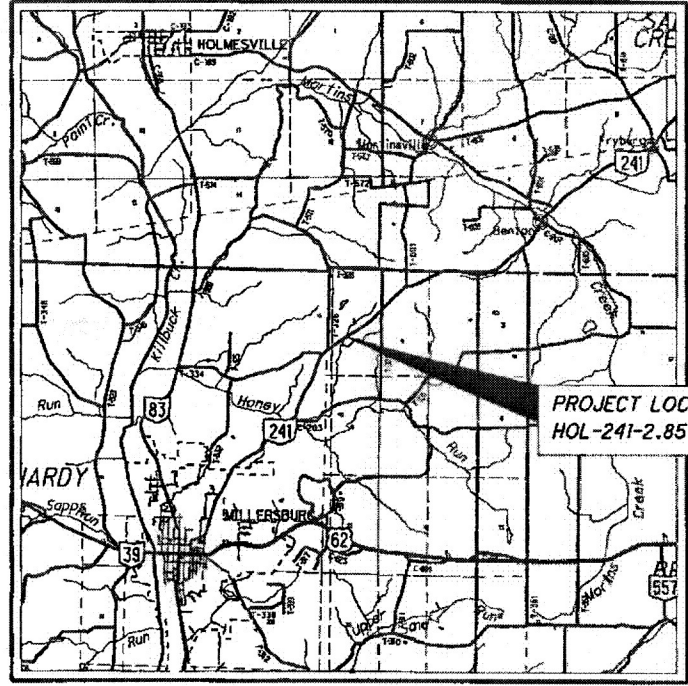


HOL - SR 241 2.650 (PART 1 AND PART 2)  
 207037 PID - 108406  
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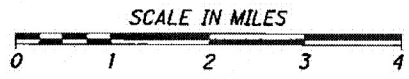
Contract Proposal available @  
 www.contracts.dot.state.oh.us

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LOCATION MAP

LATITUDE: N 40°35'10" LONGITUDE: W81°53'05"



PORTION TO BE IMPROVED	
INTERSTATE HIGHWAY	
FEDERAL ROUTES	
STATE ROUTES	
COUNTY & TOWNSHIP ROADS	
OTHER ROADS	

**DESIGN DESIGNATION**

CURRENT ADT (2020)	2,400
DESIGN YEAR ADT (2040)	2,800
DESIGN HOURLY VOLUME (2040)	350
DIRECTIONAL DISTRIBUTION	56%
TRUCKS (24 HOUR B&C)	7%
DESIGN SPEED	55MPH
LEGAL SPEED	55MPH
DESIGN FUNCTIONAL CLASSIFICATION:	
06 - MAJOR COLLECTOR (RURAL)	
NHS PROJECT	NO

**DESIGN EXCEPTIONS**

NONE

**UNDERGROUND UTILITIES**

Contact Two Working Days  
Before You Dig

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

ODOT DISTRICT II  
 ENGINEERING DEPT.  
 NEW PHILADELPHIA, OH

STATE OF OHIO  
 DEPARTMENT OF TRANSPORTATION

**HOL-241-2.85  
 PART 2**  
 HARDY TOWNSHIP  
 HOLMES COUNTY  
 FOR PART 1, SEE HOL-241-2.65

**INDEX OF SHEETS:**

TITLE SHEET	1
TYPICAL SECTION	2
GENERAL NOTES	3
MAINTENANCE OF TRAFFIC	4
GENERAL SUMMARY	5-6
PLAN AND PROFILE	7
CROSS SECTIONS	8-11
GUARDRAIL DETAILS	12-16
STRUCTURE 20' SPAN AND UNDER	17-23
RIGHT-OF-WAY	24-28

**ATTENTION**  
 Contact the Ohio Department  
 of Transportation for current  
 Plans of Record

ENGINEERS SEAL:

SIGNED: *Timothy E. Stuehlig*  
 DATE: 6-2-2020

ENGINEERS SEAL:

SIGNED: *Craig A. Schneider*  
 DATE: 6/1/2020

STANDARD CONSTRUCTION DRAWINGS				SUPPLEMENTAL SPECIFICATIONS	SPECIAL PROVISIONS
					WATERWAY PERMIT CONDITIONS 6/2/2020
		SEE PART 1			

**PROJECT DESCRIPTION**

HOL-241-2.85 OH-18-01 HOL-002  
 THE EXTENSION OF A BOX CULVERT ON THE OUTLET SLOPE ON S.R. 241. THE REPLACEMENT ALSO INCLUDES 0.02 MILES (80 FEET) OF PART WIDTH PAVEMENT REPLACEMENT AND GUARDRAIL.

**EARTH DISTURBED AREAS**

PROJECT EARTH DISTURBED AREA: N/A MAINTENANCE  
 ESTIMATED CONTRACTOR EARTH DISTURBED AREA: N/A MAINTENANCE  
 NOTICE OF INTENT EARTH DISTURBED AREA: N/A MAINTENANCE

**2019 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.

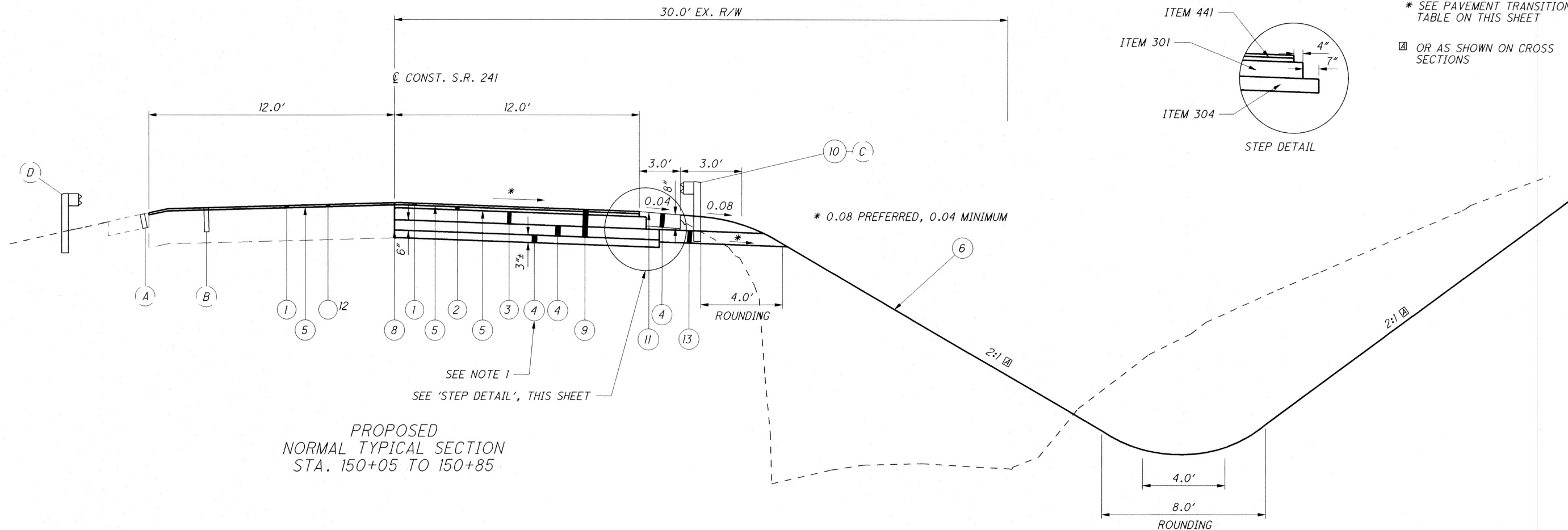
I HEREBY APPROVE THESE PLANS AND DECLARE THAT THE MAKING OF THIS IMPROVEMENT WILL NOT REQUIRE THE CLOSING TO TRAFFIC OF THE HIGHWAY AND THAT PROVISIONS FOR THE MAINTENANCE AND SAFETY OF TRAFFIC WILL BE AS SET FORTH ON THE PLANS AND ESTIMATES.

APPROVED: *Thomas D. Craig*  
 DATE: 6-2-2020 DISTRICT DEPUTY DIRECTOR

APPROVED: *Paul M. ...*  
 DATE: 7/22/2020 DIRECTOR, DEPARTMENT OF TRANSPORTATION

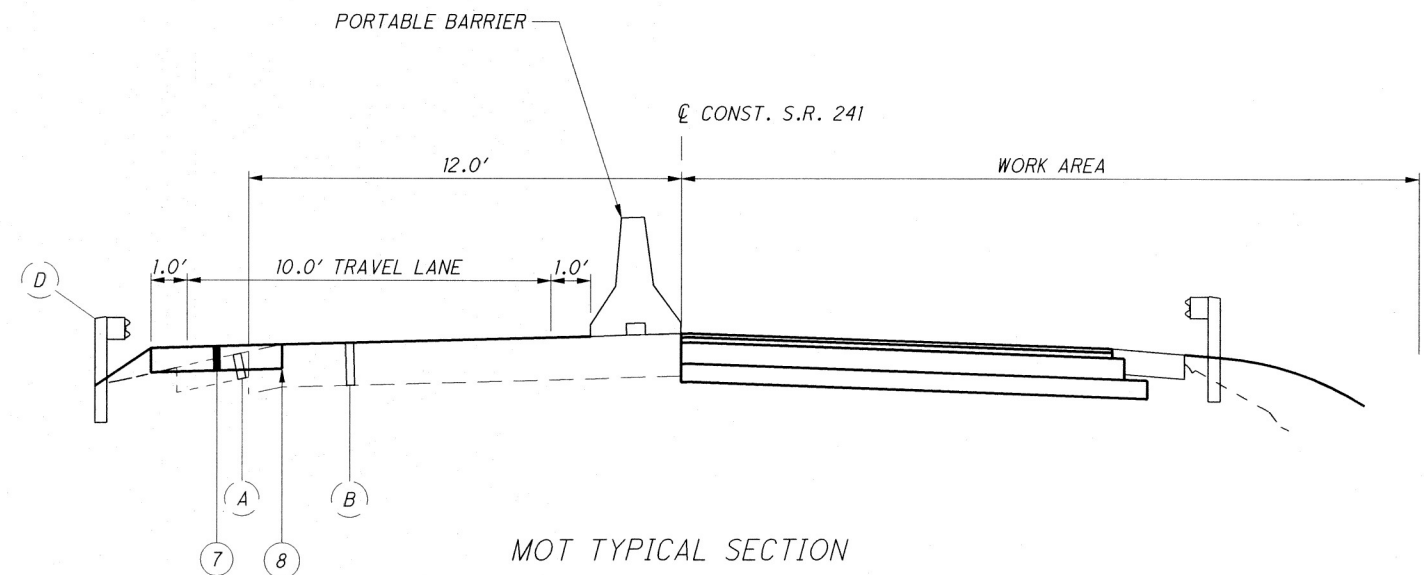
FEDERAL PROJECT NO. E180630  
 CONSTRUCTION PROJECT NO. 108406  
 RAILROAD INVOLVEMENT NONE  
 HOL-241-2.85 PART 2  
 1/28

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\* SEE PAVEMENT TRANSITION TABLE ON THIS SHEET  
 OR AS SHOWN ON CROSS SECTIONS

PROPOSED  
 NORMAL TYPICAL SECTION  
 STA. 150+05 TO 150+85



MOT TYPICAL SECTION

NOTES

- BACKFILL VOID FROM BOTTOM OF EXISTING PAVEMENT TO BOTTOM OF PROPOSED SUBGRADE WITH ITEM 304, AGGREGATE BASE.

LEGEND

- 1 ITEM 441 - 1-1/4" ASPHALT CONCRETE SURFACE COURSE, TYPE 1, (448), AS PER PLAN (PG70-22M)
- 2 ITEM 441 - 1-3/4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2, (448)
- 3 ITEM 301 - 7" ASPHALT CONCRETE BASE
- 4 ITEM 304 - AGGREGATE BASE
- 5 ITEM 407 - TACK COAT
- 6 ITEM 659 - SEEDING AND MULCHING
- 7 ITEM 615 - PAVEMENT FOR MAINTAINING TRAFFIC, CLASS B, AS PER PLAN
- 8 ITEM 252 - FULL DEPTH PAVEMENT SAWING
- 9 ITEM 202 - PAVEMENT REMOVED
- 10 ITEM 606 - GUARDRAIL, TYPE 5, USING 9 FOOT POST, AS PER PLAN
- 11 ITEM 408 - PRIME COAT, AS PER PLAN
- 12 ITEM 254 - PAVEMENT PLANING, ASPHALT CONCRETE (1 1/4")
- 13 ITEM 605 - AGGREGATE DRAIN
- A EXISTING AGGREGATE SHOULDER
- B EXISTING ASPHALT PAVEMENT (19"±)
- C EXISTING GUARDRAIL

PAVEMENT TRANSITION TABLE

STATION	PROFILE GRADE	RIGHT LANE				
		WIDTH	SLOPE	DIFF	TRANS. RATE	ELEV
150+05.00	1023.41	12	-0.0270	-0.324	813:1	1023.09
150+25.00	1023.62	12	-0.0250	-0.299		1023.32
150+50.00	1024.01	12	-0.0224	-0.269		1023.74
150+75.00	1024.57	12	-0.0198	-0.238		1024.33
150+85.00	1024.88	12	-0.0188	-0.226		1024.65

TYPICAL SECTIONS

HOL-241-2.85  
 PART 2

**UTILITIES**

THERE ARE POTENTIAL CONFLICTS WITHIN THE PROJECT LIMITS. THE CONTRACTOR AND ODOT ARE REQUIRED TO WORK WITH THE UTILITY(IES) TO MITIGATE IMPACTS TO THE PROJECTS

LISTED BELOW ARE ALL UTILITIES LOCATED WITHIN THE PROJECT CONSTRUCTION LIMITS TOGETHER WITH THEIR

RESPECTIVE OWNERS:  
CENTURY CORPORATION  
ATTN: JEFFREY SCHOONOVER  
2025 AKRON ROAD  
WOOSTER, OHIO 44691  
330-262-1128

HOLMES-WAYNE ELECTRIC COOPERATIVE  
ATTN: TIM VICKERS  
6060 STATE ROUTE 83  
MILLERSBURG, OHIO 44654  
330-674-1055

NORTHEAST OHIO NATURAL GAS  
ATTN: MARK L. WETZEL  
9081 STATE ROUTE 250  
STRASBURG, OHIO 44680  
330-878-5589

DIVERSIFIED OIL AND GAS  
ATTN: JUSTIN WEAVER  
1026 COOKSON AVENUE SE  
NEW PHILADELPHIA, OHIO 44663  
724-323-5641

THE LOCATION OF THE UNDERGROUND UTILITIES SHOWN ON THE PLANS ARE AS OBTAINED FROM THE OWNERS AS REQUIRED BY SECTION 153.64 O.R.C.

**PAVEMENT MARKINGS**

THE CONTRACTOR SHALL INSTALL PAVEMENT MARKINGS AT THE SAME LOCATION AS THE EXISTING MARKINGS. THE FOLLOWING QUANTITIES HAVE BEEN CARRIED TO THE GENERAL SUMMARY:

- ITEM 642 EDGELINE, 6", TYPE 1 0.12 MILE
- ITEM 642 CENTERLINE, TYPE 1 0.06 MILE

**ENDANGERED BAT HABITAT REMOVAL**

THE PROJECT IS LOCATED WITHIN THE KNOWN HABITAT RANGES OF THE FEDERALLY LISTED AND PROTECTED INDIANA BAT AND NORTHERN LONG-EARED BAT. NO TREES SHALL BE REMOVED UNDER THIS PROJECT FROM APRIL 1 THROUGH SEPTEMBER 30. ALL NECESSARY TREE REMOVAL SHALL OCCUR FROM OCTOBER 1 THROUGH MARCH 31. THIS REQUIREMENT IS NECESSARY TO AVOID AND MINIMIZE IMPACTS TO THESE SPECIES AS REQUIRED BY THE ENDANGERED SPECIES ACT. FOR THE PURPOSES OF THIS NOTE, A TREE IS DEFINED AS A LIVE, DYING, OR DEAD WOODY PLANT, WITH A TRUNK THREE INCHES OR GREATER IN DIAMETER AT A HEIGHT OF 4.5 FEET ABOVE THE GROUND SURFACE, AND WITH A MINIMUM HEIGHT OF 13 FEET.

**SEEDING AND MULCHING**

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

- ITEM 659, SOIL ANALYSIS TEST 2 EACH
- ITEM 659, TOPSOIL 70 SQ. YD.
- ITEM 659, REPAIR SEEDING AND MULCHING 32 SQ. YD.
- ITEM 659, COMMERCIAL FERTILIZER 0.09 TON
- ITEM 659, LIME 0.13 ACRES
- ITEM 659, WATER 5 MGAL

SEEDING AND MULCHING SHALL BE APPLIED TO ALL AREAS OF EXPOSED SOIL BETWEEN THE RIGHT-OF-WAY LINES, AND WITHIN THE CONSTRUCTION LIMITS FOR AREAS OUTSIDE THE RIGHT-OF-WAY LINES COVERED BY WORK AGREEMENT OR SLOPE EASEMENT. QUANTITY CALCULATIONS FOR SEEDING AND MULCHING ARE BASED ON THESE LIMITS.

**WORK LIMITS**

THE WORK LIMITS SHOWN ON THESE PLANS ARE FOR PHYSICAL CONSTRUCTION ONLY. PROVIDE THE INSTALLATION AND OPERATION OF ALL WORK ZONE TRAFFIC CONTROL AND WORK ZONE TRAFFIC CONTROL DEVICES REQUIRED BY THESE PLANS WHETHER INSIDE OR OUTSIDE THESE WORK LIMITS.

**SURVEYING PARAMETERS**

PRIMARY PROJECT CONTROL MONUMENTS GOVERN ALL POSITIONING ON ODOT PROJECTS. SEE SHEET 7 OF THE PLANS FOR A TABLE CONTAINING PROJECT CONTROL INFORMATION.

USE THE FOLLOWING HORIZONTAL AND VERTICAL POSITIONING PARAMETERS FOR ALL SURVEYING

POSITIONING METHOD: ODOT VRS VRS  
MONUMENT TYPE: TYPE A

**VERTICAL POSITIONING**

ORTHOMETRIC HEIGHT DATUM: NAVD 88  
GEOID: GEOID 12B

**HORIZONTAL POSITIONING**

REFERENCE FRAME: NAD 83 (2011)  
ELLIPSOID: GRS 1980  
MAP PROJECTION: LAMBERT CONFORMAL CONIC  
COORDINATE SYSTEM: OHIO STATE PLANE, NORTH ZONE  
COMBINED SCALE FACTOR: 1.00006947505758  
ORIGIN OF COORDINATE SYSTEM: N 335359.059, E 2139151.632

USE THE POSITIONING METHODS AND MONUMENT TYPE USED IN THE ORIGINAL SURVEY TO RESTORE ALL MONUMENTS RELATED TO PRIMARY PROJECT CONTROL THAT ARE DAMAGED OR DESTROYED BY CONSTRUCTION ACTIVITIES. RESTORE THE DAMAGED OR DESTROYED MONUMENTS IN ACCORDANCE WITH CMS 623.

UNITS ARE IN U.S. SURVEY FEET.

**REVIEW OF DRAINAGE FACILITIES**

BEFORE ANY WORK IS STARTED ON THE PROJECT AND AGAIN BEFORE FINAL ACCEPTANCE BY THE STATE, REPRESENTATIVES OF THE STATE AND THE CONTRACTOR SHALL MAKE AN INSPECTION OF ALL EXISTING SEWERS WHICH ARE TO REMAIN IN SERVICE AND WHICH MAY BE AFFECTED BY THE WORK. THE CONDITION OF THE EXISTING CONDUITS AND THEIR APPURTENANCE SHALL BE DETERMINED FROM FIELD OBSERVATIONS. RECORDS OF THE INSPECTION SHALL BE KEPT IN WRITING BY THE STATE.

ALL NEW CONDUITS, INLETS, CATCH BASINS, AND MANHOLES CONSTRUCTED AS A PART OF THE PROJECT SHALL BE FREE OF ALL FOREIGN MATTER AND IN A CLEAN CONDITION BEFORE THE PROJECT WILL BE ACCEPTED BY THE STATE.

ALL EXISTING SEWERS INSPECTED INITIALLY BY THE ABOVE MENTIONED PARTIES SHALL BE MAINTAINED AND LEFT IN A CONDITION REASONABLY COMPARABLE TO THAT DETERMINED BY THE ORIGINAL INSPECTION. ANY CHANGE IN THE CONDITION RESULTING FROM THE CONTRACTOR'S OPERATIONS SHALL BE CORRECTED BY THE CONTRACTOR TO THE SATISFACTION OF THE ENGINEER.

PAYMENT FOR ALL OPERATIONS DESCRIBED ABOVE SHALL BE INCLUDED IN THE CONTRACT PRICE FOR THE PERTINENT 611 CONDUIT ITEMS.

**ITEM 605 - AGGREGATE DRAINS**

THE FOLLOWING AGGREGATE DRAIN QUANTITY HAS BEEN CARRIED TO THE GENERAL SUMMARY AND SHALL BE PLACED AT THE FOLLOWING LOCATIONS:

- STA. 150+09 RT. USE 8 FT.
- STA. 150+81 RT. USE 8 FT.
- TOTAL 16 FT.

**RAISED PAVEMENT MARKERS**

THE CONTRACTOR SHALL REMOVE AND INSTALL NEW RAISED PAVEMENT MARKERS AT THE SAME LOCATION AS THE EXISTING RAISED PAVEMENT MARKERS. THE FOLLOWING QUANTITIES HAVE BEEN CARRIED TO THE GENERAL SUMMARY:

- ITEM 626 RAISED PAVEMENT MARKER REMOVED 2 EACH
- ITEM 626 RPM 2 EACH

**ITEM 203 REMOVAL MISC.: EXISTING WALL**

THIS ITEM SHALL CONSIST OF REMOVING THE EXISTING WALL MADE UP OF STEEL TUBE PILES AND GUARDRAIL PANELS. THE CONTRACTOR SHALL REMOVE ALL GUARDRAIL PANELS AND REMOVE THE PIPE PILES TO ONE FOOT BELOW EXISTING GROUND LEVEL.

PAYMENT FOR ALL OPERATIONS DESCRIBED ABOVE SHALL BE INCLUDED IN THE CONTRACT PRICE FOR ITEM REMOVAL MISC.: RETAINING WALL.

**CONNECTION BETWEEN EXISTING AND PROPOSED GUARDRAIL**

WHEN IT IS NECESSARY TO SPLICE PROPOSED GUARDRAIL TO EXISTING GUARDRAIL, ONLY THE EXISTING GUARDRAIL SHALL BE CUT, DRILLED, OR PUNCHED. THE CONNECTION SHALL BE MADE USING A W-BEAM, BEAM SPLICE AS SHOWN IN AASHTO M 180-12, EXCEPT THE BEAM WASHERS ARE NOT TO BE USED. PAYMENT SHALL BE INCLUDED IN THE CONTRACT PRICE FOR THE RESPECTIVE GUARDRAIL ITEMS.

**PART-WIDTH CONSTRUCTION**

BECAUSE OF THE NECESSITY TO BUILD THIS PROJECT UNDER TRAFFIC AND TO CONSTRUCT THE FULL PAVEMENT WIDTH IN STAGES, EXERCISE CARE TO PREVENT THE CONSTRUCTION OF A BUTT JOINT IN THE BASE COURSES. LAP LONGITUDINAL JOINTS AS SHOWN ON STANDARD CONSTRUCTION DRAWING BP-3.1.

**ASPHALT CONCRETE SURFACE COURSE TYPE 1, (448), AS PER PLAN (PG70-22M)**

FOLLOW SPECIFICATION 703.05 EXCEPT DO NOT USE COARSE AGGREGATE FROM A SOURCE DESIGNATED 'SR' OR 'SRH' ACCORDING TO THE OFFICE OF MATERIALS MANAGEMENT (OMM) IN ANY JOB MIX FORMULA (JMF) FOR THIS ITEM.

**ITEM 408 PRIME COAT, AS PER PLAN**

THE CONTRACTOR SHALL APPLY "MC-70" AT A RATE OF 0.4 GALLONS PER SQUARE YARD, OR AS DIRECTED BY THE ENGINEER TO THE COMPLETED AGGREGATE SHOULDER.

**ROUNDING**

THE ROUNDING AT SLOPE BREAKPOINTS SHOWN ON THE TYPICAL SECTIONS APPLIES TO ALL CROSS-SECTIONS EVEN THOUGH OTHERWISE SHOWN.

**CLEARING AND GRUBBING**

ALTHOUGH THERE ARE NO TREES OR STUMPS SPECIFICALLY MARKED FOR REMOVAL WITHIN THE LIMITS OF THE PROJECT, A LUMP SUM QUANTITY IS INCLUDED IN THE GENERAL SUMMARY FOR ITEM 201, CLEARING AND GRUBBING. ALL PROVISIONS AS SET FORTH IN THE SPECIFICATIONS UNDER THIS ITEM ARE INCLUDED IN THE LUMP SUM PRICE BID FOR ITEM 201, CLEARING AND GRUBBING.

**ITEM 606 GUARDRAIL, TYPE 5, USING 9 FOOT POST, AS PER PLAN**

NINE FOOT POSTS SHALL BE USED FOR THIS ENTIRE RUN WITH THE EXCEPTION OF THE POST(S) LOCATED OVER THE PROPOSED CULVERT. A STANDARD POST SHALL BE USED AT THIS LOCATION.

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GENERAL NOTES

HOL-241-2.85  
PART 2

**ITEM 614 - MAINTAINING TRAFFIC, AS PER PLAN**

NO WORK SHALL BEGIN ON PART 2 (HOL-241-2.85) UNTIL AFTER MARCH 1, 2021.

MAINTAIN A MINIMUM OF 1 LANE OF TRAFFIC AT ALL TIMES DURING CONSTRUCTION USING PORTABLE BARRIER AS PER STANDARD DRAWING MT-96.11. THE TEMPORARY SIGNAL TIMING FOR THE WORK ZONE SHALL BE DETERMINED BY THE ENGINEER AND BASED ON THE LENGTH BETWEEN WORK ZONE STOP BARS. DRIVE ACCESS SHALL BE MAINTAINED THROUGHOUT THE DURATION OF THE PROJECT.

THE MAINTENANCE OF TRAFFIC SHALL BE IN CONFORMANCE WITH THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, LATEST REVISION; THE REFERENCED STANDARD CONSTRUCTION DRAWINGS INCLUDING DESIGNER NOTES; THE CONSTRUCTION AND MATERIAL SPECIFICATIONS (CMS); POLICY NO. 516-003(P) TRAFFIC MANAGEMENT IN WORK ZONES INTERSTATE AND OTHER FREEWAYS; ODOT LOCATION AND DESIGN MANUAL, VOLUME 1; ODOT TRAFFIC ENGINEERING MANUAL; AND ALL REQUIREMENTS DETAILED IN THESE PLANS.

LENGTH AND DURATION OF LANE CLOSURES AND RESTRICTIONS SHALL BE AT THE APPROVAL OF THE ENGINEER. IT IS THE INTENT TO MINIMIZE THE IMPACT TO THE TRAVELING PUBLIC. LANE CLOSURES OR RESTRICTIONS OVER SEGMENTS OF THE PROJECT IN WHICH NO WORK IS ANTICIPATED WITHIN A REASONABLE TIME FRAME, AS DETERMINED BY THE ENGINEER, SHALL NOT BE PERMITTED. THE LEVEL OF UTILIZATION OF MAINTENANCE OF TRAFFIC DEVICES SHALL BE COMMENSURATE WITH THE WORK IN PROGRESS.

ALL WORK AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH C&MS 614 AND OTHER APPLICABLE PORTIONS OF THE SPECIFICATIONS, AS WELL AS THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES. PAYMENT FOR ALL LABOR, EQUIPMENT AND MATERIALS SHALL BE INCLUDED IN THE LUMP SUM CONTRACT PRICE FOR ITEM 614, MAINTAINING TRAFFIC, AS PER PLAN UNLESS SEPARATELY ITEMIZED IN THE PLAN.

**WORK ZONE MARKINGS**

THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN CARRIED TO THE GENERAL SUMMARY FOR USE AT LOCATIONS IDENTIFIED BY THE ENGINEER FOR WORK ZONE PAVEMENT MARKINGS PER THE REQUIREMENTS OF C&MS 614.04 AND 614.11.

- ITEM 614 WORK ZONE CENTERLINE, CLASS I, 740.06, TYPE 1 0.06 MILE
- ITEM 614 WORK ZONE EDGELINE, CLASS I, 6", 740.06, TYPE 1 0.12 MILE

**NOTIFICATION OF TRAFFIC RESTRICTIONS**

THROUGHOUT THE DURATION OF THE PROJECT, THE CONTRACTOR SHALL NOTIFY THE PROJECT ENGINEER IN WRITING OF ALL TRAFFIC RESTRICTIONS AND UPCOMING MAINTENANCE OF TRAFFIC CHANGES. THE CONTRACTOR SHALL ENSURE THE WRITING OF ALL TRAFFIC RESTRICTIONS AND UPCOMING MAINTENANCE OF TRAFFIC CHANGES. THE CONTRACTOR SHALL ENSURE THE WRITTEN NOTIFICATION IS SUBMITTED IN A TIMELY MANNER TO ALLOW THE PROJECT ENGINEER TO MEET THE REQUIRED TIME FRAMES SET FORTH IN THE TABLE BELOW TO INFORM THE SPECIAL HAULING PERMITS SECTION (HAULING.PERMITS@DOT.OHIO.GOV) AND THE DISTRICT PUBLIC INFORMATION OFFICE (PIO). THIS NOTIFICATION SHALL BE RECEIVED BY THE PROJECT ENGINEER PRIOR TO THE PHYSICAL SETUP OF ANY APPLICABLE SIGNS OR MESSAGE BOARDS.

INFORMATION SHOULD INCLUDE, BUT IS NOT LIMITED TO, ALL CONSTRUCTION ACTIVITIES THAT IMPACT OR INTERFERE WITH TRAFFIC AND SHALL LIST THE SPECIFIC LOCATION, TYPE OF WORK, ROAD STATUS, DATE AND TIME OF RESTRICTION, DURATION OF RESTRICTION, NUMBER OF LANES MAINTAINED, NUMBER OF LANES CLOSED, MINIMUM VERTICAL CLEARANCE, MINIMUM WIDTH OF DRIVABLE PAVEMENT, DETOUR ROUTES, IF APPLICABLE, AND ANY OTHER INFORMATION REQUESTED BY THE PROJECT ENGINEER.

NOTIFICATION TIME TABLE		
ITEM	DURATION OF CLOSURE	NOTICE DUE TO OFFICE OF COMMUNICATIONS
RAMP & ROAD CLOSURES	>= 2 WEEKS	21 CALENDAR DAYS PRIOR TO CLOSURE
	> 12 HOURS & < 2 WEEKS	14 CALENDAR DAYS PRIOR TO CLOSURE
	<= 12 HOURS	4 BUSINESS DAYS PRIOR TO CLOSURE
LANE CLOSURES & RESTRICTIONS	>= 2 WEEKS	14 CALENDAR DAYS PRIOR TO CLOSURE
	< 2 WEEKS	5 BUSINESS DAYS PRIOR TO CLOSURE
START OF CONSTRUCTION & TRAFFIC PATTERN CHANGES	N/A	14 CALENDAR DAYS PRIOR TO IMPLEMENTATION

ANY UNFORESEEN CONDITIONS NOT SPECIFIED IN THE PLANS REQUIRING TRAFFIC RESTRICTIONS SHALL ALSO BE REPORTED TO THE PROJECT ENGINEER USING THE NOTIFICATION TIME TABLE.

**ITEM 615 - PAVEMENT FOR MAINTAINING TRAFFIC, CLASS B, AS PER PLAN**

FOLLOW SPECIFICATION 615, EXCEPT ONLY PROVIDE FLEXIBLE PAVEMENT FOR MAINTAINING TRAFFIC, ANY REQUIRED EMBANKMENT QUANTITY SHALL BE INCLUDED WITHIN PAVEMENT FOR MAINTAINING TRAFFIC LINE ITEM.

THE FOLLOWING QUANTITY HAS BEEN CARRIED TO THE GENERAL SUMMARY:

- ITEM 615, PAVEMENT FOR MAINTAINING TRAFFIC, CLASS B, AS PER PLAN 62 S.Y.

**OVERNIGHT TRENCH CLOSING**

THE SHOULDER WIDENING SHALL BE COMPLETED TO A DEPTH OF NO MORE THAN 3" INCHES BELOW THE EXISTING PAVEMENT BY THE END OF EACH WORK DAY. NO TRENCH SHALL BE LEFT OPEN OVERNIGHT EXCEPT FOR A SHORT LENGTH (25 FEET OR LESS) OF A WORK SECTION AT THE END OF THE TRENCH. IN CASE WORK MUST BE SUSPENDED BECAUSE OF INCLEMENT WEATHER OR OTHER REASONS, THE TRENCH FOR THE UNCOMPLETED SHOULDER WIDENING SHALL BE BACKFILLED AT THE DIRECTION OF THE ENGINEER.

**TRENCH FOR WIDENING**

TRENCH EXCAVATION FOR SHOULDER WIDENING SHALL BE ONLY ON ONE SIDE OF THE PAVEMENT AT A TIME. THE OPEN TRENCH SHALL BE ADEQUATELY MAINTAINED AND PROTECTED WITH DRUMS OR BARRICADES AT ALL TIMES. PLACEMENT OF PROPOSED SUBBASE AND BASE MATERIAL SHALL FOLLOW AS CLOSELY AS POSSIBLE BEHIND EXCAVATION OPERATIONS. THE LENGTH OF WIDENING TRENCH WHICH IS OPEN AT ANY ONE TIME SHALL BE HELD TO A MINIMUM AND SHALL AT ALL TIMES BE SUBJECT TO APPROVAL OF THE ENGINEER.

**DUST CONTROL**

THE CONTRACTOR SHALL FURNISH AND APPLY WATER FOR DUST CONTROL AS DIRECTED BY THE ENGINEER. THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN INCLUDED FOR DUST CONTROL PURPOSES:

- ITEM 616, WATER 5 M. GAL.

**ITEM 614 - WORK ZONE IMPACT ATTENUATOR FOR 24" WIDE HAZARDS (BIDIRECTIONAL)**

THIS ITEM SHALL CONSIST OF FURNISHING AND INSTALLING A NONGATING IMPACT ATTENUATOR. FURNISH AN IMPACT ATTENUATOR FROM THE OFFICE OF ROADWAY ENGINEERING'S APPROVED LIST FOR WORK ZONE IMPACT ATTENUATORS, FROM THE ROADWAY STANDARDS APPROVED PRODUCTS WEB PAGE.

INSTALLATION SHALL BE AT THE LOCATIONS SPECIFIED IN THE PLANS IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.

THE CONTRACTOR SHALL REPAIR OR REPLACE A DAMAGED UNIT WITHIN 24 HOURS OF A DAMAGING IMPACT.

WHEN BIDIRECTIONAL DESIGNS ARE SPECIFIED, THE CONTRACTOR SHALL SUPPLY APPROPRIATE TRANSITIONS.

WHEN GATING IMPACT ATTENUATORS ARE DESIRED, THE CONTRACTOR SHALL SUBMIT DOCUMENTATION TO THE ENGINEER FOR ACCEPTANCE.

THE COST FOR THE ADDITIONAL BARRIER REQUIRED FOR A GATING IMPACT ATTENUATOR SHALL BE INCLUDED IN THE COST OF THE GATING IMPACT ATTENUATOR.

PAYMENT FOR THE ABOVE WORK SHALL BE INCLUDED IN THE LUMP SUM CONTRACT PRICE FOR ITEM 614 - MAINTAINING TRAFFIC, AS PER PLAN, AND SHALL INCLUDE ALL LABOR, TOOLS, EQUIPMENT AND MATERIALS NECESSARY TO CONSTRUCT AND MAINTAIN A COMPLETE AND FUNCTIONAL IMPACT ATTENUATOR SYSTEM, INCLUDING ALL RELATED BACKUPS, TRANSITIONS, LEVELING PADS, HARDWARE AND GRADING, NOT SEPARATELY SPECIFIED, AS REQUIRED BY THE MANUFACTURER.

**DELINEATION OF PORTABLE BARRIER**

BARRIER REFLECTORS AND OBJECT MARKERS SHALL BE INSTALLED ON ALL PORTABLE BARRIER (PB) USED FOR TRAFFIC CONTROL LOCATED WITHIN 5 FEET OF THE EDGE OF THE ADJACENT TRAVEL LANE.

BARRIER REFLECTORS SHALL CONFORM TO C&MS 626, EXCEPT THAT THE SPACING SHALL BE AS PER TRAFFIC SCD MT-101.70. OBJECT MARKERS AND THEIR INSTALLATION SHALL CONFORM TO C&MS 614.03 AND SCD MT-101.70.

PAYMENT FOR THE ABOVE WORK SHALL BE INCLUDED IN THE LUMP SUM CONTRACT PRICE FOR ITEM 614 - MAINTAINING TRAFFIC, AS PER PLAN, AND SHALL INCLUDE FULL COMPENSATION FOR ALL MATERIAL, LABOR, INCIDENTALS AND EQUIPMENT NECESSARY FOR FURNISHING, INSTALLING, MAINTAINING AND REMOVING EACH OF THE ABOVE ITEMS.

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MAINTENANCE OF TRAFFIC GENERAL NOTES

HOL-241-2.85  
PART 2

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SHEET NUM.												PART.	ITEM	ITEM	GRAND	UNIT	DESCRIPTION	SEE SHEET NO.		
3			7	8	9	10	11	17			OFFICE CALCS	02/STR/OT	EXT	TOTAL						
<b>ROADWAY</b>																				
LS												LS	201	11000	LS	CLEARING AND GRUBBING				
												107	107	23000	107	SY	PAVEMENT REMOVED			
			93.75										93.75	202	38000	93.75	FT	GUARDRAIL REMOVED		
			109										109	202	75000	109	FT	FENCE REMOVED		
			LS										LS	202	98000	LS	REMOVAL MISC.: EXISTING WALL	3		
				50	218	78	15						361	203	10000	361	CY	EXCAVATION		
				44	206	36	7						293	203	20000	293	CY	EMBANKMENT		
													134	134	10000	134	SY	SUBGRADE COMPACTION		
			93.75										93.75	606	13031	93.75	FT	GUARDRAIL, TYPE 5, USING 9 FOOT POSTS, AS PER PLAN	12-16	
			15										15	606	18501	15	EACH	GUARDRAIL POST, 9 FEET, AS PER PLAN	3	
<b>EROSION CONTROL</b>																				
													134	134	601	32010	134	CY	ROCK CHANNEL PROTECTION, TYPE A WITH AGGREGATE FILTER	
2													2	659	00100	2	EACH	SOIL ANALYSIS TEST		
70													70	659	00300	70	CY	TOPSOIL		
				61	429	106	34						630	659	10000	630	SY	SEEDING AND MULCHING		
32													32	659	14000	32	SY	REPAIR SEEDING AND MULCHING		
0.09													0.09	659	20000	0.09	TON	COMMERCIAL FERTILIZER		
0.13													0.13	659	31000	0.13	ACRE	LIME		
5													5	659	35000	5	MGAL	WATER		
														1,000	832	30000	1,000	EACH	EROSION CONTROL	
<b>DRAINAGE</b>																				
16													16	605	31100	16	FT	AGGREGATE DRAINS		
<b>PAVEMENT</b>																				
													104	104	252	01500	104	FT	FULL DEPTH PAVEMENT SAWING	
													107	107	254	01000	107	SY	PAVEMENT PLANING, ASPHALT CONCRETE (DEPTH 1 1/4")	
													22	22	301	46000	22	CY	ASPHALT CONCRETE BASE, PG64-22	
													38	38	304	20000	38	CY	AGGREGATE BASE	
													27	27	407	10000	27	GAL	TACK COAT	
													12	12	408	10001	12	GAL	PRIME COAT, AS PER PLAN	3
													8	8	441	50101	8	CY	ASPHALT CONCRETE SURFACE COURSE, TYPE 1, (448), AS PER PLAN (PG 70-22M)	3
													5	5	441	50300	5	CY	ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2, (448)	3
<b>TRAFFIC CONTROL</b>																				
2													2	621	00100	2	EACH	RPM		
2													2	621	54000	2	EACH	RAISED PAVEMENT MARKER REMOVED		
			2										2	626	00110	2	EACH	BARRIER REFLECTOR, TYPE 2 (BI-DIRECTIONAL)		
0.12													0.12	642	00104	0.12	MILE	EDGE LINE, 6", TYPE 1		
0.06													0.06	642	00300	0.06	MILE	CENTER LINE, TYPE 1		

CALCULATED	TES	CHECKED	JPB
<b>GENERAL SUMMARY</b>			
<b>HOL-241-2.85 PART 2</b>			
5 28			

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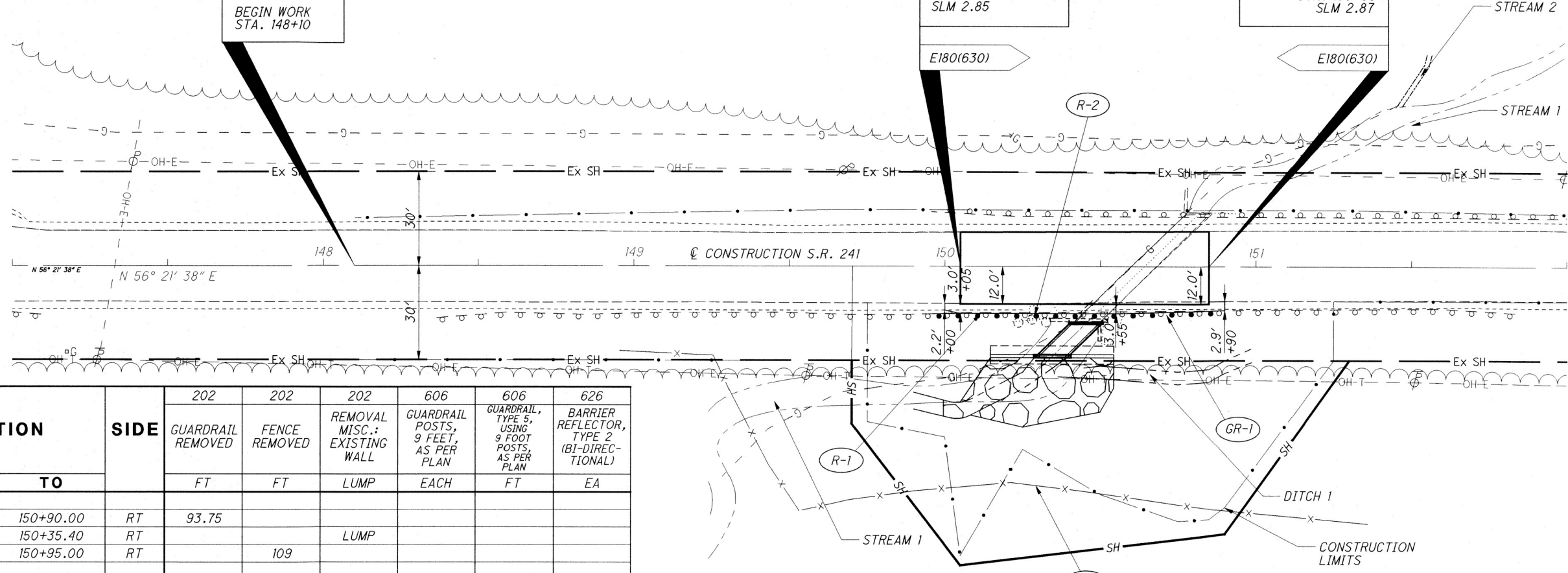
SHEET NUM.											PART.	ITEM	ITEM	GRAND	UNIT	DESCRIPTION	SEE SHEET NO.
4									23	OFFICE CALCS 02/STR/OT	EXT	TOTAL					
															STRUCTURE 20 FOOT SPAN AND UNDER (CFN: 1810514)		
										LS	LS	202	11200	LS	PORTIONS OF STRUCTURE REMOVED	22	
										64	64	304	20000	64	CY	AGGREGATE BASE	
										76	76	503	21100	76	CY	UNCLASSIFIED EXCAVATION	
									7,686		7,686	509	10000	7,686	LB	EPOXY COATED REINFORCING STEEL	
										34	34	510	10000	34	EACH	DOWEL HOLES WITH NONSHRINK, NONMETALLIC GROUT	
										27	27	511	46211	27	CY	CLASS QC1 CONCRETE, RETAINING/WINGWALL INCLUDING FOOTING, AS PER PLAN	18
										13	13	511	47010	13	CY	CLASS QC1 CONCRETE, CULVERT	
										25	25	512	10100	25	SY	SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)	
										40	40	512	33000	40	SY	TYPE 2 WATERPROOFING	
										16	16	516	13600	16	SF	1" PREFORMED EXPANSION JOINT FILLER	
										11	11	518	21200	11	CY	POROUS BACKFILL WITH GEOTEXTILE FABRIC	
																<b>MAINTENANCE OF TRAFFIC</b>	
	0.06									0.06	614	21200	0.06	MILE	WORK ZONE CENTER LINE, CLASS I, 740.06, TYPE I		
	0.12									0.12	614	22210	0.12	MILE	WORK ZONE EDGE LINE, CLASS I, 6", 740.06, TYPE I		
	62									62	615	25001	62	SY	PAVEMENT FOR MAINTAINING TRAFFIC, CLASS B, AS PER PLAN	4	
	5									5	616	10000	5	MGAL	WATER		
																<b>INCIDENTALS</b>	
	LS									LS	614	11001	LS		MAINTAINING TRAFFIC, AS PER PLAN	4	
										3	619	16000	3	MNTH	FIELD OFFICE, TYPE A		
										LS	623	10000	LS		CONSTRUCTION LAYOUT STAKES AND SURVEYING		
										LS	624	10000	LS		MOBILIZATION		

**GENERAL SUMMARY**

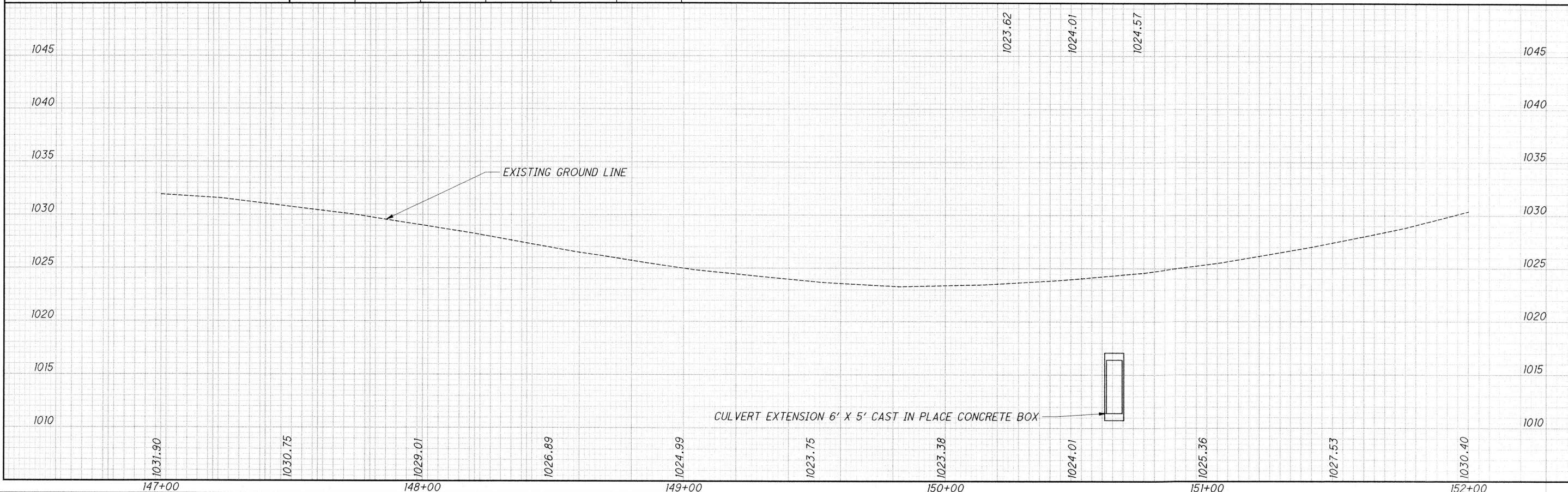
**HOL-241-2.85**  
**PART 2**

CALCULATED  
TES  
CHECKED  
JPB

HORIZONTAL CONTROL POINTS AND BENCHMARKS					
STATION	OFFSET	NORTHING	EASTING	ELEVATION	DESCRIPTION
139+80.20	-19.0787	334924.6706	2138426.0049	1088.3210	SIZE:5/8" NAME:ODOT
148+25.38	17.8404	335359.0593	2139151.6323	1026.5492	SIZE:5/8" NAME:ODOT
152+09.73	-20.8255	335604.1701	2139450.2033	1027.9980	SIZE:5/8" NAME:ODOT



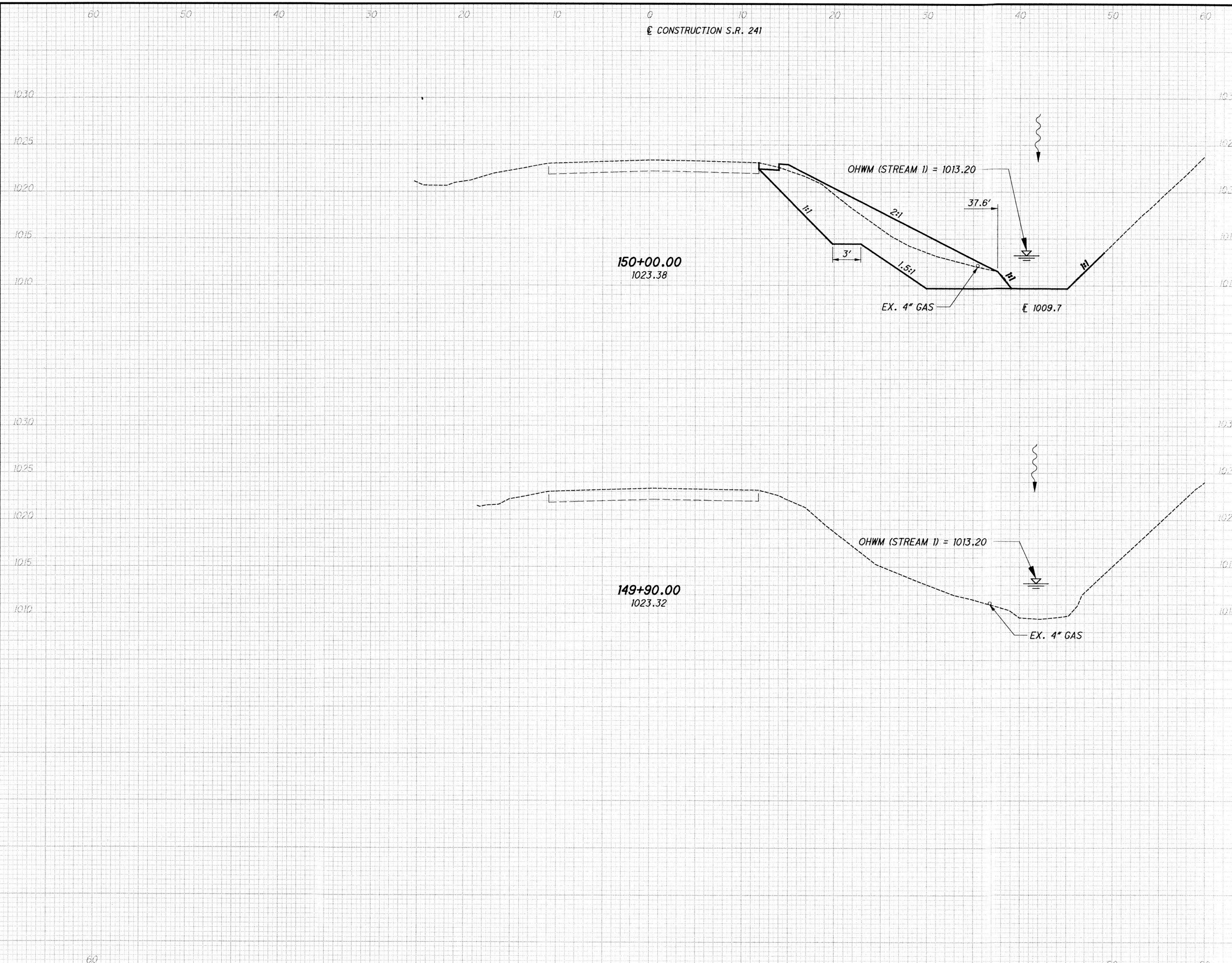
REF NO.	STATION		SIDE	202	202	202	606	606	626
	FROM	TO		GUARDRAIL REMOVED	FENCE REMOVED	REMOVAL MISC.: EXISTING WALL	GUARDRAIL POSTS, 9 FEET, AS PER PLAN	GUARDRAIL, TYPE 5, USING 9 FOOT POSTS, AS PER PLAN	BARRIER REFLECTOR, TYPE 2 (BI-DIRECTIONAL)
				FT	FT	LUMP	EACH	FT	EA
R-1	149+96.26	150+90.00	RT	93.75					
R-2	150+21.75	150+35.40	RT			LUMP			
R-3	149+86.00	150+95.00	RT		109				
GR-1	149+96.26	150+90.00	RT				15	93.75	2
<b>TOTALS CARRIED TO GENERAL SUMMARY</b>				93.75	109	LUMP	15	93.75	2



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SEEDING  
END SO.  
WIDTH YDS.

34  
45  
27  
4  
61



END AREA		VOLUME		CHECKED	JPB
CUT	FILL	CUT	FILL		
34	87	23	112		
27	16	21			
4	0	0			
61	50	44			

CROSS SECTIONS S.R. 241  
STA. 149+90.00 TO STA. 150+00.00

HOL-241-2.85  
PART 2

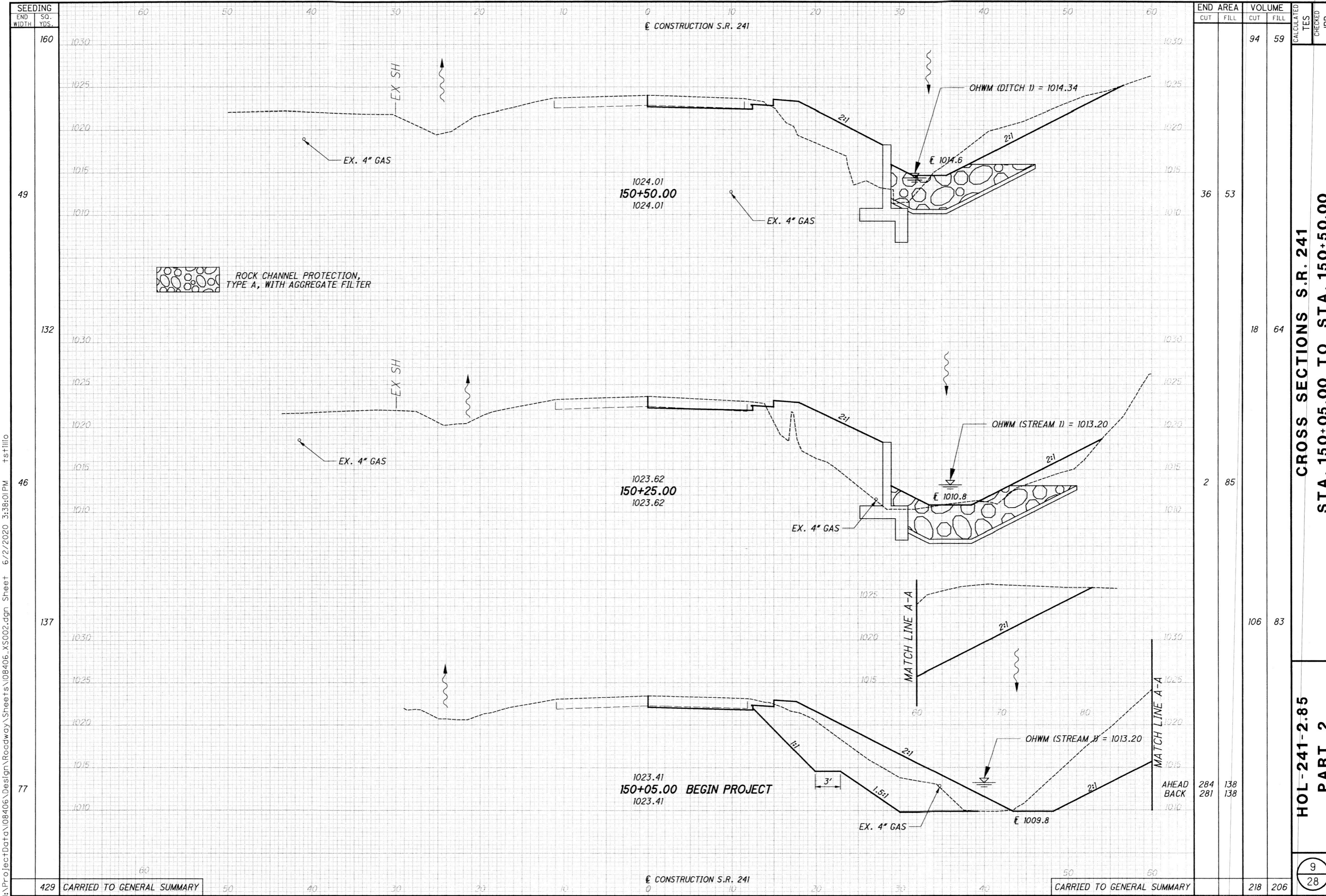
8  
28

CONSTRUCTION S.R. 241

CONSTRUCTION S.R. 241

08406\_XS002.dgn Sheet 6/2/2020 3:38:01 PM Istilio





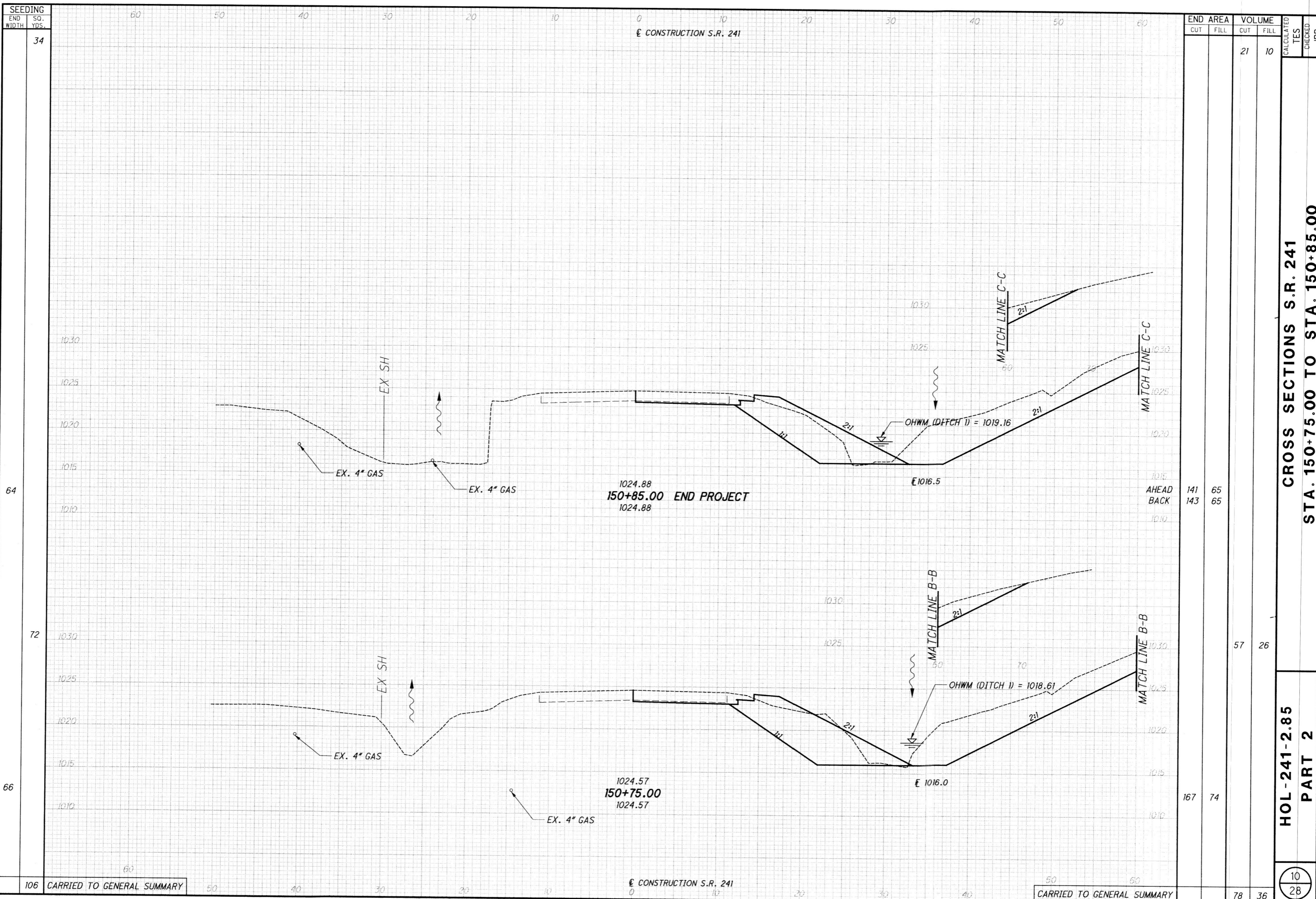
SEEDING END WIDTH	SO. YDS.	END AREA		VOLUME		CALCULATED TES	CHECKED JPB
		CUT	FILL	CUT	FILL		
160	1030			94	59		
49	1025			36	53		
132	1020			18	64		
46	1015			2	85		
137	1010			106	83		
77	1005			284	138		
429	1000			218	206		

**CROSS SECTIONS S.R. 241**  
**STA. 150+05.00 TO STA. 150+50.00**

**HOL-241-2.85**  
**PART 2**

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END STA.	END AREA		VOLUME		CALCULATED TES	CHECKED JPB
	CUT	FILL	CUT	FILL		
150+85.00	141	65	21	10		
150+75.00	167	74	57	26		
150+85.00	143	65				
150+75.00	167	74				
150+85.00			78	36		

**CROSS SECTIONS S.R. 241**  
**STA. 150+75.00 TO STA. 150+85.00**

**HOL-241-2.85**  
**PART 2**

10  
28

SEEDING  
 END WIDTH SQ. YDS.  
 34  
 64  
 72  
 66  
 106 CARRIED TO GENERAL SUMMARY

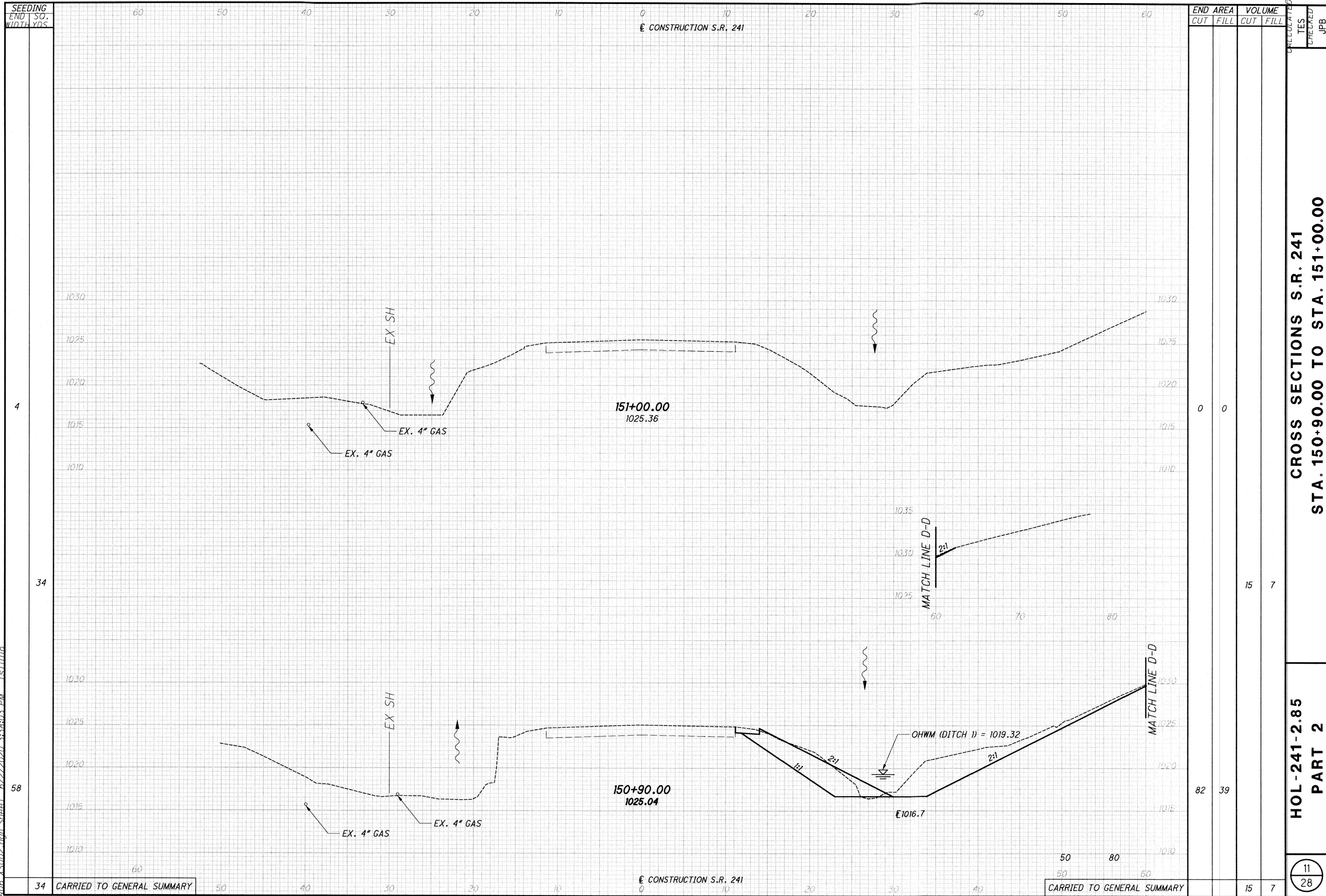
CONSTRUCTION S.R. 241

CONSTRUCTION S.R. 241

1024.88  
 150+85.00 END PROJECT  
 1024.88

1024.57  
 150+75.00  
 1024.57

CARRIED TO GENERAL SUMMARY



SEEDING  
END SO.  
WIDTH YDS.

CONSTRUCTION S.R. 241

END AREA		VOLUME		CHECKED	TES	JPB
CUT	FILL	CUT	FILL			
0	0	15	7			
82	39	15	7			

4

151+00.00  
1025.36

0 0

34

MATCH LINE D-D  
2:1

15 7

58

150+90.00  
1025.04

OHWM (DITCH 1) = 1019.32

E 1016.7

MATCH LINE D-D

82 39

CONSTRUCTION S.R. 241

CARRIED TO GENERAL SUMMARY

CROSS SECTIONS S.R. 241  
STA. 150+90.00 TO STA. 151+00.00

HOL-241-2.85  
PART 2

11  
28

28406 X5002.dgn Sheet 6/2/2020 3:38:03 PM Istilia

34 CARRIED TO GENERAL SUMMARY

**NOTES**

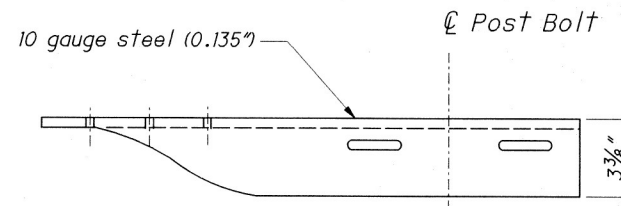
**GENERAL:** Components shown on this drawing are used in a variety of guardrail systems. See individual guardrail drawing for specific applications.

See CMS 606 for guardrail specifications not covered on these drawings.

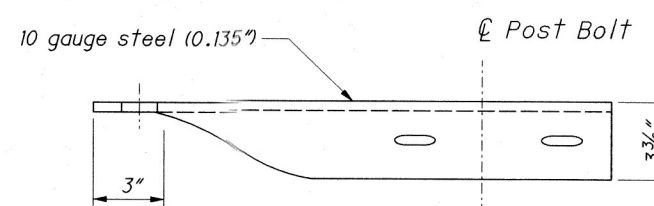
Refer to AASHTO M 180 for dimensional details of W-Beam and Thrie-Beam rail elements, related buffer and end sections, beam splices, post and splice bolts, nuts, and Type 1 W-Beam to Thrie-Beam Transition sections.

**RAIL ELEMENTS:** W-Beam Rail has an effective length of 12'-6" unless otherwise specified, with 3/4" x 2 1/2" post bolt slots on 6'-3" centers regardless of post spacing. Field punch or drill bolt holes or slots for irregularly spaced posts as specified in CMS 606.04.

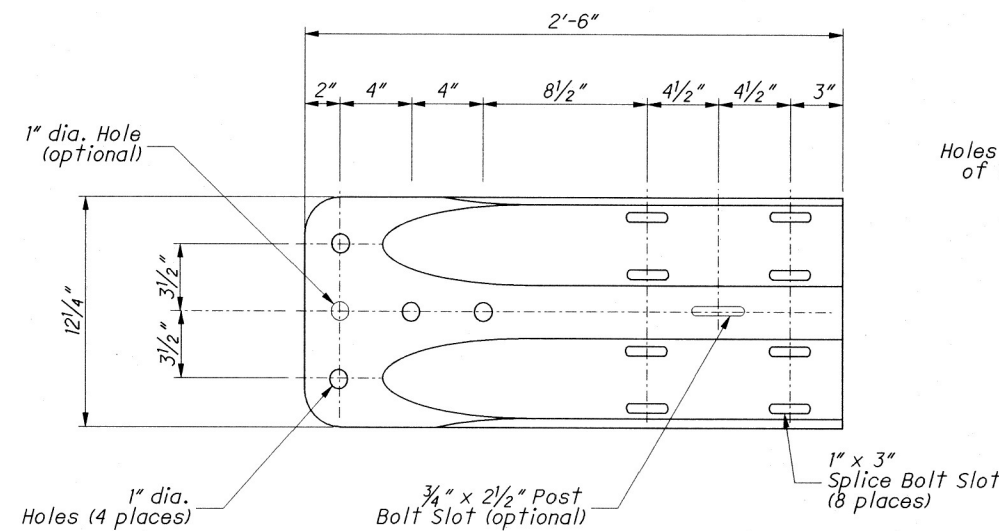
**RAIL SPLICES:** Lap splices between two rail elements or between a rail and terminal connector in the direction of traffic. Lap the buffer or flared end sections in the direction of traffic.



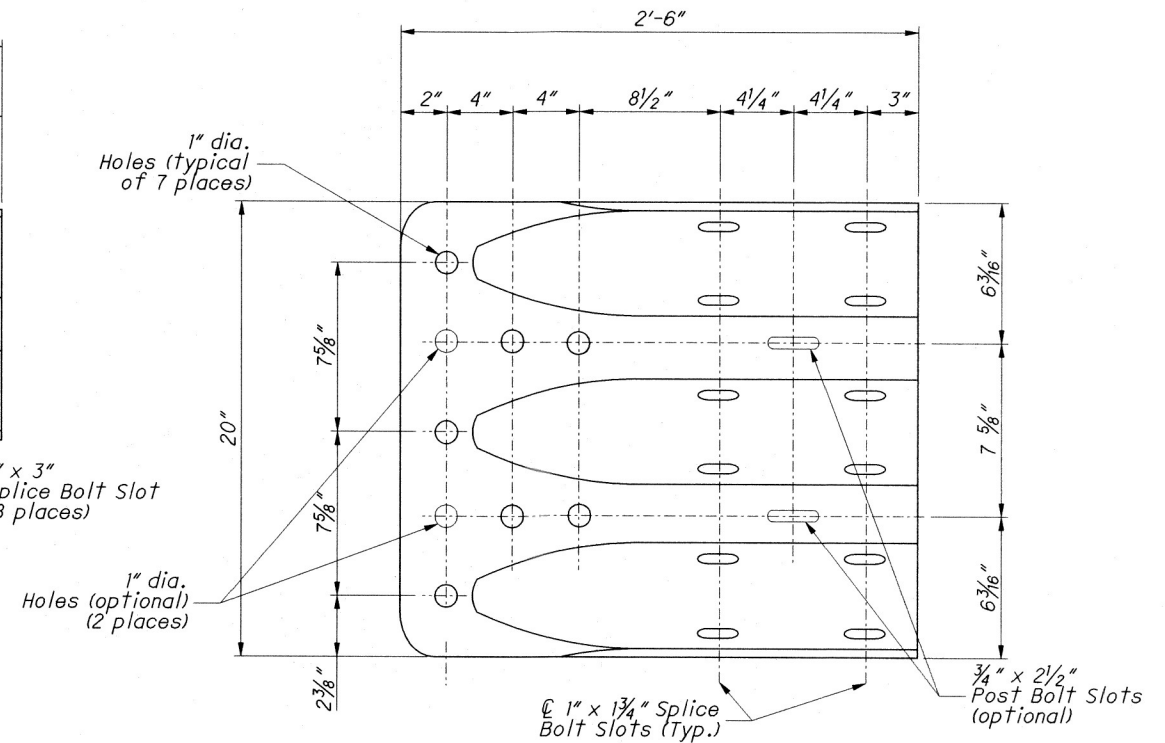
PLAN



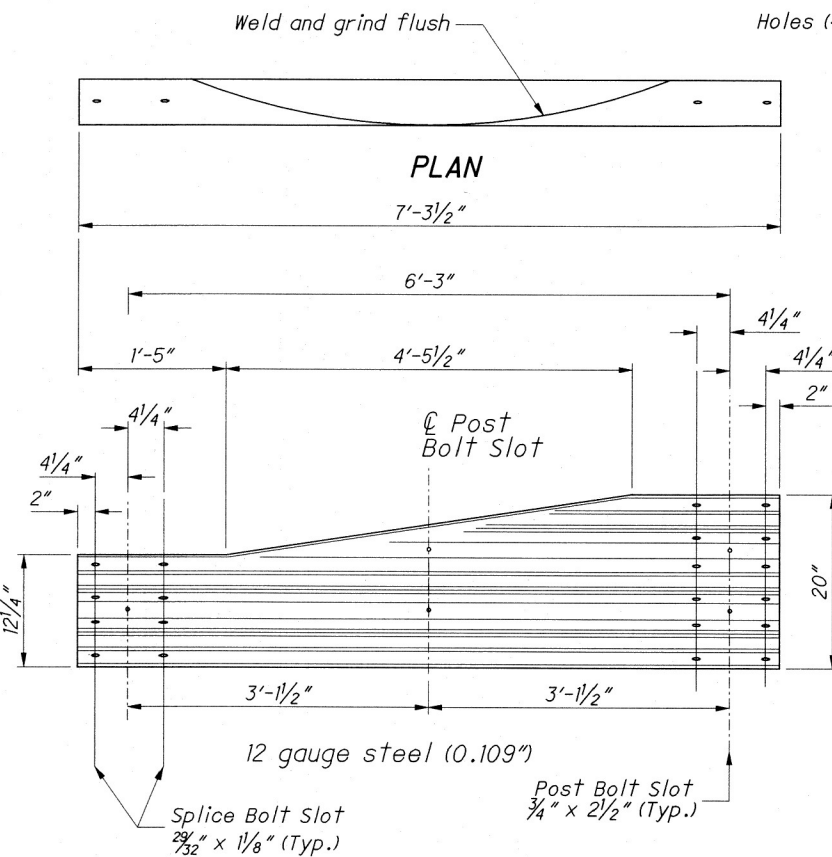
PLAN



ELEVATION  
W-BEAM TERMINAL CONNECTOR

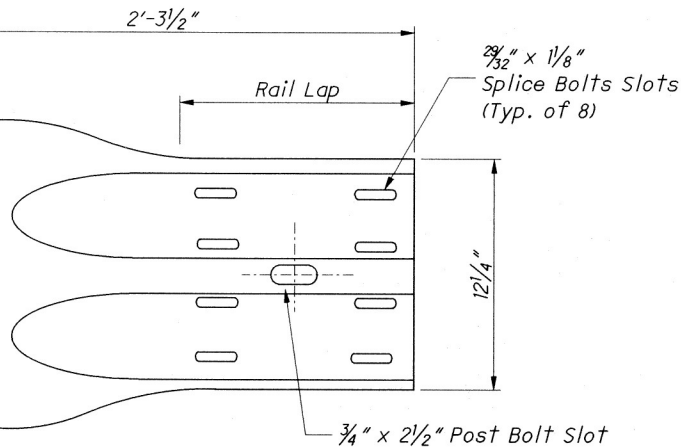
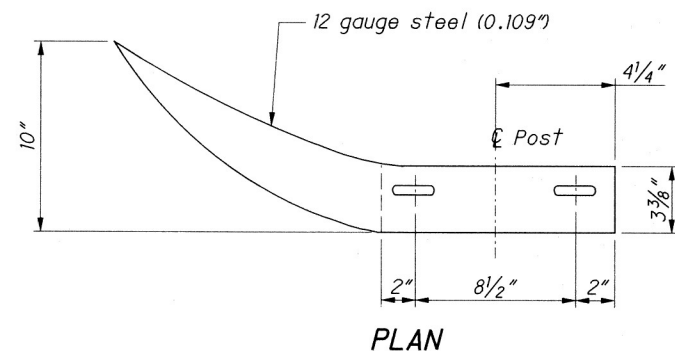


ELEVATION  
THRIE-BEAM TERMINAL CONNECTOR

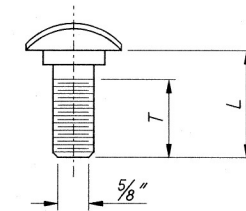


ELEVATION  
TYPE 2 TRANSITION SECTION  
(Asymmetric W to Thrie-Beam)

For details of Type 1 Transition Section (Symmetric), refer to AASHTO M 180, Figure 4.



ELEVATION  
W-BEAM FLARED END SECTION

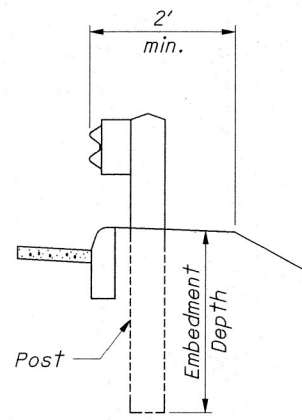


GUARDRAIL BOLT (For Post and Splice Bolts)		
L	T min.	Bolt Use
18" (Standard Rail)	4"	Type 5: WP/WB, PB
26" (Barrier Rail)		
10"	4"	Type 5: SP/WB, PB
1 1/4"	1 1/8"	Splice Bolt

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

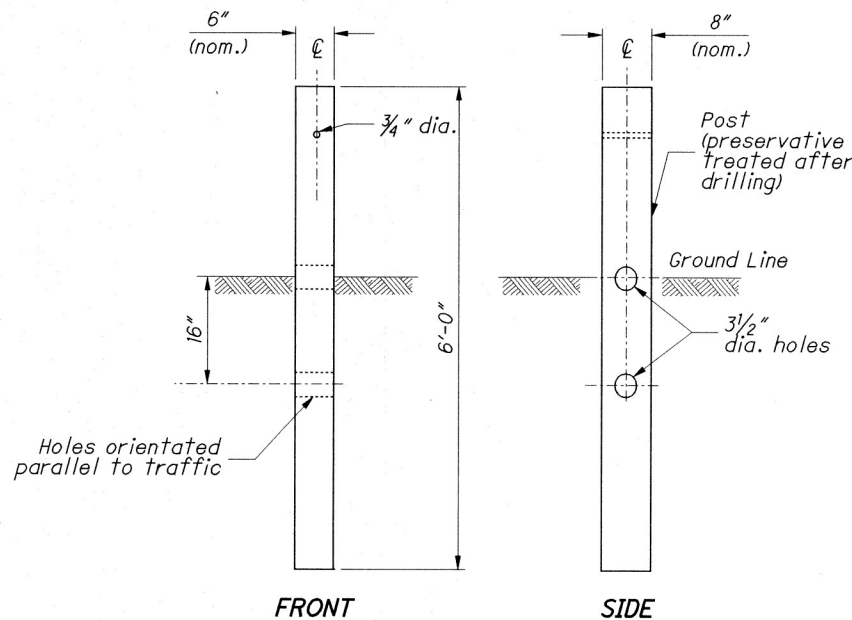
Longer Bolt may be needed for round Wood Post larger than 8" dia.

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**DETAIL A**

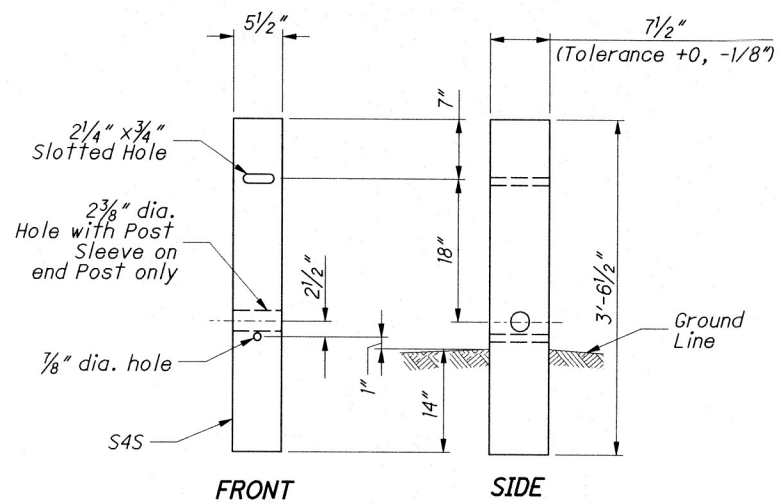
See POST EMBEDMENT DEPTH Note



**FRONT**

**SIDE**

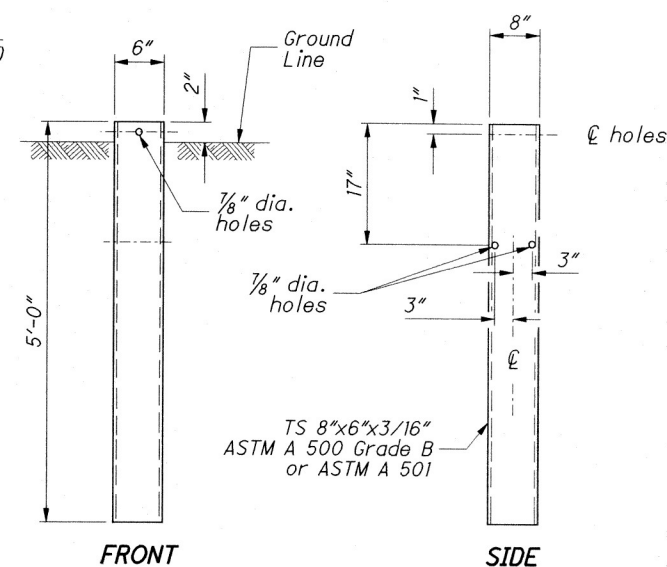
**TYPE 1 BREAKAWAY CRT POST**



**FRONT**

**SIDE**

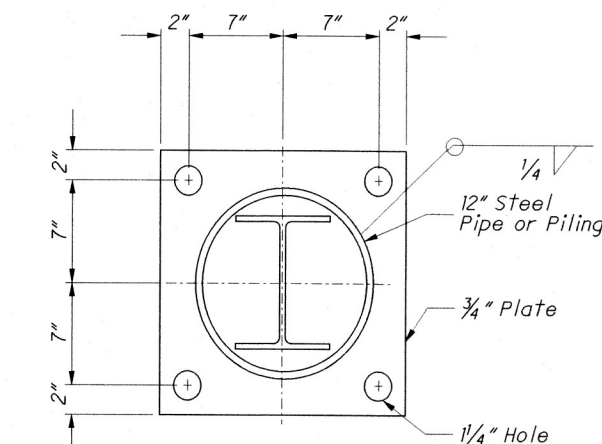
**TYPE 2 BREAKAWAY CRT POST**



**FRONT**

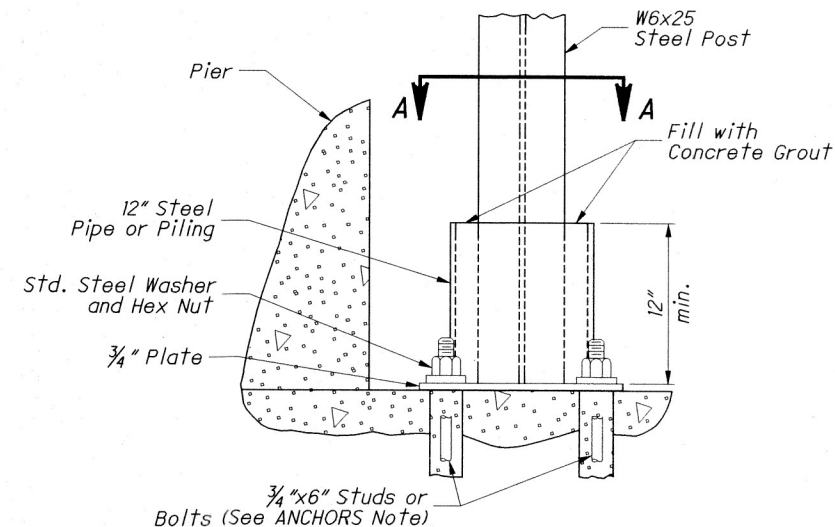
**SIDE**

**STEEL GROUND TUBE**



Footing Anchor and hardware need not be galvanized

**SECTION A-A**



**ELEVATION FOOTING ANCHOR**

See SPECIAL POST MOUNTINGS Note.

**NOTES**

**GUARDRAIL HEIGHT:** For initial installation, construct the guardrail within  $\pm 1"$  of the standard height,  $h$ , or **29"** to the top of W-Beam rail. (See MEASURING GUARDRAIL HEIGHT Detail.)  
When subsequent projects, such as resurfacings, affect the height of existing guardrail, the finished height is to be within  $\pm 2.5"$  of the standard height.

**POST EMBEDMENT DEPTH:** Standard embedment is 3'-5" min. Where less than 2' of graded shoulder width (10:1 or flatter) exists, measured from the face of the guardrail (see DETAIL "A"), use longer posts so that a minimum of 5'-5" embedment depth is provided. Payment for the longer posts will be made at the unit price bid for **ITEM 606 - GUARDRAIL POST, 9', Each.**

**SPECIAL POST MOUNTINGS:** Install posts located over a drainage inlet or structure as shown in the FOOTING ANCHOR Detail, or anchor per the details shown on **SCD GR-2.2.**

Install posts located over a footing with a cover of less than 2'-6" with a footing anchor as detailed here. (A plate, as detailed on SECTION B-B of **SCD GR-2.2**, may be used as an alternative attachment method.) Where the cover is between 2'-6" and 3'-5", the footing anchor may be omitted and the post encased instead with 4" (min.) of concrete.

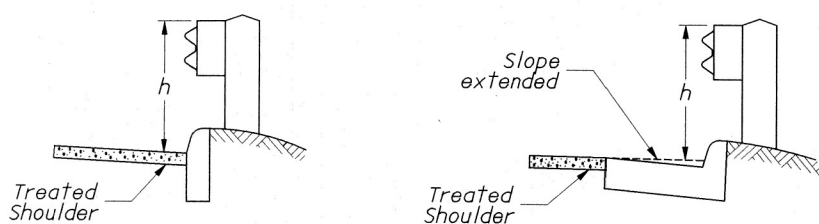
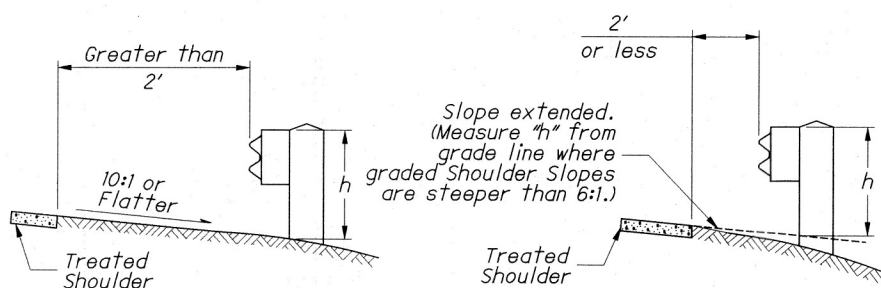
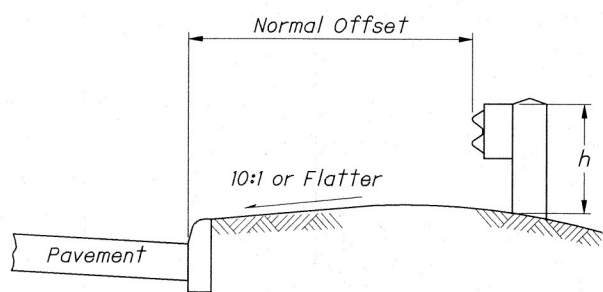
Do not drive posts located over a culvert with less than 4'-3" of cover; instead set in drilled or dug holes. Where the available post embedment depth is less than 3'-5", encase the post with a minimum of 4" concrete.

All costs associated with special post mountings are included in the unit price bid of Item 606 Guardrail of the type specified in the plans.

**ANCHORS:** Holes and grouting shall comply with CMS 510. Use either cement or non-shrink, nonmetallic grout.

Expansion shield anchors as specified in CMS 712.01 may be substituted except where concrete deterioration has occurred, as determined by the Engineer. Where self-drilling anchors are used, drill the holes with the expansion shield (not by a drill bit) and install the shield flush with the concrete surface.

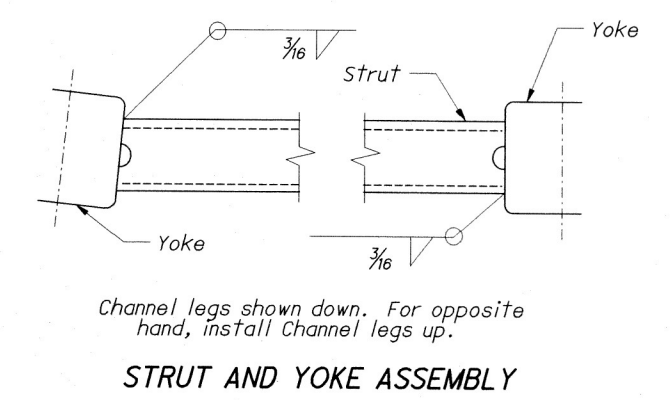
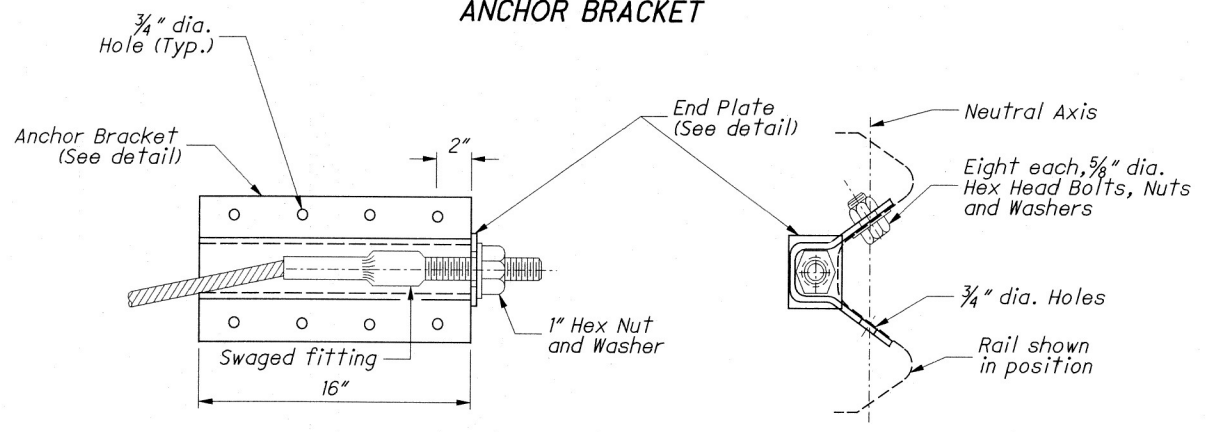
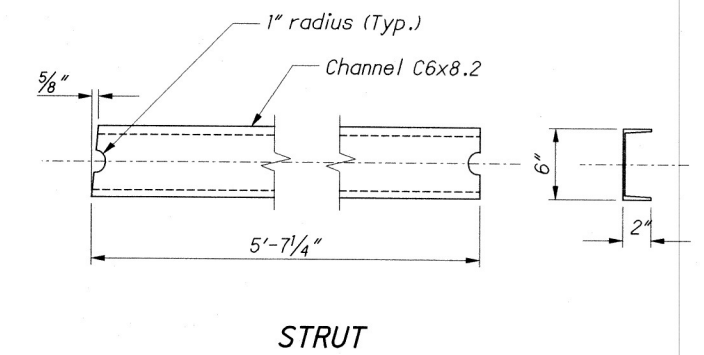
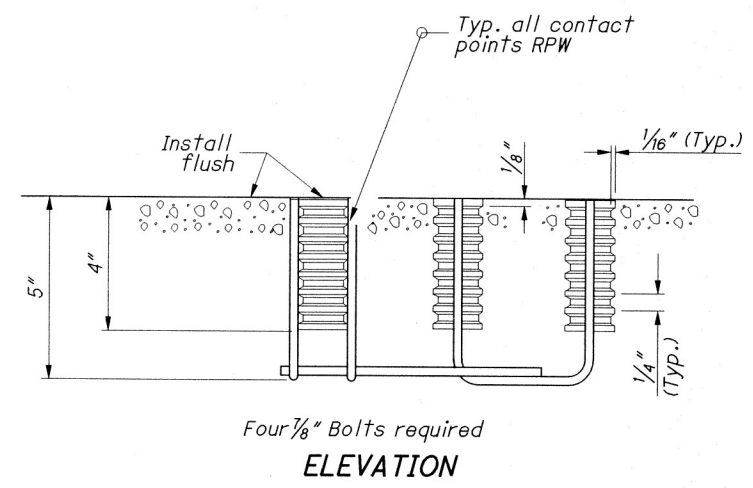
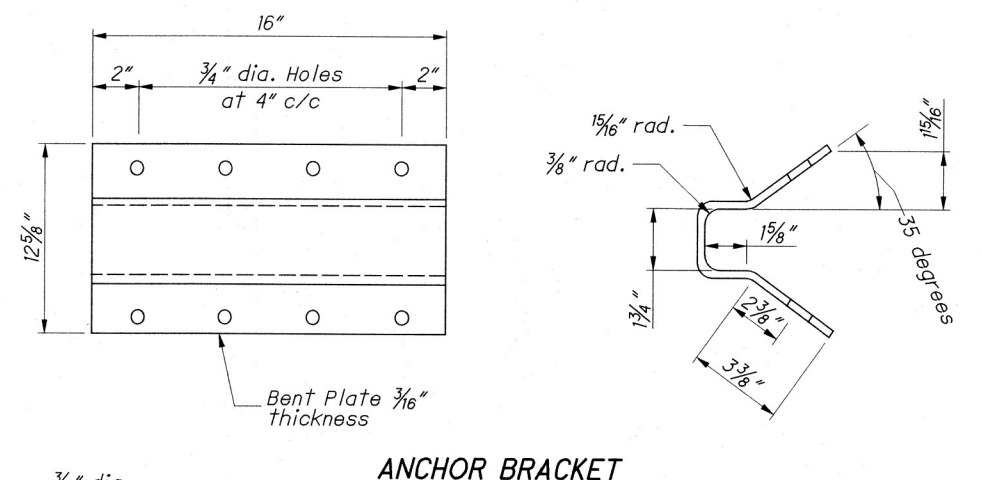
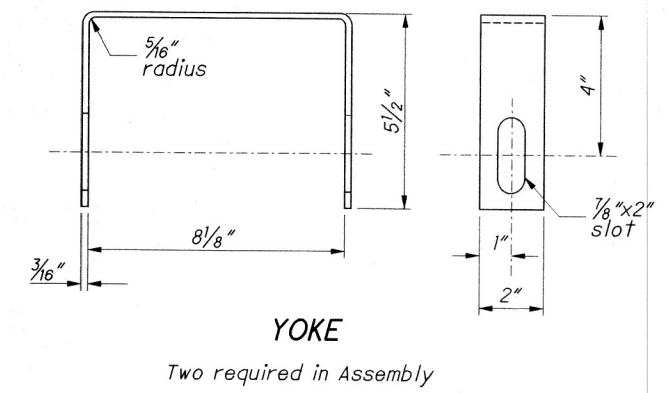
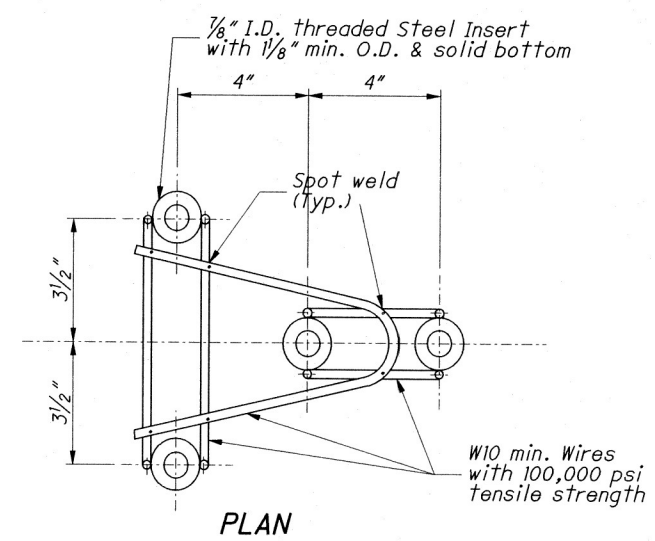
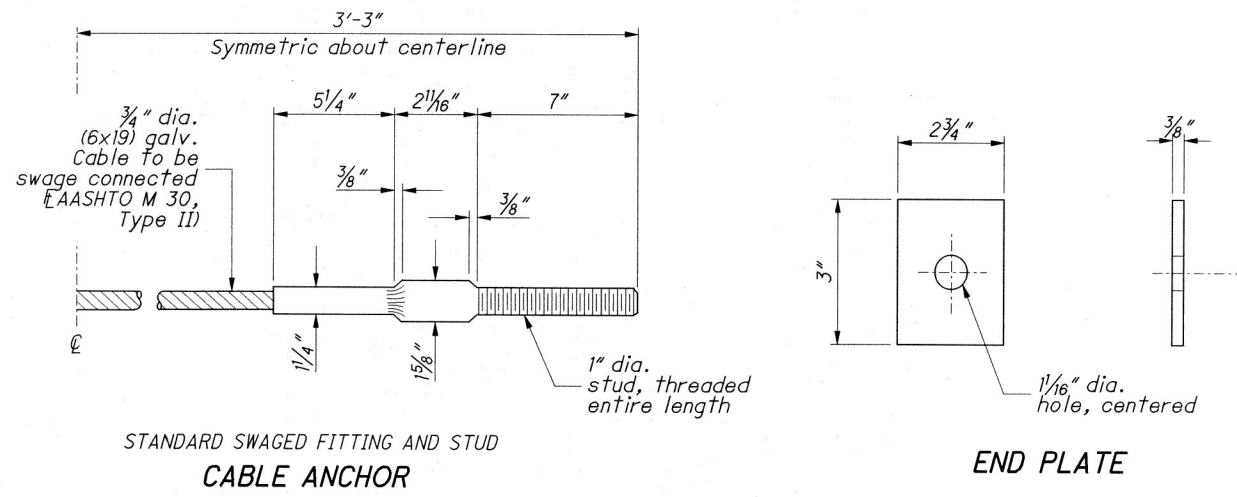
**PROTECTIVE COATING:** In lieu of the complying with CMS 710.06, coat expansion shields, anchors and concrete insert anchor assemblies embedded in concrete in accordance with ASTM A 153 or be of stainless steel. Any bolts screwed into these devices shall meet CMS 710.06. (See sheet 3 for Concrete Insert Anchor Assembly Detail.)



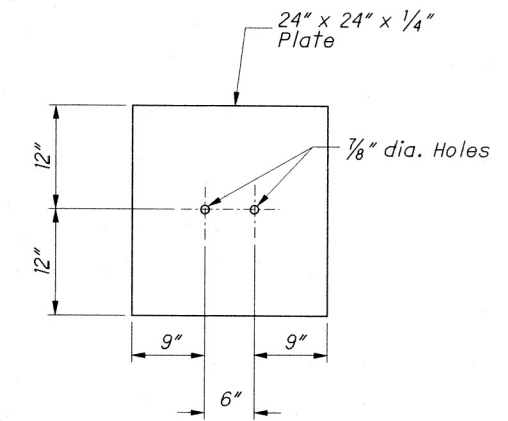
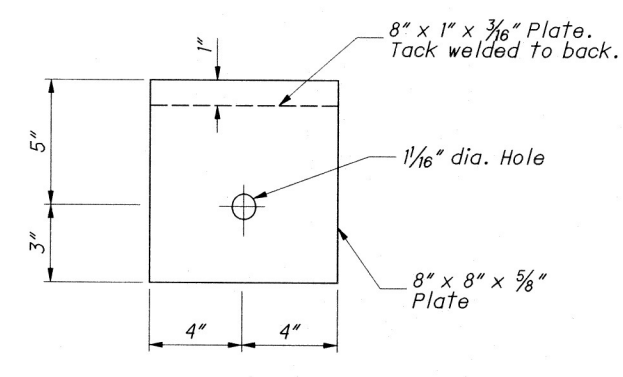
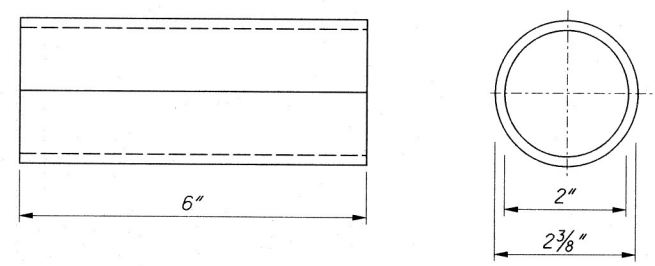
$h$  = Standard Height (See GUARDRAIL HEIGHT Note)

**MEASURING GUARDRAIL HEIGHT**

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**ANCHOR BRACKET ASSEMBLY DETAILS**



**CONCRETE INSERT ANCHOR ASSEMBLY (W-BEAM ONLY)**

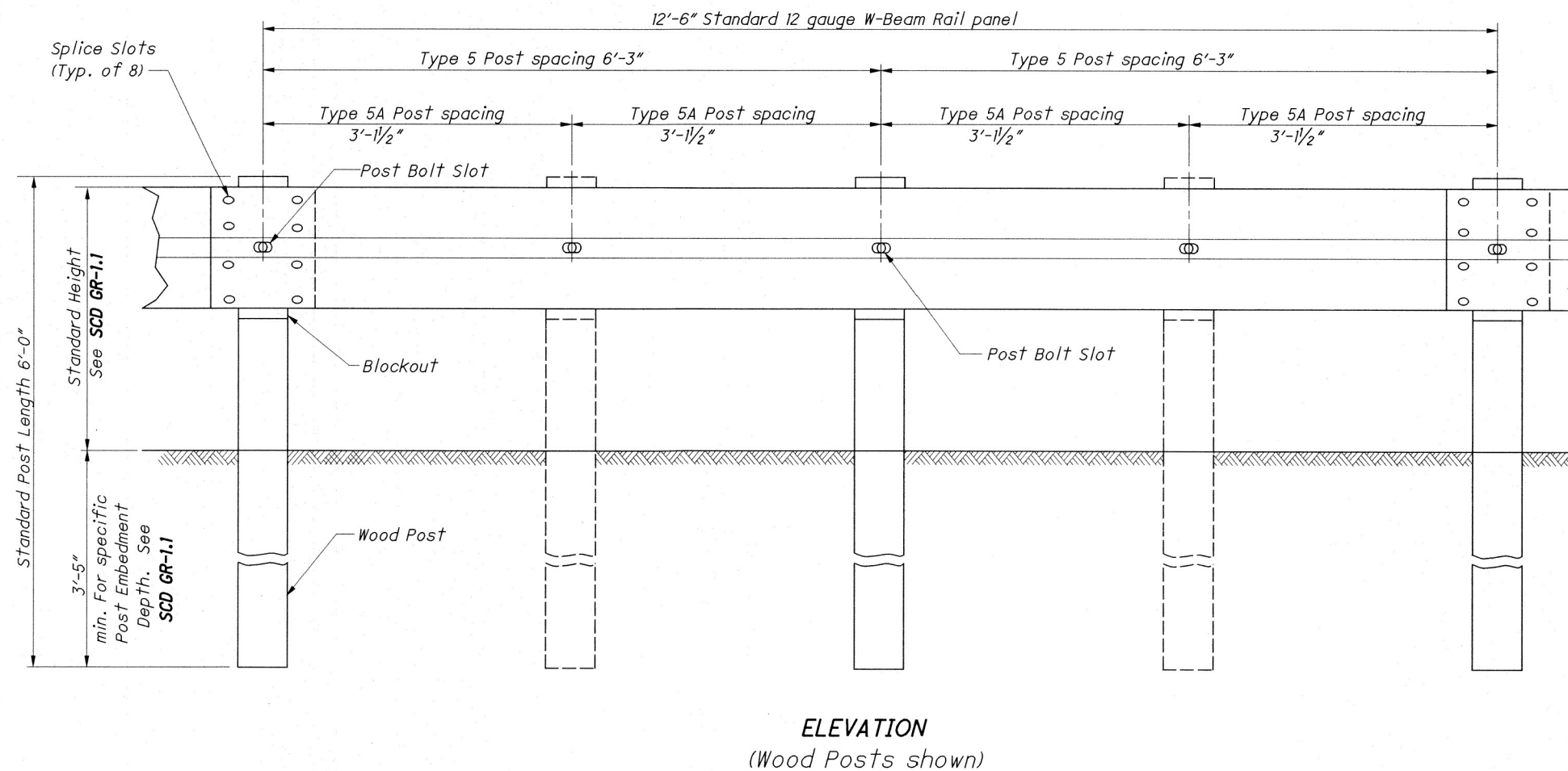
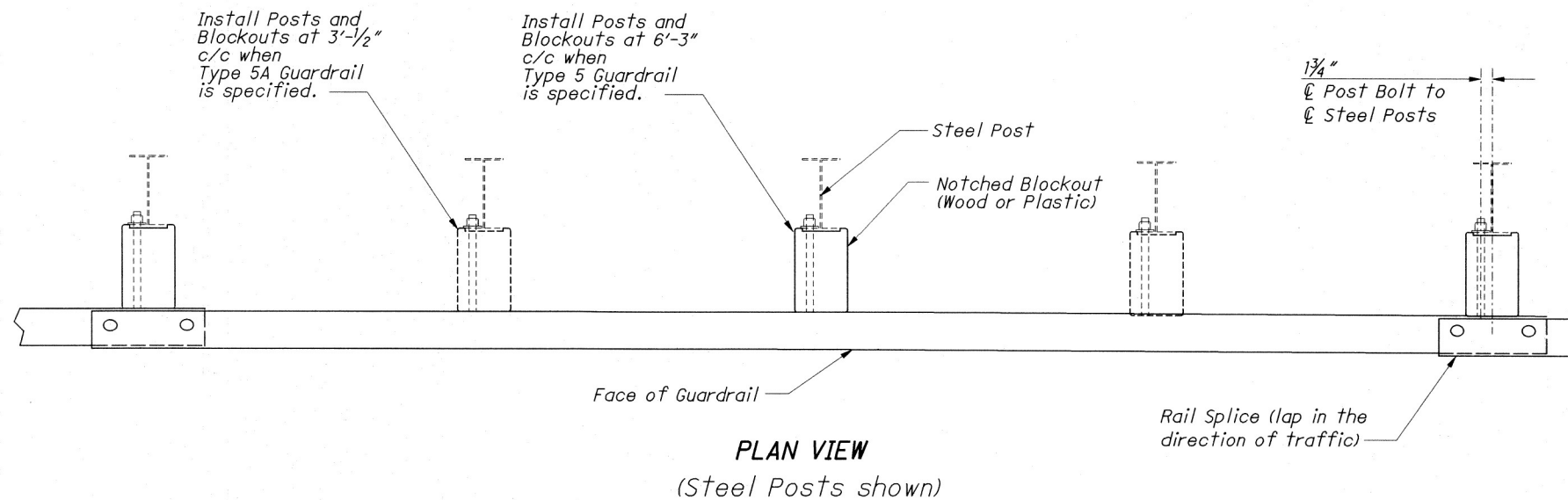
See ANCHORS and PROTECTIVE COATINGS Notes on Sheet 2

**BEARING PLATE**

**SOIL PLATE**

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**NOTES**

**RAIL:** Use W-Beam rail meeting AASHTO M 180 Type II Class A, as specified in CMS 606.

**POSTS:** Posts may be constructed of wood or steel. Wood posts may be round or 6"x8" square-sawed.

Use round wood posts on runs of single-sided rail. The round posts shall be 8"±1 in diameter at the top and not more than 3" larger at the butt with a uniform taper.

Fabricated wood posts with square ends. Posts shall be pressure-treated as per CMS 710.14. Bore bolt holes and, if required, trim the tops of posts after the posts are set.

Steel posts are to be W6x9 or W6x8.5 galvanized steel. Use the same type of post throughout the length of the project unless otherwise specified in the plans or permitted by the Engineer.

All posts are 6'-0" long unless specified otherwise in the Contract Document. Posts may be set in drilled holes or may be driven to grade.

**WELDED BEAM POSTS:** Welded beam guardrail posts may be used for Item 606, Guardrail, provided the web and flange sizes are as shown here. Welding of the web to the flanges must comply with ASTM A 769, Class 1, using Grade 36 steel [250 MPa yield point] with the following exceptions:

- Sec. 7.2 Test reports of tensile properties for each lot shall accompany each shipment.
- Sec. 12 Beams that have imperfections repaired by welding shall not be accepted for use in Item 606.
- Sec. 13 Random samples shall be tested by the Department from materials delivered to the project site, or other locations designated by the Laboratory.

**ALTERNATE POSTS:** Engineered guardrail posts having met NCHRP 350 criteria, and listed on the **Office of Materials Management's** Approved List are permitted as an equal alternate when installed according to the Manufacturer's instructions and within the limitations shown on the Approved List.

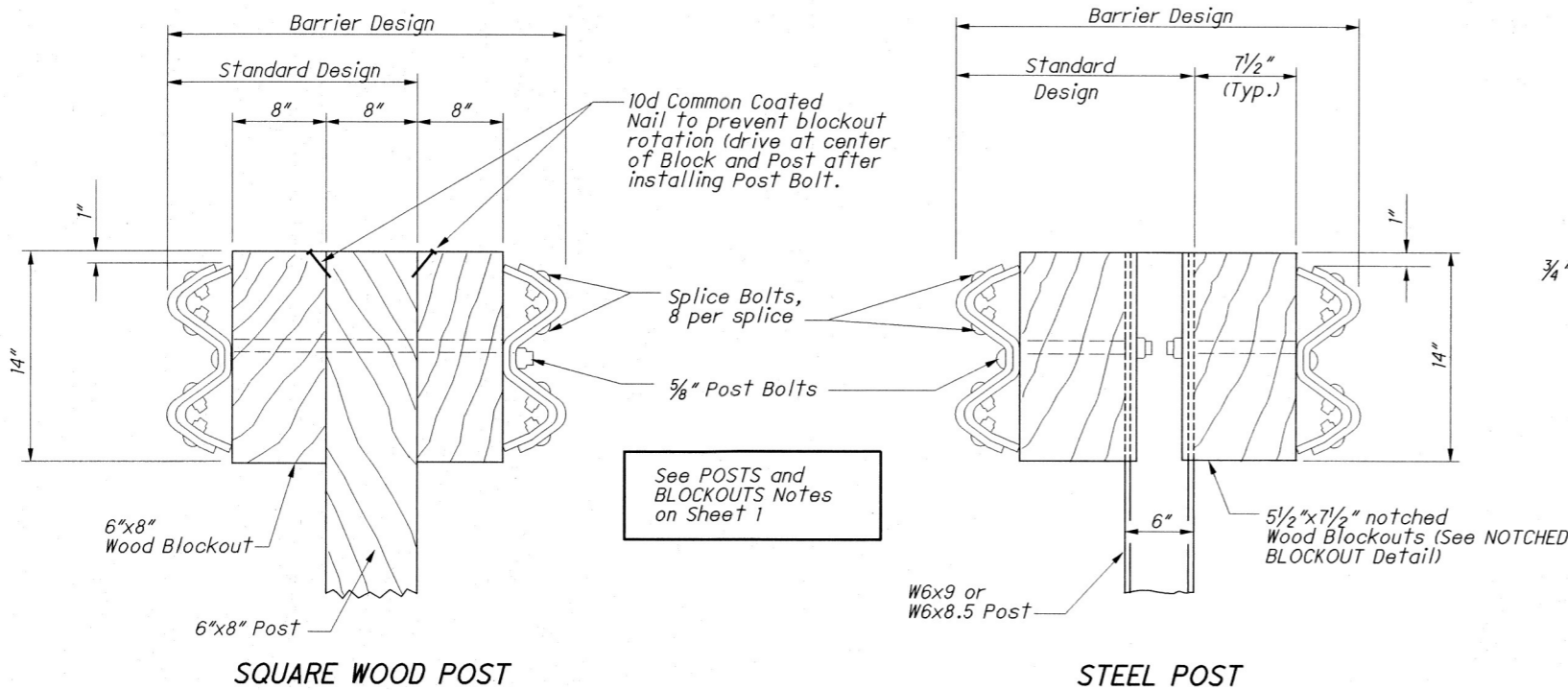
**BLOCKOUTS:** Blockout dimensions are dependent on post used. Wood Blockouts are to be pressure treated as specified in CMS 710.14. Bore bolt holes. Approved alternate blockouts may be used in lieu of the wood blockouts shown. The approved list is maintained by the **Office of Roadway Engineering**.

**WASHERS:** Install appropriate sized standard galvanized steel washers on the nut side of bolts installed on wood posts.

**DELINEATION:** For barrier reflectors, see CMS 626.

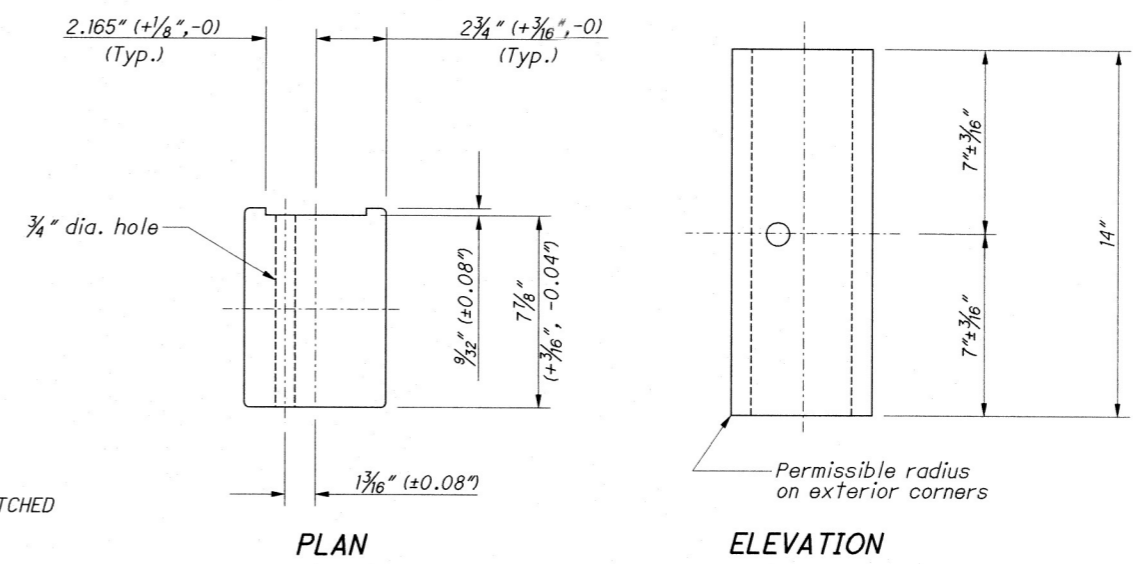
**MISCELLANEOUS:** For other guardrail details, see SCD GR-1.1.

STEEL BEAM POSTS (English)				
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"

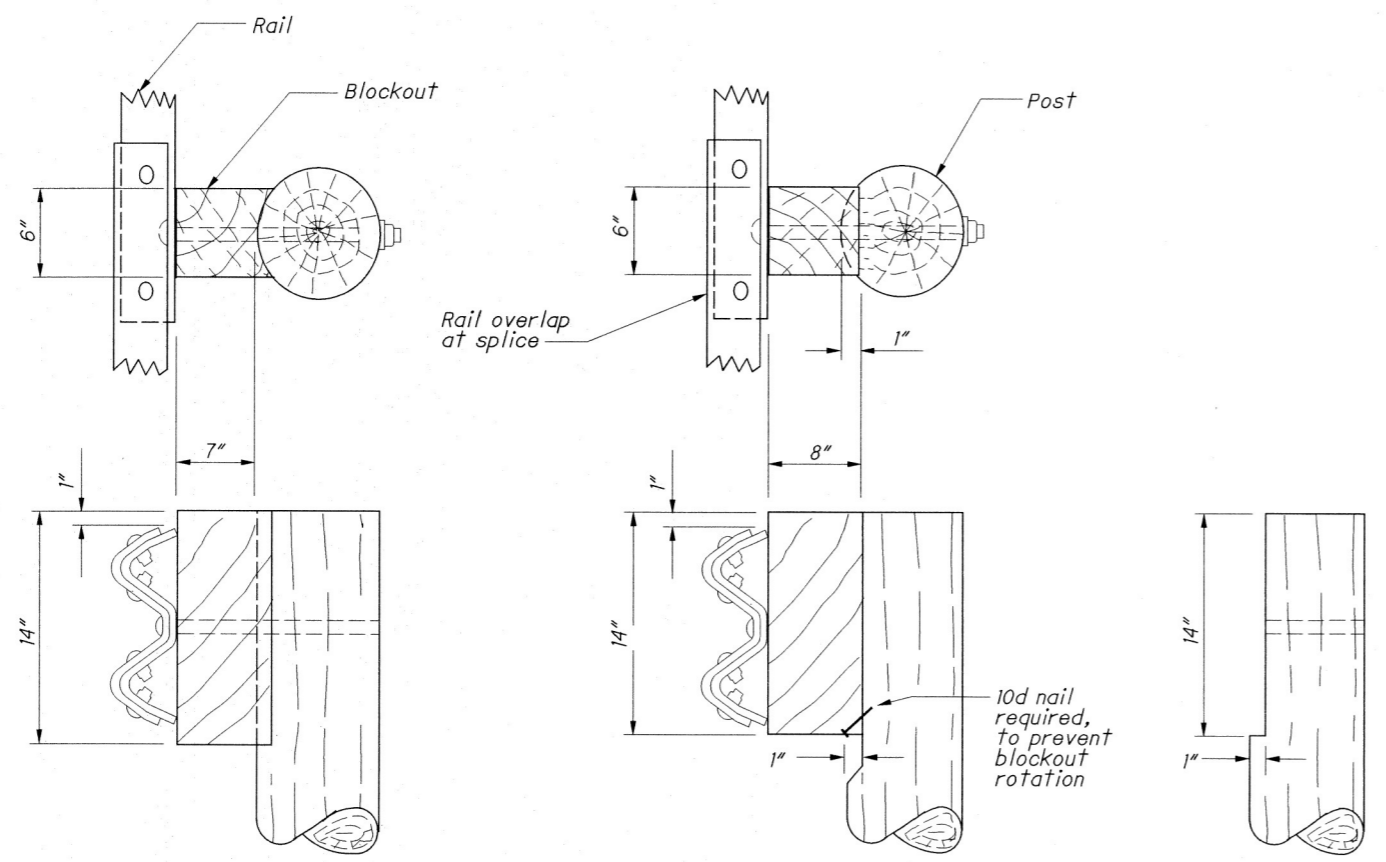


**SQUARE WOOD POST**

**STEEL POST**  
See POSTS Note, Sheet 1



**NOTCHED BLOCKOUTS FOR STEEL POSTS**  
See BLOCKOUTS Note on Sheet 1

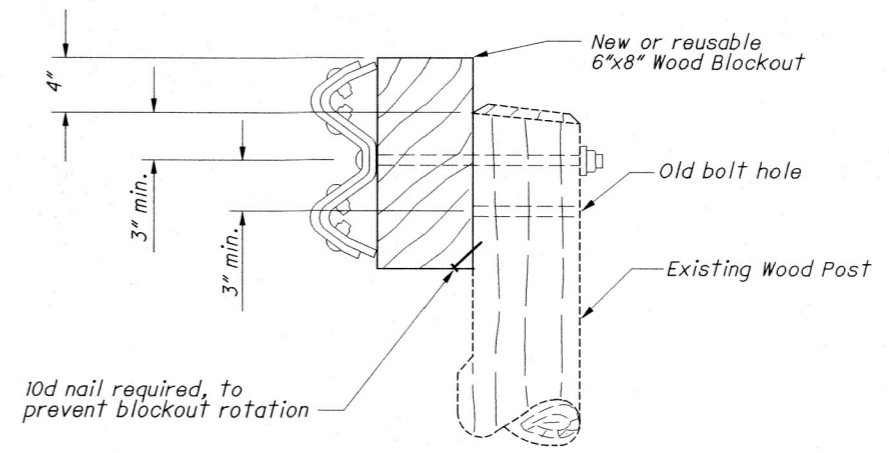


**Method 1 Routed Blockout**

**Method 2 Notched Post**

Alternate methods of placing the Blockouts on round Posts may be submitted for consideration and approved by the Engineer.

**ROUND WOOD POSTS**  
Single Sided runs only (Standard Design)



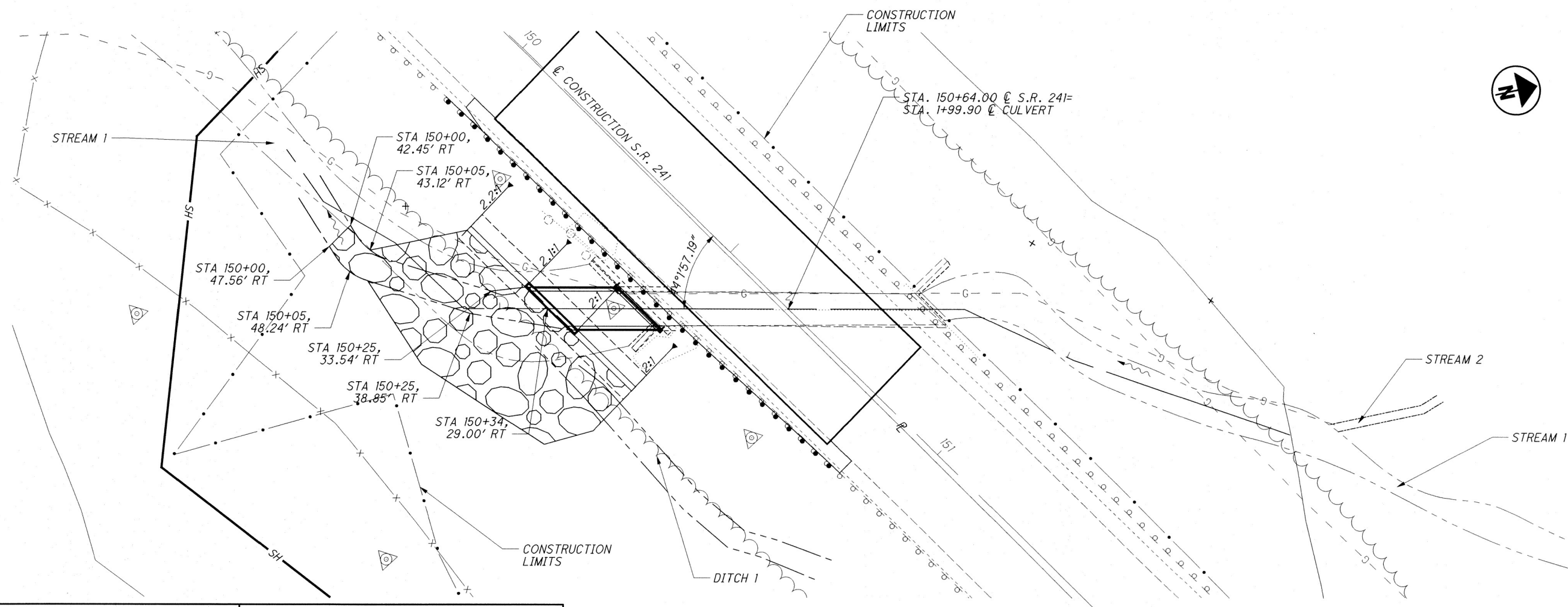
**WOOD POSTS WITH WOOD BLOCK RAISING EXISTING GUARDRAIL HEIGHT**

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DESIGNED		REVISION DATE		OFFICE OF ROADWAY ENGINEERING	
XXX	XXX	1/18/2013	XXX	1/18/2013	XXX
CHECKED		REVIEWED		DESIGNED	
XXX	XXX	XXX	XXX	XXX	XXX
PLAN INSERT SHEET					
<b>GUARDRAIL TYPE 5 &amp; 5A</b>					
<b>(GR-2.1)</b>					
<b>HOL-241-2.85</b>			<b>PART 2</b>		
2 / 2		16 / 28			

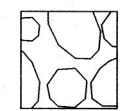


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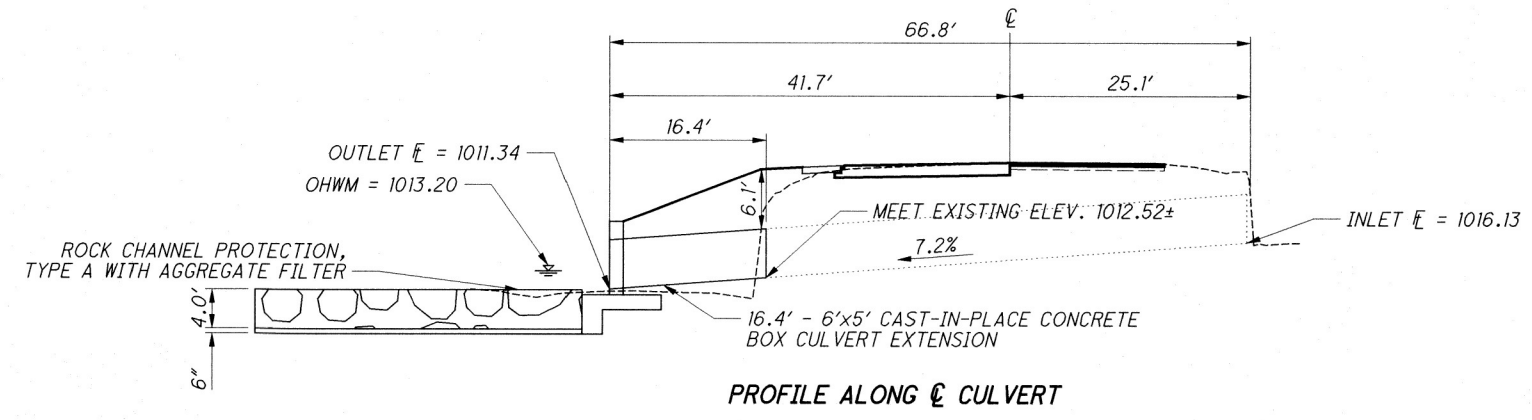
PROPOSED STRUCTURE	EXISTING STRUCTURE
TYPE: 16.4' EXTENSION OF 6' x 5' CONCRETE BOX CULVERT SPAN LENGTH: 8.4' ALONG $\hat{C}$ ROADWAY WIDTH: 22.3' EOP/EOP SKEW: 45° 58' 02.8" L.F. ALIGNMENT: TANGENT CROWN: VARIES WEARING SURFACE: ASPHALT CONCRETE PAVEMENT CULVERT FILE NUMBER: 1810514	TYPE: 6' X 5' CONCRETE BOX CULVERT SPAN LENGTH: 8.4' ALONG $\hat{C}$ ROADWAY WIDTH: 22.3' EOP/EOP LOADING: UNKNOWN SKEW: 45° 58' 02.8" L.F. ALIGNMENT: TANGENT CROWN: VARIES WEARING SURFACE: ASPHALT CONCRETE PAVEMENT CULVERT FILE NUMBER: 1810514 DATE BUILT: UNKNOWN

PLAN VIEW



ITEM 601 - ROCK CHANNEL PROTECTION, TYPE A WITH AGGREGATE FILTER  
 903.16 SQ. FT. \* x 4' ÷ 27 = 133.8 CU. YD. USE 134 CU. YD.  
 (\* CADD GENERATED AREA)  
 QUANTITIES CARRIED TO THE GENERAL SUMMARY

1025  
1020  
1015  
1010



PROFILE ALONG  $\hat{C}$  CULVERT

1025  
1020  
1015  
1010

<b>HOL-241-2.85</b> PID No. 108406	DESIGNED BSH	CHECKED ANS	DRAWN BSH	REVIEWED TES	DATE 04/14/20	DESIGN AGENCY O.D.O.T. - DISTRICT 11 ENGINEERING
	SITE PLAN HOL-241-0287 BRANCH OF HONEY RUN		HOLMES COUNTY STA. 149+98.64 STA. 151+35.14		CULVERT FILE NUMBER 1810514	

**DESIGN SPECIFICATIONS:**

THIS STRUCTURE CONFORMS TO THE "LRFD BRIDGE DESIGN SPECIFICATIONS" ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 2017, AND THE ODOT BRIDGE DESIGN MANUAL, 2019.

**DESIGN DATA:**

THE FOLLOWING DESIGN DATA IS ASSUMED:

CONCRETE CLASS QC1 - COMPRESSIVE STRENGTH 4.0 KSI (FOOTING, WINGWALL AND FORESLOPE WALL)

CAST IN PLACE BOX CULVERT CONCRETE - COMPRESSIVE STRENGTH 4.0 KSI

REINFORCING STEEL (WINGWALLS/FOOTERS) - ASTM A615, A616, OR A617 GRADE 60 MINIMUM YIELD STRENGTH 60,000 PSI

DESIGN LOADING - HL93, FWS = 60 PSF

**FOUNDATION BEARING PRESSURE:**

REFER TO SHEET 22 FOR ADDITIONAL BEARING PRESSURE INFORMATION.

**ITEM 511, CLASS QC1 CONCRETE, RETAINING/WINGWALL INCLUDING FOOTING, AS PER PLAN:**

THE DEPARTMENT WILL PERMIT THE USE OF PRECAST CONCRETE IN LIEU OF CAST-IN-PLACE CONCRETE FOR HEADWALLS AND WINGWALLS IN ACCORDANCE WITH C&MS 602.03. THE DEPARTMENT WILL PAY FOR THE WINGWALL AND HEADWALL CONCRETE IN SQUARE YARD AS DETERMINED FROM PLAN DIMENSIONS USING THE WALL HEIGHTS ABOVE THE FOOTING AND LENGTH ALONG THE EXTERIOR FACES OF THE WALLS. THE DEPARTMENT WILL CONSIDER THE REINFORCING STEEL IN THE WINGWALLS AND HEADWALLS, INCLUDING THE REINFORCEMENT THAT EXTENDS INTO THE FOOTINGS, AS INCIDENTAL TO THE RETAINING/WINGWALL CONCRETE. THE TOTAL QUANTITY OF CAST-IN-PLACE WINGWALL AND HEADWALL CONCRETE IS 27 CU. YD. THE TOTAL QUANTITY OF CAST-IN-PLACE WINGWALL AND HEADWALL REINFORCING STEEL IS 1900 LBS.

**PREFORMED EXPANSION JOINT FILLER:**

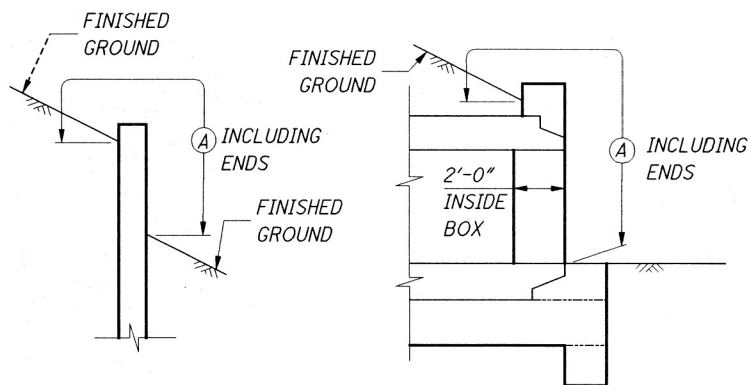
PREFORMED EXPANSION JOINT FILLER (PEJF) CONFORMING TO CMS 705.03, 1 INCH THICK, SHALL BE PLACED ABOVE THE FOOTING BETWEEN THE SIDES OF THE BOX CULVERT AND THE ENDS OF THE WINGWALLS. PAYMENT FOR MATERIALS AND INSTALLATION SHALL BE INCLUDED WITH ITEM 516 - 1" PREFORMED EXPANSION JOINT FILLER.

**ITEM 518, POROUS BACKFILL WITH GEOTEXTILE FABRIC:**

POROUS BACKFILL 1'-6" THICK SHALL BE PLACED BEHIND THE ENTIRE LENGTH OF THE WINGWALLS ONLY AND SHALL EXTEND TO 12" BELOW THE EMBANKMENT SURFACE. GEOTEXTILE FABRIC SHALL BE PLACED BETWEEN THE POROUS BACKFILL AND REPLACED EXCAVATION ADJACENT TO THE STRUCTURE. IT SHALL TURN UNDER THE BOTTOM OF THE POROUS BACKFILL AND RETURN 6" ABOVE THE TOP ELEVATION OF THE WEEPHOLE.

**SEALING OF FORESLOPE WALL AND WINGWALLS:**

ALL EXPOSED FORESLOPE WALL AND WINGWALL CONCRETE SHALL BE SEALED WITH EPOXY-URETHANE SEALER. THE LIMITS SHALL BE AS SHOWN IN THE DIAGRAMS BELOW. PAYMENT FOR THE EPOXY-URETHANE SEALER SHALL BE PER ITEM 512 - SEALING OF CONCRETE SURFACES (EPOXY-URETHANE).



WINGWALL FORESLOPE WALL AND PRECAST BOX (CULVERT OUTLET BEVEL SHOWN)

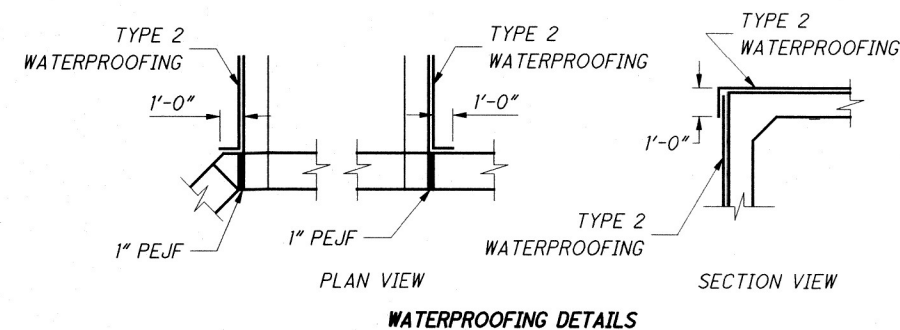
**LIMITS OF ITEM 512-SEALING CONCRETE SURFACES**

(A) - SEAL ENTIRE CONCRETE SURFACE AREA

**WATERPROOFING:**

TYPE 2 WATERPROOFING, PER CMS 512.08 AND 711.25, SHALL EXTEND VERTICALLY DOWN THE ENTIRE SIDES OF THE CAST IN PLACE CULVERT SECTION FOR ALL PORTIONS OF THE CULVERT WHICH SHALL BE IN CONTACT WITH THE BACKFILL. PAYMENT FOR THE MEMBRANE WATERPROOFING SHALL BE AT THE CONTRACT PRICE BID PER SQUARE YARD FOR ITEM 512 - TYPE 2 WATERPROOFING.

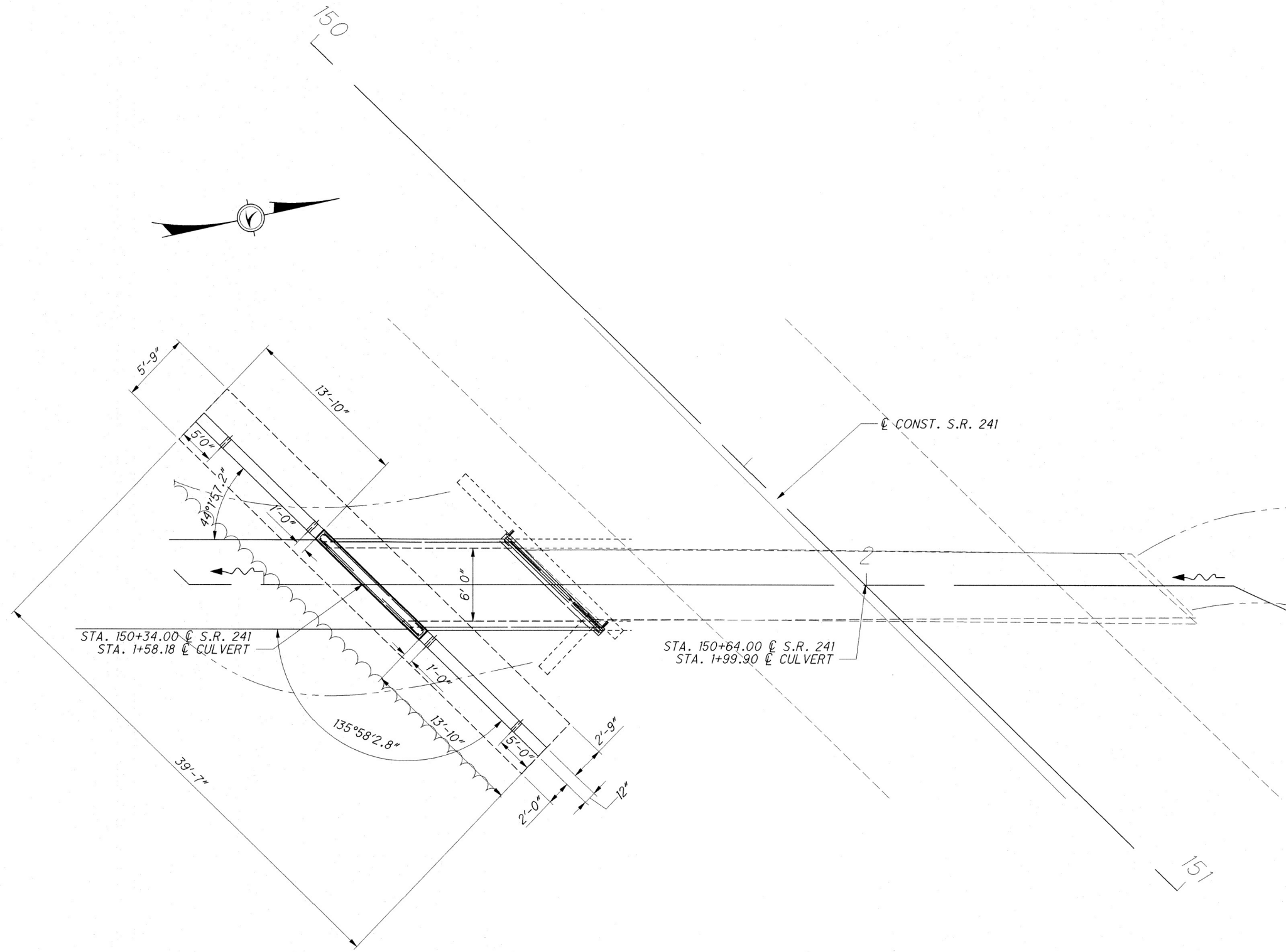
IF PAVEMENT IS NOT PLACED DIRECTLY ON TOP OF THE CULVERT, TYPE 2 WATERPROOFING, PER CMS 512.09 AND 711.25 SHALL BE APPLIED TO THE ENTIRE TOP SURFACE OF THE CAST-IN-PLACE CULVERT SECTIONS AND SHALL EXTEND ONE FOOT VERTICALLY DOWN THE SIDES FOR ALL PORTIONS OF THE CULVERT WHICH SHALL BE IN CONTACT WITH THE BACKFILL. PAYMENT FOR THE MEMBRANE WATERPROOFING SHALL BE AT THE CONTRACT PRICE BID PER SQUARE YARD FOR ITEM 512 -TYPE 2 WATERPROOFING.



PLAN VIEW SECTION VIEW WATERPROOFING DETAILS

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DESIGN AGENCY O.D.O.T. - DISTRICT 11 ENGINEERING	
DATE 04/15/20	REVIEWED TES CULVERT FILE NUMBER 1810514
DRAWN BSH	REVIS REVISED
DESIGNED BSH	CHECKED ANS
GENERAL NOTES HOL-241-0287 BRANCH OF HONEY RUN	
HOL-241-2.85	PID No. 108406
2 / 7	18 / 28



HOL-241-2.85  
PID No. 108406

3 / 7

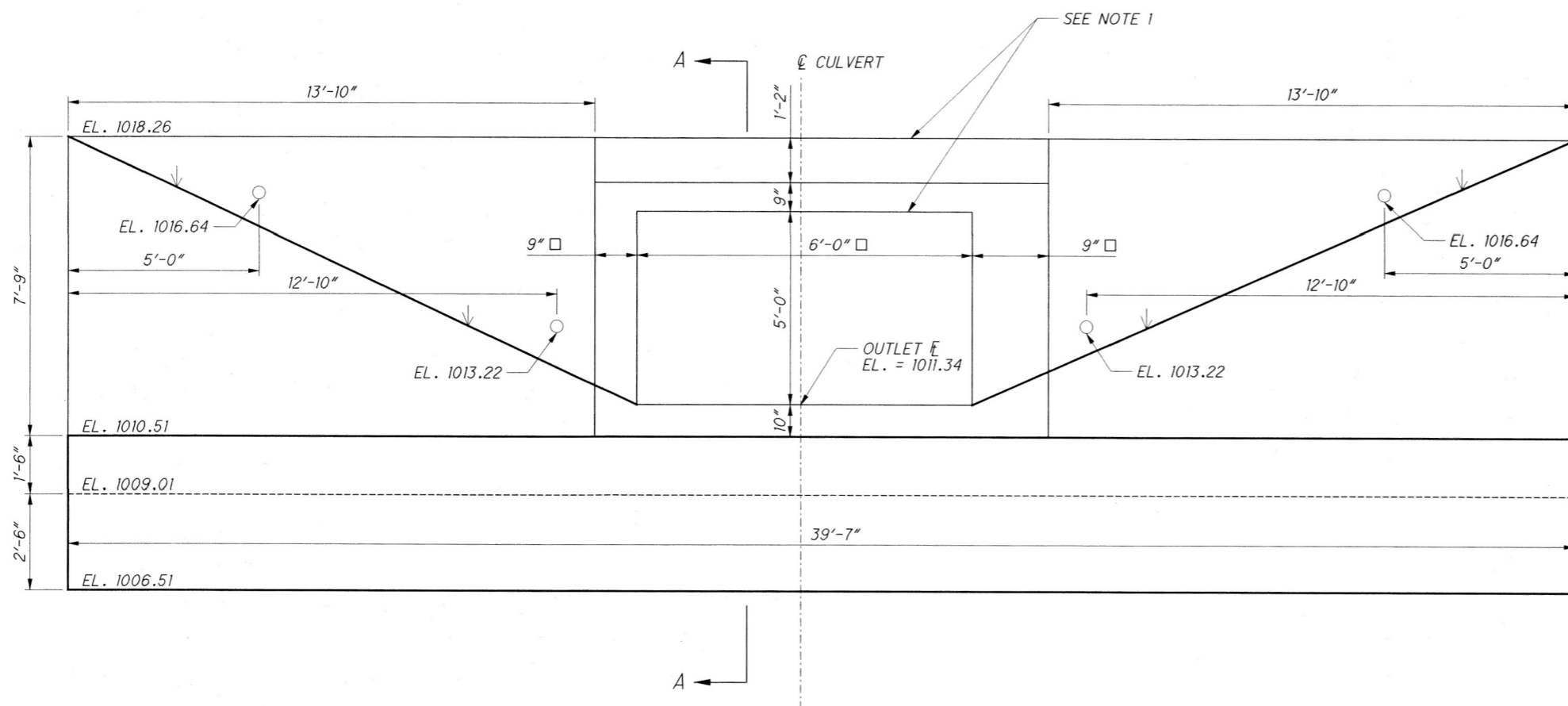
19  
28

STRUCTURE DETAILS  
HOL-241-0287  
BRANCH OF HONEY RUN

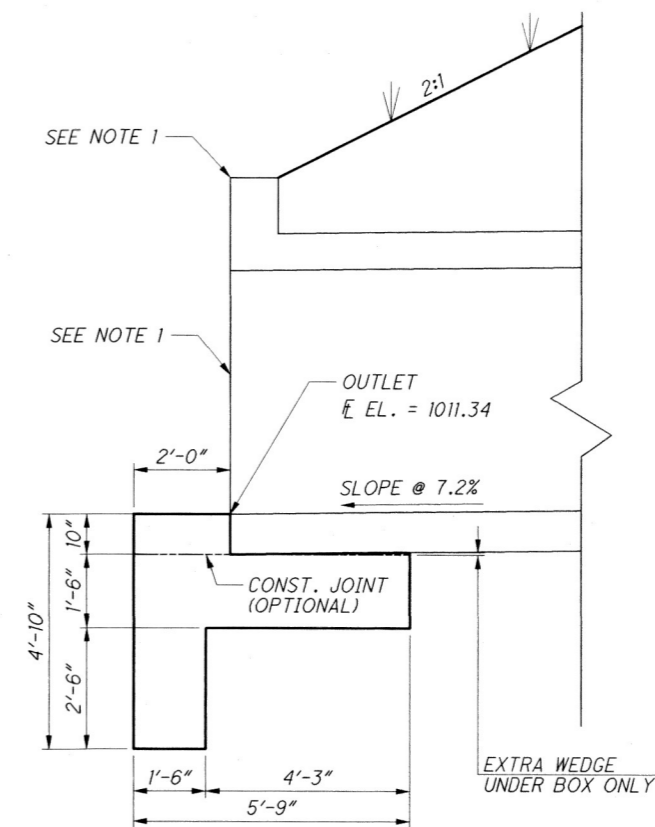
DESIGNED	BSH	CHECKED	ANS
DRAWN	BSH	REVISED	
REVIEWED	TES	CULVERT FILE NUMBER	1810514
DATE	04/15/20		

DESIGN AGENCY  
O.D.O.T. - DISTRICT 11  
ENGINEERING

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**OUTLET ELEVATION**  
 (VIEWED PERPENDICULAR TO THE WINGWALLS)  
 □ - MEASURED NORMAL TO  $\phi$  CULVERT



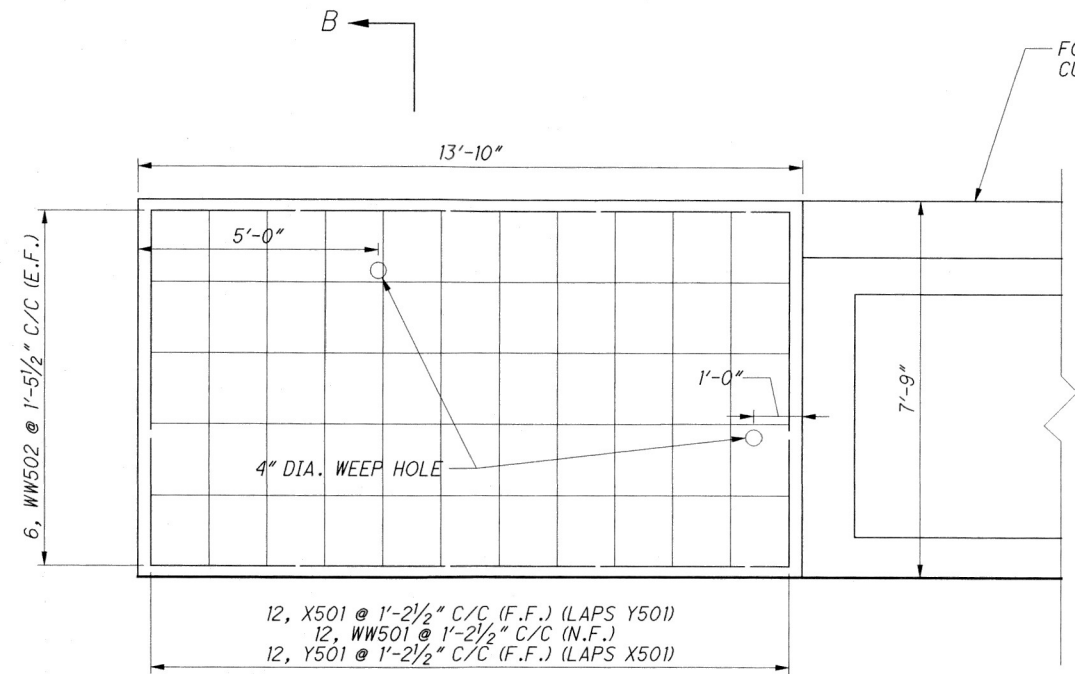
**SECTION A-A**  
 (VIEWED PERPENDICULAR TO THE WINGWALLS)  
 CULVERT DIMENSIONS SHOWN ON A SKEW - SEE NOTE 1

**NOTES:**

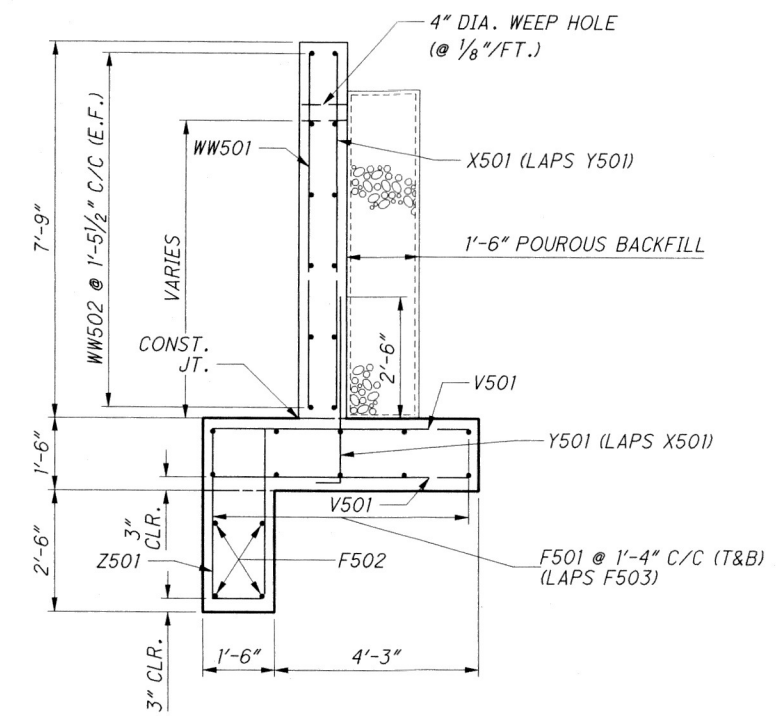
1. FOR ADDITIONAL CULVERT AND HEADWALL DIMENSIONS AND DETAILS, SEE SHEET 22

DESIGNED BSH		CHECKED ANS		DRAWN BSH		REVIEWED TES		DATE 04/15/20		DESIGN AGENCY O.D.O.T. - DISTRICT 11 ENGINEERING	
STRUCTURE DETAILS		HOL-241-0287		BRANCH OF HONEY RUN		CULVERT FILE NUMBER 1810514					
HOL-241-2.85		PID No. 108406									
4 / 7											
20		28									

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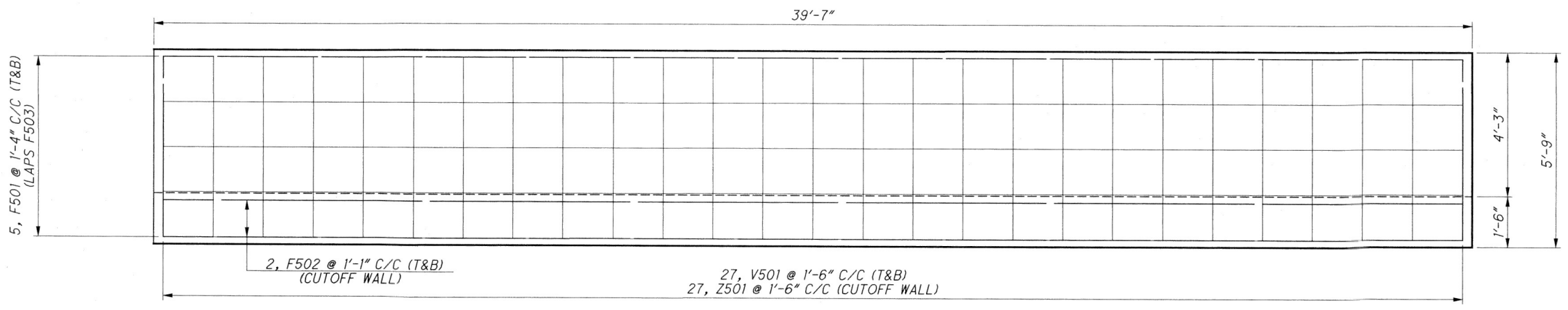


**WINGWALL ELEVATION**  
(VIEWED PERPENDICULAR TO THE WINGWALLS  
MIRROR FOR RT. SIDE)



**SECTION B-B**  
MIRROR FOR RT. SIDE

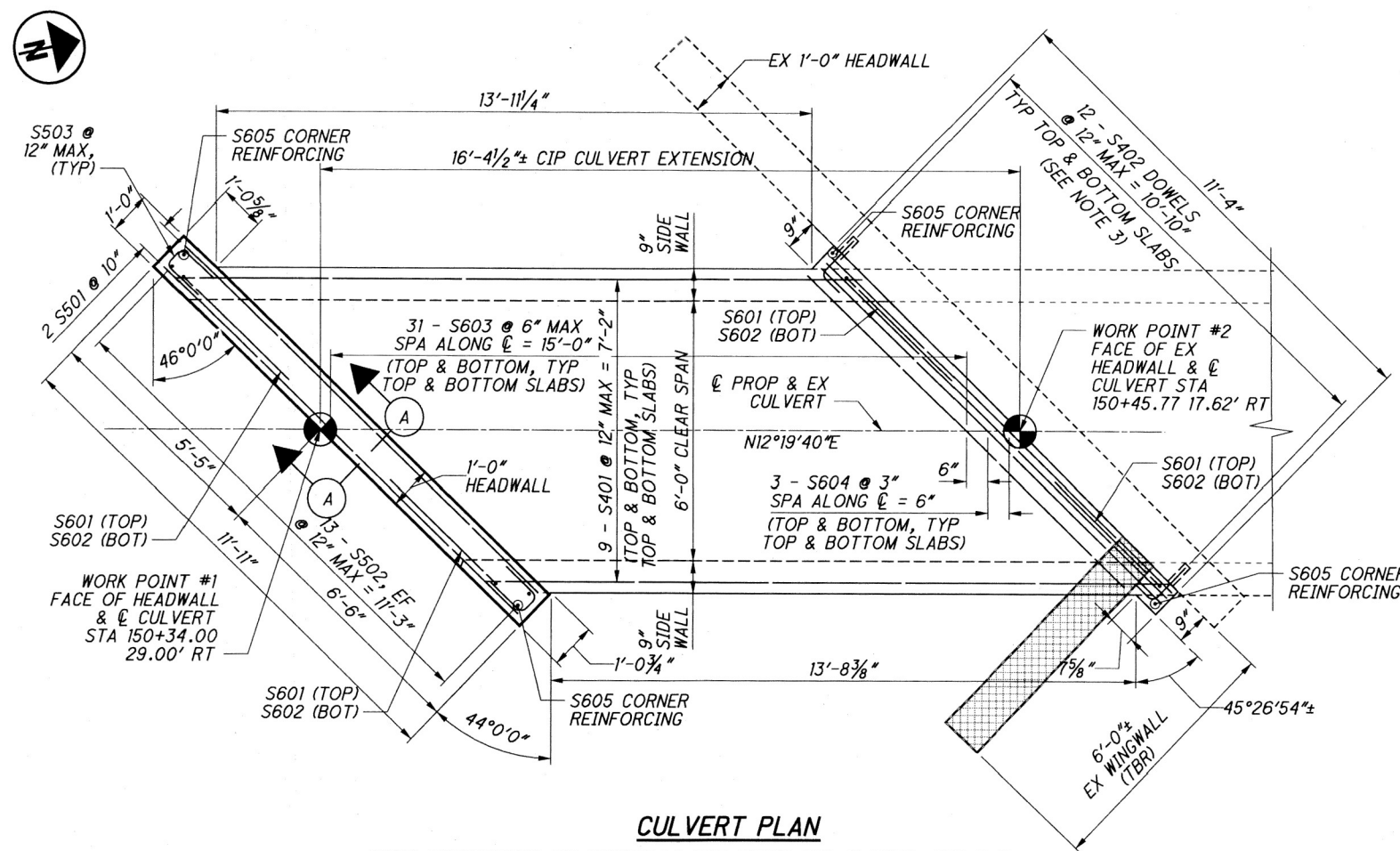
NOTE:  
1. THE INTERFACE BETWEEN THE TOP OF FOOTING AND BASE OF WINGWALL STEM IS INTENTIONALLY ROUGHENED TO A FULL AMPLITUDE OF APPROXIMATELY 1/4" BY MEANS OF A SERRATED TROWEL.



**FOOTING PLAN**

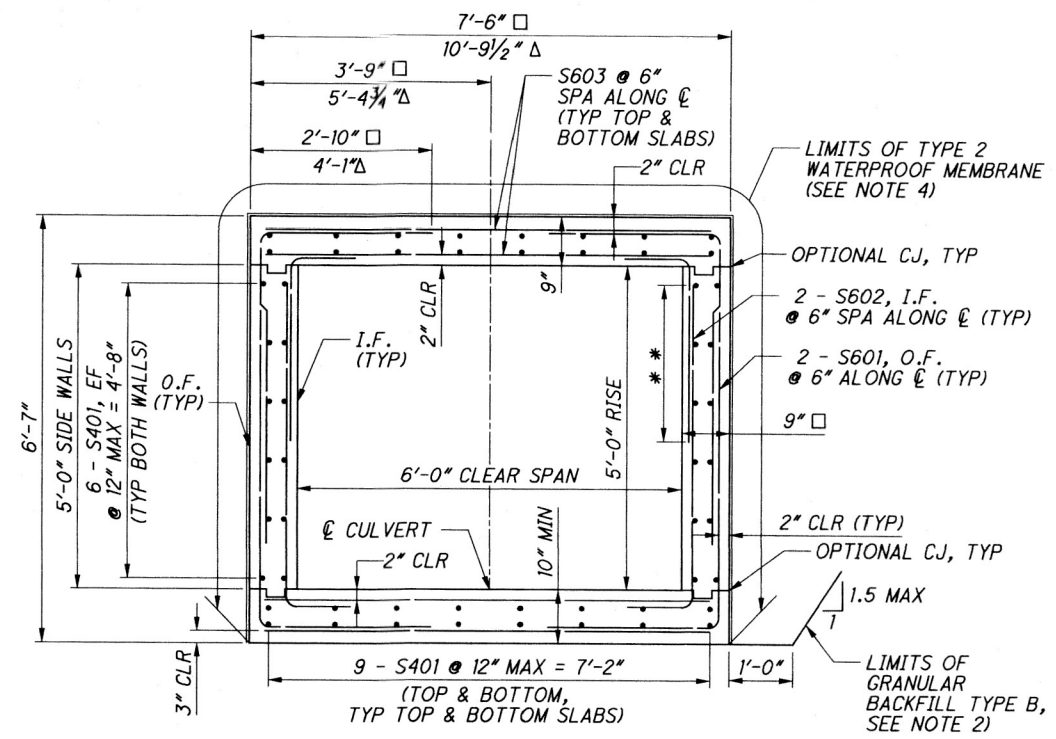
DESIGN AGENCY O.D.O.T. - DISTRICT 11 ENGINEERING	
REVIEWED TES	DATE 04/15/20
DRAWN BSH	REVIS 1810514
DESIGNED BSH	CHECKED ANS
STRUCTURE DETAILS - FOOTING	
HOL-241-2.85	
PID No. 108406	
HOL-241-0287 BRANCH OF HONEY RUN	
5	7
21	28

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**CULVERT PLAN**

(PROP FOUNDATION AND WINGWALLS NOT SHOWN FOR CLARITY, SEE SHEET 5/7. REFERENCE SITE PLAN AND PROFILE FOR ADDITIONAL CONSTRAINTS INCLUDING UTILITY LOCATIONS AND OR RIGHT OF WAY BOUNDARIES)

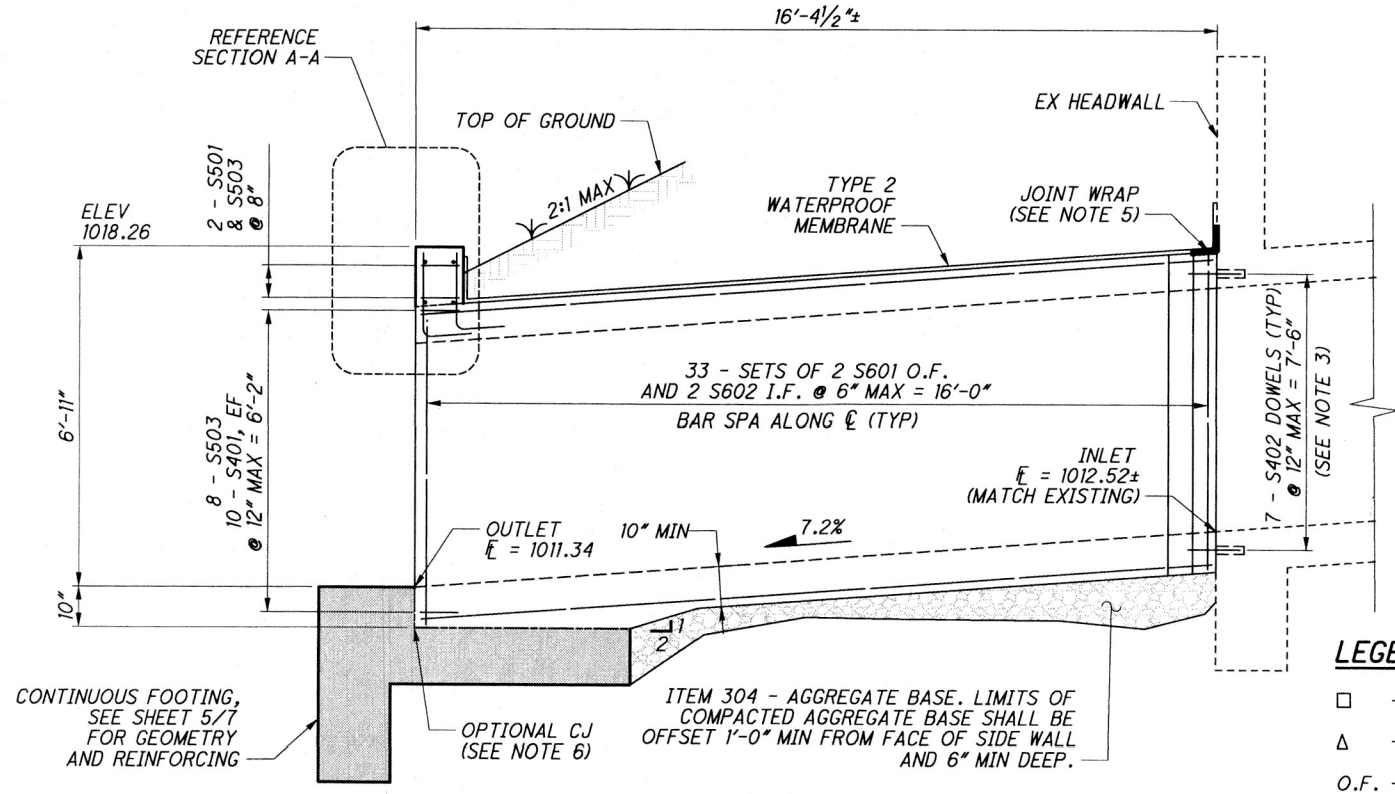


**TYPICAL SECTION**

(GEOMETRY SHOWN NORMAL TO CULVERT, TRANSVERSE REINFORCING BARS TO BE PLACED ALONG SKEW AS SHOWN IN PLAN VIEW)

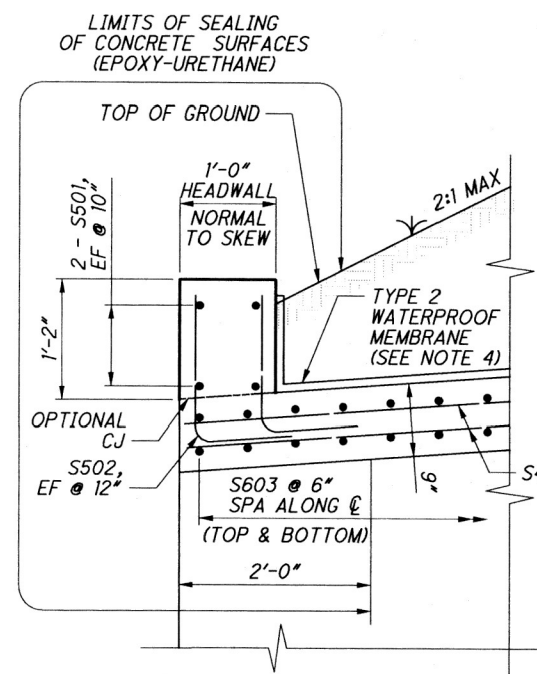
**NOTES**

- DESIGN DATA**  
 EARTH COVER: 7'-0" MAX  
 DESIGN LOAD: HL-93 WITH 60 PSF FWS  
 CONCRETE CLASS QC1: COMPRESSIVE STRENGTH 4.0 KSI  
 REINFORCING STEEL - MIN YIELD STRENGTH 60 KSI
1. THE C.I.P. CULVERT AS DESIGNED WILL PRODUCE A MAXIMUM SERVICE LOAD BEARING PRESSURE OF 2.17 KIPS PER SQUARE FOOT AND MAXIMUM STRENGTH LOAD PRESSURE OF 2.83 KIPS PER SQUARE FOOT. SEE SHEET 2/7 FOR FOUNDATION NOTES.
  2. BACKFILL FOR THE C.I.P. CULVERT SHALL BE ITEM 304 AGGREGATE BASE. COMPACTION AND PLACEMENT SHALL CONFORM TO THE REQUIREMENTS OF CMS 611.06. BACKFILL SHALL BE PLACED IN EQUAL/ALTERNATING COMPACTED LIFTS NOT EXCEEDING 6" ALONG EACH EXTERIOR SIDE WALL. LIMITS OF BACKFILL SHALL INCLUDE AN AREA OFFSET 1 FT FROM BACK OF SIDE WALL AND INCLINED AT A 1.5:1 HORIZ:VERT) MAX SLOPE TO A HEIGHT 2' MINIMUM ABOVE TOP OF CULVERT OR 1' BELOW TOP OF FINISHED GRADE, WHICHEVER REACHED FIRST. BACKFILL SHALL NOT BE PLACED UNTIL THE TOP SLAB HAS REACHED 85% OF ITS COMPRESSIVE STRENGTH OR CURE OF 14 DAYS. INCLUDE WITH ITEM 203 FOR PAYMENT.
  3. DOWELS SHALL BE #4 BENT REINFORCING BARS AND EMBEDDED 8" INTO THE EXISTING STRUCTURE. DOWELS SHALL BE PLACED MID SLAB/WALL AND SPACED 12" MAX O.C. ALONG THE ENTIRE CULVERT PERIMETER. CONTRACTOR SHALL TAKE CAUTION WHEN INSTALLING DOWELS AS TO NOT DAMAGE EXISTING TRANSVERSE REINFORCING BARS IN THE EXISTING STRUCTURE. A PACHOMETER SHALL BE USED TO LOCATE EXISTING BARS.
  4. CONTINUE WATERPROOFING PAST THE END OF THE PRECAST UNITS TO LAP 9" (MIN) ONTO BACKSIDE OF HEADWALL/WINGWALL, COVERING THE OPTIONAL HORIZONTAL JOINT AND VERTICAL CONSTRUCTION JOINTS.
  5. APPLY A 12" WIDE JOINT WRAP TO THE CONSTRUCTION JOINT ADJACENT TO THE EXISTING STRUCTURE AS DESCRIBED IN CMS 611.08 FOR RIGID STRUCTURES, EXCEPT THAT THE PROVISIONS FOR A 3-SIDED FLAT TOP KEYWAY JOINT SHALL BE UTILIZED.
  6. AT THE CONTRACTOR'S OPTION, THE BOTTOM SLAB OF THE C.I.P. CULVERT MAY BE POURED MONOLITHICALLY WITH THE WINGWALL FOOTINGS. IF SELECTED, THE CONTRACTOR SHALL COORDINATE THE PLACEMENT OF THE TOP MAT OF REINFORCING STEEL AND/OR ANY ADDITIONAL REINFORCING BARS WITHIN THE CAST-IN-PLACE FOUNDATION.
  7. THE CONTRACTOR SHALL TAKE PROPER PRECAUTIONS WHEN EXCAVATING ADJACENT TO THE EXISTING CULVERT AS TO NOT UNDERMINE ANY EXISTING FOUNDATIONS NOT INTENDED FOR REMOVAL.
  8. MINIMUM LAP LENGTHS SHALL BE AS FOLLOWS:  
 #4 BAR = 1'-11"  
 #5 BAR = 2'-5"  
 #6 BAR = 3'-7"



**SIDEWALL ELEVATION**

(EAST SIDEWALL SHOWN, WEST SIMILAR REINFORCING FOR SIDEWALL SHOWN ONLY, SEE CULVERT PLAN FOR TOP AND BOTTOM SLAB REINFORCING)



**SECTION A-A**

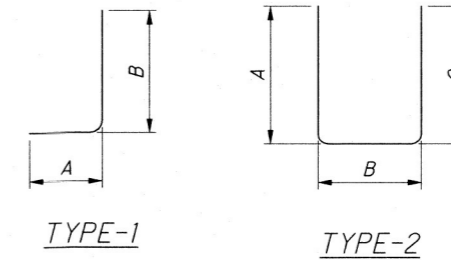
**LEGEND**

- - MEASURED NORMAL TO C
- Δ - MEASURED ALONG SKEW
- O.F. - OUTSIDE FACE
- I.F. - INSIDE FACE
- \*\* - X'-X" LAP (TYP, SEE NOTE 8)
- ▨ - PORTIONS OF STRUCTURE REMOVED

DESIGNED RMW CHECKED RUE	DRAWN RMW REVISED	REVIEWED CAS	DATE 10/25/19	DESIGN AGENCY <b>EMIT</b> Engineering, Mechanical, Industrial, Traffic, and Construction Services, Inc. 10000 West 10th Avenue, Suite 100 Denver, CO 80202 Tel: 303.751.1000 Fax: 303.751.1001 www.emitinc.com
			STRUCTURE FILE NUMBER 1810514	
<b>CULVERT EXTENSION DETAILS</b>				BRIDGE NO. HOL-241-0287 BRANCH OF HONEY RUN
HOL-241-2.85 PID No. 108406				
6 / 7				22 28

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MARK	OUTLET		TOTAL	LENGTH	WEIGHT	TYPE	DIMENSION				
	NO. 1	NO. 2					A	B	C	D	E
<b>WINGWALLS</b>											
X501	12	12	24	7' - 5"	186	STR.					
Y501	12	12	24	4' - 2"	104	1	0'-6"	3'-9"			
WW501	12	12	24	7' - 5"	186	STR.					
WW502	12	12	24	13' - 4"	334	STR.					
<b>FOOTING &amp; CUTOFF WALL</b>											
<b>OUTLET</b>											
V501	54		54	5' - 3"	296	STR.					
Z501	27		27	7' - 11"	223	2	3'-7"	1'-0"	3'-7"		
F501	10		10	39' - 1"	408	STR.					
F502	4		4	39' - 1"	163	STR.					
<b>TOTAL WEIGHT</b>					<b>1,900</b>						



**REINFORCING STEEL NOTES:**

1. THE BAR SIZE NUMBER IS SPECIFIED ON THE PLANS IN THE BAR MARK COLUMN. THE FIRST DIGIT WHERE THREE DIGITS ARE USED, AND THE FIRST TWO DIGITS WHERE FOUR ARE USED, INDICATES THE BAR SIZE NUMBER. FOR EXAMPLE, S501 IS A NO. 5 BAR. BAR DIMENSIONS SHOWN ARE OUT TO OUT UNLESS OTHERWISE NOTED. R INDICATES INSIDE RADIUS, UNLESS OTHERWISE NOTED.
2. "STR." IN THE TYPE COLUMN INDICATES STRAIGHT BARS.
3. REFER TO CMS SECTION 509.05 FOR STANDARD BEND DIMENSIONS.
4. THE TOTALS HAVE BEEN CARRIED TO THE GENERAL SUMMARY.

MARK	NUMBER	LENGTH	WEIGHT	TYPE	DIMENSIONS							
	TOTAL				A	B	C	D	E	R	INC	
S401	60	16'-0"	642	STR	-	-	-	-	-	-	-	-
S402	31	1'-10"	42	1	0'-8"	1'-3"	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
S501	4	11'-7"	49	STR	-	-	-	-	-	-	-	-
S502	26	2'-2"	59	1	0'-10"	1'-6"	-	-	-	-	-	-
S503	20	2'-5"	51	2	1'-0"	0'-8"	1'-0"	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
S601	132	8'-8"	1,719	1	3'-10"	5'-0"	-	-	-	-	-	-
S602	132	5'-4"	1,058	1	1'-0"	4'-6"	-	-	-	-	-	-
S603	124	10'-4"	1,925	STR	-	-	-	-	-	-	-	-
S604	12	11'-0"	199	STR	-	-	-	-	-	-	-	-
S605	4	6'-3"	42	1	1'-0"	6'-2"	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
<b>TOTAL WEIGHT</b>			<b>5,786</b>									

**REINFORCING STEEL LIST**

HOL-241-0287  
BRANCH OF HONEY RUN

HOL-241-2.85  
PID No. 108406

7 / 7

23  
28

DESIGN AGENCY  
O.D.O.T. - DISTRICT 11  
ENGINEERING

REVIEWED  
TES  
DATE  
04/15/20  
STRUCTURE FILE NUMBER  
1810514

DRAWN  
BSH  
CHECKED  
XXX  
DESIGNED  
BSH  
ANS