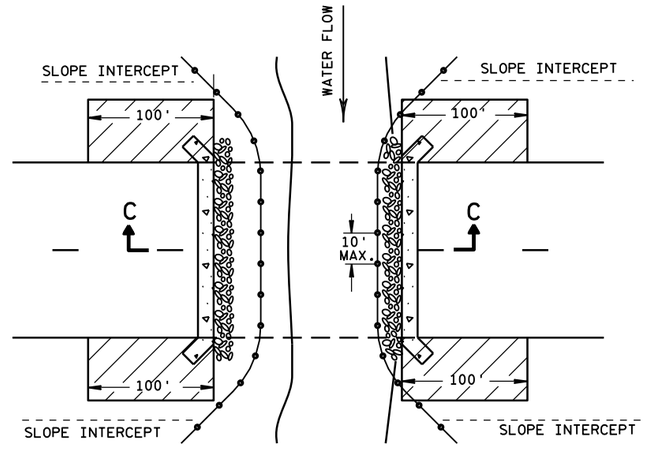
④ IN WATERWAYS SUBJECT TO FLUCTUATING WATER ELEVATIONS, PROVISIONS SHOULD BE MADE TO ALLOW THE WATER TO EQUALIZE ON EACH SIDE OF THE BARRIER. THIS MAY BE ACCOMPLISHED BY LEAVING A PORTION OF THE BARRIER OPEN ON THE UPSTREAM END.

⑤ ESTIMATED HIGH WATER ELEVATION DURING CONSTRUCTION PERIOD. MIMIMUM BARRIER HEIGHT SHALL BE 2'GREATER THAN EITHER THE O2 ELEVATION OR THE ESTIMATED HIGH WATER ELEVATION DURING CONSTRUCTION, WICHEVER IS GREATER.

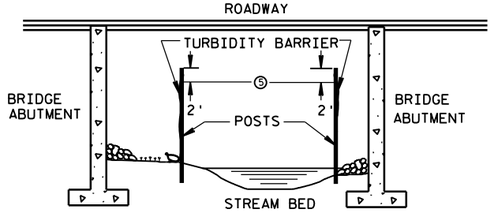
⑥ FLOAT ALTERNATIVE WILL ONLY BE ALLOWED WITH WRITTEN APPROVAL OF THE ENGINEER, AND IS MEANT FOR LOCATIONS WHERE BED ROCK PREVENTS THE INSTALLATION OF POSTS.

⑦ ALLOW SUFFICIENT SLACK VERTICALLY AND HORIZONTALLY SO THAT SEDIMENT BUILD UP WILL NOT SEPARATE OR LOWER THE TURBIDITY BARRIER.

⑧ USE AS DIRECTED BY COAST GUARD OR DNR PERMIT WHEN WORKING IN NAVIGABLE WATERWAYS.



PLAN VIEW



SECTION C-C

TURBIDITY BARRIER DETAIL SHOWING TYPICAL PLACEMENT AT STRUCTURES

TURBIDITY BARRIER	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED	
6-04-02 DATE	/S/ Beth Cannestra CHIEF ROADWAY DEVELOPMENT ENGINEER
FHWA	

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S.D.D. 8 E 11-2

6

S.D.D. 8 E 11-2

8F1: Apron Endwalls for Culvert Pipe

METAL APRON ENDWALLS

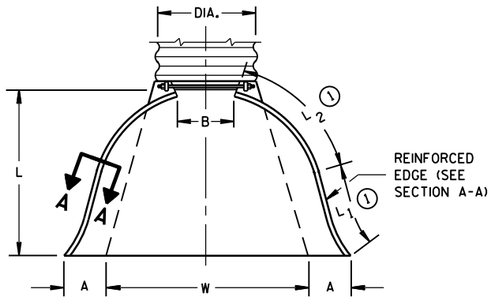
PIPE DIA. (IN.)	MIN. THICK. (inches)		DIMENSIONS (inches)							APPROX. SLOPE	BODY
	STEEL	ALUM.	A (±1")	B (MAX.)	H (±1")	L (±1 1/2")	L1 ①	L2 ①	W (±2")		
12	.064	.060	6	6	6	21	12	17 1/2	24	2 1/2 to 1	1 Pc.
15	.064	.060	7	8	6	26	14	21 3/4	30	2 1/2 to 1	1 Pc.
18	.064	.060	8	10	6	31	15	28 1/4	36	2 1/2 to 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

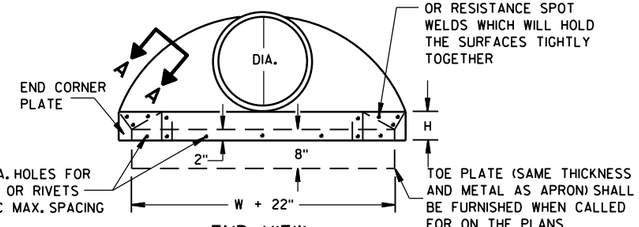
REINFORCED CONCRETE APRON ENDWALLS

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

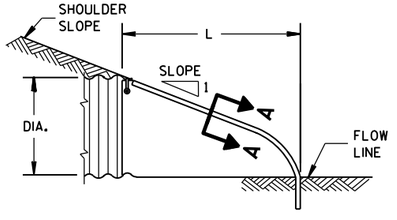
*MINIMUM
**MAXIMUM



PLAN VIEW

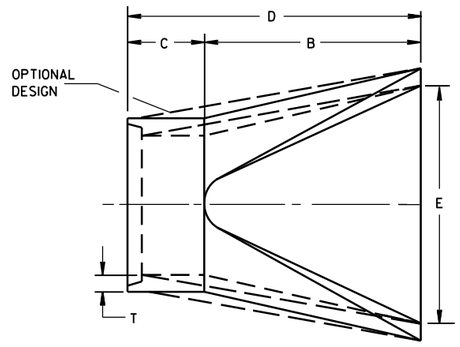


END VIEW

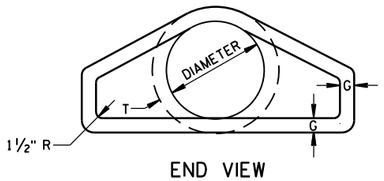


SIDE ELEVATION

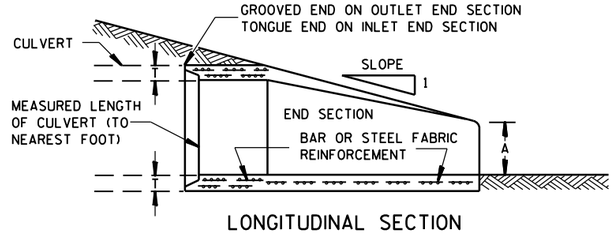
METAL ENDWALLS



PLAN

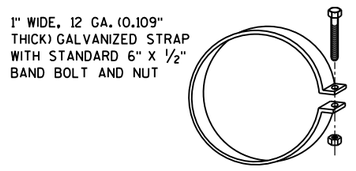


END VIEW



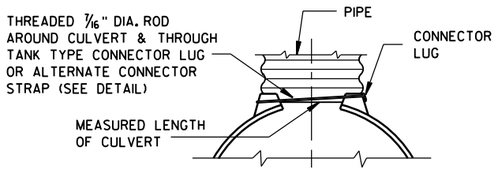
LONGITUDINAL SECTION

CONCRETE ENDWALLS

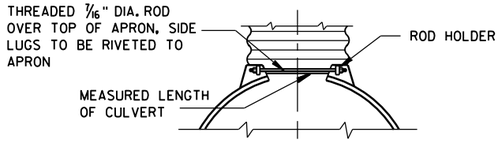


ALTERNATE FOR TYPE 1 CONNECTION

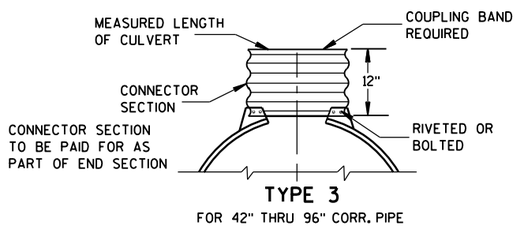
END SECTION CONNECTOR STRAP



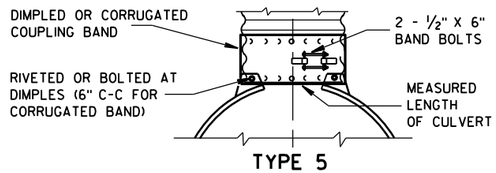
TYPE 1
FOR 12" THRU 24" CORR. PIPE



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

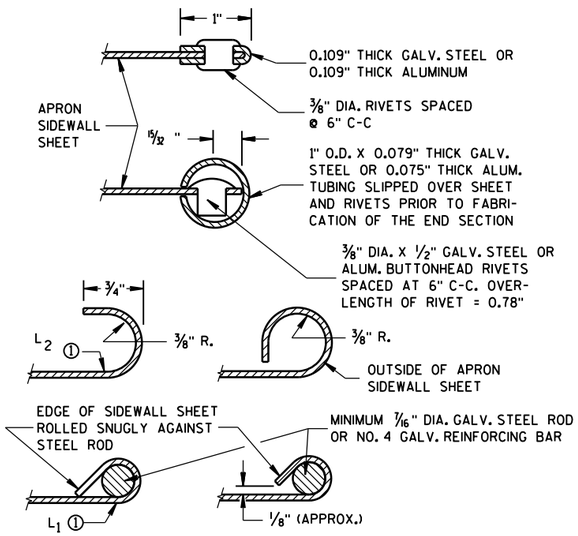
NOTE: DIMPLED BAND FITS OVER OUTSIDE OF ENDWALL, AND CORRUGATED BAND FITS INSIDE ENDWALL. DIMPLED BAND MAY BE USED WITH HELICALLY CORRUGATED PIPE.

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

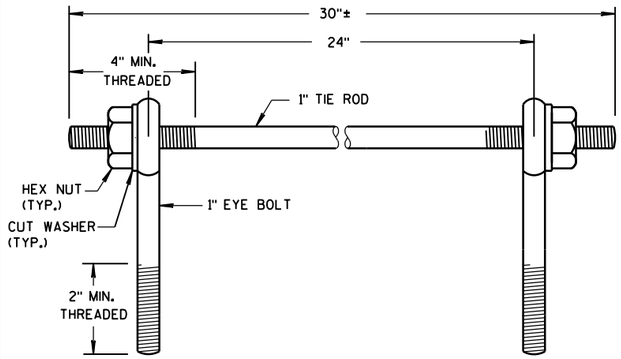
/S/ Rory L. Rhinesmith
CHIEF ROADWAY DEVELOPMENT ENGINEER

FHWA

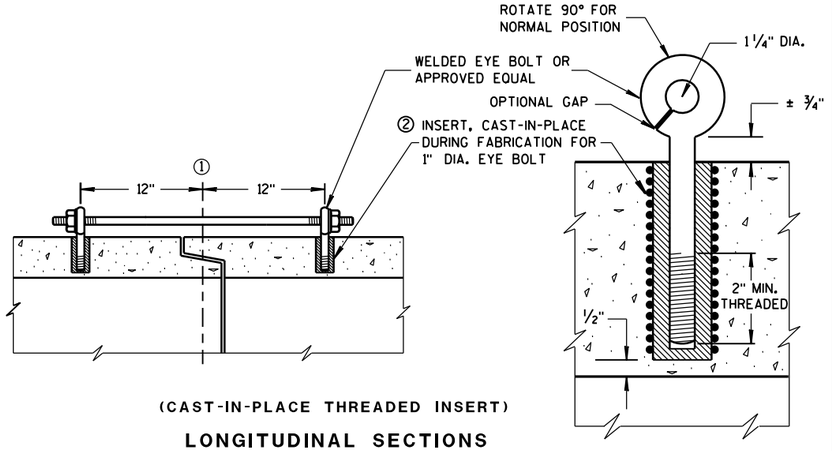
6

S.D.D. 8 F 1-11

8F4: Joint Ties for Concrete Pipe



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.

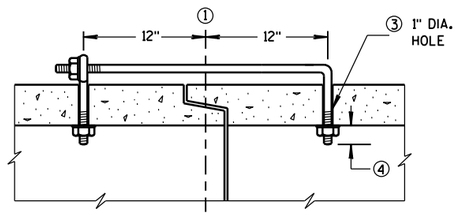
② THE INSIDE OF THE THREADED INSERTS SHALL BE CLEAN TO ALLOW THE INSERTION OF THREADED EYE BOLTS.

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

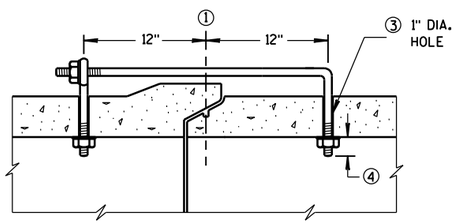
④ BOLT PROJECTION INSIDE OF PIPE SHALL NOT EXCEED 2 INCHES.

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)

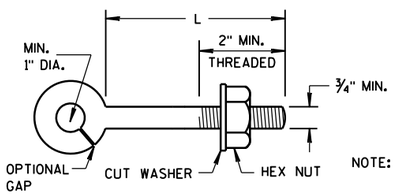


(MODIFIED BELL PIPE)

LONGITUDINAL SECTION

EYE BOLT DIMENSION TABLE

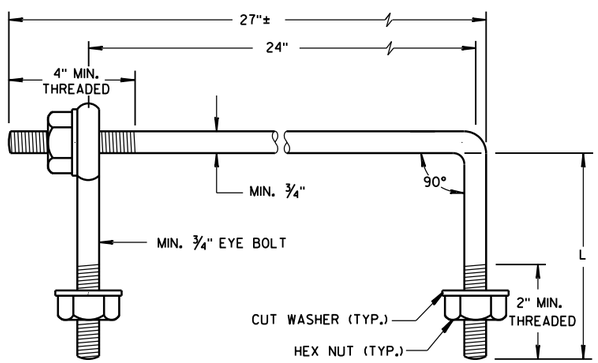
PIPE SIZE	L = LENGTH	
	TONGUE & GROOVE PIPE	MODIFIED BELL PIPE
18" TO 24"	4 1/2"	6 1/4"
30"	5"	7"
36"	5 1/2"	7"
42"	6"	
48"	6 1/2"	
60"	7 1/2"	
66"	8"	



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

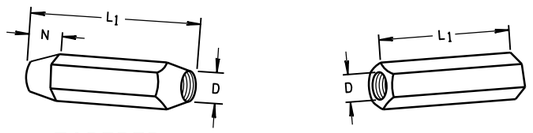
(JOINT TIES FOR 18" TO 66" DIA. CONCRETE PIPE)

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

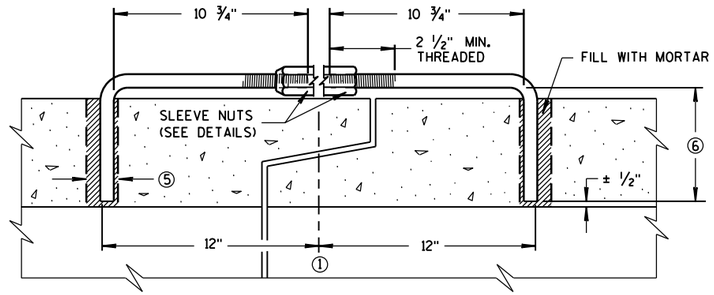
DIMENSIONS SHOWN ARE IN INCHES



TAPERED PLAIN

RIGHT AND LEFT THREADS

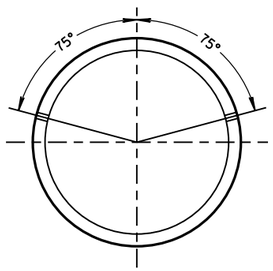
SLEEVE NUTS



LONGITUDINAL SECTION

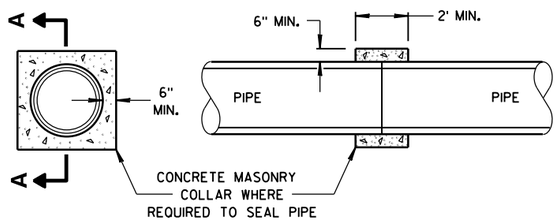
(JOINT TIES FOR 12" TO 108" DIA. CONCRETE PIPE)

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

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S.D.D. 8 F 4-7

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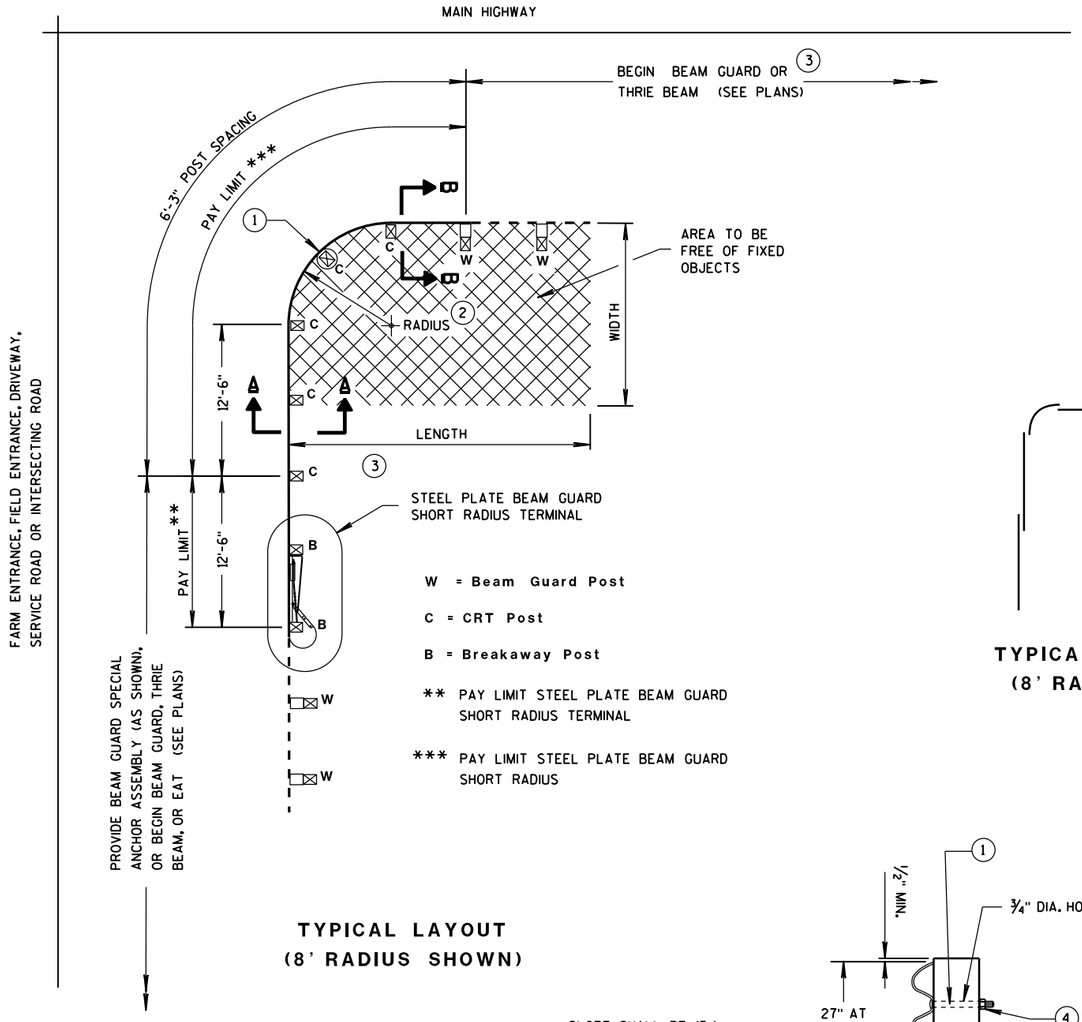
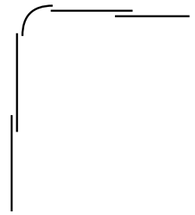
S.D.D. 8 F 4-7



TYPICAL LAYOUT
(8' RADIUS SHOWN)



TYPICAL LAP SPLICES
(8' RADIUS SHOWN)

GENERAL NOTES

ALL ANGLES, CHANNELS, AND PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A36 AND THE STRUCTURAL TUBING SHALL CONFORM TO ASTM A 500. WELDING SHALL MEET THE CURRENT REQUIREMENTS OF THE AMERICAN WELDING SOCIETY STRUCTURAL WELDING CODE ANSI/AWS D1.1. ALL STRUCTURAL STEEL SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A 123. PUNCHING, DRILLING, CUTTING, OR WELDING WILL NOT BE PERMITTED AFTER GALVANIZING. FURNISH AND INSTALL HARDWARE PER STANDARD SPECIFICATION 614.2. UNLESS NOTED OTHERWISE.

SHOP BEND CURVED RAIL SECTIONS.

SEE STANDARD DETAIL DRAWING 14 B 15 FOR OTHER DETAIL.

(1) ON THE 8 FOOT RADIUS INSTALLATION, DO NOT INSTALL BUTTON HEAD BOLT AT CENTER CRT POST.

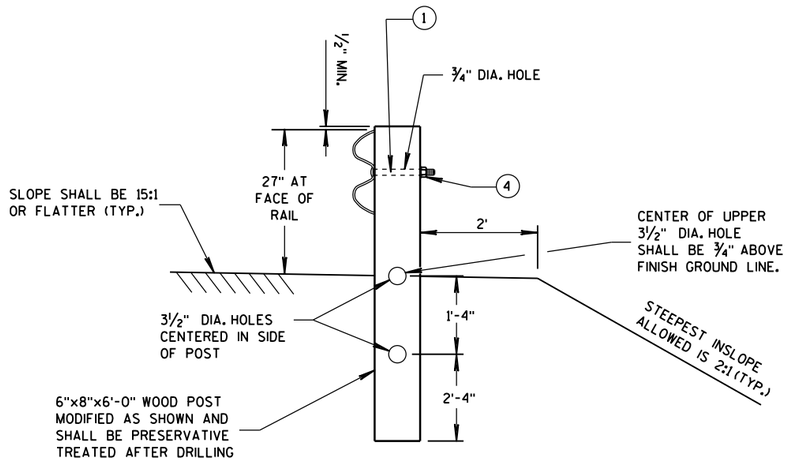
(2) RADIUS FROM 8' - 36'. SEE PLAN.

(3) HEIGHT TRANSITION MAY BE REQUIRED. SEE PLAN OR PROJECT ENGINEER.

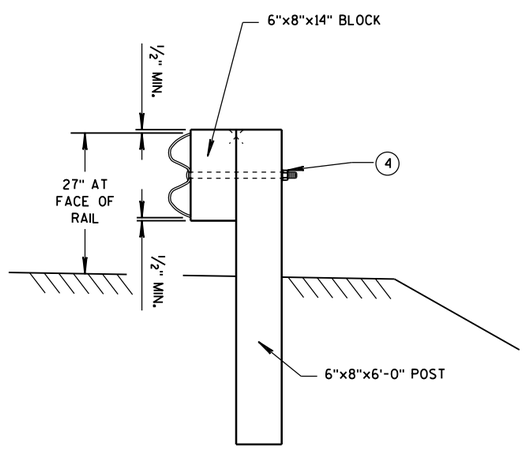
(4) 5/8" ø X 1'-6" BUTTON HEAD BOLT AND RECESS NUT WITH ROUND WASHER UNDER NUT.

RADIUS	NUMBER OF CRT POSTS	* NUMBER AND LENGTH OF CURVED RAILS	REQUIRED AREA FREE OF FIXED OBJECTS (LENGTH x WIDTH)
8'	5	1 at 12.5'	25' x 15'
16'	7	1 at 25'	30' x 15'
24'	9	1 at 25' and 1 at 12.5'	40' x 20'
32'	11	2 at 25'	50' x 20'

* THE NUMBER OF RAILS IS BASED ON A 90° INTERSECTION. SEE PLAN FOR NON 90° INSTALLATIONS.



SECTION A-A
(CRT POST)



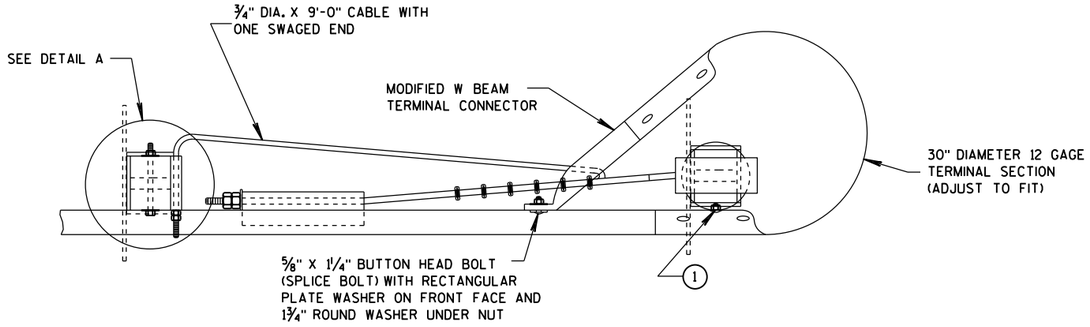
SECTION B-B
(BEAM GUARD POST)

STEEL PLATE BEAM GUARD SHORT RADIUS TERMINAL

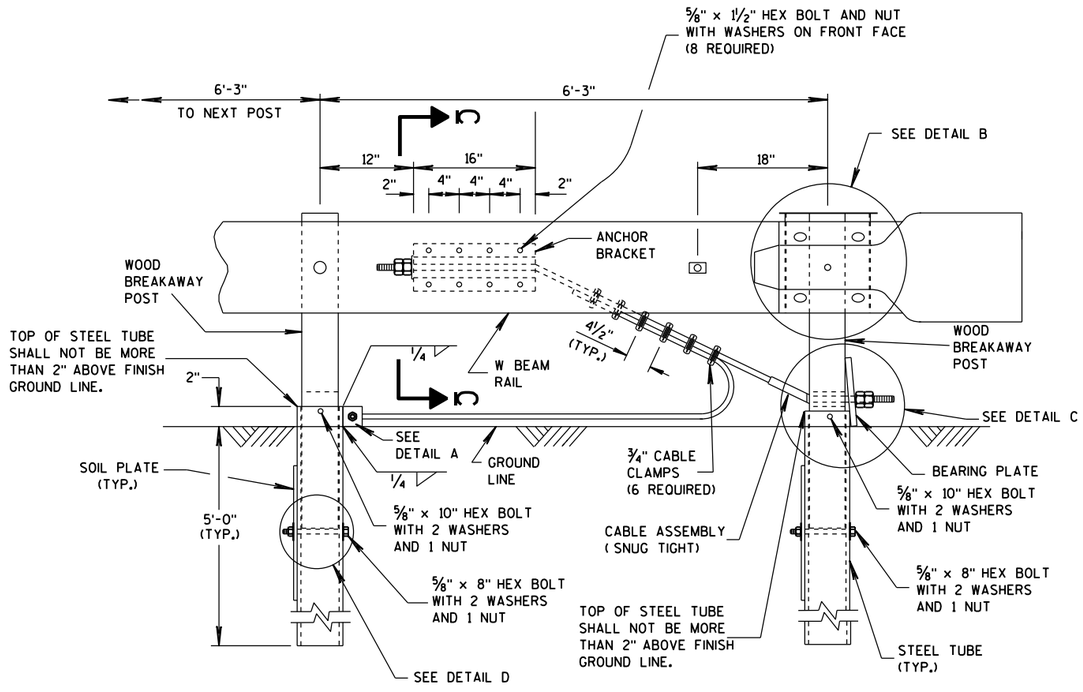
STEEL PLATE BEAM GUARD SHORT RADIUS TERMINAL

6

S.D.D. 14 B 27-1a



PLAN VIEW



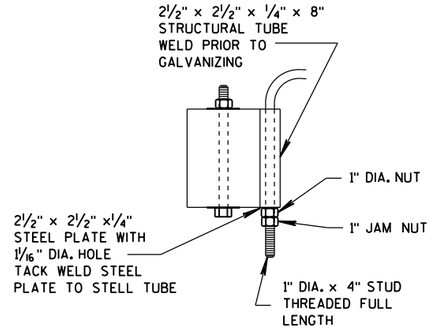
ELEVATION VIEW

STEEL PLATE BEAM GUARD SHORT RADIUS TERMINAL

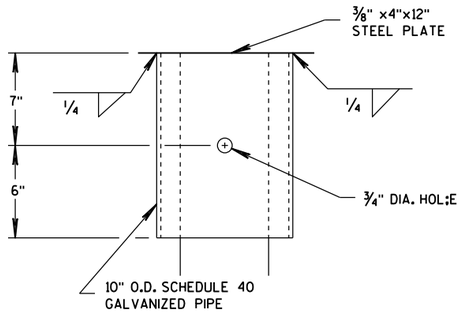
GENERAL NOTES

1. ATTACH W BEAM RAIL TO THE STEEL PIPE WITH A ⅝" X 2" BUTTON HEAD BOLT WITH NO WASHER. CONNECTION TO THE POST IS NOT REQUIRED.

   INSTALL GALVANIZED ¾" (6X19) PREFORMED WIRE OR INDEPENDENT WIRE ROPE CORE CONFORMING TO AASHTO M 30. MANUFACTURE WIRE ROPE OUT OF IMPROVED PLOW STEEL WITH A MINIMUM BREAKING STRENGTH OF 42,800 PSI.



DETAIL A



DETAIL B

(BEAM GUARD AND TERMINAL SECTION NOT SHOWN)

STEEL PLATE BEAM GUARD SHORT RADIUS TERMINAL

STATE OF WISCONSIN 23
DEPARTMENT OF TRANSPORTATION

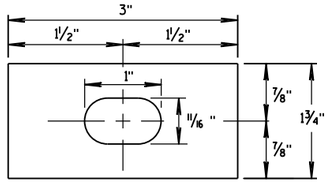
6

S.D.D. 14 B 27-1b

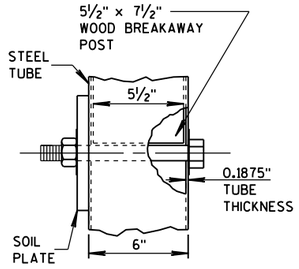
6

S.D.D. 14 B 27-1b

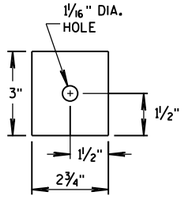
14B27 sheet c: Steel Plate Beam Guard Short Radius Terminal



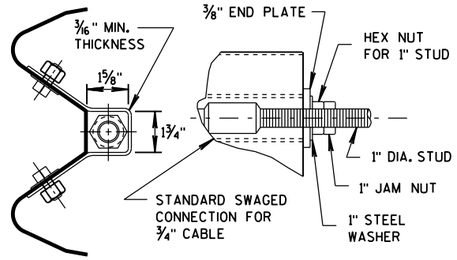
RECTANGULAR PLATE WASHER



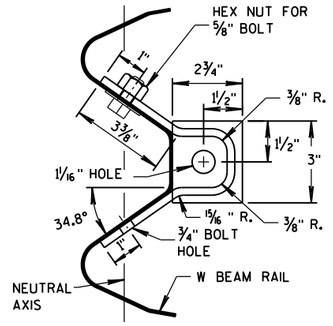
DETAIL D



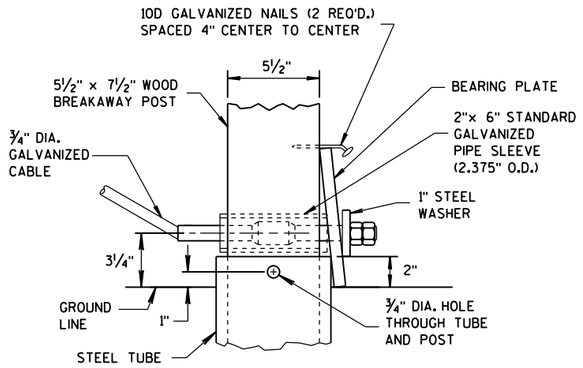
END PLATE



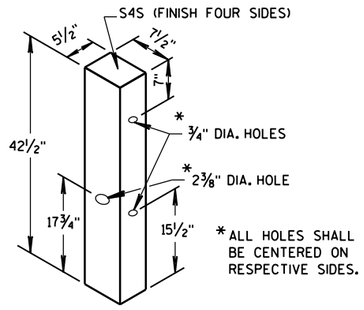
SECTION C-C
(END PLATE REMOVED)



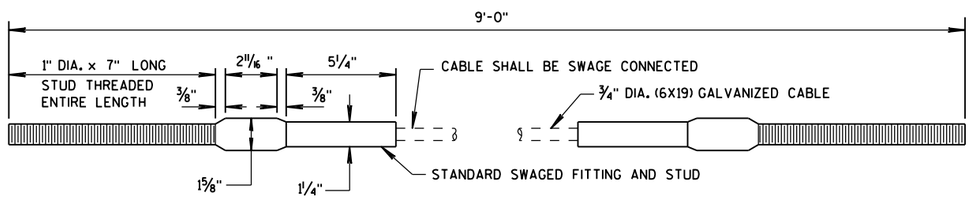
ANCHOR BRACKET



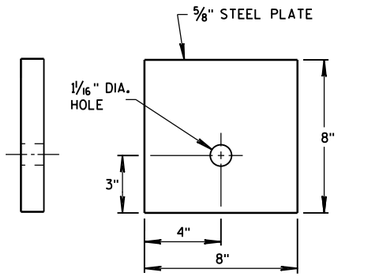
DETAIL C



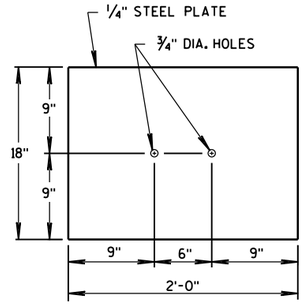
WOOD BREAKAWAY POST



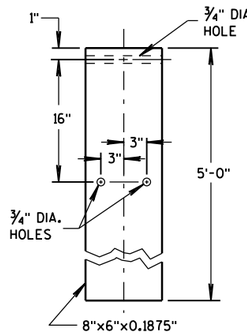
CABLE ASSEMBLY



BEARING PLATE



SOIL PLATE



STEEL TUBE

STEEL PLATE BEAM GUARD
SHORT RADIUS TERMINAL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
12/18/08
DATE
/S/ Jerry H. Zogg
ROADWAY STANDARDS DEVELOPMENT ENGINEER
FHWA

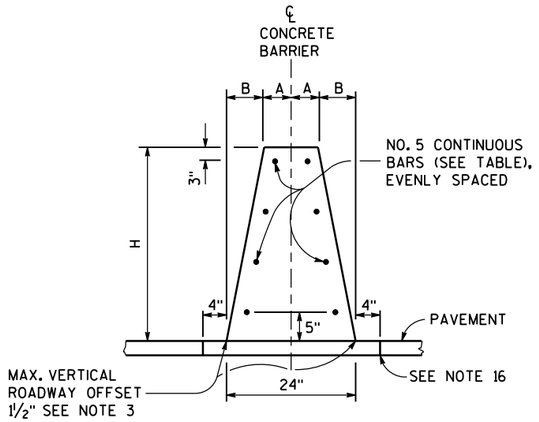
6

S.D.D. 14 B 27-1c

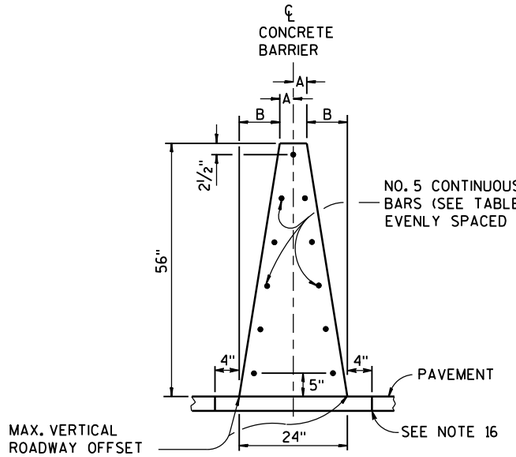
6

S.D.D. 14 B 27-1c

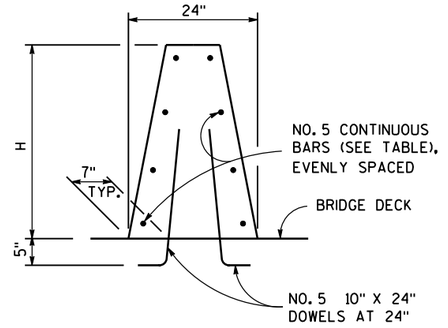
14B32 sheet a: Concrete Barrier Single Slope-Standard, Median Retaining Wall, Anchorages



32-INCH, 36-INCH OR 42-INCH SINGLE SLOPE CONCRETE BARRIER (TYPE S32, TYPE S36, AND TYPE S42)



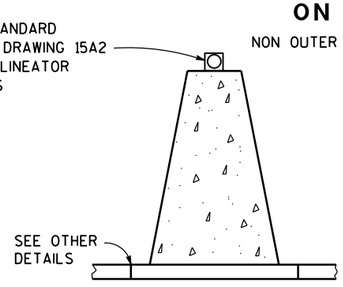
56-INCH SINGLE SLOPE CONCRETE BARRIER (TYPE S56)



SINGLE SLOPE CONCRETE BARRIER ON BRIDGE

NON OUTER PARAPET APPLICATION

BARRIER HEIGHT H INCHES	A INCHES	B INCHES	NUMBER OF NO. 5 BARS EACH
32	7	5	8
36	6¼	5¾	8
42	5¼	6¾	10
56	3	9	11



DELINEATION

GENERAL NOTES

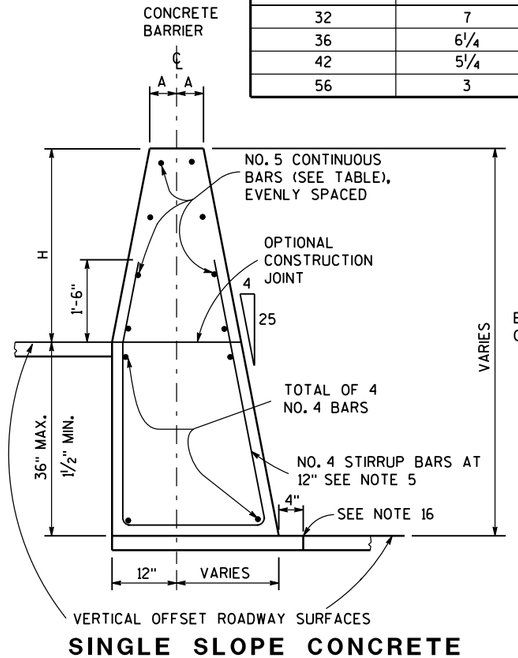
1. WHERE THE CONCRETE BARRIER IS ADDED TO THE FACE OF EXISTING CONCRETE STRUCTURE, MATCH EXISTING WEEP HOLES.
2. EXPANSION JOINTS IN CONCRETE BARRIER SHALL BE LOCATED AT ALL DECK, AND PRINCIPAL WALL JOINTS. EXPANSION JOINT FILLER MATERIAL SHALL BE THE SAME SIZE AS JOINT OR ½" MINIMUM.
3. WHERE VERTICAL ROADWAY OFFSET IS GREATER THAN 1½", USE TYPE A
4. PLACE BARRIER PERPENDICULAR TO SHOULDER GRADE, UNLESS INDICATED IN PLAN.
5. EXCEPT IN ANCHORS, VERTICAL REINFORCING STIRRUP NOT REQUIRED FOR ROADWAY OFFSETS LESS THAN 1'-0".
6. FOR TYPE S32, TYPE S36, TYPE S42, AND S56 MONOLITHIC FOOTING OR DOWELED FOOTING WITH 2-#8 x 8" @ 2'-0".
7. STAGGER LAPPING OF LONGITUDINAL STEEL. MINIMUM OVERLAP OF STEEL 2 FEET. BARS AT LAPS TO BE FIRMLY TIED OR CONNECTED.
8. 4000 PSI CONCRETE AIR ENTRAINMENT PER STANDARD SPECIFICATION 501.
9. WHEN SWITCHING BETWEEN SLIP FORM AND CAST-IN-PLACE OPERATIONS, EXTEND LONGITUDINAL STEEL 3 FEET BEYOND SLIP-FORMING CUT OFF POINT. EXPOSED STEEL INTO NEXT POURS REINFORCEMENT. LAPS TO BE FIRMLY TIED.
10. USE ¾" BEVEL OR 1" RADIUS ON ALL EXPOSED SHARP EDGES UNLESS OTHERWISE NOTED.
11. 2" CLEAR COVER TYPICAL.
12. COLD-JOINTS MAY BE USED BETWEEN ANCHOR INSTALLATIONS. WHEN A COLD JOINT IS NEEDED, 3 FEET OF LAP OF LONGITUDINAL STEEL IS REQUIRED. LAPS TO BE FIRMLY TIED.
13. IN TYPE S32, TYPE S36, TYPE S42 AND TYPE S56 NO ADDITIONAL VERTICAL STEEL NEEDED. IN TYPE S32A, TYPE S36A, TYPE S42A AND TYPE S56A REQUIRES VERTICAL STEEL. SEE OTHER DETAIL.
14. IN TYPE S32, TYPE S36, TYPE S42 AND TYPE S56 DEPTH OF FOOTING 10". IN TYPE S32A, TYPE S36A, TYPE S42A AND TYPE S56A MATCH TOTAL HEIGHT OF SINGLE SLOPE BARRIER RETAINING WALL.
15. FOR ALL BARRIER TYPES SHOWN, ANCHOR IS REQUIRED AT CONCRETE BARRIER ENDS AND AT INTERRUPTIONS IN CONCRETE BARRIER. ANCHOR MAY BE AS SHOWN ON DRAWING OR DETAILS SHOWN ON S.D.D. 14B33. ANCHORS INCIDENTAL TO CBSS.
16. CONCRETE PAD UNDER CBSS MAY BE PLACED INTEGRAL WITH BARRIER, PLACED SEPARATELY OR PLACED WITH CONCRETE SHOULDER AND SAWED FULL DEPTH. CONCRETE PAD MINIMUM DEPTH IS 6 INCHES, OR EQUAL TO THE DEPTH OF THE CONCRETE SHOULDER.

DELINEATOR SPACING ON HORIZONTAL CURVES

RADIUS OF CURVE	APPROXIMATE SPACING ON CURVE
50 FEET	20 FEET
115 FEET	25 FEET
180 FEET	35 FEET
250 FEET	40 FEET
300 FEET	50 FEET
400 FEET	55 FEET
500 FEET	65 FEET
600 FEET	70 FEET
700 FEET	75 FEET
800 FEET	80 FEET
900 FEET	85 FEET
1000 FEET	90 FEET

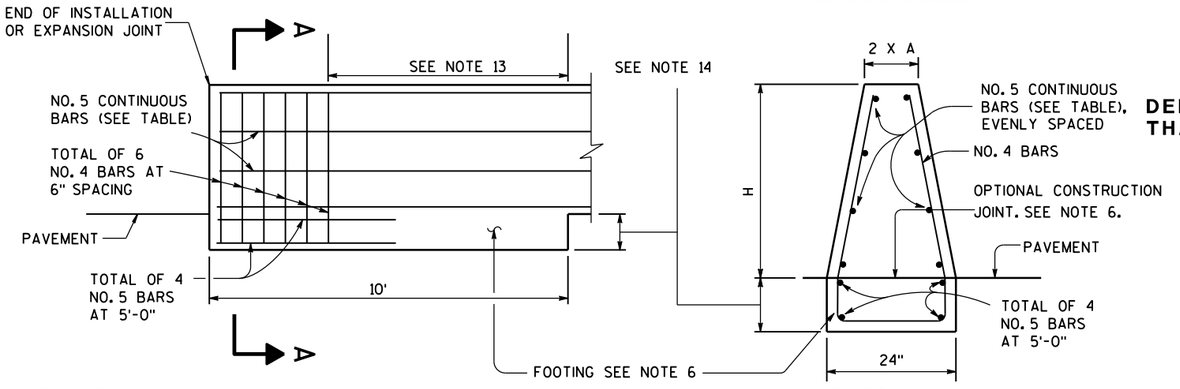
DELINEATOR SPACING ON RADIUS GREATER THAN 1000 FEET OR TANGENT SECTIONS

	LENGTH OF BARRIER	REFLECTOR SPACING	NO. SURFACES REFLECTORIZED	MIN. NO. REFLECTORS
ONE WAY TRAFFIC	< 200'	50' C-C	1	3
	> 200'	100' C-C	1	
TWO WAY TRAFFIC	< 200'	25' C-C	1	6
	> 200'	50' C-C	1	
TWO WAY TRAFFIC	< 200'	50' C-C	2	3
	> 200'	100' C-C	2	



SINGLE SLOPE CONCRETE BARRIER AND RETAINING WALL (TYPE S32A, TYPE S36A, TYPE S42A, TYPE S56A)

(BETWEEN ADJACENT ROADWAYS)



END ANCHOR SINGLE SLOPE CONCRETE BARRIER

AT CONSTRUCTION JOINT

SECTION A-A

CONCRETE BARRIER SINGLE SLOPE (CBSS)

STATE OF WISCONSIN 25
DEPARTMENT OF TRANSPORTATION

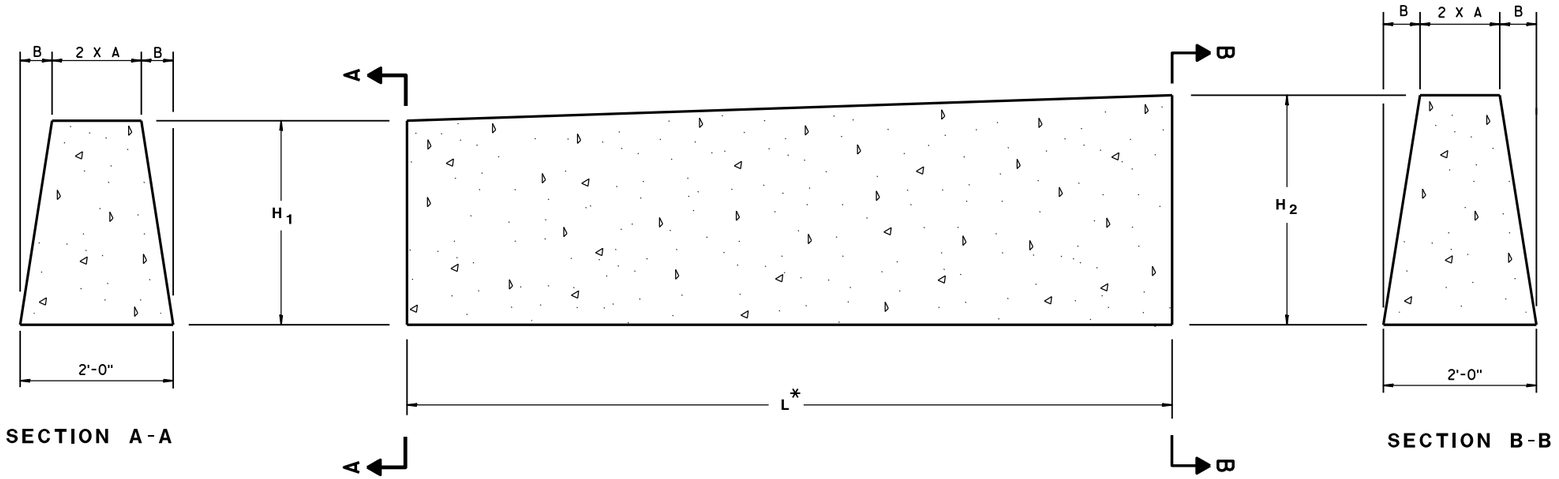
6

S.D.D. 14 B 32-3a

6

S.D.D. 14 B 32-3a

14B32 sheet d: Concrete Barrier Single Slope Double Cold Joint Height Transition



SECTION A-A

SECTION B-B

DOUBLE COLD JOINT HEIGHT TRANSITION

BARRIER DIMENSIONS

BARRIER HEIGHT INCHES	A INCHES	B INCHES
32	7	5
36	6¼	5¾
42	5¼	6¾
56	3	9

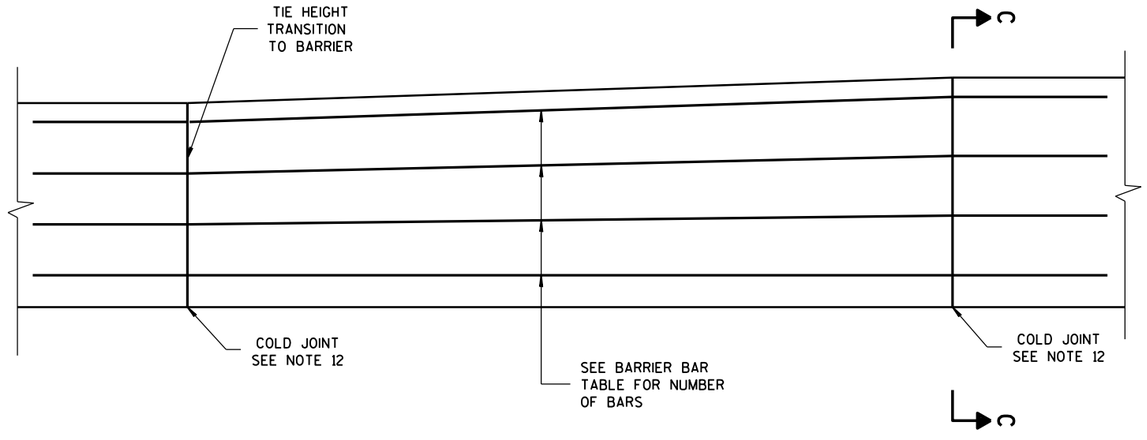
MULTIPLE HEIGHT TRANSITIONS MAY BE USED IN SEQUENCE TO GET TO APPROPRIATE HEIGHT.

USE COLD JOINT TO CONNECT MULTIPLE HEIGHT TRANSITIONS.

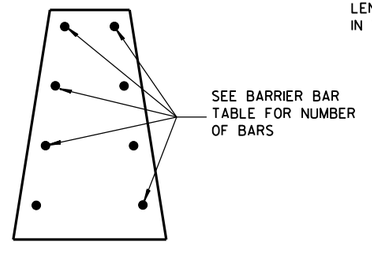
BARRIER BARS

H_1	H_2	L*	NUMBER OF NO. 5 BARS
32"	36"	10'-0"	8
36"	42"	10'-6"	10
42"	56"	24'-6"	11

* LENGTH OF DOUBLE COLD JOINT INCLUDED IN THE TOTAL LENGTH OF CBSS.



STEEL REINFORCEMENT DETAIL



SECTION C-C

CONCRETE BARRIER SINGLE SLOPE

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

June 2014
DATE

/S/ Jerry H. Zogg
ROADWAY STANDARDS DEVELOPMENT ENGINEER

FHWA

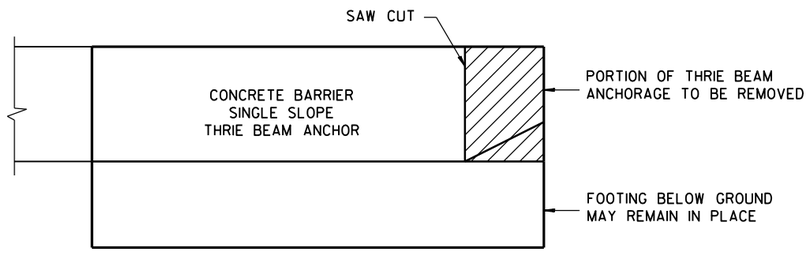
6

S.D.D. 14 B 32-3d

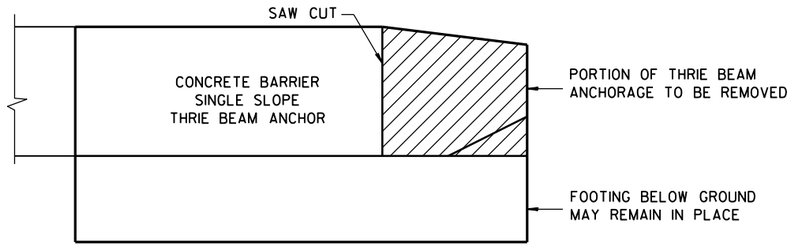
6

S.D.D. 14 B 32-3d

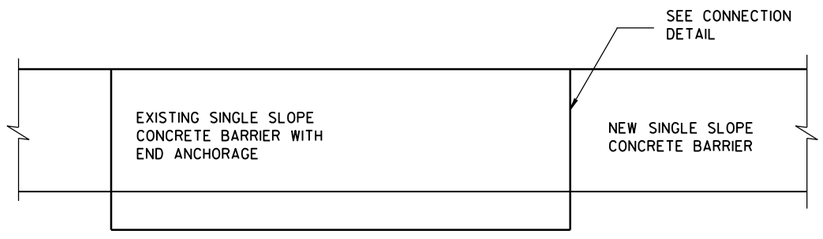
14B32 sheet e: Concrete Barrier Single Slope Removal and Retrofit



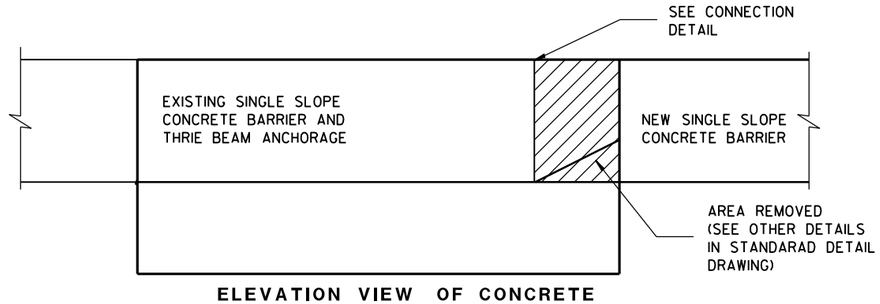
REMOVAL AREA OF
32" CONCRETE THRIE BEAM ANCHORAGE



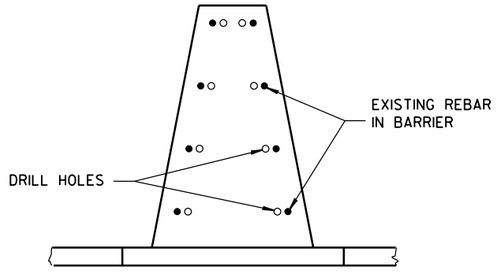
REMOVAL AREA OF CONCRETE THRIE BEAM
ANCHORAGE WITH HEIGHT GREATER THAN 32"



ELEVATION VIEW OF CONCRETE
BARRIER EXTENSION NEAR END ANCHORAGE



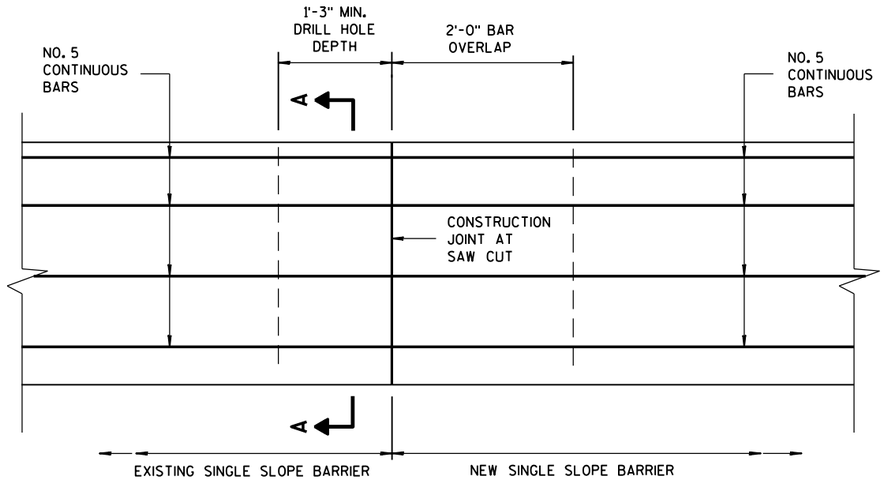
ELEVATION VIEW OF CONCRETE
BARRIER EXTENSION NEAR THRIE BEAM TERMINAL



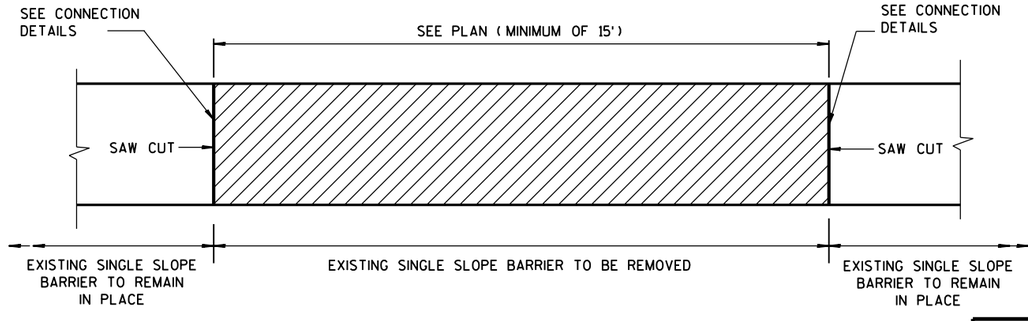
SECTION A-A

GENERAL NOTES

1. THE NUMBER OF DRILL HOLES IS EQUAL TO THE NUMBER OF REBAR IN BARRIER (SEE OTHER DETAILS).
2. MINIMUM DEPTH OF DRILL HOLES IS 1'-3".
3. DRILL HOLES TO BE A MINIMUM OF 4 INCHES FROM THE EDGE OF CONCRETE.
4. INSTALL EPOXY COATED NO. 5 BARS IN DRILL HOLES.
5. END ANCHORAGE MAY OR MAY NOT BE PRESENT ON EXISTING BARRIER.
6. REMOVE THRIE BEAM ANCHORAGE AS SHOWN.



CONNECTION OF EXISTING SINGLE SLOPE CONCRETE BARRIER TO
NEW SINGLE SLOPE CONCRETE BARRIER



ELEVATION FILE
BARRIER REMOVAL AND REPLACEMENT

RETROFIT OR REPAIR SINGLE SLOPE CONCRETE BARRIER

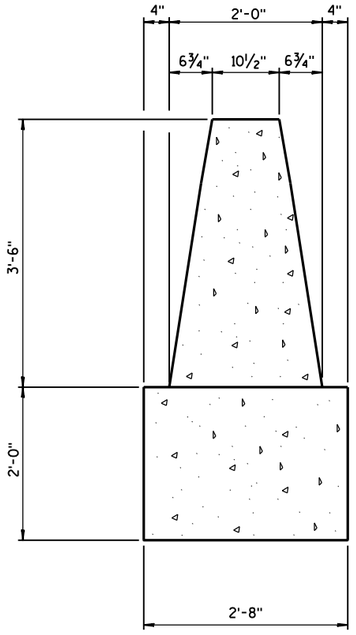
CONCRETE BARRIER
SINGLE SLOPE

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

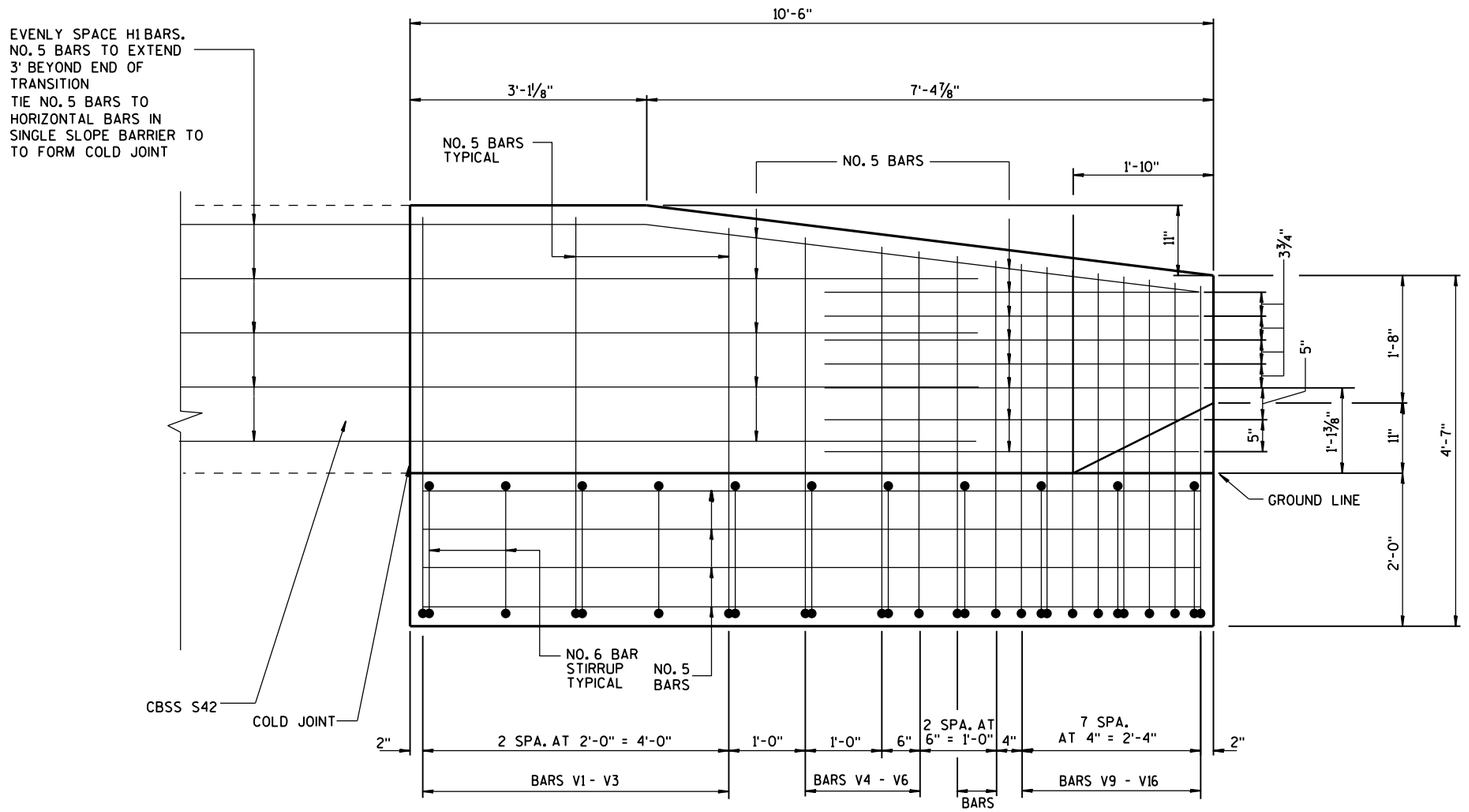
APPROVED
June 2014 — DATE
FHWA

/S/ Jerry H. Zogg — ROADWAY STANDARDS DEVELOPMENT ENGINEER

14B33 sheet g: Concrete Barrier Single Slope 42-inch Thrie Beam Anchorage-Barrier Layout

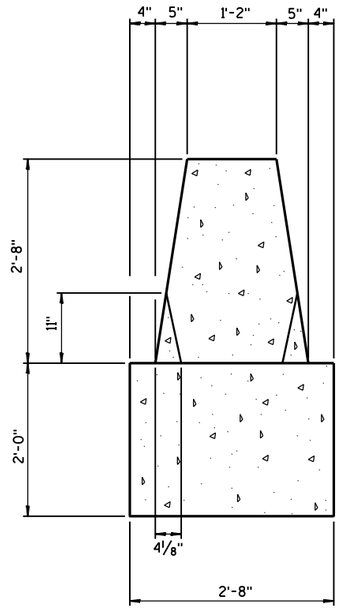


SECTION A-A

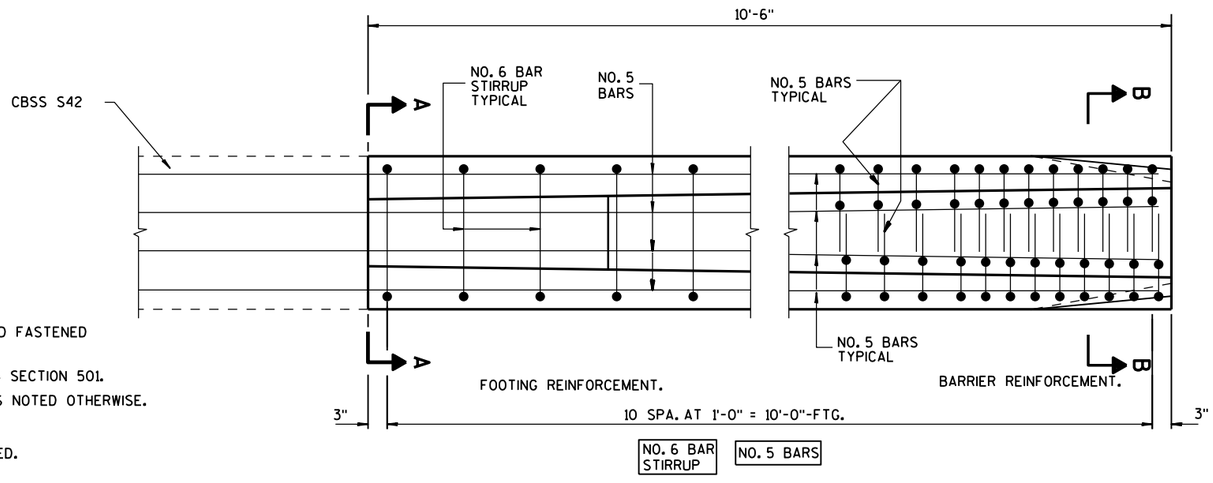


SEE SECTIONS ① THRU ⑯

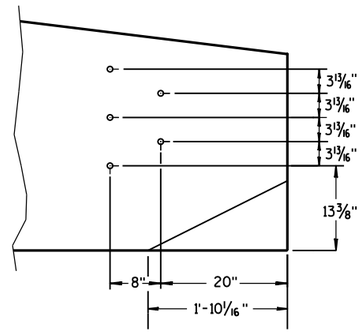
ELEVATION VIEW



SECTION B-B



PLAN VIEW



PVC PIPE LOCATIONS

GENERAL NOTES

CONSTRUCT PER STANDARD SPECIFICATION 603.

SPLICES OF LONGITUDINAL BARS TO BE 2'LONG AND FIRMLY TIED AND FASTENED TOGETHER UNLESS NOTED OTHERWISE.

4000 PSI CONCRETE AIR ENTRAINMENT PER STANDARD SPECIFICATIONS SECTION 501.

USE ¾" BEVEL OR 1" RADIUS ON ALL EXPOSED SHARP EDGES UNLESS NOTED OTHERWISE.

THRIE BEAM ANCHOR INCIDENTAL TO CONCRETE BARRIER ITEM.

INSTALL SCHEDULE 40 PVC PIPE 1" DIAMETER AT LOCATIONS INDICATED.

EXTEND PVC PIPE COMPLETELY THROUGH BARRIER.

CUT ENDS OF PVC PIPE FLUSH WITH FINISHED FACE of BARRIER.

THE NUMBER IN BAR DESIGNATION REPRESENTS THE BARS LOCATION.

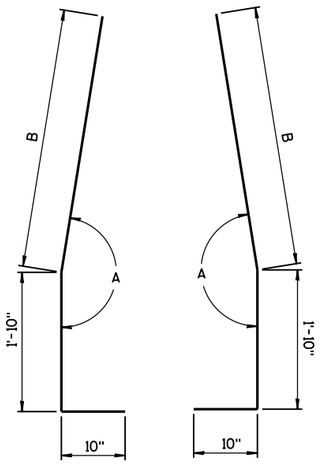
2" CLEAR COVER TYPICAL.

CONCRETE BARRIER SINGLE SLOPE 42" THRIE BEAM ANCHOR

14B33 sheet h: Bar Details for Single Slope 42-inch Thrie Beam Anchorage-Steel Layout #1

BAR CHART
SECTIONS V1 - V11

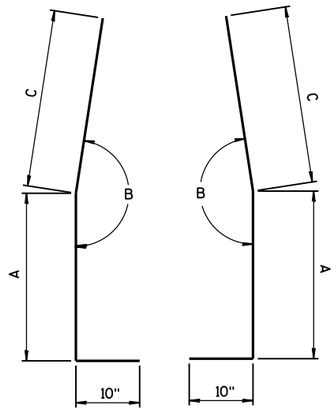
BAR	A	B
V1	170°-50'	3'-4½"
V2	171°-20'	3'-4½"
V3	171°-30'	3'-2½"
V4	171°-25'	3'-1½"
V5	171°-15'	3'-0"
V6	171°-15'	2'-11"
V7	171°-20'	2'-10½"
V8	171°-10'	2'-9½"
V9	171°-10'	2'-9"
V10	171°-05'	2'-8½"
V11	171°-10'	2'-8"



BAR BENDING DETAIL
FOR BARS V1 - V11

BAR CHART
SECTIONS V12 - V13

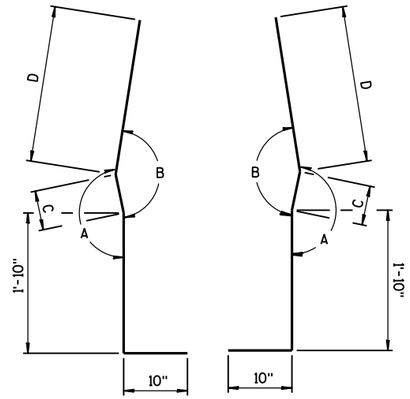
BAR	A	B	C
V12	2'-2"	171°-15'	2'-3½"
V13	2'-7"	171°-05'	1'-10"



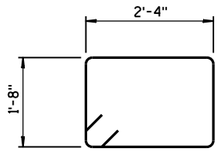
BAR BENDING DETAIL
FOR BARS V12 - V13

BAR CHART
SECTIONS V14 - V16

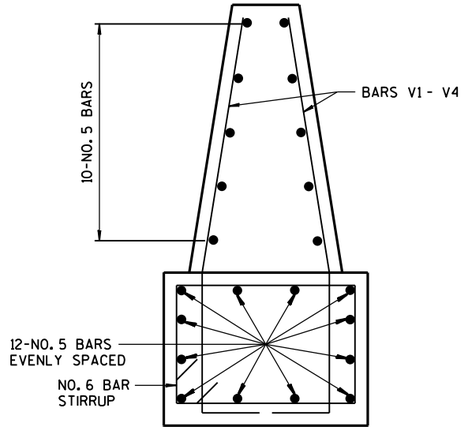
BAR	A	B	C	D
V14	168°-15'	159°-15'	6"	2'-0"
V15	169°-20'	161°-00'	8"	1'-10"
V16	168°-40'	160°-10'	10"	1'-8"



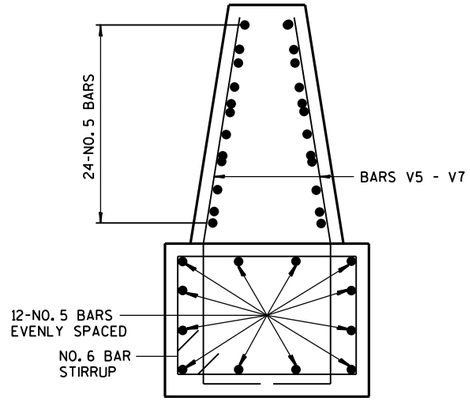
BAR BENDING DETAIL
FOR BARS V14 - V16



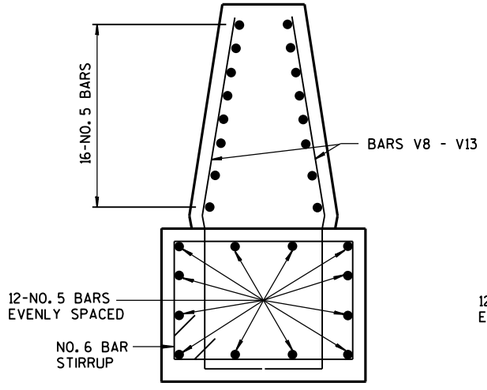
STIRRUP BAR
BENDING DETAIL



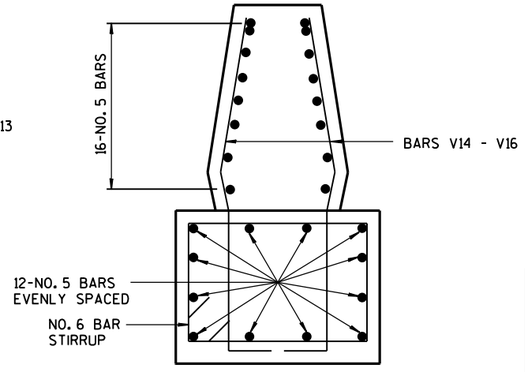
BAR DETAIL
SECTIONS V1 - V4



BAR DETAIL
SECTIONS V5 - V7



BAR DETAIL
SECTIONS V8 - V13



BAR DETAIL
SECTIONS V14 - V16

CONCRETE BARRIER
SINGLE SLOPE 42"
THRIE BEAM ANCHOR

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

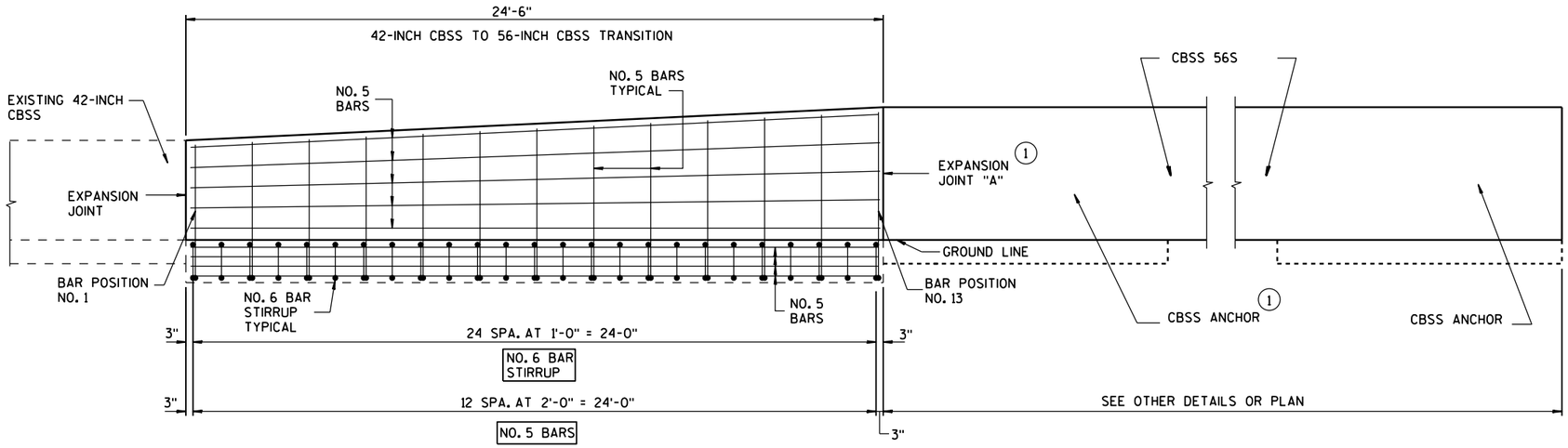
APPROVED

6-3-2010
DATE

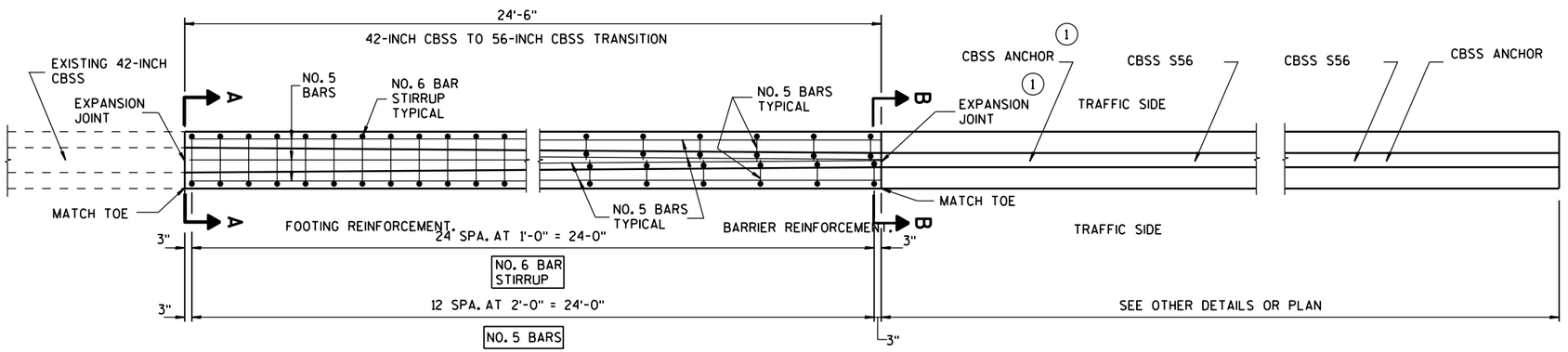
/S/ Jerry H. Zogg 20
ROADWAY STANDARDS DEVELOPMENT ENGINEER

FHWA

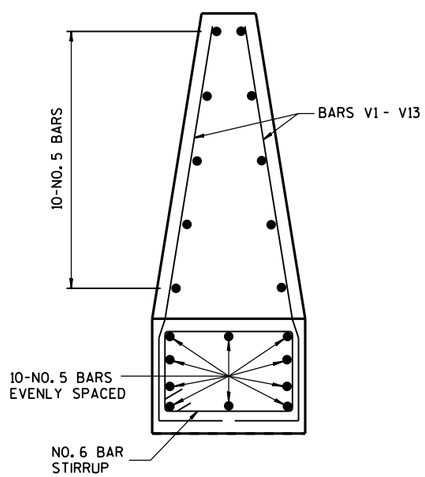
14B39 sheet e: Height Transition From 42-inch Single Slope to 56-inch Single Slope



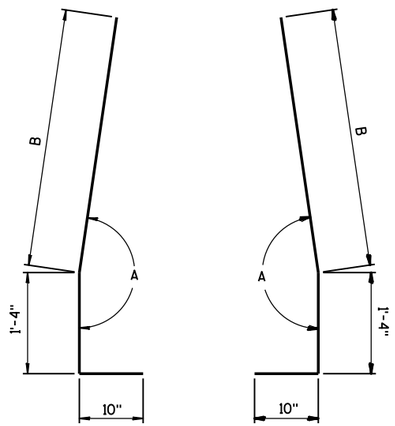
ELEVATION VIEW



PLAN VIEW



BAR DETAIL
BAR POSITION NO. 1 - NO. 13



BAR BENDING DETAIL
FOR BARS V1 - V13

BAR CHART SECTIONS V1 - V13

BAR	A	B
V1	170°-50'	3'-4½"
V2	170°-50'	3'-6"
V3	170°-55'	3'-7"
V4	171°	3'-8"
V5	170°-55'	3'-9½"
V6	170°-50'	3'-10½"
V7	170°-50'	3'-11½"

BAR	A	B
V8	170°-55'	4'-0½"
V9	170°-50'	4'-2"
V10	170°-50'	4'-3"
V11	170°-50'	4'-4½"
V12	170°-55'	4'-5½"
V13	170°-50'	4'-6½"

GENERAL NOTES

CONSTRUCT PER STANDARD SPECIFICATION 603.

SPLICES OF LONGITUDINAL BARS TO BE 2' LONG AND FIRMLY TIED AND FASTENED TOGETHER UNLESS NOTED OTHERWISE.

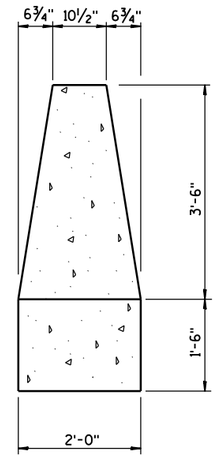
4000 PSI CONCRETE AIR ENTRAINMENT PER STANDARD SPECIFICATIONS 501.

USE ¾" BEVEL OR 1" RADIUS ON ALL EXPOSED SHARP EDGES UNLESS NOTED OTHERWISE.

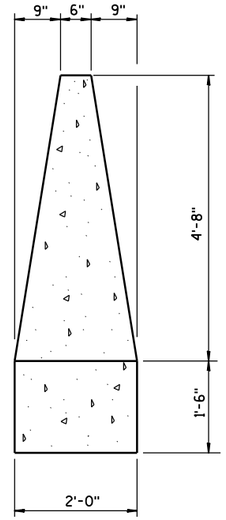
THE NUMBER IN BAR DESIGNATION REPRESENTS THE BARS LOCATION.

2" CLEAR COVER TYPICAL.

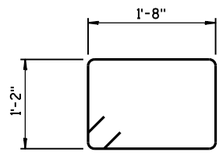
(1) EXPANSION JOINT "A" MAY BE REPLACED WITH A COLD-JOINT PROVIDED THAT 3 FEET OF LAP OF LONGITUDINAL STEEL IS PROVIDED. IF COLD-JOINT IS USED ANCHOR NOT REQUIRED.



SECTION A-A



SECTION B-B



STIRRUP BAR
BENDING DETAIL

42-INCH SINGLE SLOPE CONCRETE BARRIER TO 56-INCH SINGLE SLOPE CONCRETE BARRIER HEIGHT TRANSITION

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
6-3-2010
DATE
/S/ Jerry H. Zogg
ROADWAY STANDARDS DEVELOPMENT ENGINEER
FHWA

6

S.D.D. 14 B 39-1e

6

S.D.D. 14 B 39-1e

14B42 sheet a: Midwest Guardrail System (MGS) Installation Cross Sections, Post and Block Details

GENERAL NOTES

1. WOOD OR STEEL POSTS (w6X9 OR w6X8.5) MAY BE USED. DO NOT INTERMIX WOOD AND STEEL POSTS. INSTALL STEEL POSTS WITH HOLES ON APPROACHING TRAFFIC SIDE.

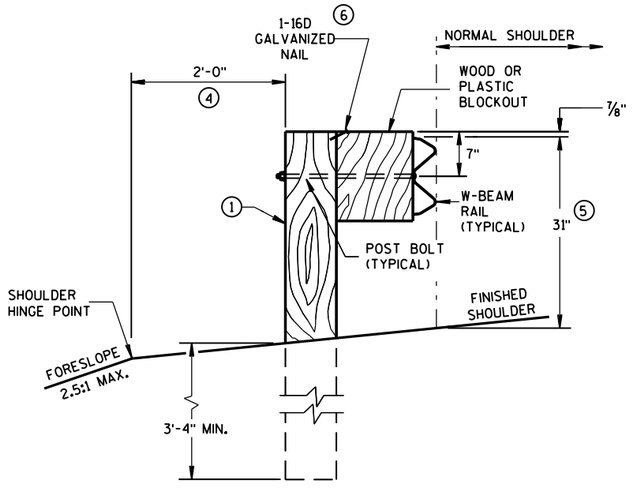
2. USE WOOD OR APPROVED PLASTIC BLOCKOUTS. WOOD BLOCKOUTS MAY BE CONSTRUCTED OUT OF TWO OR MORE WOOD BLOCKOUTS. SEE ALTERNATE WOOD BLOCKOUT DETAIL. DIMENSIONS OF APPROVED PLASTIC BLOCKOUTS MAY VARY.

3. IF ROCK IS ENCOUNTERED DURING EXCAVATION, PROVIDE A HOLE 12 INCHES IN DIAMETER EXTENDING 20 INCHES DEEP INTO THE ROCK. PLACE APPROXIMATELY 2½ INCHES OF GRANULAR MATERIAL IN THE BOTTOM OF THE HOLE. CUT THE POSTS THE TO LENGTH AMD INSTALL. BACKFILL WITH EXCAVATED MATERIAL AND COMPACT. BACKFILL IS TO BE FREE OF LARGE ROCKS.

4. WHEN THE DISTANCE FROM BACK OF POST TO SHOULDER HINGE POINT IS LESS THAN 2 FEET INSTALL LONGER POST AT HALF POST SPACING (K).

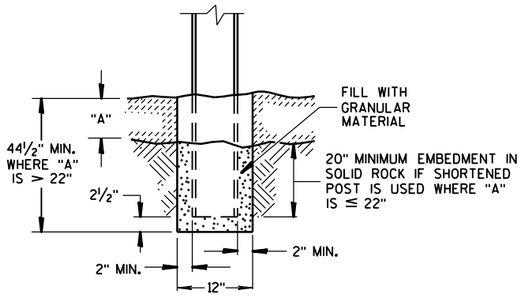
5. FOR NEW MGS INSTALLATION TOP OF W-BEAM RAIL TOLERANCE IS ± 1". FOR EXISTING MGS INSTALLATION TOP OF W-BEAM IS BETWEEN 27¾" TO 32".

6. WHEN USING STEEL POST 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.



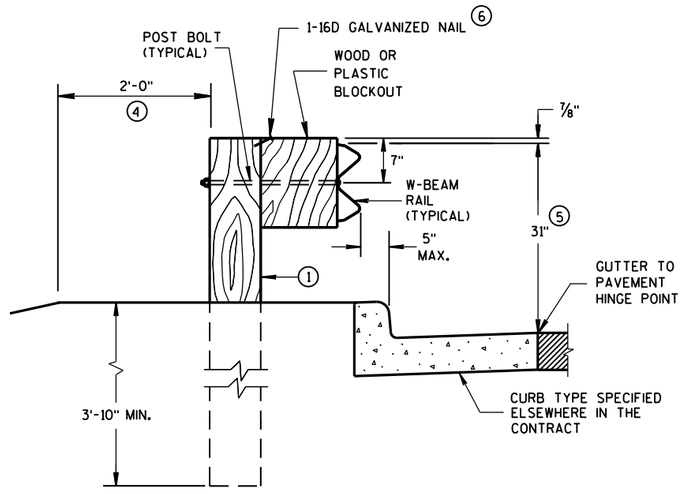
END VIEW

LOCATED ALONG A ROADWAY SHOULDER
STANDARD INSTALLATION



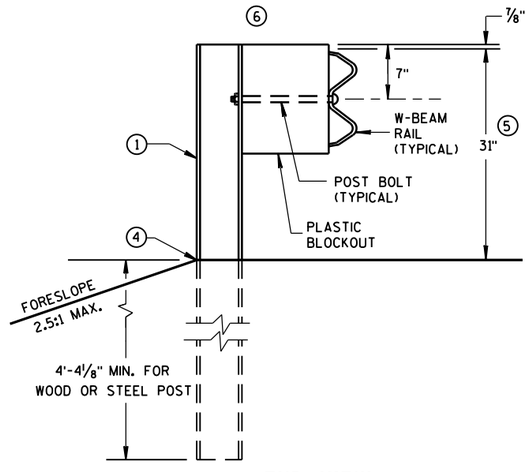
END VIEW

SETTING STEEL OR WOOD POST IN ROCK ③



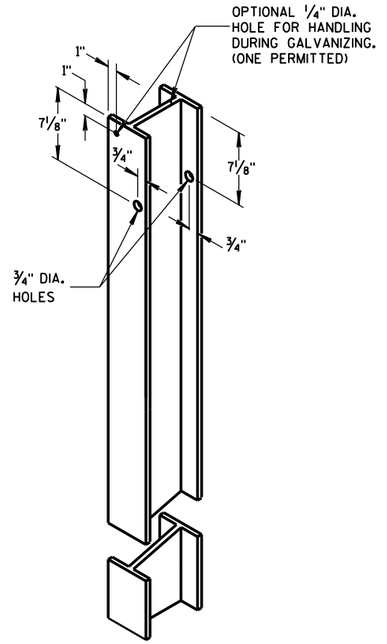
END VIEW

LOCATED ALONG A CURBED ROADWAY

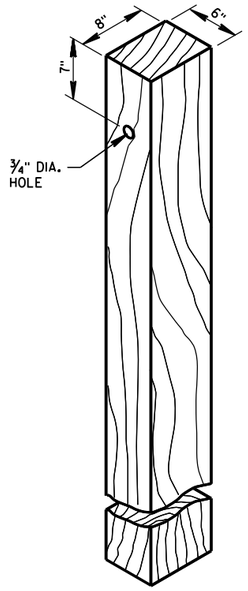


END VIEW

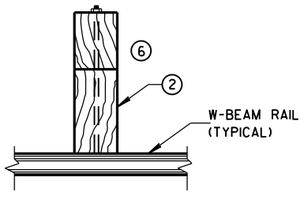
MGS LONGER POST AT HALFPOST SPACING W BEAM (K)



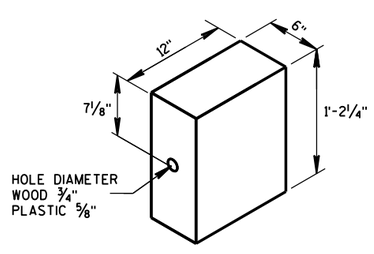
STEEL POST &
HOLE PUNCHING DETAIL
(w6X9) ①



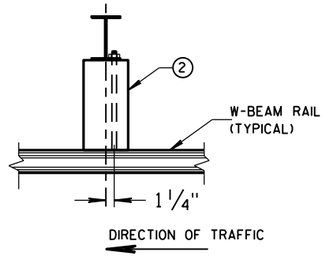
WOOD POST
(6" X 8") NOMINAL ①



PLAN VIEW
WOOD POST,
BLOCKOUT & BEAM



WOOD OR
PLASTIC BLOCKOUT ②



PLAN VIEW
STEEL POST,
PLASTIC BLOCKOUT & BEAM

MIDWEST GUARDRAIL SYSTEM
(MGS) GUARDRAIL

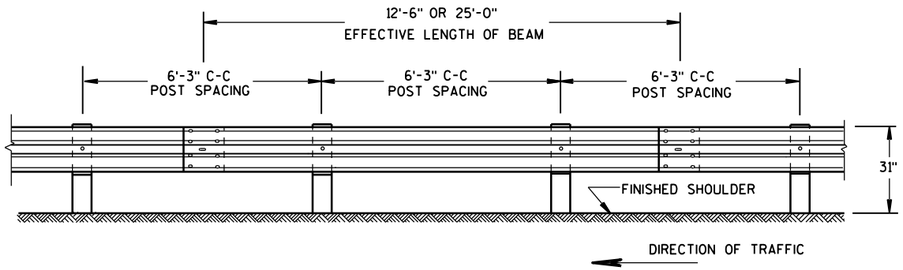
STATE OF WISCONSIN 31
DEPARTMENT OF TRANSPORTATION

6

S.D.D. 14 B 42-3a

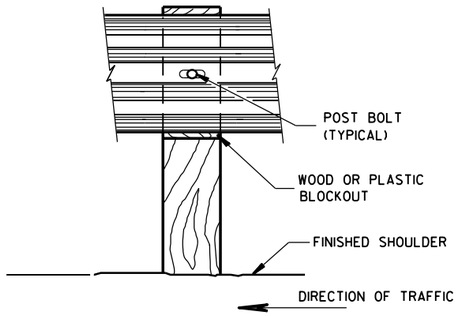
6

S.D.D. 14 B 42-3a



FRONT VIEW

POST SPACING STANDARD INSTALLATION



FRONT VIEW AT WOOD POST

GENERAL NOTES

(7) PROVIDE SILVER REFLECTIVE SHEETING ON ALL REFLECTORS EXCEPT THOSE LOCATED ALONG THE LEFT EDGE OF ONE-WAY ROADWAYS, WHICH SHALL BE PROVIDED WITH YELLOW REFLECTIVE SHEETING. SHEETING IS TYPE H. SEE STANDARD SPECIFICATION 637.

(8) DO NOT INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINAL. RAIL SPLICE LOCATIONS ARE THE ONLY ACCEPTABLE LOCATIONS FOR REFLECTORS.

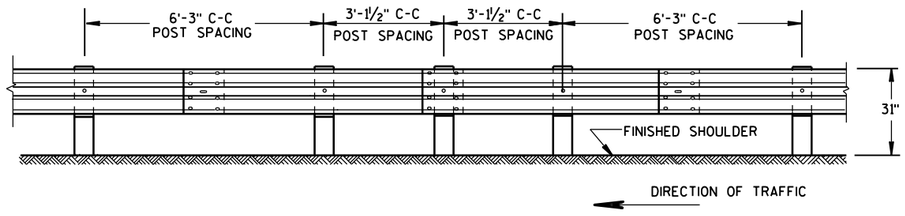
(9) REVERSE EVERY OTHER REFLECTOR FOR 2-WAY VISIBILITY. THE CONTRACTOR MAY FURNISH TWO-SIDED REFLECTORS IN LIEU OF ONE-SIDED REFLECTORS.

(10) PROVIDE AN ANGLE OF BEND OF 90° ± 1° FOR TWO-SIDED REFLECTORS.

(11) 25 FEET OF HALF POST SPACING IS REQUIRED ON APPROACH AND DEPARTURE ENDS OF QUARTER POST SPACING.

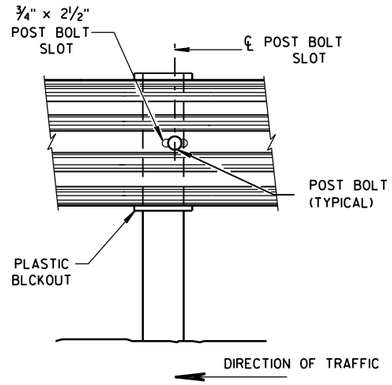
POST BOLTS ARE A 5/8" DIAMETER ASTM A307 GUARDRAIL BOLT. A POST BOLT REQUIRES 5/8" DIAMETER A563A DOUBLE RECESSED (DR) HEAVY HEX NUT AND 5/8" DIAMETER F844 FLAT WASHER. POST BOLTS MAY BE LONGER IF MULTIPLE BLOCKOUTS ARE BEING USED.

GUARD RAIL SPLICE BOLTS ARE A 5/8" DIAMETER ASTM A307 GUARDRAIL HEAD BOLT. A GUARDRAIL SPLICE BOLT REQUIRES 5/8" DIAMETER A563A DOUBLE RECESSED (DR) HEAVY HEX NUT.

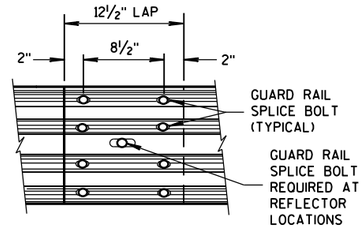


FRONT VIEW

HALF POST SPACING (HS) AND HALF POST SPACING WITH LONGER POSTS (K)

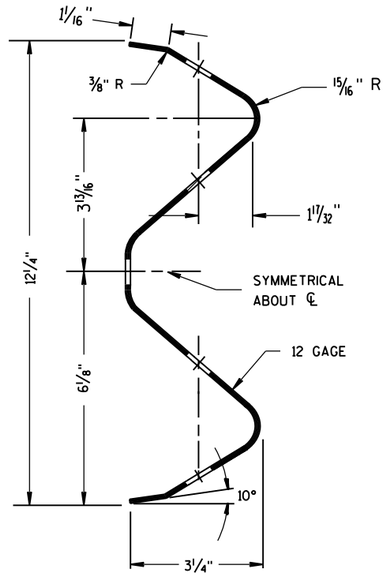


FRONT VIEW AT STEEL POST

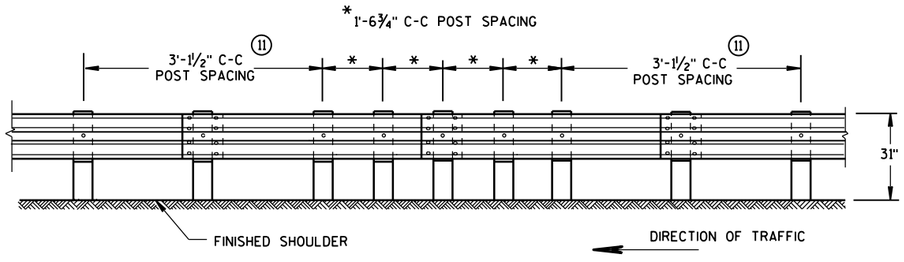


FRONT VIEW

MID-SPAN BEAM SPLICE

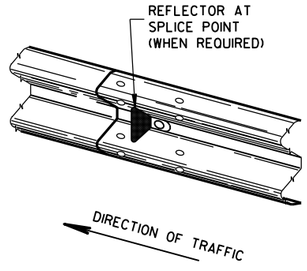


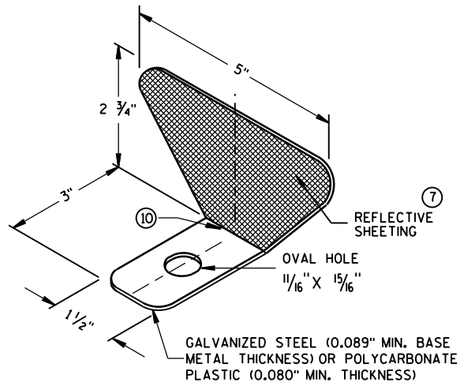
SECTION THRU W-BEAM RAIL



FRONT VIEW

QUARTER POST SPACING (QS)





ONE SIDED REFLECTOR DETAIL AND TYPICAL INSTALLATION (7)

REFLECTOR SPACING (8)

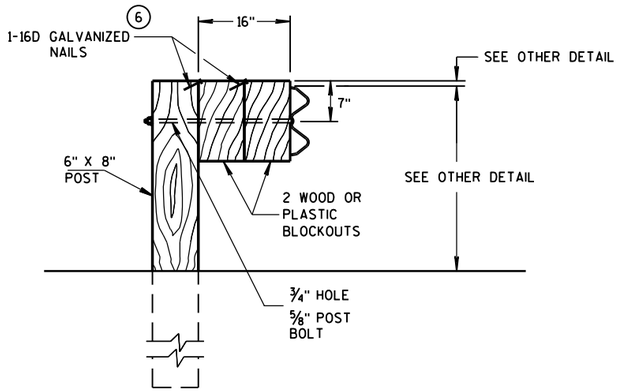
	BEAM GUARD LENGTH	REFLECTOR SPACING	NO. SURFACES REFLECTORIZED	MIN. NO. REFLECTORS
ONE WAY TRAFFIC	< 200'	50' C-C	1	3
	> 200'	100' C-C	1	
TWO WAY TRAFFIC	< 200'	25' C-C	1 (9)	6
	> 200'	50' C-C	1	
TWO WAY TRAFFIC	< 200'	50' C-C	2	3
	> 200'	100' C-C	2 (10)	

MIDWEST GUARDRAIL SYSTEM
(MGS) GUARDRAIL

STATE OF WISCONSIN 32
DEPARTMENT OF TRANSPORTATION

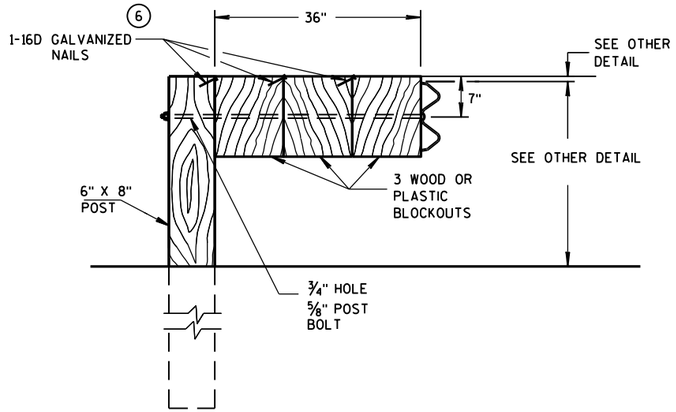
S.D.D. 14 B 42-3b

S.D.D. 14 B 42-3b



DETAIL FOR 16" BLOCKOUT DEPTH

IT IS ACCEPTABLE TO USE BLOCKOUTS UP TO 16" DEEP TO INCREASE THE POST OFFSET TO AVOID UNDERGROUND OBSTACLES. THERE IS NO LIMIT TO THE NUMBER OF POSTS THAT CAN HAVE ADDITIONAL BLOCKOUTS UP TO 16" DEEP.

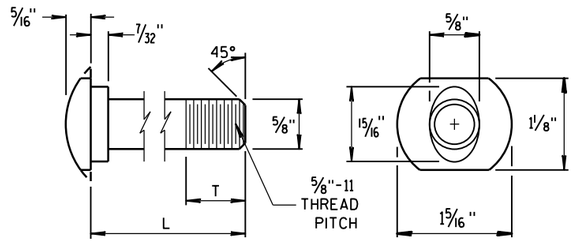


DETAIL FOR 36" BLOCKOUT DEPTH

NOTES: UNDER SPECIAL CIRCUMSTANCES, SUCH AS AVOIDING OBSTACLES THAT ARE NOT RELOCATED, IT IS ACCEPTABLE TO INSTALL ADDITIONAL BLOCKOUTS TO OBTAIN UP TO 36" DEPTH FOR ONE OR TWO POSTS IN A SECTION OF GUARDRAIL.

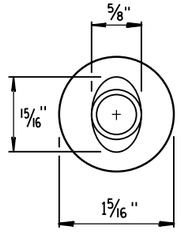
DO NOT USE 16" OR 36" BLOCKOUTS IF IT CAUSES THE POST TO BE DRIVEN BEYOND SHOULDER HINGE POINT OR CAUSES A FIXED OBJECT TO BE WITHIN THE DEFLECTION DISTANCE OF THE BARRIER.

NOTE: 1. ALL FILLETS SHALL HAVE A MINIMUM RADIUS OF 1/16".
2. IF THE BOLT EXTENDS MORE THAN 1/4" FROM THE NUT THE BOLT SHOULD BE TRIMMED BACK.

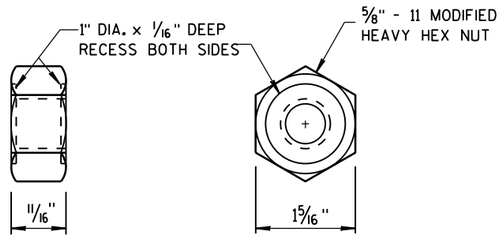


POST BOLT TABLE

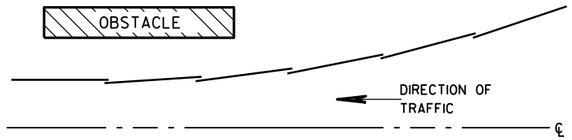
L	T (MIN.)
1¼"	1⅛"
2"	1¾"
10"	4"
14"	4 1/16"
18"	4"
21"	4 1/16"
25"	4"



ALTERNATE BOLT HEAD

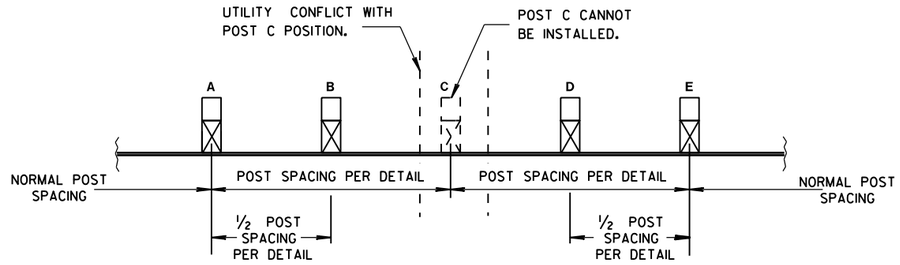


POST BOLT AND RECESS NUT

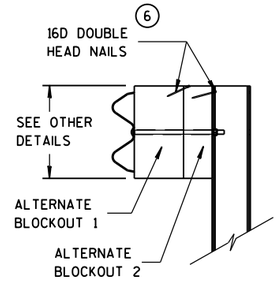


PLAN VIEW

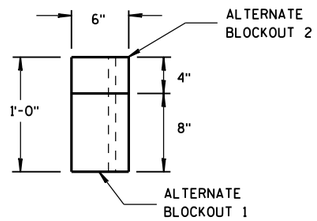
BEAM LAPPING DETAIL



POST DRIVING FOR CONTINUOUS UNDERGROUND OBSTRUCTION



SIDE VIEW



TOP VIEW

ALTERNATE WOOD BLOCKOUT DETAIL

MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

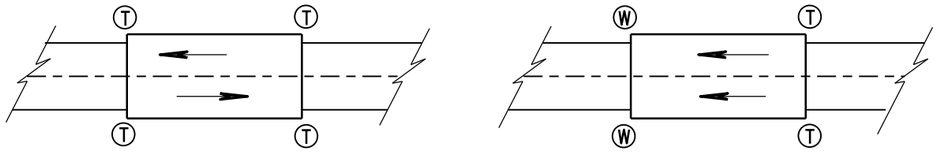
APPROVED
June 2014
DATE
FHWA

/S/ Jerry H. Zogg
ROADWAY STANDARDS DEVELOPMENT ENGINEER

6

S.D.D. 14 B 42-3c

14B45 sheet a: Midwest Guardrail System (MGS) Thrie Beam Transition: Layout



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

GENERAL NOTES

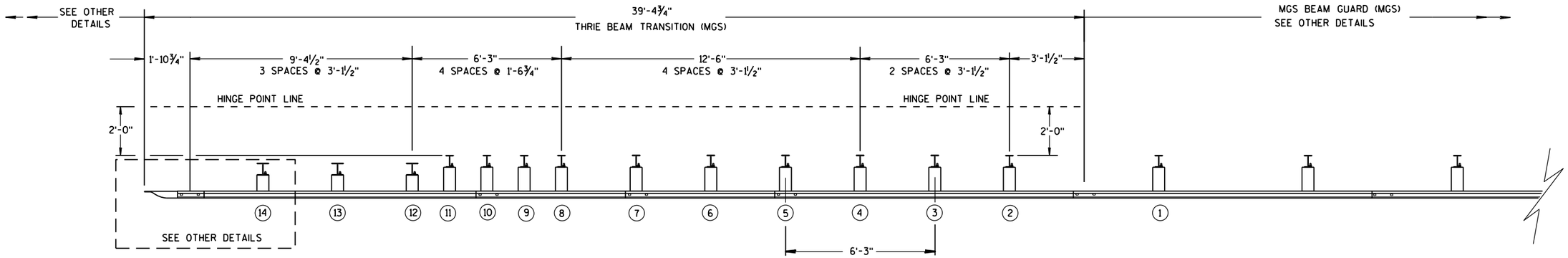
BOLT THE THRIE BEAM TO ALL POSTS AND BLOCKOUTS. DRILL OR PUNCH BOLT HOLES IN THE BEAM IF THE POST SPACING IS LESS THAN 6'-3.

IF ROCK IS ENCOUNTERED, REMOVE ROCK TO FULL DEPTH OF POST PLUS 2½", AND 12" DIAMETER AROUND POST. SEE 14B42 FOR MORE DETAILS.

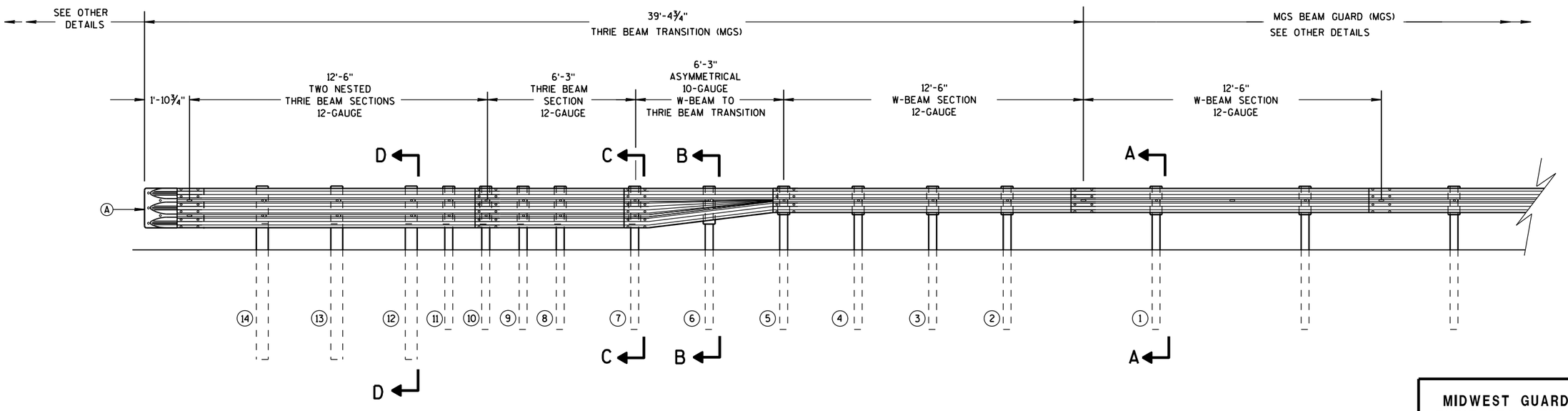
TRANSITION USES STEEL POSTS ONLY.

SEE STANDARD DETAIL DRAWING 14 B 42 FOR MORE INFORMATION.

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



PLAN VIEW



ELEVATION VIEW

MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN 34
DEPARTMENT OF TRANSPORTATION

6

S.D.D. 14 B 45-3a

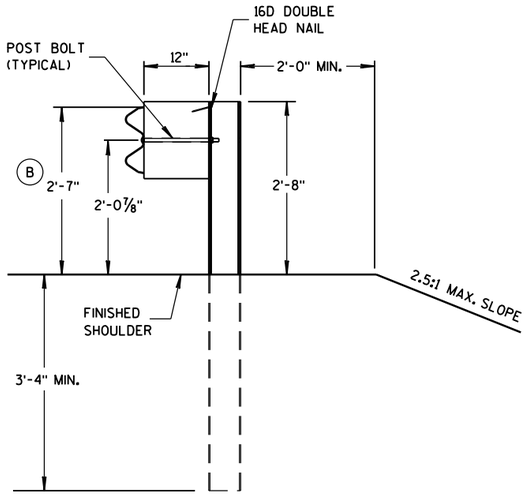
6

S.D.D. 14 B 45-3a

14B45 sheet b: Midwest Guardrail System (MGS) Thrie Beam Transition: Cross Sections, Thrie Beam Details, Splice Detail

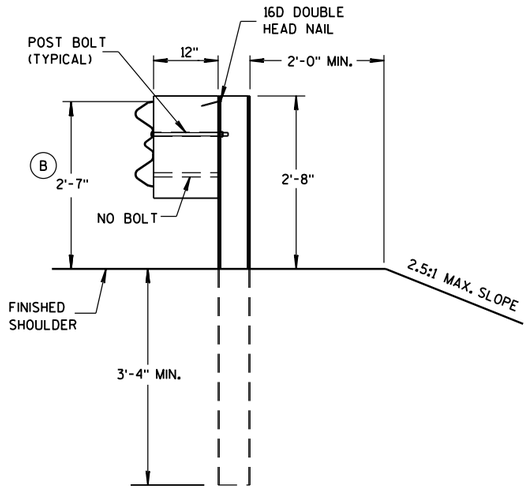
GENERAL NOTES

(B) TOLERANCE FOR TOP OF W-BEAM RAIL IS ± 1".



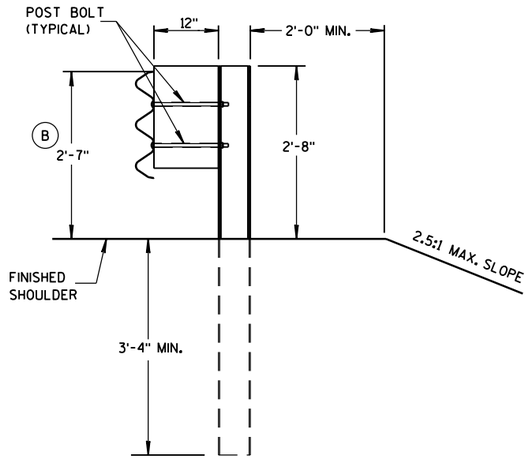
SECTION A-A

POSTS 1-5



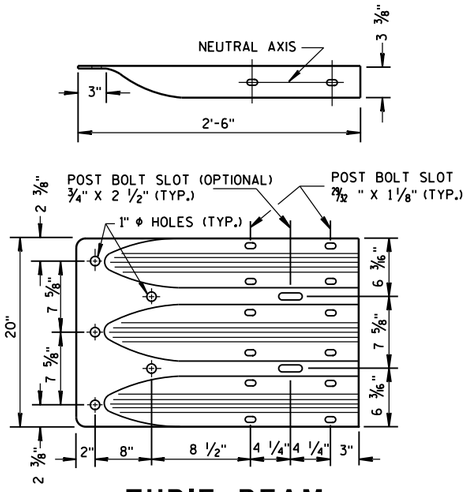
SECTION B-B

POST 6

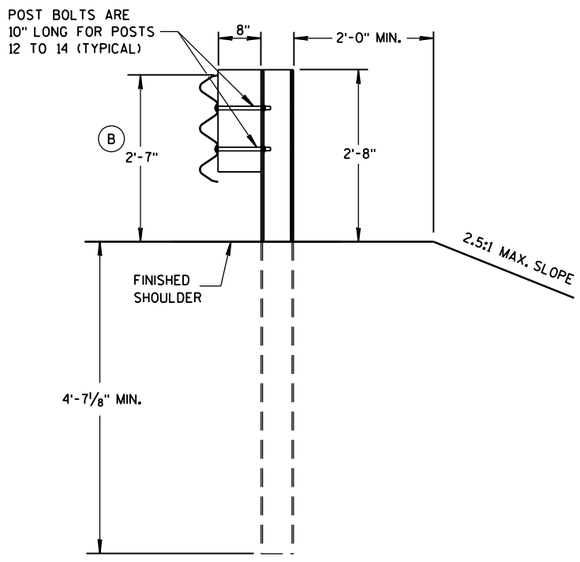


SECTION C-C

POSTS 7-11

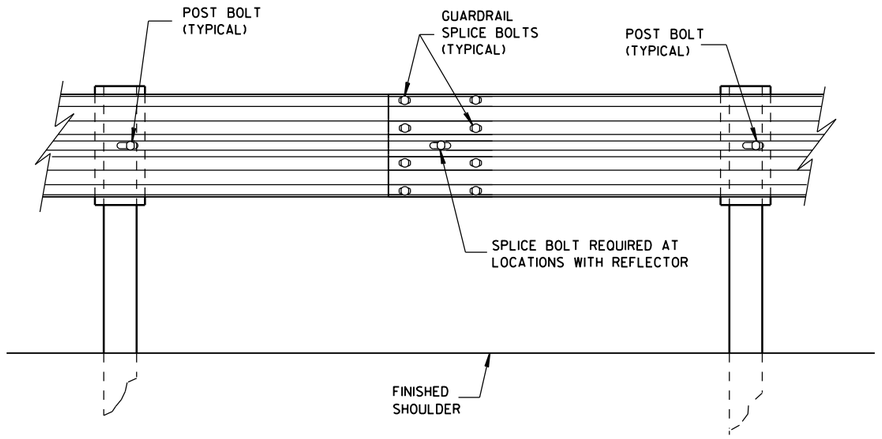


THRIE BEAM TERMINAL CONNECTOR



SECTION D-D

POSTS 12-14



SPLICE DETAIL

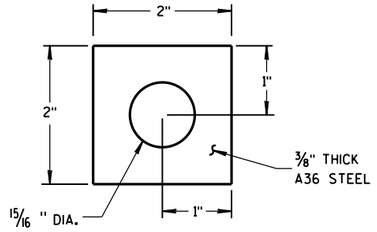
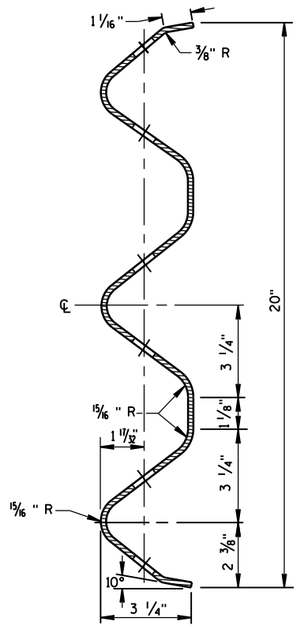


PLATE WASHER DETAIL



SECTION THRU THRIE BEAM RAIL ELEMENT

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN 35
DEPARTMENT OF TRANSPORTATION

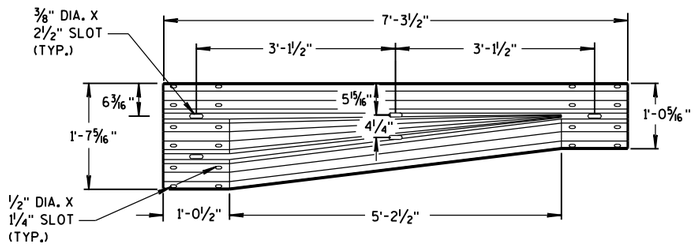
6

S.D.D. 14 B 45-3b

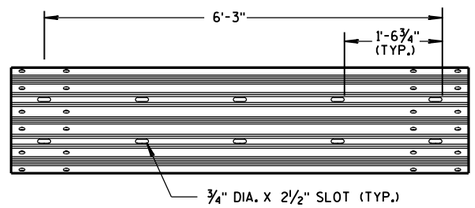
6

S.D.D. 14 B 45-3b

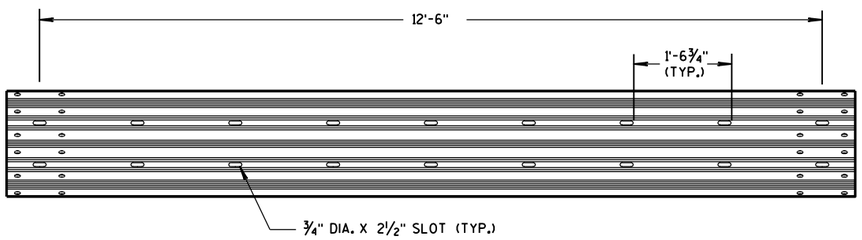
14B45 sheet c: Midwest Guardrail System (MGS) Thrie Beam Transition: Thrie Beam Details, Post Details, Block Details



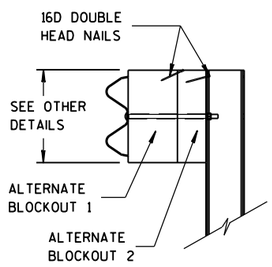
W-BEAM TO THRIE BEAM TRANSITION SECTION



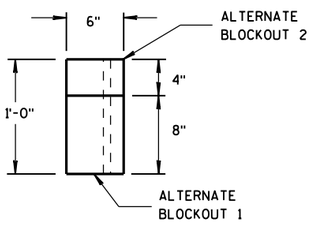
6'-3" THRIE BEAM SECTION



12'-6" THRIE BEAM SECTION

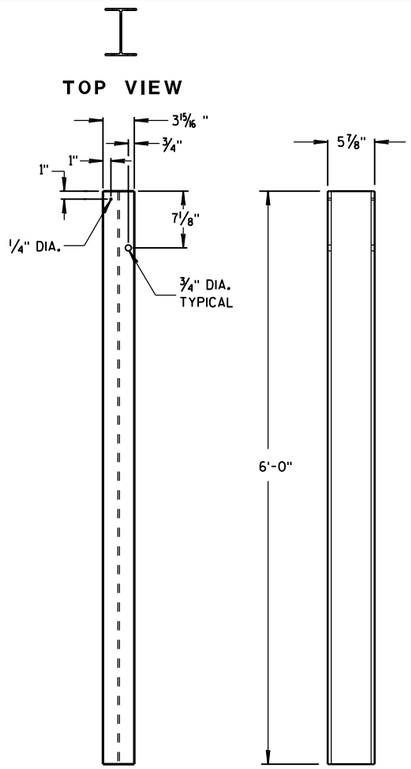


SIDE VIEW

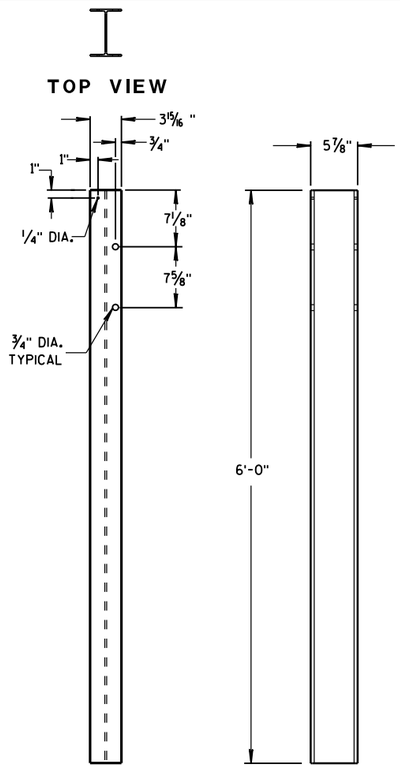


TOP VIEW

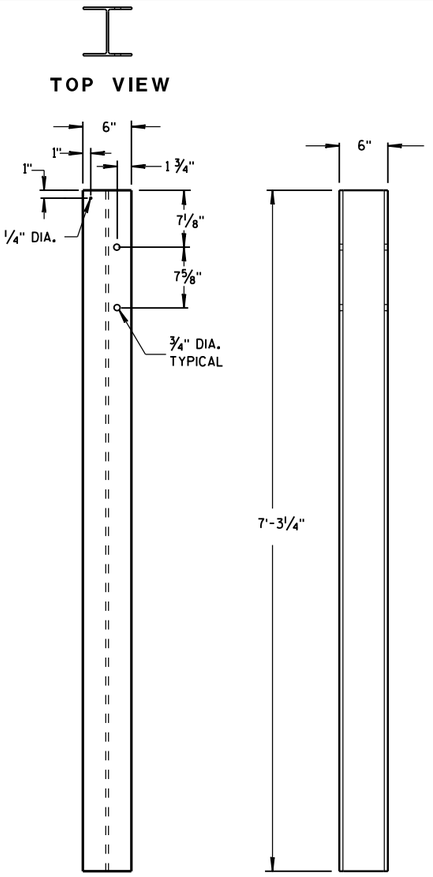
ALTERNATE WOOD BLOCKOUT DETAIL



STEEL POSTS 1-5

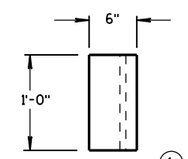


STEEL POSTS 6-11

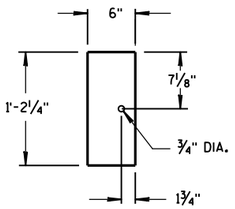


STEEL POSTS 12-14

(1) WOOD BLOCKS MAY BE CONSTRUCTED OUT OF 2 WOOD BLOCKS. SEE ALTERNATE WOOD BLOCK DETAIL.

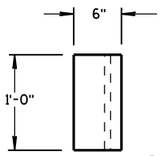


TOP VIEW (1)

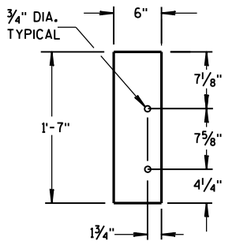


FRONT VIEW

BLOCKOUT POSTS 1-5

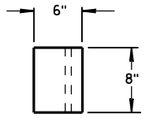


TOP VIEW (1)

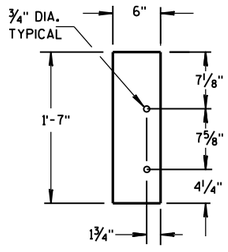


FRONT VIEW

BLOCKOUT POSTS 6-11



TOP VIEW



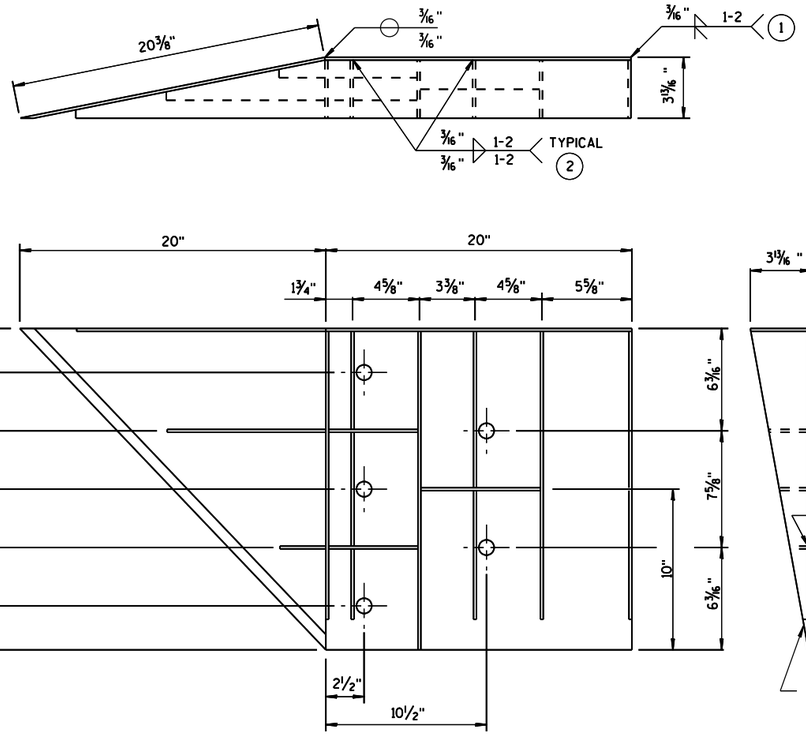
FRONT VIEW

BLOCKOUT POSTS 12-14

STEEL POST SIZES

POST NUMBER	SECTION TYPE	LENGTH
(1)	W6x9	72"
(2)	W6x9	72"
(3)	W6x9	72"
(4)	W6x9	72"
(5)	W6x9	72"
(6)	W6x9	72"
(7)	W6x9	72"
(8)	W6x9	72"
(9)	W6x9	72"
(10)	W6x9	72"
(11)	W6x9	72"
(12)	W6x15	87 1/8"
(13)	W6x15	87 1/8"
(14)	W6x15	87 1/8"

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)



WELDING INSTRUCTION

(VIEWED FROM BACK SIDE OF PLATE)

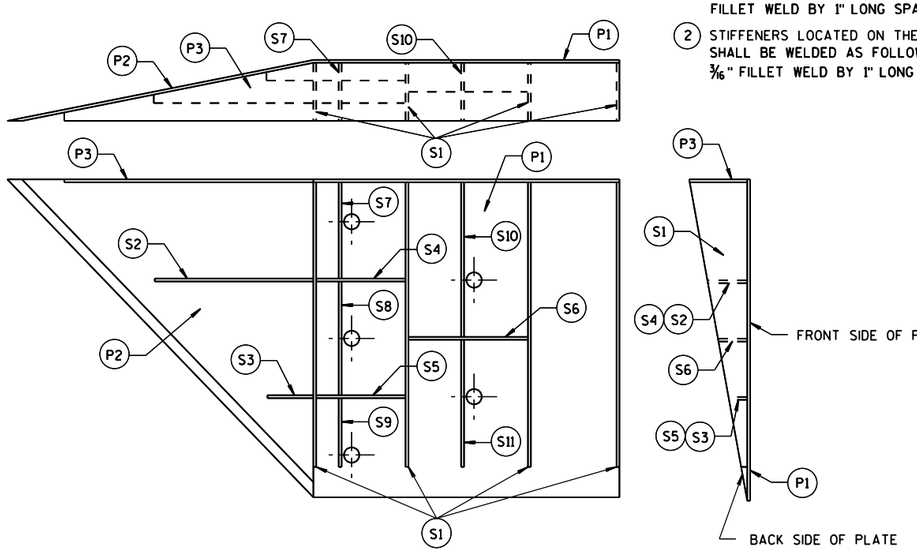


PLATE AND STIFFENER IDENTIFICATION

(VIEWED FROM BACK SIDE OF PLATE)

GENERAL NOTES

COVER PLATE PANELS ARE 3/16" THICK.

ALL STIFFENERS ARE 1/4" THICK.

CONNECTOR PLATE SHALL BE FABRICATED FROM ASTM GRADE A36 STEEL AND GALVANIZED.

FOR GALVANIZED REQUIREMENTS, SEE SECTION 614 OF THE STANDARD SPECIFICATIONS.

ALL HOLE DIAMETERS SHALL BE 1".

FOR OPPOSITE SIDE INSTALLATION MIRROR DRAWINGS.

(1) STIFFENERS LOCATED AT THE OUTSIDE EDGES OF THE COVER PLATES SHALL BE WELDED AS FOLLOWS:
SINGLE BEVEL GROOVE WELD ON EXTERNAL SIDES AND 3/16" FILLET WELD BY 1" LONG SPACED AT 2" ON INTERNAL SIDES.

(2) STIFFENERS LOCATED ON THE INSIDE OF THE COVER PLATE SHALL BE WELDED AS FOLLOWS:
3/16" FILLET WELD BY 1" LONG SPACED AT 2".

CONNECTOR PLATE DIMENSION (PER ASSEMBLY)

PLATE	QUANTITY	SHAPE	SIZE (A x B x C x D)	THICKNESS
P1	1		20" x 20"	3/16"
P2	1		20" x 20" x 28 9/16"	3/16"
P3	1		39" x 3 5/8" x 20" x 19 5/16"	3/16"
S1	4		18 7/16" x 3 3/8" x 18 3/4"	1/4"
S2	1		10 1/4" x 2 7/16" x 10 3/8" x 1/2"	1/4"
S3	1		3" x 1 1/16" x 3 1/8" x 1/2"	1/4"
S4	1		6 1/8" x 2 7/16"	1/4"
S5	1		6 1/8" x 1 1/16"	1/4"
S6	1		7 3/4" x 1 3/4"	1/4"
S7	1		2 9/16" x 6" x 3 5/8" x 5 7/8"	1/4"
S8	1		1 5/32" x 7 1/2" x 2 1/2" x 7 3/8"	1/4"
S9	1		6 1/16" x 6 3/16" x 1 1/32"	1/4"
S10	1		1 7/8" x 9 7/8" x 3 5/8" x 9 11/16"	1/4"
S11	1		8 1/2" x 8 3/4" x 1 13/16"	1/4"

SINGLE SLOPE CONNECTION PLATE

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

8/31/2012
DATE

/S/ Jerry H. Zogg
ROADWAY STANDARDS DEVELOPMENT ENGINEER

FHWA

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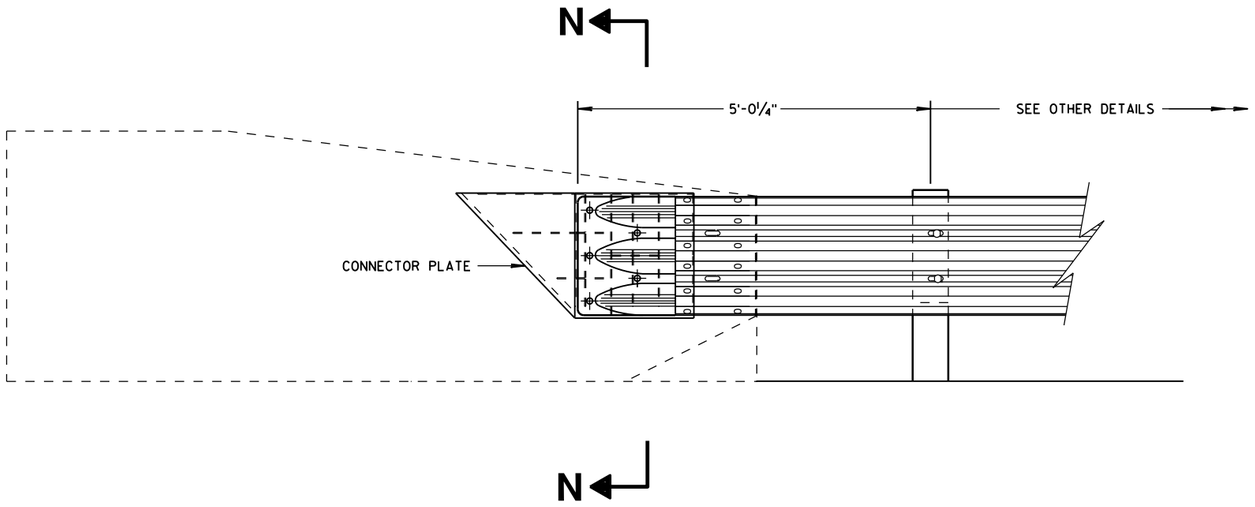
S.D.D. 14 B 45-3i

6

S.D.D. 14 B 45-3i

14B45 sheet j: Midwest Guardrail System (MGS) Thrie Beam Transition: Connection to Single Slope Barrier

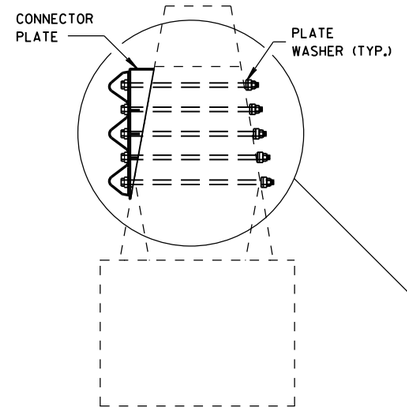


THRIE BEAM CONNECTION TO SINGLE SLOPE BARRIER

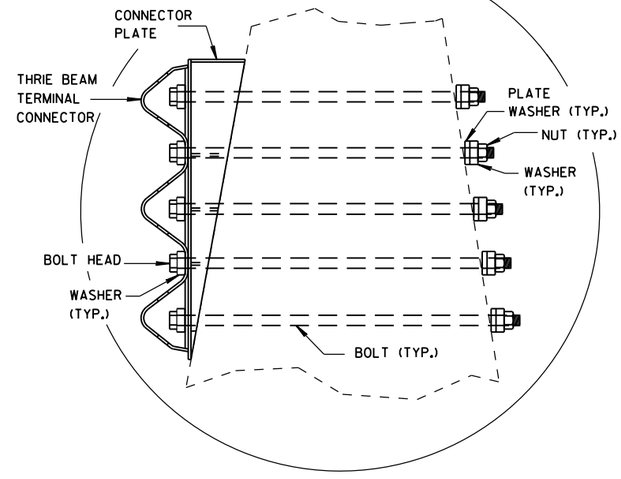
GENERAL NOTES

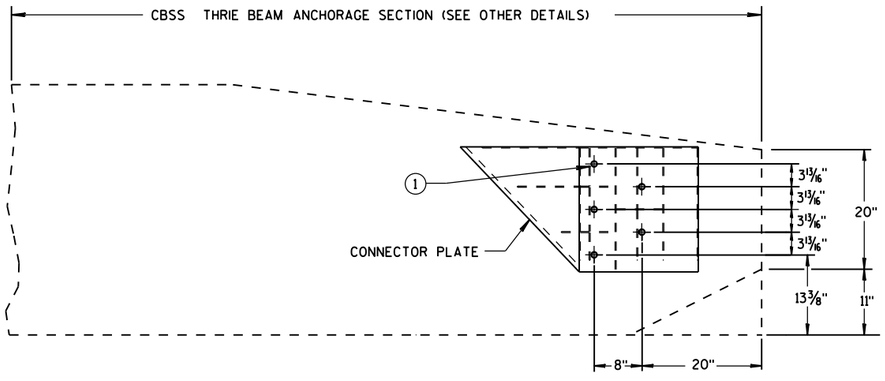
CONNECTOR PLATE, DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.

(1) 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 CONNECTOR PLATE. BOLTS THAT EXTEND THROUGH THE PARAPET AND OUT THE BACK FACE REQUIRE A HARDENED ROUND STEEL WASHER THAT IS 2" O.D. X ⅝" THICK AND ONE PLATE WASHER. REPAIR ANY DAMAGED CONCRETE FROM BOLT INSTALLATION.



SECTION N-N





SINGLE SLOPE CONNECTION PLATE PLACEMENT

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

8/31/2012
DATE

/S/ Jerry H. Zogg
ROADWAY STANDARDS DEVELOPMENT ENGINEER

FHWA

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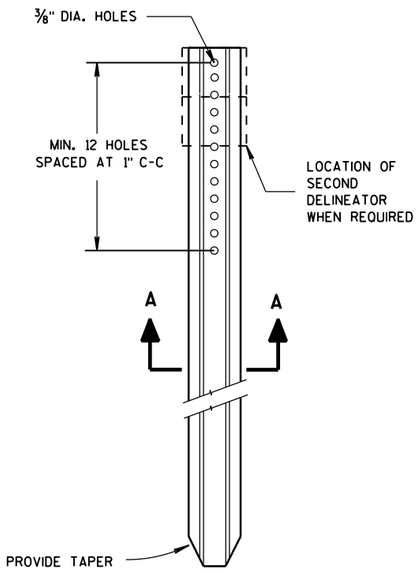
S.D.D. 14 B 45-3j

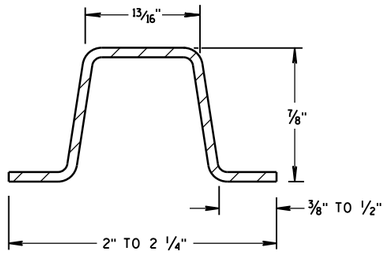
6

S.D.D. 14 B 45-3j

15A2: Delineator Post, Delineator Bracket and Delineator

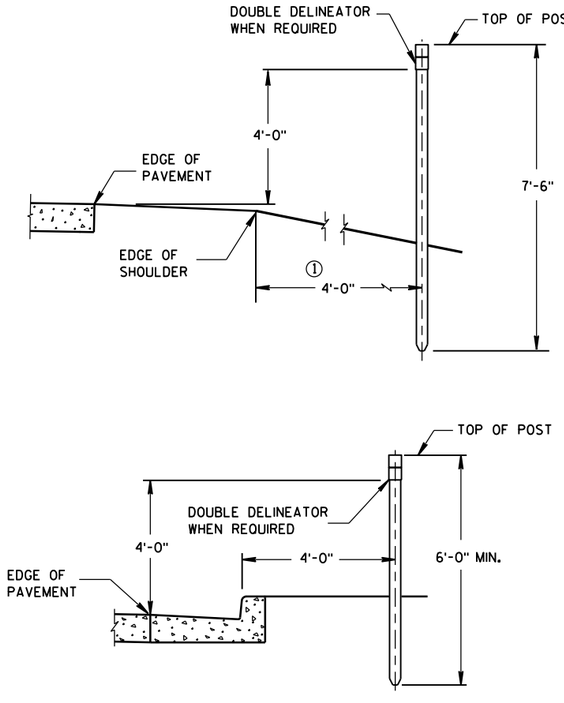


DELINEATOR POST



SECTION A-A

WEIGHT 1.12 LBS PER FT. ± 0.1 LB.

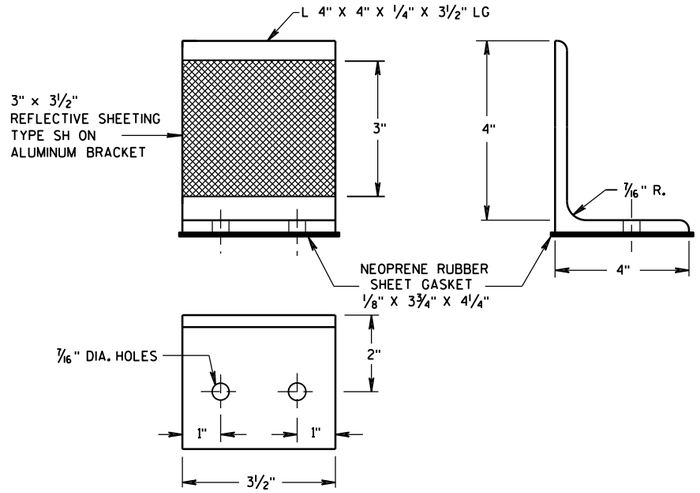


TYPICAL INSTALLATIONS OF DELINEATOR POSTS

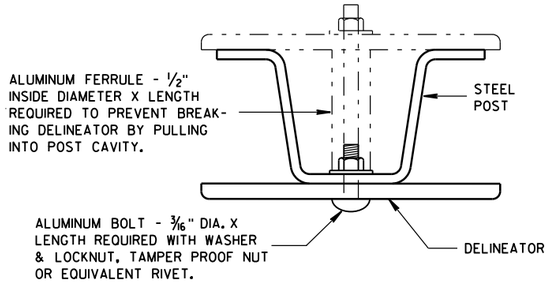
GENERAL NOTES

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

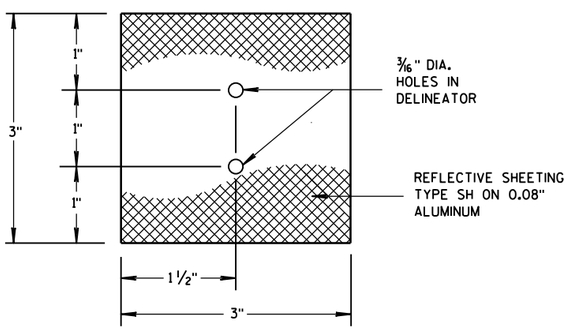
① DELINEATORS SHALL BE PLACED AT A CONSTANT DISTANCE FROM THE EDGE OF THE SHOULDER FOR THE LENGTH OF THE INSTALLATION.



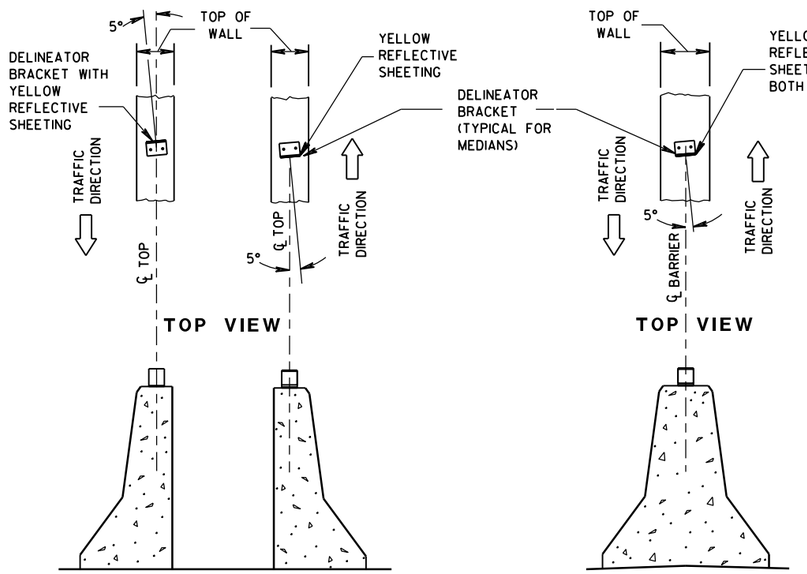
DELINEATOR BRACKET



MOUNTING DETAIL FOR DELINEATOR



3"x 3" DELINEATOR

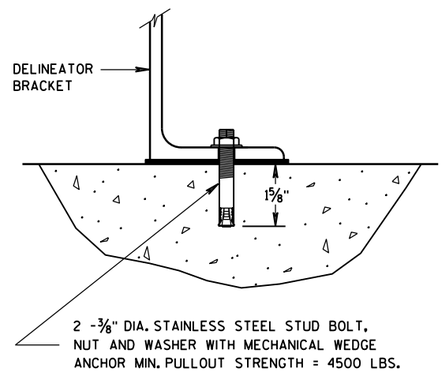


DOUBLE BARRIERS IN MEDIAN

MEDIAN BARRIER

BARRIER LOCATED TO RT. OF TRAFFIC FLOW

LOCATION AND AIMING DETAILS FOR DELINEATOR BRACKETS MOUNTED ON CONCRETE BARRIERS



DELINEATOR BRACKET MOUNTING DETAIL

DELINEATOR POST, DELINEATOR, AND DELINEATOR BRACKET WITH REFLECTIVE SHEETING

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

7/2013
DATE

/S/ Travis Feltes
STATE TRAFFIC ENGINEER

FHWA

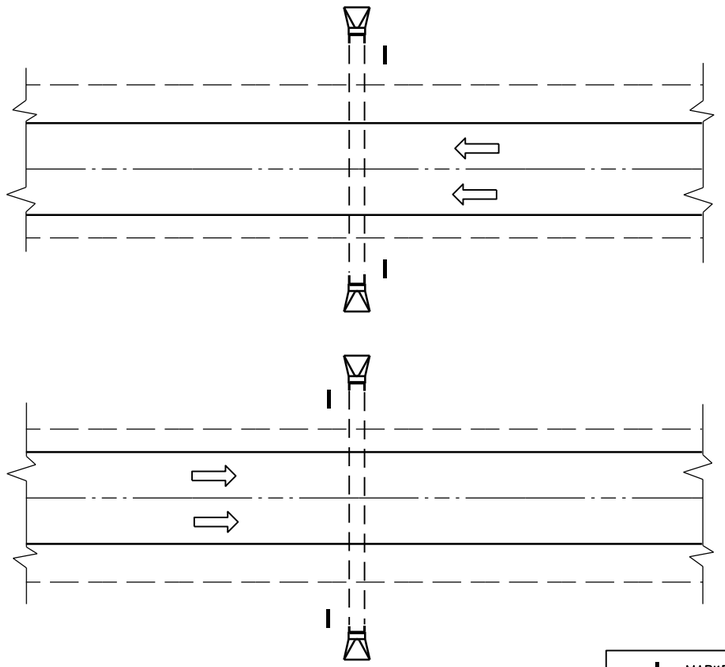
6

S.D.D. 15 A 2-8

6

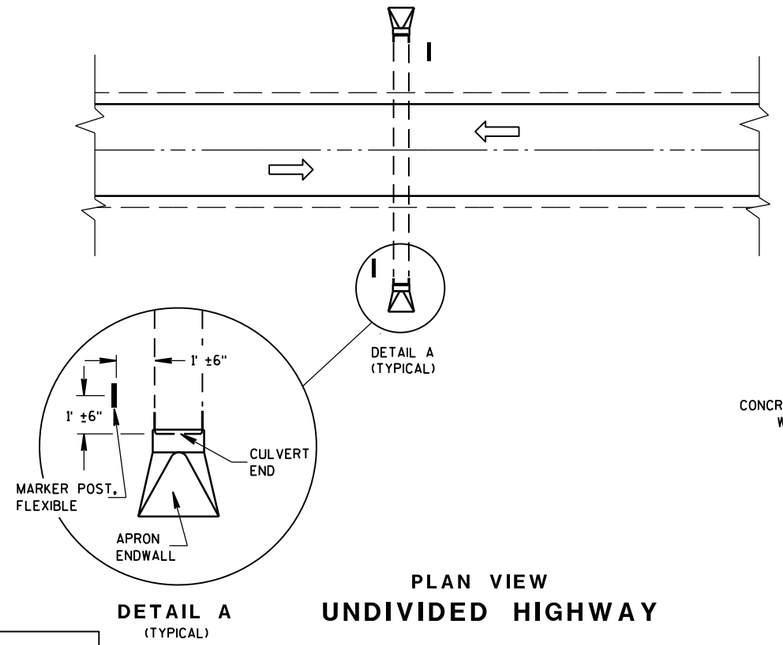
S.D.D. 15 A 2-8

15A3 sheet a: Flexible Marker Post for Culvert End



PLAN VIEW

DIVIDED HIGHWAY



DETAIL A
(TYPICAL)

PLAN VIEW

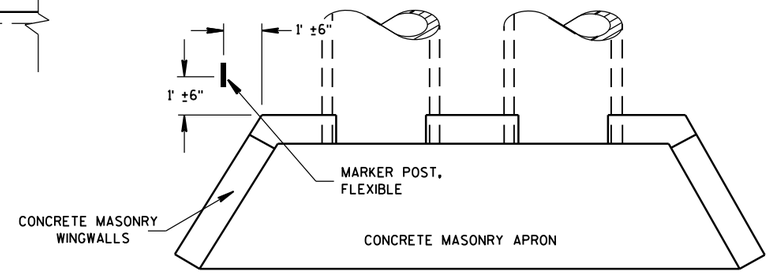
UNDIVIDED HIGHWAY

MARKER POST, FLEXIBLE

DIRECTION OF TRAFFIC FLOW

GENERAL NOTES

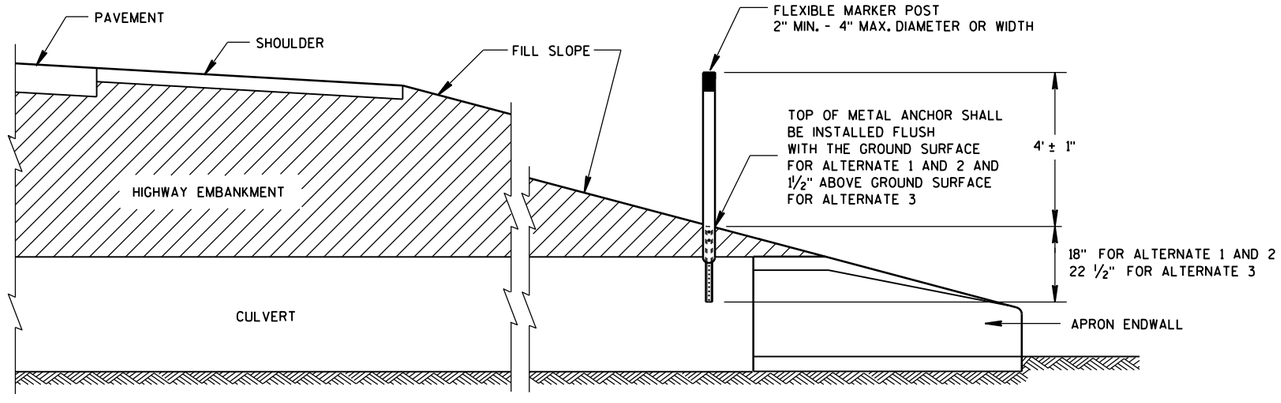
DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.



PLAN VIEW

CONCRETE MASONRY ENDWALLS FOR CULVERT PIPE AND PIPE ARCH

FLEXIBLE MARKER POST LOCATION



CROSS SECTION

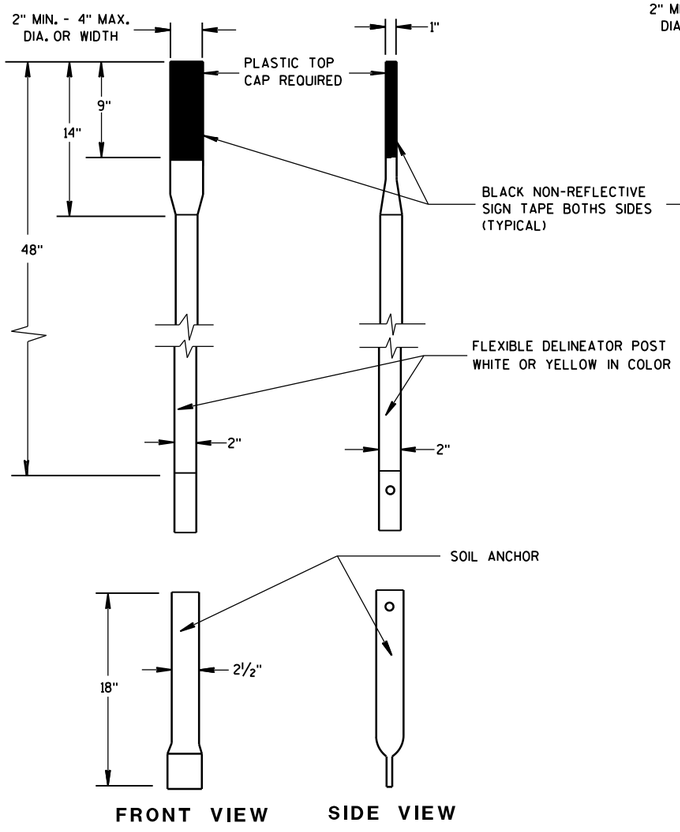
FLEXIBLE MARKER POST

FLEXIBLE MARKER POST FOR CULVERT END

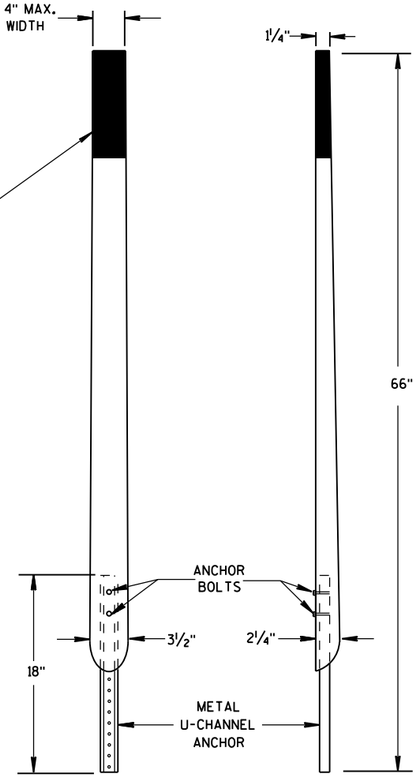
6

S.D.D. 15 A 3-2a

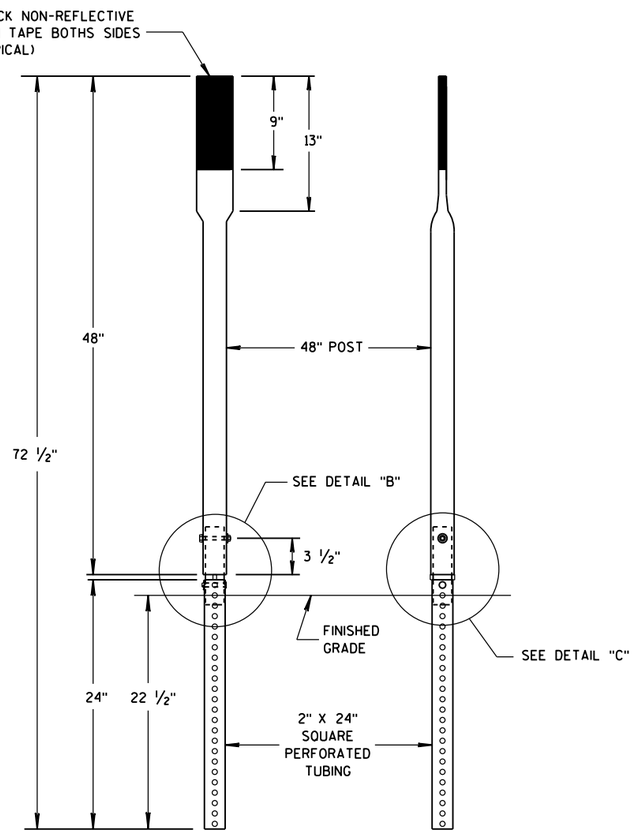
15A3 sheet b: Flexible Marker Post for Culvert End



ALTERNATE 1

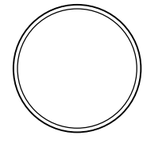


ALTERNATE 2

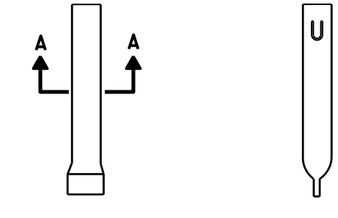


ALTERNATE 3

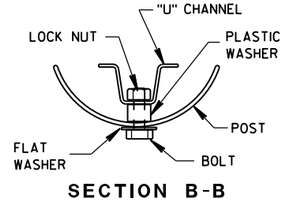
FLEXIBLE MARKER POSTS



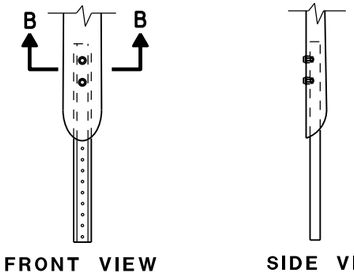
SECTION A-A



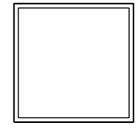
ALTERNATE 1



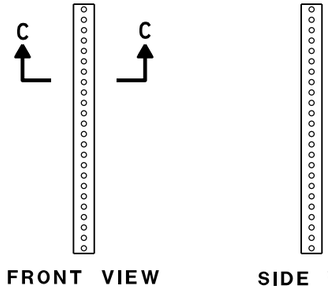
SECTION B-B



ALTERNATE 2

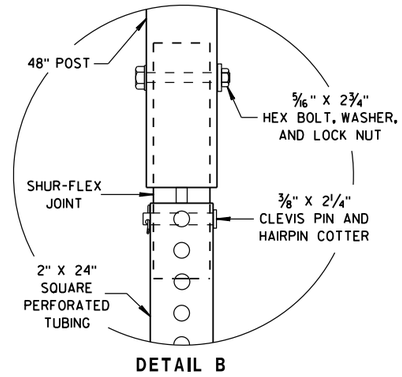


SECTION C-C

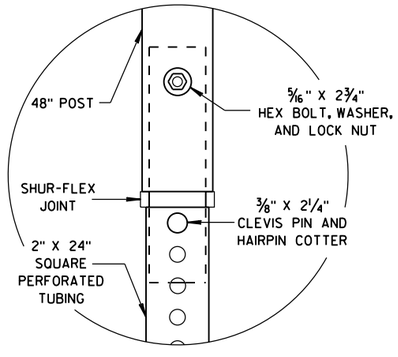


ALTERNATE 3

FLEXIBLE MARKER POST ANCHORS



DETAIL B



DETAIL C

FLEXIBLE MARKER POST
FOR CULVERT END

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
10/1/2012
DATE

/S/ Travis Feltes
STATE TRAFFIC ENGINEER OF DESIGN

FHWA

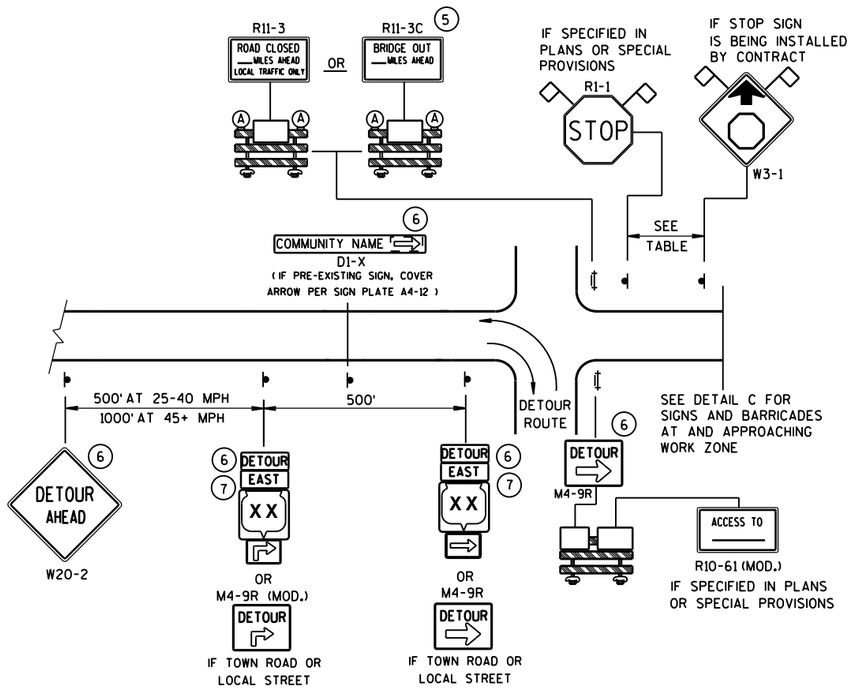
6

S.D.D. 15 A 3-2b

6

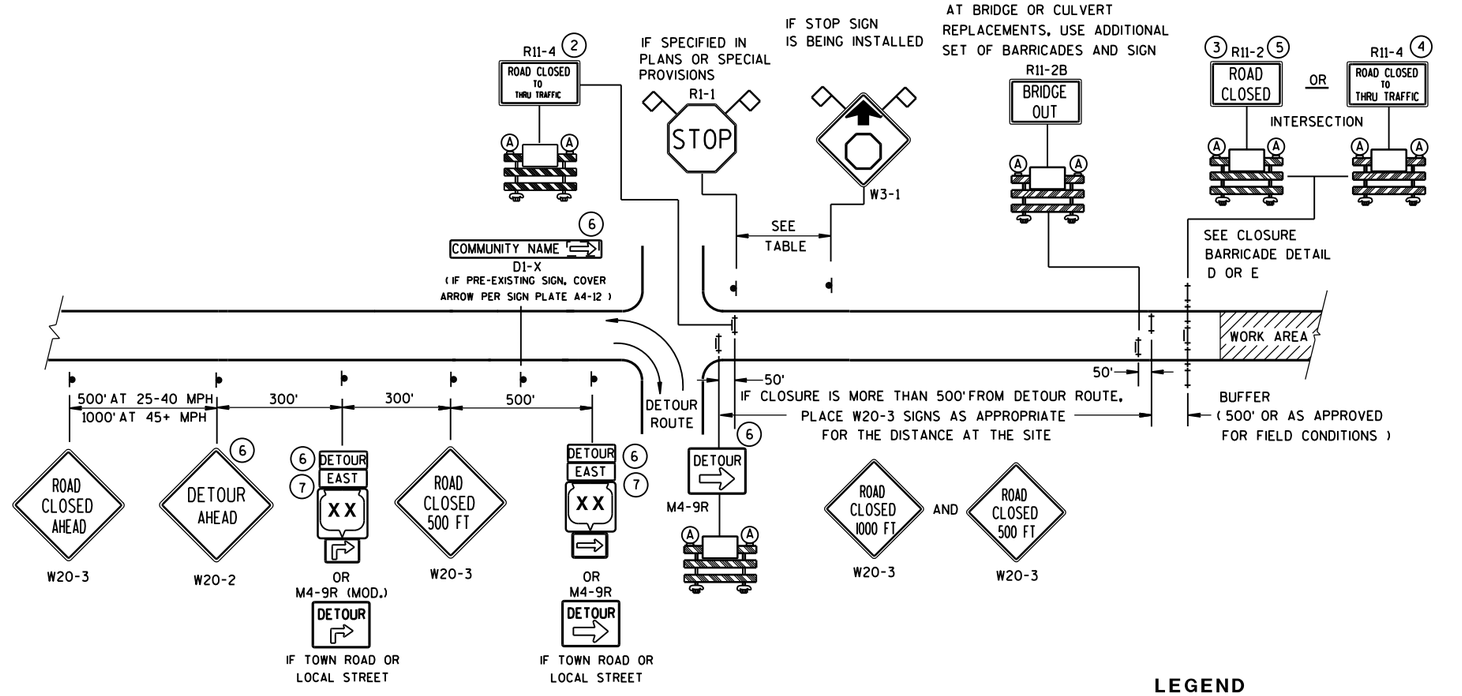
S.D.D. 15 A 3-2b

15C2 sheet a: Barricades and Signs for Mainline Closures



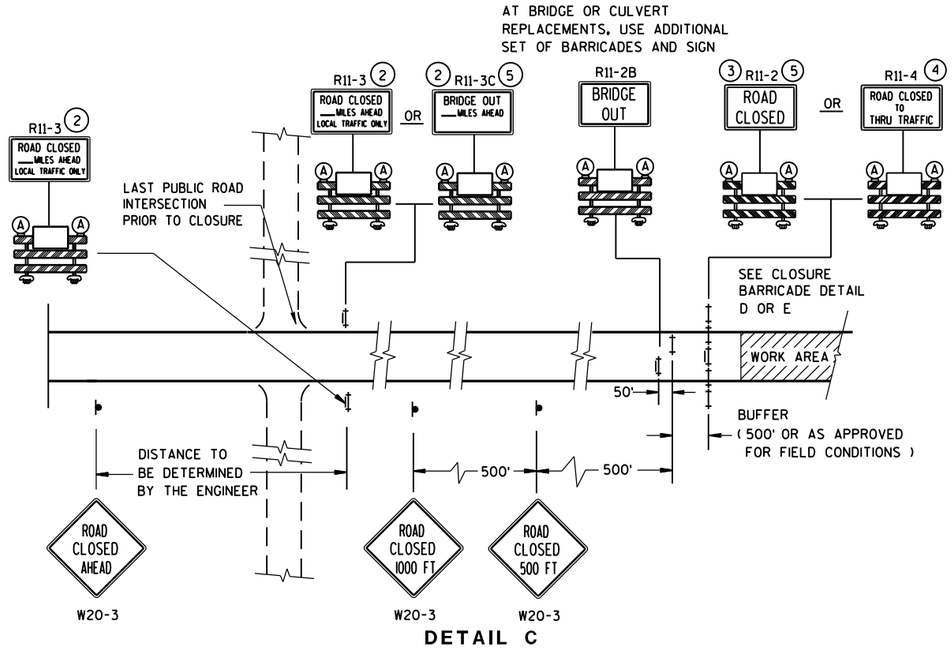
DETAIL A
MAINLINE CLOSURE WITH POSTED DETOUR

WORK ZONE GREATER THAN ½ MILE FROM DETOUR ROUTE (1000 FEET IF URBAN)



DETAIL B
MAINLINE CLOSURE WITH POSTED DETOUR

WORK ZONE LESS THAN ½ MILE FROM DETOUR ROUTE (1000 FEET IF URBAN)



DETAIL C
MAINLINE CLOSURE, NO POSTED DETOUR

SPEED LIMIT (MPH)	"STOP AHEAD" ADVANCE WARNING DISTANCE (FT)
25	200
30	200
35	350
40	350
45	500
50	550
55	750

LEGEND

- SIGN ON PERMANENT SUPPORT
- TYPE III BARRICADE
- TYPE III BARRICADE WITH ATTACHED SIGN
- (A) TYPE "A" WARNING LIGHT (FLASHING)
- WORK AREA
- DETOUR / EAST — M4-8 / M3-X
- XX — M1-4; COUNTY XX — M1-5A; XX — M1-6
- M05-1 OR M06-1
- FLAGS, 16" X 16" MIN., (ORANGE)

SEE SDD 15C2-SHEET "**b**" FOR GENERAL NOTES AND FOOTNOTES (1) THROUGH (7)

BARRICADES AND SIGNS FOR MAINLINE CLOSURES

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

8/2013 — DATE

/S/ Travis Felter — STATE TRAFFIC ENGINEER OF DESIGN

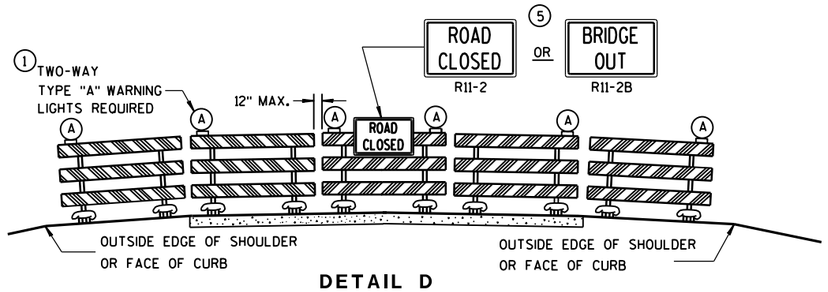
FHWA

6

S.D.D. 15 C 2-5a

6

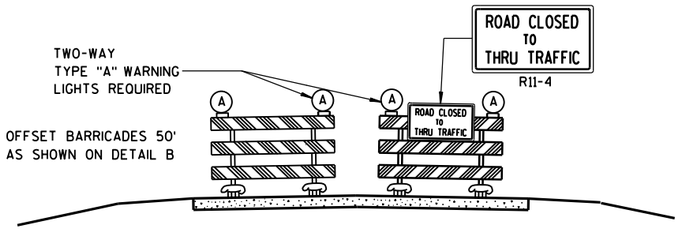
S.D.D. 15 C 2-5a



DETAIL D

ROAD CLOSURE BARRICADE DETAIL

APPROACH VIEW



DETAIL E

LANE CLOSURE BARRICADE DETAIL

APPROACH VIEW

SEE SDD 15C2-SHEET "**a**" FOR LEGEND

GENERAL NOTES

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

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.

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.

BARRICADES THAT MUST BE MOVED FOR A WORK OPERATION SHALL BE IMMEDIATELY RE-ESTABLISHED UPON COMPLETION OF THE OPERATION OR, FOR CONTINUING OPERATIONS, AT THE END OF EACH WORKING DAY.

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

ALL TYPE III BARRICADES SHALL HAVE RAILS REFLECTORIZED ON BOTH FACES. STRIPES SHALL BE PROPERLY SLOPED DOWN TOWARD THE TRAFFIC SIDE OR AS SHOWN IN THE ROAD CLOSURE BARRICADE DETAIL D FOR FULL ROAD CLOSURES.

TYPE "A" LOW-INTENSITY FLASHING WARNING LIGHTS SHALL BE VISIBLE ON BOTH SIDES OF THE BARRICADE.

THE R11-2, R11-3, M4-9, R11-4 AND R10-61 SIGNS PLACED ON BARRICADES SHALL COVER NO MORE THAN THE TOP RAIL. THE SIGNS SHALL NOT COVER ANY PORTION OF THE MIDDLE OR BOTTOM RAILS.

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

ALL SIGNS SHALL BE 48" X 48" UNLESS OTHERWISE NOTED BELOW:
- R11-2 SHALL BE 48" X 30".
- R11-3, R11-4 AND R10-61 SHALL BE 60" X 30".
- M4-9 SHALL BE 30" X 24".
- M3-X SHALL BE 24" X 12". (36" X 18" IF NEEDED TO MATCH EXISTING SIGNS.)
- M4-8 SHALL BE 24" X 12". (30" X 15" IF NEEDED TO MATCH EXISTING SIGNS.)
- M1-4, M1-5A, AND M1-6 SHALL BE 24" X 24". (36" X 36" IF NEEDED TO MATCH EXISTING SIGNS.)
- M05-1 AND M06-1 SHALL BE 21" X 21". (30" X 30" IF NEEDED TO MATCH EXISTING SIGNS.)
- D1-X SHALL BE AS SHOWN ON SPECIFIC PROJECT SIGNING DETAIL SHEETS.
- R1-1 SHALL BE 36" X 36".

(1) TWO WARNING LIGHTS SHALL BE PROVIDED ON THE CENTER BARRICADE AND A MINIMUM OF ONE WARNING LIGHT SHALL BE PROVIDED ON EACH OF THE OTHER BARRICADES WITHIN THE ROADWAY LIMITS. SPACING OF THE WARNING LIGHTS SHALL BE UNIFORM TO THE EDGE OF ROADWAY AS SHOWN (APPROX. 8-FOOT LIGHT SPACING).

(2) THESE SIGNS AND BARRICADES ARE NOT REQUIRED IF ROAD CLOSURE BEGINS AT INTERSECTION.

(3) FOR ROAD CLOSURE WITHOUT LOCAL ACCESS TO PROJECT, SEE ROAD CLOSURE BARRICADE DETAIL D.

(4) FOR ROAD CLOSURE WITH LOCAL ACCESS TO PROJECT, SEE LANE CLOSURE BARRICADE DETAIL E.

(5) FOR BRIDGE OR CULVERT REPLACEMENTS, SUBSTITUTE "BRIDGE OUT" INSTEAD OF "ROAD CLOSED" ON R11-2 AND R11-3 SIGNS.

(6) INSTALL DETOUR AND COMMUNITY GUIDE SIGNS AND ARROWS ONLY IF SPECIFIED IN THE CONTRACT. IF THERE ARE EXISTING ROUTE MARKER ASSEMBLIES THAT WILL REMAIN IN PLACE, ADJUST THE LOCATION OF THE DETOUR ROUTE SIGNS TO CORRESPOND WITH THE EXISTING ASSEMBLIES. MODIFY EXISTING SIGNS WHERE POSSIBLE. SEE SPECIFIC PROJECT DETOUR SIGNING DETAIL SHEETS. IF DETOUR SIGNS ARE BEING INSTALLED BY OTHERS, PLACE THE CONTRACTED TRAFFIC CONTROL SIGNS TO ALLOW FOR PLACEMENT OF ALL WARNING, DETOUR AND GUIDE SIGNS AS SHOWN.

(7) "EAST" CARDINAL DIRECTION MARKERS AND RIGHT TURN ARROWS ARE SHOWN. USE OTHER CARDINAL DIRECTIONS AND ARROWS AS APPROPRIATE.

BARRICADES AND SIGNS FOR MAINLINE CLOSURES

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

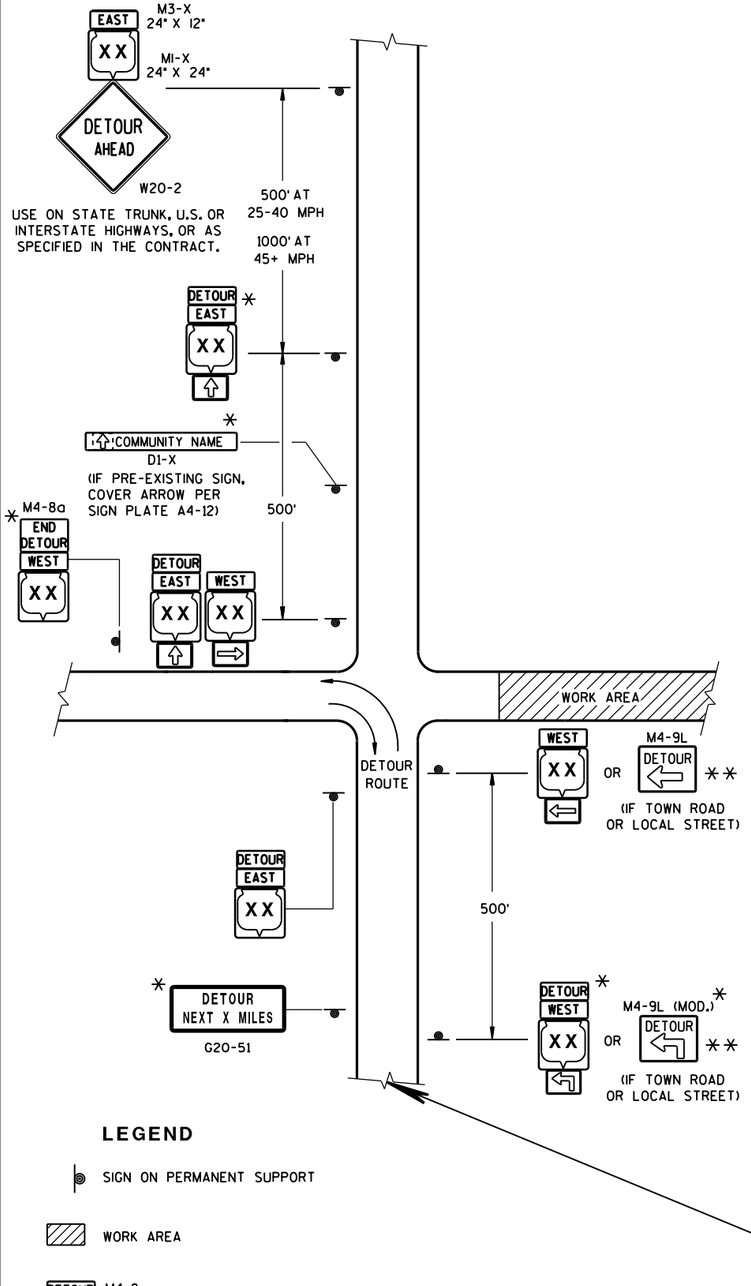
8/2013 — DATE

/S/ Travis Feltes — STATE TRAFFIC ENGINEER OF DESIGN

FHWA

6 S.D.D. 15 C 2-5b

15C2 sheet c: Detour Signing for Mainline Closures



THIS DRAWING PROVIDES GENERAL GUIDANCE ON TYPICAL DETOUR SIGN LAYOUT AND SPACING. SEE PROJECT DETOUR SIGNING SHEETS FOR SPECIFIC DETAILS FOR EACH PROJECT.

GENERAL NOTES

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

IF THERE ARE EXISTING ROUTE MARKER ASSEMBLIES THAT WILL REMAIN IN PLACE, ADJUST THE LOCATION OF THE DETOUR ROUTE SIGNS TO CORRESPOND WITH THE EXISTING ASSEMBLIES. SEE SPECIFIC PROJECT DETOUR SIGNING DETAIL SHEETS. MODIFY EXISTING SIGNS WHERE POSSIBLE.

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

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.

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

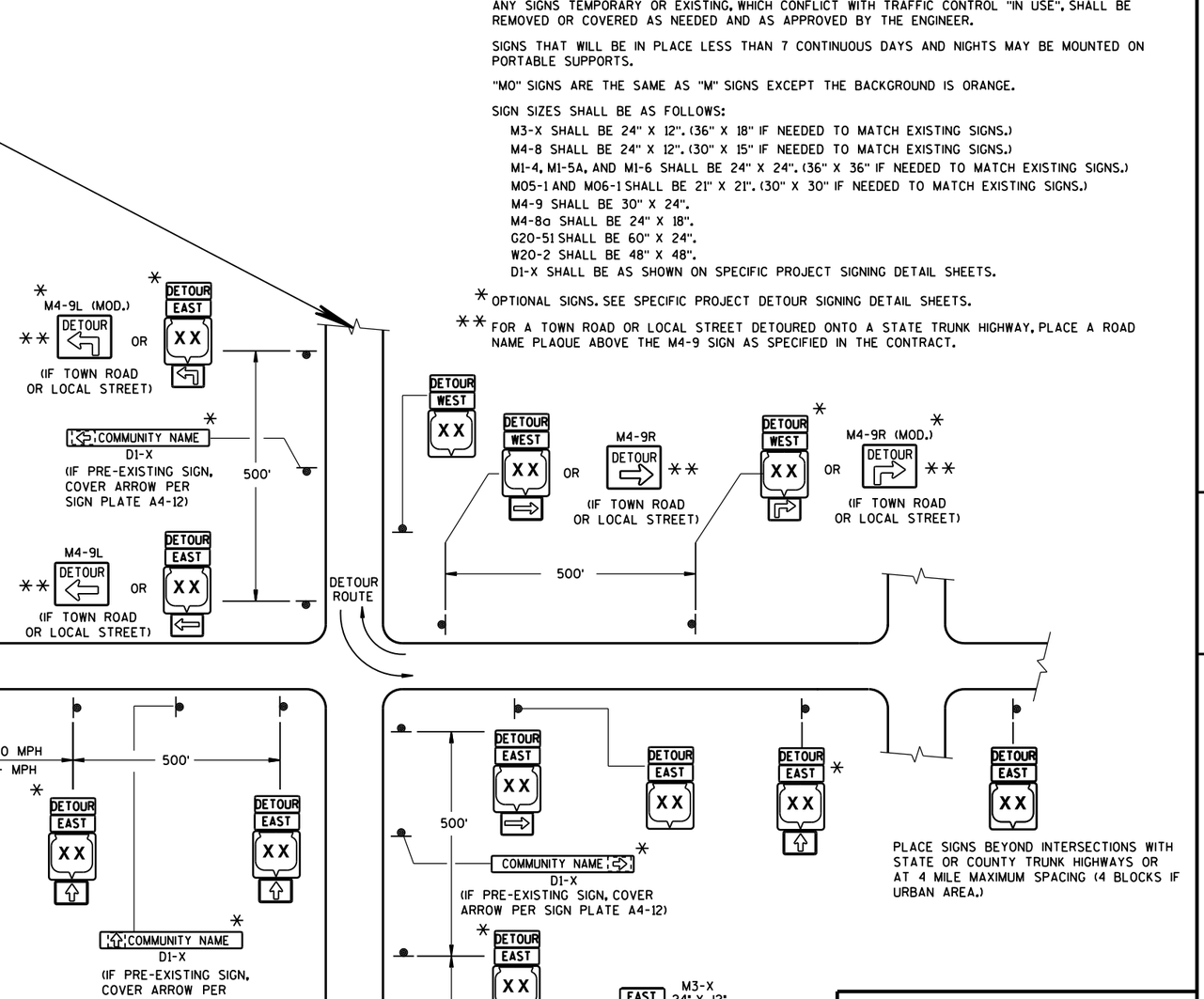
"MO" SIGNS ARE THE SAME AS "M" SIGNS EXCEPT THE BACKGROUND IS ORANGE.

SIGN SIZES SHALL BE AS FOLLOWS:

- M3-X SHALL BE 24" X 12". (36" X 18" IF NEEDED TO MATCH EXISTING SIGNS.)
- M4-8 SHALL BE 24" X 12". (30" X 15" IF NEEDED TO MATCH EXISTING SIGNS.)
- M1-4, M1-5A, AND M1-6 SHALL BE 24" X 24". (36" X 36" IF NEEDED TO MATCH EXISTING SIGNS.)
- MO5-1 AND MO6-1 SHALL BE 21" X 21". (30" X 30" IF NEEDED TO MATCH EXISTING SIGNS.)
- M4-9 SHALL BE 30" X 24".
- M4-8a SHALL BE 24" X 18".
- G20-51 SHALL BE 60" X 24".
- W20-2 SHALL BE 48" X 48".
- D1-X SHALL BE AS SHOWN ON SPECIFIC PROJECT SIGNING DETAIL SHEETS.

* OPTIONAL SIGNS. SEE SPECIFIC PROJECT DETOUR SIGNING DETAIL SHEETS.

** FOR A TOWN ROAD OR LOCAL STREET DETOURED ONTO A STATE TRUNK HIGHWAY, PLACE A ROAD NAME PLAQUE ABOVE THE M4-9 SIGN AS SPECIFIED IN THE CONTRACT.



LEGEND

- SIGN ON PERMANENT SUPPORT
- WORK AREA
- DETOUR EAST — M4-8 / M3-X
- XX OR COUNTY XX OR XX — M1-4 / M1-5A / M1-6
- MO5-1 OR MO6-1 OR MO6-1

SEE SPECIFIC PROJECT DETOUR SIGNING DETAIL SHEETS AND DETAIL A OR B ON SDD 15C2-SHEET "a"

DETAIL F

DETOUR SIGNING

DETOUR SIGNING FOR MAINLINE CLOSURES

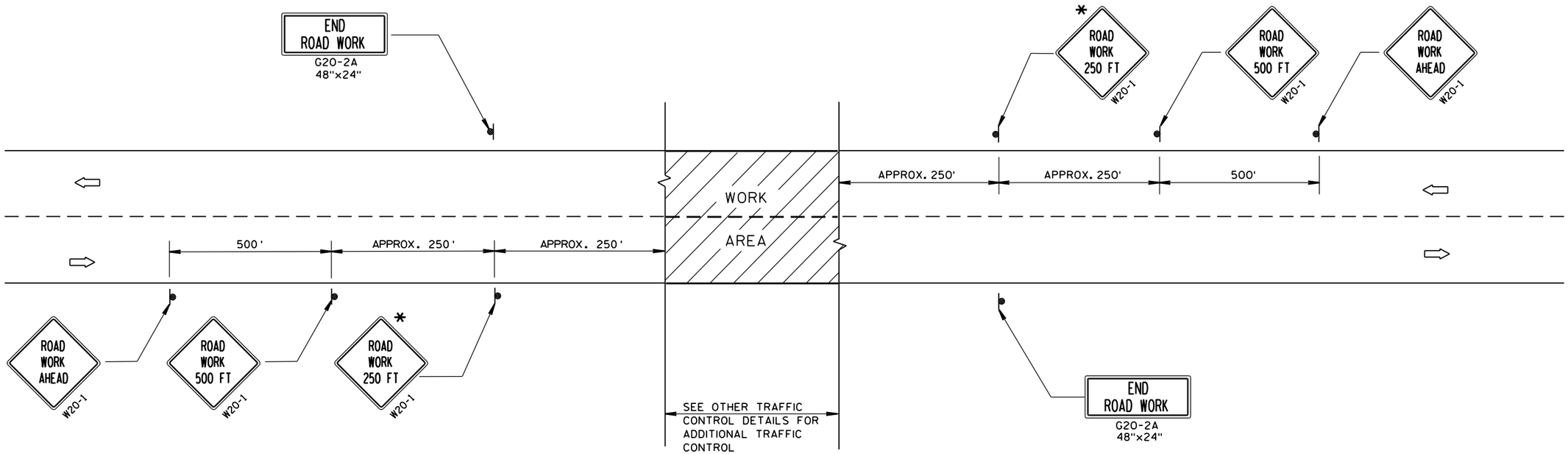
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
8/2013 — DATE
/S/ Travis Feltes — STATE TRAFFIC ENGINEER OF DESIGN
FHWA

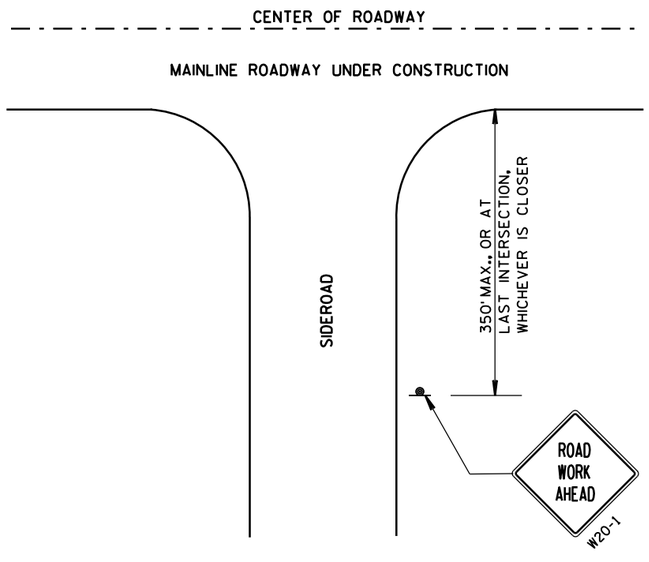
S.D.D. 15 C 2-5c

S.D.D. 15 C 2-5c

15C5: Traffic Control, Advance Warning Signs 40 M.P.H. or Less, Two Way Undivided Road Open to Traffic



TYPICAL SIDEROAD APPROACH WARNING SIGN DETAIL



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.

LEGEND

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

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
8/2013 — DATE
/S/ Travis Feltes — STATE TRAFFIC ENGINEER OF DESIGN
FHWA

6
S.D.D. 15 C 5-2

15C12: Traffic Control for Lane Closure (Suitable for Moving Operations)

LEGEND

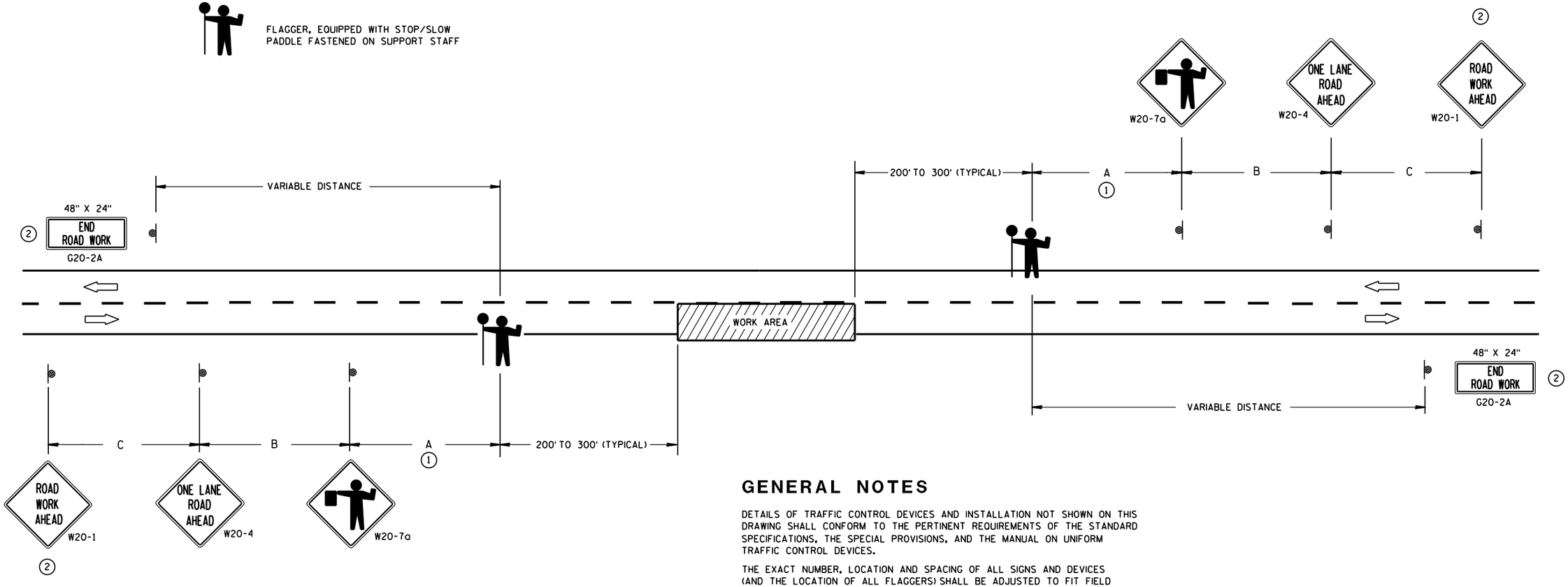
- SIGN ON PORTABLE OR PERMANENT SUPPORT
- DIRECTION OF TRAFFIC
- WORK AREA
- FLAGGER, EQUIPPED WITH STOP/SLOW PADDLE FASTENED ON SUPPORT STAFF

SIGN SPACING TABLE

SPEED LIMIT	SIGN SPACING A,B,C
25-35 MPH	200'
35-40 MPH	350'
45-55 MPH	500'

BE PREPARED TO STOP
W3-4

USE OF THE "BE PREPARED TO STOP" SIGN IS OPTIONAL. WHEN USED, THIS SIGN SHALL BE LOCATED BETWEEN THE W20-7a AND W20-4 SIGNS. A 500' TYPICAL SPACING SHALL BE PROVIDED BETWEEN THE SIGNS.



(1) FOR A MOVING WORK OPERATION,
SIGNING FOR BOTH DIRECTIONS SHALL BE REESTABLISHED (AS SIMULTANEOUSLY AS PRACTICAL) AT APPROXIMATELY 3500 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.

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.

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.

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, COVER OR REMOVE ALL TEMPORARY TRAFFIC CONTROL SIGNS.

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

TRAFFIC CONTROL FOR LANE CLOSURE (SUITABLE FOR MOVING OPERATIONS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
8/2013 — DATE
/S/ Travis Feltes — STATE TRAFFIC ENGINEER OF DESIGN
FHWA

6

S.D.D. 15 C 12-4

6

S.D.D. 15 C 12-4

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.

W20-1 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.

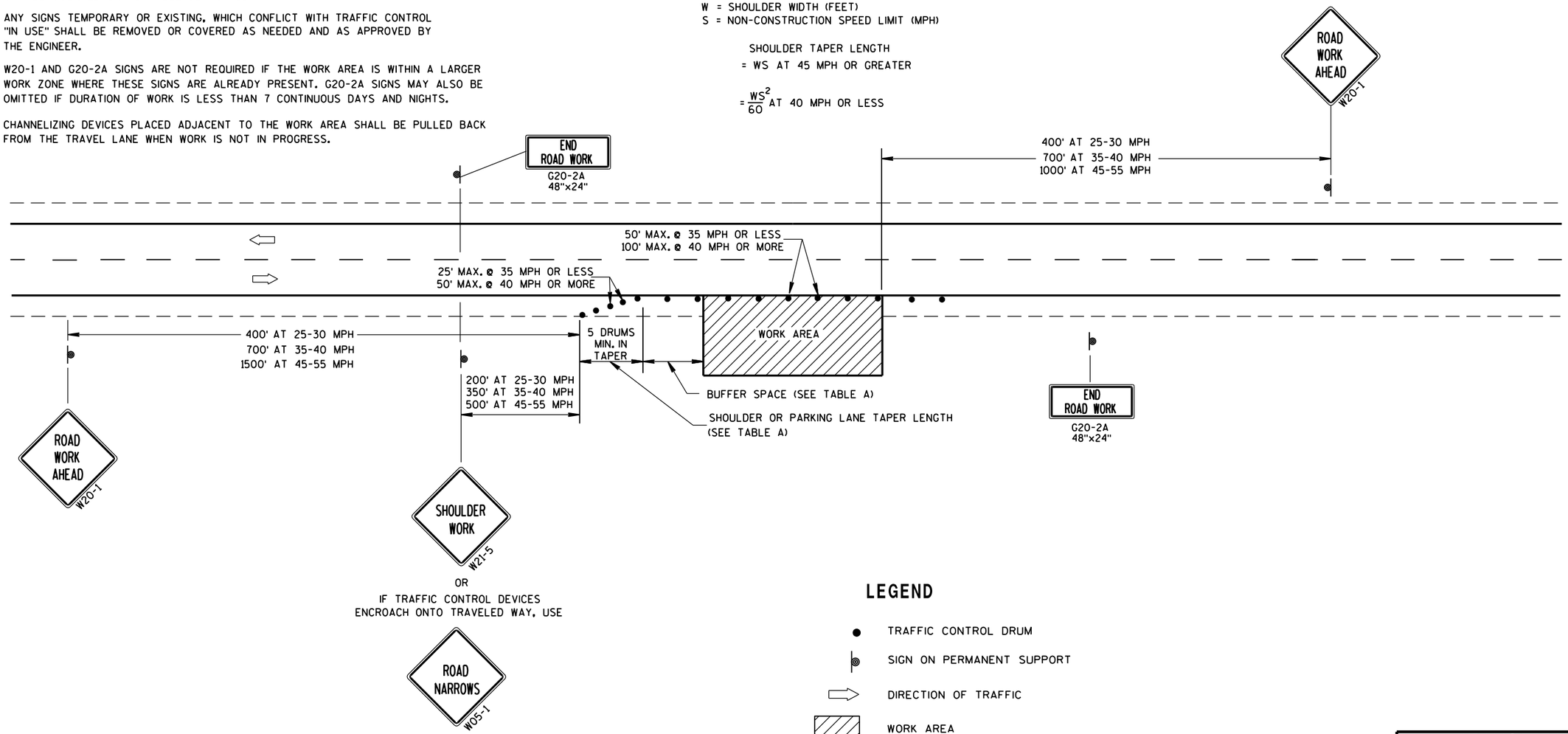
TABLE A

S \ W	SHOULDER TAPER LENGTH (FEET) 4	6	8	10	BUFFER SPACE (FEET)
30	20	30	40	50	85
35	30	45	55	70	120
40	40	55	75	90	170
45	60	90	120	150	220
50	70	100	135	170	280
55	75	110	150	185	335

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

SHOULDER TAPER LENGTH
= WS AT 45 MPH OR GREATER

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



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

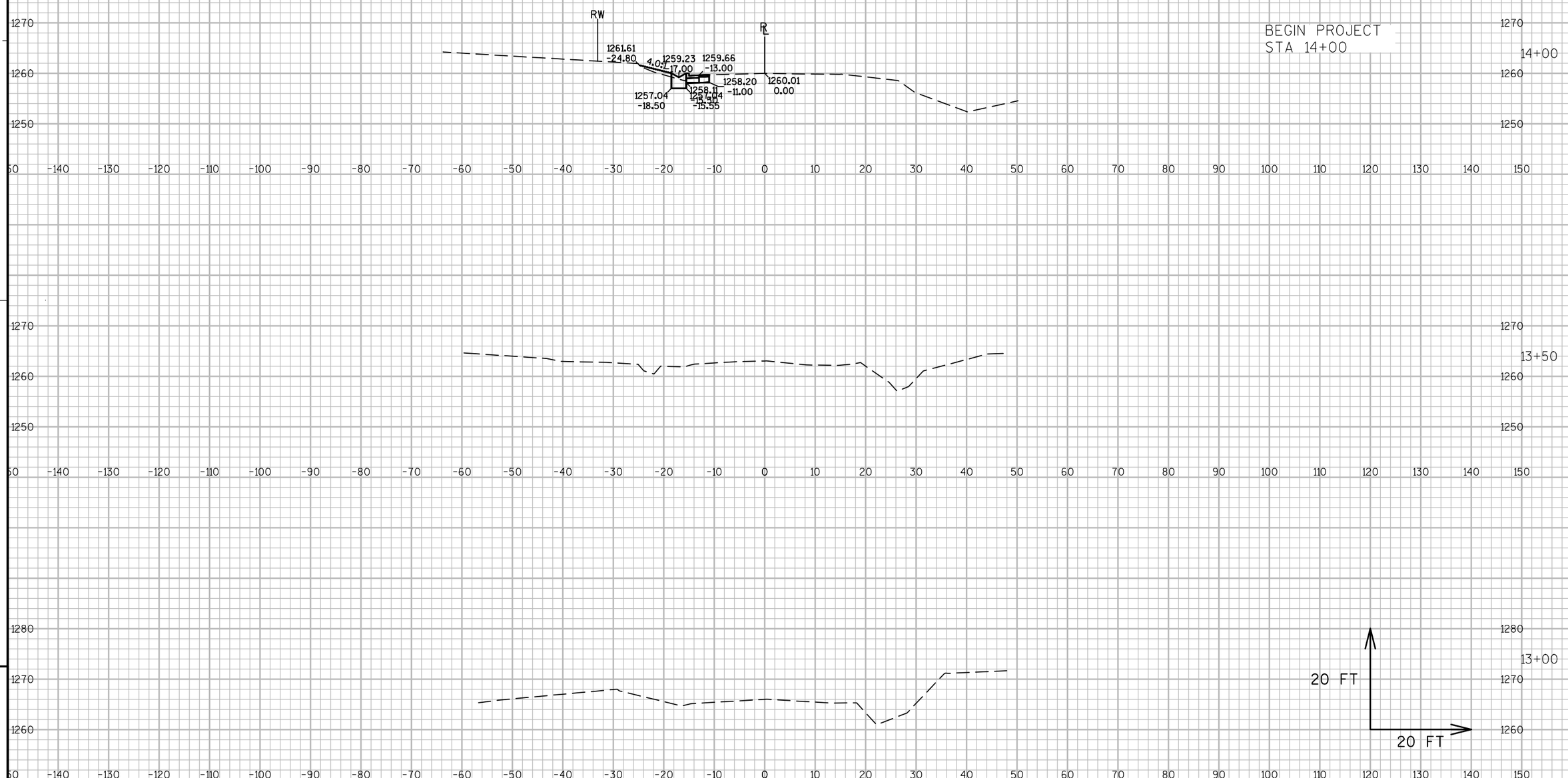
8/2013 — DATE

/S/ Travis Feltes — STATE TRAFFIC ENGINEER OF DESIGN

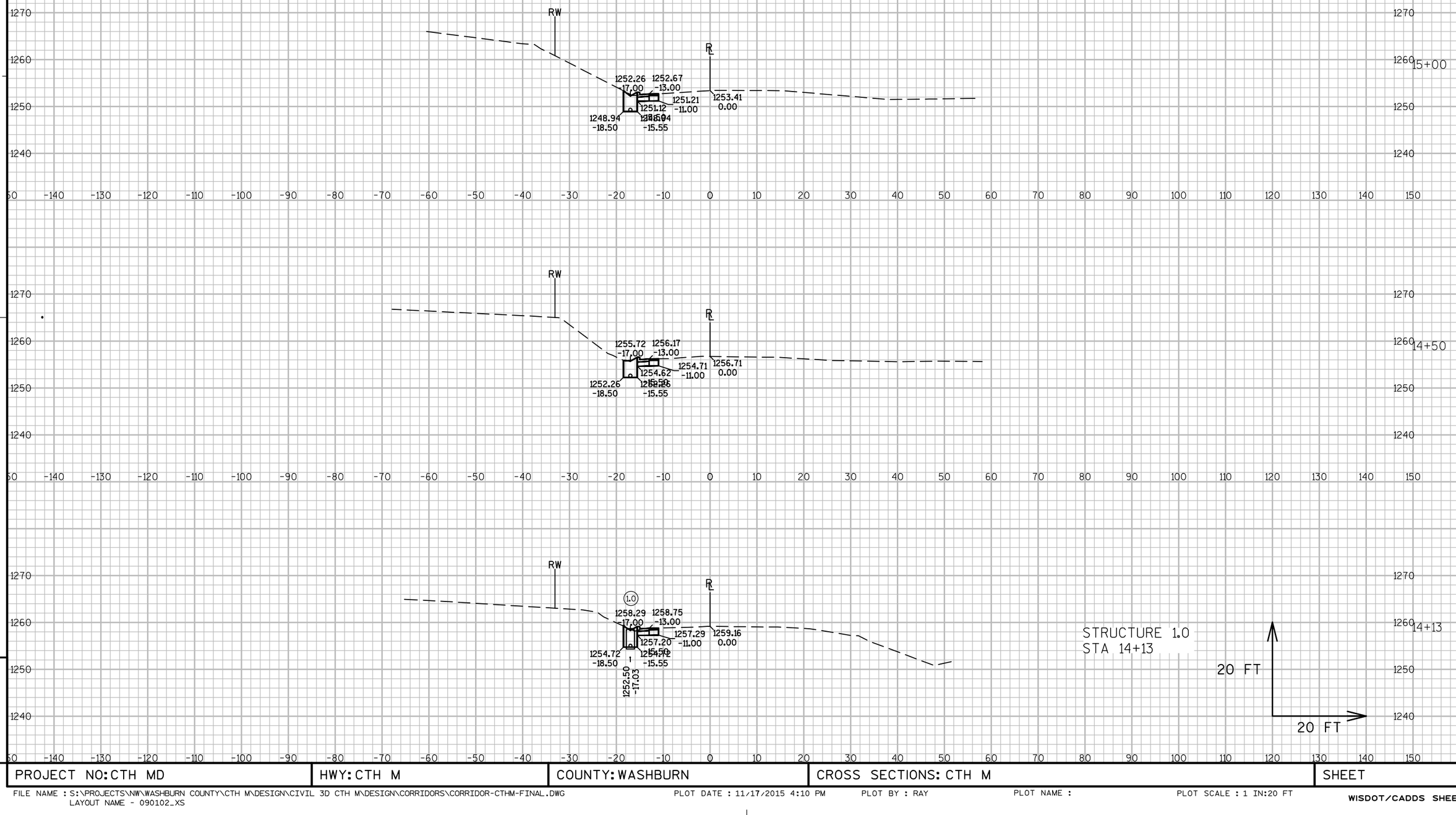
FHWA

6

S.D.D. 15 D 28-2



PROJECT NO: CTH MD	HWY: CTH M	COUNTY: WASHBURN	CROSS SECTIONS: CTH M	SHEET	E



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9

PROJECT NO: CTH MD	HWY: CTH M	COUNTY: WASHBURN	CROSS SECTIONS: CTH M	SHEET	E

FILE NAME : S:\PROJECTS\NW\WASHBURN COUNTY\CTH M\DESIGN\CIVIL 3D CTH M\DESIGN\CORRIDORS\CORRIDOR-CTHM-FINAL.DWG
LAYOUT NAME - 090102_XS

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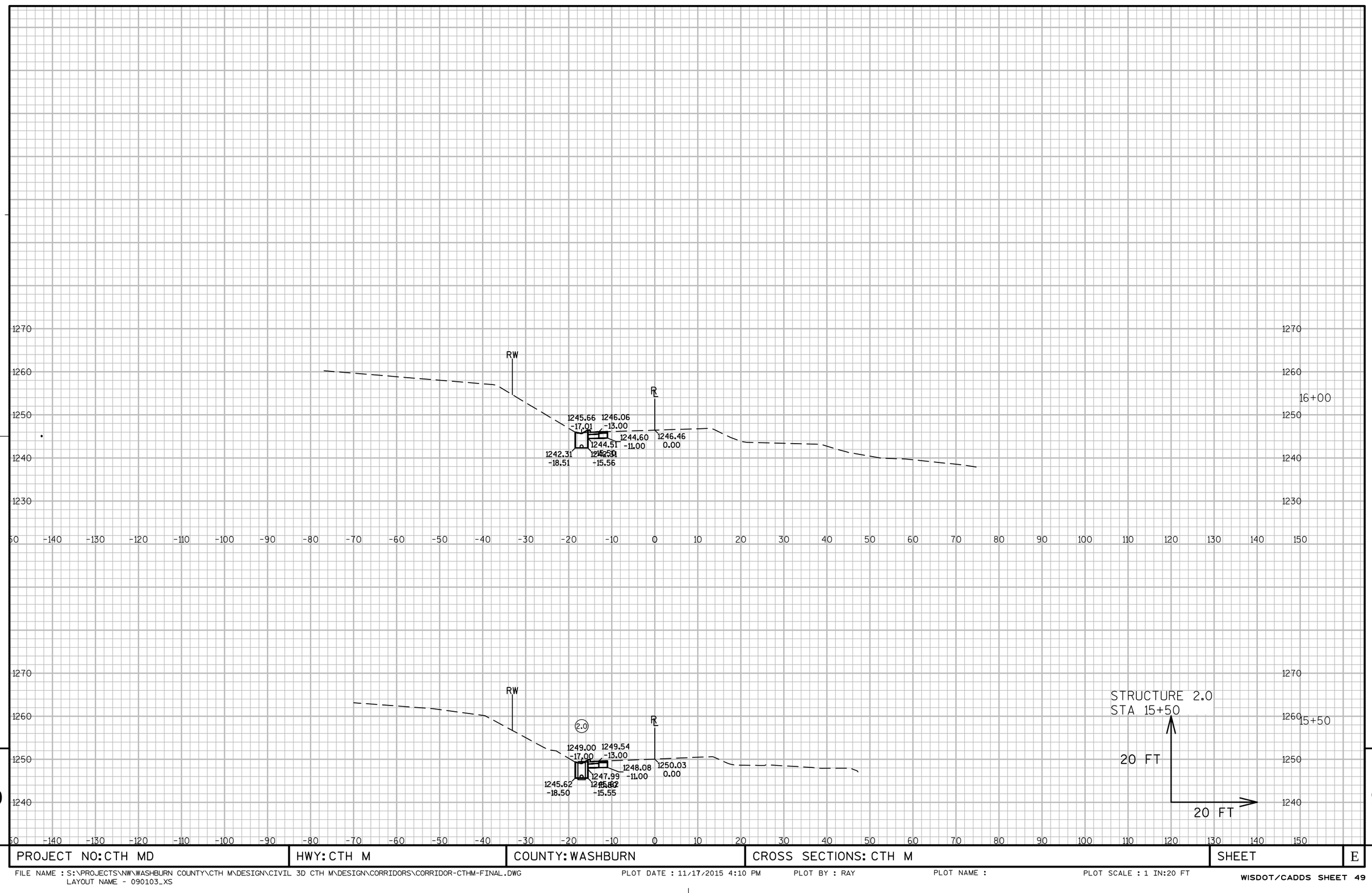

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PROJECT NO: CTH MD	HWY: CTH M	COUNTY: WASHBURN	CROSS SECTIONS: CTH M	SHEET	E

FILE NAME : S:\PROJECTS\NW\WASHBURN COUNTY\CTH M\DESIGN\CIVIL 3D CTH M\DESIGN\CORRIDORS\CORRIDOR-CTHM-FINAL.DWG
LAYOUT NAME - 090103_XS

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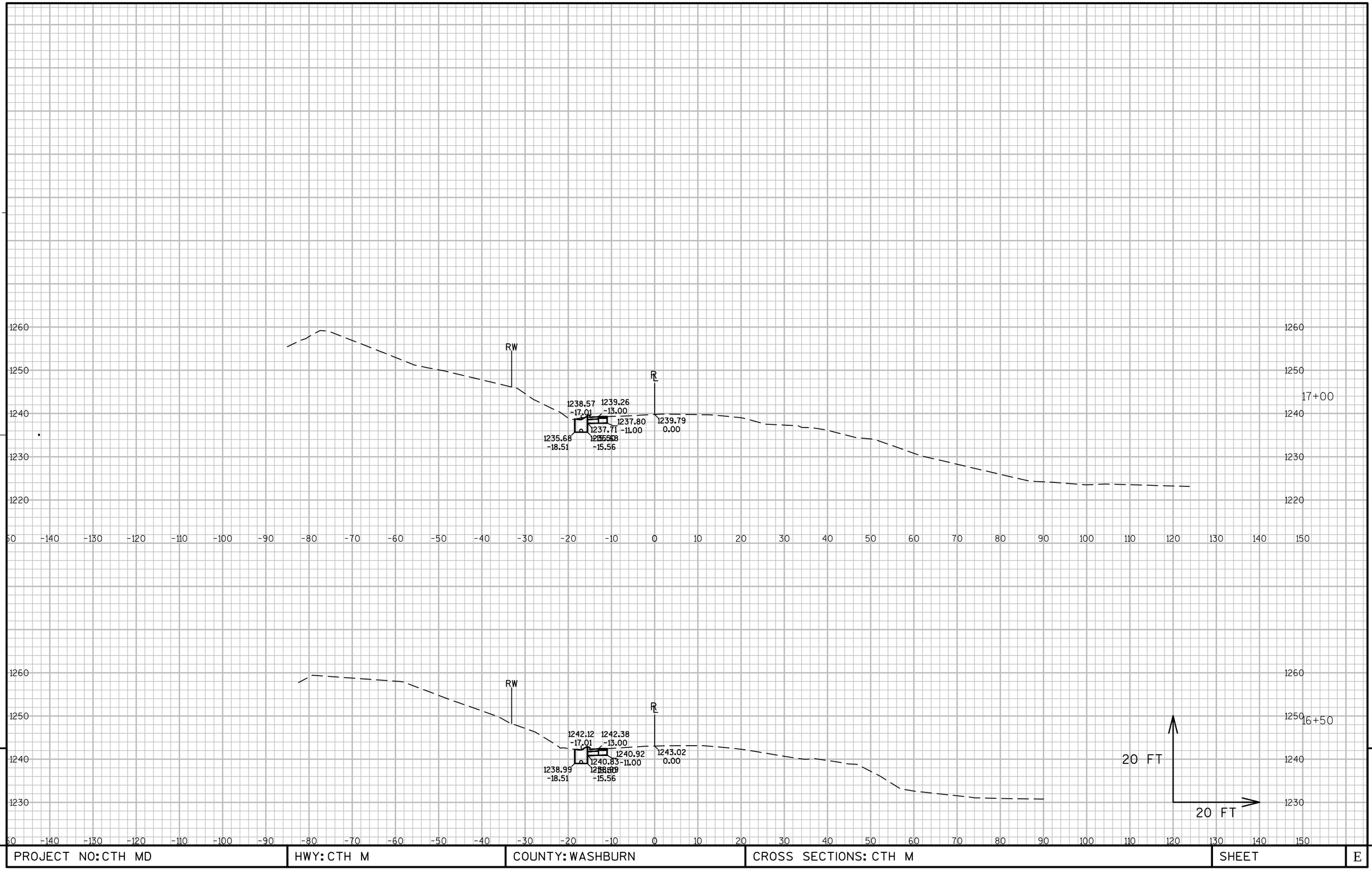


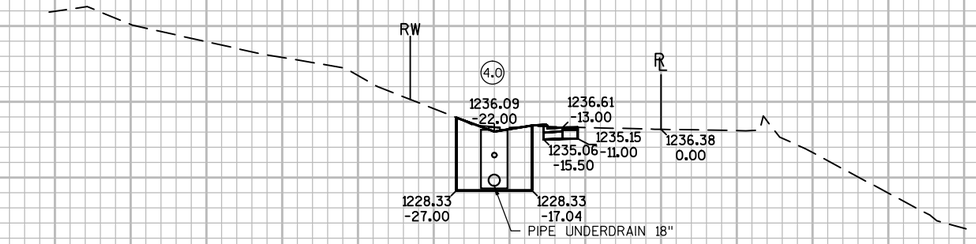
PROJECT NO: CTH MD	HWY: CTH M	COUNTY: WASHBURN	CROSS SECTIONS: CTH M	SHEET	E

FILE NAME : S:\PROJECTS\NW\WASHBURN COUNTY\CTH M\DESIGN\CIVIL 3D CTH M\DESIGN\CORRIDORS\CORRIDOR-CTHM-FINAL.DWG
LAYOUT NAME - 090104_XS

PLOT DATE : 11/17/2015 4:10 PM PLOT BY : RAY PLOT NAME : PLOT SCALE : 1 IN:20 FT

WISDOT/CADDS SHEET 49

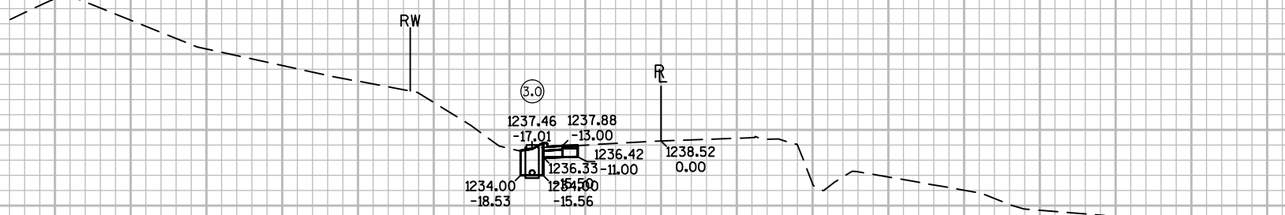
STRUCTURE 4.0
STA 17+86



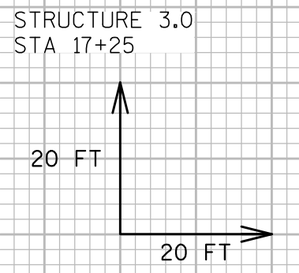
17+86

1287.40
-317.13

STRUCTURE 3.0
STA 17+25



17+25



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PROJECT NO: CTH MD	HWY: CTH M	COUNTY: WASHBURN	CROSS SECTIONS: CTH M	SHEET	E

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LAYOUT NAME - 090105_XS

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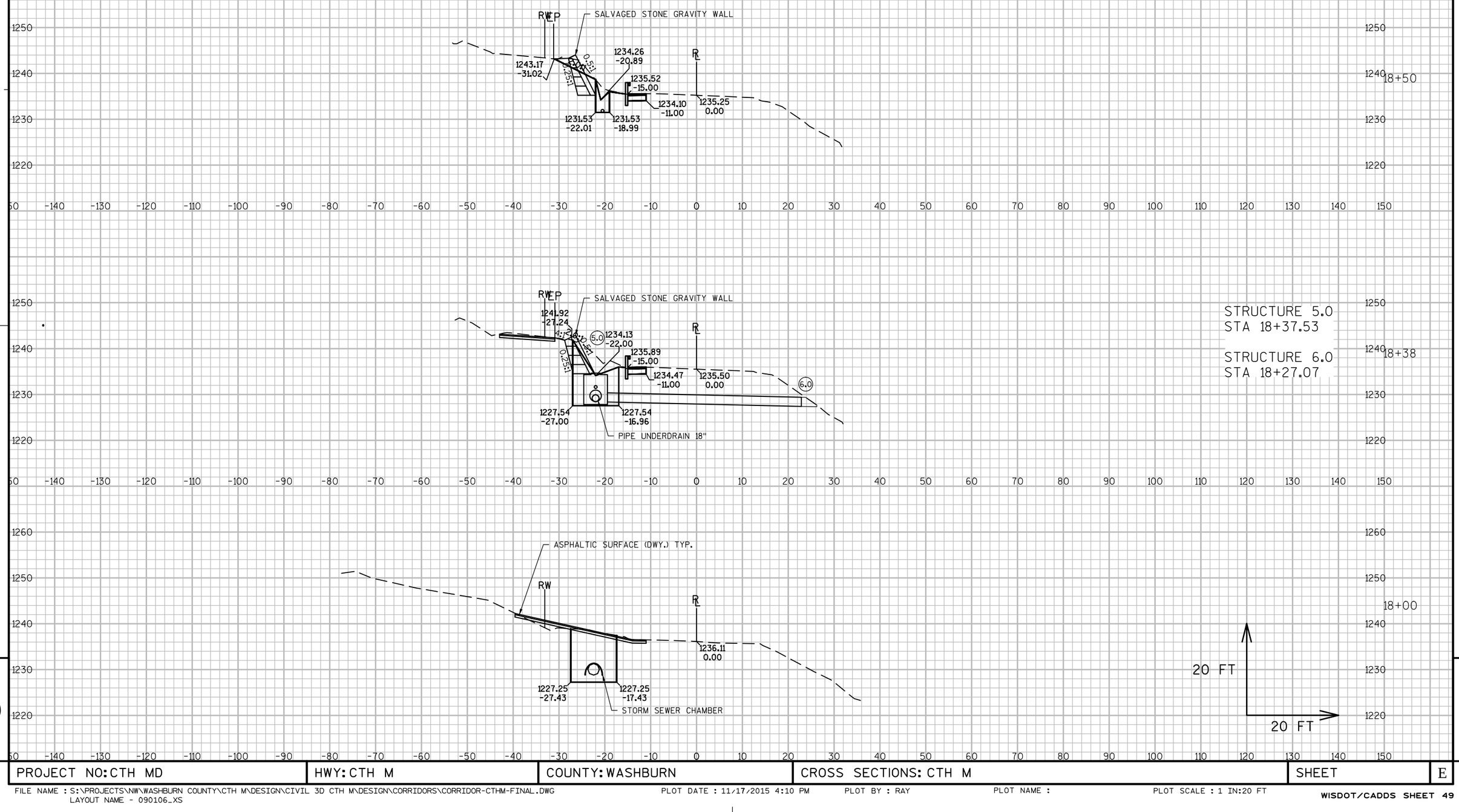

PROJECT NO: CTH MD	HWY: CTH M	COUNTY: WASHBURN	CROSS SECTIONS: CTH M	SHEET	E

FILE NAME : S:\PROJECTS\NW\WASHBURN COUNTY\CTH M\DESIGN\CIVIL 3D CTH M\DESIGN\CORRIDORS\CORRIDOR-CTHM-FINAL.DWG
LAYOUT NAME - 090106_XS

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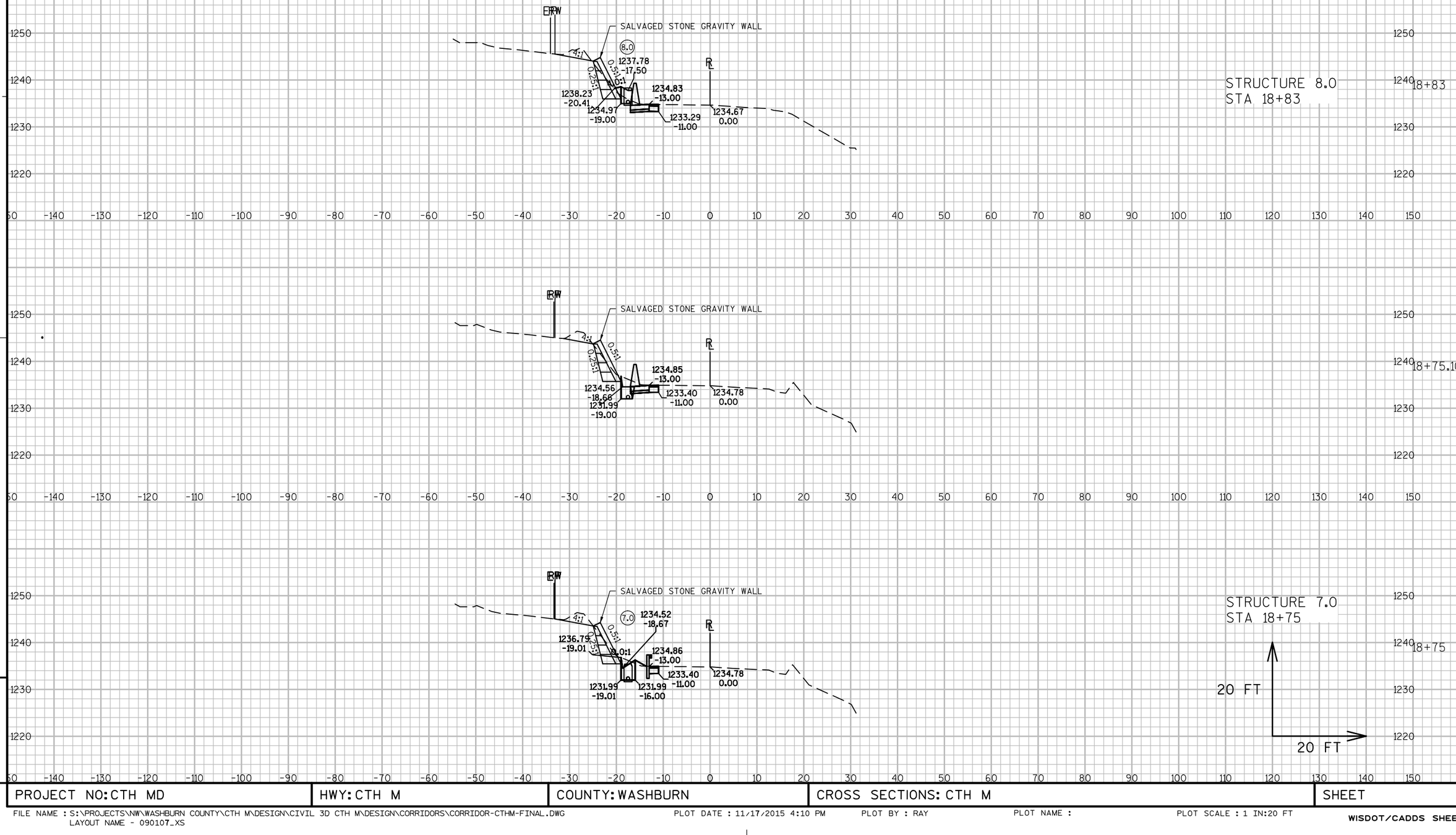

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PROJECT NO: CTH MD	HWY: CTH M	COUNTY: WASHBURN	CROSS SECTIONS: CTH M	SHEET	E

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PLOT NAME :
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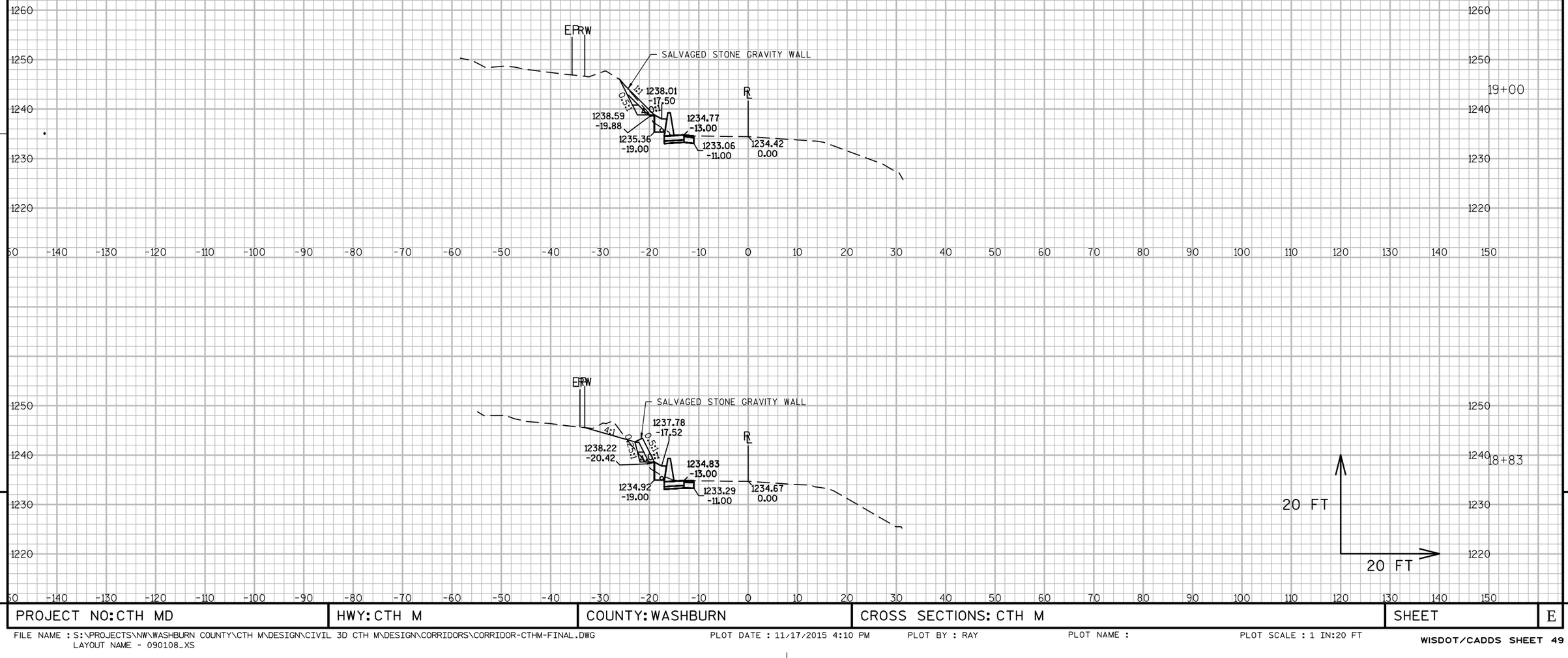

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PROJECT NO: CTH MD	HWY: CTH M	COUNTY: WASHBURN	CROSS SECTIONS: CTH M	SHEET	E

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FILE NAME : S:\PROJECTS\NW\WASHBURN COUNTY\CTH M\DESIGN\CIVIL 3D CTH M\DESIGN\CORRIDORS\CORRIDOR-CTHM-FINAL.DWG
LAYOUT NAME - 090108_XS

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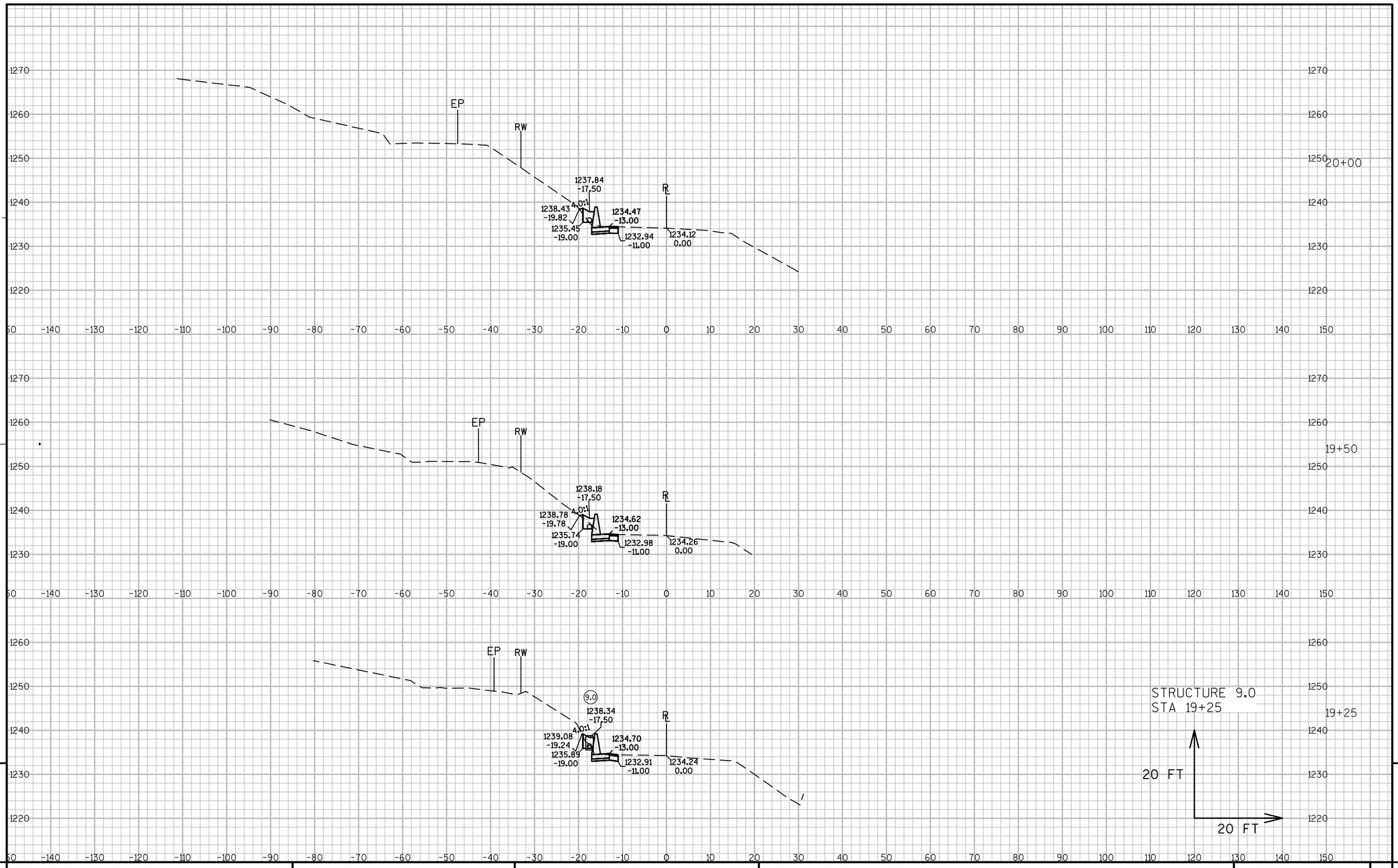

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PROJECT NO: CTH MD	HWY: CTH M	COUNTY: WASHBURN	CROSS SECTIONS: CTH M	SHEET	E

FILE NAME : S:\PROJECTS\NW\WASHBURN COUNTY\CTH M\DESIGN\CIVIL 3D CTH M\DESIGN\CORRIDORS\CORRIDOR-CTHM-FINAL.DWG
LAYOUT NAME - 090109_XS

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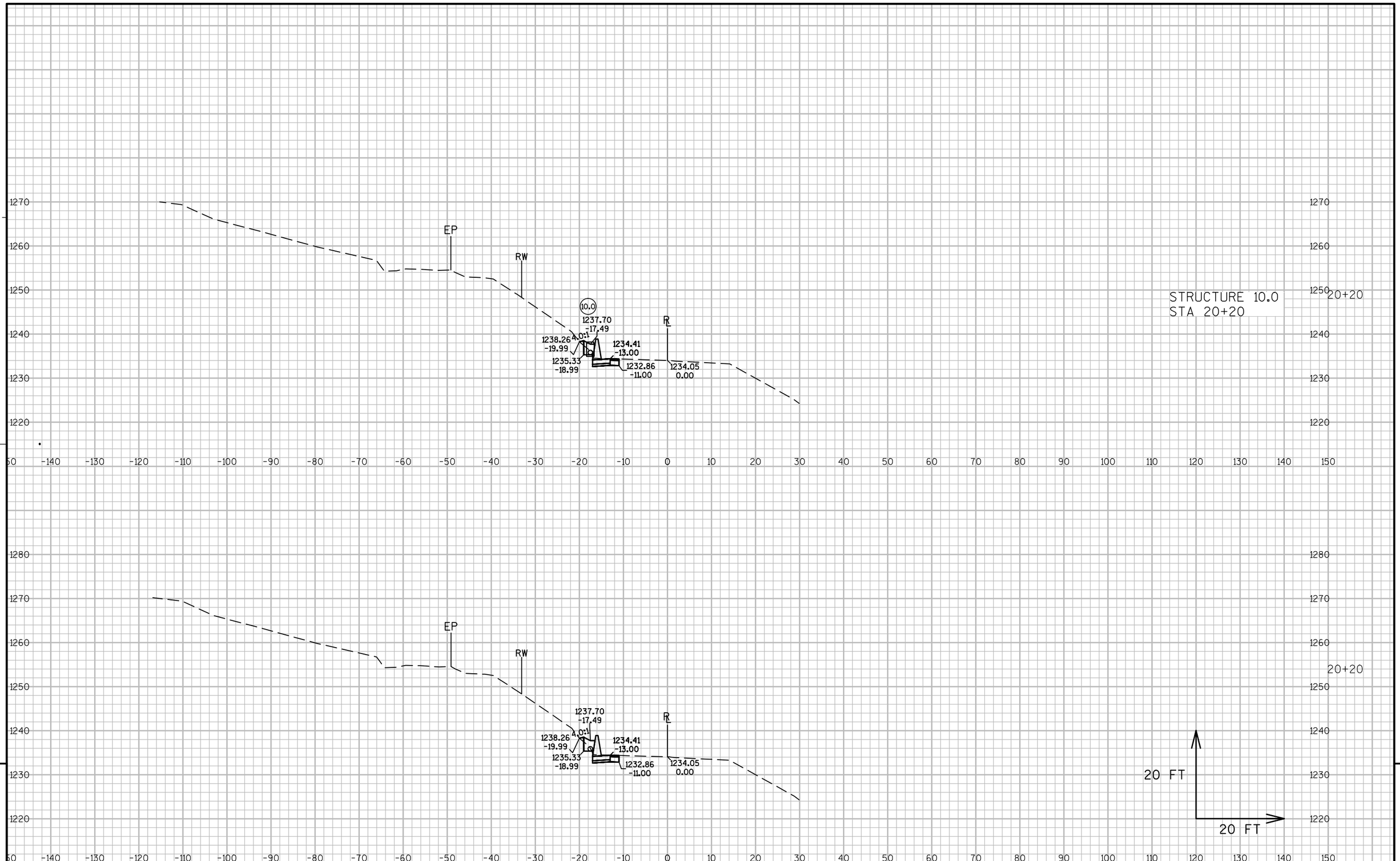

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PROJECT NO: CTH MD	HWY: CTH M	COUNTY: WASHBURN	CROSS SECTIONS: CTH M	SHEET	E

FILE NAME : S:\PROJECTS\NW\WASHBURN COUNTY\CTH M\DESIGN\CIVIL 3D CTH M\DESIGN\CORRIDORS\CORRIDOR-CTHM-FINAL.DWG
LAYOUT NAME - 090110_XS

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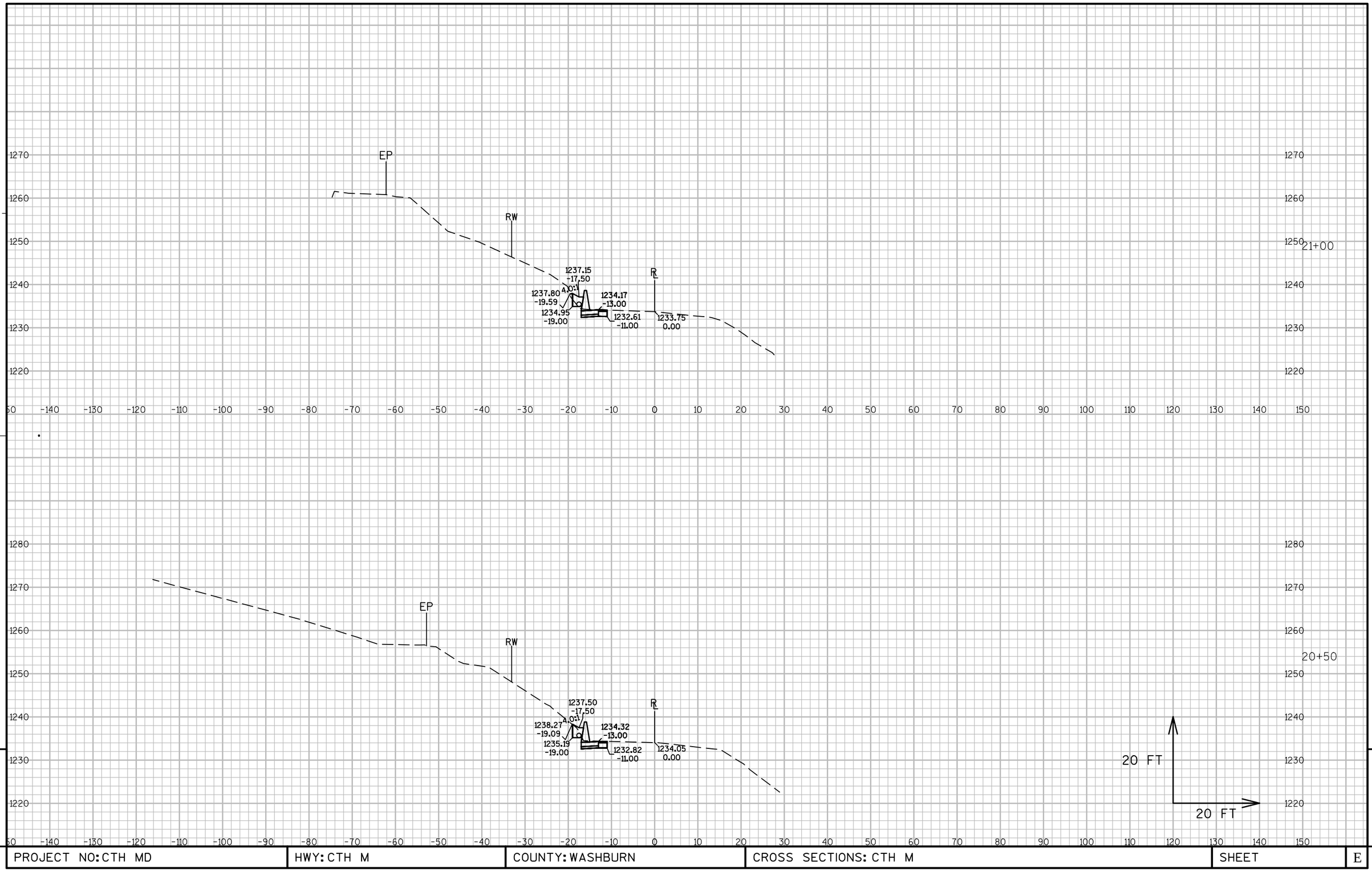

PROJECT NO: CTH MD	HWY: CTH M	COUNTY: WASHBURN	CROSS SECTIONS: CTH M	SHEET	E

FILE NAME : S:\PROJECTS\NW\WASHBURN COUNTY\CTH M\DESIGN\CIVIL 3D CTH M\DESIGN\CORRIDORS\CORRIDOR-CTHM-FINAL.DWG
LAYOUT NAME - 090111_XS

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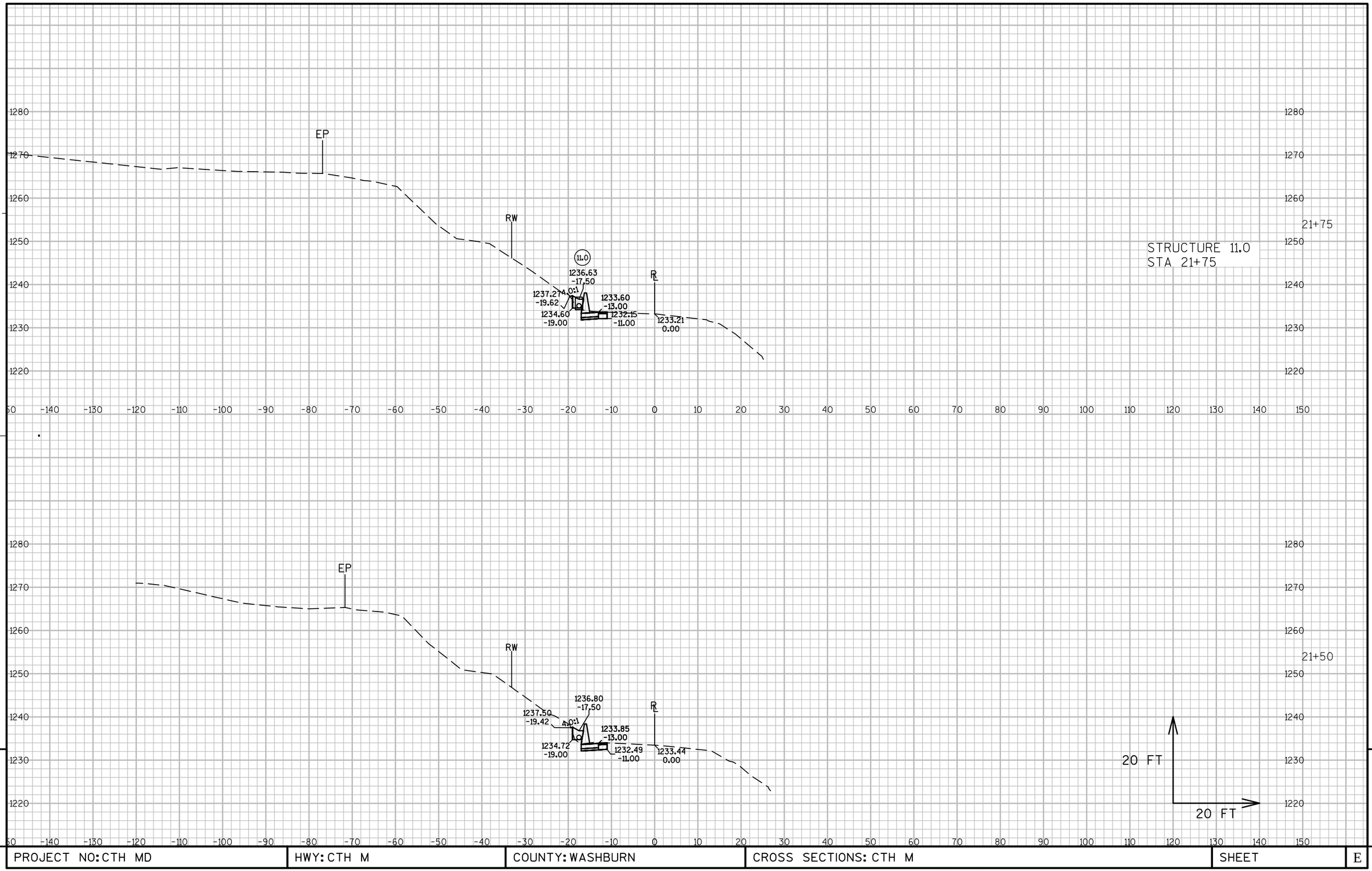

PROJECT NO: CTH MD	HWY: CTH M	COUNTY: WASHBURN	CROSS SECTIONS: CTH M	SHEET	E

FILE NAME : S:\PROJECTS\NW\WASHBURN COUNTY\CTH M\DESIGN\CIVIL 3D CTH M\DESIGN\CORRIDORS\CORRIDOR-CTHM-FINAL.DWG
LAYOUT NAME - 090112_XS

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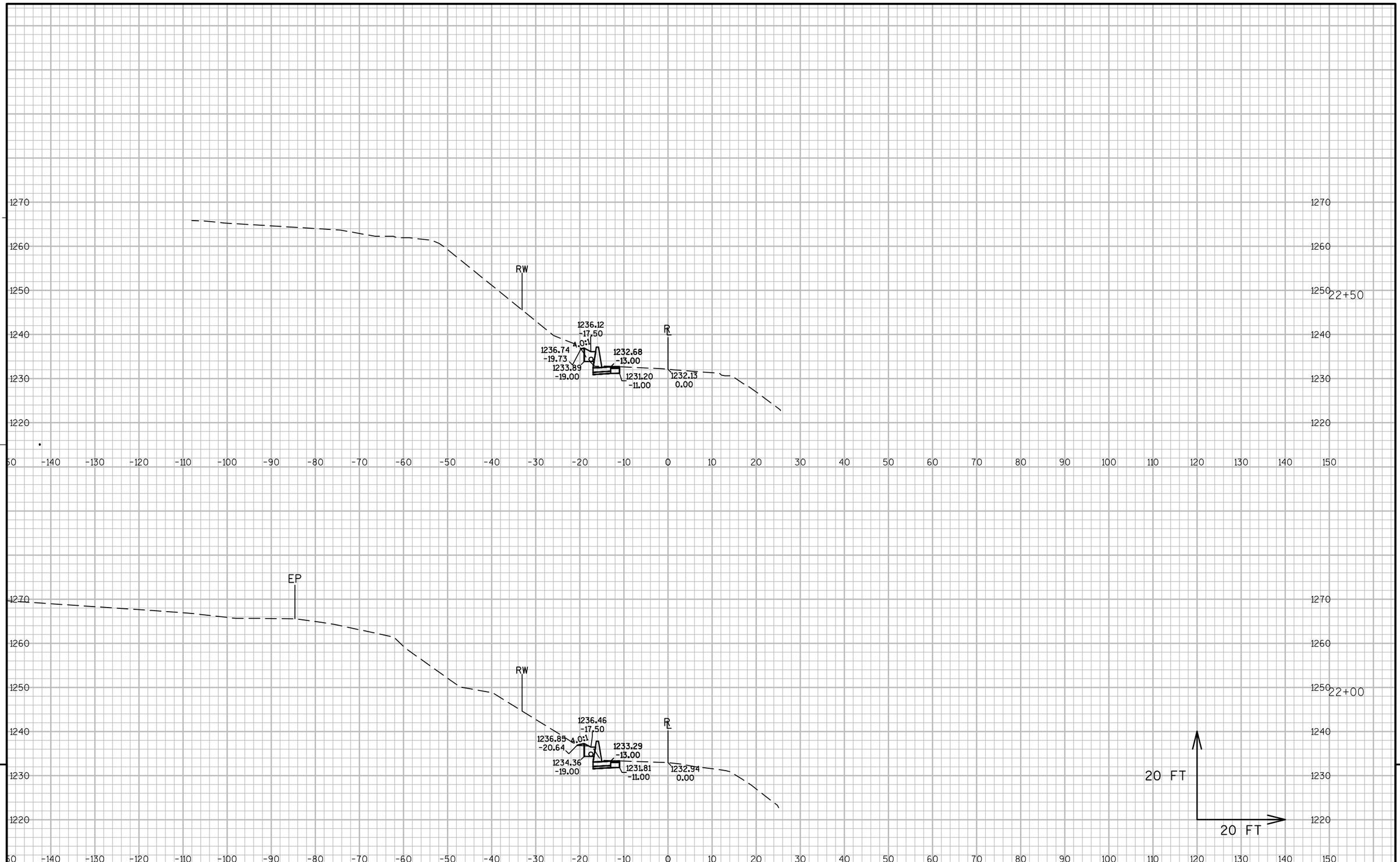

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PROJECT NO: CTH MD	HWY: CTH M	COUNTY: WASHBURN	CROSS SECTIONS: CTH M	SHEET	E

FILE NAME : S:\PROJECTS\NW\WASHBURN COUNTY\CTH M\DESIGN\CIVIL 3D CTH M\DESIGN\CORRIDORS\CORRIDOR-CTHM-FINAL.DWG
LAYOUT NAME - 090113_XS

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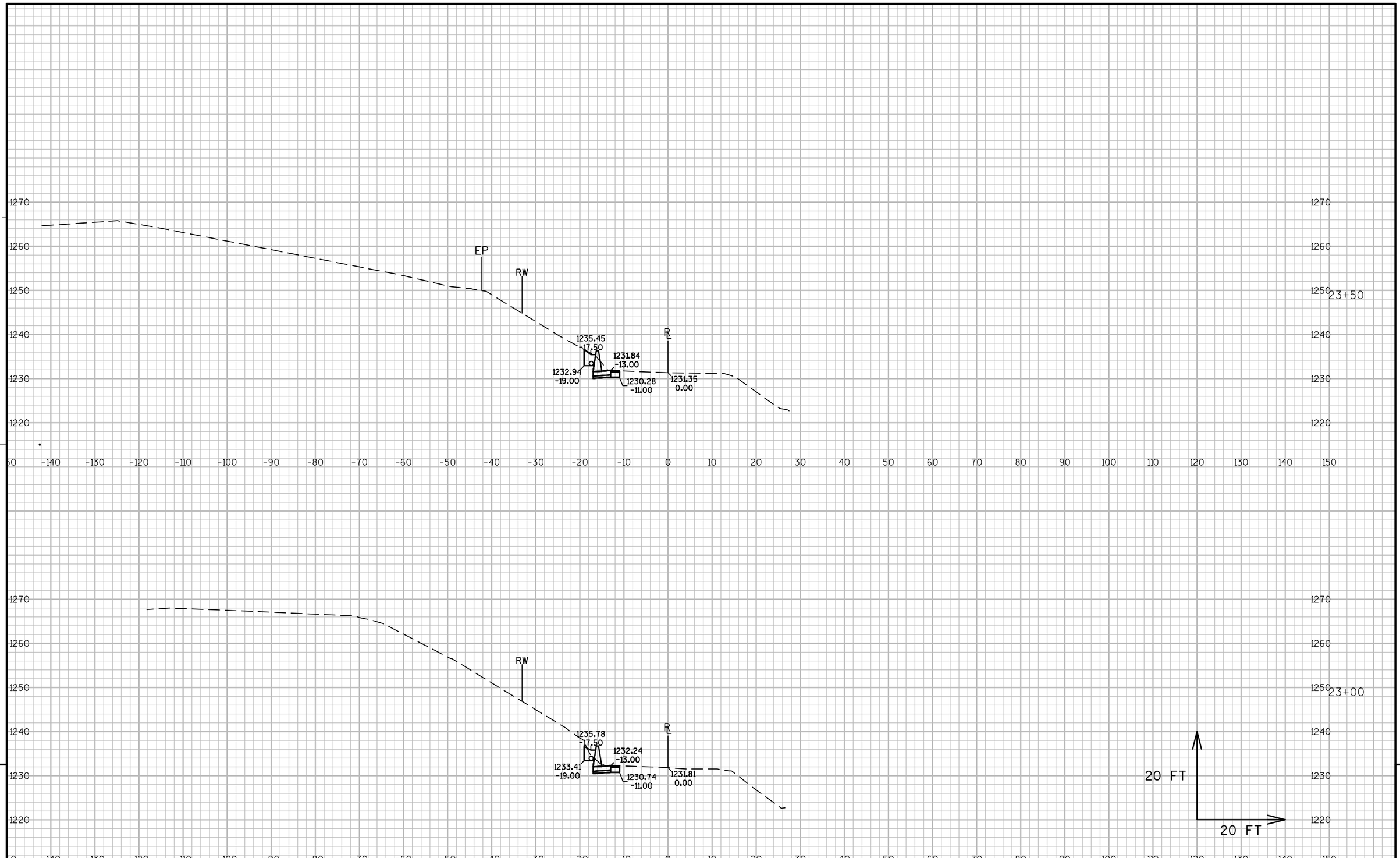

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PROJECT NO: CTH MD	HWY: CTH M	COUNTY: WASHBURN	CROSS SECTIONS: CTH M	SHEET	E

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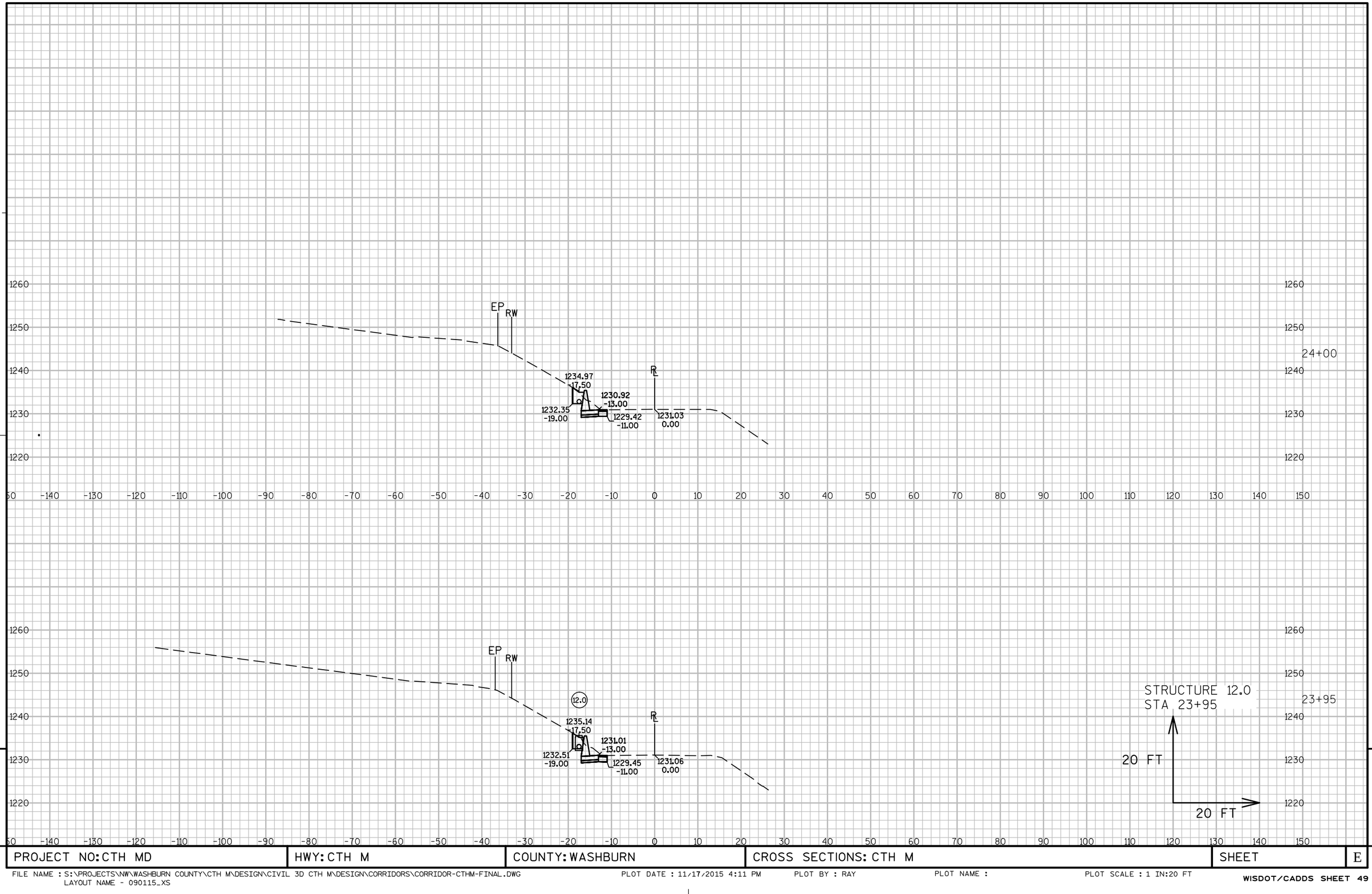
LAYOUT NAME - 090114_XS
PLOT DATE : 11/17/2015 4:11 PM
PLOT BY : RAY
PLOT NAME :
PLOT SCALE : 1 IN:20 FT
WISDOT/CADDS SHEET 49



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PROJECT NO: CTH MD	HWY: CTH M	COUNTY: WASHBURN	CROSS SECTIONS: CTH M	SHEET	E

FILE NAME : S:\PROJECTS\NW\WASHBURN COUNTY\CTH M\DESIGN\CIVIL 3D CTH M\DESIGN\CORRIDORS\CORRIDOR-CTHM-FINAL.DWG
LAYOUT NAME - 090115_XS
PLOT DATE : 11/17/2015 4:11 PM
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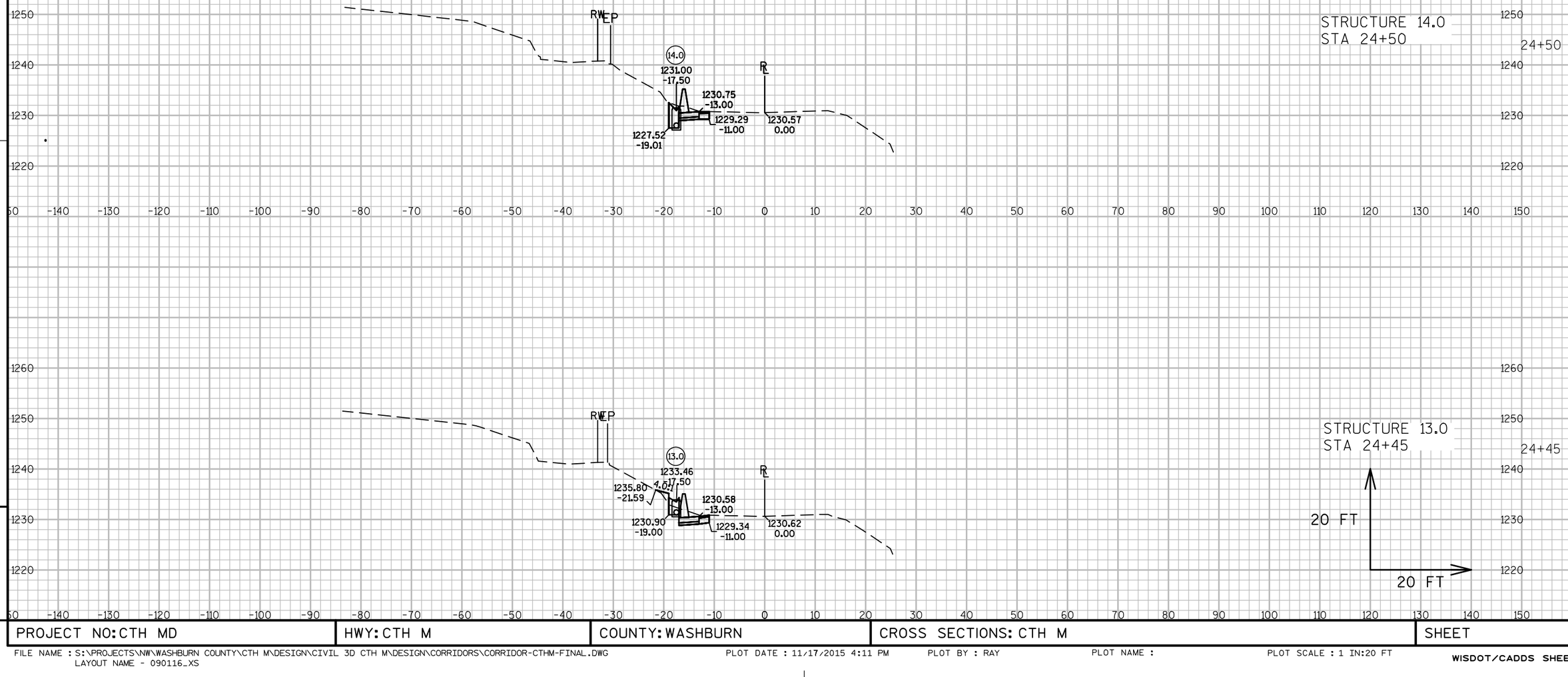
PLOT NAME :
PLOT SCALE : 1 IN:20 FT
WISDOT/CADDS SHEET 49



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PROJECT NO: CTH MD	HWY: CTH M	COUNTY: WASHBURN	CROSS SECTIONS: CTH M	SHEET	E

FILE NAME : S:\PROJECTS\NW\WASHBURN COUNTY\CTH M\DESIGN\CIVIL 3D CTH M\DESIGN\CORRIDORS\CORRIDOR-CTHM-FINAL.DWG
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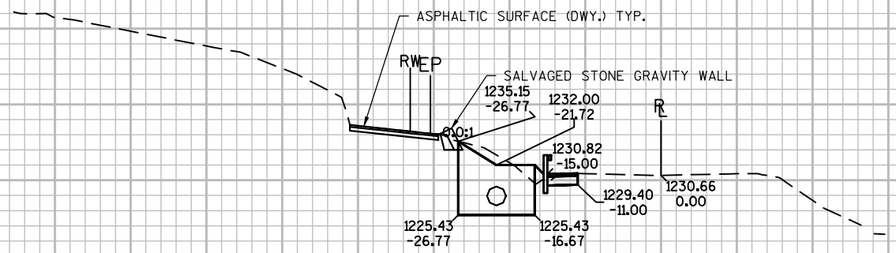

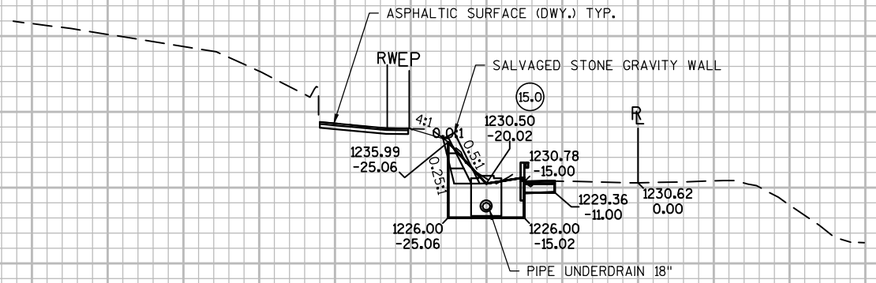

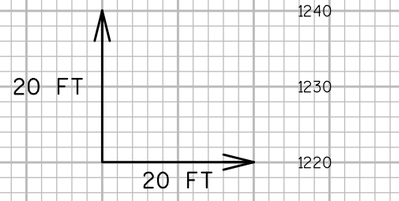

24+90

24+78

9

9

PROJECT NO: CTH MD	HWY: CTH M	COUNTY: WASHBURN	CROSS SECTIONS: CTH M	SHEET	E

FILE NAME : S:\PROJECTS\NW\WASHBURN COUNTY\CTH M\DESIGN\CIVIL 3D CTH M\DESIGN\CORRIDORS\CORRIDOR-CTHM-FINAL.DWG
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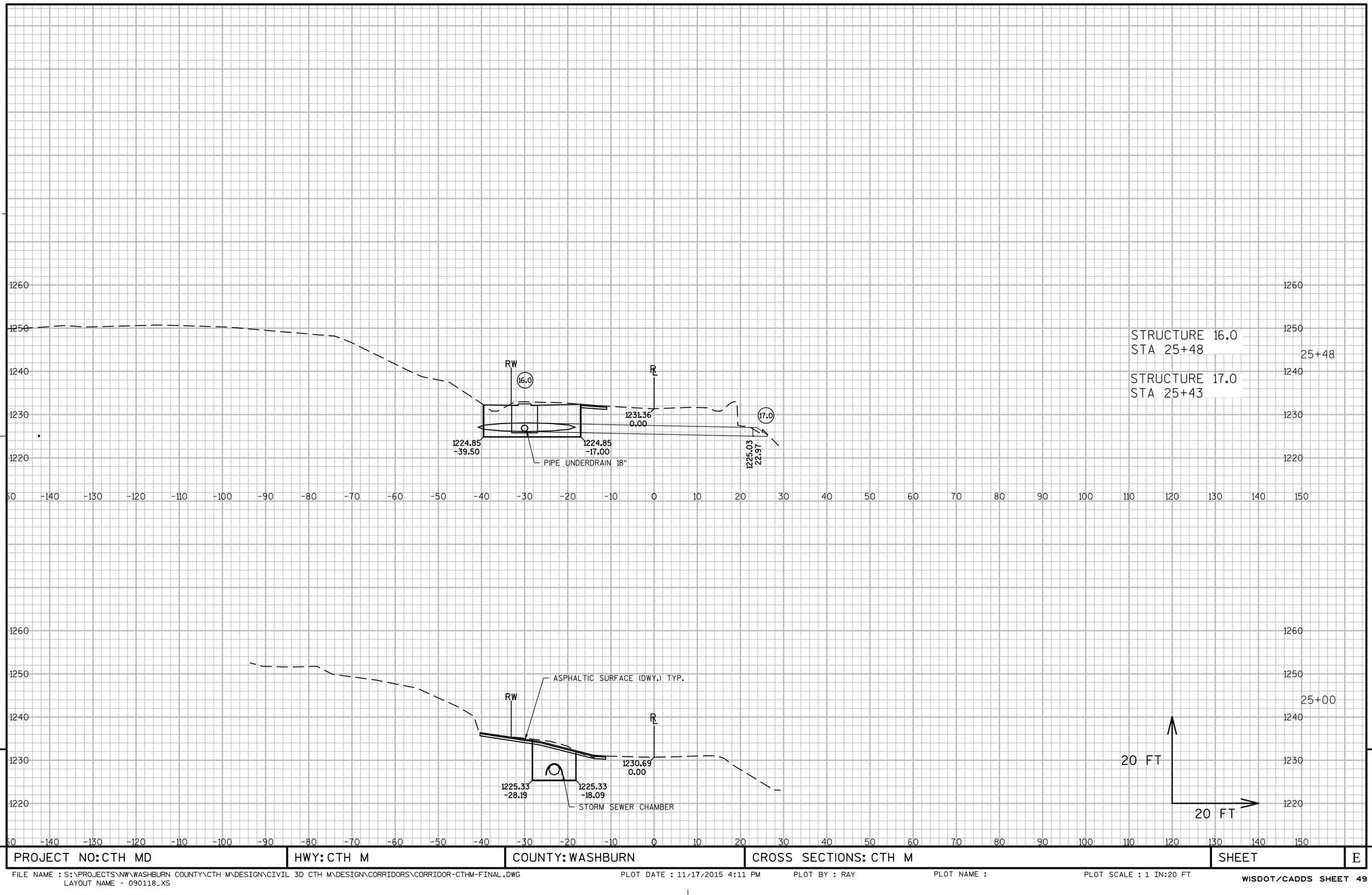

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PROJECT NO: CTH MD	HWY: CTH M	COUNTY: WASHBURN	CROSS SECTIONS: CTH M	SHEET	E

FILE NAME : S:\PROJECTS\NW\WASHBURN COUNTY\CTH M\DESIGN\CIVIL 3D CTH M\DESIGN\CORRIDORS\CORRIDOR-CTHM-FINAL.DWG
LAYOUT NAME - 090118_XS

PLOT DATE : 11/17/2015 4:11 PM PLOT BY : RAY PLOT NAME : PLOT SCALE : 1 IN:20 FT

END PROJECT
STA 26+00

26+00

STRUCTURE 18.0
STA 25+82

25+82

25+50

RW

℄

18.0

1231.90
0.00

1225.66
-25.21

1225.66
-15.03

PIPE UNDERDRAIN 18"

ASPHALTIC SURFACE (DWY.) TYP.

1231.40
0.00

1224.87
-41.36

1224.87
-18.58

STORM SEWER CHAMBER

20 FT

20 FT

PROJECT NO: CTH MD	HWY: CTH M	COUNTY: WASHBURN	CROSS SECTIONS: CTH M	SHEET	E

FILE NAME : S:\PROJECTS\NW\WASHBURN COUNTY\CTH M\DESIGN\CIVIL 3D CTH M\DESIGN\CORRIDORS\CORRIDOR-CTHM-FINAL.DWG
LAYOUT NAME - 090119_XS

PLOT DATE : 11/17/2015 4:11 PM PLOT BY : RAY PLOT NAME : PLOT SCALE : 1 IN:20 FT