

BENCHMARK DATA				
BM #1 STA. 261+42.76	ELEV. 851.05	OFFSET 41.31	RT	
BM #2 STA. 251+13.46	ELEV. 846.94	OFFSET 21.03	RT	
BM #3 STA. 258+70.59	ELEV. 846.26	OFFSET 20.74	LT	
BM #4 STA. 265+23.77	ELEV. 849.96	OFFSET 21.44	RT	

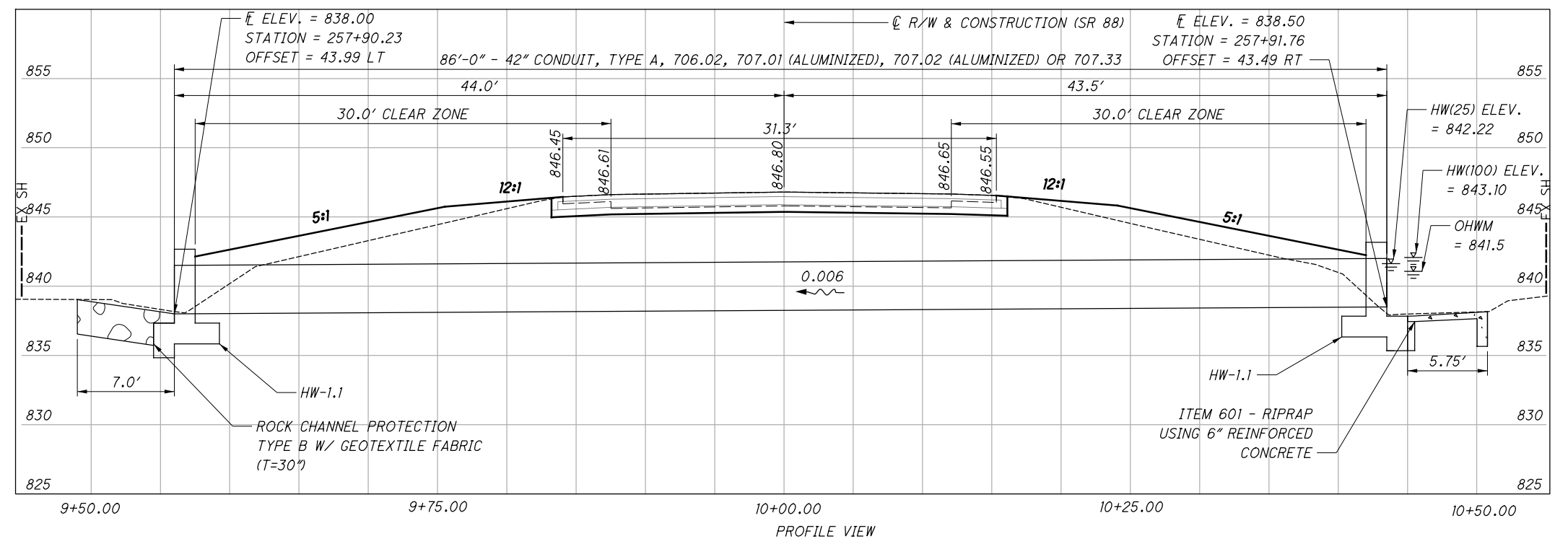
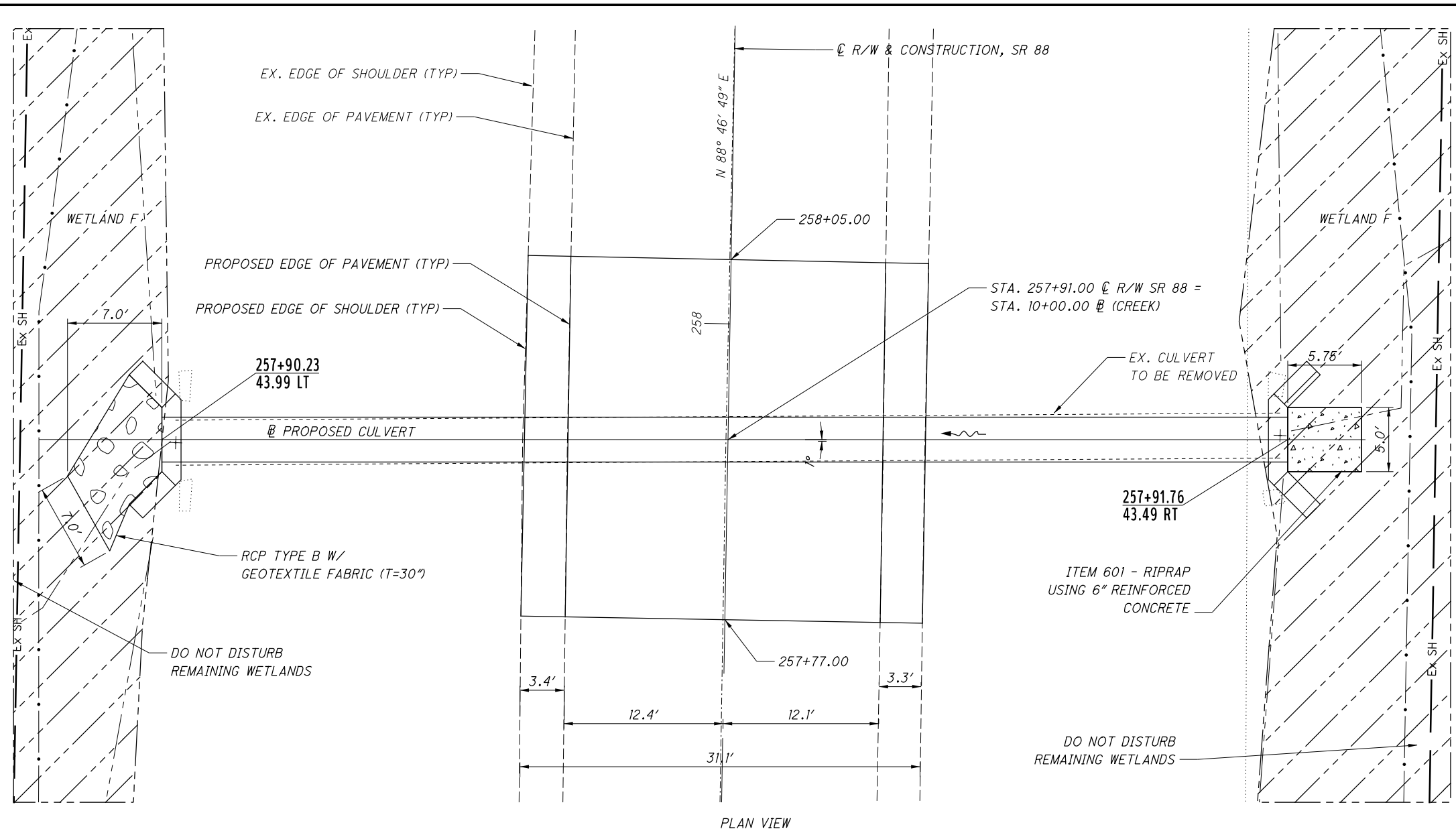
NOTES
EARTHWORK LIMITS SHOWN ARE APPROXIMATE. ACTUAL SLOPES SHALL CONFORM TO PLAN CROSS SECTIONS.

DESIGN TRAFFIC
2020 ADT = 3200 2020 ADTT = 224
2040 ADT = 3300 2040 ADTT = 231
DIRECTIONAL DISTRIBUTION = 0.55

- LEGEND**
- ROCK CHANNEL PROTECTION
 - WETLAND
 - RIPRAP

HYDRAULIC DATA
DRAINAGE AREA = 0.24 SQ. MILES
Q (25) = 49.9 CFS V (25) = 7.82 FT/S
Q (100) = 63.7 CFS V (100) = 8.67 FT/S

PH = 7
ABRASION = 2
SERVICE LIFE = 75 YEARS



EXISTING CULVERT

TYPE: 42" CORRUGATED METAL PIPE
LENGTH: 85'-10"
ROADWAY: 31'-1" EOS/EOS
SKEW: 1°22'09" RF
ALIGNMENT: NONE
CULVERT FILE NUMBER: 1847143
DISPOSITION: TO BE REMOVED AND REPLACED

PROPOSED CULVERT

TYPE: 42" CONDUIT, TYPE A, 706.02, 707.01 (ALUMINIZED) 707.02 (ALUMINIZED) OR 707.33
SPANS: 87'-6"
ROADWAY: 31'-1" EOS/EOS
SKEW: 1° RF
HEADWALLS: **REVISED** FULL HEIGHT, PER SCD HW-1.1
COORDINATES: LATITUDE N41°23'26" LONGITUDE W80°54'35"

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SURVEYING PARAMETERS

USE THE FOLLOWING PROJECT CONTROL, VERTICAL POSITIONING, AND HORIZONTAL POSITIONING PARAMETERS FOR ALL SURVEYING:

VERTICAL POSITIONING

ORTHOMETRIC HEIGHT DATUM: NAVD 88
 GEOID: GEOID12B

HORIZONTAL POSITIONING

REFERENCE FRAME: NAD 83 (2011)
 ELLIPSOID: GRS80
 MAP PROJECTION: LAMBERT CONFORMAL CONIC
 COORDINATE SYSTEM: OHIO NORTH ZONE (3401)
 COMBINED SCALE FACTOR: 0.99990288
 ORIGIN OF SCALE (X,Y): EASTING (X): 0, NORTHING (Y): 0

UNITS ARE IN U.S. SURVEY FEET. USE THE FOLLOWING
 CONVERSION FACTOR: 1 METER = 3.280833333 U.S. SURVEY
 FEET.

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.

EARTHWORK

THE FOLLOWING QUANTITIES HAVE BEEN CARRIED TO THE GENERAL
 SUMMARY FOR THE CULVERT IMPROVEMENT

ITEM 203, EXCAVATION 103 CY
 ITEM 203, EMBANKMENT 231 CY

SEEDING AND MULCHING

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

- 659, TOPSOIL 231 CY
- 659, SEEDING AND MULCHING 2081 SY
- 659, REPAIR SEEDING AND MULCHING 104 SY
- 659, COMMERCIAL FERTILIZER 0.28 TON
- 659, LIME 0.43 ACRES
- 659, WATER 11 M. GAL.

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.

CULVERT IDENTIFICATION SIGNS

STRUCTURE IDENTIFICATION SIGNS (I-H25b) WILL BE PLACED
 ON EACH APPROACH OFF THE RIGHT SHOULDER, FACING TRAFFIC,
 AND BEHIND THE GUARDRAIL IF APPLICABLE. A QUANTITY OF
 ONE SIGN PER APPROACH WILL BE INSTALLED. THE SIGNS WILL
 HAVE A NON-REFLECTIVE WHITE SHEETING BACKGROUND.

THE SIGNS WILL BE MOUNTED ON NEW NO. 2 POSTS AND WILL
 BE INSTALLED AS PER STANDARD CONSTRUCTION DRAWING
 TC-41.20, MOST CURRENT REVISION. EACH POST WILL BE
 7.5' IN LENGTH.

INSTALL SIGNS FOR THE FOLLOWING STRUCTURE:
 TRU-305-20.16

THE FOLLOWING QUANTITIES HAVE BEEN INCLUDED FOR EACH
 APPROACH:

- ITEM 630 - GROUND MOUNTED SUPPORT, NO. 2 POST, 15 FT
- ITEM 630 - SIGN, FLAT SHEET, 730.20, 2 SQ FT

UNSUITABLE SOILS

THE FOLLOWING ITEMS AND QUANTITIES ARE TO BE USED AS
 DIRECTED BY THE ENGINEER TO ADDRESS UNSUITABLE SOILS
 ENCOUNTERED IN THE AREA UNDER THE PROPOSED BOX CULVERT.

- ITEM 203 - EXCAVATION, 40 CU YD
- ITEM 203 - GRANULAR MATERIAL, TYPE C
 (703.16), 40 CU YD
- ITEM 204 - GEOTEXTILE FABRIC, TYPE D, 60 SQ YD

**PAVEMENT RESTORATION FOR PIPE INSTALLATIONS AND/OR
 REMOVALS**

THE FOLLOWING QUANTITY HAS BEEN PROVIDED FOR PAVEMENT
 RESTORATION FOLLOWING INSTALLATION AND/OR REMOVAL OF
 PIPES.

- (P1) STA. 142+18.00 TO STA. 142+60.00 (SR 305)
- ITEM 202 - PAVEMENT REMOVED 115 SY
- ITEM 204 - SUBGRADE COMPACTION 115 SY
- ITEM 255 - FULL DEPTH PAVEMENT SAWING, 50 FT
- ITEM 304 - AGGREGATE BASE, AS PER PLAN (T=6") 20 CY
- ITEM 301 - ASPHALT CONCRETE BASE, PG64-22 (T=10") 32 CY
- ITEM 407 - NON-TRACKING TACK COAT @ 0.09 GAL/SY 11 GAL.

THE EXISTING PAVEMENT BUILD-UP CONSISTS OF CONCRETE
 BASE WITH AN ASPHALT SURFACE.

THE ABOVE QUANTITIES ARE BASED ON THE PAVEMENT
 RESTORATION WIDTHS GIVEN ABOVE.

PROVIDE ANY MATERIALS USED OUTSIDE THE LIMITS STATED
 ABOVE AT NO ADDITIONAL COST.

RESURFACING AFTER PIPE INSTALLATION

THE FOLLOWING QUANTITIES HAVE BEEN PROVIDED TO
 RESURFACE THE ROADWAY AFTER THE COMPLETION OF
 THE CULVERT OR STRUCTURE PLACEMENT. THIS WORK
 DOES NOT HAVE TO BE COMPLETE DURING THE DETOUR
 PERIOD.

- STA. 141+68.00 TO STA. 143+10.00 (SR 305)
- ITEM 254 - PAVEMENT PLANING, ASPHALT CONCRETE (T= 3")
 388 SY
- ITEM 407 - NON-TRACKING TACK COAT, @ 0.09 GAL/SY 34 GAL.
- ITEM 408 - PRIME COAT, AS PER PLAN @ 0.40 GAL/SY 26 GAL
- ITEM 441 - ASPHALT CONCRETE SURFACE COURSE, TYPE 1 (448),
 (PG64-22), AS PER PLAN (T=3") (TWO 1.5" LIFTS) 33 CY
- ITEM 617 - COMPACTED AGGREGATE, AS PER PLAN 4 CY

THE ABOVE QUANTITIES ARE BASED ON A RESURFACING
 THE WIDTH OF THE PAVEMENT AND SHOULDERS FOR
 INSTALLATION AND/OR REMOVAL.

PAVEMENT MARKINGS

ALL PAVEMENT MARKINGS THAT ARE REMOVED DURING CULVERT
 REPLACEMENTS WILL BE REPLACED WITH ITEM 642 - TRAFFIC
 PAINT. THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN
 CARRIED TO THE GENERAL SUMMARY.

- ITEM 642 - EDGE LINE, 6", TYPE 1, 0.05 MILE
- ITEM 642 - CENTER LINE, TYPE 1, 0.03 MILE

ITEM 621 - RPM 3 EACH

ESTIMATED QUANTITIES FOR TRU-305-20.16

REF NO.	SHEET NO.	STATION TO STATION	202		202	503	511	601	606	606	606	606	611	626	638	511	509
			GUARDRAIL REMOVED	HEADWALL REMOVED													
			FT	EACH		SY	CY	FT	FT	EACH	EACH	FT	EACH	EACH	CY	LB	
D1	1	142+39.00 LT/RT				LUMP	68	95					40			34	2684
R1	1	142+39.00 LT/RT		2	LUMP												
R2	1	140+94.76 LT TO 143+94.79 LT	289														
R3	1	139+45.72 RT TO 143+77.43 RT	449														
R4	1	142+29.00 RT													1		
GR1	1	140+94.76 LT TO 143+94.79 LT						175	50	2			4				
GR2	1	139+45.72 RT TO 143+77.43 RT						325	50	1	1		6				
TOTALS CARRIED TO GENERAL SUMMARY			738	2	LS	LS	68	95	500	100	3	1	40	10	1	34	2684

REARRANGED

ADDED

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BACKFILL LIMITATION

WHEN THE DESIGN HEIGHT IS GREATER THAN 10 FT, THE BACKFILL BEHIND THE WINGWALLS SHALL NOT BE PLACED HIGHER THAN THE ELEVATION OF THE SOIL ABOVE THE TOE. WHEN THE SOIL ABOVE THE TOE IS AT ITS FINISHED ELEVATION, THE REMAINDER OF THE BACKFILL MAY BE PLACED.

POROUS BACKFILL WITH FILTER FABRIC

POROUS BACKFILL WITH FILTER FABRIC 1'-6" THICK SHALL BE PLACED BEHIND THE WINGWALLS ONLY AND SHALL EXTEND TO 12" BELOW THE EMBANKMENT SURFACE. GEOTEXTILE FABRIC TYPE A 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.

WEEPHOLES SHALL BE PLACED 6" TO 12" ABOVE THE NORMAL WATER ELEVATION OR GROUND LINE AND SHALL HAVE A MAXIMUM SPACING OF 10'-0". A MINIMUM OF ONE WEEPHOLE SHALL BE PROVIDED PER WINGWALL.

ITEM 518 - POROUS BACKFILL WITH GEOTEXTILE FABRIC LS

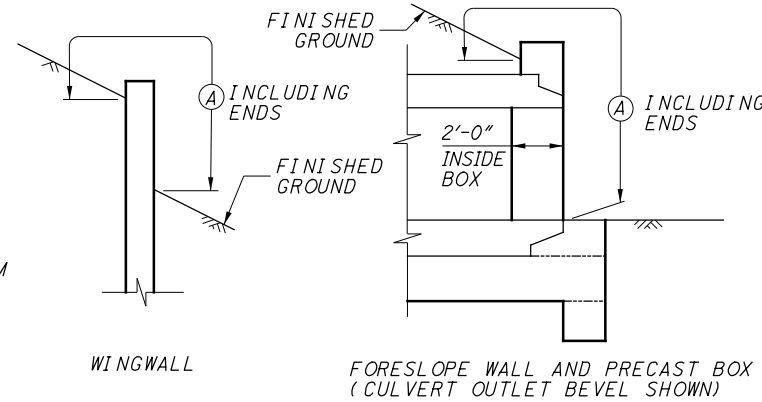
ITEM 511, CLASS QC1 CONCRETE, RETAINING/WINGWALL NOT INCLUDING FOOTING, AS PER PLAN:

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 THERE INFORCING 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 23 CU YD. THE TOTAL QUANTITY OF CAST-IN-PLACE WINGWALL AND HEADWALL REINFORCING STEEL IS 2492 LBS

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.

ITEM 512 - SEALING OF CONCRETE SURFACES 85 SY



LIMITS OF ITEM 512-SEALING CONCRETE SURFACES

(A) - SEAL ENTIRE CONCRETE SURFACE AREA

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 516 - 1" PREFORMED EXPANSION JOINT FILLER 36 FT

WATERPROOFING

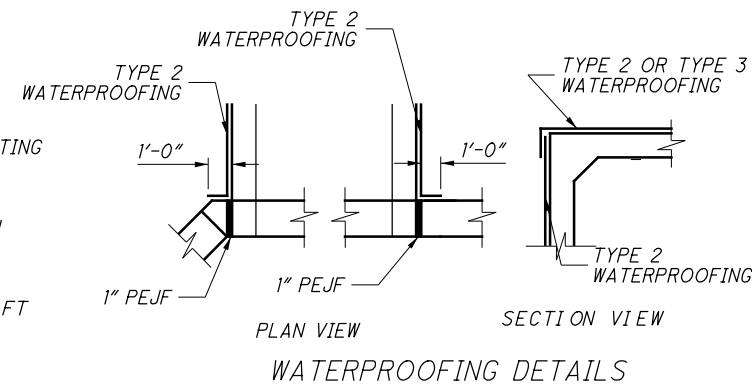
TYPE 2 WATERPROOFING, PER CMS 512 AND 711.25, SHALL EXTEND VERTICALLY DOWN THE ENTIRE SIDES OF THE PRECAST CULVERT SECTIONS FOR ALL PORTIONS OF THE CULVERT WHICH SHALL BE IN CONTACT WITH THE BACKFILL. PAYMENT FOR THE MEMBRANE WATERPROOFING SHALL BE AT THE CONTRACT PRICE BID PER SQUARE YARD FOR ITEM 512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

IF PAVEMENT IS NOT PLACED DIRECTLY ON TOP OF THE CULVERT, TYPE 2 WATERPROOFING, PER CMS 512 AND 711.25 SHALL BE APPLIED TO THE ENTIRE TOP SURFACE OF THE PRECAST 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.

IF PAVEMENT IS TO BE USED DIRECTLY ON TOP OF THE CULVERT, TYPE 3 WATERPROOFING, PER CMS 512 AND 711.29 SHALL BE APPLIED TO THE ENTIRE TOP SURFACE OF THE PRECAST 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 3 WATERPROOFING.

ITEM 512 - TYPE 2 WATERPROOFING

134 SY



REVISED

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CALCULATED PD CHECKED MAC

CULVERT DETAILS TRU-305-20.16

SUM / TRU CULVERT - FY 2020

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