

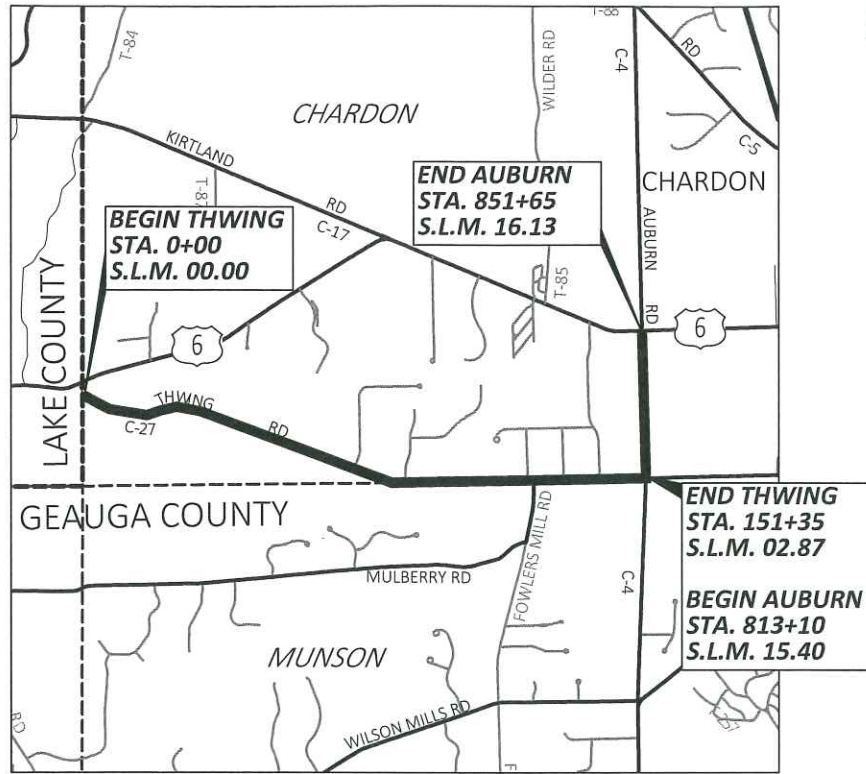
THE ASPHALT RESURFACING OF VARIOUS ROADS INCLUDING AUBURN ROAD AND THWING ROAD
 C:\Users\Timothy.Woodcock\Geogebra County\AD\PIENG Projects - Documents\2026\RS-GEA-V-2026\Design\2026\RS-GEA-V-2026\AUBURN-Q THWING A-B\2026 DESIGN\204 CADD-PLANS\RS-GEA-V-2026-PLANS.dwg
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GEAUGA COUNTY ENGINEER'S OFFICE

RS-GEA-V-2026

THE ASPHALT RESURFACING OF VARIOUS ROADS:
SECTION Q OF AUBURN ROAD 0004-Q
SECTIONS A-B OF THWING ROAD 0027-AB

CHARDON TOWNSHIP, GEAUGA COUNTY
 MUNSON TOWNSHIP, GEAUGA COUNTY



LOCATION MAP
 LATITUDE: 41°34'12" LONGITUDE 81°14'33"



DESIGN DESIGNATION

	AUBURN RD	THWING RD
LENGTH (MILE).....	0.73	2.87
CURRENT ADT.....	8200	3700
DESIGN SPEED.....	45	35
LEGAL SPEED.....	45	35
DESIGN FUNCTIONAL CLASSIFICATION.....	05	07
	05 COLLECTOR (URBAN)	
	07 LOCAL ROAD (RURAL)	

INDEX OF SHEETS:

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PROJECT DESCRIPTION

RESURFACING OF 3.60 MILES OF GEAUGA COUNTY ROADS INCLUDING:
AUBURN ROAD FROM THWING ROAD TO US 6
THWING ROAD FROM THE LAKE COUNTY LINE TO AUBURN ROAD
 THE PROJECT ALSO INCLUDES PAVEMENT MARKINGS, GUARDRAIL IMPROVEMENTS, AND ISOLATED GEOMETRY IMPROVEMENTS ON THWING ROAD.

2023 SPECIFICATIONS

THE STANDARD SPECIFICATIONS OF THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, INCLUDING SUPPLEMENTAL SPECIFICATIONS LISTED IN THE PLANS AND CHANGES LISTED IN THE PROPOSAL SHALL GOVERN THIS IMPROVEMENT EXCEPT AS MODIFIED BY THE FOLLOWING DOCUMENTS PUBLISHED BY GEAUGA COUNTY:
 2026 STANDARD CONTRACT PROVISIONS FOR IMPROVEMENT PROJECTS
 2026 MODIFICATIONS TO OHIO DEPARTMENT OF TRANSPORTATION CONSTRUCTION & MATERIAL SPECIFICATIONS

APPROVED BY GEAUGA COUNTY COUNTY ENGINEER

I HEREBY APPROVE THESE PLANS AND DECLARE THAT THE MAKING OF THIS IMPROVEMENT WILL REQUIRE THE CLOSING TO TRAFFIC OF THE COUNTY HIGHWAY AND THAT A DETOUR ROUTE WILL BE PROVIDED AS SHOWN ON THESE PLANS.

ANDREW W. HAUPT, PE, PS

4/28/2026

DATE

APPROVED BY GEAUGA COUNTY BOARD OF COMMISSIONERS

CAROLYN BRAKEY

JAMES W. DVORAK

RALPH SPIDALIERI

UNDERGROUND UTILITIES
 Contact Two Working Days Before You Dig

 OHIO811, 8-1-1, or 1-800-362-2764 (Non-members must be called directly)

PLAN PREPARED BY:
 GEAUGA COUNTY ENGINEER'S OFFICE
 12665 MERRITT ROAD
 CHARDON, OH 44024

STANDARD CONSTRUCTION DRAWINGS				SUPPLEMENTAL SPECIFICATIONS		SPECIAL PROVISIONS
BP-3.1	01/19/2024	MT-97.12	01/16/2026	800-2023	01/16/2026	MAILBOX DETAIL
BP-4.1	07/19/2013	MT-101.60	01/17/2025	832	07/18/2025	
DM-4.4	01/15/2016	TC-71.10	01/16/2026			
MGS-2.1	01/16/2026					
MGS-4.2	07/18/2026					

ENGINEER'S SEAL

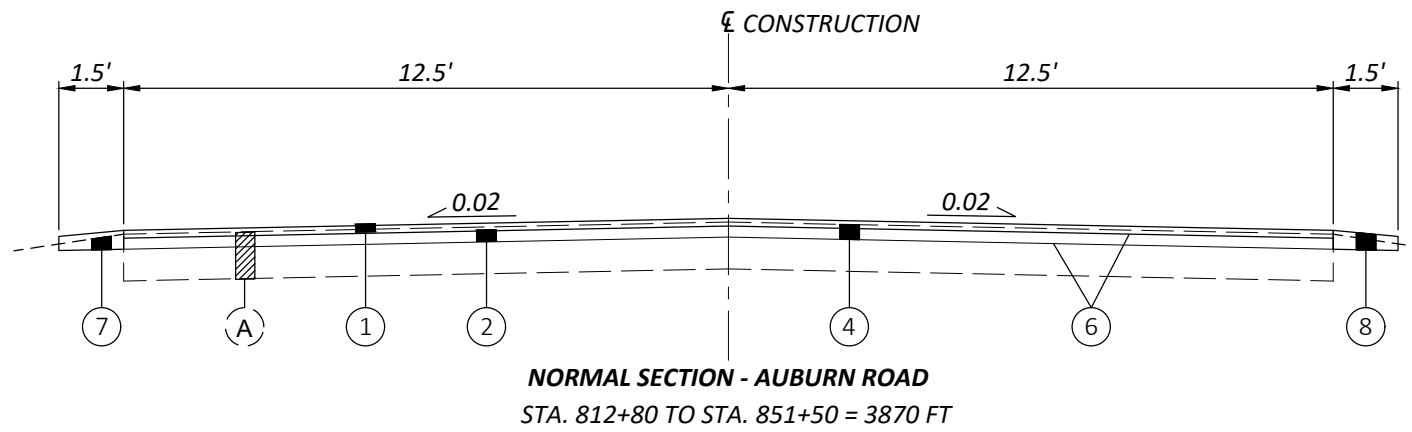
SIGNED DATE 4/28/26

5/5/2024

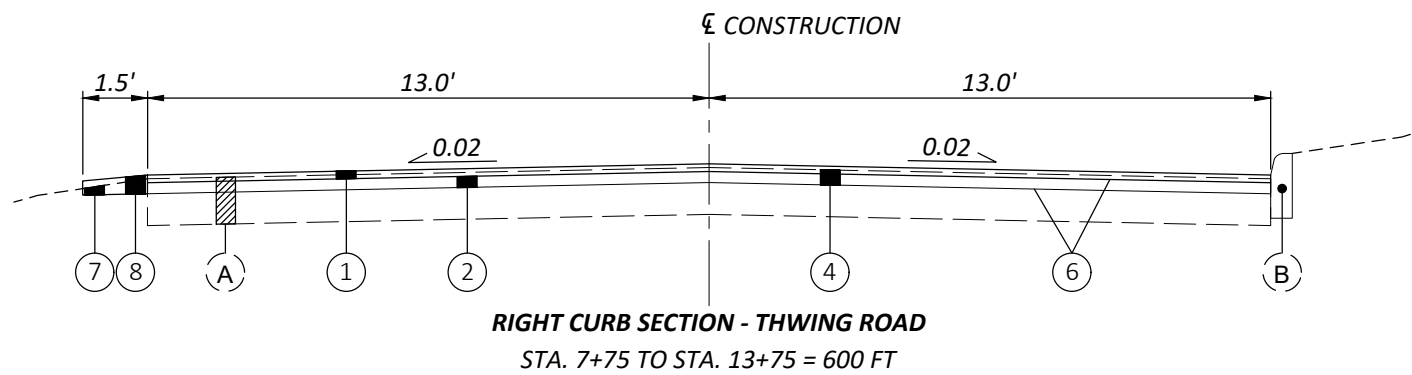
DATE

TITLE SHEET

DESIGNER	TEW
REVIEWER	SEH 4/28/26
PROJECT ID	RS-GEA-V-2026
SHEET	TOTAL
P.1	23

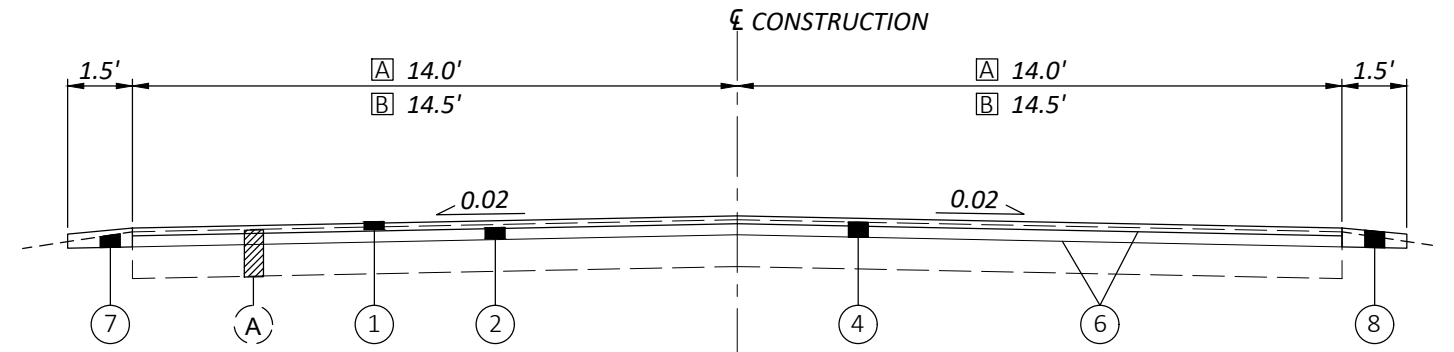


AUBURN ROAD STATIONING:
 STA. 813+10 IS THE CENTER LINE OF THWING ROAD (CH-0027)
 STA. 851+65 IS THE CENTER LINE OF CHARDON ROAD (US 6)

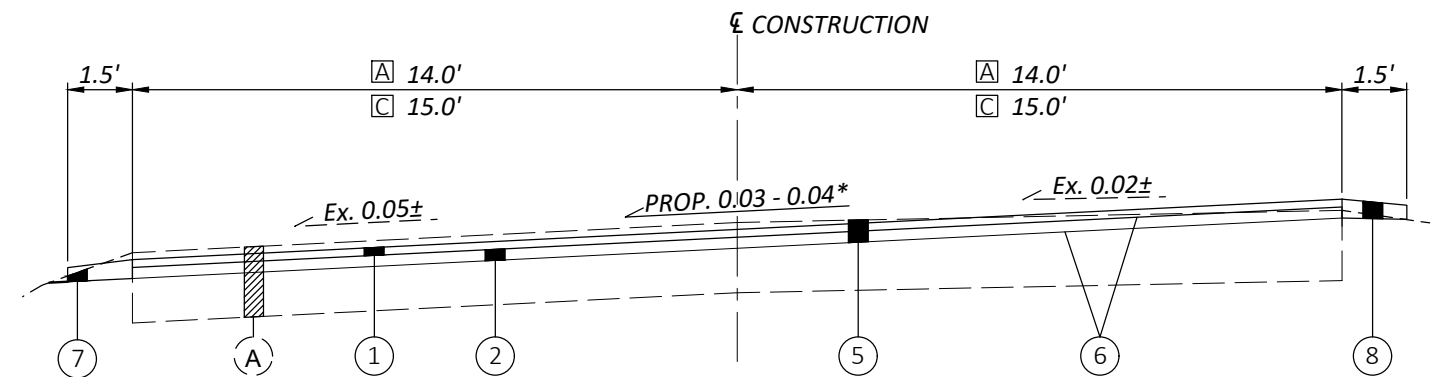


LEGEND

- ① ITEM 424 - 1" FINE GRADED POLYMER ASPHALT CONCRETE, TYPE B, (448), PG76-22M
- ② ITEM 441 - 1.25" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 1, (448), PG64-22
- ③ ITEM 441 - ASPHALT CONCRETE INTERMEDIATE COURSE LEVELING COURSE, TYPE 2, (449), PG64-22 (VARIABLE THICKNESS)
- ④ ITEM 254 - 1.5" PAVEMENT PLANING, ASPHALT CONCRETE
- ⑤ ITEM 254 - 0" - 8" PAVEMENT PLANING, ASPHALT CONCRETE, VARIABLE DEPTH
- ⑥ ITEM 407 - NON-TRACKING TACK COAT
- ⑦ ITEM 209 - LINEAR GRADING, AS PER PLAN
- ⑧ ITEM 617 - 2.25" COMPACTED AGGREGATE (RAP)
- ⑨ ITEM 617 - COMPACTED AGGREGATE (304 LIMESTONE), VARIABLE DEPTH
- ⑩ ITEM 203 - EXCAVATION
- ⑪ ITEM 203 - EMBANKMENT
- (A) 12" - 18"± ASPHALT
- (B) CONCRETE CURB TO REMAIN



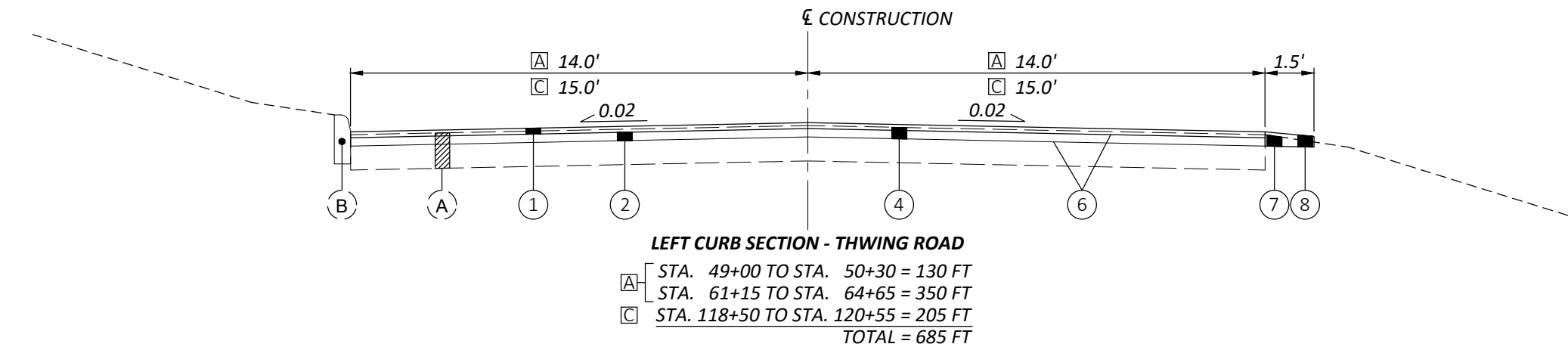
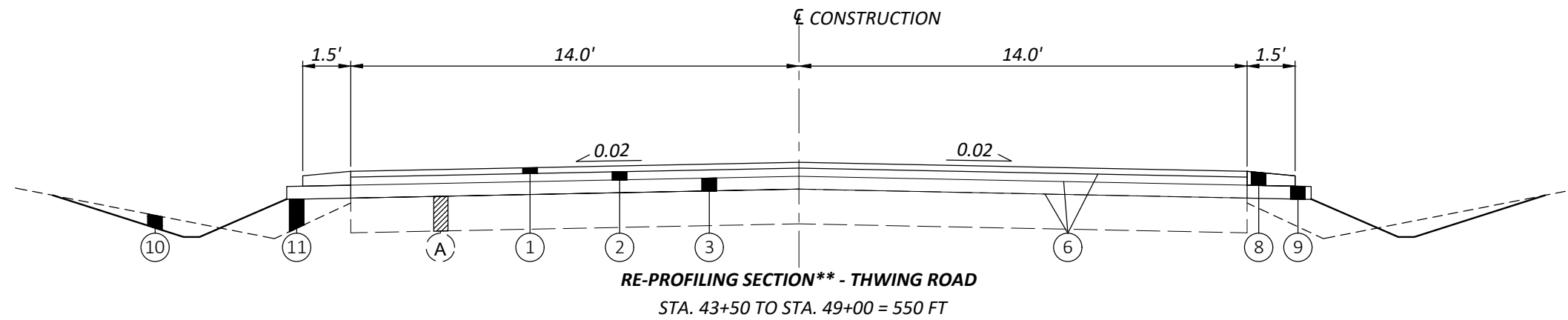
STA. 0+00 TO STA. 1+75 = 175 FT
 STA. 13+75 TO STA. 16+25 = 250 FT
 STA. 27+00 TO STA. 30+50 = 350 FT
 (A) STA. 35+50 TO STA. 43+50 = 800 FT
 STA. 50+30 TO STA. 61+15 = 1085 FT
 STA. 64+65 TO STA. 82+75 = 1810 FT
 STA. 88+00 TO STA. 118+50 = 3050 FT
 (B) STA. 120+55 TO STA. 151+35 = 3080 FT
 TOTAL = 10,600 FT



STA. 1+75 TO STA. 7+75 = 600 FT
 (C) STA. 16+25 TO STA. 21+75 = 550 FT
 STA. 21+75 TO STA. 27+00 = 525 FT (SUPERELEVATION REVERSED)
 (A) STA. 30+50 TO STA. 35+50 = 500 FT (SUPERELEVATION REVERSED)
 (C) STA. 82+75 TO STA. 88+00 = 525 FT
 TOTAL = 2700 FT

NOTES:
 * REFERENCE SUPERELEVATION TABLES FOR SPECIFIC CROSS SLOPES

THWING ROAD STATIONING
 STA. 0+00 IS THE LAKE COUNTY LINE
 STA. 75+00 IS THE CENTER LINE OF PINEGATE DRIVE (TR-0518)
 STA. 89+05 IS THE CENTER LINE OF FOREST OAKS DRIVE (TR-0583)
 STA. 120+90 IS THE CENTER LINE OF OLMAR DRIVE (TR-0310)
 STA. 122+40 IS THE CENTER LINE OF FOWLERS MILL ROAD (CH-0039)
 STA. 130+25 IS THE CENTER LINE OF HELMUT DRIVE (TR-0308)
 STA. 139+55 IS THE CENTER LINE OF HENNING DRIVE (TR-398)
 STA. 151+50 IS THE CENTER LINE OF AUBURN ROAD (CH-0004)



LEGEND

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- ⑪ ITEM 203 - EMBANKMENT
- (A) 12" - 18"± ASPHALT
- (B) CONCRETE CURB TO REMAIN

NOTES:

** REFERENCE CROSS SECTIONS FOR PROPOSED ELEVATIONS AND EARTHWORK VOLUMES

THWING ROAD STATIONING

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- STA. 89+05 IS THE CENTER LINE OF FOREST OAKS DRIVE (TR-0583)
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- STA. 139+55 IS THE CENTER LINE OF HENNING DRIVE (TR-398)
- STA. 151+50 IS THE CENTER LINE OF AUBURN ROAD (CH-0004)

GENERAL

UTILITIES

THE CONTRACTOR SHALL CONTACT OHIO811 A MINIMUM OF TWO (2) WORKING DAYS PRIOR TO COMMENCING ANY WORK. CALL 8-1-1 OR (800) 362-2764 OR GO TO [HTTPS://OUPS.ORG/](https://oups.org/). LISTED BELOW ARE ALL UTILITIES LOCATED WITHIN THE PROJECT CONSTRUCTION LIMITS TOGETHER WITH THEIR RESPECTIVE OWNERS:

ELECTRIC:
ILLUMINATING COMPANY
7755 AUBURN ROAD
CONCORD, OH 44077
(440) 358-4944

GAS:
ENBRIDGE GAS OHIO
320 SPRINGSIDE DR, SUITE 320
AKRON, OHIO 44333
(330) 664-2409

GAS:
DIVERSIFIED GAS & OIL
100 CORPORATE RIDGE
BIRMINGHAM, AL 35242
(205) 408-0909

GAS:
KNOX ENERGY CO-OP
11872 WORTHINGTON RD NW
PATASKALA, OH 43062
(740) 927-6731

GAS:
NORTHEAST OHIO
8470 STATION STREET
MENTOR, OHIO 44060
(440) 701-5100

TELEPHONE:
AT&T - OHIO
13630 LORAIN AVE, FLOOR 2
CLEVELAND, OH 44111
(216) 476-6142

CABLE:
CHARTER (SPECTRUM)
7820 DIVISION DRIVE
MENTOR, OH 44060
(440) 343-1530

CABLE:
KINETIC (WINDSTREAM)
205 S HAMB DEN STREET
CHARDON, OH 44024
(606) 784-4140

TRAFFIC SIGNAL:
ODOT DISTRICT 12
5500 TRANSPORTATION BLVD
GARFIELD HEIGHTS, OH 44125
(216) 581-2100

WATER:
AQUA OHIO - MENTOR
7748 TWILIGHT DR
MENTOR-ON-THE-LAKE, OH 44060
(440) 257-6190

SANITARY SEWER / WATER:
GEAUGA COUNTY DEPARTMENT OF WATER RESOURCES
12611 RAVENWOOD DRIVE, SUITE 390
CHARDON, OH 44024
(440) 279-1970

LOCAL OFFICIALS

THE CONTRACTOR SHALL NOTIFY THE LOCAL FIRE DEPARTMENT, POLICE AND OTHER APPROPRIATE AGENCIES THAT MAY REQUIRE THE USE OF THE ROAD DURING EMERGENCY SITUATIONS. IF ANY AREA BECOMES INACCESSIBLE AT ANY TIME, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE AGENCIES OF THESE LOCATIONS. THE CONTRACTOR SHALL SCHEDULE HIS WORK AND COORDINATE WITH LOCAL SCHOOLS AS LISTED BELOW TO ACCOMMODATE THE PICK-UP AND DELIVERY OF SCHOOL STUDENTS IF APPLICABLE.

GEAUGA COUNTY SHERIFF
12450 MERRITT ROAD
CHARDON, OH 44024
(440) 279-2009

STATE HIGHWAY PATROL
530 CENTER STREET
CHARDON, OH 44024
(440) 286-6612

LAKE COUNTY SHERIFF
104 E. ERIE STREET
PAINESVILLE, OH 44077
(440) 350-5601

KIRTLAND POLICE DEPT.
9301 CHILLICOTHE ROAD
KIRTLAND, OH 44094
(440) 256-3336

USPS - CHARDON
150 CENTER STREET
CHARDON, OH 44024
(440) 286-5601

CHARDON LOCAL SCHOOLS
428 NORTH STREET
CHARDON, OH 44024
(440) 285-4052

THE METZENBAUM CENTER
8200 CEDAR ROAD
CHESTERLAND, OH 44026
(440) 729-9406

KIRTLAND LOCAL SCHOOLS
9252 CHILLICOTHE ROAD
KIRTLAND, OH 44094
(440) 256-3311

CHARDON TWP. ROAD DEPT.
9949 MENTOR ROAD
CHARDON, OH 44024
(440) 285-9002

CHARDON FIRE DEPT.
110 S. HAMB DEN STREET
CHARDON, OH 44024
(440) 285-4665

KIRTLAND SERVICE DEPT.
10282 CHILLICOTHE ROAD
KIRTLAND, OH 44094
(440) 256-1234

KIRTLAND FIRE DEPT.
8979 KIRTLAND CHARDON RD
KIRTLAND, OH 44094
(440) 256-8979

GEAUGA TRANSIT
12555 MERRITT ROAD
CHARDON, OH 44024
(440) 279-2150

PRECONSTRUCTION MEETING

A PRE-CONSTRUCTION CONFERENCE WILL BE SCHEDULED BY THE ENGINEER WITH THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR SHALL SUBMIT A DETAILED SCHEDULE OF OPERATIONS FOR APPROVAL 24 HOURS PRIOR TO THE PRE-CONSTRUCTION MEETING. THE CONTRACTOR SHALL NOTIFY THE ENGINEER AT LEAST SEVEN (7) DAYS IN ADVANCE OF THE BEGINNING OF CONSTRUCTION, SO THE ENGINEER MAY SCHEDULE THE INSPECTION.

CONTINGENCY QUANTITIES

THE CONTRACTOR SHALL NOT ORDER MATERIALS OR PERFORM WORK FOR ITEMS DESIGNATED BY PLAN NOTE TO BE USED "AS DIRECTED BY THE ENGINEER" UNLESS AUTHORIZED BY THE ENGINEER. THE ACTUAL WORK LOCATIONS AND QUANTITIES USED FOR SUCH ITEMS SHALL BE INCORPORATED INTO THE CONTRACTORS MONTHLY INVOICES.

SEQUENCE OF CONSTRUCTION

UNLESS APPROVED BY THE ENGINEER, THE CONTRACTOR SHALL PLAN AND PROSECUTE THE WORK IN ACCORDANCE WITH THE SEQUENCE OF CONSTRUCTION:

1. PRE-CONSTRUCTION MEETING
2. TRAFFIC MAINTENANCE INSTALL / MOBILIZATION
3. **THWING DETOUR - FINISH BY AUGUST 14, 2026**
 - 3a. CONSTRUCTION LAYOUT
 - 3b. PAVEMENT PLANING, VARIABLE DEPTH
 - 3c. RE-PROFILING SECTION
 - LEVELING COURSE, INTERMEDIATE TYPE 2
 - DRIVEWAYS, 301 BASE COURSE
 - COMPACTED AGGREGATE, 304 LIMESTONE
 - EXCAVATION / EMBANKMENT
 - EROSION CONTROL
4. PAVEMENT PLANING, 1.5"
5. PAVEMENT REPAIRS
6. INTERMEDIATE ASPHALT COURSE
7. GUARDRAIL
8. CATCH BASIN, ADJUSTED TO GRADE
9. DRIVEWAYS, 441 SURFACE COURSE
10. 424 POLYMER SURFACE COURSE
11. COMPACTED AGGREGATE (RAP)
12. MAILBOX ADJUSTMENT
13. SEAL JOINTS
14. PERMANENT PAVEMENT MARKINGS
15. INCIDENTALS / PUNCH LIST

ROADWAY

ITEM 201 - CLEARING AND GRUBBING

THIS ITEM SHALL INCLUDE ALL COSTS ASSOCIATED WITH THE CLEARING AND GRUBBING FROM STA. 43+00 TO STA. 50+00 OF THWING ROAD ONLY. EXISTING GRASS, TOPSOIL, BRUSH, OVERHANGING BRANCHES, AND OTHER ORGANIC MATERIAL WITHIN THE WORK LIMITS SHALL BE REMOVED FROM SITE BY THE CONTRACTOR. ANY REMAINING STUMPS OR PORTIONS OF STUMPS, ROOTS, TOPSOIL, OR OTHER ORGANIC MATERIAL SHALL BE REMOVED BY THE CONTRACTOR.

THE CONTRACTOR SHALL LOCATE AND PROTECT ALL EXISTING DRAINS AND SEWER OUTLETS DURING THE CLEARING AND GRUBBING OPERATION. THESE FACILITIES SHALL BE PROVIDED WITH AN UNOBSTRUCTED OUTLET TO THE NEWLY CONSTRUCTED DITCH OR STORM SEWER.

ITEM 202 - PAVEMENT REMOVED

THE CONTRACTOR SHALL REMOVE EXISTING DRIVEWAY APRONS AS DIRECTED BY THE ENGINEER FOR THE THWING ROAD RE-PROFILING SECTION AND SUPERELEVATION SECTIONS. THE DRIVEWAY APRON AT 10090 SHALL BE REMOVED, AND OTHERS WILL BE IDENTIFIED AS NEEDED.

PAVEMENT SHALL BE DOUBLE SAWCUT, FULL-DEPTH AT THE REMOVAL LIMITS. CARE SHALL BE TAKEN TO NOT DAMAGE ADJACENT PAVEMENT. THE TRENCH LEFT BY THE REMOVAL OPERATION SHALL BE TEMPORARILY FILLED WITH SUITABLE MATERIAL IN ORDER TO MAINTAIN ACCESS. PAVEMENT REMOVAL LIMITS WILL BE CLEARLY MARKED BY THE ENGINEER.

THE COST TO SAWCUT, REMOVE ASPHALT AND SUBGRADE MATERIALS TO THE PROPER DEPTH, REMOVE WASTE MATERIALS, SUBGRADE COMPACTION, TEMPORARY MATERIALS FOR ACCESS RAMPS AND MAINTENANCE SHALL BE INCLUDED IN THE UNIT PRICE FOR THIS ITEM. INSTALL ACCESS RAMPS AT THE TIME OF THE REMOVAL OF THE ASPHALT.

ITEM 202 - GUARDRAIL REMOVED

THIS WORK SHALL INCLUDE ALL COSTS ASSOCIATED WITH THE REMOVAL OF EXISTING GUARDRAIL, POSTS, ANCHOR ASSEMBLIES, TERMINAL ASSEMBLIES AND FOUNDATIONS, AND ALL APPURTENANCES. EXISTING POST HOLES SHALL BE FILLED AND COMPACTED WITH SUITABLE MATERIAL. REFERENCE SHEET P.20 FOR THE THWING ROAD GUARDRAIL PLAN.

GENERAL NOTES

DESIGNER	TEW
REVIEWER	SEH 4/28/26
PROJECT ID	RS-GEA-V-2026
SHEET	TOTAL
P.4	23

ITEM 203 - EXCAVATION

UPON COMPLETION OF THE CLEARING AND GRUBBING, EXISTING EMBANKMENTS SHALL BE CUT TO GRADES AND SLOPES AS INDICATED ON THE PLANS AND CROSS SECTIONS. THWING ROAD CROSS SECTIONS AND EARTHWORK TABLES ARE DEPICTED ON SHEETS P.14 - P.17 FOR REFERENCE.

ALL SUITABLE MATERIAL EXCAVATED FROM THE SITE SHALL BE RETAINED AND USED FOR ITEM 203 EMBANKMENT. THIS ITEM SHALL INCLUDE TEMPORARY STOCKPILING OF MATERIAL UNTIL IT CAN BE PLACED IN EMBANKMENT AREAS. IF STOCKPILING IS REQUIRED, THE MATERIAL SHALL BE PROPERLY HANDLED TO AVOID PONDING WATER OR SEDIMENT LADEN RUNOFF.

THE CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE OF ANY EXCAVATED MATERIAL THAT IS NOT SUITABLE FOR USE AS EMBANKMENT, AS DIRECTED BY THE ENGINEER. ALL HAULING AND HANDLING COSTS SHALL BE INCLUDED IN THE UNIT BID PRICE FOR EXCAVATION.

ITEM 203 - EMBANKMENT

THIS ITEM SHALL CONSIST OF PLACING AND COMPACTING SUITABLE EMBANKMENT MATERIAL IMPORTED AND GENERATED DURING EXCAVATION TO THE LINE AND GRADES SHOWN IN THE PLANS. ALL COSTS ASSOCIATED WITH COMPACTION TESTING SHALL BE INCLUDED IN THIS LINE ITEM. THWING ROAD CROSS SECTIONS AND EARTHWORK TABLES ARE DEPICTED ON SHEETS P.14 - P.17 FOR REFERENCE.

ITEM 209 - LINEAR GRADING, AS PER PLAN

THE CONTRACTOR SHALL GRADE THE EXISTING SHOULDER DURING THE PAVEMENT PLANING PROCESS PER THE TYPICAL SECTION. ALL SPOILS INCLUDING ORGANICS, SOIL, AND GRAVEL SHALL BE HAULED OFF SITE AND PROPERLY DISPOSED. PAYMENT FOR THIS ITEM SHALL BE A LINEAR MEASUREMENT SEPARATE FROM PAVEMENT PLANING.

ITEM 606 - GUARDRAIL, TYPE MGS WITH LONG POSTS

THIS ITEM SHALL CONSIST OF INSTALLING GUARDRAIL, TYPE MGS, WITH LONG POSTS PER ODOT SCD MGS-2.1 AND AS SHOWN ON THE GUARDRAIL PLAN, SHEET P.20 FOR THWING ROAD ONLY.

ITEM 606 - ANCHOR ASSEMBLY, MGS TYPE E

ITEM 606, ANCHOR ASSEMBLY, MGS TYPE E SHALL CONSIST OF FURNISHING ANY OF THE MGS TYPE E GUARDRAIL END TERMINALS AS LISTED ON ODOT'S OFFICE OF ROADWAY ENGINEERING'S WEB PAGE UNDER ROADWAY SAFETY DEVICES FOR APPROVED GUARDRAIL END TREATMENTS. THE FACE OF THE MGS TYPE E IMPACT HEAD SHALL BE COVERED WITH A SHEET OF TYPE G REFLECTIVE SHEETING, PER C&MS 730.19. IT SHALL BE STRIPED IN THE SAME MANNER AS TYPE 3 OBJECT MARKERS. REFER TO THE MANUFACTURER'S INSTRUCTION REGARDING THE INSTALLATION OF, AND THE GRADING AROUND, THE FOUNDATION TUBES AND GROUND STRUT. THE TOP OF ANY FOUNDATION TUBE SHOULD BE LESS THAN 4" ABOVE THE GROUND. THE PLACEMENT OF THE FOUNDATION TUBES SHOULD BE AT AN APPROPRIATE DEPTH BELOW THE LEVEL LINE IN ORDER TO MAINTAIN THE FINISHED GUARDRAIL HEIGHT FROM THE EDGE OF THE SHOULDER. ON-SITE GRADING IS REQUIRED IF THE TOP OF THE FOUNDATION TUBES OR TOP OF THE GROUND STRUT DOES PROJECT MORE THAN 4" ABOVE THE GROUND LINE. ON SITE GRADING IS REQUIRED IF THE TOP OF THE FOUNDATION TUBES OR TOP OF THE GROUND STRUT DOES PROJECT MORE THAN 4" ABOVE THE GROUND LINE.

PAYMENT FOR ITEM 606, ANCHOR ASSEMBLY, MGS TYPE E, AND SHALL INCLUDE ALL LABOR, TOOLS, EQUIPMENT, AND MATERIALS NECESSARY TO CONSTRUCT A COMPLETE AND FUNCTIONAL ANCHOR ASSEMBLY SYSTEM, INCLUDING ALL RELATED TRANSITIONS, REFLECTIVE SHEETING, HARDWARE, GRADING, EMBANKMENT, AND EXCAVATION NOT SEPARATELY SPECIFIED, AS REQUIRED BY THE MANUFACTURER.

ITEM 606 - ANCHOR ASSEMBLY, MGS TYPE T

THE TYPE T ANCHOR ASSEMBLIES ARE TO BE CONSTRUCTED AS PER ODOT SCD MGS-4.2 AND SHALL BE USED TO TERMINATE A GUARDRAIL RUN AT DRIVEWAYS UNLESS DIRECTED OTHERWISE BY THE ENGINEER.

EROSION CONTROL

THE FOLLOWING EROSION CONTROL ITEMS ARE ONLY APPLICABLE AT THE THWING ROAD RE-PROFILING SECTION FROM APPROX. STA. 43+00 TO STA. 50+00.

ITEM 653 - TOPSOIL FURNISHED AND PLACED

THE CONTRACTOR SHALL SPREAD TOPSOIL AT A DEPTH OF 2" OVER ALL DISTURBED AREAS TO PROMOTE GROWTH AND CARE OF PERMANENT SEEDED AREAS. ADDITIONAL QUANTITY AND LOCATIONS SHALL ONLY BE USED AT THE DIRECTION OF THE ENGINEER

ITEM 659 - SEEDING AND MULCHING, CLASS 1, AS PER PLAN

THE FOLLOWING QUANTITIES ARE PROVIDED TO PROMOTE GROWTH AND CARE OF PERMANENT SEEDED AREAS:

SEEDING AND MULCHING SHALL BE APPLIED TO ALL AREAS OF EXPOSED SOIL WITHIN THE CONSTRUCTION LIMITS. QUANTITY CALCULATIONS FOR SEEDING AND MULCHING ARE PROVIDED ON THWING ROAD CROSS SECTIONS, SHEETS P.14 - P.17.

ITEM 671 - EROSION CONTROL MAT, TYPE G

THIS ITEM INCLUDES INSTALLING 36"-WIDE EROSION CONTROL MAT ALONG NEW DITCH LINES. THE CONTRACTOR SHALL PROVIDE THE SEED AND MULCH AS WELL AS THE EROSION CONTROL MAT AS PER C&MS 671.01.

ITEM 832 - EROSION CONTROL

THIS ITEM SHALL INCLUDE ALL EROSION CONTROL MEASURES PER SUPPLEMENTAL SPECIFICATION 832. THE CONTRACTOR SHALL SUBMIT PROPOSED EROSION CONTROL COUNTER MEASURES AND LOCATIONS TO THE ENGINEER FOR APPROVAL PRIOR TO INSTALLATION.

REFERENCE SHEET P.10 FOR ESTIMATED QUANTITIES. ADDITIONAL EROSION CONTROL MAY BE REQUIRED AS DIRECTED BY THE ENGINEER AND MEASURED PER SUPPLEMENTAL SPECIFICATION 832.

DRAINAGE

ITEM 611 - CATCH BASIN ADJUSTED TO GRADE

CATCH BASINS SHALL BE ADJUSTED TO GRADE BY THE CONTRACTOR. THE BASINS SHOULD BE ADJUSTED AFTER THE PLACEMENT OF THE INTERMEDIATE COURSE. TIME BETWEEN ADJUSTING THE BASINS AND PLACEMENT OF THE SURFACE SHALL BE KEPT TO A MINIMUM.

ALL CASTINGS SHALL BE ADJUSTED TO GRADE IN ACCORDANCE WITH ODOT SCD BP-3.1. THE USE OF METAL ADJUSTING RINGS IS NOT PERMITTED. THE PAVEMENT SHALL BE SAW-CUT AT FULL DEPTH (PER 255.03) AND REMOVED PRIOR TO ADJUSTMENT. THE UPPER PORTION OF THE CASTING SHALL BE LIFTED, CLEANED, AND RESET TO GRADE. THIS ITEM SHALL INCLUDE ALL LABOR, EQUIPMENT AND MATERIALS NEEDED TO REMOVE, ADJUST, AND BACKFILL OR RESTORE THE EXISTING MANHOLE, AS MARKED BY THE ENGINEER.

THE CONTRACTOR SHALL INCLUDE THE COST TO REMOVE AND REPLACE UP TO TEN FEET (10') OF CURB AND PAVEMENT ON AS NEEDED BASIS, AND RE-USE OF THE SALVAGED CASTINGS.

PAVEMENT

ITEM 253 - PAVEMENT REPAIR, 6"

THIS ITEM SHALL INCLUDE ALL LABOR, EQUIPMENT, AND MATERIAL NECESSARY TO REMOVE AND REPLACE THE EXISTING ASPHALT PAVEMENT AND BASE, AS MARKED BY THE ENGINEER. THE ASPHALT PAVEMENT AND BASE IN THE REPAIR AREAS SHALL BE REMOVED BY THE GRINDING OR SAW CUTTING METHODS WITHOUT DISPLACING OR DAMAGING THE REMAINING PAVEMENT. THE EXCAVATED TRENCH SHALL BE COMPACTED UTILIZING APPROVED COMPACTION EQUIPMENT. ALL FACES ADJOINING THE EXISTING PAVEMENT SHALL BE CLEANED AND THOROUGHLY COATED WITH AN APPROVED LIQUID ASPHALT MATERIAL. THE CONTRACTOR SHALL USE ITEM 301 ASPHALT CONCRETE BASE TO REPLACE THE EXCAVATED MATERIAL. THE COST OF THE MATERIAL SHALL BE INCLUDED IN THE UNIT PRICE FOR THIS ITEM. THE WORK ZONE SHALL FOLLOW THE SPECIFICATIONS SET FORTH IN ODOT SCD MT-97.12 WITH CONES TO SEPARATE TRAFFIC FROM THE PAVEMENT REPAIR TRENCHES. CONES SHALL BE PLACED ALONG THE ENTIRE LENGTH OF THE WORK ZONE, NOT ONLY REPAIR LOCATIONS.

DUE TO UNFORESEEABLE CONDITIONS, REPAIR AREAS WILL BE CLEARLY MARKED BY THE ENGINEER PRIOR TO STARTING. THE ANTICIPATED DEPTH OF PAVEMENT TO BE REMOVED AND REPLACED IS SIX INCHES (6"). ANY ADDITIONAL EXCAVATIONS SHALL BE MADE TO A DEPTH AS DIRECTED BY THE ENGINEER. PAYMENT FOR PAVEMENT REPAIR SHALL BE BY THE CUBIC YARD OF ASPHALT BASE MATERIAL PLACED. THE PAVEMENT REPAIRS SHALL NOT TAKE PLACE WITHIN A TWENTY-FOUR (24) HOUR PERIOD OF TIME, NOT INCLUDING SUNDAYS, AFTER ALL PAVEMENT PLANING IS COMPLETED, UNLESS APPROVED BY THE ENGINEER.

ITEM 254 - PAVEMENT PLANING, ASPHALT CONCRETE, 1.5"

PAVEMENT PLANING SHALL BE PERFORMED TO THE LINES AND GRADES SHOWN ON THE TYPICAL SECTION. SUPERELEVATED SECTIONS SHALL BE DIRECTED AND MEASURED PER ITEM 254, PAVEMENT PLANING, ASPHALT CONCRETE, VARIABLE DEPTH. AS PART OF A SEPARATE OPERATION FROM MAINLINE PLANING, THE CONTRACTOR SHALL GRIND A MINIMUM OF TWO FEET (2') INTO EACH SIDE ROAD AND EACH DRIVEWAY OR AS MARKED BY THE ENGINEER. FOR THIS PROCESS THE CONTRACTOR SHALL USE ENGINEER APPROVED MILLING EQUIPMENT. MILLING DEPTH AT THE MARKED LOCATION AT THE BACK OF THE DRIVEWAY AND/OR SIDE ROAD SHALL BE ONE AND ONE-HALF INCHES (1.5"). THE CONTRACTOR SHALL MAINTAIN AND SUPPLY PROPER ACCESS TO ALL DRIVES AND INTERSECTIONS. CARE SHALL BE TAKEN TO NOT DAMAGE ANY RESIDENTIAL DRIVEWAYS, CURB SECTIONS AND/OR CASTINGS DURING THE PLANING PROCESS. THE CONTRACTOR SHALL CUT SLOTS AT ALL ELEVATION LOW POINTS FOR DRAINAGE. THE CONTRACTOR SHALL REMOVE ALL GRINDINGS FROM THE JOB SITE AND THOROUGHLY SWEEP THE GROUND ROADWAY SECTION BEFORE OPENING IT UP TO TRAFFIC.

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ITEM 254 - PAVEMENT PLANING, ASPHALT CONCRETE, VARIABLE DEPTH

PAVEMENT PLANING SHALL BE PERFORMED TO THE LINES AND GRADES SHOWN ON THE TYPICAL SECTION. FOR AREAS OF EXISTING SUPER-ELEVATED PAVEMENT, REFERENCE SUPERELEVATION TABLES ON SHEETS P.18 - P.19 FOR PROPOSED SUPERELEVATED SLOPES AND TRANSITIONS. APPROXIMATE MILL DEPTH IS PROVIDED AND MAY BE ADJUSTED AS DIRECTED BY THE ENGINEER. THE ROAD MAY BE CLOSED TO TRAFFIC DURING THIS OPERATION WITH NORMAL ACCESS RESTORED TO LOCAL TRAFFIC DURING OFF HOURS.

AS PART OF A SEPARATE OPERATION FROM MAINLINE PLANING, THE CONTRACTOR SHALL GRIND A MINIMUM OF TWO FEET (2') INTO EACH SIDE ROAD AND EACH DRIVEWAY OR AS MARKED BY THE ENGINEER. FOR THIS PROCESS THE CONTRACTOR SHALL USE ENGINEER APPROVED MILLING EQUIPMENT. MILLING DEPTH AT THE MARKED LOCATION AT THE BACK OF THE DRIVEWAY AND/OR SIDE ROAD SHALL BE ONE AND ONE-HALF INCHES (1.5"). THE CONTRACTOR SHALL MAINTAIN AND SUPPLY PROPER ACCESS TO ALL DRIVES AND INTERSECTIONS.

CARE SHALL BE TAKEN TO NOT DAMAGE ANY RESIDENTIAL DRIVEWAYS, CURB SECTIONS AND/OR CASTINGS DURING THE PLANING PROCESS. THE CONTRACTOR SHALL CUT SLOTS AT ALL ELEVATION LOW POINTS FOR DRAINAGE. THE CONTRACTOR SHALL REMOVE ALL GRINDINGS FROM THE JOB SITE AND THOROUGHLY SWEEP THE GROUND ROADWAY SECTION BEFORE OPENING IT UP TO TRAFFIC.

ITEM 301 - ASPHALT CONCRETE BASE, PG64-22, (449), (DRIVEWAYS), AS PER PLAN

THE CONTRACTOR SHALL PLACE AN AVERAGE DEPTH OF FOUR AND ONE-HALF INCHES (4.5") AT ALL DRIVEWAYS MARKED BY THE ENGINEER, FOLLOWING THE PLACEMENT OF THE INTERMEDIATE LEVELING COURSE, TYPE 2 AND PRIOR TO THE APPLICATION OF THE INTERMEDIATE COURSE, TYPE 1. ALL ASPHALT AND CONCRETE DRIVES SHALL BE SWEEP THOROUGHLY AND THEN TACKED WITH ITEM 407 TACK COAT PRIOR TO PAVING THE APRON.

THE PAVING OF THESE AREAS SHALL BE A SEPARATE OPERATION FROM THE MAINLINE PAVING. THE DRIVEWAY APRON PLACEMENT SHALL NOT TAKE PLACE WITHIN A TWENTY-FOUR (24) HOUR PERIOD OF TIME, NOT INCLUDING SUNDAYS, AFTER ALL LEVELING COURSE IS COMPLETED, UNLESS APPROVED BY THE ENGINEER. THIS ITEM SHALL INCLUDE ALL COSTS FOR PREPARATION AND MATERIAL PLACEMENT INCLUDING BUT NOT LIMITED TO EXCAVATION, CRUSHED LIMESTONE BEDDING, AND ASPHALT PAVING.

ITEM 407 - NON-TRACKING TACK COAT

NON-TRACKING TACK COAT SHALL BE APPLIED TO THE MILLED SURFACE PRIOR TO THE PLACEMENT OF THE INTERMEDIATE COURSE. THE ENGINEER MAY ADJUST THE APPLICATION RATE OF 0.09 GALLONS PER SQUARE YARD. AN ADDITIONAL QUANTITY OF NON-TRACKING TACK COAT TO BE PLACED ON THE INTERMEDIATE COURSE OF ASPHALT PRIOR TO THE PLACEMENT OF THE SURFACE COURSE IS INCLUDED IN THE TOTAL QUANTITY FOR THIS ITEM. THIS QUANTITY HAS BEEN CALCULATED AT THE APPLICATION RATE OF 0.05 GALLONS PER SQUARE YARD AND SHALL ONLY BE ADJUSTED AT THE DIRECTION OF THE ENGINEER. TACK SHALL ALSO BE APPLIED TO EACH LIFT OF THE LEVELING COURSE PRIOR TO PLACEMENT.

ITEM 424 - FINE GRADED POLYMER ASPHALT CONCRETE, TYPE B, (448), PG76-22M

THE CONTRACTOR SHALL PLACE A SURFACE COURSE AS SHOWN ON THE TYPICAL SECTION. THE CONTRACTOR SHALL COVER ALL EXISTING ASPHALT PAVEMENT. THE CONTRACTOR SHALL USE THREE (3) ROLLERS TO COMPACT THE SURFACE COURSE INCLUDING TWO (2) TANDEM ROLLERS AND ONE (1) SMALL TANDEM ROLLER. THE SMALL TANDEM ROLLER SHALL BE USED TO COMPACT AREAS WHERE THE LARGE TANDEM ROLLER CANNOT REACH, INCLUDING MAILBOX APPROACHES AND DRIVEWAY TRANSITIONS. VIBRATION SHALL ONLY BE USED AT THE DIRECTION OF THE ENGINEER. THE SURFACE COURSE SHALL NOT BE PLACED ON THE SAME DAY AS THE INTERMEDIATE COURSE. DENSITY QUALITY CONTROL TESTING SHALL BE PERFORMED PER 448.02. SEAL ALL TRANSVERSE AND LONGITUDINAL JOINTS PER 401.17.

ITEM 441 - ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 1, (448), PG64-22

THE INTERMEDIATE COURSE SHALL BE PLACED AS SHOWN ON THE TYPICAL SECTION. THE CONTRACTOR SHALL USE THREE (3) ROLLERS TO COMPACT THE INTERMEDIATE COURSE. A VIBRATORY ROLLER SHALL SERVE AS THE BREAKDOWN ROLLER AND USE VIBRATION IN ONLY ONE DIRECTION OF TRAVEL. TWO (2) TANDEM ROLLERS SHALL BE THE SECOND AND FINISH ROLLER. DENSITY QUALITY CONTROL TESTING SHALL BE PERFORMED PER 448.02.

ITEM 441 - ASPHALT CONCRETE INTERMEDIATE LEVELING COURSE, TYPE 2, (449), PG64-22

THE CONTRACTOR SHALL PLACE AN INTERMEDIATE LEVELING COURSE CONSISTING OF A VARYING COMPACTED DEPTH FROM A MAXIMUM OF ELEVEN INCHES (11"), TAPERING TO ZERO. EACH LIFT OF PAVEMENT SHALL NOT EXCEED MORE THAN THREE INCHES (3"). REFERENCE PLAN AND PROFILE SHEET P.13 AS WELL AS CALCULATION SHEET P.11 FOR APPROXIMATE STATIONS AND ELEVATIONS. THWING ROAD MAY BE CLOSED PER THE DETOUR PLAN DURING THIS WORK WITH NORMAL ACCESS RESTORED TO LOCAL TRAFFIC DURING OFF HOURS.

THE CONTRACTOR SHALL USE TWO (2) ROLLERS TO COMPACT THE LEVELING COURSE. A VIBRATORY ROLLER SHALL SERVE AS THE BREAKDOWN ROLLER AND COMPACT THE COURSE WITH VIBRATION USED IN ONLY ONE DIRECTION OF TRAVEL AND PNEUMATIC ROLLER SHALL BE THE SECOND ROLLER, OR AS DIRECTED BY THE ENGINEER. THE VIBRATORY ROLLER SHALL ALSO SERVE AS THE FINISH ROLLER WITHOUT VIBRATION. THE LEVELING COURSE SHALL NOT BE PLACED THE SAME DAY AS THE INTERMEDIATE COURSE.

ITEM 441 - ASPHALT CONCRETE SURFACE COURSE, TYPE 1, (449), PG64-22 (DRIVEWAYS)

THE CONTRACTOR SHALL PLACE DRIVEWAY AND INTERSECTION APRONS AT THE LOCATIONS MARKED BY THE ENGINEER. THE PAVING OF THE DRIVEWAYS SHALL BE A SEPARATE OPERATION FROM THE MAINLINE PAVING. THE LENGTHS OF APRONS ARE SUBJECT TO CHANGE AT THE DIRECTION OF THE ENGINEER. THIS OPERATION SHALL BE COMPLETED AFTER THE PLACEMENT OF THE INTERMEDIATE COURSE AND BEFORE THE PLACEMENT OF THE SURFACE COURSE.

ASPHALT SHALL BE PLACED AT A ONE-AND-ONE-HALF INCH (1.5") LIFT. THE APRONS SHALL BE FEATHERED TO MEET EXISTING DRIVEWAY GRADES. ALL ASPHALT DRIVES AND INTERSECTING ROADS SHALL BE SWEEP THOROUGHLY AND THEN TACKED WITH ITEM 407 NON-TRACKING TACK COAT PRIOR TO PAVING THE APRONS. THE DRIVEWAY APRON PLACEMENT SHALL NOT TAKE PLACE WITHIN A TWENTY-FOUR (24) HOUR PERIOD OF TIME, NOT INCLUDING SUNDAYS, AFTER ALL INTERMEDIATE/BASE COURSE IS COMPLETED, UNLESS APPROVED BY THE ENGINEER.

ITEM 617 - COMPACTED AGGREGATE (RAP)

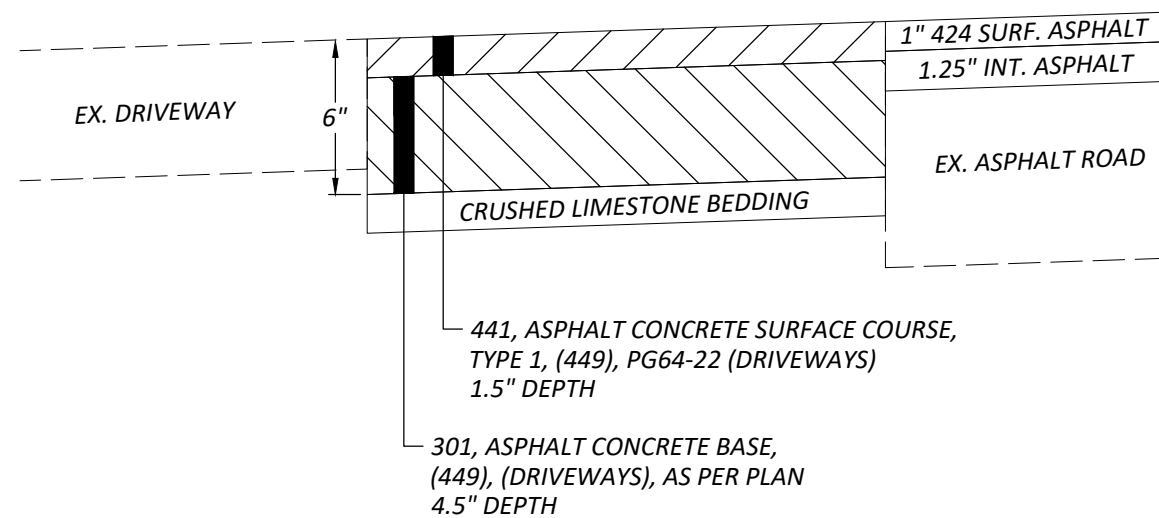
THE CONTRACTOR SHALL PLACE THE STABILIZED SHOULDER BACK UP MATERIAL AS SHOWN IN THE TYPICAL SECTION. FOR EXISTING GRAVEL DRIVEWAYS, THIS ITEM SHALL ALSO SERVE AS THE TRANSITION FROM THE NEW APRON TO THE EXISTING GRAVEL DRIVE. THE MATERIAL PLACEMENT SHALL NOT TAKE PLACE WITHIN A TWENTY-FOUR-HOUR (24HR) PERIOD OF TIME, BUT NOT MORE THAN SEVENTY-TWO HOURS (72HRS), AFTER THE PLACEMENT OF THE SURFACE COURSE. THE ROADWAY SHALL BE SWEEP AFTER THE PLACEMENT OF MATERIAL AND PRIOR TO COMPACTION. THE CONTRACTOR SHALL USE TWO ROLLERS TO COMPACT THE SHOULDER MATERIAL. SEAL ASPHALT JOINTS AT DRIVEWAY AND INTERSECTION APRONS AFTER COMPLETING THIS ITEM.

ITEM 617 - COMPACTED AGGREGATE (304 LIMESTONE)

THE CONTRACTOR SHALL PLACE THE STABILIZED SHOULDER BACK UP MATERIAL AS SHOWN IN THE TYPICAL SECTION. THE MATERIAL PLACEMENT SHALL NOT TAKE PLACE WITHIN A TWENTY-FOUR-HOUR (24HR) PERIOD OF TIME, BUT NOT MORE THAN SEVENTY-TWO HOURS (72HRS), AFTER THE PLACEMENT OF THE LEVELING COURSE. THE ROADWAY SHALL BE SWEEP AFTER THE PLACEMENT OF MATERIAL AND PRIOR TO COMPACTION.

DRIVEWAY DETAIL - FULL DEPTH ASPHALT

NOT TO SCALE



GENERAL NOTES

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REVIEWER	SEH 4/28/26
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THE ASPHALT RESURFACING OF VARIOUS ROADS INCLUDING AUBURN ROAD AND THWING ROAD
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TRAFFIC CONTROL

ITEM 626 - BARRIER REFLECTORS, TYPE 3 BIDIRECTIONAL
BARRIER REFLECTORS, TYPE 3 BIDIRECTIONAL SHALL BE FURNISHED AND INSTALLED AT APPROXIMATELY FIFTY-FOOT (50') INTERVALS ON THE PROPOSED GUARDRAIL SECTIONS.

ITEM 642 - EDGE LINE, 4", TYPE 1

ITEM 642 - CENTER LINE, TYPE 1

THE CONTRACTOR SHALL APPLY PERMANENT PAINT PAVEMENT MARKINGS TO THE NEW ASPHALT SURFACE. THE CONTRACTOR SHALL APPLY PAVEMENT MARKINGS ACCORDING TO THE CENTERLINE LOGS APPROVED BY THE ENGINEER. THE LANES SHALL BE STRIPED AT A WIDTH OF ELEVEN FEET (11'). EDGE LINES SHALL INCLUDE THE INTERSECTION RADII AND SHALL CONNECT TO THE INTERSECTING ROADWAYS.

ITEM 644 - STOP LINE

STOP LINES, PER ODOT SCD TC-71.10, SHALL BE PLACED AS LISTED AT THE LOCATIONS LISTED ON CALCULATION SHEET P.12. THE ENGINEER WILL MARK THE EXACT LOCATION.

MAINTENANCE OF TRAFFIC

ITEM 614 - LAW ENFORCEMENT OFFICER WITH PATROL CAR FOR ASSISTANCE

THE CONTRACTOR SHALL COORDINATE WITH LOCAL LAW ENFORCEMENT HAVING JURISDICTION OVER THE PROJECT LIMITS. A LAW ENFORCEMENT OFFICER SHALL MAINTAIN TRAFFIC AT SIGNALIZED INTERSECTIONS WHEN THE WORK ZONE IS WITHIN TWO HUNDRED FEET (200') OF THE INTERSECTION INCLUDING QUEUED TRUCKS. PAYMENT FOR THIS ITEM WILL NOT INCLUDE HOURS SPENT WORKING AWAY FROM SIGNALIZED INTERSECTIONS.

ITEM 614 - WORK ZONE CENTER LINE, CLASS II, 740.06, TYPE I

THE CONTRACTOR SHALL FURNISH AND INSTALL TEMPORARY RETRO-REFLECTIVE CENTERLINE PAVEMENT MARKINGS ON THE ROADWAY FOLLOWING THE PAVEMENT PLANING, APPLICATION OF THE LEVELING COURSE, APPLICATION OF THE INTERMEDIATE ASPHALT COURSE, AND THE APPLICATION OF THE ASPHALT SURFACE COURSE. THE TEMPORARY RETRO-REFLECTIVE CENTERLINE PAVEMENT MARKING SHALL BE TYPE I PAINT FOLLOWING THE PAVEMENT PLANING PROCESS. IF USED, RETRO-REFLECTIVE TAPE SHALL MEET THE 2-FOOT LENGTH AND 40-FOOT SPACING INTERVAL ESTABLISHED BY MUTCD AND C&MS.

INCIDENTALS

ITEM 614 - MAINTAINING TRAFFIC

THWING ROAD MAY BE CLOSED PER THE DETOUR PLAN ONLY DURING THE RE-PROFILING WORK AND SUPERELEVATION CORRECTION WORK. OTHERWISE, TRAFFIC SHALL BE MAINTAINED FOR THE DURATION OF THE PROJECT. THE CONTRACTOR SHALL FURNISH AT LEAST TWO (2) EMPLOYEES TO SERVE AS TRAFFIC CONTROL FLAGGERS AND THE WORK ZONE SHALL FOLLOW THE SPECIFICATIONS SET FORTH IN ODOT SCD MT-97.12 UNLESS NOTED OTHERWISE. IN ORDER TO PROPERLY MAINTAIN TRAFFIC, THE CONTRACTOR SHALL USE ADDITIONAL FLAGGERS WHEN WORKING AT THE INTERSECTIONS OF ADJACENT ROADS.

ALL TRAFFIC CONTROL DEVICES SHALL BE INSTALLED, MAINTAINED, AND REMOVED BY THE CONTRACTOR. ADDITIONAL SIGNS MAY BE REQUIRED AND INSTALLED AS DIRECTED BY THE ENGINEER. ROAD WORK SIGNS (W20-1) AND ADVANCE STREET NAME PLAQUES (W16-8P) SHALL BE PLACED IN ADVANCE OF AND ON ALL APPROACHES TO THE PROJECT. BUMP (W8-1) SIGNS SHALL BE PLACED IN EACH DIRECTION AT ALL BUTT JOINT LOCATIONS. INSTALL TEMPORARY RAMPS USING COLD PATCH ASPHALT FOR THE BUTT JOINT AT THWING ROAD AT THE LAKE COUNTY LINE. THE COST TO INSTALL, MAINTAIN, AND REMOVE THIS TRANSITION SHALL BE INCLUDED IN THE LUMP SUM COST FOR THIS ITEM.

THE CONTRACTOR SHALL INSTALL ORANGE NO EDGE LINE SIGNS (W8-H12A) AT THE BEGINNING AND END LOCATIONS OF THE PROJECT AND EVERY ONE-HALF MILE IN EACH DIRECTION ALONG THE PROJECT. THE CONTRACTOR SHALL ALSO INSTALL WHITE DO NOT PASS (R4-1) SIGNS AT THESE LOCATIONS UNTIL THE APPLICATION OF THE FINAL PAVEMENT MARKINGS. DURING THE PAVEMENT PLANING OPERATION, THE CONTRACTOR SHALL FURNISH AND MAINTAIN ORANGE GROOVED PAVEMENT SIGNS (W8-15), LOOSE GRAVEL SIGNS (W8-7), AND UNEVEN LANE SIGNS (W8-11) ON ALL APPROACHES TO THE PROJECT. REMOVE OR COVER THESE SIGNS AFTER THE MILLED SURFACE IS PAVED.

ALL WORK AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH ITEM 614 AND OTHER APPLICABLE PORTIONS OF THE SPECIFICATIONS, AS WELL AS THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (OMUTCD). THE CONTRACTOR SHALL FREQUENTLY REVIEW ALL PROJECT SIGNING FOR COMPLIANCE WITH THE PLANS AND THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES AND SHALL IMMEDIATELY CORRECT DEFECTS FOUND TO ENSURE THE SAFETY OF THE TRAVELING PUBLIC. PAYMENT FOR ALL LABOR, TRAFFIC CONTROL DEVICES, EQUIPMENT, AND MATERIALS SHALL BE INCLUDED IN THE LUMP SUM PRICE FOR THIS ITEM UNLESS SEPARATELY ITEMIZED IN THE PLAN.

ITEM SPECIAL - MAILBOX ASSEMBLY, REMOVED AND RESET

AS DIRECTED BY THE ENGINEER, THIS WORK SHALL CONSIST OF REMOVING AND RESETTING EXISTING MAILBOX ASSEMBLIES PER THE MAILBOX DETAIL. THE CONTRACTOR SHALL MAINTAIN ACCESS TO ALL MAILBOXES FOR THE DURATION OF THE PROJECT. FOR THE RE-PROFILING SECTION FROM STA. 43+00 TO STA. 50+00, THE CONTRACTOR SHALL SUPPLY TEMPORARY MAILBOXES TO MAINTAIN MAIL DELIVERY THROUGHOUT THE PROJECT.

IF THE ENGINEER DETERMINES THE EXISTING SUPPORT IS UNUSABLE, THE CONTRACTOR SHALL DISPOSE OF THE EXISTING POST, AND A NEW SUPPORT WILL BE PROVIDED BY OTHERS.

SET OR DRIVE POSTS PLUMB IN A MANNER THAT PREVENTS BATTERING OR DISTORTION OF POSTS. ATTACHMENT HARDWARE (PLATES, BOLTS, ETC.) SHALL BE MADE OF COMMERCIAL-GRADE STEEL. COATED DECK SCREWS SHALL BE USED. SUPPORT HARDWARE SHALL ACCOMMODATE EITHER A SINGLE OR A DOUBLE MAILBOX INSTALLATION. NO MORE THAN TWO BOXES MAY BE MOUNTED ON A SINGLE POST. THE CONTRACTOR SHALL SECURELY ATTACH THE MAILBOX TO THE NEW SUPPORT. THE CONTRACTOR SHALL FURNISH ALL NECESSARY ATTACHMENT HARDWARE (SCREWS, NUTS, BOLTS, PLATES, SPACERS, AND WASHERS) AS NECESSARY TO ACCOMMODATE THE COMPLETE INSTALLATION. IN THE ABSENCE OF A NEW BOX SUPPLIED BY THE RESIDENT, OR BY OTHERS, THE CONTRACTOR SHALL SALVAGE THE EXISTING BOX AND PLACE IT ON THE NEW SUPPORT.

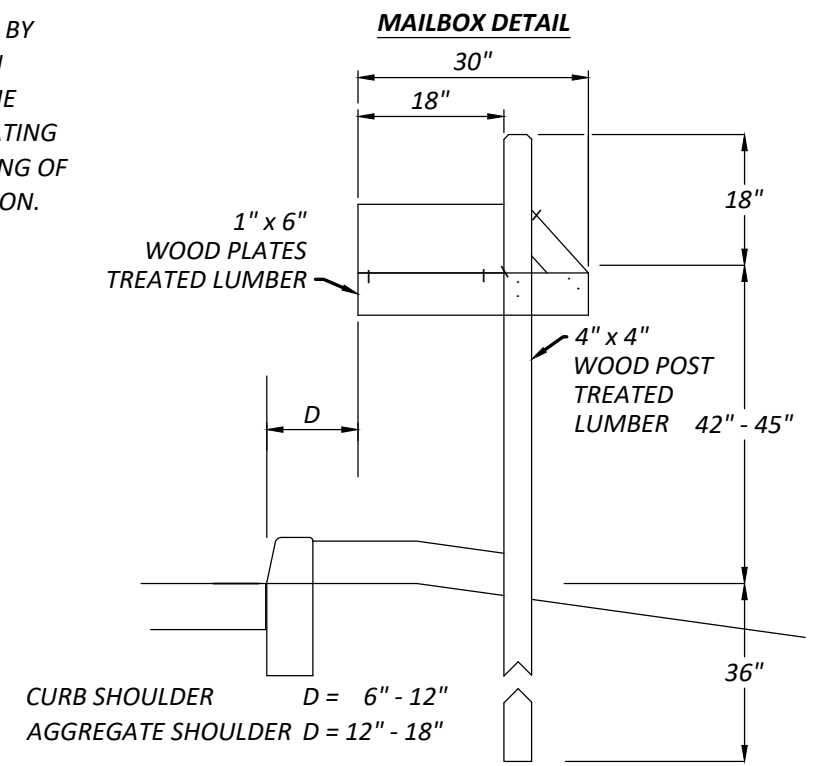
DUE CARE SHALL BE EXERCISED IN SUCH AN OPERATION, AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING OR REPLACING ANY ASSEMBLY DAMAGED BY IMPROPER HANDLING BY THE CONTRACTOR WITH AN EQUAL ASSEMBLY AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH THE LOCAL POSTMASTER REGARDING THE TIMING OF THE MOVEMENT OF ANY MAILBOX TO A NEW LOCATION.

ITEM 623 - CONSTRUCTION LAYOUT STAKES AND SURVEYING

CONSTRUCTION LAYOUT STAKING SHALL BE SUPERVISED BY AN OHIO REGISTERED PROFESSIONAL ENGINEER OR PROFESSIONAL SURVEYOR. PROJECT CONTROL IS ONLY NECESSARY ALONG THWING ROAD FROM THE LAKE COUNTY LINE (STA. 0+00) TO FOREST OAKS DRIVE (STA. 89+00).

THE EXISTING ROAD ALIGNMENT IS THE CENTER LINE OF CONSTRUCTION. STA. 0+00 IS THE LAKE COUNTY LINE AS MARKED BY THE ENGINEER.

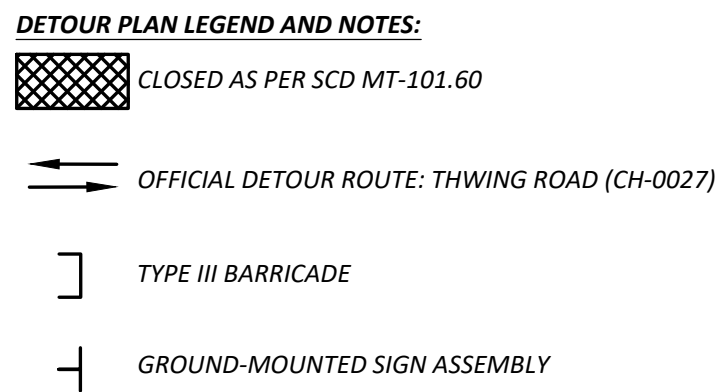
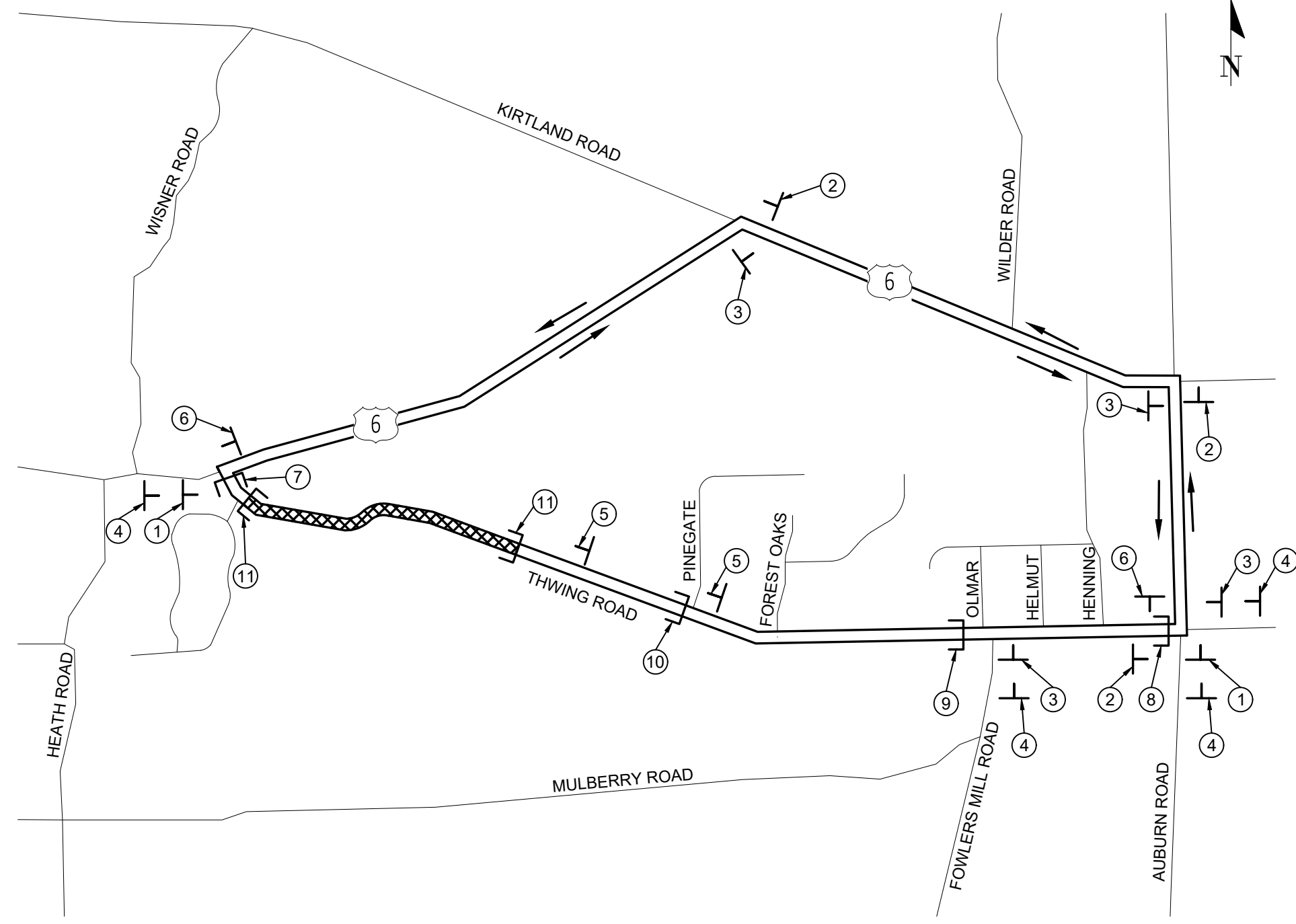
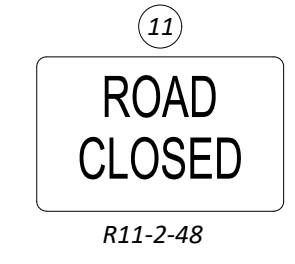
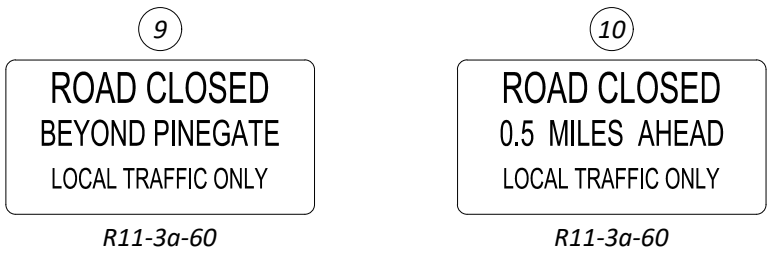
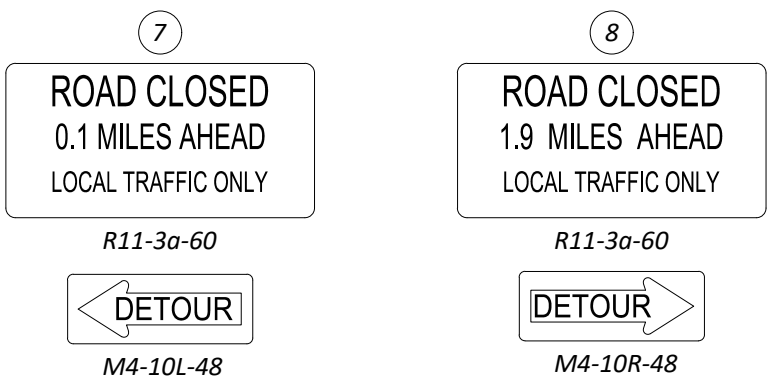
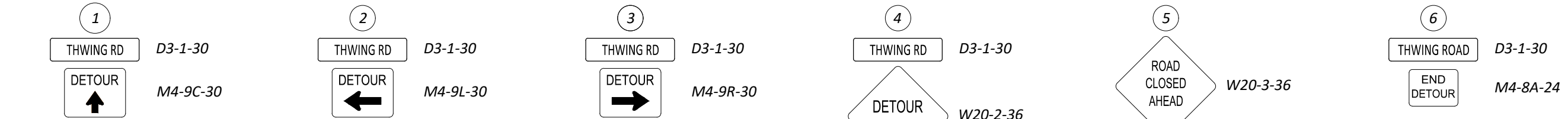
PHYSICAL STAKES SHALL BE SET IN CURVED SECTIONS AT A DISTANCE NOT TO EXCEED TWENTY-FIVE FEET (25') FOR REFERENCE TO RE-ESTABLISH THE PAVEMENT CENTERLINE AND ELEVATIONS. STAKES SHALL BE SET ALONG FIFTY-FOOT INTERVALS FOR THE RE-PROFILING SECTION FROM STA. 43+50 TO STA. 49+50. OTHERWISE, ONE HUNDRED FOOT SPACING IS ACCEPTABLE BETWEEN THESE WORK AREAS.



GENERAL NOTES

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THE ASPHALT RESURFACING OF VARIOUS ROADS INCLUDING AUBURN ROAD AND THWING ROAD
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A PORTION OF THWING ROAD MAY BE CLOSED DURING THE RE-PROFILING AND SUPERELEVATION WORK ONLY.
 THE LENGTH OF THE CLOSURE SHALL BE KEPT TO A MINIMUM AND IS SUBJECT TO APPROVAL BY THE COUNTY ENGINEER. THE ROAD SHALL BE RE-OPENED BY AUGUST 14, 2026.
 THROUGHOUT THE ROAD CLOSURE, THE CONTRACTOR SHALL:
 1. INSTALL AND MAINTAIN ALL DETOUR BARRICADES AND SIGNS AS SHOWN PER MUTCD AND OHIO SUPPLEMENT TO MUTCD
 2. NOTIFY ALL LOCAL SCHOOLS, POLICE, FIRE, SHERIFF, AND APPROPRIATE LOCAL OFFICIALS OF THE DATES OF THE CLOSURE.
 3. MAINTAIN RESIDENTIAL ACCESS TO ALL LOCAL ROADS AND DRIVEWAYS WITHIN THE PROJECT LIMITS FOR THE DURATION OF THE PROJECT.

DETOUR PLAN

DESIGNER	TEW
REVIEWER	SEH 4/28/26
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ROAD TOTALS		CONTINGENCY	ITEM	GRAND TOTAL	UNIT	DESCRIPTION
AUBURN ROAD 0004-Q	THWING ROAD 0027-AB					
						ROADWAY
			201	1	LS	CLEARING AND GRUBBING
	34	31	202	65	SY	PAVEMENT REMOVED
	850	0	202	850	FT	GUARDRAIL REMOVED
	64	6	203	70	CY	EXCAVATION
	389	11	203	400	CY	EMBANKMENT
77.4	251.9	0.7	209	330.0	STA	LINEAR GRADING, AS PER PLAN
	712.5	0.0	606	712.5	FT	GUARDRAIL, TYPE MGS WITH LONG POSTS
	2	0	606	2	EACH	ANCHOR ASSEMBLY, MGS TYPE E
	8	0	606	8	EACH	ANCHOR ASSEMBLY, MGS TYPE T
						EROSION CONTROL
	82	3	653	85	CY	TOPSOIL FURNISHED AND PLACED
	1386	64	659	1450	SY	SEEDING AND MULCHING, CLASS 1, AS PER PLAN
	317	8	671	325	SY	EROSION CONTROL MAT, TYPE G
	3258	742	832	4000	EACH	EROSION CONTROL
						DRAINAGE
1	4	0	611	5	EACH	CATCH BASIN, ADJUSTED TO GRADE, AS PER PLAN
						PAVEMENT
62.1	100.5	27.4	253	190.0	CY	PAVEMENT REPAIR, 6"
10858	37233	909	254	49000	SY	PAVEMENT PLANING, ASPHALT CONCRETE, 1.5"
	9046	454	254	9500	SY	PAVEMENT PLANING, ASPHALT CONCRETE, VARIABLE DEPTH
	25.7	4.3	301	30.0	CY	ASPHALT CONCRETE BASE, PG64-22, (449), (DRIVEWAYS), AS PER PLAN
1521	7584	895	407	10000	GAL	NON-TRACKING TACK COAT
301.6	1328.8	34.6	424	1665.0	CY	FINE GRADED POLYMER ASPHALT CONCRETE, TYPE B, (448), PG76-22M
377.0	1660.9	112.1	441	2150.0	CY	ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 1, (448) PG64-22
	144.6	30.4	441	175.0	CY	ASPHALT CONCRETE INTERMEDIATE LEVELING COURSE, TYPE 2, (449) PG64-22
20.0	56.9	3.1	441	80.0	CY	ASPHALT CONCRETE SURFACE COURSE, TYPE 1, (449) PG64-22, (DRIVEWAYS)
80.6	302.0	17.4	617	400.0	CY	COMPACTED AGGREGATE (RAP)
	27.2	12.8	617	40.0	CY	COMPACTED AGGREGATE (304 LIMESTONE)
						TRAFFIC CONTROL
	24	0	626	24	EACH	BARRIER REFLECTORS, TYPE 3 BIDIRECTIONAL
1.46	5.74	0.00	642	7.20	MILE	EDGE LINE, 4", TYPE 1
0.73	2.87	0.00	642	3.60	MILE	CENTER LINE, TYPE 1
51	110	4	644	165	FT	STOP LINE
						MAINTENANCE OF TRAFFIC
18		6	614	24	HOURLY	LAW ENFORCEMENT OFFICER WITH PATROL CAR FOR ASSISTANCE
2.19	8.81	0.00	614	11.00	MILE	WORK ZONE CENTER LINE, CLASS II, 740.06, TYPE 1
						INCIDENTALS
			614	1	LS	MAINTAINING TRAFFIC
			623	1	LS	CONSTRUCTION LAYOUT STAKES AND SURVEYING
			624	1	LS	MOBILIZATION
			SPEC	1	LS	CONTRACT PERFORMANCE BOND AND PREMIUM
	5	5	SPEC	10	EACH	MAILBOX ASSEMBLY, REMOVED AND RESET

GENERAL SUMMARY	
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SHEET	P.9
TOTAL	23

THE ASPHALT RESURFACING OF VARIOUS ROADS INCLUDING AUBURN ROAD AND THWING ROAD
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ROADWAY

ITEM 202 - PAVEMENT REMOVED

APPROXIMATE QUANTITIES PROVIDED, EXACT LIMITS TO BE MARKED IN THE FIELD BY THE ENGINEER

10090 THWING ROAD LENGTH = 15 FT WIDTH = 20 FT AREA = 34 SY

INCLUDE CONTINGENCY FOR ADDITIONAL DRIVEWAY REMOVAL IN SUPERELEVATION OR RE-PROFILING SECTIONS

USE = 65 SY

ITEM 202 - GUARDRAIL REMOVED

REFERENCE GUARDRAIL PLAN, SHEET P.20

USE = 850 FT

ITEM 203 - EXCAVATION

REFERENCE EARTHWORK TABLES ON CROSS SECTIONS:

SHEET P.14	STA. 43+50 TO STA. 44+50	6 CY
SHEET P.15	STA. 44+50 TO STA. 46+00	19 CY
SHEET P.16	STA. 46+00 TO STA. 47+50	3 CY
SHEET P.17	STA. 47+50 TO STA. 49+50	36 CY
TOTAL		64 CY

USE = 70 CY

ITEM 203 - EMBANKMENT

REFERENCE EARTHWORK TABLES ON CROSS SECTIONS:

SHEET P.14	STA. 43+50 TO STA. 44+50	38 CY
SHEET P.15	STA. 44+50 TO STA. 46+00	56 CY
SHEET P.16	STA. 46+00 TO STA. 47+50	245 CY
SHEET P.17	STA. 47+50 TO STA. 49+50	50 CY
TOTAL		389 CY

USE = 400 CY

ITEM 209 - LINEAR GRADING

AUBURN ROAD	3870 FT x 2 SIDES / 100 =	77.4 STA
THWING ROAD - NORMAL	10,600 FT x 2 SIDES / 100 =	212.0 STA
THWING ROAD - RIGHT CURB	600 FT x 1 SIDE / 100 =	6.0 STA
THWING ROAD - SUPERELEVATED	2,700 FT x 1 SIDE / 100 =	27.0 STA
THWING ROAD - LEFT CURB	685 FT x 1 SIDE / 100 =	6.9 STA
TOTAL		329.3 STA

USE = 330.0 STA

ITEM 606 - GUARDRAIL, TYPE MGS WITH LONG POSTS

REFERENCE GUARDRAIL PLAN, SHEET P.20

USE = 712.5 FT

ITEM 606 - ANCHOR ASSEMBLY, MGS TYPE E

REFERENCE GUARDRAIL PLAN, SHEET P.20

USE = 2 EACH

ITEM 606 - ANCHOR ASSEMBLY, MGS TYPE T

REFERENCE GUARDRAIL PLAN, SHEET P.20

USE = 8 EACH

EROSION CONTROL

ITEM 653 - TOPSOIL FURNISHED AND PLACED

REFERENCE EROSION CONTROL TABLES ON CROSS SECTIONS:

SHEET P.14	STA. 43+50 TO STA. 44+50	11 CY
SHEET P.15	STA. 44+50 TO STA. 46+00	23 CY
SHEET P.16	STA. 46+00 TO STA. 47+50	25 CY
SHEET P.17	STA. 47+50 TO STA. 49+50	23 CY
TOTAL		82 CY

USE = 85 CY

ITEM 659 - SEEDING AND MULCHING, CLASS 1, AS PER PLAN

REFERENCE EROSION CONTROL TABLES ON CROSS SECTIONS:

SHEET P.14	STA. 43+50 TO STA. 44+50	192 SY
SHEET P.15	STA. 44+50 TO STA. 46+00	384 SY
SHEET P.16	STA. 46+00 TO STA. 47+50	426 SY
SHEET P.17	STA. 47+50 TO STA. 49+50	384 SY
TOTAL		1386 SY

USE = 1450 SY

ITEM 671 - EROSION CONTROL MAT, TYPE G

NEWLY CONSTRUCTED DITCHES:

STA. 43+50 TO 45+00	150 FT x 2 SIDES =	300 FT
STA. 45+25 TO 46+25	100 FT x 2 SIDES =	200 FT
STA. 46+75 TO 49+00	225 FT x 2 SIDES =	450 FT
SUBTOTAL		950 FT

WIDTH = 36 INCHES

950 FT x 3 FT / 9 = 317 SY

USE = 325 SY

ITEM 832 - EROSION CONTROL

APPROXIMATE QUANTITIES PROVIDED, ADDITIONAL ITEMS SHALL BE INSTALLED AS DIRECTED BY THE ENGINEER.

REFERENCE ODOT SUPPLEMENT 832, APPENDIX F:

PERIMETER FILTER FABRIC FENCE STA. 44+00 TO STA. 47+00
 300 FT x 2 SIDES x \$4.89/FT = 2934 EACH

FILTER FABRIC DITCH CHECK

4 DITCH CHECKS AT 30" CULVERT, STA. 46+50

4 x 6 FT WIDTH x \$13.50/FT = 324 EACH

TOTAL = 3258 EACH

USE = 4000 EACH

DRAINAGE

ITEM 611 - CATCH BASIN, ADJUSTED TO GRADE, AS PER PLAN

AUBURN ROAD / THWING ROAD INTERSECTION	1 EACH
THWING ROAD STA. 11+00 CURB INLET, EB LANE	1 EACH
THWING ROAD STA. 16+50 DRIVEWAY, EB LANE	1 EACH
THWING ROAD / OLMAR DRIVE INTERSECTION	1 EACH
THWING ROAD / HENNING ROAD INTERSECTION	1 EACH
USE = 5 EACH	

CALCULATIONS

DESIGNER	TEW
REVIEWER	SEH 4/28/26
PROJECT ID	RS-GEA-V-2026
SHEET	TOTAL
P.10	23

PAVEMENT

ITEM 253 - PAVEMENT REPAIR, 6"

APPROXIMATE QUANTITIES PROVIDED, EXACT LIMITS TO BE MARKED IN THE FIELD BY THE ENGINEER

AUBURN ROAD	85 CY/MILE x 0.73 MILES	VOLUME = 62.1 CY
THWING ROAD	35 CY/MILE x 2.87 MILES	VOLUME = 100.5 CY
TOTAL 162.6 CY		

INCLUDE CONTINGENCY FOR ADDITIONAL PAVEMENT REPAIRS AS DIRECTED BY THE ENGINEER

USE = 190.0 CY

ITEM 254 - PAVEMENT PLANING, ASPHALT CONCRETE, 1.5"

AUBURN ROAD	L = 3870'	W = 25.25'	AREA = 10,858 SY
-------------	-----------	------------	------------------

THWING ROAD

NORMAL SECTION, 28'	L = 7520'	W = 28'	AREA = 23,396 SY
NORMAL SECTION, 29'	L = 3080'	W = 29'	AREA = 9925 SY
RIGHT CURB SECTION	L = 600'	W = 26'	AREA = 1734 SY
LEFT CURB SECTION, 28'	L = 480'	W = 28'	AREA = 1494 SY
LEFT CURB SECTION, 30'	L = 205'	W = 30'	AREA = 684 SY
THWING SUBTOTAL = 37,233 SY			

TOTAL = (10,858 + 37,233) SY = 48,091 SY

INCLUDE CONTINGENCY FOR DRIVEWAY MILLING AS DIRECTED BY THE ENGINEER

USE = 49,000 SY

ITEM 254 - PAVEMENT PLANING, ASPHALT CONCRETE, VARIABLE DEPTH

THWING ROAD

SUPERELEVATED SECTION, 28'	L = 500'	W = 28'	AREA = 1556 SY
SUPERELEVATED SECTION, 30'	L = 2200'	W = 30'	AREA = 7334 SY
RE-PROFILING SECTION	L = 50'	W = 28'	AREA = 156 SY
TOTAL = 9046 SY			

USE = 9500 SY

ITEM 301 - ASPHALT CONCRETE BASE, PG64-22, (449), (DRIVEWAYS), AS PER PLAN

AVG. DIMENSIONS SHOWN, EXACT LIMITS TO BE MARKED IN THE FIELD BY THE ENGINEER

9711 THWING	LENGTH = 10 FT	WIDTH = 25 FT	AREA = 27.8 SY
9723 THWING	LENGTH = 10 FT	WIDTH = 35 FT	AREA = 38.9 SY
9910 THWING	2 x LENGTH = 10 FT	WIDTH = 25 FT	AREA = 55.6 SY
9978 THWING	LENGTH = 10 FT	WIDTH = 15 FT	AREA = 16.7 SY
10090 THWING	LENGTH = 15 FT	WIDTH = 20 FT	AREA = 33.3 SY
10114 THWING	LENGTH = 15 FT	WIDTH = 20 FT	AREA = 33.3 SY
SUBTOTAL 205.6 SY			

DEPTH = 4.5 INCH

TOTAL = 205.6 SY x 4.5 INCH / 36 = 25.7 CY

USE = 30.0 CY

ITEM 407 NON-TRACKING TACK COAT

AUBURN ROAD 10,858 SY x (0.09 + 0.05) GAL/SY = 1521 GAL

THWING ROAD

REF. ITEM 254, 1.5"	37,233 SY
REF. ITEM 254, VARIABLE DEPTH	9046 SY
RE-PROFILING SECTION, UN-MILLED	500 FT x 28 FT = 1556 SY
THWING TOTAL AREA = 47,835 SY	

47,835 SY x (0.09 + 0.05) GAL/SY = 6697 GAL

INCLUDE TACK FOR EACH LIFT OF LEVELING COURSE IN RE-PROFILING SECTION

3 x 500 FT x 28 FT / 9 x (0.09 + 0.05 + 0.05) GAL/SY = 887 GAL

TOTAL = 1521 + 6697 + 887 = 9105 GAL

INCLUDE CONTINGENCY FOR DRIVEWAY PAVING **USE = 10,000 GAL**

ITEM 424 - FINE GRADED POLYMER ASPHALT CONCRETE, TYPE B, (448),

PG76-22M

DEPTH = 1.0 INCH

AUBURN ROAD 10,858 SY x 1 INCH / 36 = 301.6 CY

THWING ROAD 47,835 SY x 1 INCH / 36 = 1328.8 CY

TOTAL 1630.4 CY

USE = 1665.0 CY

ITEM 441 - ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 1, (448) PG64-22

DEPTH = 1.25 INCH

AUBURN ROAD 10,858 SY x 1.25 INCH / 36 = 377.0 CY

THWING ROAD 47,835 SY x 1.25 INCH / 36 = 1660.9 CY

TOTAL 2037.9 CY

INCLUDE CONTINGENCY FOR SUPERELEVATED AREAS **USE = 2150.0 CY**

ITEM 441 - ASPHALT CONCRETE INTERMEDIATE LEVELING COURSE, TYPE 2, (449), PG64-22

THWING ROAD STA. 43+90 TO STA. 44+75

DEPTH VARIES, 0" - 4", AVG. = 2.5 INCH

85 FT x 28 FT x 0.21 FT / 27 = 18.5 CY

THWING ROAD STA. 45+70 TO STA. 48+90

DEPTH VARIES, 0" - 11", AVG. = 4.5 INCH

320 FT x 28 FT x 0.38 FT / 27 = 126.1 CY

TOTAL 144.6 CY

INCLUDE CONTINGENCY FOR SUPERELEVATED AREAS **USE = 175.0 CY**

ITEM 441 - ASPHALT CONCRETE SURFACE COURSE, TYPE 1, (449), PG64-22

(DRIVEWAYS)

AVG. DIMENSIONS SHOWN, EXACT LIMITS TO BE MARKED IN THE FIELD BY THE ENGINEER

AUBURN ROAD 31 DRIVES, ASSUME HALF REQUIRE NEW TRANSITION
QTY. = 16 EACH LENGTH = 9 FT WIDTH = 30 FT AREA = 480.0 SY

THWING ROAD, FULL DEPTH ASPHALT, REFERENCE ITEM 301 AREA = 205.6 SY

THWING ROAD 90 OTHER DRIVES, ASSUME 1/3 REQUIRE NEW TRANSITION

QTY. = 30 EACH LENGTH = 9 FT WIDTH = 25 FT AREA = 750.0 SY

SUM = 1435.6 SY

THWING ROAD, INTERSECTING SIDE ROADS (DIGITAL MEASUREMENTS)

PINEGATE DRIVE	LENGTH = 14 FT	AREA = 60.0 SY
FOREST OAKS DRIVE	LENGTH = 12 FT	AREA = 65.0 SY
OLMAR DRIVE	LENGTH = 13 FT	AREA = 75.0 SY
FOWLERS MILL ROAD	LENGTH = 13 FT	AREA = 80.0 SY
HELMUT DRIVE	LENGTH = 17 FT	AREA = 65.0 SY
HENNING DRIVE	LENGTH = 17 FT	AREA = 65.0 SY
SUM = 410.0 SY		

DEPTH = 1.5 INCH

TOTAL = (1435.6 + 410.0) SY x 1.5 INCH / 36 = 76.9 CY **USE = 80.0 CY**

ITEM 617 - COMPACTED AGGREGATE (RAP)

AUBURN ROAD	3870 FT x 2 SIDES = 7740 FT
THWING ROAD - NORMAL	10,600 FT x 2 SIDES = 21,200 FT
THWING ROAD - RIGHT CURB	600 FT x 1 SIDE = 600 FT
THWING ROAD - SUPERELEVATED	2,700 FT x 2 SIDES = 5400 FT
THWING ROAD - RE-PROFILING	550 FT x 2 SIDES = 1100 FT
THWING ROAD - LEFT CURB	685 FT x 1 SIDE = 685 FT
SUM 36,725 FT	

WIDTH = 1.5 FT DEPTH = 2.25 INCH

TOTAL = 36,725 FT x 1.5 FT x (2.25 INCH/12) / 27 = 382.6 CY **USE = 400.0 CY**

ITEM 617 - COMPACTED AGGREGATE (304 LIMESTONE)

THWING ROAD - RE-PROFILING 550 FT x 2 SIDES = 1100 FT

WIDTH = 2.0 FT AVG. DEPTH = 4.0 INCH

TOTAL = 1100 FT x 2.0 FT x (4.0 INCH/12) / 27 = 27.2 CY

INCLUDE CONTINGENCY FOR SUPERELEVATED AREAS **USE = 40.0 CY**

DESIGNER	TEW
REVIEWER	SEH 4/28/26
PROJECT ID	RS-GEA-V-2026
SHEET	TOTAL
P.11	23

THE ASPHALT RESURFACING OF VARIOUS ROADS INCLUDING AUBURN ROAD AND THWING ROAD
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TRAFFIC CONTROL

ITEM 626 - BARRIER REFLECTORS, TYPE 3 BIDIRECTIONAL

REFERENCE GUARDRAIL PLAN, SHEET P.20

USE = 24 EACH

ITEM 642 - EDGE LINE, 4", TYPE 1

AUBURN ROAD LENGTH = 0.73 MILE x 2 SIDES = 1.46 MILE
 THWING ROAD LENGTH = 2.87 MILE x 2 SIDES = 5.74 MILE

USE = 7.20 MILE

ITEM 642 - CENTER LINE, TYPE 1

AUBURN ROAD LENGTH = 0.73 MILE
 THWING ROAD LENGTH = 2.87 MILE

USE = 3.60 MILE

ITEM 644 - STOP LINE

ESTIMATED QUANTITIES SHOWN, EXACT LAYOUT WILL BE PROVIDED BY THE ENGINEER

AUBURN RD / THWING RD
 4 APPROACHES x 20 FT LENGTH = 80 FT

AUBURN RD / US 6 (NB ONLY)
 40-FT DISTANCE FROM TRAFFIC SIGNAL HEAD LENGTH = 11 FT

PINEGATE DRIVE LENGTH = 10 FT

FOREST OAKS DRIVE LENGTH = 10 FT

OLMAR DRIVE LENGTH = 10 FT

FOWLERS MILL ROAD LENGTH = 20 FT

HELMUT DRIVE LENGTH = 10 FT

HENNING DRIVE LENGTH = 10 FT
 TOTAL 161 FT

USE = 165 FT

MAINTENANCE OF TRAFFIC

ITEM 614 - LAW ENFORCEMENT OFFICER WITH PATROL CAR FOR ASSISTANCE

AUBURN ROAD / US 6 INTERSECTION

PAVEMENT PLANING OPERATION	TIME = 3 HOUR
PAVEMENT REPAIR OPERATION	TIME = 3 HOUR
INTERMEDIATE PAVING OPERATION	TIME = 3 HOUR
DRIVEWAY PAVING OPERATION	TIME = 3 HOUR
SURFACE PAVING OPERATION	TIME = 3 HOUR
COMPACTED AGGREGATE OPERATION	TIME = 3 HOUR
TOTAL	18 HOUR

USE = 24 HOUR

ITEM 614 - WORK ZONE CENTER LINE, CLASS II, 740.06, TYPE I

THREE APPLICATIONS PER ROAD: PAVEMENT PLANING, INTERMEDIATE PAVING, AND SURFACE PAVING

AUBURN ROAD	0.73 MILE x 3 APPLICATIONS = 2.19 MILE
THWING ROAD	2.87 MILE x 3 APPLICATIONS = 8.61 MILE
THWING ROAD, RE-PROFILING SECTION LEVELING COURSE	0.10 MILE x 2 APPLICATIONS = 0.20 MILE

USE = 11.00 MILE

INCIDENTALS

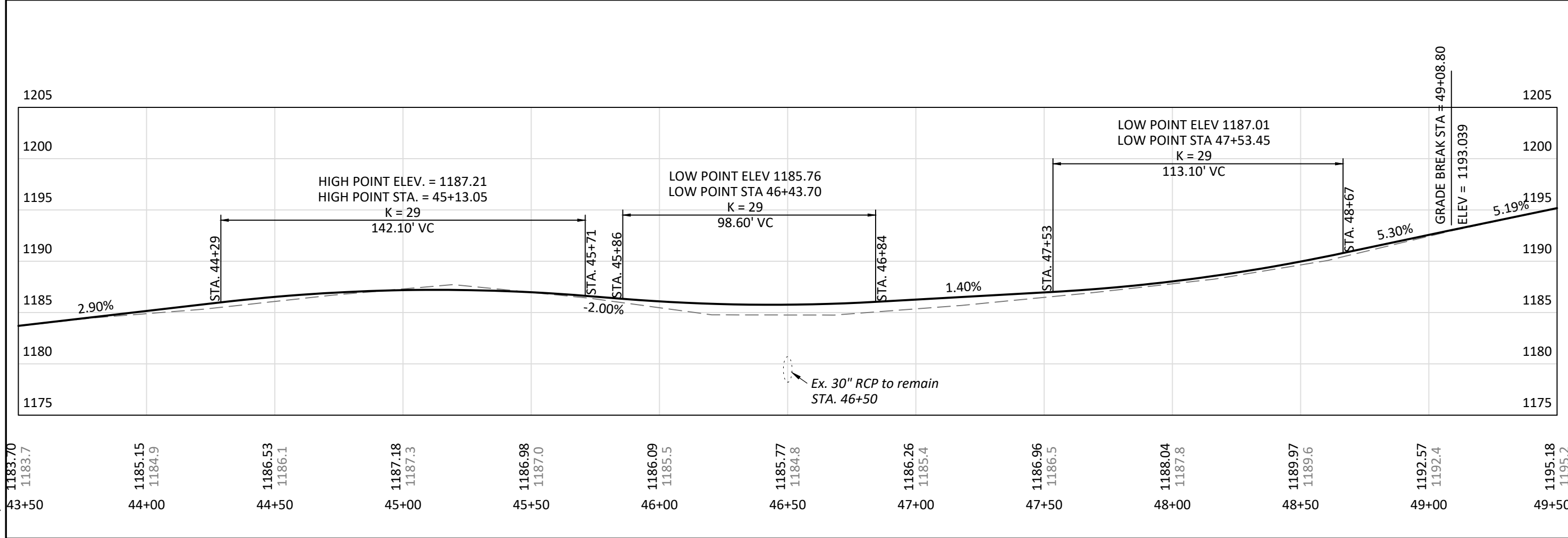
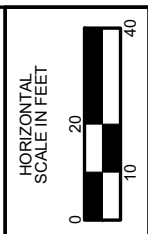
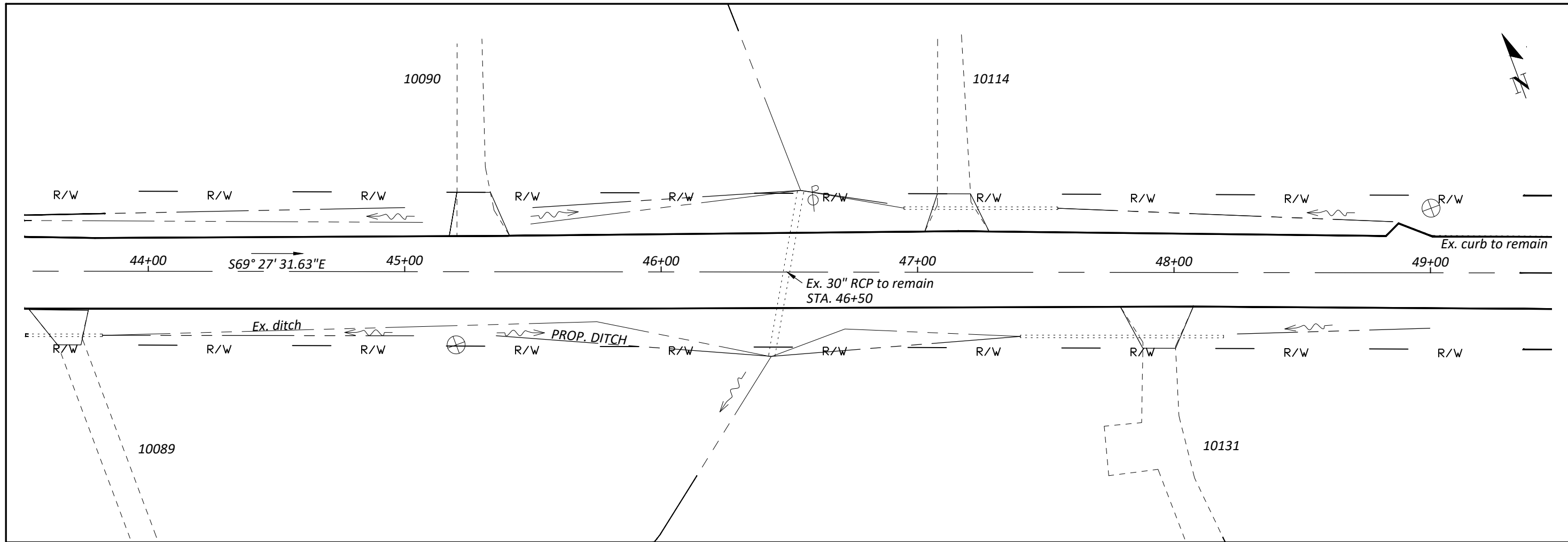
ITEM SPEC - MAILBOX ASSEMBLY, REMOVED AND RESET

THWING ROAD, RE-PROFILING SECTION 5 EACH

INCLUDE CONTINGENCY FOR MAILBOXES THAT MAY NEED ADJUSTMENT
USE = 10 EACH

CALCULATIONS

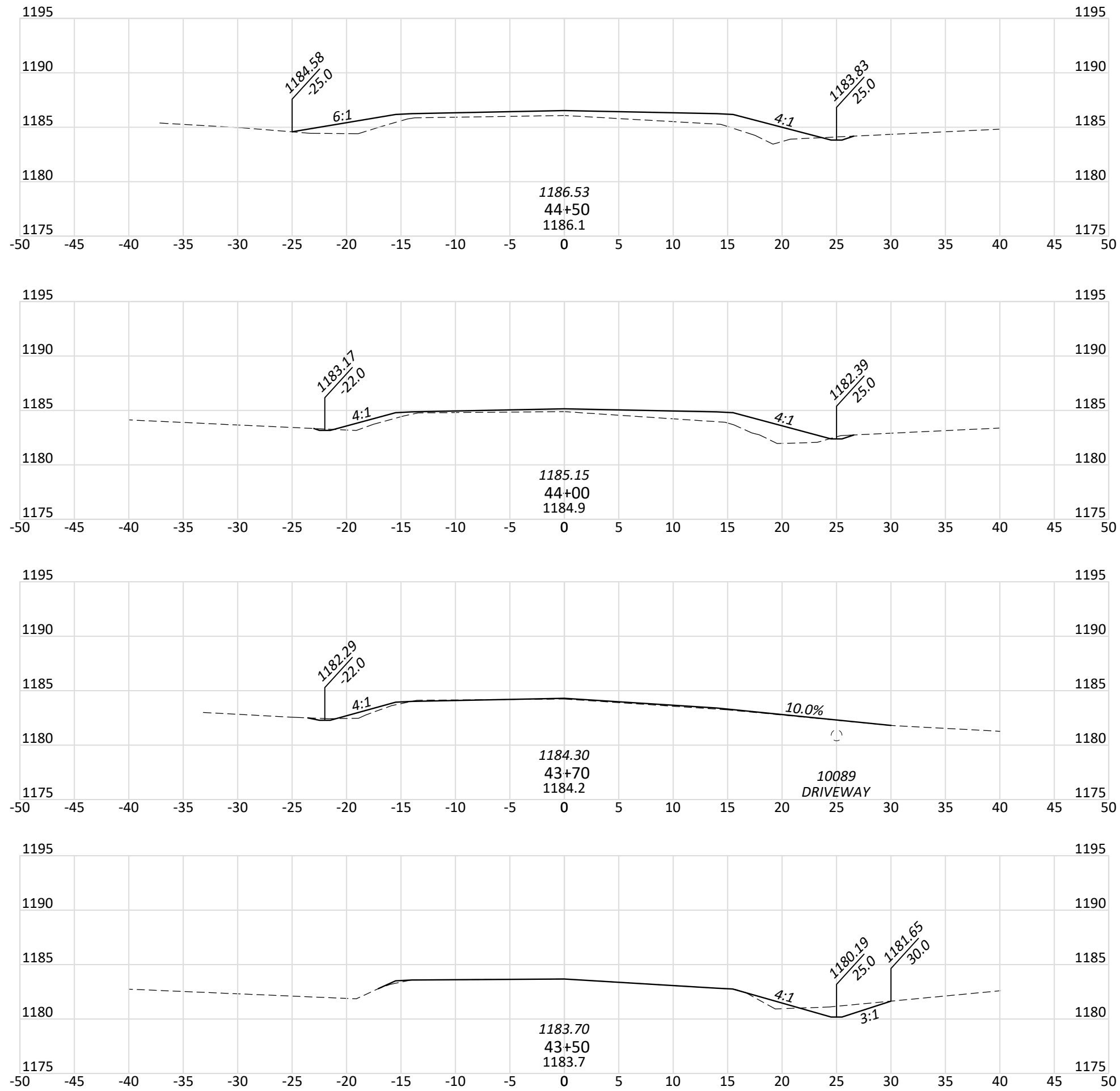
DESIGNER	TEW
REVIEWER	SEH 4/28/26
PROJECT ID	RS-GEA-V-2026
SHEET	TOTAL
P.12	23



PLAN AND PROFILE - THWING ROAD

DESIGNER	TEW
REVIEWER	SEH 4/28/26
PROJECT ID	RS-GEA-V-2026
SHEET	P.13
TOTAL	23

EROSION CONTROL		
END WIDTH	659	653
	SEEDING	TOPSOIL
FT	SY	CY
20		
103		6
17		
55		3
16		
34		2
14		
SHEET TOTALS	192	11

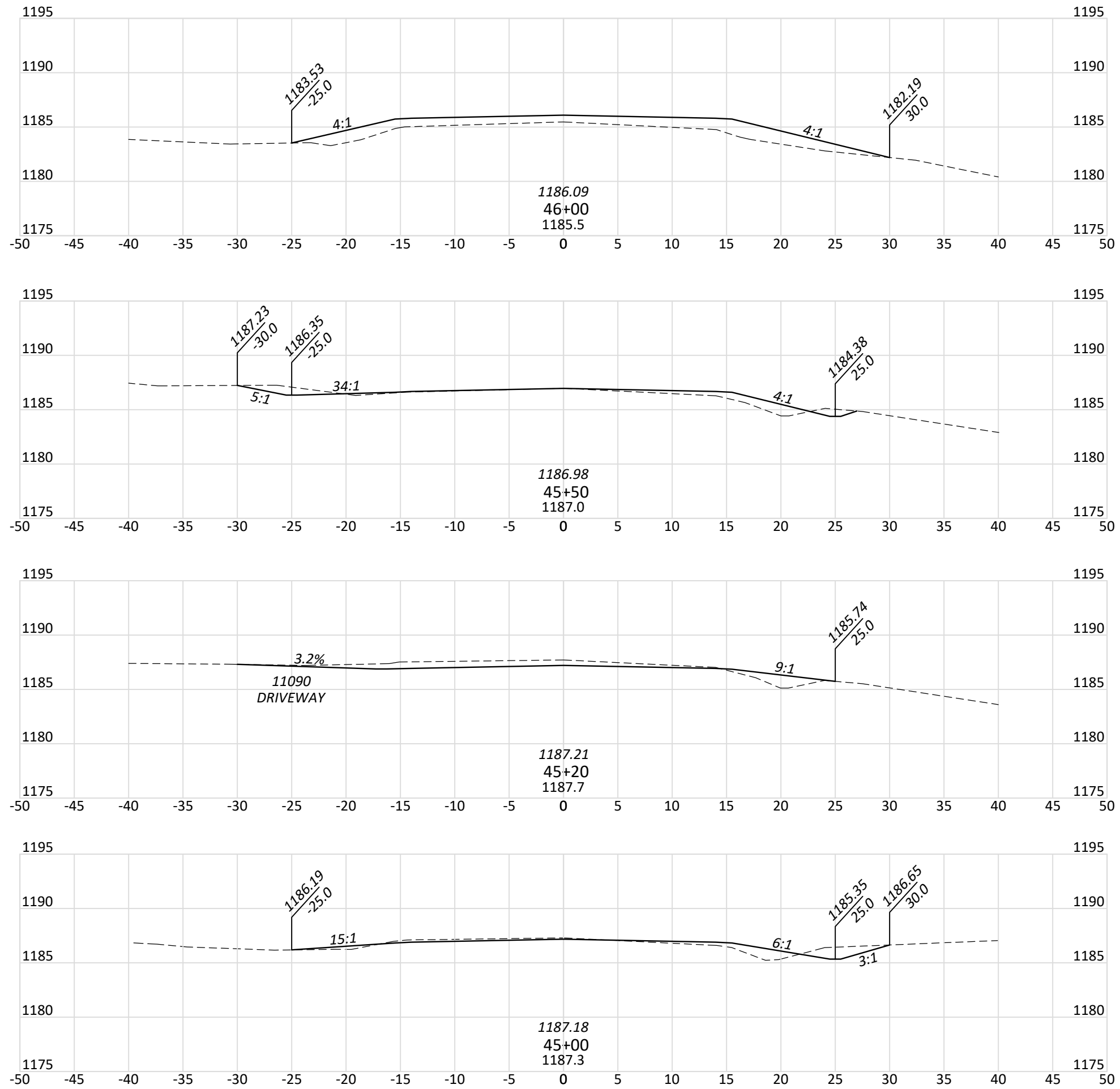


END AREA	VOLUME	
	CUT	FILL
1	16	
		2
		28
1	14	
		1
		9
1	2	
		3
		1
6	2	
SHEET TOTALS	6	38

CROSS SECTIONS - THWING ROAD		DESIGNER	TEW
		REVIEWER	SEH 4/28/26
		PROJECT ID	RS-GEA-V-2026
		SHEET TOTAL	P.14 23

THE ASPHALT RESURFACING OF VARIOUS ROADS INCLUDING AUBURN ROAD AND THWING ROAD
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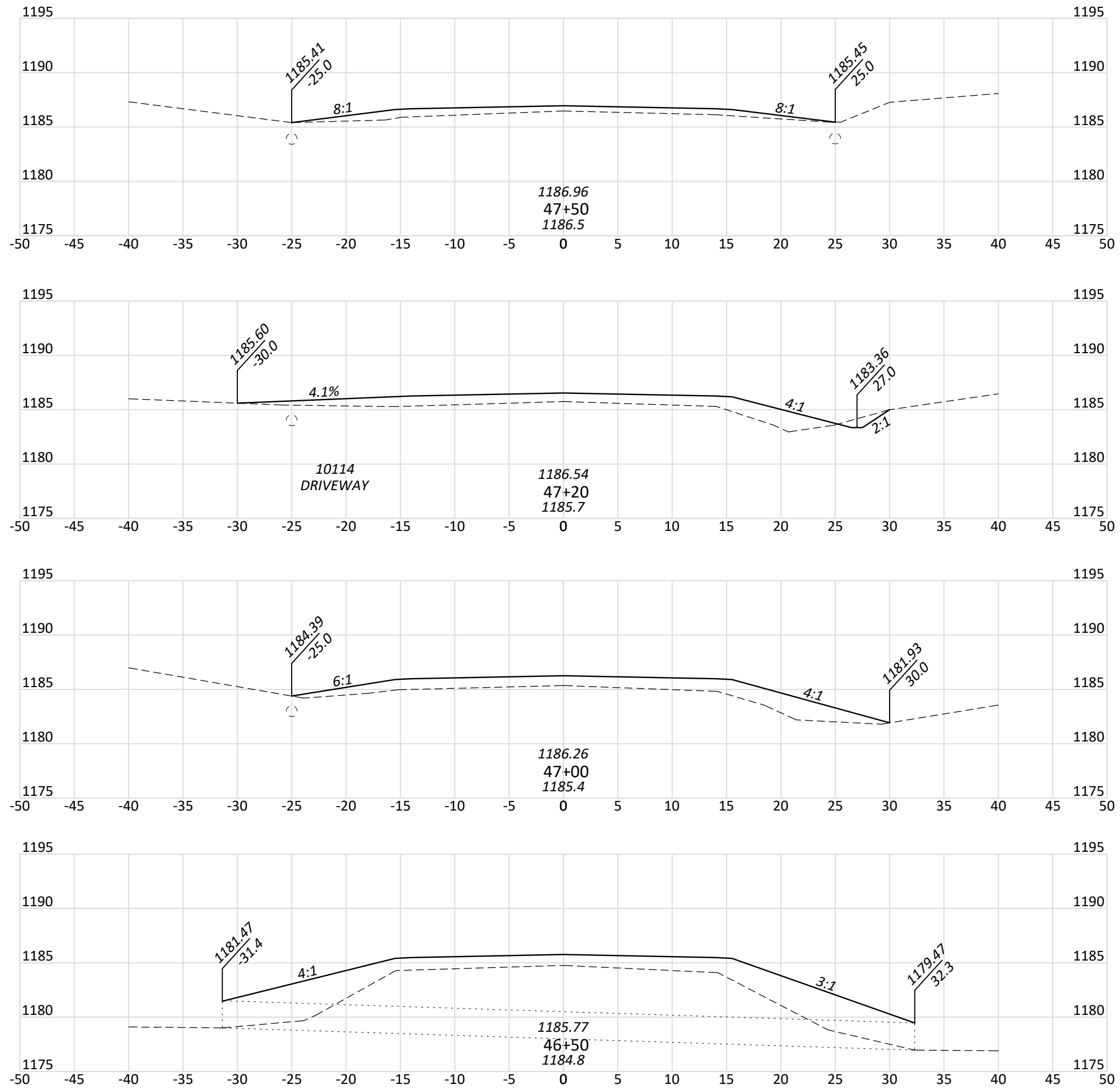
EROSION CONTROL		
END WIDTH	659 SEEDING	653 TOPSOIL
FT	SY	CY
23		
131		8
24		
80		5
24		
53		3
23		
120		7
SHEET TOTALS	384	23



END AREA		VOLUME	
CUT	FILL	CUT	FILL
0	21	6	25
6	6	4	7
1	6	3	4
6	6		
SHEET TOTALS		19	56

CROSS SECTIONS - THWING ROAD		DESIGNER	TEW
		REVIEWER	SEH 4/28/26
		PROJECT ID	RS-GEA-V-2026
		SHEET TOTAL	P.15 23

EROSION CONTROL		
END WIDTH	659	653
	SEEDING	TOPSOIL
FT	SY	CY
18		
65	4	
21		
49	3	
23		
156	9	
33		
156	9	
SHEET TOTALS	426	25

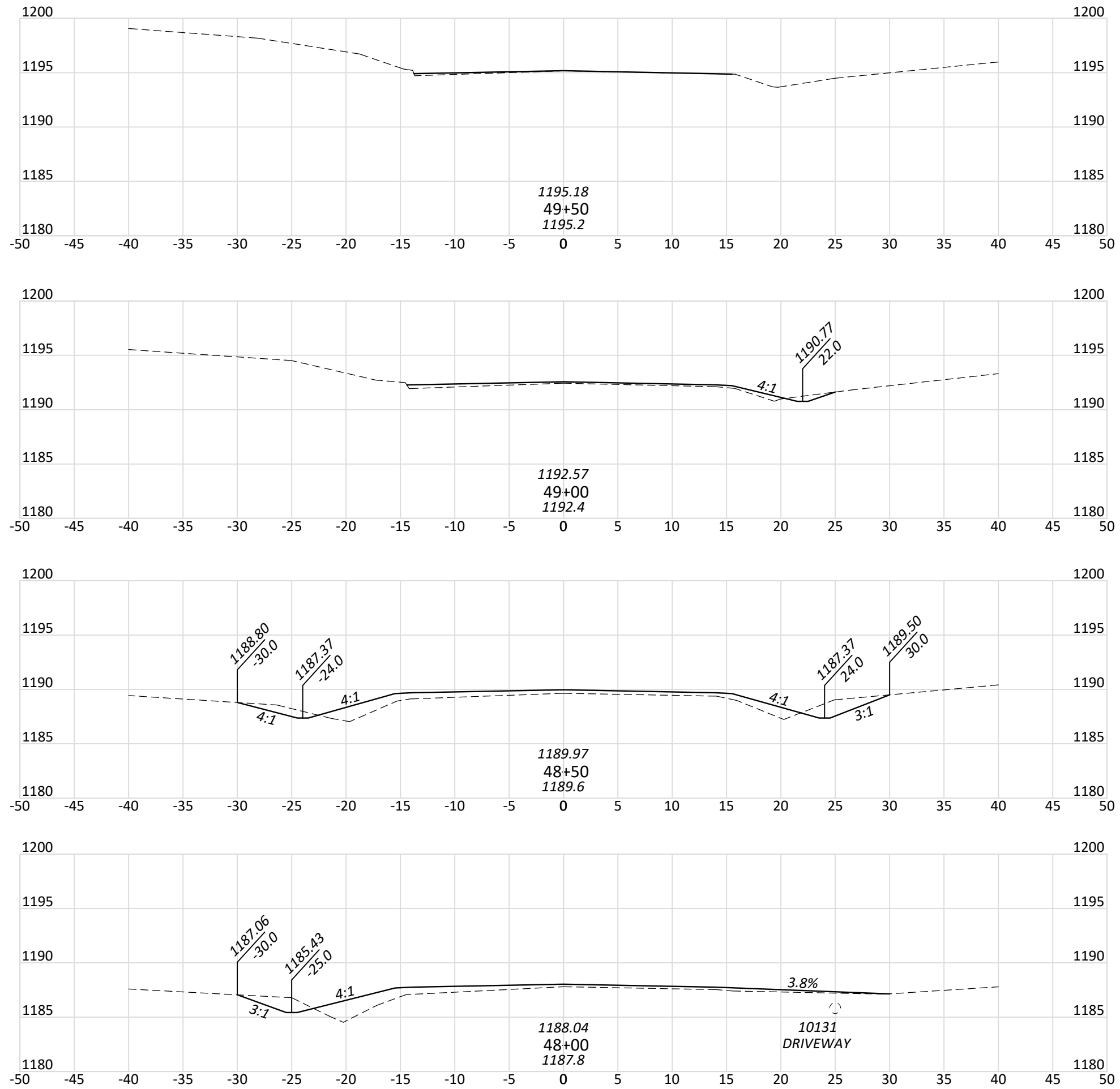


	END AREA		VOLUME	
	CUT	FILL	CUT	FILL
	0	8		
			2	16
	3	20		
			1	17
	0	26		
			0	108
	0	91		
SHEET TOTALS			3	245

CROSS SECTIONS - THWING ROAD		DESIGNER	TEW
		REVIEWER	SEH 4/28/26
		PROJECT ID	RS-GEA-V-2026
		SHEET TOTAL	P.16 23

THE ASPHALT RESURFACING OF VARIOUS ROADS INCLUDING AUBURN ROAD AND THWING ROAD
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 04-May-26 9:00 AM

EROSION CONTROL		
END WIDTH	659	653
	SEEDING	TOPSOIL
FT	SY	CY
0		
25		2
9		
103		6
28		
142		8
23		
114		7
SHEET TOTALS	384	23

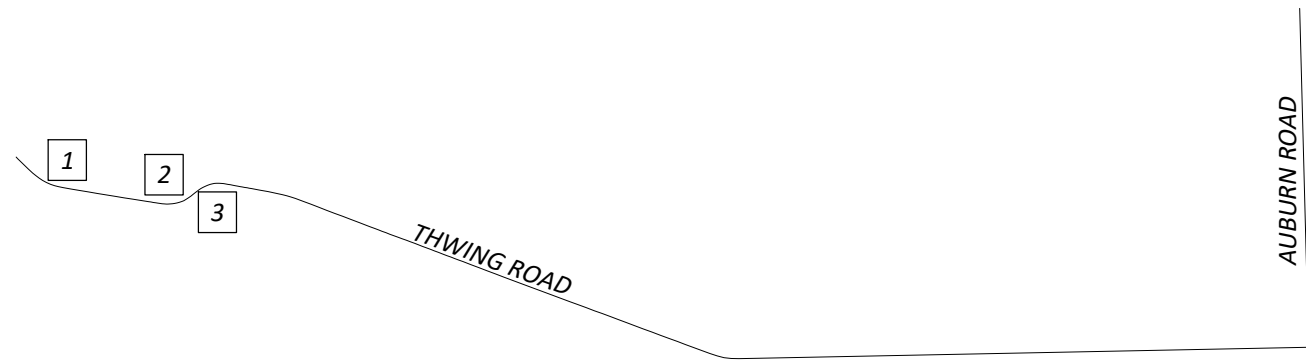


	END AREA		VOLUME	
	CUT	FILL	CUT	FILL
0	0	0		
25			2	2
9	2	2		
103			12	12
28	11	11		
142			16	19
23	6	10		
114			6	17
SHEET TOTALS			36	50

CROSS SECTIONS - THWING ROAD			
		DESIGNER	TEW
		REVIEWER	SEH 4/28/26
		PROJECT ID	RS-GEA-V-2026
SHEET	P.17	TOTAL	23

CURVE 1	9723 THWING ROAD	P.I. Station 4+65	Dc = 8° 45'
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LEFT SIDE					CENTERLINE CONTROL		RIGHT SIDE					REMARKS
SURFACE ELEVATION	MILL DEPTH (INCH)	ELEVATION CORRECTION	CROSS SLOPE	WIDTH	STATION	SURFACE ELEVATION	WIDTH	CROSS SLOPE	ELEVATION CORRECTION	MILL DEPTH (INCH)	SURFACE ELEVATION	
952.97	2	0.00	-0.020	14.4	1+75	953.26	14.4	-0.020	+0.19	0	952.97	N.C.
954.16	1	+0.12	-0.020	15.0	2+00	954.46	15.0	-0.020	+0.19	0	954.16	
955.34	1	+0.11	-0.020	15.0	2+25	955.64	15.0	-0.010	+0.19	0	955.49	
956.59	1	+0.11	-0.020	15.0	2+50	956.89	15.0	-0.000	+0.19	0	956.89	
958.05	0	+0.19	-0.020	15.0	2+75	958.35	15.0	+0.010	+0.19	0	958.50	9706
959.39	0	+0.19	-0.020	15.0	3+00	959.69	15.0	+0.020	+0.19	0	959.99	P.C.
960.59	1	+0.12	-0.030	15.0	3+25	961.04	15.0	+0.030	+0.19	0	961.49	9711
961.78	3	-0.10	-0.040	15.0	3+50	962.38	15.0	+0.040	+0.19	0	962.98	F.S.
963.43	4	-0.12	-0.040	15.0	3+75	964.03	15.0	+0.040	+0.19	0	964.63	
965.11	4	-0.13	-0.040	15.0	4+00	965.71	15.0	+0.040	+0.19	0	966.31	
966.96	3	-0.04	-0.040	15.0	4+25	967.56	15.0	+0.040	+0.19	0	968.16	
969.00	1	+0.12	-0.040	15.0	4+50	969.60	15.0	+0.040	+0.19	0	970.20	
971.08	0	+0.16	-0.040	15.0	4+75	971.68	15.0	+0.040	+0.19	0	972.28	
973.29	1	+0.11	-0.040	15.0	5+00	973.89	15.0	+0.040	+0.19	0	974.49	
975.62	0	+0.19	-0.040	15.0	5+25	976.22	15.0	+0.040	+0.19	0	976.82	
978.03	0	+0.19	-0.040	15.0	5+50	978.63	15.0	+0.040	+0.10	1	979.23	
980.49	1	+0.08	-0.040	15.0	5+75	981.09	15.0	+0.040	+0.19	0	981.69	9723
982.87	2	+0.02	-0.040	15.0	6+00	983.47	15.0	+0.040	+0.19	0	984.07	
985.25	4	-0.15	-0.040	15.0	6+25	985.85	15.0	+0.040	+0.19	0	986.45	F.S.
988.00	2	+0.06	-0.030	15.0	6+50	988.45	15.0	+0.030	+0.19	0	988.90	
990.74	0	+0.15	-0.020	15.0	6+75	991.04	15.0	+0.020	+0.19	0	991.34	P.T.
993.34	2	-0.01	-0.020	15.0	7+00	993.64	15.0	+0.010	+0.19	0	993.79	
995.94	5	-0.20	-0.020	14.7	7+25	996.23	14.7	+0.010	+0.19	0	996.38	
998.86	2	0.00	-0.020	14.4	7+50	999.15	14.4	+0.000	+0.10	1	999.15	
1001.90	0	+0.19	-0.020	13.9	7+75	1002.18	13.9	+0.000	0.00	2	1002.18	9747
1004.77	0	+0.15	-0.020	13.6	8+00	1005.04	13.6	-0.010	+0.14	1	1004.90	
1007.58	2	0.00	-0.020	13.3	8+25	1007.85	13.3	-0.020	+0.19	0	1007.58	N.C.



CURVE 2	9859 THWING ROAD	P.I. Station 19+60	Dc = 14° 58'
CURVE 3	9910 THWING ROAD	P.I. Station 23+95	Dc = 14° 58'

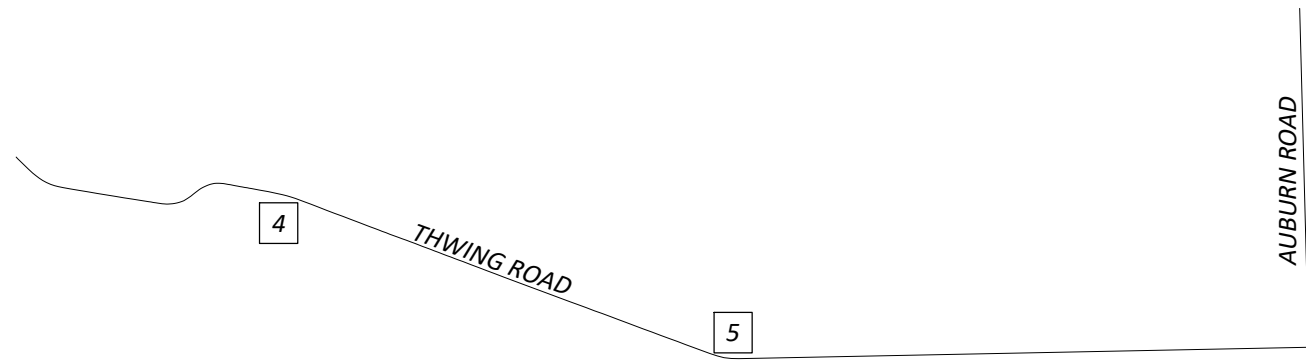
LEFT SIDE					CENTERLINE CONTROL		RIGHT SIDE					REMARKS
SURFACE ELEVATION	MILL DEPTH (INCH)	ELEVATION CORRECTION	CROSS SLOPE	WIDTH	STATION	SURFACE ELEVATION	WIDTH	CROSS SLOPE	ELEVATION CORRECTION	MILL DEPTH (INCH)	SURFACE ELEVATION	
1083.16	0	+0.16	-0.020	13.3	16+25	1083.43	13.3	-0.020	-0.11	4	1083.16	9825
1085.17	0	+0.16	-0.020	13.7	16+50	1085.44	13.7	-0.010	-0.34	6	1085.30	CB ADJ.
1087.00	1	+0.13	-0.020	14.1	16+75	1087.28	14.1	-0.000	-0.32	6	1087.28	1/2 LEVEL
1088.84	0	+0.19	-0.020	14.5	17+00	1089.13	14.5	+0.010	-0.19	5	1089.28	
1090.67	0	+0.19	-0.020	15.0	17+25	1090.97	15.0	+0.020	-0.13	4	1091.27	R.C.
1092.36	0	+0.19	-0.030	15.0	17+50	1092.81	15.0	+0.030	-0.10	3	1093.26	P.C.
1094.06	0	+0.19	-0.040	15.0	17+75	1094.66	15.0	+0.040	-0.09	3	1095.26	
1095.89	0	+0.19	-0.040	15.0	18+00	1096.49	15.0	+0.040	-0.18	4	1097.09	F.S.
1097.63	0	+0.19	-0.040	15.0	18+25	1098.23	15.0	+0.040	-0.25	5	1098.83	
1099.33	0	+0.19	-0.040	15.0	18+50	1099.93	15.0	+0.040	-0.32	6	1100.53	
1100.82	2	+0.05	-0.040	15.0	18+75	1101.42	15.0	+0.040	-0.30	6	1102.02	
1102.32	1	+0.09	-0.040	15.0	19+00	1102.92	15.0	+0.040	-0.29	6	1103.52	
1103.82	0	+0.19	-0.040	15.0	19+25	1104.42	15.0	+0.040	-0.30	6	1105.02	
1105.31	0	+0.19	-0.040	15.0	19+50	1105.91	15.0	+0.040	-0.35	6	1106.51	
1106.76	0	+0.19	-0.040	15.0	19+75	1107.36	15.0	+0.040	-0.35	6	1107.96	
1108.23	0	+0.19	-0.040	15.0	20+00	1108.83	15.0	+0.040	-0.35	6	1109.43	
1109.55	0	+0.19	-0.040	15.0	20+25	1110.15	15.0	+0.040	-0.35	6	1110.75	
1110.88	0	+0.19	-0.040	15.0	20+50	1111.48	15.0	+0.040	-0.27	5	1112.08	F.S.
1112.36	0	+0.19	-0.040	14.8	20+75	1112.95	14.8	+0.040	-0.14	4	1113.54	
1113.92	0	+0.19	-0.030	14.8	21+00	1114.36	14.8	+0.030	-0.25	5	1114.80	P.T.
1115.56	0	+0.19	-0.020	14.8	21+25	1115.86	14.8	+0.020	-0.31	6	1116.16	
1117.36	0	+0.19	-0.010	14.8	21+50	1117.51	14.8	+0.010	-0.32	6	1117.66	
1119.31	0	+0.19	0.000	14.8	21+75	1119.31	14.8	0.000	-0.20	5	1119.31	
1121.28	0	+0.19	+0.010	14.8	22+00	1121.13	14.8	-0.010	-0.19	5	1120.98	
1123.32	0	+0.19	+0.020	15.0	22+25	1123.02	15.0	-0.020	-0.19	5	1122.72	INT. T2
1125.40	0	+0.19	+0.030	15.0	22+50	1124.95	15.0	-0.030	-0.34	6	1124.50	
1127.46	0	+0.17	+0.030	15.0	22+75	1127.01	15.0	-0.030	-0.34	6	1126.56	
1129.49	1	+0.08	+0.030	15.0	23+00	1129.04	15.0	-0.030	-0.37	7	1128.59	
1131.47	2	0.00	+0.030	15.0	23+25	1131.02	15.0	-0.030	-0.48	8	1130.57	9890
1133.62	2	0.00	+0.030	15.0	23+50	1133.17	15.0	-0.030	-0.48	8	1132.72	
1135.82	3	-0.10	+0.030	15.0	23+75	1135.37	15.0	-0.030	-0.30	6	1134.92	
1137.95	6	-0.34	+0.030	15.0	24+00	1137.50	15.0	-0.030	-0.18	4	1137.05	
1140.02	3	-0.10	+0.030	15.0	24+25	1139.57	15.0	-0.030	-0.35	6	1139.12	9910
1142.01	0	+0.19	+0.030	15.0	24+50	1141.56	15.0	-0.030	-0.52	8	1141.11	
1144.13	0	+0.19	+0.030	15.0	24+75	1143.68	15.0	-0.030	-0.47	8	1143.23	
1146.08	0	+0.19	+0.030	15.0	25+00	1145.63	15.0	-0.030	-0.51	8	1145.18	
1148.16	0	+0.19	+0.030	15.0	25+25	1147.71	15.0	-0.030	-0.36	7	1147.26	
1149.91	0	+0.19	+0.030	15.0	25+50	1149.46	15.0	-0.030	-0.40	7	1149.01	
1151.79	0	+0.19	+0.030	15.0	25+75	1151.34	15.0	-0.030	-0.33	6	1150.89	INT. T2
1153.41	1	+0.11	+0.020	15.0	26+00	1153.11	15.0	-0.020	-0.02	2	1152.81	R.C.
1154.91	0	+0.17	+0.010	15.0	26+25	1154.76	15.0	-0.020	+0.19	0	1154.46	
1156.02	2	+0.02	+0.000	15.0	26+50	1156.02	15.0	-0.020	+0.19	0	1155.72	1/2 LEVEL
1156.89	3	-0.10	-0.010	15.0	26+75	1157.04	15.0	-0.020	+0.19	0	1156.74	
1157.65	3	-0.10	-0.020	15.0	27+00	1157.95	15.0	-0.020	+0.19	0	1157.65	N.C.

SUPERELEVATION TABLES - THWING ROAD

DESIGNER	TEW
REVIEWER	SEH 4/28/26
PROJECT ID	RS-GEA-V-2026
SHEET TOTAL	P.18 23

CURVE 4 9978 THWING ROAD P.I. Station 33+10 Dc = 3° 58'

LEFT SIDE					CENTERLINE CONTROL		RIGHT SIDE					REMARKS
SURFACE ELEVATION	MILL DEPTH (INCH)	ELEVATION CORRECTION	CROSS SLOPE	WIDTH	STATION	SURFACE ELEVATION	WIDTH	CROSS SLOPE	ELEVATION CORRECTION	MILL DEPTH (INCH)	SURFACE ELEVATION	
1160.13	0	+0.19	-0.020	14.0	29+25	1160.41	14.0	-0.020	-0.08	3	1160.13	
1160.09	0	+0.19	-0.020	14.0	29+50	1160.37	14.0	-0.020	-0.14	4	1160.09	
1159.96	0	+0.19	-0.020	14.0	29+75	1160.24	14.0	-0.020	-0.24	5	1159.96	9944
1159.73	0	+0.19	-0.020	14.0	30+00	1160.01	14.0	-0.020	-0.29	6	1159.73	
1159.58	0	+0.19	-0.020	14.0	30+25	1159.86	14.0	-0.020	-0.33	6	1159.58	
1159.46	0	+0.16	-0.020	14.0	30+50	1159.74	14.0	-0.020	-0.51	8	1159.46	N.C.
1159.52	1	+0.14	-0.010	14.0	30+75	1159.66	14.0	-0.020	-0.51	8	1159.38	
1159.48	1	+0.07	-0.000	14.0	31+00	1159.48	14.0	-0.020	-0.51	8	1159.20	
1159.44	0	+0.19	+0.010	14.0	31+25	1159.30	14.0	-0.020	-0.41	7	1159.02	
1159.40	0	+0.19	+0.020	14.0	31+50	1159.12	14.0	-0.020	-0.28	6	1158.84	P.C.
1159.36	0	+0.19	+0.030	14.0	31+75	1158.94	14.0	-0.030	-0.27	5	1158.52	F.S.
1159.50	0	+0.19	+0.030	14.0	32+00	1159.08	14.0	-0.030	-0.06	3	1158.66	
1159.88	1	+0.08	+0.030	14.1	32+25	1159.46	14.1	-0.030	-0.05	3	1159.04	
1160.42	2	0.00	+0.030	14.2	32+50	1159.99	14.2	-0.030	-0.03	3	1159.56	
1161.09	2	0.00	+0.030	14.3	32+75	1160.66	14.3	-0.030	-0.07	3	1160.23	9978
1161.89	3	-0.07	+0.030	14.2	33+00	1161.46	14.2	-0.030	-0.04	3	1161.03	
1162.65	5	-0.21	+0.030	14.1	33+25	1162.23	14.1	-0.030	-0.03	3	1161.81	
1163.33	4	-0.13	+0.030	14.0	33+50	1162.91	14.0	-0.030	-0.05	3	1162.49	
1163.90	3	-0.10	+0.030	14.0	33+75	1163.48	14.0	-0.030	-0.11	4	1163.06	
1164.18	3	-0.03	+0.030	14.0	34+00	1163.76	14.0	-0.030	-0.20	5	1163.34	
1164.33	2	0.00	+0.030	14.0	34+25	1163.91	14.0	-0.030	-0.30	6	1163.49	F.S.
1164.25	2	0.00	+0.020	14.0	34+50	1163.97	14.0	-0.020	-0.35	6	1163.69	P.T.
1164.18	1	+0.07	+0.010	14.0	34+75	1164.04	14.0	-0.020	-0.35	6	1163.76	
1163.83	1	+0.10	+0.000	14.0	35+00	1163.83	14.0	-0.020	-0.10	3	1163.55	10002
1163.35	0	+0.16	-0.010	14.1	35+25	1163.49	14.1	-0.020	+0.04	2	1163.21	
1162.70	0	+0.17	-0.020	14.2	35+50	1162.98	14.2	-0.020	0.00	2	1162.70	N.C.

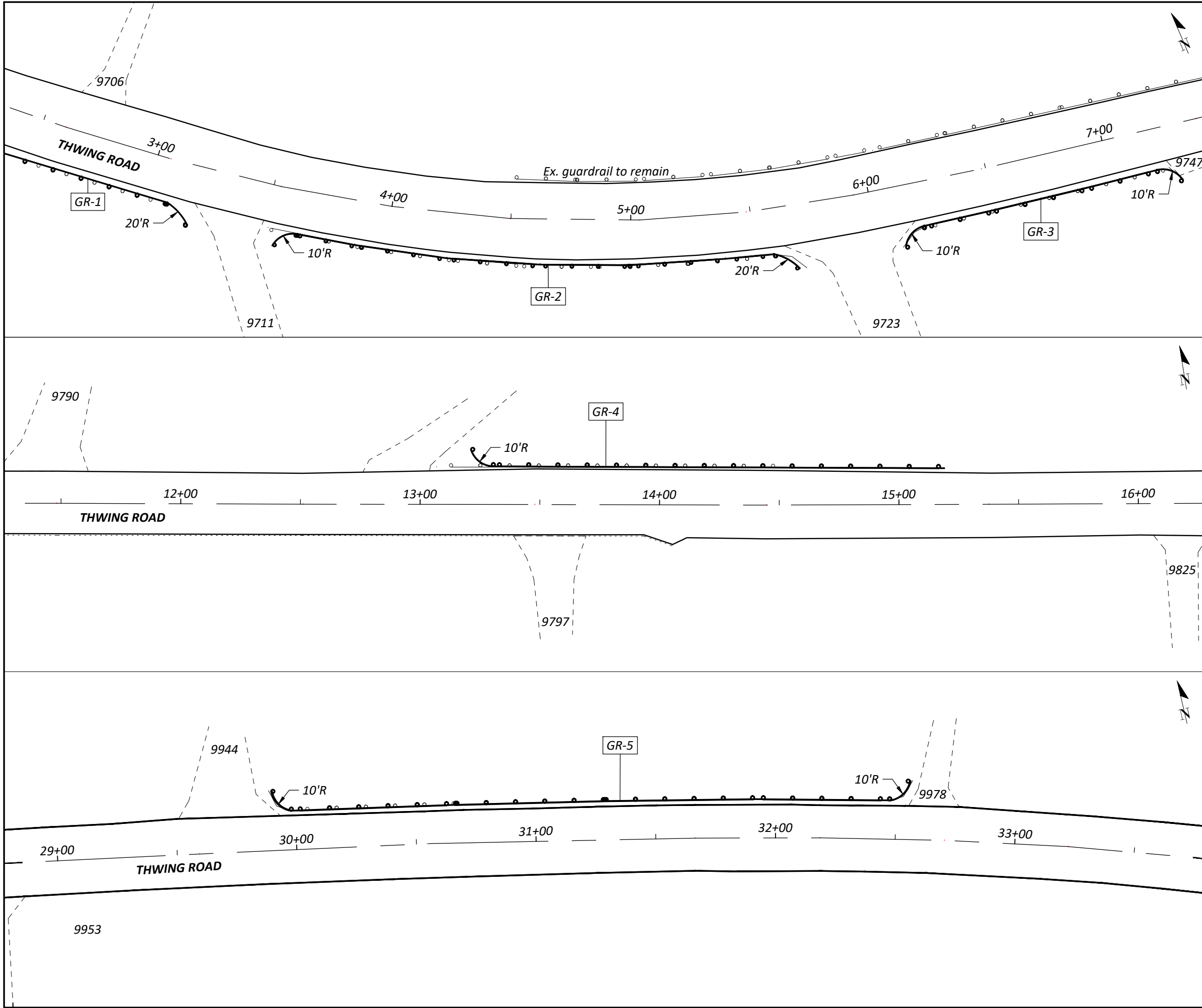


CURVE 5 10482 THWING ROAD P.I. Station 85+65 Dc = 10° 00'

LEFT SIDE					CENTERLINE CONTROL		RIGHT SIDE					REMARKS
SURFACE ELEVATION	MILL DEPTH (INCH)	ELEVATION CORRECTION	CROSS SLOPE	WIDTH	STATION	SURFACE ELEVATION	WIDTH	CROSS SLOPE	ELEVATION CORRECTION	MILL DEPTH (INCH)	SURFACE ELEVATION	
1284.49	1	+0.14	-0.020	14.0	82+75	1284.77	14.0	-0.020	+0.14	1	1284.49	
1284.94	0	+0.19	-0.020	14.1	83+00	1285.22	14.1	-0.020	+0.09	1	1284.94	
1285.18	0	+0.19	-0.020	14.1	83+25	1285.46	14.1	-0.020	0.00	2	1285.18	
1285.42	0	+0.19	-0.020	14.2	83+50	1285.70	14.2	-0.020	-0.11	4	1285.42	N.C.
1285.55	0	+0.19	-0.020	14.2	83+75	1285.83	14.2	-0.010	-0.18	4	1285.69	
1285.57	0	+0.19	-0.020	14.3	84+00	1285.86	14.3	-0.000	-0.18	4	1285.86	
1285.49	0	+0.19	-0.020	14.3	84+25	1285.77	14.3	+0.010	-0.16	4	1285.92	
1285.40	0	+0.19	-0.020	14.4	84+50	1285.69	14.4	+0.020	-0.13	4	1285.97	P.C.
1285.17	2	+0.06	-0.030	14.4	84+75	1285.60	14.4	+0.030	-0.09	3	1286.03	
1284.92	4	-0.17	-0.040	14.7	85+00	1285.51	14.7	+0.040	-0.03	3	1286.10	F.S.
1284.82	5	-0.27	-0.040	15.0	85+25	1285.42	15.0	+0.040	-0.10	3	1286.02	
1284.74	5	-0.27	-0.040	15.0	85+50	1285.34	15.0	+0.040	-0.07	3	1285.94	10475
1284.69	8	-0.48	-0.040	15.0	85+75	1285.29	15.0	+0.040	-0.18	4	1285.89	
1284.63	8	-0.51	-0.040	15.0	86+00	1285.23	15.0	+0.040	+0.12	1	1285.83	10482
1284.54	8	-0.51	-0.040	15.0	86+25	1285.14	15.0	+0.040	+0.19	0	1285.74	F.S.
1284.61	6	-0.31	-0.030	15.0	86+50	1285.06	15.0	+0.030	+0.19	0	1285.51	
1284.54	5	-0.20	-0.020	15.0	86+75	1284.84	15.0	+0.020	+0.19	0	1285.14	P.T.
1284.33	5	-0.22	-0.020	15.0	87+00	1284.63	15.0	+0.010	+0.19	0	1284.78	
1284.12	5	-0.27	-0.020	15.0	87+25	1284.42	15.0	+0.000	+0.15	0	1284.42	
1283.91	2	0.00	-0.020	15.0	87+50	1284.21	15.0	+0.010	-0.03	3	1284.36	
1283.62	1	+0.14	-0.020	14.8	87+75	1283.92	14.8	+0.020	-0.03	3	1284.22	N.C.
1283.07	1	+0.09	-0.020	14.6	88+00	1283.36	14.6	+0.020	+0.02	2	1283.65	

SUPERELEVATION TABLES - THWING ROAD

DESIGNER	TEW
REVIEWER	SEH 4/28/26
PROJECT ID	RS-GEA-V-2026
SHEET	TOTAL
P.19	23



REF. NO.	STATION		SIDE	GUARDRAIL, TYPE MGS WITH LONG POSTS	ANCHOR ASSEMBLY, MGS, TYPE E	ANCHOR ASSEMBLY, MGS, TYPE T	BARRIER REFLECTORS, TYPE 3 BIDIRECTIONAL
	FROM	TO					
GR-1	2+30	3+18	RIGHT	25.0	1	1	3
GR-2	3+50	5+75	RIGHT	200.0		2	5
GR-3	6+10	7+35	RIGHT	100.0		2	4
GR-4	13+20	15+20	LEFT	137.5	1	1	5
GR-5	29+85	32+60	LEFT	250.0		2	7
TOTALS CARRIED TO CALCULATIONS SHEETS				712.5	2	8	24

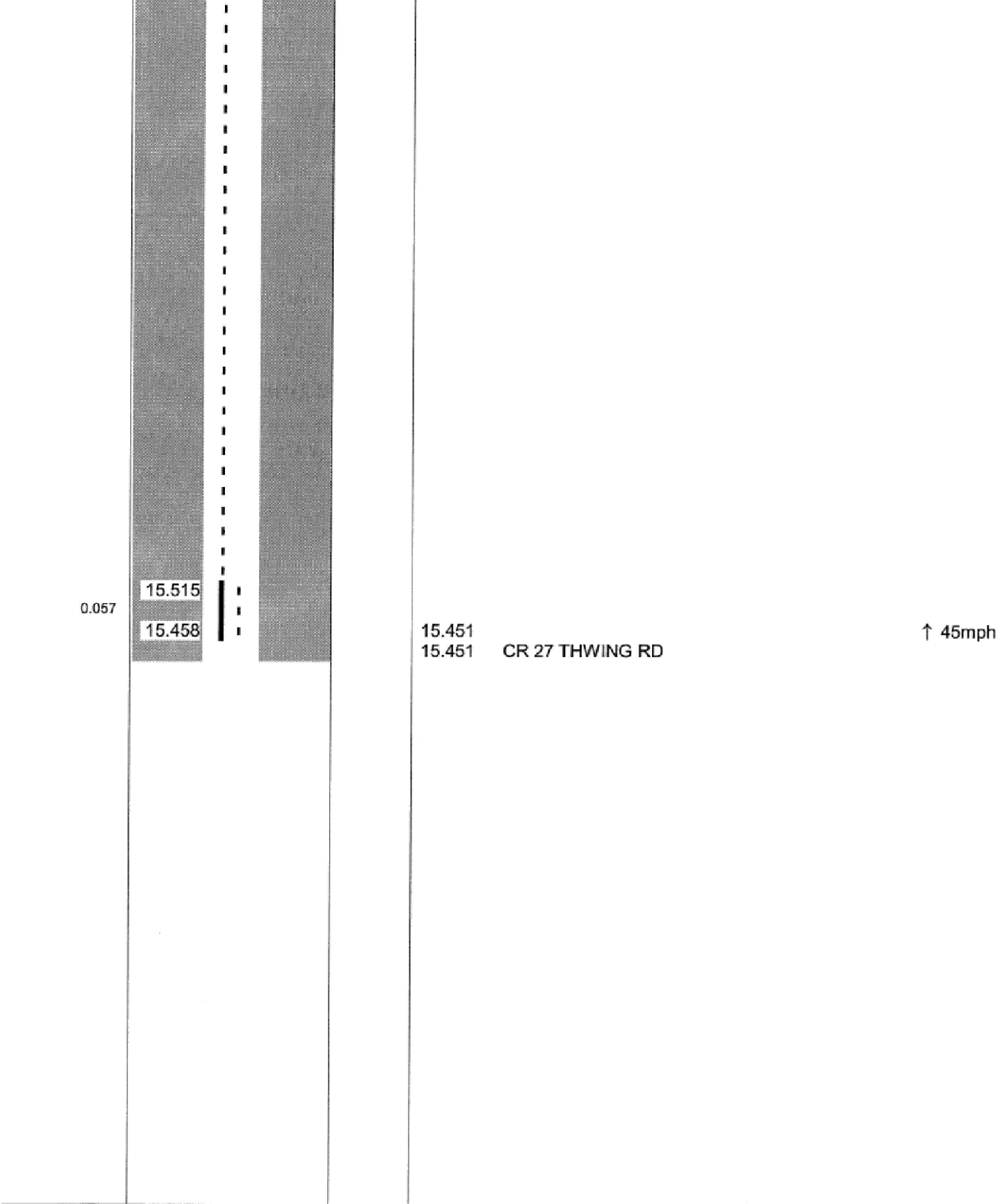
GUARDRAIL PLAN - THWING ROAD

DESIGNER	TEW
REVIEWER	SEH 4/28/26
PROJECT ID	RS-GEA-V-2026
SHEET	TOTAL
P.20	23

HORIZONTAL SCALE IN FEET

Geauga County Engineering Department
No Passing Zone Log

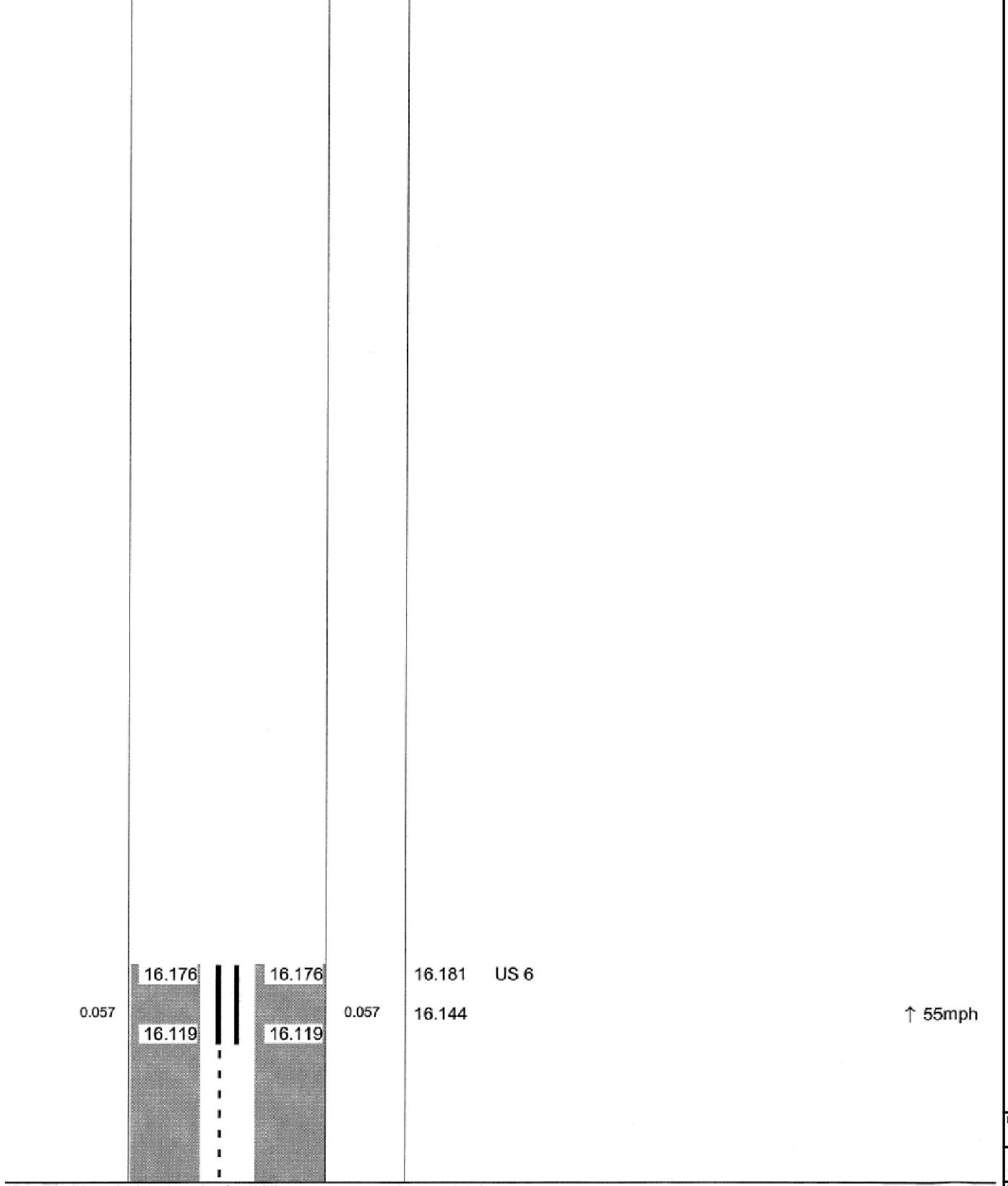
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 Length: 0.730 Direction: North To: 16.181 US 6
 Scale: 1.00 mile/page



Sheet total equivalent length of solid line: 0.193 Accum. total: 0.193 © 2007 - MasterMind Systems, Inc. - Traffic Safety Suite

Geauga County Engineering Department
No Passing Zone Log

Route: 0004Q (AUBURN RD) From: 15.451 CR 27 THWING RD
 Length: 0.730 Direction: North To: 16.181 US 6
 Scale: 1.00 mile/page



Sheet total equivalent length of solid line: 0.144 Accum. total: 0.337 © 2007 - MasterMind Systems, Inc. - Traffic Safety Suite

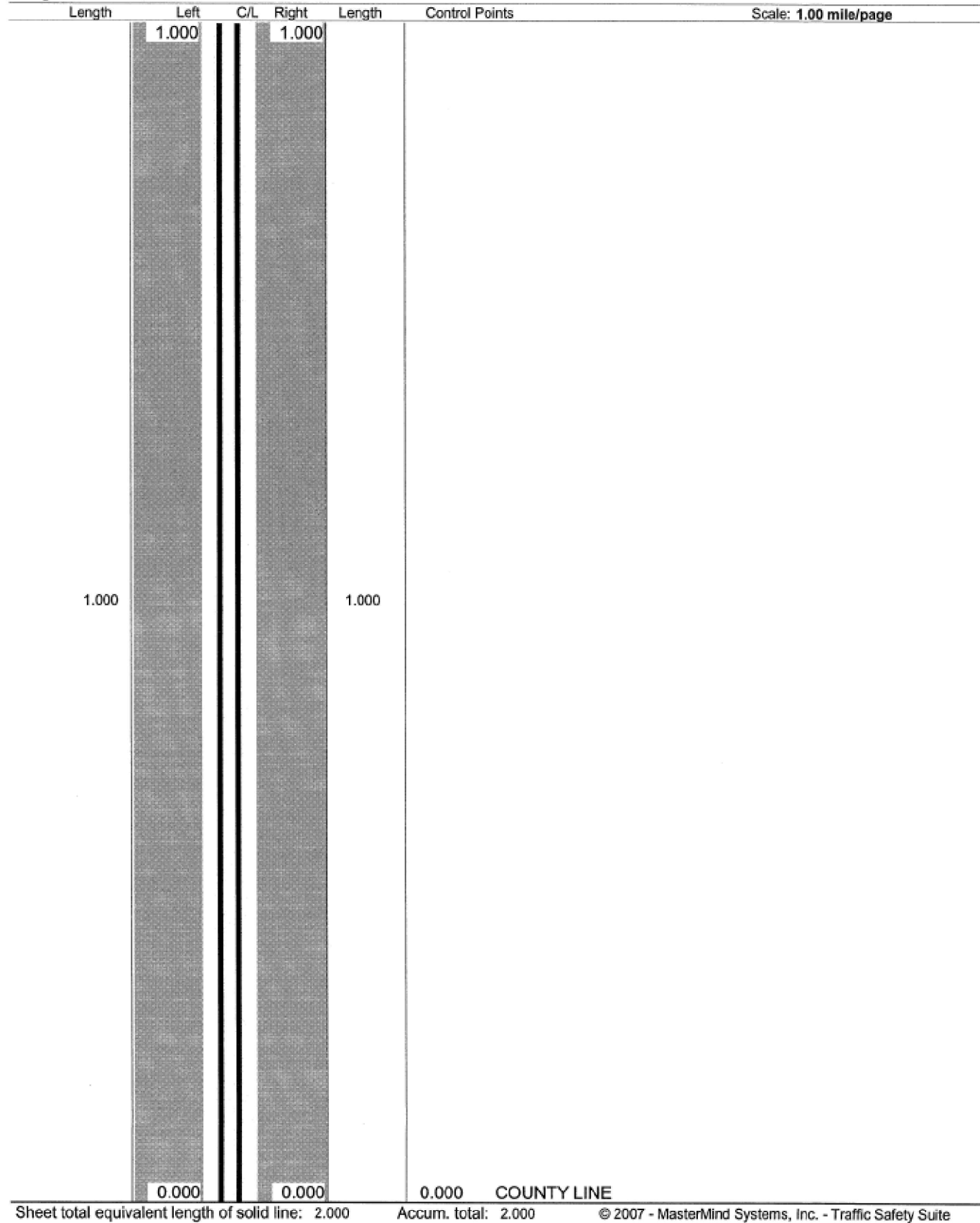
THE ASPHALT RESURFACING OF VARIOUS ROADS INCLUDING AUBURN ROAD AND THWING ROAD
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PAVEMENT MARKINGS - AUBURN ROAD

DESIGNER	TEW
REVIEWER	SEH 4/28/26
PROJECT ID	RS-GEA-V-2026
SHEET	TOTAL
P.21	23

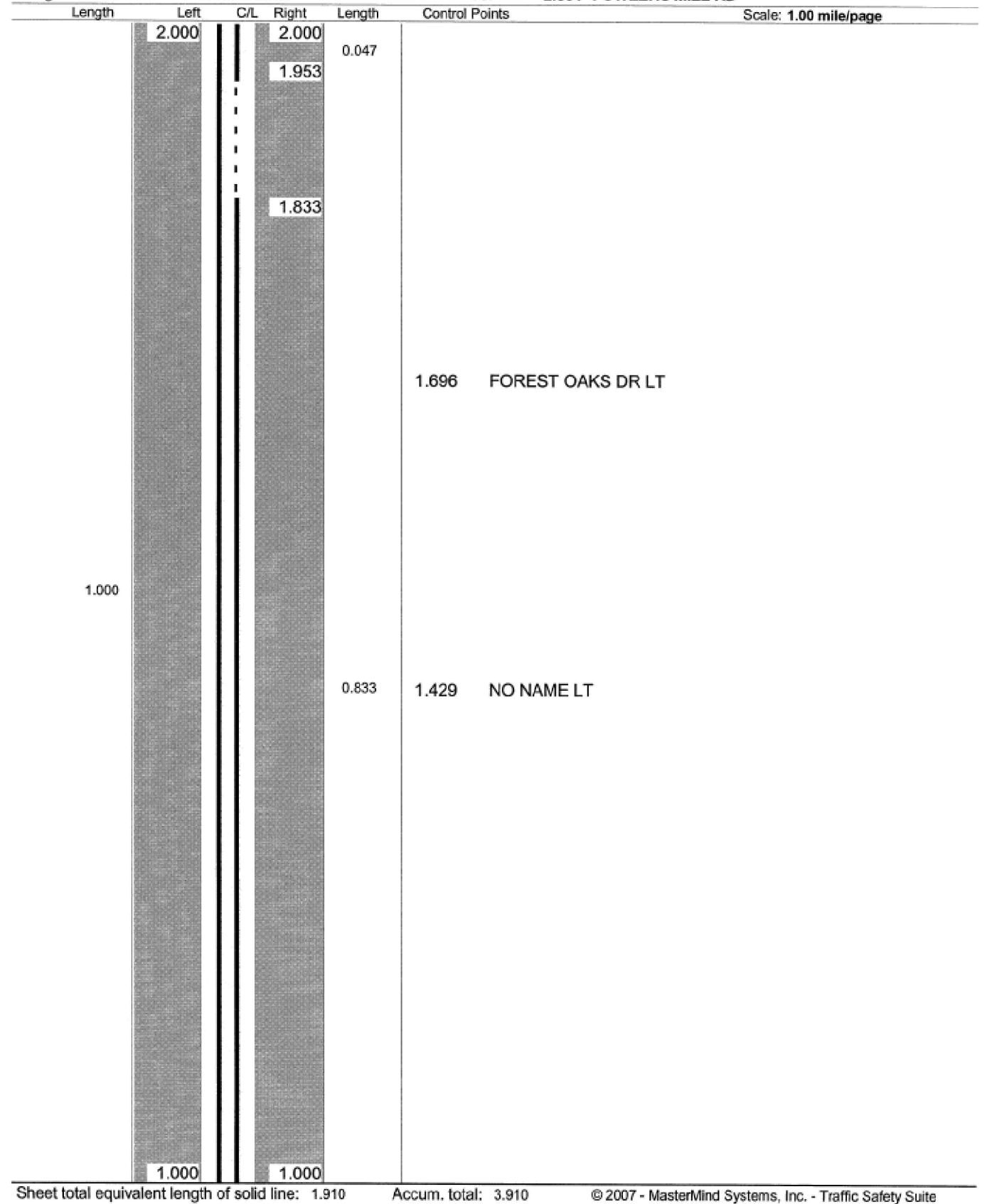
Geauga County Engineering Department
No Passing Zone Log

Route: 0027A (THWING RD) Direction: East
Length: 2.331 From: 0.000 COUNTY LINE To: 2.331 FOWLERS MILL RD
Scale: 1.00 mile/page



Geauga County Engineering Department
No Passing Zone Log

Route: 0027A (THWING RD) Direction: East
Length: 2.331 From: 0.000 COUNTY LINE To: 2.331 FOWLERS MILL RD
Scale: 1.00 mile/page



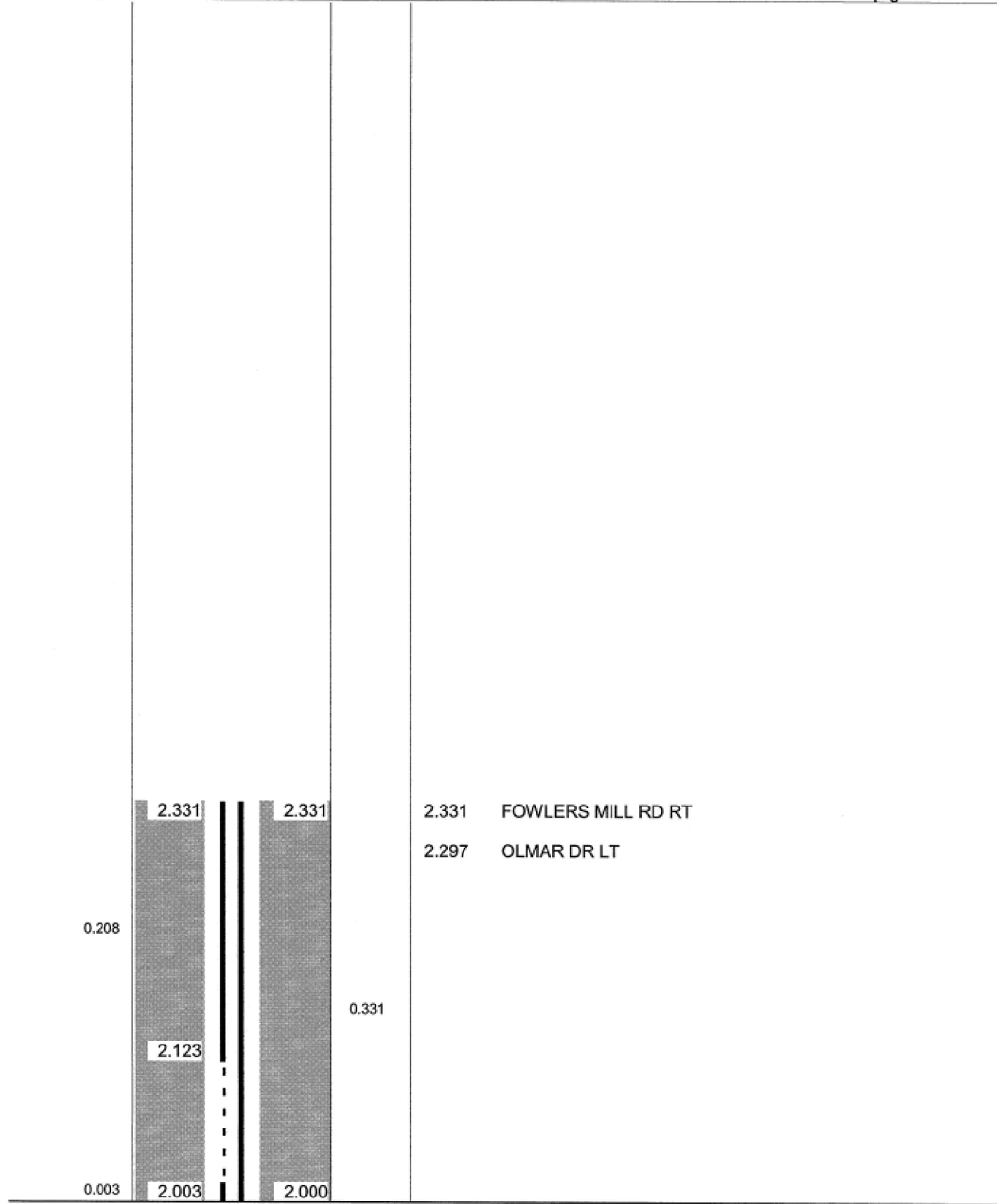
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04-May-26 9:00 AM

PAVEMENT MARKINGS - THWING ROAD

DESIGNER	TEW
REVIEWER	SEH 4/28/26
PROJECT ID	RS-GEA-V-2026
SHEET	P.22
TOTAL	23

Geauga County Engineering Department
No Passing Zone Log

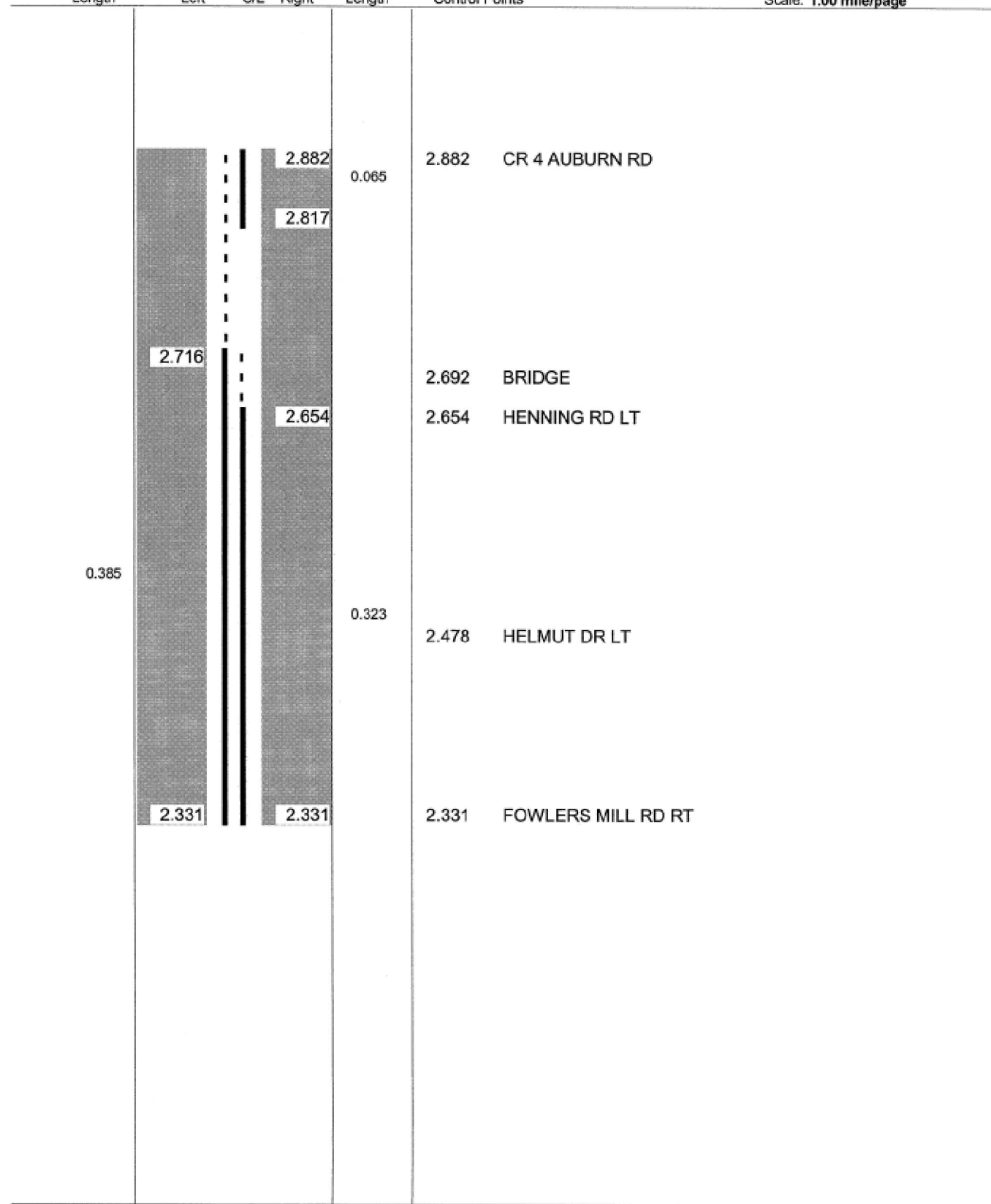
Route: 0027A (THWING RD) From: 0.000 COUNTY LINE
 Length: 2.331 Direction: East To: 2.331 FOWLERS MILL RD
 Scale: 1.00 mile/page



Sheet total equivalent length of solid line: 0.572 Accum. total: 4.482 © 2007 - MasterMind Systems, Inc. - Traffic Safety Suite

Geauga County Engineering Department
No Passing Zone Log

Route: 0027B (THWING RD) From: 2.331 FOWLERS MILL RD
 Length: 0.551 Direction: East To: 2.882 CR 4 AUBURN RD
 Scale: 1.00 mile/page

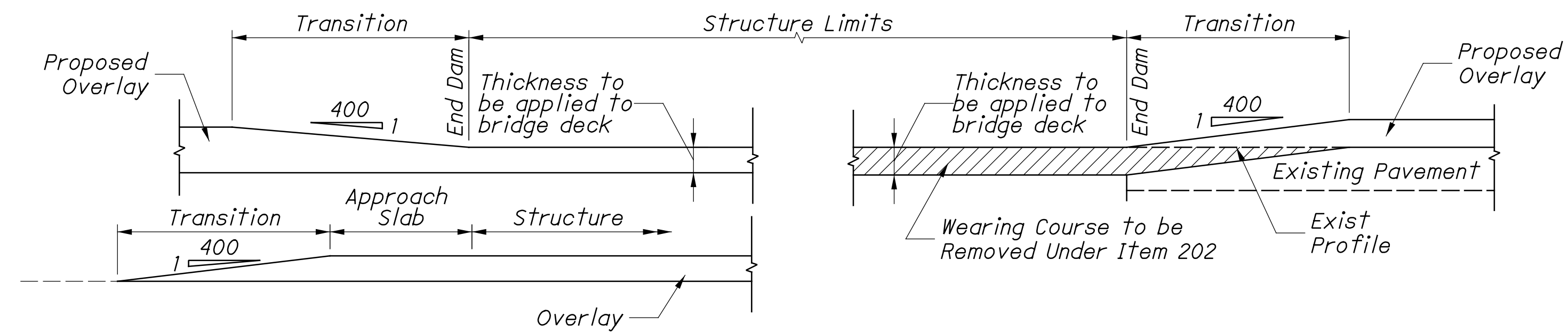


Sheet total equivalent length of solid line: 0.830 Accum. total: 0.830 © 2007 - MasterMind Systems, Inc. - Traffic Safety Suite

THE ASPHALT RESURFACING OF VARIOUS ROADS INCLUDING AUBURN ROAD AND THWING ROAD
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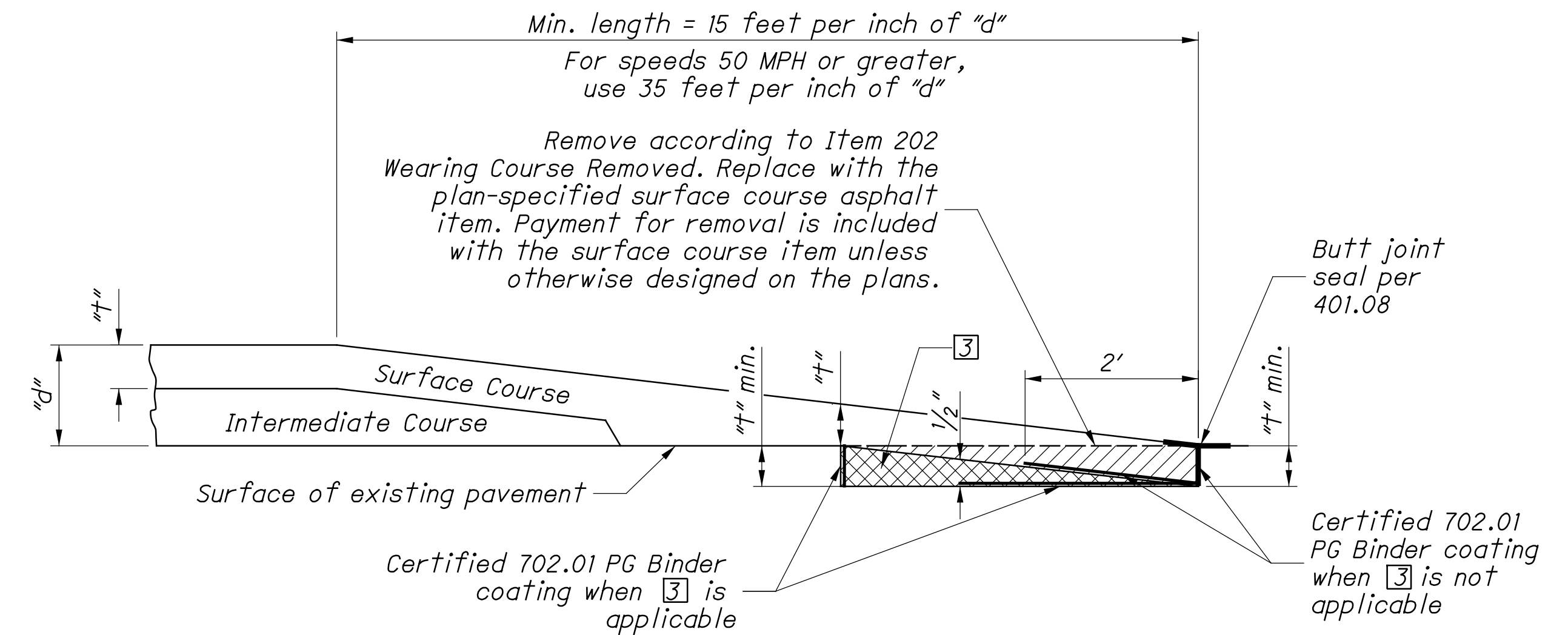
PAVEMENT MARKINGS - THWING ROAD

DESIGNER	TEW
REVIEWER	SEH 4/28/26
PROJECT ID	RS-GEA-V-2026
SHEET	TOTAL
P.23	23

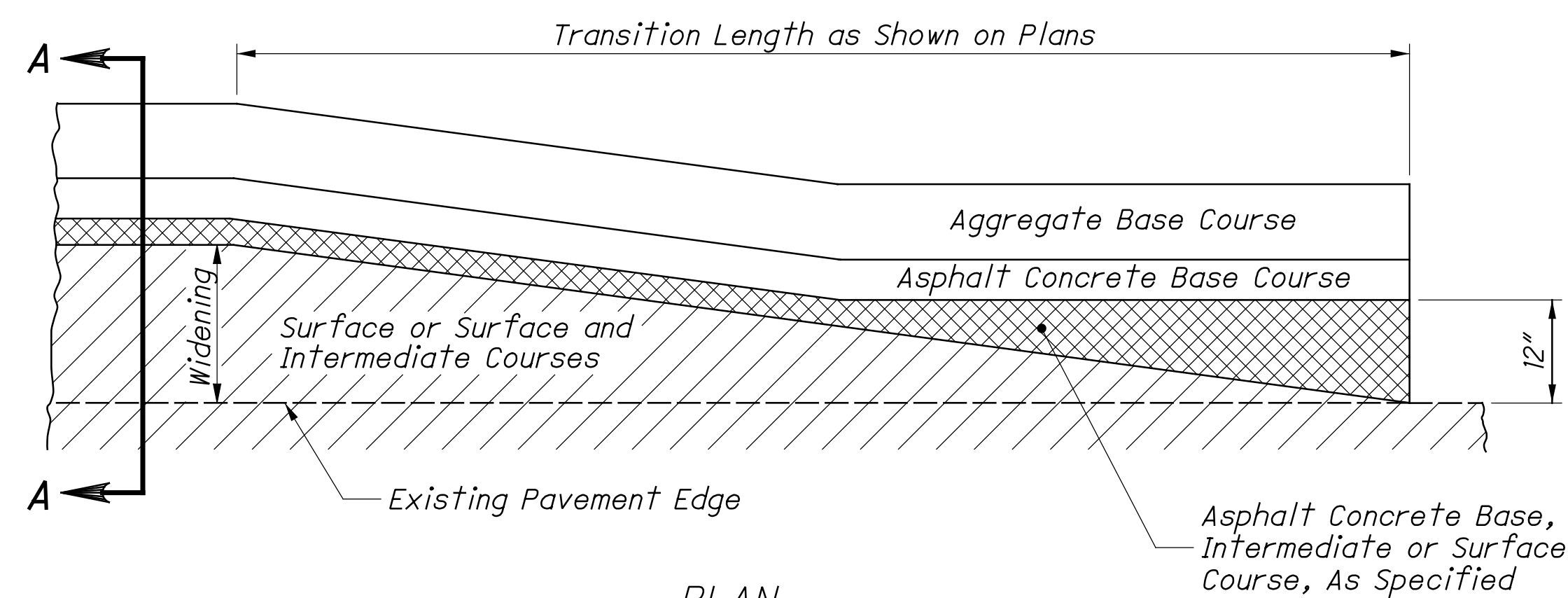


Details assume non-settled approach slabs. Smoothing of the profile for Settlement is required per plan grades or as directed by the Engineer.

TRANSITIONING AT STRUCTURES

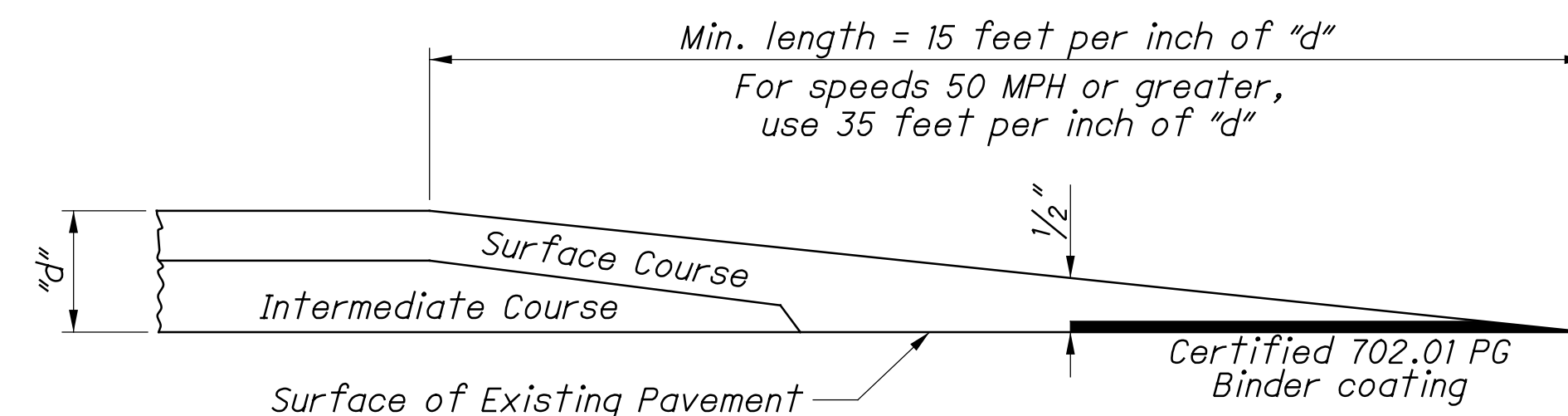


Butt Joint



PLAN

MERGING EDGE OF PAVEMENT WIDENING WITH EDGE OF EXISTING PAVEMENT



Taper End

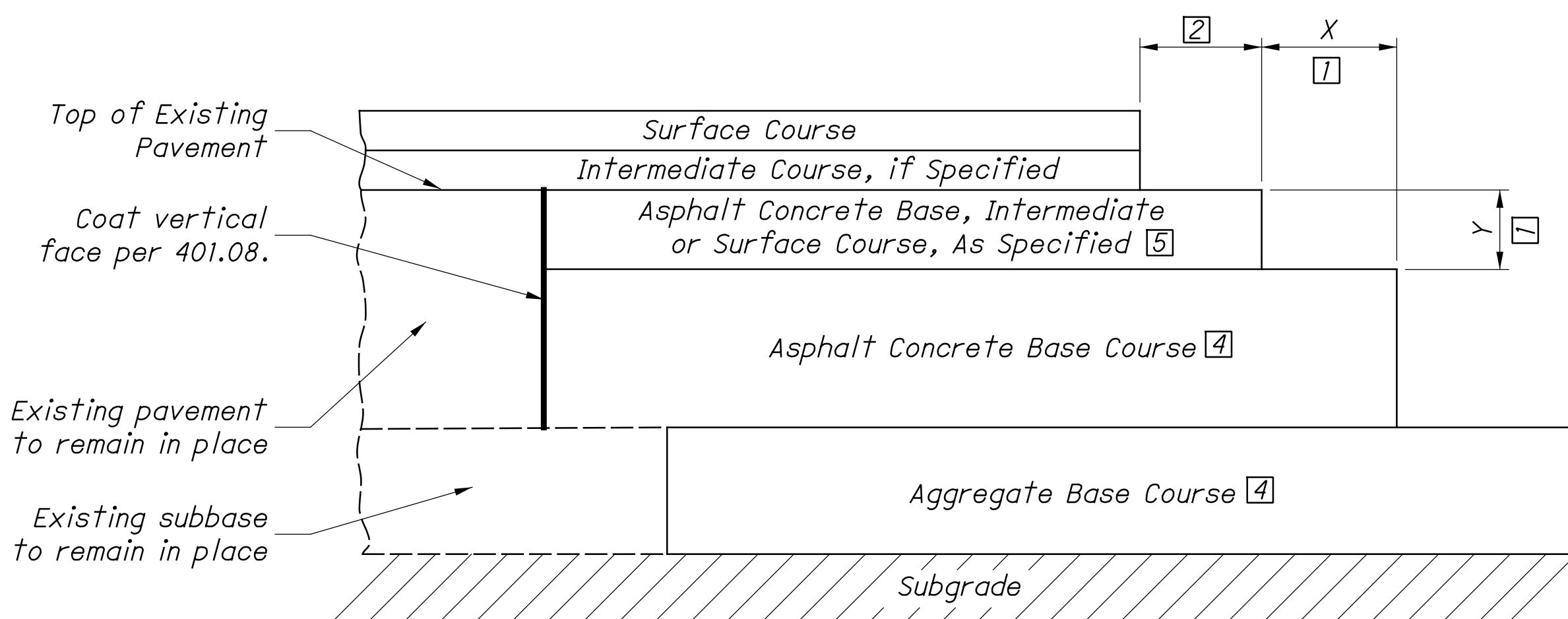
NOTE: Butt joint is required unless the taper end is specified in the plans or approved by the Engineer

BUTT JOINTS AND TAPER ENDS

Values for "t" and "d" are obtained from the plans.

LEGEND

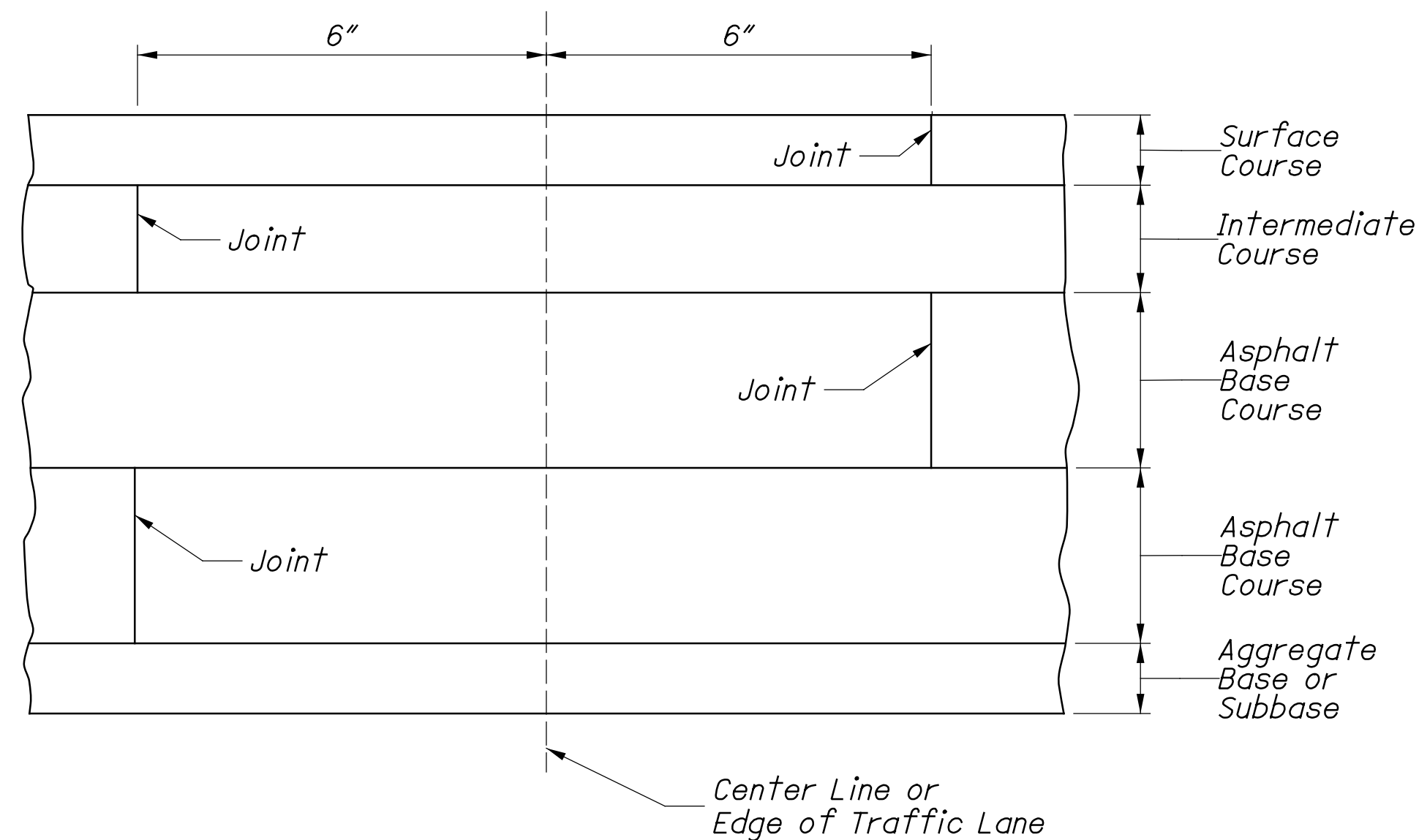
- 1 The extended width (X) of a base or subbase lift shall be equal to the depth (Y) of the overlying lift or 6", whichever is greater, or as shown on the plans.
- 2 The extended width shall be equal to the combined thickness of the surface and intermediate courses, or 4", whichever is greater.
- 3 Permissible removal and replacement.
- 4 The bottom of the proposed Asphalt Concrete Base course and Aggregate Base course may not align with the existing pavement or subbase as shown. Ensure the widening subgrade is at or below the existing subgrade to ensure proper drainage.
- 5 Construct the lift shown so that the compacted surface slightly exceeds the elevation of the top of the existing pavement.



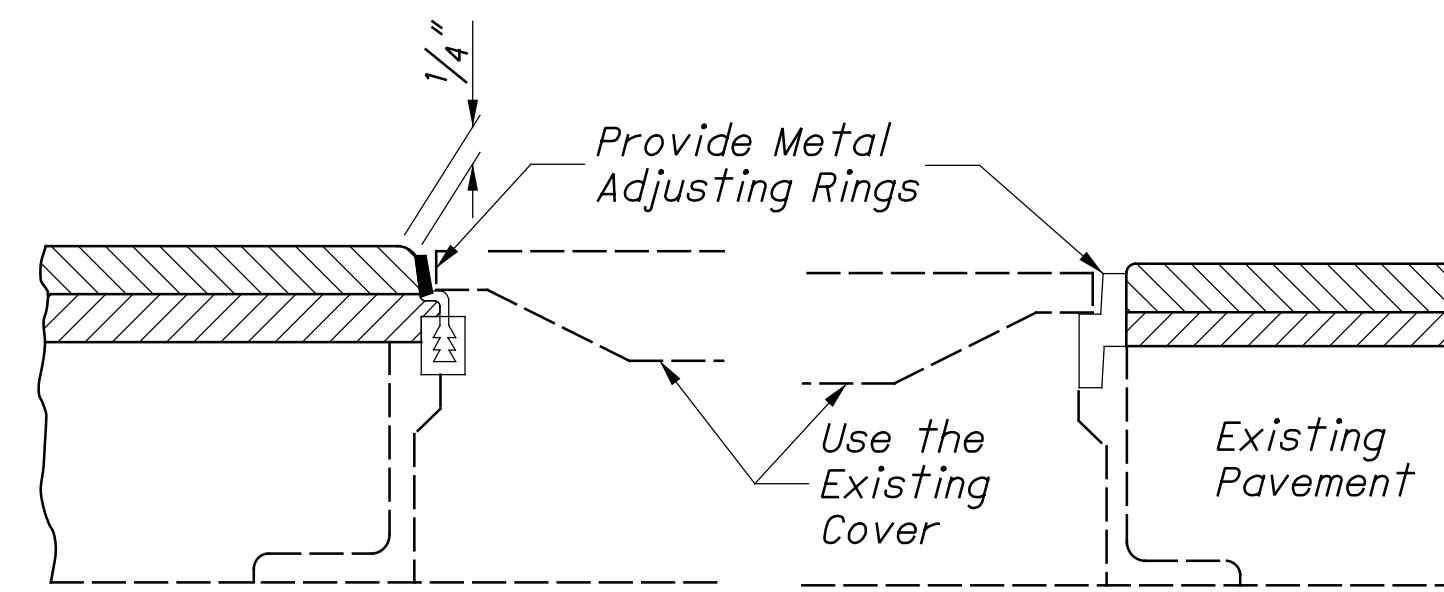
SECTION A-A

COURSE DETAIL FOR WIDENING

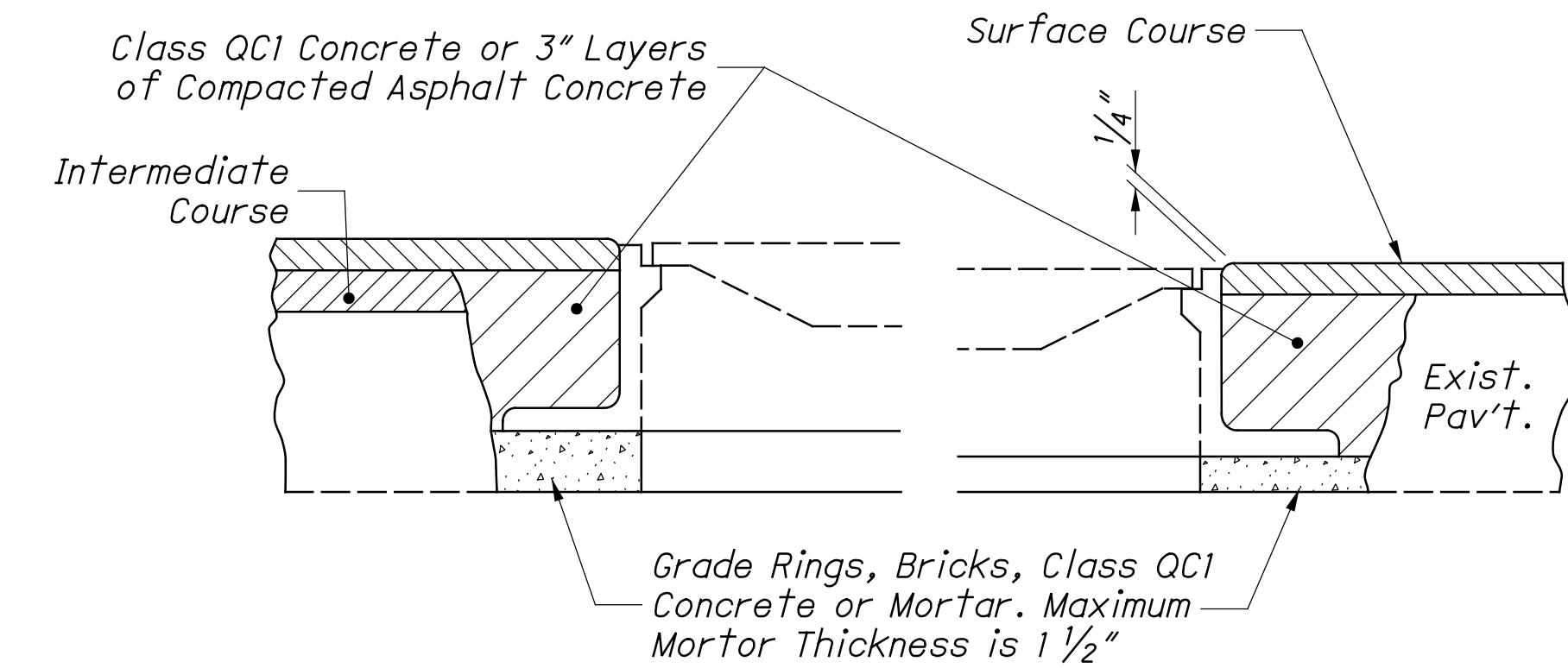
Note: Do not use this detail for cold longitudinal joints required by phasing for maintenance of traffic.



LAPPING LONGITUDINAL JOINTS
(see notes)

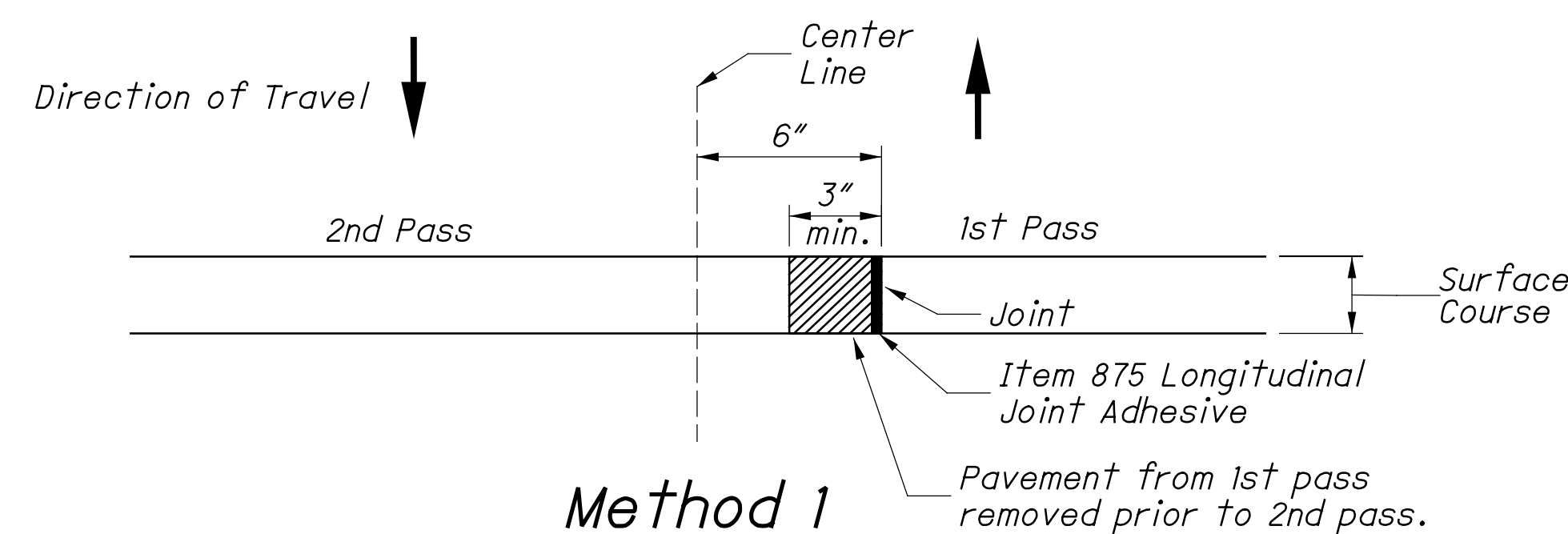


Using Metal Adjusting Rings

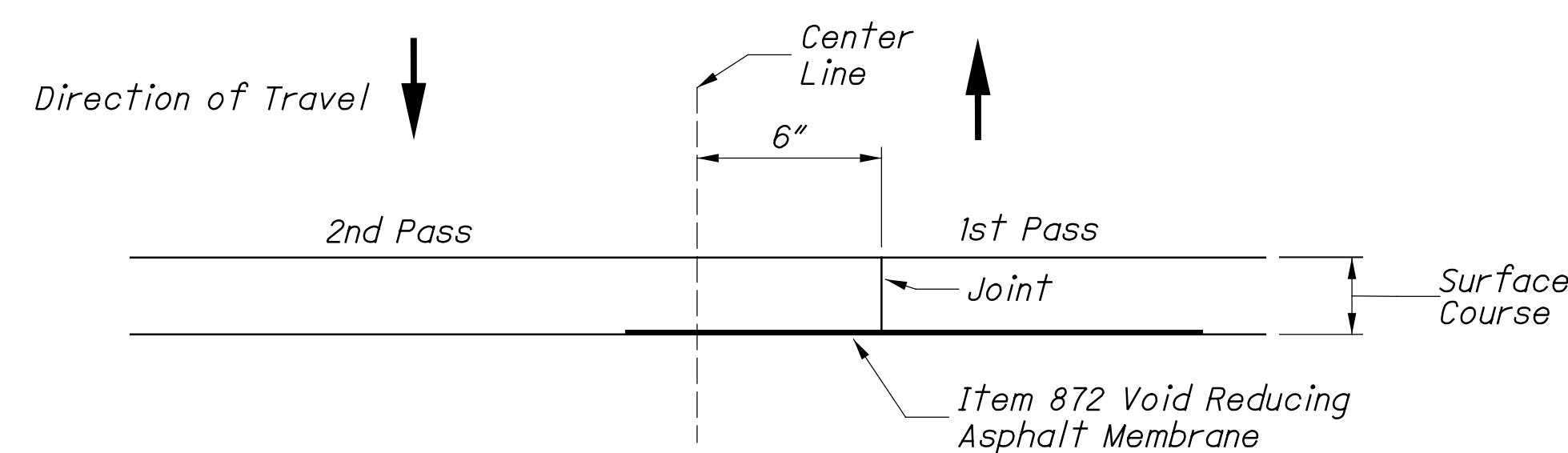


Using Concrete or Mortar

MANHOLES ADJUSTED TO GRADE

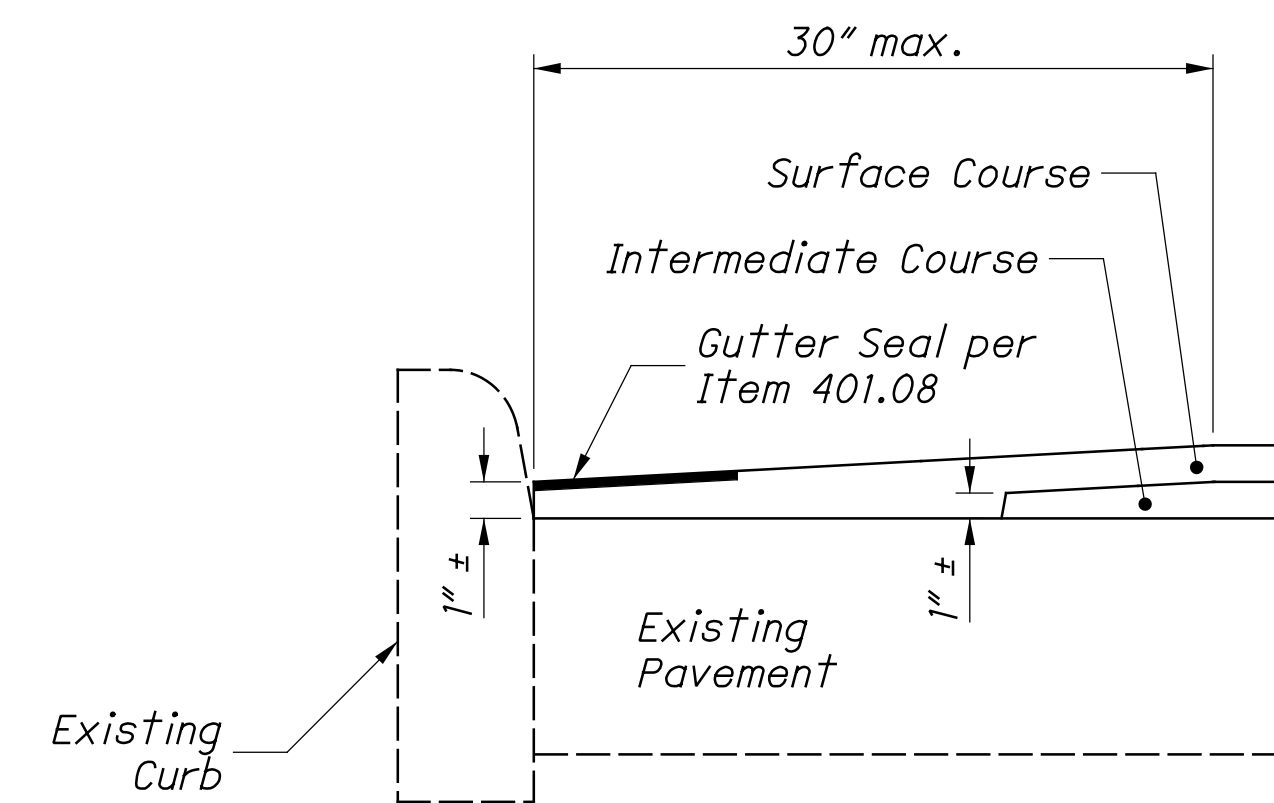


Method 1



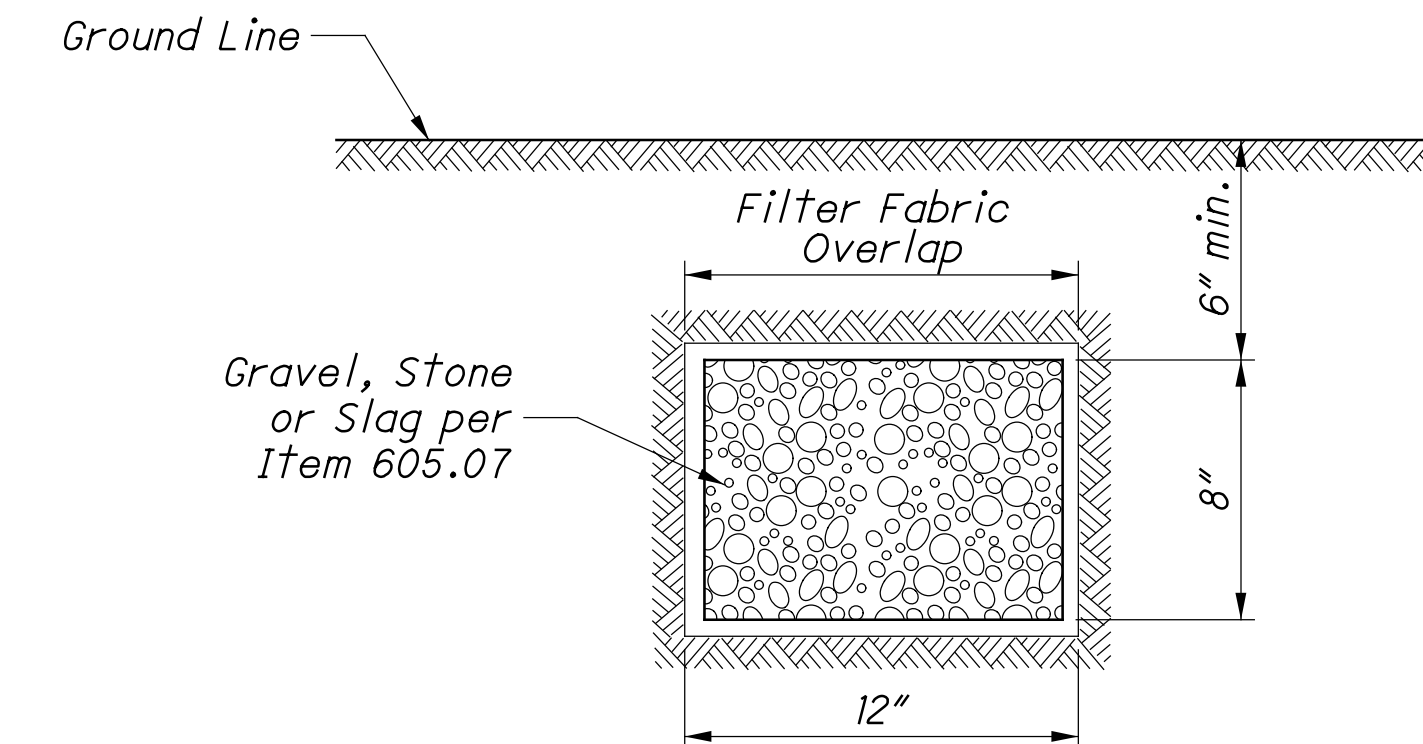
Method 2

LONGITUDINAL JOINT PREPARATION
(if specified)



Special care shall be taken during construction to obtain maximum compaction of asphalt concrete in gutters.

GUTTER FINISH



Aggregate drains to be placed where and as directed by Engineer. Provide Filter Fabric when specified as a separate pay item.

AGGREGATE DRAIN

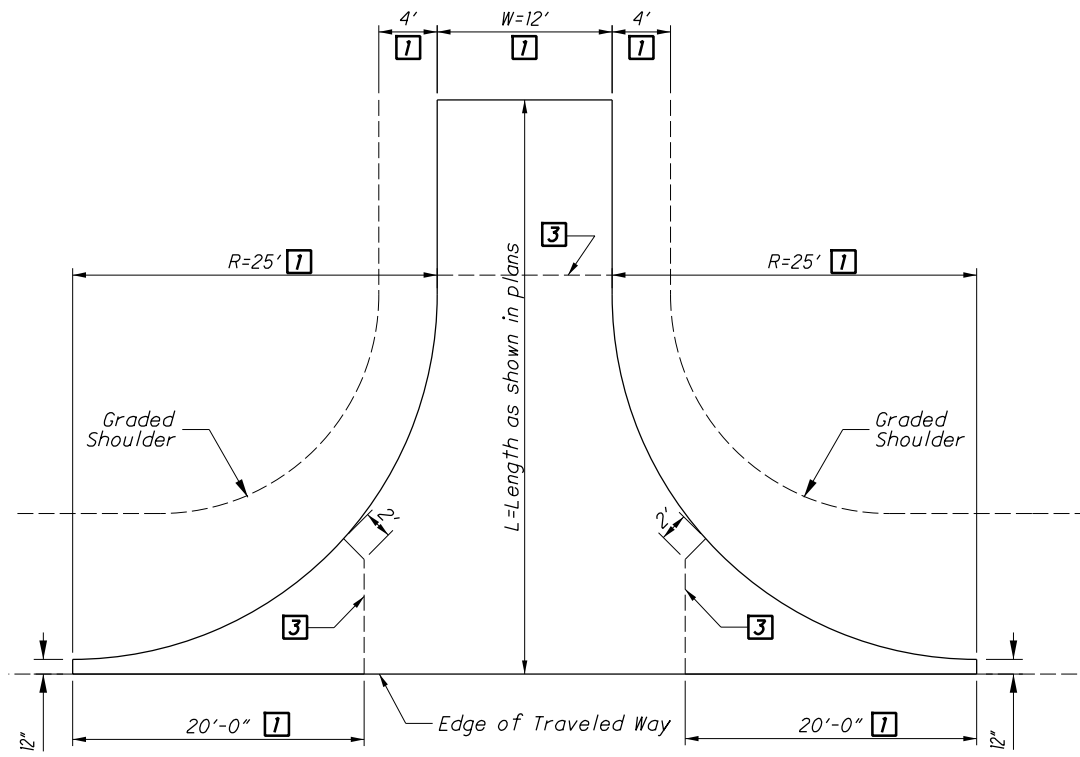
NOTES

GENERAL: Lap all longitudinal joints as shown regardless of the number of courses being placed. Do not construct a longitudinal joint directly above and in line with the longitudinal joint of previously placed material.

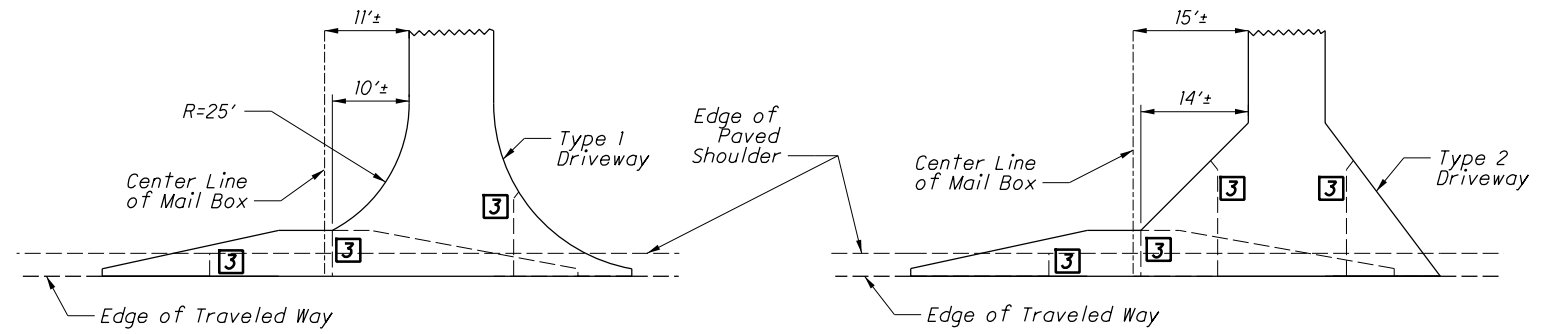
METAL ADJUSTING RINGS:

Metal adjusting rings shall:
(a) Attach securely to the existing frame by welding or mechanical devices;
(b) Consist either of cast metal having an integral rim and seat, or be fabricated metal with a sturdy connection between the seat and rim; and
(c) Provide an even seat for the manhole cover.
In addition, the adjusting ring type shall be a design acceptable to the local governmental agency responsible for street and sewer maintenance. Any installation unacceptable to the Engineer shall be replaced by the Contractor at his expense.

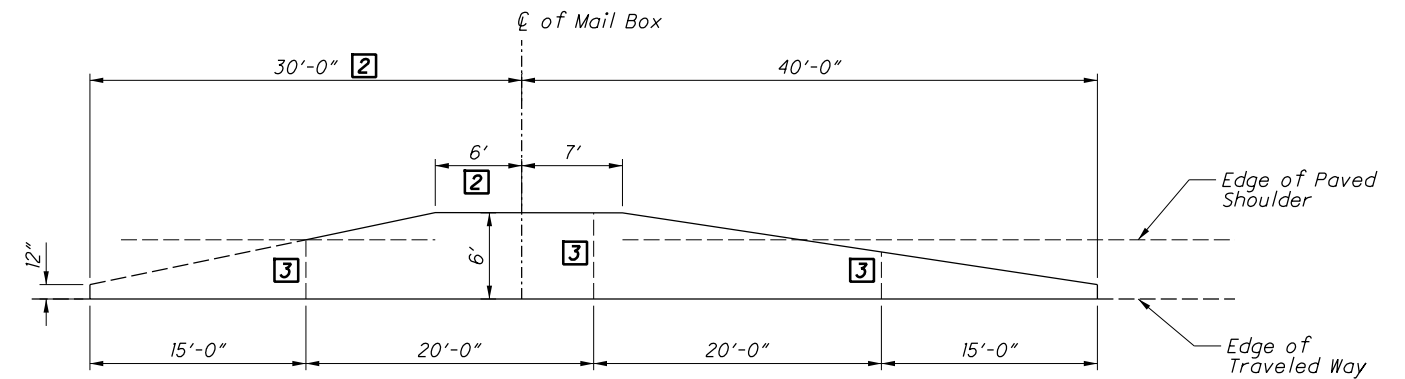
PAYMENT: The Department will pay for manholes adjusted to grade using Item 611 Manhole, Catch Basin, or Inlet Adjusted to Grade. The Department will pay for longitudinal joint preparation using Item 874 Longitudinal Joint Preparation.



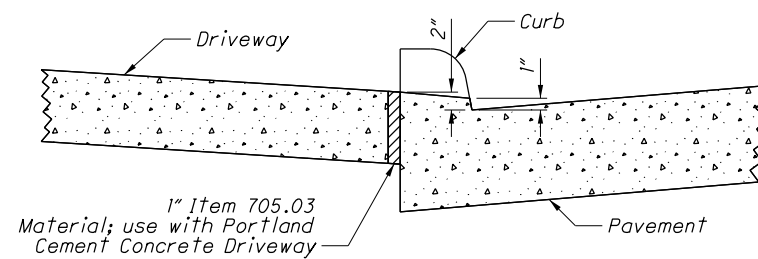
TYPE 1 DRIVEWAY



COMBINED DRIVEWAY & MAIL BOX APPROACH

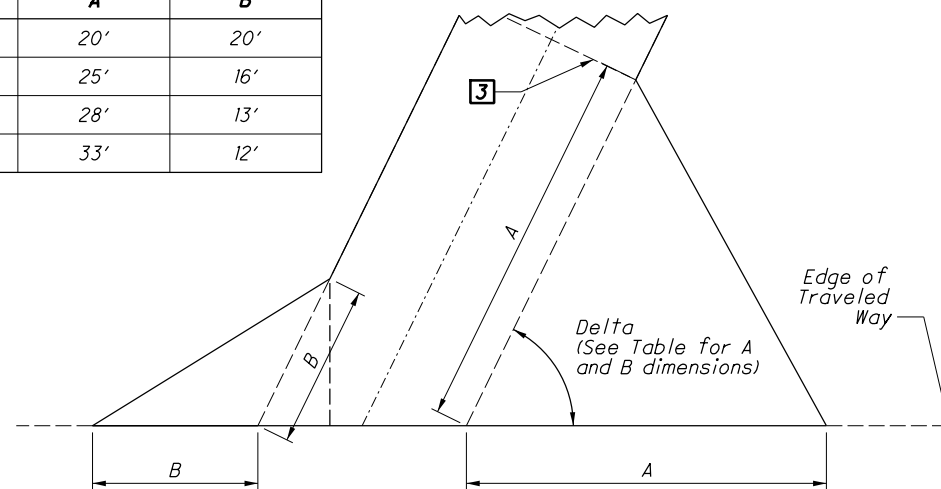


TYPICAL MAIL BOX APPROACH



DROP CURB DETAILS AT DRIVEWAYS

Delta	A	B
80° to 90°	20'	20'
75° to 85°	25'	16'
65° to 75°	28'	13'
55° to 65°	33'	12'



TYPE 2 SKEWED DRIVEWAY

Transition from Standard Curb Section to Drop Curb Section to be made in 18" distance from Driveway

NOTES

GENERAL: The design details shown here shall govern the construction of driveways unless otherwise shown in the project plans.

The pavement type and thickness shall be specified in the project plans.

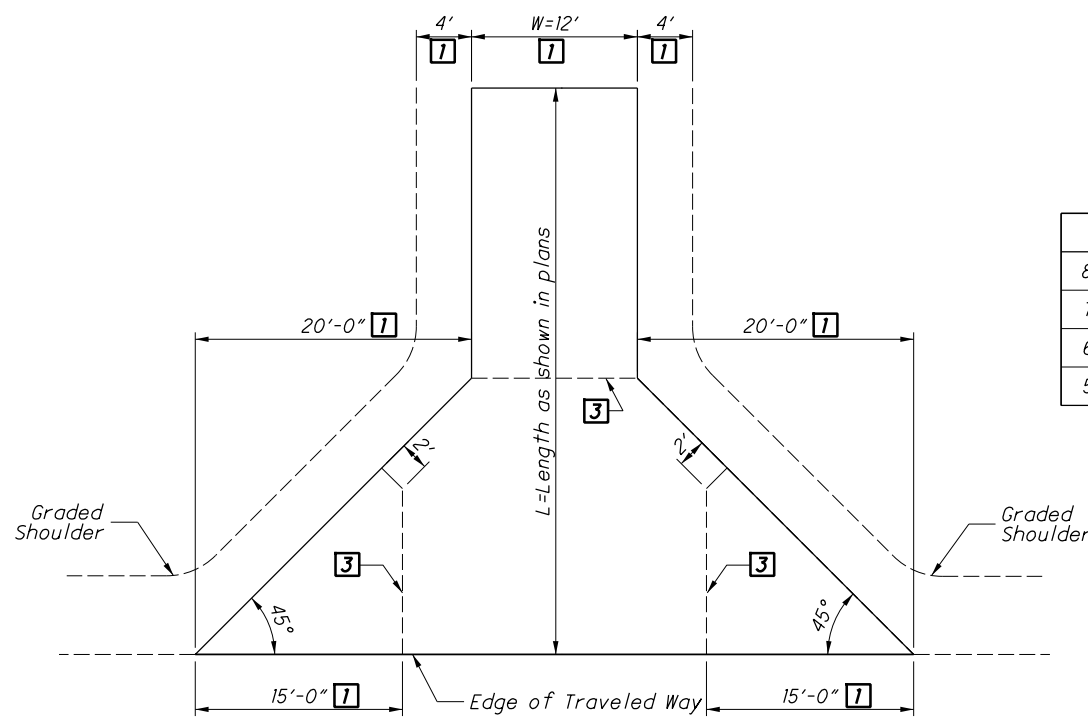
Driveway and mail box approaches shall be combined when feasible.

JOINTS: Impressed joints for portland cement concrete driveways shall be 1/4" minimum width by 3"± depth and shall be sealed with Item 705.04 or ASTM D 1850.

In addition to the joints shown here, impressed joints without tie bars shall be placed in portland cement concrete driveways at intervals not to exceed 17' in the portion of the driveway beyond the flare.

LEGEND

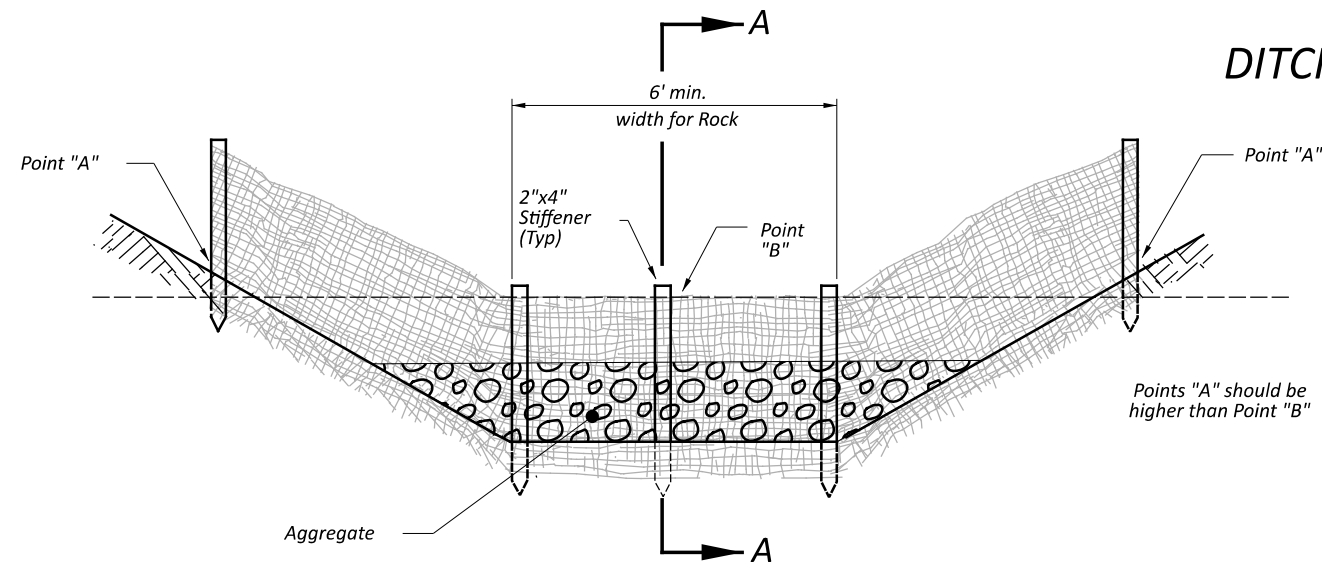
- 1 Unless otherwise shown in the plans.
- 2 Add 3' for each additional Mail Box
- 3 Impressed Joint without Tie Bars for Portland Cement Surface



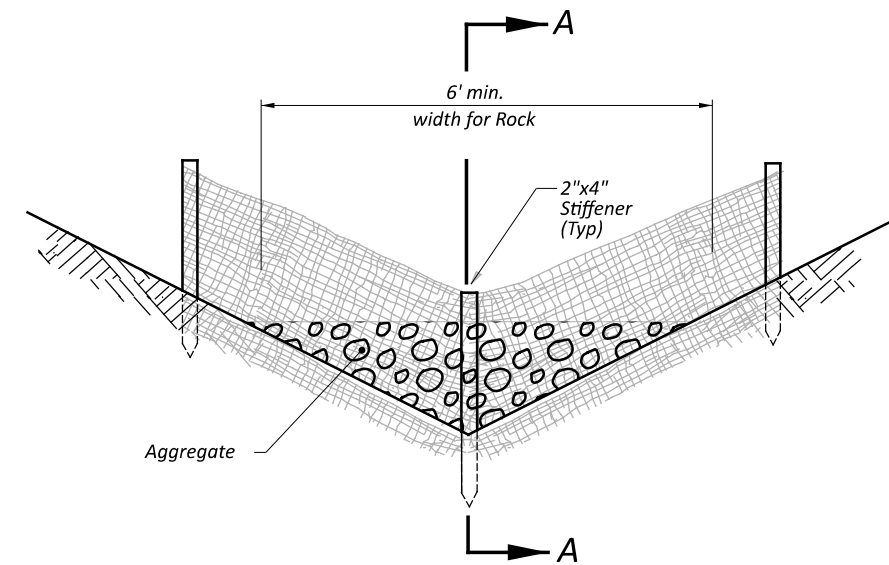
TYPE 2 DRIVEWAY



DITCH CHECKS



CROSS-SECTIONAL VIEW OF FLAT BOTTOM DITCH



CROSS-SECTIONAL VIEW OF "V" DITCH

NOTES

GEOTEXTILE FABRIC DITCH CHECKS:

MATERIALS:

Furnish geotextile fabric ditch checks consisting of the following materials:

1. 30" wide geotextile fabric with sound wood supports with maximum on-center spacing of 10'. Use geotextile fabric conforming to 712.09, Type C.
2. A vertically driven 2"x4" stiffener stake in the center of the ditch.
3. Aggregate conforming to one of the following gradations: No. 1 through No. 4 on Table 703.01-1.

When using straw bales, furnish 30" long 2"x2" wooden stakes, reinforcing bars or fence posts to stake straw bales in place.

CONSTRUCTION:

Trench the geotextile fabric fence as detailed for PERIMETER GEOTEXTILE FABRIC FENCE (see Sheet 2). Place a vertical 2"x4" stiffener stake in the center of the ditch with the top level to the top of the fence and at least 6" below the bottom of the ditch. Excavate for aggregate and place the aggregate on the downstream side of the ditch check.

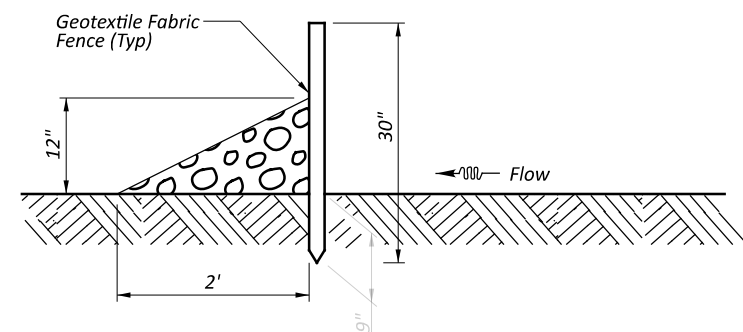
If the Engineer determines that rock should not be used for the geotextile fabric ditch checks, replace aggregate with straw bales configured with minimal gaps between bales. Tightly place each bale adjacent to one another. Entrench 2" to 3" into the ground prior to staking. Firmly stake each bale with at least two stakes.

PAYMENT:

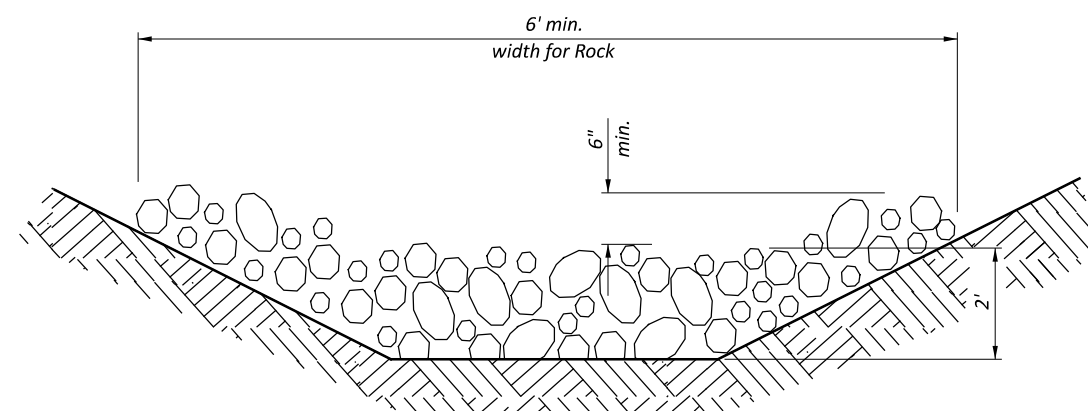
The Department will pay for accepted quantities at the prices shown in Appendix F of Supplemental Specification 832 (SS832) for the following items:

- Geotextile Fabric Ditch Check

All items shown on this Standard Construction Drawing that are required for construction that are not specifically identified in SS832 Appendix F are considered incidental.



**PROFILE VIEW OF FLAT BOTTOM AND V DITCH
 SECTION A-A**



Minimum dimensions: 2' high x 6' wide x 3' long

**CROSS-SECTIONAL VIEW
 ROCK CHECK**

NOTES

ROCK CHECKS:

MATERIALS:

Furnish material conforming to Item 601 - Rock Channel Protection, Type C or D, Without Filter.

CONSTRUCTION:

If the Engineer determines that rock should not be used for the rock checks, replace rock channel protection with straw bales configured with minimal gaps between bales. Tightly place each bale adjacent to one another. Entrench 2" to 3" into the ground prior to staking. Firmly stake each bale with at least two stakes.

PAYMENT:

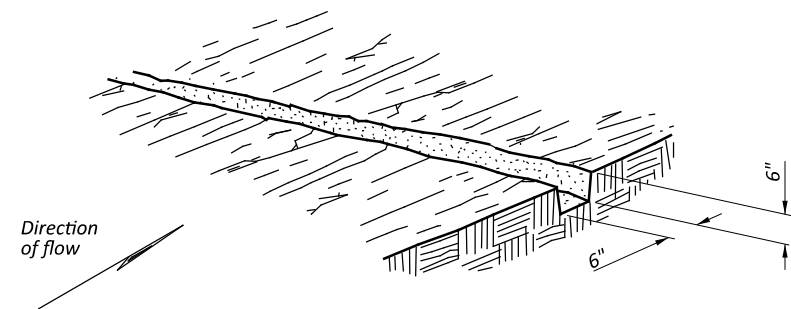
The Department will pay for accepted quantities at the prices shown in Appendix F of Supplemental Specification 832 (SS832) for the following items:

- Rock Channel Protection, Type C or D, Without Filter

All items shown on this Standard Construction Drawing that are required for construction that are not specifically identified in SS832 Appendix F are considered incidental.

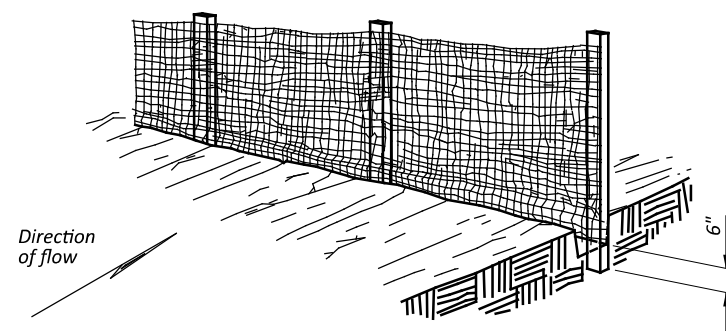


PERIMETER GEOTEXTILE FABRIC FENCE



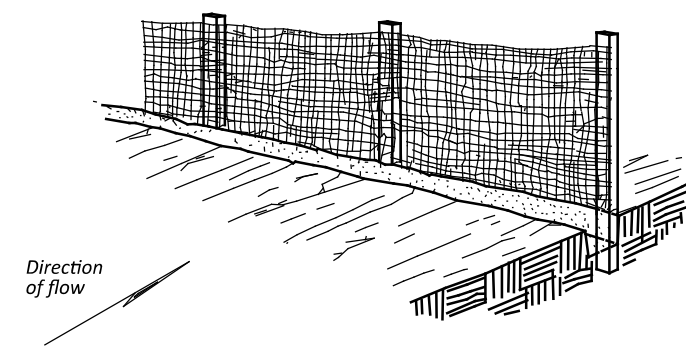
Excavate a 6"x6" trench
along the proposed fence line.

STEP 1



Place fabric and support stakes
and extend fabric into the trench.

STEP 2



Backfill and compact the excavated soil.

STEP 3

NOTES

MATERIALS:

Furnish 30" wide geotextile fabric with sound wood supports with maximum on-center spacing of 10'. Use geotextile fabric conforming to 712.09, Type C.

CONSTRUCTION:

Trench the geotextile fabric fence as detailed. The contractor may elect to trench the fence detailed on steps 1 through 3 in one plowing operation.

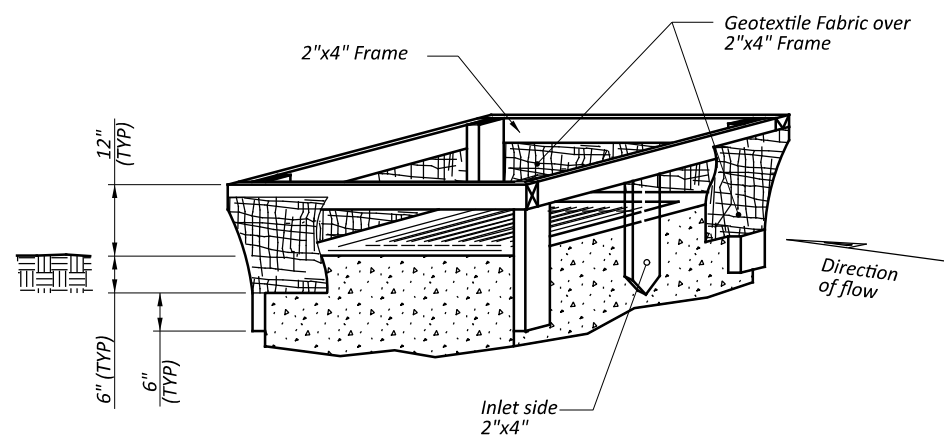
PAYMENT:

The Department will pay for accepted quantities at the prices shown in Appendix F of Supplemental Specification 832 (SS832) for the following items:

- Perimeter Geotextile Fabric Fence

All items shown on this Standard Construction Drawing that are required for construction that are not specifically identified in SS832 Appendix F are considered incidental.

INLET PROTECTION



INLET PROTECTION

NOTES

MATERIALS:

Furnish inlet protection consisting of 18" wide geotextile fabric fence with a securely nailed 2"x4" wood frame with a vertically driven 2"x4" on the inlet, or flow, side of the structure. Use geotextile fabric conforming to 712.09, Type C.

CONSTRUCTION:

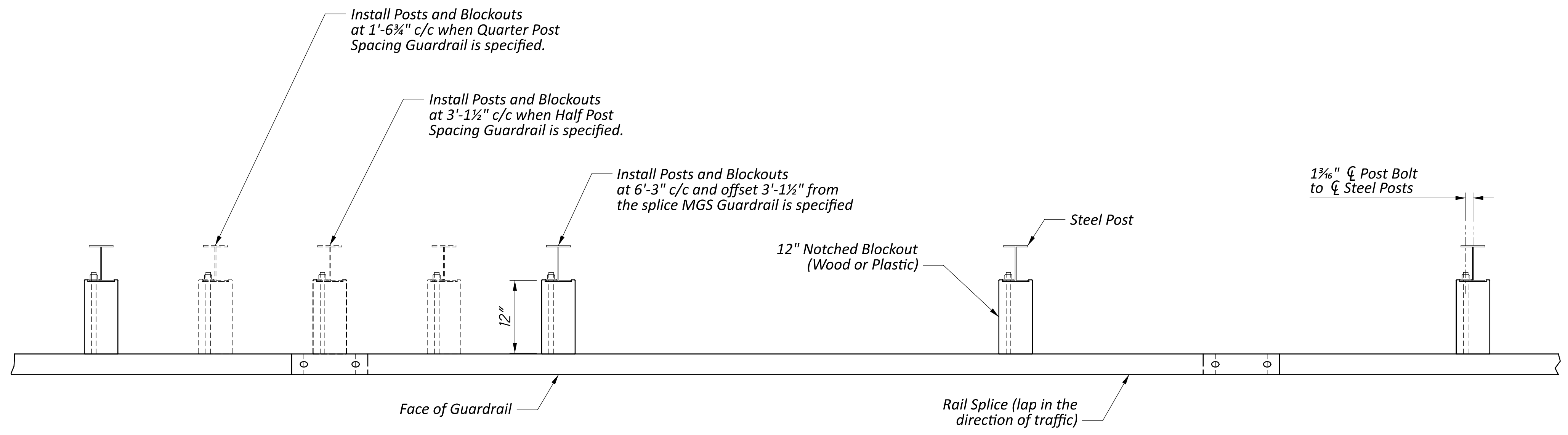
Construct an 18" wide geotextile fabric fence supported around a storm drain inlet or catch basin with a securely nailed 2"x4" wood frame. Excavate a 6" trench around the inlet, and drive support posts 6" below the excavated trench bottom. Stretch the fabric around the frame. Secure it tightly, ensuring that 6" of fabric is in the trench. Overlap the fabric on one side of the inlet so that the fabric ends are not attached to the same post. Backfill and compact the excavated soil tightly onto the fabric. Place a vertical 2"x4" in the center of the inlet so that the top is at the top of the fence and the bottom is at least 6" below the bottom of the ditch.

PAYMENT:

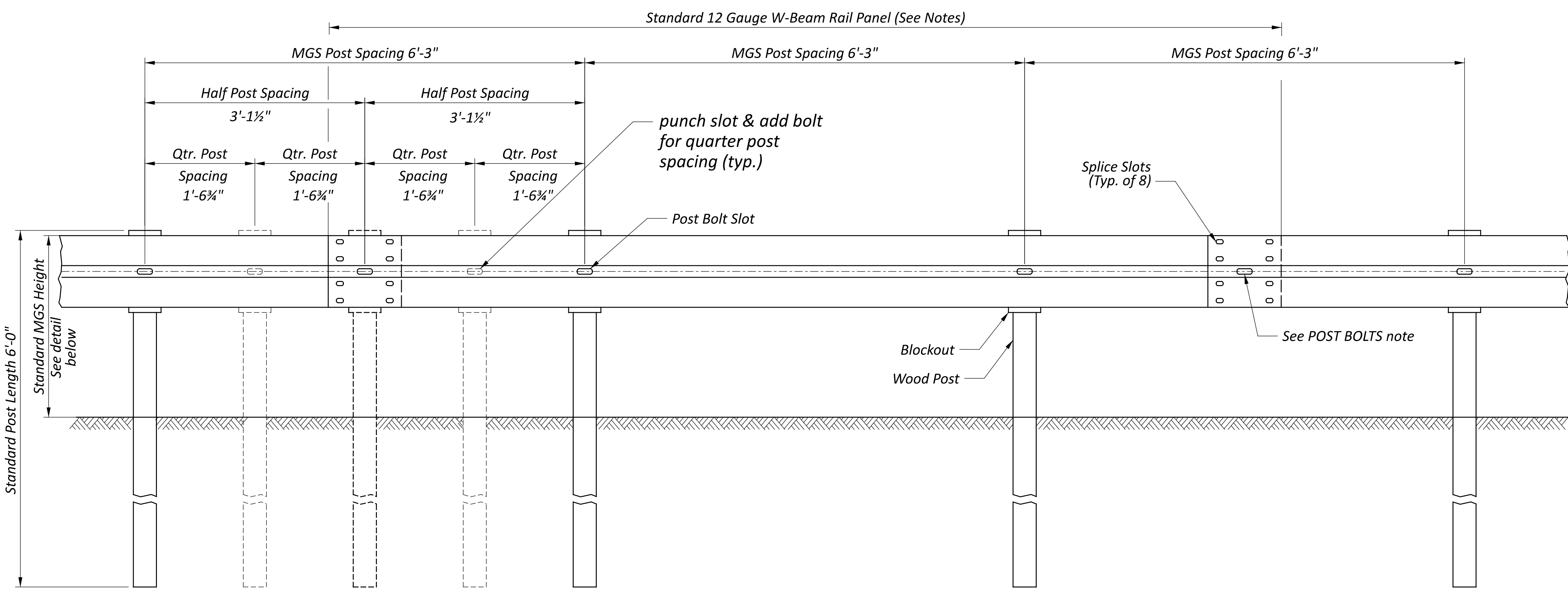
The Department will pay for accepted quantities at the prices shown in Appendix F of Supplemental Specification 832 (SS832) for the following items:

- Inlet Protection

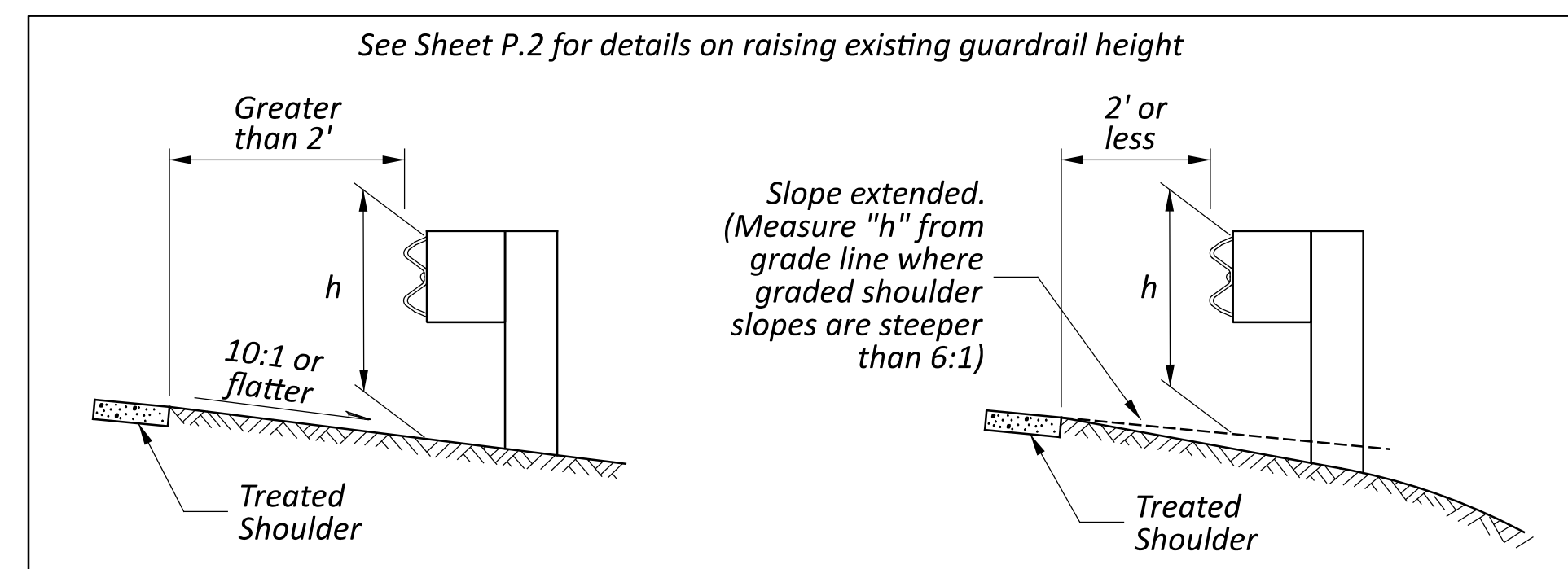
All items shown on this Standard Construction Drawing that are required for construction that are not specifically identified in SS832 Appendix F are considered incidental.



PLAN VIEW
(Steel Posts shown)



ELEVATION
(Wood Posts shown)



MEASURING GUARDRAIL HEIGHT

NOTES

RAIL: Use W-Beam rail meeting the requirements of CMS 606.02. Either 13'-6 1/2" long (12'-6" between splices) or 26'-1/2" long (25'-0" between splices) rail sections may be used. See sheet P.3 for details

POSTS: Posts may be round wood, rectangular wood, or steel. A consistent post material shall be used for mainline posts of the same length unless otherwise specified in the plans or permitted by the Engineer. See sheet P.2 for details.

Wood post shall be fabricated and pressure-treated for approved species as per CMS 710.12. Bore bolt holes and, if required, trim the tops of posts after the posts are set. Exposed wood in result of boring holes or trimming posts shall be treated with copper naphanate or other AWPA standard M4 approved chemical.

Half-post and quarter-post spacing sections shall be constructed with steel posts.

Posts shall not be set in concrete, at any depth. See sheet P.5 for details on setting posts in asphalt, rocky terrain, and vegetation control strips.

See sheets P.6-P.7 for details on culvert mounted posts.

BLOCKOUTS: Blockout dimensions are dependent on post used, see sheet P.2. Wood Blockouts are to be pressure treated as specified in CMS 710.14. Bore bolt holes. Approved Alternate blockouts may be used in lieu of the wood blockouts shown. See the Approved Products List posted on Office of Roadway Engineering's website.

Half-post spacing sections require a 10" (height) blockout for each post spaced at 3'-1 1/2" c/c. See sheet P.2 for details. Quarter-post spacing sections require a 14" (height) blockout for each post spaced at 1'-6 3/4".

When terminating double-sided barrier guardrail with an impact attenuator, use reduced 8" deep blockouts on the last # posts on the barrier design to accommodate the narrower widths of the attenuators.

WASHERS: Install appropriate sized standard galvanized steel washers on the nut side of bolts installed on wood posts. Beam washers are not to be used.

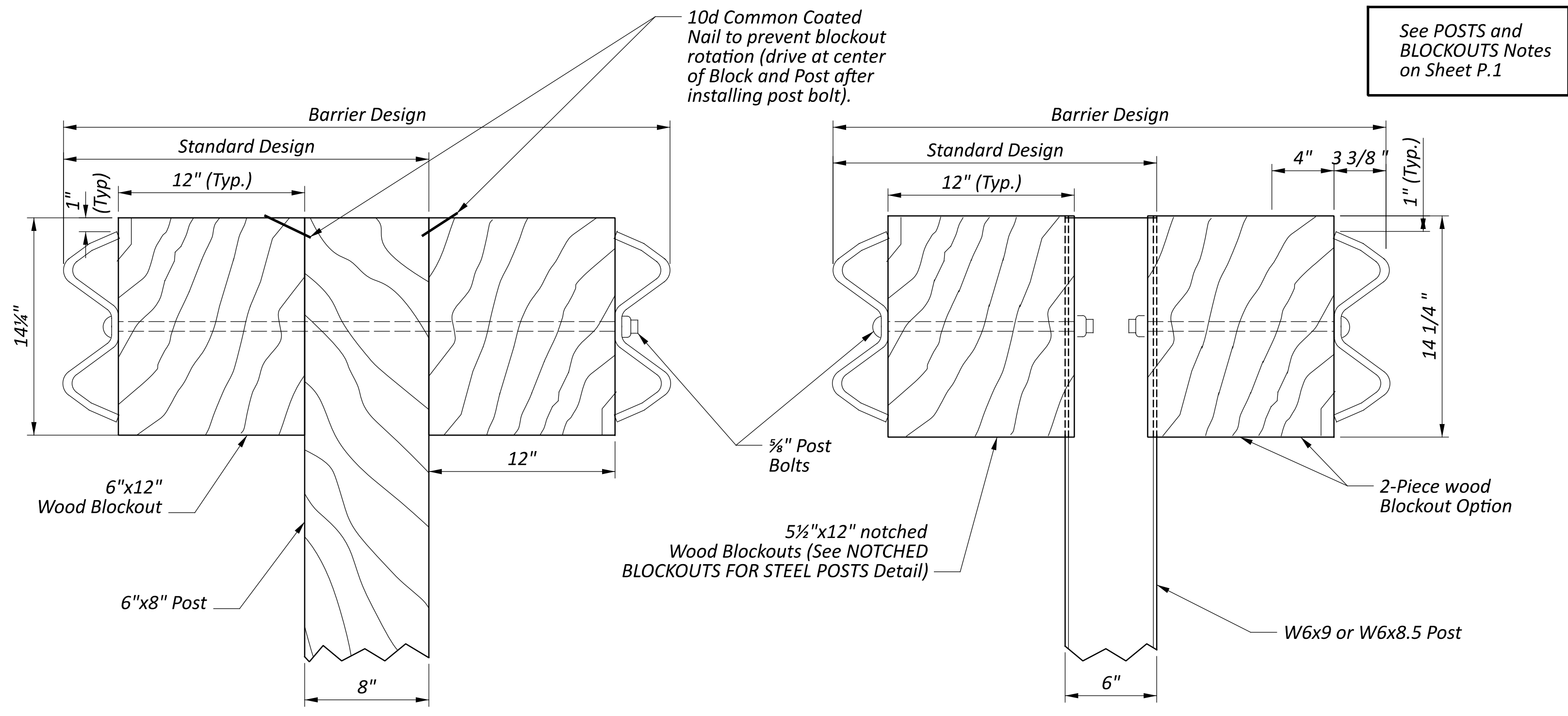
POST BOLTS: The post bolt is not required at mid-span rail splice locations, but the contractor may install a bolt here to aid in installation. The bolt may remain in place when the splice is not within the pay limits of an end treatment.

GUARDRAIL HEIGHT: For initial installation, construct the guardrail within $\pm 1"$ of the standard 31" height to the top of W-Beam rail. When subsequent projects, such as resurfacings, affect the height of existing guardrail, adjustment is not required if the finished height is within $\pm 3"$ of the standard height.

DELINEATION: For Barrier Reflectors see CMS 626.

PAYMENT: MGS guardrail is paid in feet per Item 606 - Guardrail, Type MGS.
 MGS with Long Posts is paid in feet per Item 606 - Guardrail, Type MGS With Long Posts
 MGS with Half or Quarter Post Spacing is paid in feet per Item 606 - Guardrail, Type MGS Half Post Spacing or Item 606 - Guardrail, Type MGS Quarter Post Spacing
 Double sided MGS (barrier design) is paid in feet per Item 606 - Guardrail, Barrier Design, Type MGS

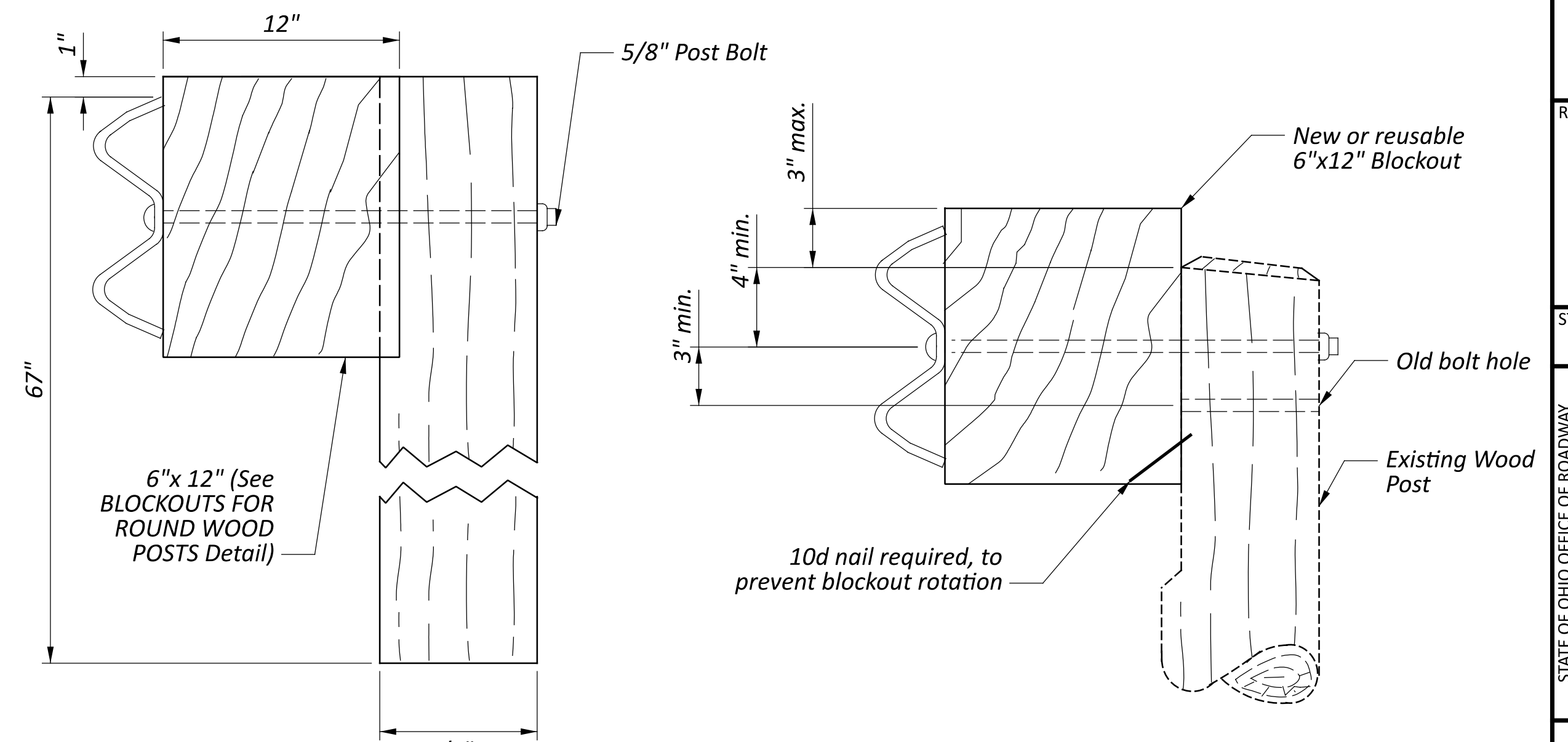




See POSTS and BLOCKOUTS Notes on Sheet P.1

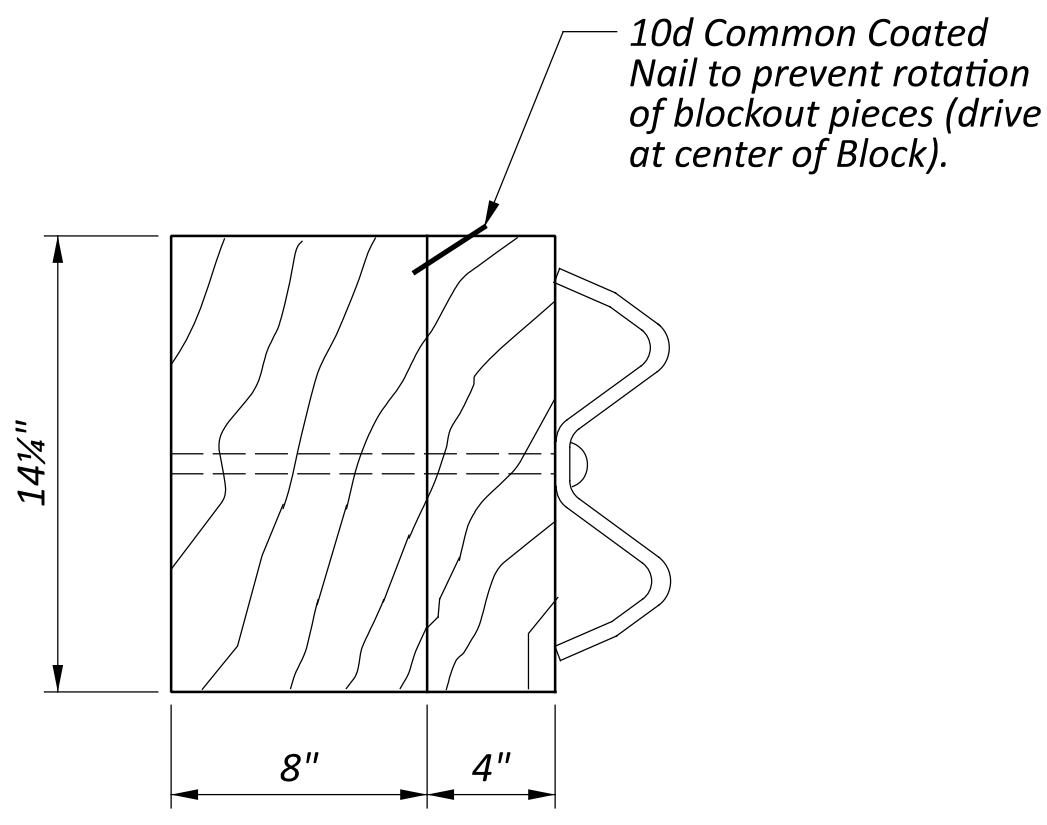
RECTANGULAR WOOD POST

STEEL POST



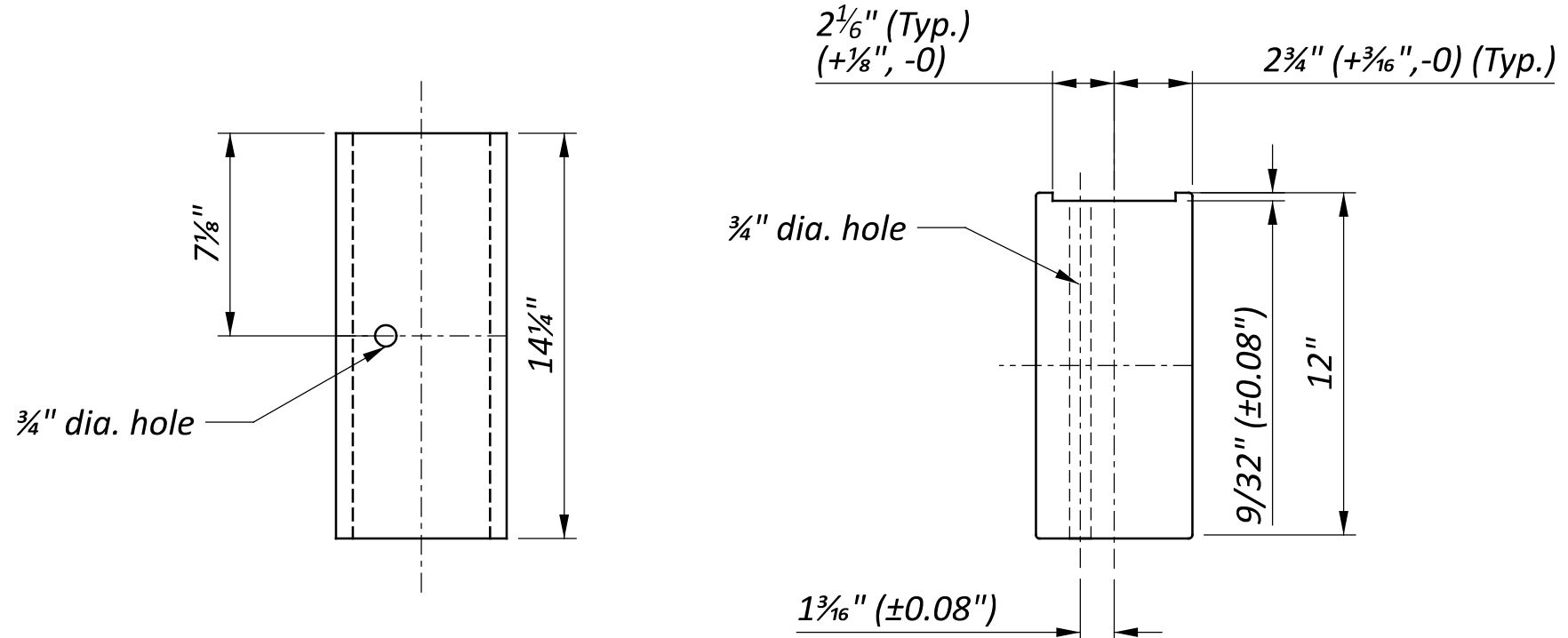
ROUND WOOD POST

RAISING EXISTING GUARDRAIL HEIGHT



TWO-PIECE WOOD BLOCKOUT OPTION

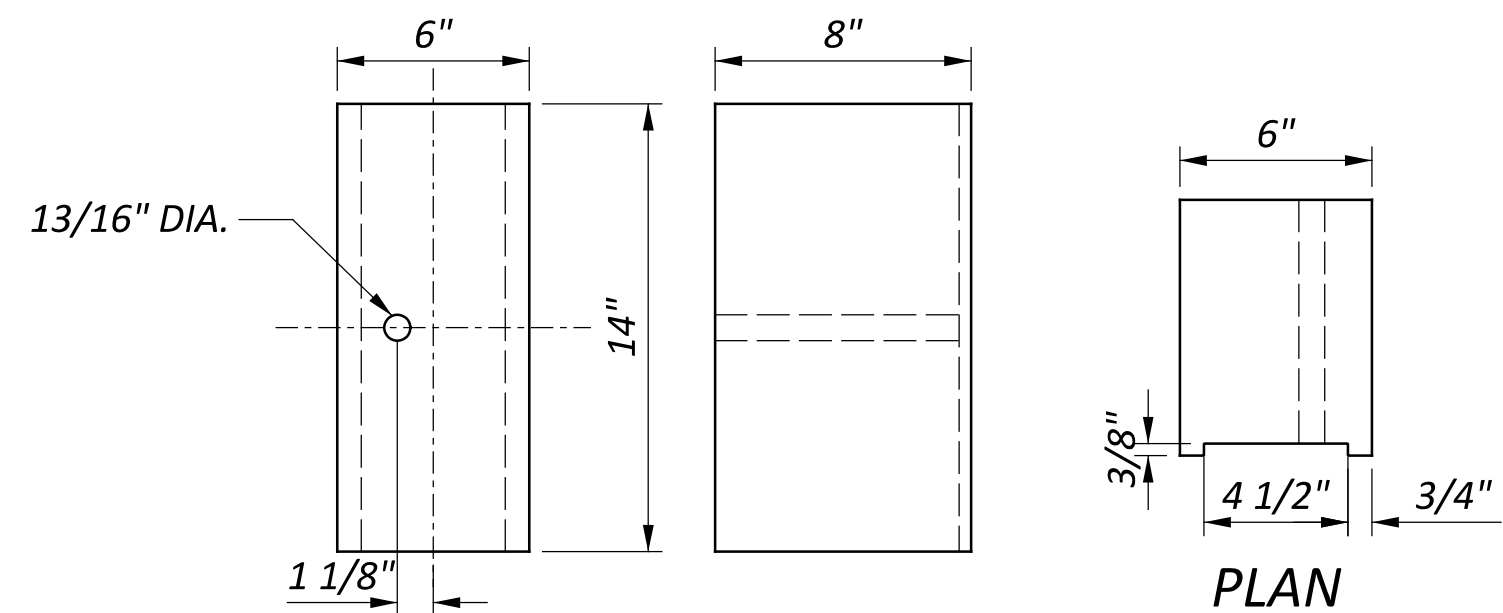
STEEL BEAM POSTS				
Size	Beam depth	Flange width	Flange thickness	Web thickness
Rolled W6x8.5	5.8"	3.94"	0.193"	0.170"
Rolled W6x9	5.9"	3.94"	0.215"	0.170"
Welded 6x8.5	6.0"	3.94"	0.193"	0.170"
Welded 6x9	6.0"	3.94"	0.215"	0.170"



ELEVATION PLAN

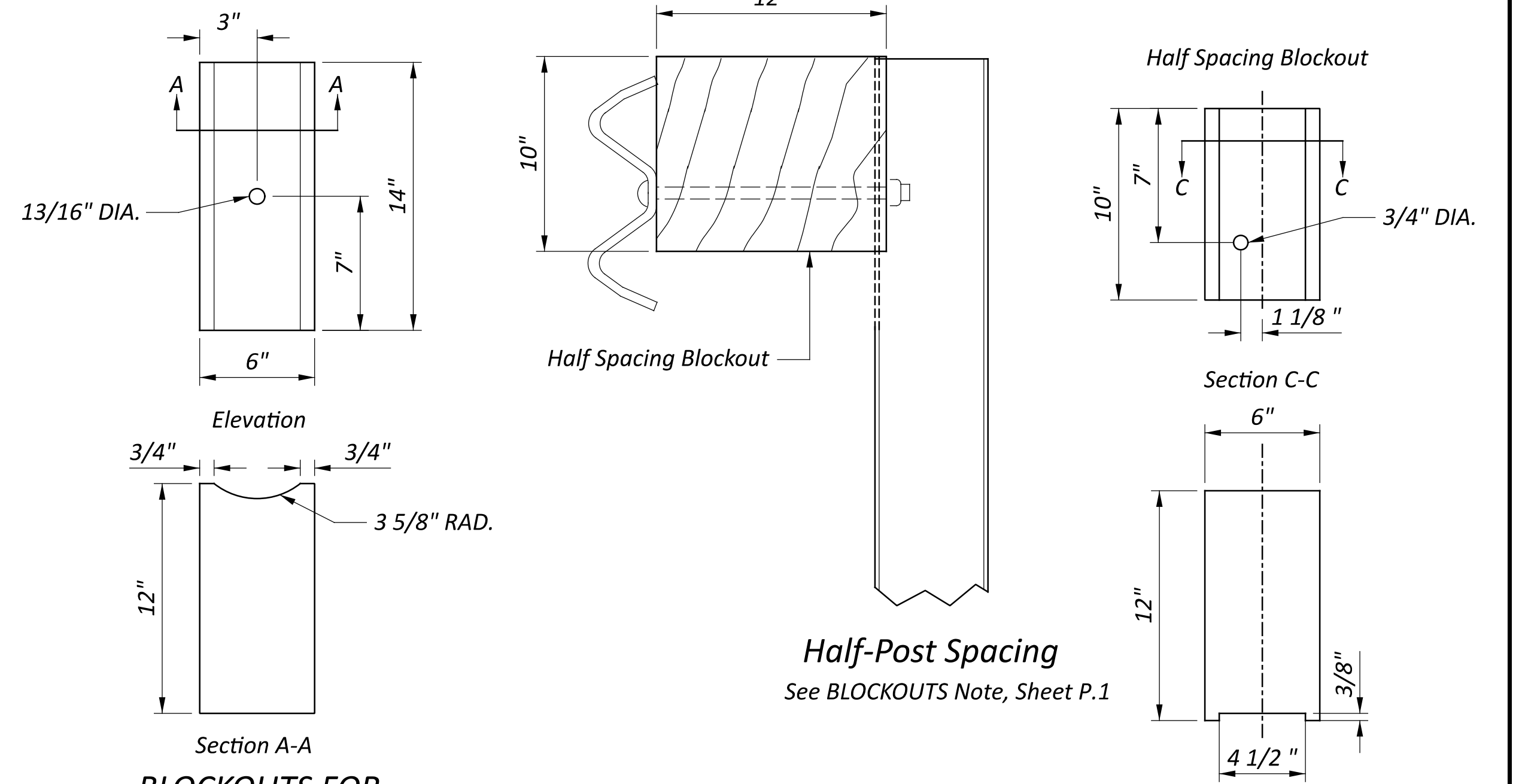
NOTCHED BLOCKOUTS FOR STEEL POSTS

See BLOCKOUTS Note on Sheet P.1



ELEVATION PROFILE PLAN

BLOCKOUT FOR TOP MOUNTED CULVERT DETAIL #1
See detail on Sheet P.6



BLOCKOUTS FOR ROUND WOOD POSTS

Half-Post Spacing
See BLOCKOUTS Note, Sheet P.1

POSTS: The standard post length is 6'-0" (+3", -0" tolerance) for steel and rectangular wood posts. Round wood posts shall be 5'-8" (+3", -0" tolerance) in length. Post type shall remain consistent along the length of a run of MGS; do not use round wood posts if a portion of the run requires long posts.

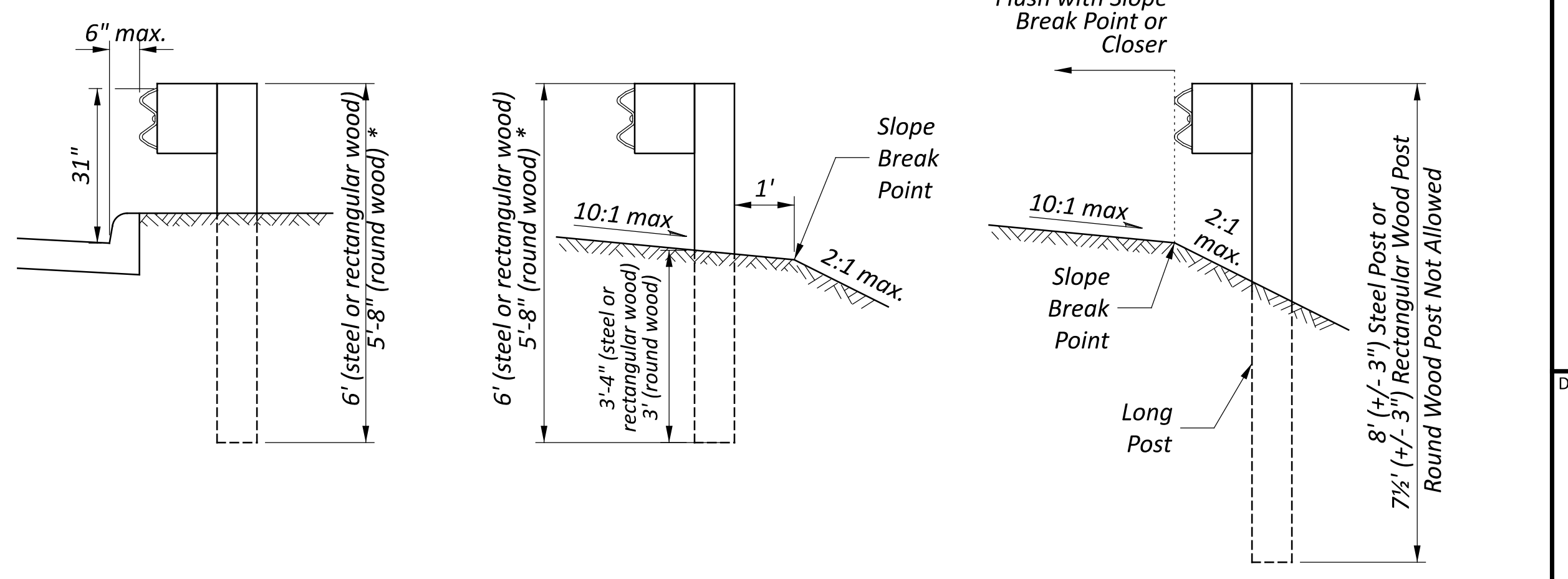
POST EMBEDMENT DEPTH: Standard embedment depth is 3'-4" minimum for steel and rectangular wood posts. Embedment depth shall be 3'-0" for round wooden posts.

Do not drive posts located over a culvert with less than 4'-3" of cover; instead set in drilled or dug holes. Where site constraints prohibit the post from being placed at least one foot in front of the slope break point, use longer posts as shown in the Guardrail Post Length and Position Detail. The face of the rail may not be beyond the slope break point.

SPECIAL POST MOUNTINGS: Install posts located over a drainage inlet or structure with a cover of less than 3'-4" as shown in the FOOTING ANCHOR Detail on Sheet P.4.

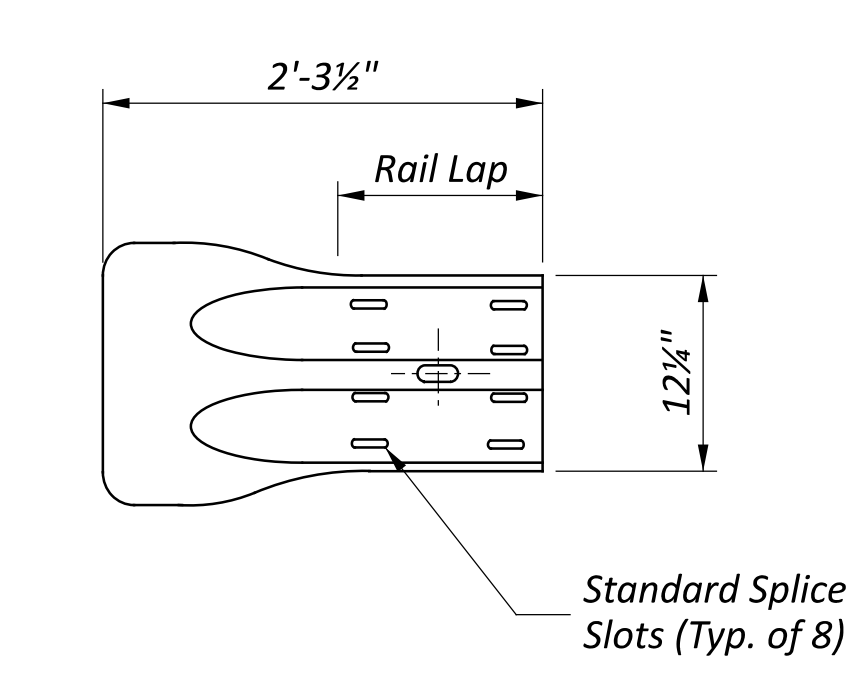
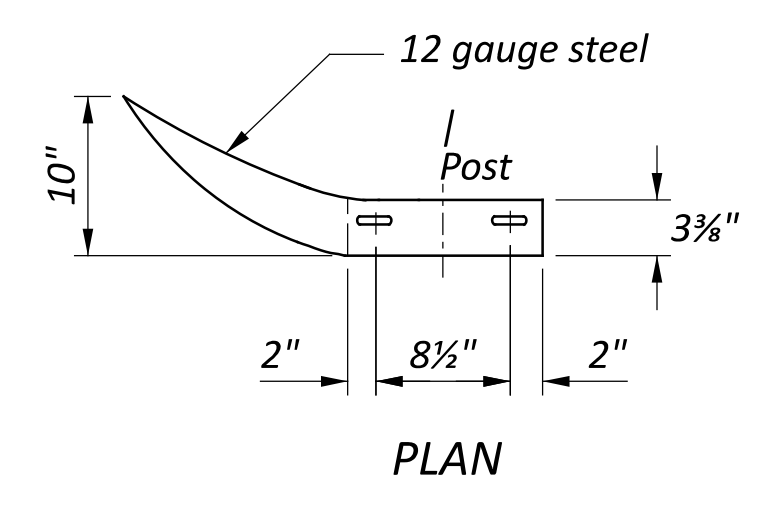
ANCHORS: Holes shall comply with CMS 510. Use non-shrink, nonmetallic grout per CMS 705.20.

PROTECTIVE COATING: In lieu of the complying with CMS 710.06, coat expansion shields, anchors and concrete insert anchor assemblies embedded in concrete in accordance with ASTM A 153 or be of stainless steel. Any bolts screwed into these devices shall meet CMS 710.06.

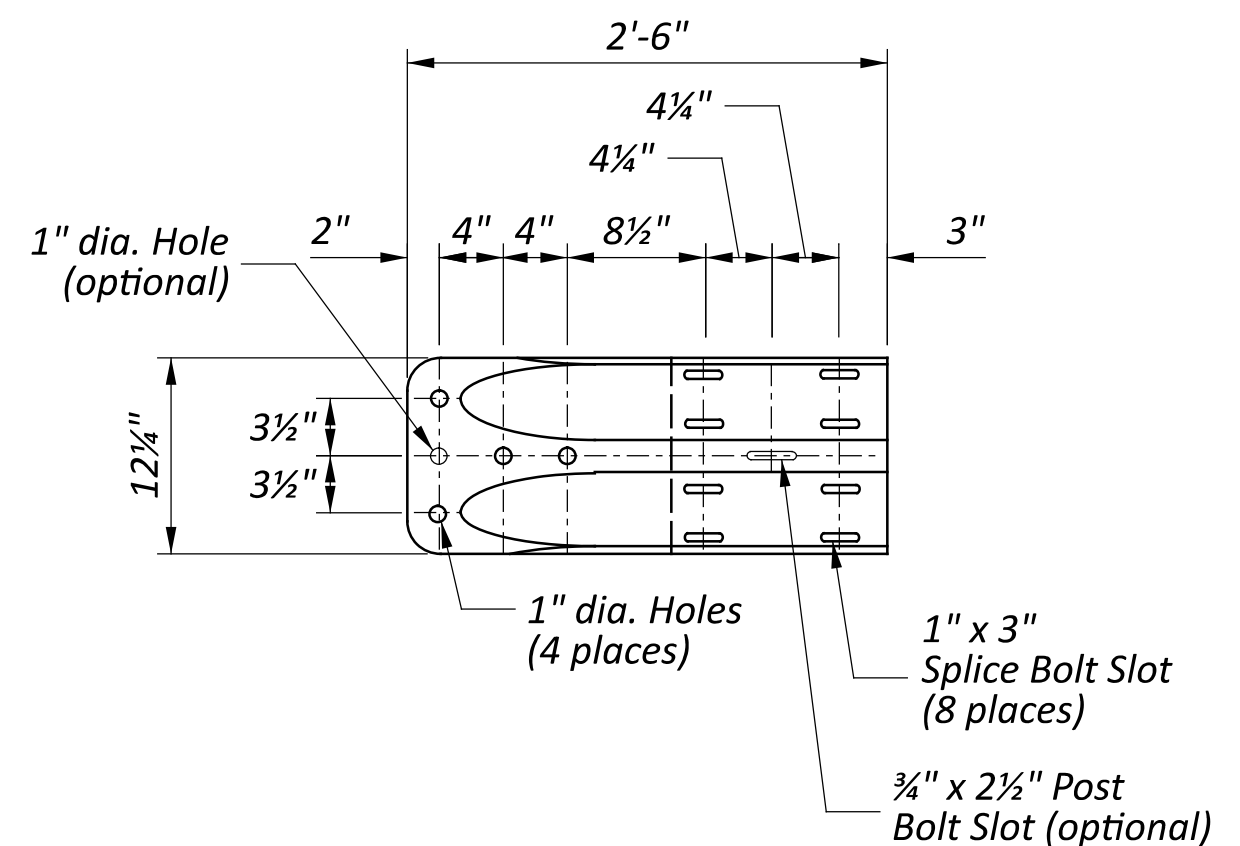
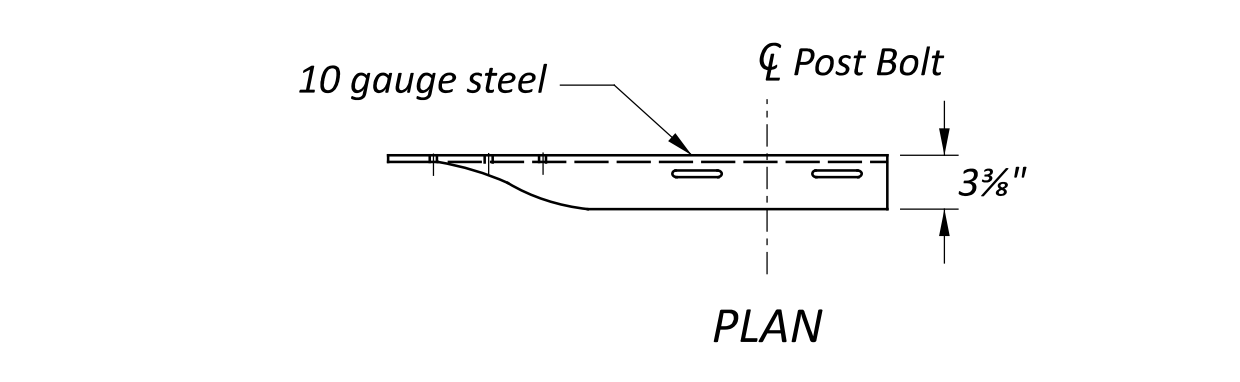


GUARDRAIL POST LENGTH AND POSITION

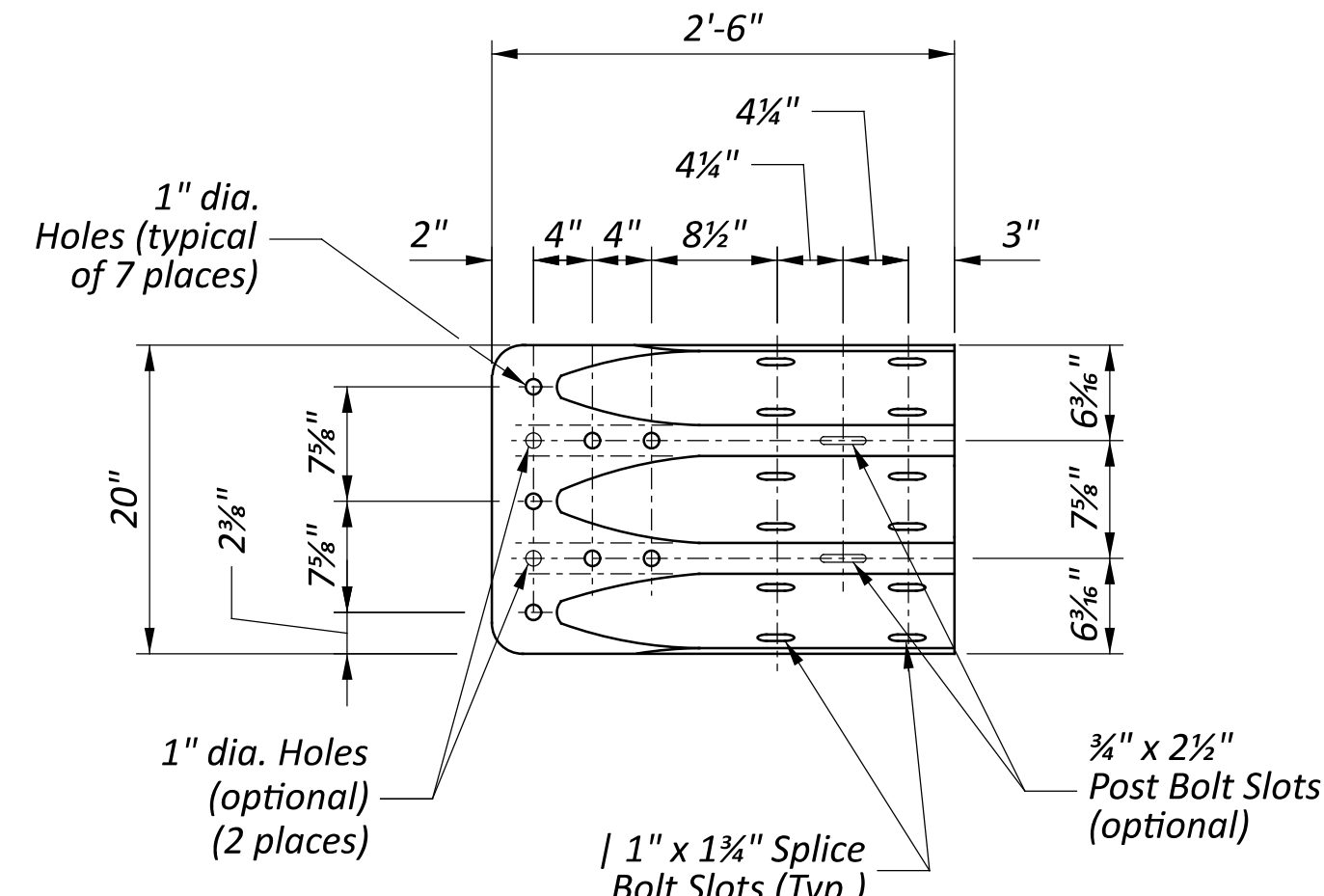
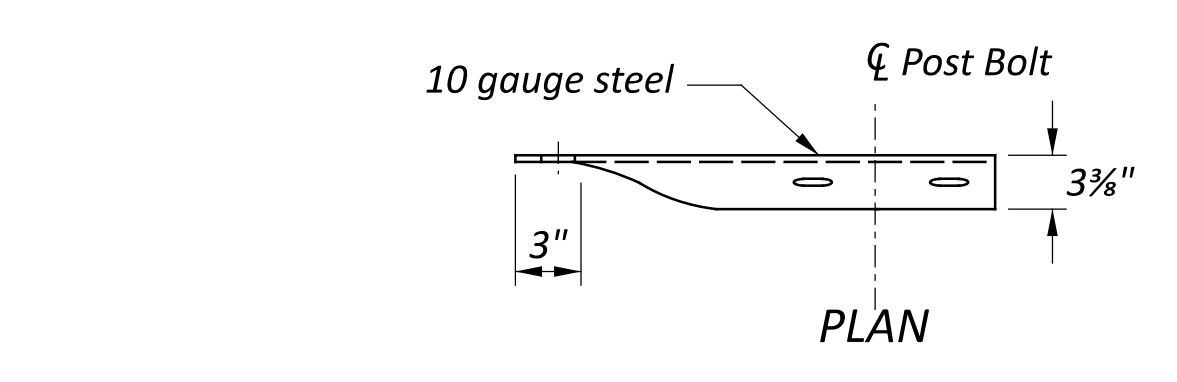
MGS-2.1
 MODEL: Sheet 3 PAPER: 34x22 (in.) DATE: 11/17/2025 TIME: 10:43:40 AM PLTDRV: OHDOT_PDF.plt PENTBL: OHDOT_Per.tbl USER: Andrew.Holloway@dot.ohio.gov WORKSPACE: OHDOTCv02 WORKSET: PIS_SCD PRODUCT: OpenRoadsDesigner 24.00.00.205
 pw:\ohdot-pw.bentley.com\ohdot-pw-02\Documents\03 Standards\PIS_SCD\Roadway\Working Folder\2026\01_Jan\MGS-2.1_2026-01-16.dgn



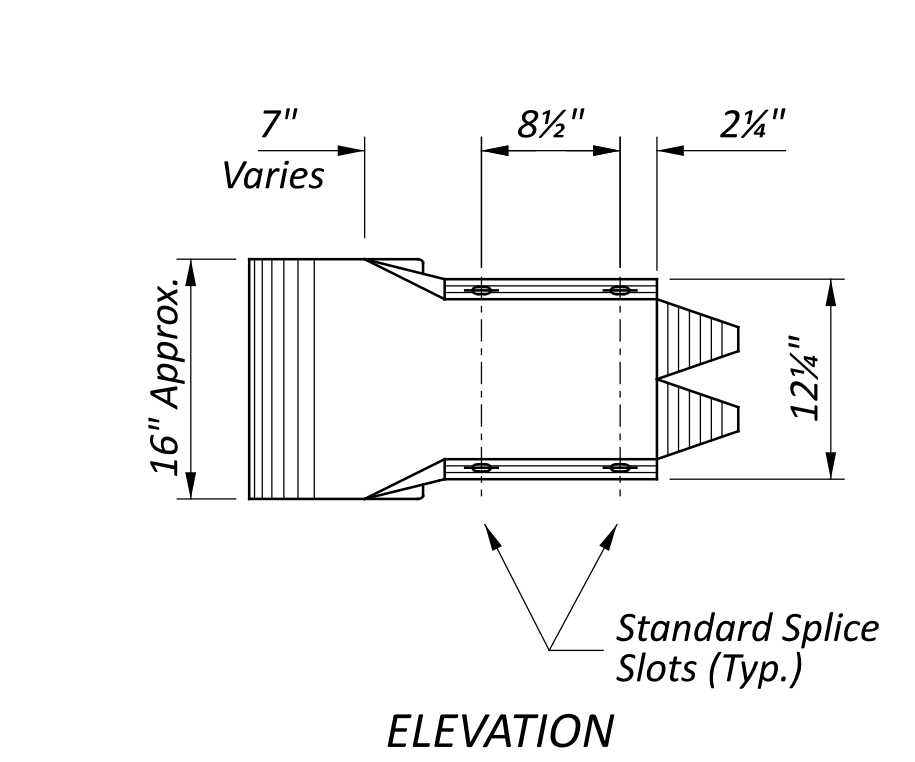
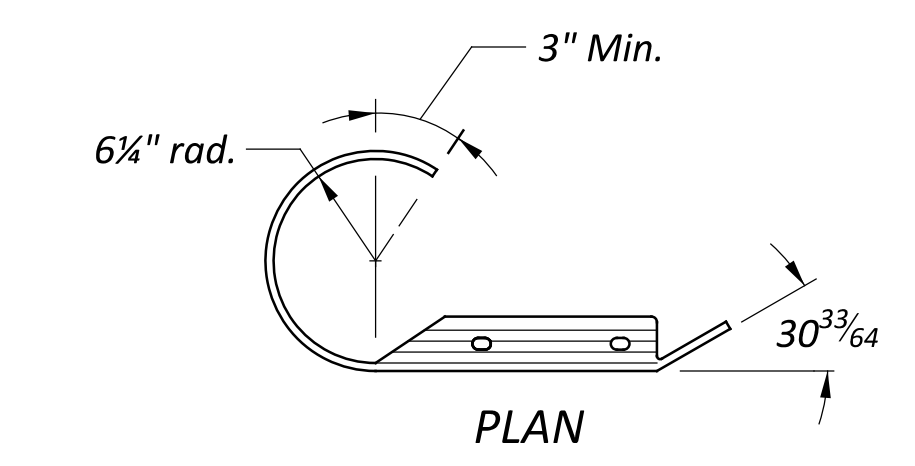
ELEVATION
W-BEAM FLARED END SECTION



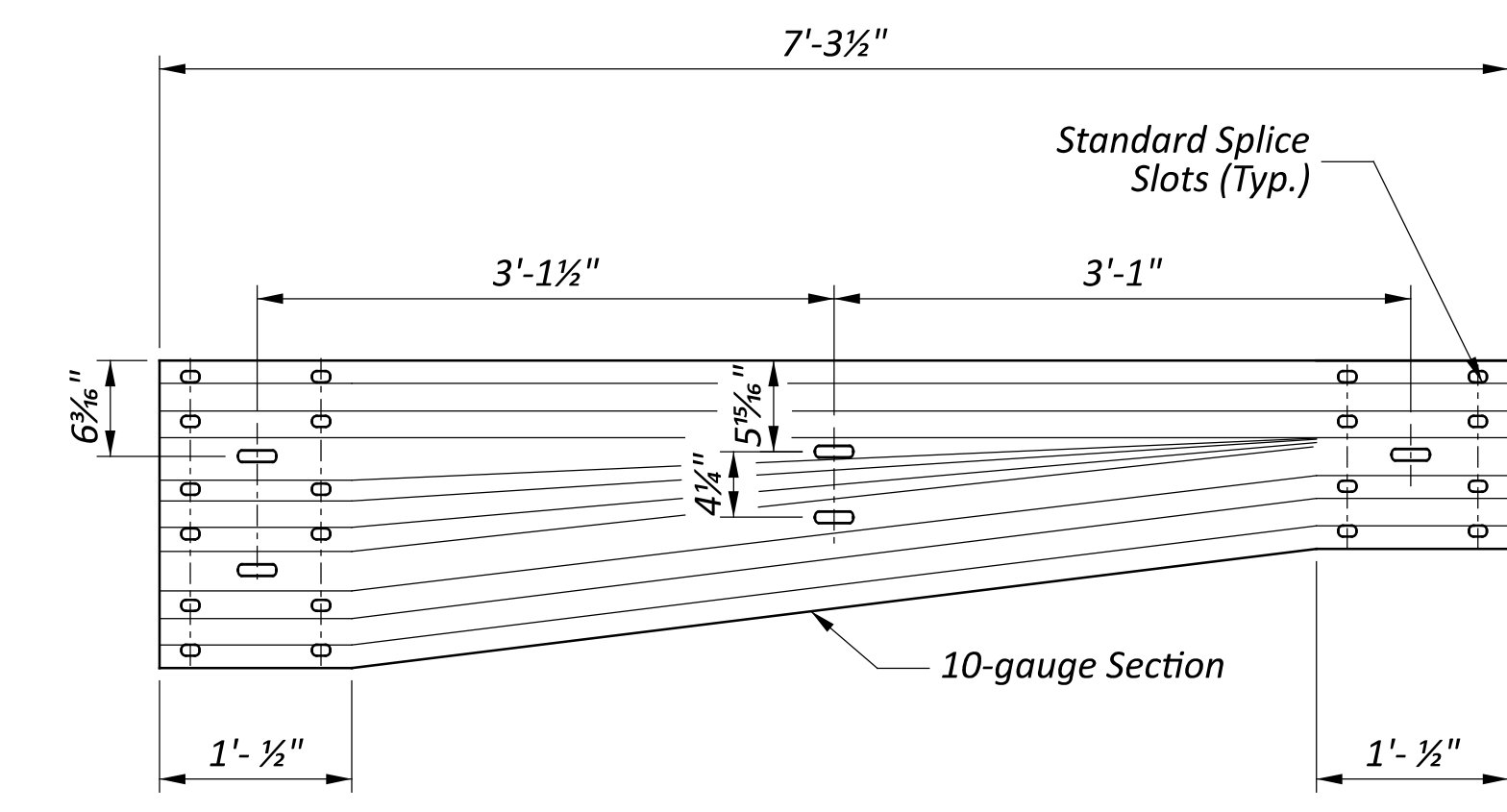
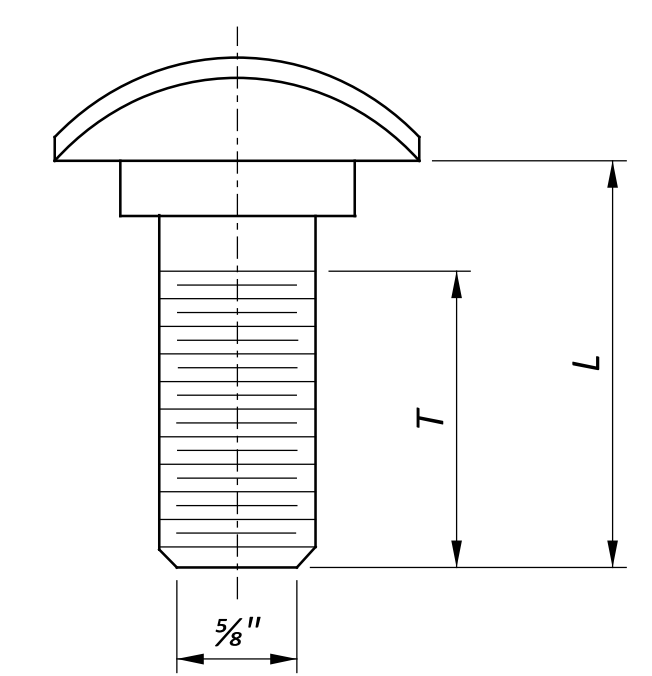
ELEVATION
W-BEAM TERMINAL CONNECTOR



ELEVATION
THRIE-BEAM TERMINAL CONNECTOR



ELEVATION
ROUNDED W-BEAM END SECTION



ASYMMETRIC TRANSITION SECTION
(W to Thrie-Beam)
(For details of Type 1 Transition Section (Symmetric), refer to AASHTO M 180 Figure 4.)

NOTES

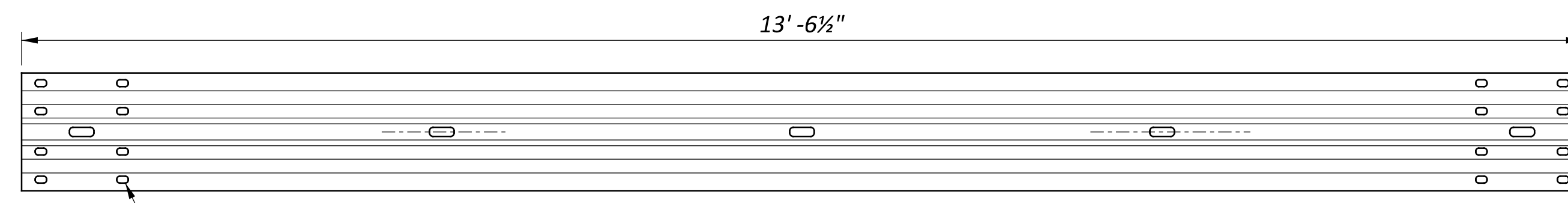
GENERAL: Components shown on this drawing are used in a variety of guardrail systems. See individual guardrail drawing for specific applications.
See CMS 606 for guardrail specifications not covered on these drawings.

Refer to AASHTO M 180 for dimensional details of W-Beam and Thrie-Beam rail elements, related buffer and end sections, beam splices, post and splice bolts, nuts, and Type 1 W-Beam to Thrie-Beam Transition sections. Beam washers are not to be used. Bolts grade shall be ASTM A307.

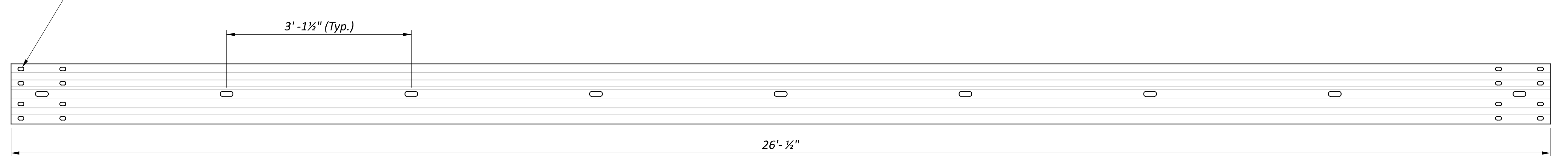
RAIL ELEMENTS: Unless otherwise specified, W-Beam Rail is 12 gauge steel with an effective length of 12'-6" or 25'-0", with 29/32"x1 1/8" splice bolt slots, and 3/4" x 2 1/2" post bolt slots on 3'-1 1/2" centers regardless of post spacing. Field punch or drill bolt holes or slots for irregularly spaced posts as specified in CMS 606.04.

Substituting one 10 gauge steel beam element where two nested 12 gauge steel beams are specified is permitted (both W-beam and Thrie-beam).

RAIL SPLICES: Lap splices between two rail elements or between a rail and terminal connector in the direction of traffic. Lap the flared end sections in the direction of traffic.



12'-6" W-BEAM SECTION



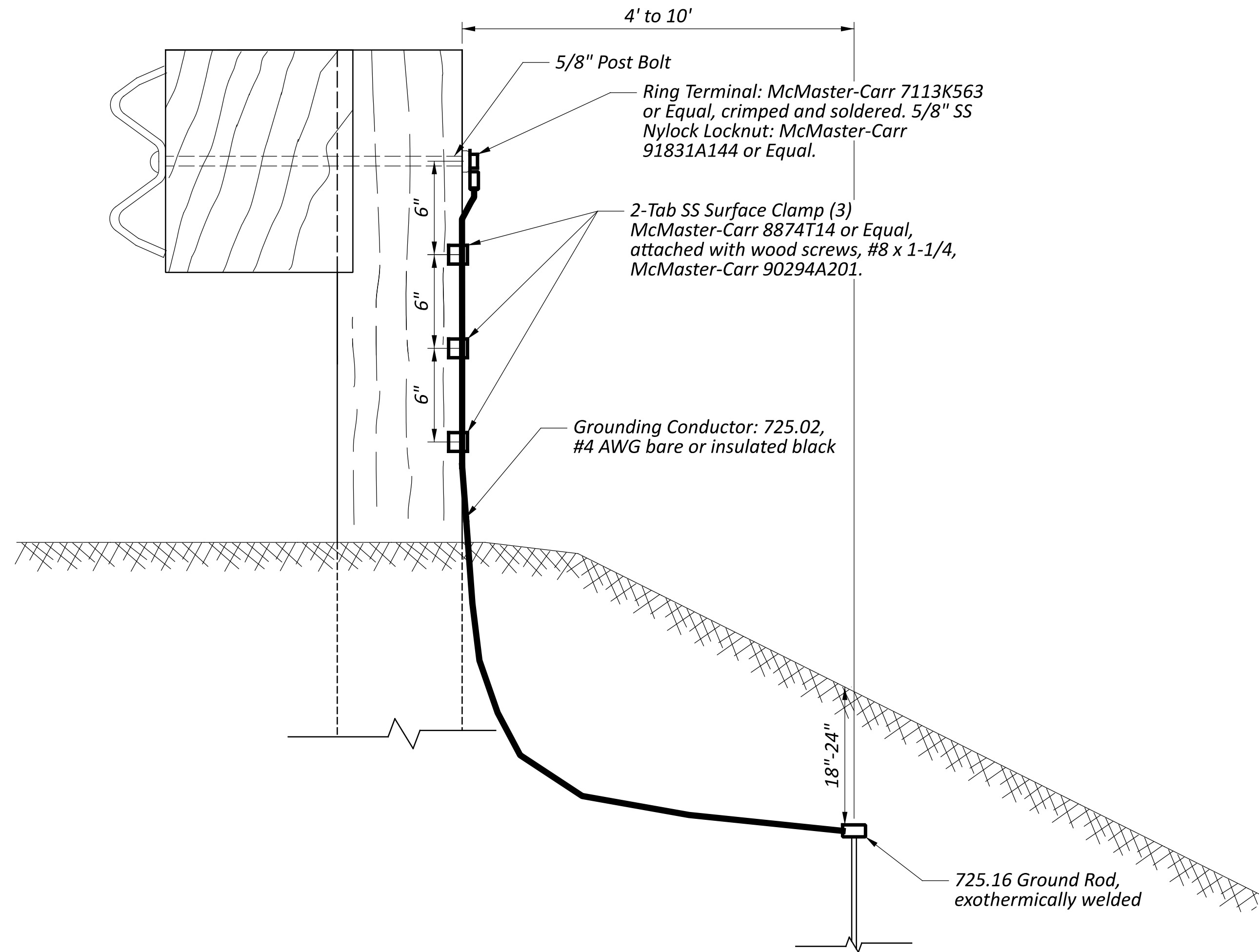
25'-0" W-BEAM SECTION

GUARDRAIL BOLT (For Post and Splice Bolts)		
L	T min.	Bolt Use
22" (Standard Rail)	4"	Type MGS: WP/WB, PB
34" (Barrier Rail)		
14"	4"	Type MGS: SP/WB, PB
1 1/4"	1 1/8"	Splice Bolt

WP = Wood Post WB = Wood Blockout
 SP = Steel Post PB = Plastic Blockout

Longer Bolt may be needed for round Wood Post larger than 8" dia.

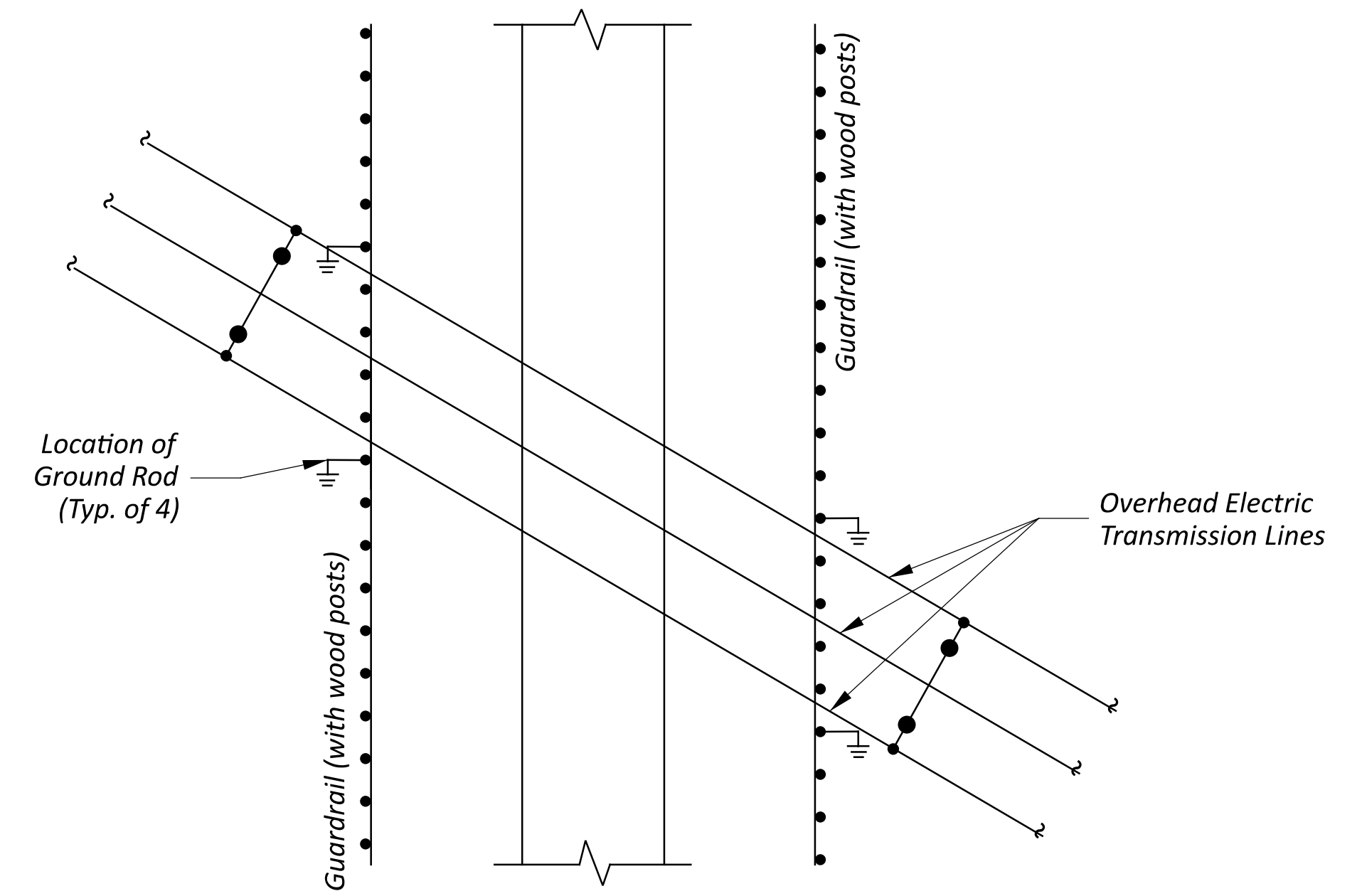
WOOD POST GROUNDING DETAIL
 ROUND (SHOWN) OR RECTANGULAR WOOD POSTS



NOTES:

GENERAL: Apply two coats of insulating varnish over exothermic welds and exposed cable.

PAYMENT: Guardrail grounds will be paid for at the unit price bid for **Item 625 - Ground Rod**, Each.



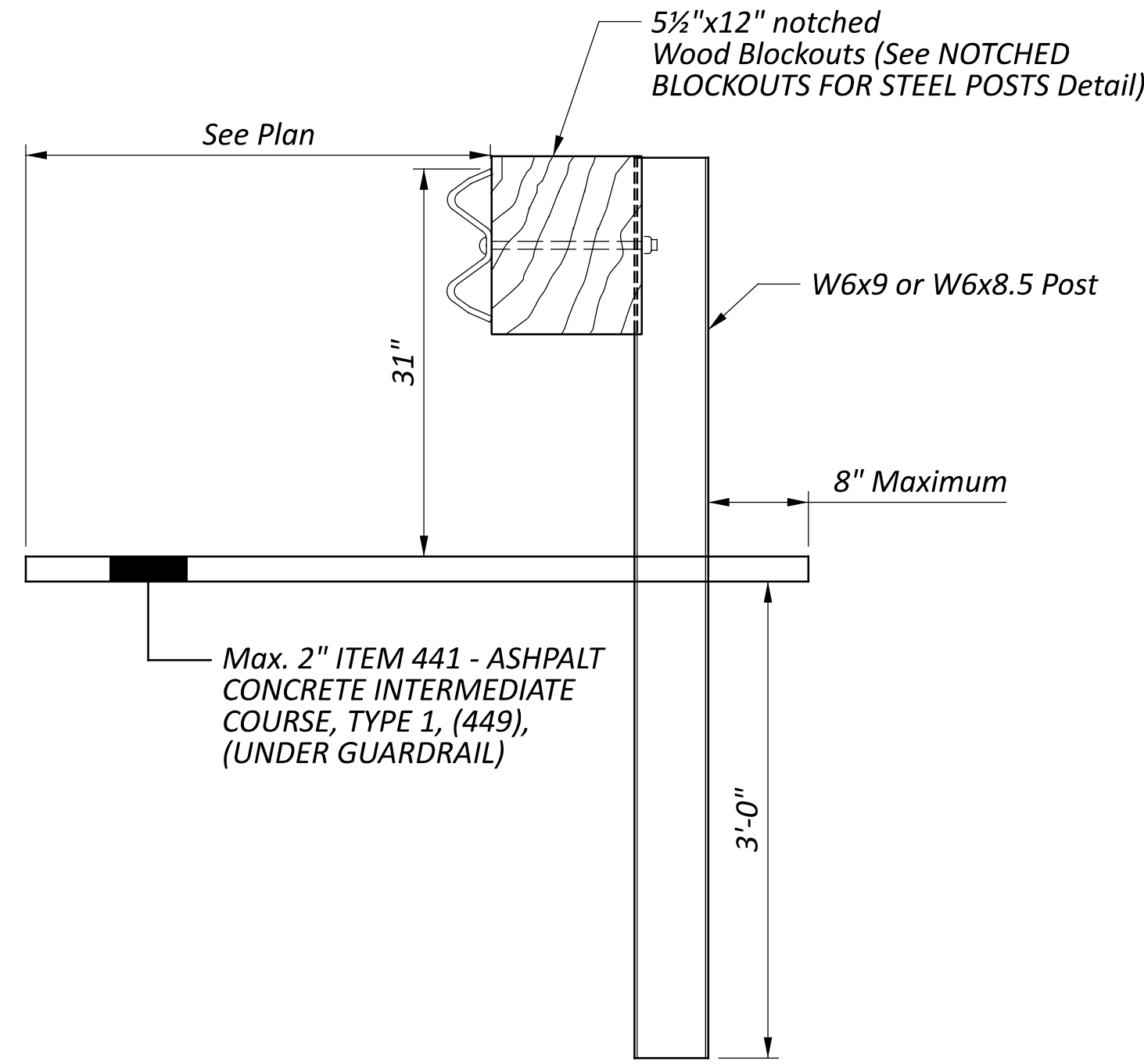
GUARDRAIL GROUNDS AT TRANSMISSION/SUB-TRANSMISSION LINES CROSSING

Ground Rod Installation Guidelines

	Transmission/Sub-Transmission Power Lines (≥69kV)	Distribution/Service Power Lines (<69kV)
Cross alignment of guardrail with wood posts	Install Ground Rods per Guardrail Grounds at Transmission Lines Crossing Detail	No Ground Rods required
Run Parallel to the guardrail with wood posts (within 50' measured horizontally of guardrail alignment)	Install (1) Ground Rod at the center of the run	No Ground Rods required

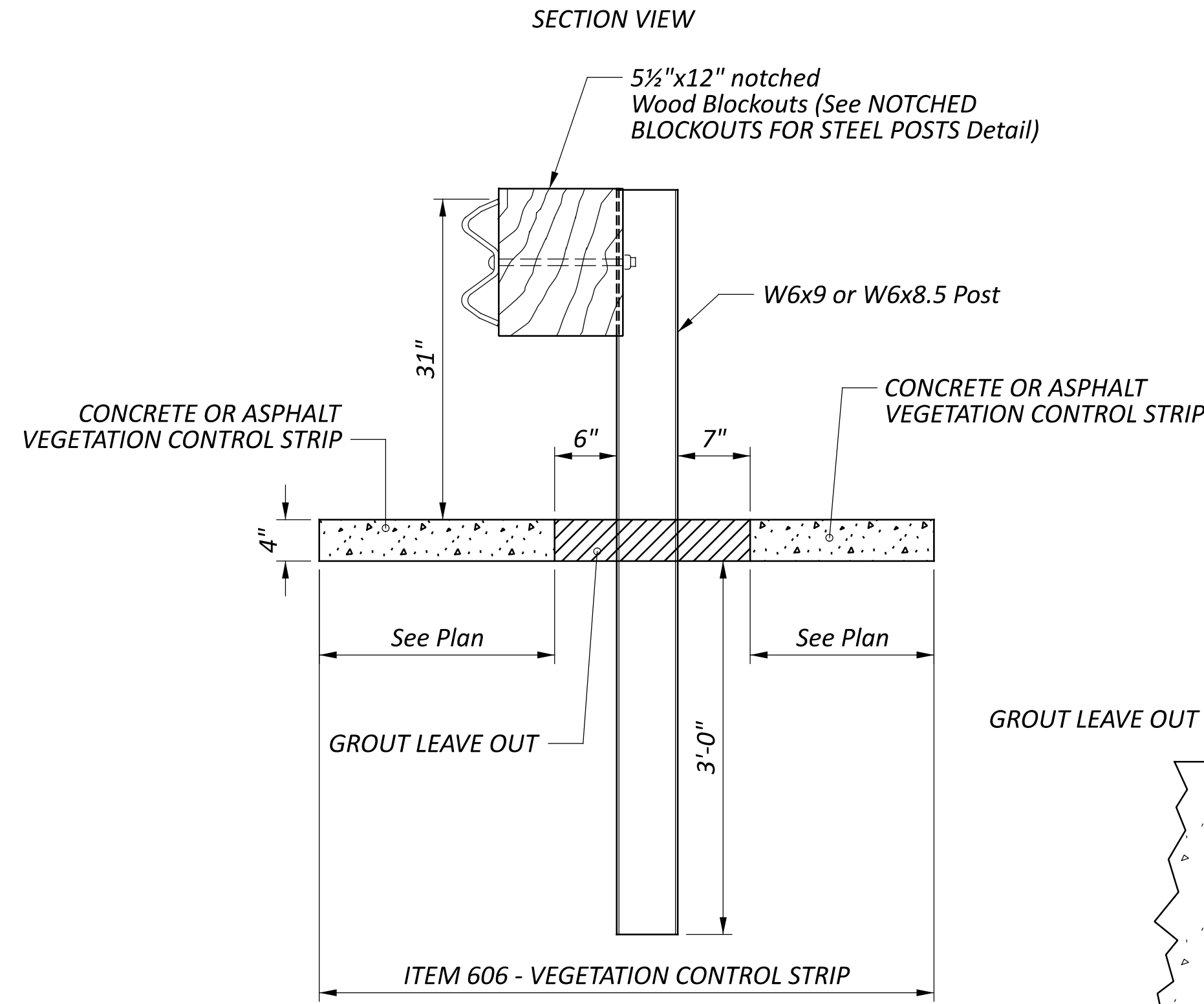


MGS GUARDRAIL INSTALLED IN ASPHALT



POSTS: GUARDRAIL POSTS SHALL BE STEEL W6X9 OR W6X8.5. DO NOT USE LONG POSTS.

MGS GUARDRAIL INSTALLED IN CONCRETE OR ASPHALT VEGETATION CONTROL STRIP



NOTES:

CONCRETE VEGETATION CONTROL STRIP: CONCRETE VEGETATION CONTROL STRIP SHALL BE CONSTRUCTED WITH QC 1 CONCRETE PER CMS 499 AND CURED PER CMS 451.11 WITH A CURING COMPOUND CONFORMING TO CMS 705.07. IMMEDIATELY PRIOR TO PLACEMENT OF THE CONCRETE, THOROUGHLY MOISTEN THE SUBGRADE.

FOLLOW ITEM 511.12 FOR CONCRETE PLACEMENT DURING COLD WEATHER CONDITIONS.

SAW OR FORM TRANSVERSE JOINTS TO A MINIMUM DEPTH OF 1" AND TO A WIDTH OF APPROXIMATELY 1/8" EVERY 8 FEET. INSTALL 1/2" THICK EXPANSION JOINT FILLER PER CMS 705.03 EVERY 100 FEET.

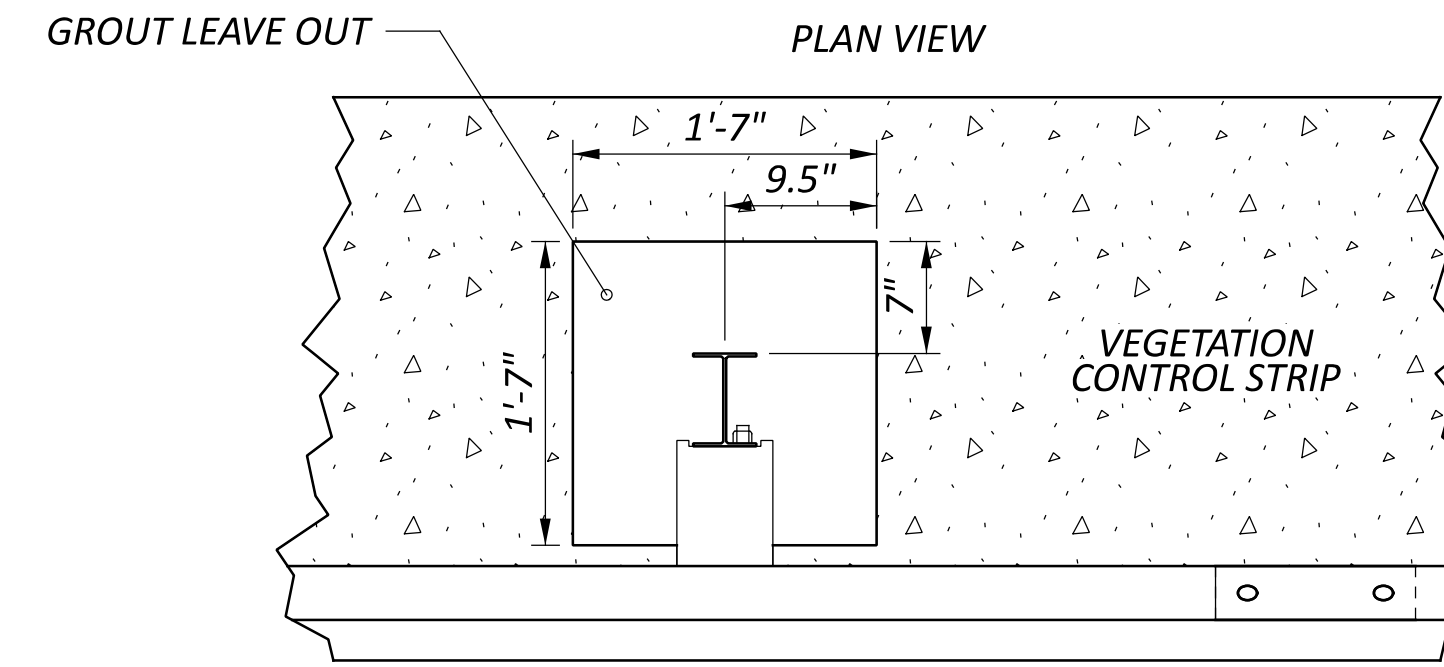
ASPHALT VEGETATION CONTROL STRIP: THE ASPHALT SHALL BE AS SPECIFIED IN THE PLANS.

GROUT LEAVE OUT: GROUT LEAVE OUTS ARE TO BE 19" WIDE X 19" LONG X 4" DEEP. THE LEAVE OUT SHALL EXTEND A MINIMUM OF 7" FROM BACK OF POST TO THE END OF THE LEAVE OUT.

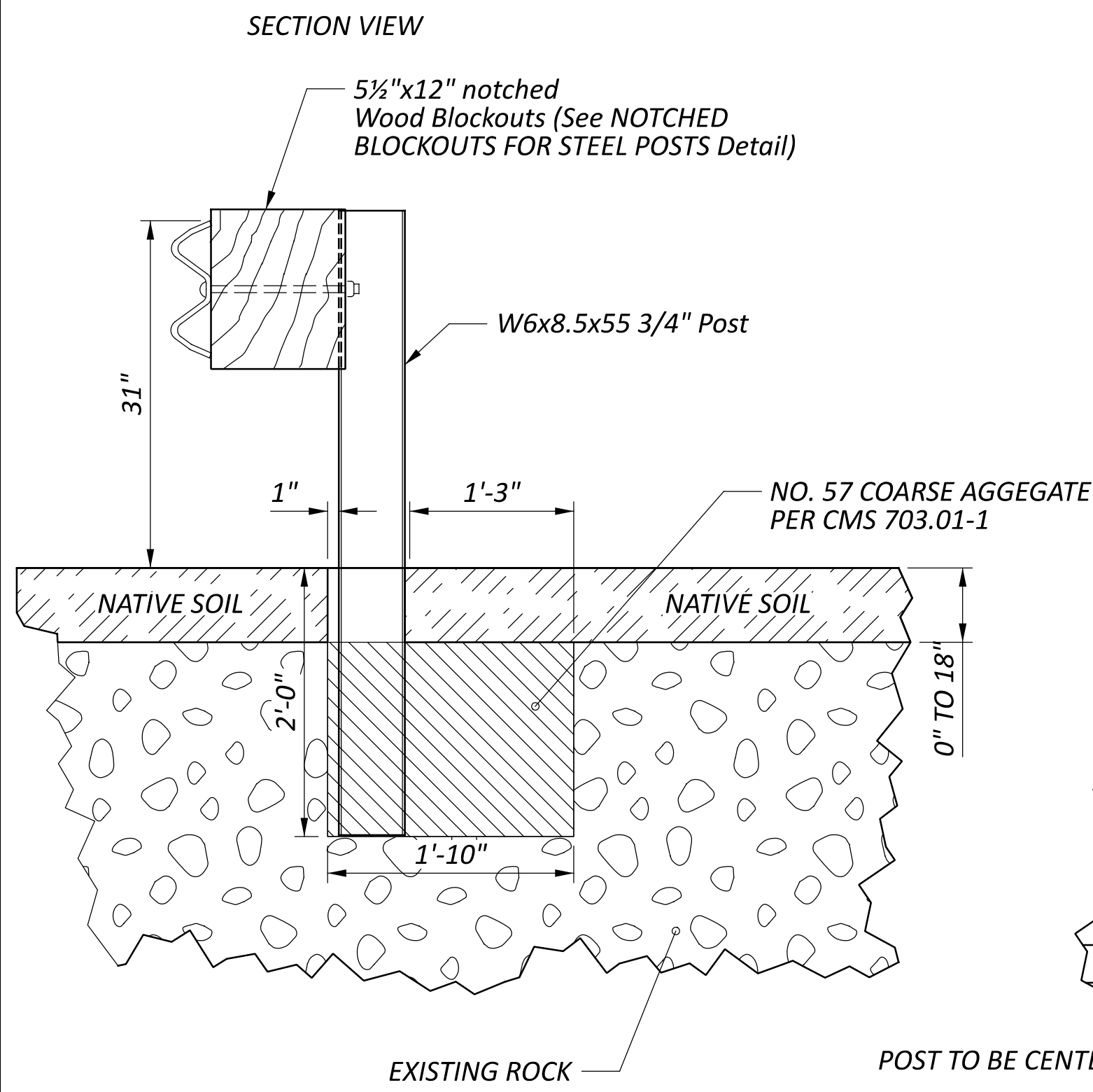
THE GROUT USED FOR THE LEAVE OUT SHALL BE A MIXTURE CONSISTING OF: ONE PART TYPE 1A CEMENT PER CMS 701.01, 14 PARTS SAND PER CMS 703.03, AND 5 PARTS WATER PER VOLUME.

POSTS: GUARDRAIL POSTS SHALL BE STEEL W6X9 OR W6X8.5. DO NOT USE LONG POSTS.

PAYMENT: THE LABOR, MATERIALS, AND EQUIPMENT REQUIRED TO CONSTRUCT THE ENTIRE SECTION OF THE VEGETATION CONTROL STRIP, INCLUDING THE CONCRETE OR ASPHALT, GROUT LEAVE OUTS, TRANSVERSE JOINTS, EXPANSION JOINTS, AND OTHER INCIDENTALS SHALL BE PAID AT THE UNIT BID PRICE PER SQUARE YARD FOR ITEM 606 - VEGETATION CONTROL STRIP, CONCRETE OR ITEM 606 - VEGETATION CONTROL STRIP, ASPHALT. GUARDRAIL SHALL BE PAID SEPARATELY BY LINEAR FOOT UNDER ITEM 606 - GUARDRAIL, TYPE MGS.



MGS GUARDRAIL EMBEDDED IN ROCK (ROCK ENCOUNTERED 0" TO 18" FROM FINISHED GRADE)

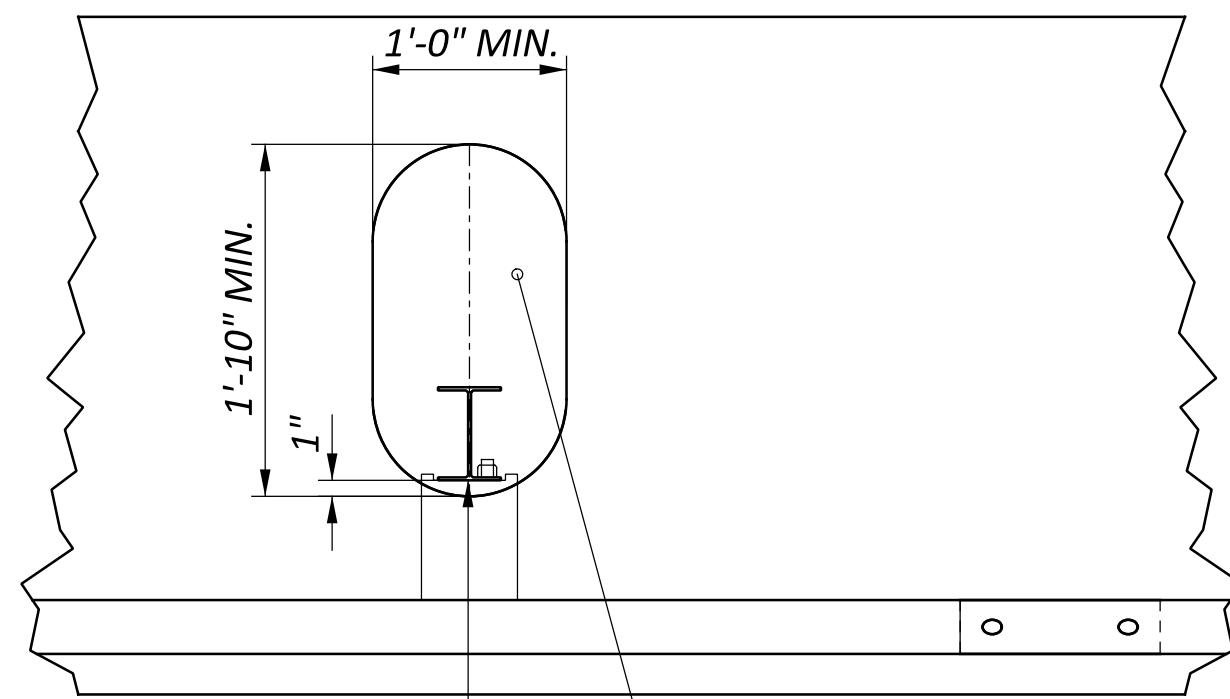


NOTES:

POSTS: GUARDRAIL POSTS SHALL BE STEEL W6X8.5X55 3/4. POSTS MAY BE FIELD CUT IF ROCK IS ENCOUNTERED UNEXPECTEDLY AND NOT IDENTIFIED IN THE PLANS. OTHERWISE, POSTS OF THE CORRECT LENGTH SHALL BE FURNISHED. WHEN FIELD CUTTING POSTS, REPAIR THE EXPOSED SURFACE ACCORDING TO ASTM A 780 EXCEPT THE DEPARTMENT WILL NOT ALLOW AEROSOL SPRAY APPLICATIONS OF PAINTS CONTAINING ZINC DUST.

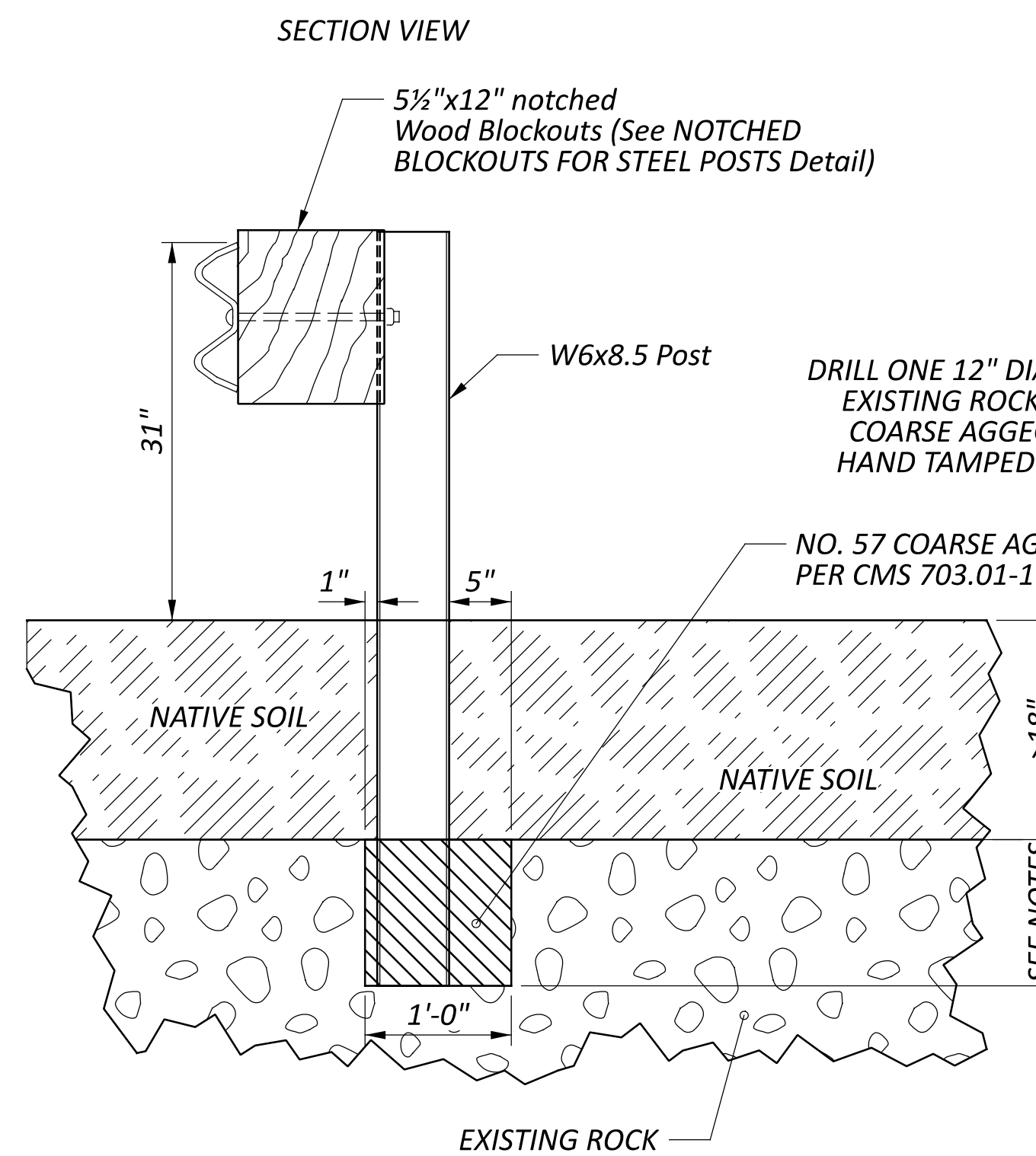
PAYMENT: THE LABOR, MATERIALS, AND EQUIPMENT REQUIRED TO DRILL INTO THE EXISTING ROCK, REMOVE THE MATERIAL, BACKFILL WITH NO. 57 COARSE AGGREGATE, AND INSTALL THE SPECIFIED POSTS, BLOCKOUTS, W-BEAM RAIL, AND OTHER INCIDENTALS TO COMPLETE THE INSTALLATION SHALL BE PAID BY LINEAR FOOT UNDER ITEM 606 - GUARDRAIL, TYPE MGS EMBEDDED IN ROCK (0" TO 18" COVER).

PLAN VIEW



DRILL INTO THE EXISTING ROCK, BACKFILL WITH NO. 57 COARSE AGGREGATE PER CMS 703.01-1, HAND TAMPED WITH A ROD IN 6" LIFTS

MGS GUARDRAIL EMBEDDED IN ROCK (ROCK ENCOUNTERED >18" FROM FINISHED GRADE)



NOTES:

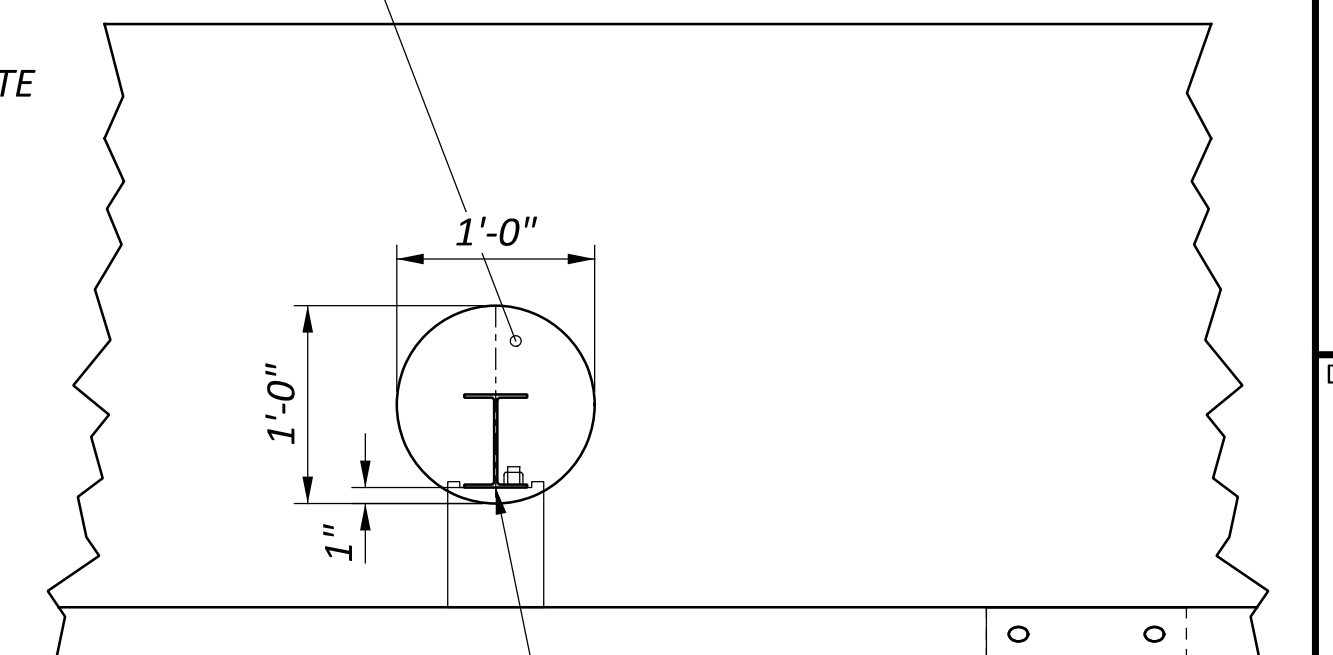
POSTS: GUARDRAIL POSTS SHALL BE STEEL W6X8.5. THE POST SHALL EXTEND 12" INTO THE EXISTING ROCK OR TO THE STANDARD EMBEDMENT DEPTH (40"), WHICHEVER IS LESS. DO NOT USE LONG POSTS.

POSTS MAY BE FIELD CUT IF ROCK IS ENCOUNTERED UNEXPECTEDLY AND NOT IDENTIFIED IN THE PLANS. OTHERWISE, POSTS OF THE CORRECT LENGTH SHALL BE FURNISHED. WHEN FIELD CUTTING POSTS, REPAIR THE EXPOSED SURFACE ACCORDING TO ASTM A 780 EXCEPT THE DEPARTMENT WILL NOT ALLOW AEROSOL SPRAY APPLICATIONS OF PAINTS CONTAINING ZINC DUST.

PAYMENT: THE LABOR, MATERIALS, AND EQUIPMENT REQUIRED TO DRILL INTO THE EXISTING ROCK, REMOVE THE MATERIAL, BACKFILL WITH NO. 57 COARSE AGGREGATE, AND INSTALL THE SPECIFIED POSTS, BLOCKOUTS, W-BEAM RAIL, AND OTHER INCIDENTALS TO COMPLETE THE INSTALLATION SHALL BE PAID BY LINEAR FOOT UNDER ITEM 606 - GUARDRAIL, TYPE MGS EMBEDDED IN ROCK (GREATER THAN 18" COVER).

DRILL ONE 12" DIAMETER HOLE INTO THE EXISTING ROCK, BACKFILL WITH NO. 57 COARSE AGGREGATE PER CMS 703.01-1, HAND TAMPED WITH A ROD IN 6" LIFTS

PLAN VIEW



POST TO BE CENTERED IN EXCAVATION

MGS-2.1

MODEL: Sheet 5 PAPER: 34x22 (in.) DATE: 12/11/2025 TIME: 2:53:36 PM PLOT: PLTDRY: OHDOT_PDF.plt USER: Andrew.Holloway@dot.ohio.gov WORKSPACE: OHDOTCEV02 WORKSET: PIS_SCD PRODUCT: OpenRoadsDesigner 24.00.00.205

OFFICE OF ROADWAY ENGINEERING

REVISIONS

01-19-2018
01-17-2025
07-18-2025
01-16-2026

STDS ENGINEER
A. Holloway

STATE OF OHIO OFFICE OF ROADWAY ENGINEERING ADMINISTRATOR
Adam Koenig

MIDWEST GUARDRAIL SYSTEM,
STANDARD TYPE MGS
EMBEDMENT IN ASPHALT, CONCRETE, AND ROCK DETAILS

DESIGN AGENCY



SCD NUMBER

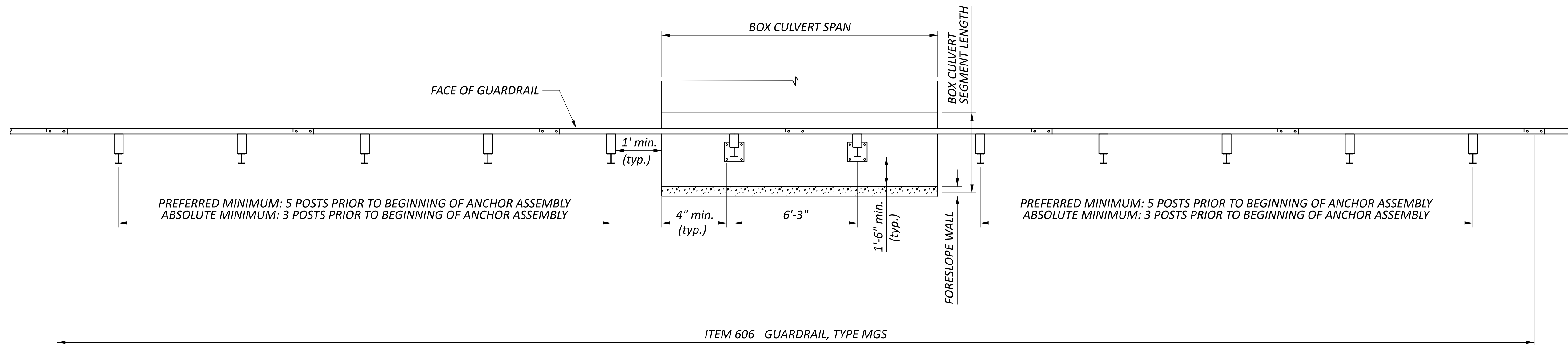
MGS-2.1

SHEET TOTAL

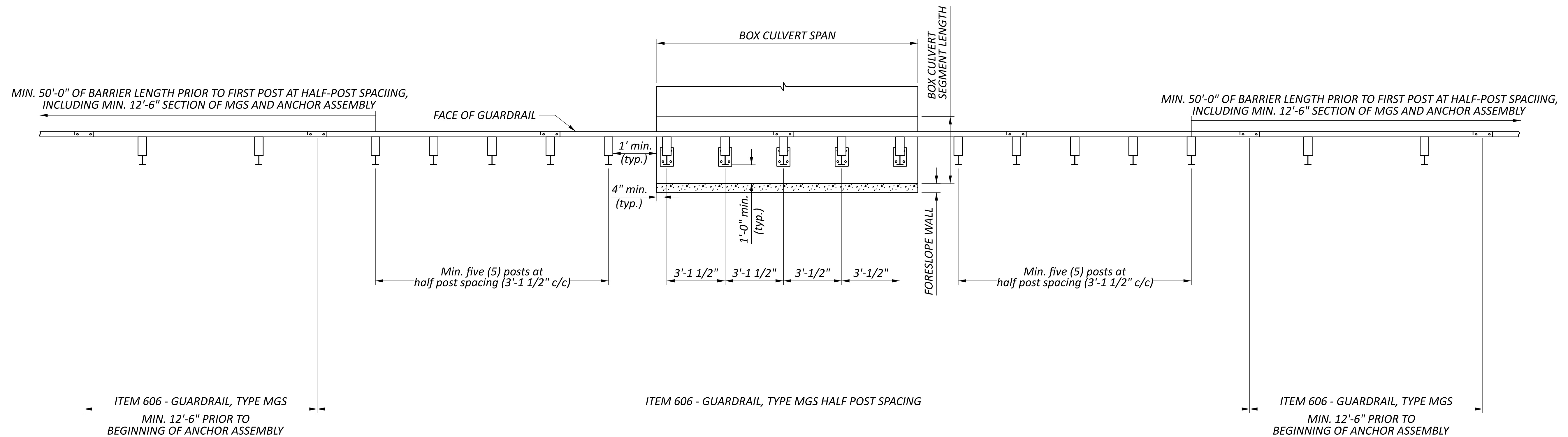
P.5 7

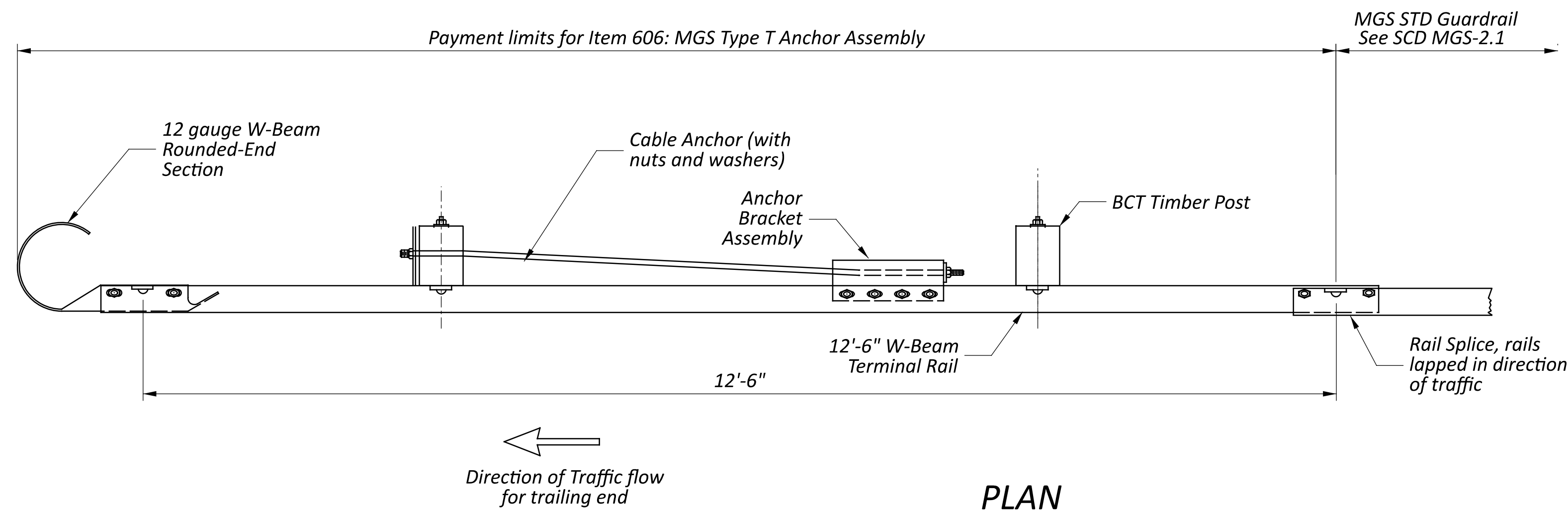


TOP MOUNTED CULVERT DETAIL #1
PLAN VIEW

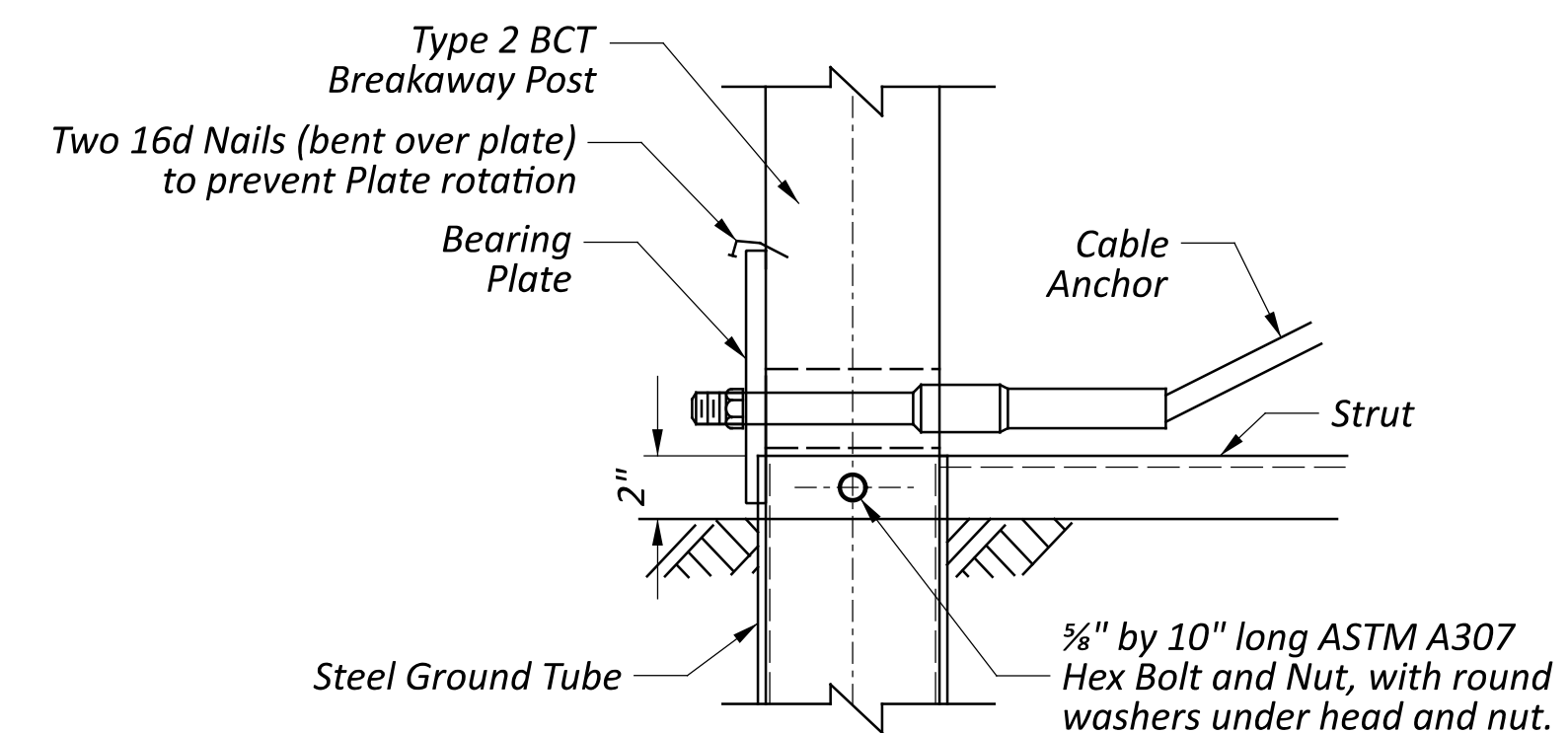
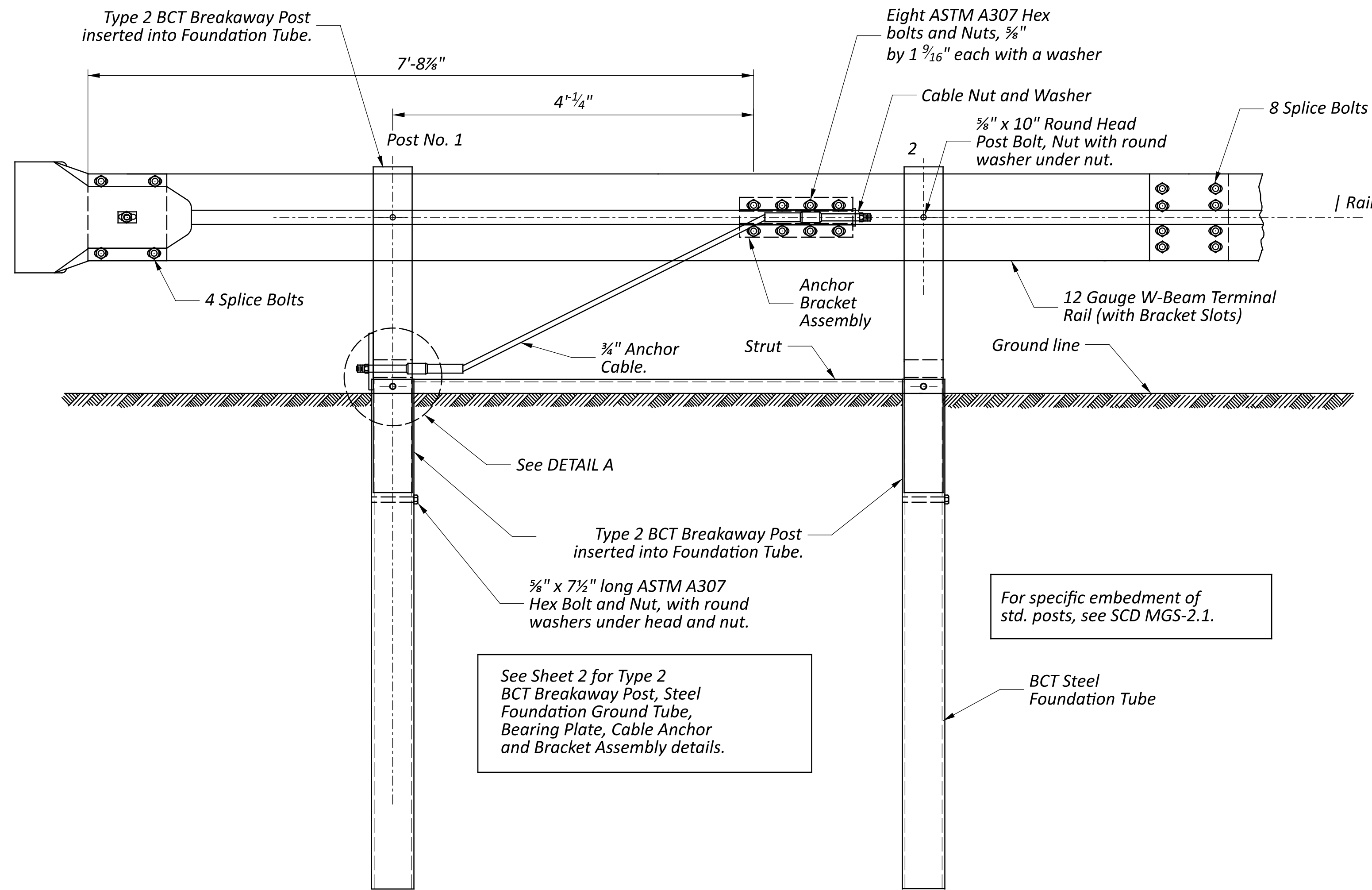


TOP MOUNTED CULVERT DETAIL #2
PLAN VIEW





PLAN



DETAIL A

NOTES

APPLICATION: Use Type T Anchor Assemblies on the trailing end of guardrail runs, located outside of the clear zone of opposing traffic. The assembly is 12'-6" long; post #1 of the Type T shall be set 25' beyond the trailing end of the hazard.

For termination requirements at driveways, and side road approaches and Terminals at Structures, see Location & Design Manual, Volume 1, Figure 603-3.

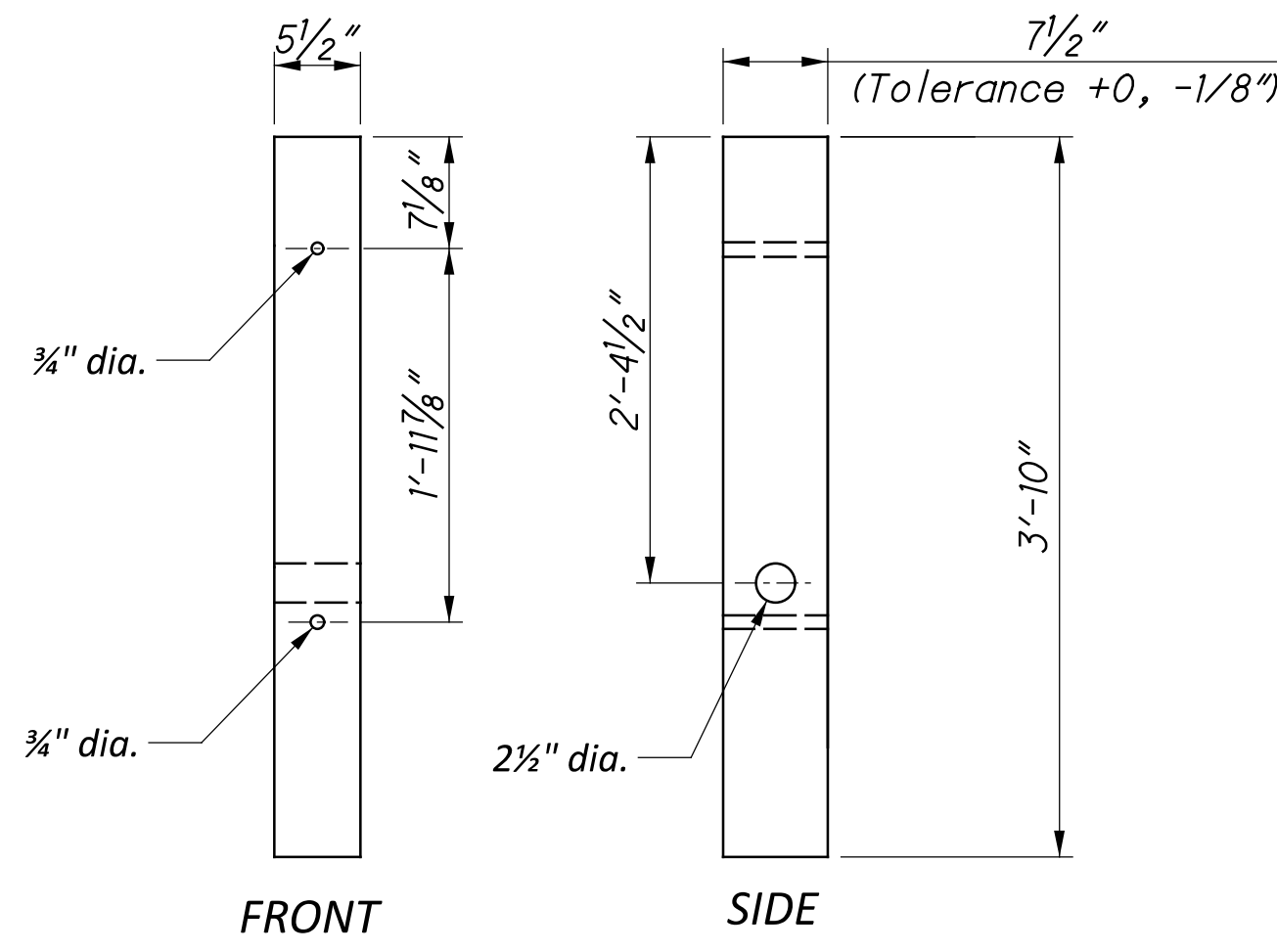
MATERIALS: See Sheet 2 for parts used on this anchor, including the Type 2 BCT Breakaway Posts, Steel Ground Foundation Tube, Bearing Plate, Cable Anchor, and Bracket Assembly. See MGS-2.1 for the Rounded W-Beam End Section.

Bearing Plate is ASTM A709 Grade 36. Steel Ground Foundation Tube shall be ASTM A500, Grade B, and meet CMS 707.10. All angles, channels and plates shall meet CMS 711.01. All structural steel shall be galvanized as specified in CMS 711.02. All bolt washers indicated are standard galvanized steel of the appropriate size.

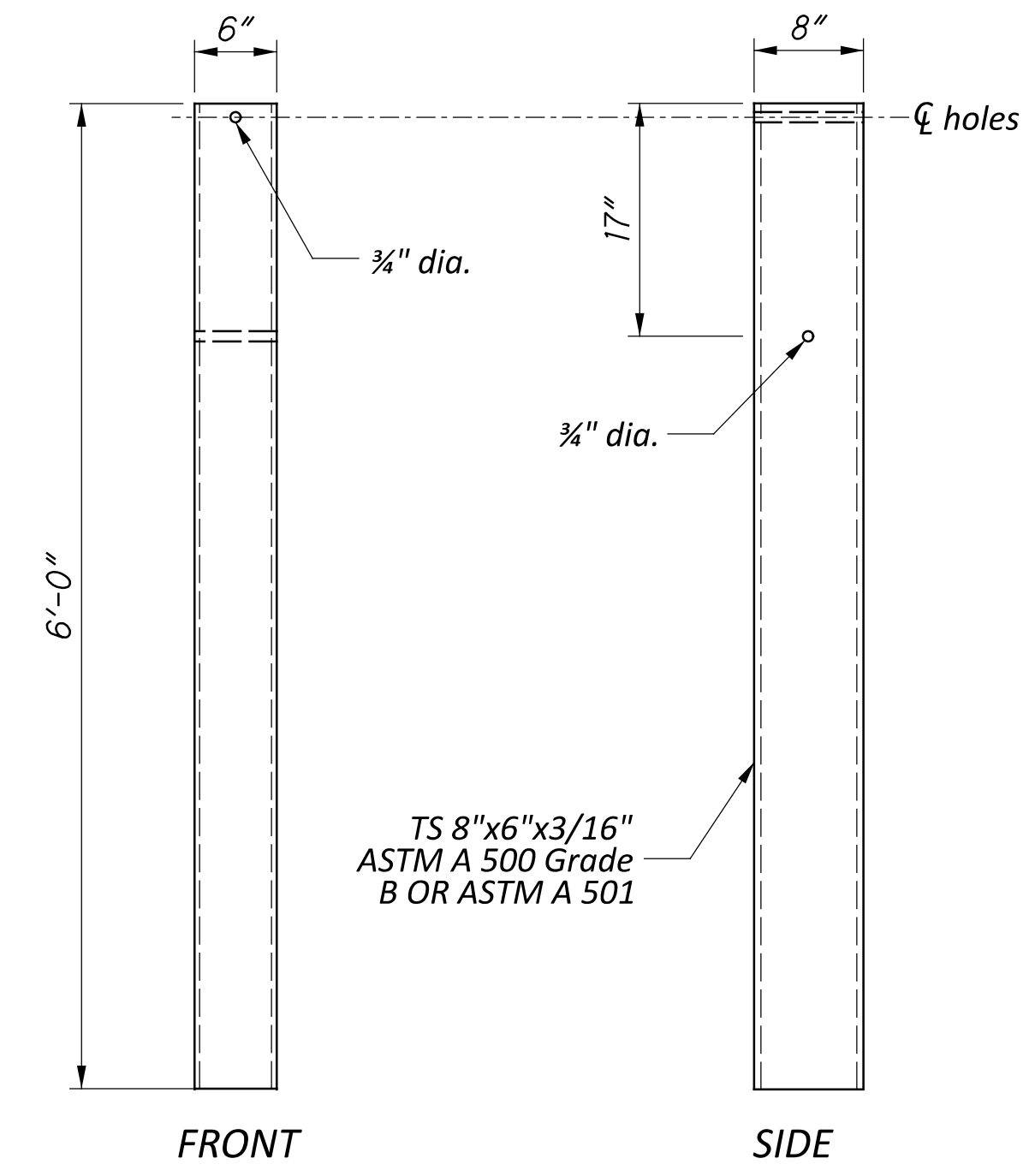
For components on this anchor that are not detailed on SCD MGS-2.1, see part descriptions in the AASHTO/AGC/ARTBA Standardized Hardware Guide.

PAYMENT: All equipment, labor and materials, including the W-Beam Rounded End Section and the W-Beam Terminal Rail for the 12'-6" anchor assembly shall be included in the unit price bid for Item 606 - Anchor Assembly, MGS Type T, Each.

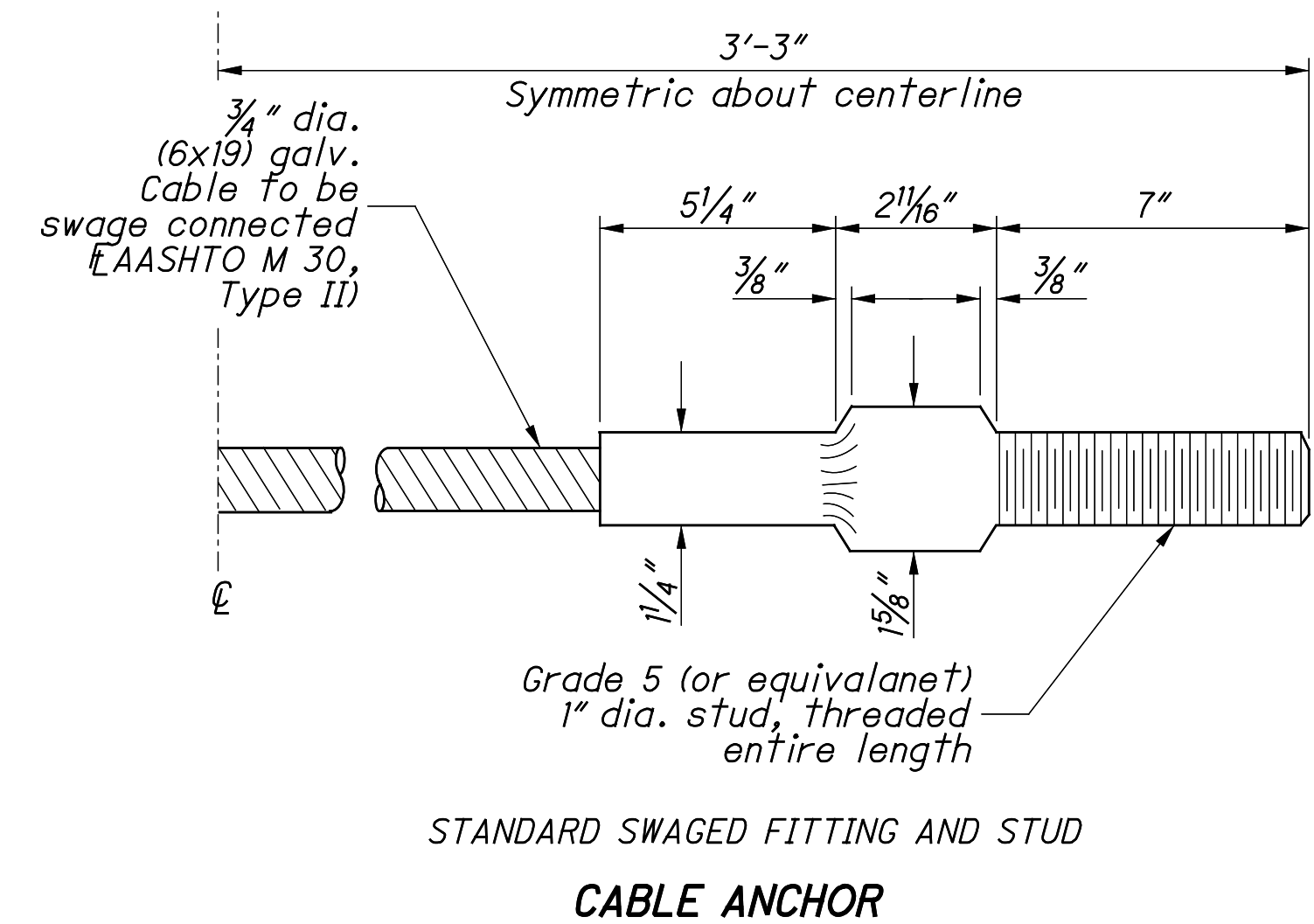




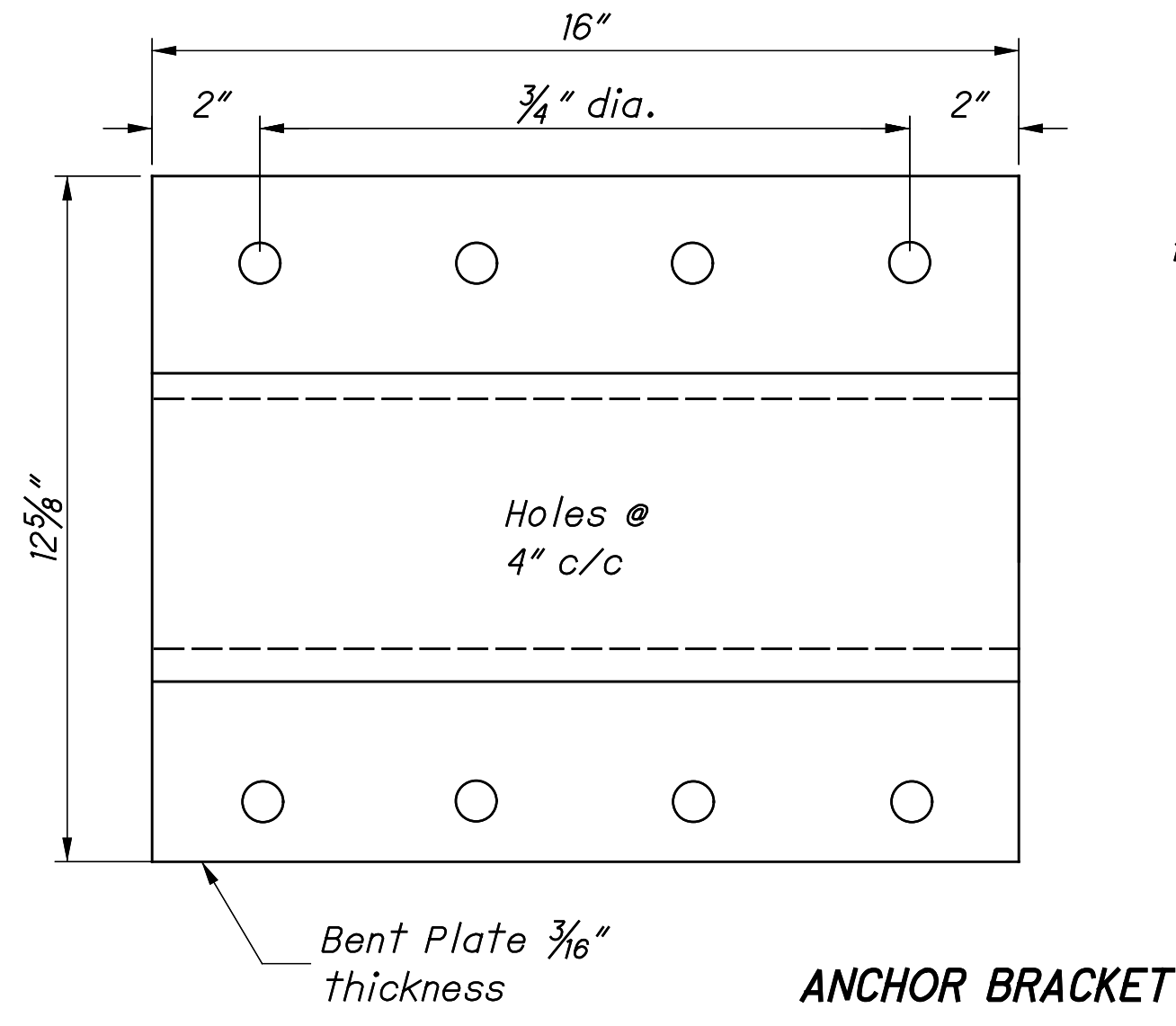
TYPE 2 BREAKAWAY BCT TIMBER POST



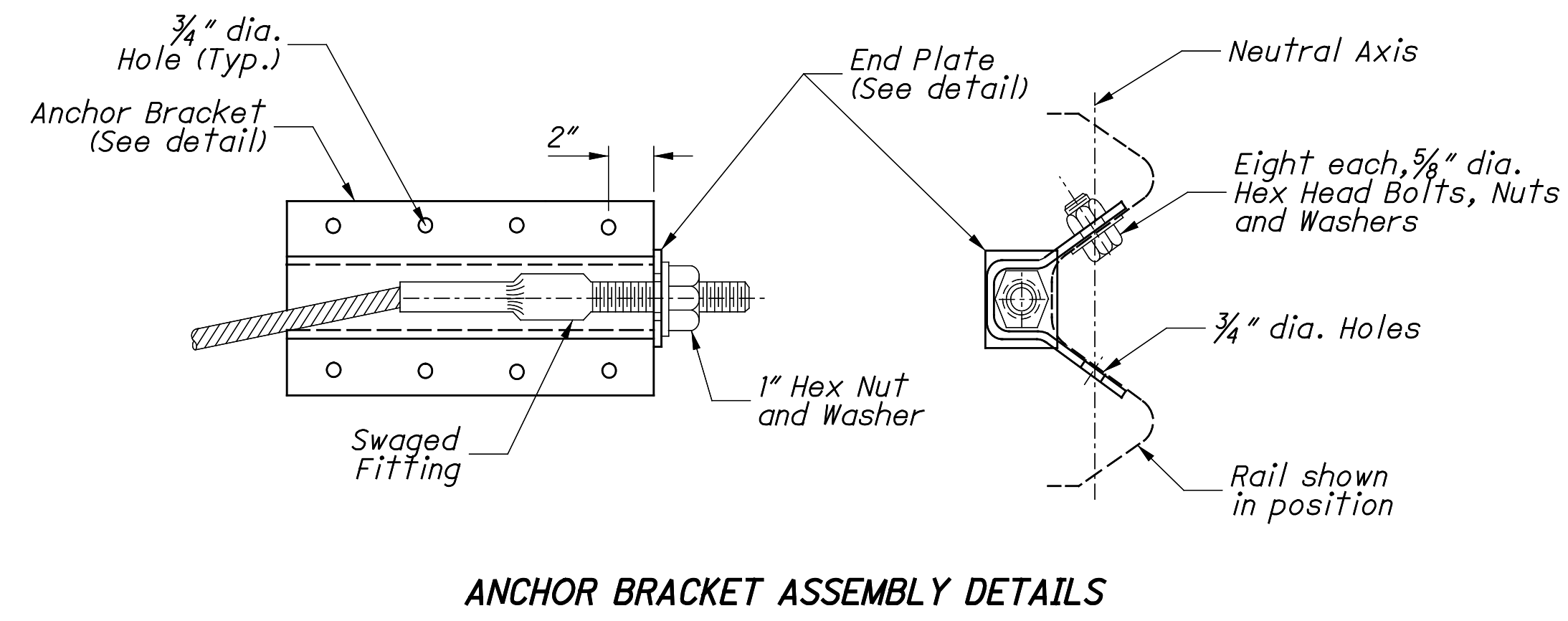
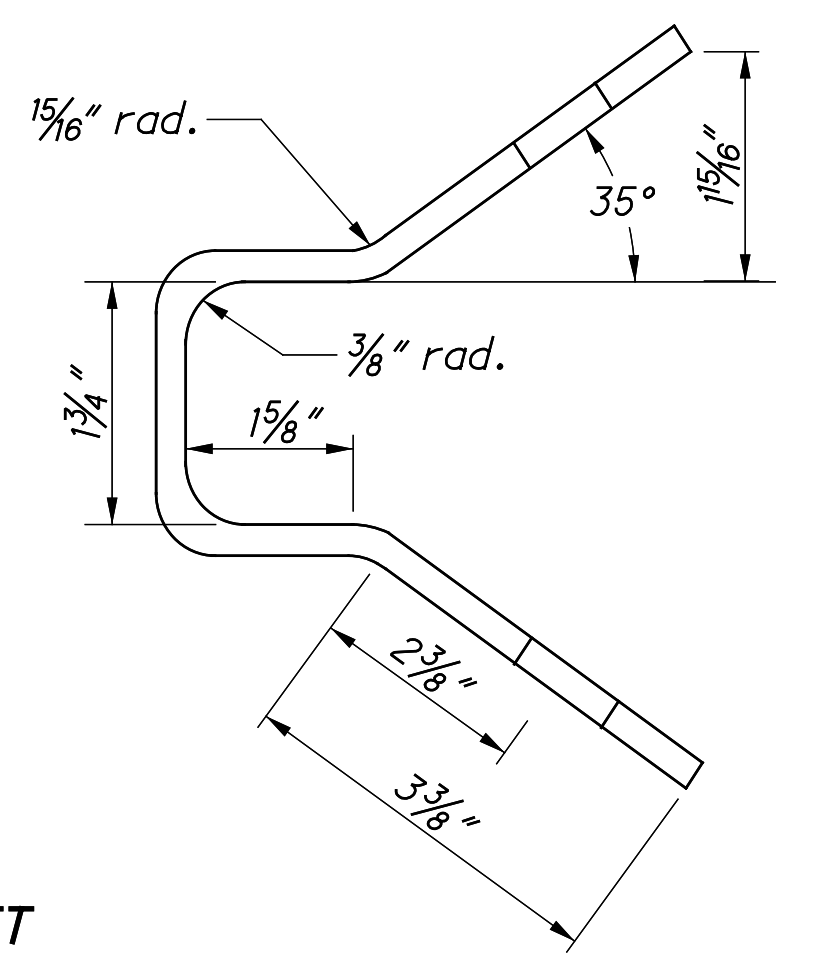
STEEL GROUND FOUNDATION TUBE



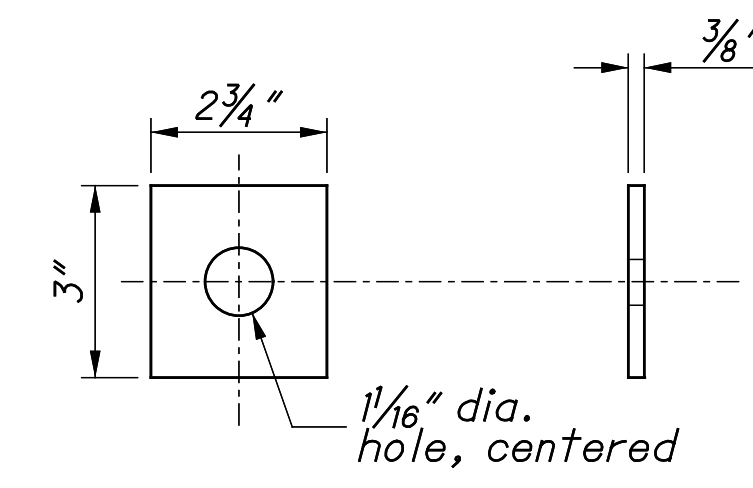
STANDARD SWAGED FITTING AND STUD
CABLE ANCHOR



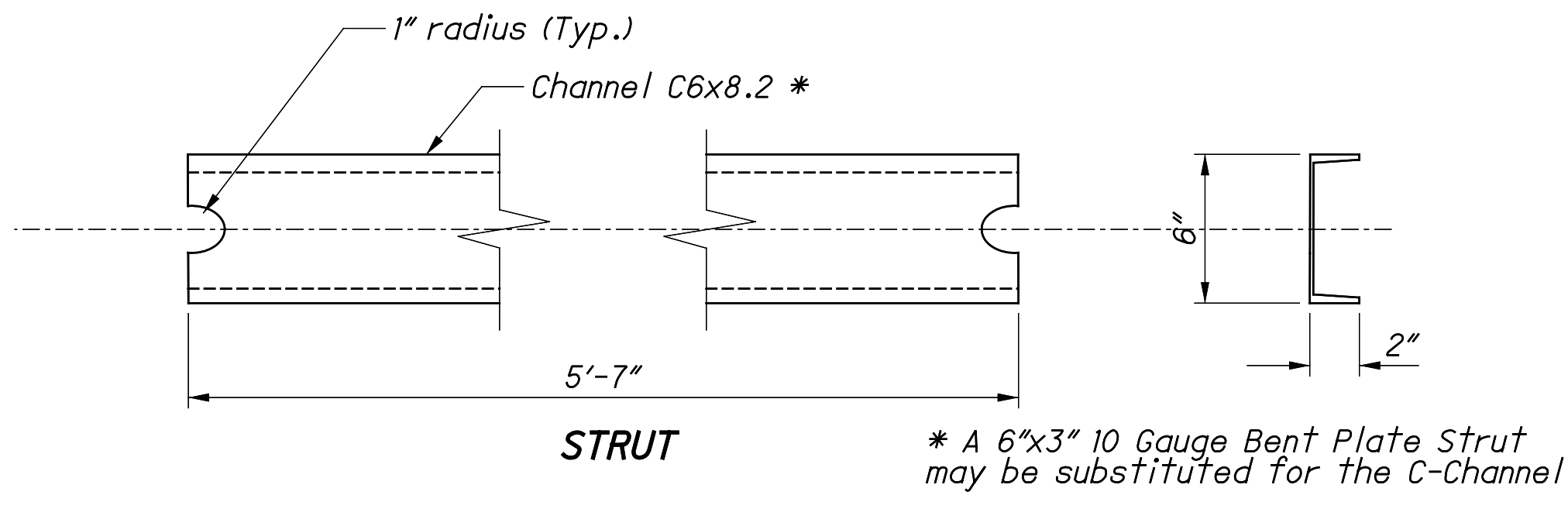
ANCHOR BRACKET



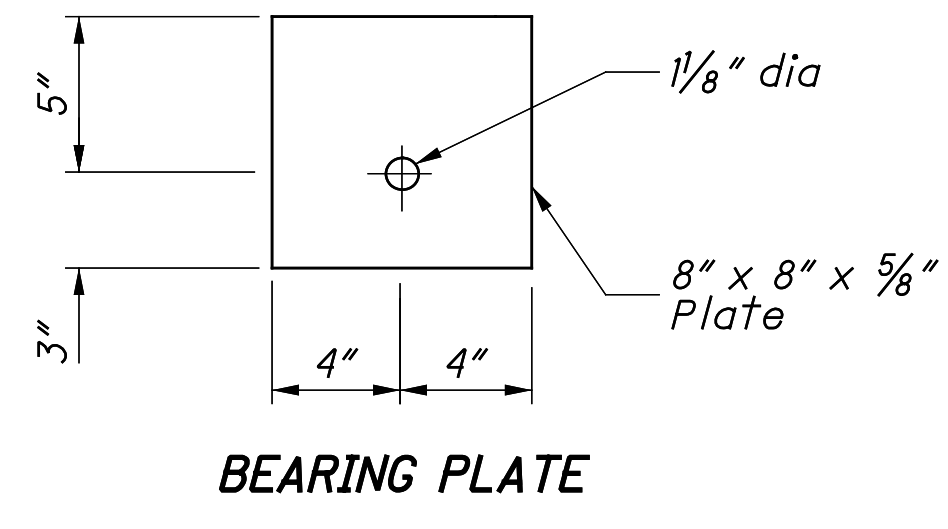
ANCHOR BRACKET ASSEMBLY DETAILS



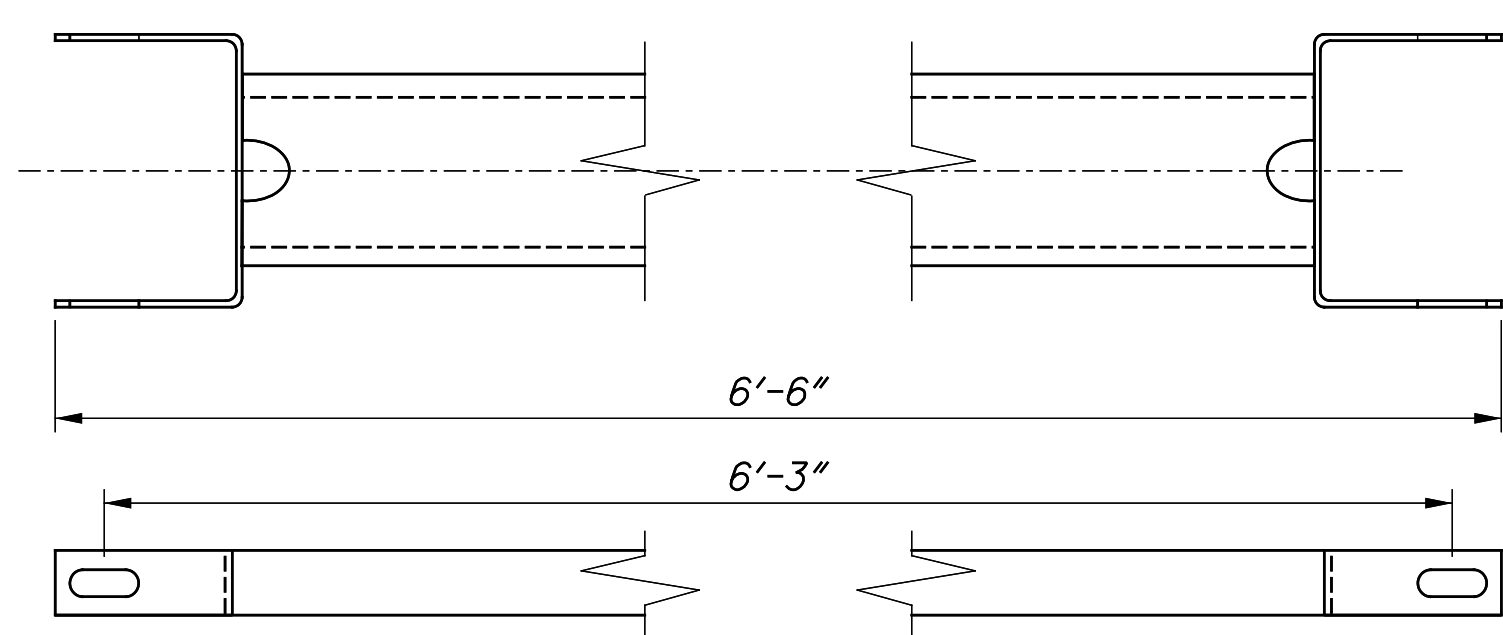
END PLATE



STRUT

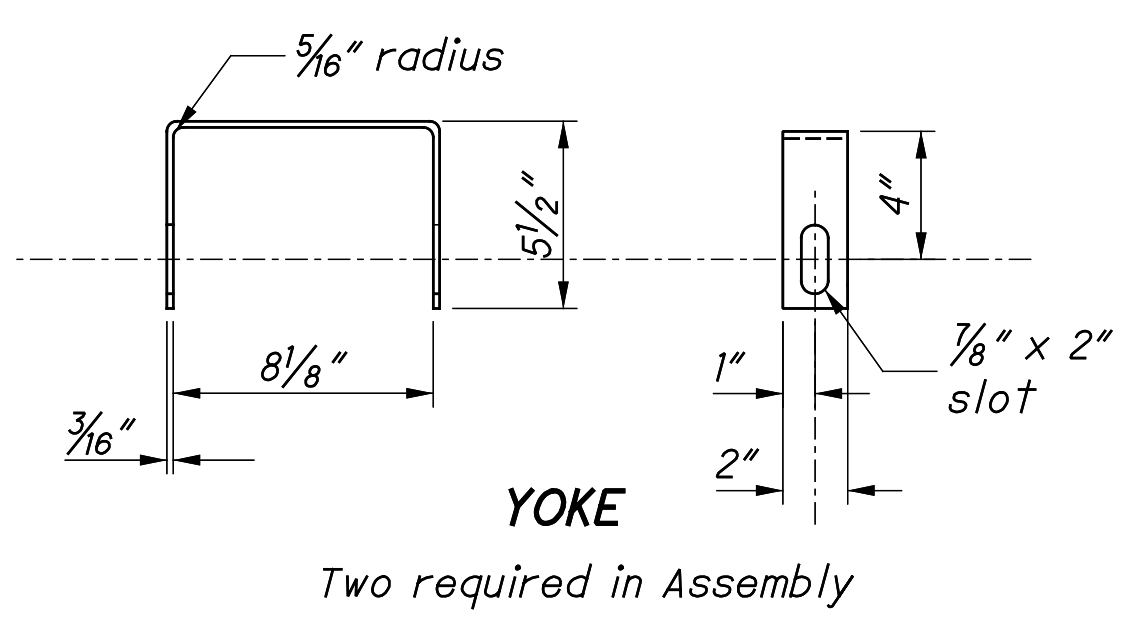


BEARING PLATE



Channel legs shown down. For opposite hand, install Channel legs up.

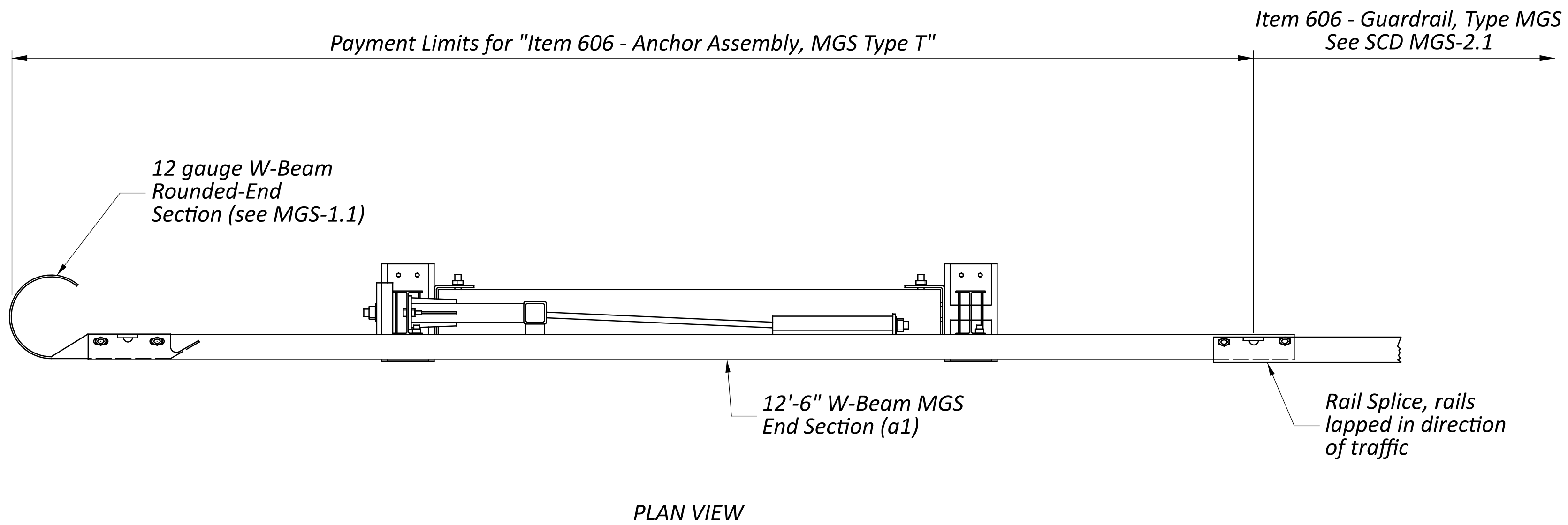
STRUT AND YOKE ASSEMBLY



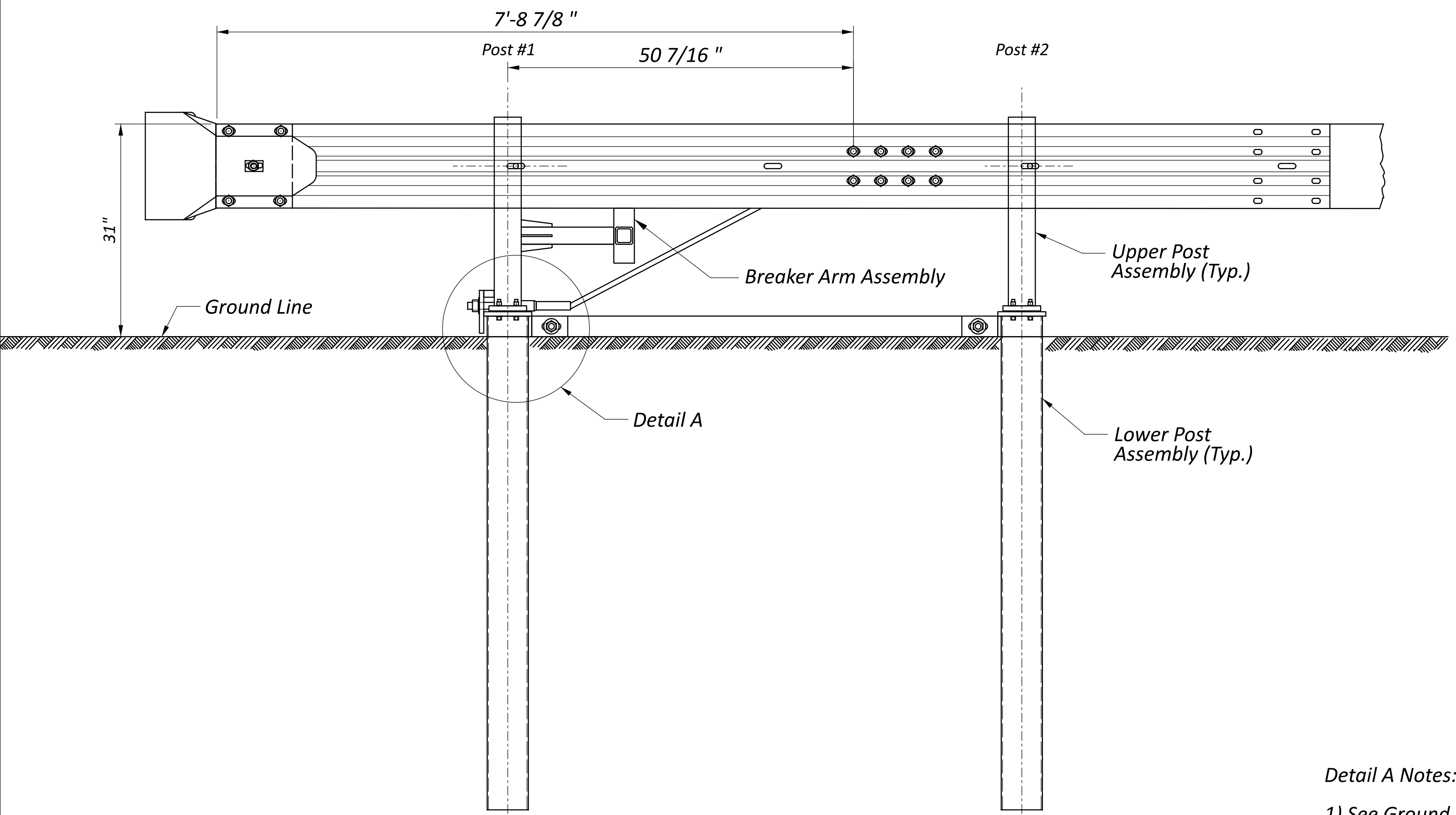
YOKE

Two required in Assembly

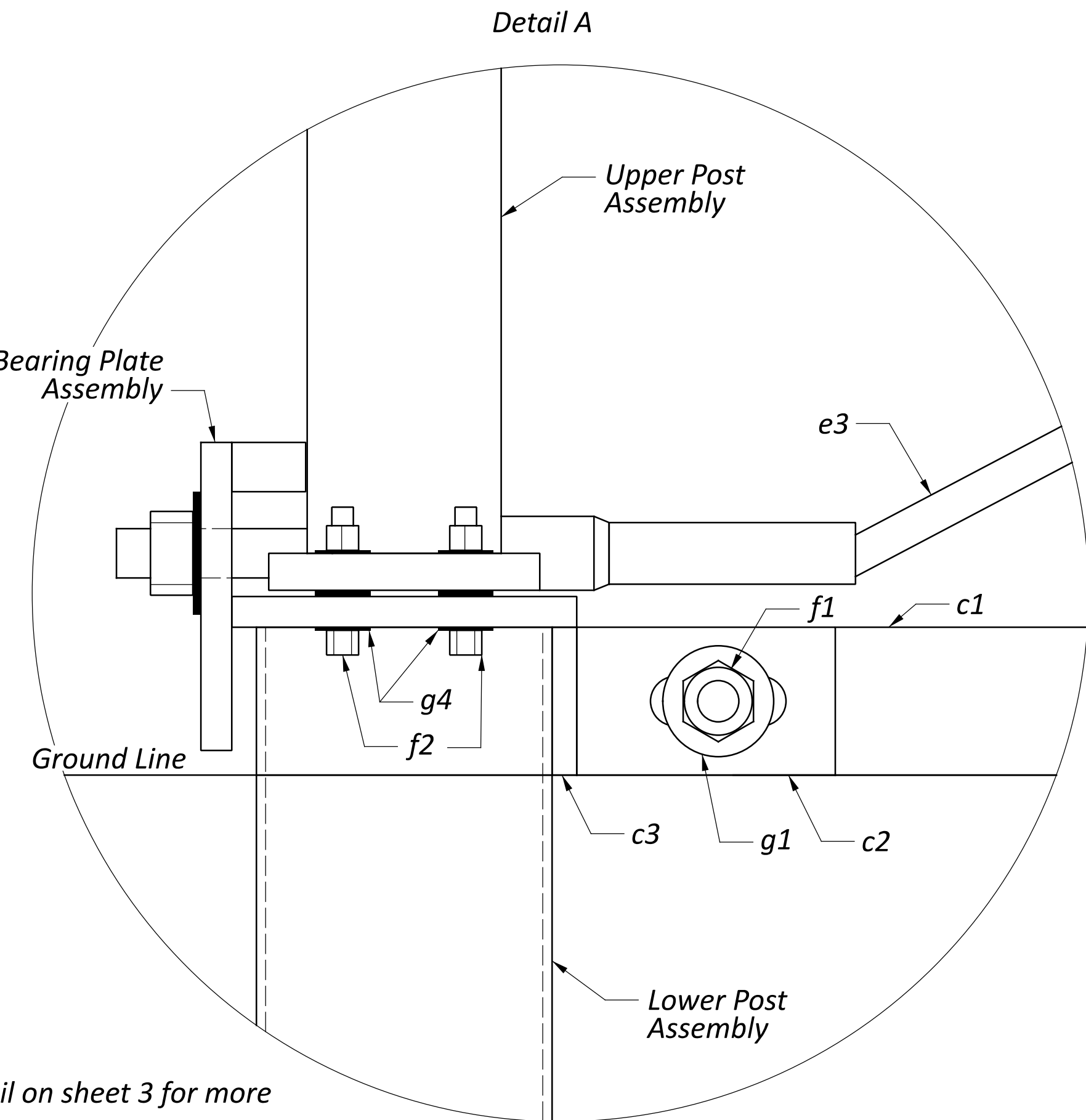




PLAN VIEW



ELEVATION VIEW



Detail A Notes:

- 1) See Ground Strut Connection Detail on sheet 3 for more information.
- 2) Part c3 is a spacer between part c2 and the lower post assembly.

NOTES

APPLICATION: Use Type T Anchor Assemblies on the trailing end of guardrail runs, located outside of the clear zone of opposing traffic. The assembly is 12'-6" long; post #1 of the Type T shall be set 25' beyond the trailing end of the hazard.

For termination requirements at driveways, and side road approaches and Terminals at Structures, see Location & Design Manual, Volume 1, Figure 603-3.

MATERIALS: See SCD MGS-1.1 for details for the Rounded W-Beam End Section. See sheet 6 for a bill of materials.

PAYMENT: All equipment, labor and materials, including the W-Beam Rounded End Section and the W-Beam Terminal Rail Section for the 12'-6" anchor assembly shall be included in the unit price bid for Item 606 - Anchor Assembly, MGS Type T, Each.

REVISIONS
07-19-2013 01-17-2025 07-18-2025
STDS ENGINEER A. Holloway

STATE OF OHIO OFFICE OF ROADWAY ENGINEERING ADMINISTRATOR
Adam Koenig

STANDARD ROADWAY CONSTRUCTION DRAWING
 MIDWEST GUARDRAIL SYSTEM
 TYPE T ANCHOR ASSEMBLY (STEEL POST SYSTEM)

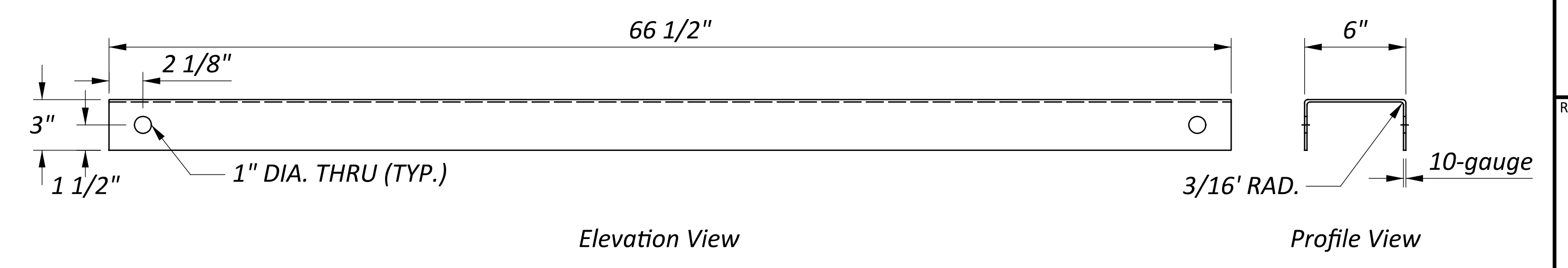
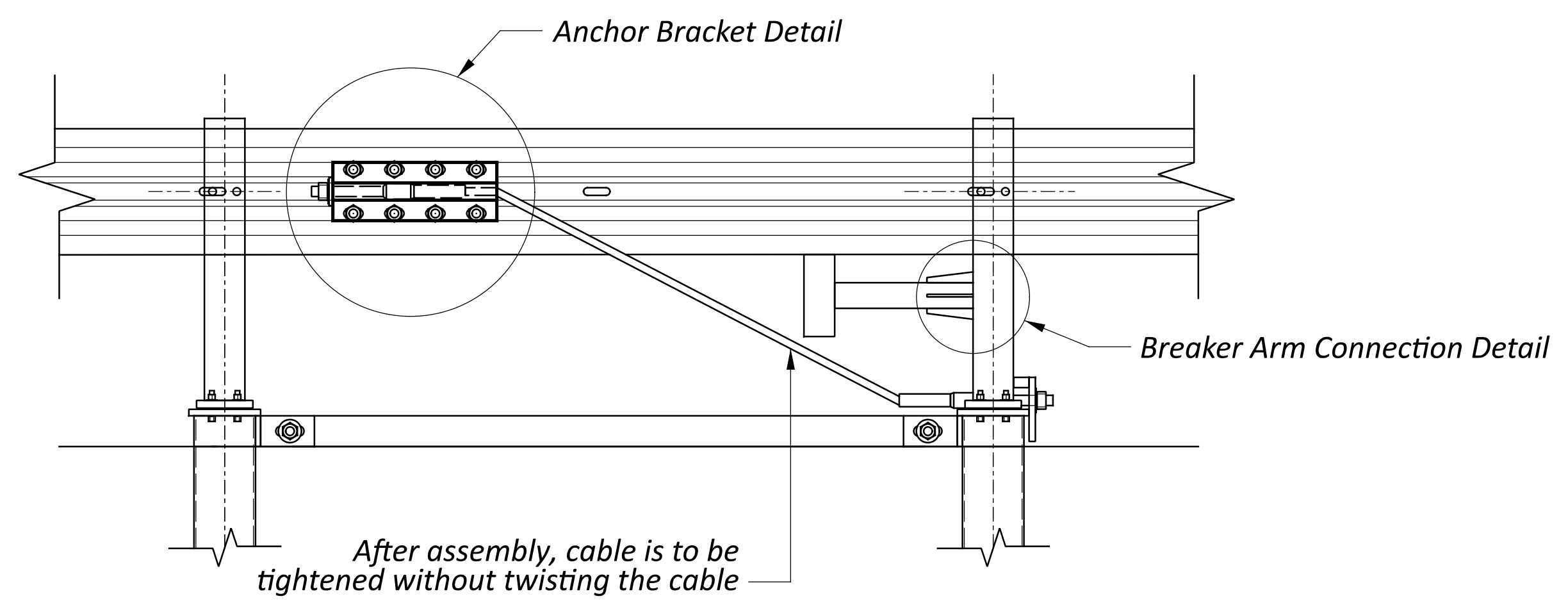
DESIGN AGENCY



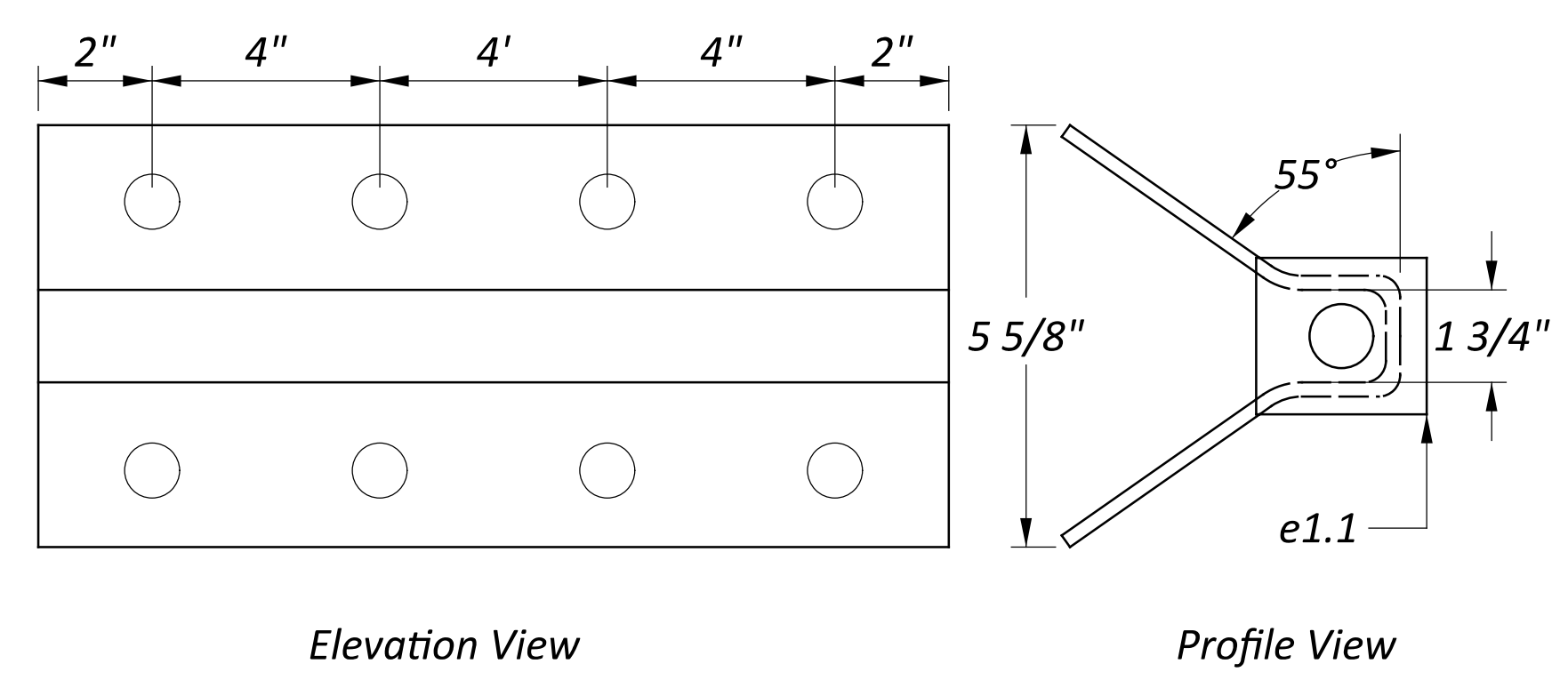
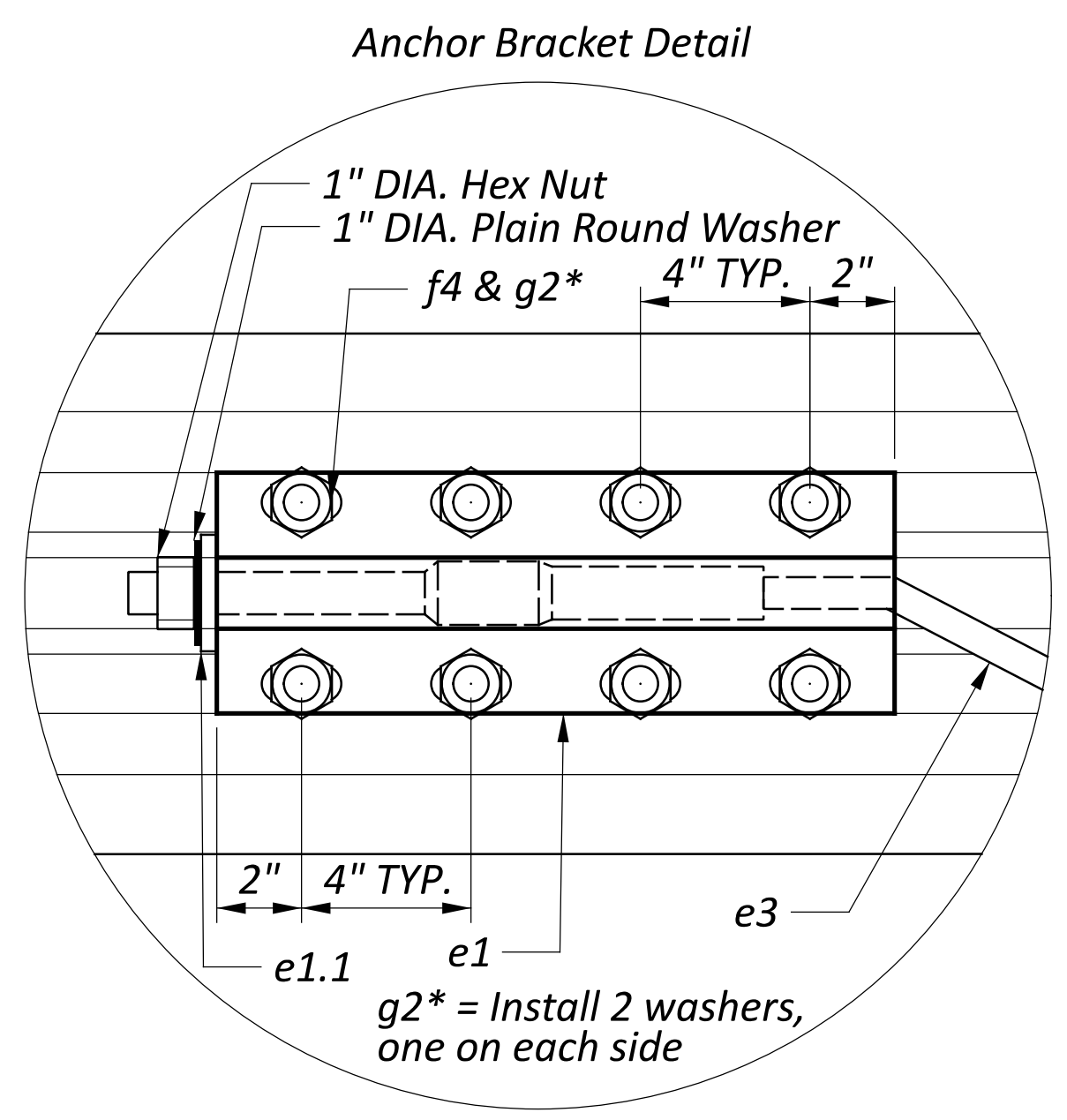
SCD NUMBER
 MGS-4.2

SHEET TOTAL
 P.3 7

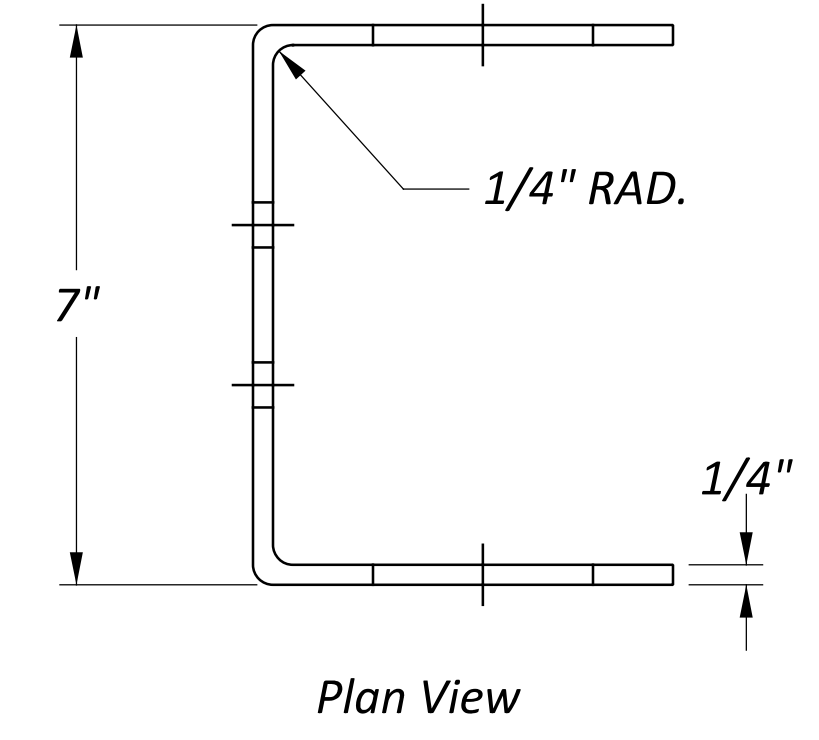
THIS DRAWING REPLACES MGS-4.2 DATED 1-17-2025.



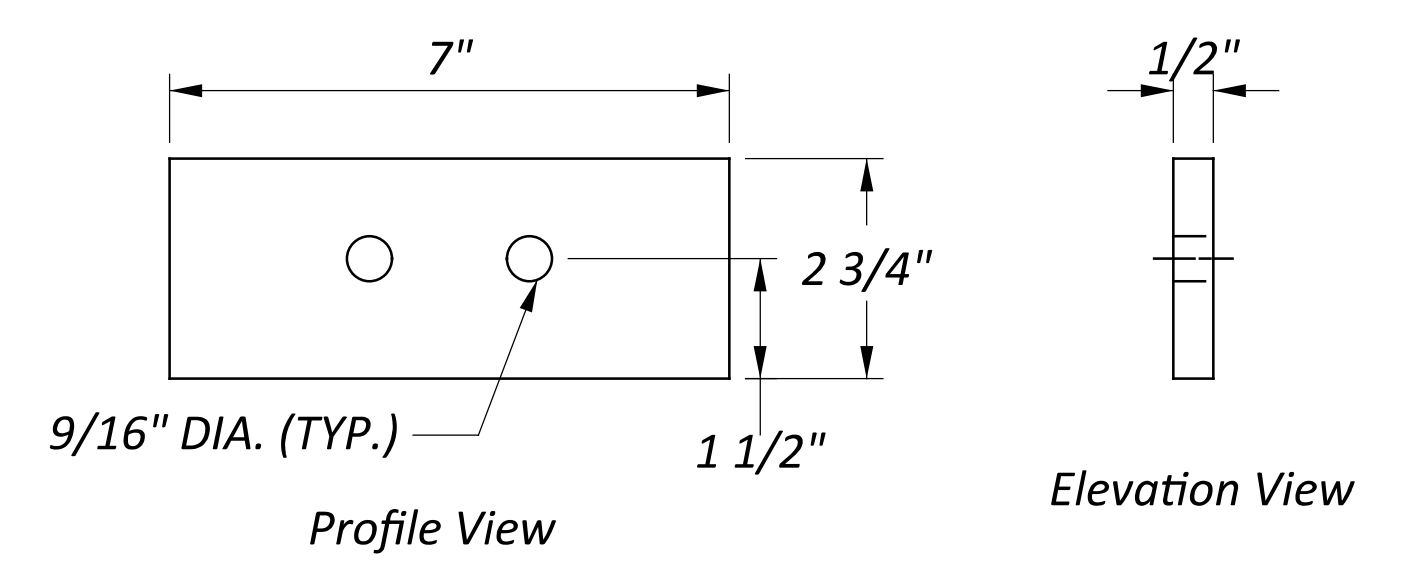
Ground Strut Channel (c1)



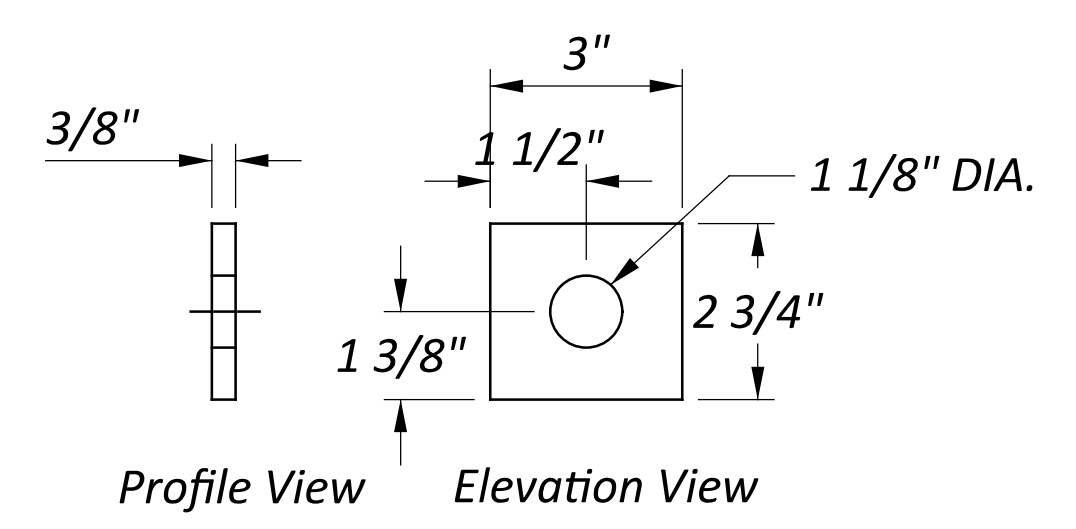
Anchor Bracket (e1)



17" x 3" x 1/4" Bent Steel Plate (c2)

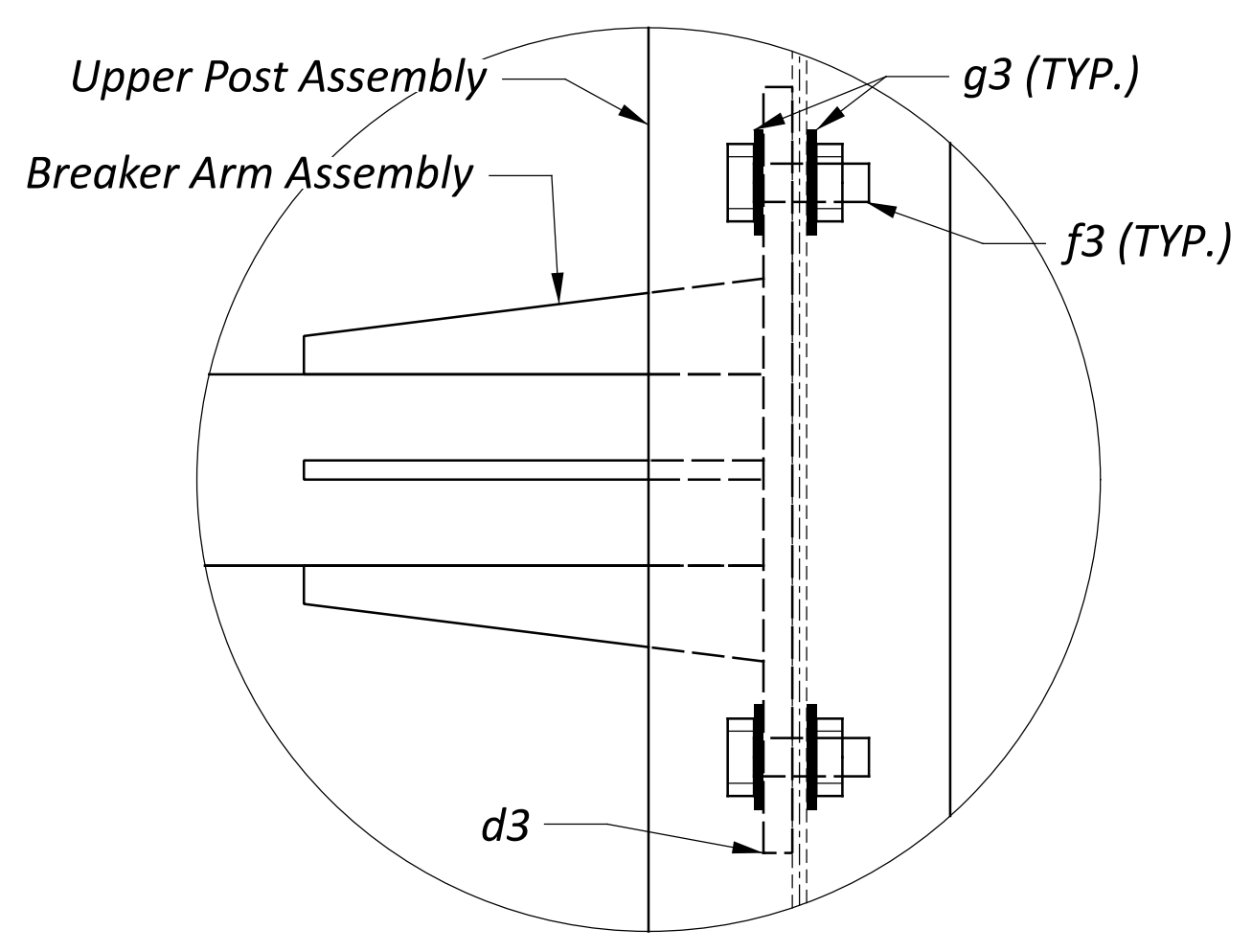


7" x 2 3/4" x 1/2" Steel Plate (c3)

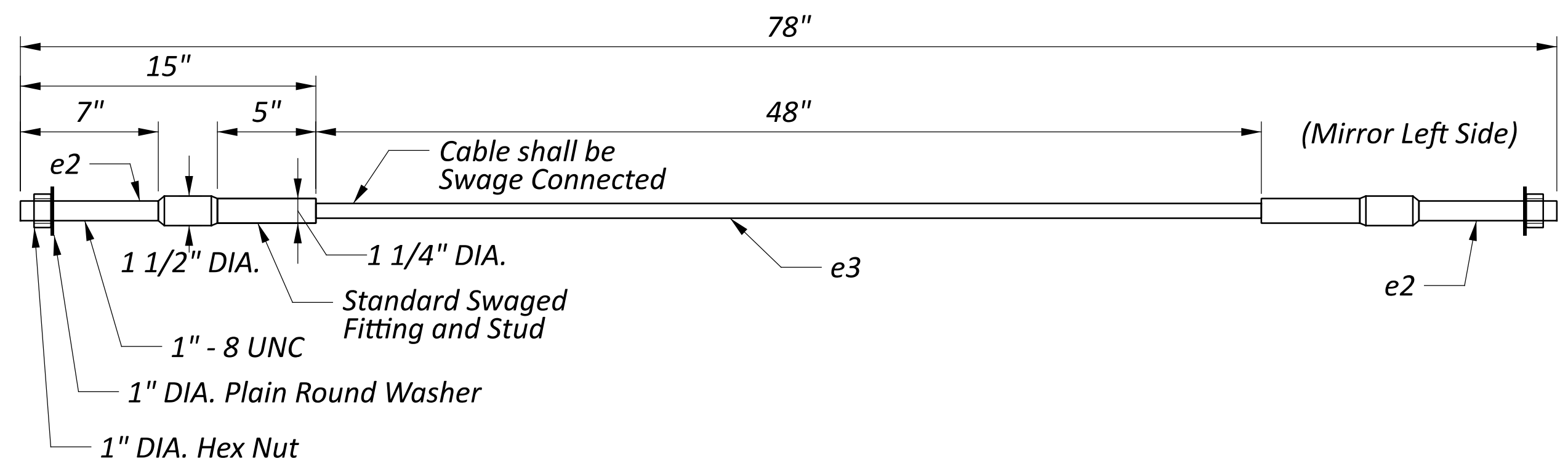
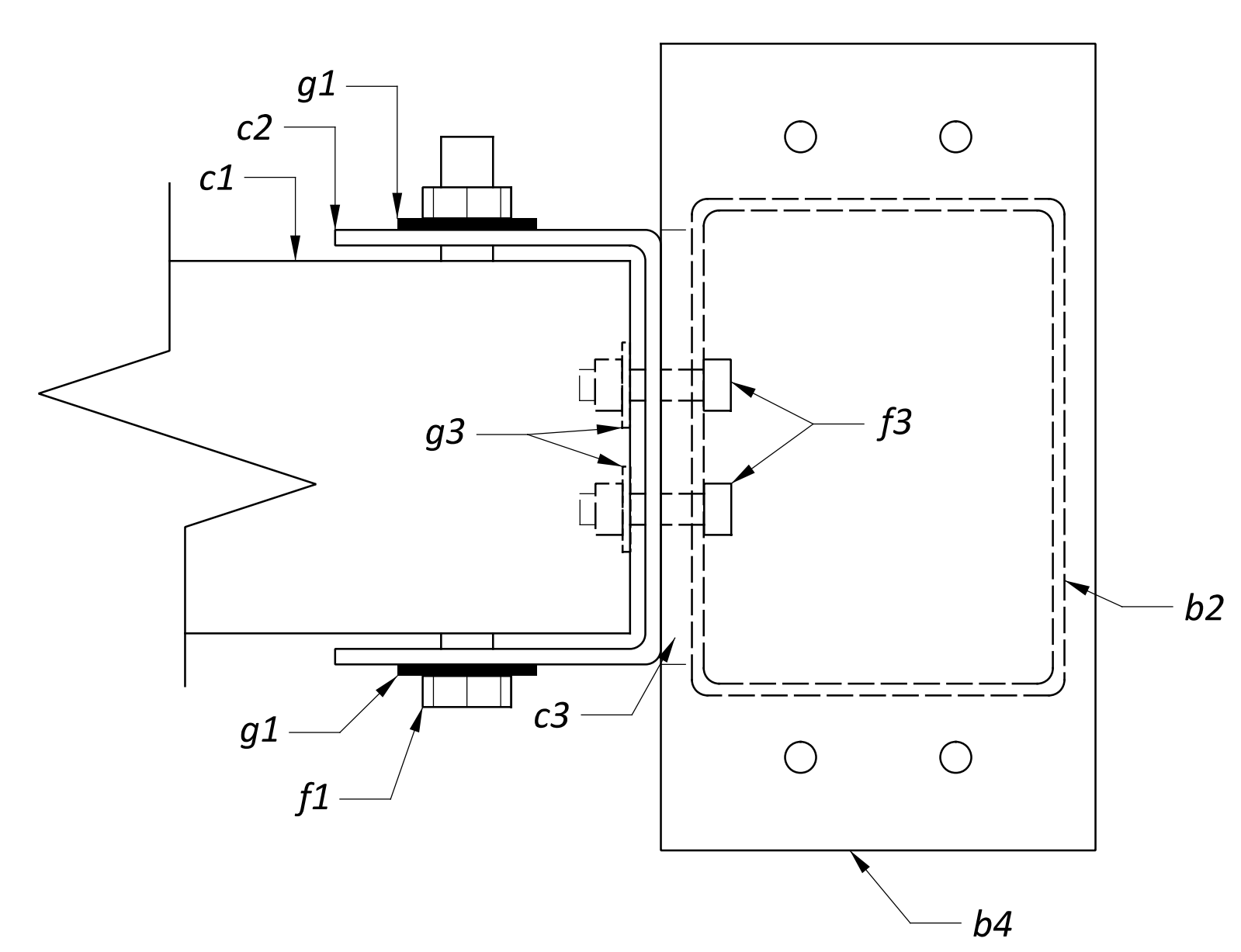


Anchor Bracket End Plate (e1.1)

Breaker Arm Connection Detail



Ground Strut Connection Detail

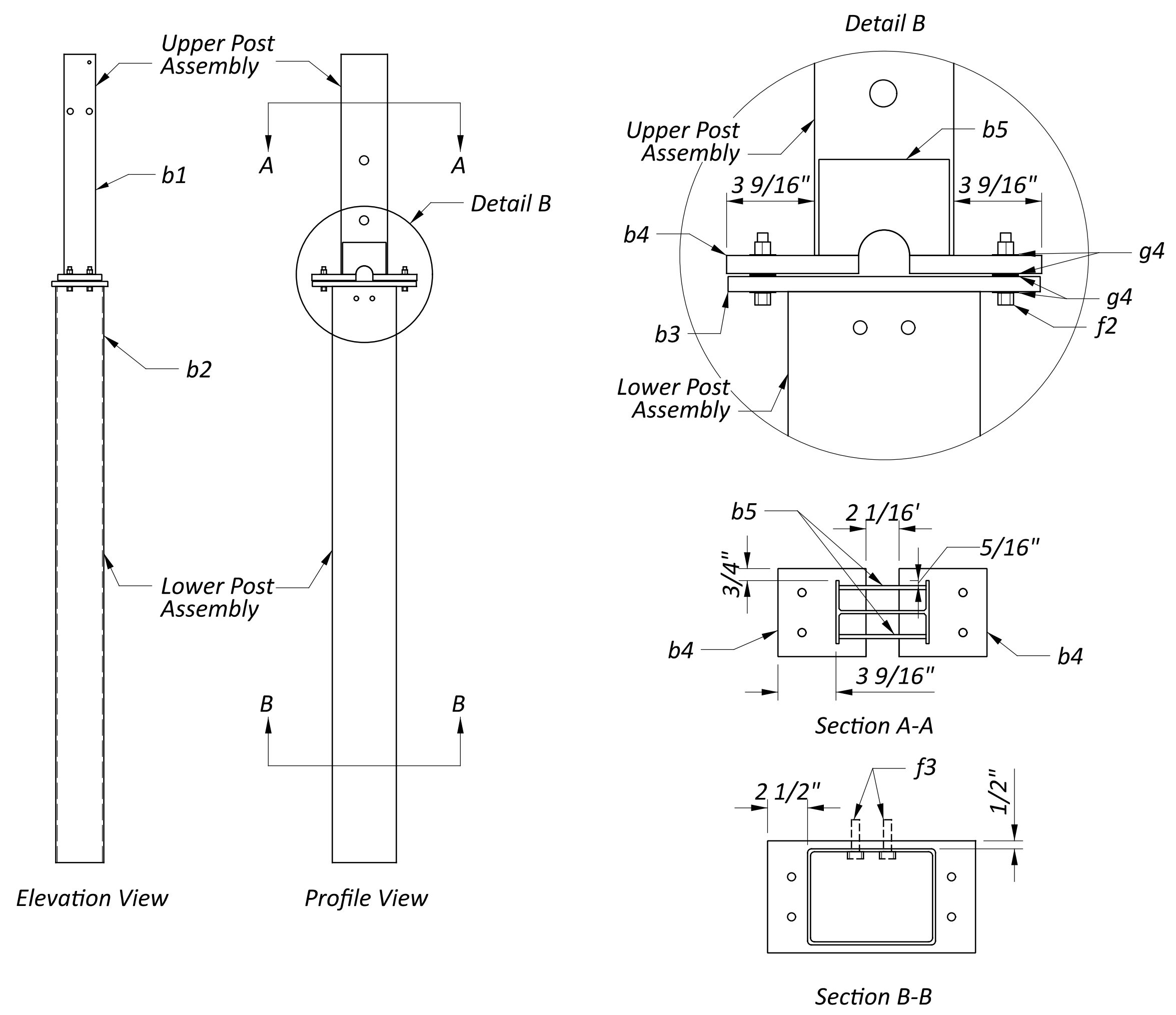


Cable Assembly (e2 & e3)

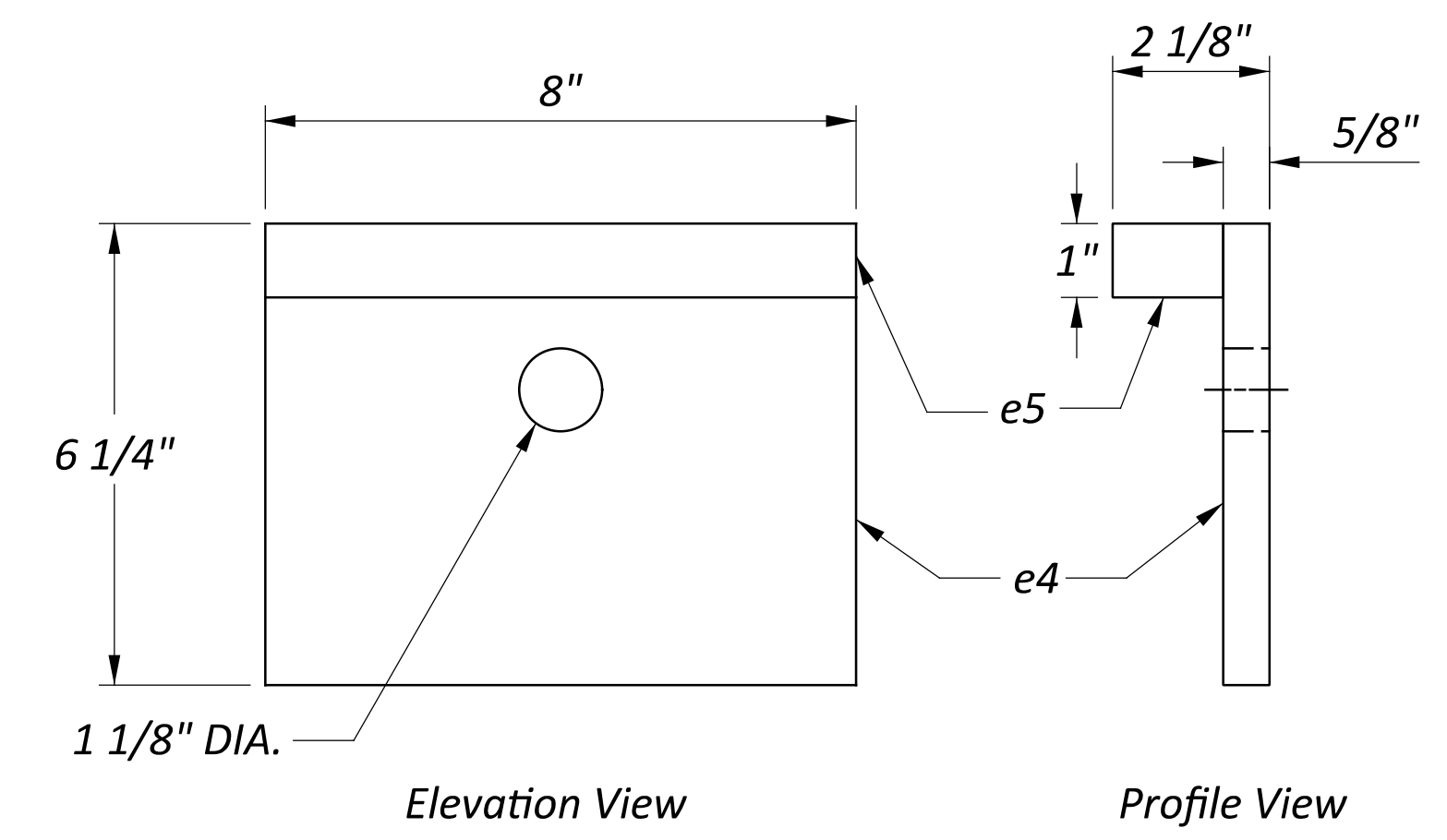
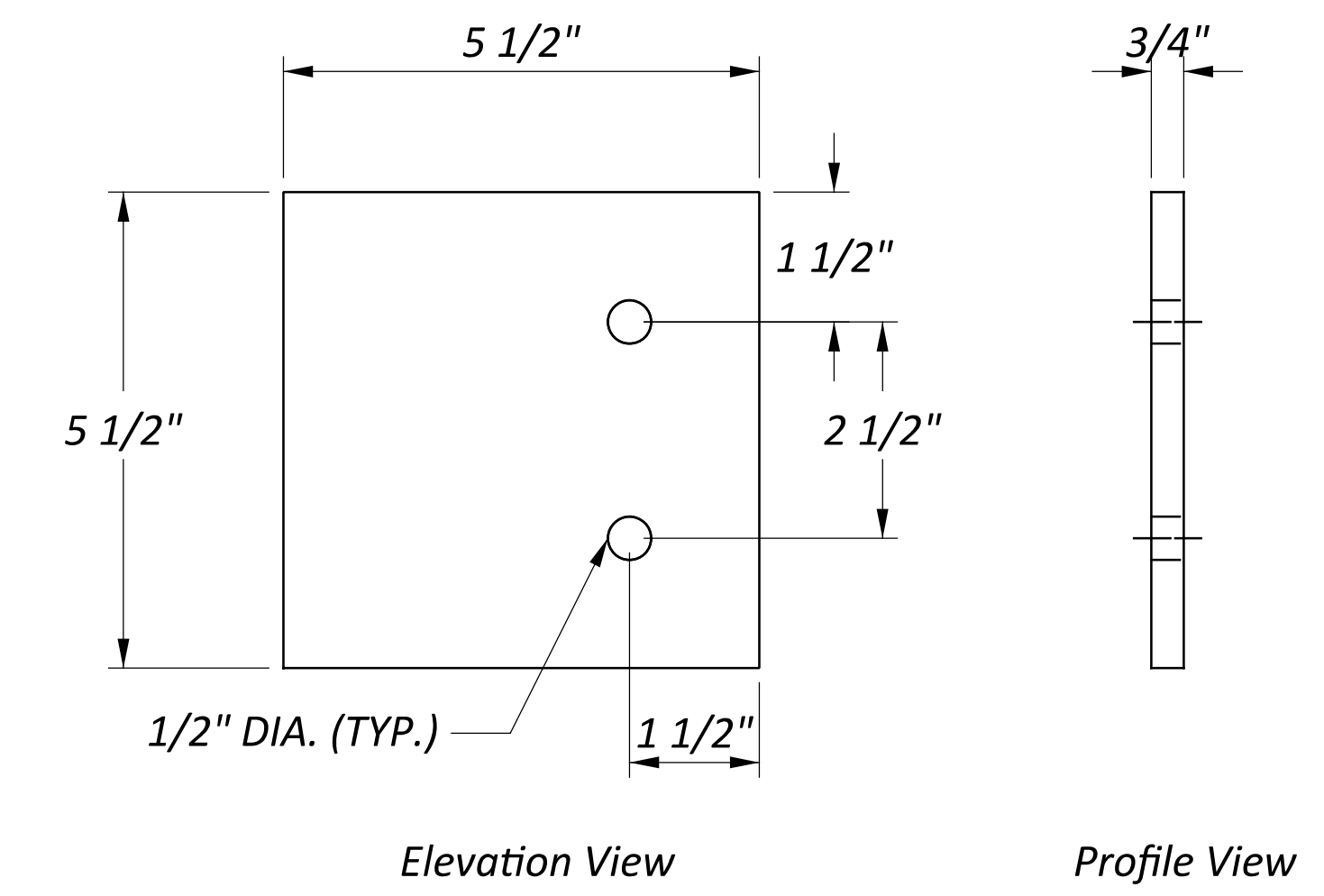
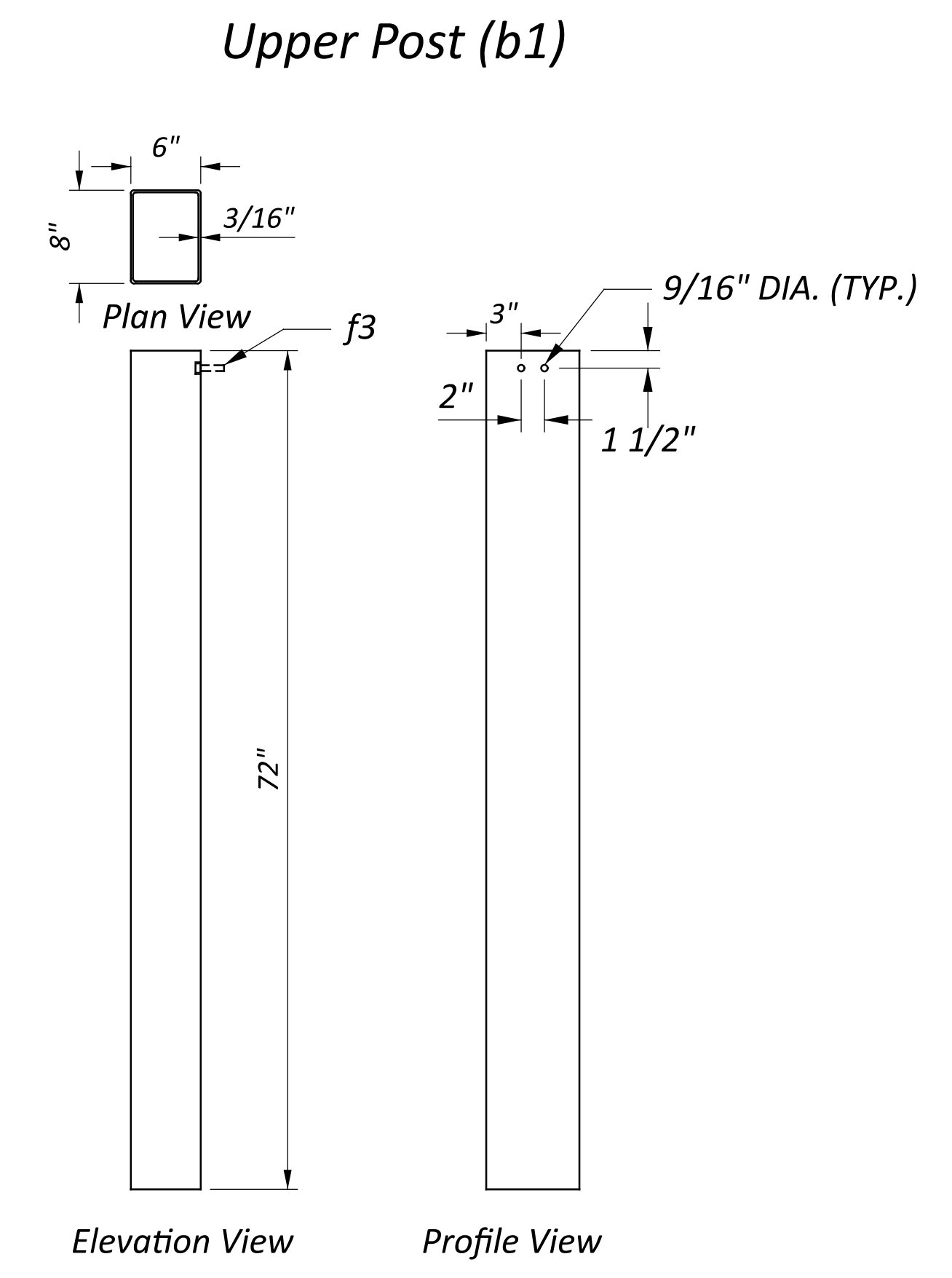
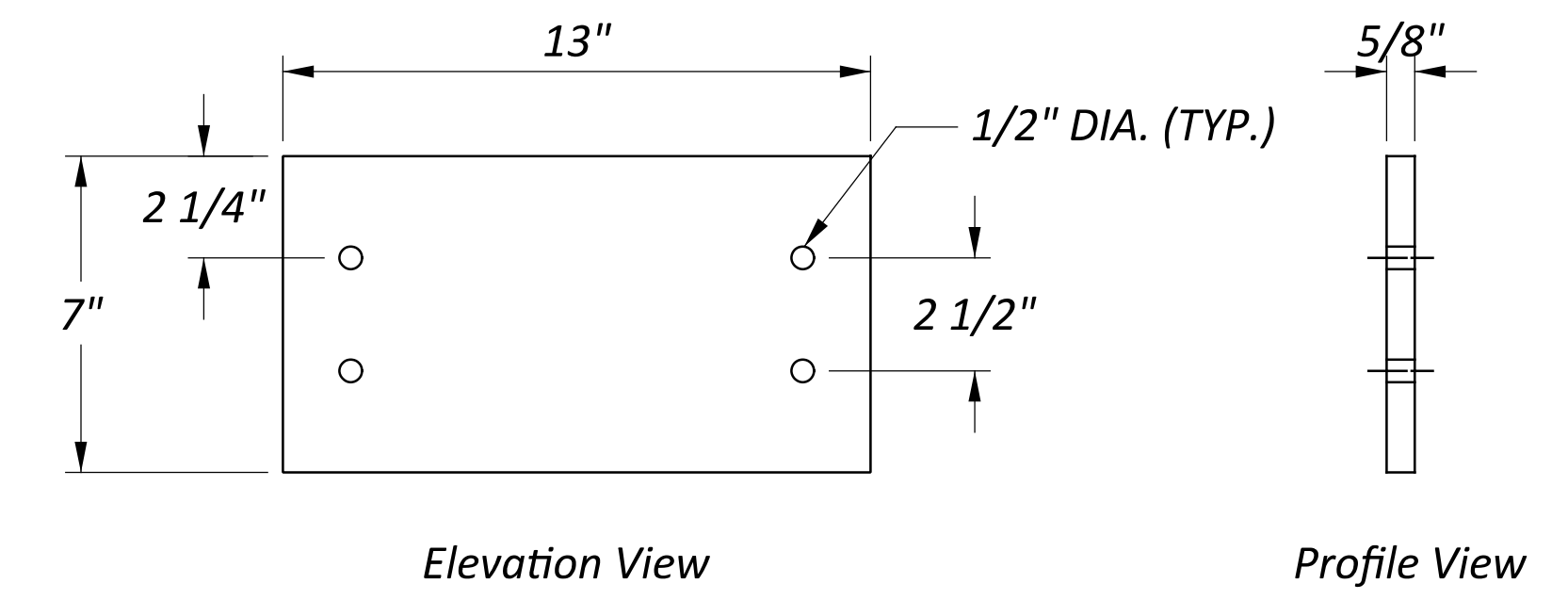
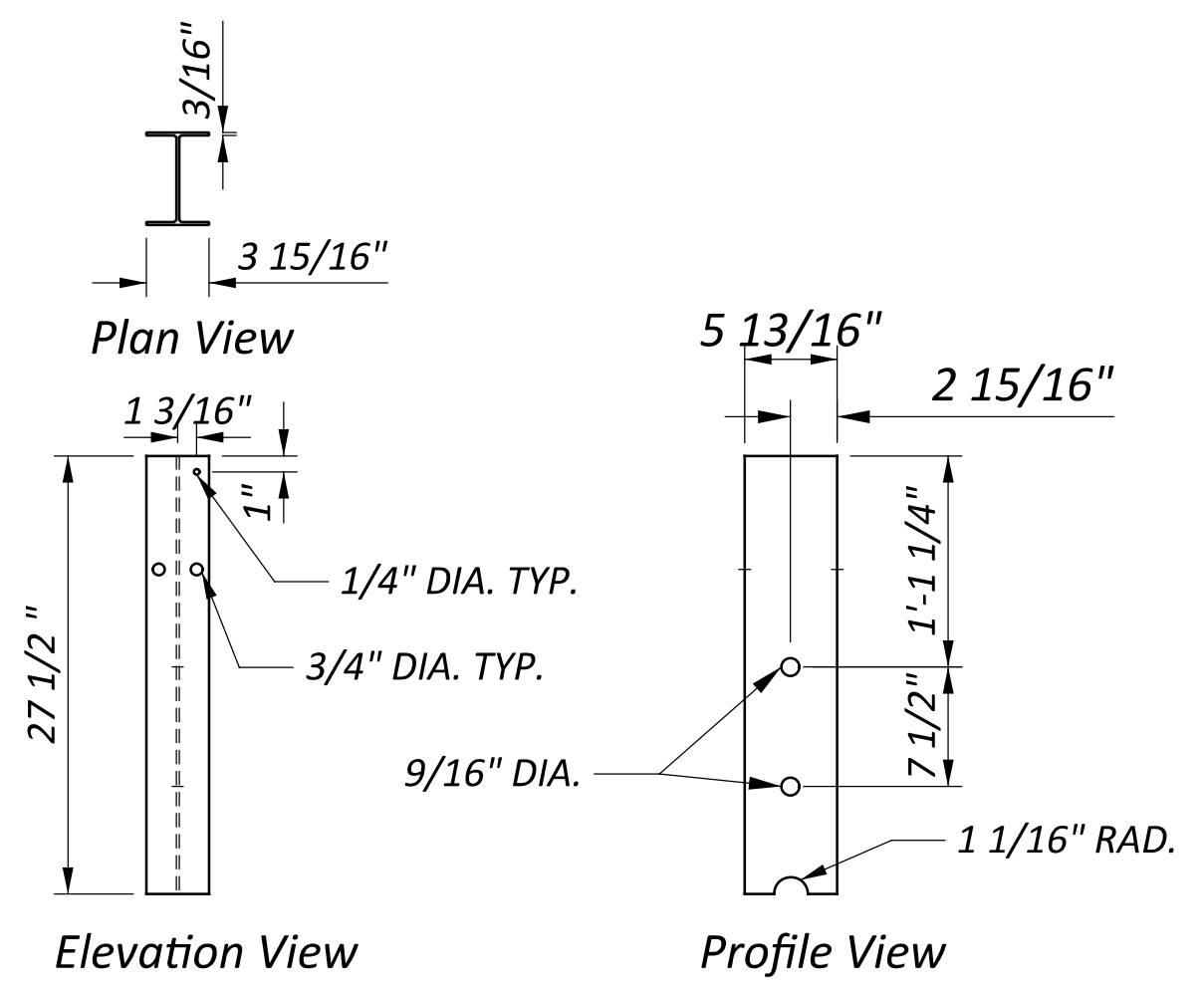
MGS-4.2



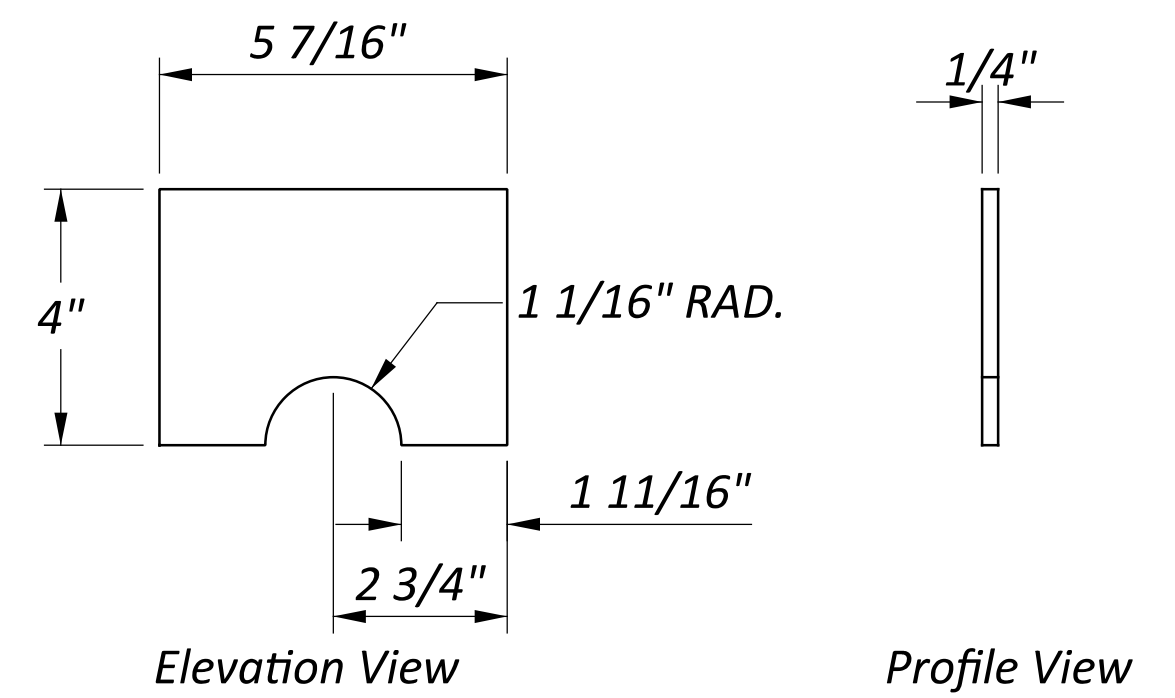
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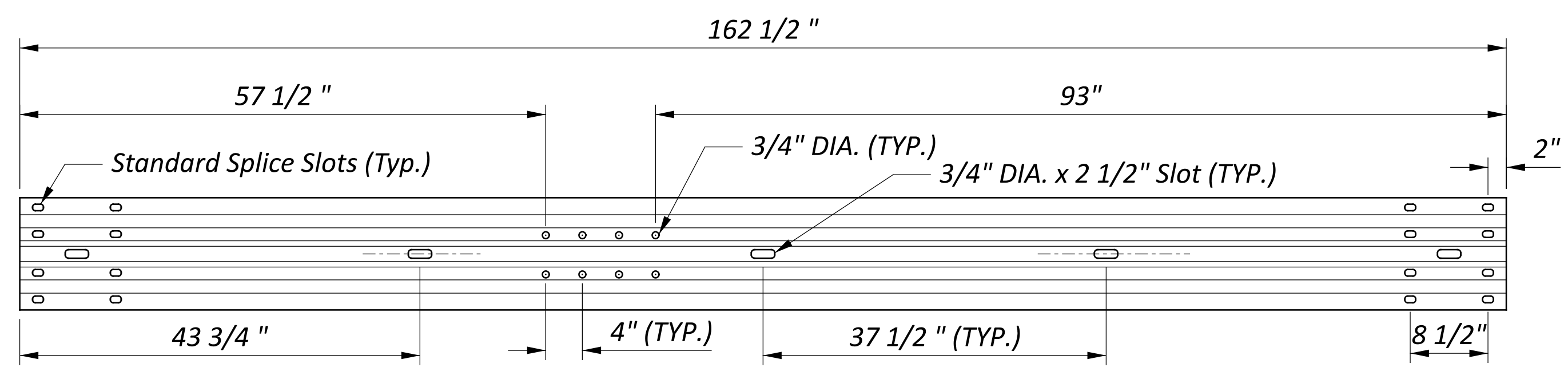
- Notes:
- 1) Connection hardware hidden in Section A-A and Section B-B for clarity.
 - 2) Lower post assembly hidden in Section A-A for clarity.
 - 3) Vertical through-bolts (part f2) are to be torqued to approx. 60-75 ft-lb.



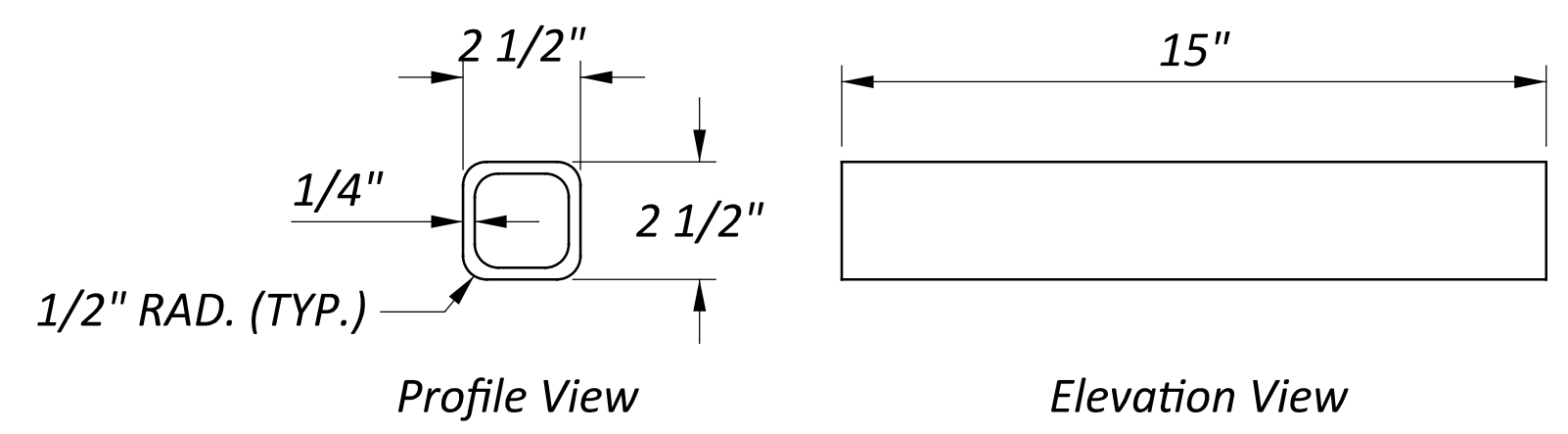
Foundation Tube (b2)



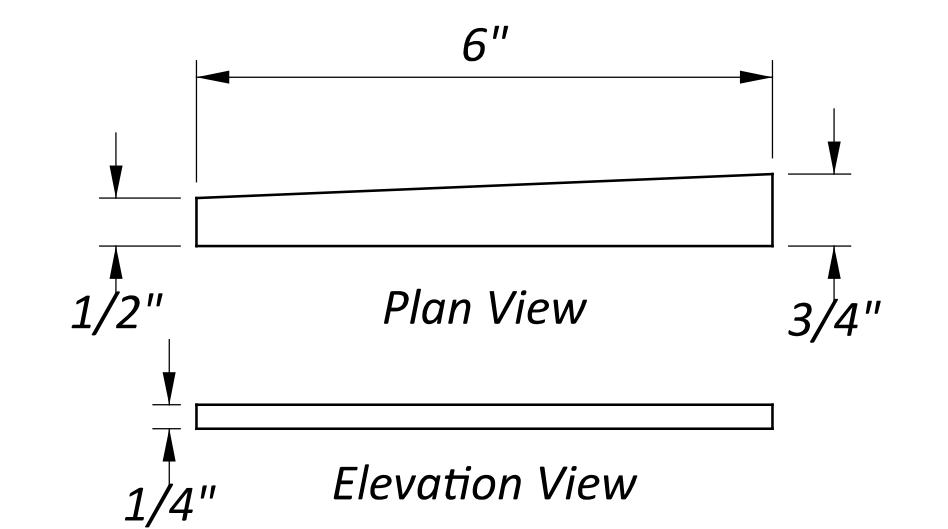
MGS-4.2



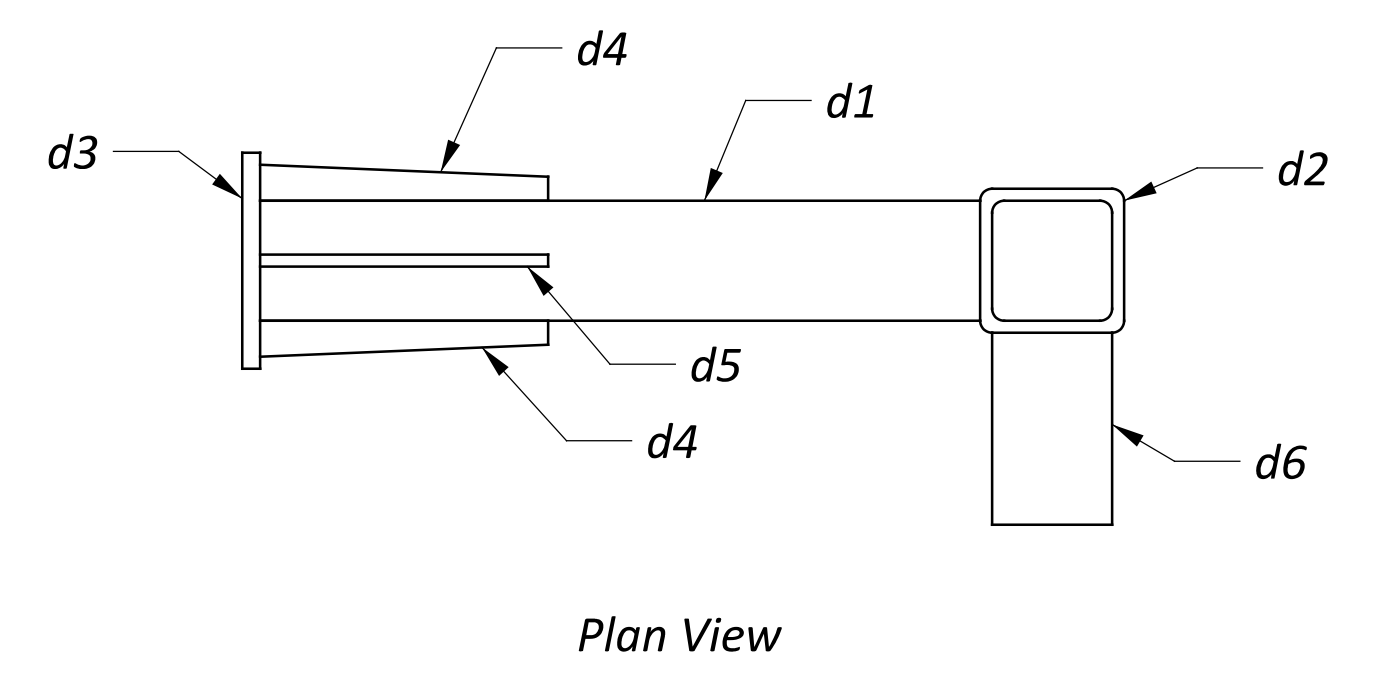
12'-6" W-Beam MGS End Section (a1)



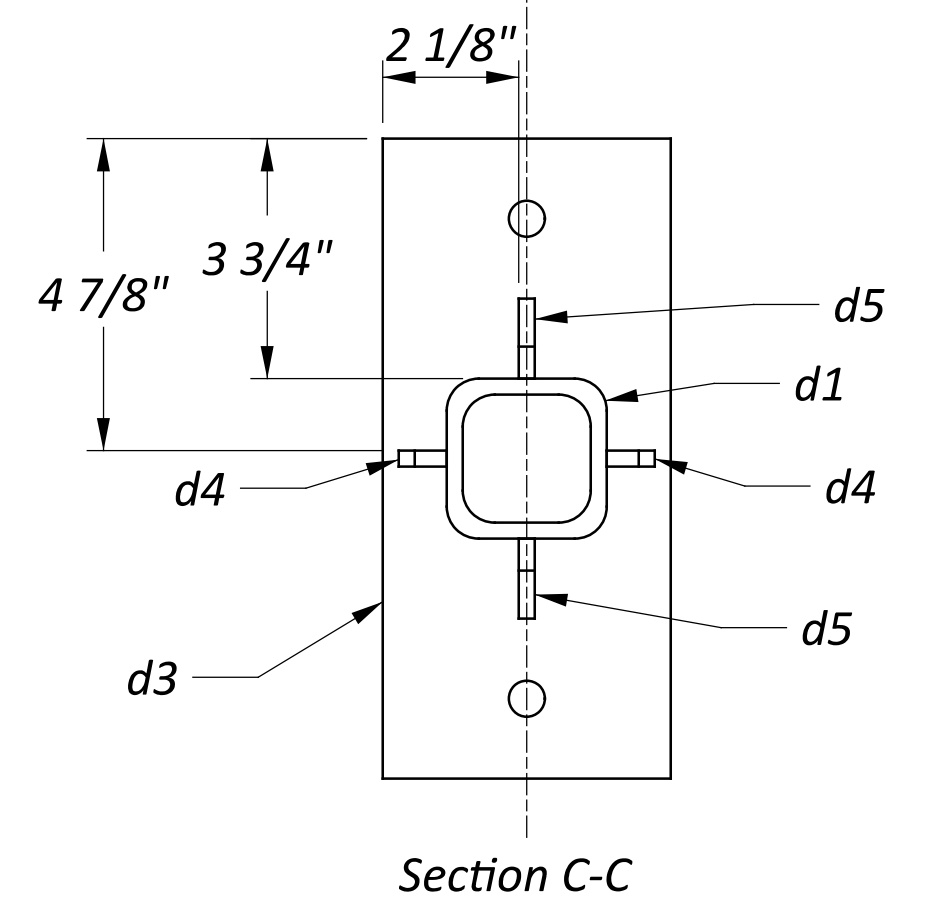
HSS 2 1/2" x 2 1/2" x 1/4",
15" Long Square Tube (d1)



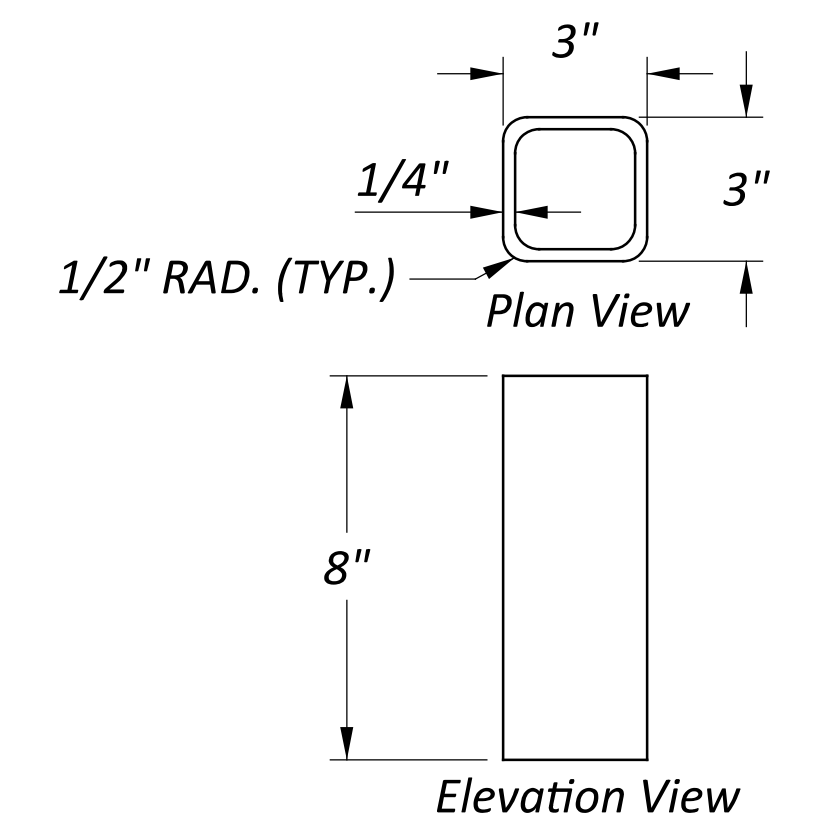
6" x 3/4" x 1/4" Gusset (d4)



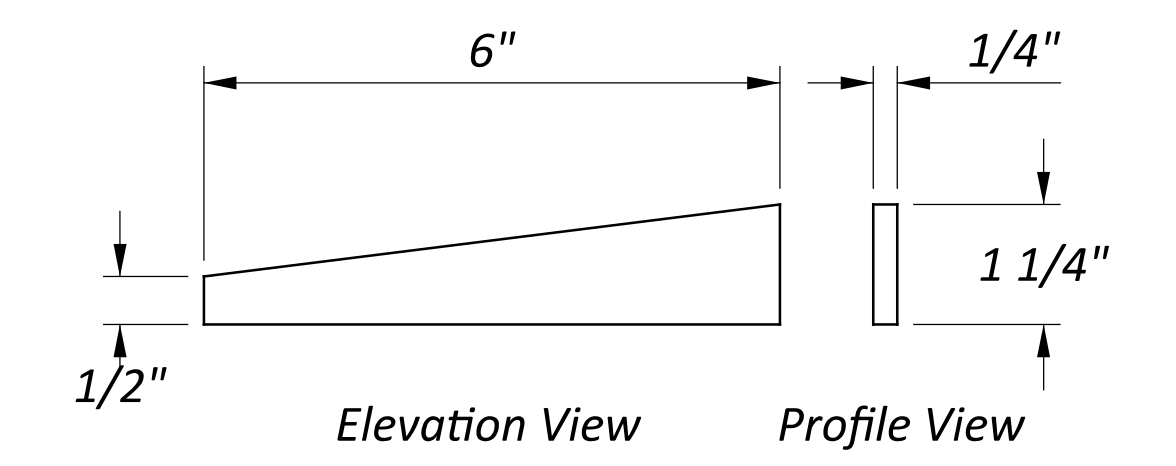
Plan View



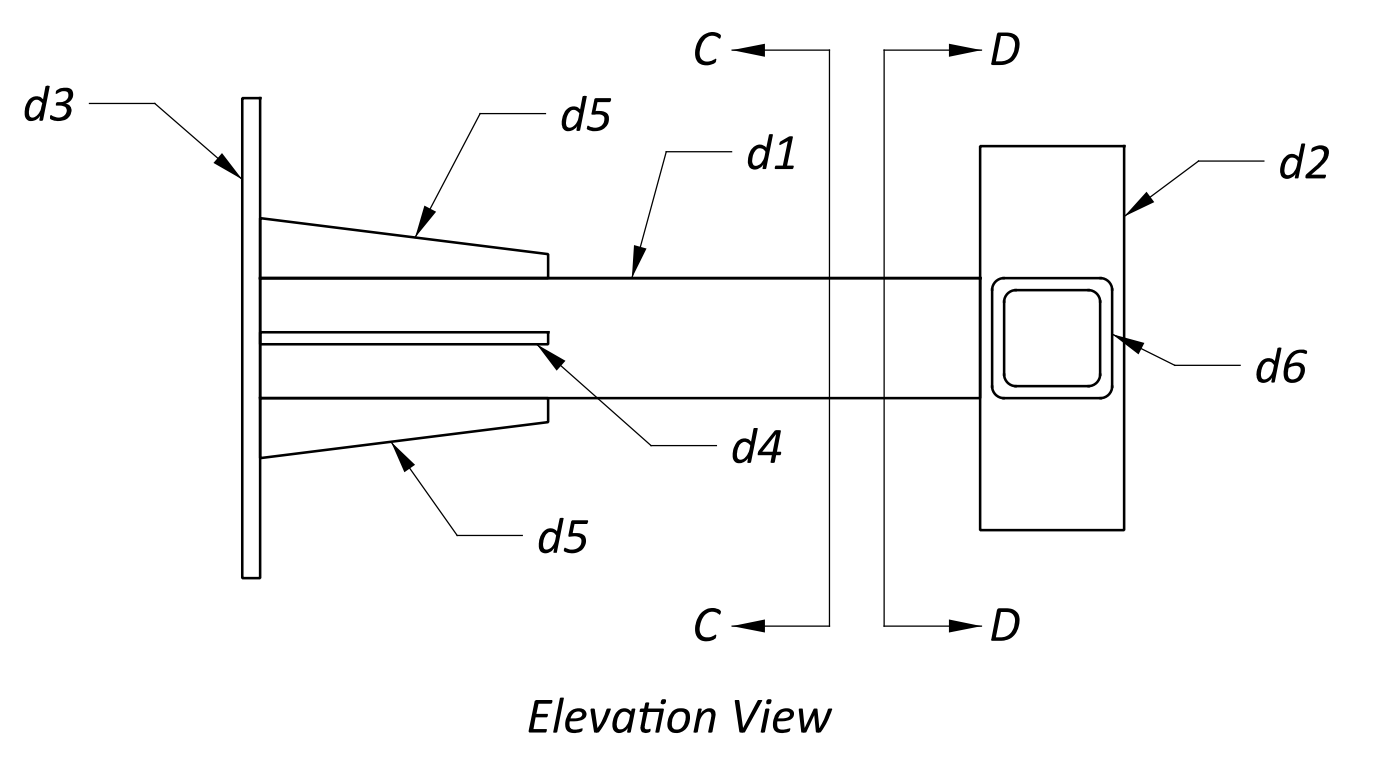
Section C-C



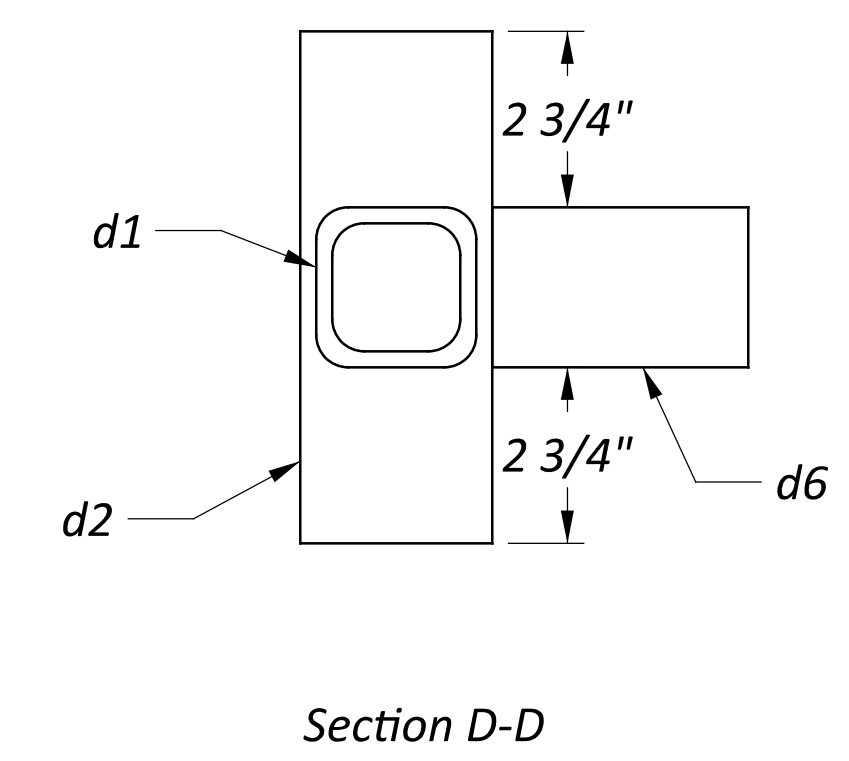
HSS 3" x 3" x 1/4",
8" Long Square Tube (d2)



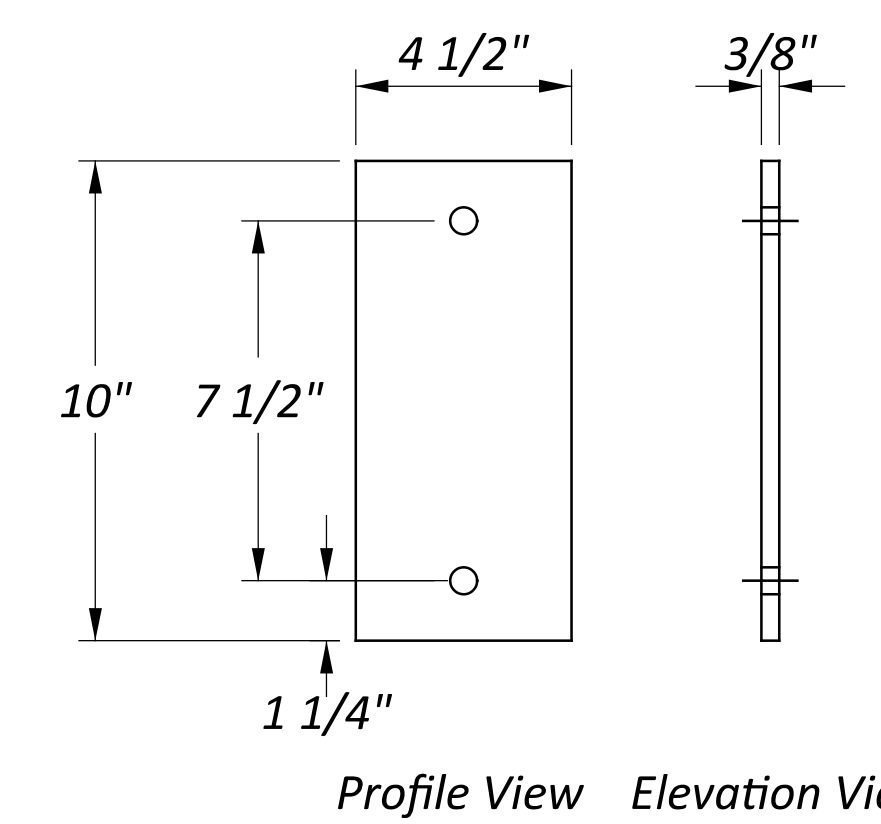
6" x 1 1/4" x 1/4" Gusset (d5)



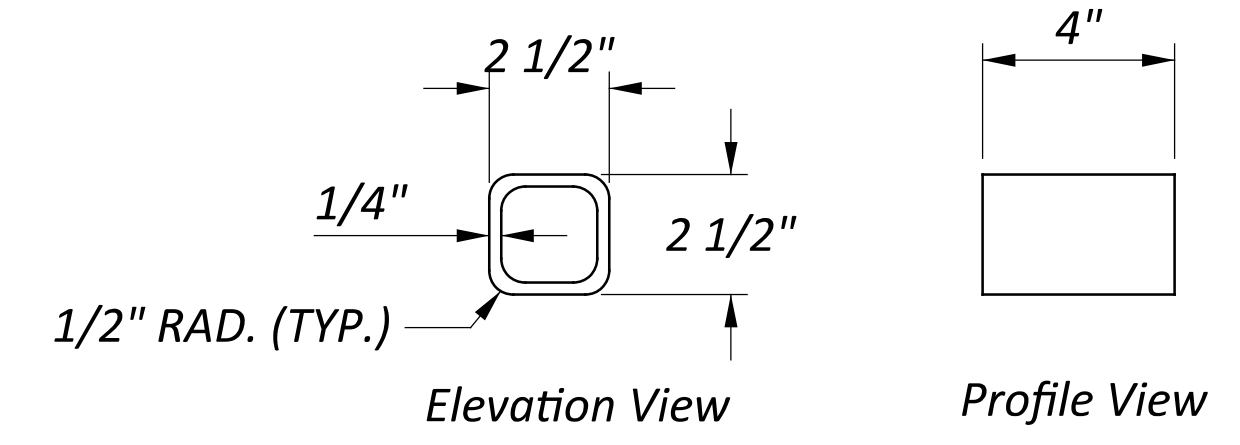
Elevation View



Section D-D



10" x 4 1/2" x 3/8" Plate (d3)



HSS 2 1/2" x 2 1/2" x 1/4",
4" Long Square Tube (d6)

Breaker Arm Assembly (d1, d2, d3, d4, d5, d6)

MGS-4.2

THIS DRAWING REPLACES MGS-4.2 DATED 1-17-2025.

BILL OF MATERIALS (INCLUDED FOR REFERENCE)					
Part	Quantity (for reference)	Description	Material Spec.	Treatment Spec.	Hardware Guide
a1	1	12'-6" W-Beam MGS End Section	AASHTO M180	ASTM A123 or A653	-
-	1	12 gauge W-Beam Rounded End Section		See MGS-2.1	
b1	2	W6x8.5 or W6x9, 27 1/2" Long Steel Post	ASTM A992	-	-
b2	2	TS 8" x 6" x 3/16", 72" Long Foundation Tube	ASTM A500 Gr. B	-	-
b3	2	13" x 7" x 5/8" Steel Plate	ASTM A36	-	-
b4	4	5 1/2" x 5 1/2" x 3/4" Steel Plate	ASTM A36	-	-
b5	4	5 7/16" x 4" x 1/4" Steel Plate	ASTM A36	-	-
c1	1	66 1/2" x 11 3/4" x 10-gauge Bent Steel Channel Strut	ASTM A36	ASTM A123	-
c2	2	17" x 3" x 1/4" Bent Steel Plate	ASTM A36	ASTM A123	-
c3	2	7" x 2 3/4" x 1/2" Steel Plate	ASTM A36	ASTM A123	-
d1	1	HSS 2 1/2" x 2 1/2" x 1/4", 15" Long Square Tube	ASTM A500 Gr. B	-	-
d2	1	HSS 3" x 3" x 1/4", 8" Long Square Tube	ASTM A500 Gr. B	-	-
d3	1	10" x 4 1/2" x 3/8" Plate	ASTM A36	-	-
d4	2	6" x 3/4" x 1/4" Gusset	ASTM A36	-	-
d5	2	6" x 1 1/4" x 1/4" Gusset	ASTM A36	-	-
d6	1	HSS 2 1/2" x 2 1/2" x 1/4", 4" Long Square Tube	ASTM A500 Gr. B	-	-
e1	1	Anchor Bracket Assembly	ASTM A36	ASTM A123	FPA01
e1.1	1	Anchor Bracket End Plate	ASTM A36	ASTM A123	-
e2	2	Anchor Cable End Swaged Fitting	Fitting - ASTM A576 Gr. 1035 Stud - ASTM F568 Class C	Fitting - ASTM A153 Stud - ASTM A153 or B695	-
e3	1	Anchor Cable Assembly	-	-	FCA01
e4	1	8" x 6 1/4" x 5/8" Bearing Plate Base	ASTM A36	-	FPB01
e5	1	8" x 1 1/2" x 1" Bearing Plate Flange	ASTM A36	-	-
f1	2	7/8" - 9 UNC, 8 1/2" Long Hex Head Bolt and Nut	Bolt - ASTM A307 Gr. A or equivalent Nut - ASTM A563A or equivalent	ASTM A123 or B695 Class 55 or F2329	-
f2	8	7/16" - 14 UNC, 2 1/2" Long Fully Threaded Hex Top Bolt and Nut	Bolt - ASTM A449 or equivalent Nut - ASTM A563DH or equivalent	ASTM A123 or B695 Class 55 or F2329	FBX12b
f3	6	1/2" - 13 UNC, 2" Long Hex Bolt and Nut	ASTM A563A or equivalent	ASTM A123 or B695 Class 55 or F2329	FNX24a
f4	8	5/8" - 11 UNC, 1 1/2" Long Hex Head Bolt and Nut	Bolt - ASTM A307 Gr. A or equivalent Nut - ASTM A563A or equivalent	ASTM A123 or B695 Class 55 or F2329	FBX16a
-	2	5/8" - 11 UNC, 1 1/4" Long Guardrail Bolt and Nut	Bolt - ASTM A307 Gr. A Nut - ASTM A563A	ASTM A123 or B695 Class 55 or F2329	FBB01
-	2	1" Dia. Plain Round Washer	ASTM F844	ASTM A123 or A153 or F2329	FWC24a
g1	4	7/8" Dia. Plain Round Washer	ASTM F844	ASTM A123 or A153 or F2329	-
g2	16	5/8" Dia. Plain Round Washer	ASTM F844	ASTM A123 or A153 or F2329	FWC16a
g3	8	1/2" Dia. Plain Round Washer	ASTM F844	ASTM A123 or A153 or F2329	FWC14a
g4	32	7/16" Dia. Plain Round Washer	ASTM F844	ASTM A123 or A153 or F2329	FWC12a



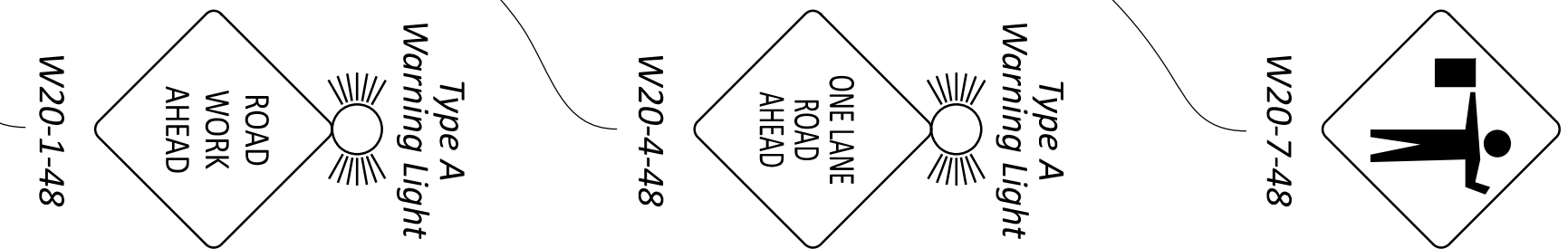
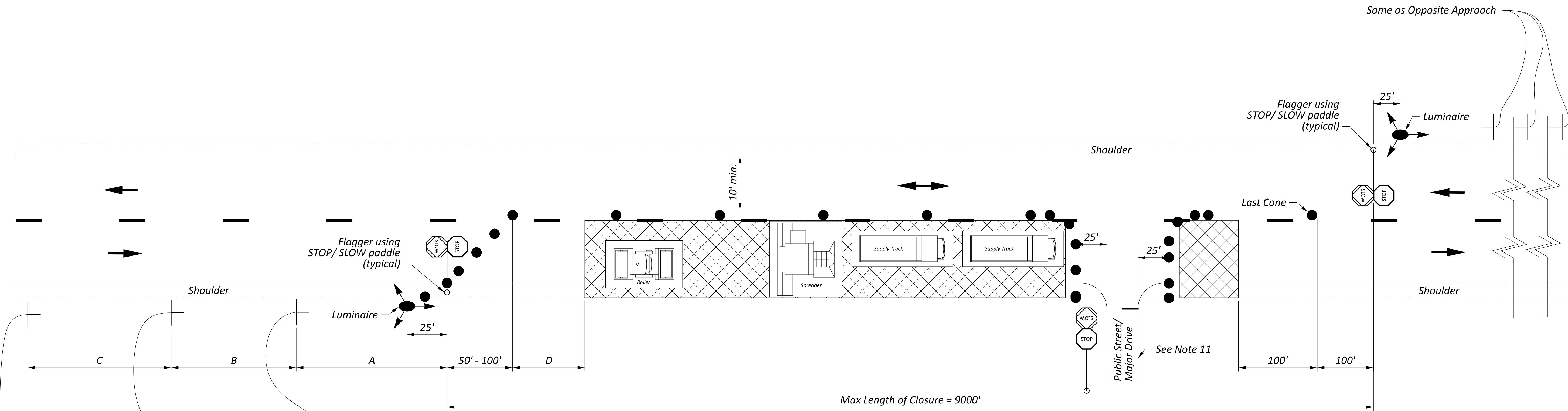
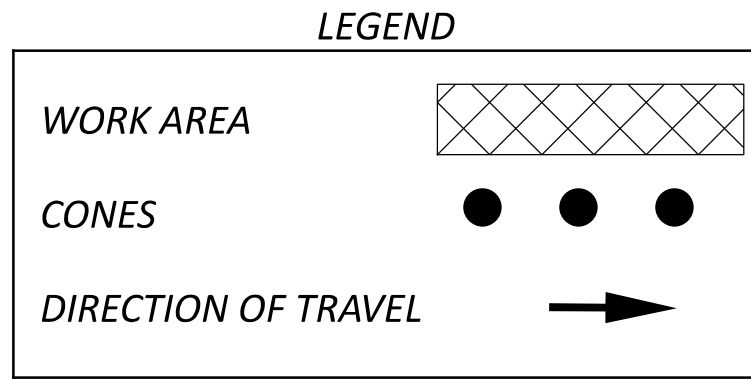


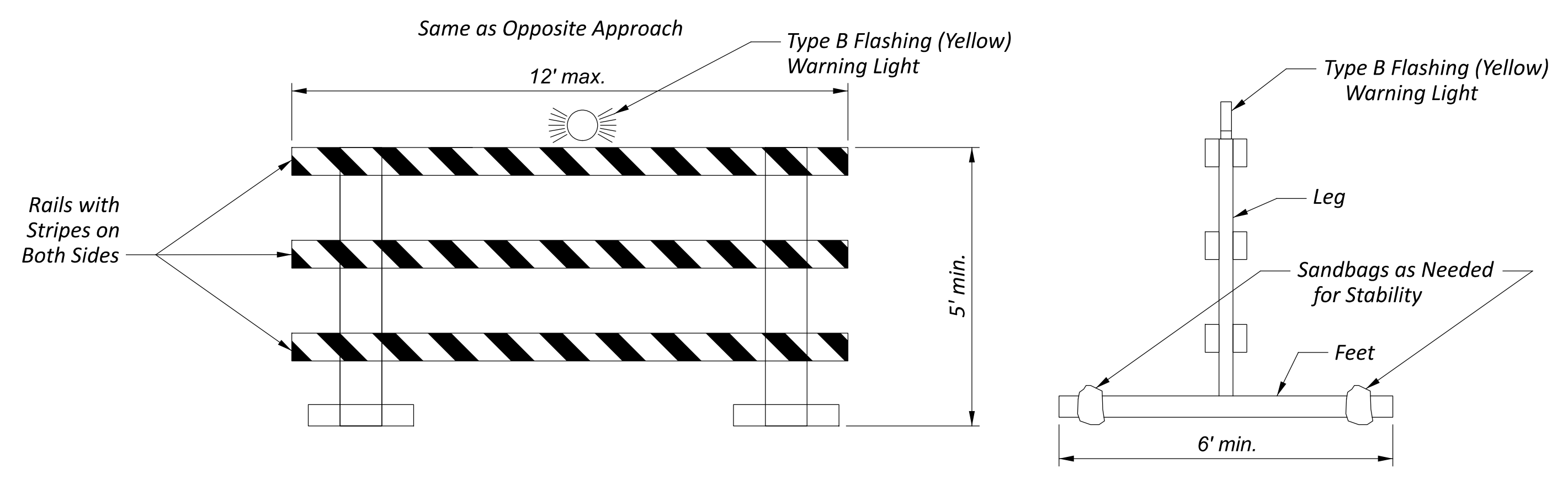
TABLE I (SIGN SPACING)

ROAD TYPE	DISTANCE BETWEEN SIGNS (FT)		
	A	B	C
Two-Lane (≤ 40 MPH)	100	100	100
Two-Lane (45-50 MPH)	350	350	350
Two-Lane (55-60 MPH)	500	500	500

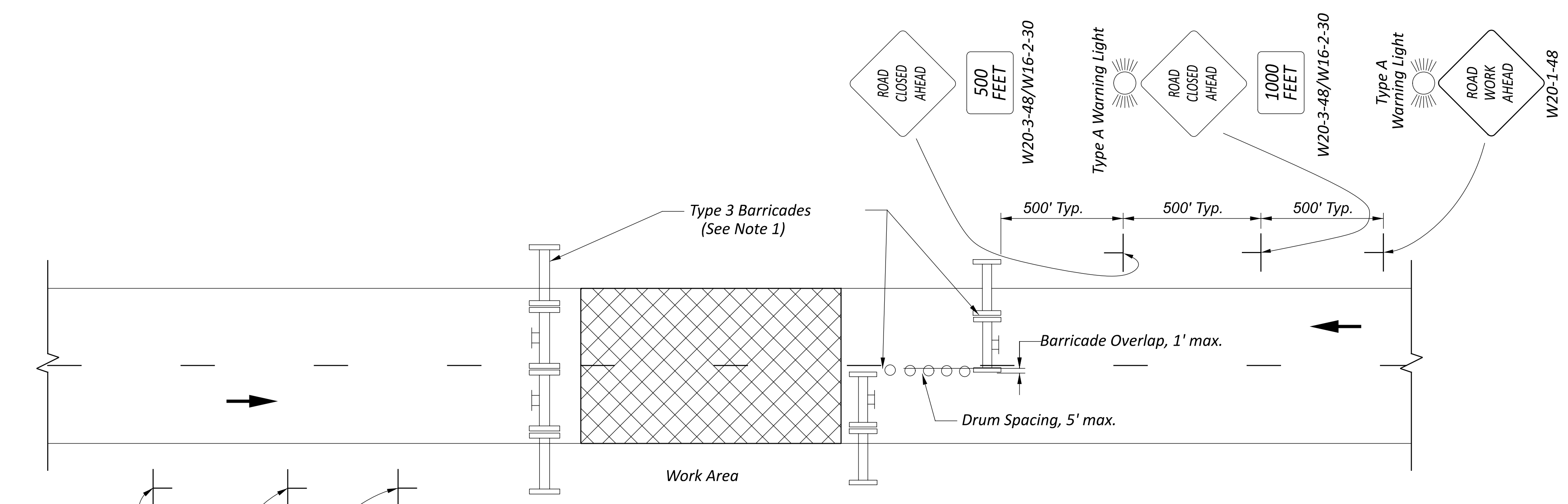
TABLE II

SPEED LIMIT (MPH)	BUFFER (D) (FT) MIN.
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570

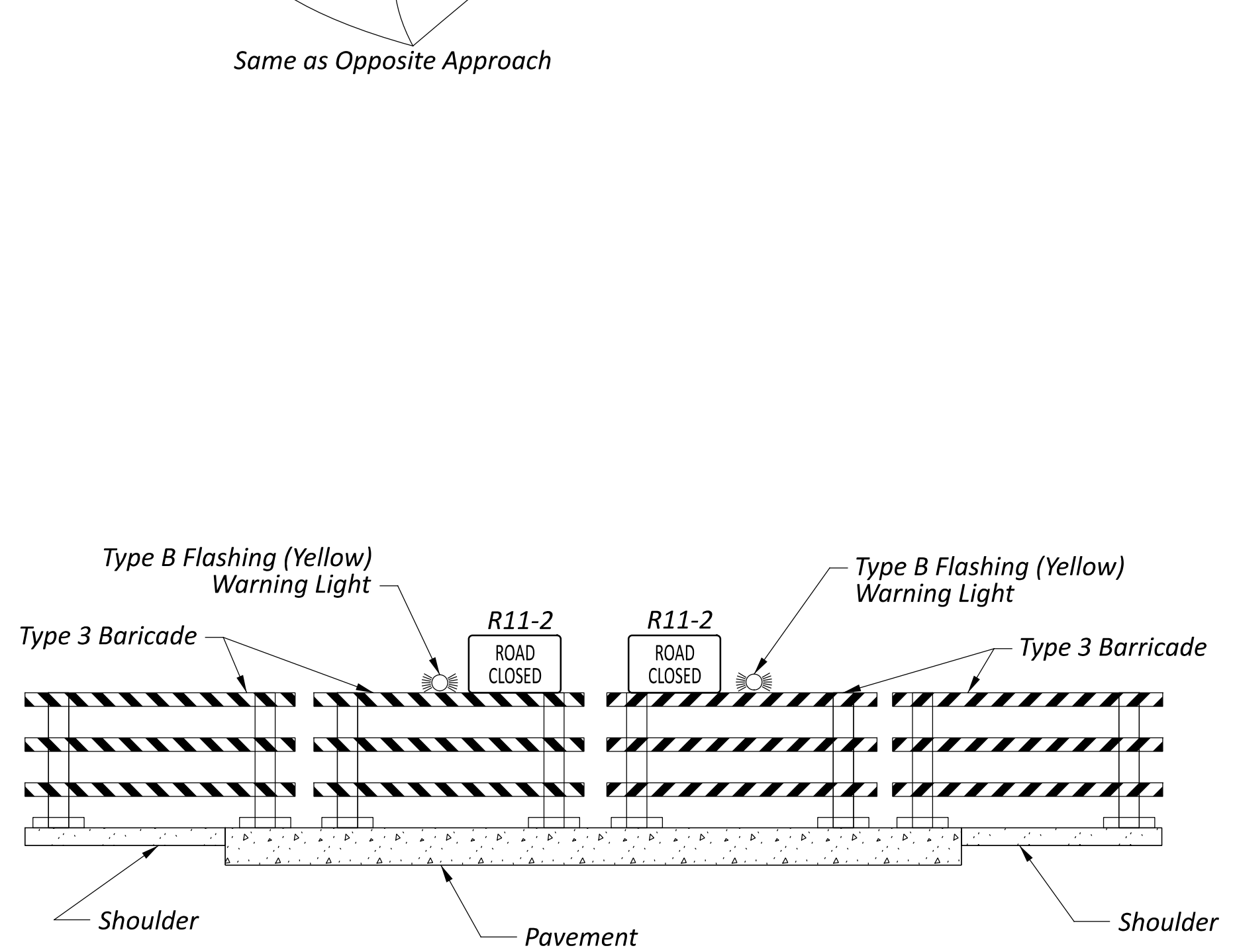




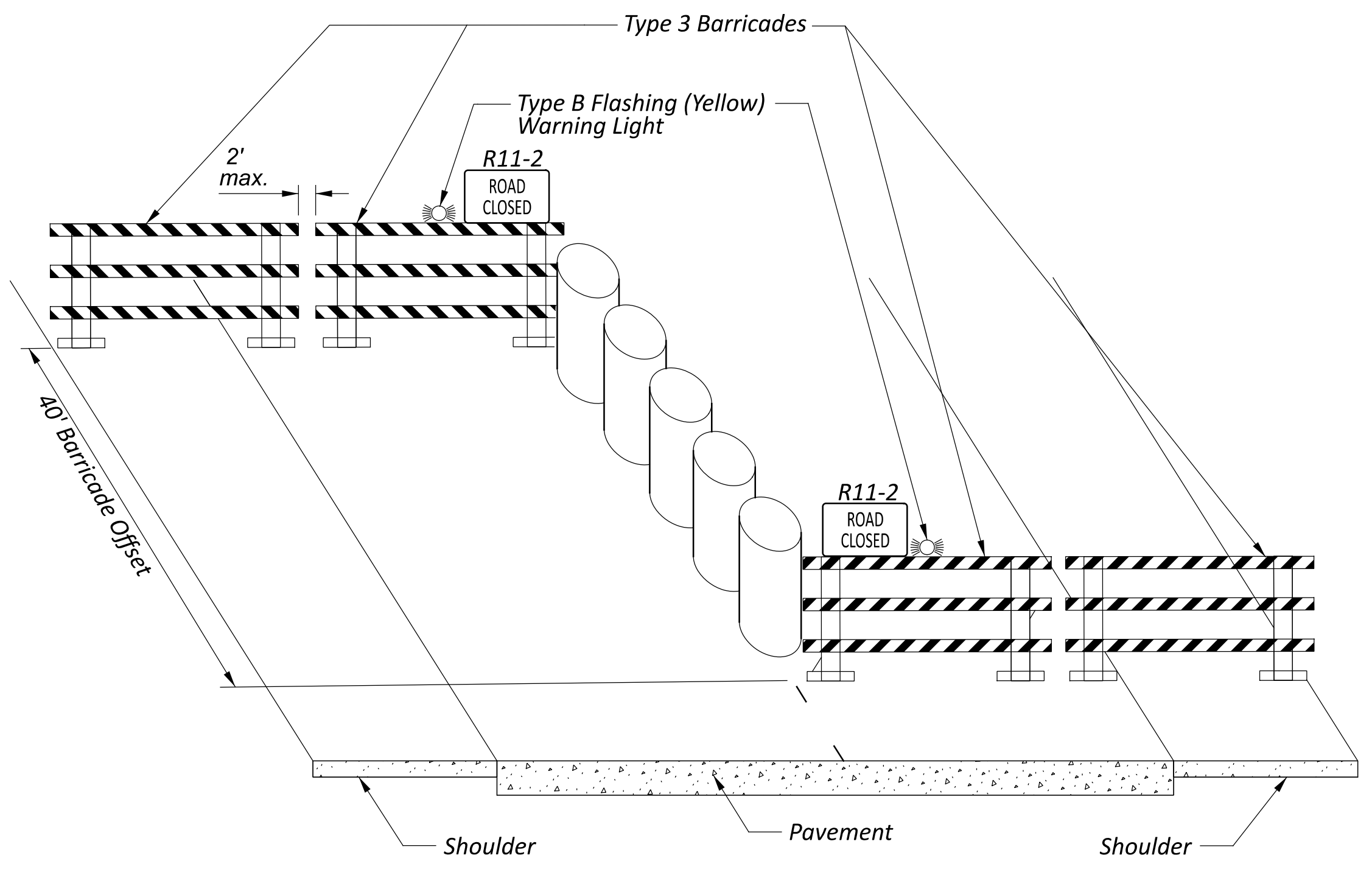
TYPE 3 BARRICADE DETAIL



ADVANCE WARNING SIGNS FOR CLOSURE



BARRICADE CLOSURE PROFILE



BARRICADE CLOSURE OFFSET OPTION

NOTES:

BARRICADE USE

- 1A. Barricades shall be MASH compliant (or NCHRP 350 compliant if used on or before 12/31/2024) and shall be erected according to details shown. When the road is closed to traffic, barricades shall be used to effectively close the entire roadway, including the paved or aggregate shoulder.
- 1B. Barricades along adjacent lanes may be offset from each other as shown, with drums used to close the resulting gap. Maximum drum spacing shall be 5'.

BARRICADE REFLECTORIZATION AND COLOR

- 2A. In construction or maintenance areas, all rails of the barricades shall be reflectorized with orange and white Type XI retroreflective sheeting (CMS 730.194) in 6" wide alternate stripes which slope downward toward the center line of the road at an angle of 45 degrees. All three rails of the barricade shall be striped on both sides. Legs and feet shall be either all white or may display the natural color of the material used.
- 2B. Barricades used in permanent or semi-permanent application shall differ only in that they shall use red and white stripes.

SIGNS

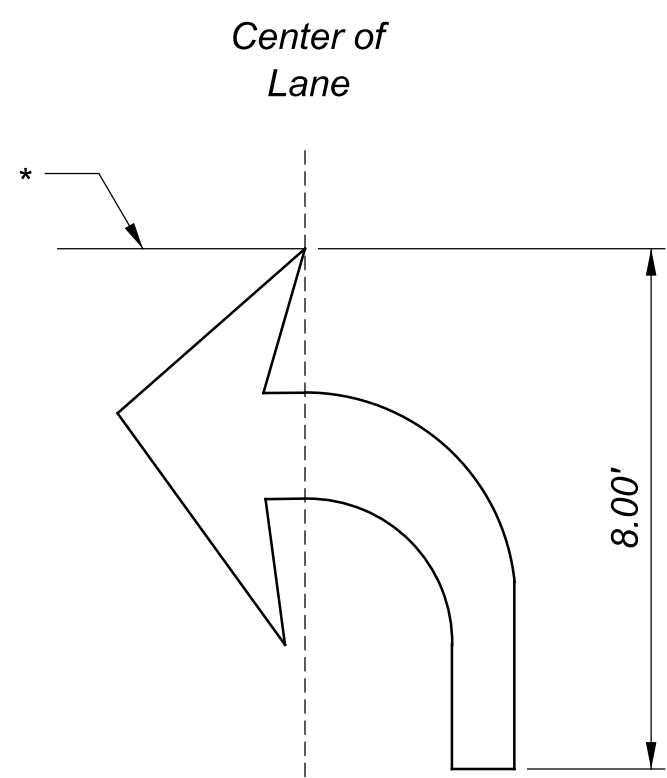
- 3A. Where the road is closed to traffic by the erection of barricades, ROAD CLOSED (R11-2) signs shall be mounted laterally as shown.
- 3B. The advance warning signs shown on this drawing are intended for use when the traveled way is brought to an end with no direction given to traffic. Where traffic has been directed from the permanent roadway at or just in advance of the barricades, advance signing should be provided as shown in Standard Construction Drawing MT-95.70 or Ohio Manual of Uniform Traffic Control Devices Figure 6H-7 as appropriate.
- 3C. Advance warning signs approaching a lane closure, as shown on these plans, shall consist of two ROAD CLOSED AHEAD (W20-3) signs with distance plaques placed about 500' and 1000' from the closure, and a ROAD WORK AHEAD (W20-1) sign placed about 1500' from the closure. The signs shall be placed on both sides of the roadway for multi-lane divided highways or when required by the plans.

FLASHING WARNING LIGHTS

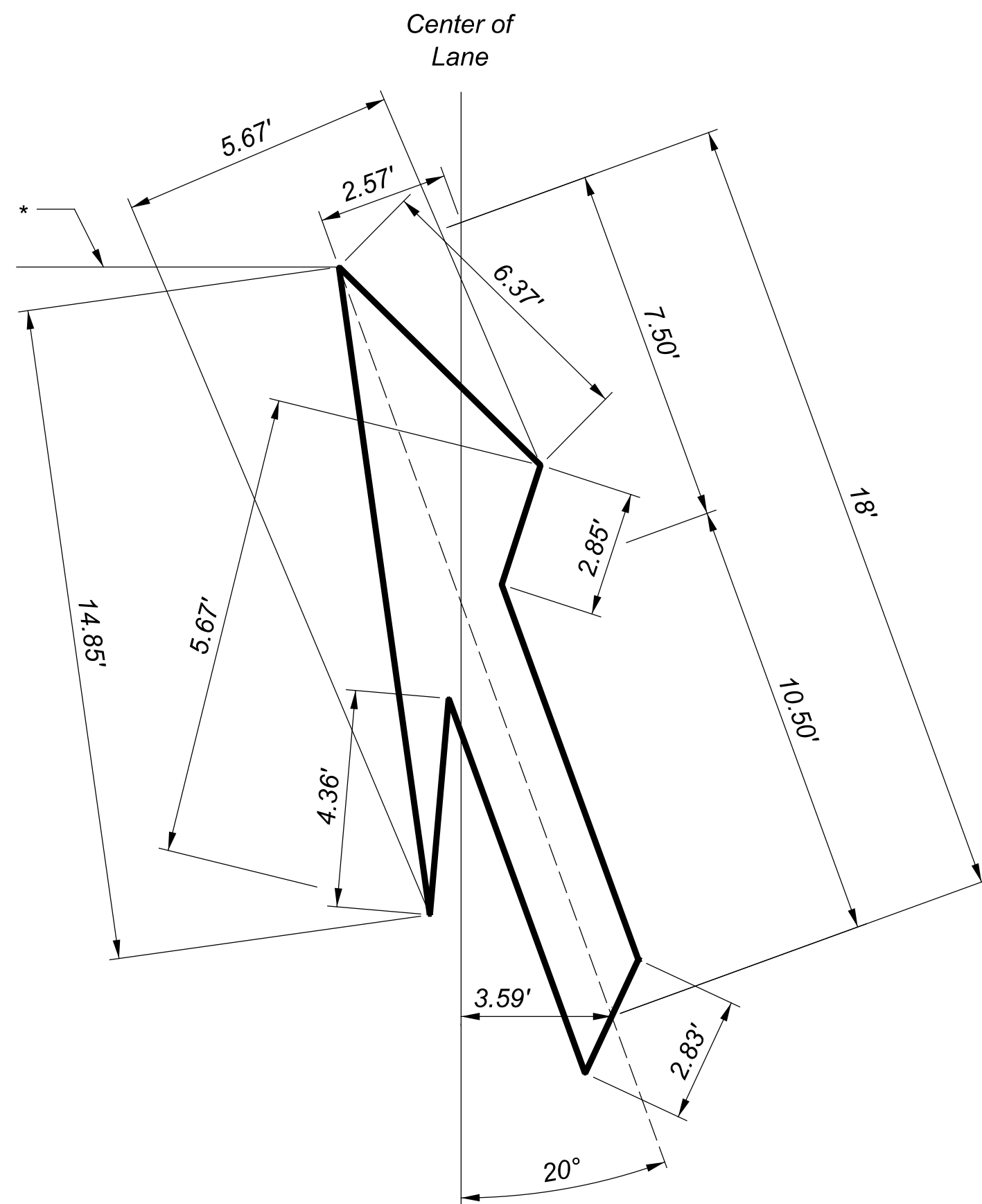
- 4A. Type A flashing warning lights are required on the ROAD WORK AHEAD (W20-1) sign and on the first ROAD CLOSED AHEAD (W20-3) sign.
- 4B. Type B flashing warning lights shall be provided on Type 3 Barricades, one light per each closed lane. Each light shall be conspicuously visible at all distances up to 1000' under normal atmospheric conditions. The light shall be in operation at all times during the period the highway is closed.

OPERATION ON 2-LANE, 2-WAY ROADWAYS

- 5A. Where the barricade runs across the entire roadway without longitudinally offsetting sections, the Contractor will normally open only the left side of the barricade as necessary to allow the construction vehicle to enter, and then shall immediately close it. The entire barricade will not normally be opened at the same time. The Contractor shall assign an employee to assure that the barricade is closed at the end of each workday.
- 5B. Where the sections of the barricade are offset from each other with drums provided to close the gap (see note 1B), the Contractor may move the drums as necessary to allow the construction vehicle to enter, and then shall immediately replace the drums. The Contractor shall assign an employee to assure that the drums are in place at the end of each workday.



TURN ARROW
 (Right Arrow Opposite)

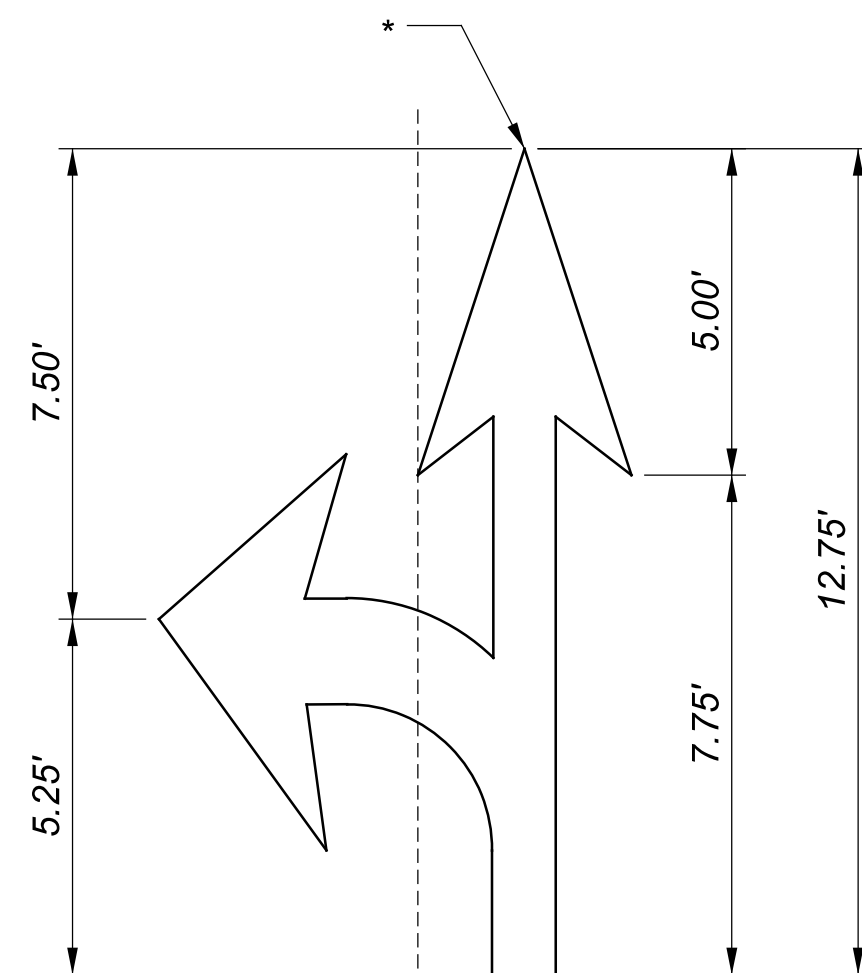


LANE-REDUCTION ARROW (RIGHT)
 (For Left Lane, Use Mirror Image)

TABLE 1 - LANE-USE ARROWS

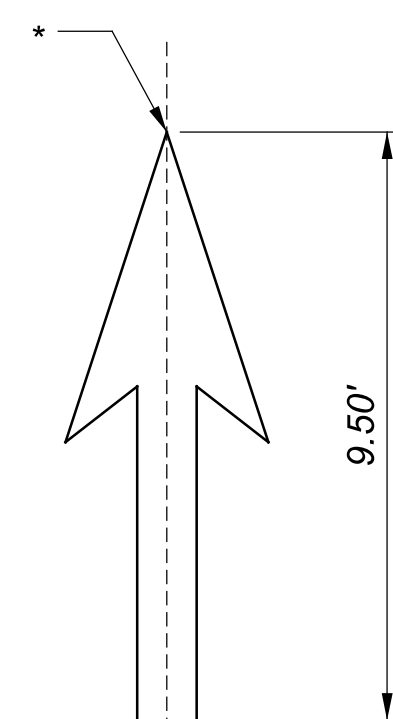
ARROW TYPE	SIZE (FT)	AREA (SQ FT)
Turn Arrow	8.00	17
Through Arrow	9.50	13
Turn and Through Arrow	12.75	28
Lane-Reduction Arrow	18.00	46

* - Indicates Station Reference Point

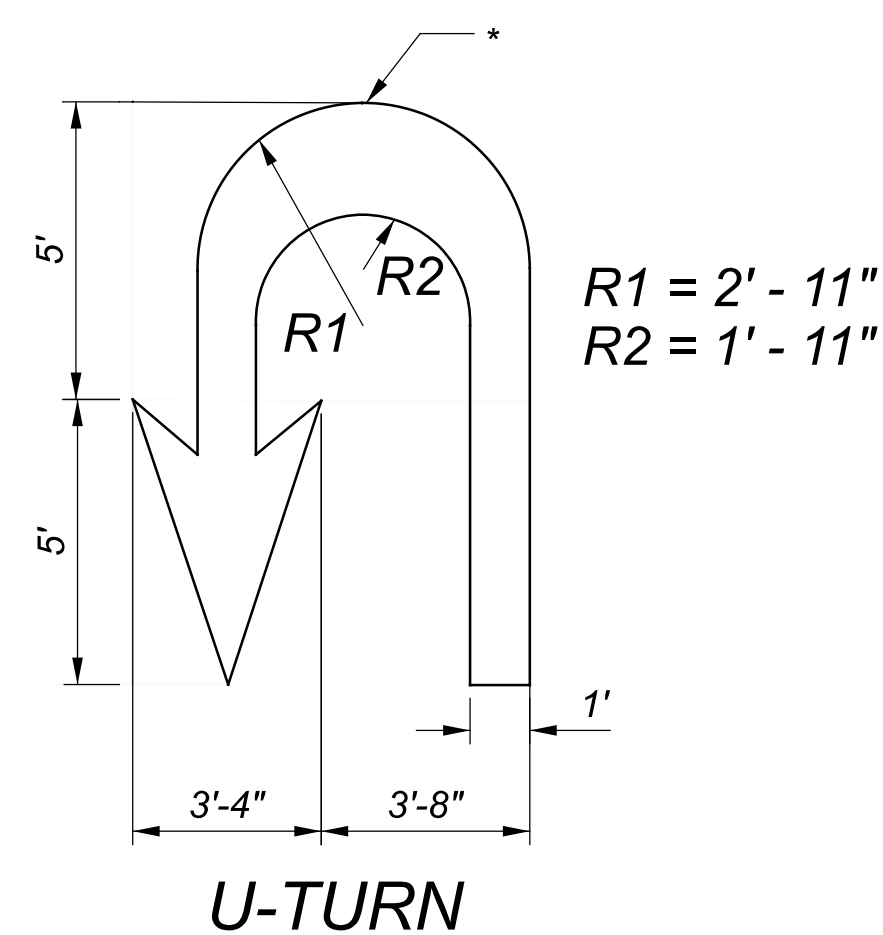


TURN AND THROUGH ARROW

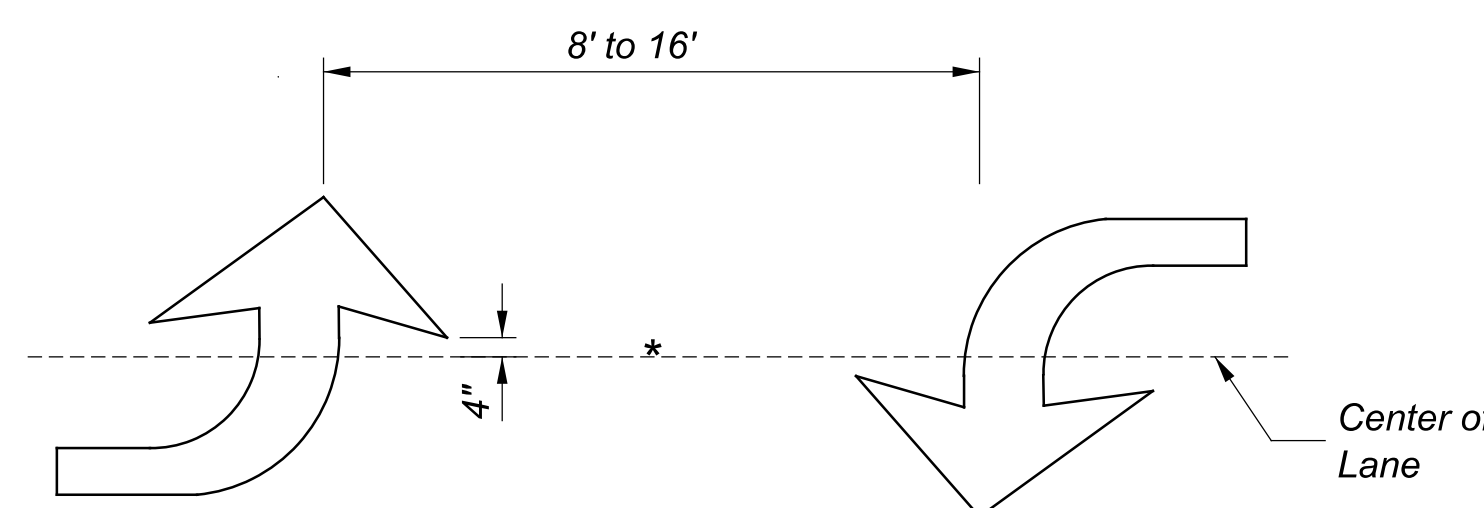
(Three-Headed Directional Arrows Can be Achieved by the Combination of Turn Arrows.)



THROUGH ARROW

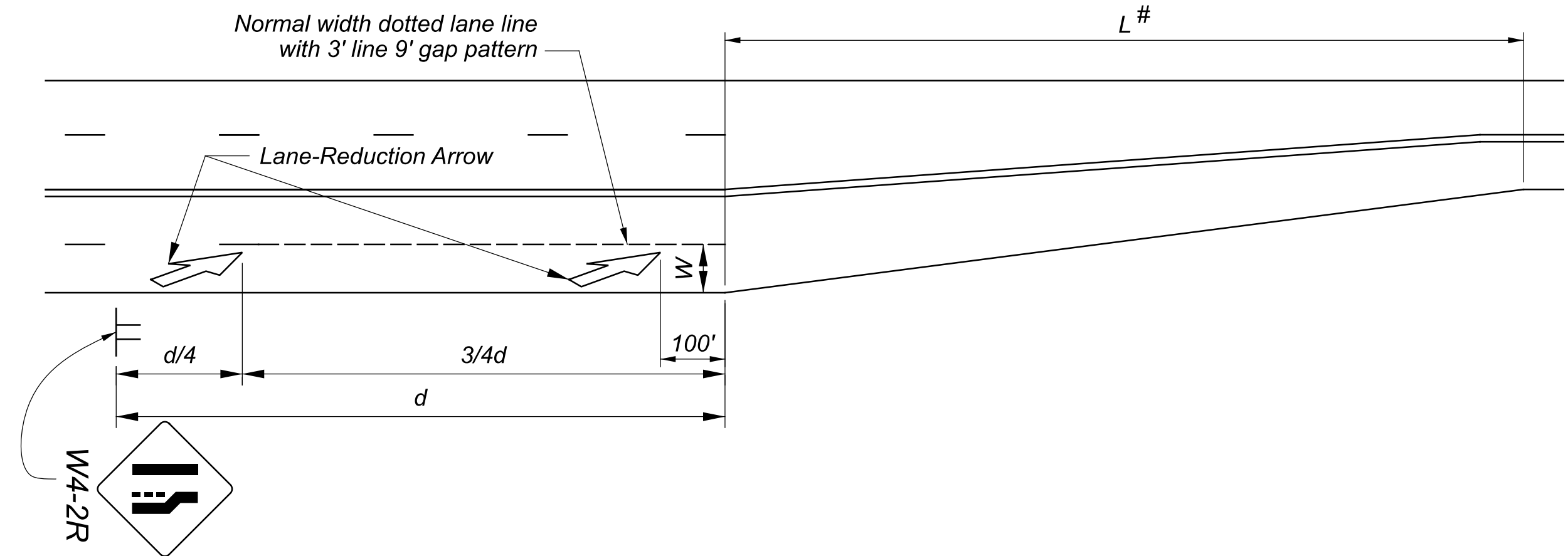


U-TURN



TWO-WAY LEFT-TURN ARROWS

(See Note 6)



Speed (S) (MPH)	Lane Width (W) (FT)	Taper Length (L) # (FT)	Advance Warning Distance (d) (FT)
25	12	125	325
30	12	180	460
35	12	245	565
40	12	320	670
45	12	540	775
50	12	600	885
55	12	660	990
60	12	720	1100
65	12	780	1200
70	12	840	1250

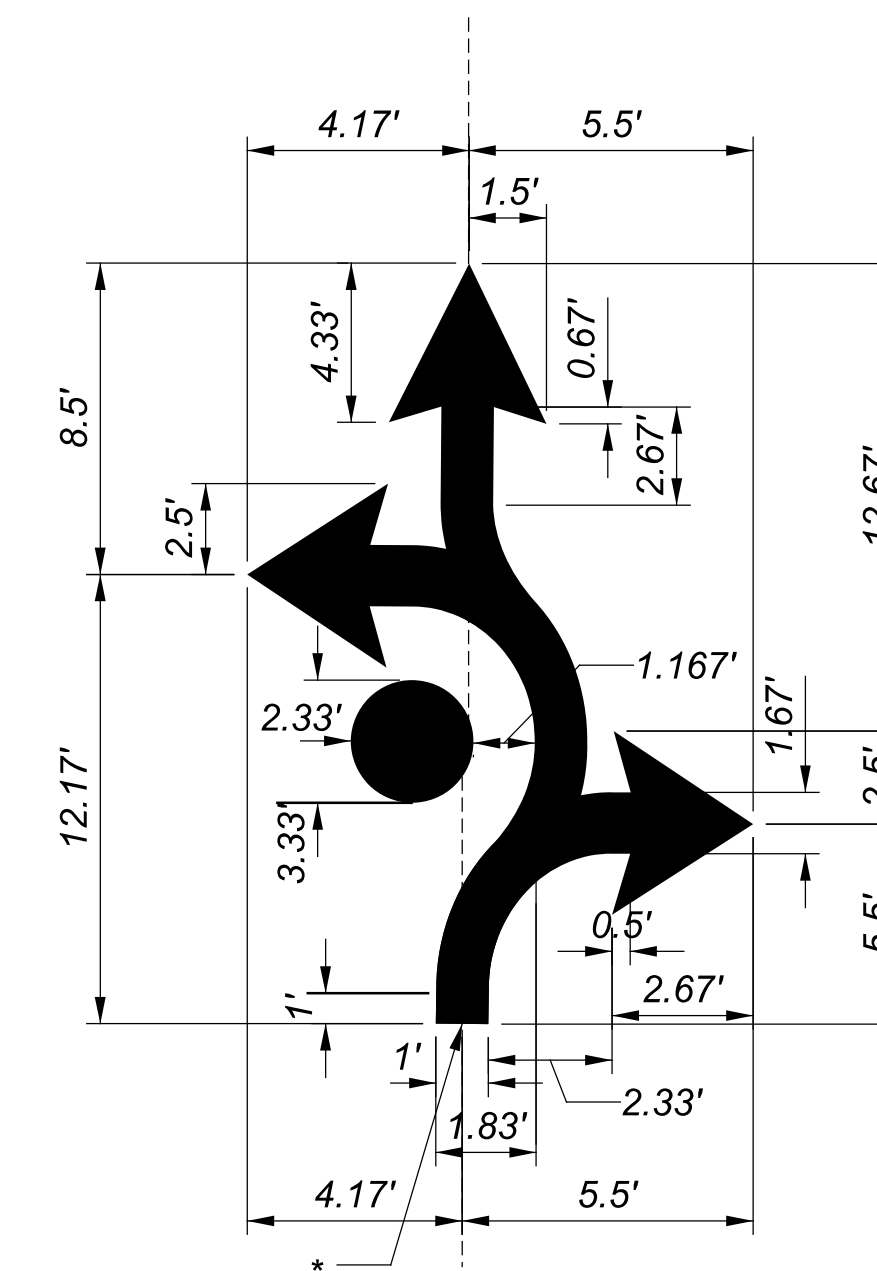
LANE-REDUCTION ARROW MARKING DETAIL

(See Note 8)

Taper Length (L) shown is for 12 foot lane width (W). Use formula for other lane widths.

S - Posted, 85th-percentile or statutory speed, in MPH
 W - Lane width or offset, in feet

L - Taper length in feet for Speed < 45 MPH = $WS^2 / 60$
 L - Taper length in feet for Speed > 45 MPH = WS
 d - Advance Warning Distance, in feet



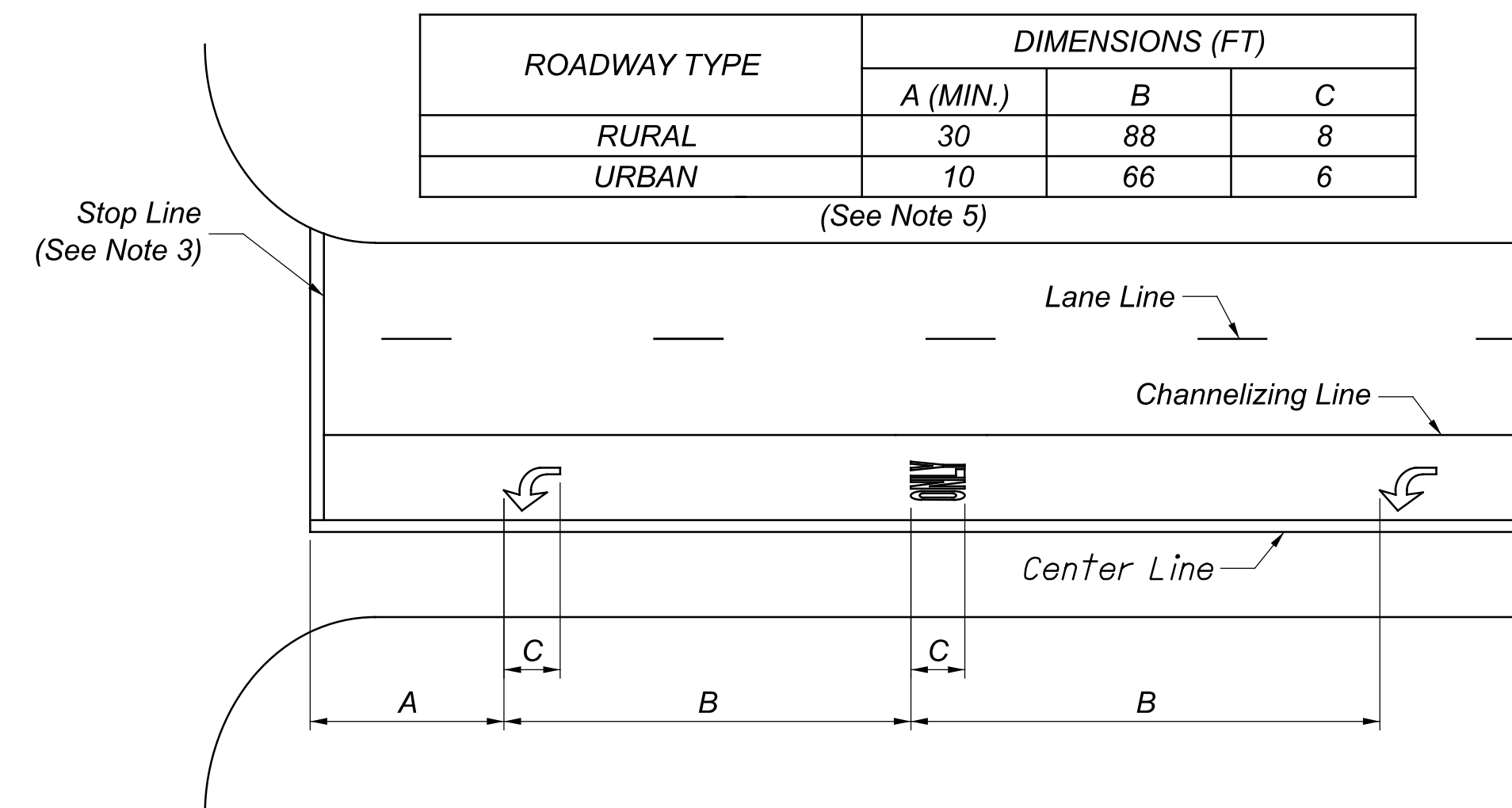
FISH-HOOK ARROW (ROUNDBABOUTS)

OVERALL DIMENSIONS		
ELEMENTS INCLUDED	OVERALL WIDTH	OVERALL HEIGHT
1	6.5'	14.67'
1 & 2	6.5'	20.67'
1 & 3	9.67'	14.67'
1, 2 & 3	9.67'	20.67'
0 & 2*	4.5'	20.67'
0, 2 & 3*	7.67'	20.67'
2	3.833'	20.67'
2 & 3	7.0'	20.67'
3	6.0'	8.0'

* THE DOT (ELEMENT 0) IS ONLY USED IN SYMBOLS FOR THE LEFTMOST LANE.



TABLE 4 - LANE USE MARKINGS



SHARED-USE PATH AND BIKEWAY MARKINGS

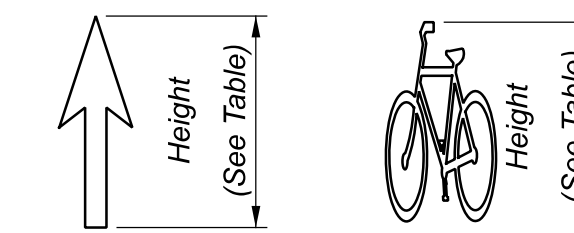
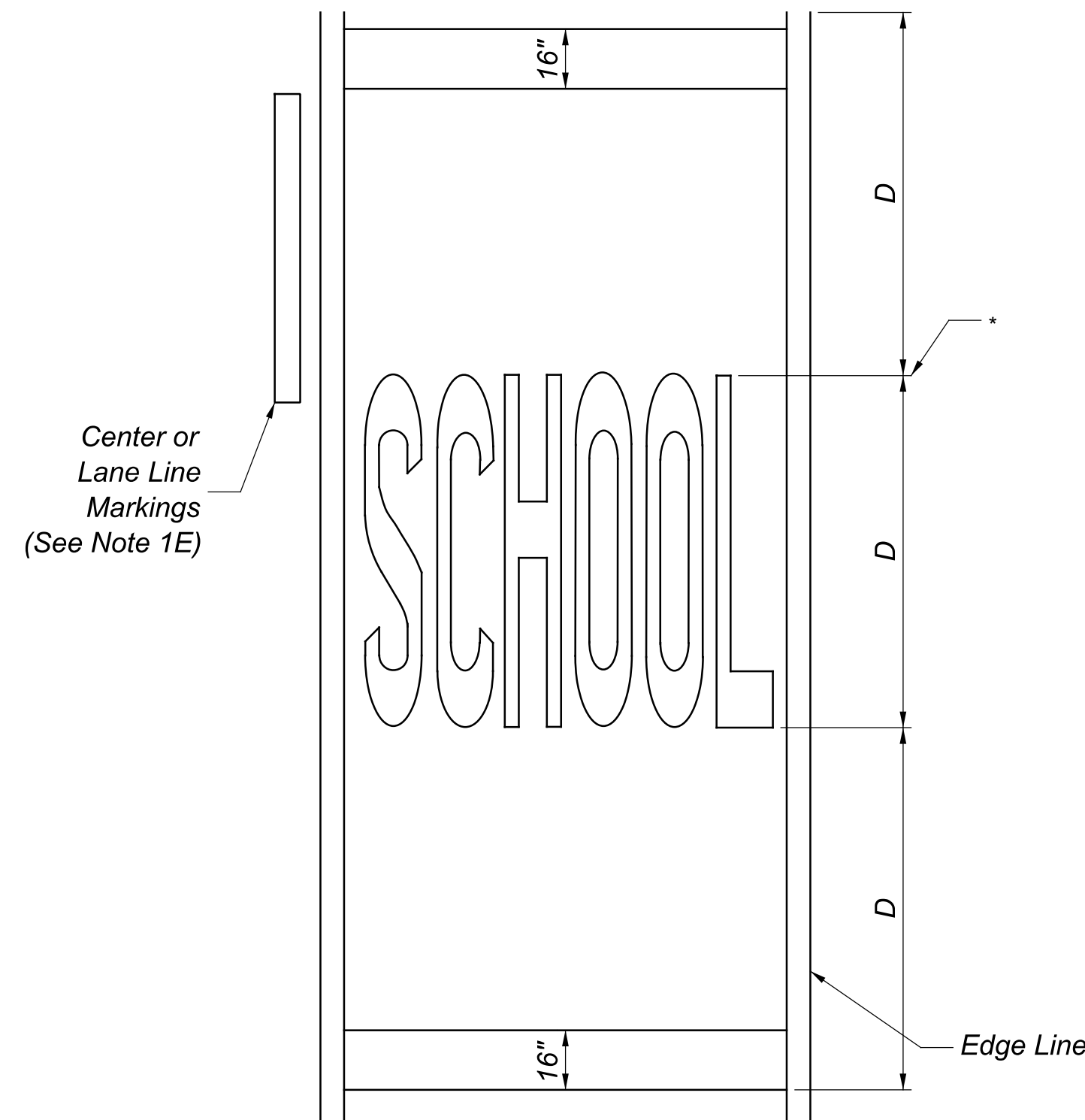
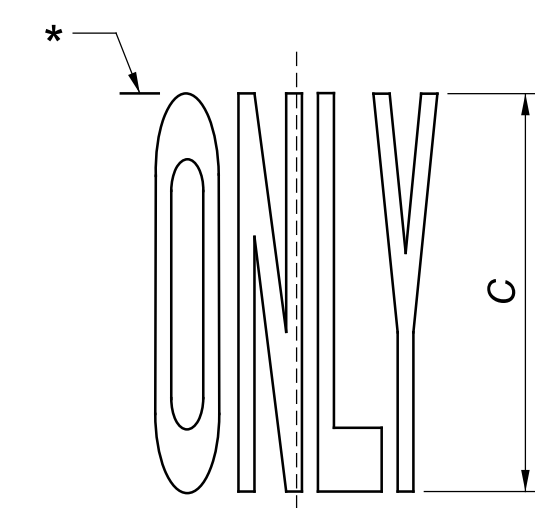


TABLE 1 - BIKEWAY MARKINGS

FACILITY TYPE	HEIGHT (FEET)	STRAIGHT ARROW	BIKE SYMBOL	HWY	XING	RXR SYMBOL
		AREA (SQUARE FEET)				
SHARED USE PATH	4	----	----	5	6	----
	10	----	----	----	----	16
BICYCLE LANE	6	6	5	----	16	----
ROADWAY-URBAN	6	5	5	----	16	----
ROADWAY-RURAL	8	7	7	----	21	----

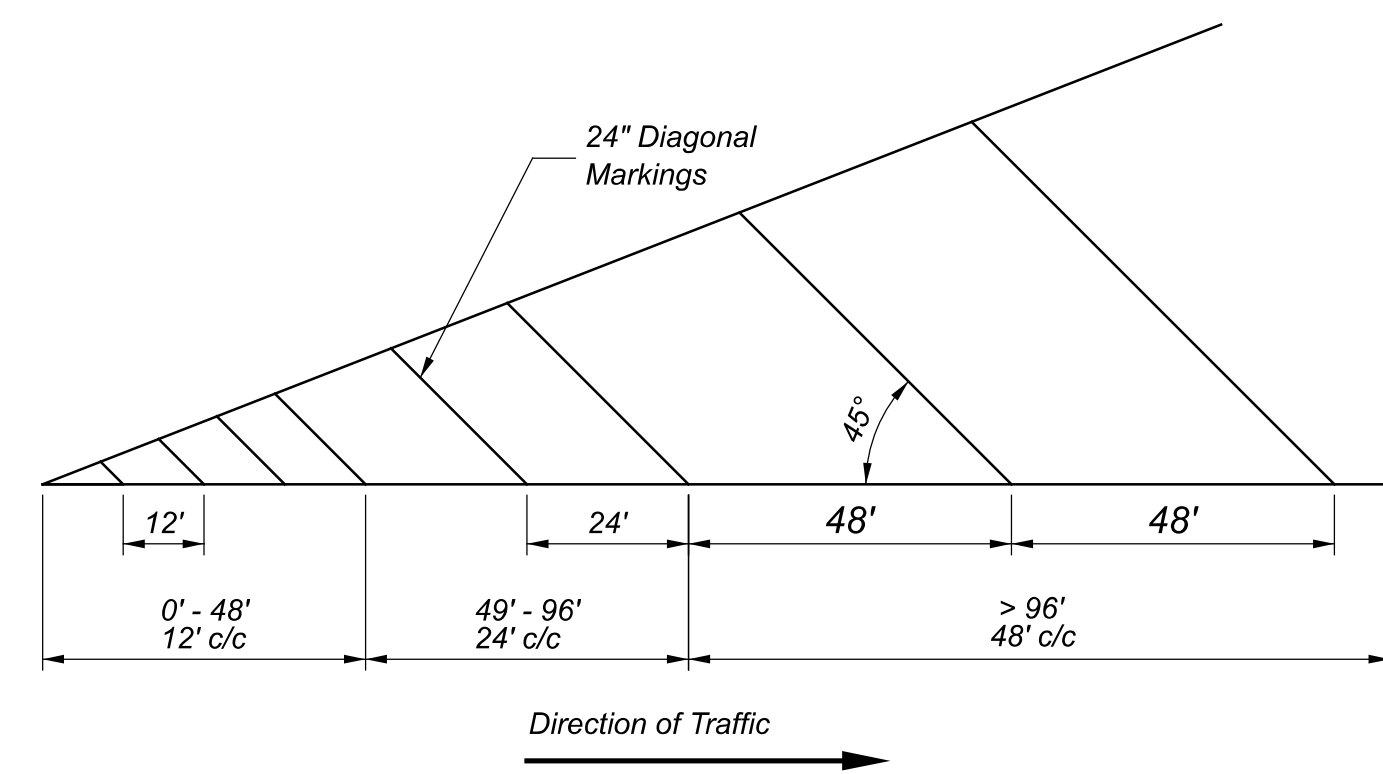


SCHOOL WORD MARKING
 (See Note 1)



ONLY WORD MARKING
 (See Note 4)

WORD	HEIGHT (C, D)		
	URBAN	RURAL	MULTI-LANE
ONLY (C)	17	23	N/A
SCHOOL (D)	27	37	90



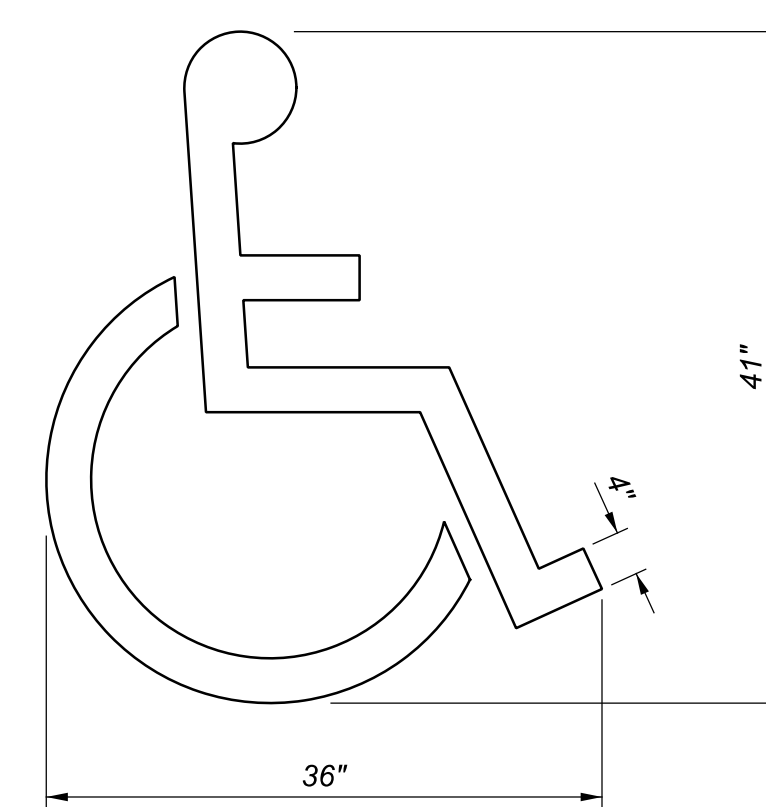
TYPICAL SPACING DETAIL FOR 24" DIAGONAL MARKINGS

(Chevron Markings, Including a Spacing Table, are Shown on SCD TC-72.20.)

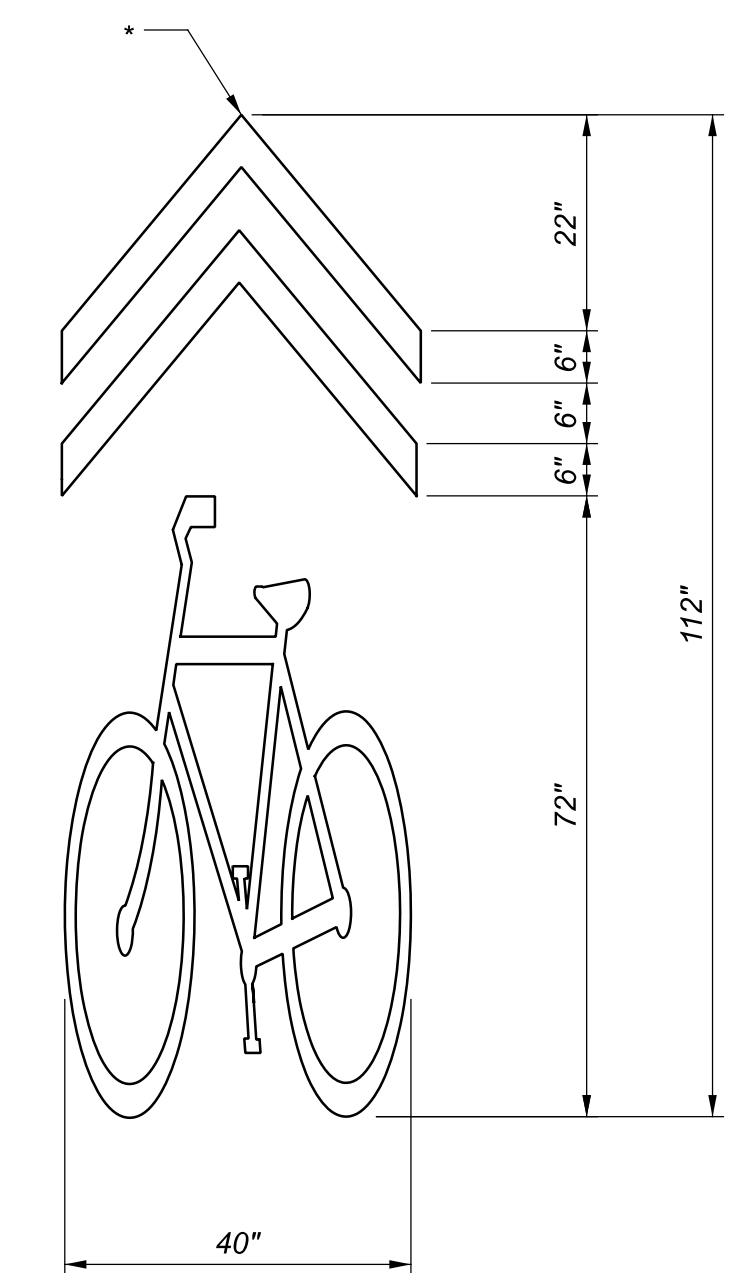
* - Indicates Station Reference Point

TABLE 2 - HANDICAP, BIKE & CHEVRON MARKINGS

SYMBOL	HEIGHT (IN)	WIDTH (IN)	AREA (SQ FT)
HANDICAP	41	36	2.7
BIKE	72	40	16
CHEVRON	40	40	3.3 (.83 x 4)

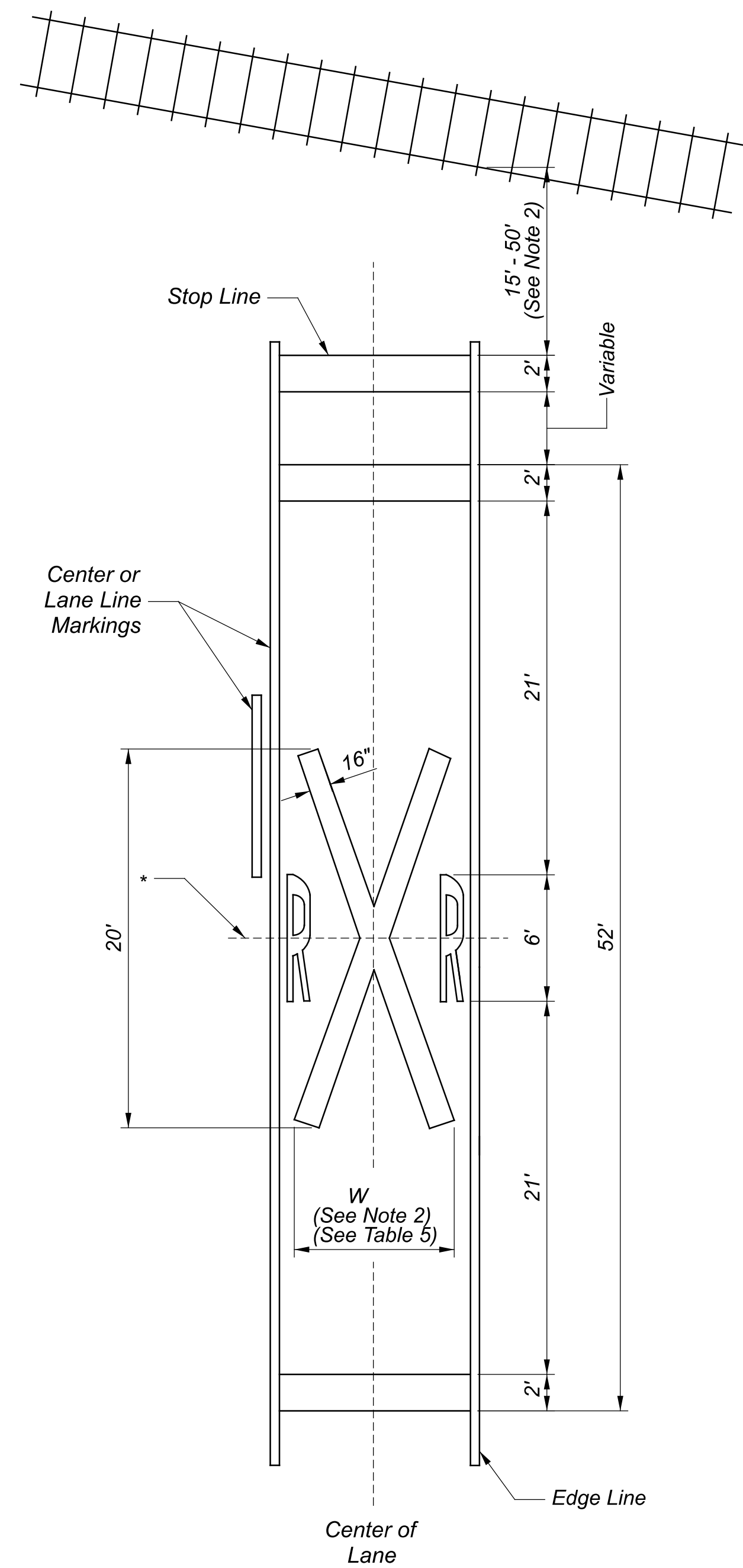


HANDICAP SYMBOL MARKING



SHARED LANE MARKING
 (See Note 7)



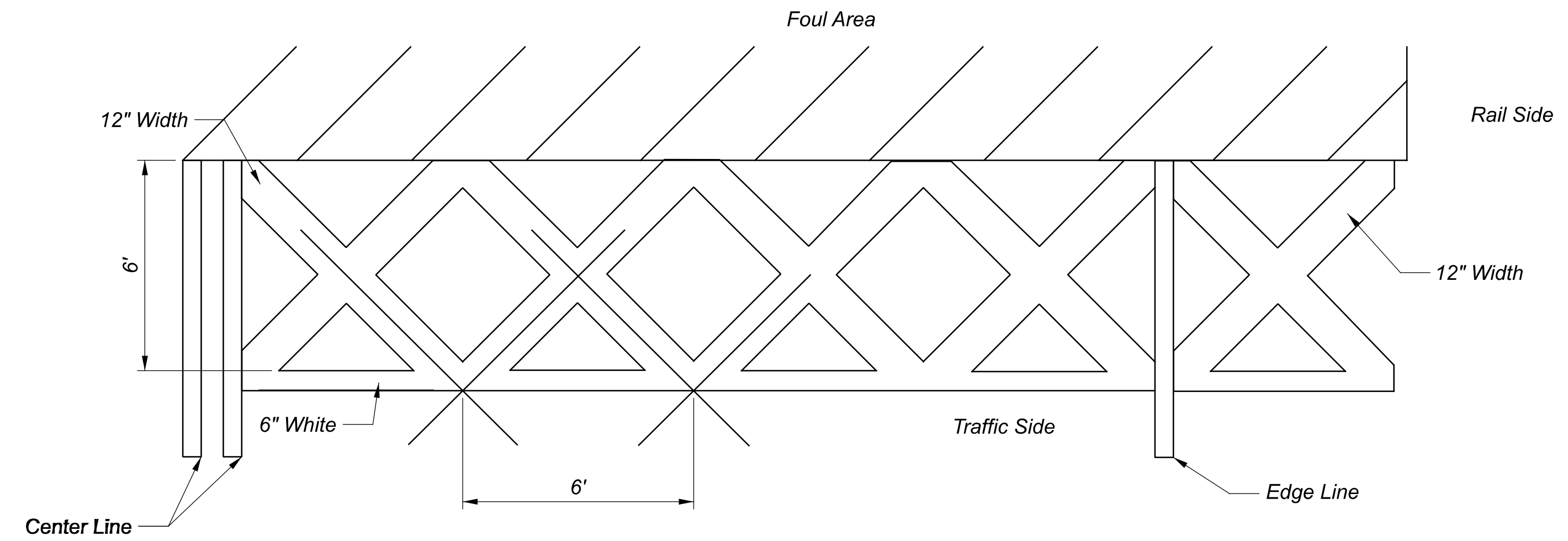


RAILROAD SYMBOL MARKING

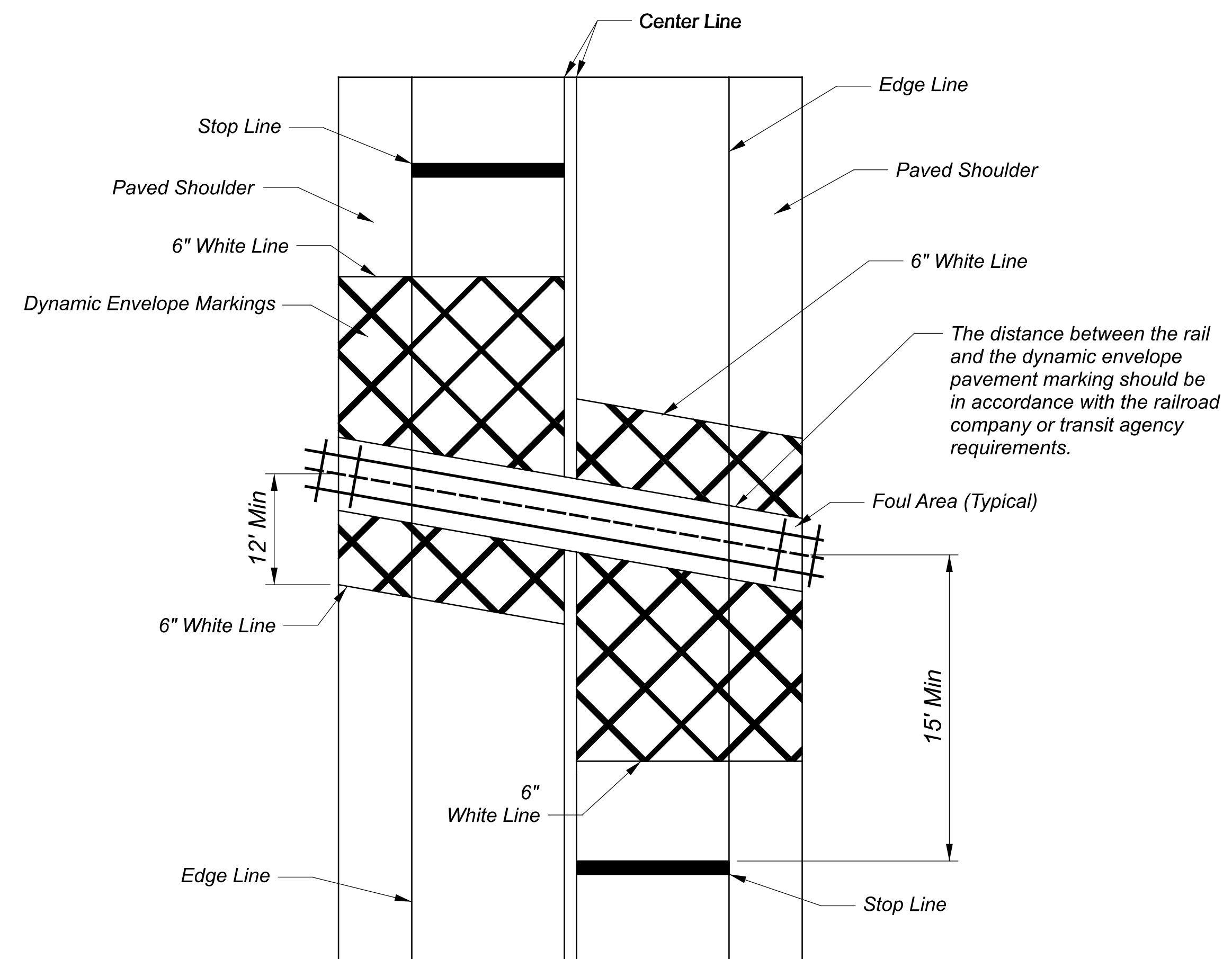
(See Note 2)

TABLE 5 - R X R SYMBOL

	WIDTH (W) (FT)	8	9	10	11	12
	AREA (SQ FT)		67	68	70	71



DYNAMIC ENVELOPE MARKINGS



DYNAMIC ENVELOPE AND DO NOT OCCUPY INTERSECTION MARKINGS LAYOUT

NOTES:

SCHOOL Marking

- 1A. The SCHOOL markings shall be installed on all paved approaches in advance of all School Zones.
- 1B. The SCHOOL markings should be placed at least 100' in advance of the School Zone. The preferred placement of the SCHOOL marking is adjacent to the School Zone Advance sign.
- 1C. On two-way, two-lane highways the following shall apply:
 - 1.) When the approach lane to the School Zone is 11' or more in width -
 - a.) The SCHOOL word marking and transverse lines shall be contained in, and centered in, the lane.
 - b.) The character height shall be 6' for urban areas and 8' for rural areas.
 - 2.) When the approach lane to the School Zone is less than 11' in width -
 - a.) One installation of the SCHOOL word marking and transverse lines shall extend across both lanes of traffic.
 - b.) The characters shall be 10' in height.
- 1D. On multi-lane approaches the following shall apply -
 - 1.) When the approach lanes to the School Zone are 11' or more in width -
 - a.) The SCHOOL word marking and transverse lines shall be contained in, and centered in, each lane.
 - b.) The character height shall be 6' for urban areas and 8' for rural areas.
 - 2.) When the approach lanes to the School Zone are less than 11' in width -
 - a.) One installation of the SCHOOL word marking shall extend to the width of two approach lanes.
 - b.) Transverse lines shall extend across all approach lanes of traffic.
 - c.) The characters shall be 10' in height.
- 1E. Center or lane lines shall not pass through the SCHOOL word marking.
- 1F. 6' and 8' high SCHOOL word marking shall be marked with 4" strokes.

10' high SCHOOL word marking shall be marked with 8" strokes.
- 1G. The area of the transverse lines varies with the width of the pavement; therefore, the area must be added to the value in Table 3 (sheet 2).

Railroad Crossing Markings

- 2A. On multi-lane approaches, markings shall be as follows -
 - a.) The RXR symbol shall be placed in each approach lane.
 - b.) Transverse lines used with the railroad symbols shall extend across all approach lanes.
- 2B. The railroad symbol should be located so that the Railroad Advance Warning (W10-1) sign is within the two transverse boundary lines of the railroad symbol.
- 2C. The stop line shall be located for best sight distance between 15' - 50' of the near edge of the tracks.
- 2D. The stop line shall be approximately 8' from a gate (if present).
- 2E. Width (W) of the "X" will vary according to the lane width.
- 2F. The height of the "R" shall be 6'.
- 2G. The area of the transverse lines and stop lines varies with the width of the pavement; therefore the area must be added to the value in Table 5 (sheet 3).
- 2H. Dynamic Envelope Markings consist of a 6-inch white channelizing line placed a minimum of 6-feet away and parallel to the nearest outside edge of rail at a highway-rail grade crossing. The Dynamic Envelope Markings also consists of 12-inch white diagonal markings arranged at 6-foot centers in a 6-foot by 6-foot "X" layout (sheet 3).

Stop Line Marking

- 3A. Except as specified in Notes 3B and 3C, the stop line should be placed as follows:
 - a.) The stop line should be placed where cross-corner vision is maximum.
 - b.) In no case shall the stop line be placed more than 30' or less than 4' from the nearest edge of the intersecting roadway.
 - c.) For normal intersections the maximum distance should be 10'.
- 3B. If a marked crosswalk is present the stop line should be placed 4' in advance of, and parallel to, the nearest crosswalk line.
- 3C. For signalized intersections the stop line should be placed at a minimum distance of 40' from the nearest signal head.

ONLY Word Marking

- 4A. The ONLY word marking is optional.
- 4B. Where used, the spacing between ONLY and arrow markings should be based on Table 4 (sheet 2).
- 4C. When lane-use arrow markings are used and the ONLY marking is not, an additional lane-use arrow should be used in its place to retain the spacing as shown in Table 4 (sheet 2).

Lane-Use Arrow Markings

- 5A. Lane-use arrow markings are optional except where a through traffic lane(s) approaching an intersection becomes a mandatory turn lane(s).
- 5B. Where used, the spacing between markings should be based on Table 4 (sheet 2). However, based on the turn lane length, the spacing between the markings may be adjusted.

Two-Way Left-Turn Only (TWLTO) Arrows

- 6A. Arrow sets should be longitudinally spaced at intervals of:
 - a.) 500' - 1000' for speeds less than or equal to 40 mph,
 - b.) 1000' - 1500' for speeds over 40 mph
- 6B. In addition, an arrow set should be placed:
 - a.) 100' - 200' from the near edge of an intersecting roadway, or
 - b.) Inside both ends of TWLTO lanes.

Shared Lane Marking

- 7A. When chevron markings are used, its area must be added to the value of the bike symbol markings (see Table 2 on sheet 1).
- 7B. When used, the shared lane marking should be placed immediately after an intersection and spaced at intervals not greater than 250' thereafter.

Lane-Reduction Arrow Markings

- 8A. Lane-reduction arrow markings should be placed where a lane reduction transition occurs on a roadway as follows:
 - a.) Lane-reduction arrow markings may be placed for speeds of less than 45 mph, if determined to be appropriate based on engineering judgement.
 - b.) Lane-reduction arrow markings should be placed for speeds of 45 mph or over.
 - c.) Lane-reduction arrow markings may be placed in long acceleration lanes.
 - d.) Where lane-reduction arrows are used, they should be placed as follows:
 - i.) First lane-reduction arrow 100' in advance of the 'Begin Taper' point.
 - ii.) Second lane-reduction arrow placed at the 3/4d point.

Handicap Symbol Markings

- 9A. For the handicap symbol marking, a blue background and white border shall not be used.

