

ROUNDING

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

UTILITIES

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

ELECTRIC:
 AMERICAN ELECTRIC POWER
 215 NORTH FRONT STREET
 COLUMBUS, OHIO 43215
 (614) 464-7911

GAS:
 COLUMBIA GAS OF OHIO
 939 WEST GOODALE BOULEVARD
 COLUMBUS, OHIO 43212
 (614) 460-2240

TELEPHONE:
 SBC AMERITECH
 150 EAST GAY STREET
 ROOM 6F
 COLUMBUS, OHIO 43215
 (614) 223-8535

CABLE:
 TIME WARNER COMMUNICATIONS
 1266 DUBLIN ROAD
 COLUMBUS, OHIO 43212
 (614) 481-5261

SANITARY, STORM:
 CITY OF COLUMBUS
 DIVISION OF SEWERAGE & DRAINAGE
 910 DUBLIN ROAD
 COLUMBUS, OHIO 43215
 (614) 645-7175

WATER:
 CITY OF COLUMBUS
 DIVISION OF WATER
 910 DUBLIN ROAD
 COLUMBUS, OHIO 43215
 (614) 645-7677

UTILITIES

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.

SURVEYING PARAMETERS

PRIMARY PROJECT CONTROL MONUMENTS GOVERN ALL POSITIONING ON ODOT PROJECTS. SEE THIS SHEET FOR A TABLE CONTAINING PRIMARY PROJECT CONTROL INFORMATION.

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

PRIMARY PROJECT CONTROL

POSITIONING METHOD: STATIC GNSS
 MONUMENT TYPE: A

VERTICAL POSITIONING

ORTHOMETRIC HEIGHT DATUM: NAVD88
 GEOID: GEOID09

HORIZONTAL POSITIONING

REFERENCE FRAME: NAD83(CORS96)
 ELLIPSOID: GRS80
 MAP PROJECTION: LAMBERT CONFORMAL CONIC
 COORDINATE SYSTEM: OHIO STATE PLANE - SOUTH ZONE
 COMBINED SCALE FACTOR: 1.000059007
 ORIGIN OF COORDINATE SYSTEM: 0,0

USE THE POSITIONING METHOD 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 SUPPLEMENTAL SPECIFICATION 823.

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

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.

CLEARING AND GRUBBING

REMOVE ALL TREES AND STUMPS SPECIFICALLY MARKED FOR REMOVAL WITHIN THE CONSTRUCTION LIMITS UNDER THE LUMP SUM BID FOR ITEM 201, CLEARING AND GRUBBING. THE FOLLOWING IS AN APPROXIMATE ESTIMATE OF THE NUMBER OF TREES AND STUMPS TO BE REMOVED.

SIZES	NO. TREES	NO. STUMPS	TOTAL
18"	8	2	10
30"	1	2	3
48"	0	1	1
60"	1	0	1

SEEDING AND MULCHING

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

659, SEEDING AND MULCHING 310 SQ. YD.

659, REPAIR SEEDING AND MULCHING 16 SQ. YD.
 (310) X (0.05) = 15.5 SQ. YD.

659, SOIL ANALYSIS TEST 2 EACH

659, TOPSOIL 34 CU. YD.
 (310) X (111 CY PER 1000 SY) = 34.4 SQ. YD.

659, COMMERCIAL FERTILIZER 0.05 TON
 [(310) X (1 TON / 7410 SY)] + [(16 SY) X (1 TON / 1115 SY)] = 0.05 TON

659, LIME 0.1 ACRE
 (310) X (1 ACRE / 4840 SY) = 0.06 ACRE

659, INTER-SEEDING 16 SQ. YD.
 (310) X (0.05) = 15.5 SQ. YD.

659, WATER 2 M. GAL.
 [(310) X (0.0054 M GAL / SY)] + [(16) X (.0027 GAL/SY)] = 2 M. GAL

APPLY SEEDING AND MULCHING 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 TEMPORARY EASEMENT. QUANTITY CALCULATIONS FOR SEEDING AND MULCHING ARE BASED ON THESE LIMITS.

RESIDENTIAL AND COMMERCIAL DRAINAGE CONNECTIONS

EXISTING ROOF DRAINS, FOOTER DRAINS, OR YARD DRAINS, DISTURBED BY THE WORK, SHALL BE PROVIDED WITH UNOBSTRUCTED OUTLETS BY CONNECTING A CONDUIT THROUGH THE CURB OR INTO A DRAINAGE STRUCTURE. THE LOCATION, TYPE, SIZE AND GRADE OF THE NEW CONDUIT REQUIRED TO REPLACE OR EXTEND THE EXISTING DRAIN WILL BE DETERMINED BY THE ENGINEER.

THE FOLLOWING CONDUIT TYPES MAY BE USED: 707.33, 707.41 NON-PERFORATED, 707.42, 707.43, 707.45, 707.46, 707.47, 707.51, 707.52 SDR35.

THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN INCLUDED IN THE GENERAL SUMMARY FOR USE AS DIRECTED BY THE ENGINEER FOR THE WORK NOTED ABOVE:

611, 6" CONDUIT, TYPE B	50 FT.
611, 6" CONDUIT, TYPE C	50 FT.
611, 6" CONDUIT, TYPE E	50 FT.
611, 6" CONDUIT, TYPE F	50 FT.

PROFILE AND ALIGNMENT

THE PROPOSED PAVEMENT RESURFACING SHALL FOLLOW THE ALIGNMENT SHOWN ON THE PLAN VIEW SHEETS. THE PROPOSED PROFILE SHALL FOLLOW THE PROPOSED ELEVATIONS SHOWN ON THE CROSS SECTION SHEETS. THE PROPOSED ASPHALT CONCRETE OVERLAY SHALL VARY TO PRODUCE THE PROPOSED ELEVATIONS SHOWN ON THE CROSS SECTIONS.

PRIMARY PROJECT CONTROL INFORMATION

POINT NUMBER	GRID COORDINATES U.S. SURVEY FEET		SCALED COORDINATES U.S. SURVEY FEET		ORTHOMETRIC HEIGHT (ELEVATION)	DESCRIPTION
	NORTHING	EASTING	NORTHING	EASTING		
CP1	648471.989	2085554.754	648510.253	2085677.816	634.80	PROJECT CONTROL - STEEL ROD SET IN CONCRETE
CP2	646970.005	2084508.912	647008.181	2084631.913	636.54	PROJECT CONTROL - STEEL ROD SET IN CONCRETE
CP3	647678.067	2084753.211	647716.285	2084876.226	655.38	AZIMUTH MARK - STEEL ROD SET IN CONCRETE
CP4	647186.714	2084974.770	647224.903	2084974.711	656.63	AZIMUTH MARK - STEEL ROD SET IN CONCRETE

ITEM 659, SEEDING AND MULCHING

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 ITEM 659, SEEDING AND MULCHING, ARE BASED ON THESE LIMITS.

SEE SHEET 18 FOR SEEDING AND MULCHING SUBSUMMARY.

WATERING AND MOWING PERMANENT SEEDED AREAS

THE FOLLOWING ESTIMATED QUANTITIES ARE TO BE USED AS DIRECTED BY THE ENGINEER TO PROMOTE GROWTH AND TO CARE FOR PERMANENT SEEDED AREAS PER 659.09:

659, WATER	22 M.GAL.
659, MOWING	23 M SQ. FT.

EROSION CONTROL

ITEMS 601, 660 AND 670 ARE PROVIDED IN THE PLANS FOR EROSION CONTROL. ROCK OF A STABLE NATURE SHALL NOT BE REMOVED IN ORDER TO PLACE ANY OF THESE ITEMS AND TURF OF A STABLE NATURE SHALL NOT BE REMOVED IN ORDER TO PLACE 660 OR 670. THE ENGINEER SHALL CHECK AND NON-PERFORM QUANTITIES OR ADJUST LOCATIONS AND QUANTITIES OF THESE ITEMS WHERE INDICATED BY FIELD CONDITIONS DURING CONSTRUCTION.

ITEM 604, CATCH BASIN NO. 2-3 AND 2-5 AS PER PLAN

CATCH BASINS SHALL BE CONSTRUCTED IN CONFORMANCE WITH ITEM 604 EXCEPT THAT THE GRATES SHALL BE NEENAH NO. R-4859-C OR EAST JORDAN NO. 5110 TYPE M2 OR APPROVED EQUALS.

ITEM 611 - CONDUIT BORED OR JACKED

WHERE IT IS SPECIFIED THAT A CONDUIT BE INSTALLED BY THE METHOD OF BORING OR JACKING, NO TRENCH EXCAVATION SHALL BE CLOSER THAN 10 FEET TO THE (EDGE OF PAVEMENT) NEAREST RAIL). PROVIDE A 0.50 INCH UNGALVANIZED CASING PIPE CONFORMING TO 748.06 THAT HAS JOINT WITH A CIRCUMFERENTIAL FULLY PENETRATING B-U4B WELD THAT IS PERFORMED BY AN ODOT APPROVED FIELD WELDER. THE INSTALLED CASING PIPE IN THE STORM WATER CONVEYANCE CARRIER UNLESS OTHERWISE SPECIFIED IN THE PLANS. HYDROSTATIC TESTING IS NOT REQUIRED FOR THE CASING PIPE.

CROSSINGS AND CONNECTIONS TO EXISTING PIPES AND UTILITIES

WHERE PLANS PROVIDE FOR A PROPOSED CONDUIT TO BE CONNECTED TO, OR CROSS OVER OR UNDER AN EXISTING SEWER OR UNDERGROUND UTILITY, THE CONTRACTOR SHALL LOCATE THE EXISTING PIPES OR UTILITIES BOTH AS TO LINE AND GRADE BEFORE STARTING TO LAY THE PROPOSED CONDUIT.

IF IT IS DETERMINED THAT THE ELEVATION OF THE EXISTING CONDUIT, OR EXISTING APPURTENANCE TO BE CONNECTED, DIFFERS FROM THE PLAN ELEVATION OR RESULTS IN A CHANGE IN THE PLAN CONDUIT SLOPE, THE ENGINEER SHALL BE NOTIFIED BEFORE STARTING CONSTRUCTION OF ANY PORTION OF THE PROPOSED CONDUIT WHICH WILL BE AFFECTED BY THE VARIANCE IN THE EXISTING ELEVATIONS.

IF IT IS DETERMINED THAT THE PROPOSED CONDUIT WILL INTERSECT AN EXISTING SEWER OR UNDERGROUND UTILITY IF CONSTRUCTED AS SHOWN ON THE PLAN, THE ENGINEER SHALL BE NOTIFIED BEFORE STARTING CONSTRUCTION OF ANY PORTION OF THE PROPOSED CONDUIT WHICH WOULD BE AFFECTED BY THE INTERFERENCE WITH AN EXISTING FACILITY.

PAYMENT FOR ALL THE OPERATIONS DESCRIBED ABOVE SHALL BE INCLUDED IN THE CONTRACT PRICE FOR THE PERTINENT 603 CONDUIT ITEM.

ITEM 605, AGGREGATE DRAINS

AGGREGATE DRAINS SHALL BE PLACED AT FIFTY (50) FOOT INTERVALS ON EACH SIDE OF NORMAL CROWNED SECTIONS, STAGGERED SO THAT EACH DRAIN IS 25 FEET FROM THE ADJACENT DRAIN ON THE OPPOSITE SIDE AND AT TWENTY-FIVE (25) FOOT INTERVALS ON THE LOW SIDE ONLY OF SUPERELEVATED SECTIONS. AN AGGREGATE DRAIN SHALL BE PLACED AT THE LOW POINT OF EACH SAG VERTICAL CURVE.

UNRECORDED UNTREATED NON-STORMWATER DRAINAGE

FURNISH NO CONTINUANCE FOR ANY UNRECORDED UNTREATED NON-STORMWATER DRAINAGE SUCH AS UNTREATED SEPTIC, UNTREATED WASTEWATER, UNTREATED CURTAIN/GRADIENT DRAINS, AND UNTREATED FOUNDATION FLOOR DRAINS DISTURBED BY THE WORK. PLUG ANY UNRECORDED, UNTREATED, NON-STORMWATER DRAINAGE WITH CLASS C CONCRETE AT THE RIGHT-OF-WAY LINE. PAYMENT FOR PLUGGING SHALL BE INCLUDED IN THE CONTRACT PRICE FOR THE PERTINENT 202 OR 203 ITEM.

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 CONTRACTOR, ALONG WITH LOCAL REPRESENTATIVES 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 APPURTENANCES 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 603 CONDUIT ITEMS.

UNRECORDED ACTIVE SANITARY SEWER CONNECTIONS

FURNISH A CONTINUANCE FOR ALL UNRECORDED ACTIVE SANITARY SEWER CONNECTIONS SUCH AS SANITARY, WASTEWATER, CURTAIN/GRADIENT DRAINS, AND FOUNDATION FLOOR DRAINS DISTURBED BY THE WORK. FURNISH AN UNOBSTRUCTED CONTINUANCE OF THE UNRECORDED ACTIVE SANITARY SEWER CONNECTIONS TO THE SATISFACTIN OF THE ENGINEER. ALL SUCH CONTINUANCE REQUIRES A RIGHT-OF-WAY USE PERMIT. ALL SANITARY AND SANITARY WASTEWATER MAY ALSO REQUIRE A NPDES PERMIT FROM THE OHIO ENVIRONMENTAL PROTECTION AGENCY. REPORT ALL CONTINUANCE TO THE LOCAL HEALTH DEPARTMENT.

THE FOLLOWING CONDUIT TYPES MAY BE USED: 707.42, 707.43, 707.44, 707.45, 707.46, 707.47, 707.51, 707.52 SDR35, 706.01, 706.02, OR 706.08 WITH JOINTS AS PER 706.11 OR 706.12.

THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN INCLUDED IN THE GENERAL SUMMARY FOR USE AS DIRECTED BY THE ENGINEER FOR THE WORK NOTED ABOVE:

611, 8" CONDUIT, TYPE B, FOR SANITARY 100 FT.

611, 6" CONDUIT, TYPE C, FOR SANITARY 100 FT.

ITEM 611 - 10' X 8' CONDUIT, TYPE A, 706.05, AS PER PLAN (DESIGN EARTH COVER = 6 FEET)

SEGMENTAL, PRECAST CONCRETE FOUR SIDED STRUCTURES WHICH ARE BELOW FINISHED GRADE AND WILL NOT BE PAVED DIRECTLY OVER SHALL HAVE ITEM SPECIAL, MEMBRANE WATERPROOFING, SHEET TYPE 2 (SEE PROPOSAL NOTE) APPLIED TO THE TOP SURFACE AND VERTICALLY DOWN THE ENTIRE SIDES FOR ALL PORTIONS OF THE STRUCTURE WHICH SHALL BE IN CONTACT WITH THE BACKFILL.

THE EXTERIOR JOINT GAP ON THE TOP AND SIDES BETWEEN THE PRECAST STRUCTURE SECTIONS SHALL BE FILLED WITH PORTLAND CEMENT MORTAR PRIOR TO INSTALLING THE MEMBRANE WATERPROOFING. JOINT WRAP AS SPECIFIED IN 611.08 AND CONCRETE SEALING AS SPECIFIED IN 611.09 ARE NOT REQUIRED UNDER THE LIMITS OF THE MEMBRANE WATERPROOFING. PAYMENT FOR THE MEMBRANE WATERPROOFING SHALL BE AT THE CONTRACT PRICE BID PER SQUARE YARD FOR PERTINENT ITEM SPECIAL, MEMBRANE WATERPROOFING, SHEET TYPE (SEE PROPOSAL NOTE).

WHEN ITEM SPECIAL, SEALING OF CONCRETE SURFACES (EPOXY) (SEE PROPOSAL NOTE) IS SPECIFIED ON THE HEADWALLS OF A PRECAST CONCRETE STRUCTURE, ANY PRECAST STRUCTURE SECTIONS BEYOND THE LIMIT OF THE MEMBRANE WATERPROOFING SHALL ALSO BE SEALED WITH THE SAME SEALANT. PAYMENT FOR THE SEALING OF THE PRECAST CONCRETE STRUCTURE SURFACES SHALL BE MADE AT THE CONTRACT PRICE BID PER SQUARE YARD FOR ITEM SPECIAL, SEALING OF CONCRETE SURFACES (EPOXY) (SEE PROPOSAL NOTE).

GENERAL NOTES

FRA -44 -13.67

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**PLAN
PROFILE
SHEET
NO.**

PLAN PROFILE SHEET NO.	202		601		611															605					BENDS AND BRANCHES FOR INFORMATION ONLY				
	CATCH BASIN ABANDONED	ROCK CHANNEL PROTECTION, TYPE D WITH FILTER	6" CONDUIT, TYPE B, 707.17 NON-PERFORATED, ASTM D-3034 SDR 35, SS931 OR SS944	12" CONDUIT, TYPE C	15" CONDUIT, TYPE C	21" CONDUIT, TYPE B	30" CONDUIT, TYPE B	CONDUIT, BORED OR JACKED: 6", TYPE B	6" CONDUIT, TYPE F	CATCH BASIN, NO. 4	CATCH BASIN, NO. 5, AS PER PLAN	CATCH BASIN ADJUSTED TO GRADE	CATCH BASIN RECONSTRUCTED TO GRADE	PRECAST REINFORCED CONCRETE OUTLET	4" SHALLOW PIPE UNDERDRAINS	4" UNCLASSIFIED PIPE UNDERDRAINS	4" SHALLOW PIPE UNDERDRAINS	4" UNCLASSIFIED PIPE UNDERDRAINS	4" ROCK CUT UNDERDRAINS	6"x45° BEND	6"x490° BEND	6"x6" TEE	6"x6" WYE	6"x6" CROSS					
	EACH	CU YD	FT	FT	FT	FT	FT	FT	FT	EACH	EACH	EACH	EACH	EACH	FT	FT	FT	FT	FT	EACH	EACH	EACH	EACH	EACH					
117								35	222					3	2793					3	2	1		1					
118									42					1	4000					6	2	2		2					
119	1				105				260	1				4	3783				267	4	2	2							
120									26					1	50				3947				2	1					
121		23				6	6	50	180		1	1	1					4000				3	3	2					
122								51	213				1		3	1660			873	2									
123									112							1882				1			2						
124			25						90				1			3984				3	2	2							
125									98				1			3683	283			5			1						
126	1			108					160	1					2	4071				5	2	3							
127									113						1	3650	350			4									
128									196						4	4000				4		3							
129	1			107					188	1					4	4000				4		2							
130			25						130						1	4000				4		2							
131									198						4	4000				2	2	2	1	1					
132									123						2	4000				2			2						
133									144						3	4000				2	2	2		1					
134								27	171			1			3	4577				4	2	3	1						
135																3160				2	3								
135A			50						156						1	2024				2	2	2							
136									60						3			928				2							
137									26						1		836	47			2								
138									24						1		542	50			1		1						
139									40			1			2		958				2			1					
142									56						3		1122				3								
143									18						1		720	50			2		1						
144									38						2		814					2							
145									38						2		1218				4		1						
146									40						2		822				2	2							
147									34						2		720				2			1					
TOTALS CARRIED TO GENERAL SUMMARY	3	23	100	215	105	6	6	163	3196	3	1	5	2	56	63317	633	8680	147	9087										

SP 1307-1
DATE: JANUARY 2013

CALCULATED
JKP
CHECKED
FGW

DRAINAGE SUB-SUMMARY

STA - 6 - 18.84

86
267

REF NO.	STORM SEWER PROFILE SHEET NO.	STATION		SIDE	202		601	602	611								605	670	SP 1307-2 DATE: JANUARY 2013				
					PIPE REMOVED, 24" AND UNDER	CATCH BASIN REMOVED	ROCK CHANNEL PROTECTION, TYPE B WITH FILTER	CONCRETE MASONRY	6" CONDUIT, TYPE F	12" CONDUIT, TYPE B	15" CONDUIT, TYPE C	18" CONDUIT, TYPE B	24" CONDUIT, TYPE B	42" CONDUIT, TYPE B, 706.02	CATCH BASIN, NO. 4	CATCH BASIN, NO. 4A	CATCH BASIN, NO. 5	CATCH BASIN, NO. 5A	4" SHALLOW PIPE UNDERDRAINS	DITCH EROSION PROTECTION	BENDS AND BRANCHES FOR INFORMATION ONLY		
																					6"X6" TEE	6"X6" CROSS	6"X90° BEND
FROM	TO	FT	EACH	CU YD	CU YD	FT	FT	FT	FT	FT	FT	EACH	EACH	EACH	EACH	FT	SO YD	EACH	EACH	EACH			
D1	209 & 210	360+00	364+00	CL							400				1						125		
D2	210		364+00	RT						200											250		
D3	154		363+60	LT&RT						160													
D4	154		364+00	LT																			
D5	154		364+00	CL																			
D6	154		364+00	RT			6																
D7	154		364+00	LT																			
D8	210	364+00	365+00	RT						100											197		
D9	210	364+00	365+35	CL						135					1						226		
D10	210	364+00	365+75	LT						175											259		
D11	157		368+20	CL																			
D12	157		368+20	LT																			
D13	157		368+20	RT			1	0.4															
D14	212	368+20	371+00	LT						280											125		
D15	212	368+20	371+00	CL						280					1						125		
D16	212	368+20	371+00	RT						280											125		
R1			368+00	RT	20	1																	
U1		359+90	363+97	RT					20												407		1
U2		359+90	363+97	LT					20												407		1
U3		359+90	363+97	LT					22												814	1	1
U4		359+90	363+97	RT					22												814	1	1
U5		364+03	368+18	RT					20												415	1	
U6		364+03	368+18	RT					22												830	1	1
U7		364+03	368+18	LT					22												830	1	1
U8		364+03	368+18	LT					20												415	1	
U9		368+22	371+00	LT					22												556	1	1
U10		368+22	371+00	RT					22												556	1	1
U11		368+22	371+00	RT					20												278		1
U12		368+22	371+00	LT					20												278		1
U13		371+00	373+50	LT																	500	2	
U14		371+00	373+50	LT																	250	1	
U15		371+00	373+50	RT																	500	2	
U16		371+00	373+50	RT																	250	1	
ALL QUANTITIES FROM PLAN & PROFILE SHEET 81																							
TOTALS CARRIED TO GENERAL SUMMARY					20	1	7	0.4	252	160	1850	68	141	144	4	1	7	2	8100	1557			

CALCULATED
MTG
CHECKED
CJM

ESTIMATED QUANTITIES

LUC-76 - 31.48

SHEET NUMBER														ITEM	ITEM EXT.	GRAND TOTAL	UNIT	DESCRIPTION	SEE SHEET NO.		
OFFICE CALCS	11	82	83	84	85	86	87	88	89	91	105	157	255							259	
	LUMP														201	11000	LUMP		CLEARING AND GRUBBING		
32738															202	23000	32738	SQ YD	PAVEMENT REMOVED		
1503															202	23500	1503	SQ YD	WEARING COURSE REMOVED		
											1953				202	32000	1953	FT	CURB REMOVED		
											927				202	32001	927	FT	CURB REMOVED, AS PER PLAN	105	
							12687.5								202	38000	12687.5	FT	GUARDRAIL REMOVED		
								34							202	38700	34	EACH	GUARDRAIL POST REMOVED		
					3										202	58500	3	EACH	CATCH BASIN ABANDONED		
	185	8423	20657	6224	169				188	479	153	331		2870	203	10000	39679	CU YD	EXCAVATION		
		1067	2189	7148	1069				225	1144	50	62			203	20000	12954	CU YD	EMBANKMENT		
71464															204	10000	71464	SQ YD	SUBGRADE COMPACTION		
							11650								606	13000	11650	FT	GUARDRAIL, TYPE 5		
							175								606	13050	175	FT	GUARDRAIL, TYPE 5A		
							12								606	22010	12	EACH	ANCHOR ASSEMBLY, TYPE E-98		
							12								606	25000	12	EACH	ANCHOR ASSEMBLY, TYPE A		
							23								606	26500	23	EACH	ANCHOR ASSEMBLY, TYPE T		
							36								606	35000	36	EACH	BRIDGE TERMINAL ASSEMBLY, TYPE 1		
							4								606	35100	4	EACH	BRIDGE TERMINAL ASSEMBLY, TYPE 2		
	10														623	38500	10	EACH	MONUMENT ASSEMBLY		
													50		601	32200	50	CU YD	ROCK CHANNEL PROTECTION, TYPE C WITH FILTER		
	2														659	00100	2	EACH	SOIL ANALYSIS TEST		
1773															659	00300	1773	CU YD	TOPSOIL		
15970															659	10000	15970	SQ YD	SEEDING AND MULCHING		
799															659	14000	799	SQ YD	REPAIR SEEDING AND MULCHING		
799															659	15000	799	SQ YD	INTER-SEEDING		
	2.23														659	20000	2.23	TON	COMMERCIAL FERTILIZER		
	3.30														659	31000	3.30	ACRE	LIME		
	86														659	35000	86	M GAL	WATER		
															832	15000	LUMP		STORM WATER POLLUTION PREVENTION PLAN		
															832	30000	15000	EACH	EROSION CONTROL		
							8680								605	05100	8680	FT	4" SHALLOW PIPE UNDERDRAINS		
							63317								605	05101	63317	FT	4" SHALLOW PIPE UNDERDRAINS, AS PER PLAN	116	
							3196								611	01500	3196	FT	6" CONDUIT, TYPE F		
							215								611	04600	215	FT	12" CONDUIT, TYPE C		
							105								611	06100	105	FT	15" CONDUIT, TYPE C, 706.02		
							246								611	08900	246	FT	21" CONDUIT, TYPE B, 706.02		
							138								611	11700	138	FT	27" CONDUIT, TYPE A, 706.02; OR 30", 707.01		
							350								611	27001	350	FT	78" CONDUIT, TYPE A, AS PER PLAN, 706.02	11	
							96								611	52500	96	FT	24" X 38" CONDUIT, TYPE A, 706.04		
							183								611	96600	183	FT	CONDUIT, BORED OR JACKED: 6", TYPE B	11	
							3								611	01200	3	EACH	CATCH BASIN, NO. 4		
							1								611	01601	1	EACH	CATCH BASIN, NO. 5, AS PER PLAN	116	
							4								611	09000	4	EACH	CATCH BASIN ADJUSTED TO GRADE		

GENERAL SUMMARY

TRU-99-13.48

SP 1307-3(a)
DATE: JANUARY 2013

CALCULATED
JKP
CHECKED
FGW

SHEET NUMBER					PARTICIPATION			ITEM	ITEM EXT.	GRAND TOTAL	UNIT	DESCRIPTION	SEE SHEET NO.
OFFICE CALCS	64	68	97	165	175	100% CITY	NH						
ROADWAY													
1000							1000		202	23000	1000	SQ YD	PAVEMENT REMOVED
		12							202	58700	12	EACH	MANHOLE ABANDONED
							2		202	75403	2	EACH	LIGHT POLE REMOVED FOR STORAGE, AS PER PLAN
							2		202	75500	2	EACH	LIGHT POLE FOUNDATION REMOVED
							2		202	75505	2	EACH	LUMINAIRE REMOVED FOR STORAGE, AS PER PLAN
				500				500	606	98000	500	FT	GUARDRAIL, MISC.: TENSIONED CABLE (BRIFEN) (ALTERNATE 1)
				20				20	606	98100	20	EACH	GUARDRAIL, MISC.: TENSIONED CABLE ANCHOR TERMINAL (BRIFEN) (ALTERNATE 1)
				500				500	606	98000	500	FT	GUARDRAIL, MISC.: TENSIONED CABLE (TRINITY) (ALTERNATE 2)
				2				2	606	98100	2	EACH	GUARDRAIL, MISC.: TENSIONED CABLE ANCHOR TERMINAL (TRINITY) (ALTERNATE 2)
				500				500	606	98000	500	FT	GUARDRAIL, MISC.: TENSIONED CABLE (MARION STEEL) (ALTERNATE 3)
				2				2	606	98100	2	EACH	GUARDRAIL, MISC.: TENSIONED CABLE ANCHOR TERMINAL (MARION STEEL) (ALTERNATE 3)
EROSION CONTROL													
				2				2	659	00100	2	EACH	SOIL ANALYSIS
				44				44	659	00300	44	CU YD	TOPSOIL
				400				400	659	10000	400	SQ YD	SEEDING AND MULCHING
				20				20	659	14000	20	SQ YD	REPAIR SEEDING AND MULCHING
				20				20	659	15000	20	SQ YD	INTER-SEEDING
				0.05				0.05	659	20000	0.05	TON	COMMERCIAL FERTILIZER
				0.08				0.08	659	31000	0.08	ACRES	LIME
				2.2				2.2	659	35000	2.2	M GAL	WATER
				0.9				0.9	659	40000	0.9	M SQ FT	MOWING
									832	15000		LUMP	STORM WATER POLLUTION PREVENTION PLAN
									832	30000	5000	EACH	EROSION CONTROL
PAVEMENT													
1844								1844	254	01000	1844	SQ YD	PAVEMENT PLANING, ASPHALT CONCRETE
1265								1265	301	46000	1265	CU YD	ASPHALT CONCRETE BASE, PG64-22
2627							986	1641	304	20000	2627	CU YD	AGGREGATE BASE
5333							5333		305	12000	5333	SQ YD	8" CONCRETE BASE
533							533		407	10000	533	GALLON	TACK COAT
3114							1066	2048	407	14000	3114	GALLON	TACK COAT FOR INTERMEDIATE COURSE
10								10	442	20000	10	CU YD	ASPHALT CONCRETE SURFACE COURSE, 12.5MM, TYPE A (448)
497							268	229	446	46040	497	CU YD	ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2, PG64-28
38								38	446	46040	38	CU YD	ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2, PG64-28 (DRIVEWAYS)
415							226	189	446	50000	415	CU YD	ASPHALT CONCRETE SURFACE COURSE, TYPE 1H
18								18	446	50000	18	CU YD	ASPHALT CONCRETE SURFACE COURSE, TYPE 1H (DRIVEWAYS)
4000							4000		609	12000	4000	FT	COMBINATION CURB AND GUTTER, TYPE 2
WATER WORK													
			896			896			SPECIAL	63860400	896	FT	12" DUCTILE IRON WATER PIPE AND FITTINGS (COL. 801)
			14			14			SPECIAL	63861900	14	EACH	6" VALVE AND APPURTENANCES (COL. 802)
			10			10			SPECIAL	63863800	10	EACH	1-1/2" WATER SERVICE TAP, COMPLETE (COL. 805)
			8			8			SPECIAL	63865502	8	EACH	SERVICE BOX REMOVED AND RESET (COL. 807)
			4			4			SPECIAL	63866602	4	EACH	FIRE HYDRANT, TYPE A (COL. 809)
SANITARY SEWER													
		200						200	611	00900	200	FT	6" CONDUIT, TYPE B, 706.01 OR 706.08 WITH 706.11 OR 706.12 JOINTS
		284						284	611	02000	284	FT	8" CONDUIT, TYPE C, 706.08 WITH 706.12 JOINTS
		273						273	611	04400	273	FT	12" CONDUIT, TYPE B, 706.03 WITH 706.11 JOINTS
		28						28	611	05900	28	FT	15" CONDUIT, TYPE B, 706.03 WITH 706.11 JOINTS
		230						230	611	07400	230	FT	18" CONDUIT, TYPE B, 706.03 WITH 706.11 JOINTS
		5						5	611	31500	5	EACH	MANHOLE, NO. 3 WITH 706.11 JOINTS
		8						8	611	34500	8	EACH	MANHOLE ADJUSTED TO GRADE
		3						3	611	35500	3	EACH	MANHOLE RECONSTRUCTED TO GRADE

GENERAL SUMMARY

FRA-11-26.48

CALCULATED
DMK
CHECKED
CML

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REF NO.	SHEET NO.	STATION		SIDE	202		601	602	611										SP 1309-1(b)				
					CATCH BASIN REMOVED	PIPE REMOVED 24" AND UNDER	ROCK CHANNEL PROTECTION TYPE C WITH FABRIC FILTER	CONCRETE MASONRY	24" CONDUIT, TYPE A, 706.02	15" CONDUIT, TYPE B	18" CONDUIT, TYPE B	12" CONDUIT, TYPE C	15" CONDUIT, TYPE C	6" CONDUIT, TYPE F	6" CONDUIT, TYPE F	MANHOLE ADJUSTED TO GRADE (SANITARY)	MANHOLE RECONSTRUCTED TO GRADE (SANITARY)	CATCH BASIN, NO. 2-2B	CATCH BASIN, NO. 2-3	CATCH BASIN, NO. 3A	DATE: JANUARY 2013		BENDS AND BRANCHES FOR INFO. ONLY
																					605	609	
FROM	TO	EACH	FT	CU YD	CU YD	FT	FT	FT	FT	FT	FT	FT	FT	EACH	EACH	EACH	EACH	EACH	FT	FT	NO.		
C-1	31-32,34	362+00	373+00	Rt																			
C-2	31-32	362+00	366+93	Lt																	1100		
C-3	32,34	367+37	371+67	Lt																	532		
																					458		
R-1	31	360+97		Rt	1																		
R-2	31 & 32	365+16	366+30	Rt	1	114																	
R-3	32	366+89	367+33	Rt		44																	
R-4	32	367+28	367+35	Rt		28																	
R-5	32	367+56	368+03	Rt		47																	
R-6	32	368+65	369+13	Rt		48																	
R-7	32	369+46	370+50	Rt		104																	
R-8	32 & 34	370+83	372+00	Rt	1	117																	
D-1	31 & 55	362+35		Lt & Rt			2	0.9	24														
D-2	31	365+15		Rt								22										1	
D-3	31	365+15	365+50	Rt									35			1							
D-4	31	365+50	365+80	Rt									30				1						
D-5	31 & 32	365+80	366+50	Rt						70												1	
D-6	32	366+42	366+62	Lt									80									1	
D-7	32	366+50		Rt									15									1	
D-8	32	366+50	367+47	Rt										97								1	
D-9	32	367+27	367+47	Rt											25							1	
D-10	32	367+47	368+50	Rt																		1	
D-11	32	368+50		Rt									15									1	
D-12	32	368+50	369+32	Rt																		1	
D-13	32	369+32	369+98	Rt																		1	
D-14	32	369+98		Rt									15									1	
D-15	32	369+98	370+70	Rt																		1	
D-16	32	370+70	371+45	Rt																		1	
S-1	31 & 55	362+55		Rt																			
S-2	32 & 57	366+36		Rt																			
S-3	32 & 57	369+40		Rt												1							
U-1	31	362+00	365+15	Rt																	305	1	
U-2	31 & 32	362+00	366+42	Lt																	432	1	
U-3	31 & 32	365+20	366+50	Rt																	120	1	
U-4	32	366+55	368+50	Rt																	185	1	
U-5	32	368+55	369+98	Rt																	133	1	
U-6	32	367+55	371+45	Lt																	382	1	
U-7	32 & 34	370+03	372+00	Rt																	187	1	
TOTALS CARRIED TO GENERAL SUMMARY					3	502	2	0.9	24	70	495	147	65	25	70	1	2	1	8	5	1744	2090	

ESTIMATED QUANTITIES - STA. 360+50 TO STA 371+50

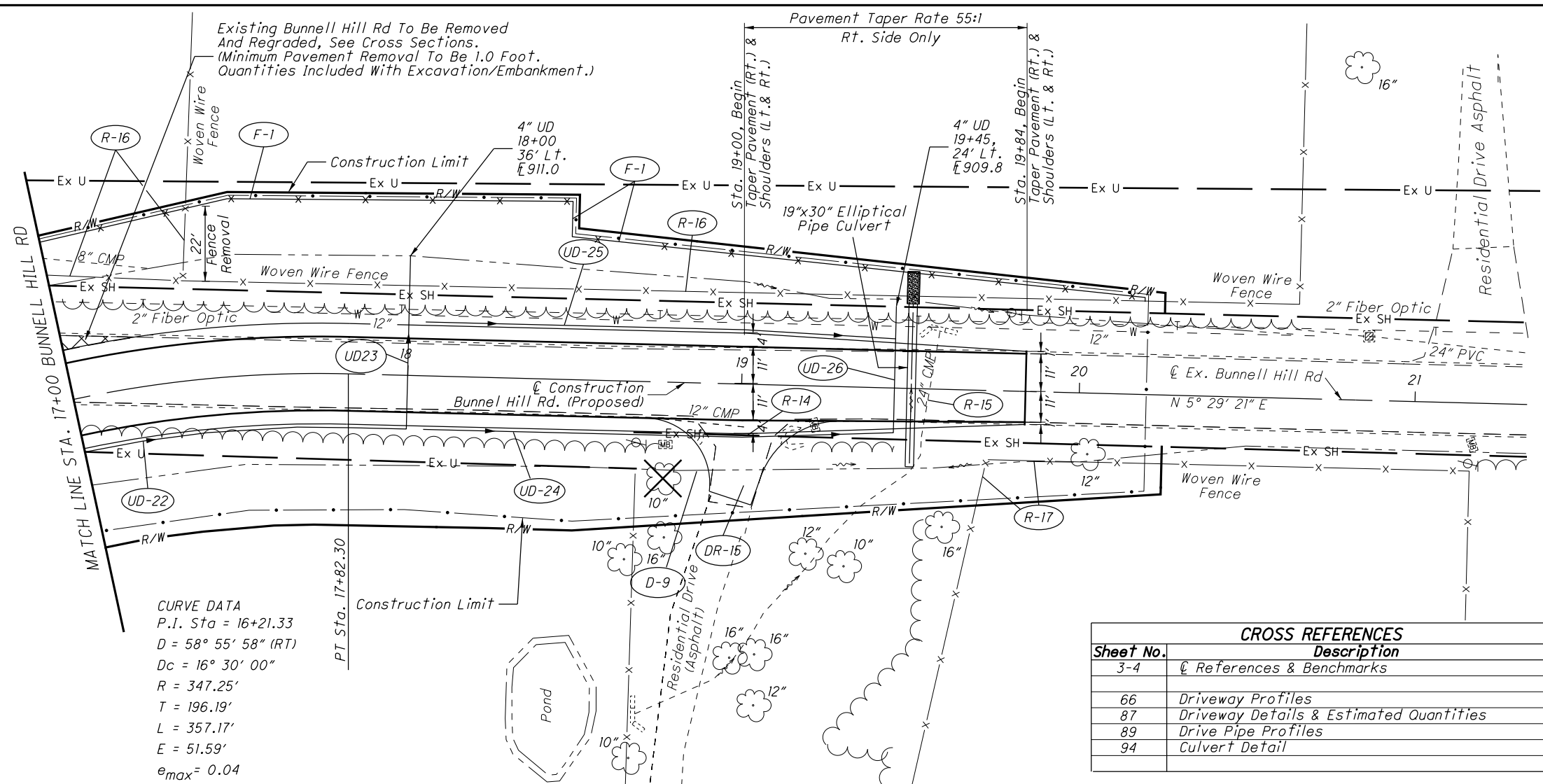
CLI-67-16.86



CALCULATED MSO
CHECKED JAD

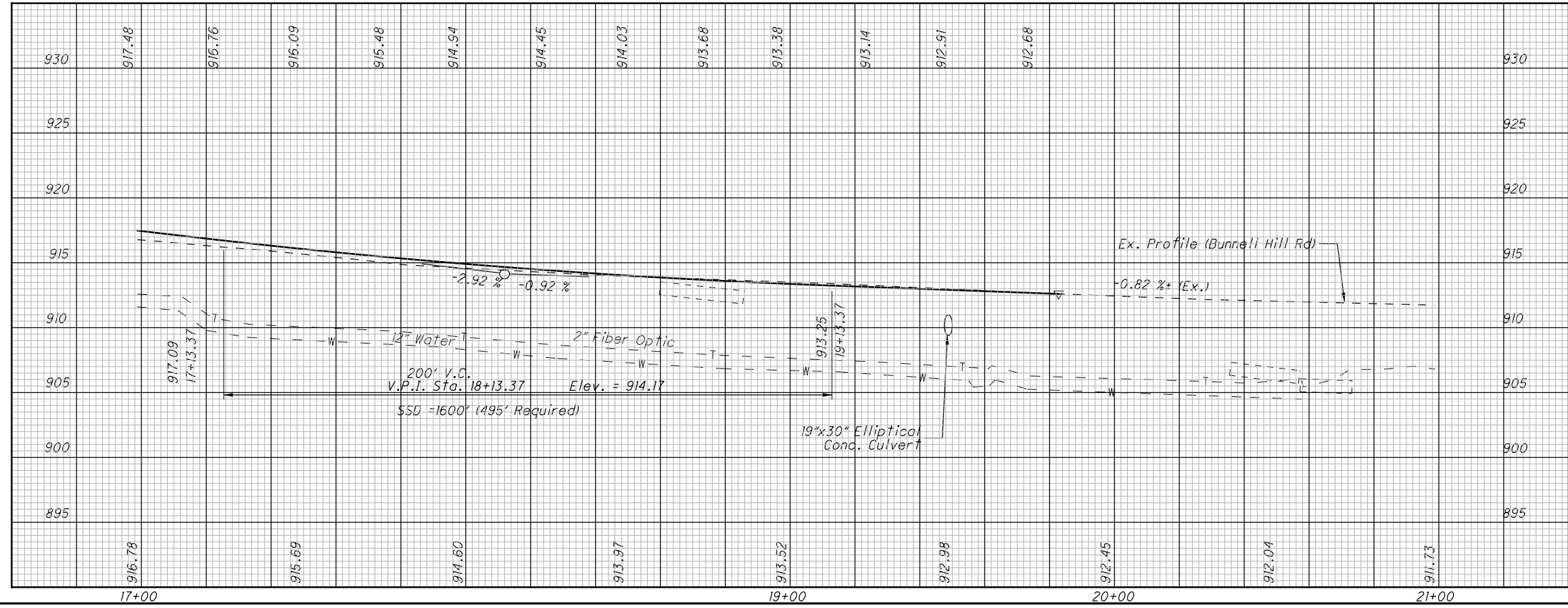
PLAN AND PROFILE - BUNNELL HILL RD
STA. 17+00 TO STA 21+00

WAR-48.19.40



CURVE DATA
P.I. Sta = 16+21.33
D = 58° 55' 58" (RT)
Dc = 16° 30' 00"
R = 347.25'
T = 196.19'
L = 357.17'
E = 51.59'
e_{max} = 0.04

Sheet No.	Description
3-4	References & Benchmarks
66	Driveway Profiles
87	Driveway Details & Estimated Quantities
89	Drive Pipe Profiles
94	Culvert Detail



REF NO.	STATION		SIDE	DESCRIPTION	QUANTITY	BENDS & BRANCHES FOR INFO. ONLY
	FROM	TO				
R-14	18+86	19+20	Rt.			
R-15	19+52	19+55	Center			
R-16	16+60	20+20	Lt.			
R-17	19+70	20+19	Rt.			
UD-22	17+00	18+00	Rt.			
UD-23	18+00	18+00	Center			
UD-24	18+05	19+45	Rt.			1
UD-25	18+05	19+45	Lt.			
UD-26	19+45	19+45	Center			2
D-9	18+83	19+17	Rt.			
F-1	16+62	20+19	Lt.			
TOTALS CARRIED TO GENERAL SUMMARY						
				PIPE REMOVED, 24" AND UNDER	57	
				FENCE REMOVED	470	
				4" SHALLOW PIPE UNDERDRAIN (24" DEEP)	96	
				4" BASE PIPE UNDERDRAIN (18" DEEP)	280	
				4" CONDUIT, TYPE D	33	
				4" CONDUIT, TYPE B	89	
				4" PRECAST REINF. CONCRETE OUTLET	2	

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CROSS REFERENCES	
Sheet No.	Description
3	References & Benchmarks
38	Culvert Details

SP 1309-6
DATE: JANUARY 2013

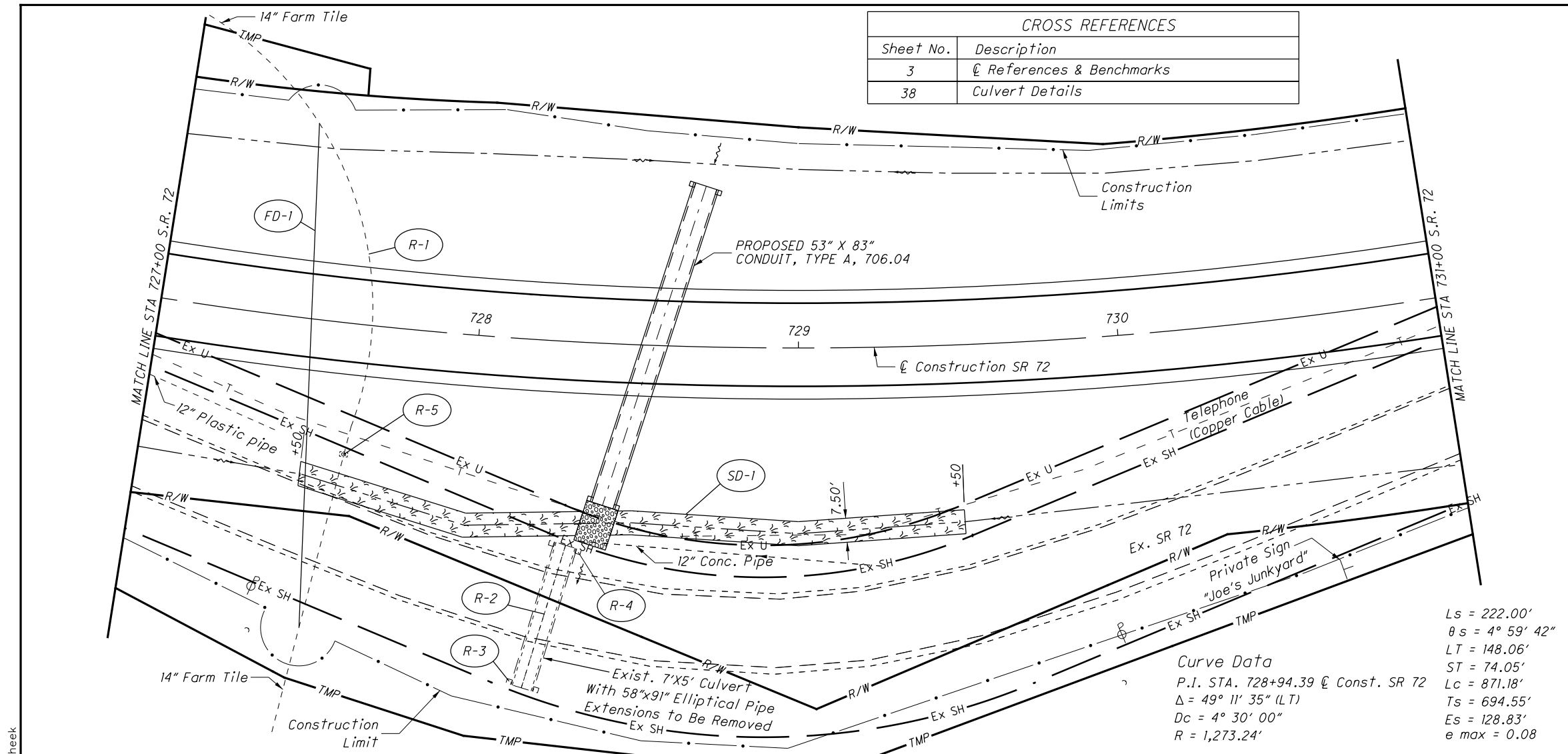


CALCULATED MSO CHECKED JAD

PLAN AND PROFILE
STA 727+00 TO 731+00

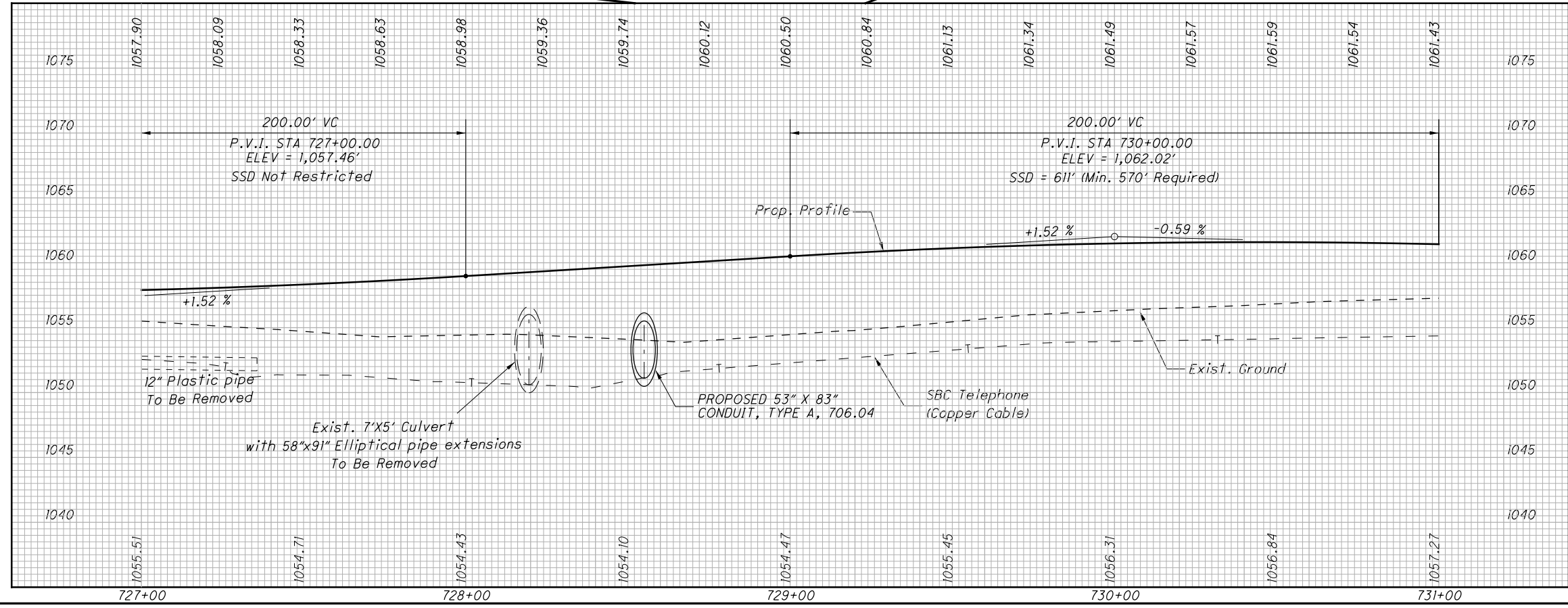
GRE-72-13.67

17
51



Curve Data
P.I. STA. 728+94.39 @ Const. SR 72
 $\Delta = 49^\circ 11' 35''$ (LT)
 $D_c = 4^\circ 30' 00''$
 $R = 1,273.24'$

$L_s = 222.00'$
 $\theta_s = 4^\circ 59' 42''$
 $LT = 148.06'$
 $ST = 74.05'$
 $L_c = 871.18'$
 $T_s = 694.55'$
 $E_s = 128.83'$
 $e_{max} = 0.08$



REF NO.	STATION		SIDE	DESCRIPTION	QTY	UNIT	REMARKS
	FROM	TO					
R-1	727+43	727+56	RT & LT	EROSION CONTROL MAT, TYPE A	158	SO. YD.	
R-2	728+15	728+22	RT	15" CONDUIT, TYPE B	1	FT	
R-3	728+17	728+23	RT	REMOVAL MISC.: 7'x5' CONCRETE BOX CULVERT WITH 58"x91" ELLIPTICAL PIPE EXTENSIONS	1	EACH	
R-4	728+27	728+35	RT	REMOVAL MISC.: 2"x2' FARM TILE	1	EACH	
R-5	728+51	728+53	RT	REMOVAL MISC.: 2"x2' FARM TILE	1	EACH	
FD-1	727+43	727+56	RT & LT	PIPE REMOVED, 24" AND UNDER	184	FT	
SD-1	727+50	729+50	RT	HEADWALL REMOVED	2	EACH	
TOTALS CARRIED TO GENERAL SUMMARY							

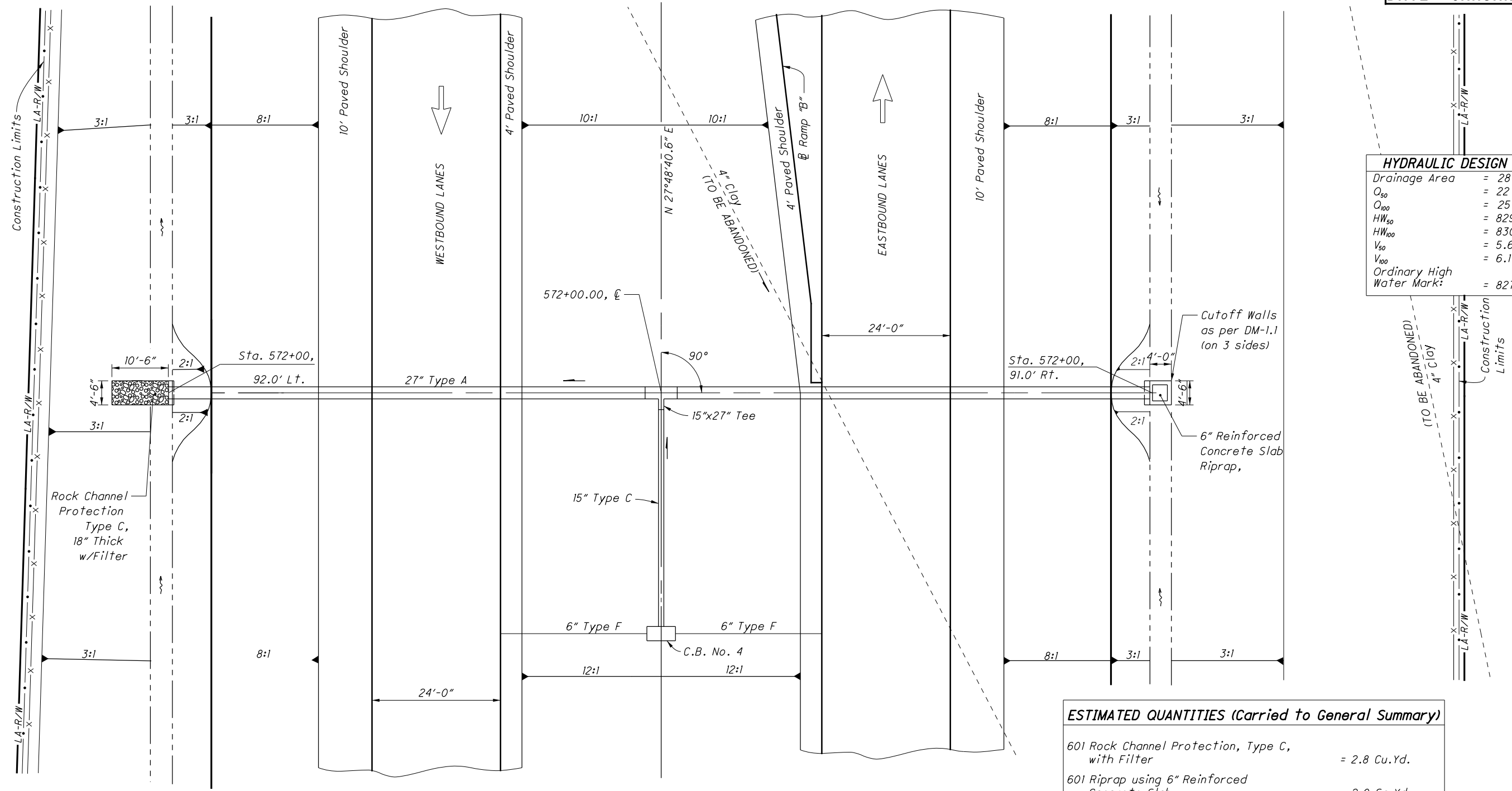
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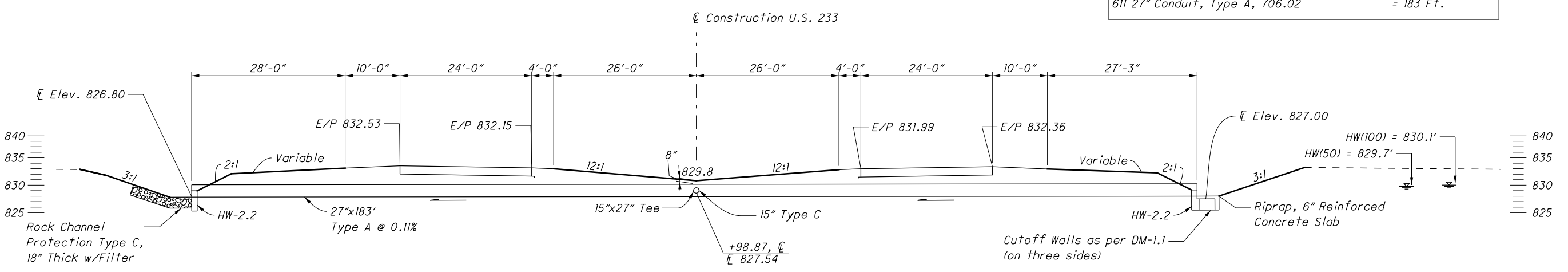
0 5 10 20
HORIZONTAL SCALE IN FEET

CALCULATED DMK CHECKED CML

HYDRAULIC DESIGN DATA	
Drainage Area	= 28 Ac.
Q_{50}	= 22 cfs
Q_{100}	= 25 cfs
HW_{50}	= 829.7'
HW_{100}	= 830.1'
V_{50}	= 5.6 fps
V_{100}	= 6.1 fps
Ordinary High Water Mark:	= 827.3'



ESTIMATED QUANTITIES (Carried to General Summary)	
601 Rock Channel Protection, Type C, with Filter	= 2.8 Cu.Yd.
601 Riprap using 6" Reinforced Concrete Slab	= 2.0 Sq.Yd.
602 Concrete Masonry	= 1.15 Cu.Yd.
611 27" Conduit, Type A, 706.02	= 183 Ft.



CULVERT DETAILS
U.S. 233 - STA. 572+00

ALL-233-22.69

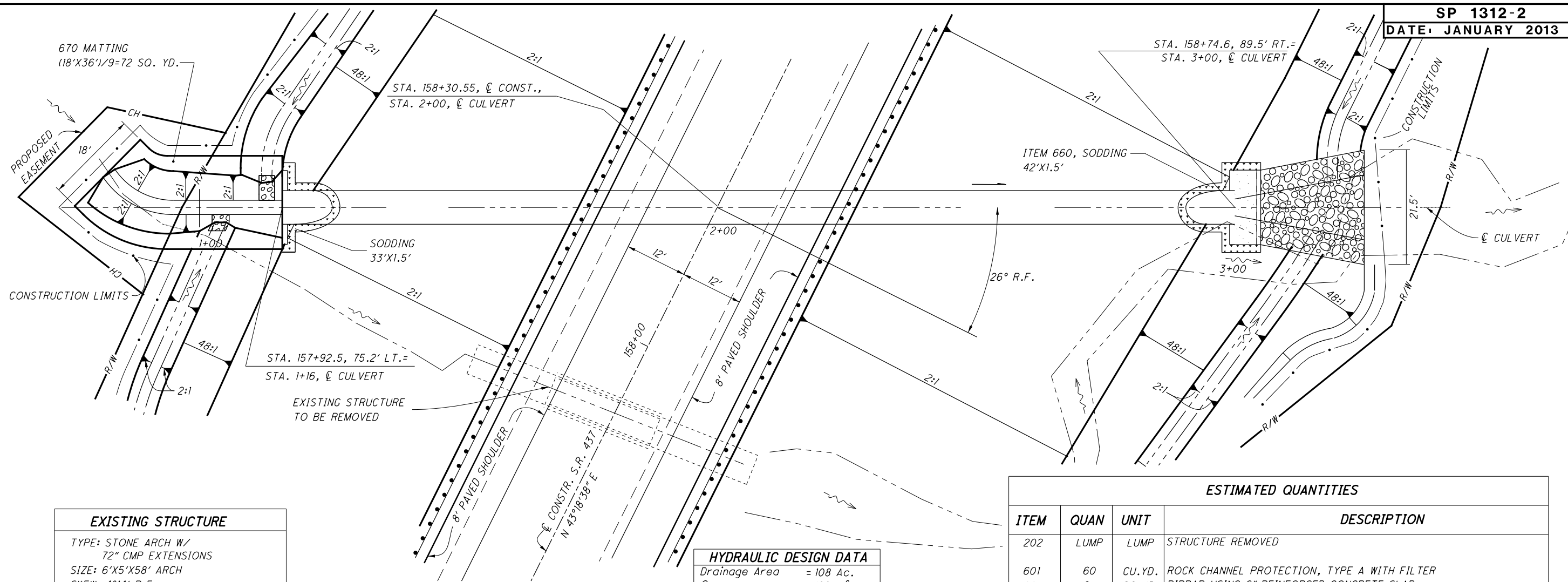


0 5 10 20
HORIZONTAL SCALE IN FEET

CALCULATED JOH
CHECKED JDH

CULVERT DETAIL
S.R. 437 STA. 158+30

PRE-437-2.65



EXISTING STRUCTURE

TYPE: STONE ARCH W/
72" CMP EXTENSIONS

SIZE: 6'X5'X58' ARCH

SKEW: 4°14' R.F.

ALIGNMENT: TANGENT

DATE BUILT: 1908

CONDITION: POOR

HYDRAULIC DESIGN DATA

Drainage Area = 108 Ac.

Q_{25} = 188 cfs

Q_{100} = 260 cfs

HW_{25} = 815.6'

HW_{100} = 817.6'

V_{25} = 16.0 fps

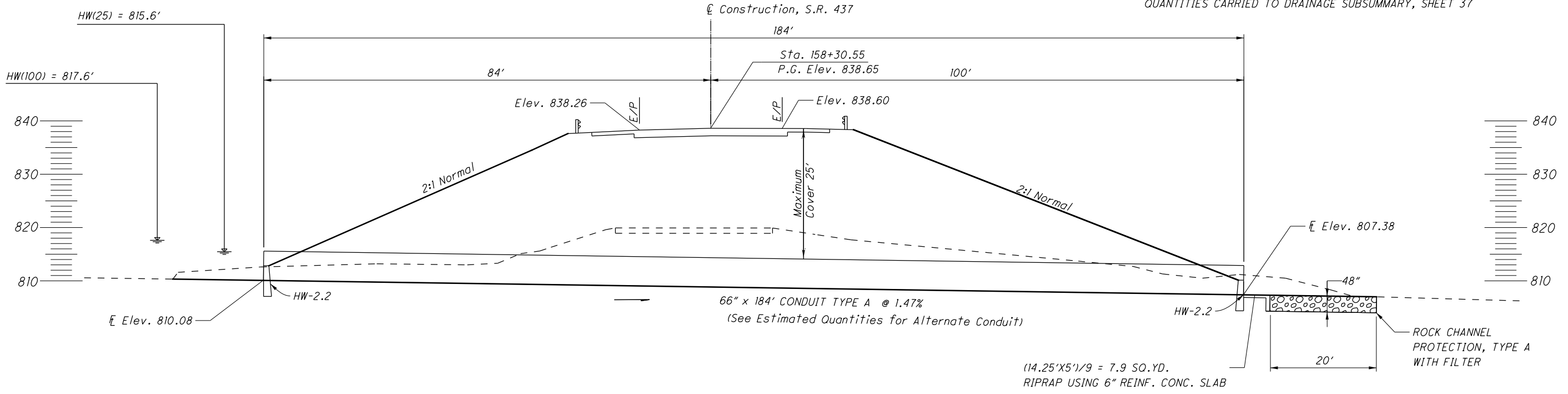
V_{100} = 18.5 fps

ORDINARY HIGH WATER MARK = 810.3'

ESTIMATED QUANTITIES

ITEM	QUAN	UNIT	DESCRIPTION
202	LUMP	LUMP	STRUCTURE REMOVED
601	60	CU.YD.	ROCK CHANNEL PROTECTION, TYPE A WITH FILTER
601	8	SO.YD.	RIPRAP USING 6" REINFORCED CONCRETE SLAB
602	5.9	CU.YD.	CONCRETE MASONRY
611	184	FT.	66" CONDUIT, TYPE A, 706.02 2250 D-LOAD; OR 78", 707.02 (0.138) ALUMINUM-COATED, 707.22 (0.105)
660	13	SO.YD.	SODDING
670	72	SO.YD.	DITCH EROSION PROTECTION MAT TYPE C

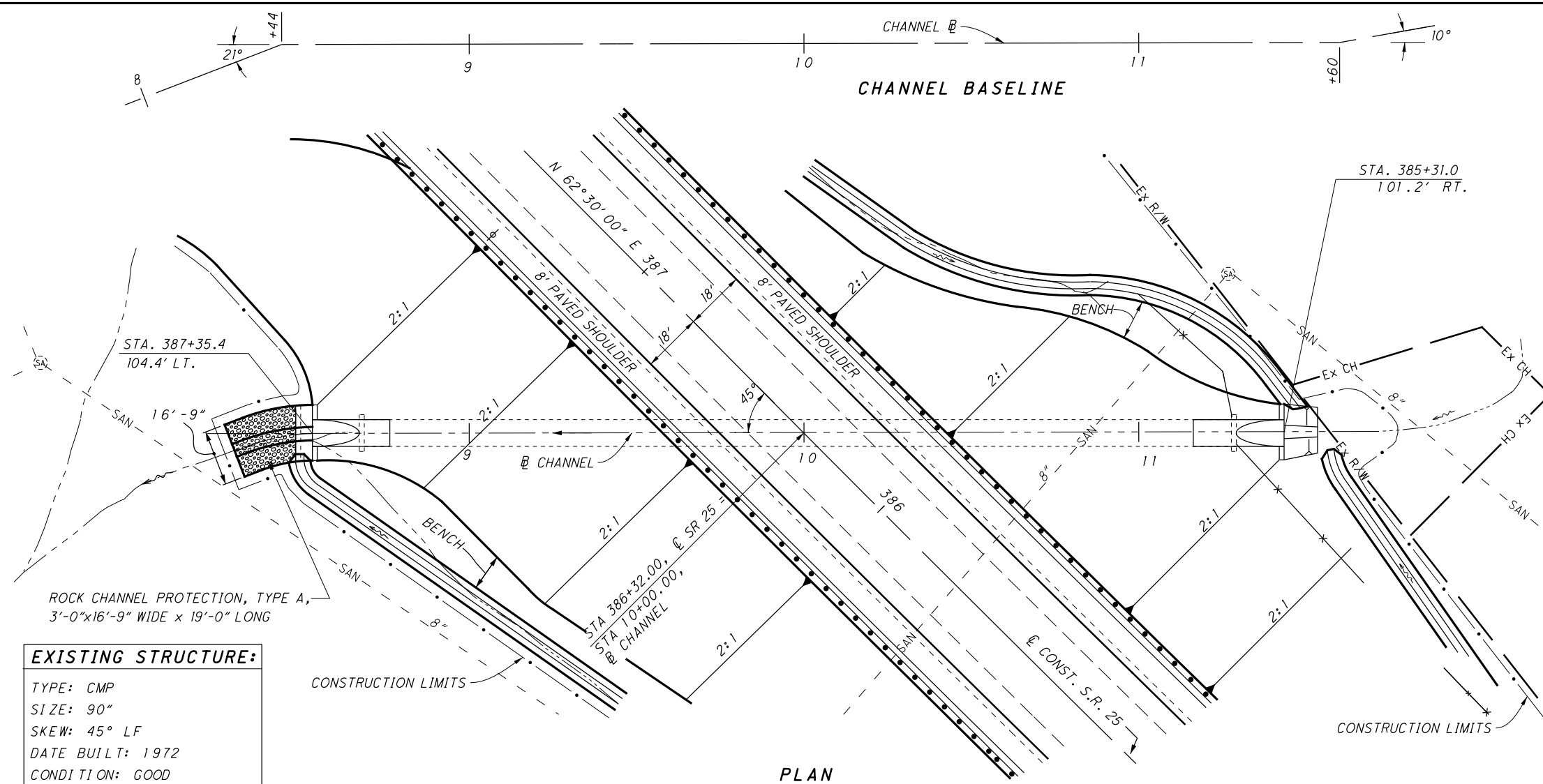
QUANTITIES CARRIED TO DRAINAGE SUBSUMMARY, SHEET 37



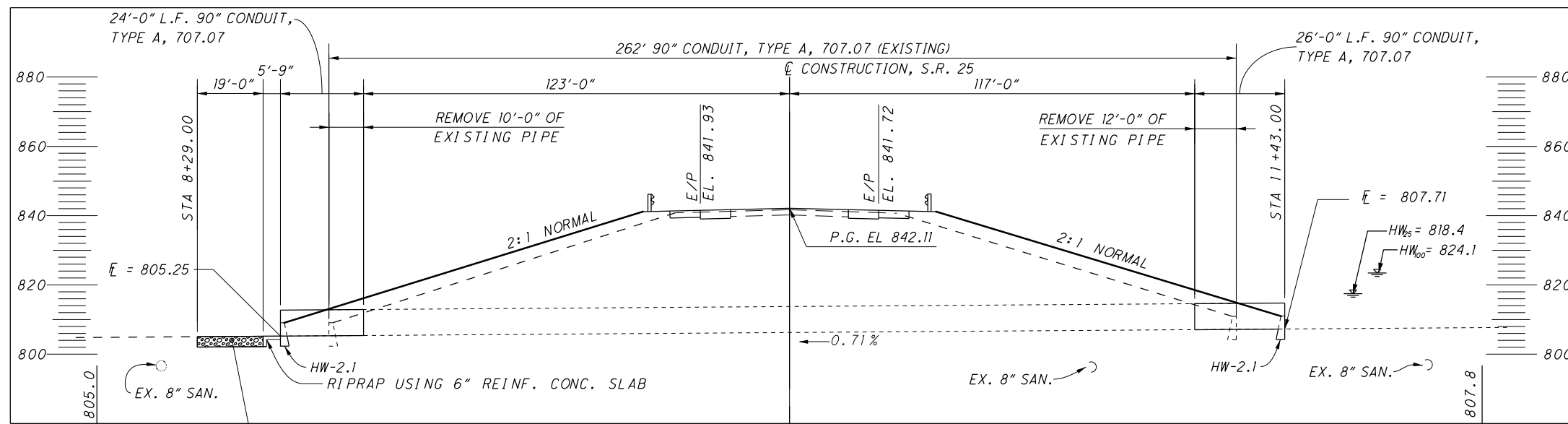


0 10 20 40
HORIZONTAL SCALE IN FEET

CALCULATED JKP
CHECKED FGW



EXISTING STRUCTURE:
TYPE: CMP
SIZE: 90"
SKEW: 45° LF
DATE BUILT: 1972
CONDITION: GOOD



HYDRAULIC DESIGN DATA

Drainage Area	= 540 Ac.
Q_{25}	= 480 cfs
Q_{100}	= 640 cfs
HW ₂₅	= 818.4'
HW ₁₀₀	= 824.1'
V_{25}	= 13.5 fps
V_{100}	= 16.0 fps
ORDINARY HIGH WATER MARK	= 808'

ROCK CHANNEL PROTECTION, TYPE A, 36" THICK W/ FABRIC FILTER

PROFILE ALONG CENTERLINE OF CHANNEL

ESTIMATED QUANTITIES

ITEM	QUANTITY	UNIT	DESCRIPTION
601	9.3	SQ. YD.	RIP-RAP USING 6" REINFORCED CONCRETE SLAB
601	35.4	CU. YD.	ROCK CHANNEL PROTECTION, TYPE A WITH FABRIC FILTER
602	8.0	CU. YD.	CONCRETE MASONRY
611	50	FT.	90" CONDUIT, TYPE A, 707.07
QUANTITIES CARRIED TO SHEET NO. 38			

CULVERT DETAIL
STA. 386+32

STA-25-16.86

DESIGN SPECIFICATIONS:

THIS STRUCTURE CONFORMS TO "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES" ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 2002 AND THE ODOT BRIDGE DESIGN MANUAL.

DESIGN LOADING:

HS25 AND THE ALTERNATE MILITARY LOADING.

DESIGN STRESSES:

CAST-IN-PLACE STRUCTURES
CONCRETE CLASS "QC MISC." - $f'c = 4,000$ psi SUBSTRUCTURE
REINFORCING STEEL - ASTM A615, A616, OR A617
 $F_y = 60,000$ psi.

PRECAST STRUCTURES: FOR THREE-SIDED STRUCTURES SEE CULVERT NOTES. FOR BOX AND PIPE CULVERT CMS 611.

REMOVAL OF EXISTING STRUCTURE:

PORTIONS OF THE EXISTING STRUCTURE SHALL BE REMOVED AS INDICATED.

FOUNDATION BEARING PRESSURE:

WINGWALL AND CULVERT FOOTINGS, AS DESIGNED PRODUCE A MAXIMUM BEARING PRESSURE OF 1.5 TONS PER SQUARE FOOT.

THREE-SIDED CULVERT WALL AND TOP SLAB THICKNESS

THE WALL AND TOP SLAB THICKNESSES SHOWN ON THE PLANS WERE OBTAINED FROM THE MANUFACTURERS AT THE TIME THE PLANS WERE PREPARED. IF THE WALL AND/OR TOP SLAB THICKNESS OF THE CULVERT PROPOSED ARE DIFFERENT FROM WHAT IS SHOWN IN THE PLANS, A MARKED COPY OF THE PROJECT PLANS, INCLUDING ALL PLAN NOTES AND DETAILS SHOWING ALL ITEMS AFFECTED BY THE DIFFERENT CULVERT DIMENSIONS, SHALL BE SUBMITTED FOR APPROVAL WITH THE SHOP DRAWINGS. ALL WORK REQUIRED TO ACCOMMODATE ANY REVISED DIMENSIONS SHALL BE AT NO EXTRA COST TO THE STATE.

ITEM 512, TYPE 2 WATERPROOFING

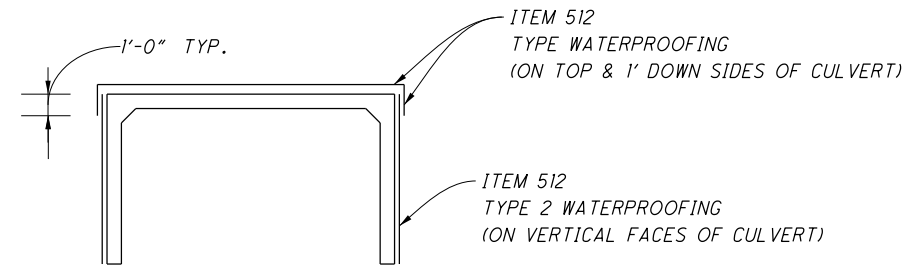
MEMBRANE WATERPROOFING (SHEET TYPE 2) SHALL BE APPLIED TO THE TOP SURFACE OF THE PRECAST CULVERT SECTIONS AND SHALL EXTEND VERTICALLY DOWN ALL SIDES FORTH PORTIONS OF THE CULVERT WHICH SHALL BE IN CONTACT WITH THE BACKFILL. THE EXTERIOR JOINT GAP ON THE TOP AND SIDES BETWEEN THE PRECAST CULVERT SECTIONS SHALL BE FILLED WITH PORTLAND CEMENT MORTAR PRIOR TO INSTALLING THE MEMBRANE WATERPROOFING. JOINT WRAP AS SPECIFIED IN 611.08 AND CONCRETE SEALING AS SPECIFIED IN 611.09 ARE NOT REQUIRED UNDER THE LIMITS OF THE MEMBRANE WATERPROOFING. PAYMENT FOR THE MEMBRANE WATERPROOFING SHALL BE AT THE CONTRACT PRICE BID PER SQUARE YARD FOR ITEM 512, TYPE 2 WATERPROOFING.

PRECAST WINGWALLS, HEADWALLS AND FOOTERS

AT THE OPTION OF THE CONTRACTOR, A PRECAST WINGWALL, HEADWALL, OR FOOTER MAY BE FURNISHED PER ITEM 602. THE PRECAST OPTION FURNISHED WILL MEET THE CAST-IN-PLACE STRUCTURAL DESIGN LOADINGS, DESIGN HEIGHT, AND DESIGN LENGTH DIMENSIONS.

FULL COMPENSATION FOR THE PRECAST WINGWALL, HEADWALL, OR FOOTER IS THE NUMBER OF CUBIC YARDS OF ITEM 511 AND POUNDS OF ITEM 509 FOR THE CORRESPONDING CAST-IN-PLACE STRUCTURE.

WHEN SEALING OF CONCRETE SURFACES (EPOXY) IS SPECIFIED ON THE HEADWALLS OF A PRECAST CONCRETE BOX CULVERT, ANY PRECAST CULVERT SECTIONS BEYOND THE LIMIT OF THE MEMBRANE WATERPROOFING SHALL BE SEALED USING EPOXY SEALER. PAYMENT FOR THE SEALING OF THE PRECAST CONCRETE BOX SURFACES SHALL BE MADE AT THE CONTRACT PRICE BID PER SQUARE YARD FOR ITEM 512 - SEALING OF CONCRETE SURFACES (EPOXY URETHANE).



GENERAL SUMMARY (GUE - 660 - 2.52)

ITEM	ITEM EXT.	TOTAL	UNIT	DESCRIPTION
202	11000	LUMP		STRUCTURE REMOVED
503	21100	67	CY	UNCLASSIFIED EXCAVATION
509	10000	6015	LB	EPOXY COATED REINFORCING STEEL
511	46000	12	CY	CLASS QC MISC. CONCRETE, WINGWALL
511	46500	54	CY	CLASS QC MISC. CONCRETE, FOOTING
511	46600	1	CY	CLASS QC MISC. CONCRETE, MISC. : HEADWALLS
512	33000	128	SY	TYPE 2 WATERPROOFING
512	10100	34	SY	SEALING OF CONCRETE SURFACES (EPOXY URETHANE)
516	13600	27	SF	1" PREFORMED EXPANSION JOINT FILLER
518	21200	16	CY	POROUS BACKFILL WITH FILTER FABRIC
601	32100	57	CY	ROCK CHANNEL PROTECTION, TYPE B WITH FILTER
601	34200	43	CY	ROCK CHANNEL PROTECTION, TYPE C WITHOUT FILTER
611	70000	40	FT	CONDUIT, TYPE A, PRECAST REINFORCED CONCRETE FLAT TOPPED, THREE SIDED CULVERT (14'-0" SPAN X 6'-0" RISE)

**CULVERT ESTIMATED QUANTITIES
STA. 133+13.00**

GUE - 660 - 2.52



0 5 10 20
HORIZONTAL
SCALE IN FEET

CALCULATED
MRV
CHECKED
MLC

CULVERT DETAIL
STA 781+16.50

JAC-93-14.35

EXISTING STRUCTURE

TYPE: 48" AND 54" CORRUGATED METAL PIPES
SKEW: 16° L.F.
ALIGNMENT: TANGENT

PROPOSED STRUCTURE

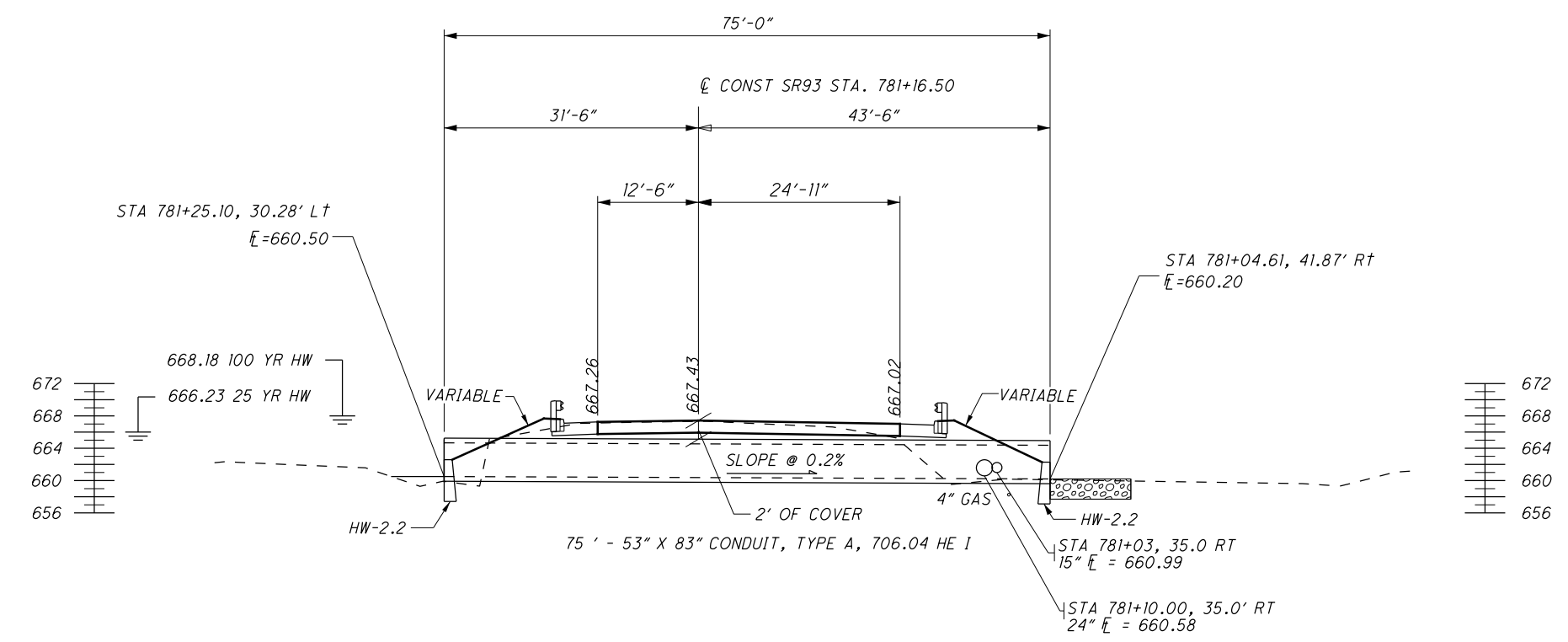
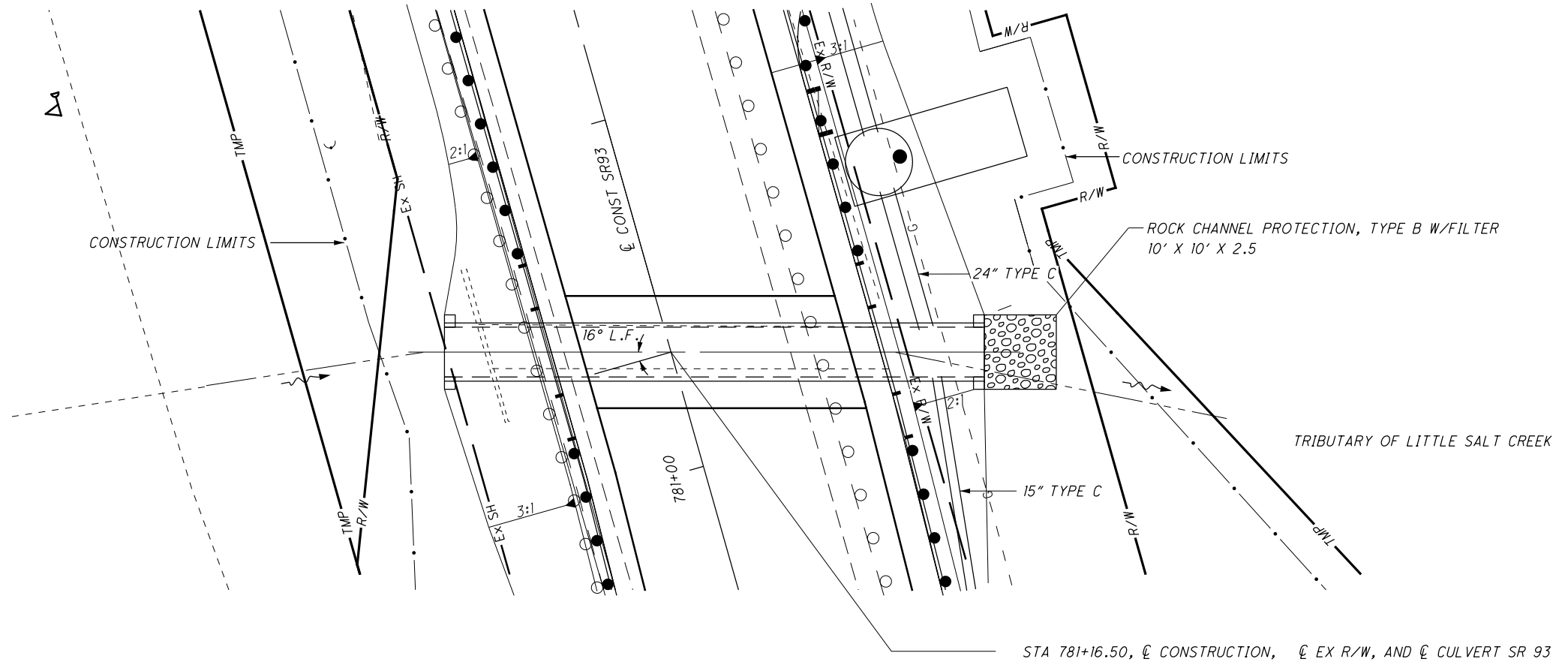
TYPE: 53"X83" ELLIPTICAL CONCRETE PIPE
SKEW: 16° L.F.
ALIGNMENT: TANGENT

HYDRAULIC DESIGN DATA

DRAINAGE AREA : 344 ACRES
Q(25): 230 CFS
HW(25): 666.24 FT
V(25): 11 FT/S
Q(100): 325 CFS
HW(100): 668.81 FT
V(100): 13 FT/S
ORDINARY HIGH WATER MARK: 661.0'

ESTIMATED QUANTITIES CARRIED TO GENERAL SUMMARY

601 ROCK CHANNEL PROTECTION TYPE B W/FILTER	9 CU.YD.
602 CONCRETE MASONRY	3.3 CU.YD.
611 53" X 83" CONDUIT, TYPE A, 706.04 HE I	75 FT.



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