

LAX

PROJECT ID: 1077-02-70

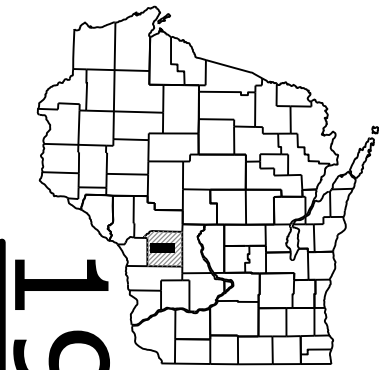
COUNTY: MONROE

JULY 2018

ORDER OF SHEETS

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

TOTAL SHEETS = 134



DESIGN DESIGNATION

IH 90	
A.A.D.T. 2019	= 17,300
A.A.D.T. 2039	= 20,500
D.H.V.	= 1,498
D.D.	= 58 / 42
T.	= 23.5%
DESIGN SPEED	= 70 MPH
ESALS	= 13,000,000

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	
MARSH AREA	
WOODED OR SHRUB AREA	

PROFILE

GRADE LINE	
ORIGINAL GROUND	
MARSH OR ROCK PROFILE (To be noted as such)	
SPECIAL DITCH	
GRADE ELEVATION	
CULVERT (Profile View)	
UTILITIES	
ELECTRIC	
FIBER OPTIC	
GAS	
SANITARY SEWER	
STORM SEWER	
TELEPHONE	
WATER	
UTILITY PEDESTAL	
POWER POLE	
TELEPHONE POLE	

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

PLAN OF PROPOSED IMPROVEMENT

SPARTA - TOMAH

STH 16 TO CTH M

IH 90

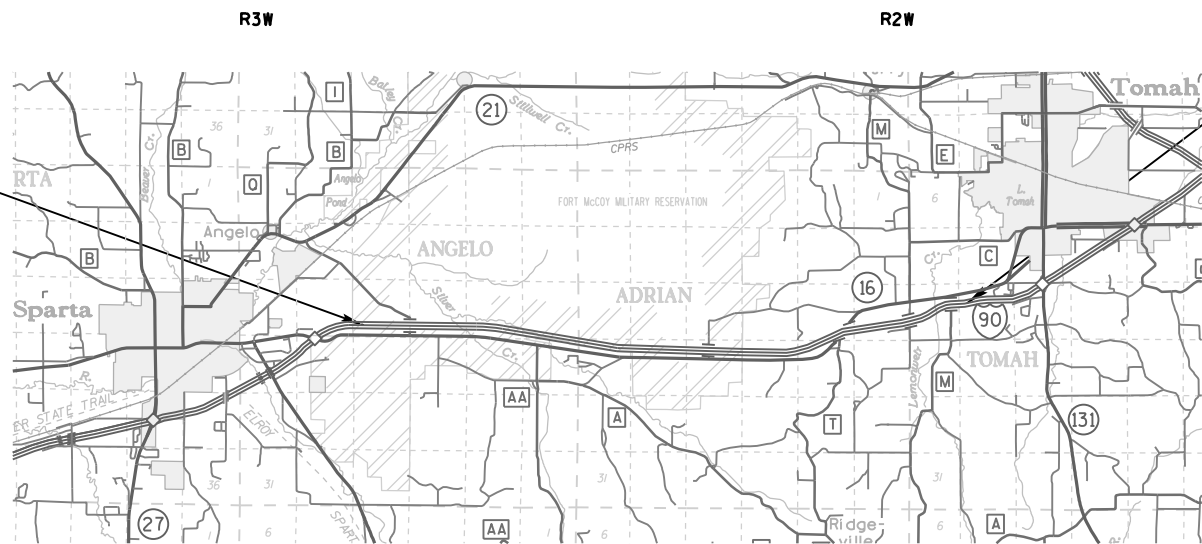
MONROE COUNTY

STATE PROJECT NUMBER
1077-02-70

BEGIN PROJECT 1077-02-70

STA 1588+88 EB	STA 1590+05A WB
X=644,566.721	X=644,577.251
Y=379,394.487	Y=379,504.809

T17



END PROJECT 1077-02-70

STA 2192+30 EB	STA 2192+06A WB
X=703,881.145	X=703,804.057
Y=382,921.101	Y=382,990.135

LAYOUT
SCALE 0 2 MI.

TOTAL NET LENGTH OF CENTERLINE = 0.000 MI.

HORIZONTAL POSITIONS SHOWN ARE WISCONSIN COUNTY COORDINATES, MONROE COUNTY, NAD83 2012, IN U.S. SURVEY FEET. VALUES ARE GRID COORDINATES, GRID BEARINGS, AND GRID DISTANCES. GRID DISTANCES MAY BE USED AS GROUND DISTANCES. VERTICAL DATUM NAVD 89 (2012)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

PREPARED BY

Surveyor	WISDOT
Designer	MIKE GREINER
Project Manager	BRIAN MEYER
Regional Examiner	SW REGION
Regional Supervisor	JIM SAVOLDELLI
C.O. Examiner	

APPROVED FOR THE DEPARTMENT

DATE: 1/24/18

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2	GENERAL NOTES			STANDARD ABBREVIATIONS				2																																																																																																																																																																																																																		
	- THE LOCATIONS OF EXISTING AND PROPOSED UTILITY INSTALLATIONS AS SHOWN ON THE PLANS ARE APPROXIMATE. THERE MAY BE OTHER UTILITY INSTALLATIONS WITHIN THE PROJECT AREA THAT ARE NOT SHOWN. - PRIOR TO THE PLACEMENT OF STEEL PLATE BEAM GUARD OR MGS GUARDRAIL, THE SHOULDERS SHALL BE IN PLACE, SHAPED AND COMPACTED UNLESS SHOWN OTHERWISE. - HMA PAVEMENT WEIGHT CALCULATIONS ARE BASED ON 112 LB/SY/IN. 5 INCH HMA PAVEMENT, WEST CROSSOVER TAPERS, SHALL BE CONSTRUCTED IN A SINGLE LAYER 2.25 INCH HMA PAVEMENT, WEST CROSSOVER MILLING LOCATIONS, SHALL BE CONSTRUCTED IN A SINGLE LAYER 5 INCH HMA PAVEMENT, EAST CROSSOVER, SHALL BE CONSTRUCTED IN A SINGLE LAYER - CONTRACTOR WILL BE RESPONSIBLE FOR RESHAPING AND SEEDING ANY PREVIOUSLY GRASSED AREAS WHICH ARE DISTURBED BY HIS OPERATION OUTSIDE OF THE NORMAL CONSTRUCTION LIMITS. - THE QUANTITY OF THE ITEMS FOR EROSION PROTECTION INCLUDES AN UNDISTRIBUTED AMOUNT FOR PROTECTION, CONTROL AND ABATEMENT OF WATER POLLUTION RESULTING FROM SOIL EROSION. THE DISTRIBUTION AND LOCATION OF THESE MATERIALS ARE TO BE DETERMINED BY THE ENGINEER. (SALVAGED) TOPSOIL AND EMAT HAS BEEN COMPUTED BY DIRECT MEASUREMENTS ON THE CROSS SECTIONS TO THE TOE OF SLOPE. SEEDING AND FERTILIZER HAS BEEN COMPUTED BY DIRECT MEASUREMENTS ON THE CROSS SECTIONS PLUS 5 FT.			<table><tr><td>AC</td><td>ACRE</td><td>LC.</td><td>LONG CHORD</td></tr><tr><td>AGG</td><td>AGGREGATE</td><td>LS</td><td>LUMP SUM</td></tr><tr><td><</td><td>ANGLE</td><td>M.P.</td><td>MARKER POST</td></tr><tr><td>AE, AEW</td><td>APRON ENDWALL</td><td>MGAL</td><td>1000 GALLONS</td></tr><tr><td>ASPH.</td><td>ASPHALTIC</td><td>N.C.</td><td>NORMAL CROWN</td></tr><tr><td>A.D.T.</td><td>AVERAGE DAILY TRAFFIC</td><td>N</td><td>NORTH</td></tr><tr><td>A.A.D.T.</td><td>ANNUAL AVERAGE DAILY TRAFFIC</td><td>NB</td><td>NORTHBOUND</td></tr><tr><td>B.F.</td><td>BACK FACE</td><td>NOR</td><td>NORMAL</td></tr><tr><td>BM</td><td>BENCHMARK</td><td>NO.</td><td>NUMBER</td></tr><tr><td>BTWN</td><td>BETWEEN</td><td>PAV'T</td><td>PAVEMENT</td></tr><tr><td>CTR.</td><td>CENTER</td><td>P.L.E.</td><td>PERMANENT LIMITED EASEMENT</td></tr><tr><td>C/L</td><td>CENTER LINE</td><td>P.C.</td><td>POINT OF CURVATURE</td></tr><tr><td>Δ</td><td>CENTRAL ANGLE OR DELTA</td><td>P.I.</td><td>POINT OF INTERSECTION</td></tr><tr><td>C.E.</td><td>COMMERCIAL ENTRANCE</td><td>P.T.</td><td>POINT OF TANGENCY</td></tr><tr><td>CONST.</td><td>CONSTRUCTION</td><td>PCC</td><td>PORTLAND CEMENT CONCRETE</td></tr><tr><td>CMCP</td><td>CORRUGATED METAL CULVERT PIPE</td><td>P.E.</td><td>PRIVATE ENTRANCE</td></tr><tr><td>CMP</td><td>CORRUGATED METAL PIPE</td><td>PGL</td><td>PROFILE GRADE LINE</td></tr><tr><td>CO.</td><td>COUNTY</td><td>P.L.</td><td>PROPERTY LINE</td></tr><tr><td>CTH</td><td>COUNTY TRUNK HIGHWAY</td><td>R</td><td>RADIUS OR RANGE</td></tr><tr><td>CR.</td><td>CREEK</td><td>R/L</td><td>REFERENCE LINE</td></tr><tr><td>CABC</td><td>CRUSHED AGGREGATE BASE COURSE</td><td>R.C.C.P.</td><td>REINFORCED CONCRETE CULVERT PIPE</td></tr><tr><td>CY</td><td>CUBIC YARD</td><td>REQ'D</td><td>REQUIRED</td></tr><tr><td>CP</td><td>CONTROL POINT OR CULVERT PIPE</td><td>RT</td><td>RIGHT</td></tr><tr><td>C&G</td><td>CURB AND GUTTER</td><td>R.H.F.</td><td>RIGHT HAND FORWARD</td></tr><tr><td>D</td><td>DEGREE OF CURVE</td><td>R/W</td><td>RIGHT OF WAY</td></tr><tr><td>D.H.V.</td><td>DESIGN HOURLY VOLUME</td><td>RD.</td><td>ROAD</td></tr><tr><td>DIA.</td><td>DIAMETER</td><td>SHLD.</td><td>SHOULDER(S)</td></tr><tr><td>D.D.</td><td>DIRECTIONAL DISTRIBUTION</td><td>SHR.</td><td>SHRINKAGE</td></tr><tr><td>DISCH.</td><td>DISCHARGE</td><td>S</td><td>SOUTH</td></tr><tr><td>DMS</td><td>DYNAMIC MESSAGE SIGN</td><td>SB</td><td>SOUTHBOUND</td></tr><tr><td>EA</td><td>EACH</td><td>S.F.</td><td>SQUARE FOOT (FEET)</td></tr><tr><td>E</td><td>EAST</td><td>SDD</td><td>STANDARD DETAIL DRAWING(S)</td></tr><tr><td>EB</td><td>EASTBOUND</td><td>STH</td><td>STATE TRUNK HIGHWAY</td></tr><tr><td>ELEC.</td><td>ELECTRIC(AL), ELEC. CABLE</td><td>STA.</td><td>STATION</td></tr><tr><td>EL., ELEV.</td><td>ELEVATION</td><td>S.E.</td><td>SUPERELEVATION</td></tr><tr><td>ESALS</td><td>EQUIVALENT SINGLE AXLE LOADS</td><td>S/L</td><td>SURVEY LINE</td></tr><tr><td>EXC.</td><td>EXCAVATION</td><td>SYM</td><td>SYMMETRICAL</td></tr><tr><td>EXIST</td><td>EXISTING</td><td>T.</td><td>PERCENT TRUCKS</td></tr><tr><td>F.F.</td><td>FACE TO FACE</td><td>TEL.</td><td>TELEPHONE</td></tr><tr><td>FERT.</td><td>FERTILIZER</td><td>TEMP.</td><td>TEMPORARY</td></tr><tr><td>F.E.</td><td>FIELD ENTRANCE</td><td>T.L.E.</td><td>TEMPORARY LIMITED EASEMENT</td></tr><tr><td>F/L, F.L.</td><td>FLOW LINE</td><td>T.O.C.</td><td>TOP OF CURB</td></tr><tr><td>GALV.</td><td>GALVANIZE</td><td>TYP</td><td>TYPICAL</td></tr><tr><td>H.S.</td><td>HIGH STRENGTH</td><td>UNCL.</td><td>UNCLASSIFIED</td></tr><tr><td>CWT</td><td>HUNDRED WEIGHT</td><td>U.G.</td><td>UNDERGROUND (CABLE)</td></tr><tr><td>INL</td><td>INLET</td><td>VAR</td><td>VARIABLE</td></tr><tr><td>INTER.</td><td>INTERSECTION</td><td>V.C.</td><td>VERTICAL CURVE</td></tr><tr><td>IH</td><td>INTERSTATE HIGHWAY</td><td>V.P.C.</td><td>VERTICAL POINT OF CURVATURE</td></tr><tr><td>JT.</td><td>JOINT</td><td>V.P.I.</td><td>VERTICAL POINT OF INTERSECTION</td></tr><tr><td>LT</td><td>LEFT</td><td>V.P.T.</td><td>VERTICAL POINT OF TANGENCY</td></tr><tr><td>L.H.F.</td><td>LEFT HAND FORWARD</td><td>Wt.</td><td>WEIGHT</td></tr><tr><td>L.</td><td>LENGTH OF CURVE</td><td>W</td><td>WEST</td></tr><tr><td>L.F.</td><td>LINEAR FOOT(FEET)</td><td>WB</td><td>WESTBOUND</td></tr></table>					AC	ACRE	LC.	LONG CHORD	AGG	AGGREGATE	LS	LUMP SUM	<	ANGLE	M.P.	MARKER POST	AE, AEW	APRON ENDWALL	MGAL	1000 GALLONS	ASPH.	ASPHALTIC	N.C.	NORMAL CROWN	A.D.T.	AVERAGE DAILY TRAFFIC	N	NORTH	A.A.D.T.	ANNUAL AVERAGE DAILY TRAFFIC	NB	NORTHBOUND	B.F.	BACK FACE	NOR	NORMAL	BM	BENCHMARK	NO.	NUMBER	BTWN	BETWEEN	PAV'T	PAVEMENT	CTR.	CENTER	P.L.E.	PERMANENT LIMITED EASEMENT	C/L	CENTER LINE	P.C.	POINT OF CURVATURE	Δ	CENTRAL ANGLE OR DELTA	P.I.	POINT OF INTERSECTION	C.E.	COMMERCIAL ENTRANCE	P.T.	POINT OF TANGENCY	CONST.	CONSTRUCTION	PCC	PORTLAND CEMENT CONCRETE	CMCP	CORRUGATED METAL CULVERT PIPE	P.E.	PRIVATE ENTRANCE	CMP	CORRUGATED METAL PIPE	PGL	PROFILE GRADE LINE	CO.	COUNTY	P.L.	PROPERTY LINE	CTH	COUNTY TRUNK HIGHWAY	R	RADIUS OR RANGE	CR.	CREEK	R/L	REFERENCE LINE	CABC	CRUSHED AGGREGATE BASE COURSE	R.C.C.P.	REINFORCED CONCRETE CULVERT PIPE	CY	CUBIC YARD	REQ'D	REQUIRED	CP	CONTROL POINT OR CULVERT PIPE	RT	RIGHT	C&G	CURB AND GUTTER	R.H.F.	RIGHT HAND FORWARD	D	DEGREE OF CURVE	R/W	RIGHT OF WAY	D.H.V.	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Dial  or (800) 242-8511

www.DiggersHotline.com

UTILITY CONTACTS

Mike Olsen
ATC Management, Inc. - Electricity-transmission
801 O'keefe Rd
P.O. Box 6113
De Pere, WI 54115-6113
(920) 338-6582
molsen@atcllc.com

Ryan Niemeier
CenturyLink - Communication Line
333 N Front St
La Crosse, WI 54601
(608) 796-5190
ryan.niemeier@centurylink.com

Nate Sobojinski
Fort McCoy - Communication Line
2171 S. 8th Avenue
Fort McCoy, WI 54656
(608) 388-9184
Nathan.J.Sobojinski.civ@mail.mil

Roy Boyles
Oakdale Electric Cooperative - Electricity
P.O. Box 128
Oakdale, WI 54649-0128
(608) 372-8851
rboyles@oakdalerec.com

Dick Hammetter
Wisconsin Independent Network, LLC - Communication Line
Suite 219
800 Wisconsin Ave
Eau Claire, WI 54703
(715) 838-4406
Hammetter@WINS.net

Tony Marciniak
ATC Management, Inc. - Electricity-transmission
W234 N 2000 Ridgeview Parkway Ct
P.O. Box 47
Waukesha, WI 53187-0047
(262) 506-6814
TMarciniak@atcllc.com

Rob Maly
Dairyland Power Cooperative - Electricity
3200 East Ave S
P.O. Box 817
La Crosse, WI 54602-0817
(608) 788-4000
Rob.Maly@DairylandPower.com

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

Mike Adams
Wisconsin DOT RWIS Program - Communication Tower
Rm 501
P.O. Box 7986
Madison, WI 53707-7986
(608) 266-5004
Michael.Adams@dot.wi.gov

John Louis
Wisconsin Independent Network, LLC – Communication Line
Suite 219
800 Wisconsin Ave
Eau Claire, WI 54703
(715) 864-2918
JLouis@WINS.net

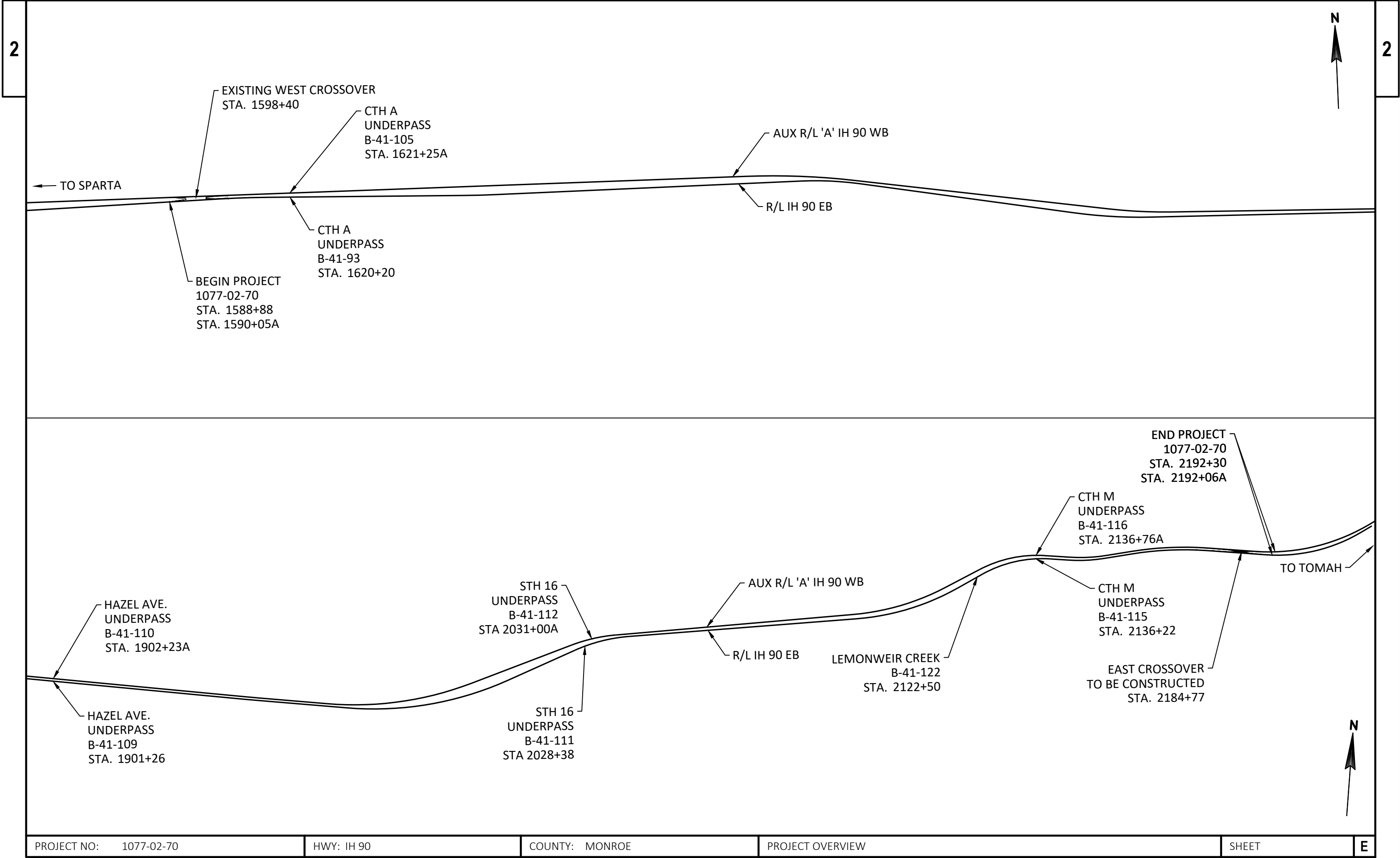
DNR LIAISON

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

DESIGN CONTACTS

BRIAN MEYER
PROJECT MANAGER
WISDOT SW REGION
3550 MORMON COULEE ROAD
LA CROSSE, WI 54601
608-789-5676

MICHAEL GREINER
PROJECT DESIGNER
WISDOT SW REGION
3550 MORMON COULEE ROAD
LA CROSSE, WI 54601
608-789-5958

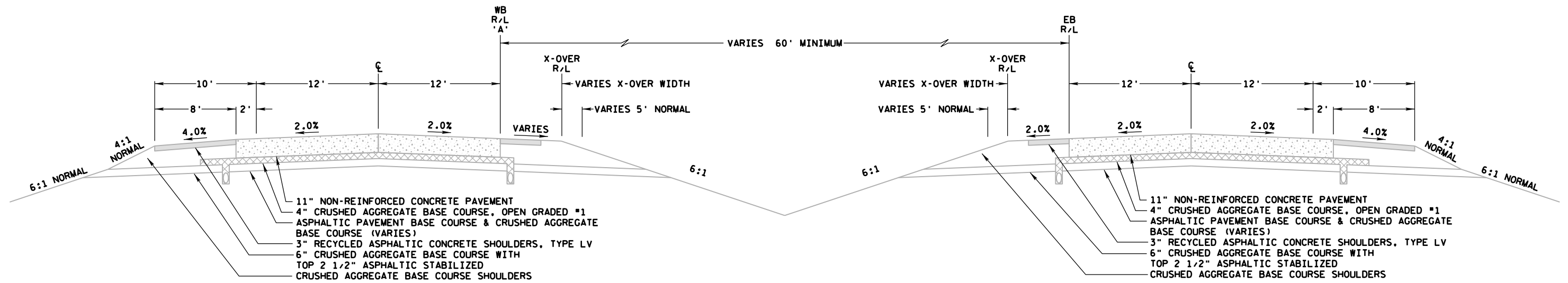




EASTBOUND
STA 1589+98 - 1592+88
STA 1602+92 - 1606+92



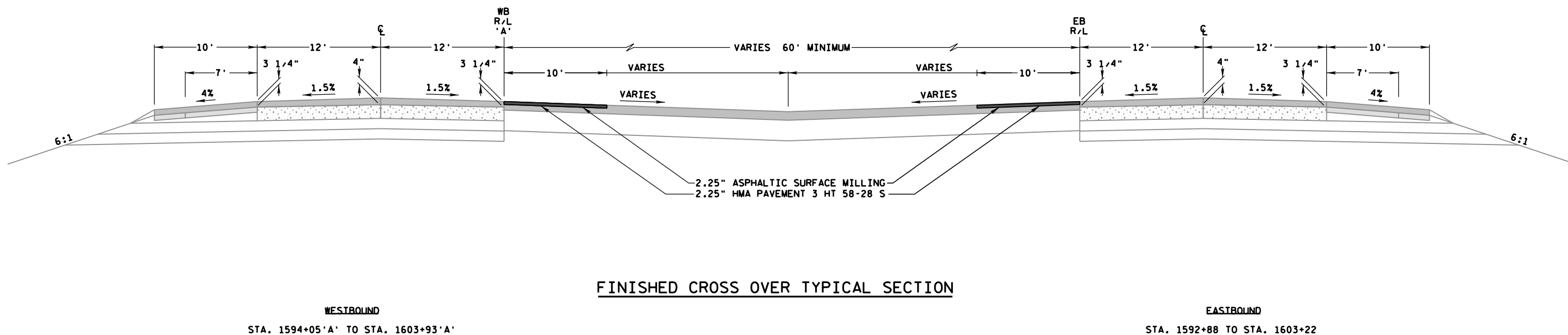
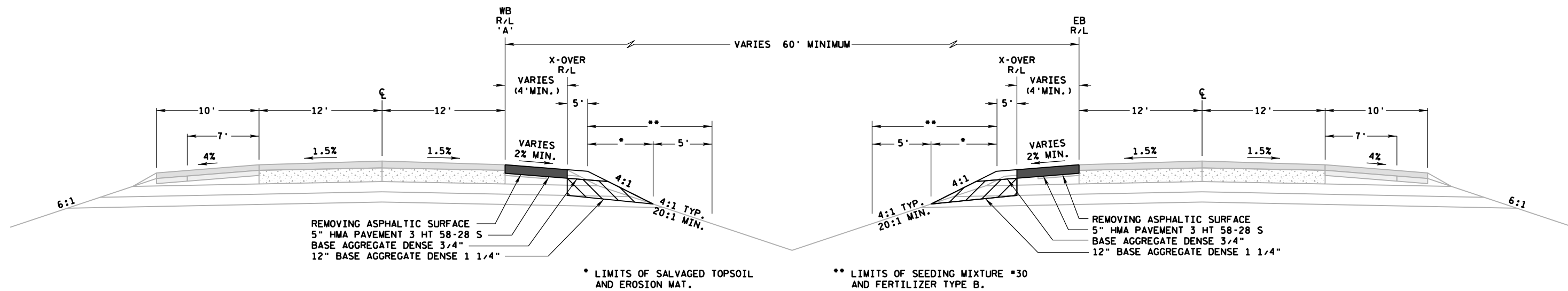
EASTBOUND
STA 1592+88 - 1602+92

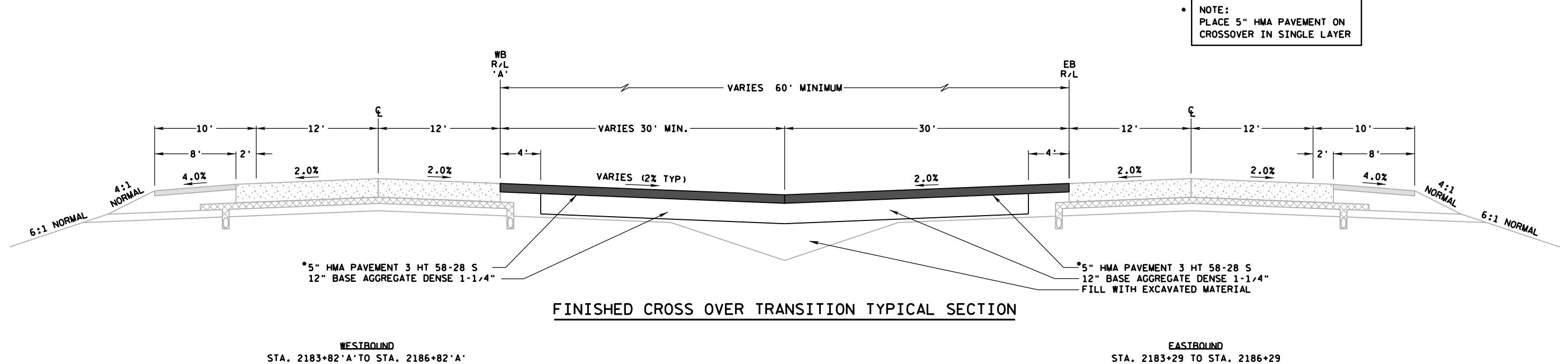
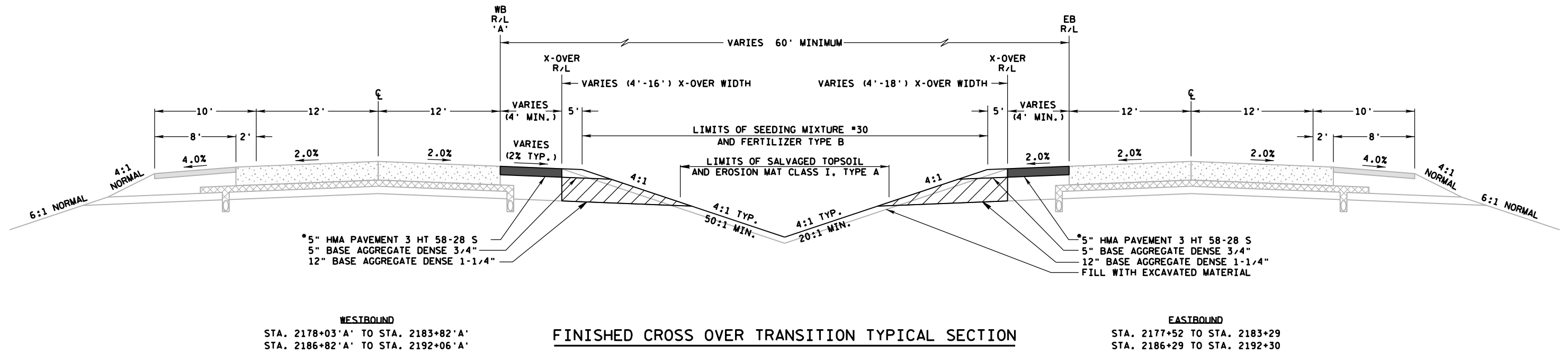


EXISTING TYPICAL SECTION - IH 90

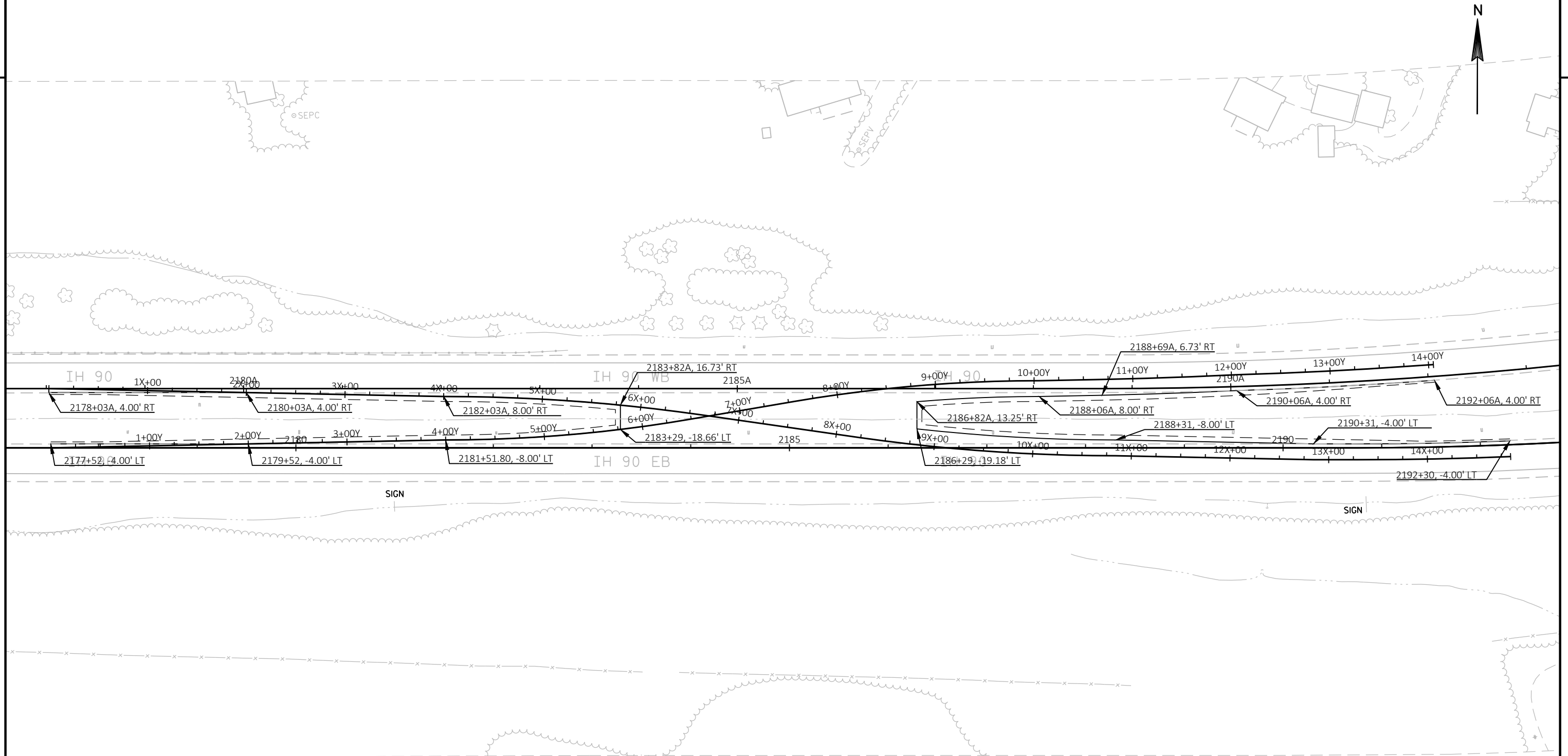
WESTBOUND
STA. 2178+02'A' TO STA. 2192+06'A'

EASTBOUND
STA. 2177+51 TO STA. 2192+30





* NOTE:
PLACE 5" HMA PAVEMENT ON
CROSSOVER IN SINGLE LAYER



PROJECT NO: 1077-02-70

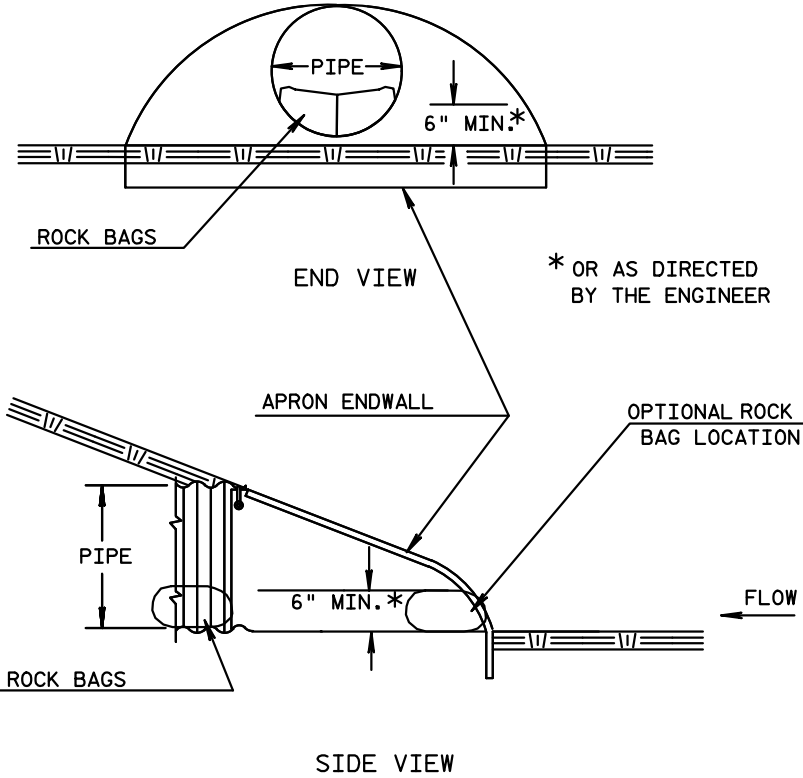
HWY: IH 90

COUNTY: MONROE

CONSTRUCTION DETAIL-PAVEMENT HINGE POINTS

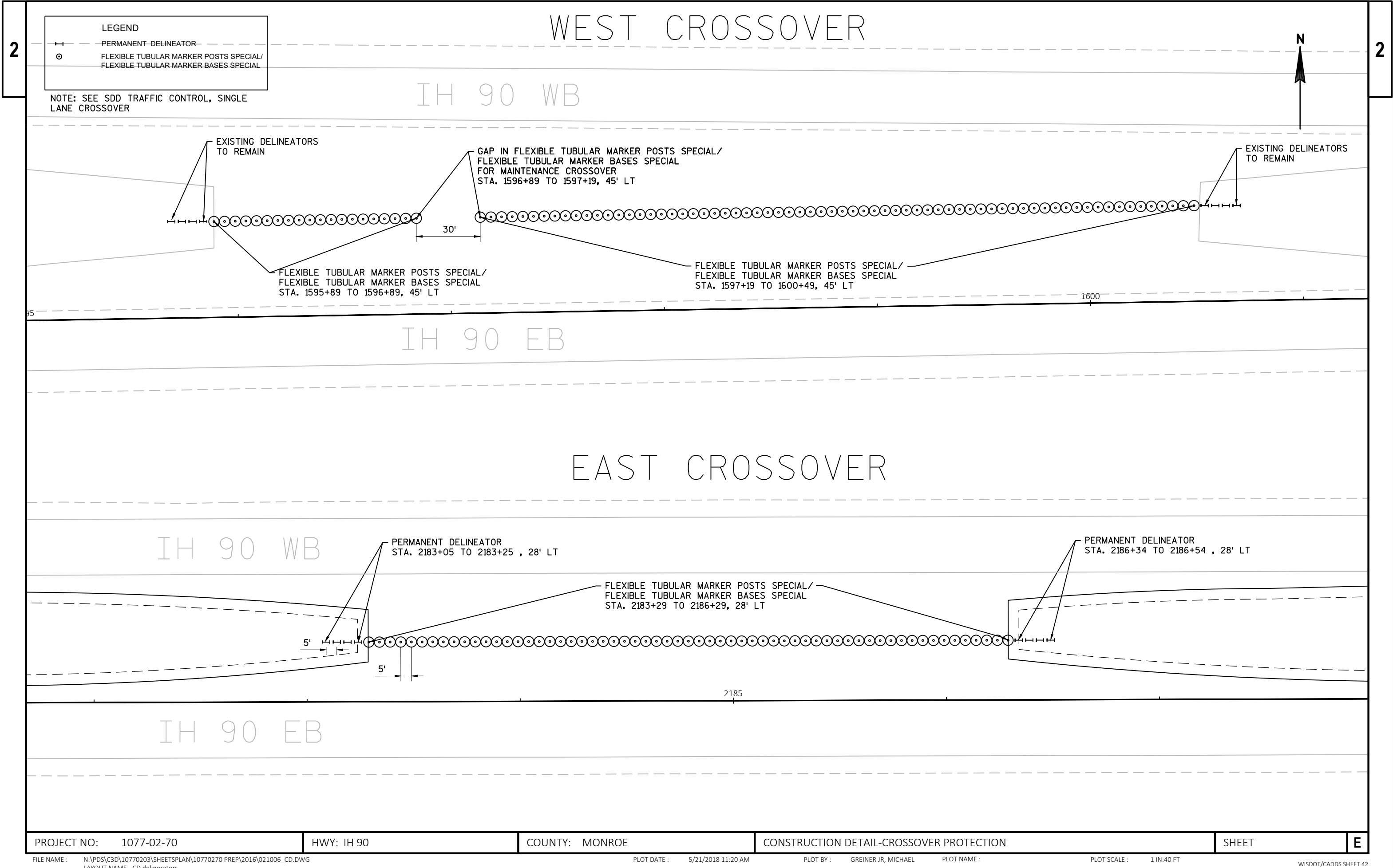
SHEET

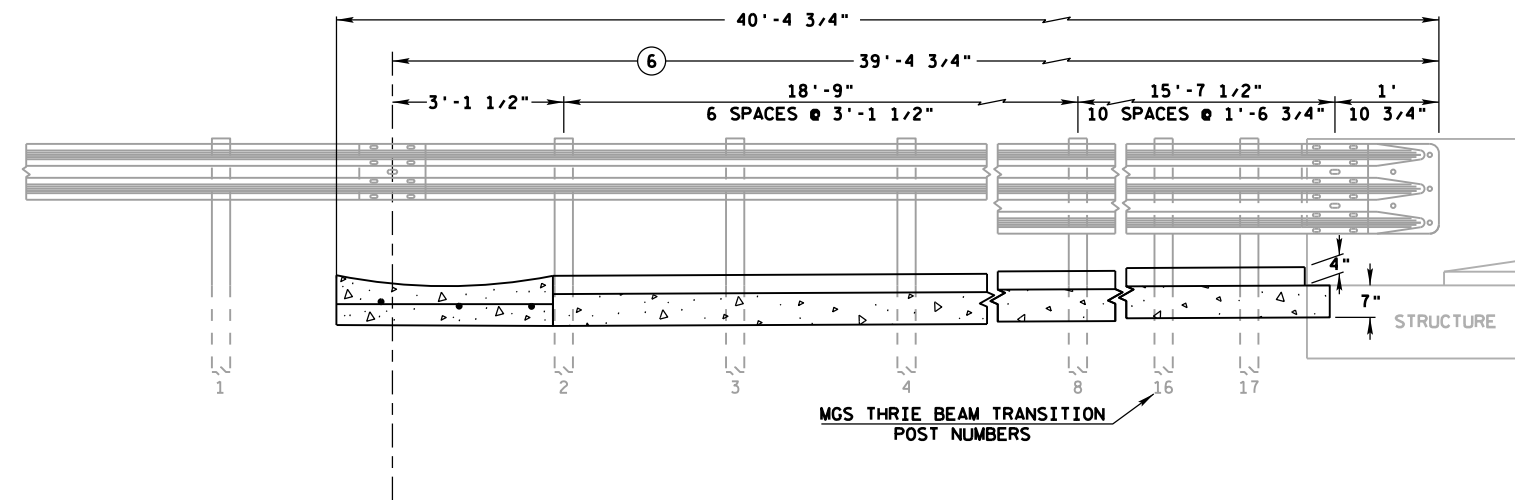
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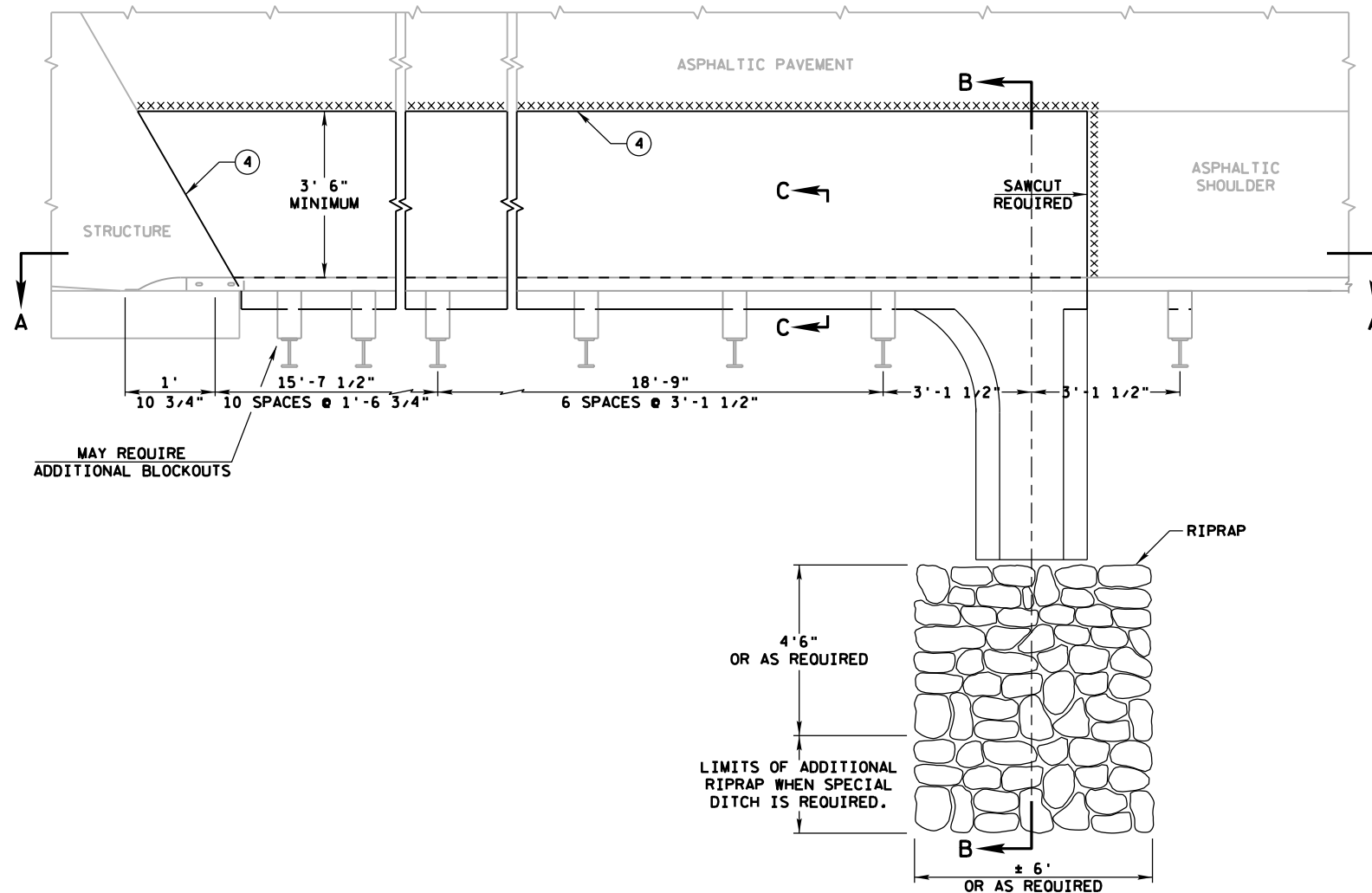
CULVERT PIPE CHECKS

ESTIMATED BAG SIZE = 18" X 12" X 6"	
PIPE SIZE	ESTIMATED NO. OF BAGS
12 "	1
15 "	2
18 "	2
21 "	3
14 " X 23 "	3
24 "	3
27 "	4
30 "	5
19 " X 30 "	5
36 "	7
24 " X 38 "	8
42 "	8
29 " X 45 "	10
48 "	10
34 " X 53 "	10
38 " X 60 "	13
60 "	13
66 "	15
53 " X 83 "	19

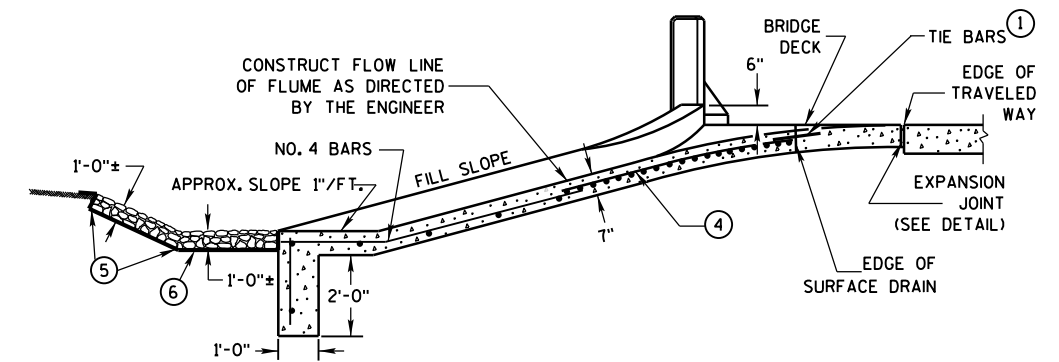




SECTION A-A



PLAN VIEW

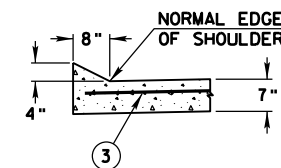


SECTION B-B

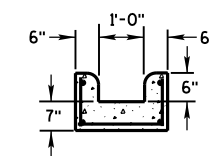
GENERAL NOTES

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

- ① NO. 4 X 2'-0" TIE BARS SPACED AT 3'-0" CENTERS TO BE USED ONLY WHEN ADJACENT TO P.C. CONCRETE.
- ② NO. 4 X 2'-0" TIE BARS SPACED AT 12" CENTERS TO BE PLACED BY BRIDGE CONTRACTOR, OR PAVEMENT TIES PLACED AS DIRECTED BY THE ENGINEER.
- ③ PIPE UNDERDRAIN MAY BE ANY OF THE MATERIALS LISTED IN SECTION 612.2 OF THE STANDARD SPECIFICATIONS EXCEPT DRAIN TILE.
- ④ MINIMUM REINFORCEMENT SHALL BE 6" X 6" - W4.0 X W4.0 OR NO. 3 BARS LONGITUDINAL AND TRANSVERSE SPACING 12" C-C.
- ⑤ LIMITS OF ADDITIONAL RIPRAP WHEN SPECIAL DITCH IS REQUIRED.
- ⑥ GEOTEXTILE FABRIC, TYPE 'R'
- ⑦ HOT POURED SEALANT UNLESS OTHERWISE SPECIFIED.



SECTION C-C



SECTION E-E

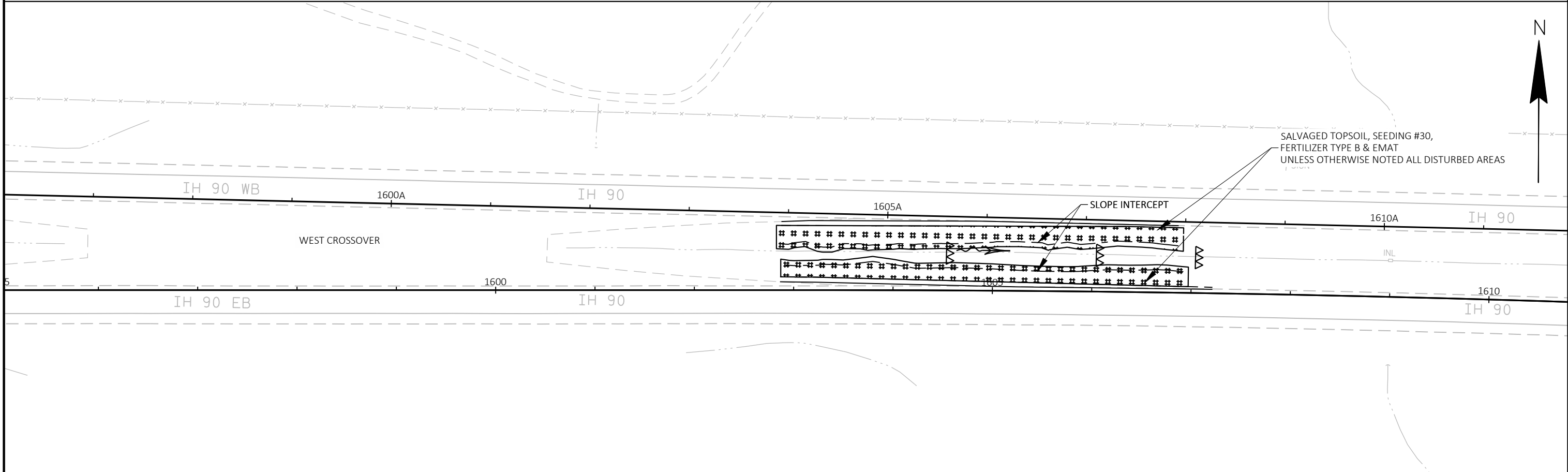
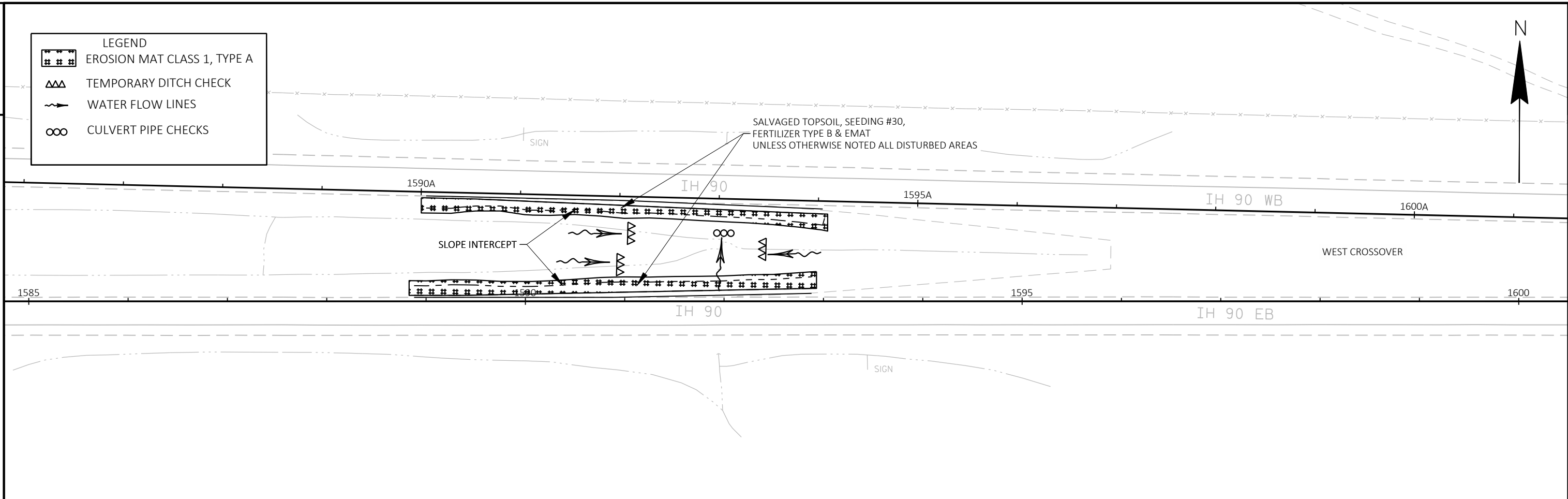
LEGEND

 EROSION MAT CLASS 1, TYPE A

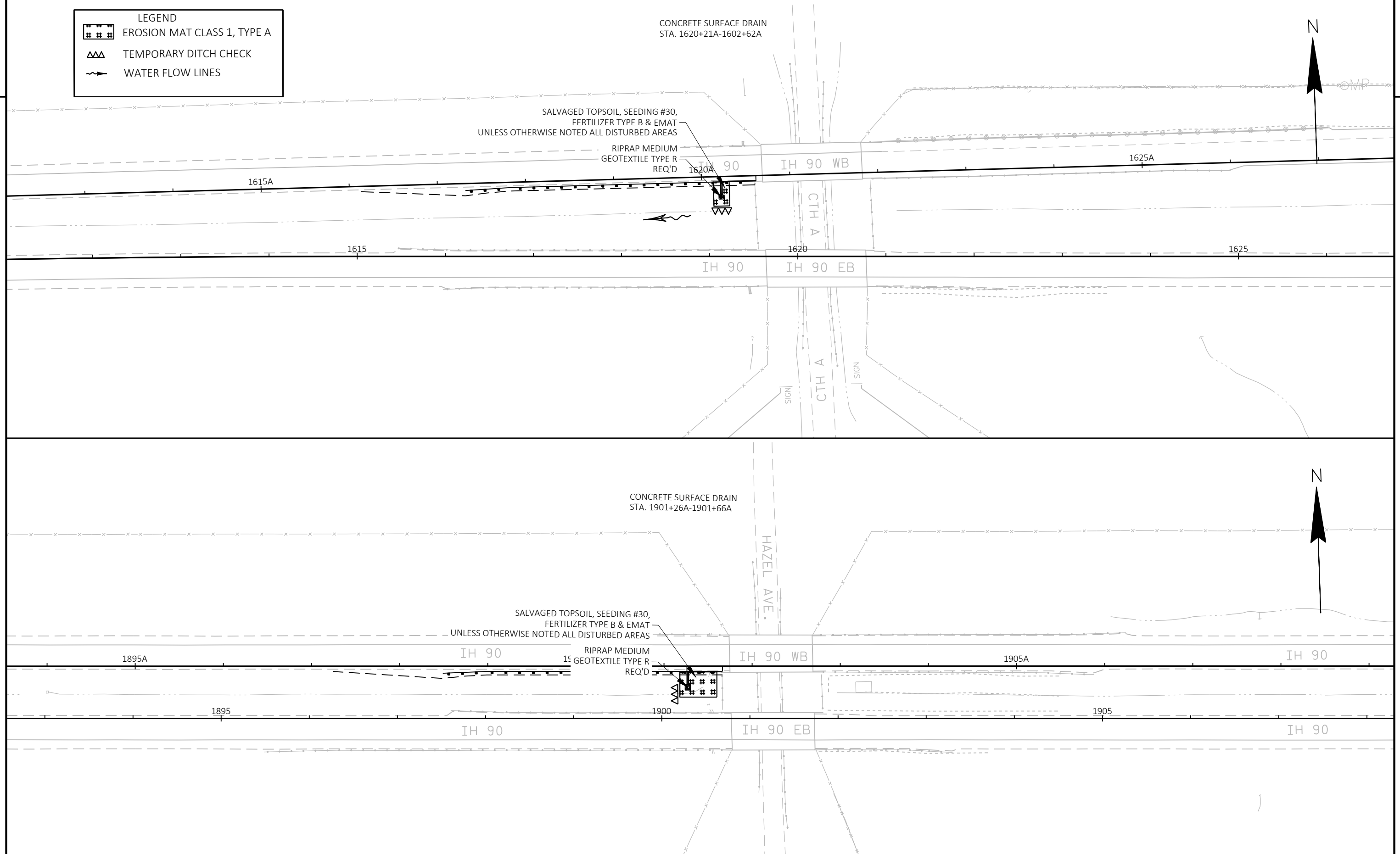
 TEMPORARY DITCH CHECK

 WATER FLOW LINES

 CULVERT PIPE CHECKS



PROJECT NO: 1077-02-70	HWY: IH 90	COUNTY: MONROE	EROSION CONTROL	SHEET	E
------------------------	------------	----------------	-----------------	-------	---



SILT FENCE
OVERLAP
MIN 1.5'

NOTE
17 ROCK BAGS MINIMUM PER 8'
OPENING.

A
A

MIN 8" OPENING
IN SILT FENCE

TOP VIEW



6" MIN
BAG HEIGHT

SECTION A-A

ROCK BAGS USED FOR SILT FENCE RELIEF

BARRIER SYSTEM GRADING SHAPING FINISHING
STA. 2128+11A-2131+63A

SLOPE INTERCEPT

2130A

SALVAGED TOPSOIL, SEEDING #30,
FERTILIZER TYPE B & EMAT
UNLESS OTHERWISE NOTED ALL DISTURBED AREAS

2130

IH 90

IH 90

RIPRAP MEDIUM
GEOTEXTILE TYPE R
REQ'D

CONCRETE SURFACE DRAIN
STA. 2136+35A-2136+74A

- LEGEND
- EROSION MAT CLASS 1, TYPE A
 - EROSION MAT CLASS 1, TYPE B
 - SILT FENCE
 - INLET PROTECTION
 - TEMPORARY DITCH CHECK
 - SILT FENCE RELIEF
 - WATER FLOW LINES

N

EAST CROSSOVER

SALVAGED TOPSOIL, SEEDING #30,
FERTILIZER TYPE B & EMAT
UNLESS OTHERWISE NOTED ALL DISTURBED AREAS

SALVAGED TOPSOIL, SEEDING #30,
FERTILIZER TYPE B & EMAT
UNLESS OTHERWISE NOTED ALL DISTURBED AREAS

IH 90

2180A

IH 90 WB

2185A

2185

IH 90

2190A

SLOPE INTERCEPT

IH 90

SLOPE INTERCEPT

IH 90 EB

IH 90

EROSION MAT CLASS 1, TYPE B

SIGN

PROJECT NO: 1077-02-70

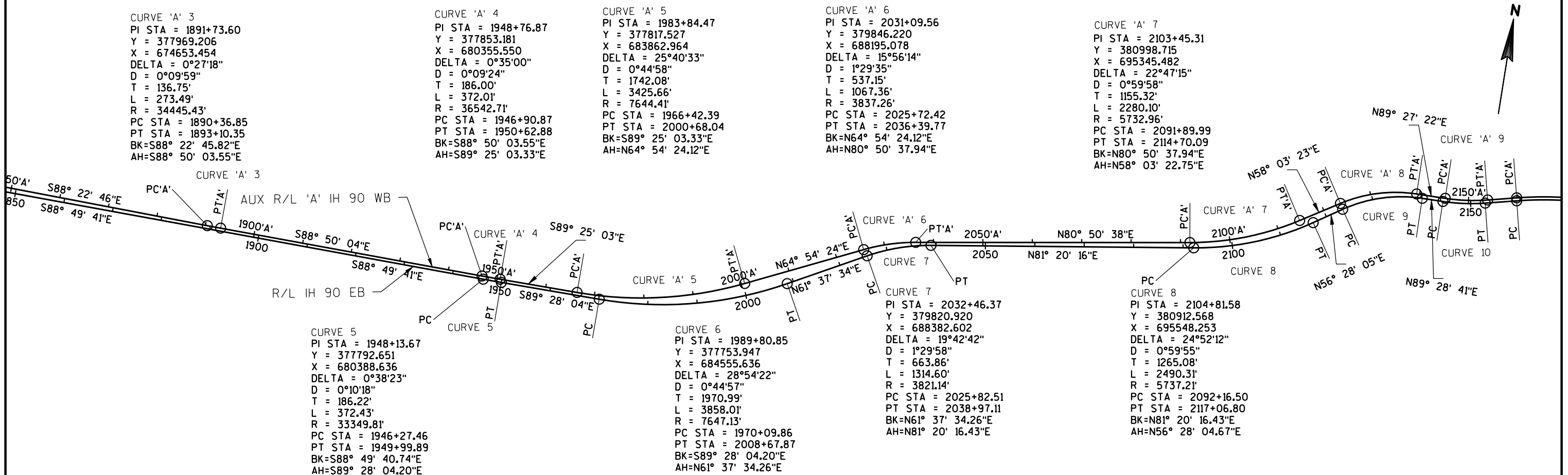
HWY: IH 90

COUNTY: MONROE

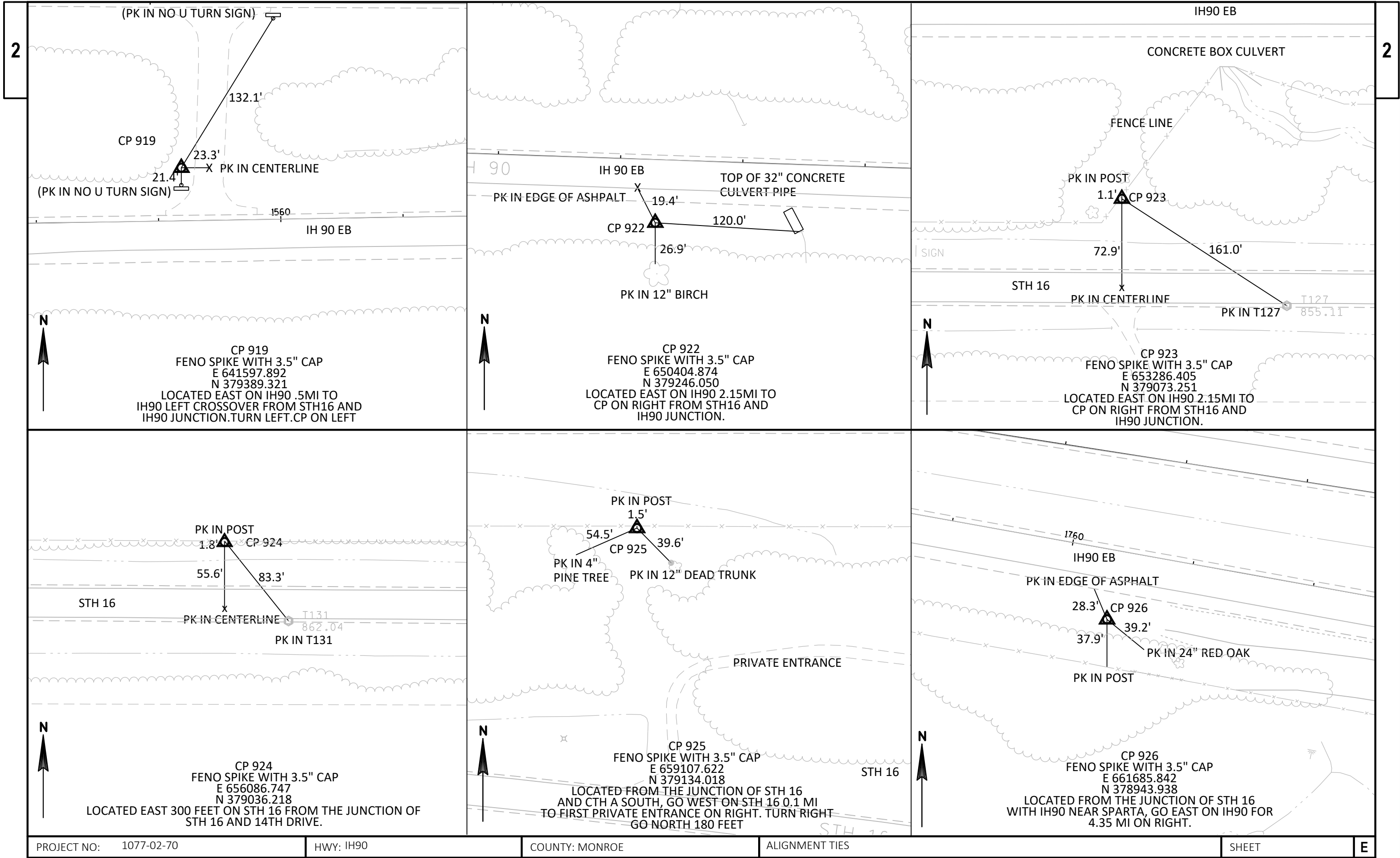
EROSION CONTROL

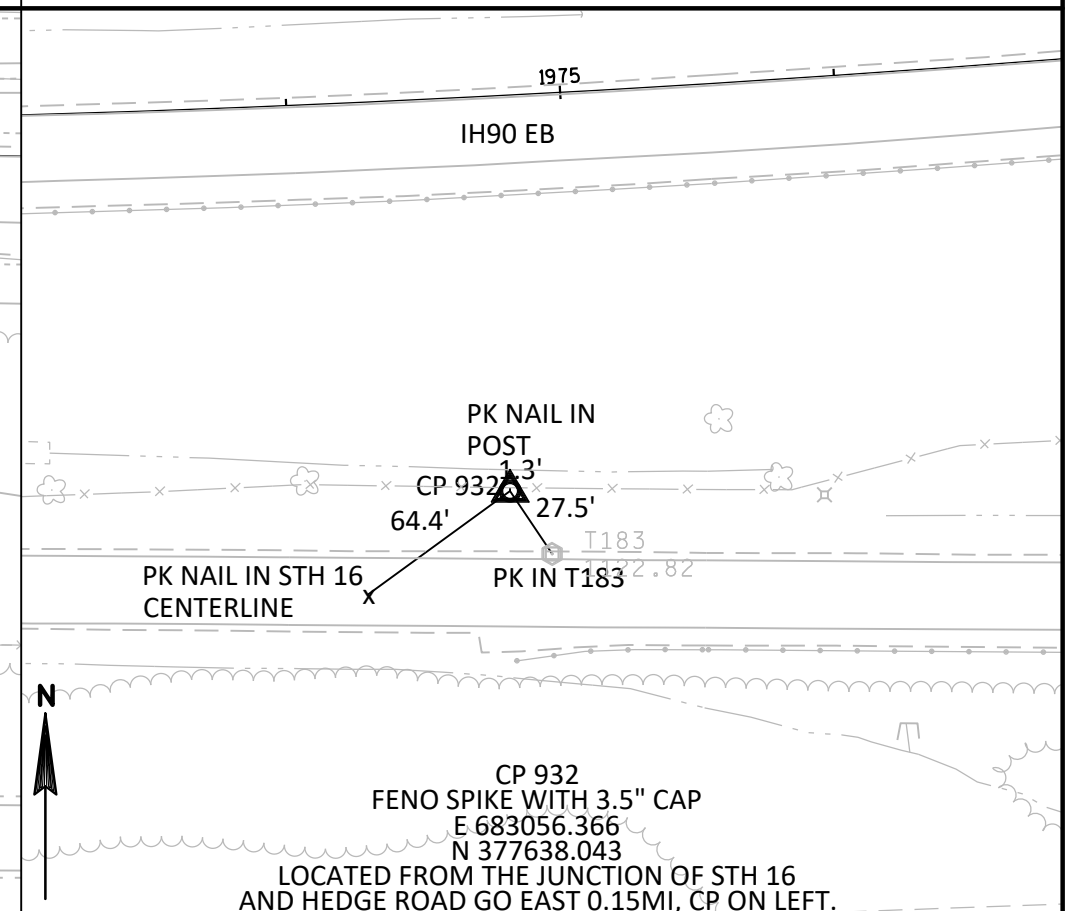
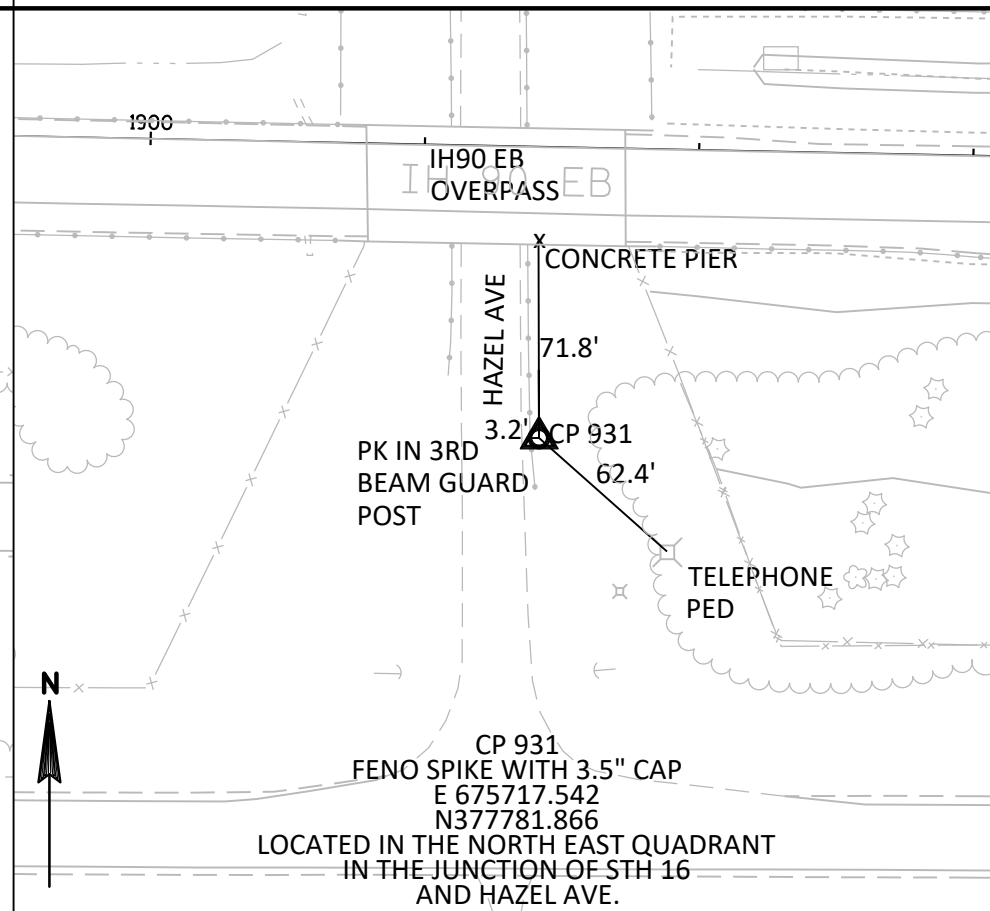
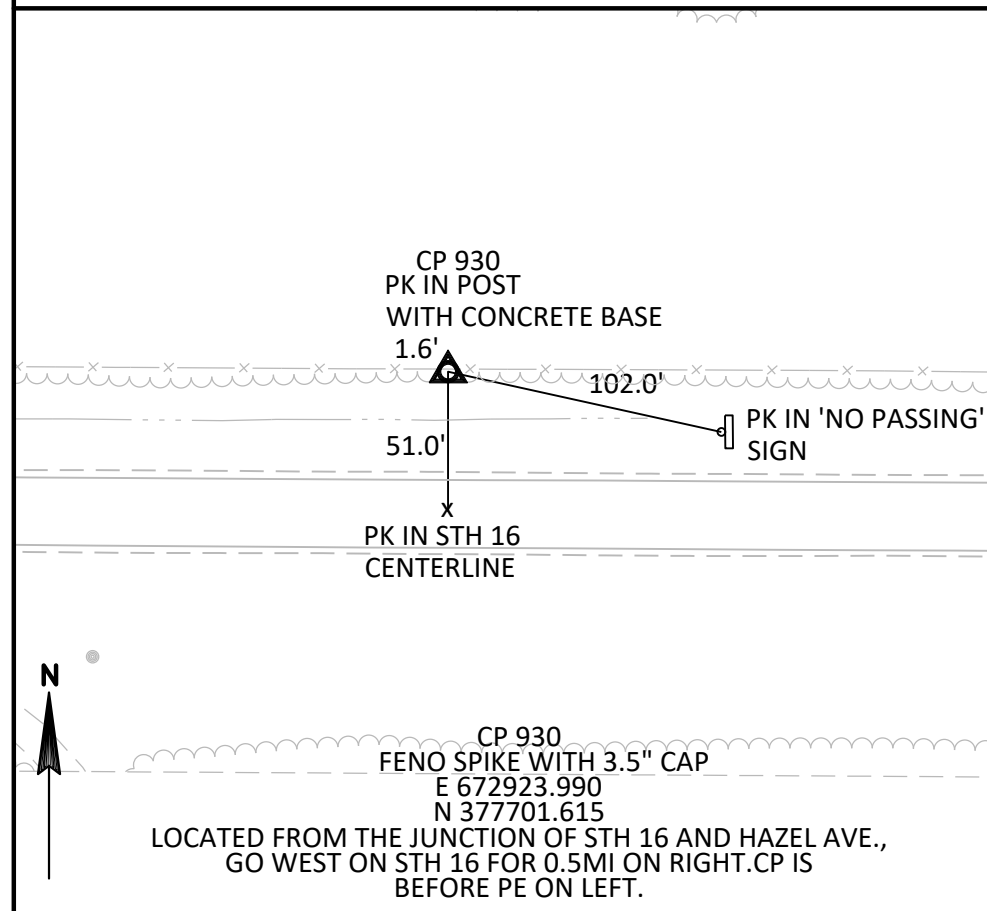
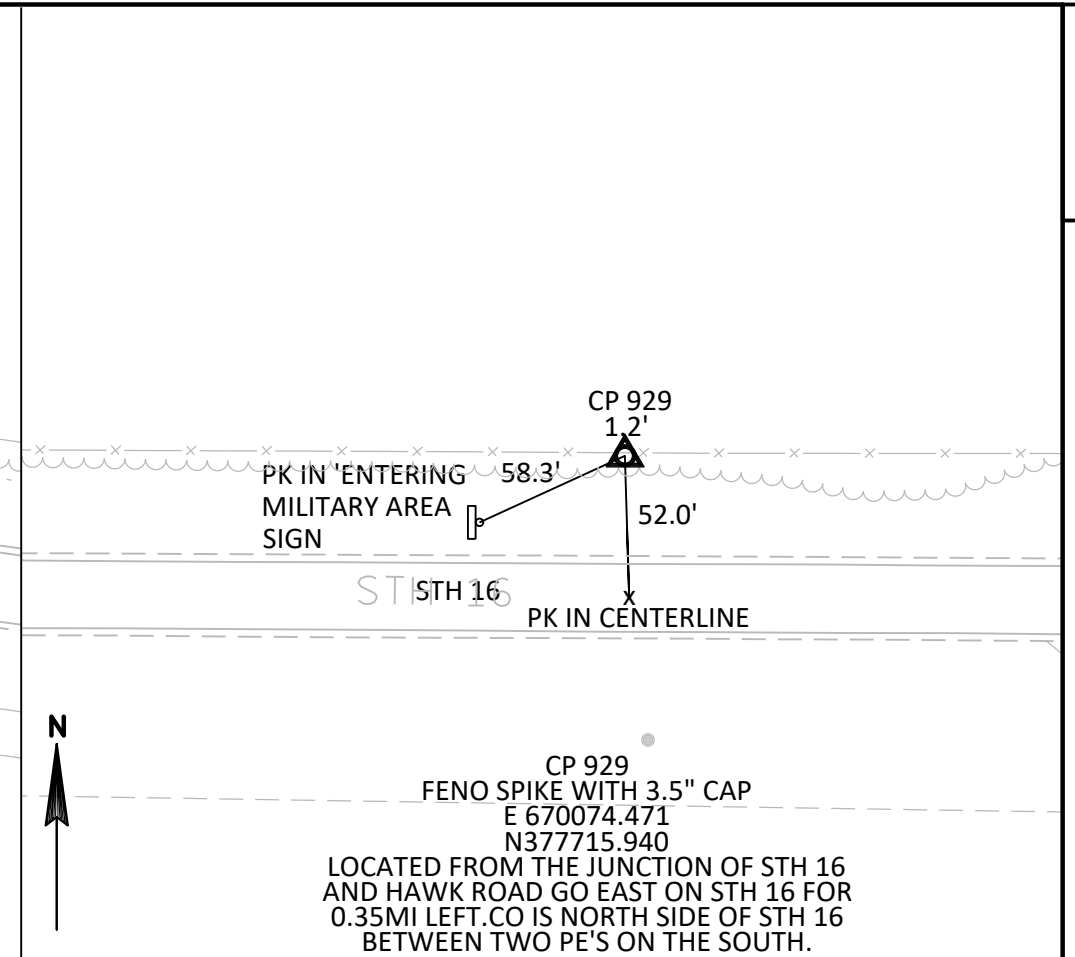
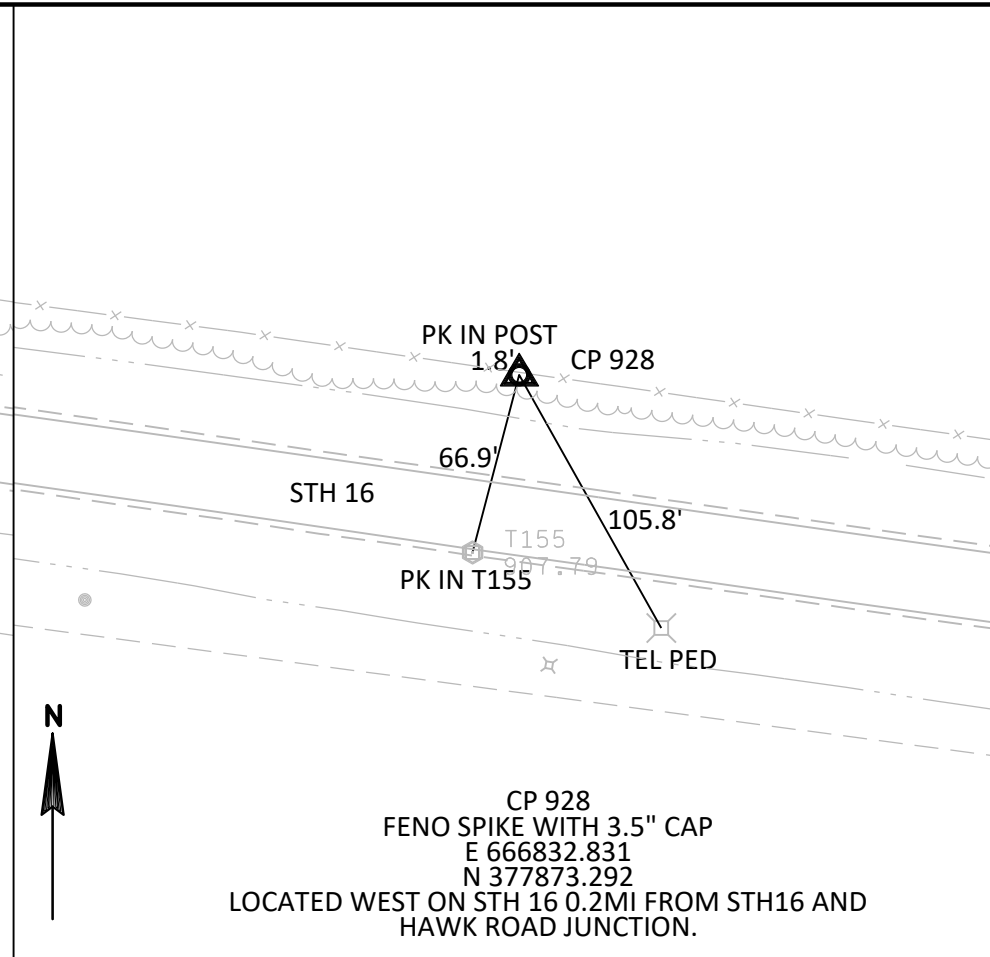
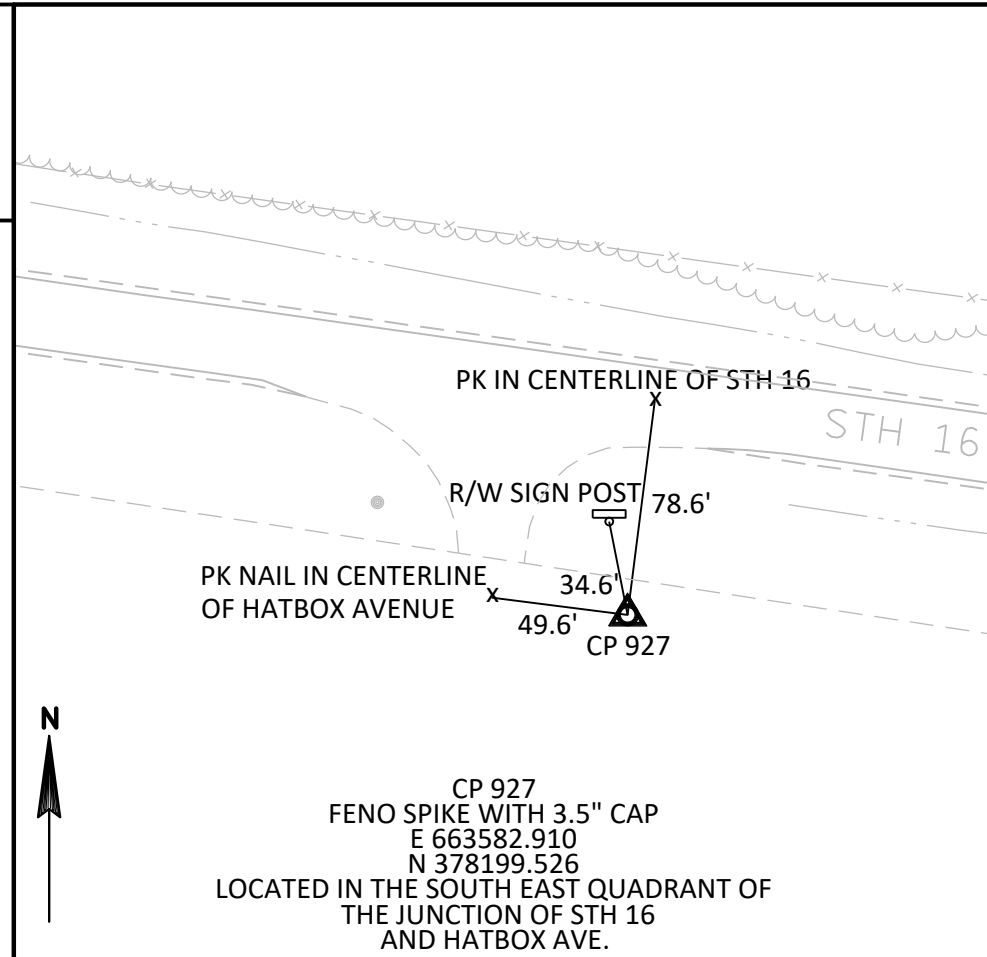
SHEET

E









PROJECT NO: 1077-02-70

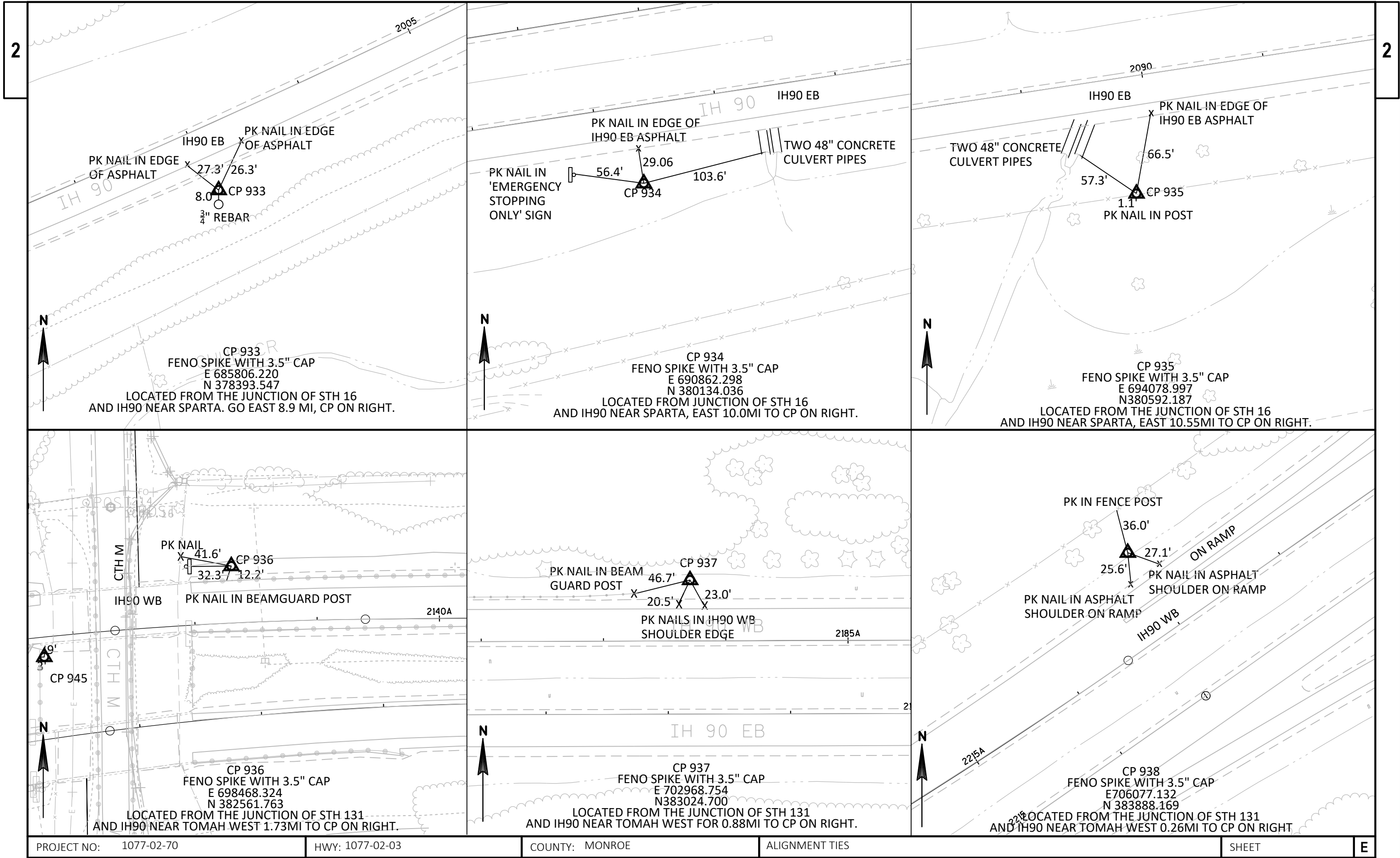
HWY: IH90

COUNTY: MONROE

ALIGNMENT TIES

SHEET

E



PK NAIL IN 6" OAK

45.3'

43.5'

10.5'

70 MPH SIGN

PK NAIL IN ASPHALT SHOULDER OF IH90 WB

CP940
FENO SPIKE WITH 3.5" CAP
E 712368.718
N 388099.38

LOCATED FROM JUNCTION OF US12 / 16
AND IH90 NEAR TOMAH WEST 0.67MI TO CP ON RIGHT

Diagram illustrating the location of a fence spike (CP 941) relative to a highway (IH 90) and an on-ramp.

Key features and measurements:

- CP 941**: FENO SPIKE WITH 3.5" CAP
- Coordinates**: E 714697.196, N 389719.815
- Location Description**: LOCATED FROM THE JUNCTION OF US 12 / 16 AND IH90 NEAR TOMAH, WEST 0.09MI TO CP ON RIGHT SIDE OF WESTBOUND ON RAMP
- Distances**:
 - 80.1' (from spike to highway)
 - 108.6' (from spike to on-ramp)
 - 33.4' (from spike to PK NAIL IN ASPHALT EDGE OF ON RAMP)
- Labels**: SIGN, ON RAMP, IH 90, PK NAIL IN ASPHALT EDGE OF ON RAMP
- North Arrow**: Indicated by an arrow pointing upwards.
- Scale Bar**: 0 10 20 30 40 50 60 70 80 90 100

CP 947

180'

FENO WITH WITNESS POST

IH90 WB

T226

1039.67

CP 947

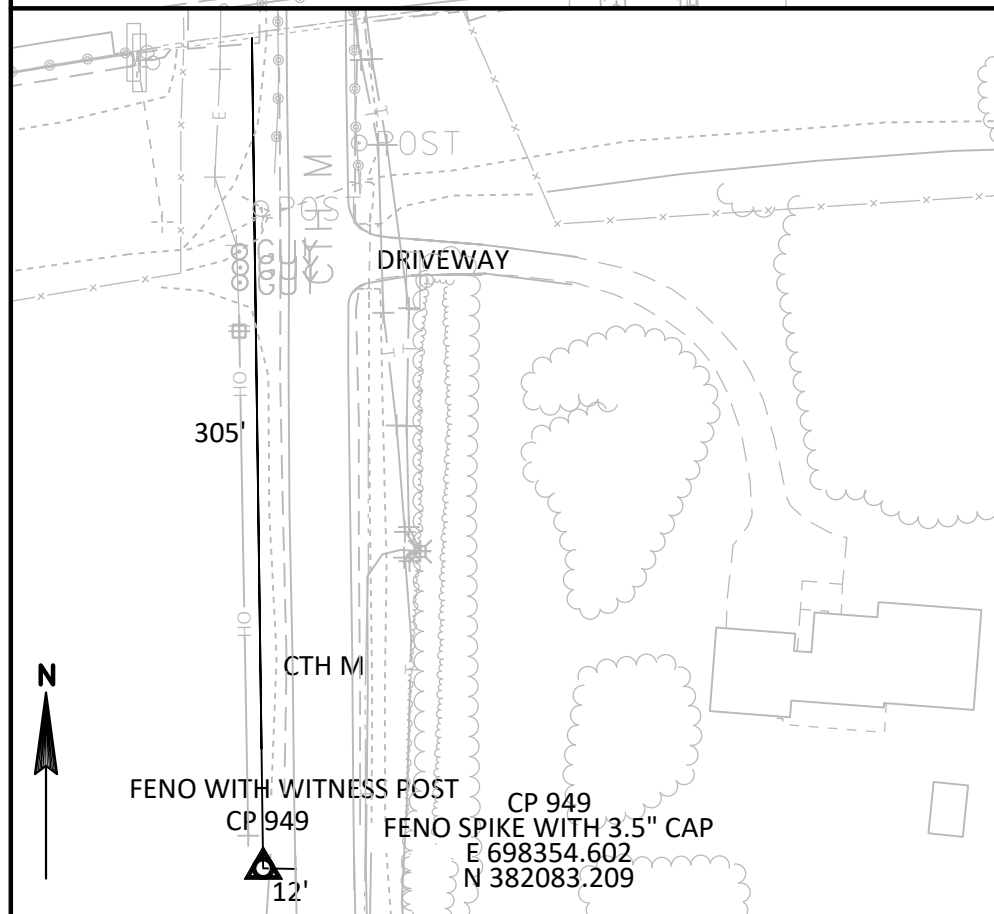
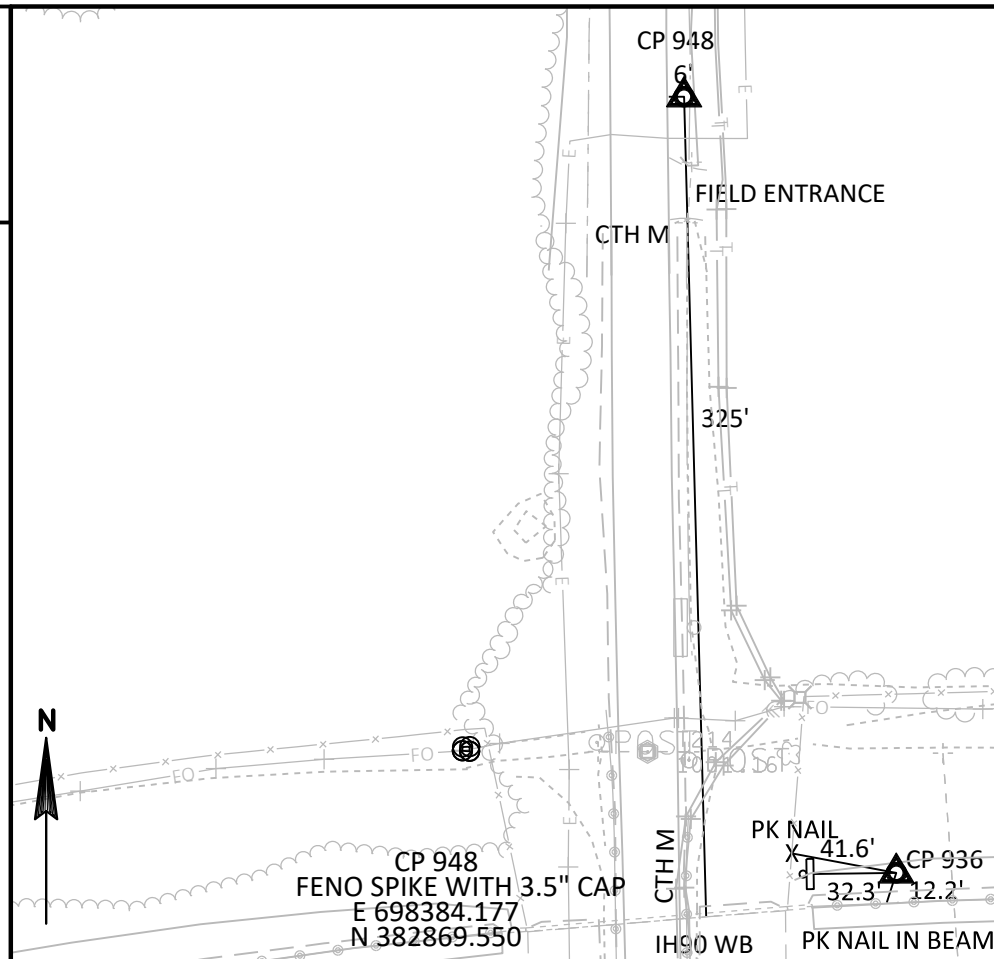
FENO SPIKE WITH 3.5" CAP

E 699445.210

N 382580.248

E

WISDOT/CADDS SHEET 44



PROJECT NO: 1077-02-70

HWY: IH90

COUNTY: MONROE

ALIGNMENT TIES

SHEET

E

Estimate Of Quantities

1077-02-70

Line	Item	Item Description	Unit	Total	Qty
0002	201.0105	Clearing	STA	1.000	1.000
0004	201.0205	Grubbing	STA	1.000	1.000
0006	204.0110	Removing Asphaltic Surface	SY	712.000	712.000
0008	204.0120	Removing Asphaltic Surface Milling	SY	2,222.000	2,222.000
0010	204.0165	Removing Guardrail	LF	116.000	116.000
0012	204.0180	Removing Delineators and Markers	EACH	39.000	39.000
0014	204.0190	Removing Surface Drains	EACH	3.000	3.000
0016	205.0100	Excavation Common	CY	1,978.000	1,978.000
0018	205.3000.S	Temporary Emergency Pullouts	EACH	21.000	21.000
0020	213.0100	Finishing Roadway (project) 01. 1077-02-70	EACH	1.000	1.000
0022	305.0110	Base Aggregate Dense 3/4-Inch	TON	989.000	989.000
0024	305.0120	Base Aggregate Dense 1 1/4-Inch	TON	4,702.000	4,702.000
0026	416.1010	Concrete Surface Drains	CY	18.000	18.000
0028	450.4000	HMA Cold Weather Paving	TON	379.500	379.500
0030	455.0605	Tack Coat	GAL	111.200	111.200
0032	460.2000	Incentive Density HMA Pavement	DOL	980.000	980.000
0034	460.7223	HMA Pavement 3 HT 58-28 S	TON	1,517.700	1,517.700
0036	520.8000	Concrete Collars for Pipe	EACH	1.000	1.000
0038	521.1615	Apron Endwalls for Culvert Pipe Sloped Side Drains Steel 15-Inch 10 to 1	EACH	1.000	1.000
0040	522.0415	Culvert Pipe Reinforced Concrete Class IV 15-Inch	LF	265.000	265.000
0042	606.0200	Riprap Medium	CY	5.000	5.000
0044	611.0642	Inlet Covers Type MS	EACH	1.000	1.000
0046	611.3901	Inlets Median 1 Grate	EACH	1.000	1.000
0048	612.0406	Pipe Underdrain Wrapped 6-Inch	LF	44.000	44.000
0050	612.0806	Apron Endwalls for Underdrain Reinforced Concrete 6-Inch	EACH	4.000	4.000
0052	614.0010	Barrier System Grading Shaping Finishing	EACH	8.000	8.000
0054	614.0305	Steel Plate Beam Guard Class A	LF	497.000	497.000
0056	614.0370	Steel Plate Beam Guard Energy Absorbing Terminal	EACH	2.000	2.000
0058	614.2300	MGS Guardrail 3	LF	1,226.000	1,226.000
0060	614.2500	MGS Thrie Beam Transition	LF	158.000	158.000
0062	614.2610	MGS Guardrail Terminal EAT	EACH	6.000	6.000
0064	618.0100	Maintenance And Repair of Haul Roads (project) 01. 1077-02-70	EACH	1.000	1.000
0066	619.1000	Mobilization	EACH	1.000	1.000
0068	624.0100	Water	MGAL	135.000	135.000
0070	625.0500	Salvaged Topsoil	SY	3,835.000	3,835.000
0072	628.1504	Silt Fence	LF	279.000	279.000
0074	628.1520	Silt Fence Maintenance	LF	279.000	279.000

Estimate Of Quantities

1077-02-70

Line	Item	Item Description	Unit	Total	Qty
0076	628.1905	Mobilizations Erosion Control	EACH	3.000	3.000
0078	628.1910	Mobilizations Emergency Erosion Control	EACH	2.000	2.000
0080	628.2002	Erosion Mat Class I Type A	SY	3,872.000	3,872.000
0082	628.2004	Erosion Mat Class I Type B	SY	12.000	12.000
0084	628.7005	Inlet Protection Type A	EACH	2.000	2.000
0086	628.7504	Temporary Ditch Checks	LF	137.000	137.000
0088	628.7555	Culvert Pipe Checks	EACH	5.000	5.000
0090	628.7570	Rock Bags	EACH	34.000	34.000
0092	629.0210	Fertilizer Type B	CWT	4.300	4.300
0094	630.0130	Seeding Mixture No. 30	LB	113.000	113.000
0096	630.0200	Seeding Temporary	LB	21.000	21.000
0098	633.0100	Delineator Posts Steel	EACH	8.000	8.000
0100	633.0500	Delineator Reflectors	EACH	8.000	8.000
0102	633.5200	Markers Culvert End	EACH	1.000	1.000
0104	642.5001	Field Office Type B	EACH	1.000	1.000
0106	643.0300	Traffic Control Drums	DAY	17,592.000	17,592.000
0108	643.0420	Traffic Control Barricades Type III	DAY	1,177.000	1,177.000
0110	643.0705	Traffic Control Warning Lights Type A	DAY	1,315.000	1,315.000
0112	643.0715	Traffic Control Warning Lights Type C	DAY	1,895.000	1,895.000
0114	643.0800	Traffic Control Arrow Boards	DAY	270.000	270.000
0116	643.0900	Traffic Control Signs	DAY	2,297.000	2,297.000
0118	643.1051	Traffic Control Signs PCMS with Cellular Communications	DAY	66.000	66.000
0120	643.5000	Traffic Control	EACH	1.000	1.000
0122	645.0130	Geotextile Type R	SY	21.000	21.000
0124	646.1020	Marking Line Epoxy 4-Inch	LF	7,525.000	7,525.000
0126	646.9000	Marking Removal Line 4-Inch	LF	5,340.000	5,340.000
0128	649.0150	Temporary Marking Line Removable Tape 4-Inch	LF	5,040.000	5,040.000
0130	650.4500	Construction Staking Subgrade	LF	2,883.000	2,883.000
0132	650.5000	Construction Staking Base	LF	4,483.000	4,483.000
0134	650.6000	Construction Staking Pipe Culverts	EACH	1.000	1.000
0136	650.9910	Construction Staking Supplemental Control (project) 01. 1077-02-70	LS	1.000	1.000
0138	650.9920	Construction Staking Slope Stakes	LF	4,483.000	4,483.000
0140	690.0150	Sawing Asphalt	LF	32.000	32.000
0142	ASP.1T0A	On-the-Job Training Apprentice at \$5.00/HR	HRS	500.000	500.000
0144	ASP.1T0G	On-the-Job Training Graduate at \$5.00/HR	HRS	500.000	500.000
0146	SPV.0060	Special 01. Coring Concrete Pipe	EACH	1.000	1.000
0148	SPV.0060	Special 02. Flexible Tubular Marker Posts Special	EACH	146.000	146.000
0150	SPV.0060	Special 03. Flexible Tubular Marker Bases Special	EACH	146.000	146.000

Division	From/To Station	Location	205.0100 Common Excavation (1)		Salvaged/Unusable Pavement Material (4)	Available Material (5)	Unexpanded Fill	Expanded Fill (13)	Mass Ordinate +/- (14)	Waste	208.0100 Borrow	Comment:
			Cut (2)	EBS Excavation (3)				Factor 1.25				
Division 1												
WEST CROSSOVER	1588+86-1593+00	MEDIAN	290	-	-	290	0		290	290	0	
WEST CROSSOVER	1602+86-1606+94	MEDIAN	456	-	-	456	0		456	456	0	
EAST CROSSOVER	2177+48-2192+30	MEDIAN	1,232	-	146	1,086	407	509	577	577	0	
Division 1 Subtotal			1,978	0	146	1,832	407	509	1,323	1,323		
Grand Total			1,978	0	146	1,832	407	509	1,323	1,323	0	
Total Common Exc			1,978									

Notes:
(13) Expanded Fill Factor = 1.25
(14) The Mass Ordinate + or - Qty calculated for the Division. Plus quantity indicates an excess of material within the Division. Minus indicates a shortage of material within the Division.
(15) Use 494 CY of material from Division 1. Borrow Excavation item number 208.0100

TEMPORARY EMERGENCY PULLOUTS

						*	*	*	*	*	*	*	*
205.3000.S						FILL	FILL	EXCAVATION	SALVAGED	FERTILIZER	SEEDING	SEEDING	EROSION MAT
CATEGORY	STATION	TO	STATION	LOCATION	EACH	CY	(1.25) CY	COMMON CY	TOPSOIL SY	TYPE B CWT	MIX NO. 30 LB	TEMPORARY LB	CLASS 1 TYPE A SY
0010	163100	-	163325	IH 90 WB MEDIAN	1	-	-	-	73	0.2	4	5	73
0010	165700	-	165925	IH 90 WB MEDIAN	1	-	-	-	125	0.2	5	7	125
0010	168400	-	168625	IH 90 WB MEDIAN	1	-	-	-	63	0.2	3	5	63
0010	171000	-	171225	IH 90 WB MEDIAN	1	-	-	-	107	0.2	4	6	107
0010	173650	-	173875	IH 90 WB MEDIAN	1	-	-	-	40	0.1	3	4	40
0010	176300	-	176525	IH 90 WB MEDIAN	1	-	-	-	63	0.2	3	5	63
0010	179000	-	179225	IH 90 WB MEDIAN	1	-	-	-	156	0.2	5	8	156
0010	181600	-	181825	IH 90 WB MEDIAN	1	-	-	-	200	0.2	6	9	200
0010	184250	-	184475	IH 90 WB MEDIAN	1	-	-	-	126	0.2	5	7	126
0010	186750	-	186975	IH 90 WB MEDIAN	1	-	-	-	83	0.2	4	6	83
0010	188800	-	189025	IH 90 WB MEDIAN	1	-	-	-	178	0.2	6	8	178
0010	192150	-	192375	IH 90 WB MEDIAN	1	-	-	-	147	0.2	5	7	147
0010	195100	-	195325	IH 90 WB MEDIAN	1	-	-	-	167	0.2	5	8	167
0010	197400	-	197625	IH 90 WB MEDIAN	1	-	-	-	113	0.2	4	6	113
0010	200100	-	200325	IH 90 WB MEDIAN	1	-	-	-	72	0.2	4	5	72
0010	202000	-	202225	IH 90 WB MEDIAN	1	-	-	-	85	0.2	4	6	85
0010	205400	-	205625	IH 90 WB MEDIAN	1	-	-	-	85	0.2	4	6	85
0010	208000	-	208225	IH 90 WB MEDIAN	1	-	-	-	134	0.2	5	7	134
0010	210500	-	210725	IH 90 WB MEDIAN	1	-	-	-	135	0.2	3	7	135
0010	212700	-	212925	IH 90 WB MEDIAN	1	-	-	-	60	0.3	7	5	60
0010	215700	-	215925	IH 90 WB MEDIAN	1	-	-	-	222	0.3	6	9	222
TOTAL 0010						21		2434		4.3	95	136	2434
													966

*ITEMS AND QUANTITIES FOR INFORMATION ONLY.

PAVING SUMMARY

						204.0110	204.0120	305.0110	305.0120	450.4000	455.0605	460.7223		
						REMOVING	Removing	BASE	BASE AGGREGATE	HMA COLD	TACK COAT	HMA Pavement		
						ASPHALTIC	Asphaltic	AGGREGATE	DENSE 1 1/4-	WEATHER PAVING		3 HT 58-28 S		
						SURFACE	Surface	DENSE 3/4-	INCH					
							Milling	INCH						
CATEGORY	STATION	TO	STATION	LOCATION	SY	SY		TON	TON	TON	GAL	TON	REMARKS	
0010	1588+88	-	1607+22	EB MEDIAN LT	356	1127		285	445	59.6	56.4	238.2	WEST CROSSOVER	
0010	1590+05A	-	1607+93A	WB MEDIAN RT	356	1095		285	445	58.7	54.8	234.6	WEST CROSSOVER	
0010	2177+52	-	2192+30	MEDIAN	-	-		419	3812	261.2	-	1044.9	EAST CROSSOVER	
TOTAL 0010					712	2222		989	4702	379.5	111.2	1517.7		

DRAINAGE SUMMARY

						522.0415	521.1615	611.0642	611.3901	612.0406	612.0806	520.8000	SPV.0060.01		
						Culvert Pipe	APRON ENDWALLS	INLET	INLETS	PIPE	APRON ENDWALLS	CONCRETE	CORING		
						Reinforced	FOR CULVERT PIPE	COVERS	MEDIAN 1	UNDERDRAIN	FOR UNDERDRAIN	COLLARS FOR	CONCRETE		
						Concrete	SLOPED SIDE	TYPE MS	GRATE	WRAPPED 6-	REINFORCED	PIPE	PIPE		
						Class IV 15-	DRAINS STEEL 15-			INCH	CONCRETE 6-				
						Inch	INCH 10 TO 1				INCH				
CATEGORY	STATION	TO	STATION	LOCATION	LF	EACH		EACH	EACH	LF	EACH	EACH	EACH	REMARKS	
0010	2182+95	-	2187+08	EAST CROSSOVER	265	1		1	1	-	-	-	-		
0010	2182+03		-	EAST CROSSOVER	-	-		-	-	7	1	-	-		
0010	2184+58		-	EAST CROSSOVER	-	-		-	-	16	-	1	1		
0010	2187+06		-	EAST CROSSOVER	-	-		-	-	12	1	-	-		
0010	2189+49		-	EAST CROSSOVER	-	-		-	-	5	1	-	-		
0010	2182+07A		-	EAST CROSSOVER	-	-		-	-	4	1	-	-		
TOTAL 0010					265	1		1	1	44	4	1	1		

3

GUARDRAIL SUMMARY

					204.0165 REMOVING GUARDRAIL	614.0305 STEEL PLATE BEAM GUARD CLASS A	614.0370 STEEL PLATE BEAM GUARD ENERGY ABSORBING TERMINAL	614.2300 MGS GUARDRAIL 3	614.2500 MGS THRIE BEAM TRANSITION	614.2610 MGS GUARDRAIL TERMINAL EAT		
CATEGORY	STATION	TO	STATION	LOCATION	LF	LF	EACH	LF	LF	EACH	REMARKS	
0010	1617+32A	-	1620+62A	IH 90 WB RT	-	-	-	238	39.4	1	INSTALL TO MAX HEIGHT	
0010	1898+49A	-	1901+67A	IH 90 WB RT	-	-	-	225	39.4	1	INSTALL TO MAX HEIGHT	
0010	1962+44A	-	1966+07A	IH 90 WB LT	14	313	1	-	-	-		
0010	2026+41A	-	2029+58A	IH 90 WB RT	-	-	-	225	39.4	1	INSTALL TO MAX HEIGHT	
0010	2119+93A	-	2121+59A	IH 90 WB LT	14	-	-	113	-	1		
0010	2129+29A	-	2131+63A	IH 90 WB LT	50	184	1	-	-	-		
0010	2133+44A	-	2136+74A	IH 90 WB RT	-	-	-	238	39.4	1	INSTALL TO MAX HEIGHT	
0010	2154+40A	-	2156+80A	IH 90 WB LT	38	-	-	188	-	1		
TOTAL 0010					116	497	2	1226	158	6		

3

BARRIER SYSTEM GRADING SHAPING FINISHING

															*	*	*	*	*	*	*	*	*		
															614.0010	FILL	FILL	EXCAVATION	SALVAGED	FERTILIZER	SEEDING	CLASS 1	TYPE	BASE	AGGREGATE
CATEGORY	STATION	TO	STATION	LOCATION	EACH	REMARKS	CY	(1.25)	COMMON	TOPSOIL	TYPE B	MIX NO. 30	A	DENSE	1 1/4-INCH										
0010	1617+32A	-	1620+62A	IH 90 WB RT	1		-	-	-	108	0.10	2	108		14										
0010	1898+49A	-	1901+67A	IH 90 WB RT	1		-	-	-	180	0.20	4	180		24										
0010	1962+44A	-	1966+07A	IH 90 WB LT	1		-	-	-	81	0.10	2	81		12										
0010	2026+41A	-	2029+58A	IH 90 WB RT	1		-	-	-	473	0.30	9	473		103										
0010	2119+93A	-	2121+59A	IH 90 WB LT	1		-	-	-	177	0.02	4	177		2										
0010	2129+29A	-	2131+63A	IH 90 WB LT	1		77	97	-	601	0.40	11	601		53										
0010	2133+44A	-	2136+74A	IH 90 WB RT	1		-	-	-	350	0.30	7	350		48										
0010	2154+40A	-	2156+80A	IH 90 WB LT	1		-	-	-	123	0.10	3	123		10										
TOTAL 0010					8																				

*ITEMS AND QUANTITIES FOR INFORMATION ONLY.

3

EROSION CONTROL SUMMARY

					628.1504	628.1520	628.1905	628.1910	628.7005	628.7504	628.7555	628.7570		
					SILT	SILT FENCE	MOBILIZATIONS	MOBILIZATIONS	INLET	TEMPORARY	CULVERT	ROCK		
					FENCE	MAINTENANCE	EROSION	EROSION	PROTECTION	DITCH	PIPE	CHECKS	BAGS	
							CONTROL	CONTROL	TYPE A	CHECKS				
CATEGORY	STATION	TO	STATION	LOCATION	LF	LF	EACH	EACH	EACH	LF	EACH	EACH	REMARKS	
0010	1590+95	-	1592+42	WEST CROSSOVER	-	-	-	-	-	24	3	-		
0010	1604+53	-	1607+04	WEST CROSSOVER	-	-	-	-	-	24	-	-		
0010	1620+21A	-	1620+62A	MEDIAN	-	-	-	-	-	8	-	-	CONCRETE SURFACE DRAIN	
0010	1901+26A	-	1901+66A	MEDIAN	-	-	-	-	-	8	-	-	CONCRETE SURFACE DRAIN	
0010	2128+33	-	2129+99	IH 90 WB LT	222	-	-	-	-	-	-	-		
0010	2128+33	-	2129+99	IH 90 WB LT	-	222	-	-	-	-	-	-		
0010	2129+28A			IH 90 WB LT	-	-	-	-	-	-	-	17	SILF FENCE RELIEF	
0010	2136+35A		2136+74	MEDIAN	-	-	-	-	-	8	-	-	CONCRETE SURFACE DRAIN	
0010	2182+88	-	2181+07	EAST CROSSOVER	-	-	-	-	-	24	-	-		
0010	2183+88			EAST CROSSOVER	-	-	-	-	1	-	-	-		
0010	2186+91	-	2192+41	EAST CROSSOVER	-	-	-	-	-	32	-	-		
0010	PROJECT			-	-	-	2	1	-	-	-	-	INITIAL AND FINAL	
0010				UNDISTRIBUTED	56	56	1	1	1	9	2	17		
TOTAL 0010					279	279	3	2	2	137	5	34		

3

SEED, FERTILIZER & EMAT SUMMARY

					624.0100	625.0500	628.2002	628.2004	629.0210	630.0130	630.0200		
					WATER	SALVAGED	Erosion Mat	EROSION MAT	FERTILIZER	SEEDING	SEEDING		
						TOPSOIL	Class I Type	CLASS I TYPE B	TYPE B	MIXTURE	TEMPORARY		
							A			NO. 30			
CATEGORY	STATION	TO	STATION	LOCATION	**MGAL**	SY	SY	SY	CWT	LB	LB	REMARKS	
0010	1590+88	-	1592+88	EB MEDIAN	9.0	256	256	-	0.3	8	-	WEST CROSSOVER	
0010	1603+22	-	1605+22	EB MEDIAN	9.0	267	267	-	0.3	7	-	WEST CROSSOVER	
0010	1590+05	-	1594+05	WB MEDIAN	10.0	267	267	-	0.3	8	-	WEST CROSSOVER	
0010	1603+93	-	1607+93	WB MEDIAN	9.0	278	278	-	0.3	7	-	WEST CROSSOVER	
0010	1620+61A		1620+62A	WB MEDIAN	1.0	46	55	-	0.1	2	-		
0010	1901+26A		1901+66A	WB MEDIAN	3.0	120	134	-	0.1	4	-		
0010	2136+35A		2136+74A	WB MEDIAN	3.0	120	134	-	0.1	4	-		
0010	2178+00	-	2183+00	EB MEDIAN	13.0	344	344	-	0.4	10	-	EAST CROSSOVER	
0010	2186+50	-	2192+30	EB MEDIAN	16.0	433	433	9	0.5	13	-	EAST CROSSOVER	
0010	2177+50	-	2183+00	WB MEDIAN	13.0	344	344	-	0.4	11	-	EAST CROSSOVER	
0010	2186+00	-	2192+30	WB MEDIAN	23.0	650	650	-	0.6	18	-	EAST CROSSOVER	
0010				UNDISTIBUTED	26.0	710	710	3	1.0	21	21		
TOTAL 0010					135.0	3835	3872	12	4.3	113	21		

**Seeded Area (SY) x 1 inch of rain x 0.0278 yd/inch = XXXX CY of water
XXXX CY of water x 1 gal/0.004951 CY x 1 Mgal/1000 gal = XXXX Mgal of water
XXXX Mgal of water x 4 weeks of watering = XXXX Mgal of water

3

MARKERS CULVERT END										SURFACE DRAIN SUMMARY									
CATEGORY	STATION	LOCATION	633.5200 EACH	REMARKS	204.0190 REMOVING SURFACE DRAINS		416.1010 CONCRETE SURFACE DRAINS		606.0200 RIPRAP MEDIUM		645.0130 GEOTEXTILE TYPE R								
0010	218708	MEDAIN	1																
TOTAL 0010			1																
CATEGORY	STATION TO	STATION LOCATION	EACH	CY	CY	SY	REMARKS												
0010	1620+21A -	1620+62A MEDIAN	1	6	1.5	7													
0010	1901+26A -	1901+66A MEDIAN	1	6	1.5	7													
0010	2136+35A -	2136+74A MEDIAN	1	6	1.5	7													
TOTAL 0010			3	18	5	21													
TRAFFIC CONTROL SUMMARY																			
STATION	TO	STATION	LOCATION	DURATION	DRUMS EACH	DAY	BARRICADES EACH	DAY	TYPE A EACH	LIGHTS TYPE DAY	TYPE C EACH	LIGHTS TYPE DAY	ARROW BOARDS EACH	DAY	SIGNS EACH	DAY	PCMS EACH	COMMUNICATIONS EACH	
STAGE 1 EB																			
1520+48	-	1562+48	IH 90 EB	23.00	-	-	-	-	-	-	-	-	-	-	8	184	1	23	
1567+23	-	1572+48	IH 90 EB	23.00	15	345	-	-	-	-	-	-	1	23	-	-	-	-	
1572+48	-	1580+88	IH 90 EB	23.00	17	386	-	-	-	-	17	386	1	23	-	-	-	-	
1580+88	-	1606+92	IH 90 EB	23.00	26	599	3	69	6	138	-	-	-	-	5	115	-	-	
2109+11	-	2151+11	IH 90 EB	23.00	-	-	-	-	-	-	-	-	-	-	8	184	-	-	
2155+86	-	2161+11	IH 90 EB	23.00	15	345	-	-	-	-	-	-	1	23	-	-	-	-	
2161+11	-	2169+51	IH 90 EB	23.00	17	391	-	-	-	-	17	386	1	23	-	-	-	-	
2169+51	-	2192+30	IH 90 EB	23.00	23	524	3	69	6	138	-	-	-	-	5	115	-	-	
STAGE 1 WB																			
1590+05A	-	1800+25A	IH 90 WB	23.00	210	4835	17	391	17	391	-	-	-	-	19	437	-	-	
1800+25A	-	1808+65A	IH 90 WB	23.00	17	391	-	-	-	-	17	391	1	23	-	-	-	-	
1808+65A	-	1813+90A	IH 90 WB	23.00	15	345	-	-	-	-	-	-	1	23	-	-	-	-	
1818+65A	-	1860+65A	IH 90 WB	23.00	-	-	-	-	-	-	-	-	1	23	8	184	-	-	
2001+00A	-	2200+06A	IH 90 WB	23.00	199	4578	16	368	16	368	-	-	-	-	18	414	-	-	
2200+06A	-	2208+46A	IH 90 WB	23.00	17	391	-	-	-	-	17	391	1	23	-	-	-	-	
2208+46A	-	2213+71A	IH 90 WB	23.00	15	345	-	-	-	-	-	-	1	23	-	-	-	-	
2218+46A	-	2260+46A	IH 90 WB	23.00	-	-	-	-	-	-	-	-	1	23	8	184	1	23	
STAGE 1A WB																			
1816+00A	-	1984+25A	IH 90 WB	9.00	168	1514	14	126	14	126	-	-	-	-	16	144	-	-	
1984+25A	-	1992+65A	IH 90 WB	9.00	17	153	-	-	-	-	17	153	1	9	-	-	-	-	
1992+65A	-	1997+90A	IH 90 WB	9.00	15	135	-	-	-	-	-	-	1	9	-	-	-	-	
2002+65A	-	2044+65A	IH 90 WB	9.00	-	-	-	-	-	-	-	-	-	-	8	72	1	9	
Stage 2 WB																			
1961+25A	-	2139+63A	IH 90 WB	11.00	178	1962	14	154	14	154	-	-	-	-	16	176	-	-	
2139+63A	-	2148+03A	IH 90 WB	11.00	17	187	-	-	-	-	17	187	1	11	-	-	-	-	
2148+03A	-	2153+28A	IH 90 WB	11.00	15	165	-	-	-	-	-	-	1	11	-	-	-	-	
2158+03A	-	2200+03A	IH 90 WB	11.00	-	-	-	-	-	-	-	-	-	-	8	88	1	11	
PROJECT																			
TOTAL 0010						17592	1177	1315	1895	270	2297	66							
PROJECT NO: 1077-02-70				HWY: IH 90				COUNTY: MONROE				MISCELLANEOUS QUANTITIES				SHEET NO:		E	

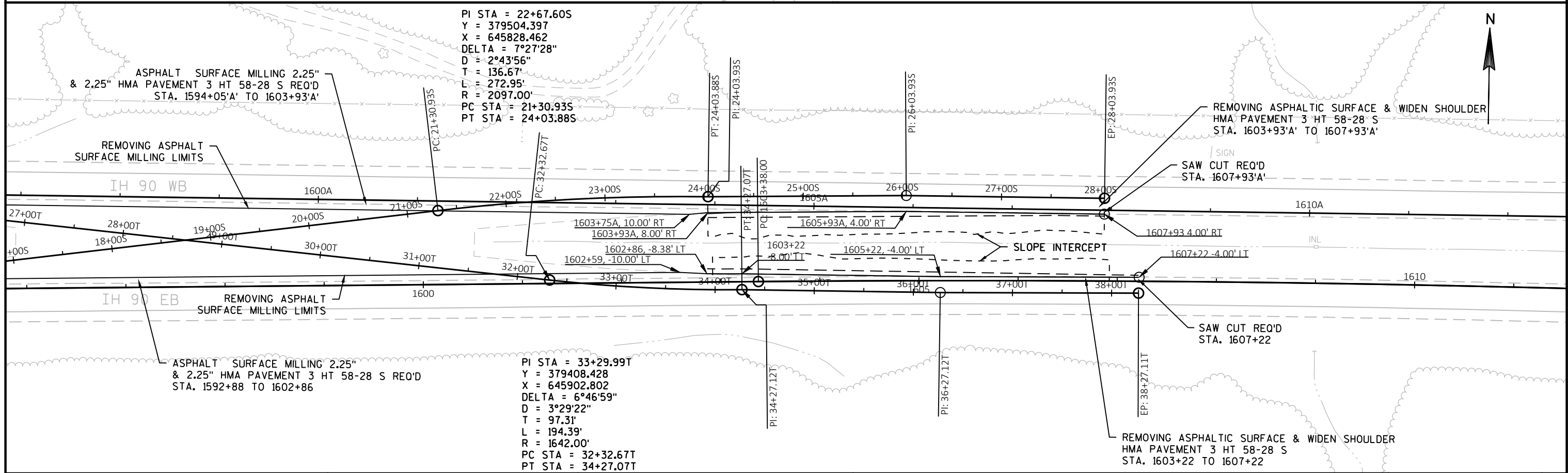
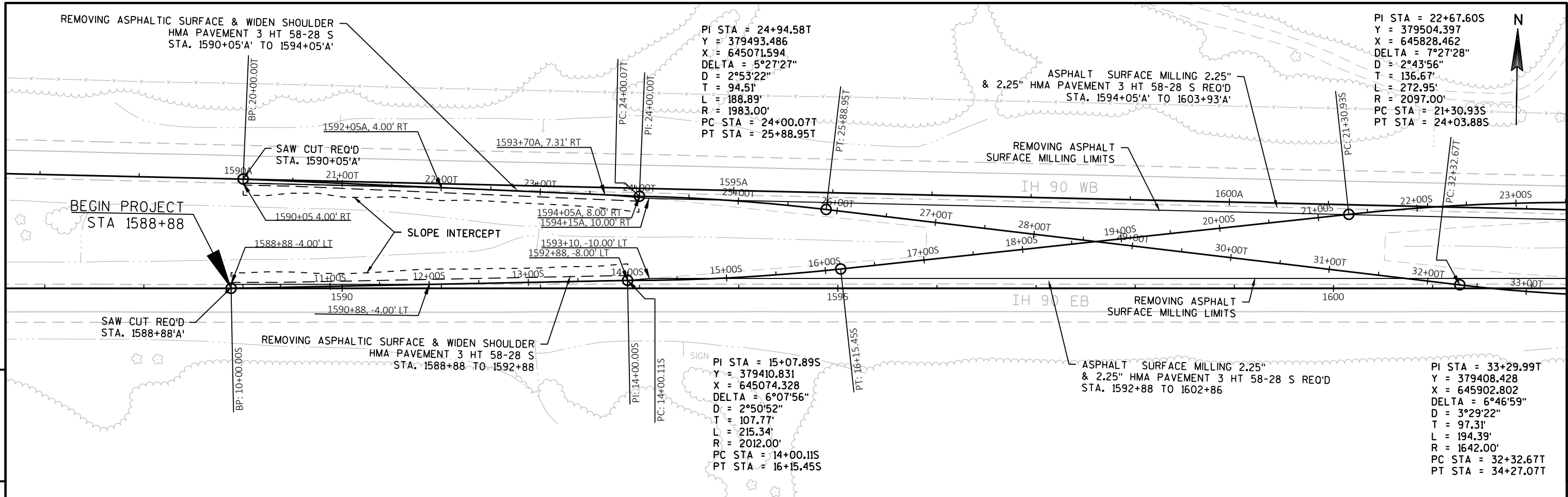
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CROSSOVER PROTECTION

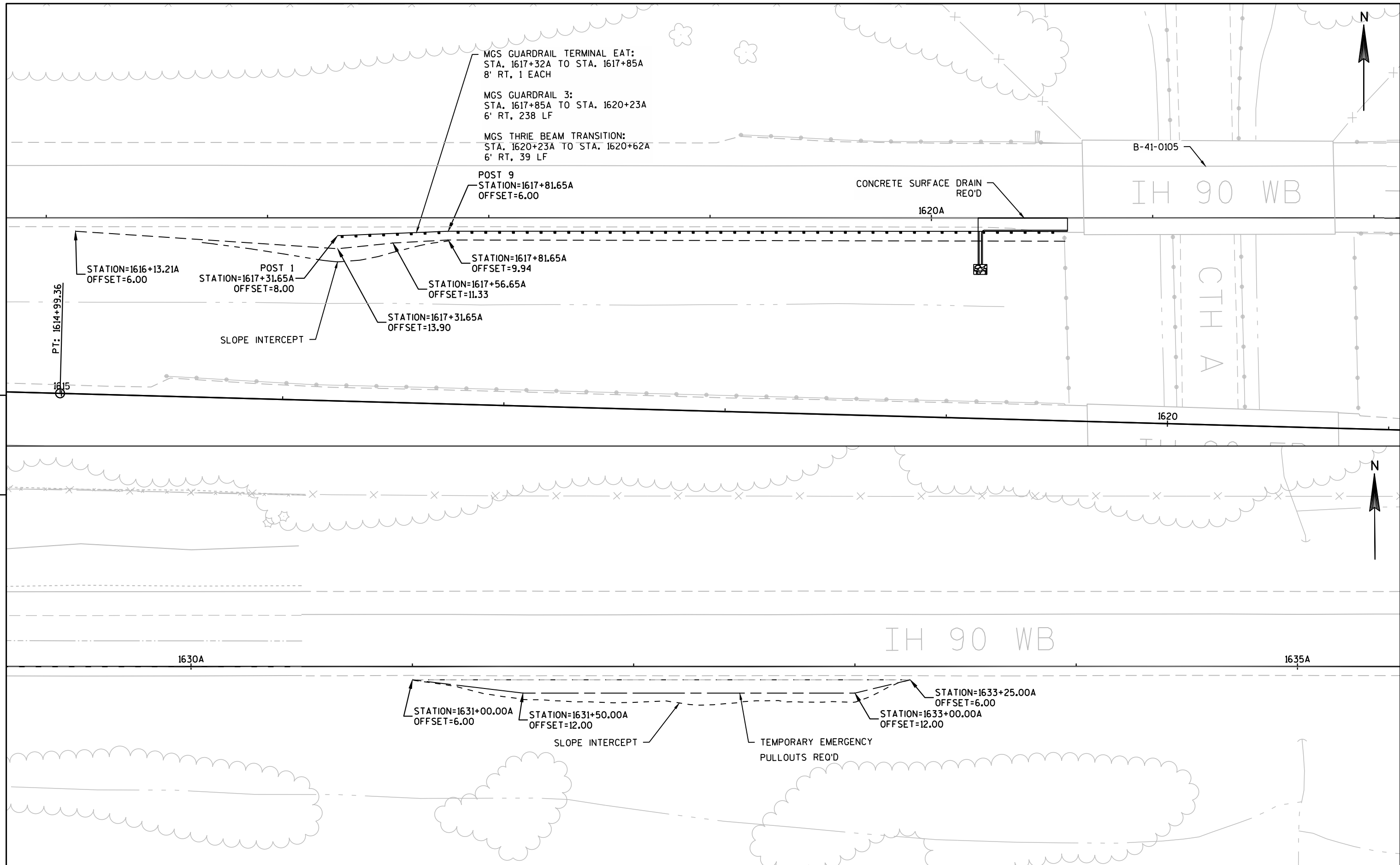
204.0180 REMOVING DELINEATORS AND MARKERS 633.0100 DELINEATOR POSTS STEEL 633.0500 DELINEATOR REFLECTORS SPV.0060.02 FLEXIBLE TUBULAR MARKER POSTS SPECIAL SPV.0060.03 FLEXIBLE TUBULAR MARKER BASES SPECIAL										
CATEGORY	STATION	TO	STATION	LOCATION	EACH	EACH	EACH	EACH	EACH	REMARKS
0010	1595+89	-	1600+49	IH 90 MEDIAN	39	-	-	86	86	WEST CROSSOVER
0010	2183+05	-	2186+54	IH 90 MEDIAN	-	8	8	60	60	EAST CROSSOVER
TOTAL 0010					39	8	8	146	146	

PAVEMENT MARKING SUMMARY

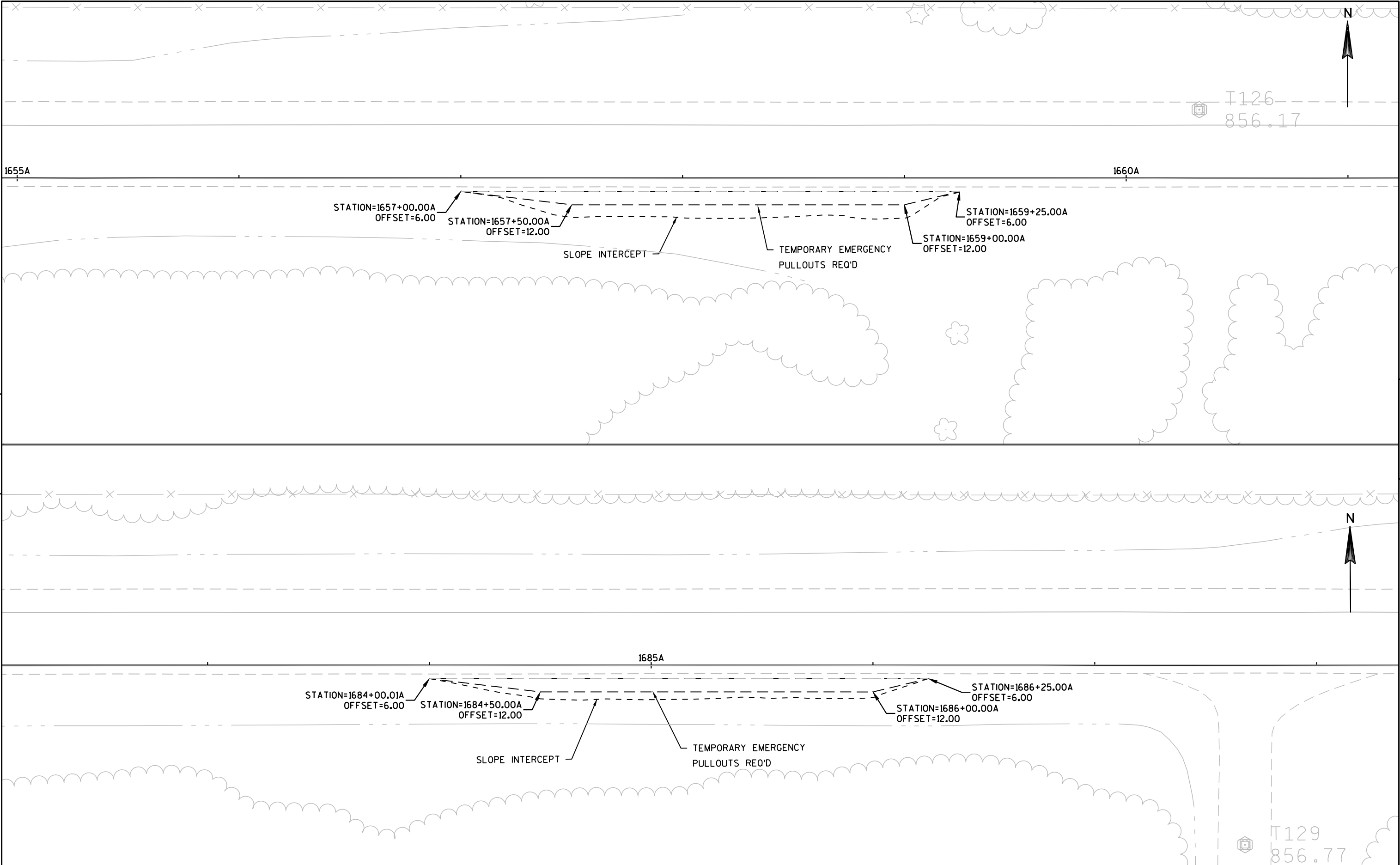
646.9000 MARKING REMOVAL LINE 4-INCH 649.0150 TEMPORARY MARKING LINE REMOVABLE TAPE 4-INCH 646.1020 MARKING LINE EPOXY 4-INCH								
CATEGORY	STATION	TO	STATION	LOCATION	LF	LF	LF	REMARKS
0010	1571+98	-	1580+88	IH 90 EB	890	840	175	STAGE 1
0010	1588+88	-	1606+92	IH 90 EB	-	-	1804	WEST CROSSOVER
0010	2160+61	-	2169+51	IH 90 EB	890	840	175	STAGE 1
0010	2177+51	-	2192+30	IH 90 EB	-	-	1479	EAST CROSSOVER
0010	1590+05A	-	1607+93A	IH 90 WB	-	-	1788	WEST CROSSOVER
0010	1809+15A	-	1800+25A	IH 90 WB	890	840	175	STAGE 1
0010	2208+96A	-	2200+06A	IH 90 WB	890	840	175	STAGE 1
0010	1993+15A	-	1984+25A	IH 90 WB	890	840	175	STAGE 1A
0010	2148+53A	-	2139+63A	IH 90 WB	890	840	175	STAGE 2
0010	2178+02A	-	2192+06A	IH 90 WB	-	-	1404	EAST CROSSOVER
TOTAL 0010					5340	5040	7525	



PROJECT NO: 1077-02-70	HWY: IH 90	COUNTY: MONROE	PLAN: EXISTING WEST CROSSOVER	SHEET	E
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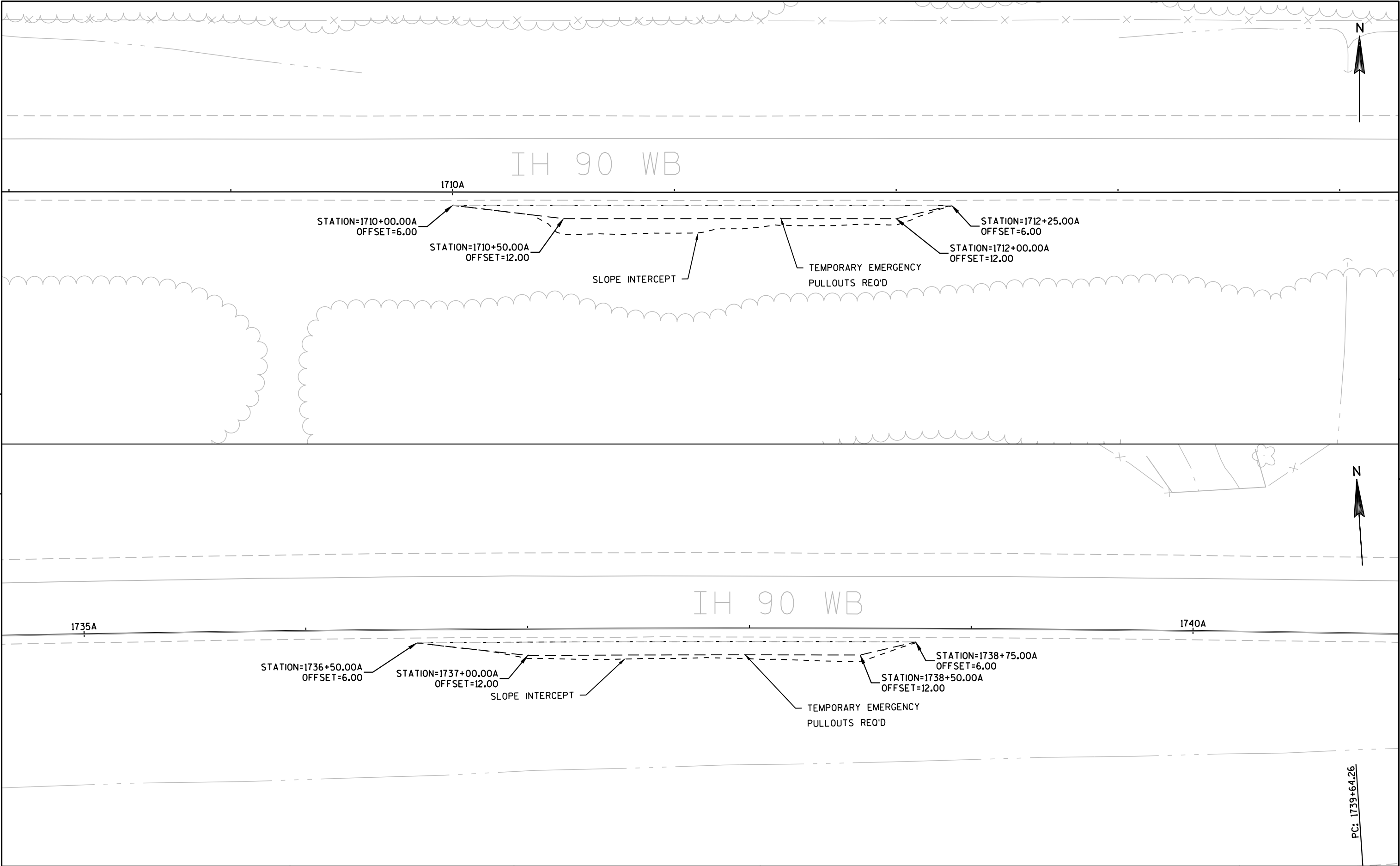


PROJECT NO:1077-02-70	HWY: IH 90	COUNTY: MONROE	PLAN: WEST BOUND	SHEET	-----	E
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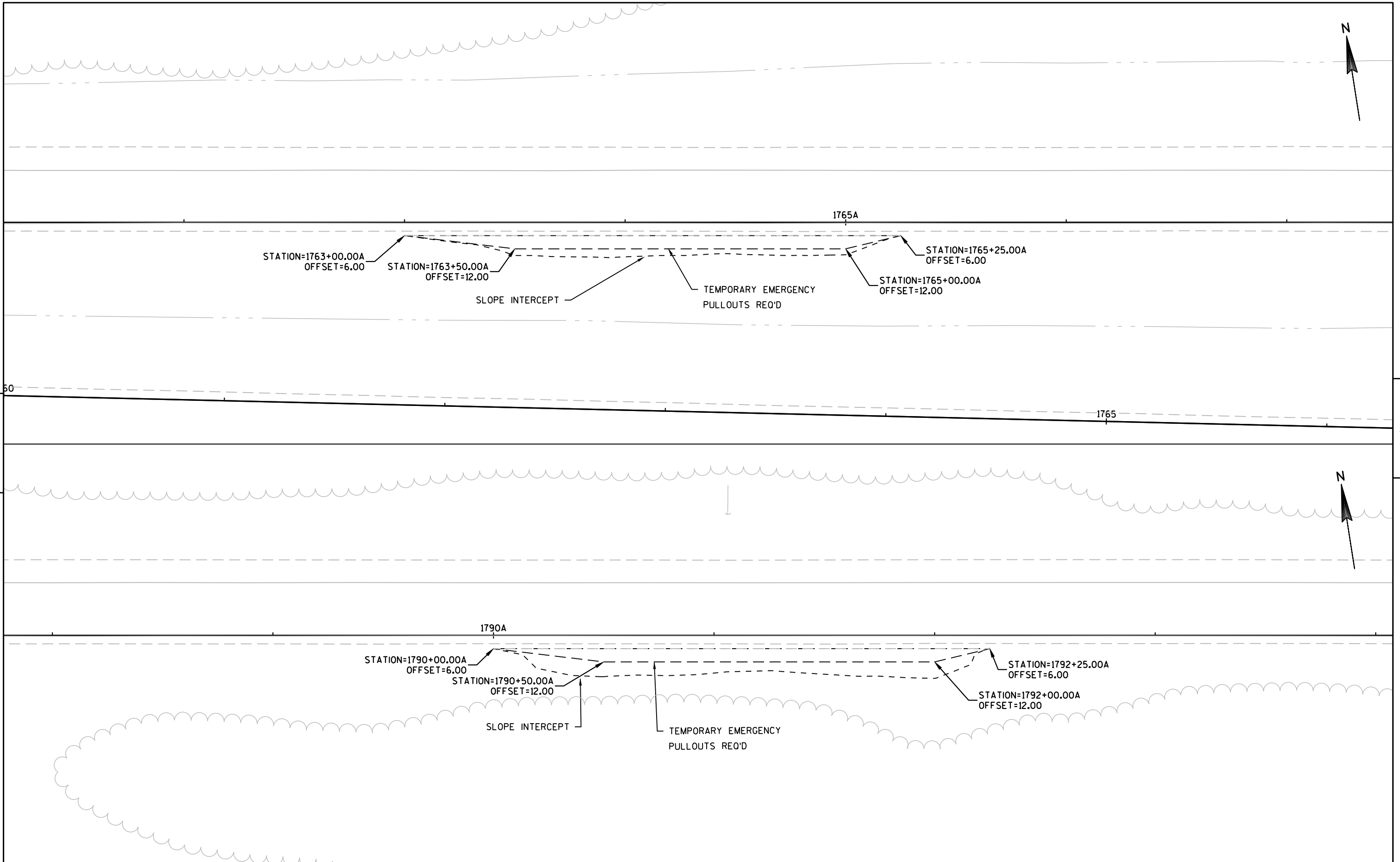
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5

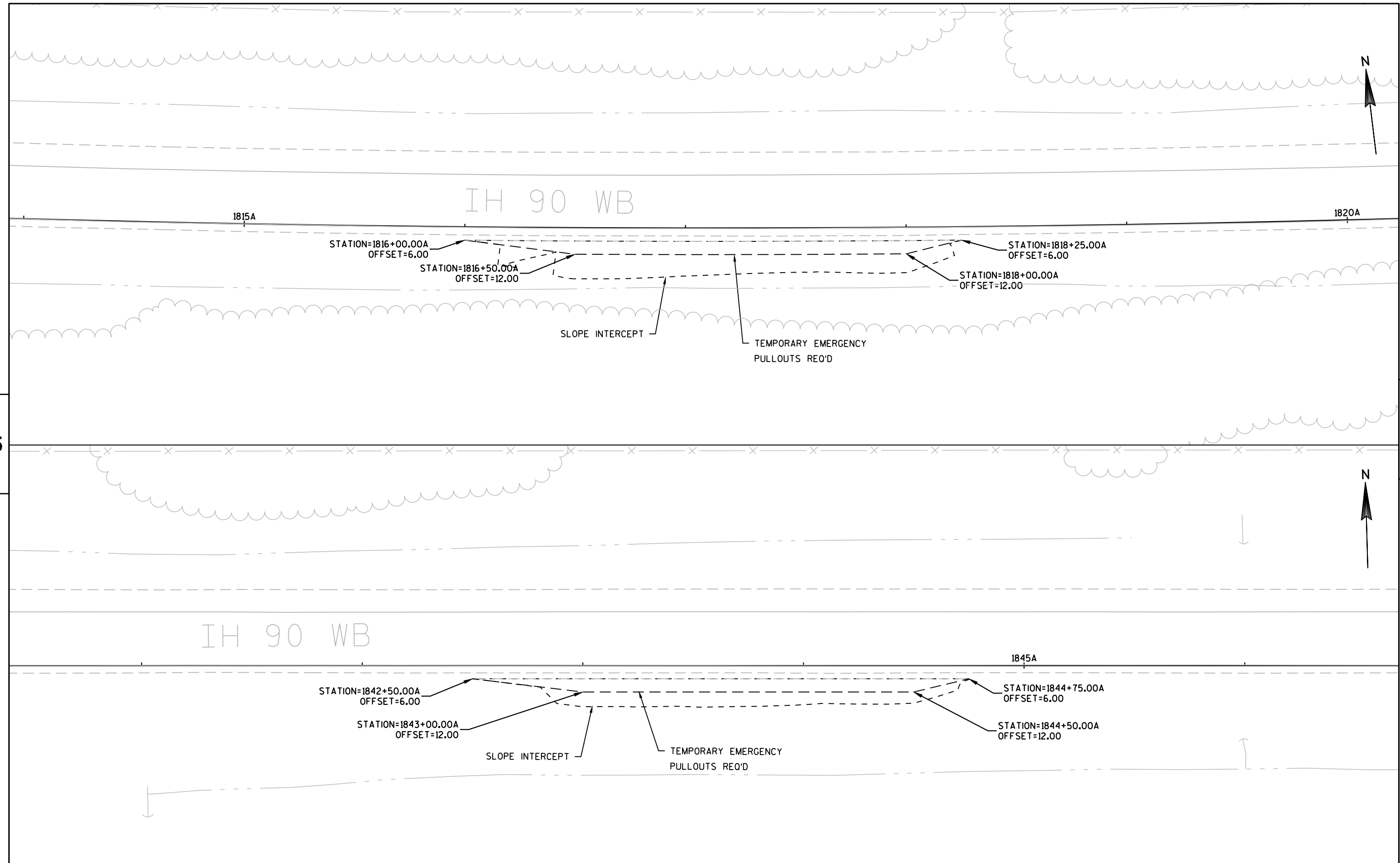


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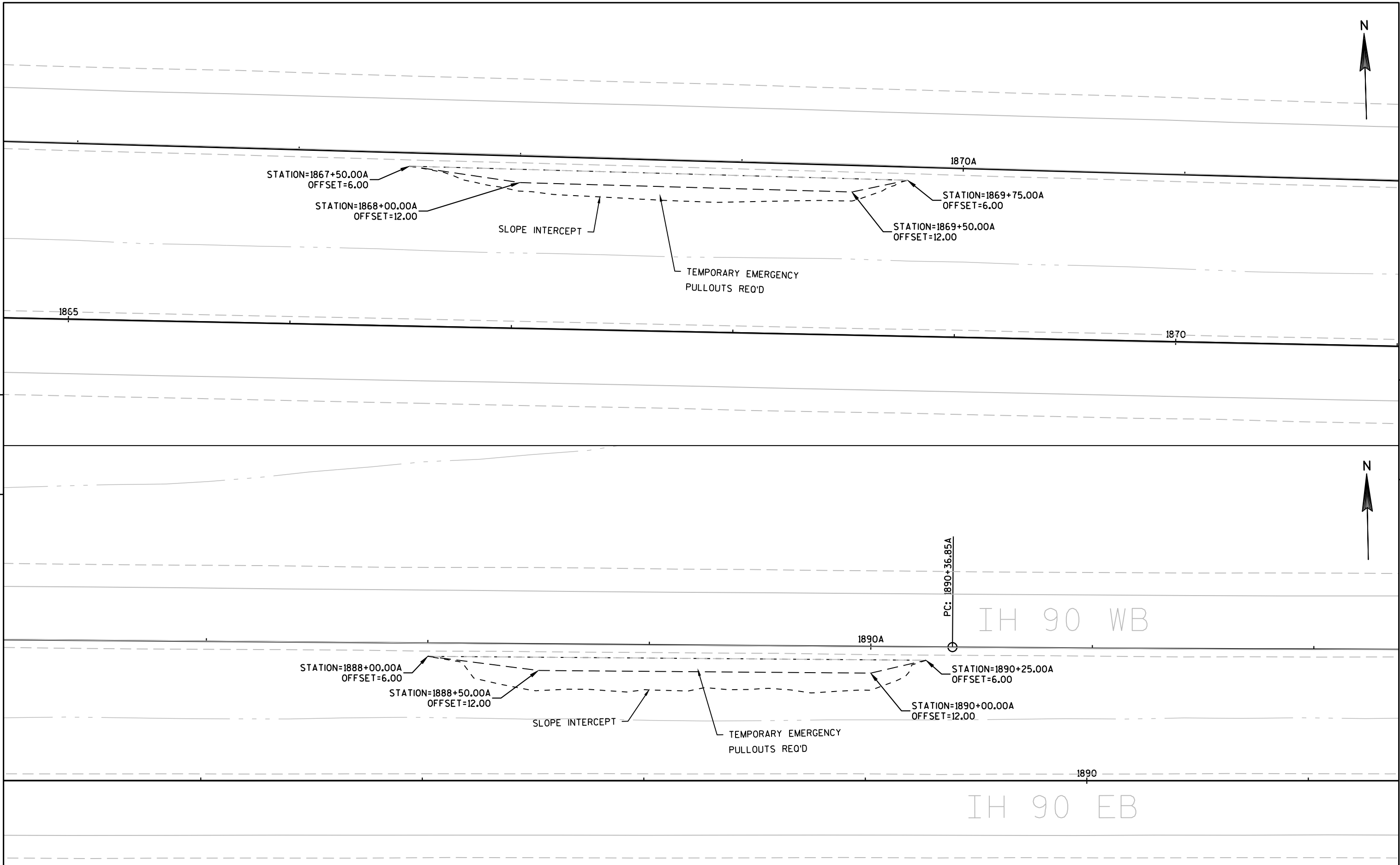
PROJECT NO:1077-02-70	HWY: IH 90	COUNTY: MONROE	PLAN: WEST BOUND	SHEET	E
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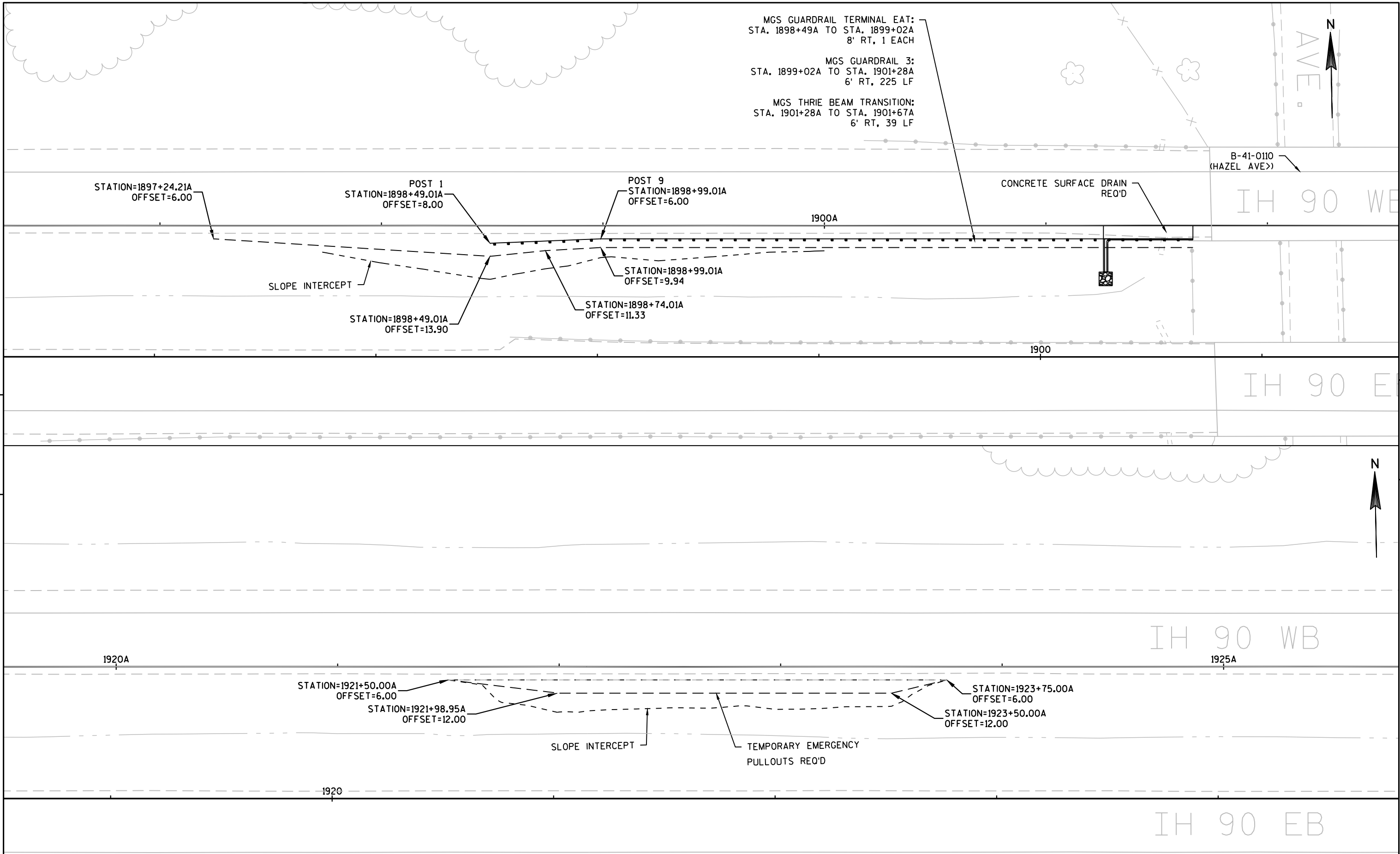
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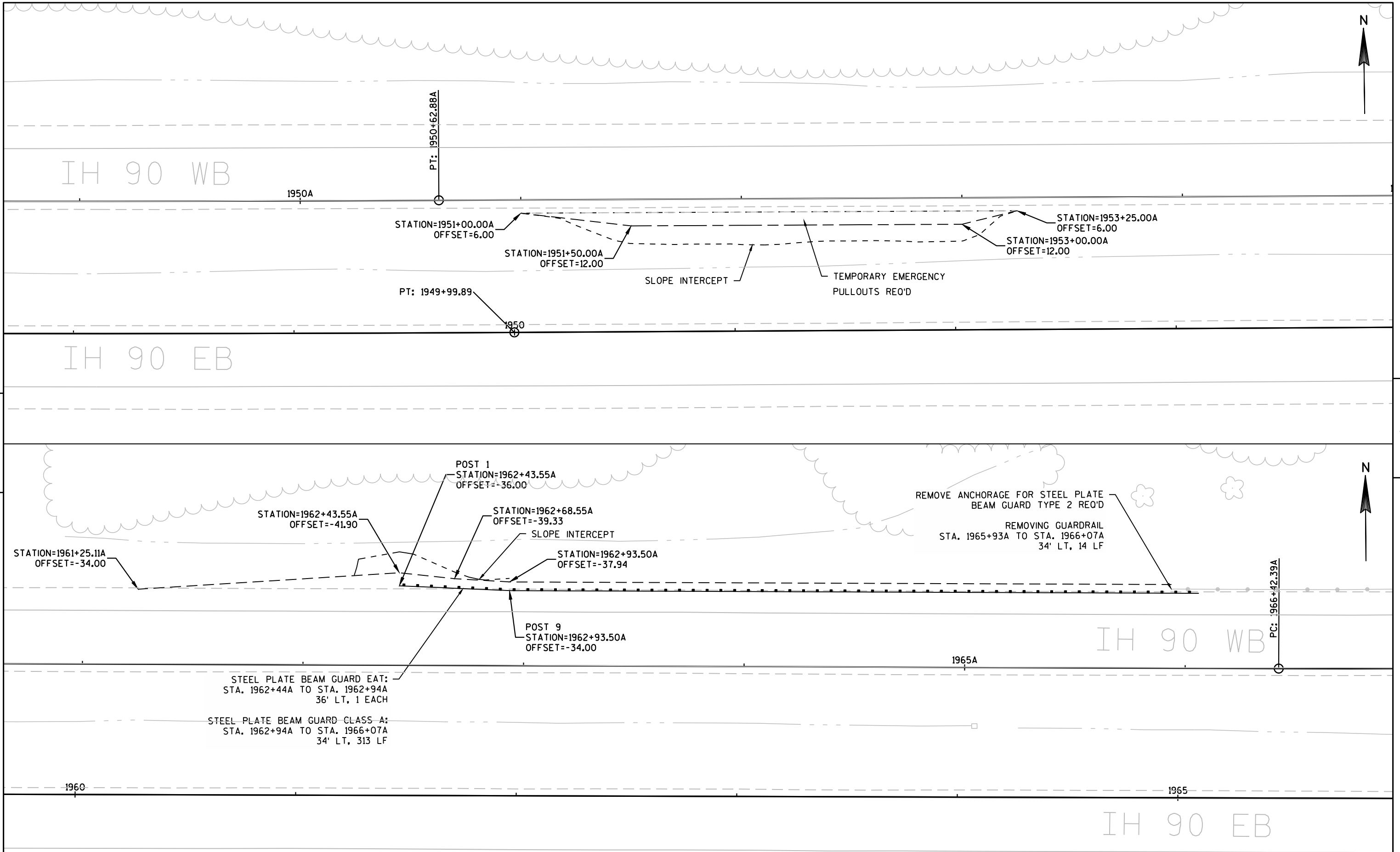
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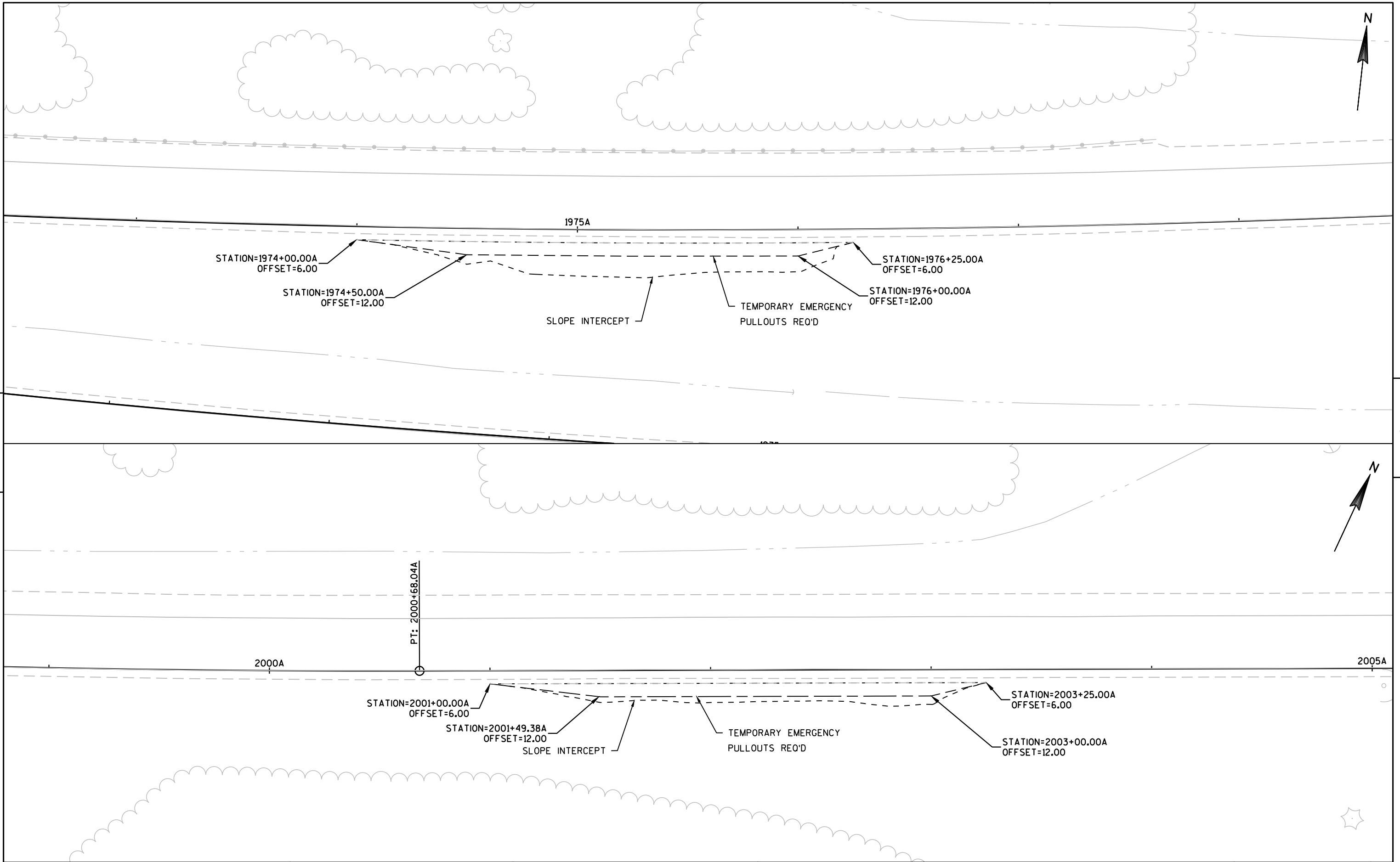
PROJECT NO:1077-02-70	HWY: IH 90	COUNTY: MONROE	PLAN: WEST BOUND	SHEET	5
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PROJECT NO:1077-02-70	HWY: IH 90	COUNTY: MONROE	PLAN: WEST BOUND	SHEET	-----	E
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PROJECT NO:1077-02-70	HWY: IH 90	COUNTY: MONROE	PLAN: WEST BOUND	SHEET	5
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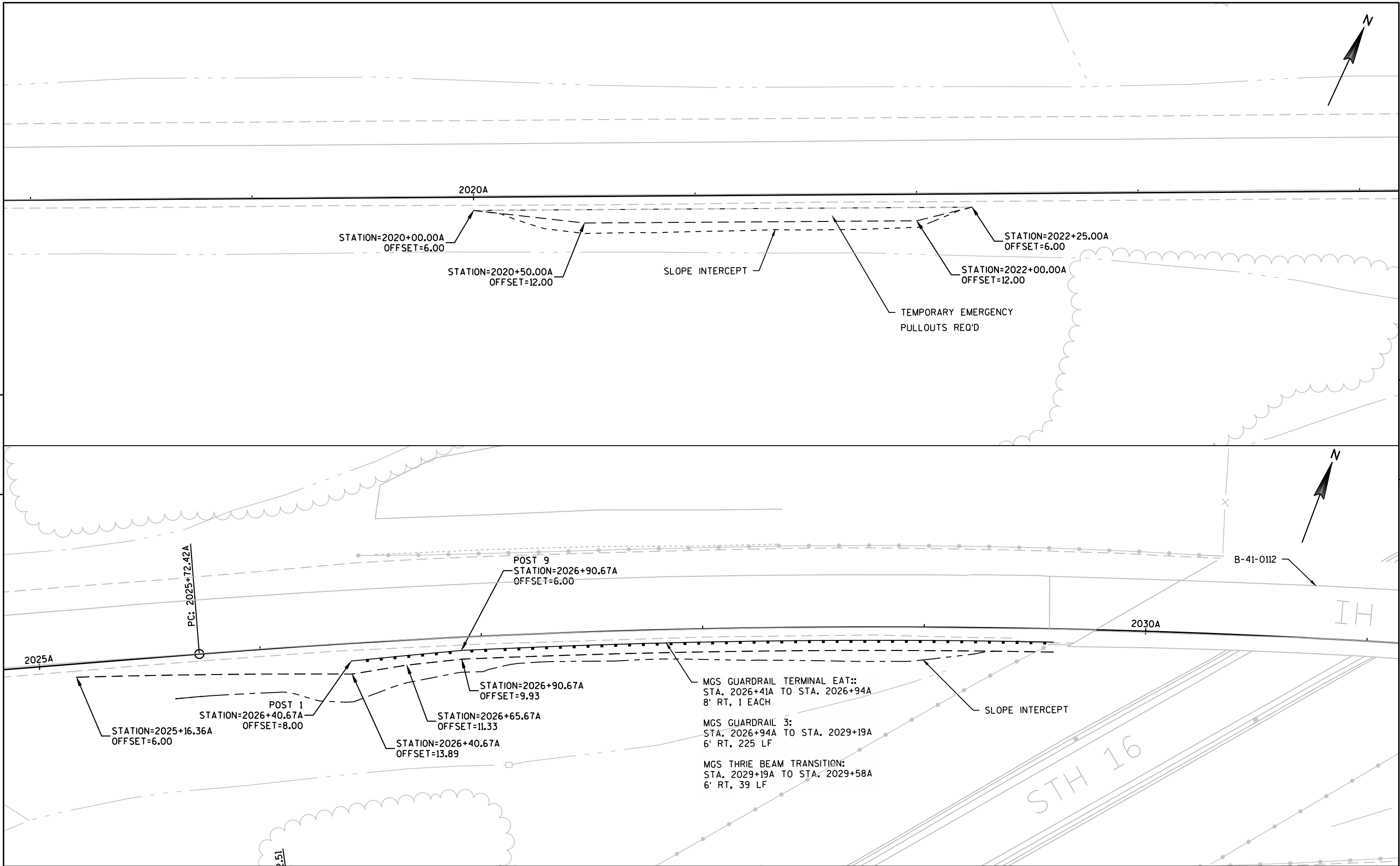
PROJECT NO:1077-02-70	HWY: IH 90	COUNTY: MONROE	PLAN: WEST BOUND	SHEET	5
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LAYOUT NAME - SHEET - (40)

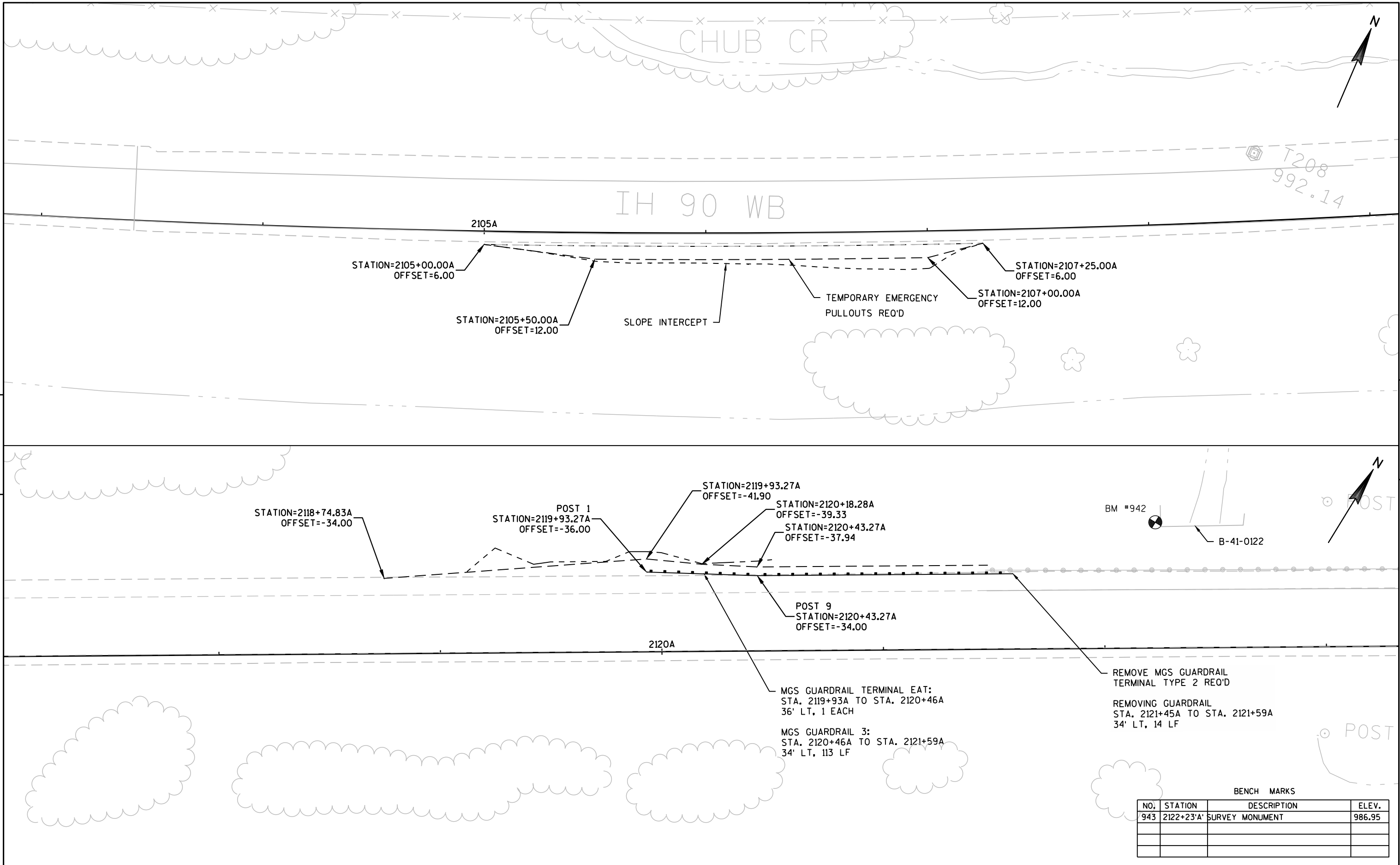
PLOT DATE : 1/11/2018 8:27 AM

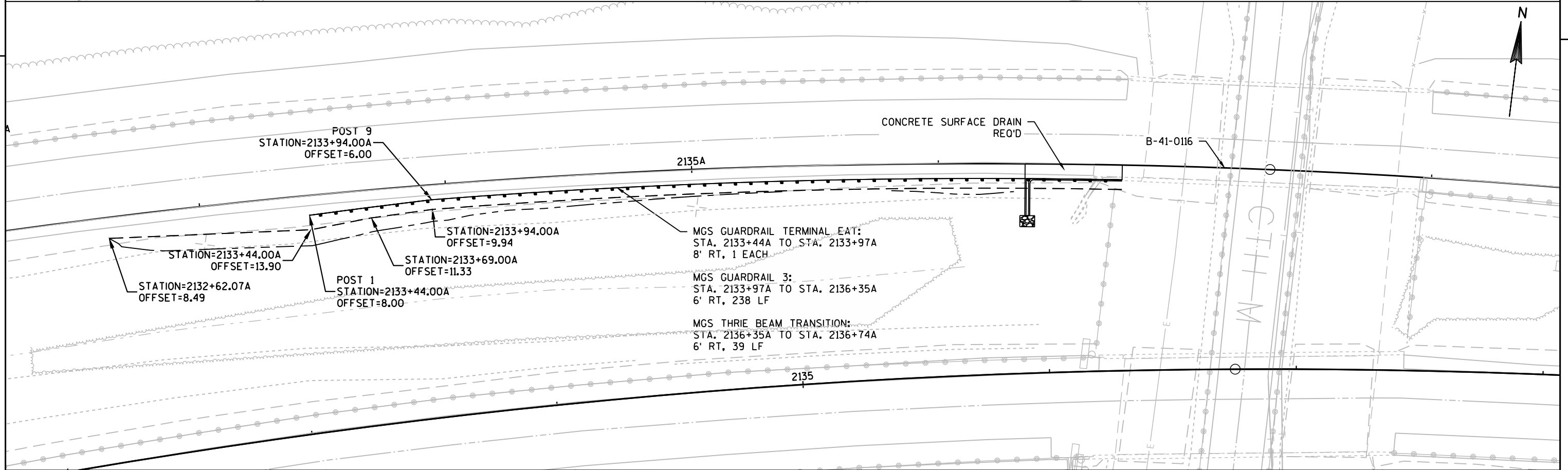
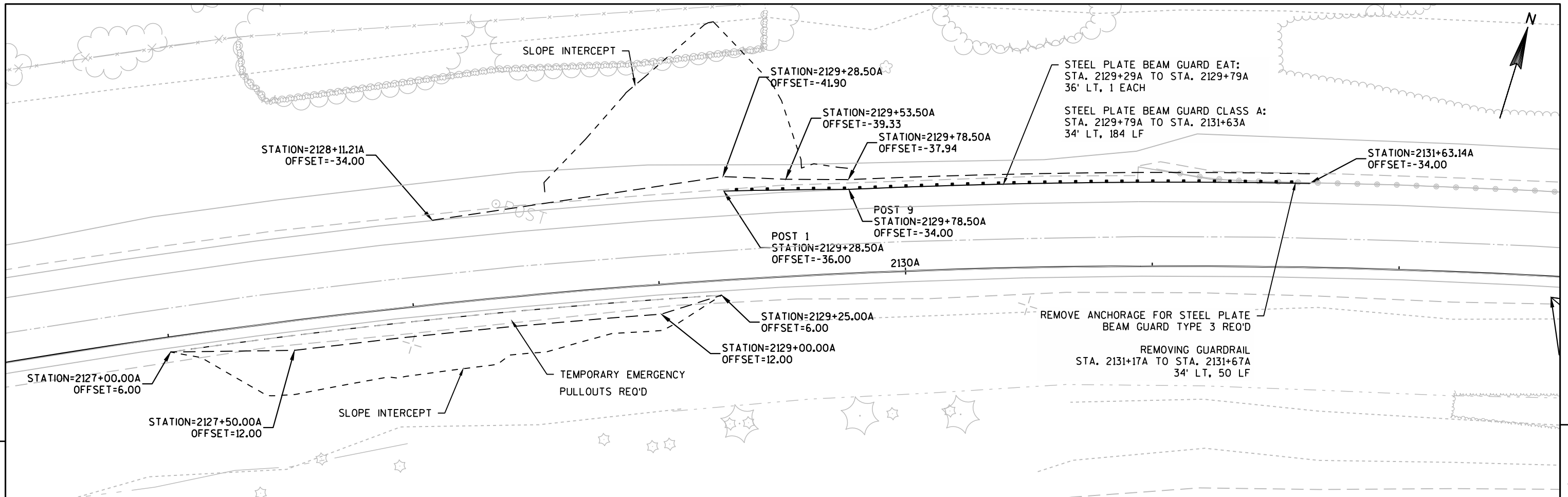
PLOT BY : GREINER JR, MICHAEL PLOT NAME : PLOT SCALE : 1 IN:40 FT

WISDOT/CADDs SHEET 42

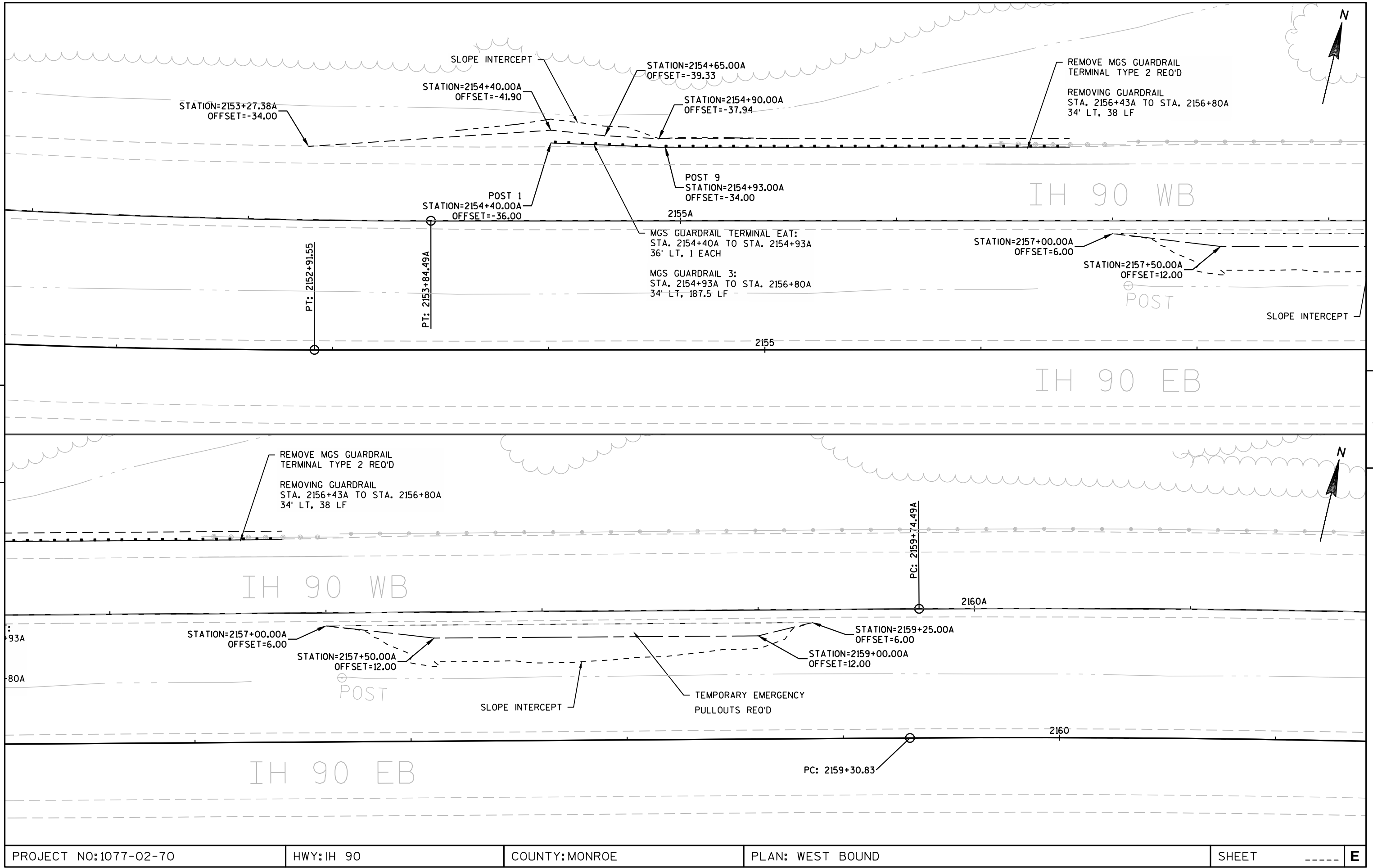


PROJECT NO:1077-02-70	HWY: IH 90	COUNTY: MONROE	PLAN: WEST BOUND	SHEET	E
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PROJECT NO:1077-02-70	HWY: IH 90	COUNTY: MONROE	PLAN: WEST BOUND	SHEET	E
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BENCH MARKS			
NO.	STATION	DESCRIPTION	ELEV.
937	2183+18	FENO MARKER	1053.25

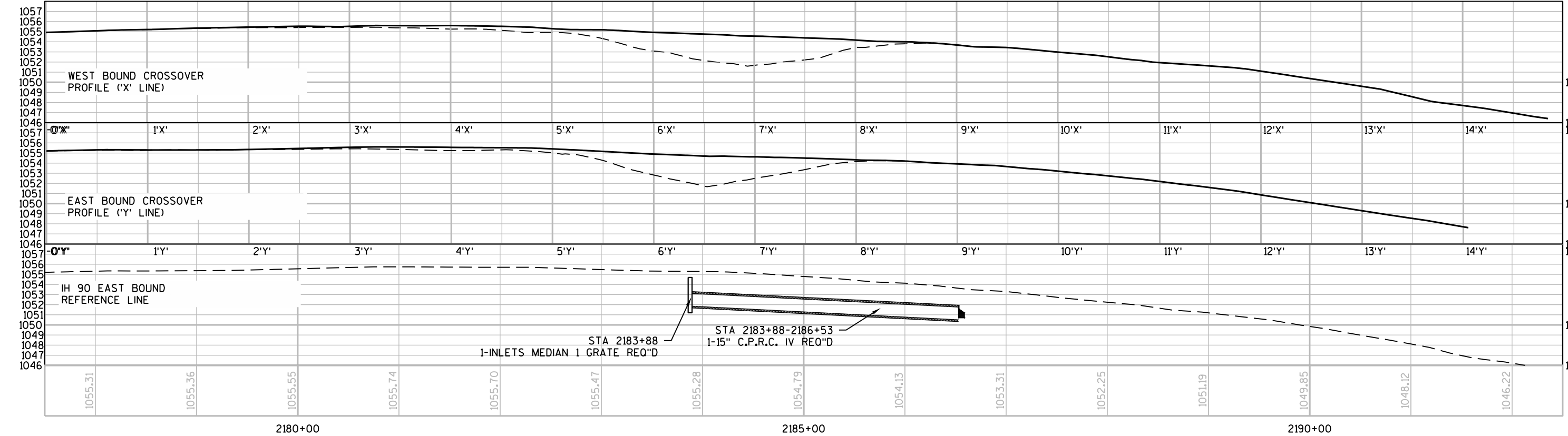
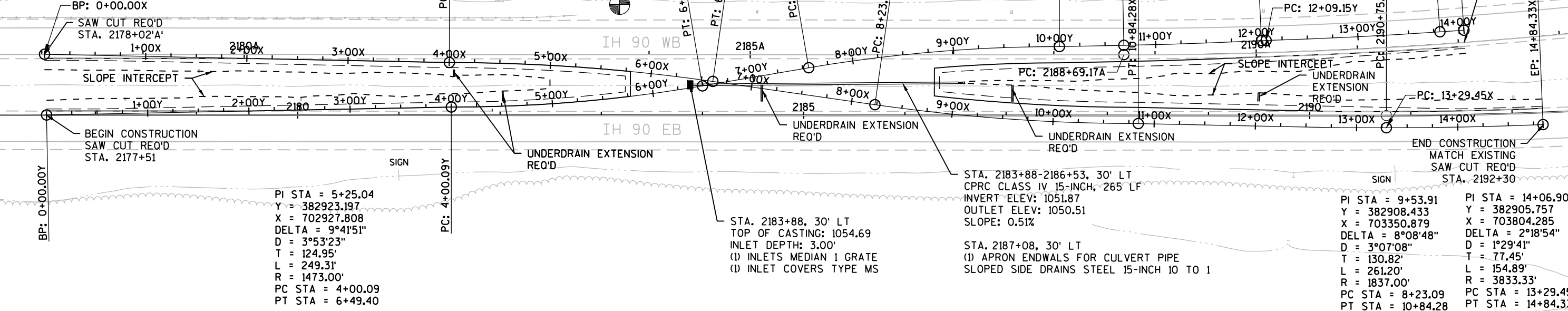
PI STA = 5+30.94
Y = 382967.208
X = 702931.574
DELTA = 8°08'48"
D = 3°07'08"
T = 130.82'
L = 261.20'
R = 1837.00'
PC STA = 4+00.12
PT STA = 6+61.32

PI STA = 8+80.64
Y = 382984.222
X = 703278.741
DELTA = 9°41'51"
D = 3°53'42"
T = 124.78'
L = 248.97'
R = 1471.00'
PC STA = 7+55.86
PT STA = 10+04.83

PI STA = 11+36.55
Y = 382987.615
X = 703535.206
DELTA = 1°41'21"
D = 1°14'27"
T = 68.07'
L = 136.12'
R = 4617.15'
PC STA = 10+68.48
PT STA = 12+04.60

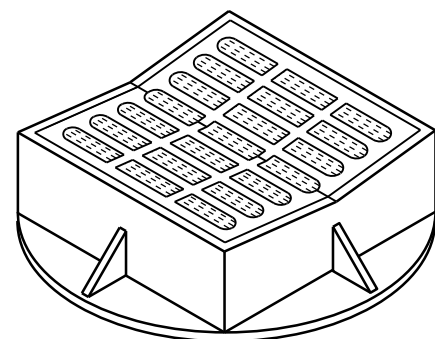
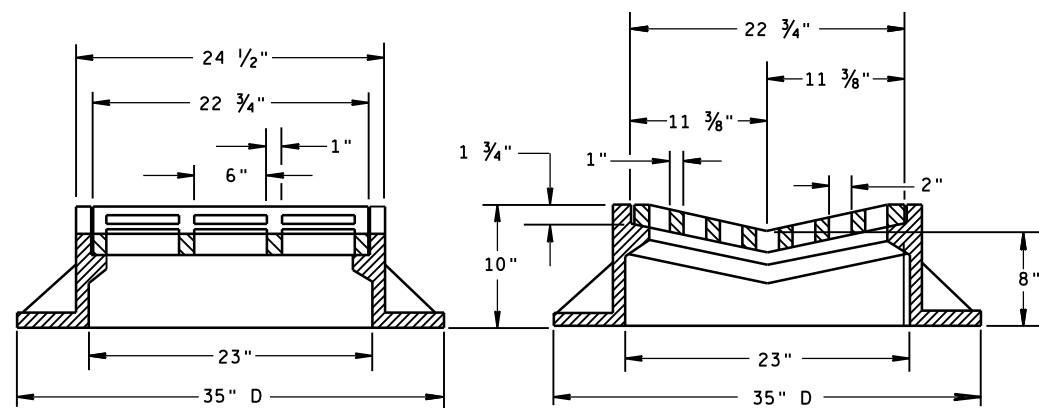
PI STA = 9+53.91
Y = 382908.433
X = 703350.879
DELTA = 8°08'48"
D = 3°07'08"
T = 130.82'
L = 261.20'
R = 1837.00'
PC STA = 8+23.09
PT STA = 10+84.28

PI STA = 14+06.90
Y = 382905.757
X = 703804.285
DELTA = 2°18'54"
D = 1°29'41"
T = 77.45'
L = 154.89'
R = 3833.33'
PC STA = 13+29.45
PT STA = 14+84.33

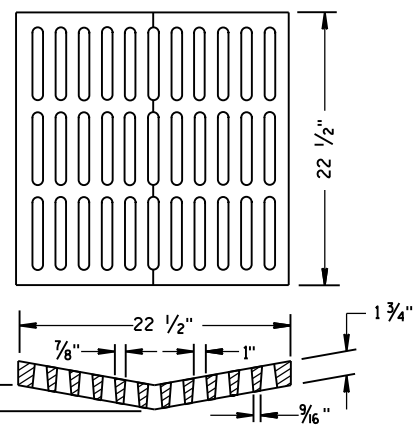


Standard Detail Drawing List

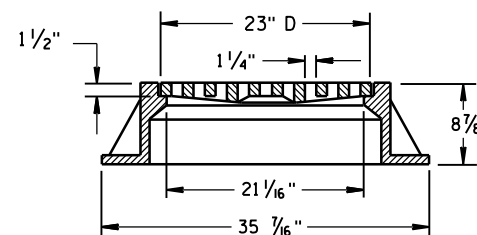
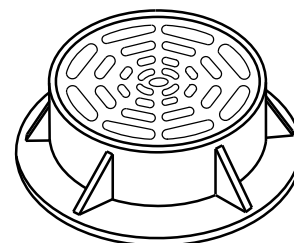
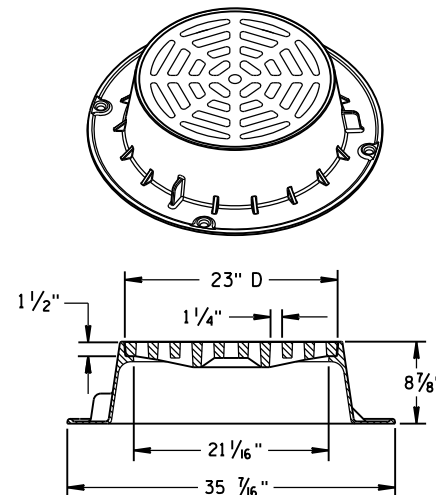
08A05-19B	INLET COVERS TYPE B, B-A, C, MS, MS-A, & WM
08C08-02	INLETS MEDIAN 1 AND 2 GRATE
08D02-06	CONCRETE SURFACE DRAINS FLUME TYPE AT STRUCTURES
08E08-03	TYPICAL INSTALLATIONS OF EROSION BALES / TEMPORARY DITCH CHECKS
08E09-06	SILT FENCE
08E10-02	INLET PROTECTION TYPE A, B, C AND D
08F04-07	JOINT TIES FOR CONCRETE PIPE AND CONCRETE COLLAR DETAIL
08F06-04	REINFORCED CONCRETE APRON ENDWALL FOR PIPE UNDERDRAIN
08F08-02	STEEL APRON ENDWALLS FOR CULVERT PIPE AND PIPE ARCH SLOPED CROSS DRAINS
14B15-11A	STEEL PLATE BEAM GUARD, CLASS "A" INSTALLATION & ELEMENTS
14B15-11B	STEEL PLATE BEAM GUARD, CLASS "A" INSTALLATION & ELEMENTS
14B15-11C	STEEL PLATE BEAM GUARD, CLASS "A", INSTALLATION & ELEMENTS
14B24-09A	STEEL PLATE BEAM GUARD ENERGY ABSORBING TERMINAL
14B24-09B	STEEL PLATE BEAM GUARD ENERGY ABSORBING TERMINAL
14B24-09C	STEEL PLATE BEAM GUARD ENERGY ABSORBING TERMINAL
14B42-05A	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B42-05B	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B42-05C	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B42-05D	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B44-03A	MIDWEST GUARDRAIL SYSTEM ENERGY ABSORBING TERMINAL (MGS)
14B44-03B	MIDWEST GUARDRAIL SYSTEM ENERGY ABSORBING TERMINAL (MGS)
14B44-03C	MIDWEST GUARDRAIL SYSTEM ENERGY ABSORBING TERMINAL (MGS)
14B45-04A	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-04B	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-04C	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-04D	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-04E	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-04F	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-04G	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-04H	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-04I	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-04J	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-04K	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-04L	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
15A02-09	DELINEATOR POST, DELINEATOR REFLECTOR AND DELINEATOR BRACKET WITH REFLECTIVE SHEETING
15A03-02A	FLEXIBLE MARKER POST FOR CULVERT END
15A03-02B	FLEXIBLE MARKER POST FOR CULVERT END
15C08-18A	LONGITUDINAL MARKING (MAINLINE)
15C11-07A	CHANNELIZING DEVICES FLEXIBLE TUBULAR MARKER POST
15D12-06A	TRAFFIC CONTROL, LANE CLOSURE
15D13-02	TEMPORARY EMERGENCY PULLOUTS



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"

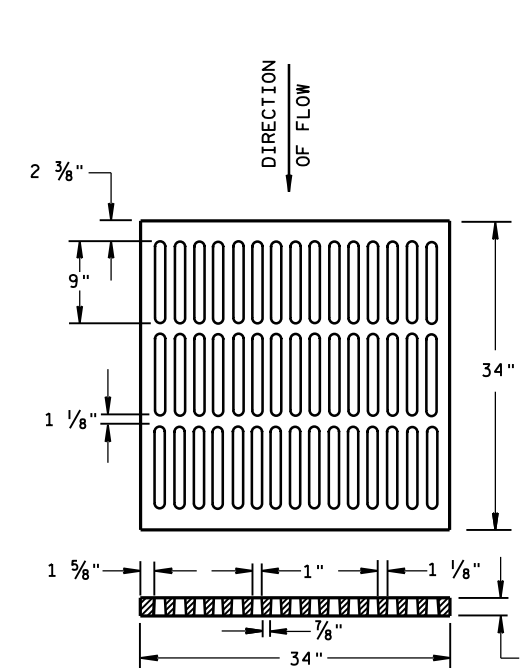
NOTE: EITHER CASTING IS ACCEPTABLE

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.

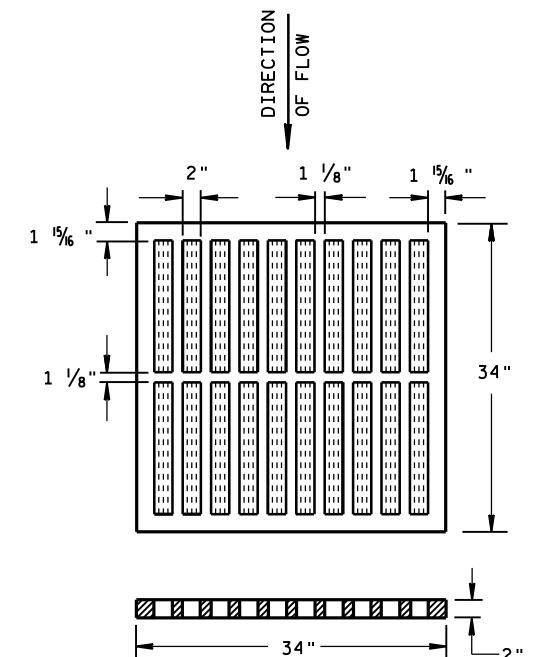
DETAIL DRAWINGS FOR PROPOSED ALTERNATE DESIGNS FOR CATCH BASIN, MANHOLE AND INLET COVERS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PROVIDING THAT SUCH ALTERNATE DESIGNS MAKE PROVISION FOR EQUIVALENT CAPACITY AND STRENGTH.

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



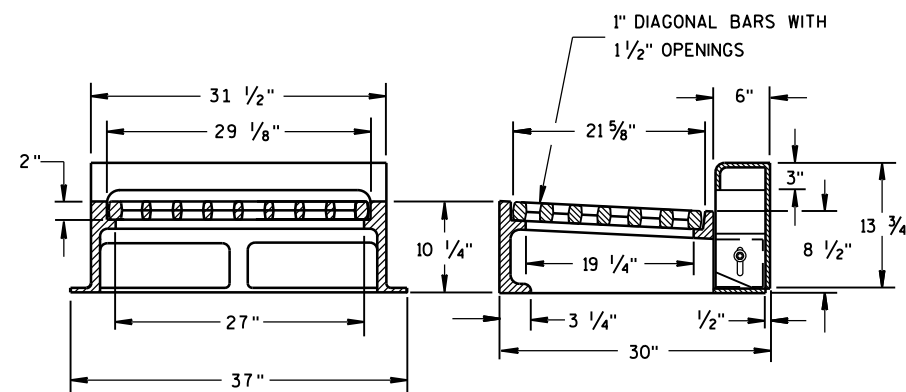
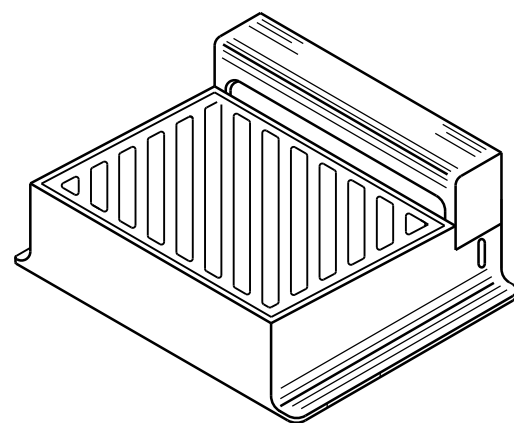
ALTERNATIVE TYPE "MS"

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.

DIRECTION
OF FLOW

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

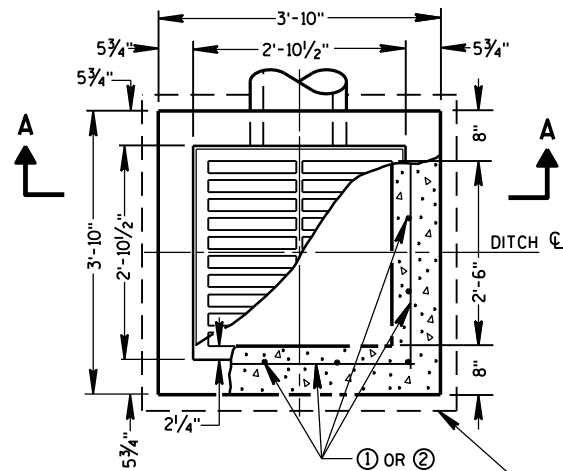
STATE OF WISCONSIN
 DEPARTMENT OF TRANSPORTATION

APPROVED
 DATE

11/27/2013
 DATE

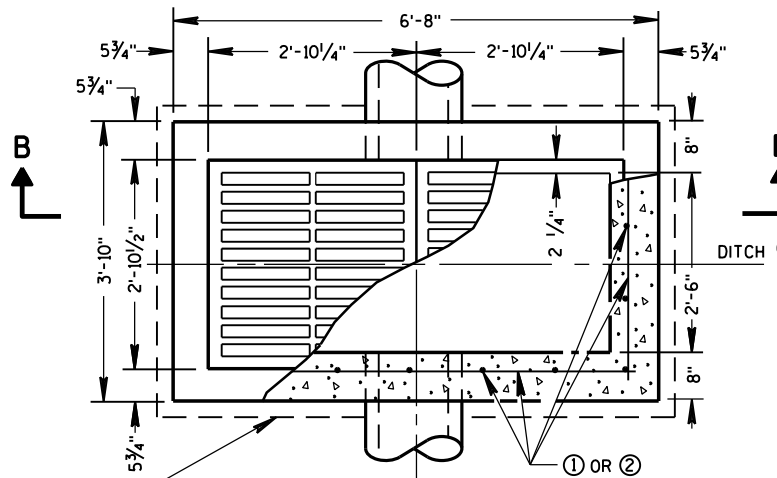
/S/ Jerry H. Zogg
 ROADWAY STANDARDS DEVELOPMENT
 ENGINEER

FHWA

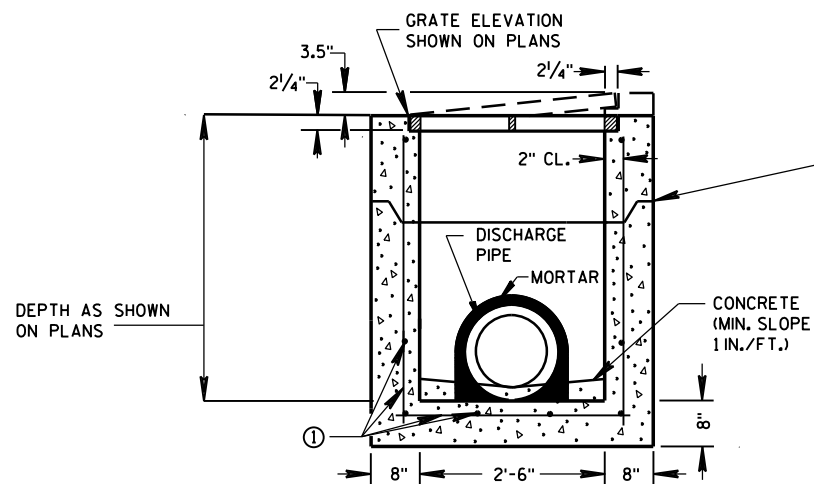


PLAN VIEW

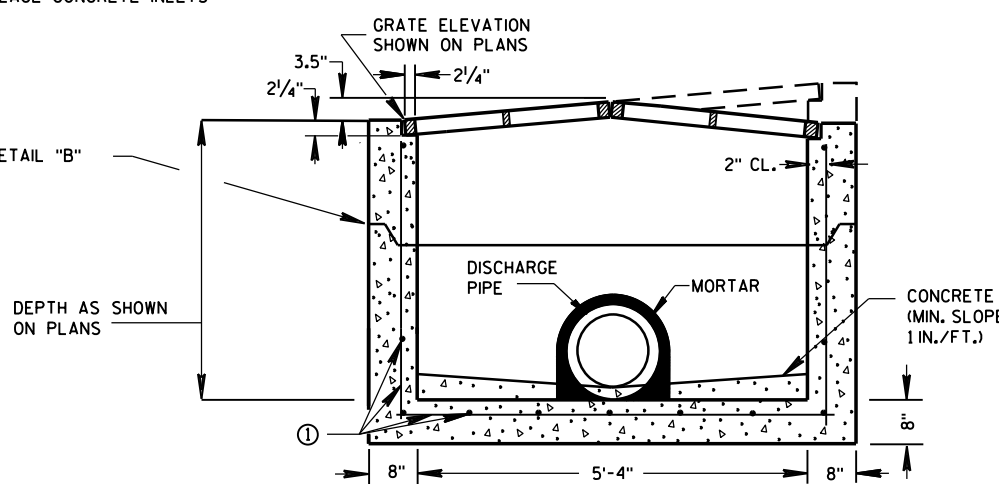
4" OVERHANGING BASE ON REINFORCED CAST-IN-PLACE CONCRETE INLETS



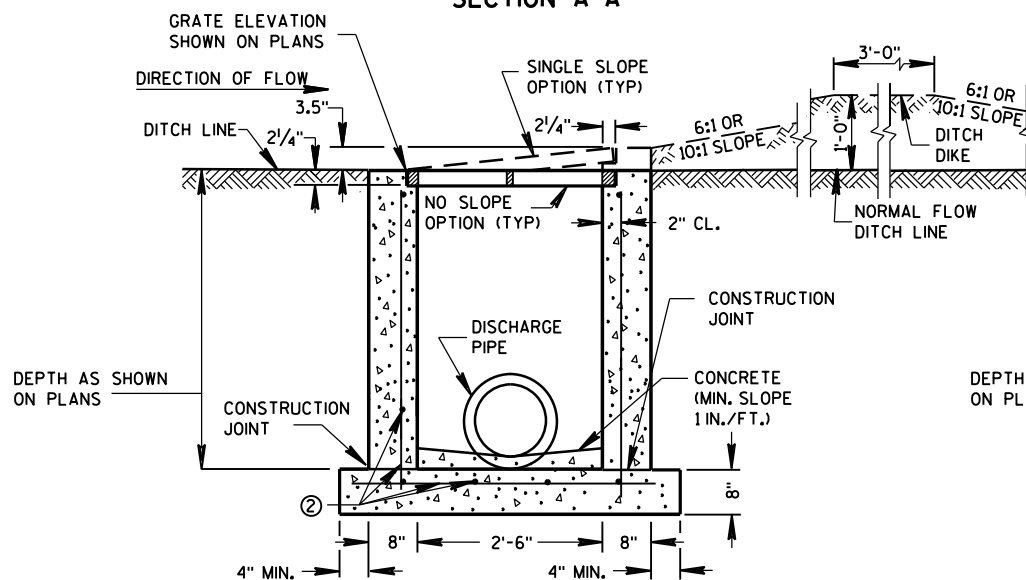
PLAN VIEW



PRECAST REINFORCED CONCRETE SECTION A-A

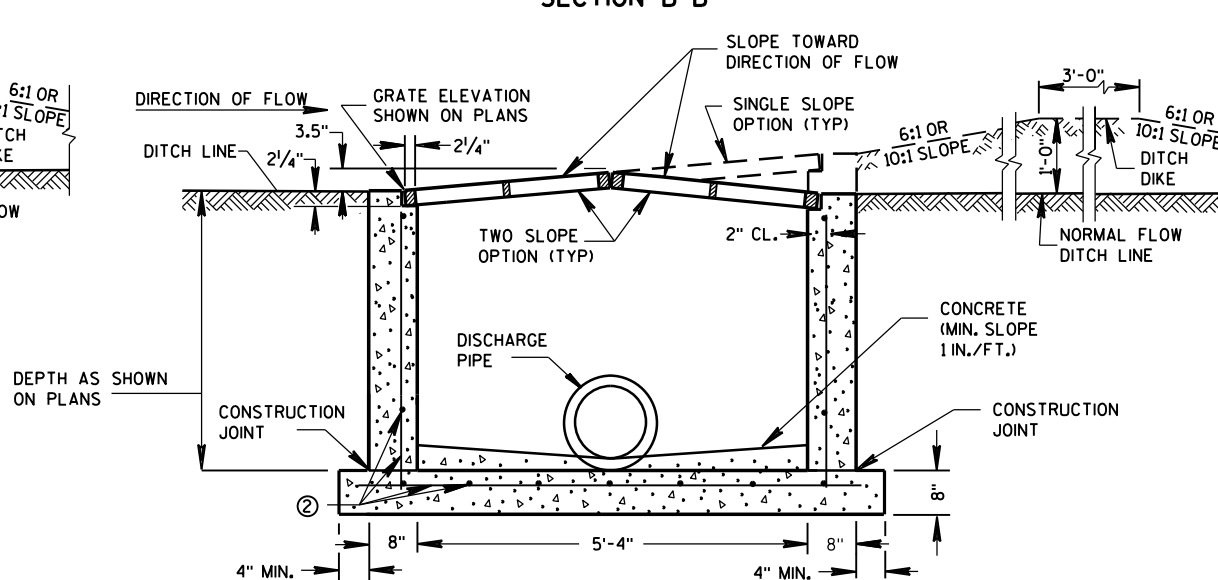


PRECAST REINFORCED CONCRETE SECTION B-B



REINFORCED CAST-IN-PLACE CONCRETE SECTION A-A

INLETS MEDIAN 1 GRATE



REINFORCED CAST-IN-PLACE CONCRETE SECTION B-B

INLETS MEDIAN 2 GRATE

GENERAL NOTES

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

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

DETAILED DRAWINGS FOR PROPOSED ALTERNATE DESIGNS FOR INLETS WHICH MAY INCLUDE PRECAST REINFORCED CONCRETE INLETS, SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PROVIDING THAT SUCH ALTERNATE DESIGNS MAKE PROVISION FOR EQUIVALENT CAPACITY AND STRENGTH.

ALL MEDIAN INLETS ARE DESIGNATED ON THE PLANS AS "INLETS, IG-MS", ETC. THE FIRST NUMBER AND LETTER DESIGNATE THE TYPE OF STRUCTURE, AND THE FOLLOWING LETTERS DESIGNATE THE TYPE OF COVER TO BE USED TO COMPRISE THE COMPLETE UNIT. BASES SHALL BE PLACED ON A BED OF MATERIAL AT LEAST 6 INCHES IN DEPTH, WHICH MEETS THE REQUIREMENTS OF FOUNDATION BACKFILL. THIS BEDDING SHALL BE COMPACTED AND PROVIDE UNIFORM SUPPORT FOR THE ENTIRE AREA OF THE BASE.

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

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

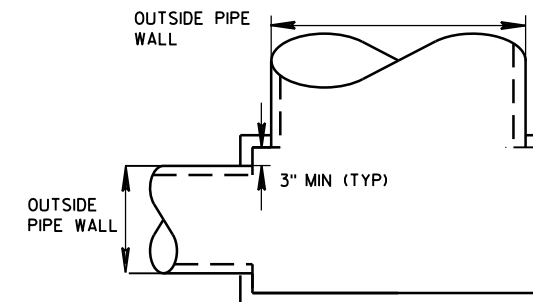
ALL PRECAST INLET UNITS SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF ASTM C 913.

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

- ① FOR PRECAST INLETS PROVIDE REINFORCING STEEL IN ACCORDANCE TO ASTM C 913.
- ② CONTRACTOR TO PROVIDE DRAWING(S) STAMPED BY A PROFESSIONAL ENGINEER FOR STEEL REINFORCING DESIGN FOR CAST-IN-PLACE STRUCTURES.

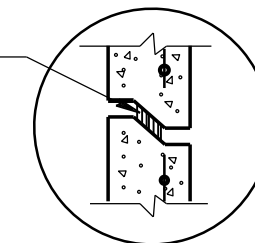
PIPE MATRIX

INLET SIZE	MAXIMUM INSIDE PIPE DIAMETER	
	WIDTH (IN)	LENGTH (IN)
1 GRATE	18	18
2 GRATE	18	42



DETAIL "A"

JOINTS TO BE SEALED WITH A BUTYL RUBBER SEAL PER SEALANT MANUFACTURERS RECOMMENDATIONS CONFORMING TO ASTM C 990 (TYP)



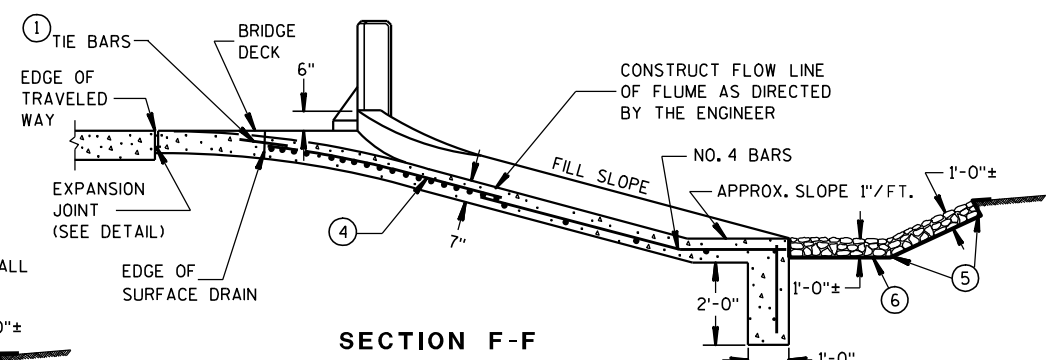
DETAIL "B"

INLETS MEDIAN 1 AND 2 GRATE

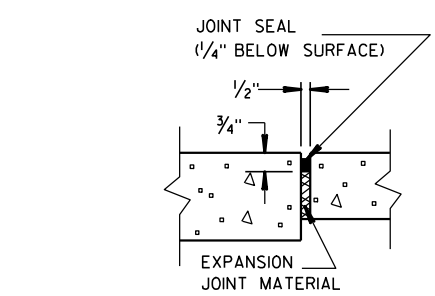
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
Sept., 2016
DATE
FHWA

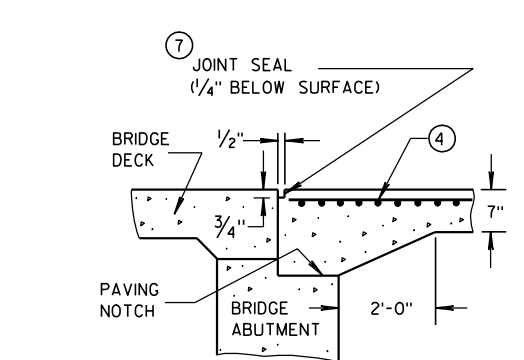
/S/ Rodney Taylor
ROADWAY STANDARDS DEVELOPMENT
UNIT SUPERVISOR



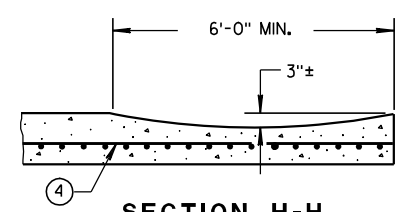
SECTION A-A



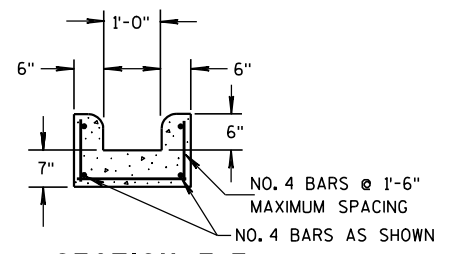
EXPANSION JOINT DETAIL



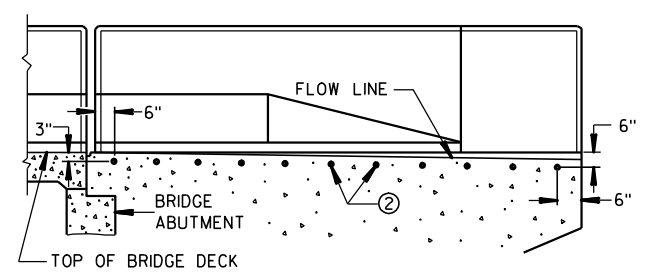
SECTION D-D



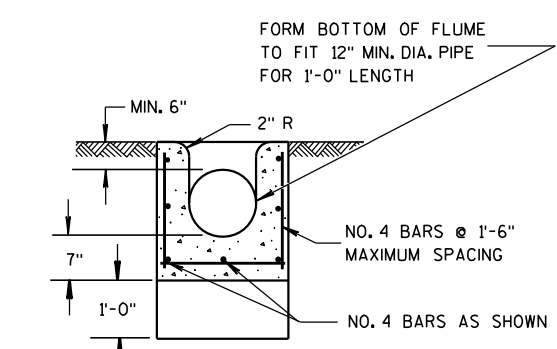
SECTION H-H



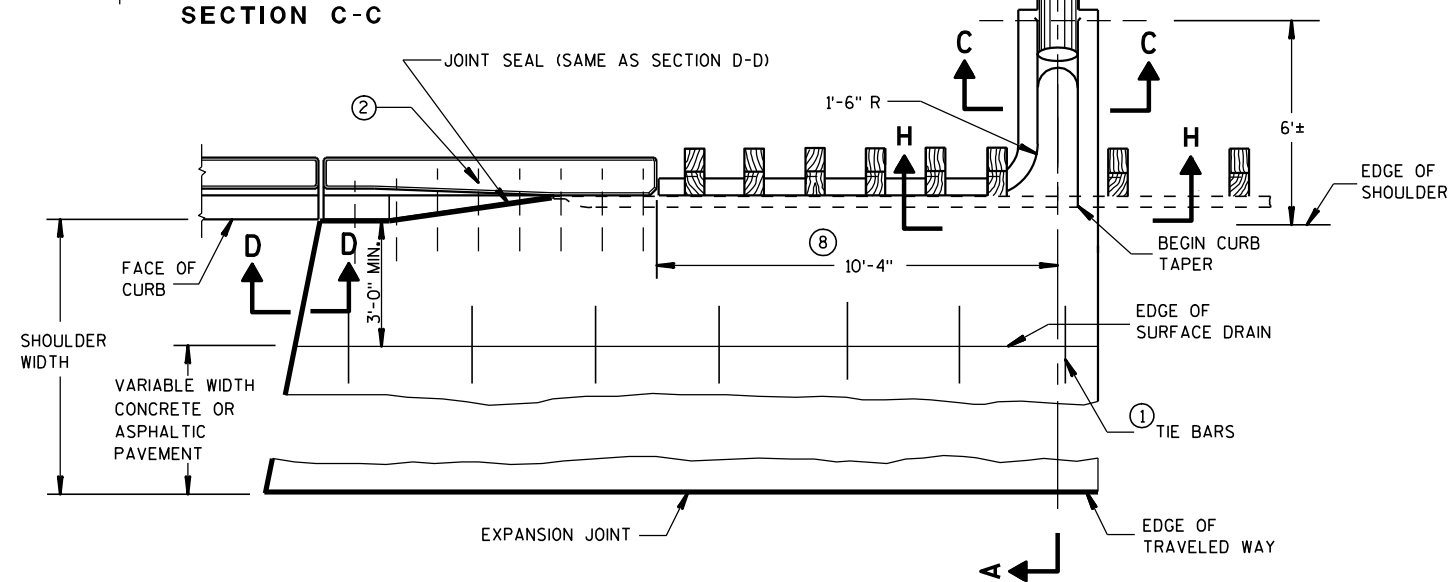
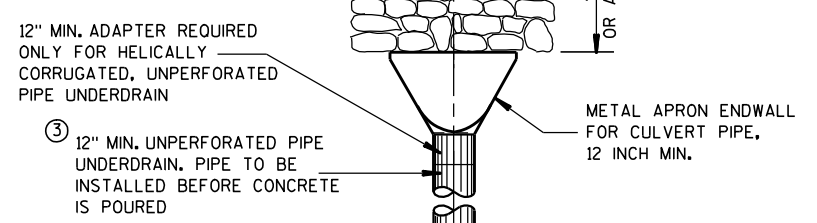
SECTION E-E



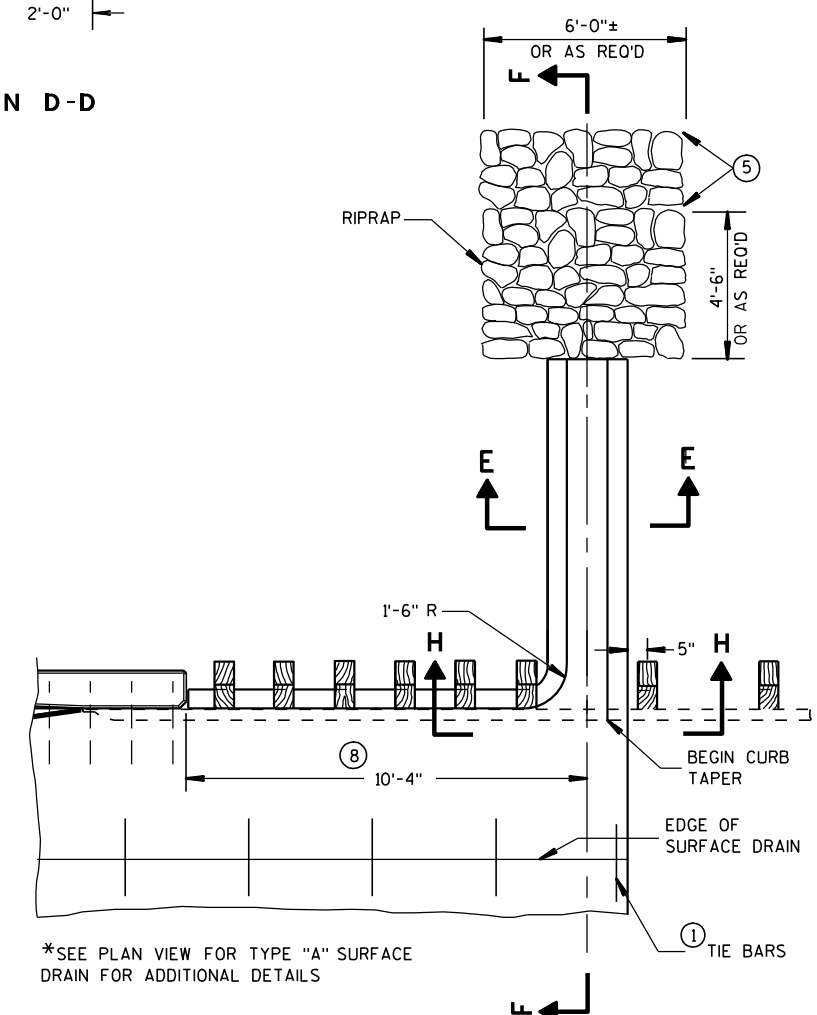
LOCATION OF TIE BARS IN WINGWALL



SECTION C-C



PLAN VIEW
SURFACE DRAIN WITH PIPE
TYPE "A"



* PARTIAL PLAN VIEW
SURFACE DRAIN WITHOUT PIPE
TYPE "B"

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.

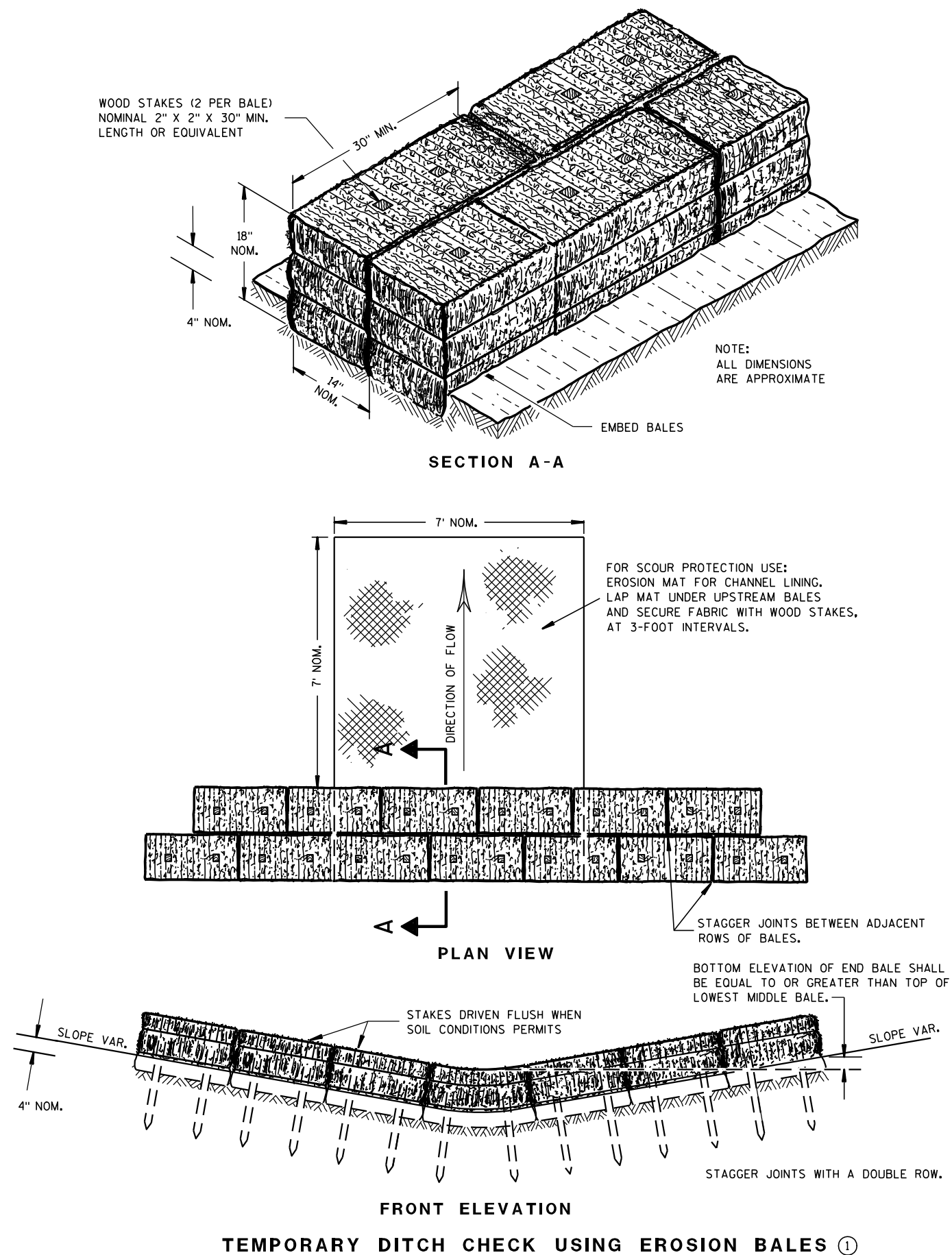
ALL STEEL REINFORCEMENT SHALL BE EMBEDDED 2 INCHES CLEAR
UNLESS OTHERWISE SHOWN OR NOTED.

- ① NO. 4 X 2'-0" TIE BARS SPACED AT 3'-0" CENTERS TO BE USED ONLY WHEN ADJACENT TO P.C. CONCRETE.
- ② NO. 4 X 2'-0" TIE BARS SPACED AT 12" CENTERS TO BE PLACED BY BRIDGE CONTRACTOR, OR DRILLED TIE BARS PLACED AS DIRECTED BY THE ENGINEER.
- ③ PIPE UNDERDRAIN MAY BE ANY OF THE MATERIALS LISTED IN SECTION 612.2 OF THE STANDARD SPECIFICATIONS EXCEPT DRAIN TILE.
- ④ MINIMUM REINFORCEMENT SHALL BE 6" X 6" - W4.0 X W4.0 OR NO. 3 BARS LONGITUDINAL AND TRANSVERSE SPACING 12" C-C.
- ⑤ LIMITS OF ADDITIONAL RIPRAP WHEN SPECIAL DITCH IS REQUIRED.
- ⑥ GEOTEXTILE FABRIC, TYPE "R"
- ⑦ HOT POURED SEALANT UNLESS OTHERWISE SPECIFIED.
- ⑧ THIS DIMENSION MAY VARY DEPENDING ON THE SPACING OF POSTS FOR THE STEEL PLATE BEAM GUARD, THE TYPICAL LOCATION FOR THE SURFACE DRAIN IS WHERE THE POST SPACING WIDENS TO 3'-1½".

CONCRETE SURFACE DRAINS FLUME TYPE AT STRUCTURES

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

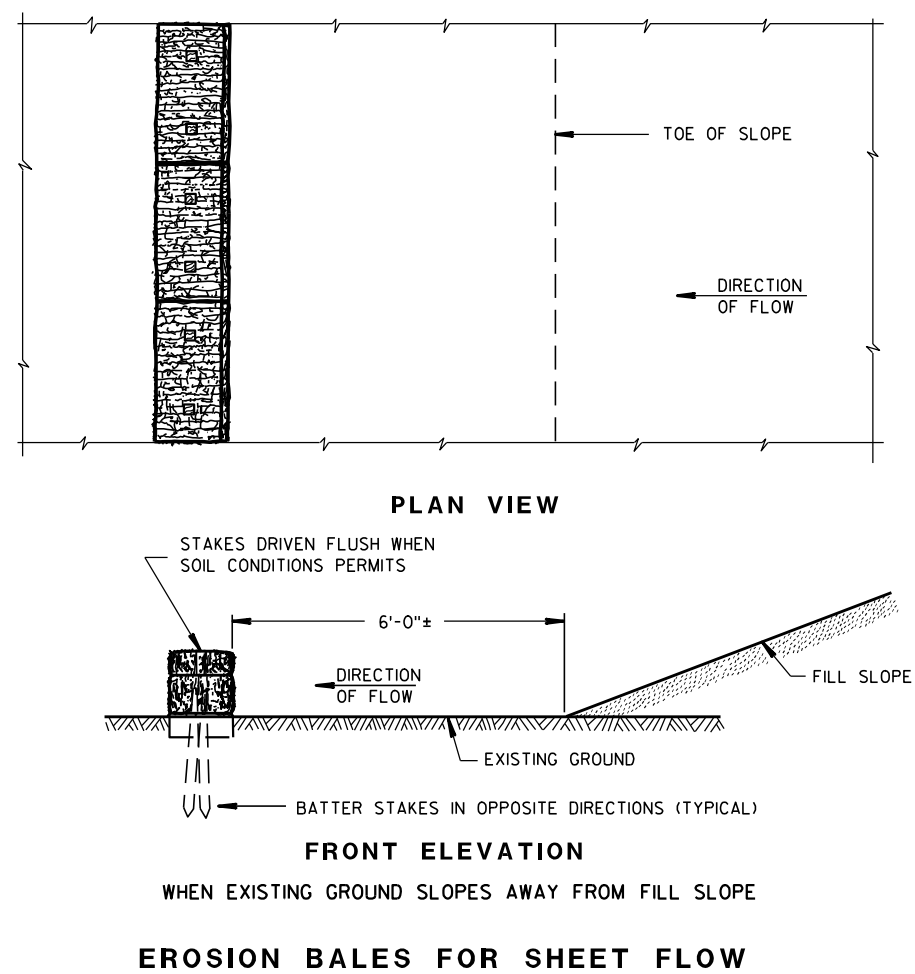
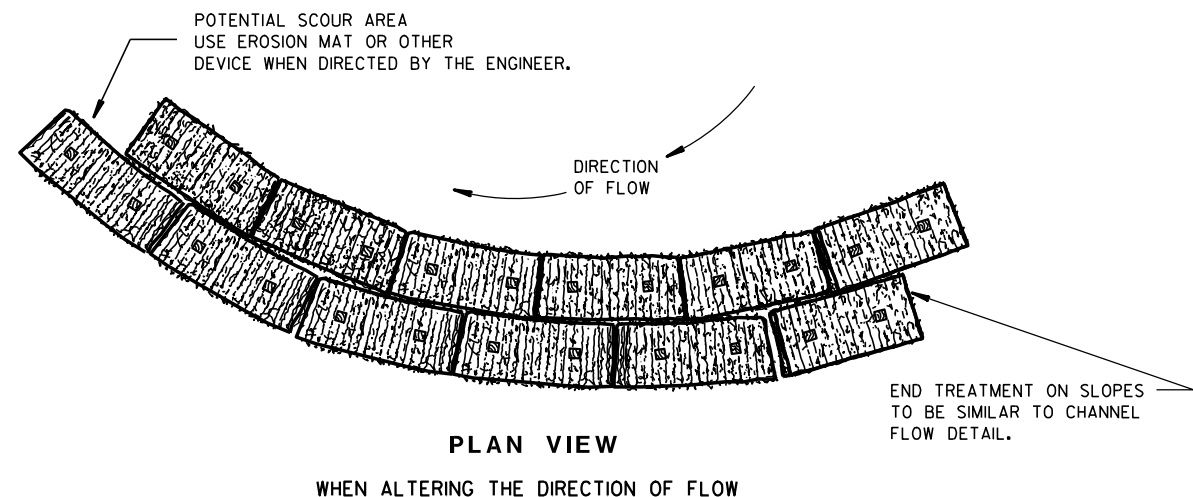
APPROVED	
<u>9/4/08</u>	<u>/S/ Jerry H. Zogg</u>
DATE	ROADWAY STANDARDS DEVELOPMENT
FHWA	ENGINEER



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.

- ① TEMPORARY DITCH CHECKS EITHER EROSION BALES OR MANUFACTURED SHALL BE PAID FOR UNDER THE BID ITEM OF TEMPORARY DITCH CHECK. THE DEPARTMENT WILL NOT PAY FOR TEMPORARY DITCH CHECKS CONSTRUCTED OF A SINGLE ROW OF EROSION BALES.

TYPICAL INSTALLATIONS OF
EROSION BALES / TEMPORARY
DITCH CHECKS

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

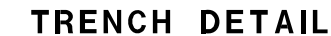
6/04/02
DATE

FHWA

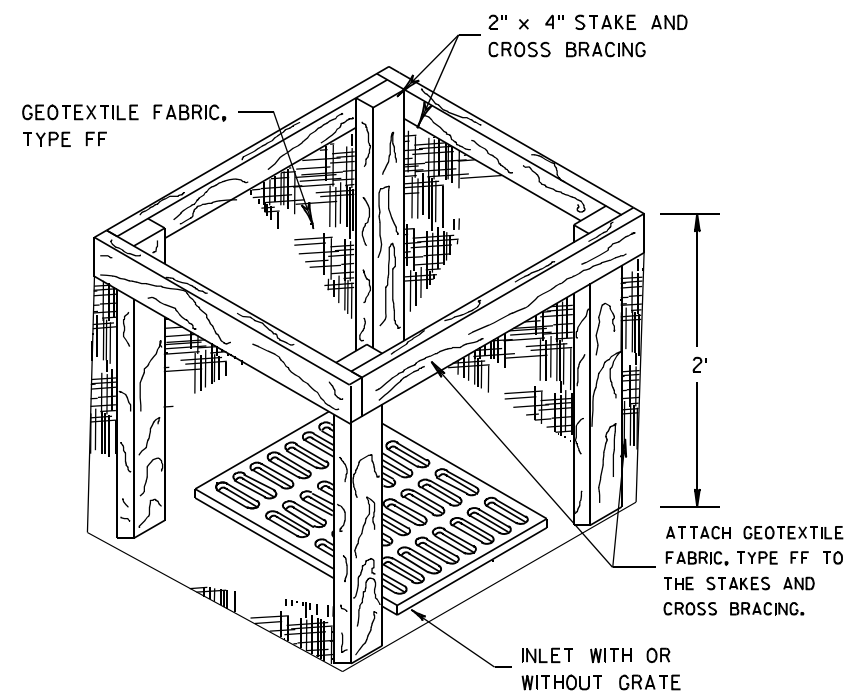
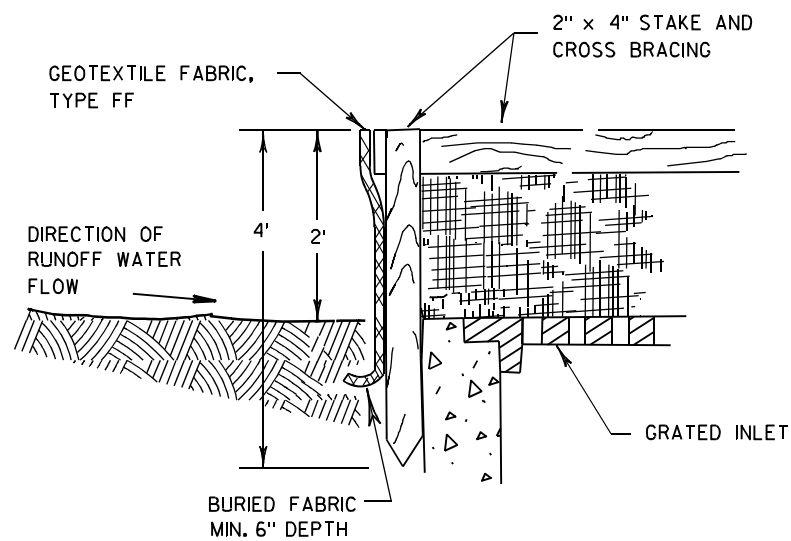
/S/ Beth Canestra
CHIEF ROADWAY DEVELOPMENT ENGINEER



- 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 1 1/8" X 1 1/8" 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.



SILT FENCE	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED <u>4-29-05</u> <u>DATE</u>	<u>/S/ Beth Canestra</u> CHIEF ROADWAY DEVELOPMENT ENGINEER



INLET PROTECTION, TYPE A

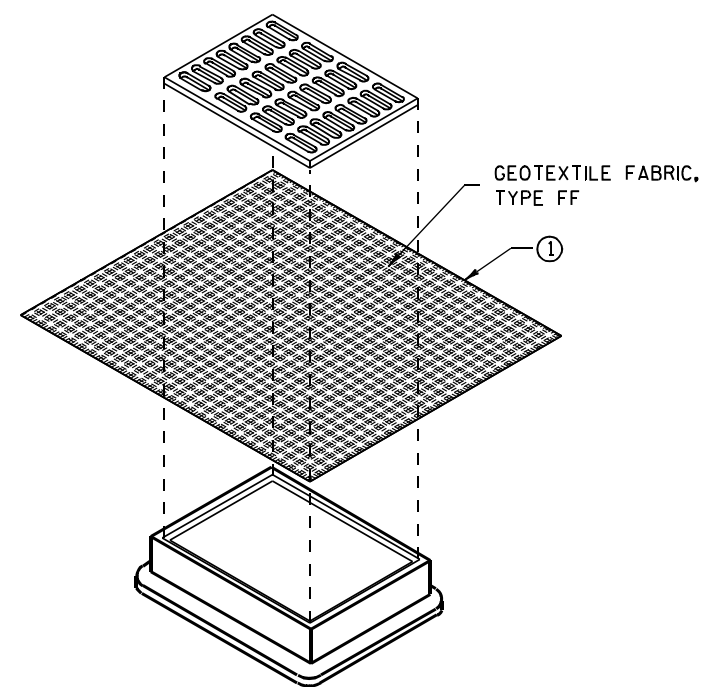
GENERAL NOTES

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.

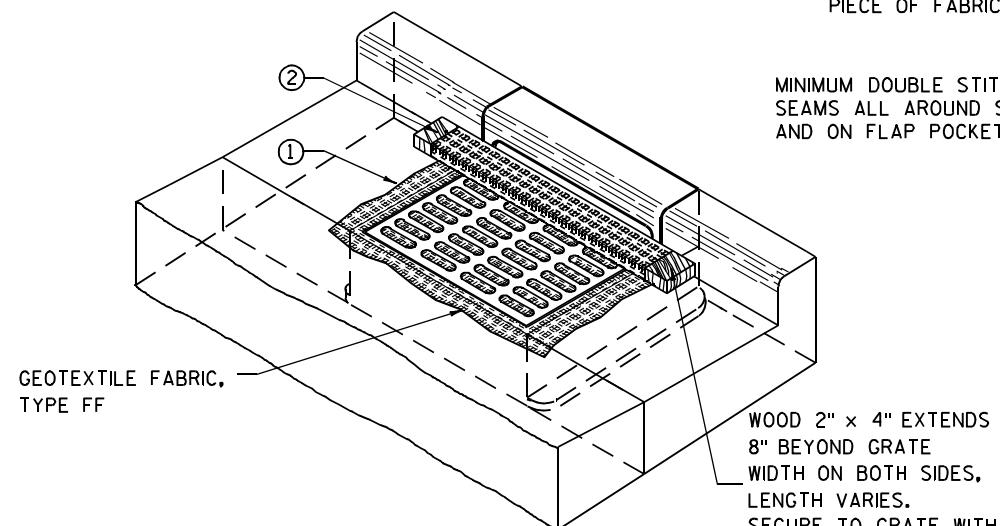
WHEN REMOVING OR MAINTAINING INLET PROTECTION, CARE SHALL BE TAKEN SO THAT THE SEDIMENT TRAPPED ON THE GEOTEXTILE FABRIC DOES NOT FALL INTO THE INLET. ANY MATERIAL FALLING INTO THE INLET SHALL BE REMOVED IMMEDIATELY.

- 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.



**INLET PROTECTION, TYPE B
(WITHOUT CURB BOX)**

(CAN BE INSTALLED IN ANY INLET WITHOUT A CURB BOX)



INLET PROTECTION, TYPE C (WITH CURB BOX)

INSTALLATION NOTES

TYPE B & C

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

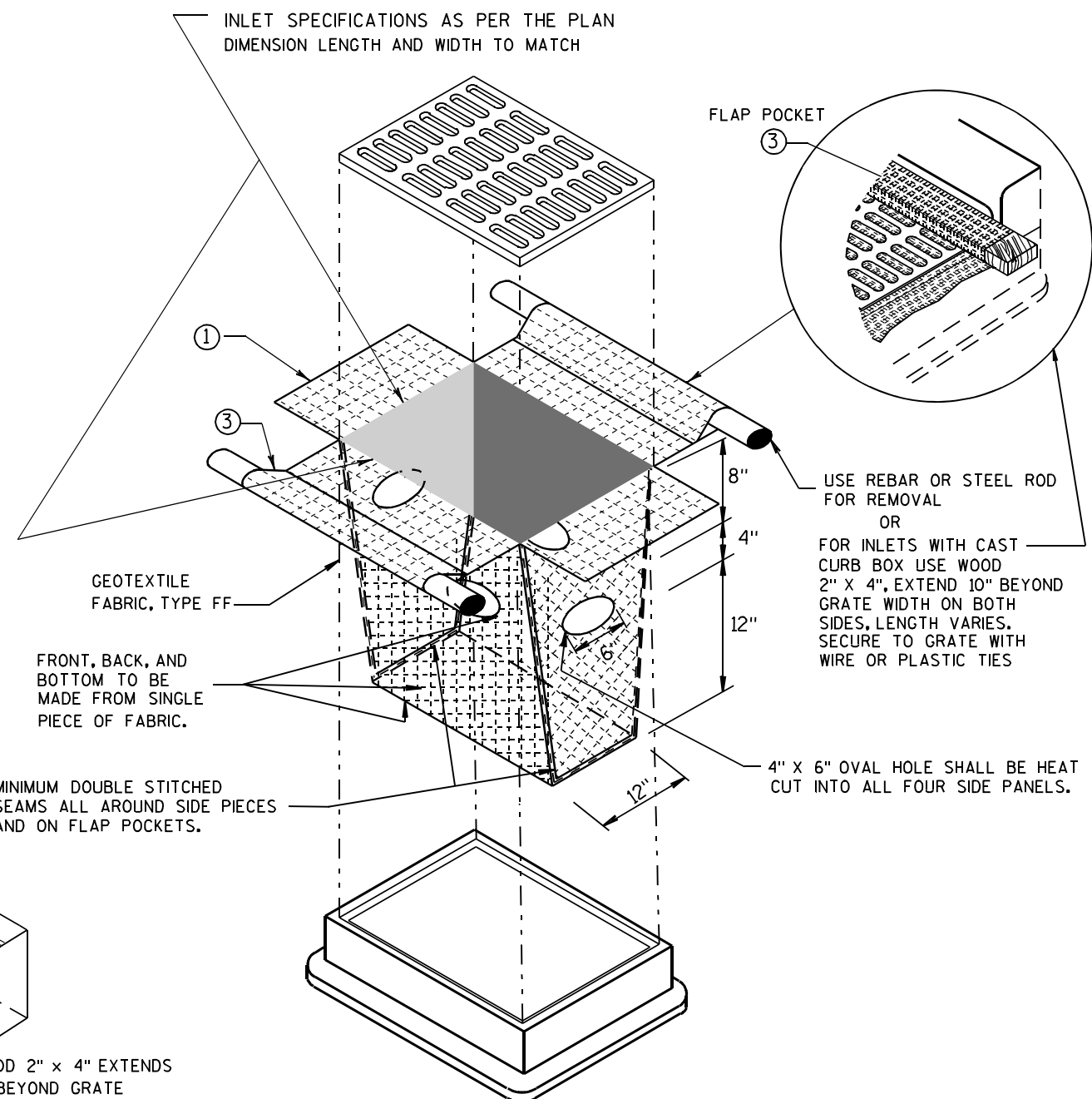
THE CONTRACTOR SHALL DEMONSTRATE A METHOD OF MAINTENANCE, USING A SEWN FLAP, HAND HOLDS OR OTHER METHOD TO PREVENT ACCUMULATED SEDIMENT FROM ENTERING THE INLET.

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.



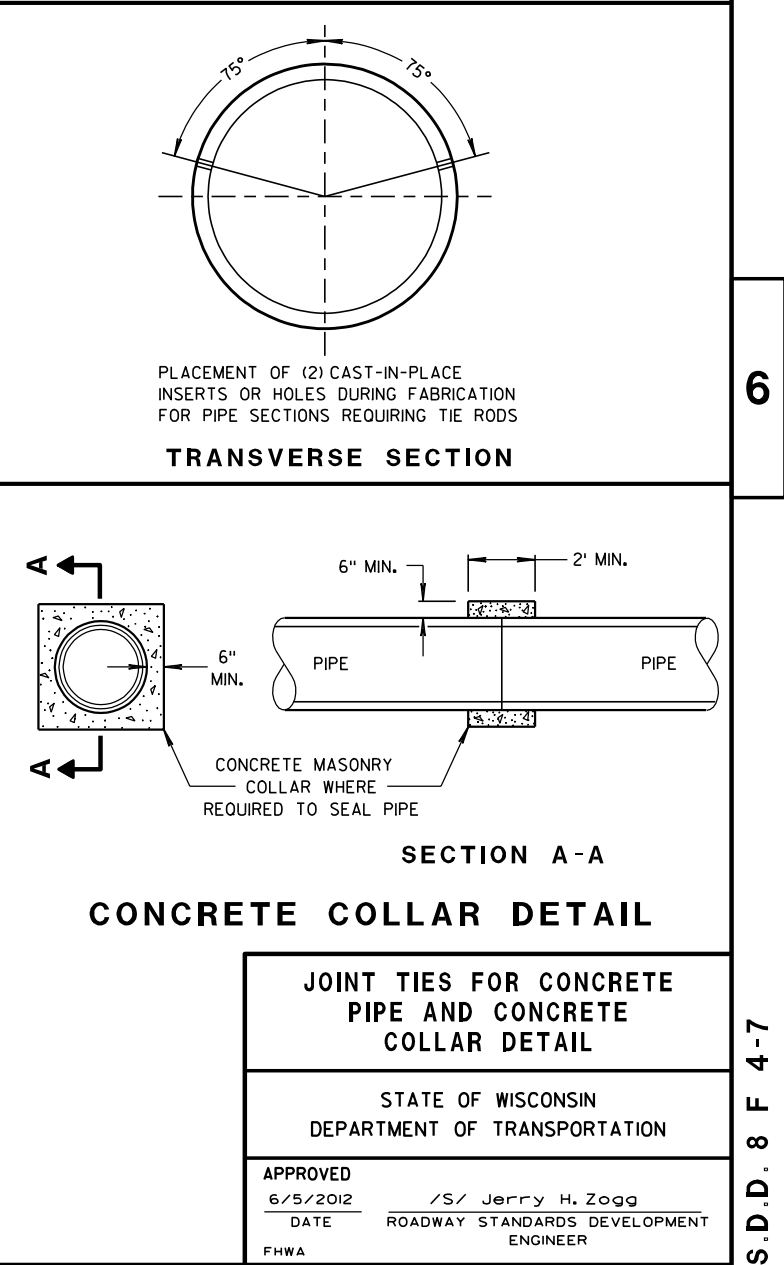
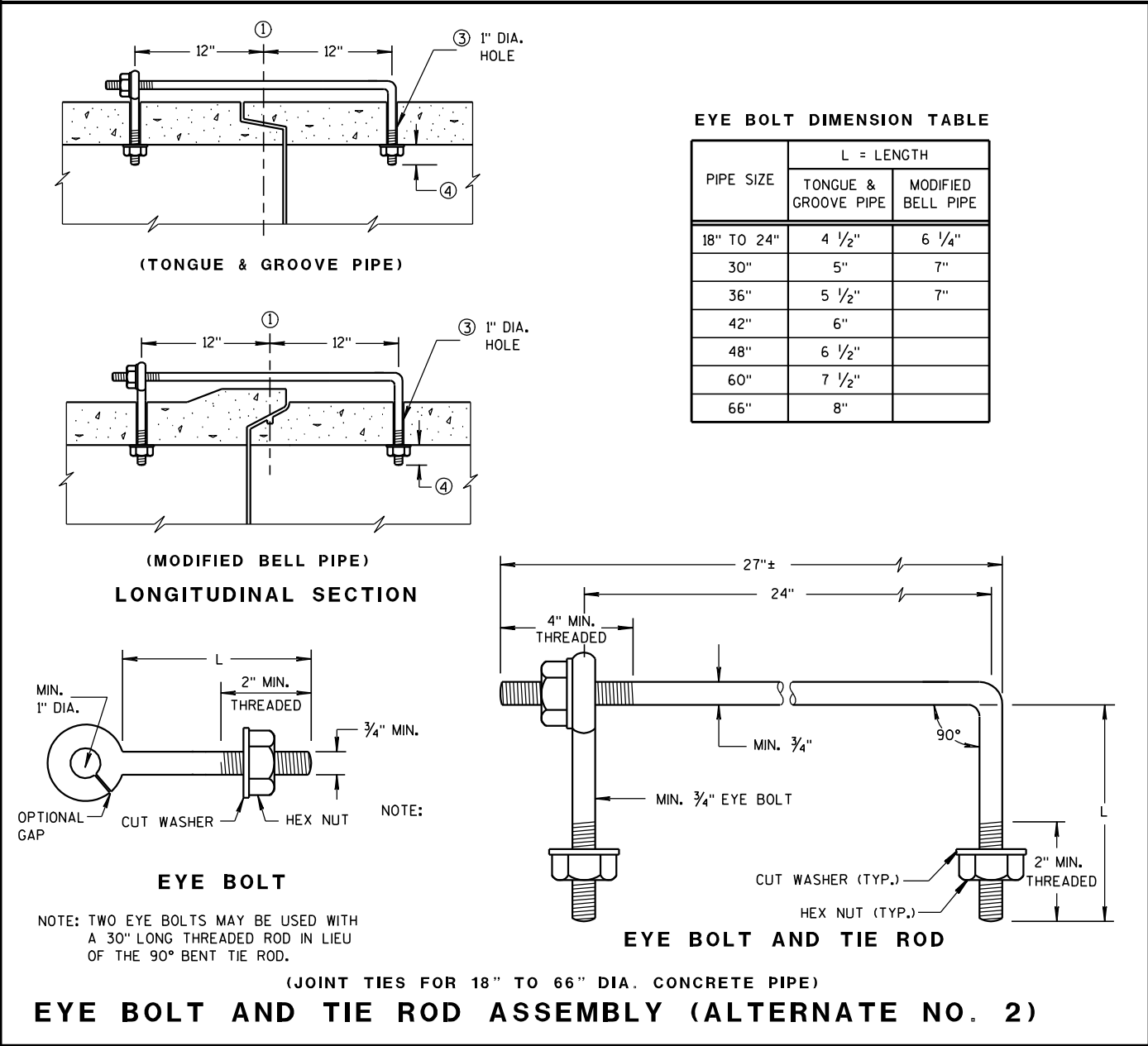
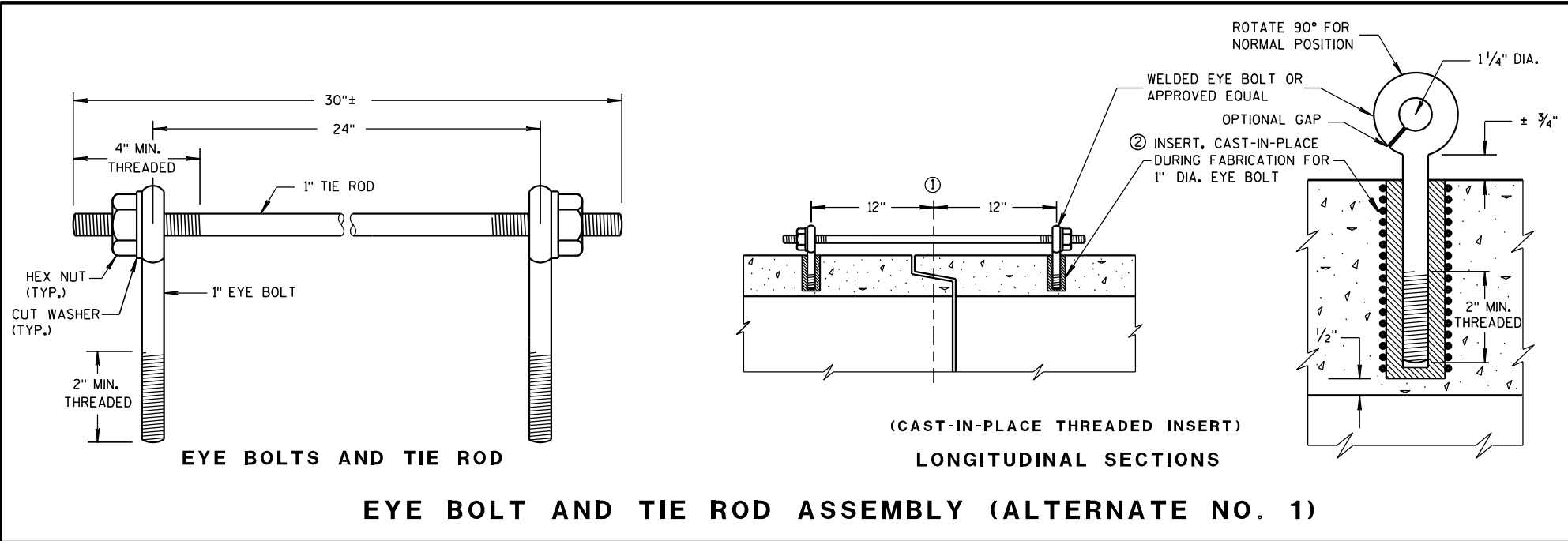
INLET PROTECTION, TYPE D

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

**INLET PROTECTION
TYPE A, B, C, AND D**

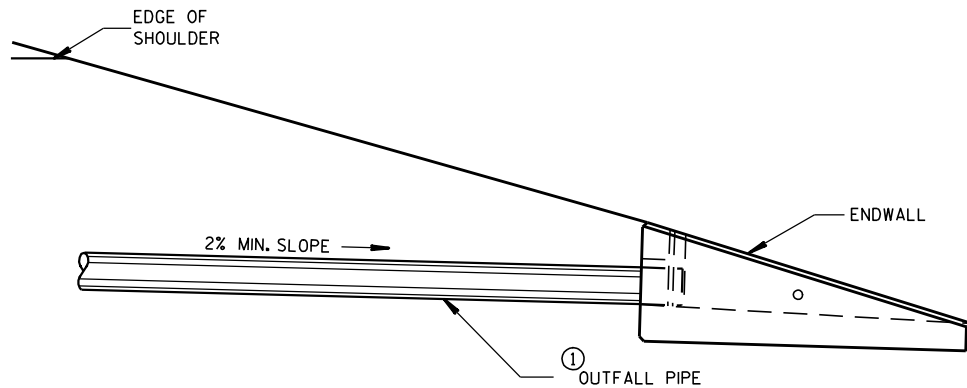
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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

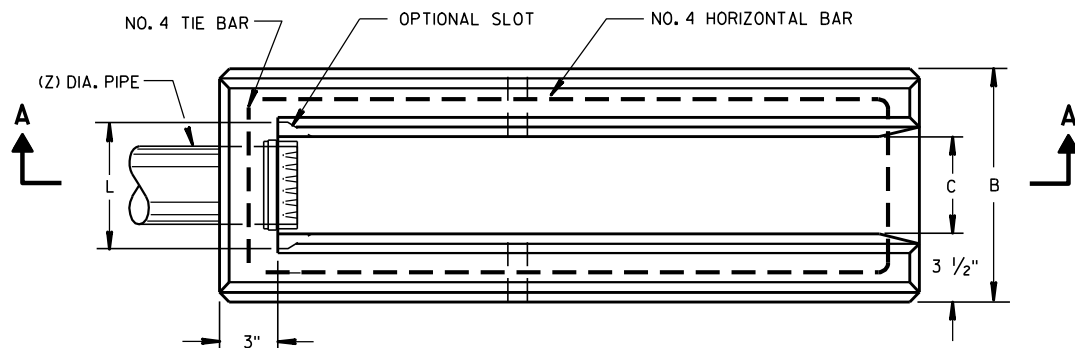


DIMENSIONS IN INCHES											
PIPE DIA.	A	B	C	D	E	F	G	H	J	L	Z
**4	6	12	5 1/4	9	8	32	36	11	2 3/8	6 1/2	4
6	8	14	7 1/4	11	10	42	44	13	3 5/8	8 1/2	6

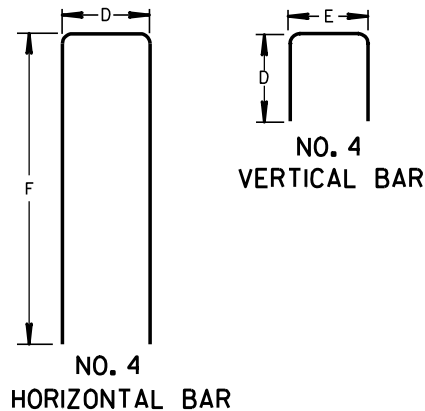
** APRON ENDWALL FOR 6 INCH DIAMETER PIPE MAY BE SUBSTITUTED FOR THIS SIZE PROVIDED THE HOLE IN THE HEADWALL IS SIZED AND LOCATED TO CONFORM TO THE 4 INCH DIAMETER PIPE DIMENSIONS (C & J)



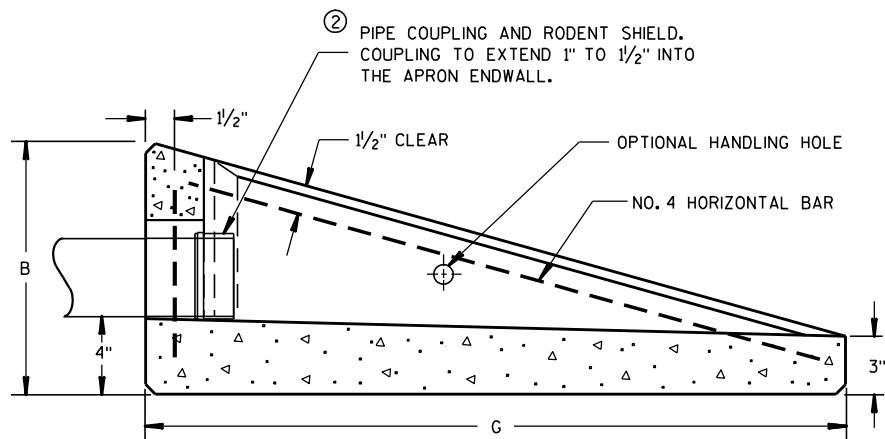
INSTALLATION DETAIL



PLAN VIEW

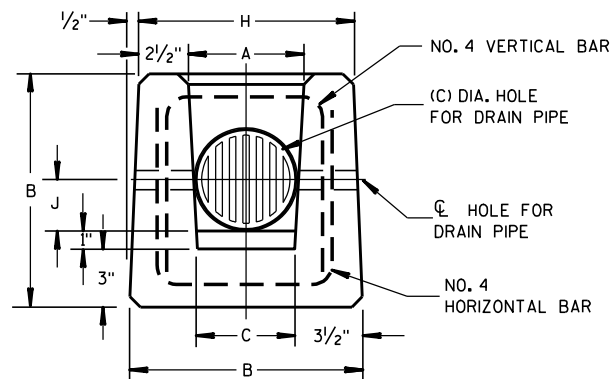


BAR STEEL REINFORCEMENT DETAILS



SECTION A-A

CONCRETE APRON ENDWALL FOR UNDERDRAIN



END VIEW

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.

ALTERNATIVE DESIGNS WHICH PROVIDE EQUIVALENT CAPACITY AND STRENGTH MAY BE USED WHEN APPROVED BY THE ENGINEER. ENDWALL MAY BE EITHER PRECAST OR CAST-IN-PLACE CONCRETE.

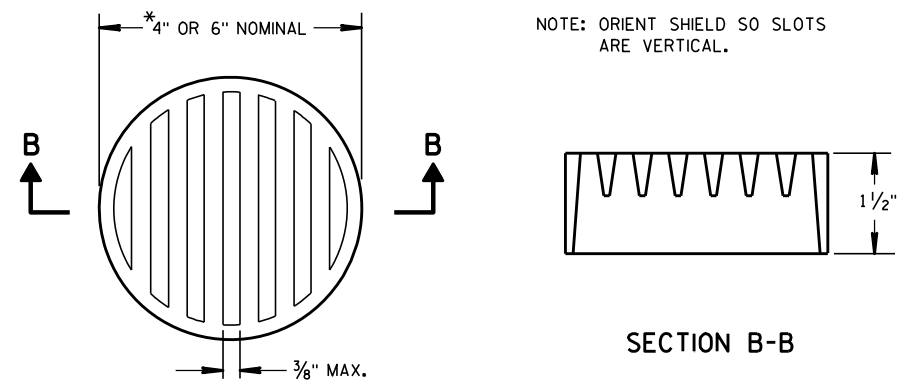
THE UNDERDRAIN PIPE SHALL BE FULLY INSERTED AND SEALED INTO THE ENDWALL WITH CEMENT MORTAR PRIOR TO BACKFILLING AROUND THE STRUCTURE.

THE UPPERMOST POINT OF THE ENDWALL SHALL BE PLACED FLUSH WITH THE ROADWAY SLOPE. ADJACENT EMBANKMENT SLOPES SHALL BE SHAPED TO FIT THE SIDES AND TOE OF THE ENDWALL. EXACT PLACEMENT OF THE OUTFALL PIPE AND ENDWALL SHALL BE DETERMINED BY THE ENGINEER TO MATCH THE ELEVATIONS AND FLOW DIRECTION OF THE ROADSIDE DITCH.

- ① THE OUTFALL PIPE UNDERDRAIN AND FITTINGS SHALL CONFORM TO THE REQUIREMENTS OF THE SPECIFICATION FOR POLY (VINYL CHORIDE) (PVC) PLASTIC DRAIN, WASTE AND VENT PIPE AND FITTINGS, ASTM DESIGNATION: D 2665, SCHEDULE 40 PVC OR THE STANDARD SPECIFICATION FOR TYPE PSM POLY (VINYL CHORIDE) (PVC) SEWER PIPE AND FITTINGS, ASTM DESIGNATION: D 3034, TYPE PSM SDR 23.5 PVC SEWER PIPE, ALL JOINTS SHALL BE SOLVENT WELDED.

THE OUTFALL PIPE INCLUDING ALL FITTINGS AND THE RODENT SHIELD SHALL BE MEASURED AND PAID FOR AS PIPE UNDERDRAIN UNPERFORATED.

- ② THE RODENT SHIELD SHALL BE A PVC GRATE SIMILAR TO THIS DETAIL. THE GRATE IS COMMERCIALY AVAILABLE AS A FLOOR STRAINER. A PIPE COUPLING IS REQUIRED FOR THE ATTACHMENT OF THIS SHIELD TO THE OUTFALL PIPE. THE SHIELD SHALL BE FASTENED TO THE PIPE COUPLING WITH TWO OR MORE NO. 10 X 1-INCH STAINLESS STEEL SHEET METAL SCREWS.



② RODENT SHIELD

*NOTE: DIMENSIONS ARE APPROXIMATE. THE GRATE IS SIZED TO FIT INTO A PIPE COUPLING.

REINFORCED CONCRETE APRON ENDWALL FOR PIPE UNDERDRAIN

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

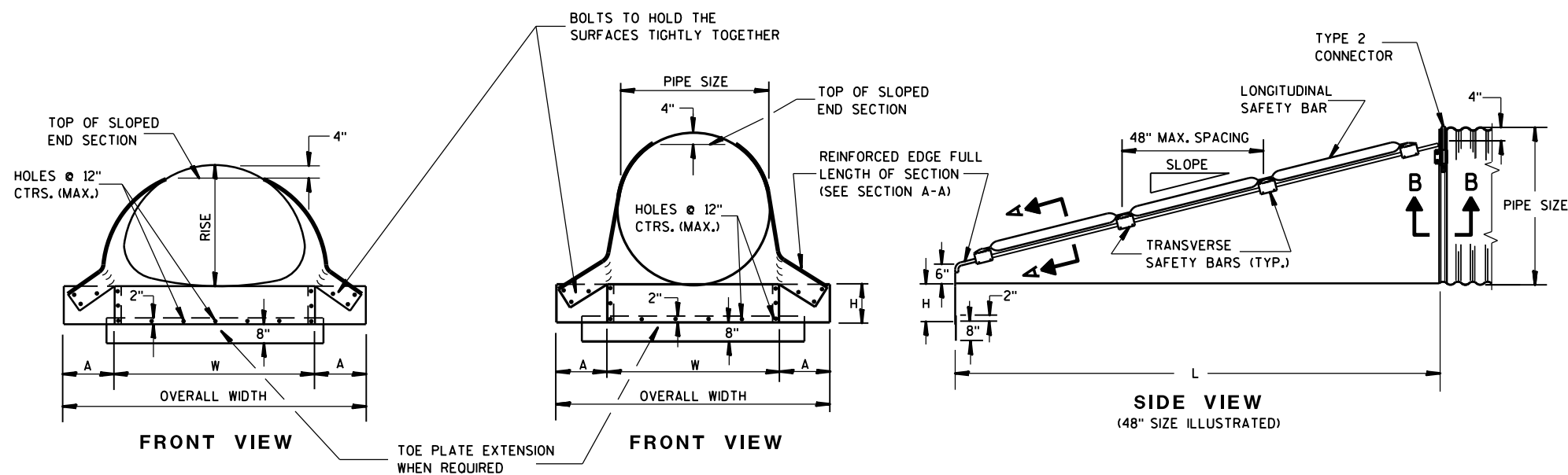
APPROVED

3/10/98

DATE

FHWA

/S/ Rory L. Rhinesmith
CHIEF ROADWAY DEVELOPMENT ENGINEER



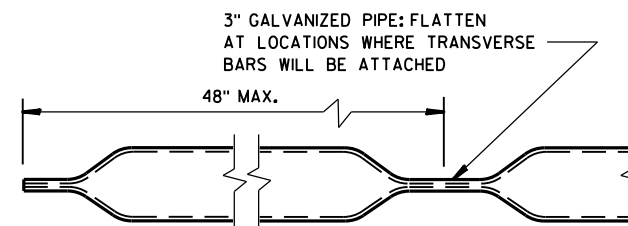
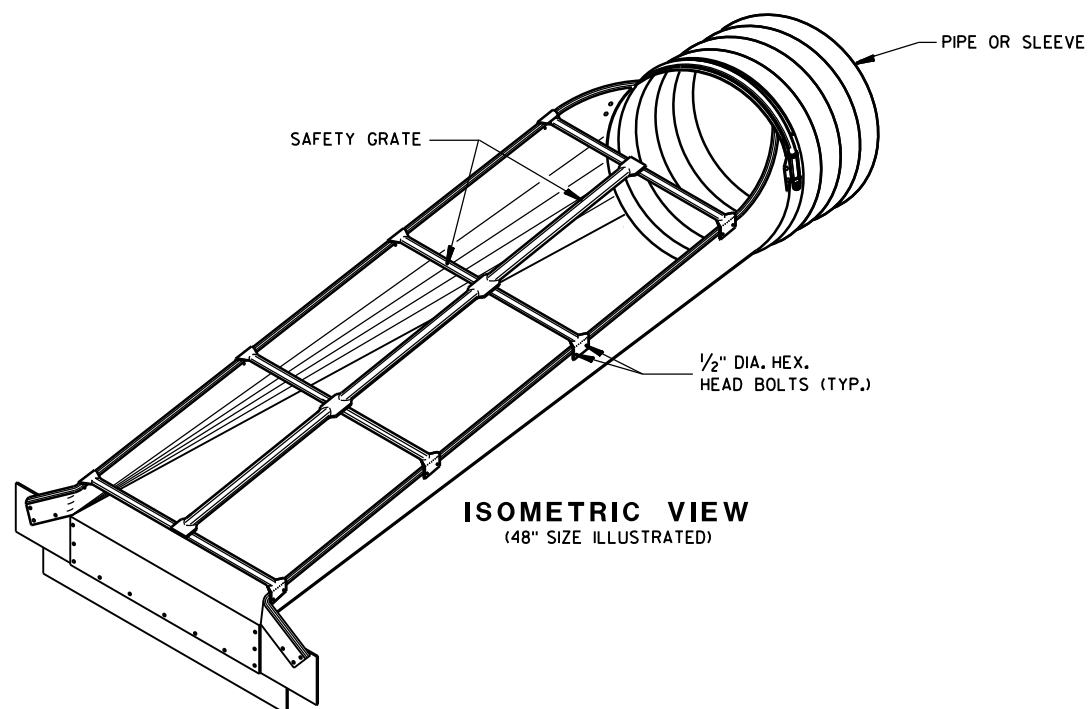
GENERAL NOTES

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.

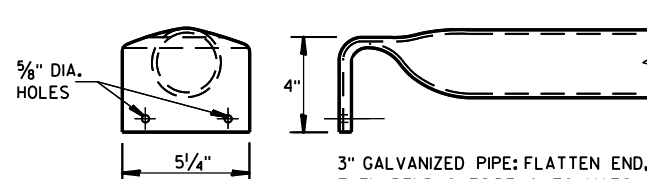
SAFETY GRATES SHALL BE FABRICATED FROM 3-INCH DIAMETER GALVANIZED PIPE MEETING THE REQUIREMENTS OF ASTM A-53, GRADE B, SCHEDULE 40 OR APPROVED EQUAL. THE LONGITUDINAL BAR SHALL BE WELDED TO THE TRANSVERSE BARS WHERE THE BARS CROSS. THE NUMBER OF TRANSVERSE BARS REQUIRED WILL VARY DEPENDING ON THE LENGTH OF THE END SECTION.

SLOPED STEEL ENDWALLS LOCATED AT THE ENDS OF CONCRETE CULVERT PIPE SHALL BE FURNISHED WITH STEEL ADAPTER SLEEVES.

STEEL APRON ENDWALLS FOR CULVERT PIPE CROSS DRAINS										
PIPE DIA. (IN.)	MIN. THICK. IN.	GAGE	DIMENSIONS (inches)				L DIMENSIONS			
			A	H	W	OVERALL WIDTH	SLOPE	LENGTH INCHES	SLOPE	LENGTH INCHES
36	.109	12	12	9	42	66	4:1	104	6:1	156
42	.109	12	16	12	48	80	4:1	128	6:1	192
48	.109	12	16	12	54	86	4:1	152	6:1	228
54	.109	12	16	12	60	92	4:1	176	6:1	264
60	.109	12	16	12	66	98	4:1	200	6:1	300

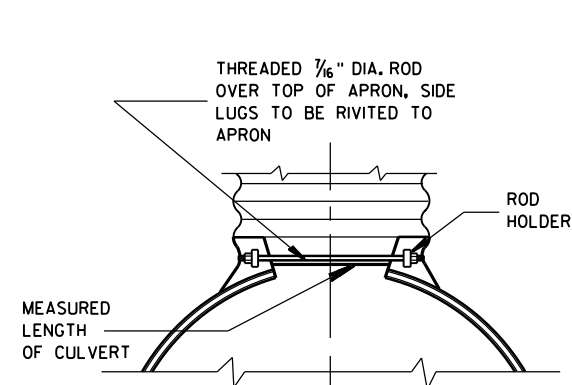


LONGITUDINAL SAFETY BAR

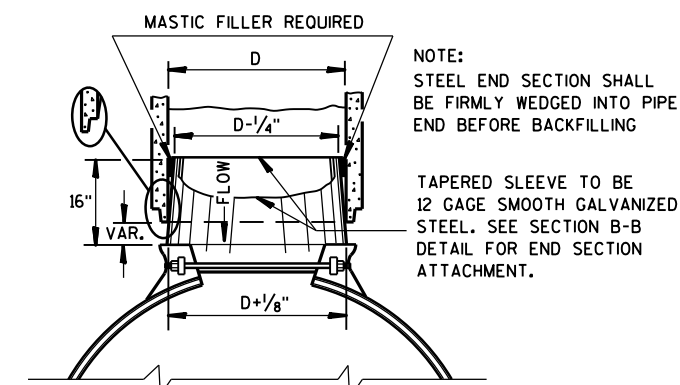


TRANSVERSE SAFETY BAR

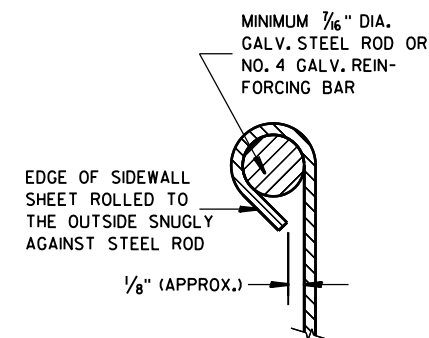
STEEL APRON ENDWALLS FOR PIPE ARCH SLOPED CROSS DRAINS												
EQUIV. DIA. (IN.)	INCHES		MIN. THICK.		DIMENSIONS (Inches)				L DIMENSIONS			
	SPAN	RISE	IN.	GAGE	A	H	W	OVERALL WIDTH	SLOPE	LENGTH INCHES	SLOPE	LENGTH INCHES
30	35	24	.079	14	12	9	41	65	4:1	56	6:1	84
36	42	29	.109	12	12	9	48	72	4:1	76	6:1	114
42	49	33	.109	12	16	12	55	87	4:1	92	6:1	138
48	57	38	.109	12	16	12	63	95	4:1	112	6:1	168
54	64	43	.109	12	16	12	70	102	4:1	132	6:1	198
60	71	47	.109	12	16	12	77	109	4:1	148	6:1	222



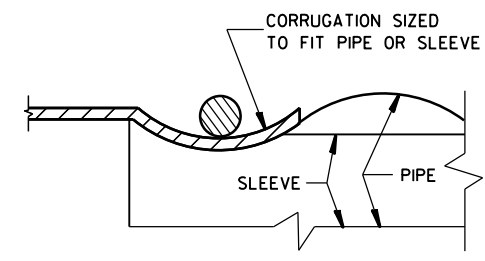
TYPE 2 CONNECTOR DETAIL



STEEL ADAPTER SLEEVE FOR CONCRETE PIPE



SECTION A-A



SECTION B-B

STEEL APRON ENDWALLS FOR CULVERT PIPE AND PIPE ARCH SLOPED CROSS DRAINS

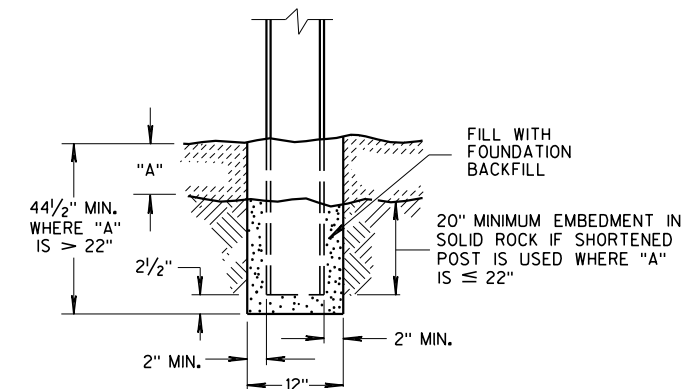
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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

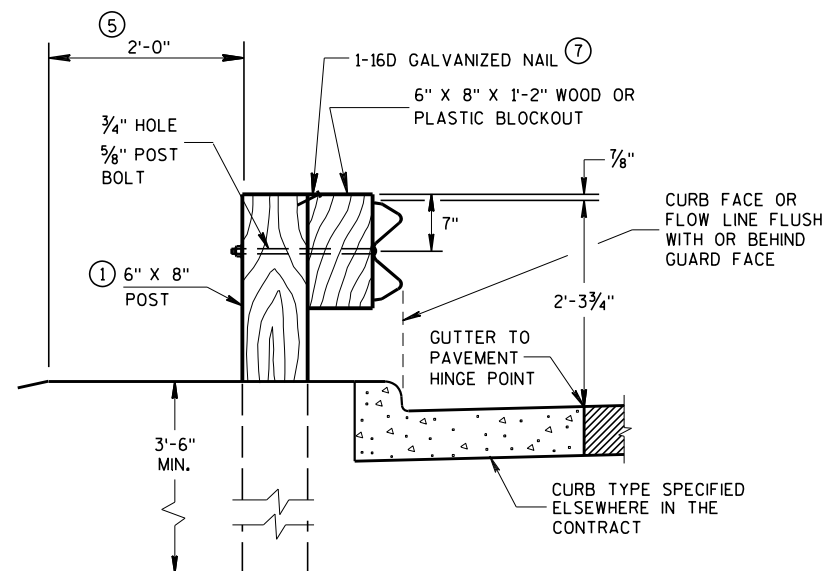
GENERAL NOTES

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

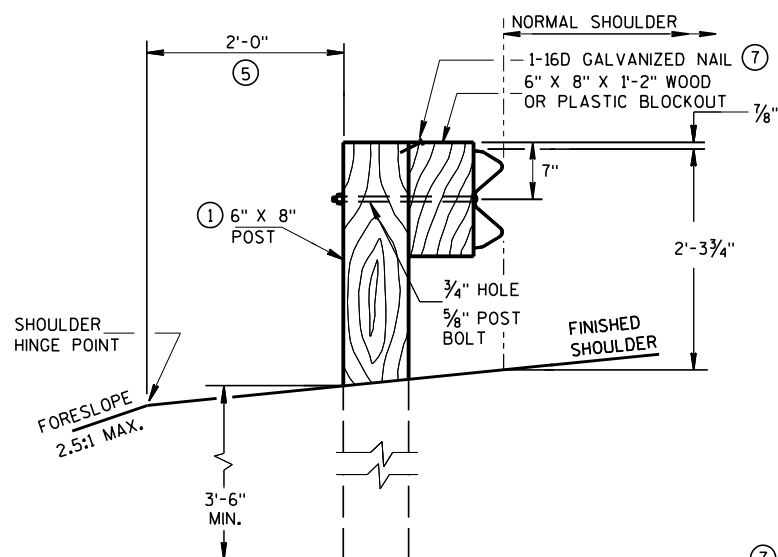
INSTALL BEAM GUARD SECTIONS AND ALL NECESSARY HARDWARE ACCORDING TO THE APPLICABLE PLAN AND CURRENT STANDARD AND SUPPLEMENTAL SPECIFICATIONS. ALL DIMENSIONS ARE SUBJECT TO MANUFACTURER'S TOLERANCES EXCEPT WHERE ALLOWABLE TOLERANCES ARE SHOWN.



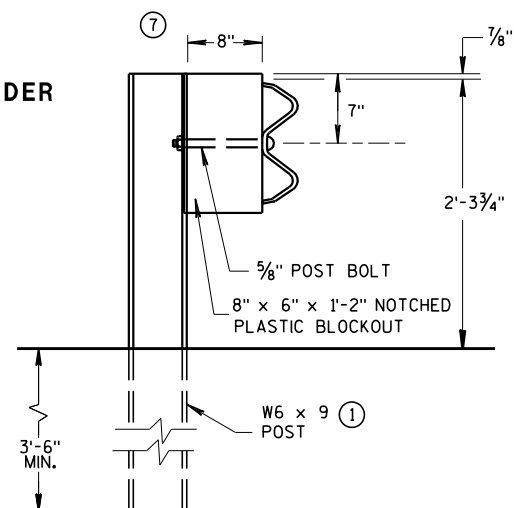
END VIEW
SETTING STEEL OR WOOD POST IN ROCK ⑥



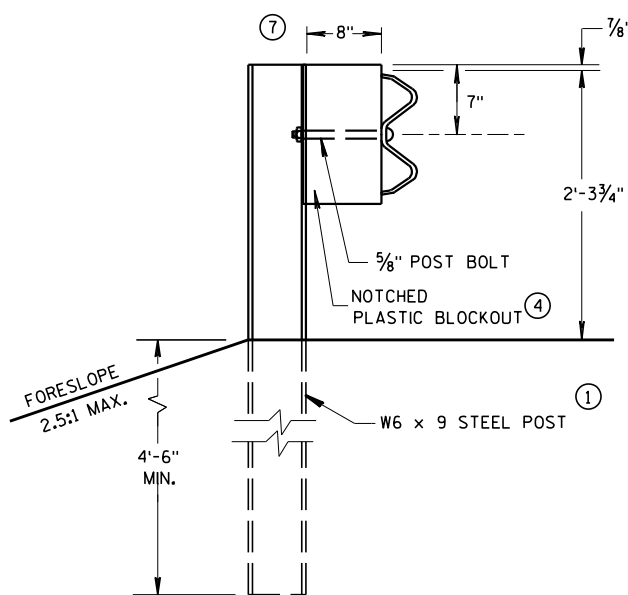
END VIEW
LOCATED ALONG A CURBED ROADWAY



END VIEW
LOCATED ALONG A ROADWAY SHOULDER
STANDARD INSTALLATION

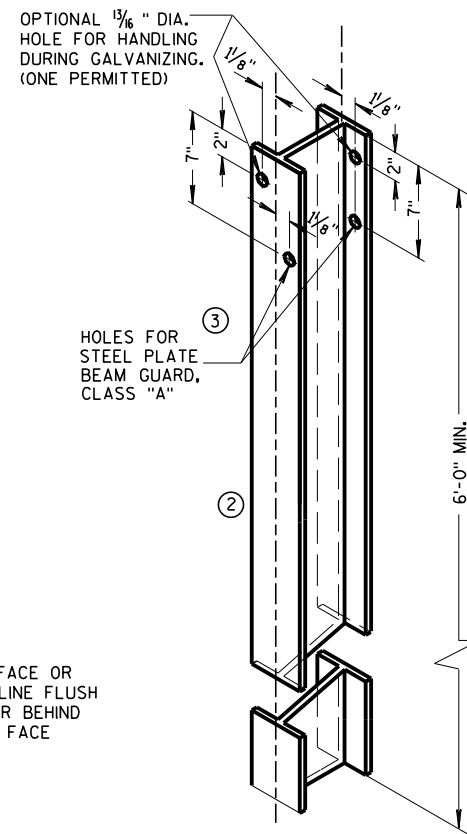


END VIEW
STEEL POST & NOTCHED
PLASTIC BLOCKOUT ALTERNATIVE
STANDARD INSTALLATION



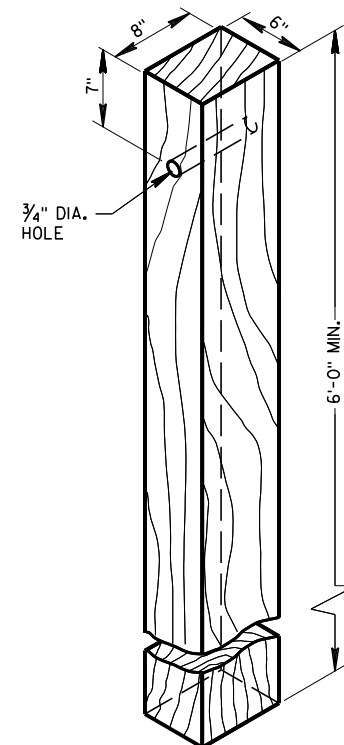
END VIEW
LONGER POST AT HALF
POST SPACING W BEAM
(LHW)

TYPICAL INSTALLATION OF STEEL PLATE BEAM GUARD

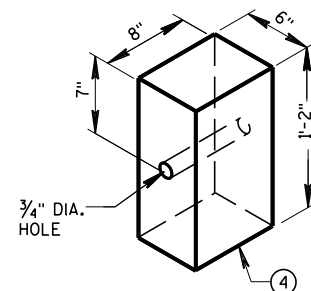


STEEL POST &
HOLE PUNCHING DETAIL
(W6 X 9) ①

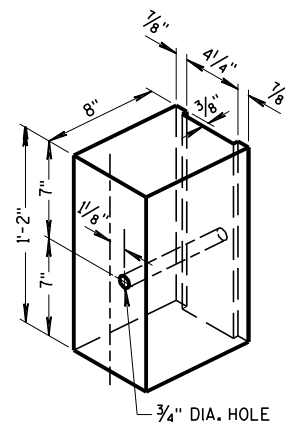
ALL HOLES 1/8" DIAMETER EXCEPT AS NOTED



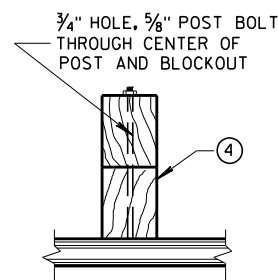
WOOD POST
(6" X 8") NOMINAL



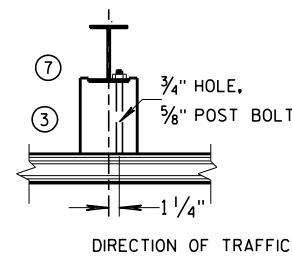
WOOD OR PLASTIC
BLOCKOUT FOR
WOOD POSTS



TYPICAL NOTCHED
PLASTIC BLOCKOUT
FOR STEEL POSTS ①



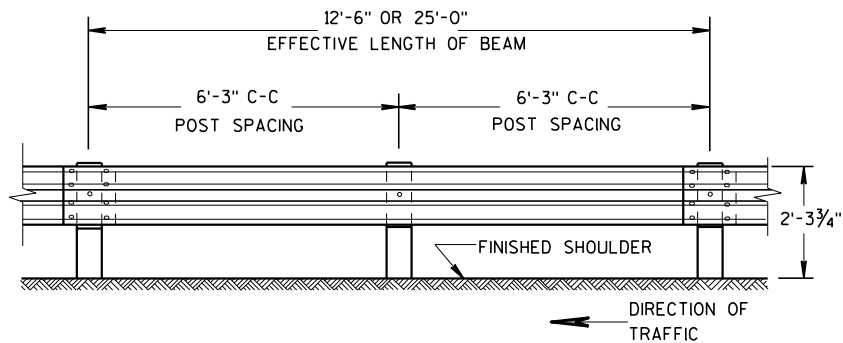
PLAN VIEW
WOOD POST, BLOCKOUT & BEAM



PLAN VIEW
STEEL POST, NOTCHED
PLASTIC BLOCKOUT & BEAM

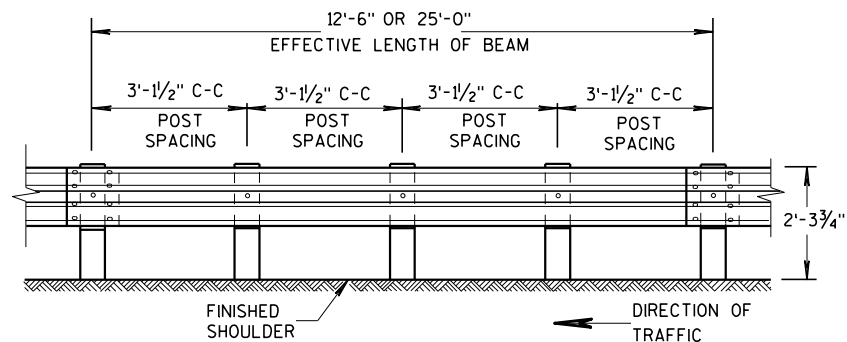
STEEL PLATE BEAM GUARD,
CLASS "A"
INSTALLATION & ELEMENTS

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



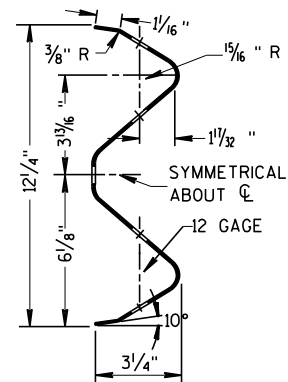
FRONT VIEW

POST SPACING STANDARD INSTALLATION

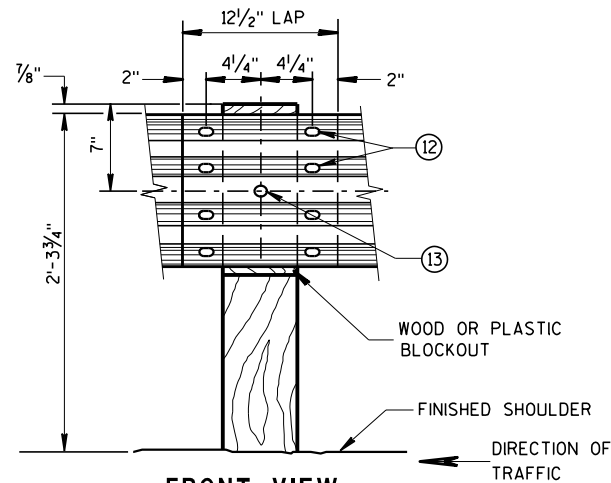


FRONT VIEW

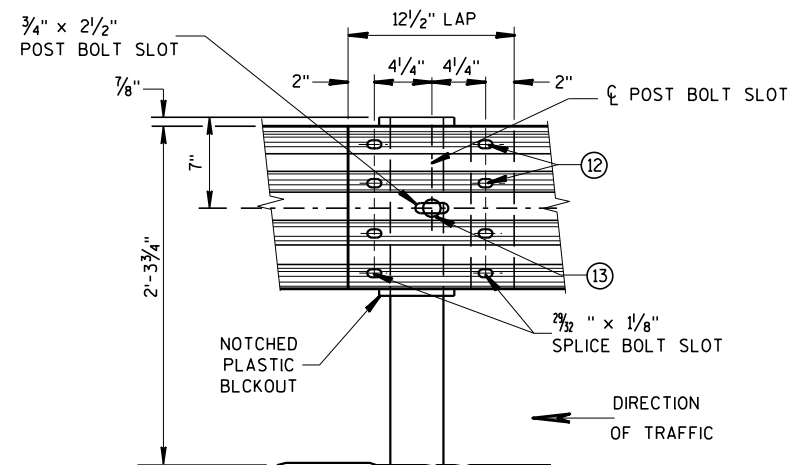
POST SPACING FOR LONGER POST
AT HALF POST SPACING W BEAM (LHW)



SECTION THRU W BEAM



FRONT VIEW
BEAM SPLICE AT WOOD POST
AND POST MOUNTING DETAIL

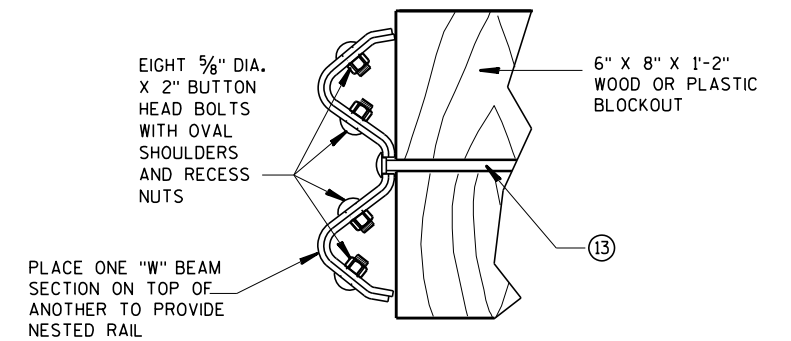


FRONT VIEW
BEAM SPLICE AT STEEL POST
TYPICAL SPlicing DETAILS
OF STEEL PLATE BEAM GUARD

GENERAL NOTES

FURNISH GUARDRAIL DEFLECTORS FROM APPROVED PRODUCTS LIST.

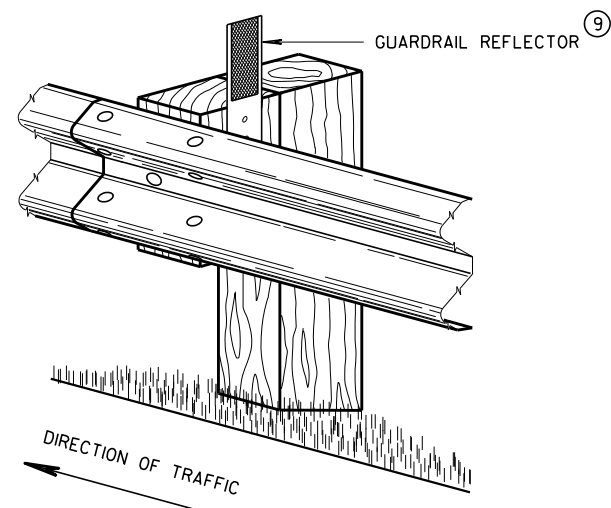
- ⑨ DO NOT INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINA. START REFLECTORS AT POST #9 AND SPACE EVENLY EVERY 100 FEET (MAX.) TO THE END OF GUARDRAIL RUN, USING A MINIMUM OF 3 REFLECTORS.
- ⑫ 8 - 5/8" ϕ X 2" BUTTON HEAD BOLTS WITH OVAL SHOULDERS & RECESS NUTS.
- ⑬ 5/8" DIA. BUTTON HEAD BOLT AND RECESS NUT WITH 5/8" DIA. F844 FLAT WASHER UNDER NUT.



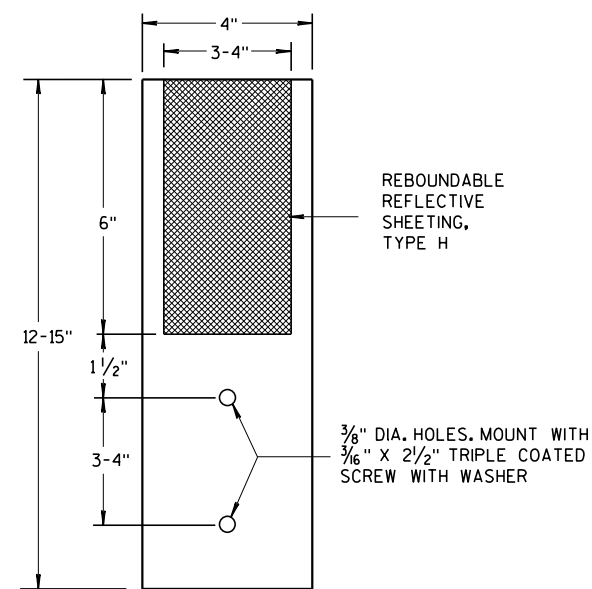
NESTED W BEAM (NW)

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

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



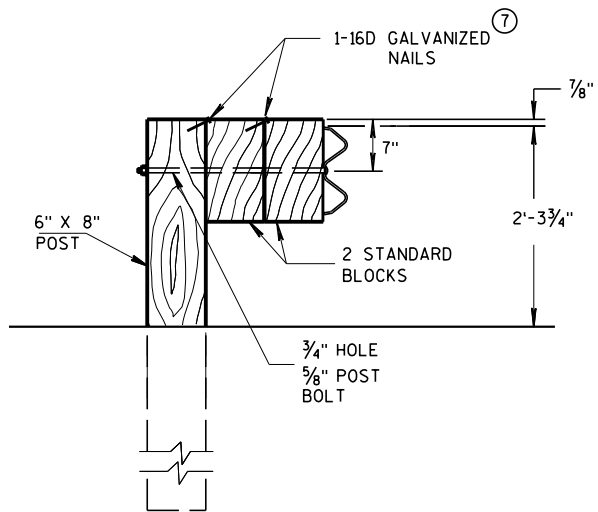
4" X 12" GUARDRAIL REFLECTOR DETAIL
AND TYPICAL INSTALLATION *



4"x 12" GUARDRAIL REFLECTOR

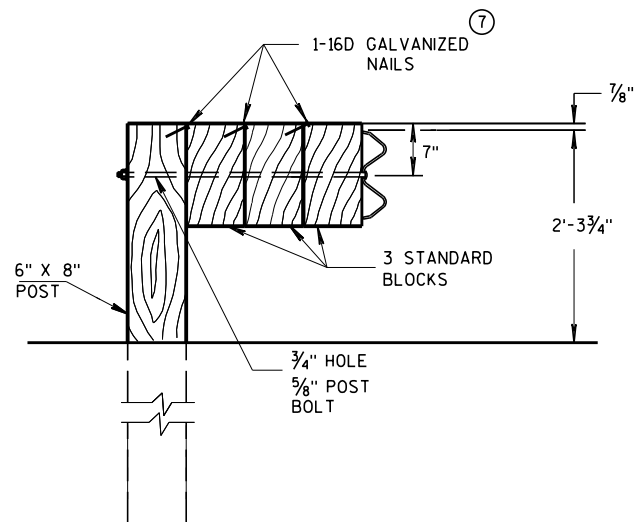
STEEL PLATE BEAM GUARD,
CLASS "A",
INSTALLATION & ELEMENTS

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



DETAIL FOR DOUBLE BLOCKS

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

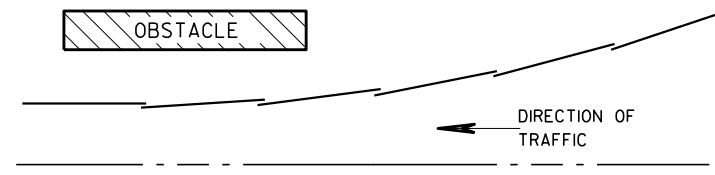


DETAIL FOR TRIPLE BLOCKS

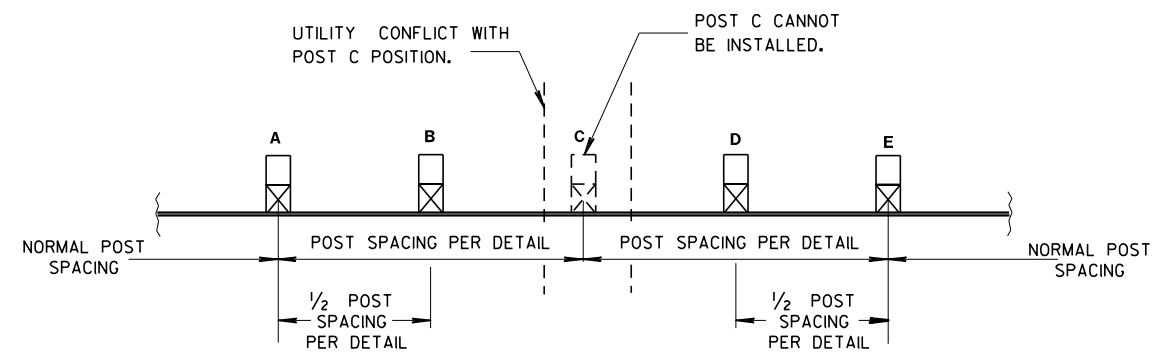
TRIPLE BLOCK DETAIL IS LIMITED TO ONE
LOCATION WITHIN A BEAM GUARD RUN.

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

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



PLAN VIEW BEAM LAPPING DETAIL



POST DRIVING FOR CONTINUOUS UNDERGROUND OBSTRUCTION

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

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

June 2017

DATE

FHWA

/S/ Rodney Taylor

ROADWAY STANDARDS DEVELOPMENT

UNIT SUPERVISOR

BILL OF MATERIALS

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

GENERAL NOTES

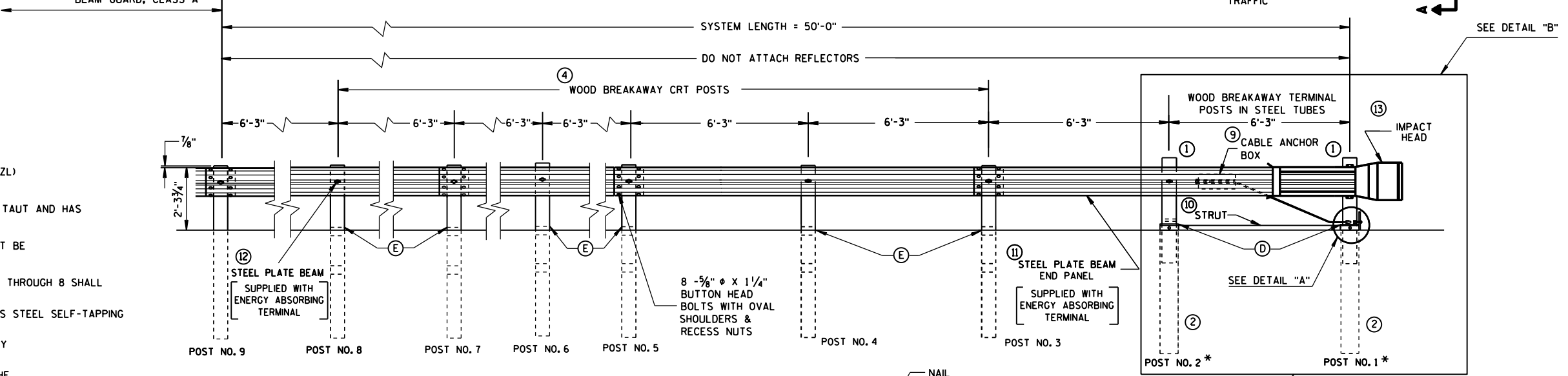
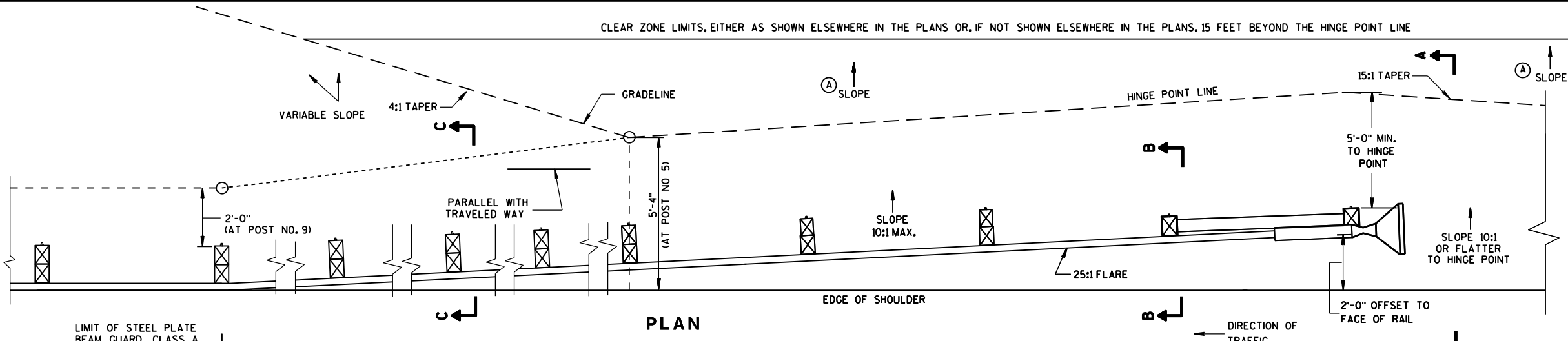
FOLLOW MANUFACTURE'S BOLTING RECOMMENDATIONS.

- (A) THE SLOPE IN THE AREA BOUNDED BY THE GRADELINE, THE HINGE POINT LINE (HPL), AND THE CLEAR ZONE LIMITS (CZL) SHALL BE 4:1 OR FLATTER.
- (B) AFTER FINAL ASSEMBLY, RECHECK CABLE TO BE SURE IT IS TAUT AND HAS NOT RELAXED.
- (D) THE TOP OF THE STEEL TUBE ON POSTS 1 AND 2 SHALL NOT BE MORE THAN 3" ABOVE THE FINISH GROUND ELEVATION.
- (E) THE CENTER OF THE UPPER 3/2" DIAMETER HOLE ON POST 3 THROUGH 8 SHALL BE 3/4" ABOVE THE FINISHED GROUND LINE.
- (F) ATTACH ALUMINUM SHEET TO E.A.T. HEAD USING 4 STAINLESS STEEL SELF-TAPPING SCREWS, ONE SCREW PER CORNER.

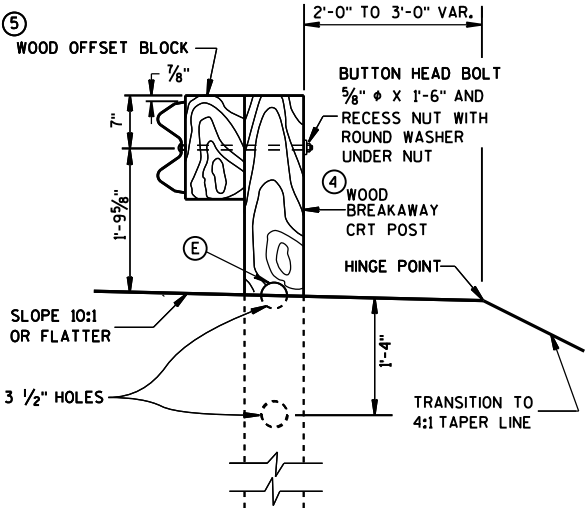
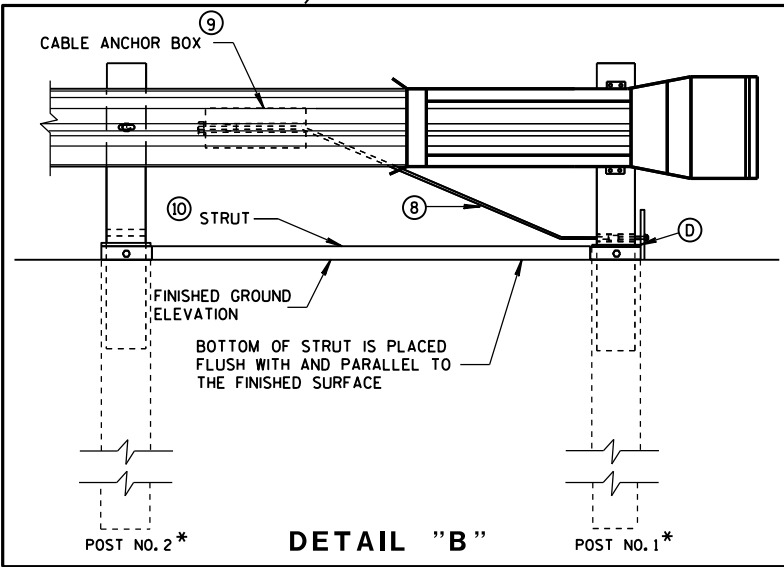
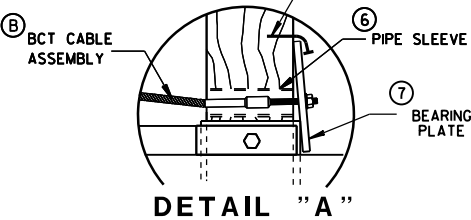
STEEL POSTS SHALL NOT BE ALLOWED FOR USE WITH ENERGY ABSORBING TERMINALS.

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

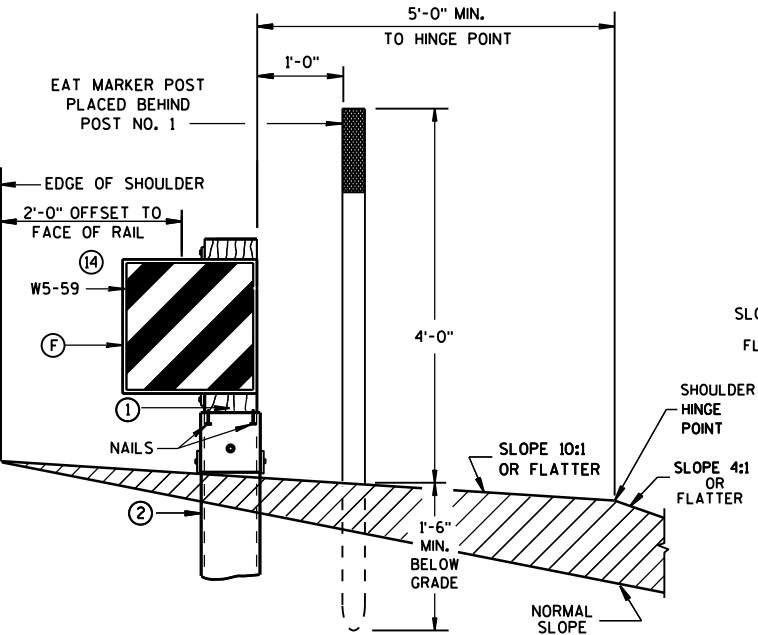
*DO NOT ATTACH BLOCKOUTS TO POSTS 1 AND 2.



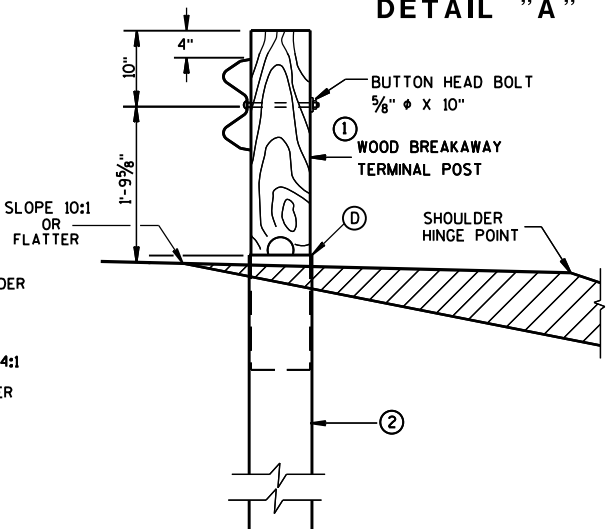
ELEVATION



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



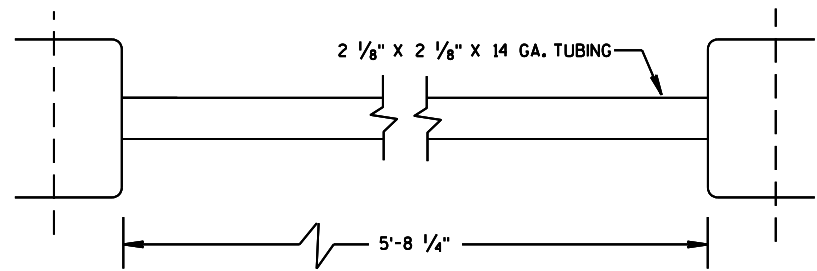
SECTION A-A
TYPICAL AT POST NO. 1*



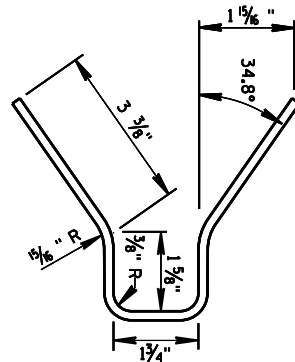
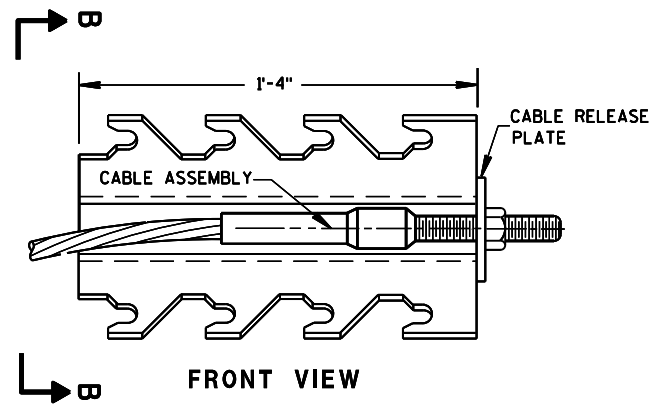
SECTION B-B
TYPICAL AT POST NO. 2*

STEEL PLATE BEAM GUARD
ENERGY ABSORBING TERMINAL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

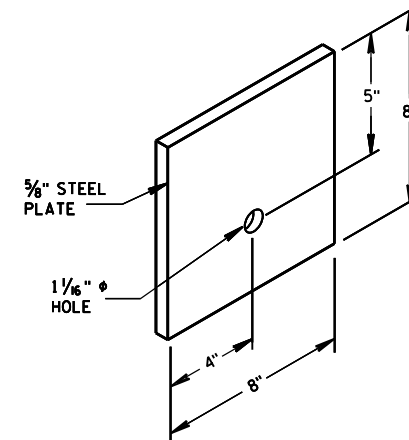


⑩ STRUT DETAIL

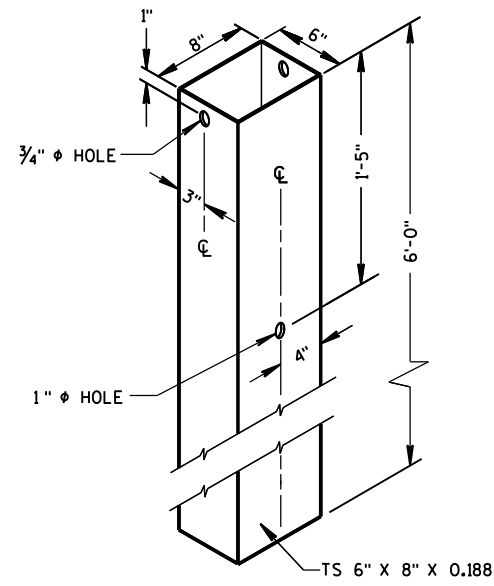


SECTION B-B

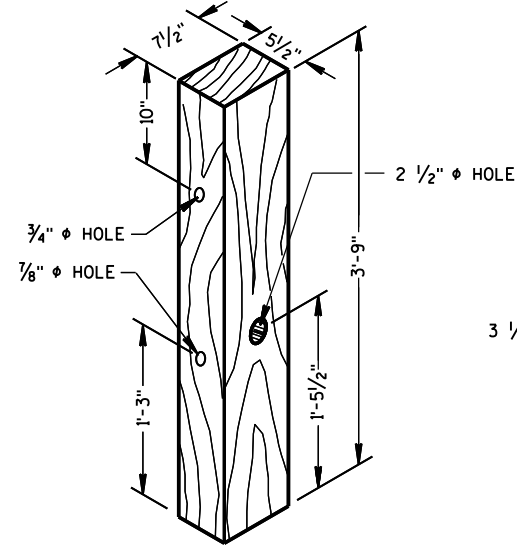
⑨ CABLE ANCHOR BOX



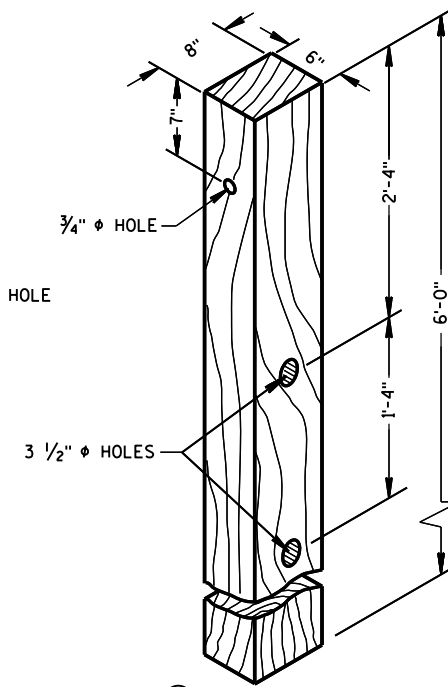
⑦ STEEL BEARING PLATE



② **72" STEEL TUBE**
(POSTS NO. 1-4)

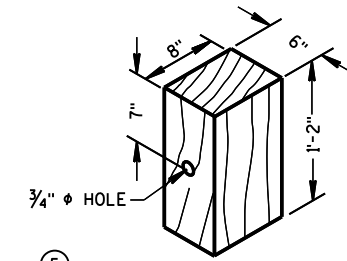


① **TERMINAL POST**



④ **CRT POST**
(POSTS NO'S 5-8)

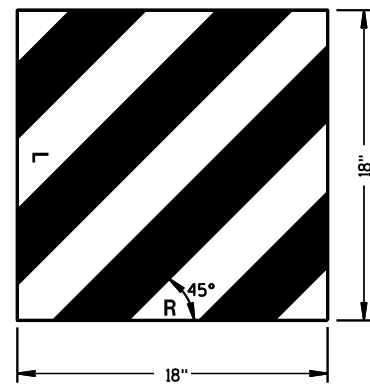
WOOD BREAKAWAY POSTS



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

GENERAL NOTES

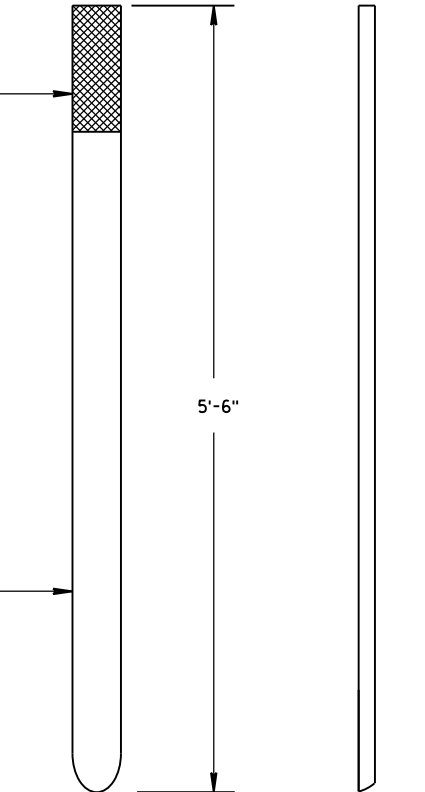
WHEN ROCK IS ENCOUNTERED DURING EXCAVATION, A 12 INCH DIA. POST HOLE EXTENDING 20 INCHES DEEP INTO THE ROCK MAY BE USED IF APPROVED BY THE ENGINEER. GRANULAR MATERIAL SHALL BE PLACED IN THE BOTTOM OF THE HOLE APPROXIMATELY 2 1/2" INCHES DEEP TO PROVIDE DRAINAGE. THE SOIL TUBES SHALL BE FIELD CUT TO LENGTH, PLACED IN THE HOLE AND BACKFILLED WITH ADEQUATELY COMPACTED MATERIAL EXCAVATED FROM THE HOLE.



⑭ **REFLECTIVE SHEETING DETAILS**

TYPE H
YELLOW REFLECTIVE
SHEETING 3" X 9".
SEE STANDARD
SPECIFICATION 637.

E.A.T. MARKER
POST (YELLOW)
SEE APPROVED
PRODUCTS LIST



FRONT VIEW SIDE VIEW

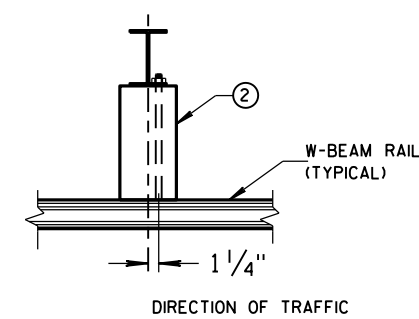
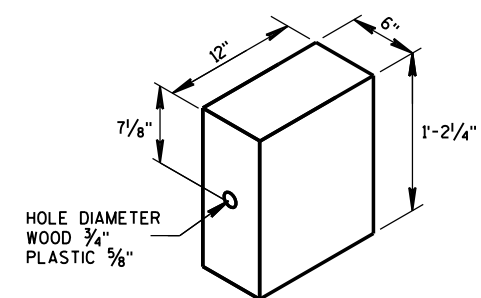
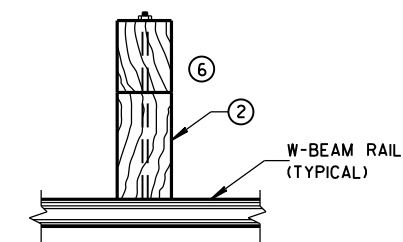
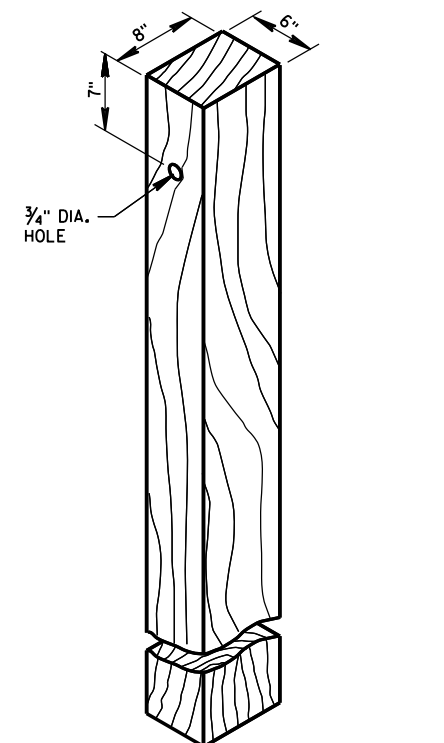
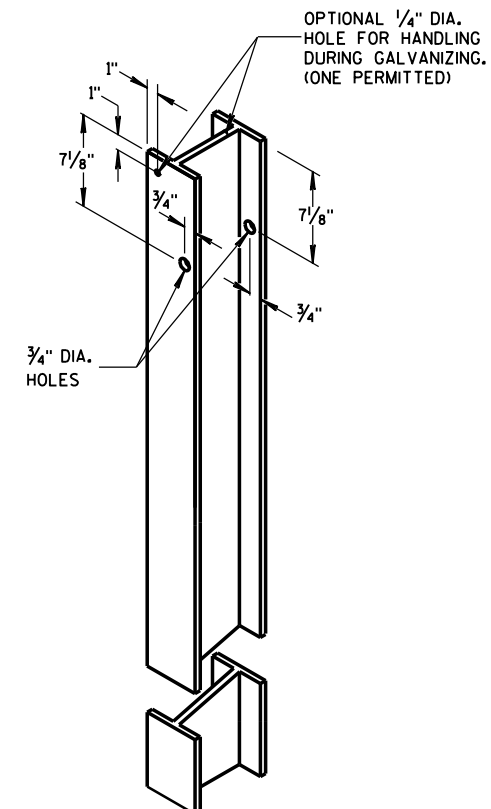
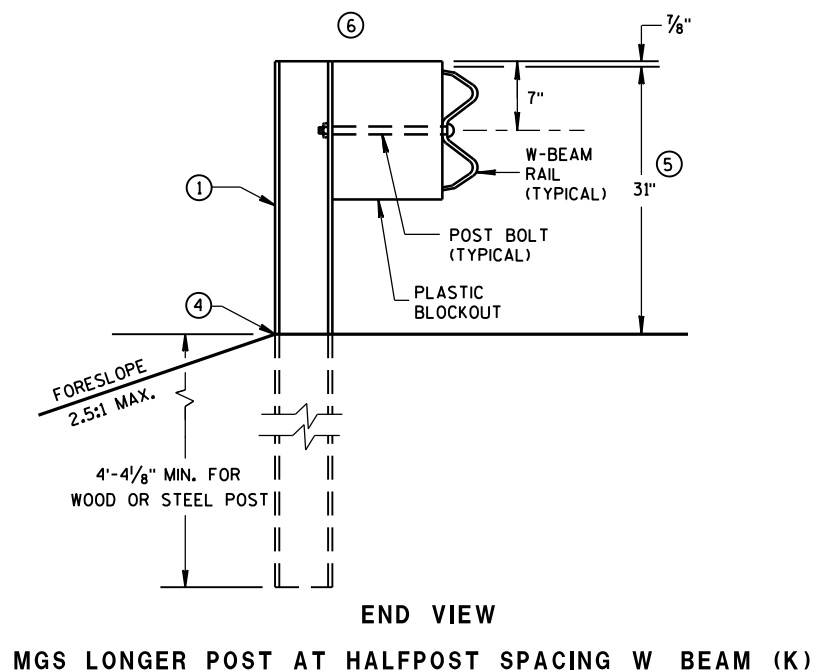
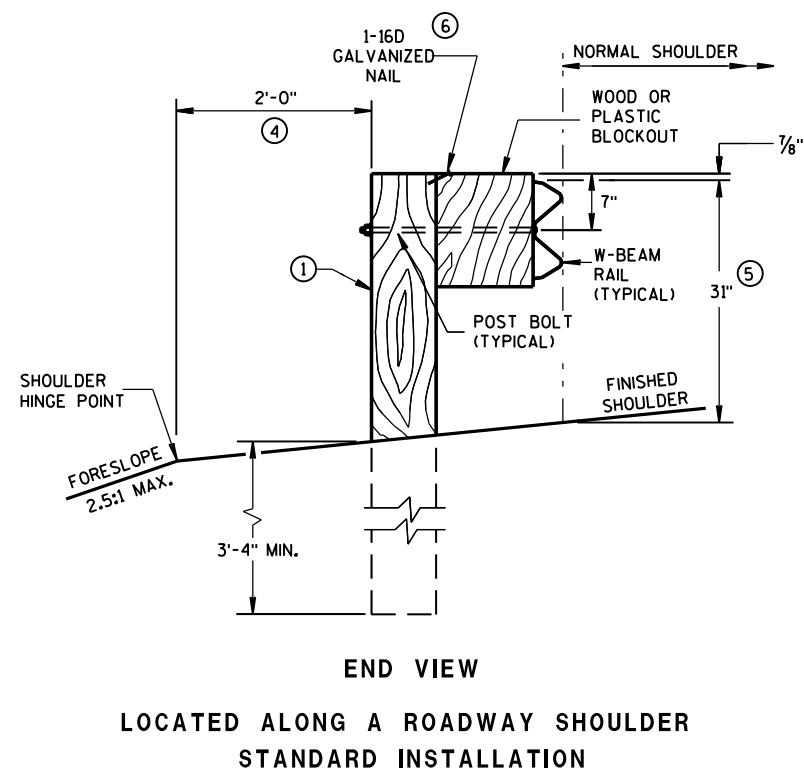
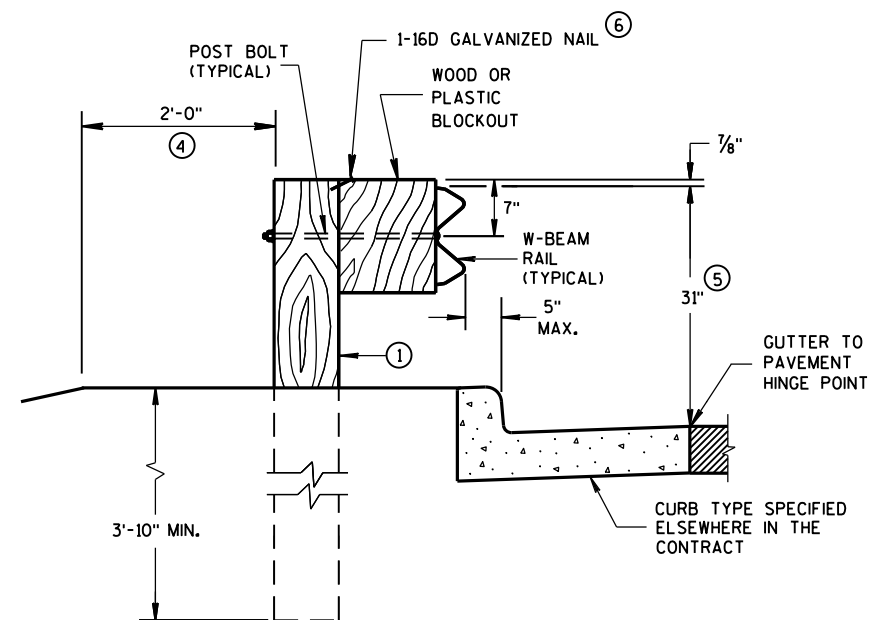
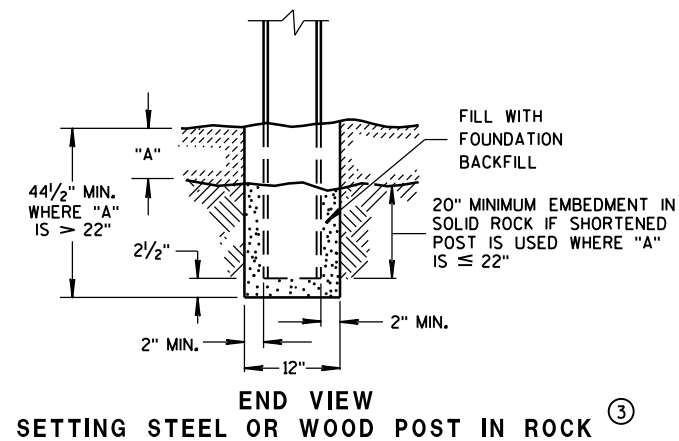
E.A.T. MARKER POST

**STEEL PLATE BEAM GUARD
ENERGY ABSORBING TERMINAL**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

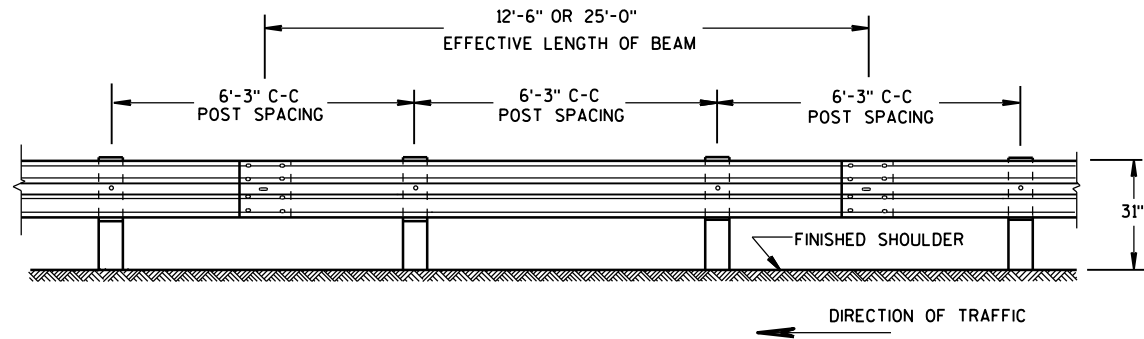
APPROVED
June 2017 /S/ Rodney Taylor
DATE ROADWAY STANDARDS DEVELOPMENT
FHWA UNIT SUPERVISOR

- 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 TO THE LENGTH AND 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.



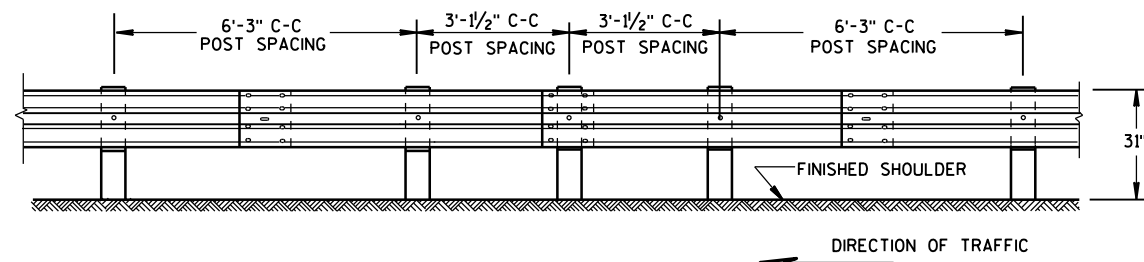
**MIDWEST GUARDRAIL SYSTEM
(MGS) GUARDRAIL**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



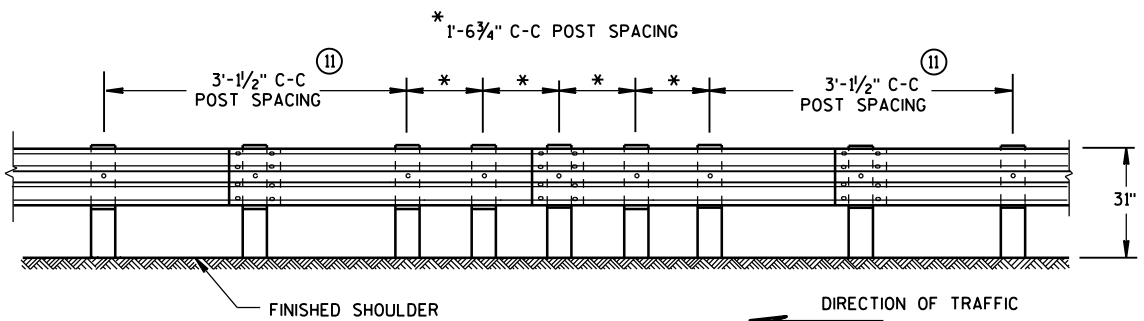
FRONT VIEW

POST SPACING STANDARD INSTALLATION



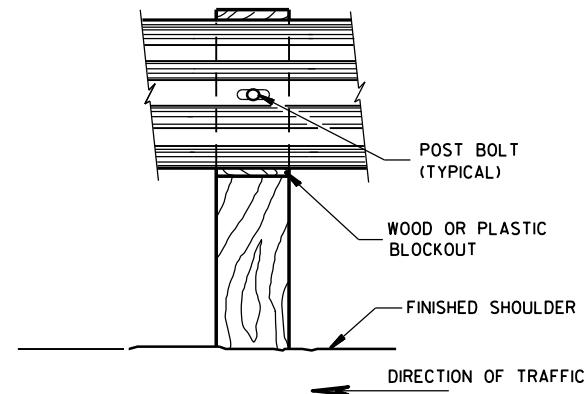
FRONT VIEW

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

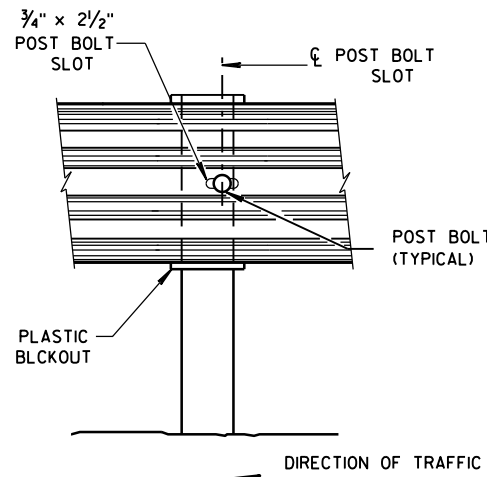


FRONT VIEW

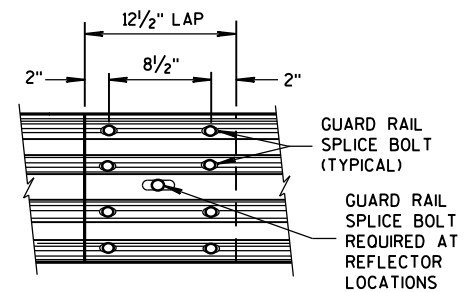
QUARTER POST SPACING (QS)



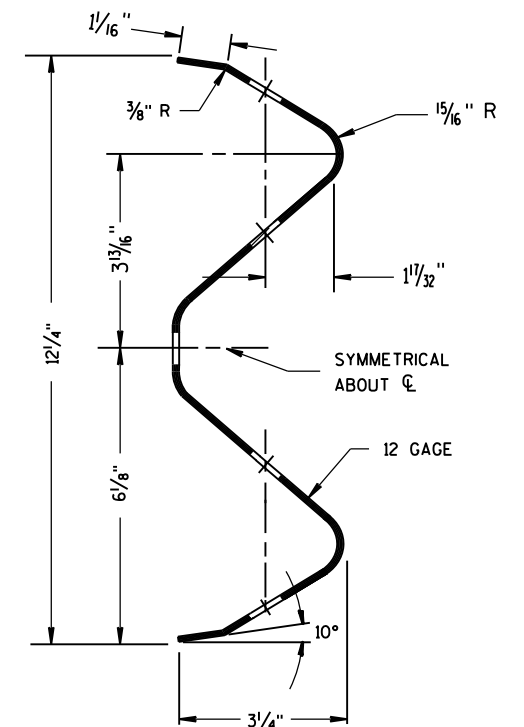
FRONT VIEW AT WOOD POST



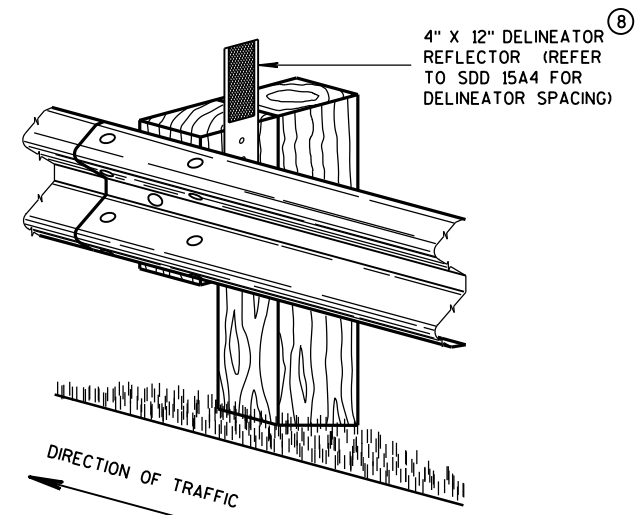
FRONT VIEW AT STEEL POST



FRONT VIEW
MID-SPAN BEAM SPLICE



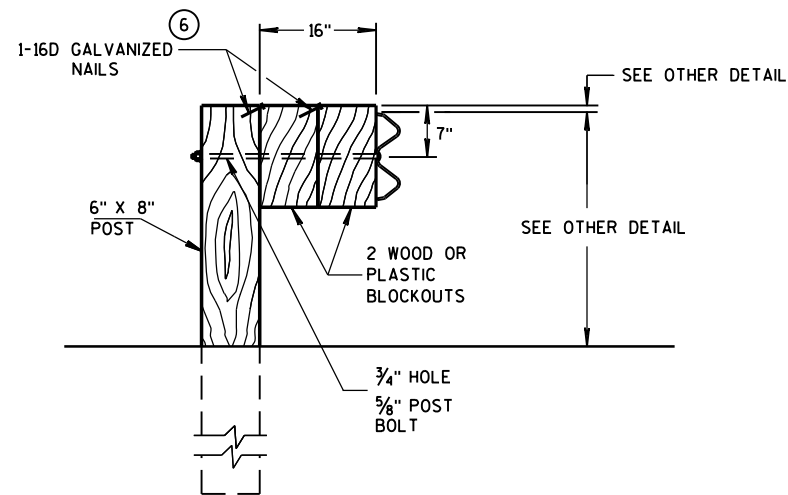
SECTION THRU W-BEAM RAIL



ONE SIDED REFLECTOR DETAIL AND TYPICAL INSTALLATION

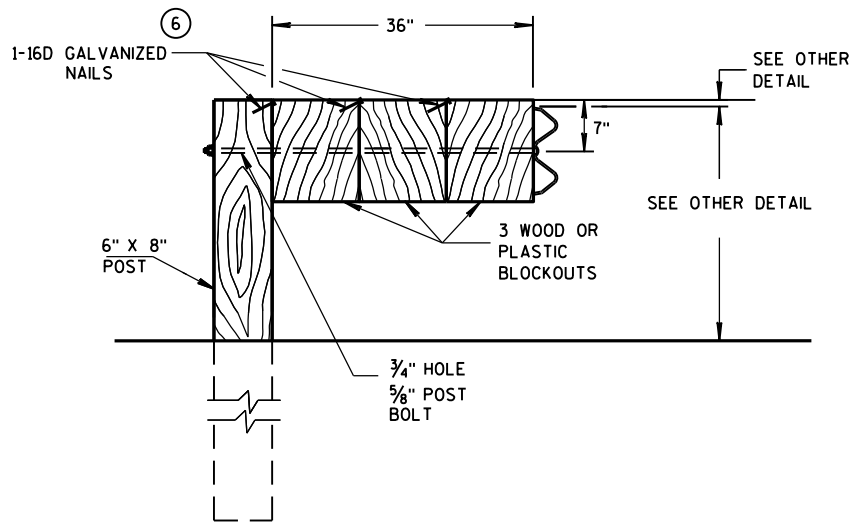
GENERAL NOTES

- 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.
 - 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.



DETAIL FOR 16" BLOCKOUT DEPTH

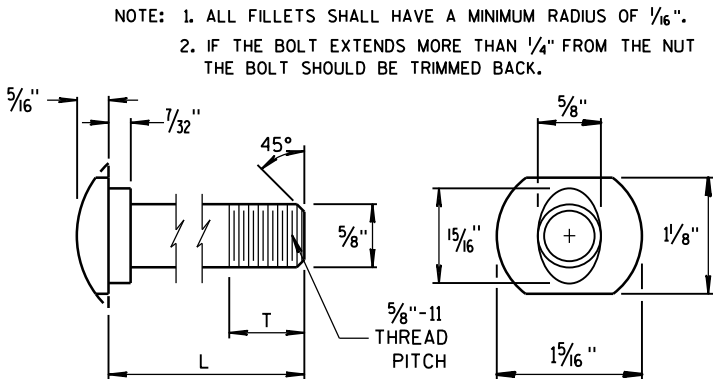
IT IS ACCEPTABLE TO USE BLOCKOUTS UP TO 16" DEEP TO INCREASE THE POST OFFSET TO AVOID UNDERGROUND OBSTACLES. THERE IS NO LIMIT TO THE NUMBER OF POSTS THAT CAN HAVE ADDITIONAL BLOCKOUTS UP TO 16" DEEP.



DETAIL FOR 36" BLOCKOUT DEPTH

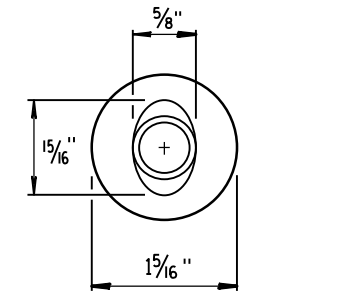
NOTES: UNDER SPECIAL CIRCUMSTANCES, SUCH AS AVOIDING OBSTACLES THAT ARE NOT RELOCATED, IT IS ACCEPTABLE TO INSTALL ADDITIONAL BLOCKOUTS TO OBTAIN UP TO 36" DEPTH FOR ONE OR TWO POSTS IN A SECTION OF GUARDRAIL.

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.

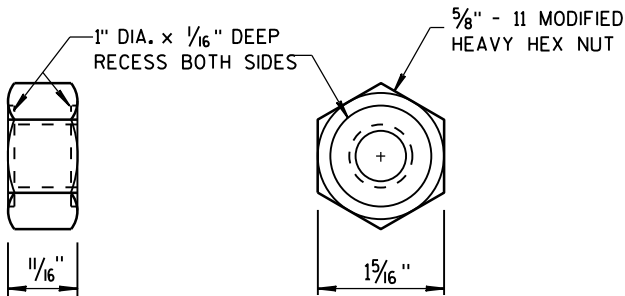


POST BOLT TABLE

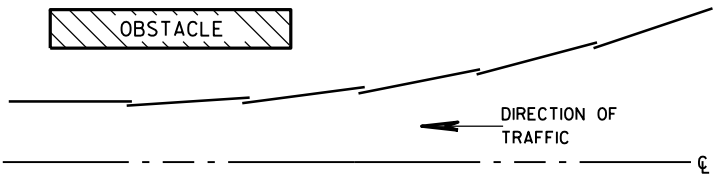
L	T (MIN.)
1 1/4"	1 1/8"
2"	1 3/4"
10"	4"
14"	4 1/16"
18"	4"
21"	4 1/16"
25"	4"



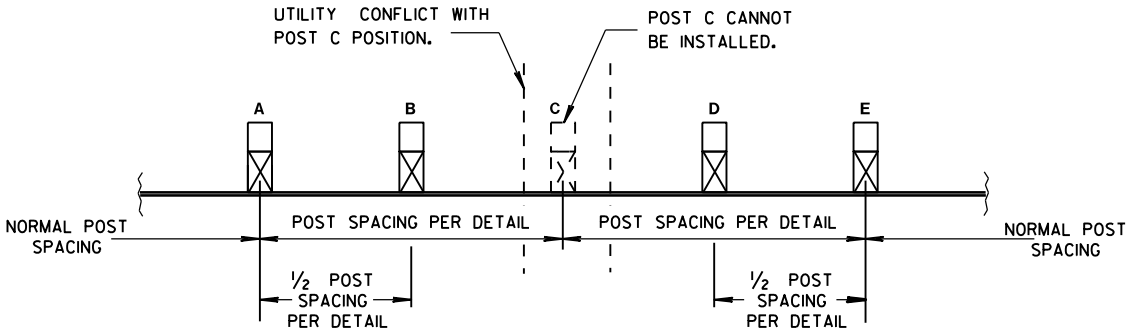
ALTERNATE BOLT HEAD



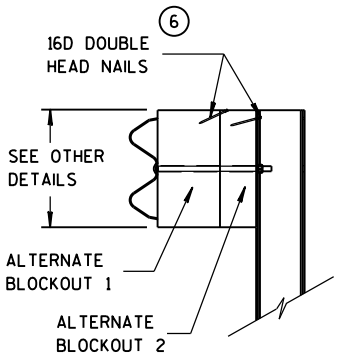
POST BOLT, SPLICE BOLT AND RECESS NUT



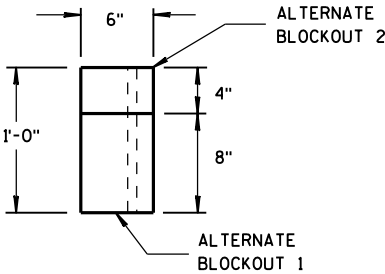
PLAN VIEW BEAM LAPPING DETAIL



POST DRIVING FOR CONTINUOUS UNDERGROUND OBSTRUCTION



SIDE VIEW

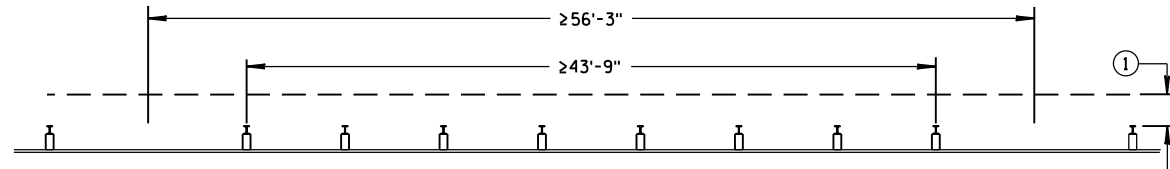


TOP VIEW

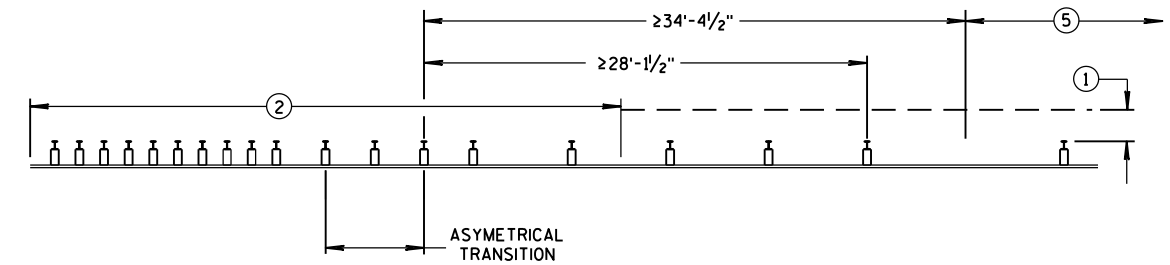
ALTERNATE WOOD BLOCKOUT DETAIL

MIDWEST GUARDRAIL SYSTEM
(MGS) GUARDRAIL

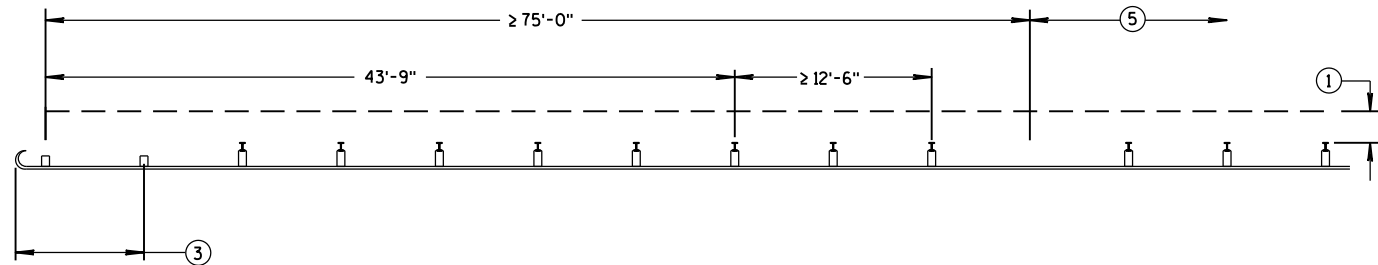
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



MISSING POST IN NORMAL BEAM GUARD RUN

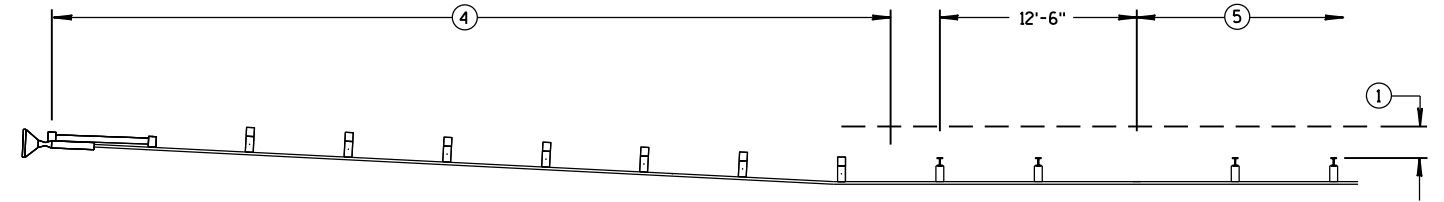


MISSING POST NEAR APPROACH THRIE BEAM TRANSITION

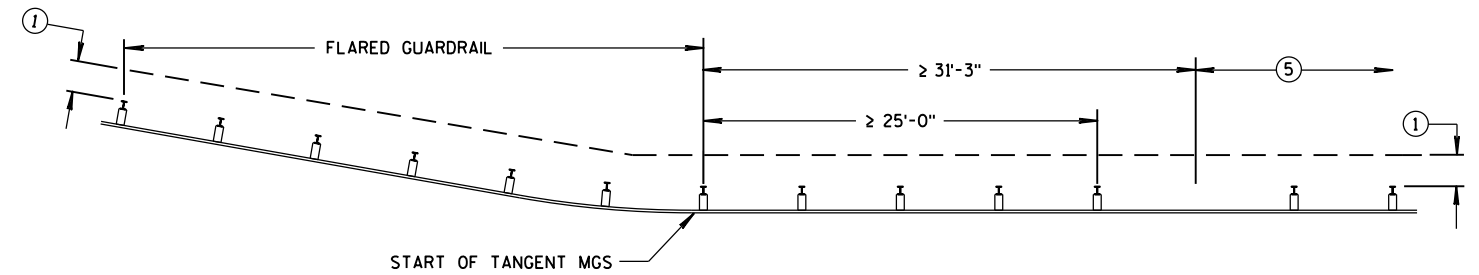


MISSING POST IN NORMAL BEAM GUARD RUN
NEAR TYPE 2 TERMINAL

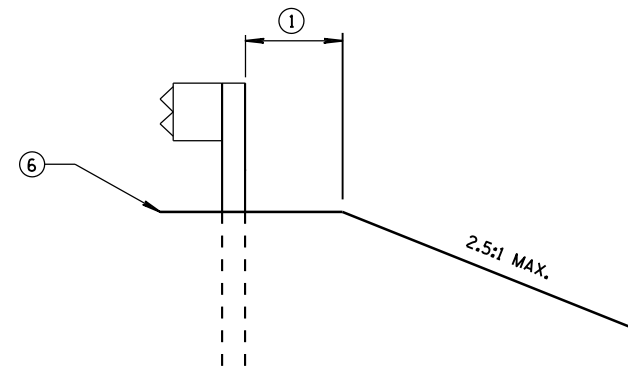
- ① MINIMUM OF 2 FEET OF GRADING BEHIND POST.
- ② SEE SDD 14B45 FOR MORE DETAILS.
- ③ SEE SDD 14B47 FOR MORE DETAILS.
- ④ SEE SDD 14B44 FOR MORE DETAILS.
- ⑤ SEE MISSING POST IN NORMAL BEAM GUARD RUN FOR DISTANCE TO NEXT MISSING POST AND AREA FOR WELL DRAINED, COMPACTED SOILS.
- ⑥ SEE PLAN FOR SHOULDER DESIGN.



MISSING POST IN NORMAL BEAM GUARD RUN NEAR EAT



MISSING POST IN NORMAL BEAM GUARD RUN
NEAR FLARED BEAM GUARD



CROSS SECTION VIEW

MIDWEST GUARDRAIL SYSTEM
(MGS) GUARDRAIL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

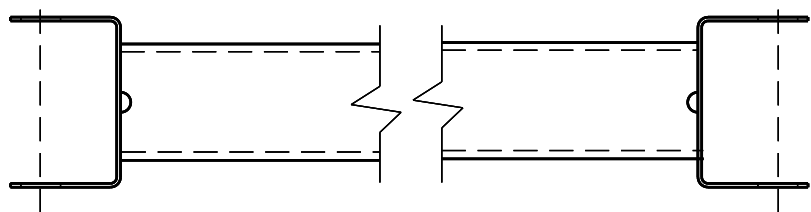
APPROVED
June 2017
DATE
/S/ Rodney Taylor
ROADWAY STANDARDS DEVELOPMENT
UNIT SUPERVISOR
FHWA

6

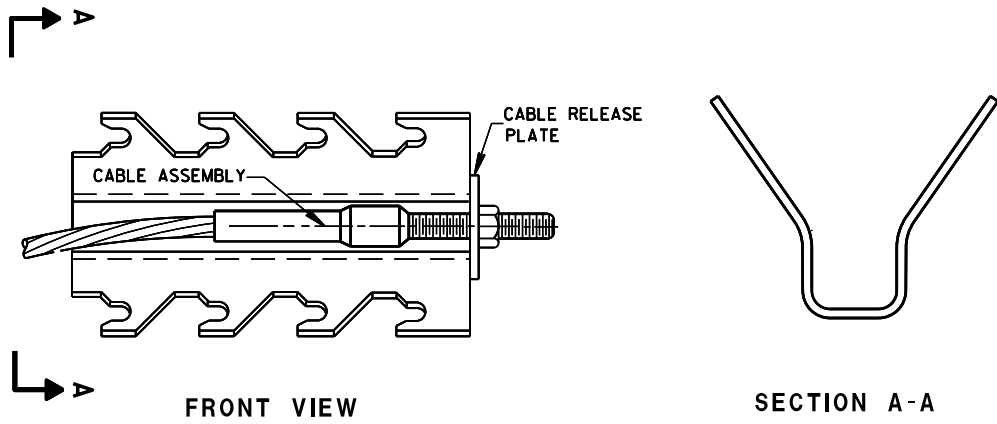
- S.D.D. 14 B 44-3a**

S.D.D. 14 B 44-3a



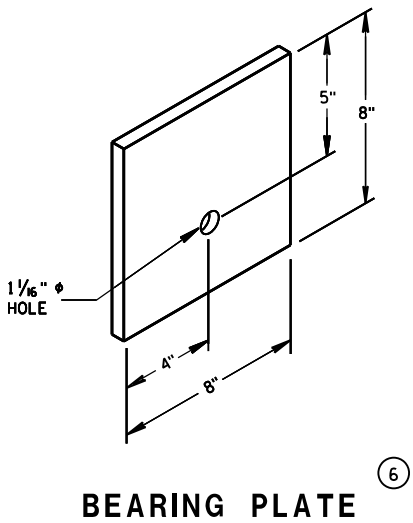


GENERIC GROUND STRUT (9) (H)

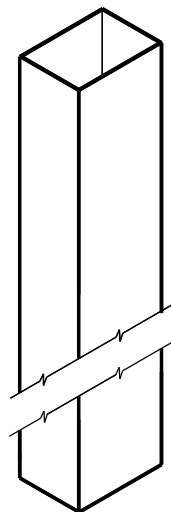


GENERIC ANCHOR CABLE BOX (8) (H)

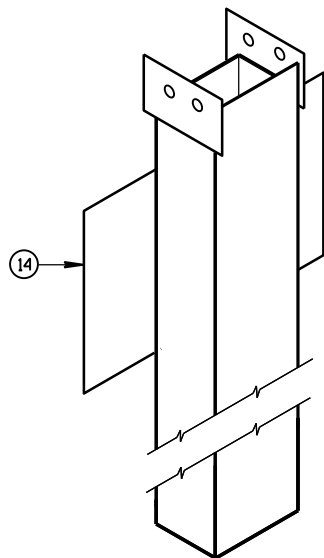
BILL OF MATERIALS	
PART NO.	DESCRIPTION
MATERIALS PROVIDED BY MGS EAT MANUFACTURER. SEE MANUFACTURER'S DETAILS FOR MORE INFORMATION.	
(1)	UPPER POST NO.1 6" X 6" TUBE
(2)	LOWER POST NO.1
(3)	WOOD CRT
(4)	WOOD BLOCKOUT
(5)	PIPE SLEEVE
(6)	BEARING PLATE
(7)	BCT CABLE ASSEMBLY
(8)	ANCHOR CABLE BOX
(9)	GROUND STRUT
(10)	PERFORATED W-BEAM RAIL END PANEL, 12'-6" LONG.
(11)	STANDARD W-BEAM RAIL. MULTIPLE SECTIONS REQUIRED. SECTIONS VARY IN LENGTH.
(12)	IMPACT HEAD
(13)	EAT MARKER POST - YELLOW (SEE APPROVED PRODUCTS LIST)
(14)	SOIL PLATE
(15)	UPPER POST NO. 2
(16)	LOWER POST NO. 2



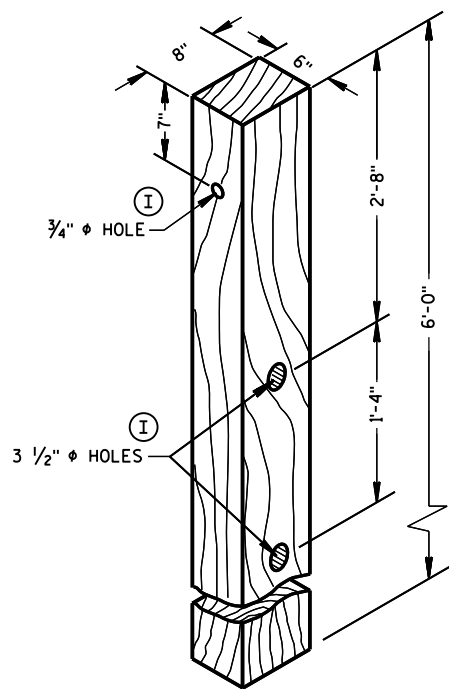
BEARING PLATE (6)



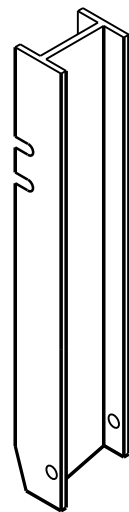
UPPER POST NO. 1⁽¹⁾



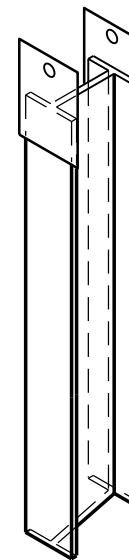
LOWER POST NO. 1⁽²⁾



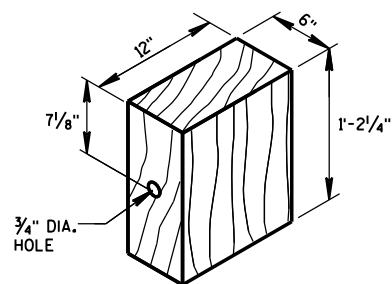
POSTS NUMBER 3-9
WOOD CRT POST⁽³⁾



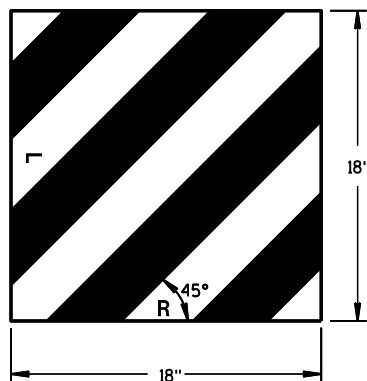
UPPER POST NO. 2⁽¹⁵⁾



LOWER POST NO. 2⁽¹⁶⁾



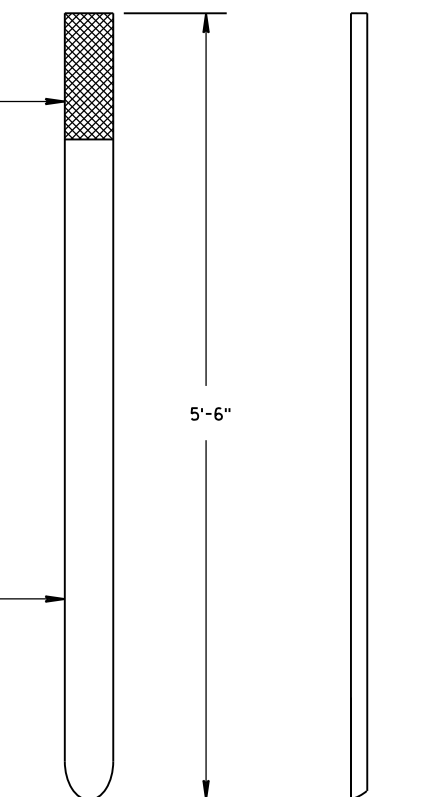
WOOD BLOCKOUT⁽⁴⁾
REQ'D. AT ALL POSTS EXCEPT POST NO'S 1 & 2



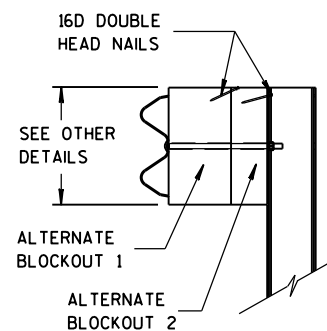
REFLECTIVE SHEETING DETAIL^(H)

TYPE H
YELLOW REFLECTIVE
SHEETING 3" X 9".
SEE STANDARD
SPECIFICATION 637.

E.A.T. MARKER
POST (YELLOW)

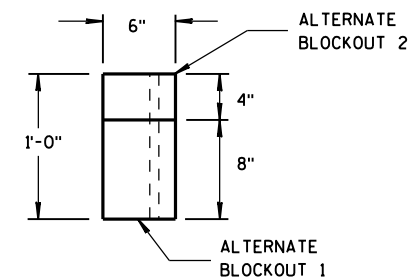


FRONT VIEW
SIDE VIEW
E.A.T. MARKER POST⁽¹³⁾



SIDE VIEW

ALTERNATE WOOD
BLOCKOUT DETAIL

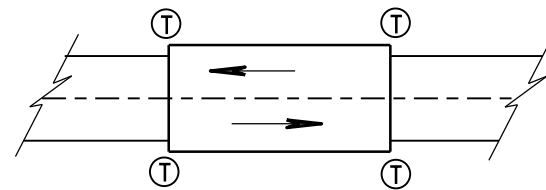


TOP VIEW

MIDWEST GUARDRAIL SYSTEM
ENERGY ABSORBING TERMINAL
(MGS)

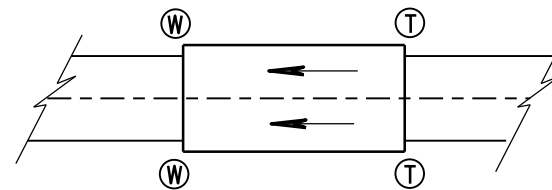
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
DATE June 2017 /S/ Rodney Taylor
FHWA ROADWAY STANDARDS DEVELOPMENT
UNIT SUPERVISOR



TWO WAY TRAFFIC

Ⓣ THRIE BEAM CONNECTION



ONE WAY TRAFFIC

Ⓦ W-BEAM CONNECTION WHEN REQUIRED

GENERAL NOTES

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

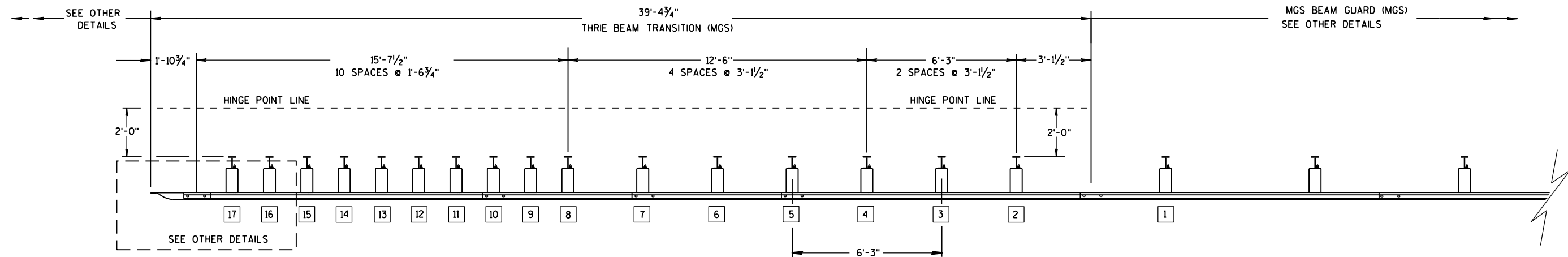
TRANSITION USES STEEL POSTS ONLY.

SEE STANDARD DETAIL DRAWING 14 B 42 FOR MORE INFORMATION.

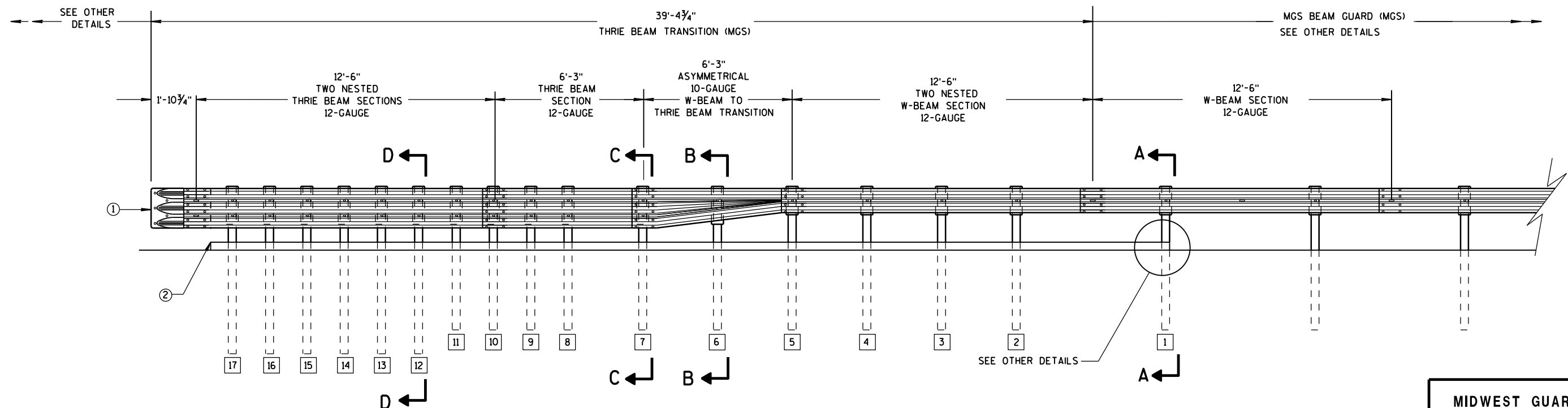
① BRIDGE RAILING TYPE "W" DOES NOT REQUIRE A TERMINAL CONNECTOR.

② OPTIONAL CURB AND GUTTER OR DRAINAGE FEATURE SEE PLAN FOR INFORMATION.

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



PLAN VIEW



ELEVATION VIEW

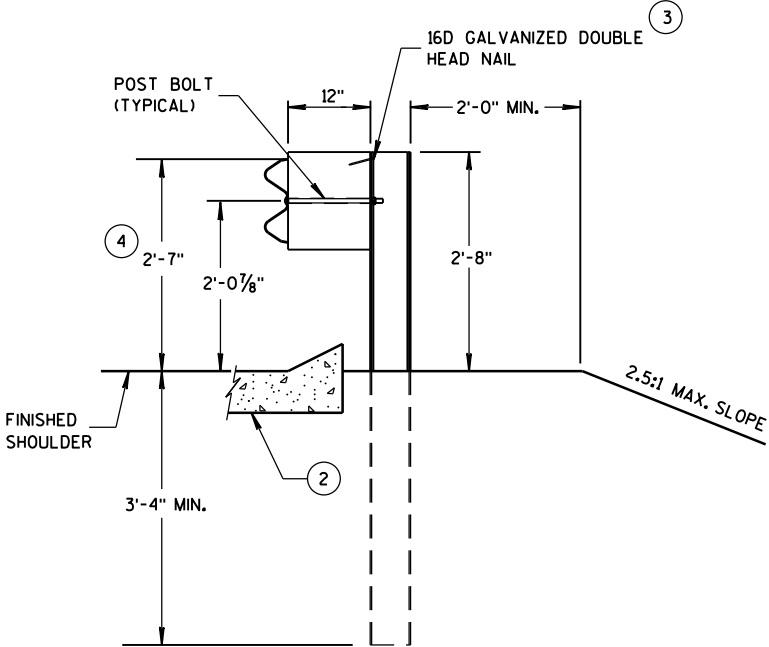
MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

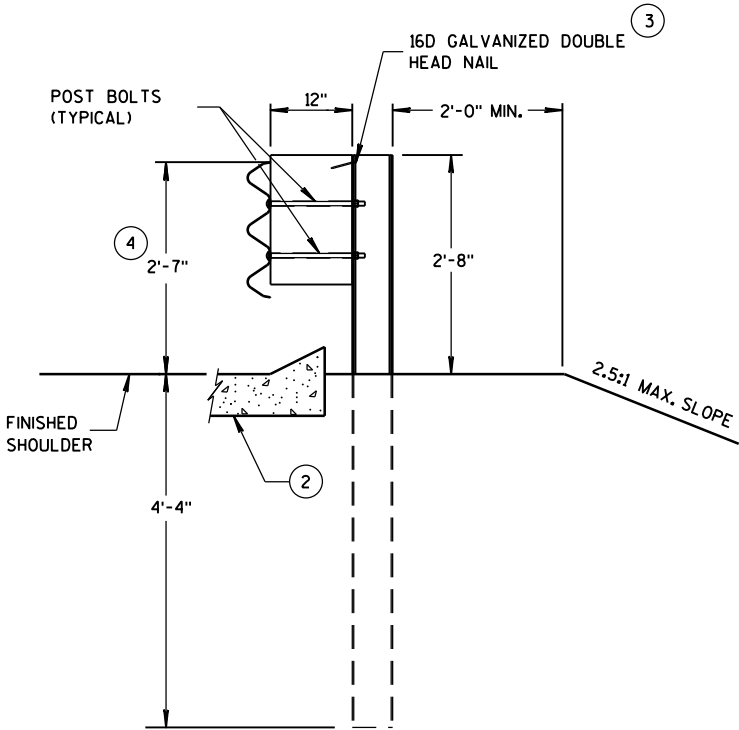
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

GENERAL NOTES

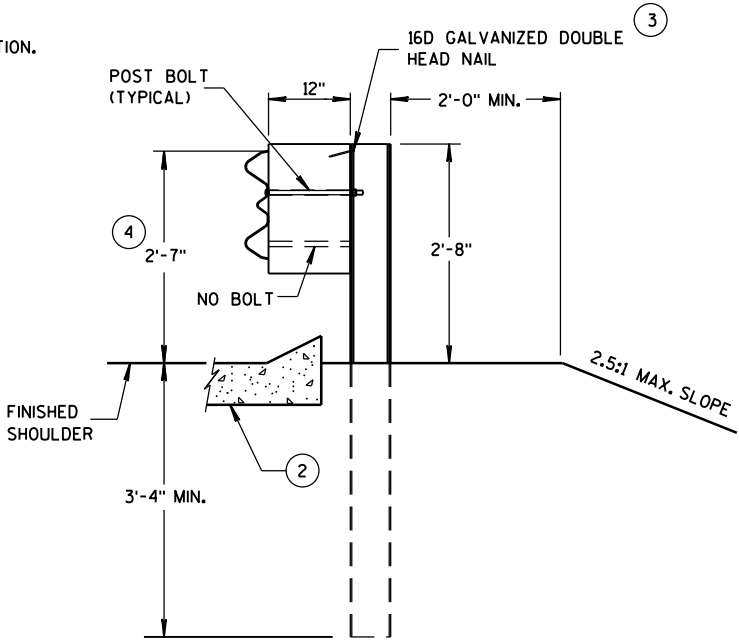
- 2 OPTIONAL CURB AND GUTTER OR DRAINAGE FEATURE SEE PLAN FOR INFORMATION.
- 3 WHEN USING STEEL POSTS AND WOOD BLOCKOUTS INSTALL FOUR 10D GALVANIZED NAILS. INSTALL NAILS AT THE BACK CORNERS OF THE BLOCK AND BEND THE NAILS OVER THE FLANGE OF THE STEEL POST.
- 4 TOLERANCE FOR TOP OF W-BEAM RAIL IS ± 1".



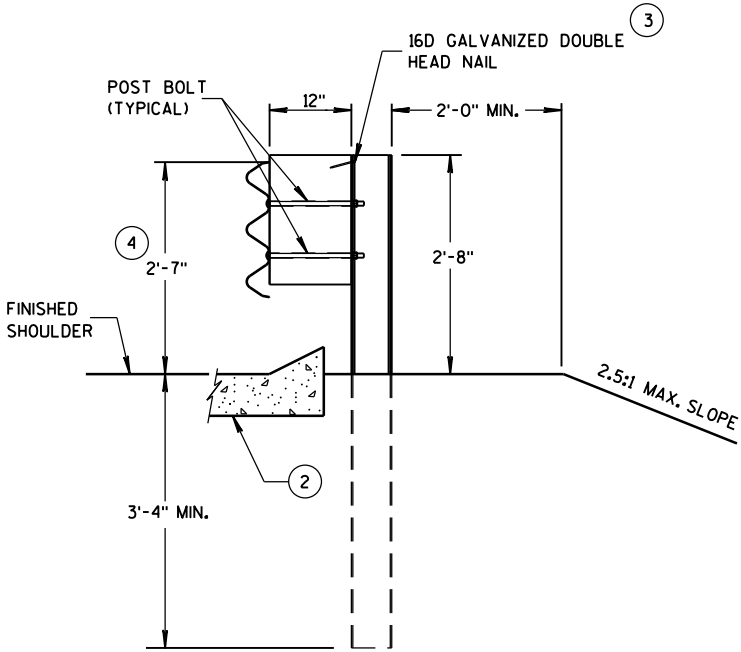
SECTION A-A
POSTS 1-5



SECTION D-D
POSTS 12-17



SECTION B-B
POST 6



SECTION C-C
POSTS 7-11

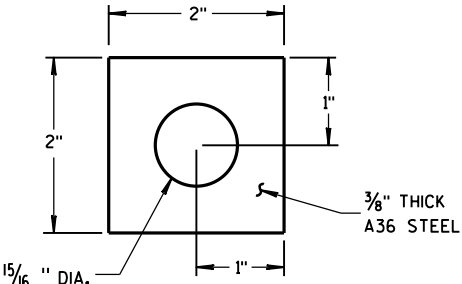
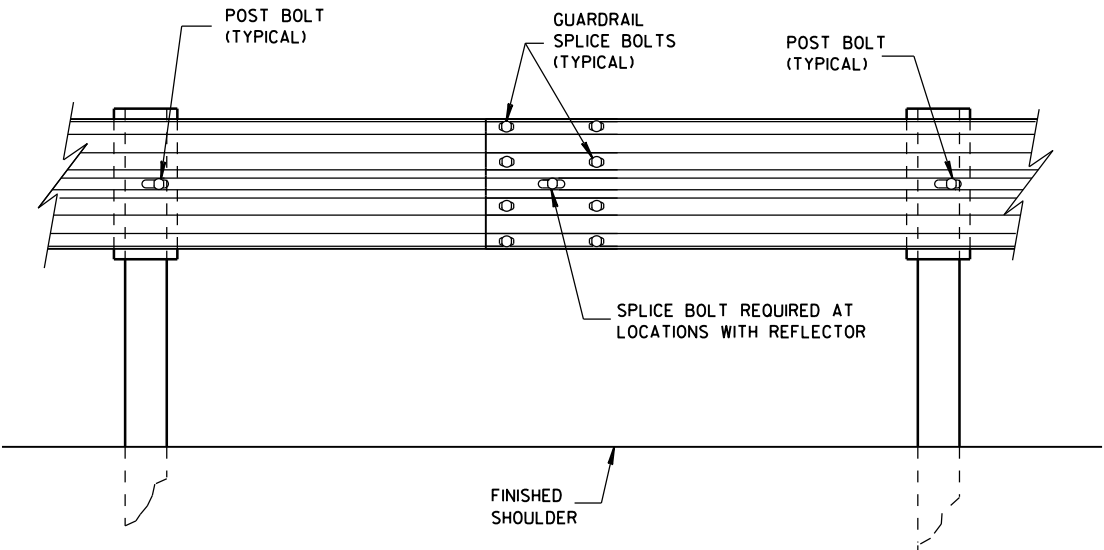
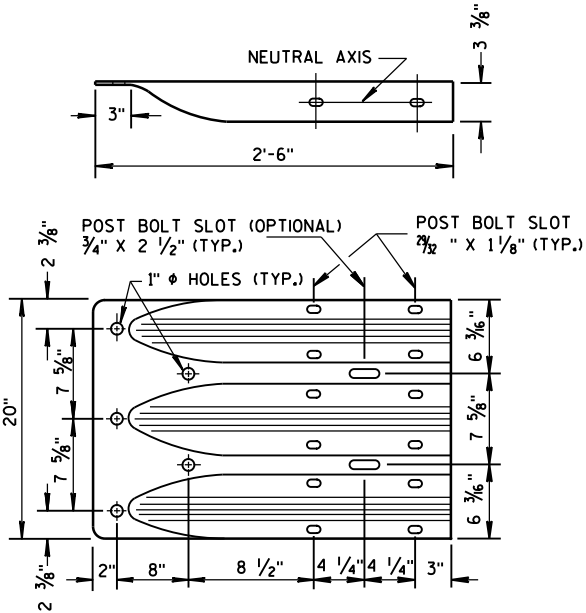


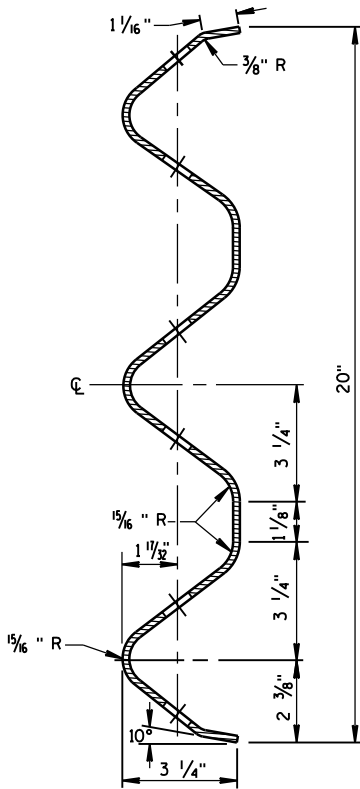
PLATE WASHER DETAIL



SPlice DETAIL



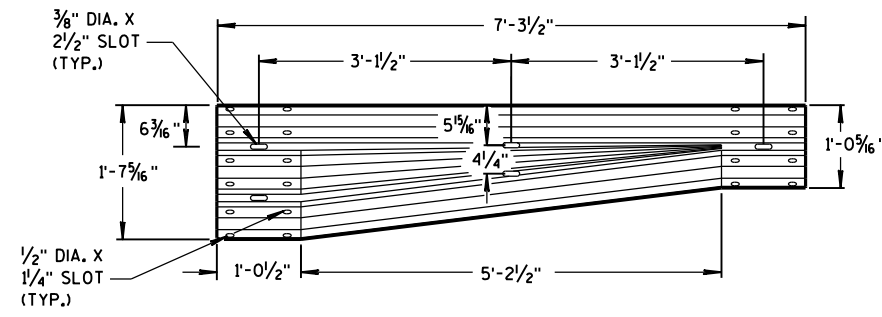
THRIE BEAM
TERMINAL CONNECTOR



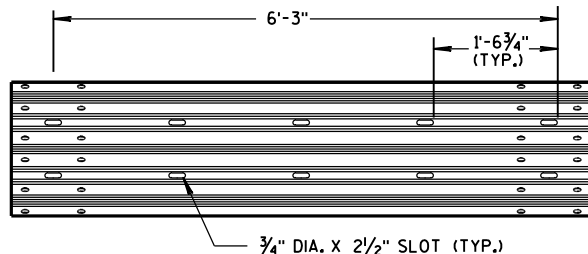
SECTION THRU THRIE
BEAM RAIL ELEMENT

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

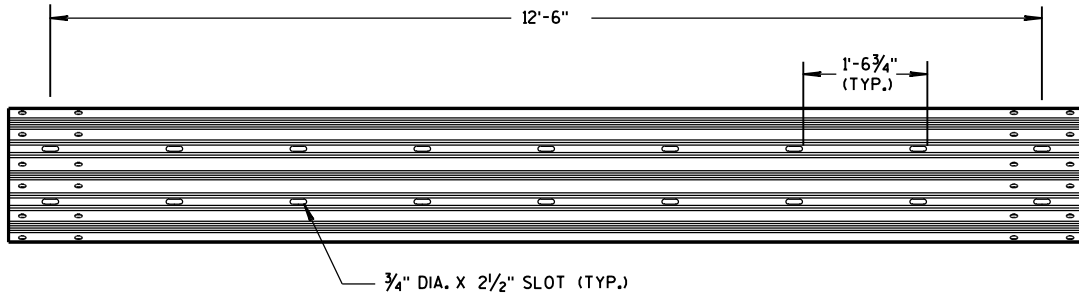
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



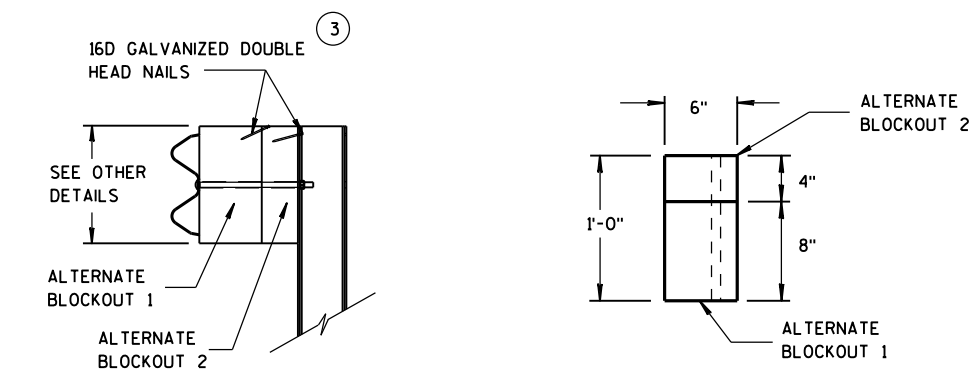
W-BEAM TO THRIE BEAM TRANSITION SECTION



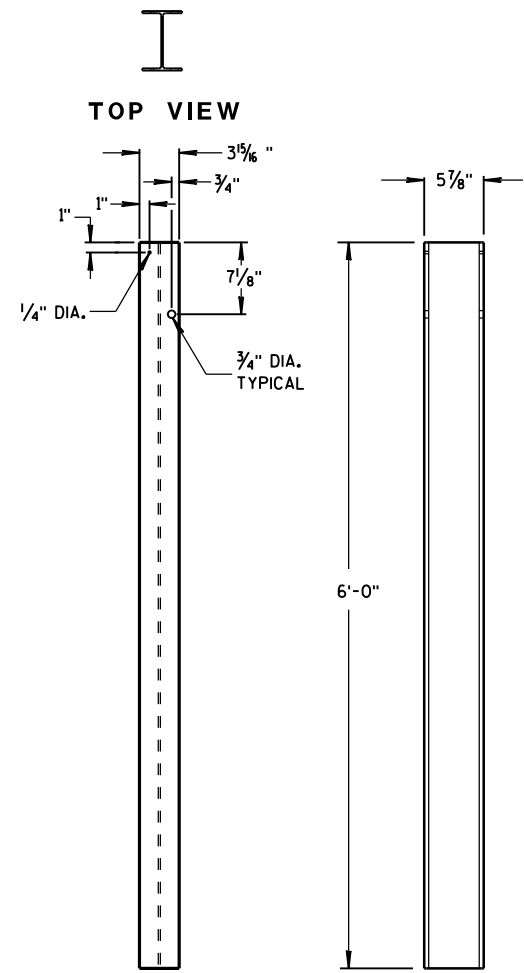
6'-3" THRIE BEAM SECTION



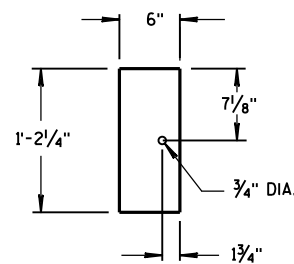
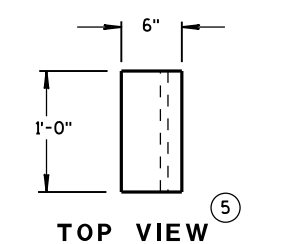
12'-6" THRIE BEAM SECTION



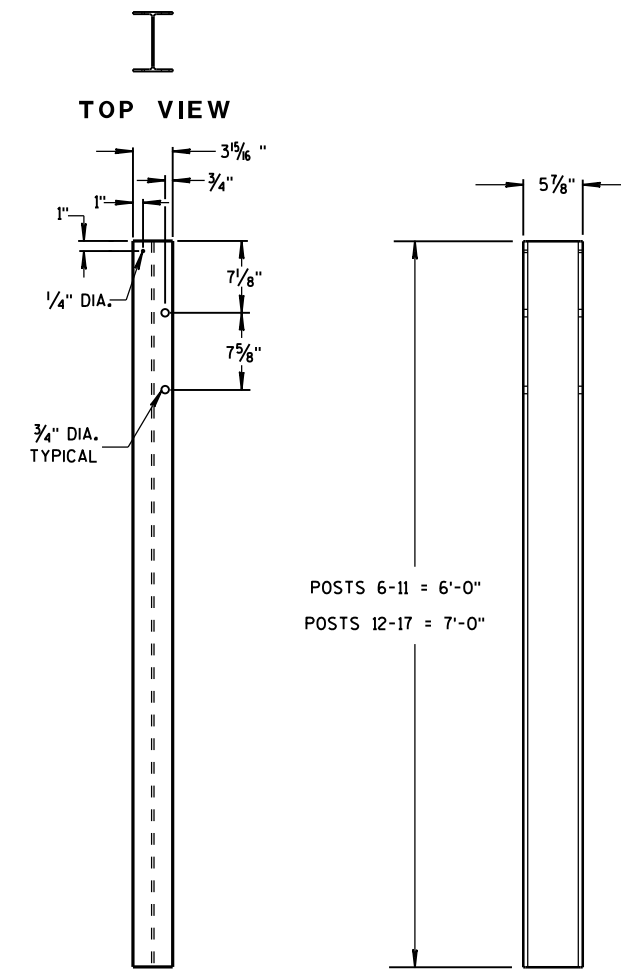
ALTERNATE WOOD BLOCKOUT DETAIL



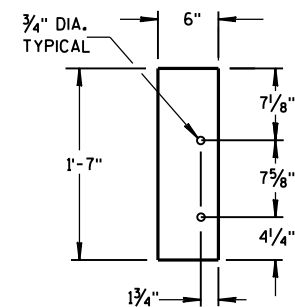
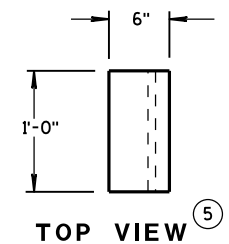
STEEL POSTS 1-5



BLOCKOUT POSTS 1-5



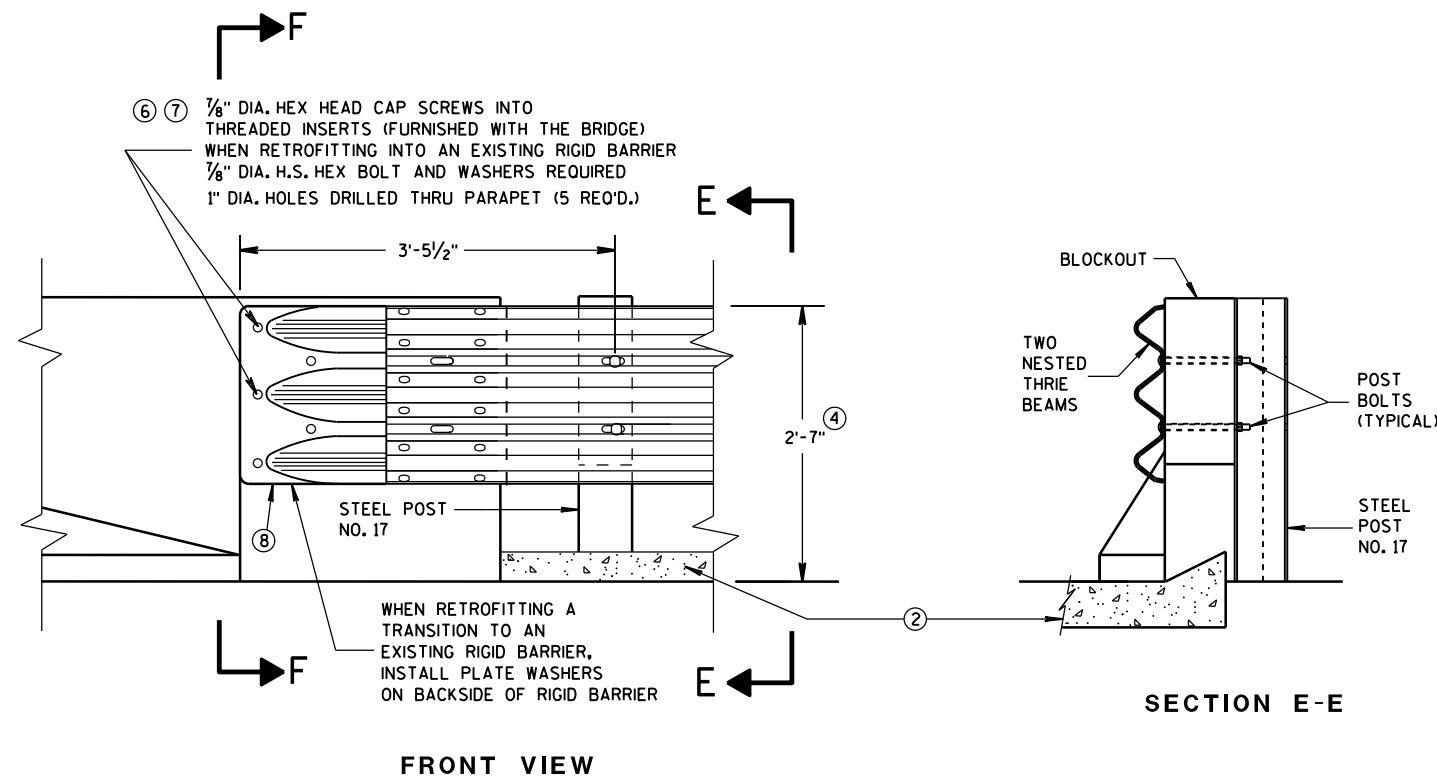
STEEL POSTS 6-17



BLOCKOUT POSTS 6-17

GENERAL NOTES

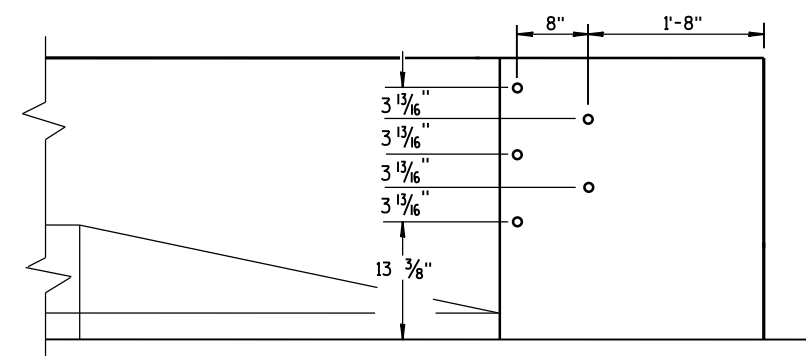
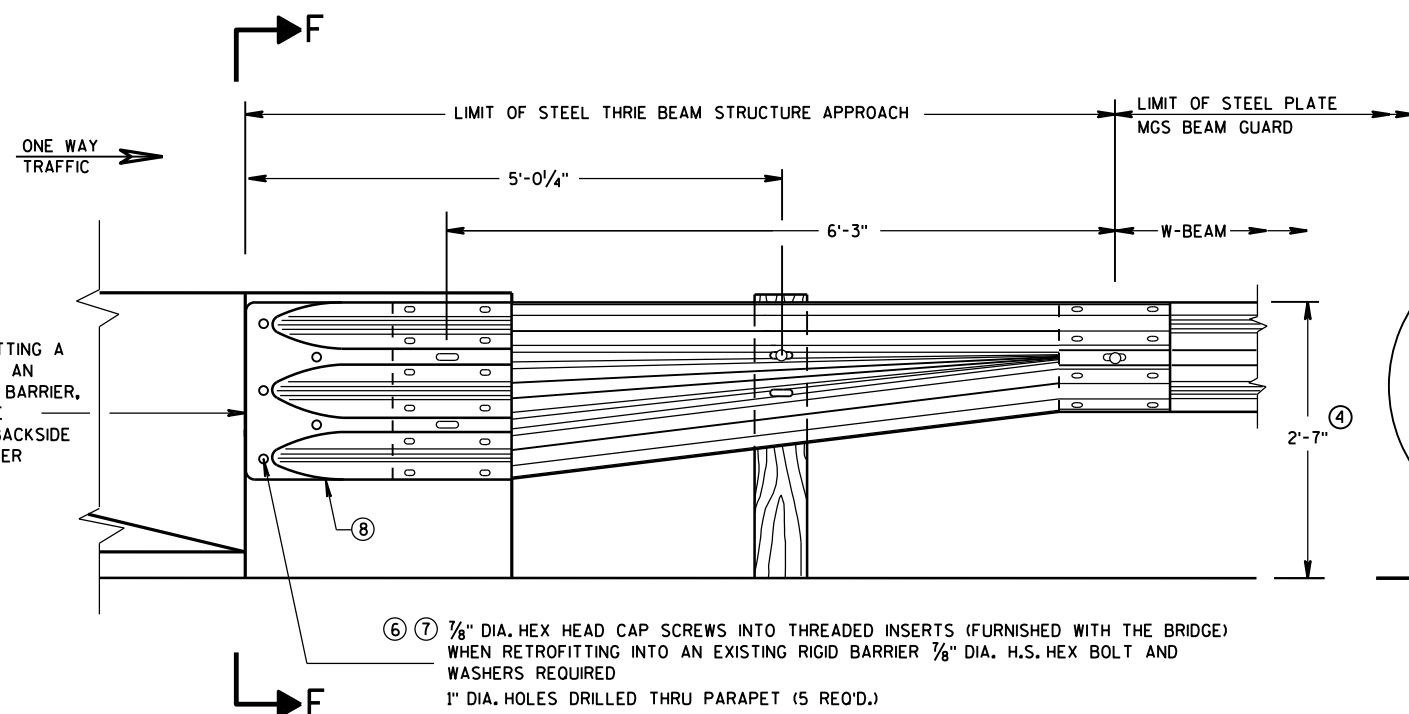
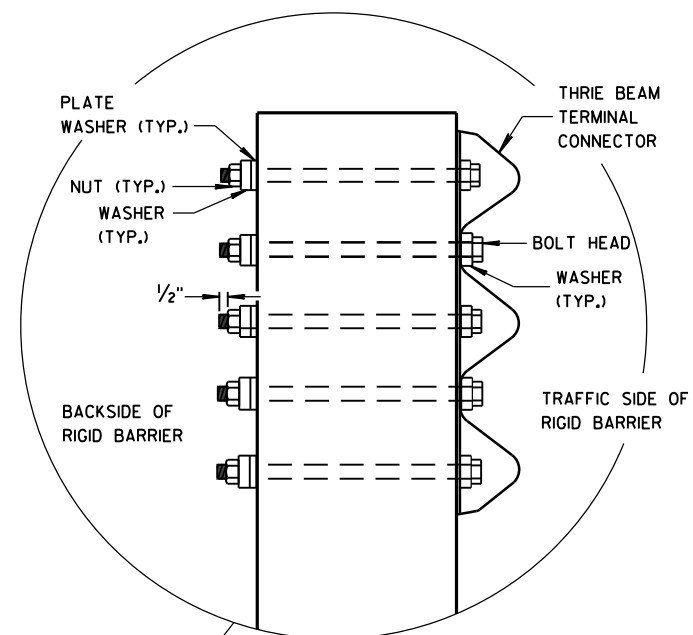
- STEEL POSTS ARE W6X9 OR W6X8.5.
- BOLT HOLES FOR POST ARE ON FRONT AND OF SIDE OF POST.
- WHEN USING STEEL POSTS AND WOOD BLOCKOUTS INSTALL FOUR 16D GALVANIZED NAILS. INSTALL NAILS AT THE BACK CORNERS OF THE BLOCK AND BEND THE NAILS OVER THE FLANGE OF THE STEEL POST.
- WOOD BLOCKS MAY BE CONSTRUCTED OUT OF 2 WOOD BLOCKS. SEE ALTERNATE WOOD BLOCK DETAIL.



GENERAL NOTES

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

- ② OPTIONAL CURB AND GUTTER OR DRAINAGE FEATURE SEE PLAN FOR INFORMATION.
- ④ TOLERANCE FOR TOP OF BEAM IS $\pm 1"$.
- ⑥ DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.
- ⑦ 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 5/8" THICK AND ONE PLATE WASHER. REPAIR ANY DAMAGED CONCRETE FROM BOLT INSTALLATION.
- ⑧ THE RECESS FOR A W-BEAM CONNECTION, WHICH EXISTS ON SOME PARAPETS OF THIS TYPE, SHALL BE FILLED WITH A TREATED TIMBER BLOCKOUT. BLOCKOUT SIZE IS 1'-6" X 2'-0" X 3 1/2".



DRILL HOLE LOCATION

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

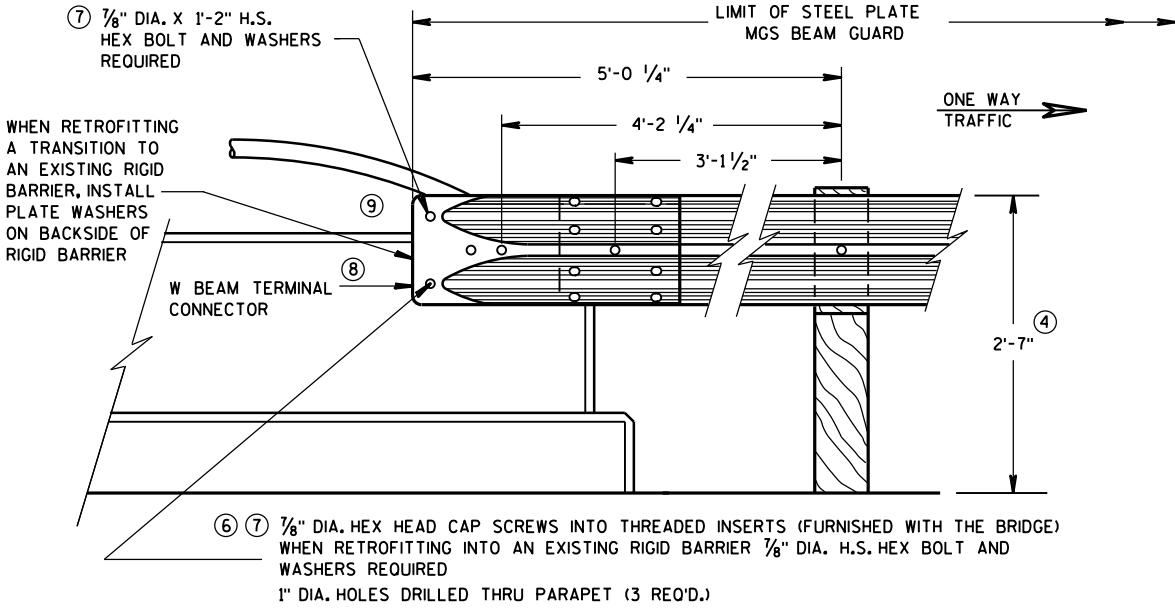
APPROVED
June, 2015
DATE
FHWA

/S/ Jerry H. Zogg
ROADWAY STANDARDS DEVELOPMENT
ENGINEER

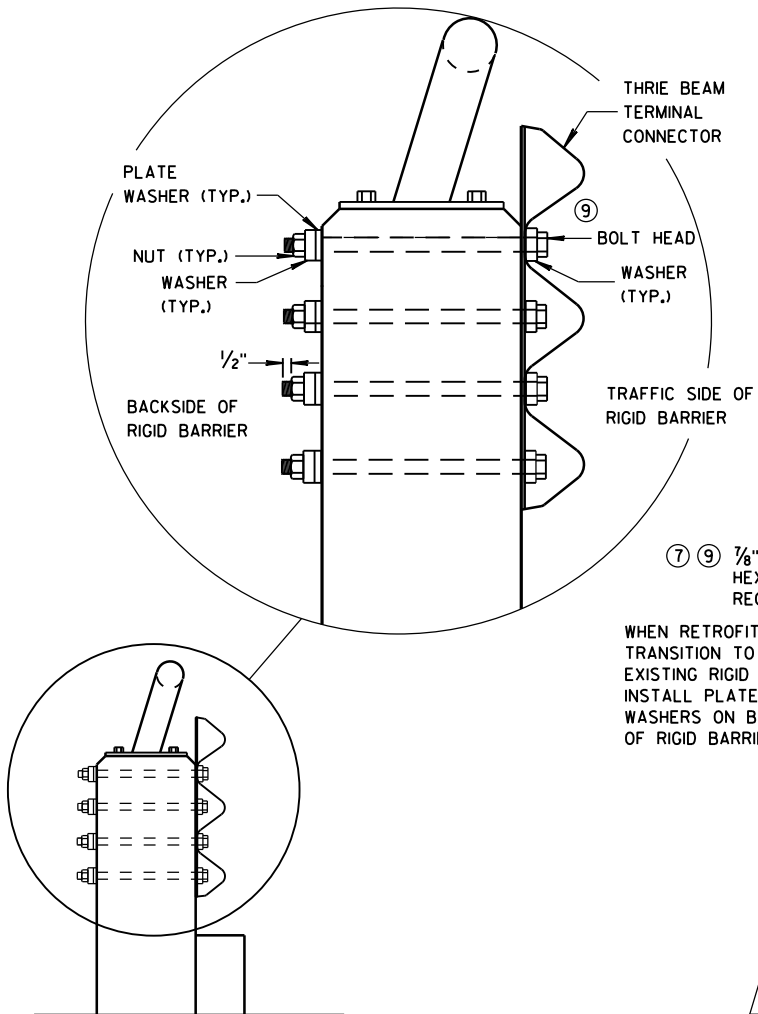
GENERAL NOTES

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

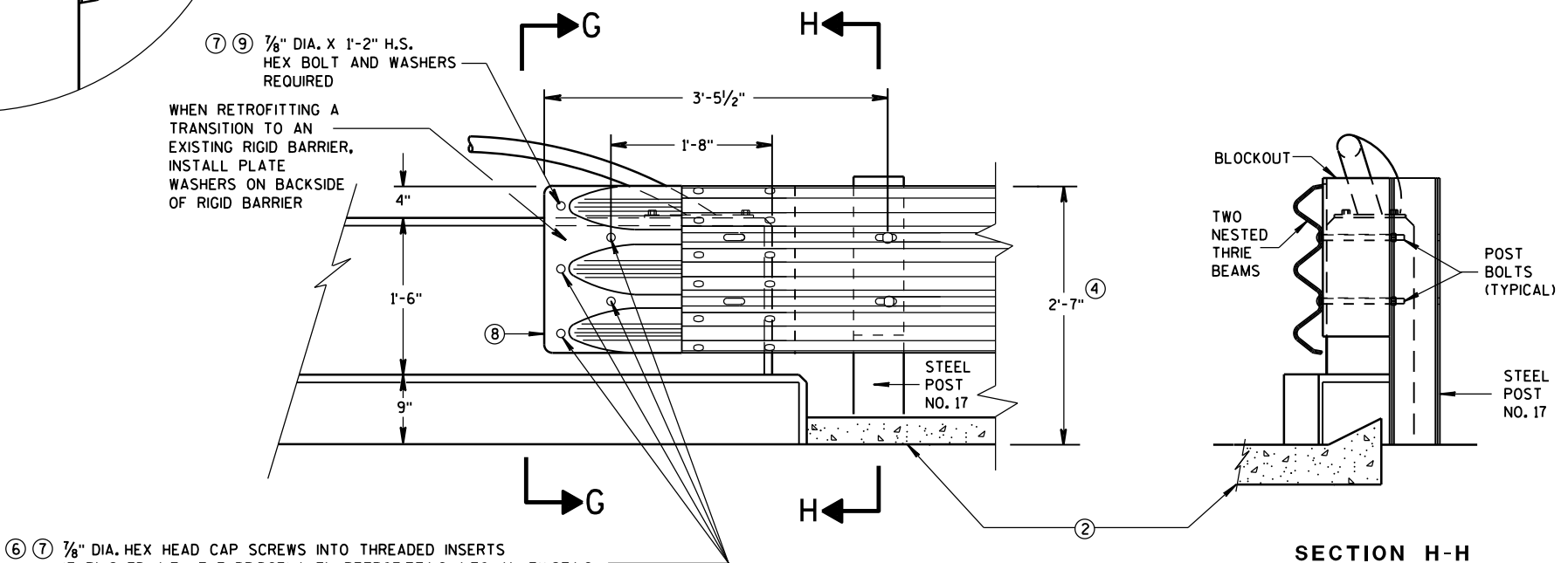
- ② OPTIONAL CURB AND GUTTER OR DRAINAGE FEATURE SEE PLAN FOR INFORMATION.
- ④ TOLERANCE FOR TOP OF BEAM IS $\pm 1"$.
- ⑥ DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.
- ⑦ BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH 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 $\frac{5}{8}"$ THICK AND ONE PLATE WASHER. REPAIR ANY DAMAGED CONCRETE FROM BOLT INSTALLATION.
- ⑧ THE RECESS FOR A W-BEAM CONNECTION, WHICH EXISTS ON SOME PARAPETS OF THIS TYPE, SHALL BE FILLED WITH A TREATED TIMBER BLOCKOUT. BLOCKOUT SIZE IS 1'-6" X 2'-0" X 3 $\frac{1}{2}"$.
- ⑨ BOLT, NUT AND WASHERS NOT REQUIRED FOR THIS LOCATION WHEN RETROFITTING AN EXISTING PAPAPET AND THE HOLE IS EITHER ABOVE PARAPET OR WITHIN 4 INCHES OF THE EDGE OF PARAPET.



FRONT VIEW
W BEAM CONNECTION TO VERTICAL FACE PARAPET
(USE ONLY ON THE TRAFFIC EXIT END OF ONE WAY BRIDGES)



SECTION G-G



FRONT VIEW

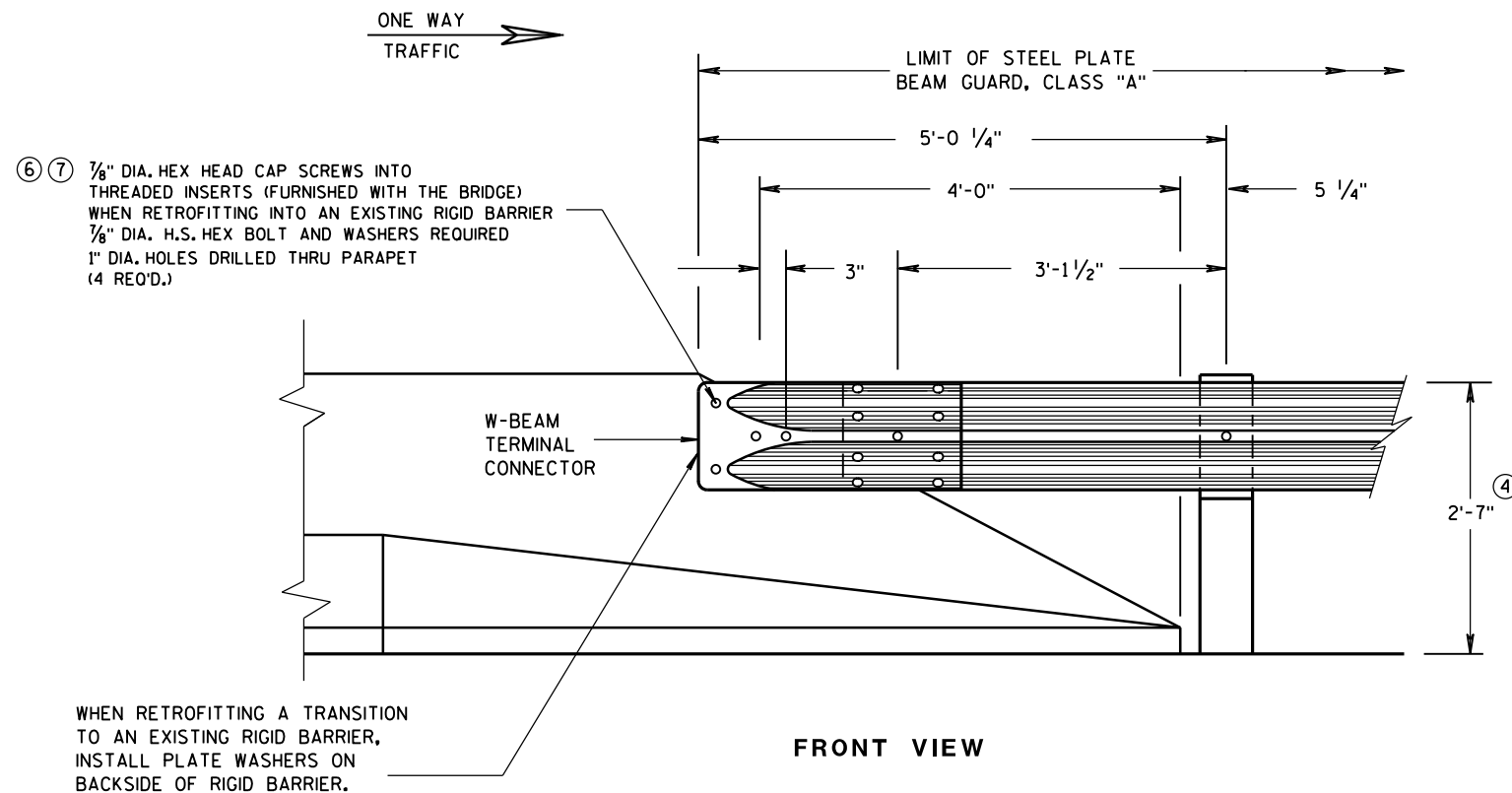
THRIE BEAM CONNECTION TO VERTICAL FACED PARAPETS

SECTION H-H

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

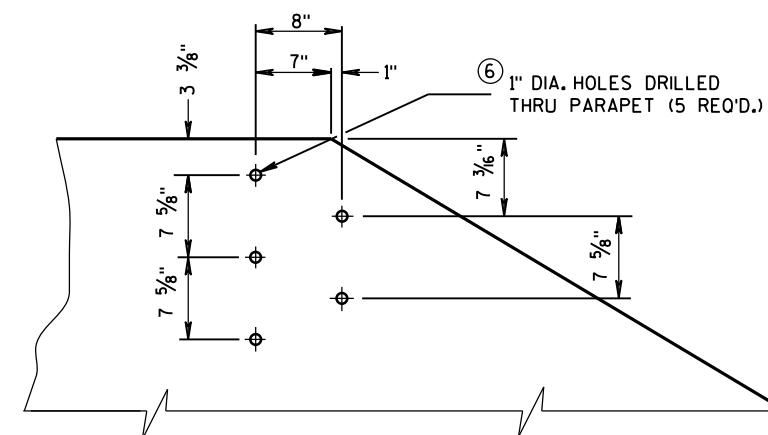
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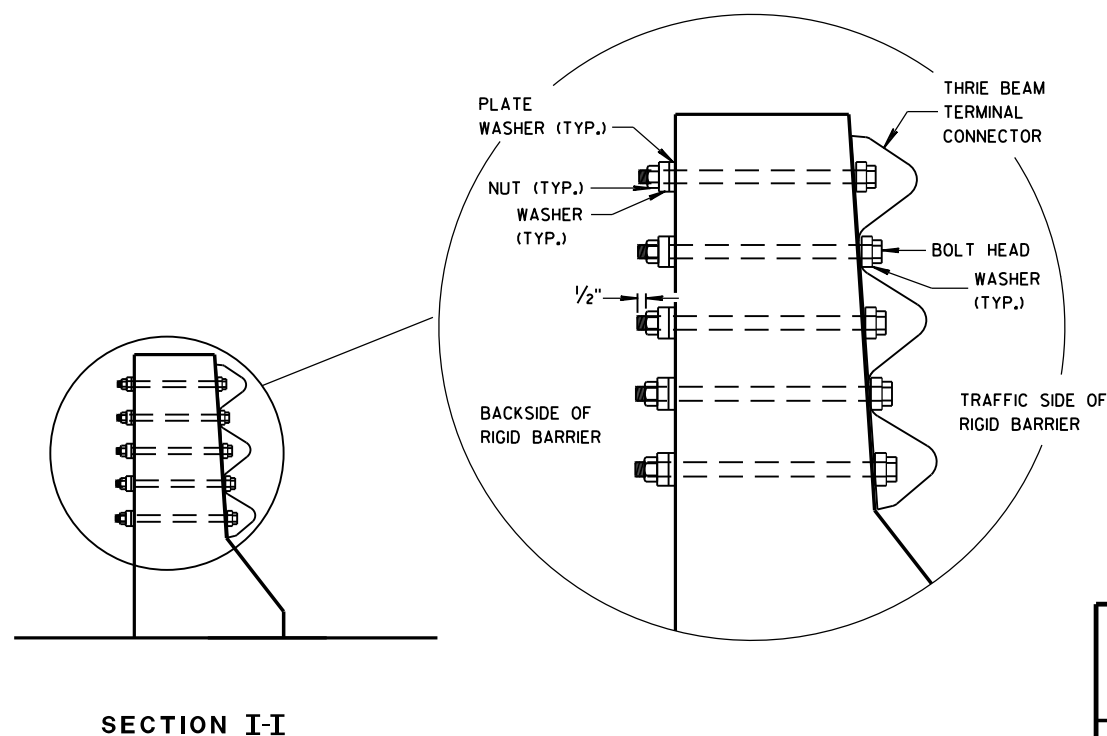
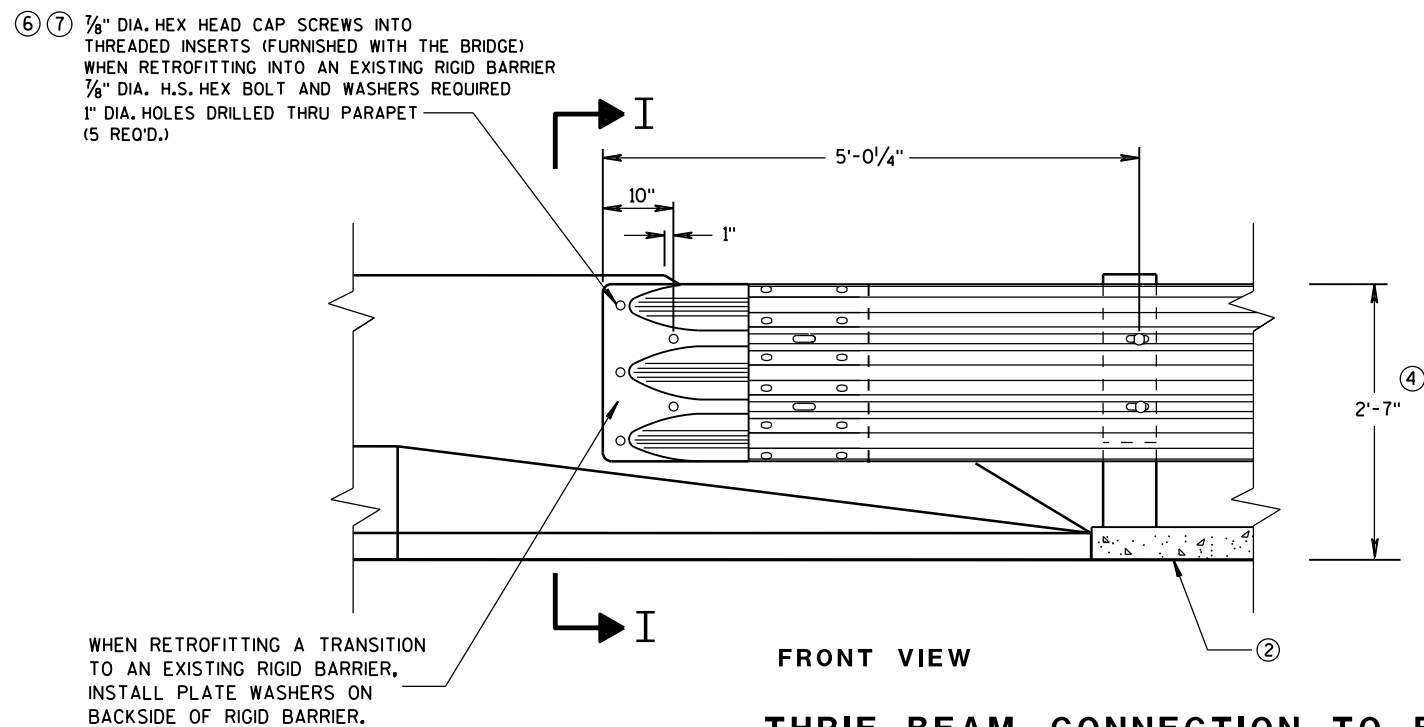


GENERAL NOTES

- ② OPTIONAL CURB AND GUTTER OR DRAINAGE FEATURE SEE PLAN FOR INFORMATION.
- ④ TOLERANCE FOR TOP OF BEAM IS $\pm 1"$.
- ⑥ DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.
- ⑦ 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 5/8" THICK AND ONE PLATE WASHER. REPAIR ANY DAMAGED CONCRETE FROM BOLT INSTALLATION.



DRILL HOLE LOCATION AND PATTERN
FOR THRIE BEAM CONNECTION

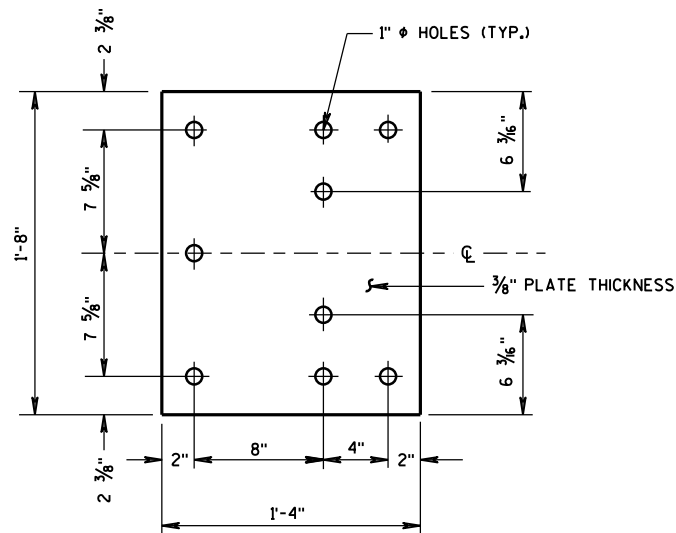


MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

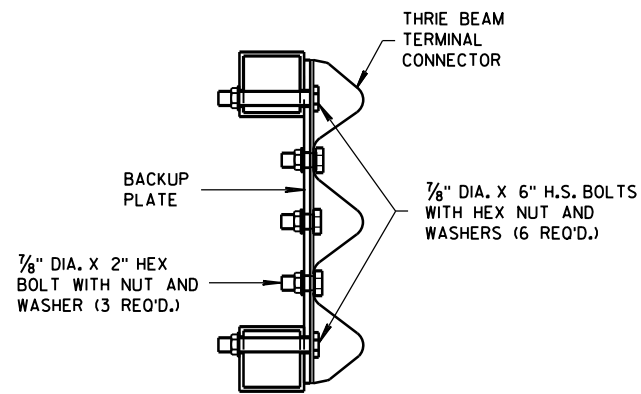
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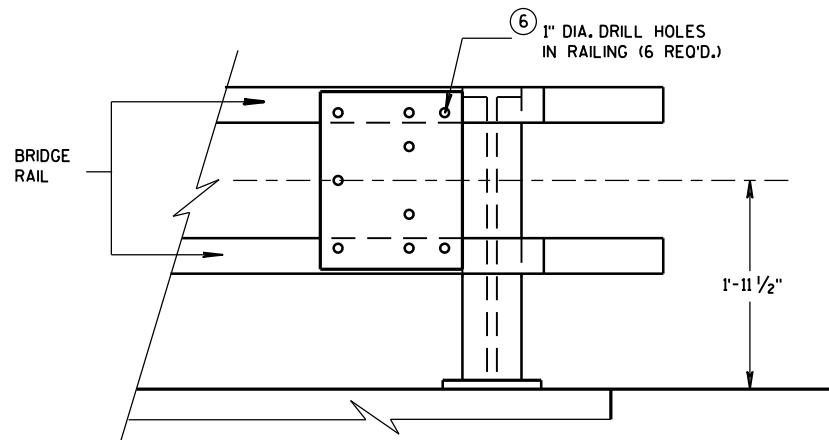
/S/ Jerry H. Zogg
ROADWAY STANDARDS DEVELOPMENT
ENGINEER



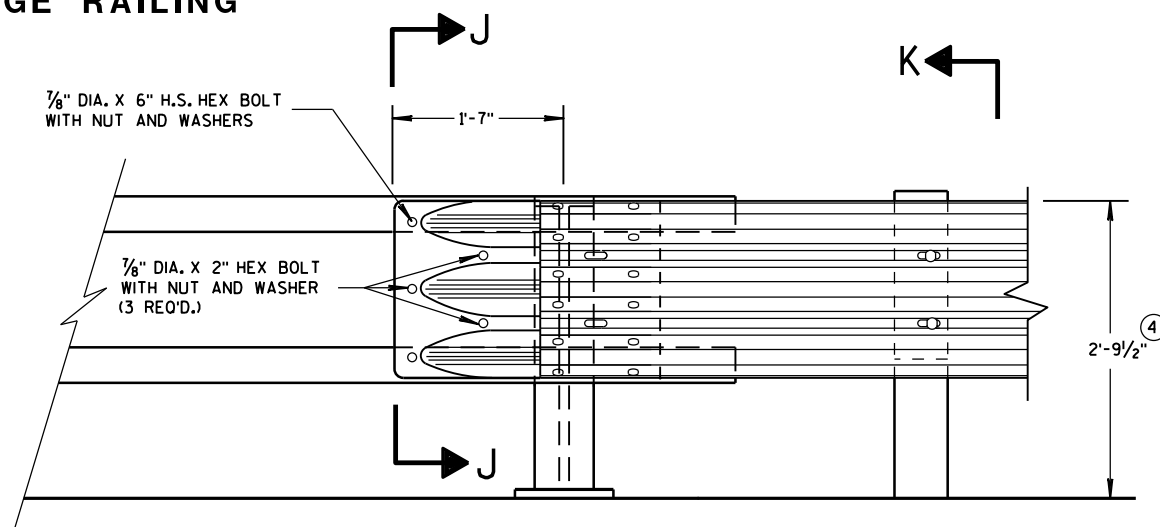
BACK-UP PLATE DETAIL



SECTION J-J

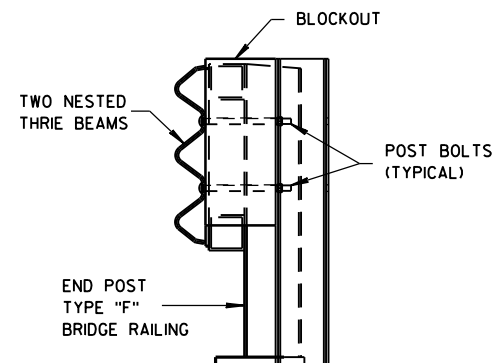


BACK-UP PLATE MOUNTING ONTO BRIDGE RAILING



FRONT VIEW

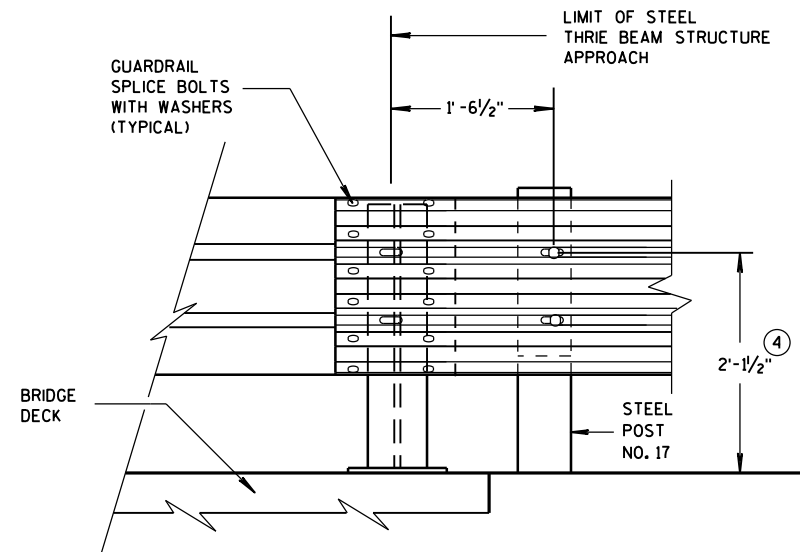
THRIE BEAM CONNECTION TO TUBULAR RAILING TYPE "F"



SECTION K-K

GENERAL NOTES

- ④ TOLERANCE FOR TOP OF BEAM IS $\pm 1"$.
- ⑥ DRILLING HOLES THROUGH THE PAPER, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.



FRONT VIEW

THRIE BEAM CONNECTION TO STEEL RAILING TYPE "W"

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

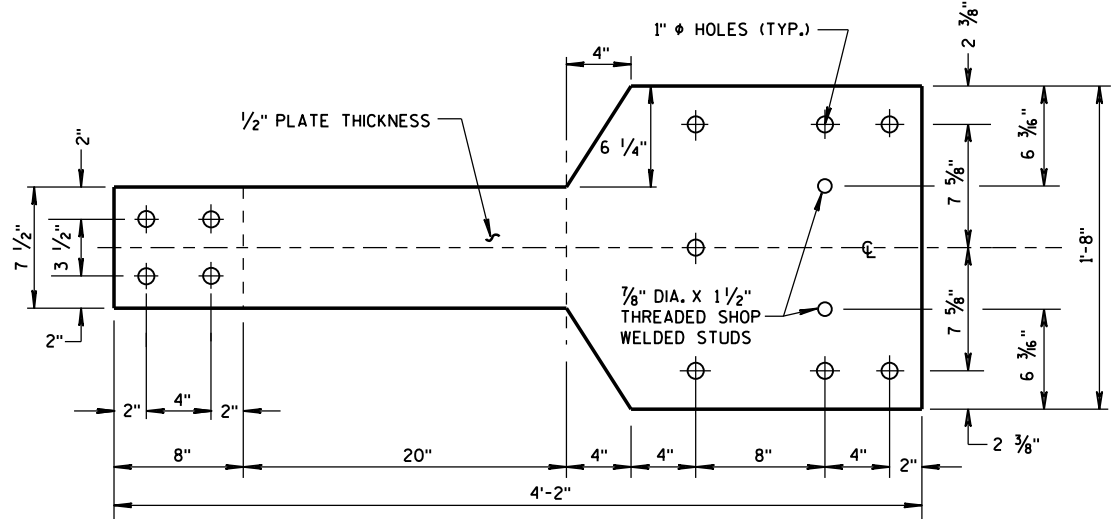
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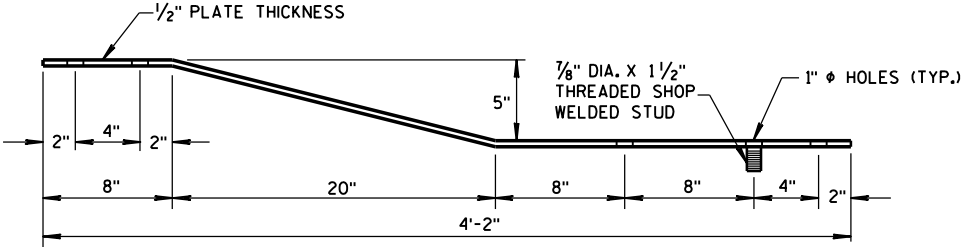
/S/ Jerry H. Zogg
ROADWAY STANDARDS DEVELOPMENT
ENGINEER

GENERAL NOTES

④ TOLERANCE FOR TOP OF W-BEAM RAIL IS $\pm 1"$.

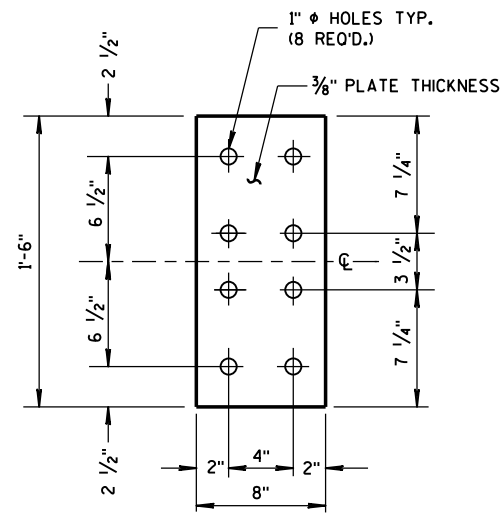


FRONT VIEW



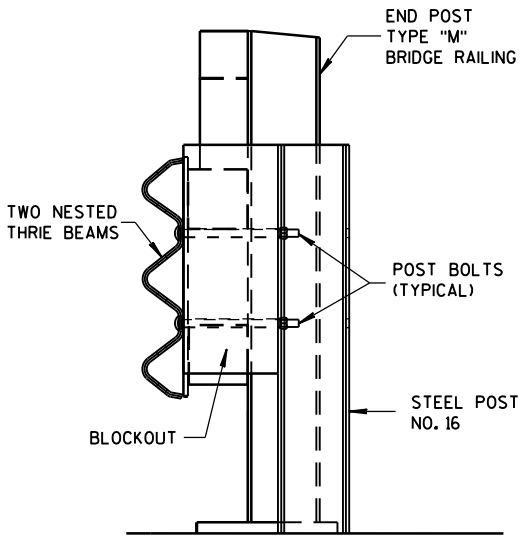
PLAN VIEW

BACK-UP PLATE DETAIL, TYPE "M"

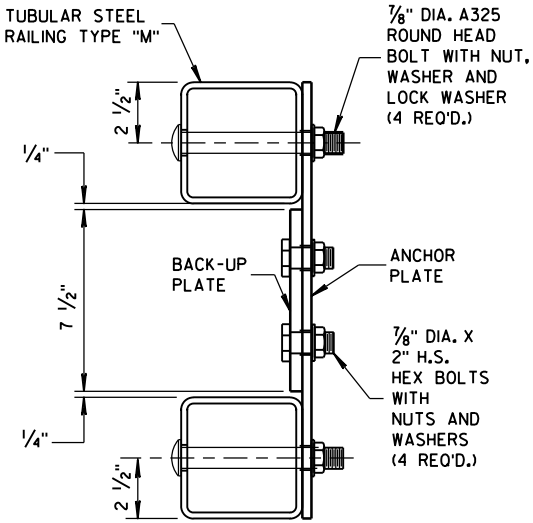


FRONT VIEW

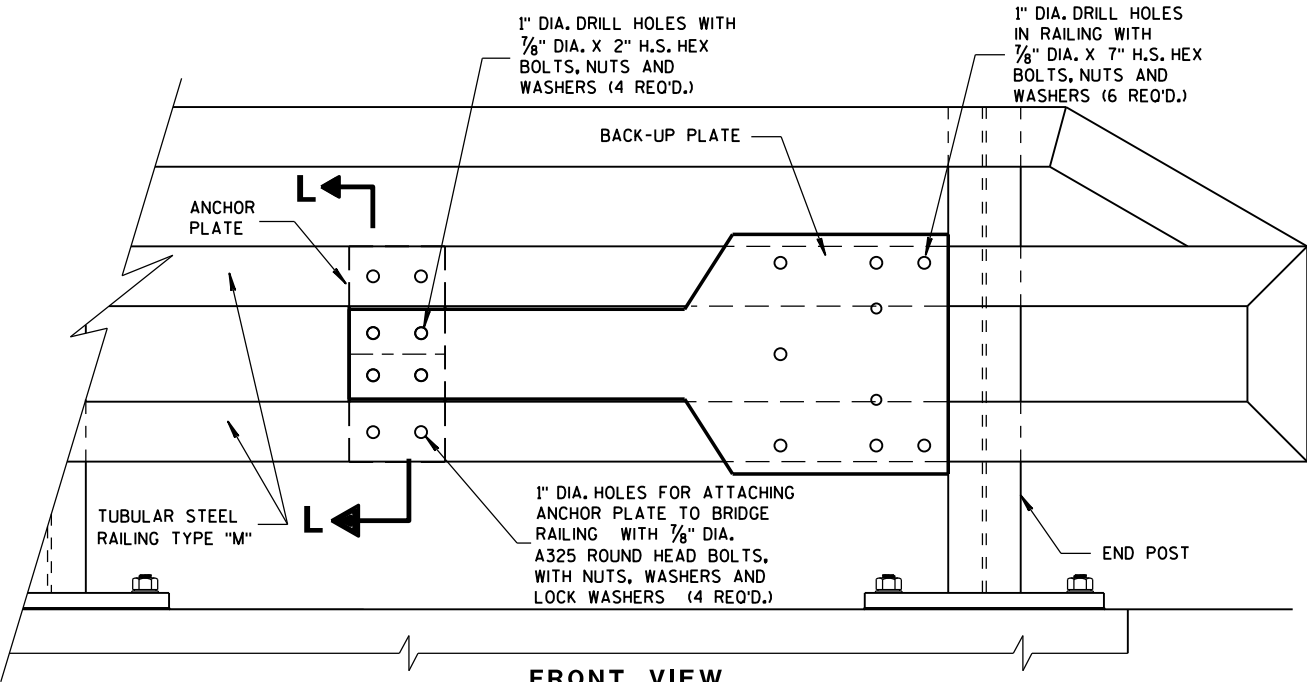
ANCHOR PLATE DETAIL, TYPE "M"



SECTION M-M

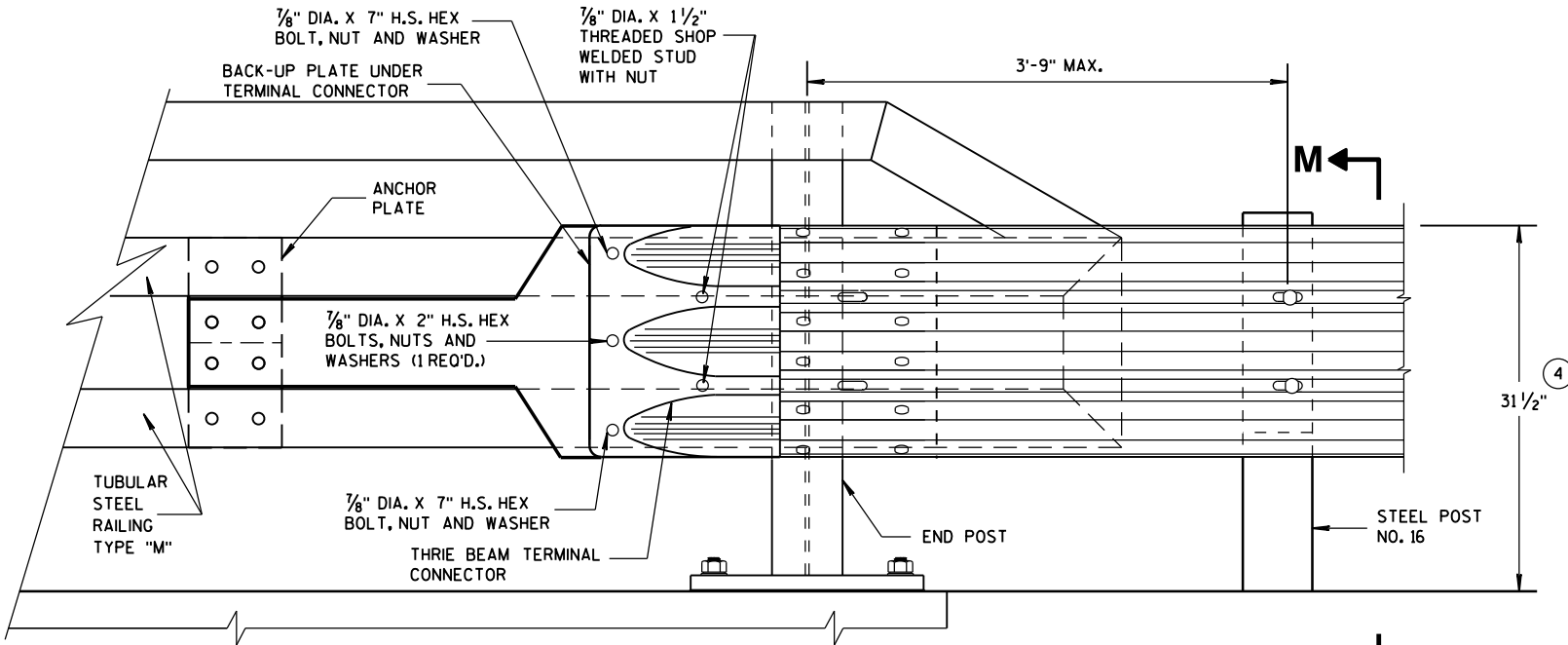


SECTION L-L

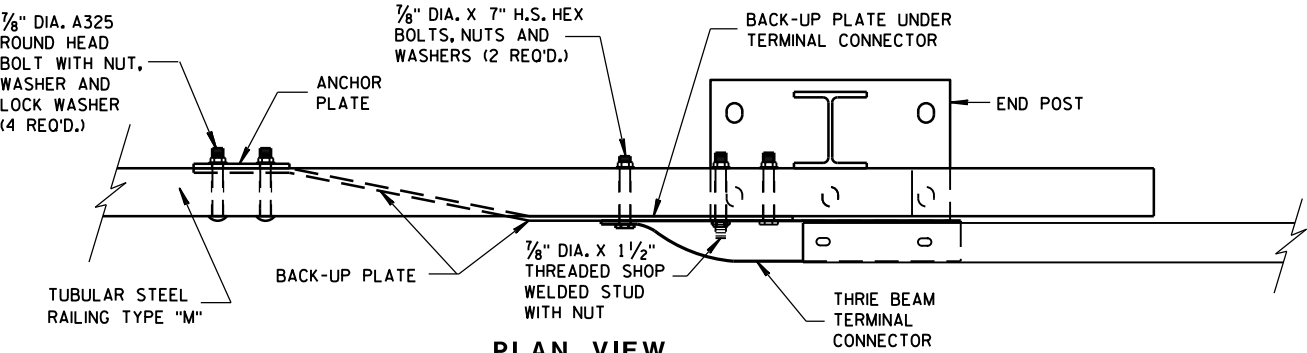


FRONT VIEW

ANCHOR AND BACK-UP PLATE MOUNTING TO BRIDGE RAILING, TYPE "M"



FRONT VIEW



PLAN VIEW

THRIE BEAM CONNECTION TO TUBULAR RAILING, TYPE "M"

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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June, 2015

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/s/ Jerry H. Zogg

ROADWAY STANDARDS DEVELOPMENT

ENGINEER



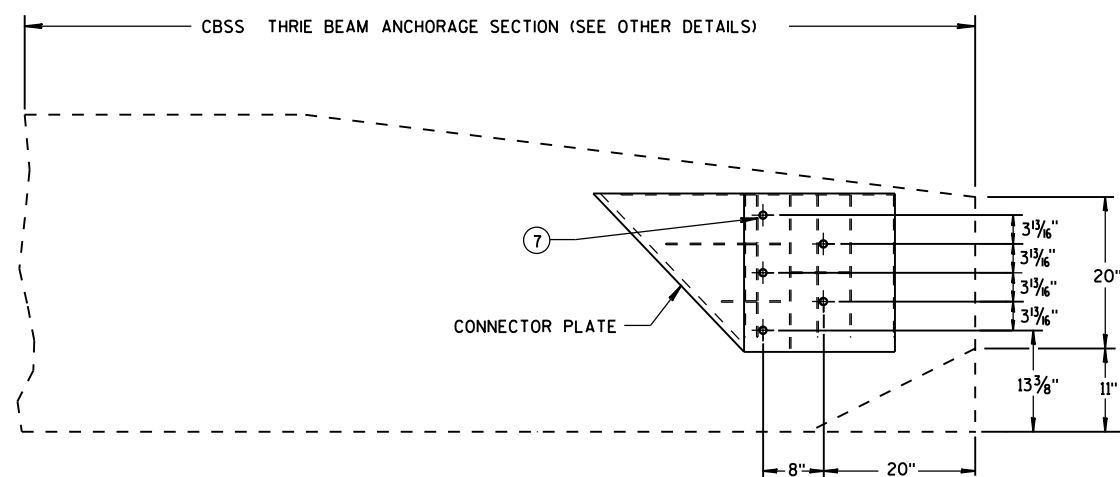
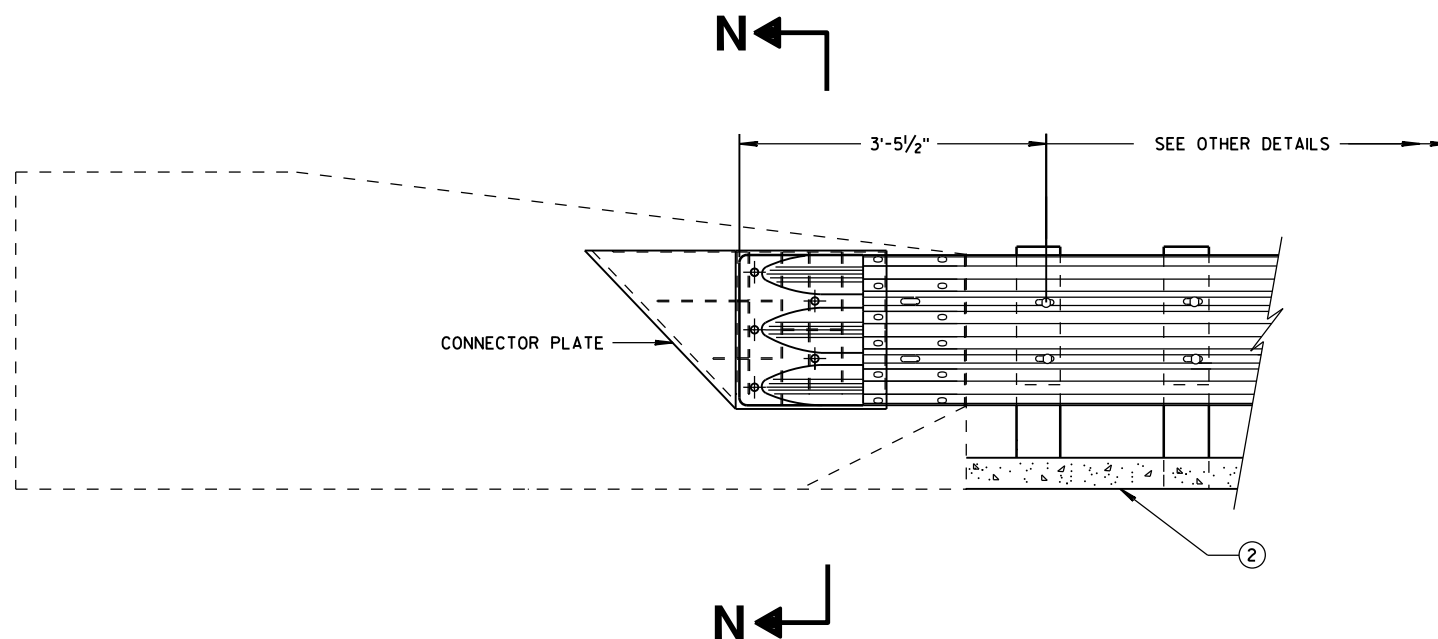
- 10 STIFFENERS LOCATED AT THE OUTSIDE EDGES OF THE COVER PLATES SHALL BE WELDED AS FOLLOWS:
SINGLE BEVEL GROOVE WELD ON EXTERNAL SIDES AND $\frac{3}{8}$ " FILLET WELD BY 1" LONG SPACED AT 2" ON INTERNAL SIDES.
- 11 STIFFENERS LOCATED ON THE INSIDE OF THE COVER PLATE SHALL BE WELDED AS FOLLOWS:
 $\frac{3}{8}$ " 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 3/16"	3/16"
P3	1		39" x 3 5/8" x 20" x 19 5/16"	3/16"
S1	4		18 1/16" x 3 5/8" x 18 3/4"	1/4"
S2	1		10 1/4" x 2 1/16" x 10 3/8" x 1/2"	1/4"
S3	1		3" x 1/16" x 3/8" x 1/2"	1/4"
S4	1		6 1/8" x 2 1/16"	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 3/16" x 6" x 3 3/8" 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 3/32"	1/4"
S10	1		1 7/8" x 9 7/8" x 3 5/8" x 9 1/16"	1/4"
S11	1		8 1/2" x 8 3/4" x 1 1/16"	1/4"

SINGLE SLOPE CONNECTION PLATE

APPROVED	
June, 2015	/s/ Jerry H. Zogg
DATE	ROADWAY STANDARDS DEVELOPMENT ENGINEER
FHWA	

THRIE BEAM CONNECTION TO SINGLE SLOPE BARRIER



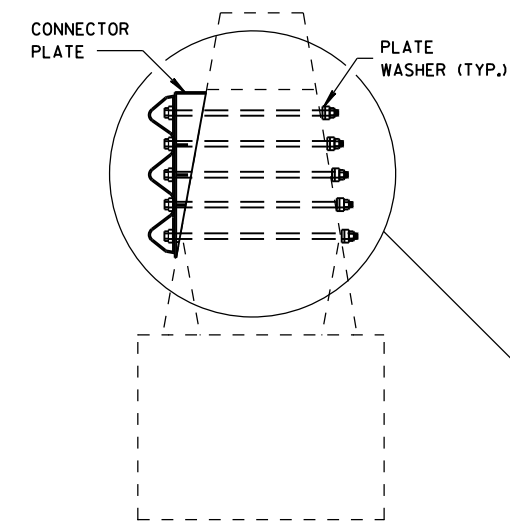
SINGLE SLOPE CONNECTION PLATE PLACEMENT

GENERAL NOTES

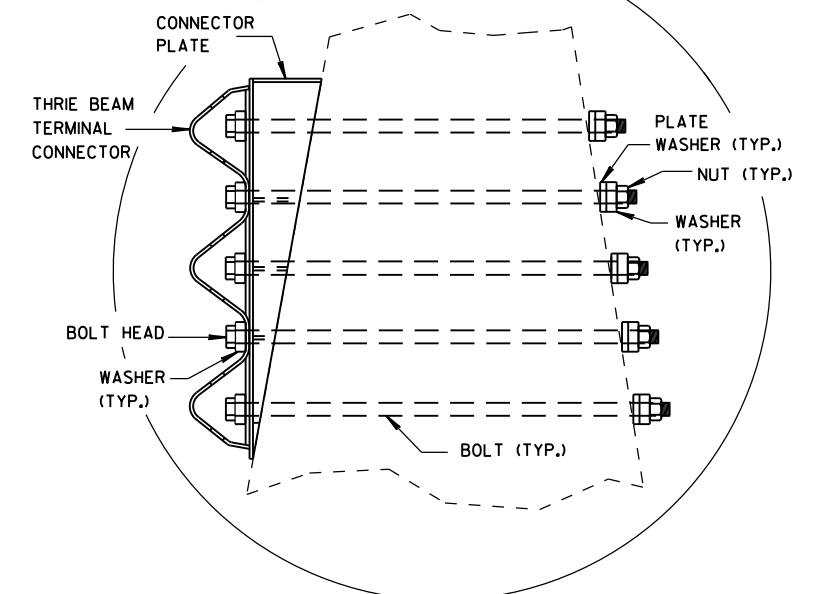
CONNECTOR PLATE, DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.

(2) OPTIONAL CURB AND GUTTER OR DRAINAGE FEATURE SEE PLAN FOR INFORMATION.

(7) 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 5/8" THICK AND ONE PLATE WASHER. REPAIR ANY DAMAGED CONCRETE FROM BOLT INSTALLATION.



SECTION N-N



MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

June, 2015

DATE

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/s/ Jerry H. Zogg

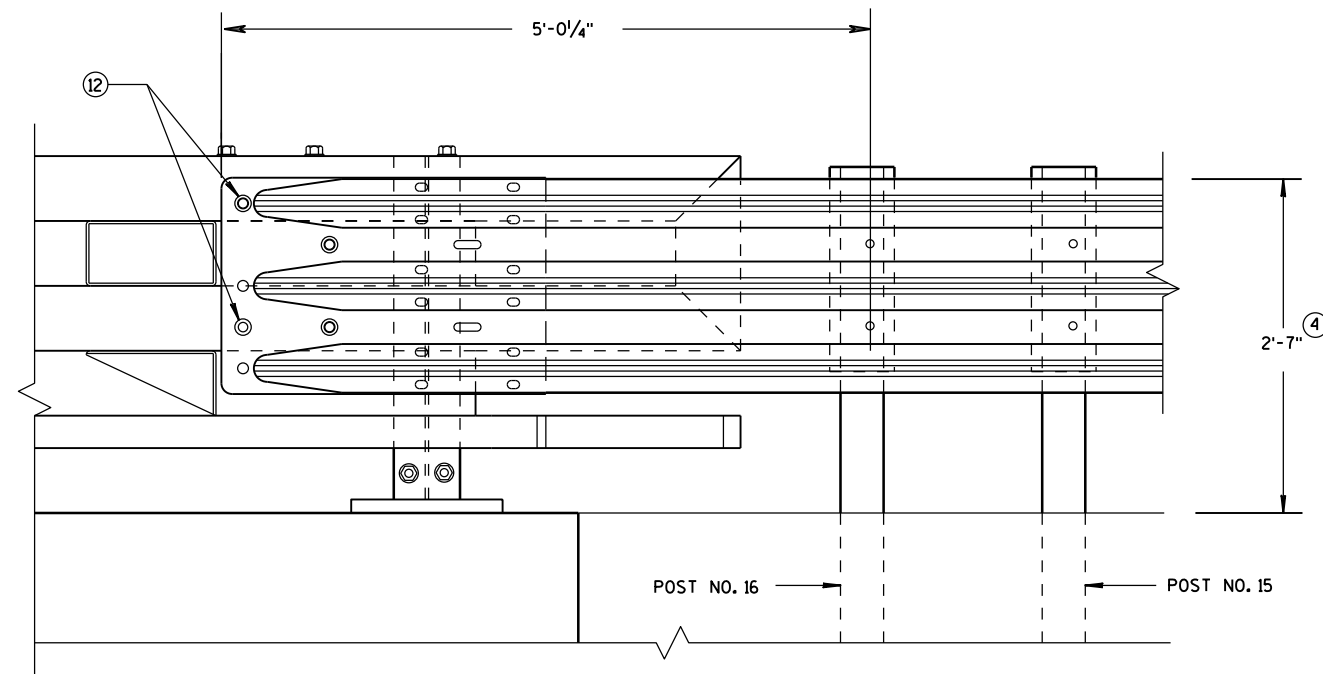
ROADWAY STANDARDS DEVELOPMENT

ENGINEER

GENERAL NOTES

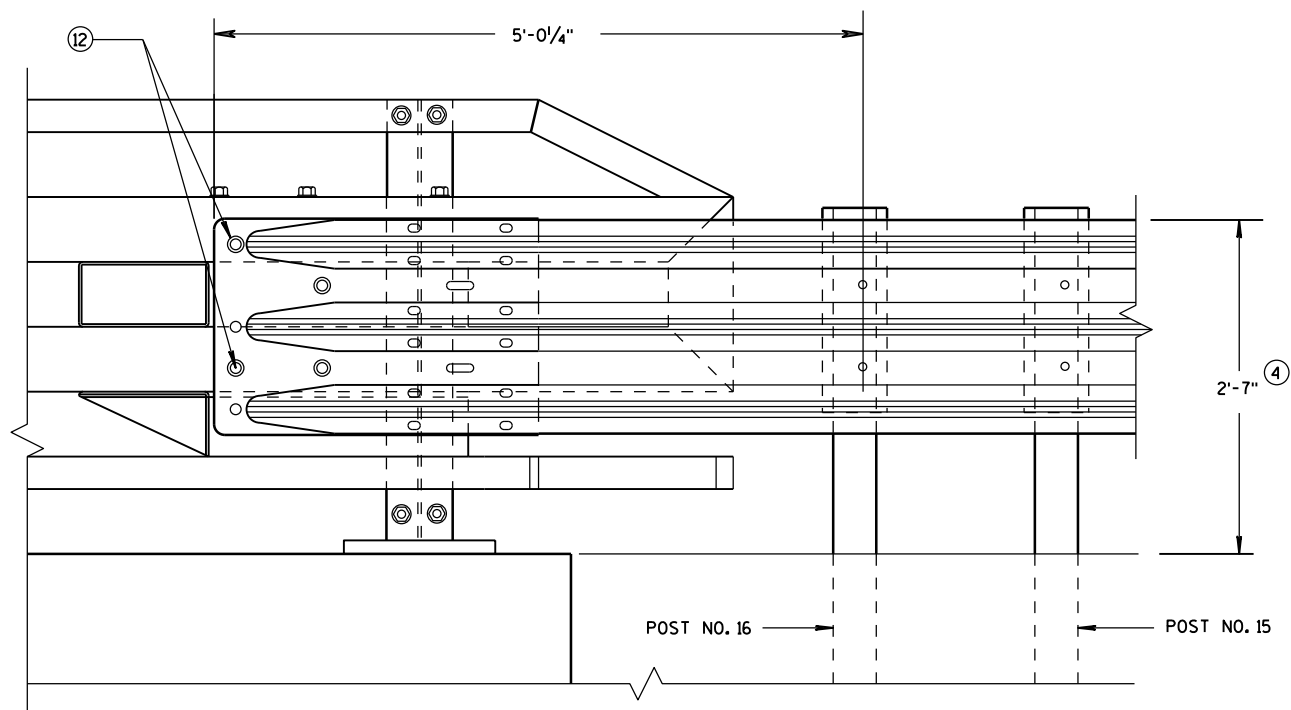
④ TOLERANCE FOR TOP OF BEAM IS $\pm 1"$.

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ELEVATION OF DETAIL AT NY3 END POST

THRIE BEAM RAIL ATTACHMENT



ELEVATION OF DETAIL AT NY4 END POST

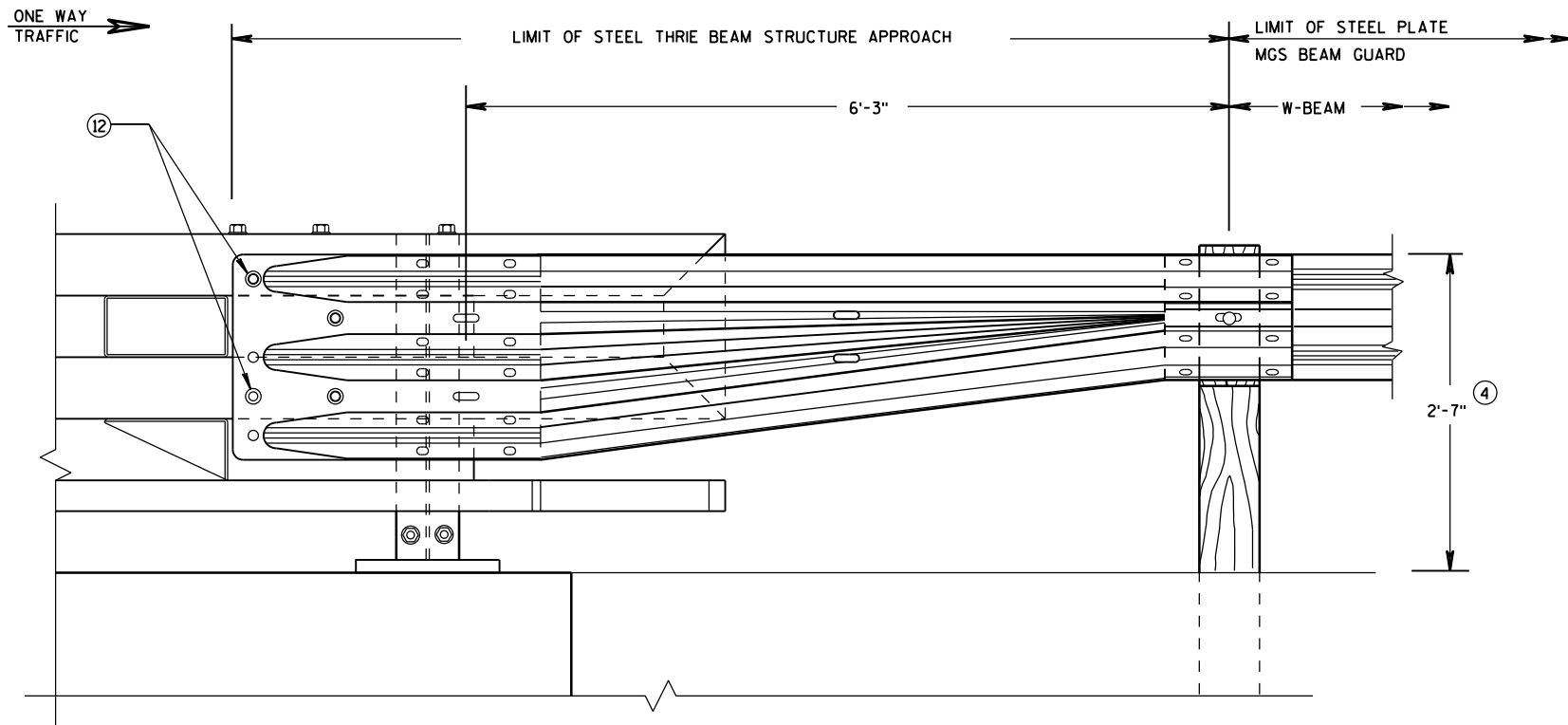
THRIE BEAM RAIL ATTACHMENT

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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ENGINEER

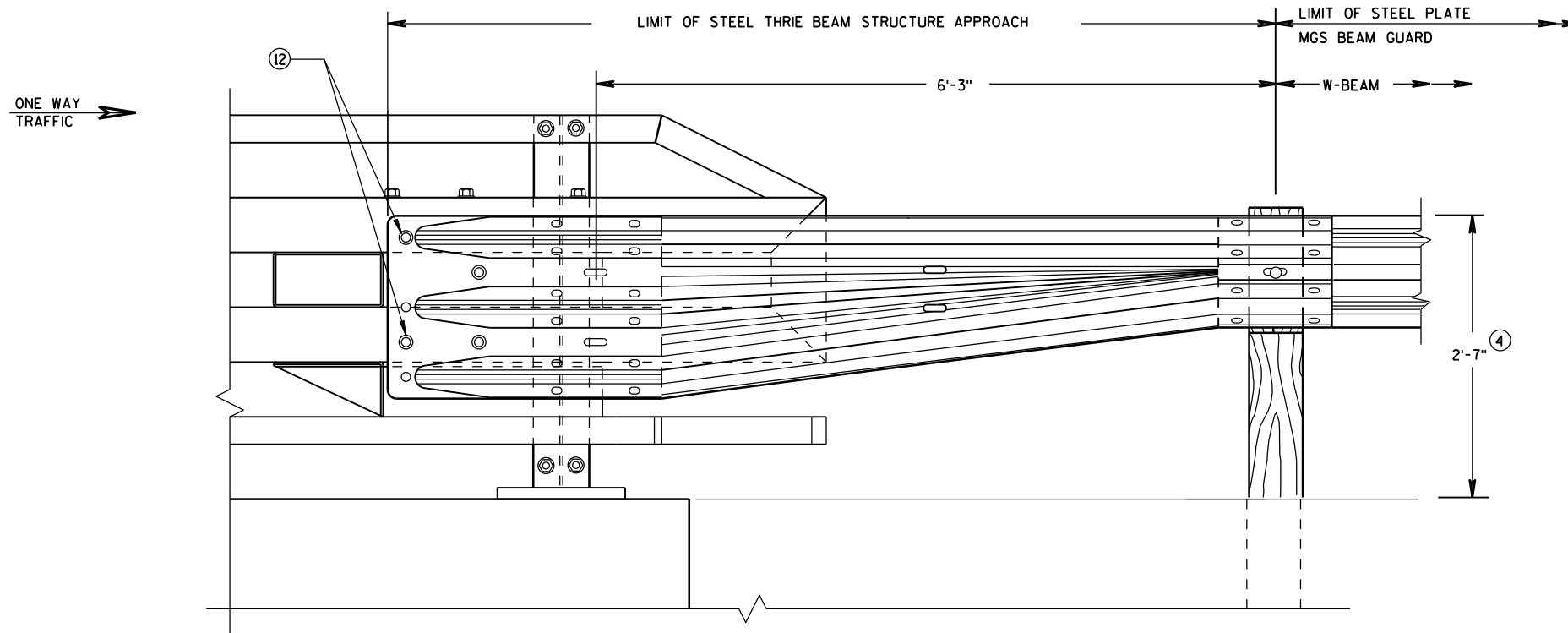


FRONT VIEW

**W BEAM TRANSITION AND
CONNECTION TO BRIDGE RAILING TYPE "NY3"**
(USE ONLY ON THE TRAFFIC EXIT END OF ONE WAY BRIDGES)

GENERAL NOTES

- ④ TOLERANCE FOR TOP OF BEAM IS $\pm 1"$.
- ⑫ 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. ON BACKSIDE OF PARAPET ONE ROUND WASHER, AND NUT REQUIRED. BOLT THREAD IS TO EXTEND $\frac{1}{2}$ -INCH BEYOND NUT.



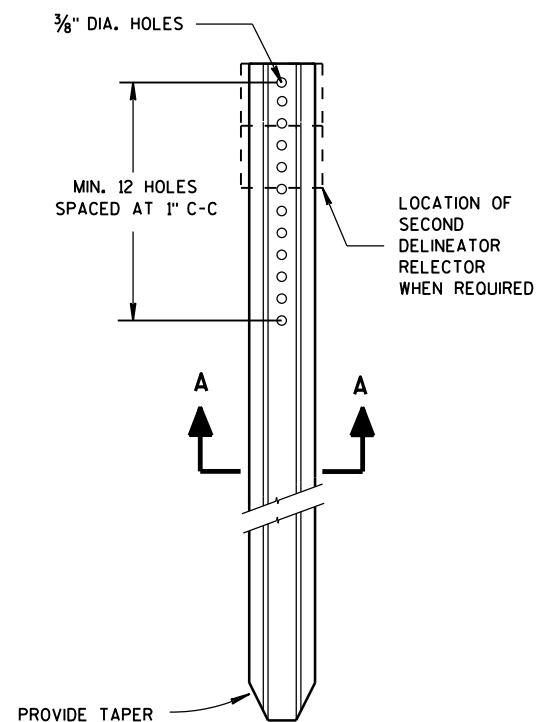
FRONT VIEW

**W BEAM TRANSITION AND
CONNECTION TO BRIDGE RAILING TYPE "NY4"**
(USE ONLY ON THE TRAFFIC EXIT END OF ONE WAY BRIDGES)

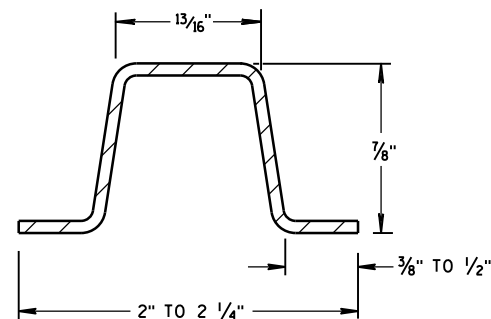
MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED June, 2015 DATE	/S/ Jerry H. Zogg ROADWAY STANDARDS DEVELOPMENT ENGINEER
FHWA	

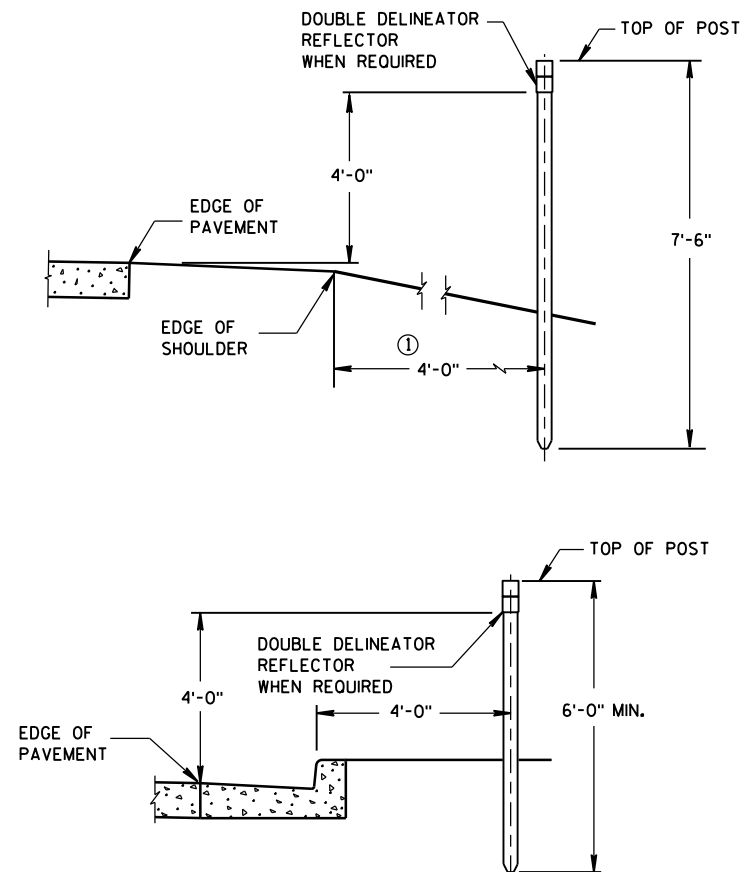


DELINEATOR POST



SECTION A-A

WEIGHT 1.12 LBS PER FT. ± 0.1 LB.

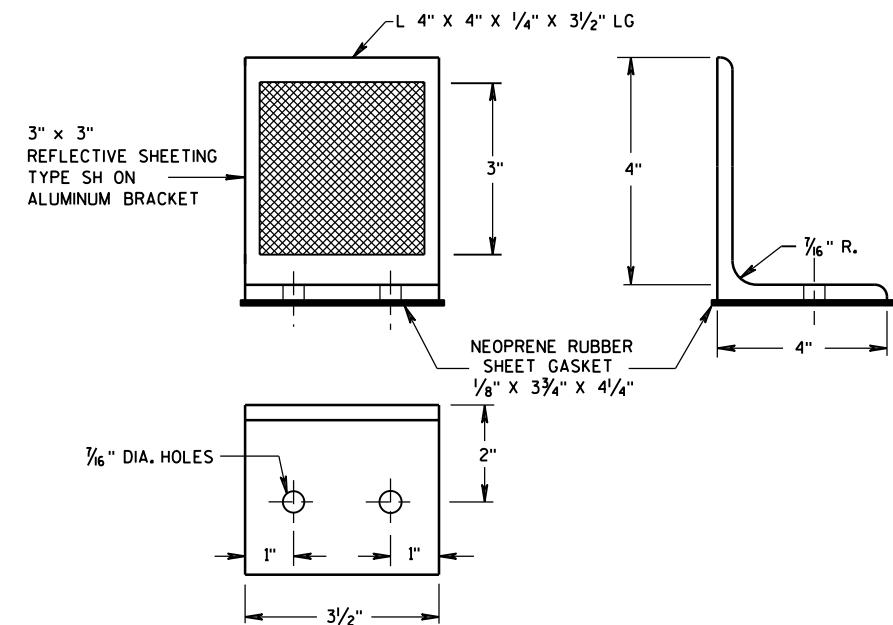


TYPICAL INSTALLATIONS OF DELINEATOR POSTS

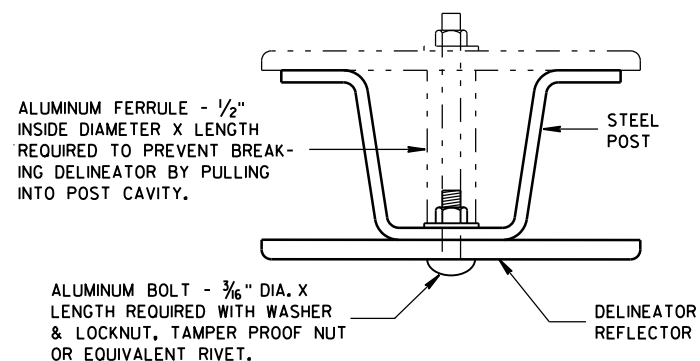
GENERAL NOTES

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

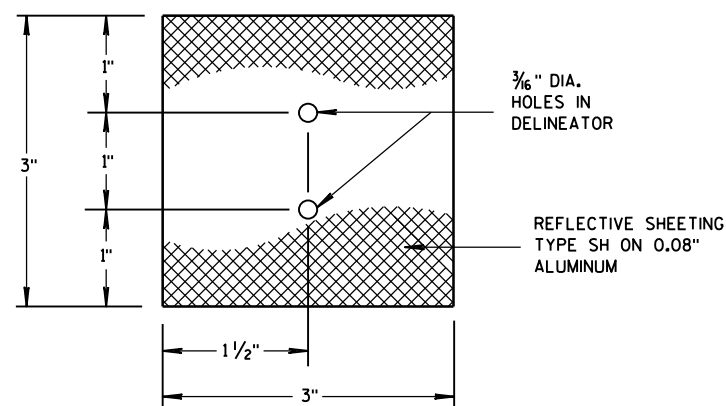
- ① DELINEATORS SHALL BE PLACED AT A CONSTANT DISTANCE FROM THE EDGE OF THE SHOULDER FOR THE LENGTH OF THE INSTALLATION.



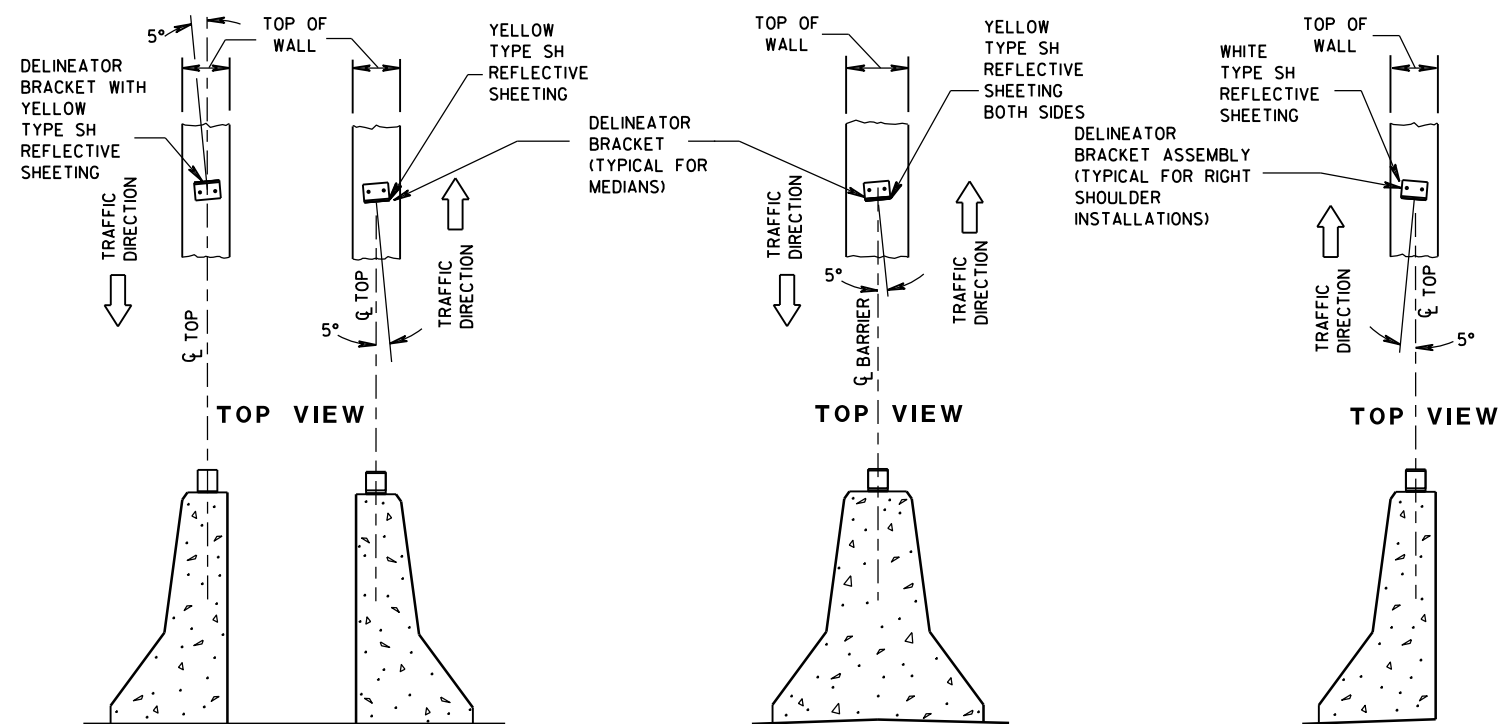
DELINEATOR BRACKET



MOUNTING DETAIL FOR DELINEATOR REFLECTOR



3" x 3" DELINEATOR REFLECTOR

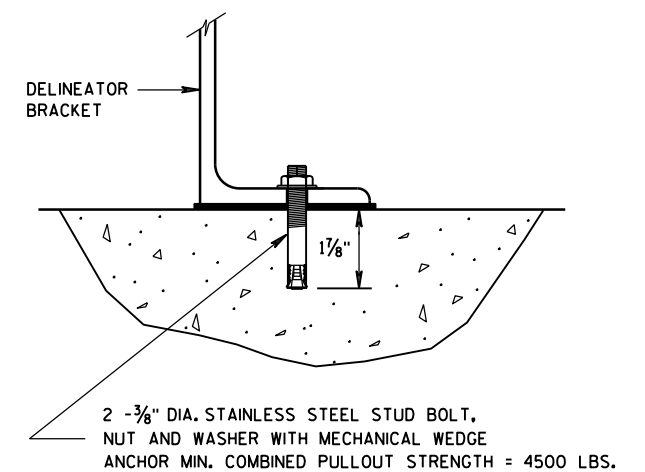


DOUBLE BARRIERS IN MEDIAN

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 REFLECTOR AND
DELINEATOR BRACKET
WITH REFLECTIVE SHEETING

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

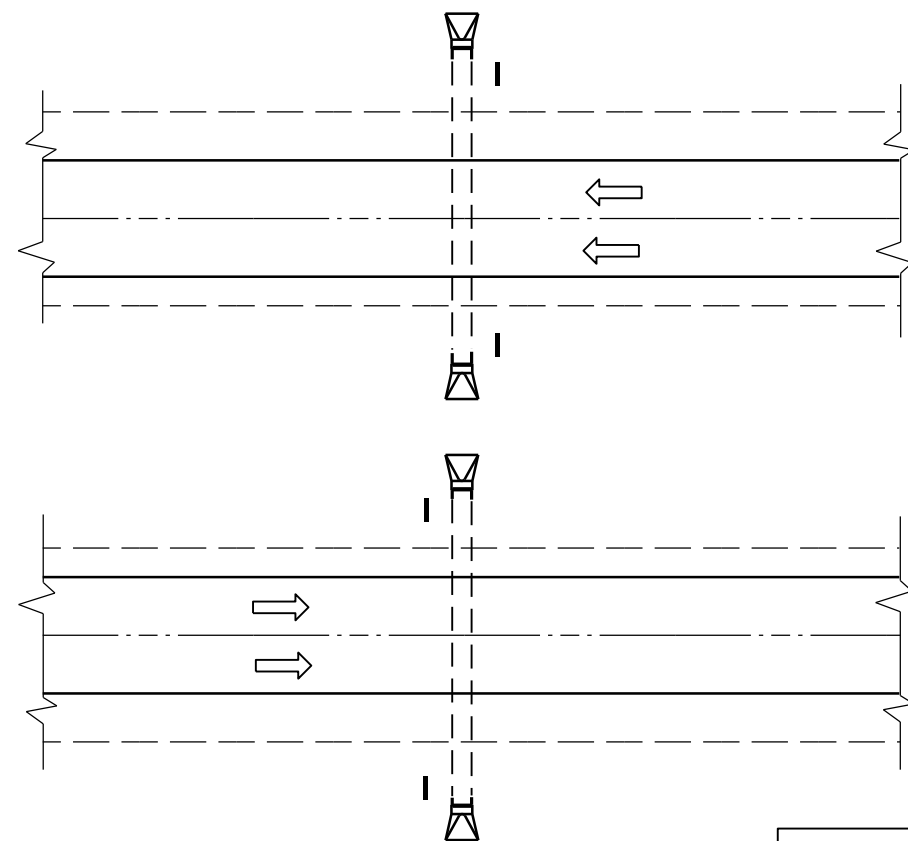
4-18-16

DATE

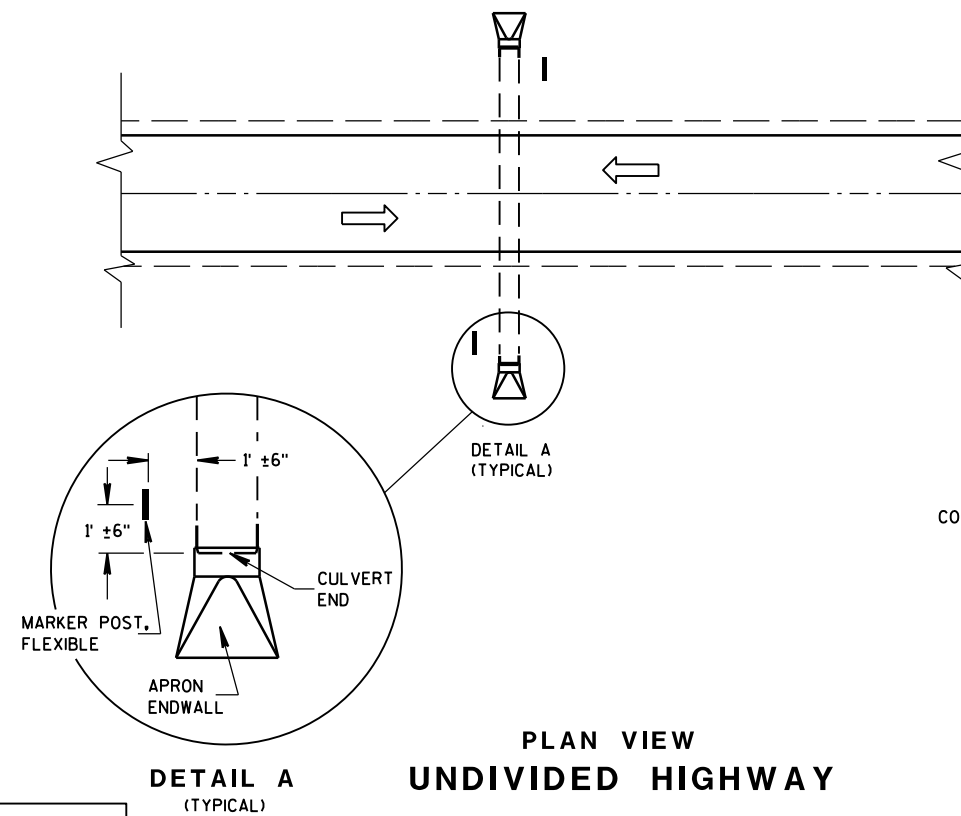
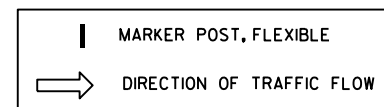
/S/ Matthew R. Rauch

STATE SIGNING AND MARKING ENGINEER

FHWA



PLAN VIEW
DIVIDED HIGHWAY

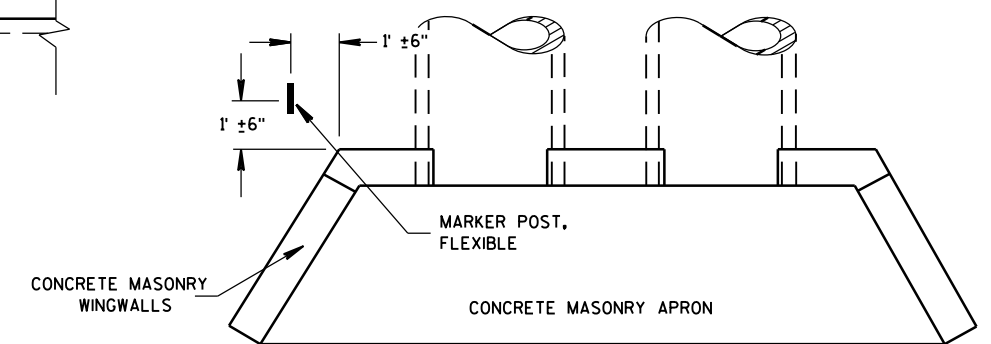


PLAN VIEW
UNDIVIDED HIGHWAY

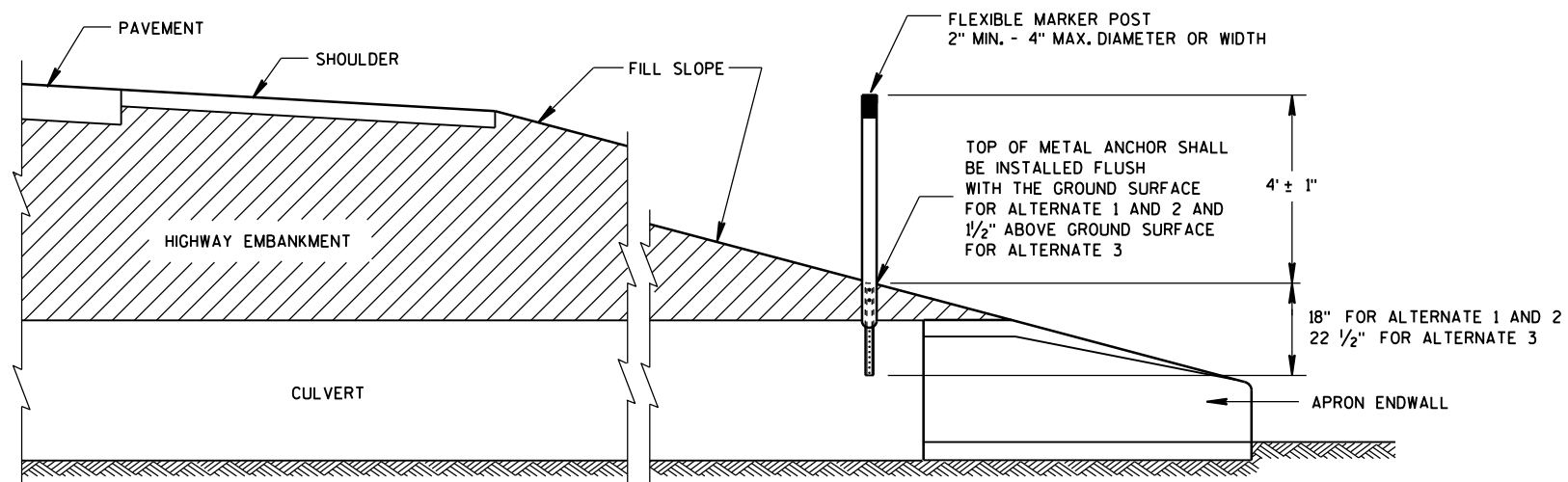
FLEXIBLE MARKER POST LOCATION

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.



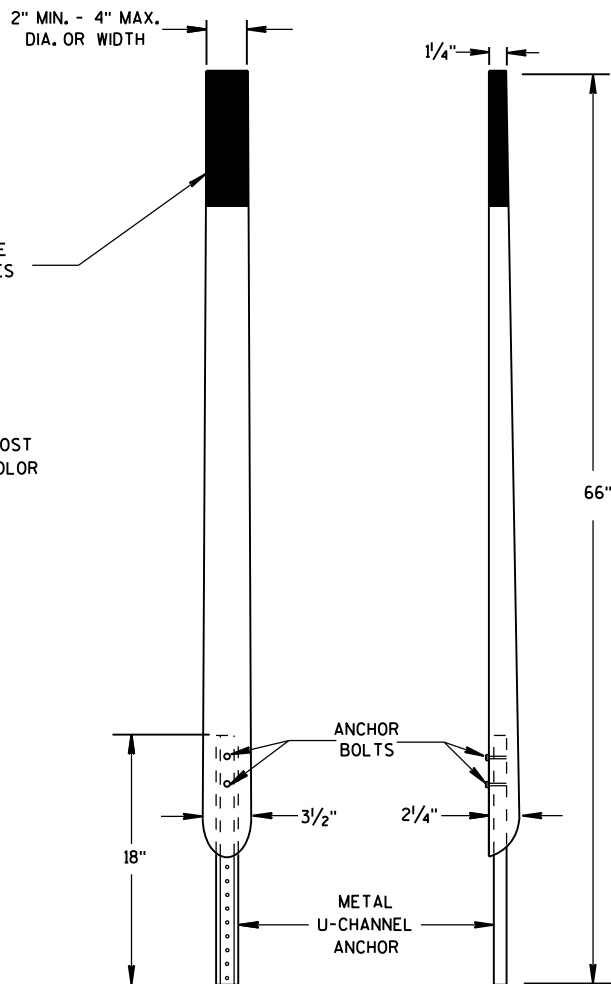
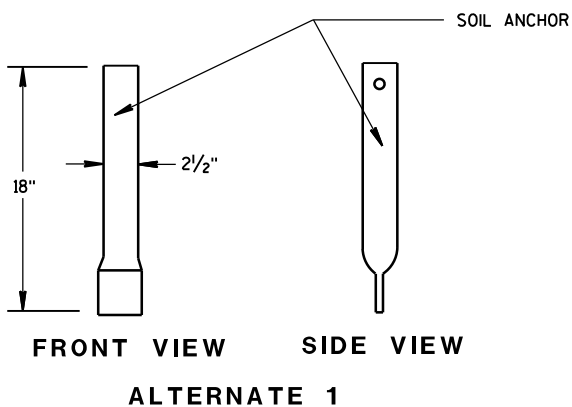
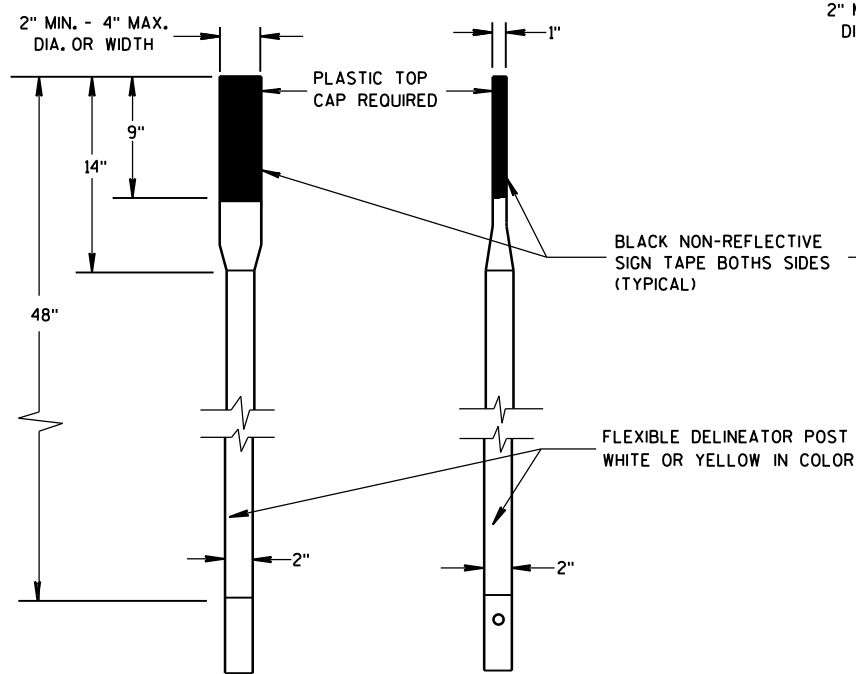
PLAN VIEW
CONCRETE MASONRY ENDWALLS FOR
CULVERT PIPE AND PIPE ARCH



CROSS SECTION
FLEXIBLE MARKER POST

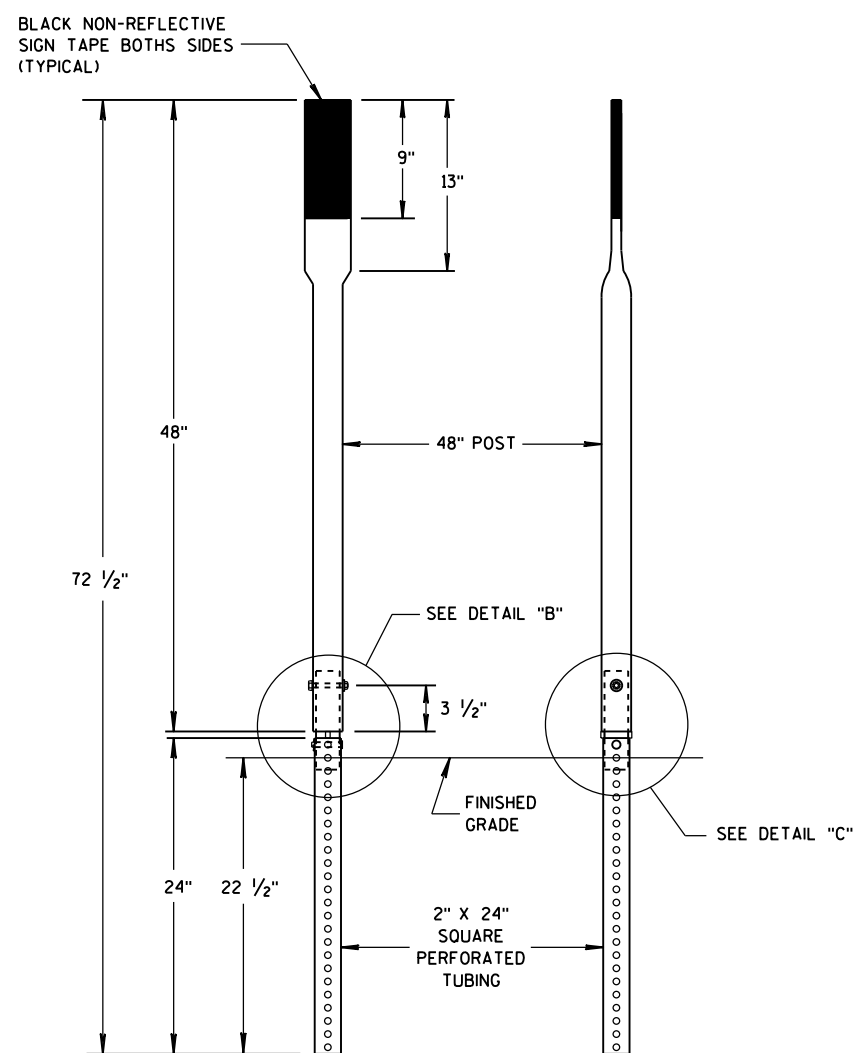
FLEXIBLE MARKER POST
FOR CULVERT END

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

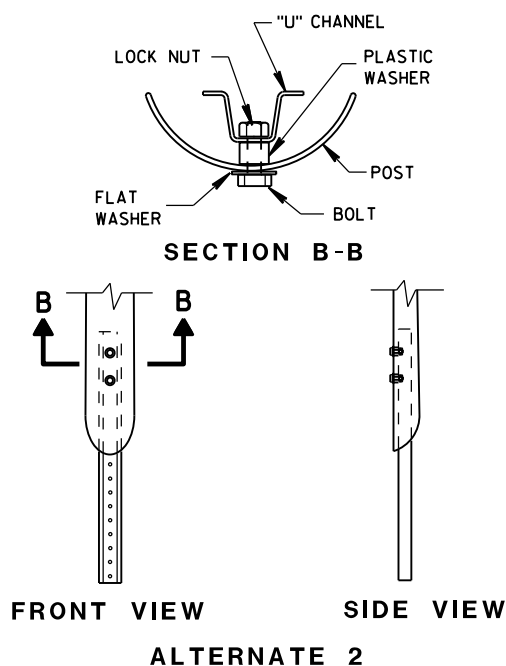
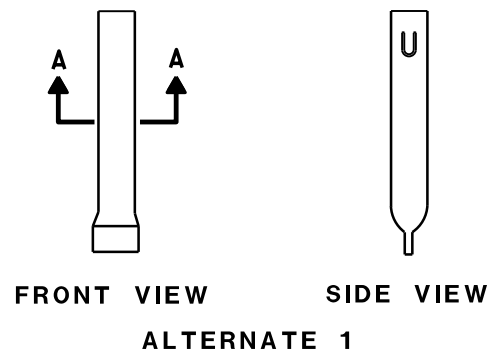
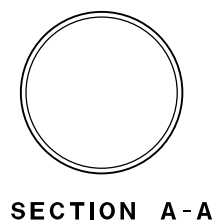
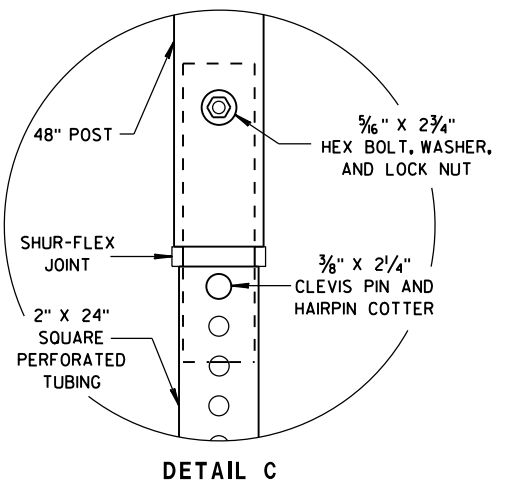
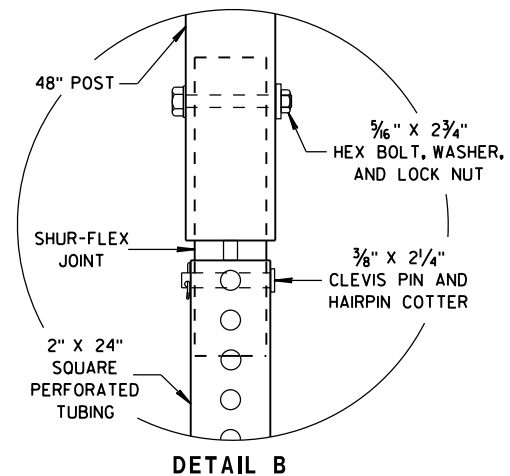
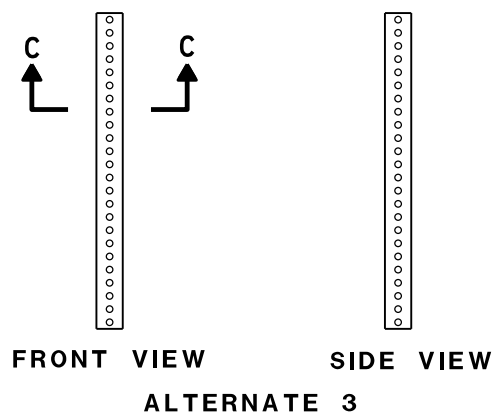
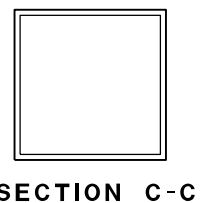


FRONT VIEW SIDE VIEW
ALTERNATE 2

FLEXIBLE MARKER POSTS



FRONT VIEW SIDE VIEW
ALTERNATE 3

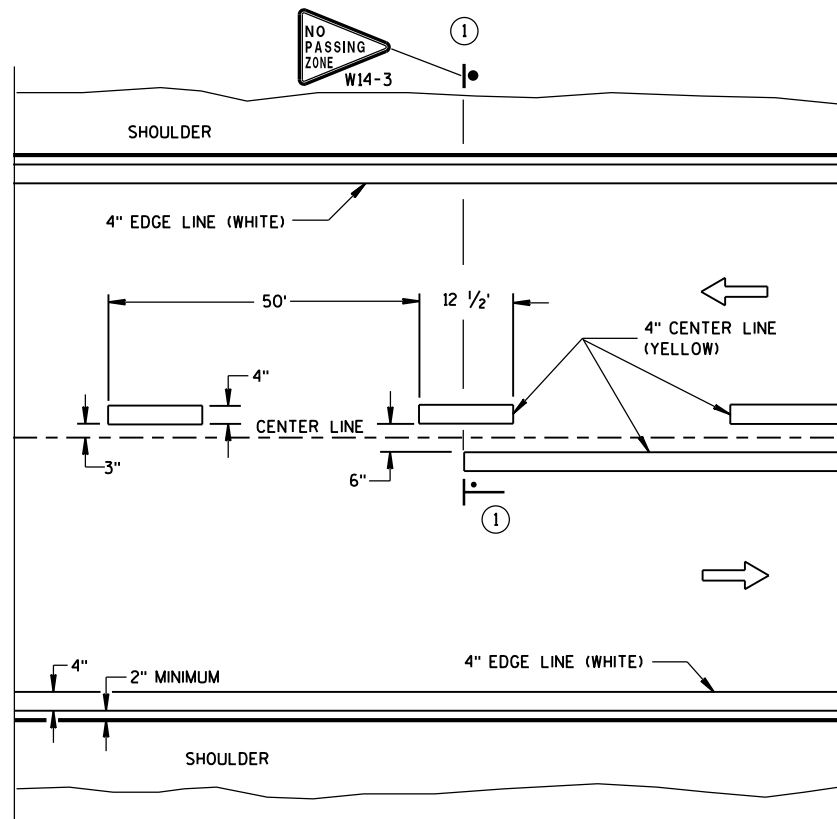


FLEXIBLE MARKER POST ANCHORS

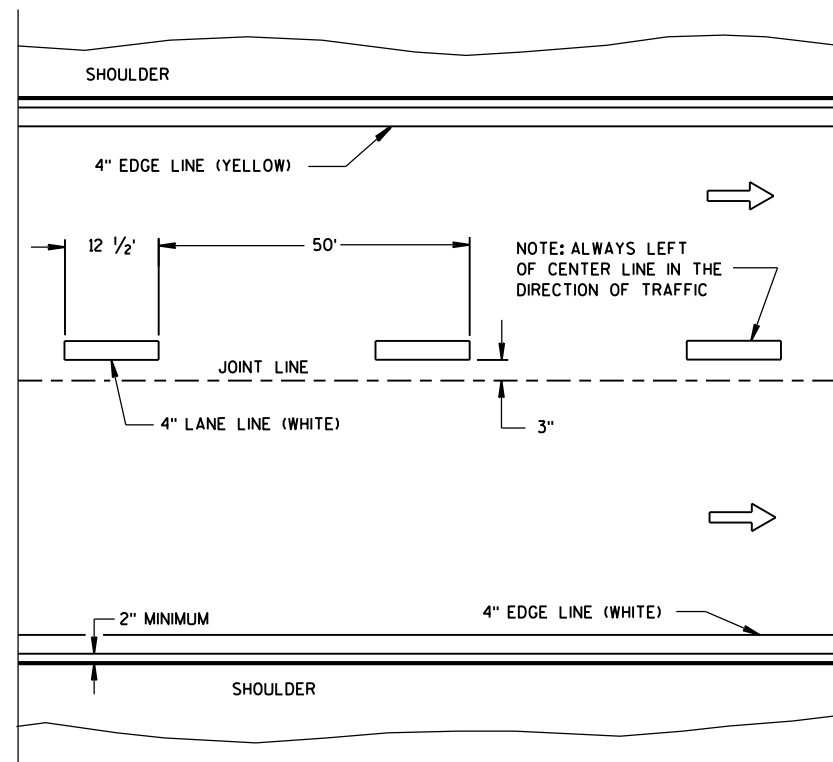
FLEXIBLE MARKER POST
FOR CULVERT END

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
10/1/2012 /S/ Travis Feltes
DATE STATE TRAFFIC ENGINEER OF DESIGN
FHWA

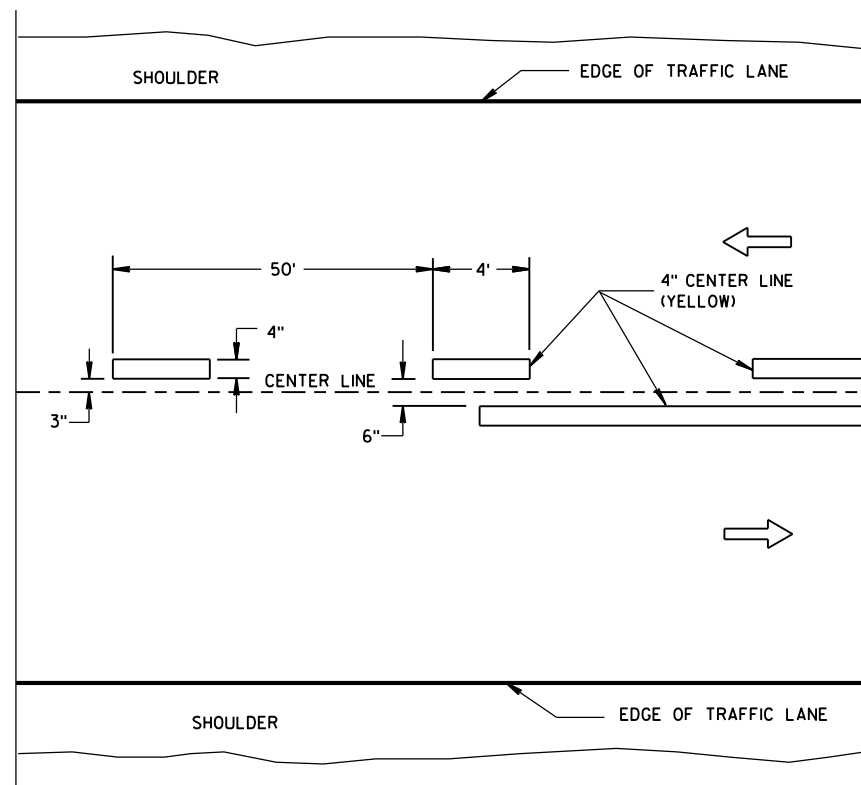


TWO WAY TRAFFIC

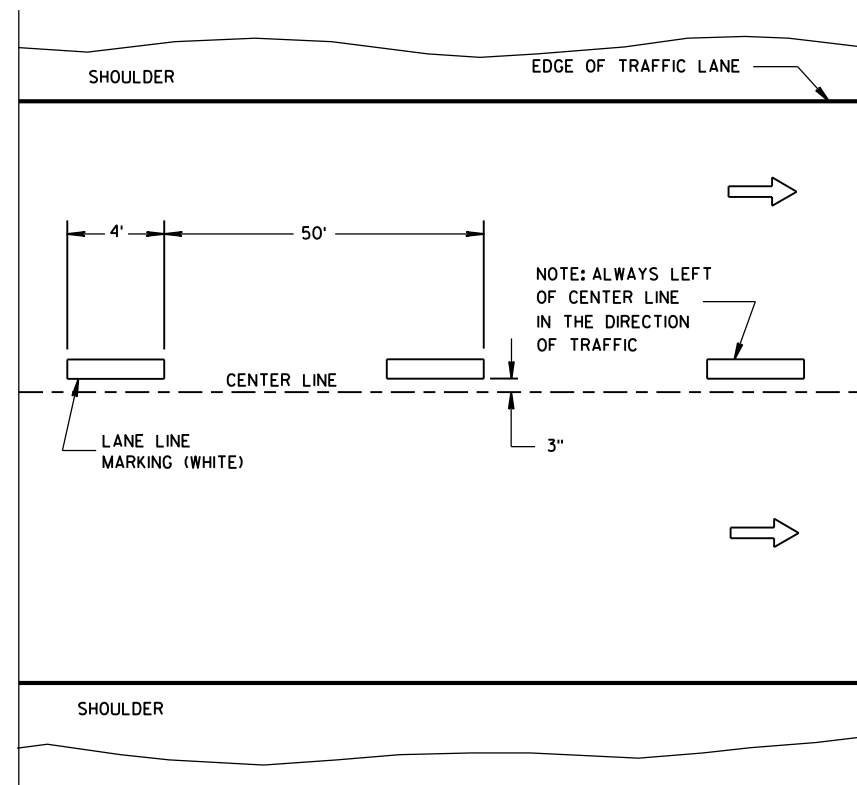


ONE WAY TRAFFIC

PERMANENT PAVEMENT MARKING



TWO WAY TRAFFIC



ONE WAY TRAFFIC

TEMPORARY PAVEMENT MARKING

GENERAL NOTES

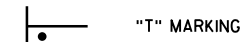
DETAILS OF CONSTRUCTION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS.

- ① LOCATE THE NO PASSING ZONE W14-3 SIGN WITHIN 50 FEET OF THE "T" MARKING.

NOTE

ARROW SYMBOL () SHOWS DIRECTION OF TRAVEL

LEGEND



"T" MARKING

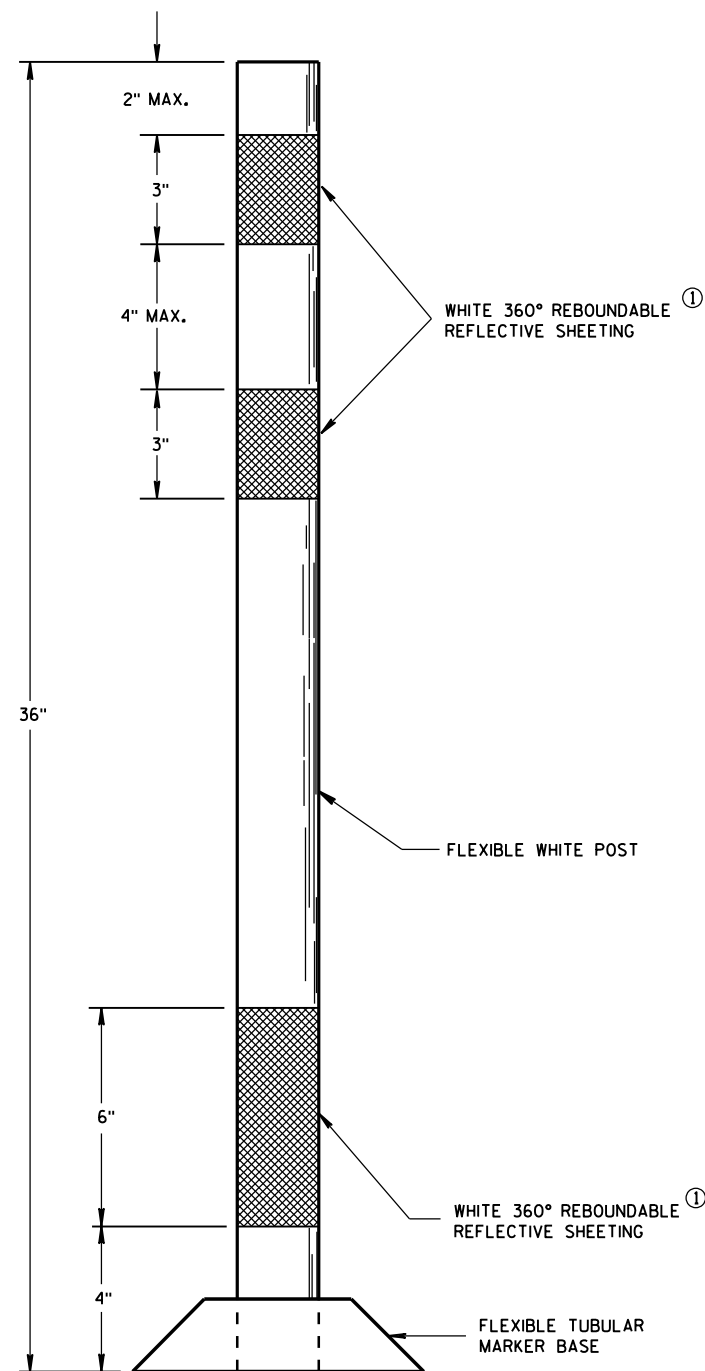


POST MOUNTED SIGN

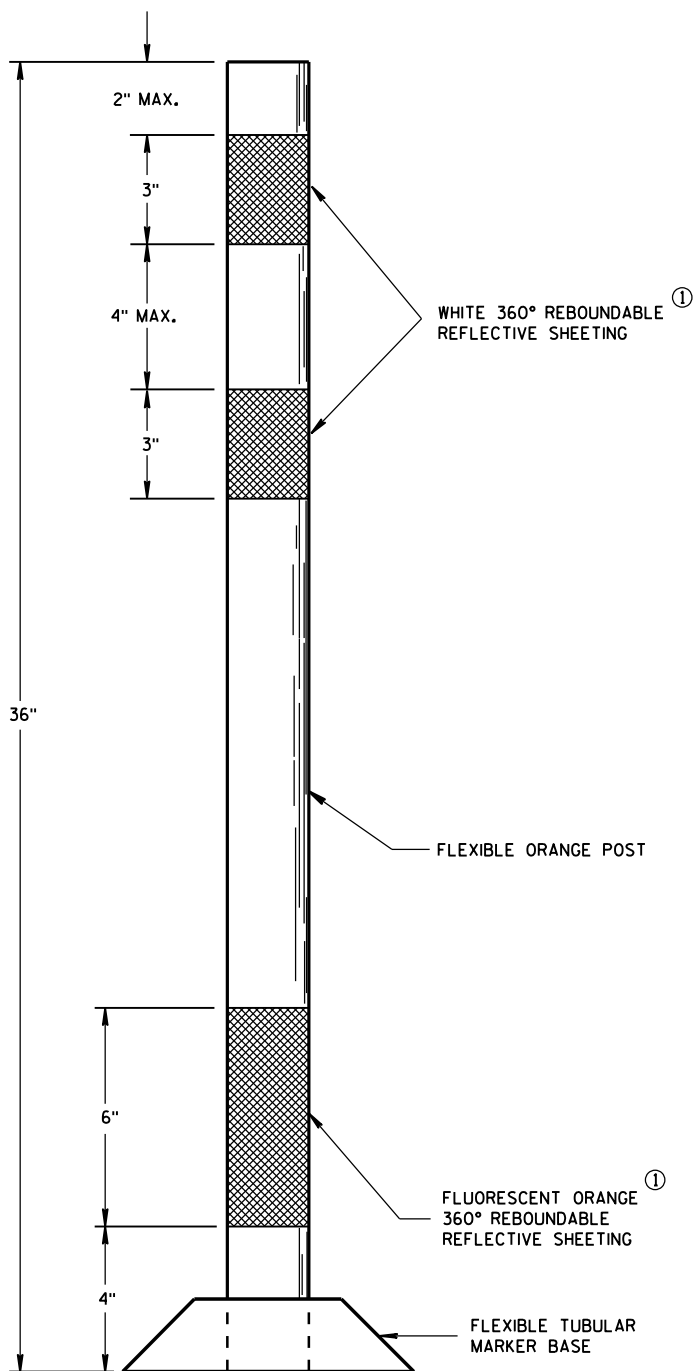
LONGITUDINAL MARKING (MAINLINE)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
June 2017 /S/ Matthew R. Rauch
DATE STATE SIGNING AND MARKING ENGINEER
FHWA



**FLEXIBLE
TUBULAR MARKER POST
PERMANENT CROSSOVER**



**FLEXIBLE
TUBULAR MARKER POST
WORK ZONE**

GENERAL NOTES

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

SURFACE MOUNTED BASES SHALL BE FURNISHED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS TO BE COMPATIBLE WITH FLEXIBLE TUBULAR MARKER POSTS TO A SIZE AND SHAPE THAT WILL PROVIDE A STABLE POST FOUNDATION WHEN SECURED TO THE PAVEMENT.

THE ASPHALTIC ADHESIVE OR BUTYL PAD FURNISHED SHALL BE IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS, UNLESS DIRECTED BY THE ENGINEER TO USE BOLTS.

- ① REFLECTIVE SHEETING SHALL FOLLOW THE REQUIREMENTS IN THE APPROVED PRODUCTS LISTING FOR SIGN SHEETING.

CHANNELIZING DEVICES FLEXIBLE TUBULAR MARKER POST	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED June 2017 DATE	/S/ Andrew Heldtke WORK ZONE ENGINEER
FHWA	

LEGEND

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

GENERAL NOTES

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

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

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

ALL SIGNS ARE 48"x48" UNLESS OTHERWISE NOTED.

"W0" IS THE SAME AS "W" EXCEPT THE BACKGROUND IS ORANGE.

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

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

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

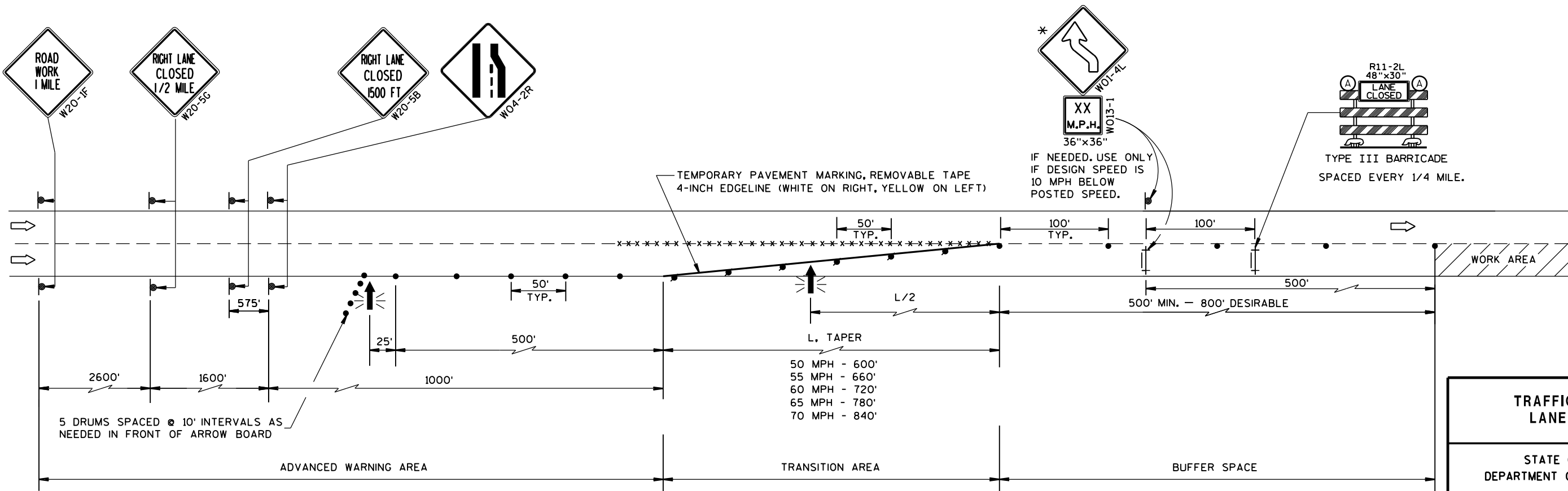
REMOVE PAVEMENT MARKINGS IF LANE CLOSURE IS TO BE IN PLACE FOR LONGER THAN 4 OR MORE DAYS AND NIGHTS.

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

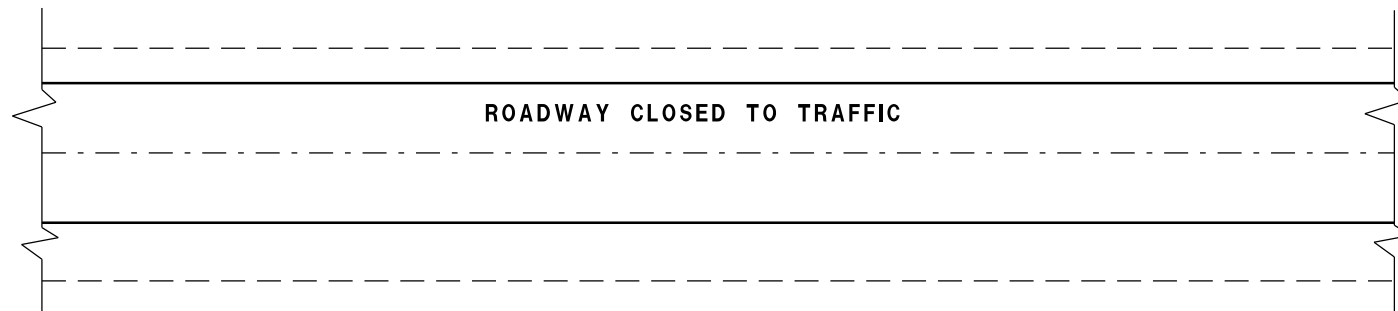
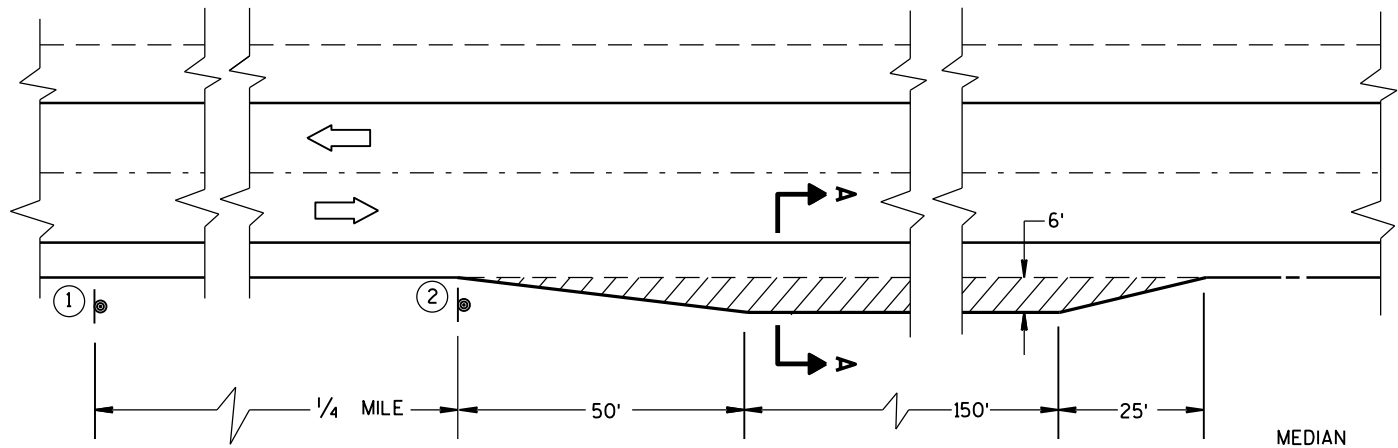
IF THE HORIZONTAL ALIGNMENT IS SUCH THAT A CURVE MAY REQUIRE ADDITIONAL DELINEATION, THE DEVICE SPACING MAY BE DECREASED TO 50 FEET.

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

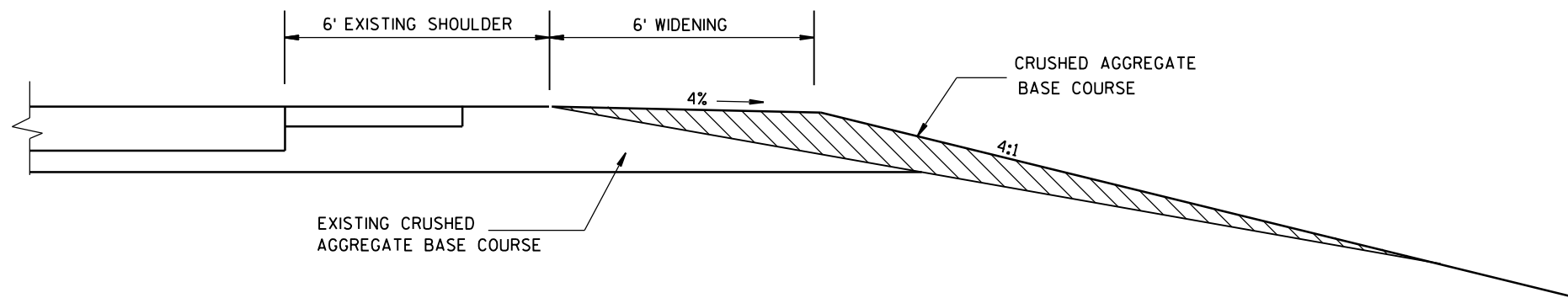
* THE LEFT REVERSE CURVE SIGN (W01-4L) IS ONLY REQUIRED WHEN THIS DETAIL IS USED IN COMBINATION WITH "SINGLE LANE CROSSOVER" DETAIL.



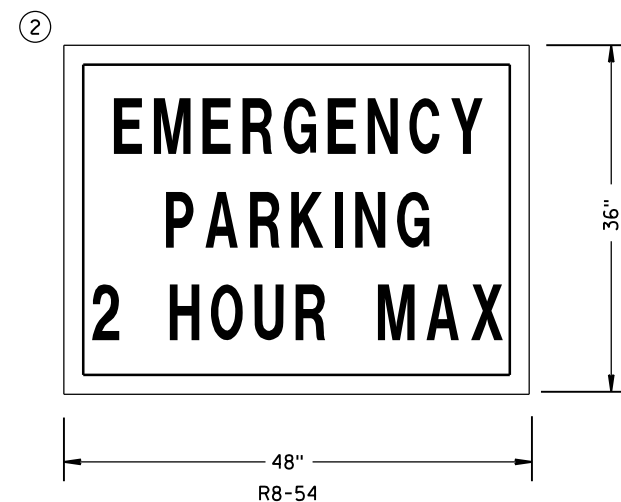
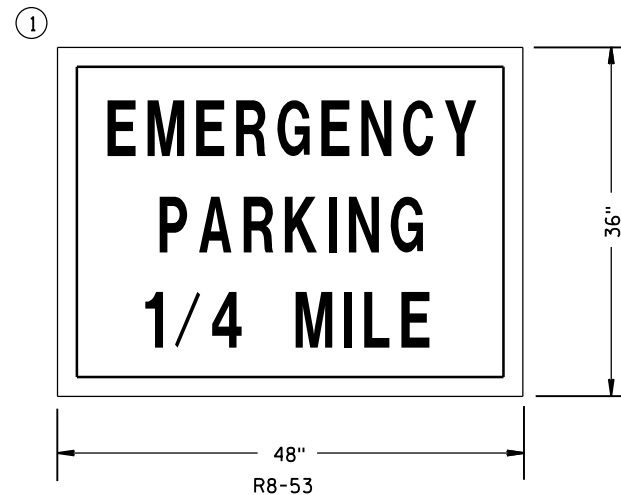
TRAFFIC CONTROL, LANE CLOSURE	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED March 2016 DATE	/S/ Peter Amakobe Atepe STATEWIDE WORK ZONE TRAFFIC SAFETY ENGINEER
FHWA	



PLAN VIEW
TEMPORARY EMERGENCY PULLOUTS FOR DIVIDED HIGHWAYS



SECTION A-A



SIGNS TO BE BLACK LETTERS ON WHITE
REFLECTIVE BACKGROUND

SIGNS FOR TEMPORARY
EMERGENCY PULLOUTS

GENERAL NOTES

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

TEMPORARY EMERGENCY PULLOUTS AND SIGNS SHALL BE REMOVED AND THE ROADWAY RESTORED TO ITS ORIGINAL CROSS SECTION AND CONDITION PRIOR TO REOPENING THE ROADWAY TO ONE WAY TRAFFIC.

LEGEND

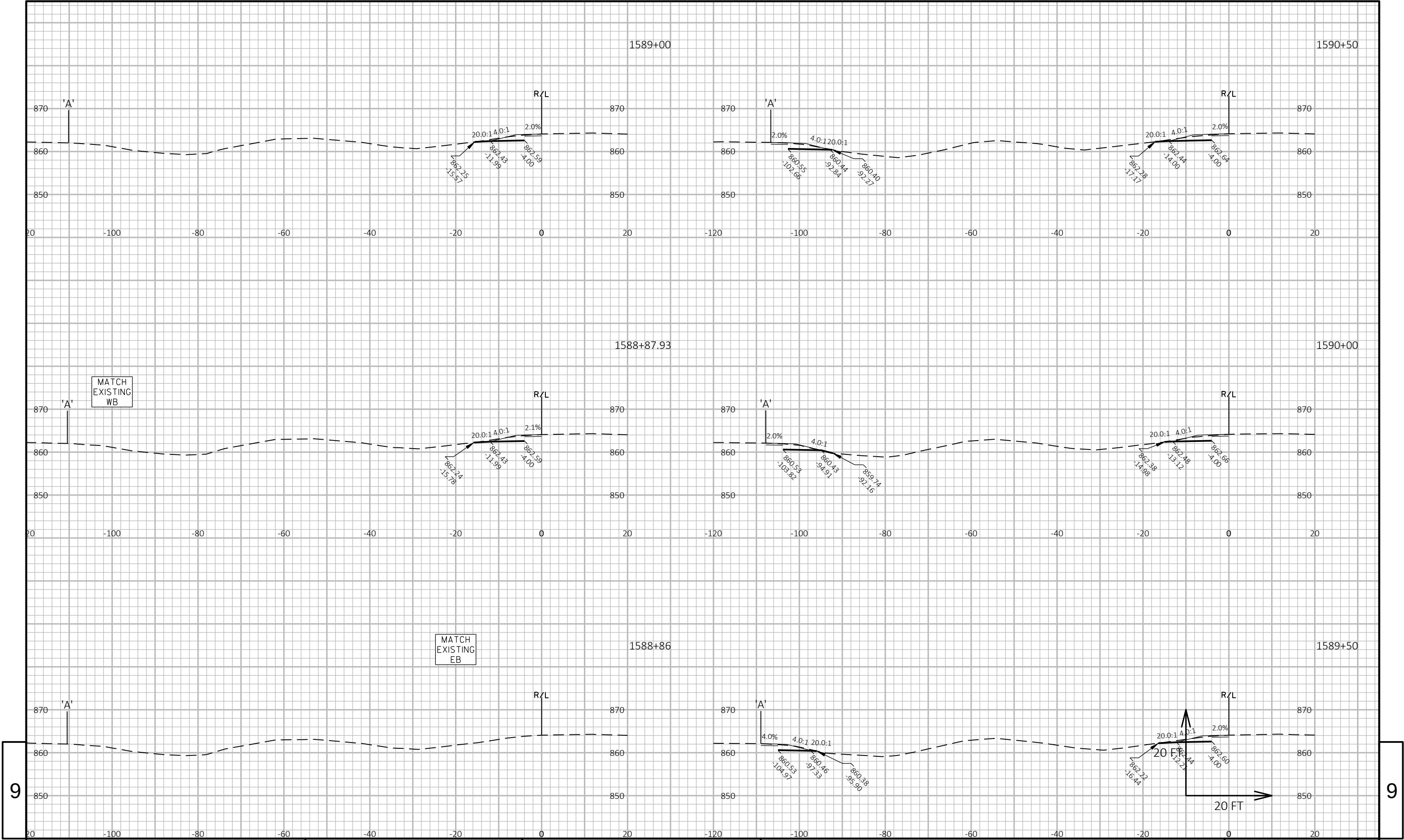
- ⊙ SIGN ON PERMANENT SUPPORT
- ➡ DIRECTION OF TRAFFIC

TEMPORARY EMERGENCY PULLOUTS	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED 8/2013 DATE	/S/ Travis Feltes STATE TRAFFIC ENGINEER OF DESIGN
FHWA	

WEST CROSSOVER										
STATION	Distance	AREA (SF)			Incremental Vol (CY) (Unadjusted)			Cumulative Vol (CY)		
		Cut	Salvaged/Unusable Pavement Material	Fill	Cut	Salvaged/Unusable Pavement Material	Fill	Cut 1.00	Expanded Fill 1.25	Mass Ordinate
					Note 1	Note 2	Note 3	Note 1		Note 8
1588+86.	0.00	0.00	0.00	0.00	0	0	0	0	0	0
1588+87.93	1.93	7.47	0.00	0.00	0	0	0	0	0	0
1589+00.	12.07	7.45	0.00	0.00	3	0	0	4	0	4
1589+50.	50.00	14.77	0.00	0.00	21	0	0	24	0	24
1590+00.	50.00	14.69	0.00	0.18	27	0	0	51	0	51
1590+50.	50.00	16.96	0.00	0.00	29	0	0	81	0	80
1591+00.	50.00	20.76	0.00	0.00	35	0	0	116	0	115
1591+50.	50.00	21.49	0.00	0.00	39	0	0	155	0	154
1592+00.	50.00	23.31	0.00	0.00	41	0	0	196	0	196
1592+50.	50.00	25.81	0.00	0.00	45	0	0	242	0	241
1592+88.06	38.06	31.61	0.00	0.00	40	0	0	282	0	282
1592+90.	1.94	16.31	0.00	0.00	2	0	0	284	0	284
1592+99.3	9.30	17.38	0.00	0.00	6	0	0	290	0	289
1593+00.	0.70	0.00	0.00	0.00	0	0	0	290	0	290
					290	0	0		0	

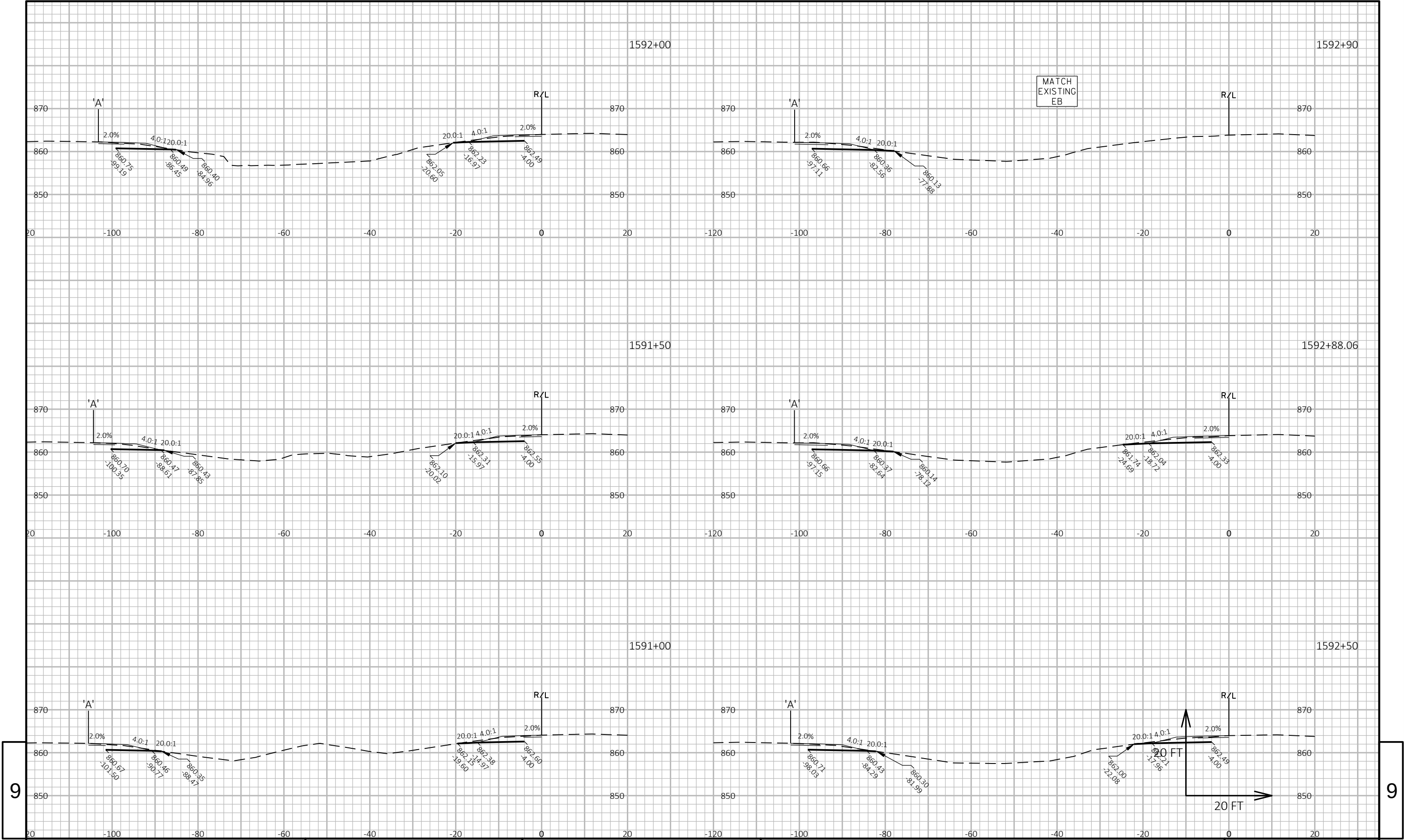
WEST CROSSOVER										
STATION	Distance	AREA (SF)			Incremental Vol (CY) (Unadjusted)			Cumulative Vol (CY)		
		Cut	Salvaged/Unusable Pavement Material	Fill	Cut	Salvaged/Unusable Pavement Material	Fill	Cut 1.00	Expanded Fill 1.25	Mass Ordinate
					Note 1	Note 2	Note 3	Note 1		Note 8
1602+86.	0.00	0.00	0.00	0.00	0	0	0	0	0	0
1602+87.62	1.62	22.71	0.00	0.00	1	0	0	1	0	1
1602+90.	2.38	22.42	0.00	0.00	2	0	0	3	0	3
1602+91.98	1.98	38.70	0.00	0.00	2	0	0	5	0	5
1603+00.	8.02	37.63	0.00	0.00	11	0	0	16	0	16
1603+50.	50.00	36.14	0.00	0.00	68	0	0	85	0	85
1604+00.	50.00	36.66	0.00	0.00	67	0	0	152	0	152
1604+50.	50.00	33.37	0.00	0.00	65	0	0	217	0	217
1605+00.	50.00	31.16	0.00	0.00	60	0	0	277	0	277
1605+50.	50.00	24.26	0.00	0.00	51	0	0	328	0	328
1606+00.	50.00	25.19	0.00	0.00	46	0	0	374	0	374
1606+50.	50.00	24.82	0.00	0.00	46	0	0	420	0	420
1606+86.63	36.63	23.78	0.00	0.00	33	0	0	453	0	453
1606+88.	1.37	12.52	0.00	0.00	1	0	0	454	0	454
1606+91.99	3.99	12.19	0.00	0.00	2	0	0	456	0	456
1606+94.	2.01	0.00	0.00	0.00	0	0	0	456	0	456
					456	0	0		0	

EAST CROSSOVER											
STATION	Distance	AREA (SF)			Incremental Vol (CY) (Unadjusted)			Cumulative Vol (CY)			
		Cut	Salvaged/Unusable Pavement Material		Cut	Salvaged/Unusable Pavement Material		Cut 1.00	Expanded Fill 1.25		Mass Ordinate
					Note 1	Note 2	Note 3	Note 1			Note 8
2177+48.	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0
2177+49.79	1.79	9.68	1.40	0.00	0	0	0	0	0	0	0
2177+51.78	1.99	18.74	2.70	0.00	1	0	0	1	0	1	
2178+00.	48.22	19.50	2.70	0.00	34	5	0	36	0	30	
2178+50.	50.00	20.78	2.70	0.00	37	5	0	73	0	63	
2179+00.	50.00	22.71	2.70	0.00	40	5	0	113	0	98	
2179+50.	50.00	23.34	2.70	0.00	43	5	0	156	0	136	
2180+00.	50.00	24.00	2.70	0.00	44	5	0	200	0	175	
2180+50.	50.00	26.69	2.70	0.00	47	5	0	246	0	216	
2181+00.	50.00	24.65	2.70	0.00	48	5	0	294	0	259	
2181+50.	50.00	23.77	2.70	1.40	45	5	1	339	2	297	
2182+00.	50.00	27.75	2.70	1.41	48	5	3	387	5	337	
2182+50.	50.00	29.43	2.70	4.42	53	5	5	440	12	378	
2183+00.	50.00	28.68	2.70	17.73	54	5	21	493	37	401	
2183+50.	50.00	24.61	2.70	22.31	49	5	37	543	84	399	
2184+00.	50.00	22.79	2.70	24.93	44	5	44	587	138	383	
2184+31.49	31.49	23.39	2.70	22.47	27	3	28	613	173	372	
2184+50.	18.51	22.46	2.70	22.15	16	2	15	629	192	367	
2185+00.	50.00	22.21	2.70	24.76	41	5	43	671	246	349	
2185+50.	50.00	24.65	2.70	23.41	43	5	45	714	302	332	
2186+00.	50.00	23.40	2.70	26.10	44	5	46	758	359	314	
2186+50.	50.00	26.81	2.70	21.33	46	5	44	805	414	301	
2187+00.	50.00	25.32	2.70	9.51	48	5	29	853	450	308	
2187+50.	50.00	25.88	2.70	7.48	47	5	16	901	470	331	
2188+00.	50.00	24.13	2.70	5.27	46	5	12	947	484	358	
2188+50.	50.00	23.86	2.70	2.30	44	5	7	991	493	388	
2189+00.	50.00	21.56	2.70	1.54	42	5	4	1,033	498	421	
2189+50.	50.00	19.61	2.70	2.72	38	5	4	1,072	502	449	
2190+00.	50.00	18.52	2.70	1.41	35	5	4	1,107	507	475	
2190+50.	50.00	18.29	2.70	0.00	34	5	1	1,141	509	502	
2191+00.	50.00	18.58	2.70	0.00	34	5	0	1,175	509	531	
2191+50.	50.00	15.94	2.70	0.00	32	5	0	1,207	509	558	
2191+55.2	5.20	10.95	2.70	0.00	3	1	0	1,210	509	560	
2192+00.	44.80	9.00	1.40	0.00	17	3	0	1,226	509	573	
2192+30.13	30.13	2.10	1.40	0.34	6	2	0	1,232	509	578	
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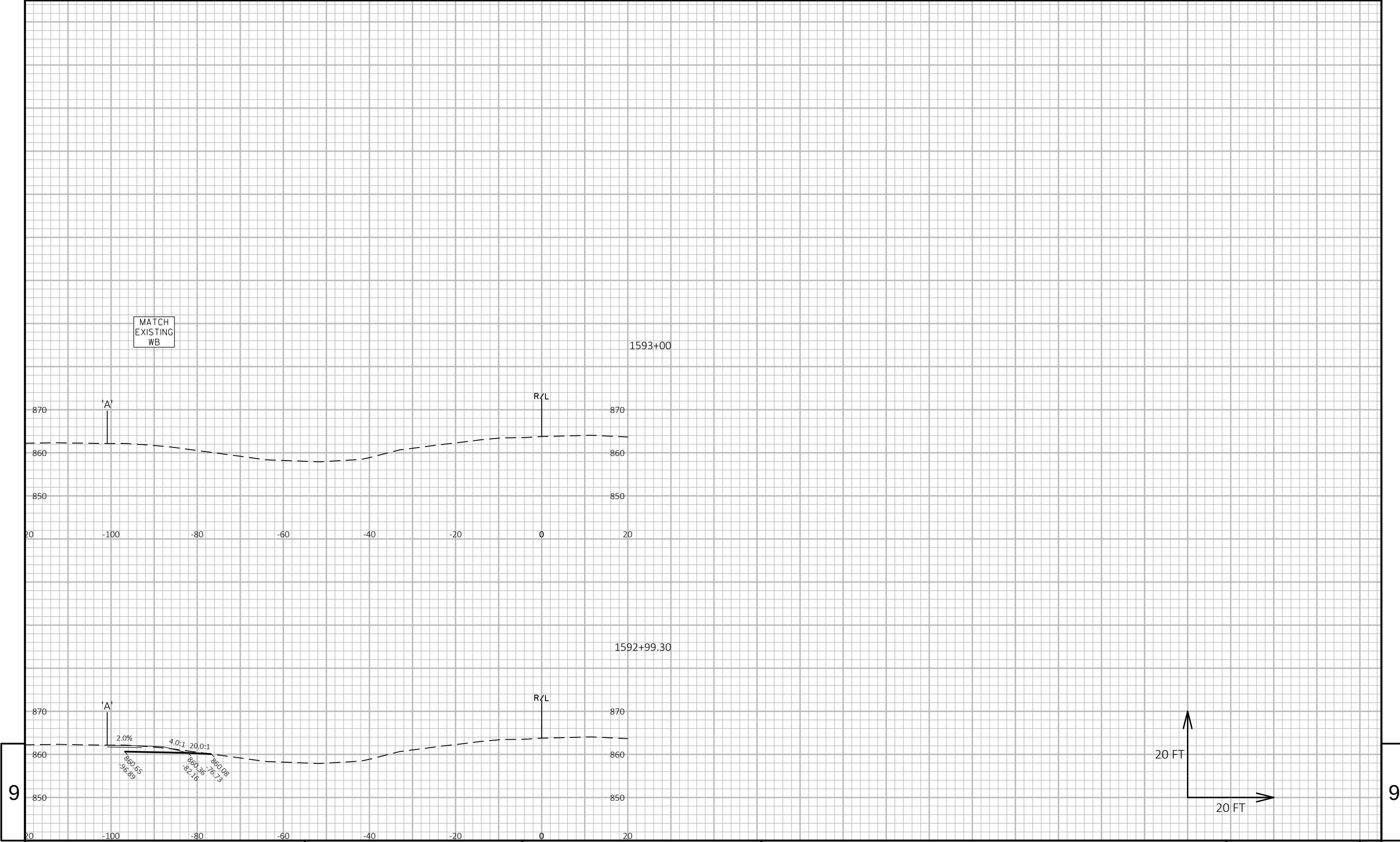


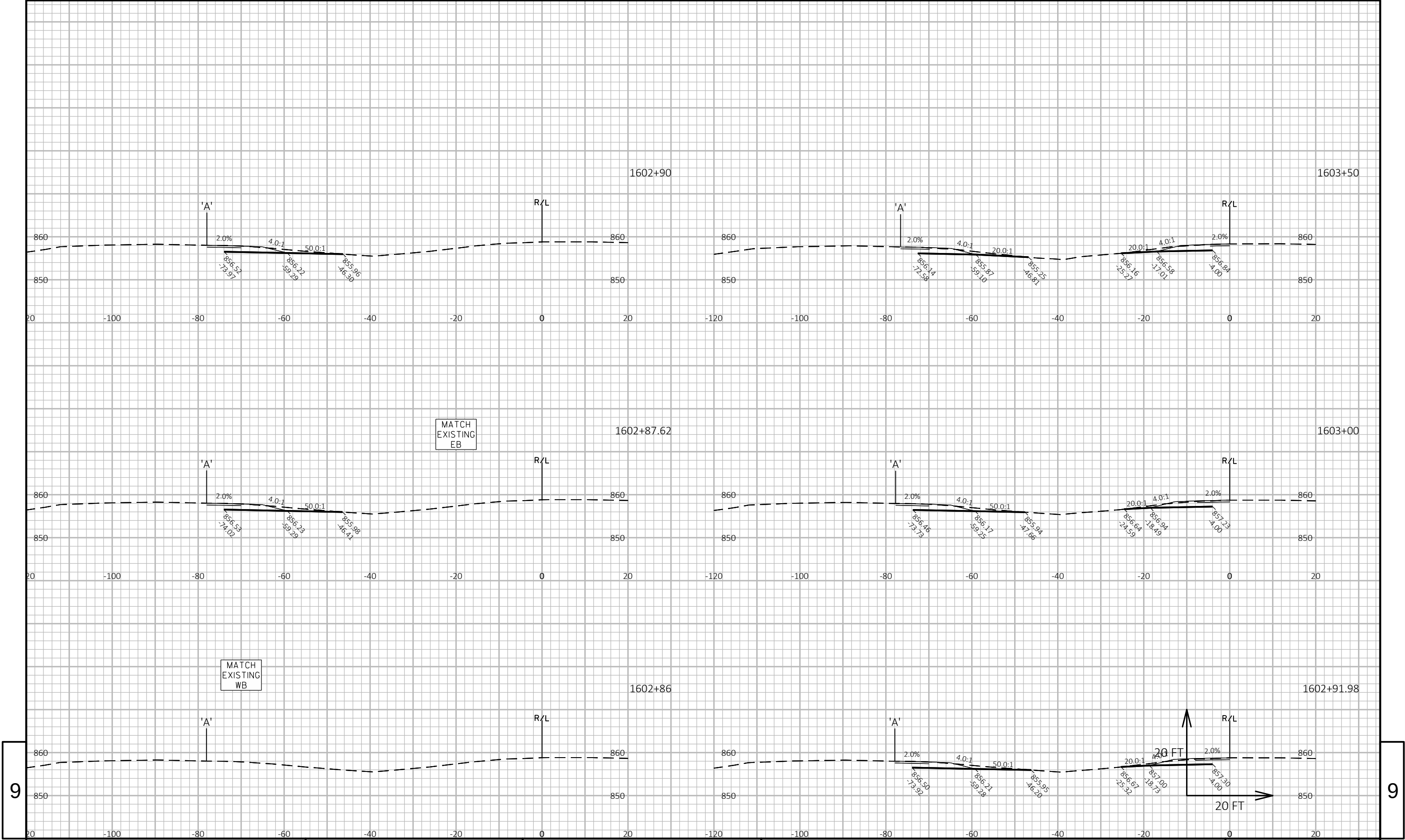
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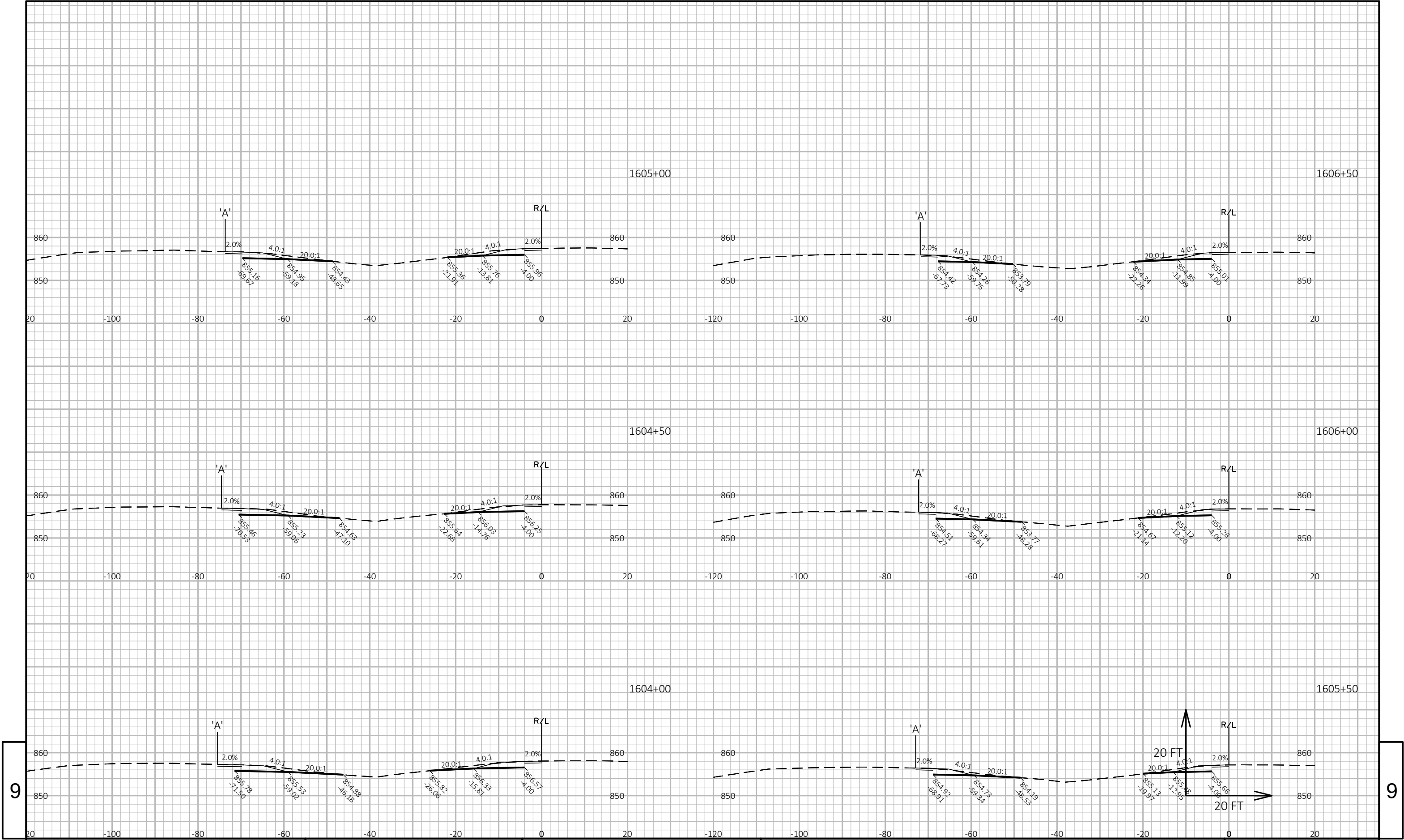
PROJECT NO: 1077-02-70	HWY: IH 90	COUNTY: MONROE	CROSS SECTIONS: WEST CROSSOVER WIDENING	SHEET	E
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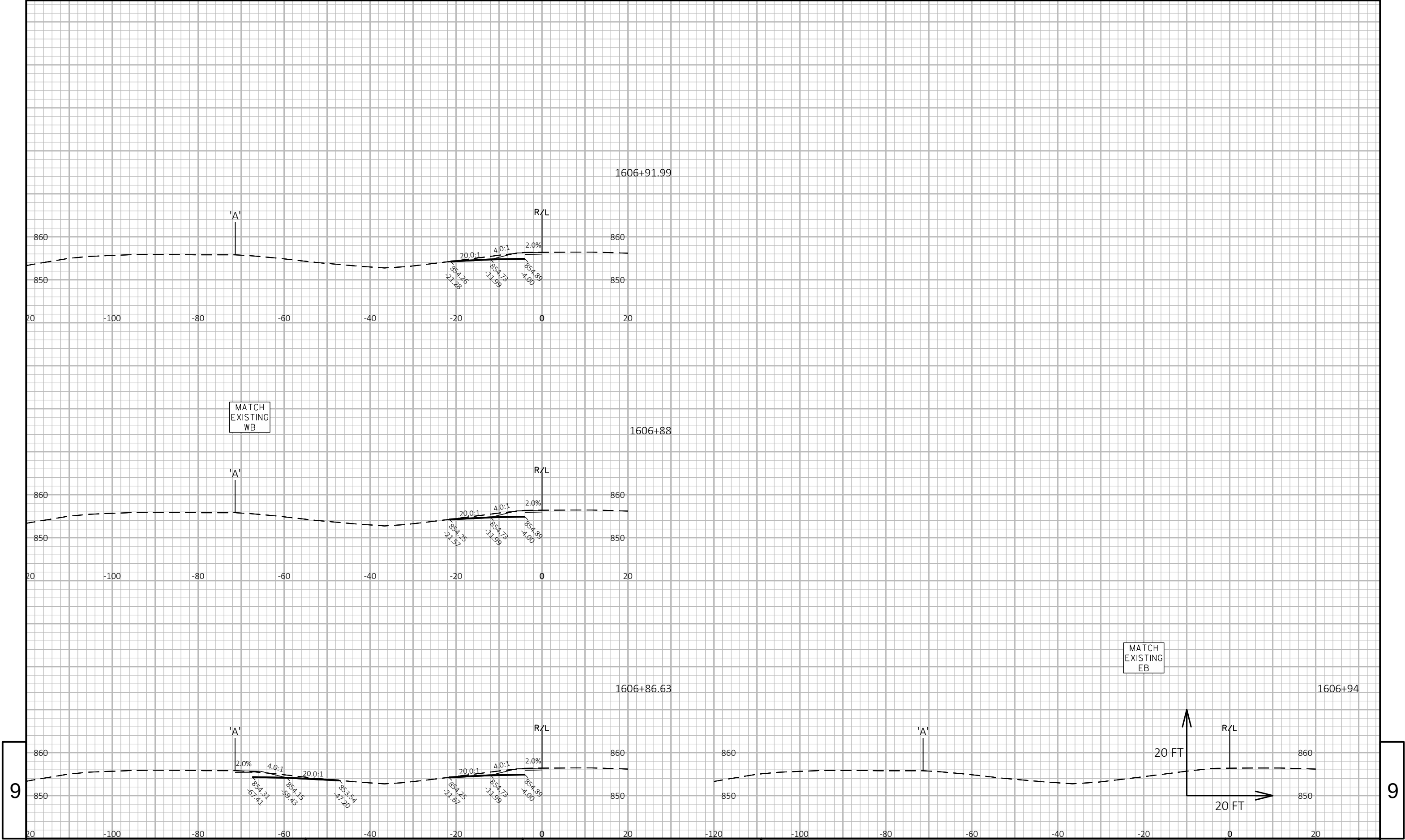




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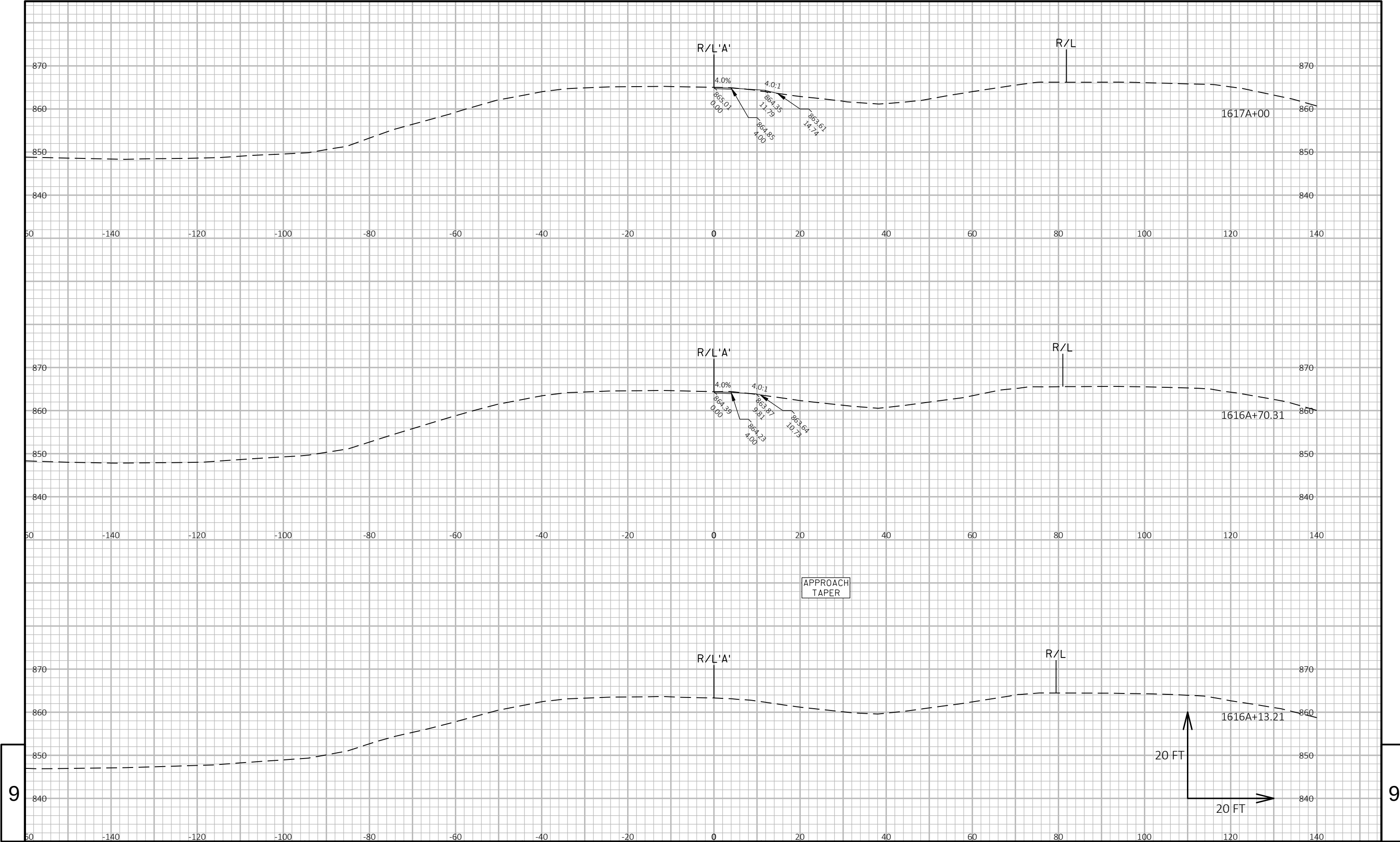
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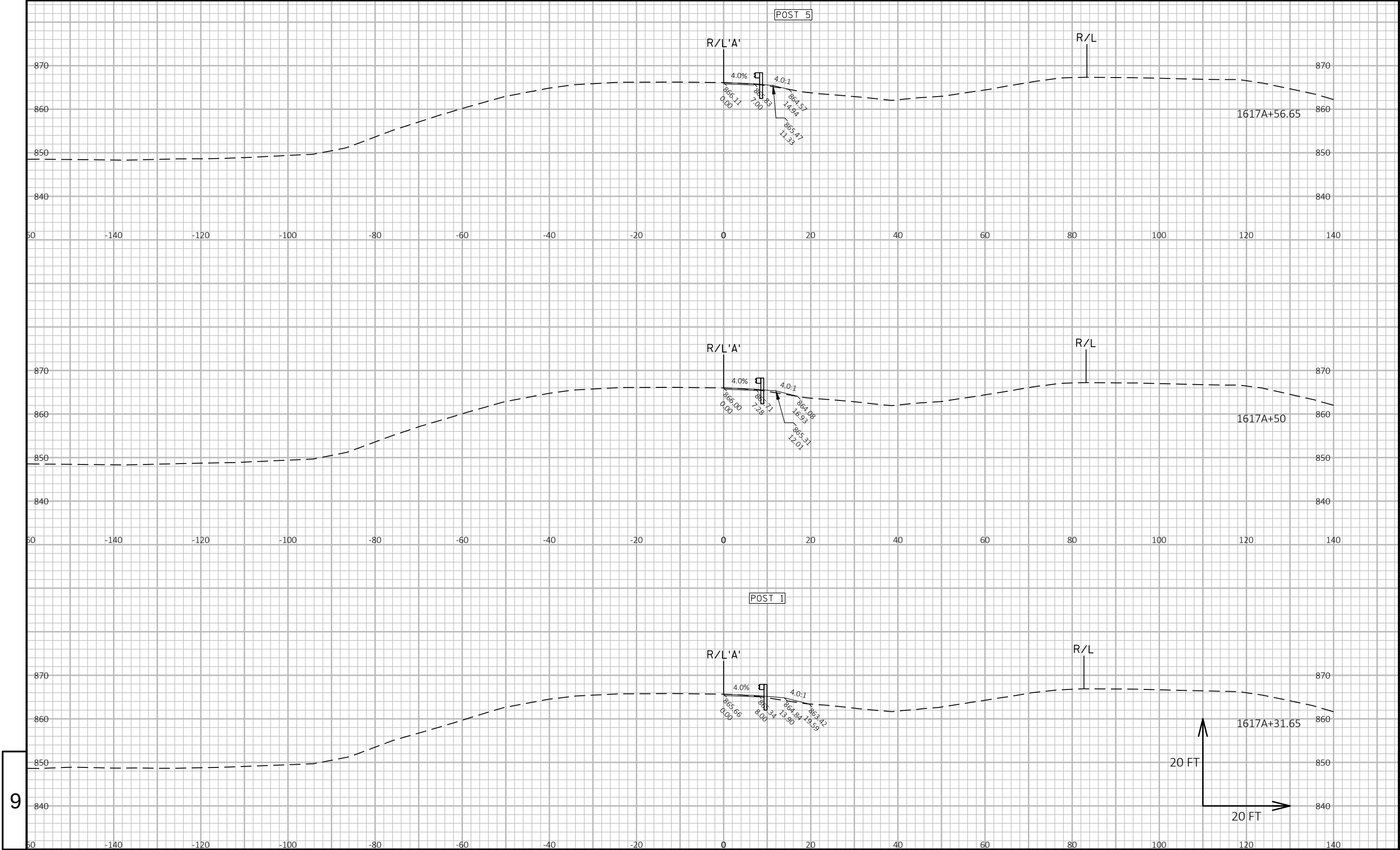
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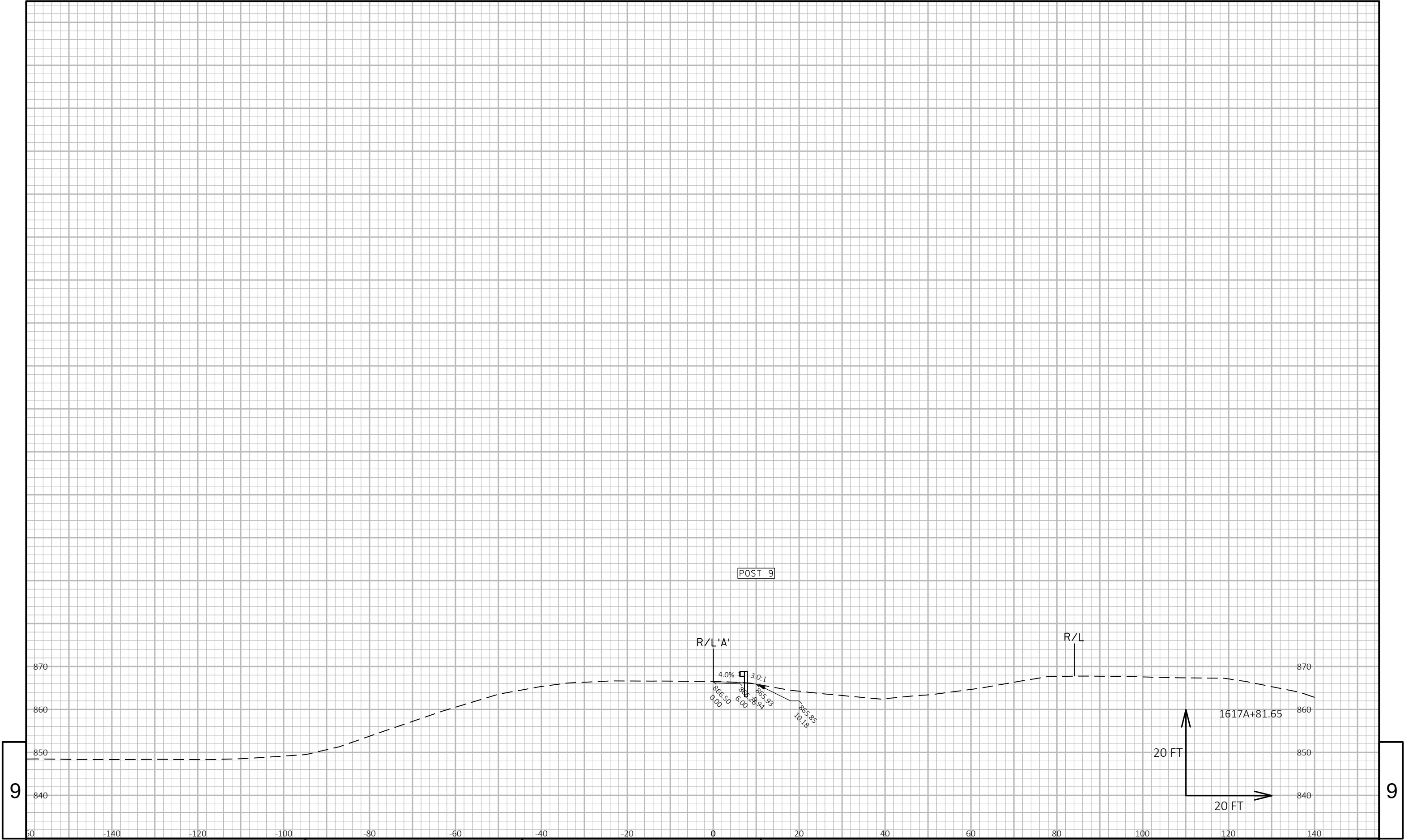


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PROJECT NO: 1077-02-70	HWY: IH 90	COUNTY: MONROE	CROSS SECTIONS: WB BEAMGUARD	SHEET	E
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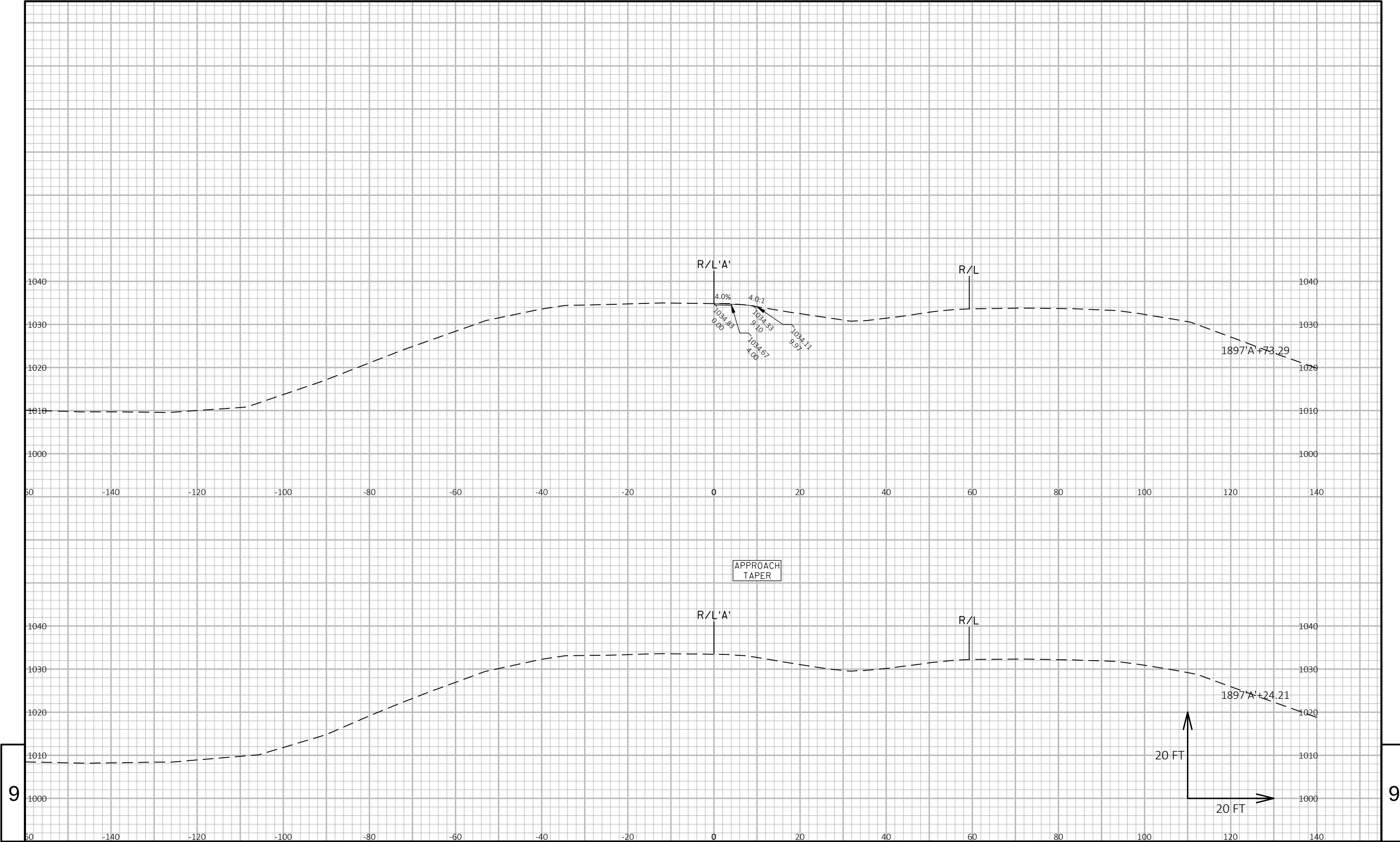




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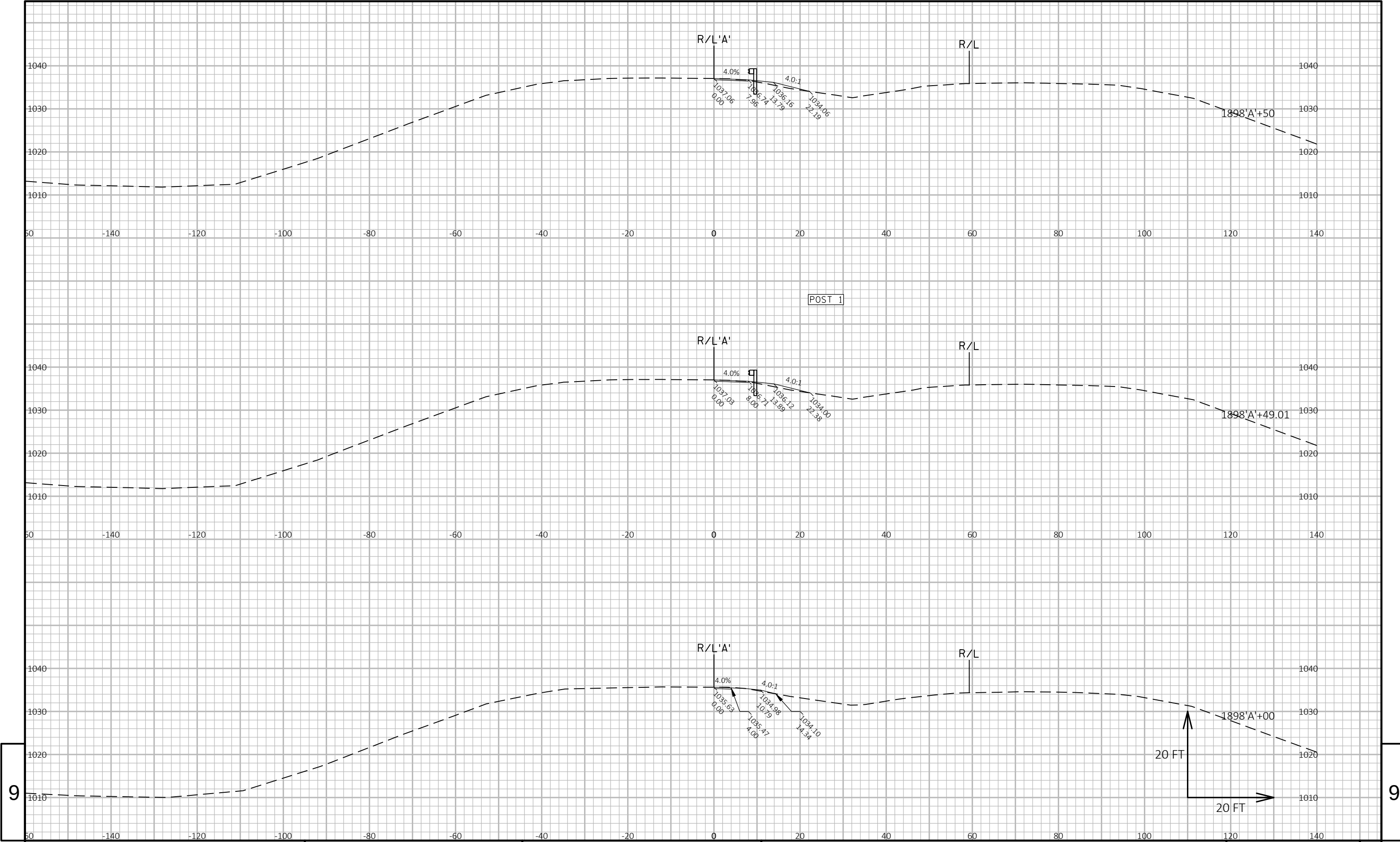
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PROJECT NO: 1077-02-70	HWY: IH 90	COUNTY: MONROE	CROSS SECTIONS: WB BEAMGUARD	SHEET	E
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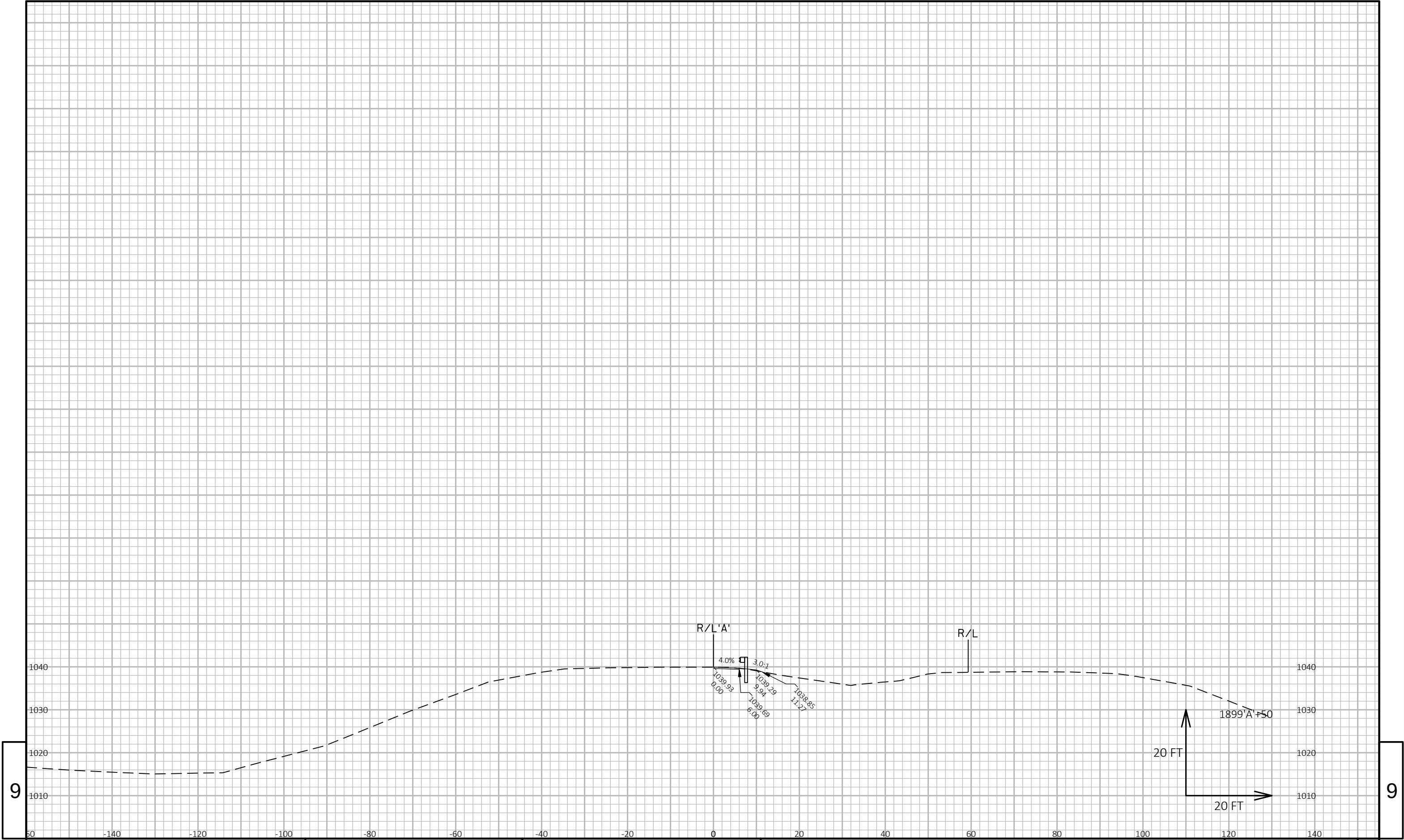
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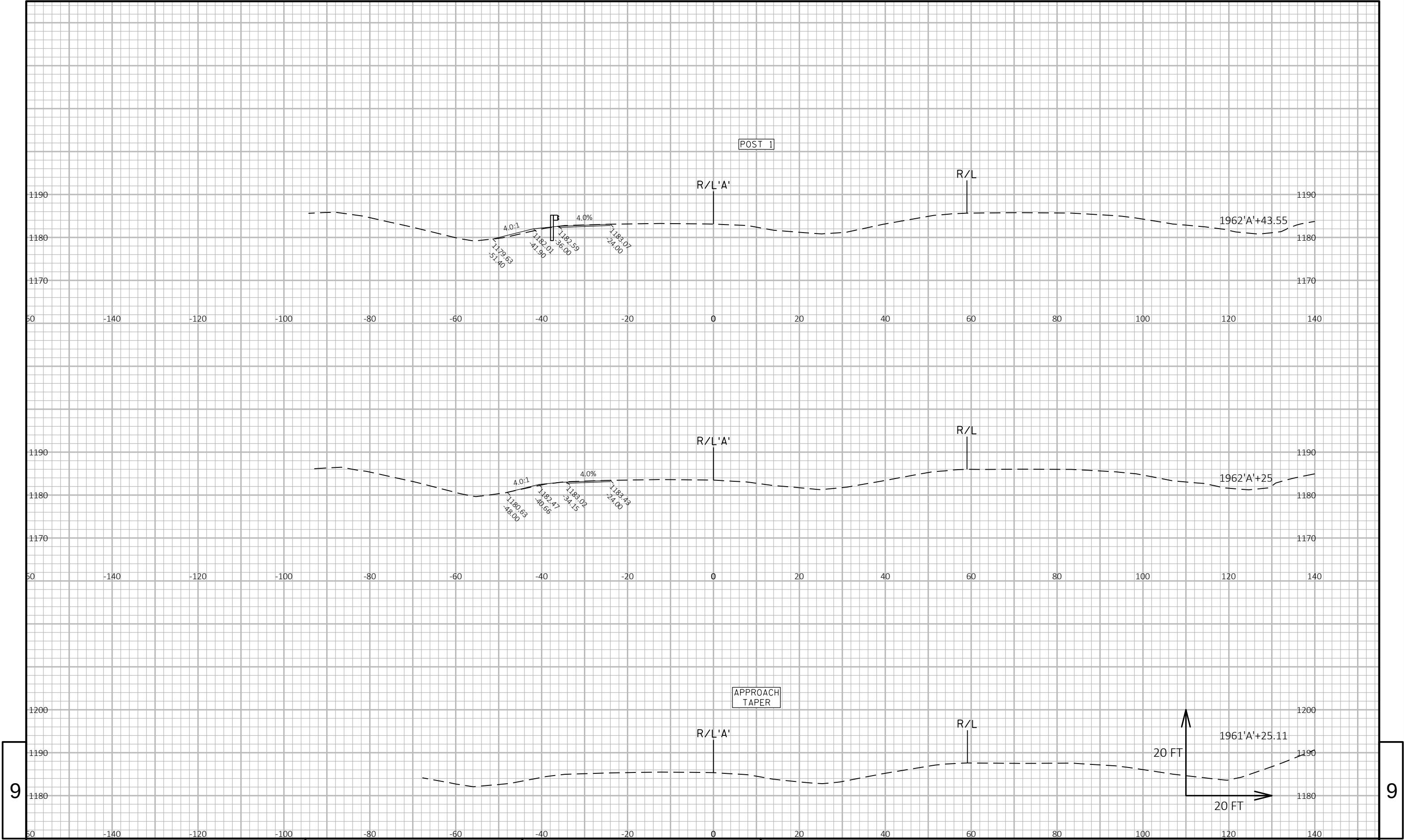


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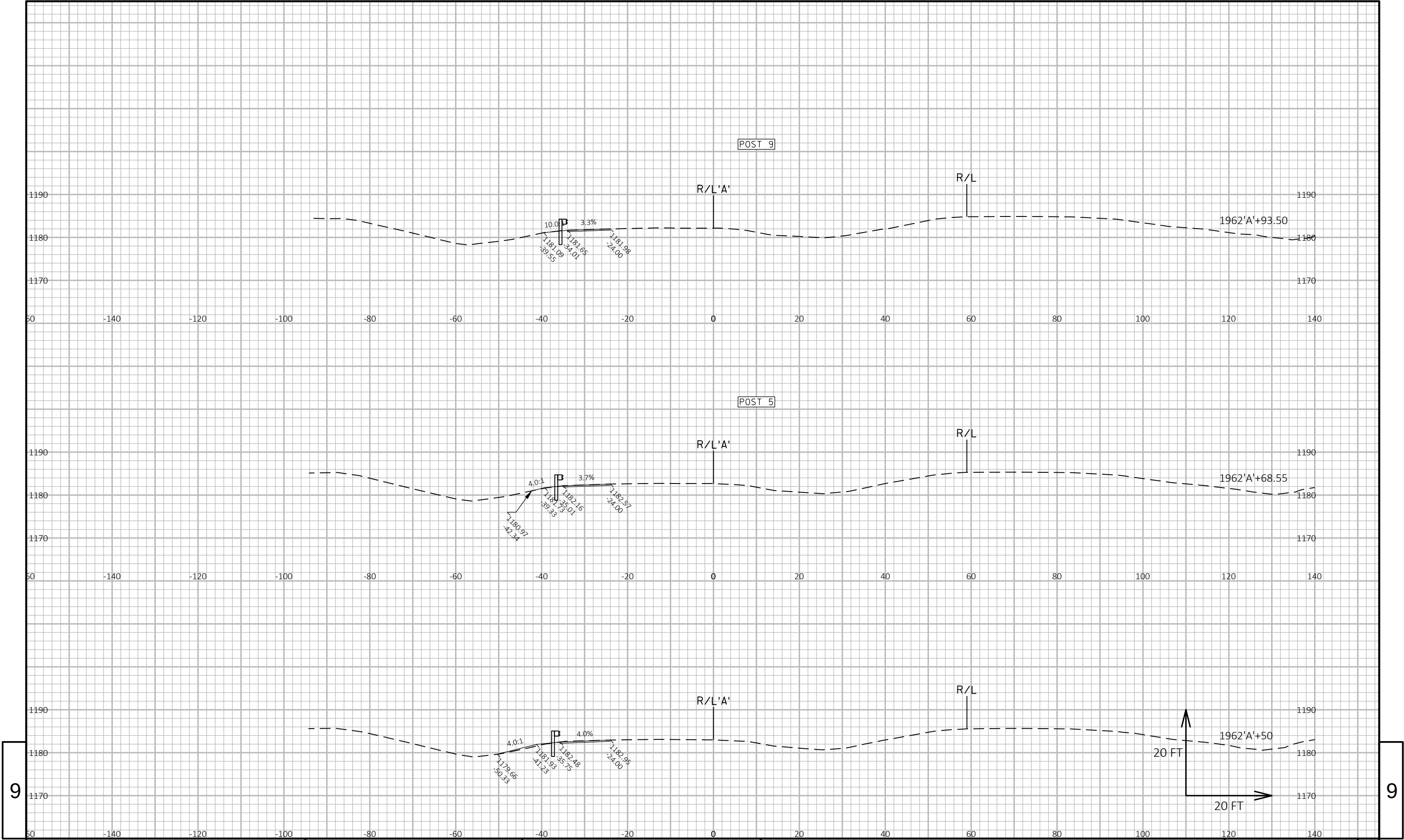
PROJECT NO: 1077-02-70	HWY: IH 90	COUNTY: MONROE	CROSS SECTIONS: WB BEAMGUARD	SHEET	E
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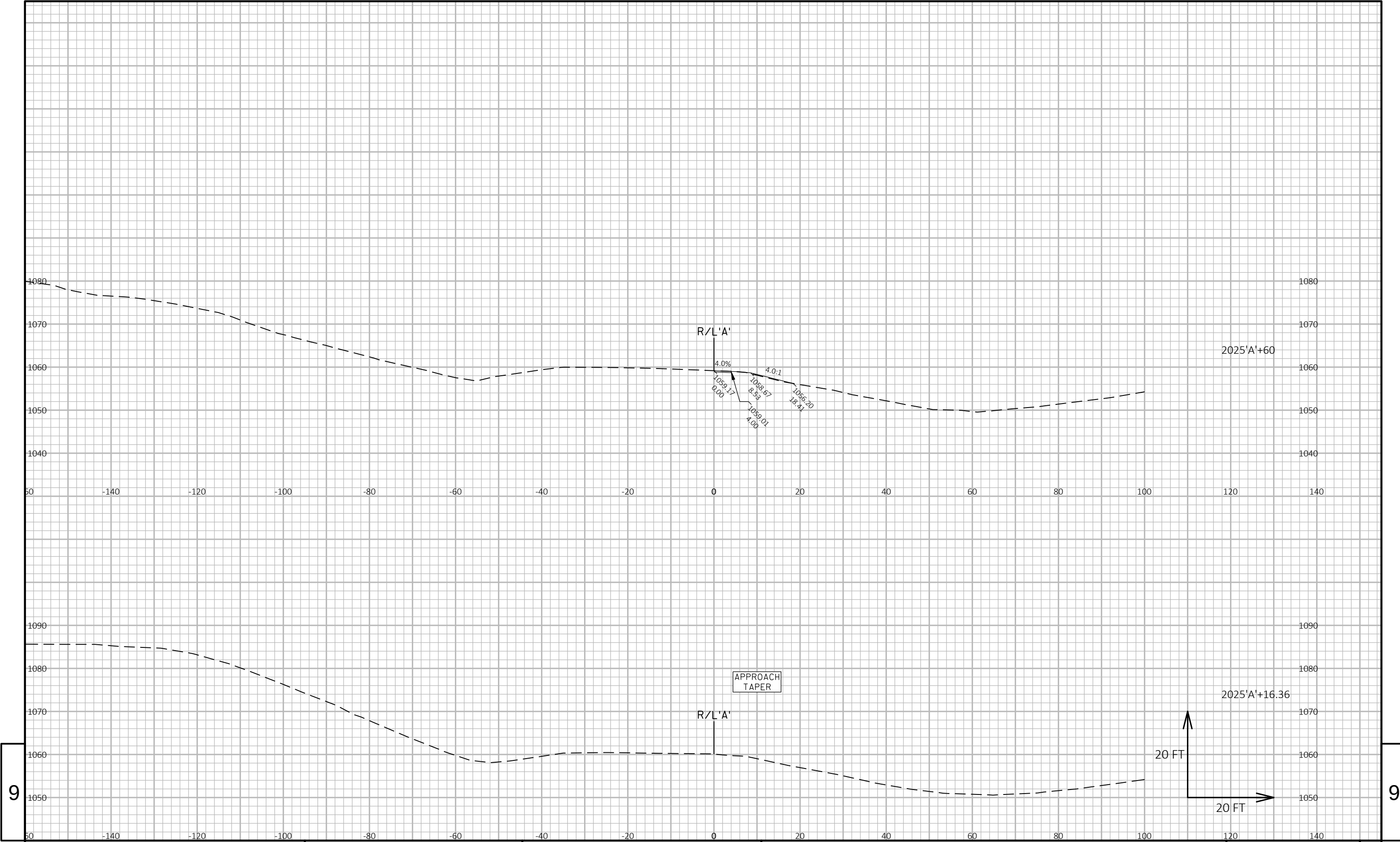
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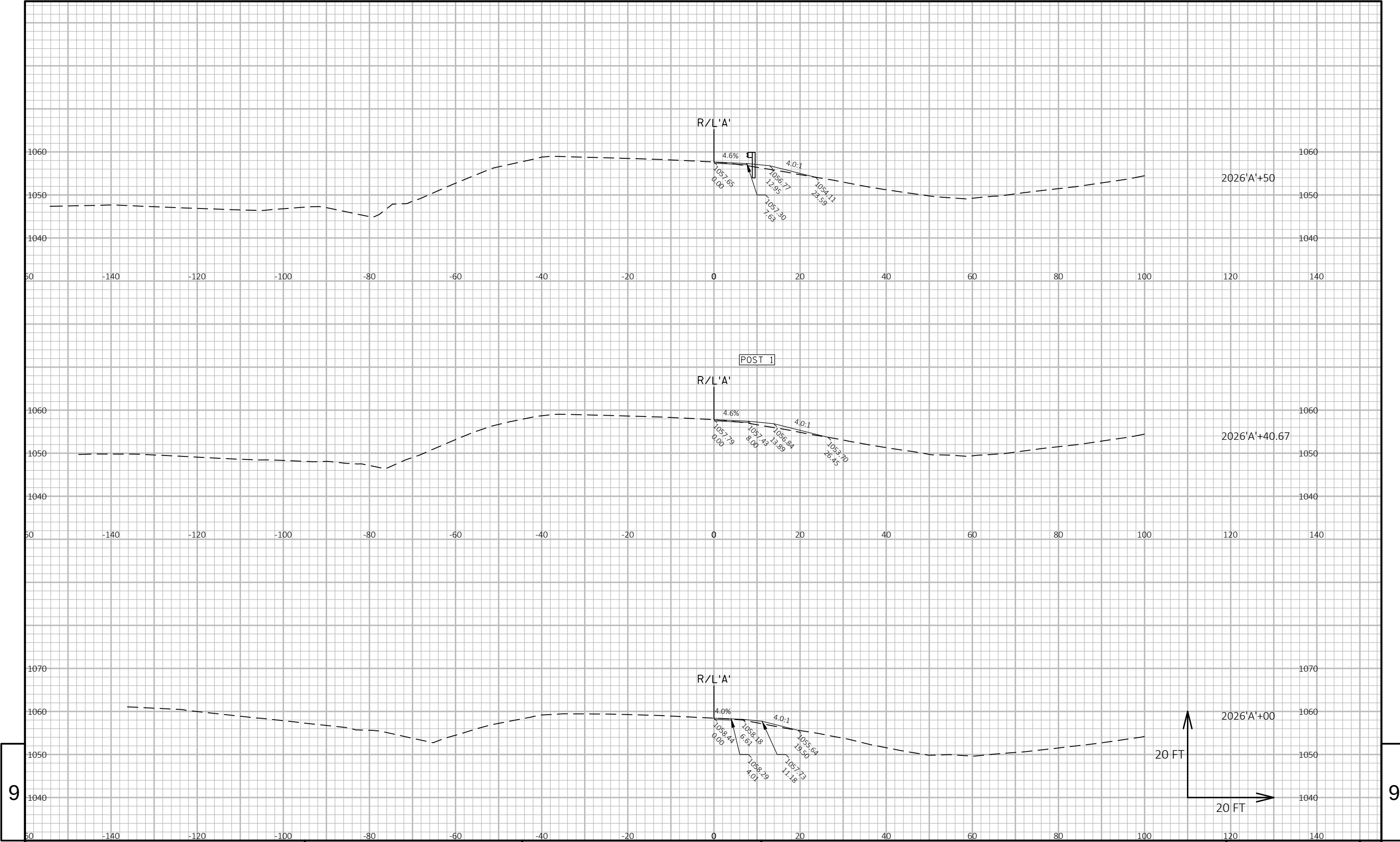
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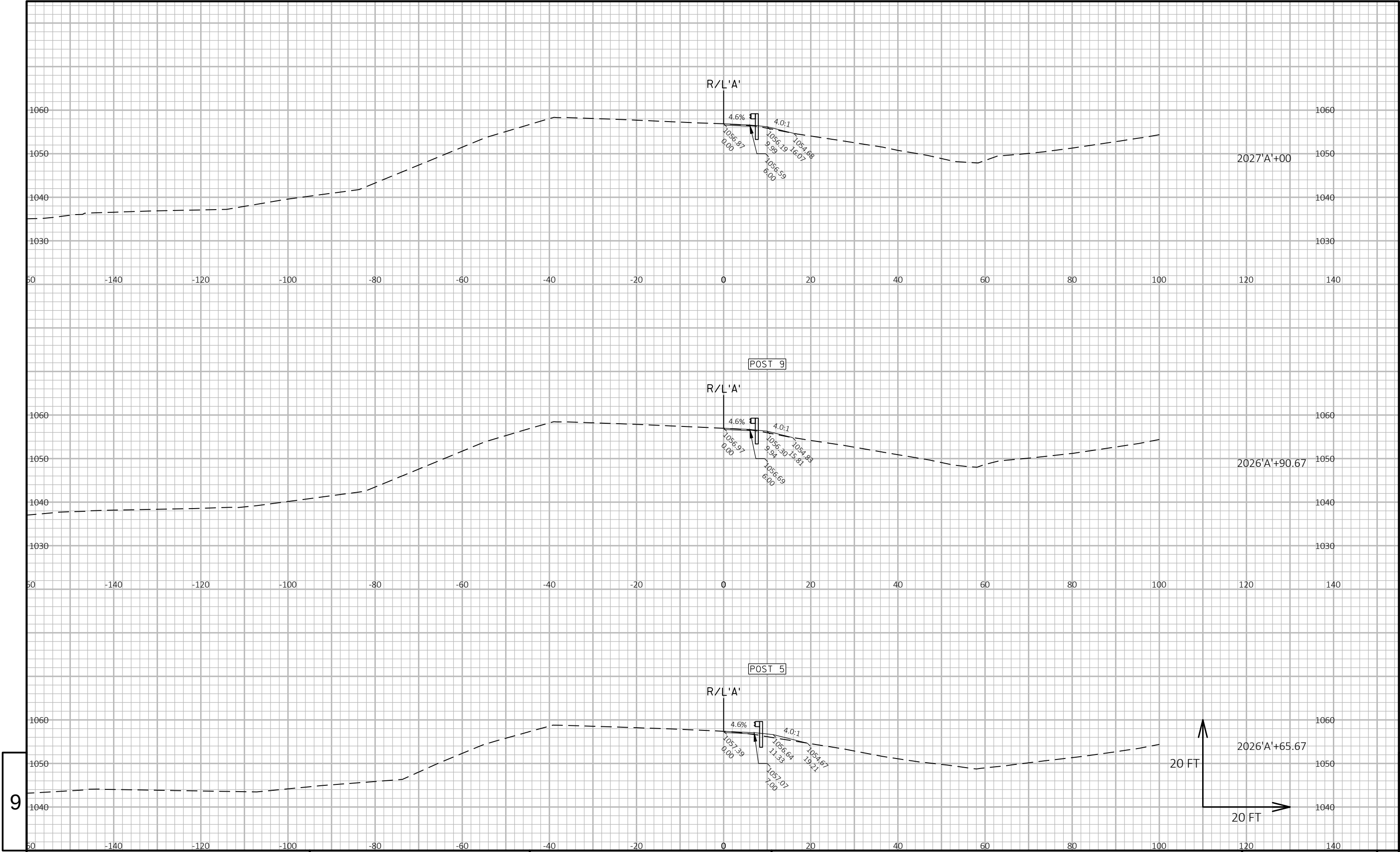
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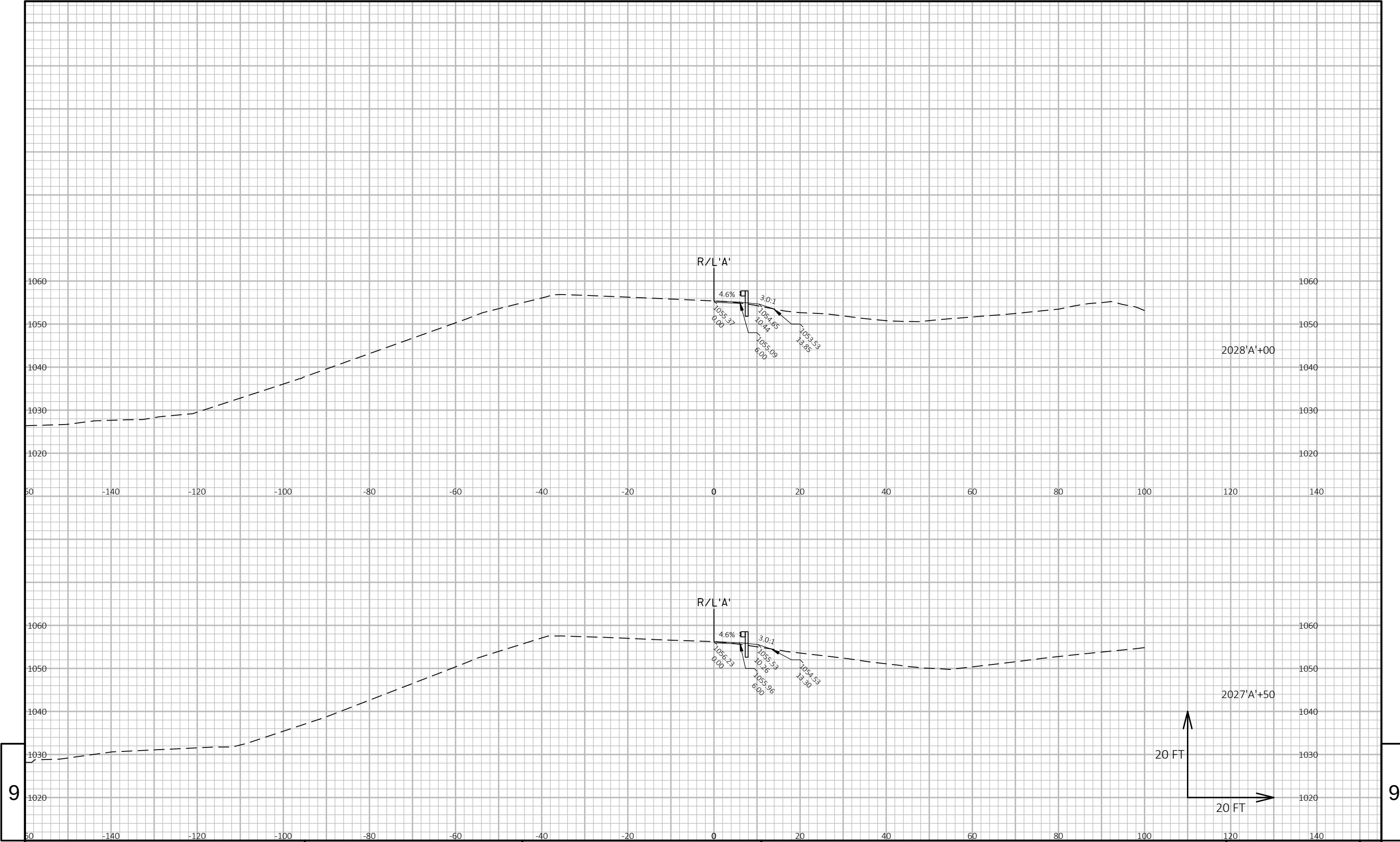


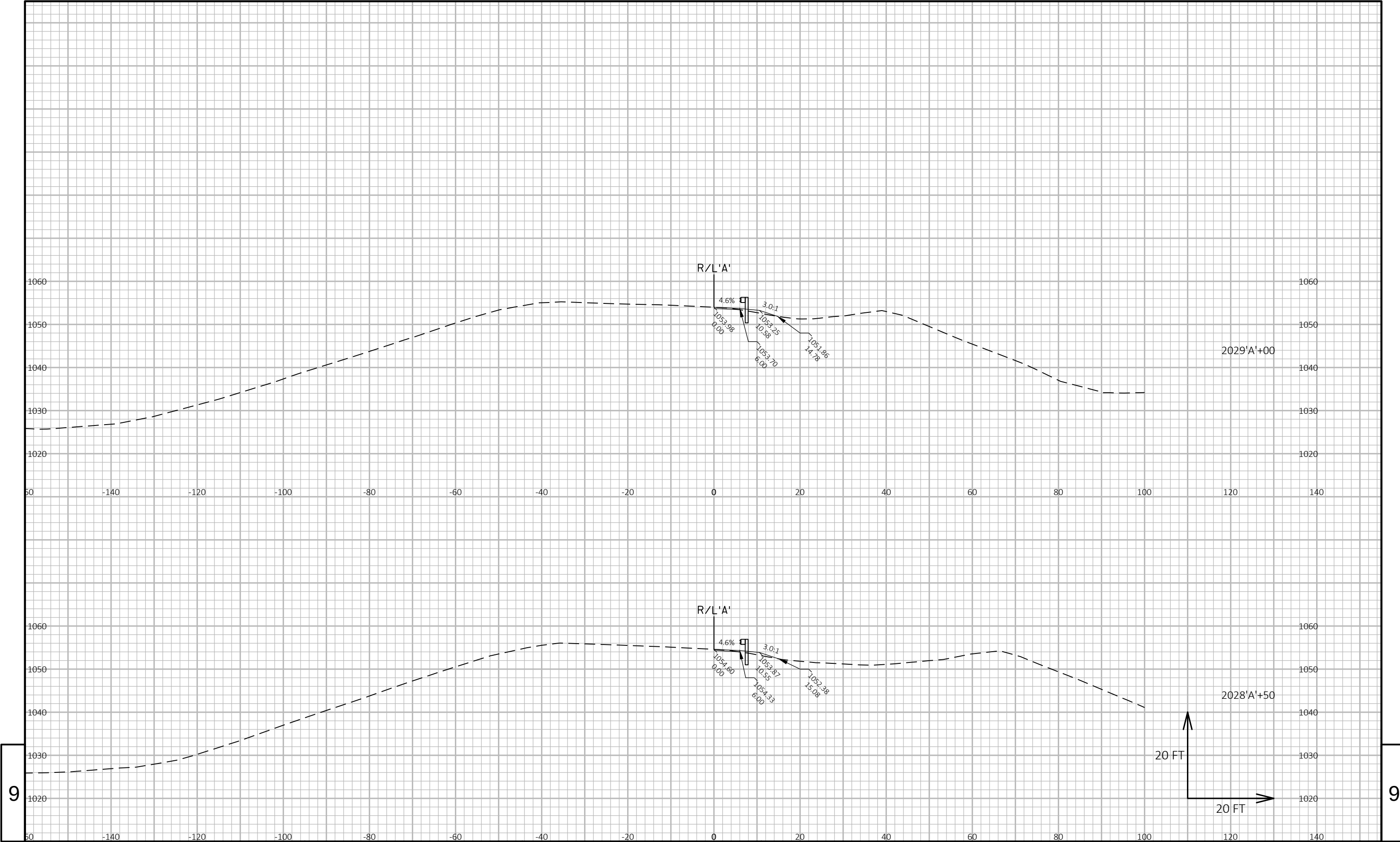


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PROJECT NO: 1077-02-70	HWY: IH 90	COUNTY: MONROE	CROSS SECTIONS: WB BEAMGUARD	SHEET	E
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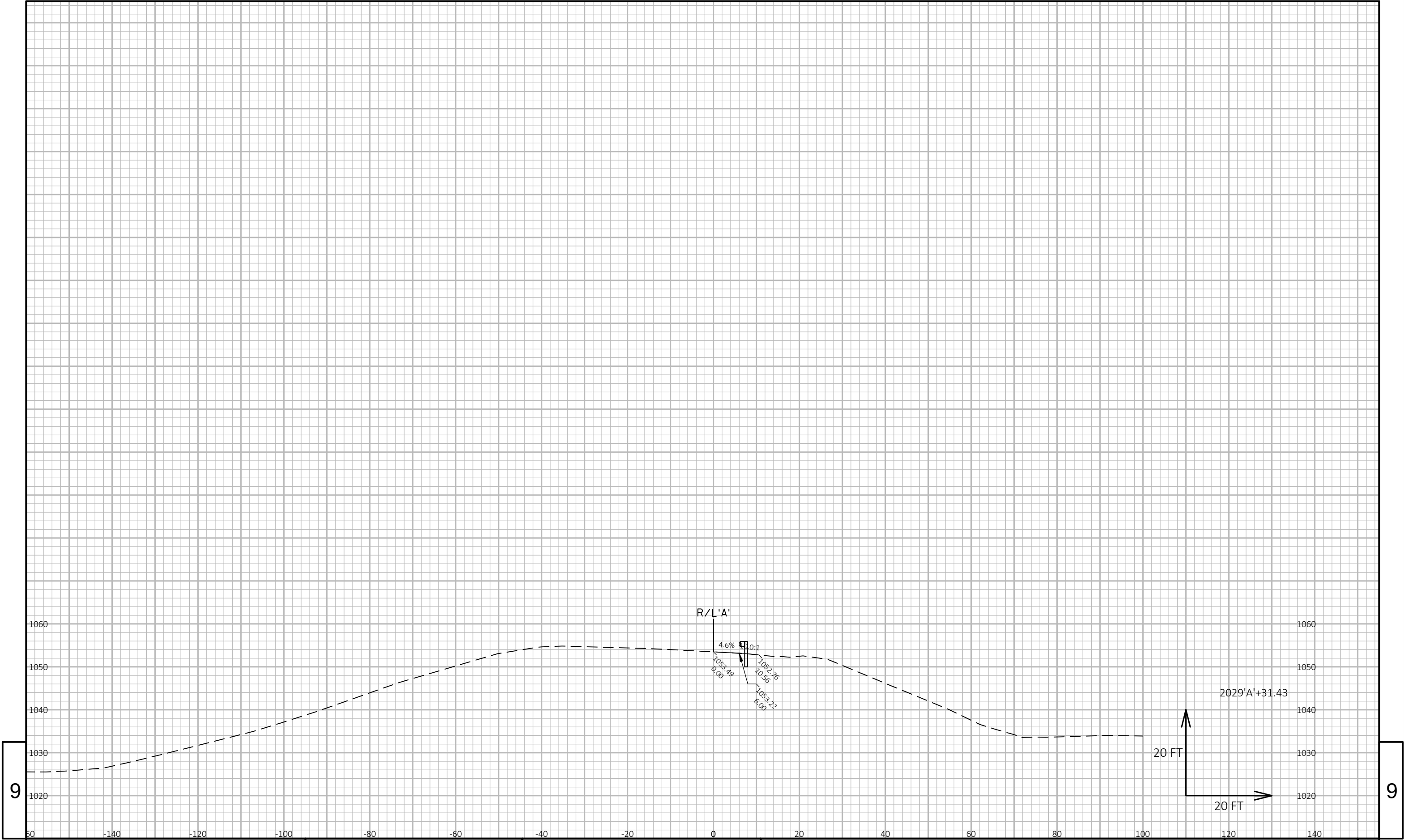




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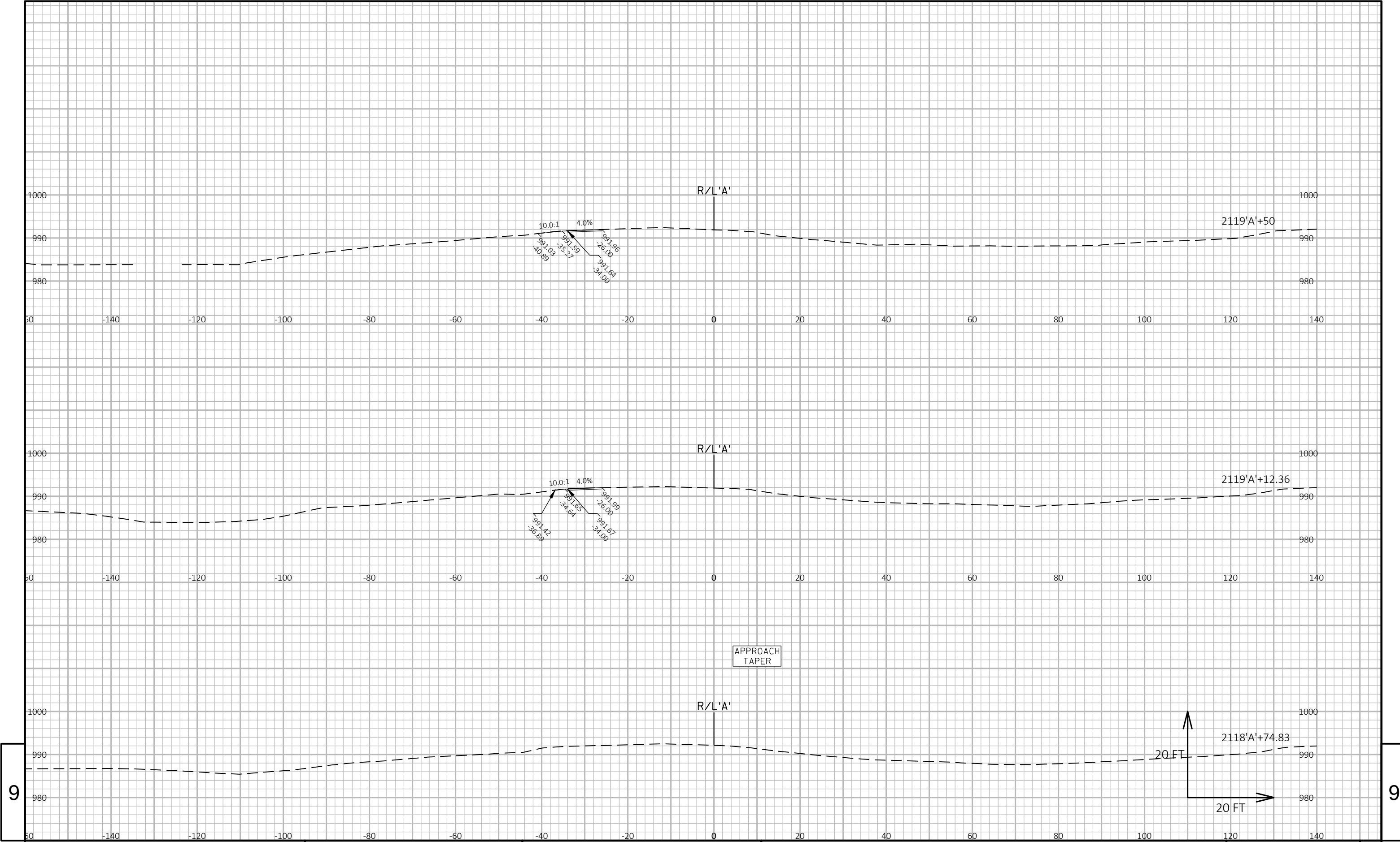
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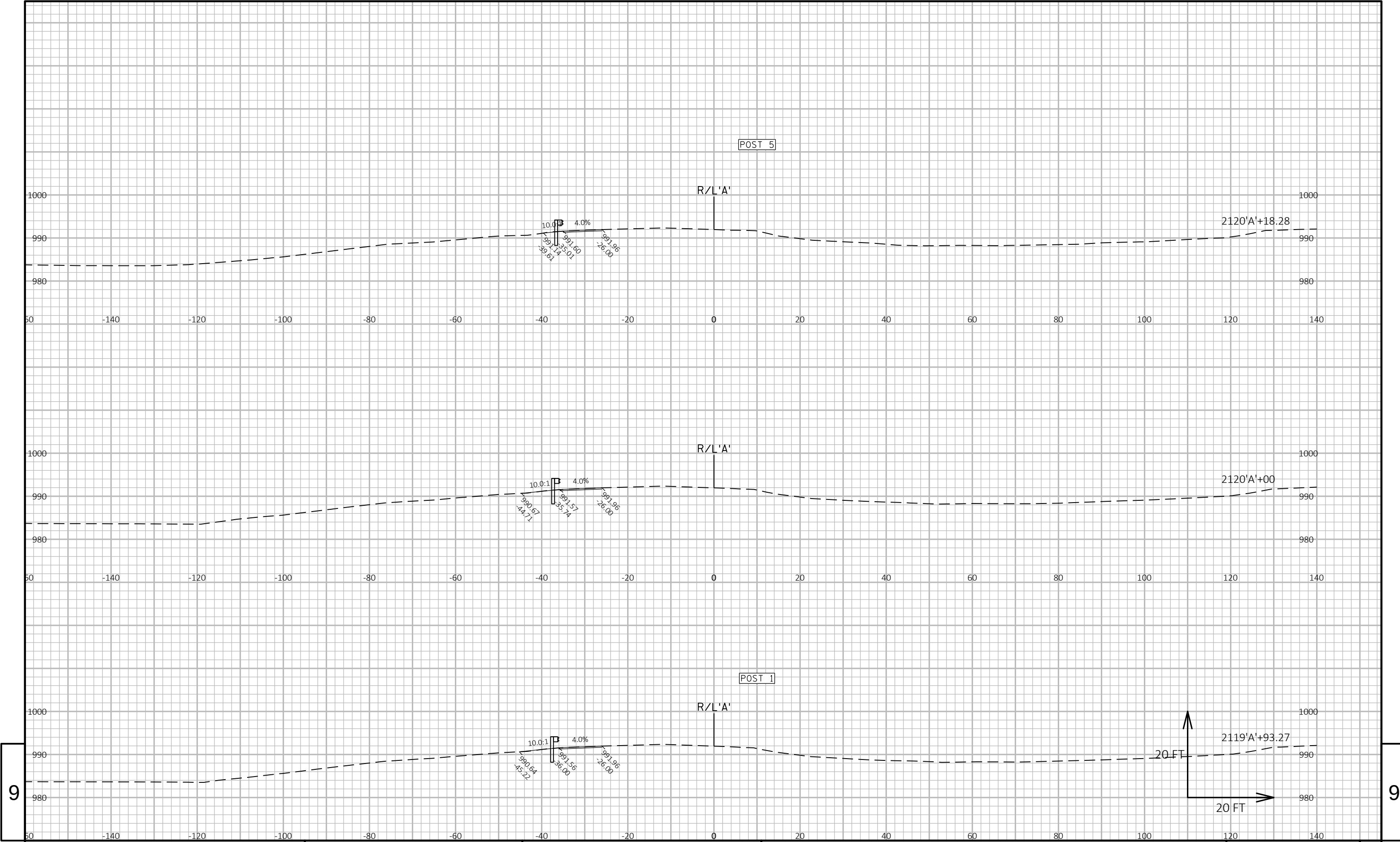
PROJECT NO: 1077-02-70	HWY: IH 90	COUNTY: MONROE	CROSS SECTIONS: WB BEAMGUARD	SHEET	E
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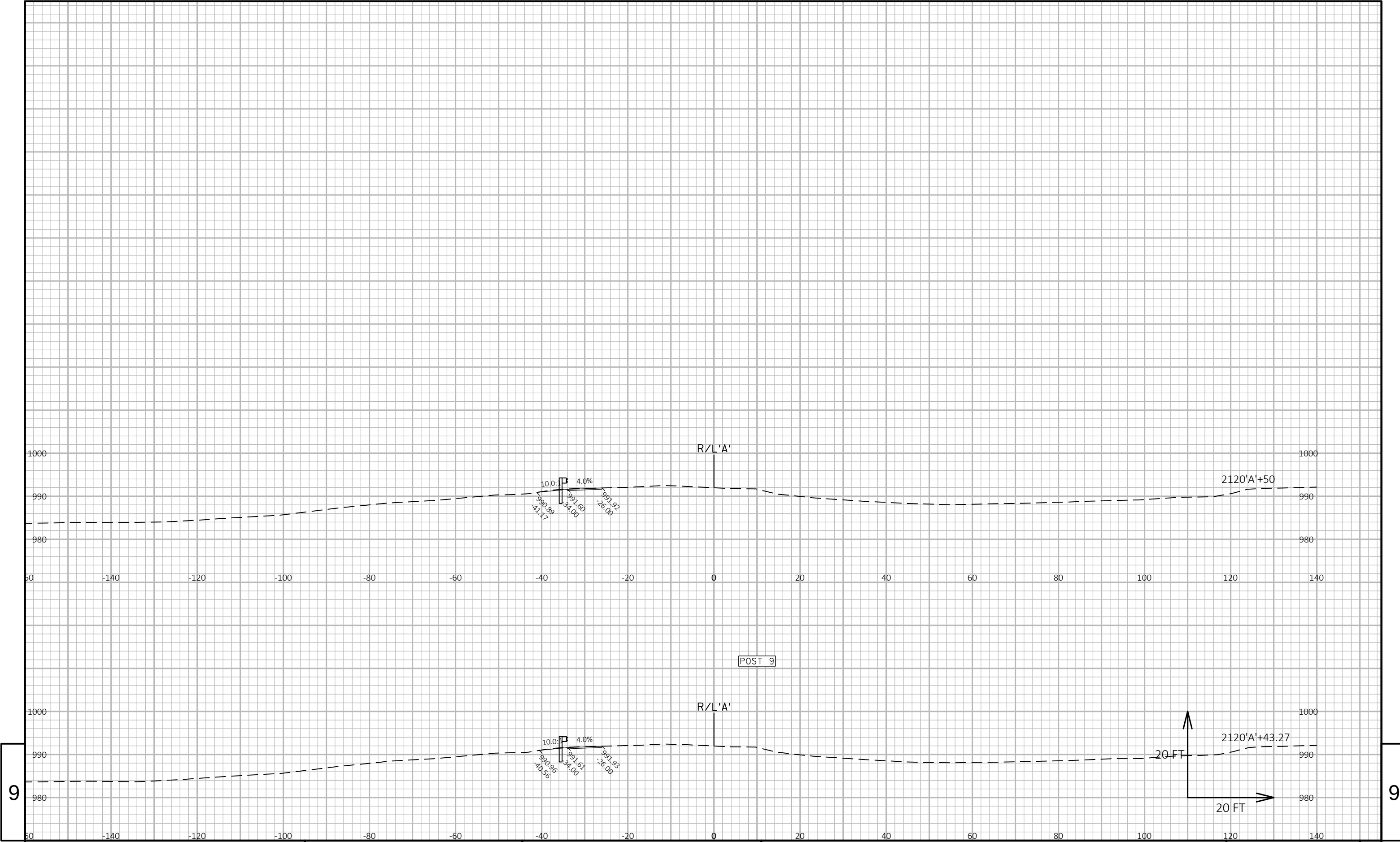
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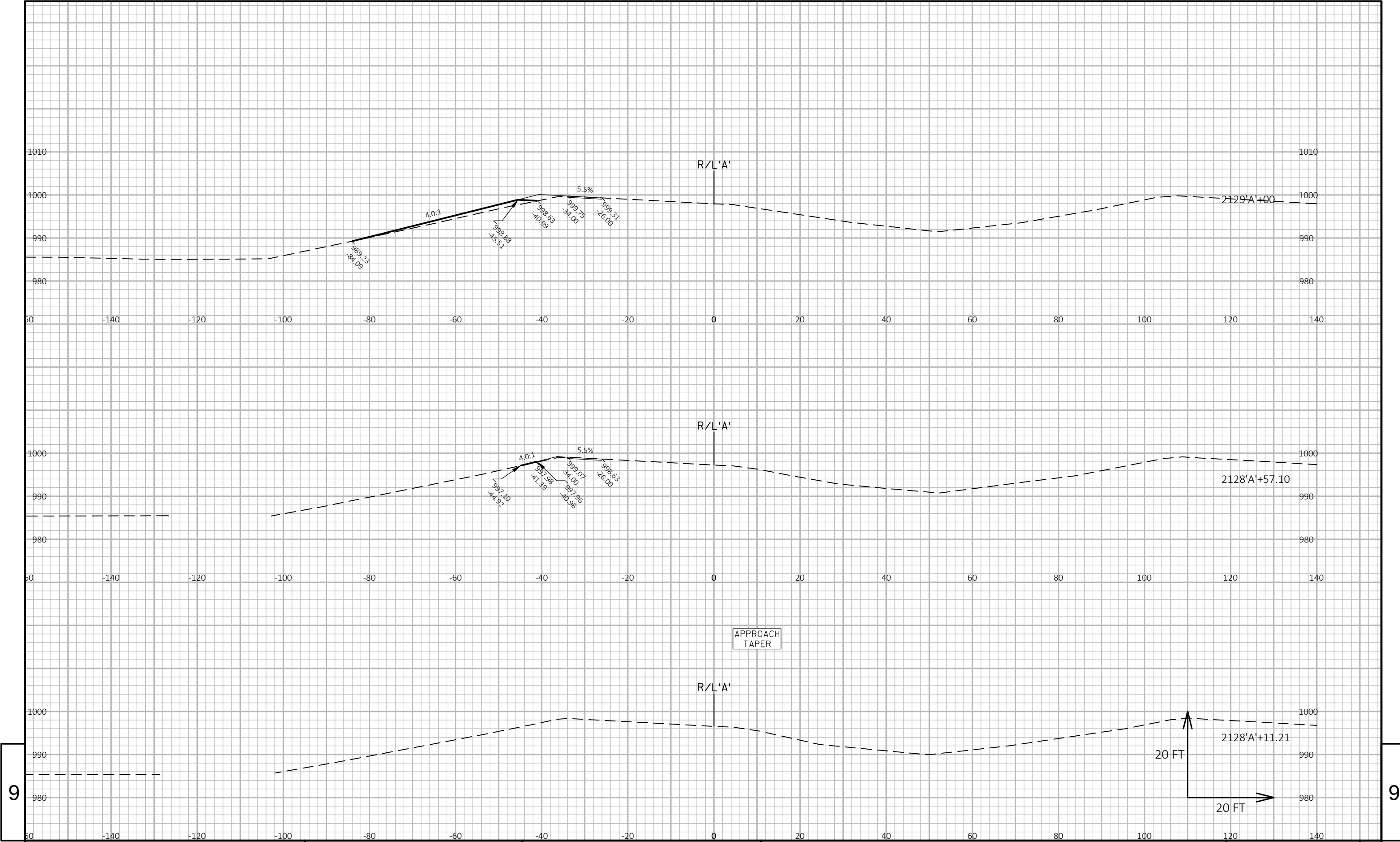
PROJECT NO: 1077-02-70	HWY: IH 90	COUNTY: MONROE	CROSS SECTIONS: WB BEAMGUARD	SHEET E
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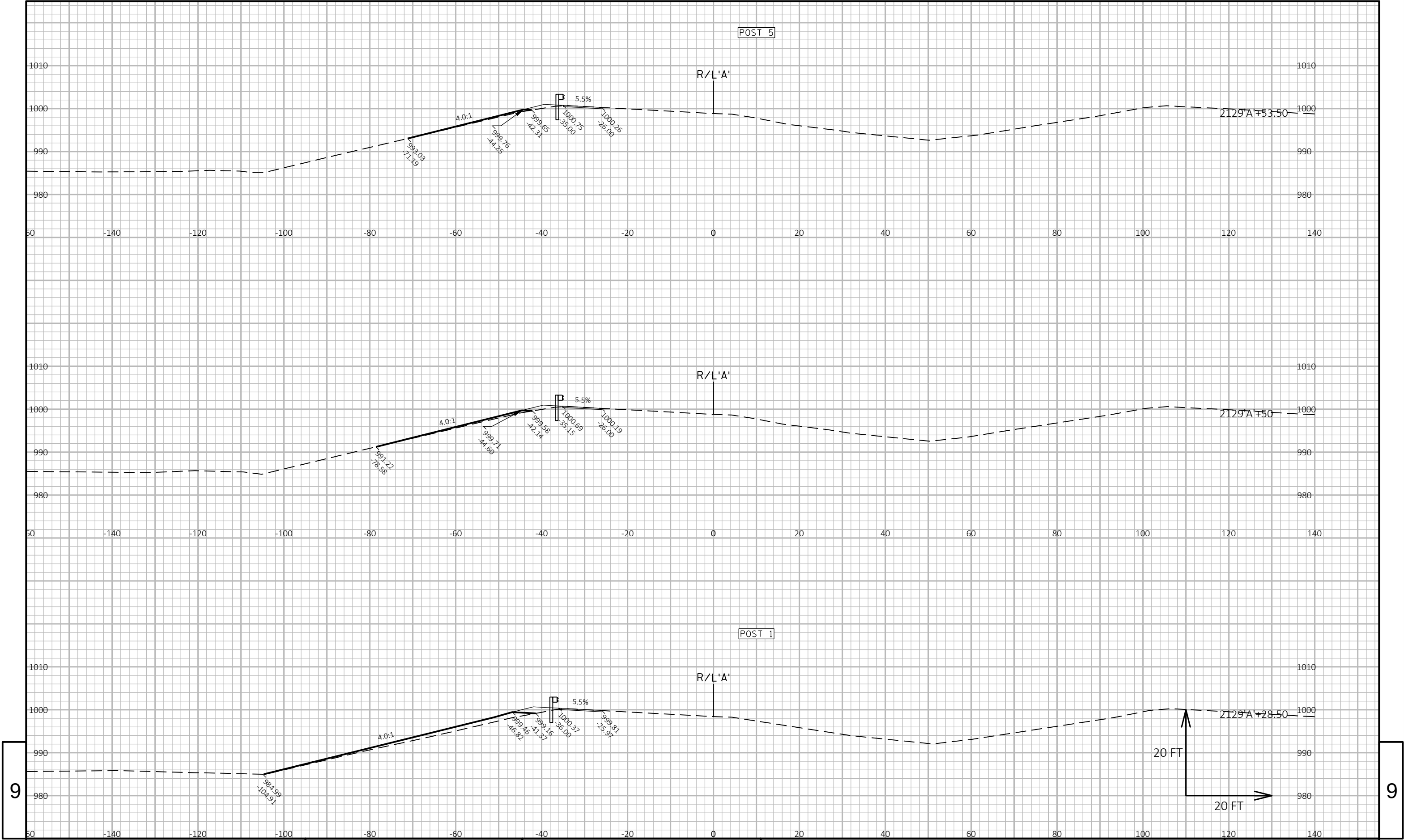
PROJECT NO: 1077-02-70	HWY: IH 90	COUNTY: MONROE	CROSS SECTIONS: WB BEAMGUARD	SHEET	E
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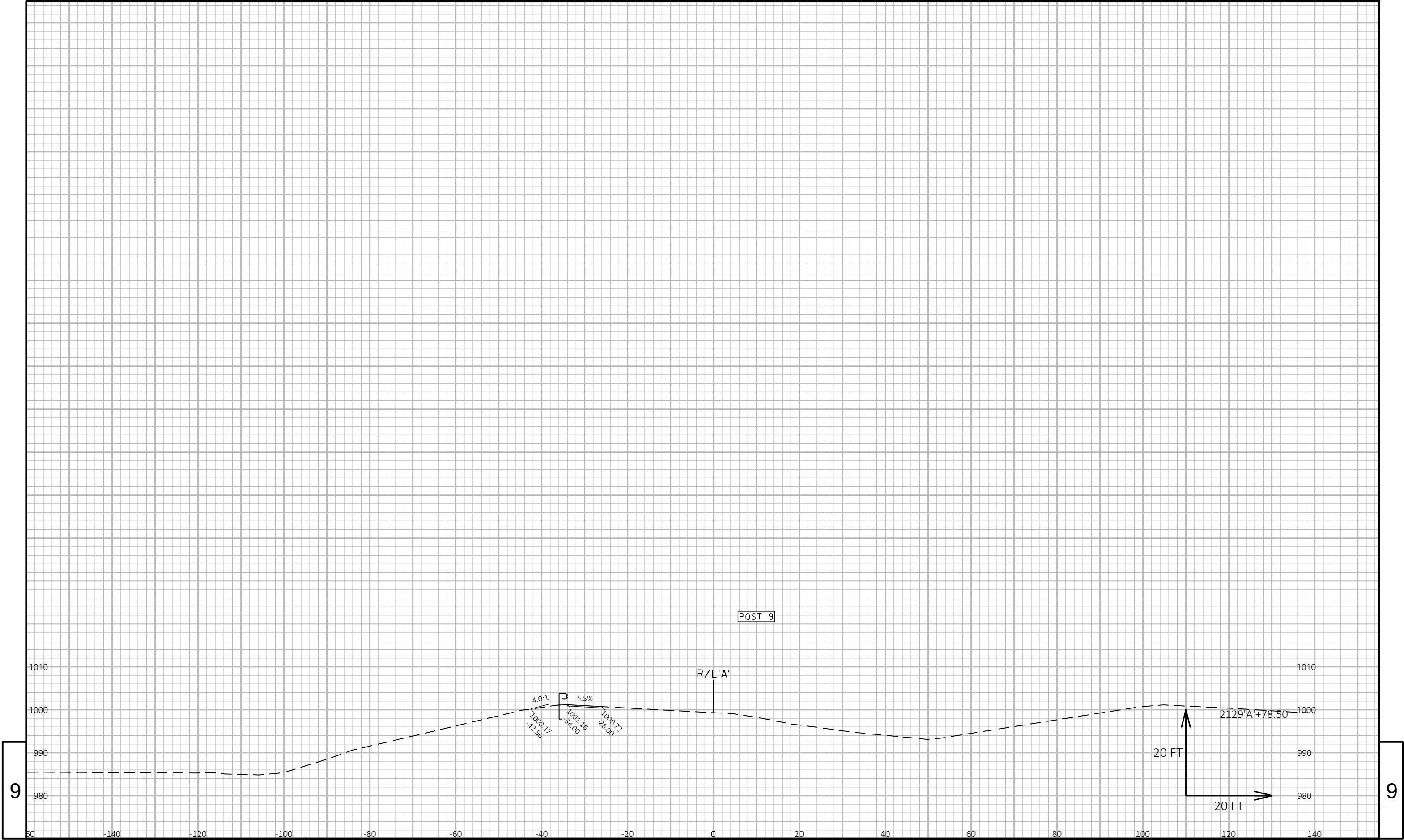


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PROJECT NO: 1077-02-70	HWY: IH 90	COUNTY: MONROE	CROSS SECTIONS: WB BEAMGUARD	SHEET	E
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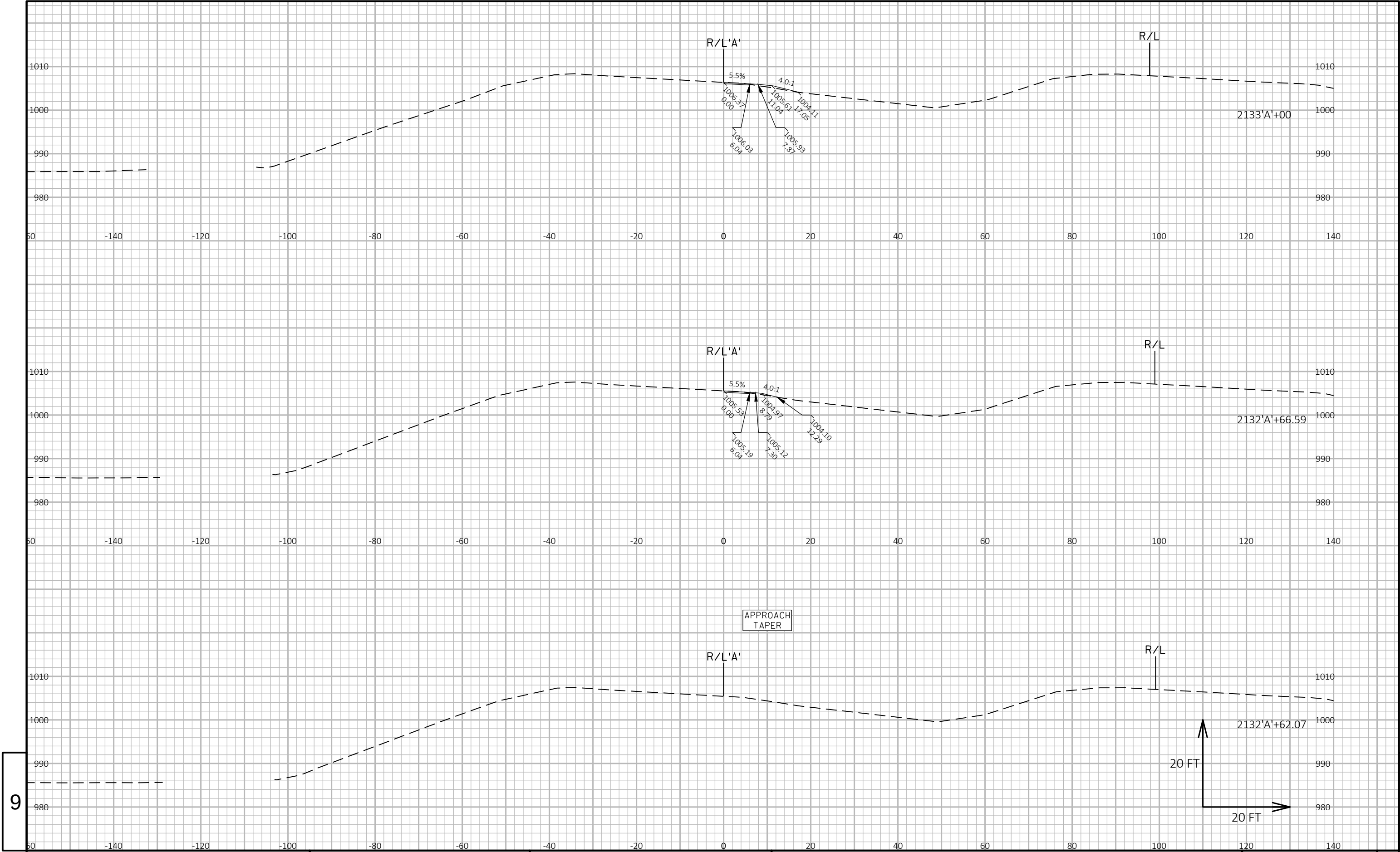




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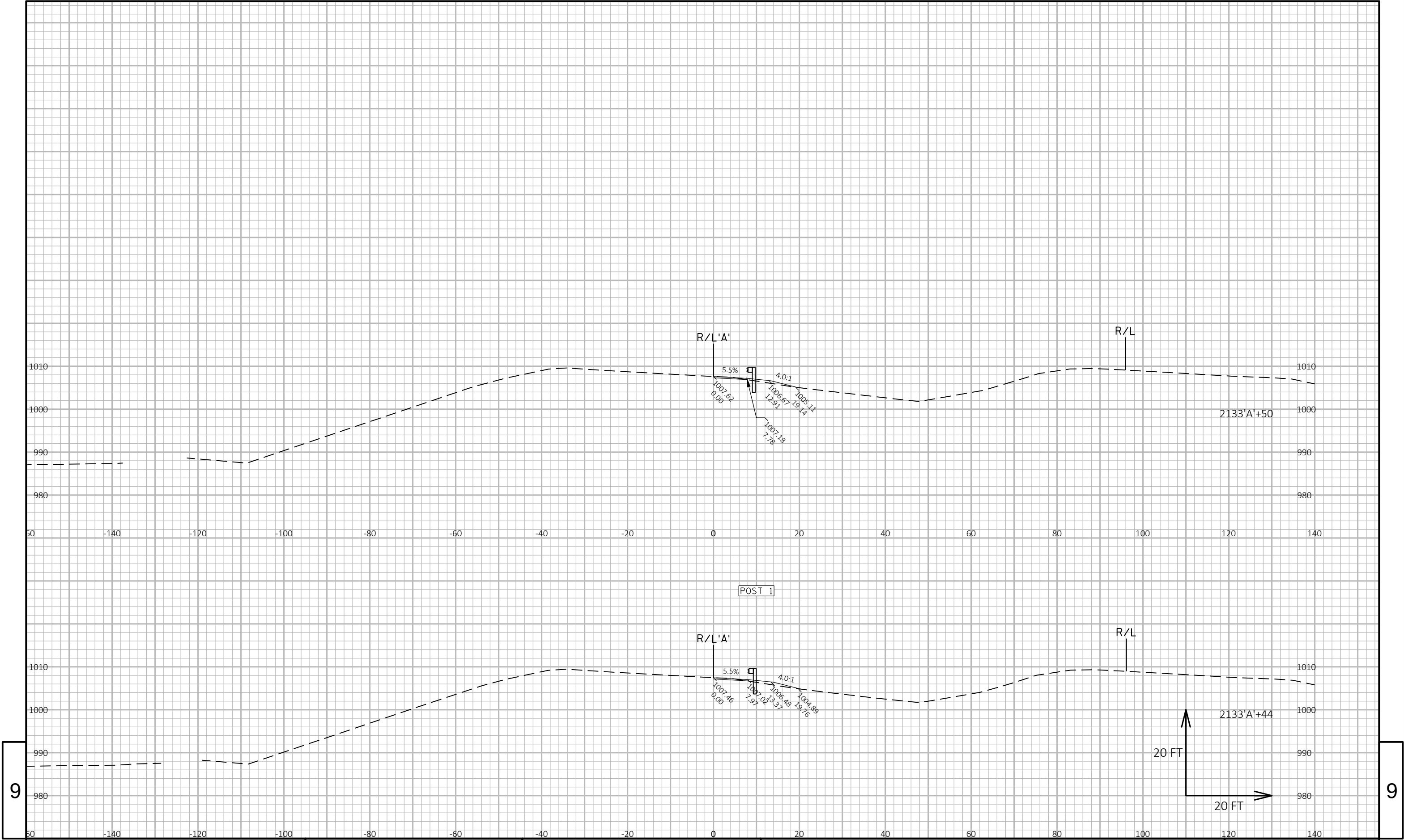
PROJECT NO: 1077-02-70	HWY: IH 90	COUNTY: MONROE	CROSS SECTIONS: WB BEAMGUARD	SHEET	E
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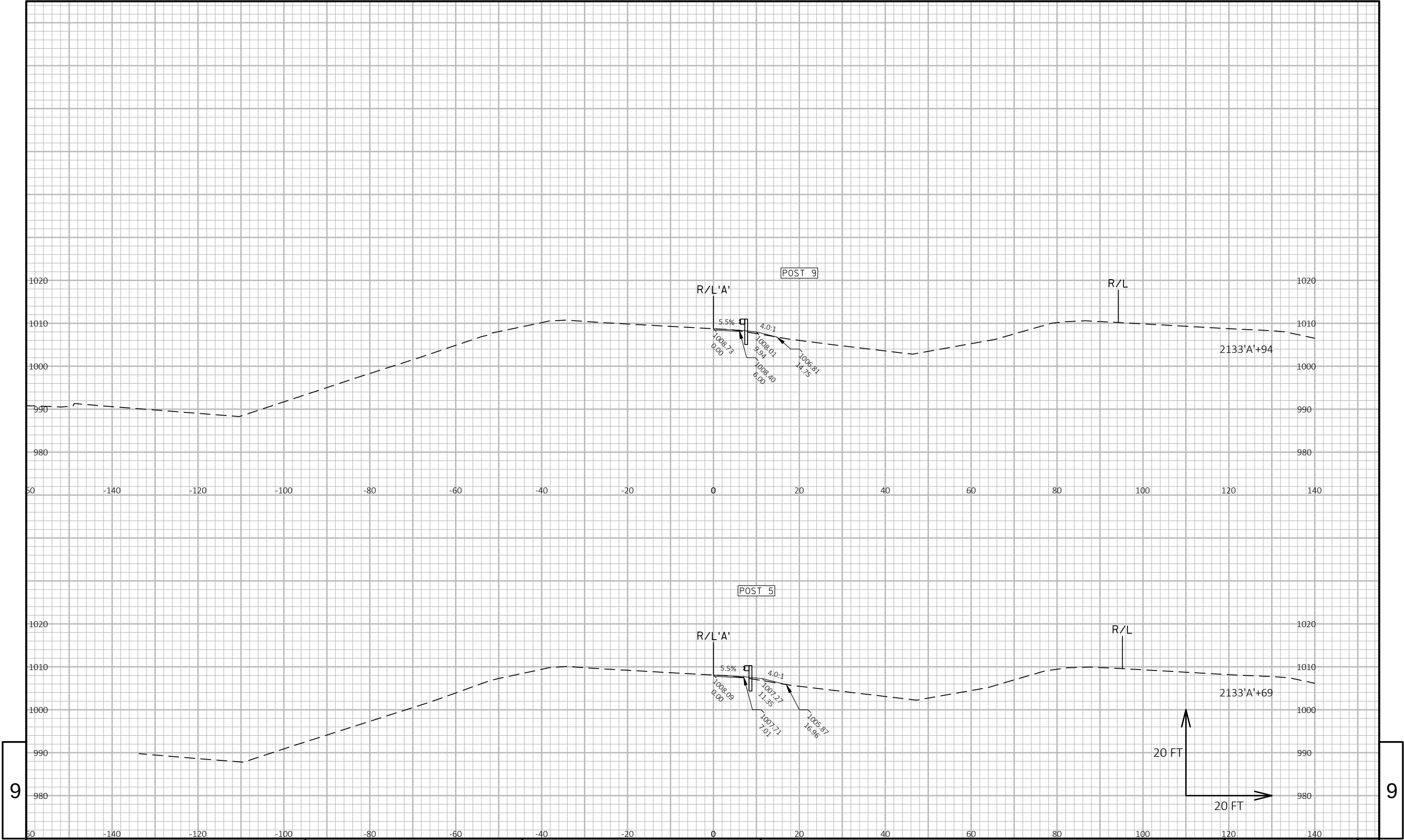
PROJECT NO: 1077-02-70	HWY: IH 90	COUNTY: MONROE	CROSS SECTIONS: WB BEAMGUARD	SHEET	E
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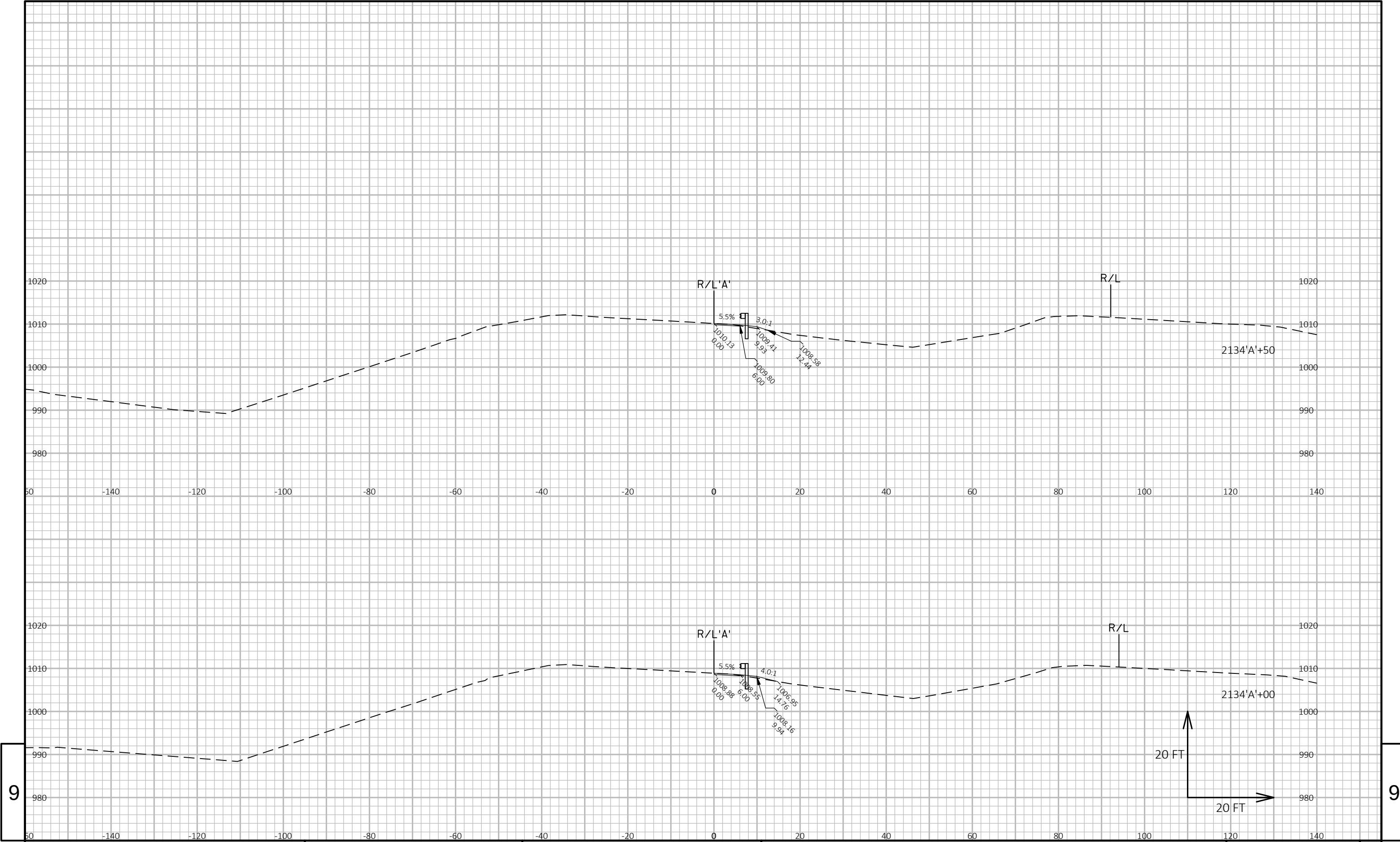
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PROJECT NO: 1077-02-70	HWY: IH 90	COUNTY: MONROE	CROSS SECTIONS: WB BEAMGUARD	SHEET E
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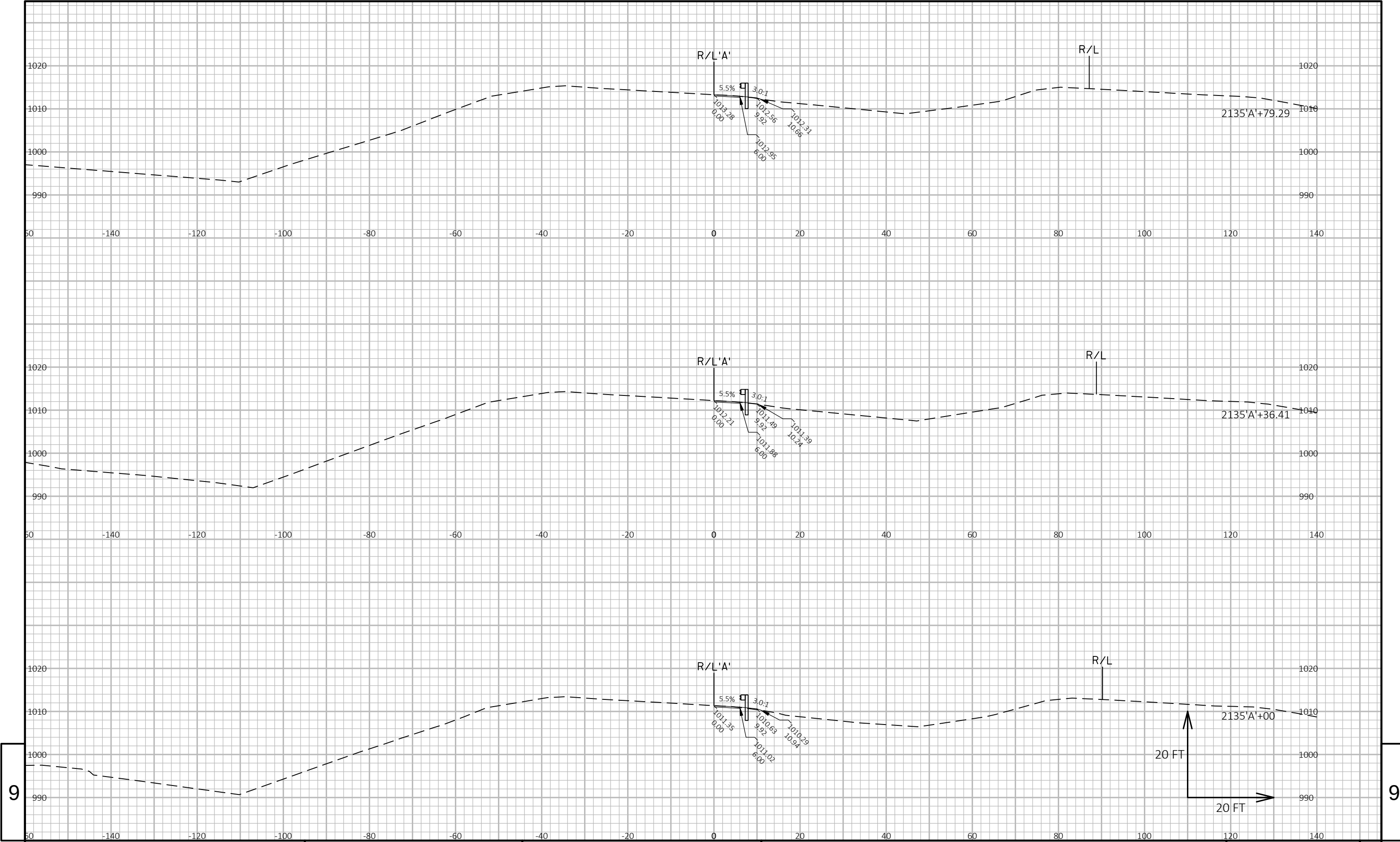
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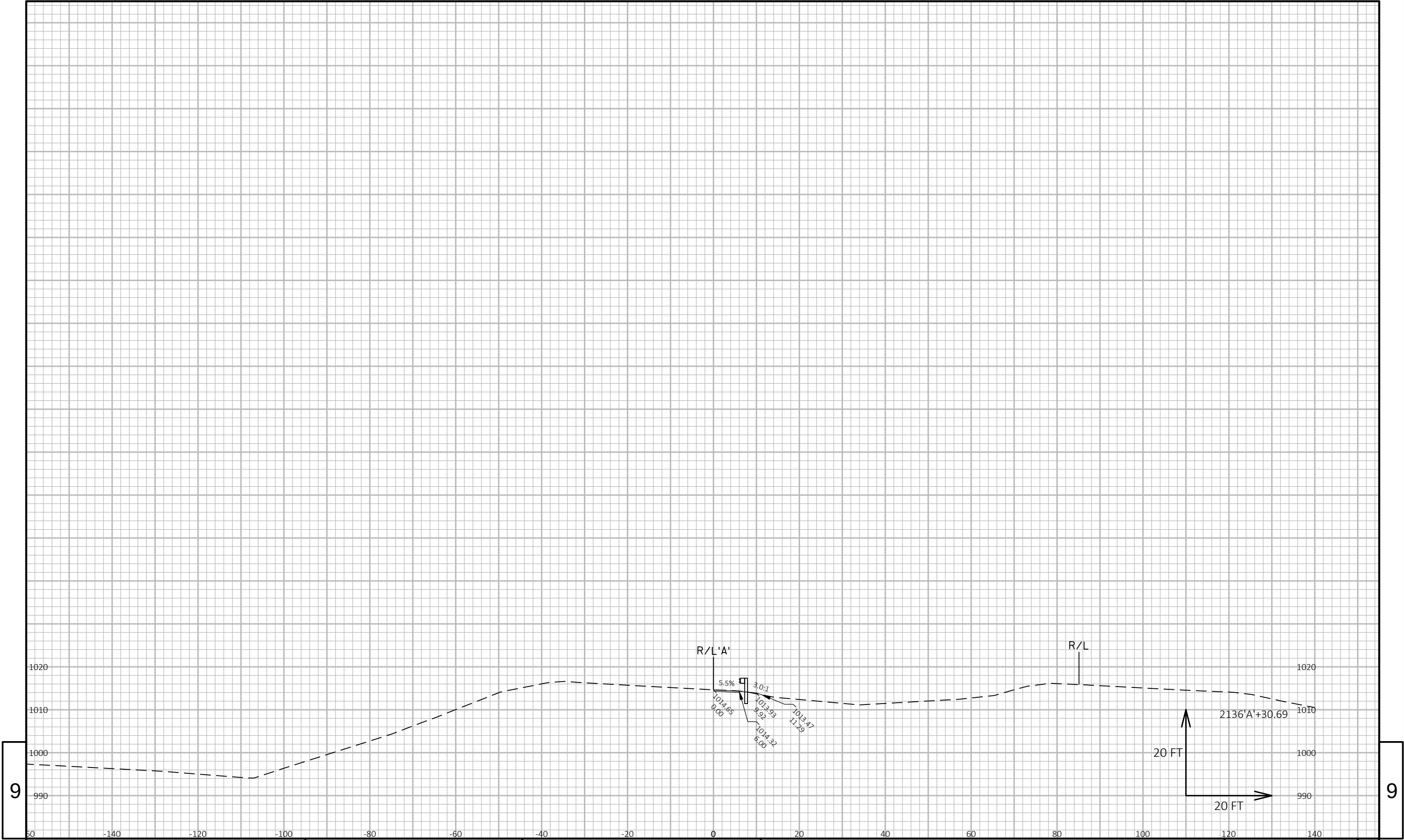
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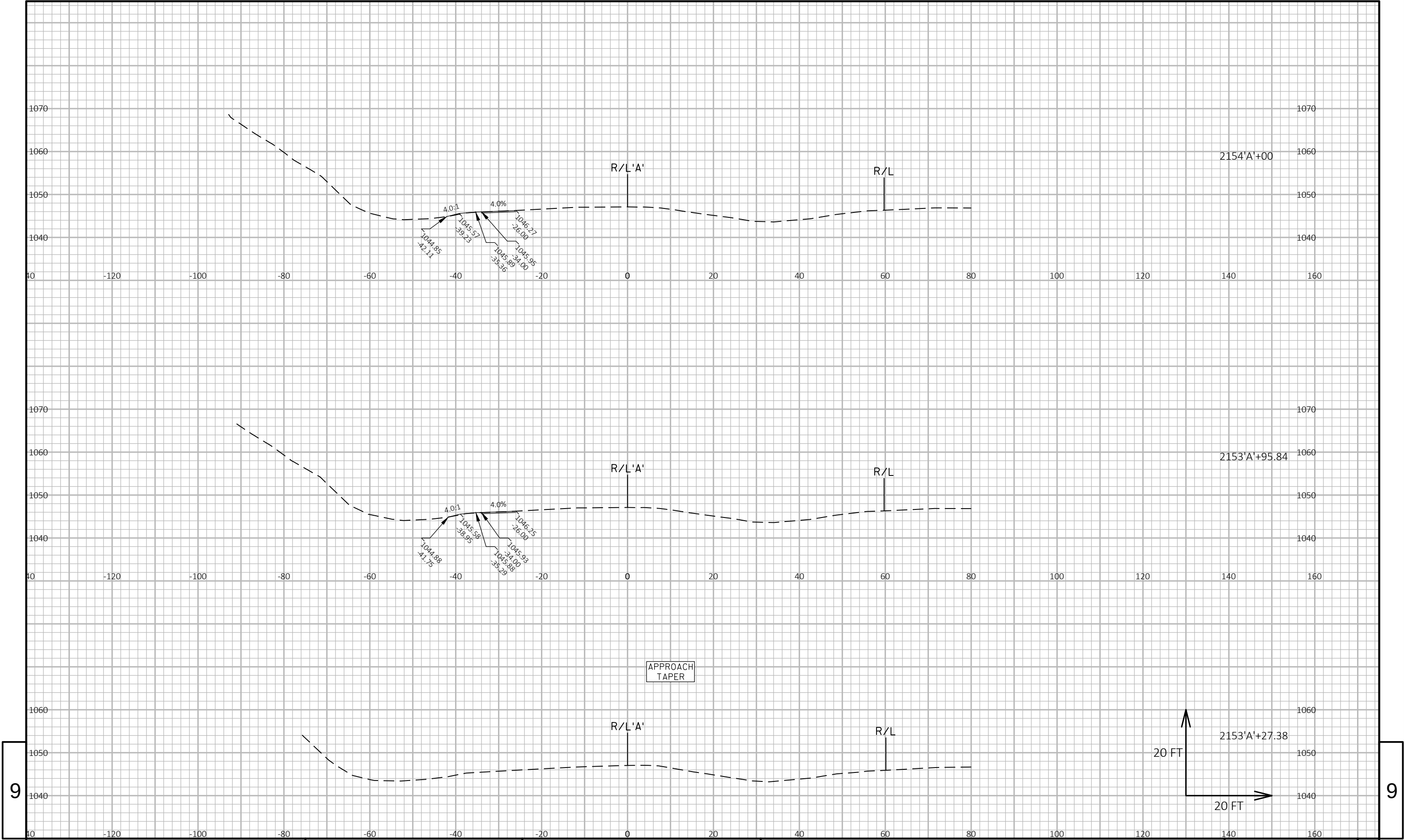
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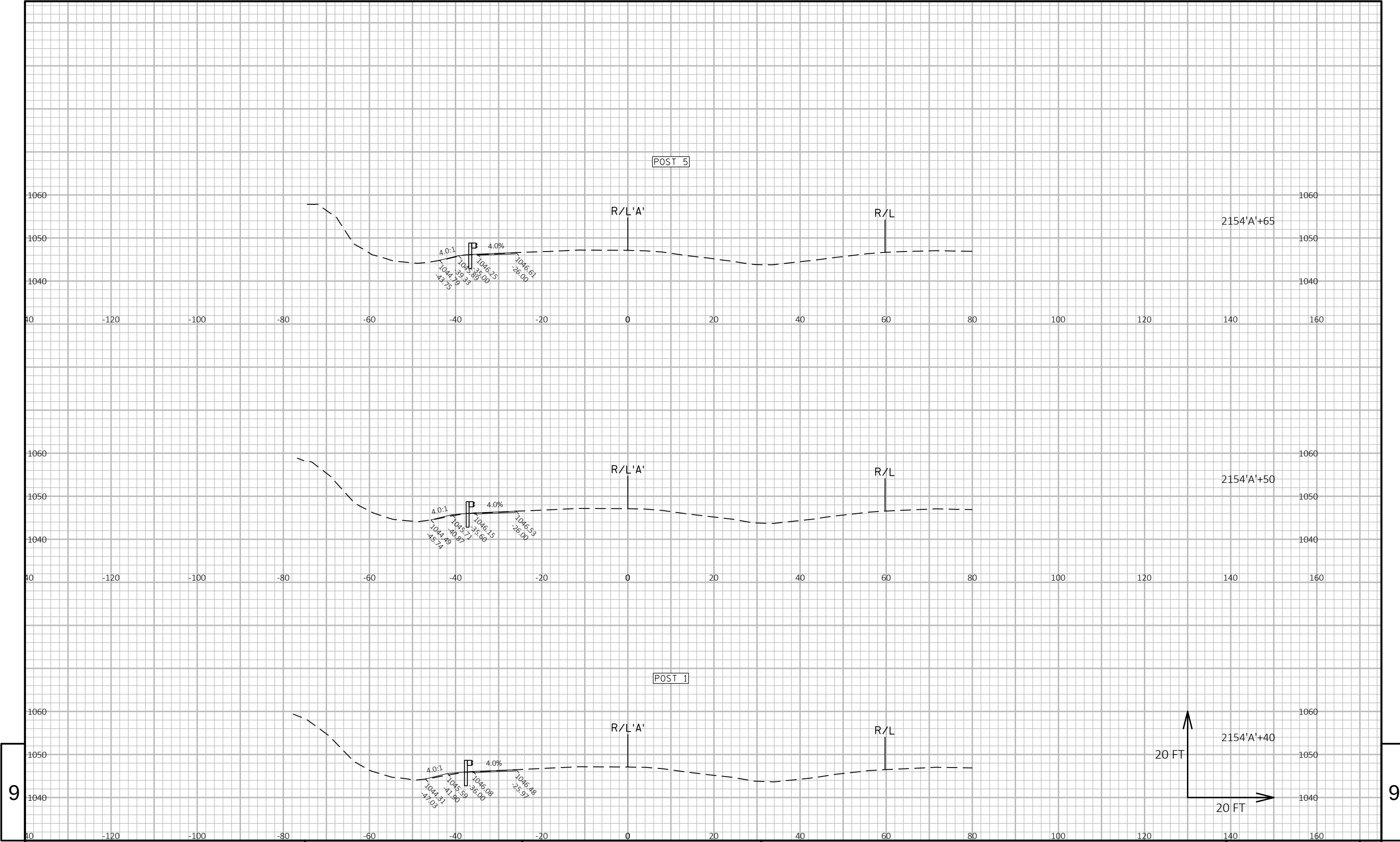


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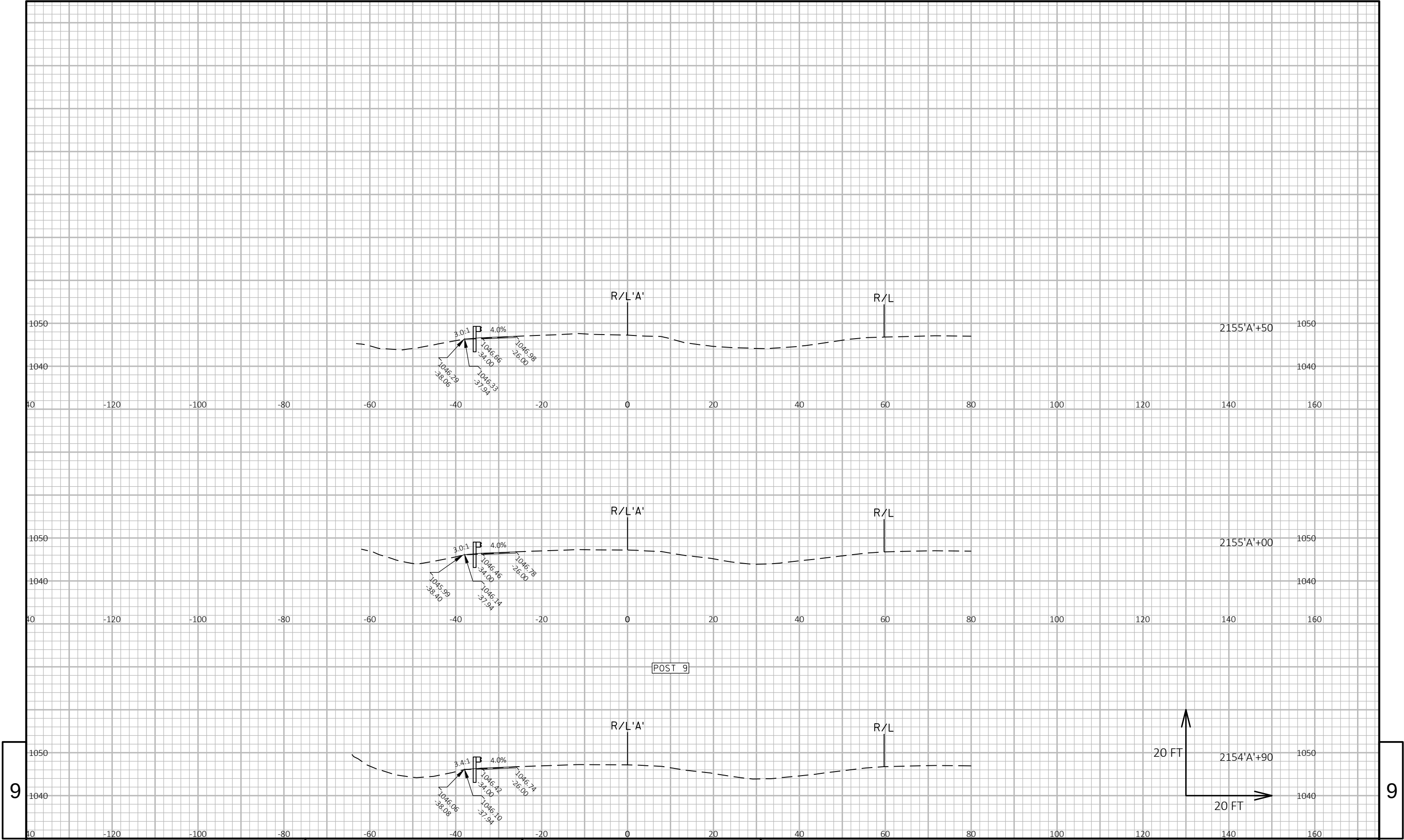
PROJECT NO: 1077-02-70	HWY: IH 90	COUNTY: MONROE	CROSS SECTIONS: WB BEAMGUARD	SHEET	E
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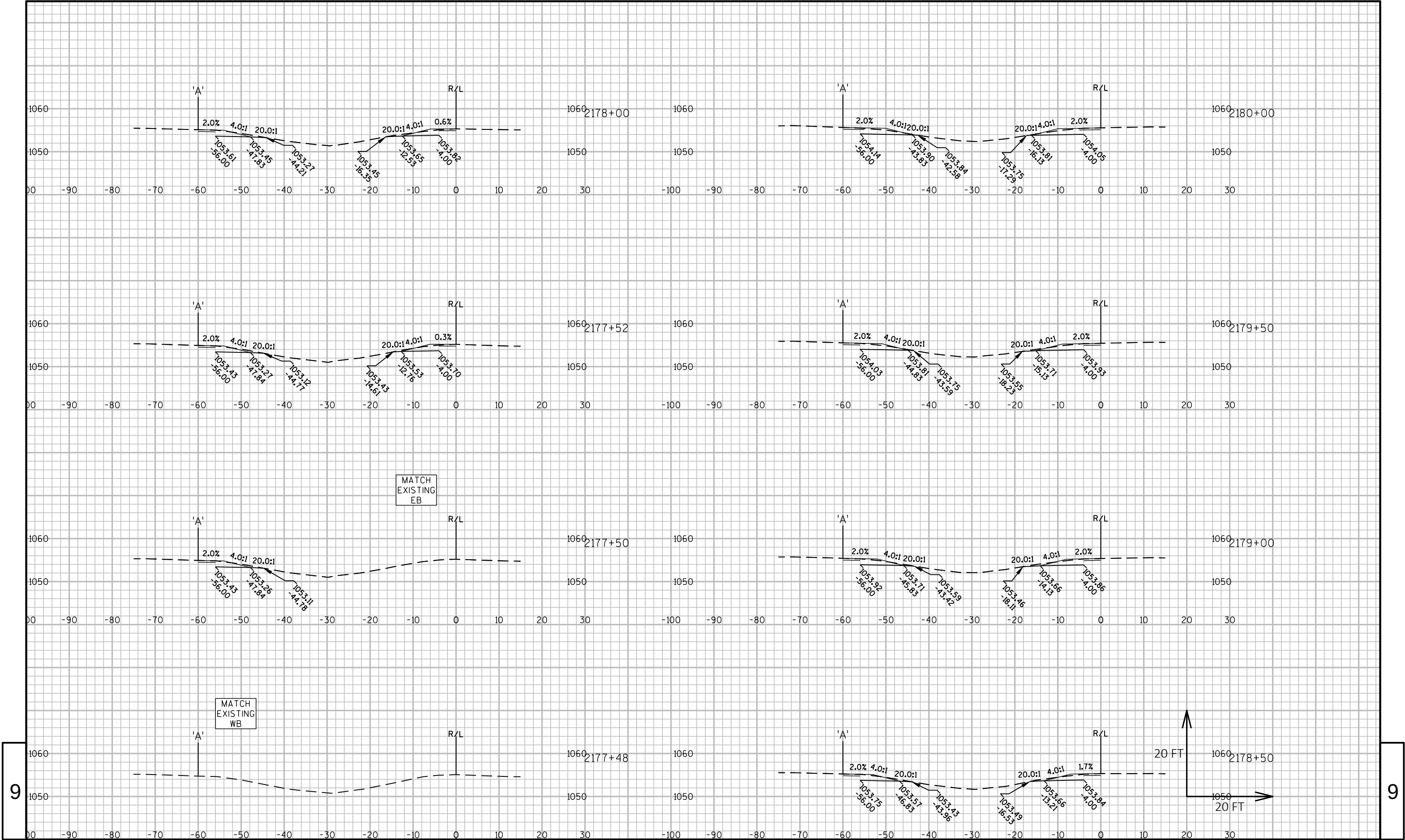
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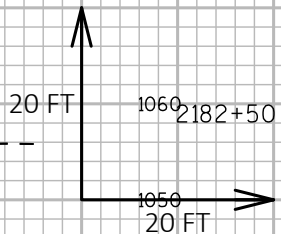
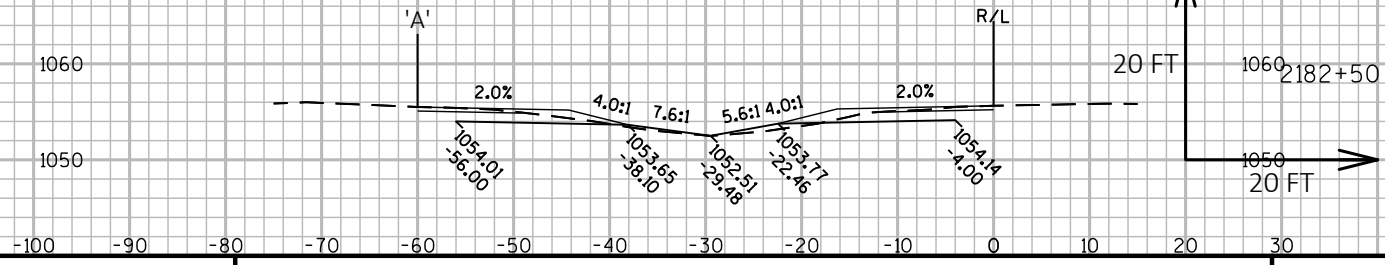
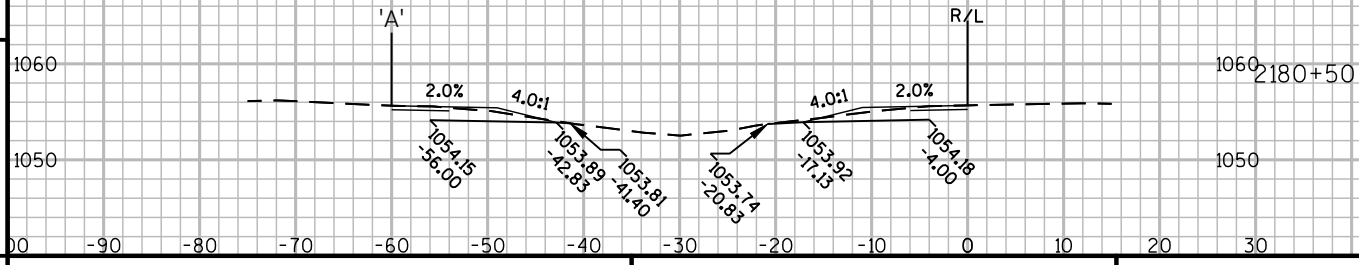
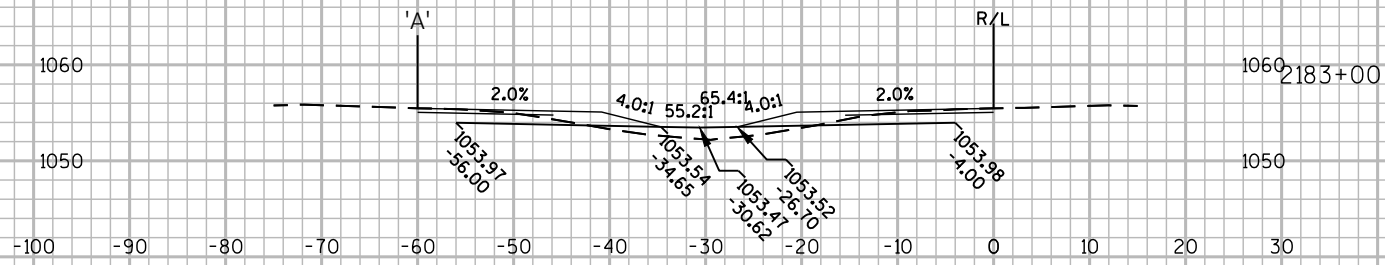
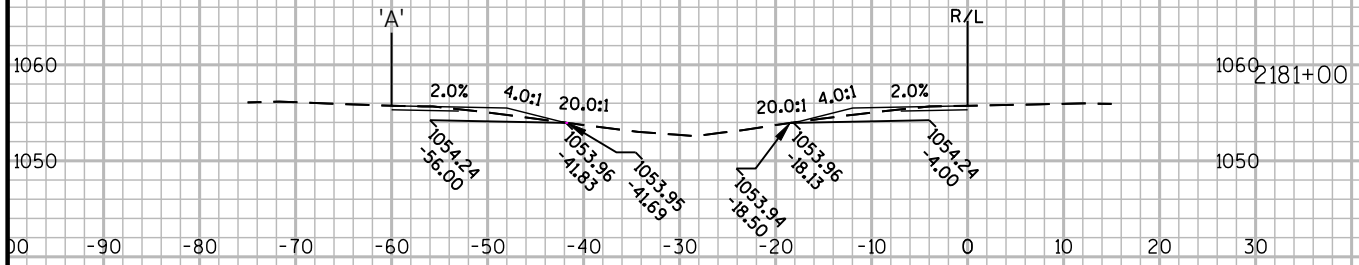
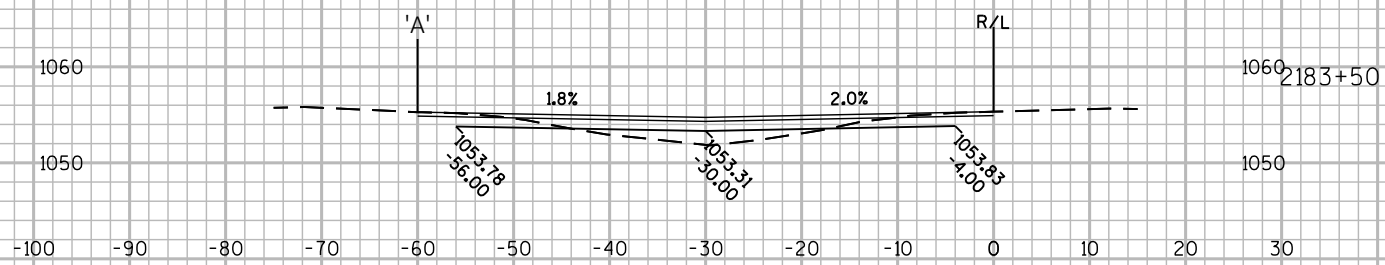
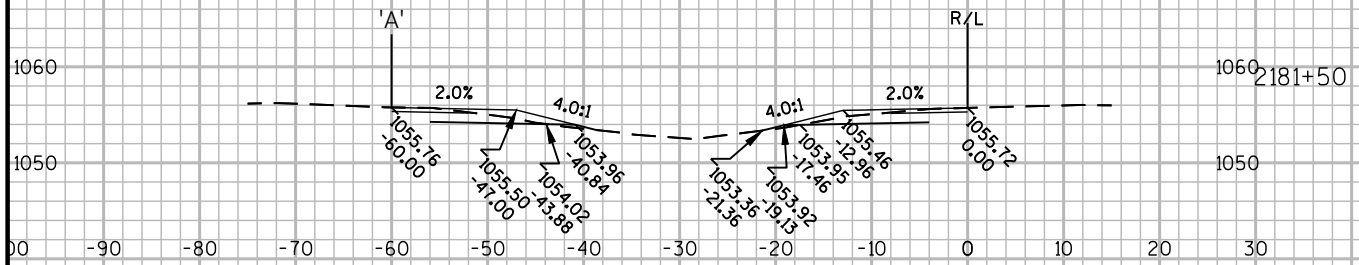
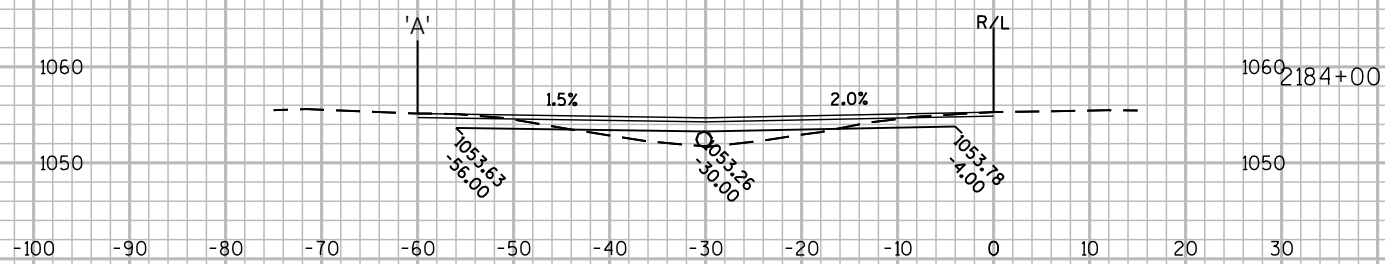
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PROJECT NO: 1077-02-70

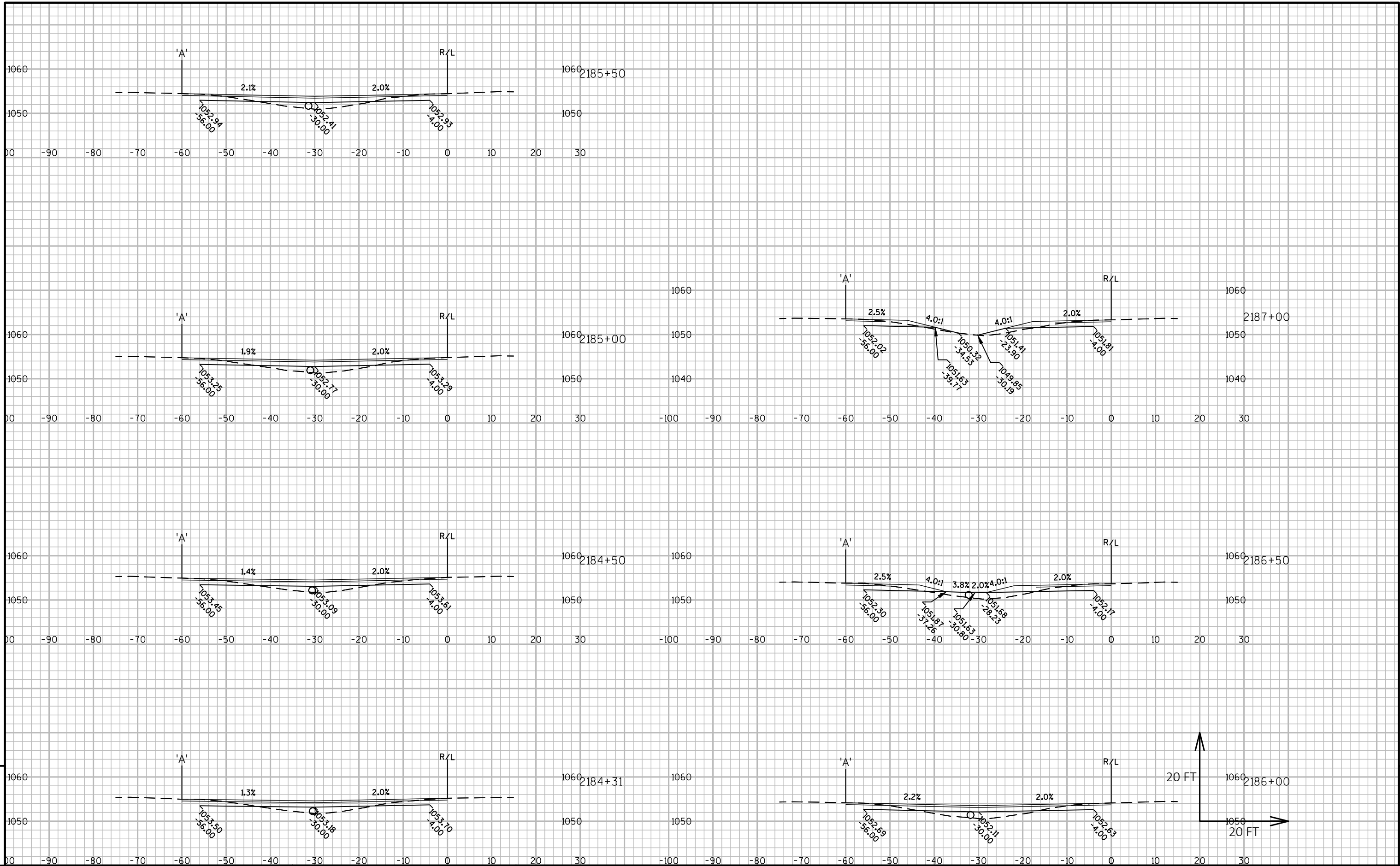
HWY: IH 90

COUNTY: MONROE

CROSS SECTIONS: EAST MAINLINE CROSSOVER

SHEET

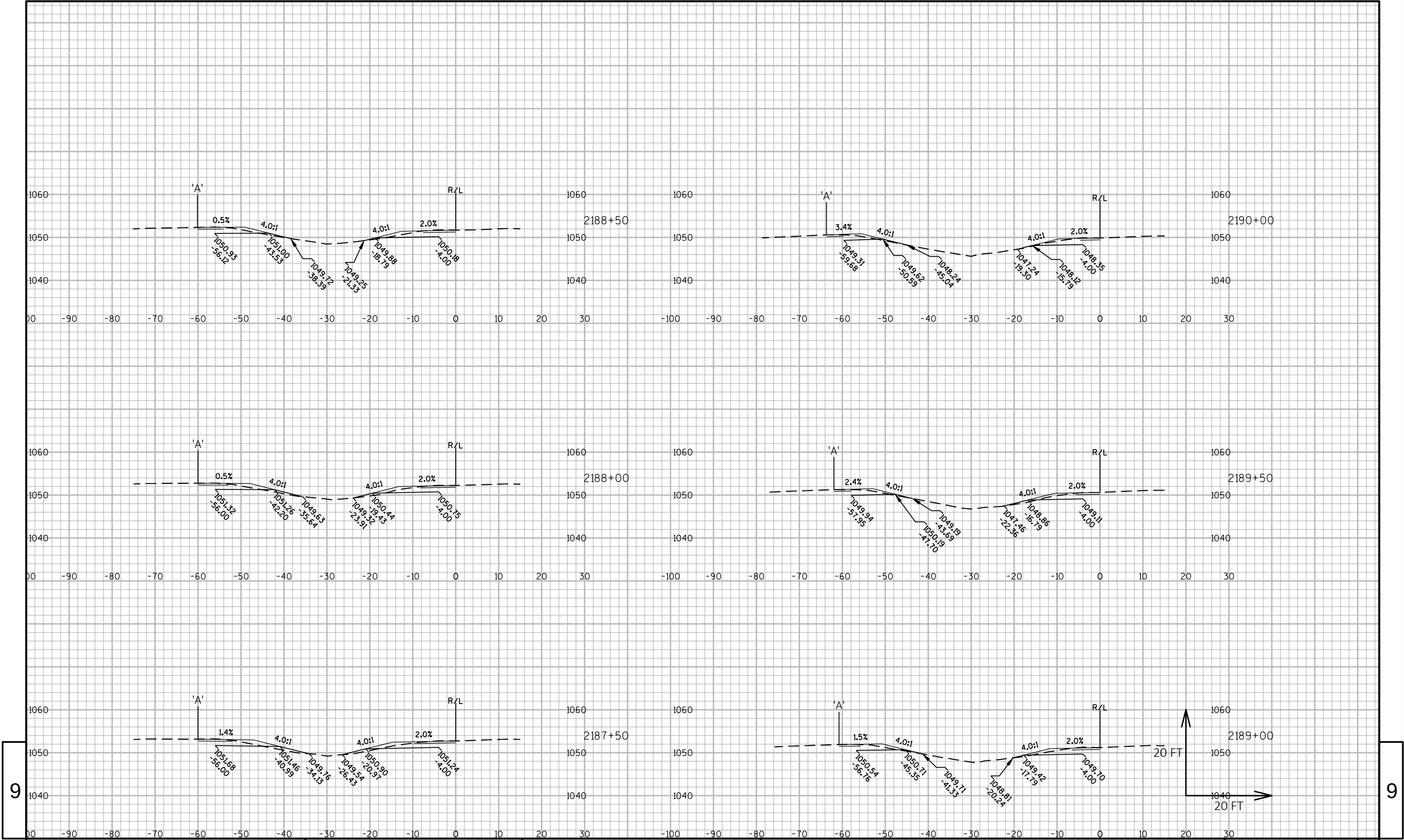
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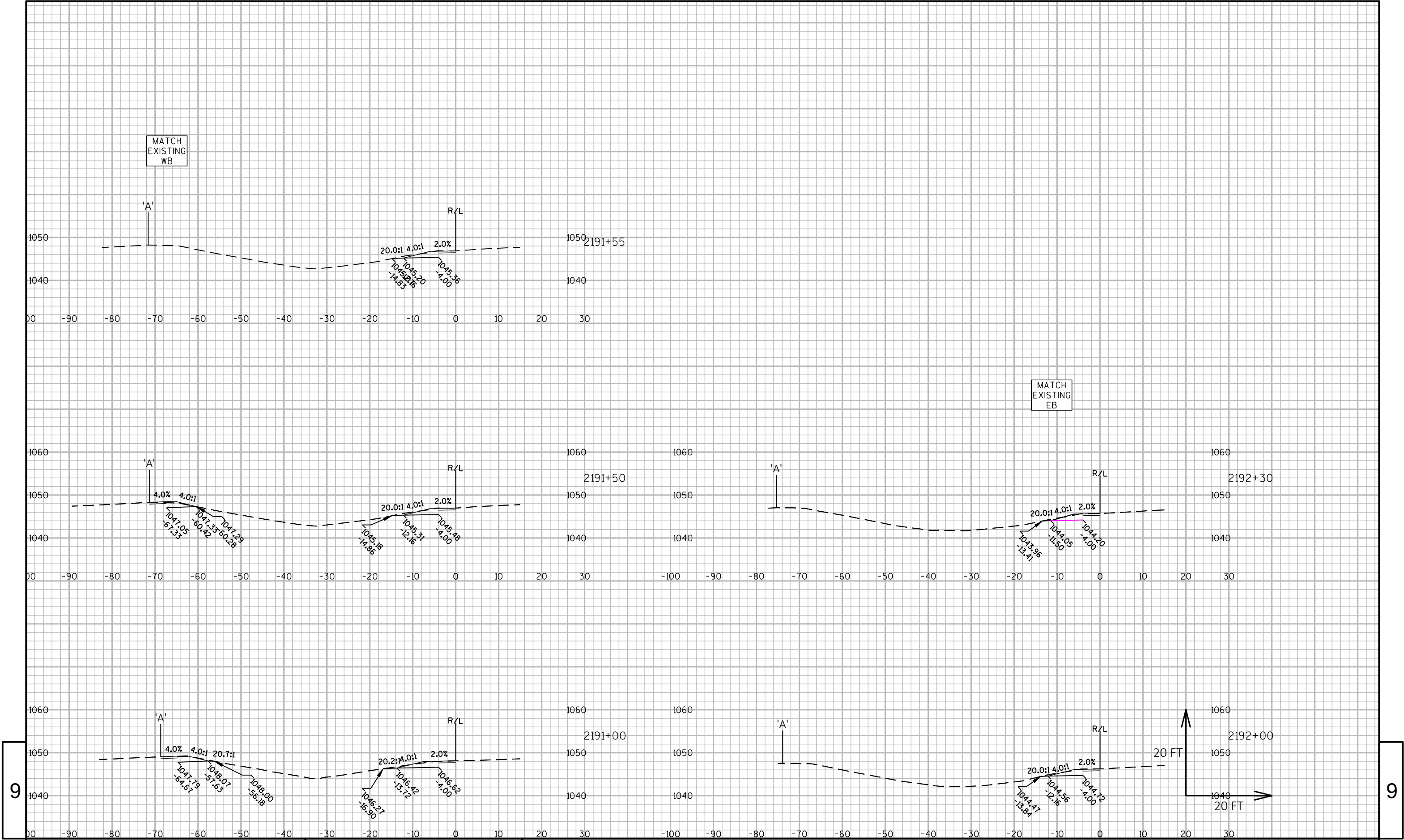


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PROJECT NO: 1077-02-70	HWY: IH 90	COUNTY: MONROE	CROSS SECTIONS: EAST MAINLINE CROSSOVER	SHEET	E
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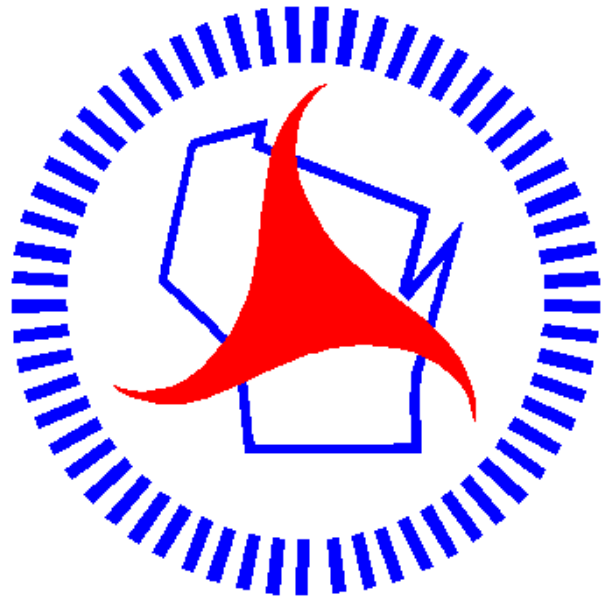




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Notes



Wisconsin Department of Transportation

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