



SHEET NUMBER											PARTICIPATION		ITEM	ITEM EXT.	GRAND TOTAL	UNIT	DESCRIPTION	FIG. 1307-3(c)		SEE SHEET NO.	CALCULATED	JKP CHECKED	FGW	
16	18	23	55	192	262			DATE: JANUARY 2016																
																	<b>RETAINING WALLS</b>							
																	<b>OPTION A: REINFORCED EARTH WALL</b>							
									1710			203	20000	1710	CU YD	EMBANKMENT								
									3474			203	35000	3474	CU YD	GRANULAR EMBANKMENT								
									LS			503	11100	LS		COFFERDAMS AND EXCAVATION BRACING								
									1124			503	21101	1124	CU YD	UNCLASSIFIED EXCAVATION, AS PER PLAN							108	
									4766			SPECIAL	61050010	4766	SQ FT	RETAINING WALL, MISC.: REINFORCED EARTH WALL SYSTEM							190	
																	<b>OPTION B: RETAINED EARTH WALL</b>							
									1636			203	20000	1636	CU YD	EMBANKMENT								
									3584			203	35000	3584	CU YD	GRANULAR EMBANKMENT								
									LS			503	11100	LS		COFFERDAMS AND EXCAVATION BRACING								
									1150			503	21101	1150	CU YD	UNCLASSIFIED EXCAVATION, AS PER PLAN								108
									4738			SPECIAL	61050010	4738	SQ FT	RETAINING WALL, MISC.: RETAINED EARTH WALL SYSTEM								190
																	<b>BUILDING DEMOLITION</b>							
									LS			202	56000	LS		BUILDING DEMOLISHED: PARCEL NO. 11-WD-1, 1 STORY BRICK BUILDING								
									LS			202	56000	LS		BUILDING DEMOLISHED: PARCEL NO. 13-T, 1 STORY BLOCK BUILDING								
									LS			202	56000	LS		BUILDING DEMOLISHED: PARCEL NO. 13-WL, 2 STORY BRICK BUILDING								
									LS			202	56000	LS		BUILDING DEMOLISHED: PARCEL NO. 19-T, 1 STORY METAL BUILDING								
																	<b>STRUCTURES OVER 20' SPAN</b>							
																<b>STRUCTURE TRU-99-1924 GENERAL SUMMARY</b>								229
																<b>STRUCTURE TRU-99-2056 GENERAL SUMMARY</b>								236
									878			SPECIAL	51272000	878	SQ YD	EPOXY WATERPROOFING OVERLAY (1/4" THICK)								190
																	<b>MAINTENANCE OF TRAFFIC</b>							
	10											614	11110	10	HOURLY	LAW ENFORCEMENT OFFICER WITH PATROL CAR FOR ASSISTANCE								
	5											614	12460	5	EACH	WORK ZONE MARKING SIGN								
			38									614	12470	38	EACH	WORK ZONE SPEED LIMIT SIGN								
	100											614	12500	100	EACH	REPLACEMENT SIGN								
	200											614	12600	200	EACH	REPLACEMENT DRUM								
												614	12800	1528	EACH	WORK ZONE RAISED PAVEMENT MARKER								
												614	13100	1201	EACH	BARRIER REFLECTOR								
	14.00											614	20300	14.00	MILE	WORK ZONE LANE LINE, CLASS I, 740.06, TYPE II								
												614	21300	0.11	MILE	WORK ZONE CENTER LINE, CLASS I, 740.06, TYPE II								
	0.26											614	21700	0.26	MILE	WORK ZONE CENTER LINE, CLASS II, 740.06, TYPE II								
												614	22000	4.33	MILE	WORK ZONE EDGE LINE, CLASS I								
												614	22300	7.34	MILE	WORK ZONE EDGE LINE, CLASS I, 740.06, TYPE II								
												614	26600	48	FT	WORK ZONE STOP LINE, CLASS I, 740.06, TYPE II								
	5692											614	28600	5692	FT	WORK ZONE GORE MARKING, CLASS II, 740.06, TYPE II								
												615	10000	LS		ROADS FOR MAINTAINING TRAFFIC								
												615	35001	944	SQ YD	PAVEMENT FOR MAINTAINING TRAFFIC, AS PER PLAN								17
	30											616	10000	30	M GAL	WATER								
	10											616	20000	10	TON	CALCIUM CHLORIDE								
												622	41001	30280	FT	PORTABLE BARRIER, 32", AS PER PLAN								58
																	<b>INCIDENTALS</b>							
												614	11000	LS		MAINTAINING TRAFFIC								
												619	16020	8	MONTH	FIELD OFFICE, TYPE C								
												623	10000	LS		CONSTRUCTION LAYOUT STAKES AND SURVEYING								
												624	10000	LS		MOBILIZATION								

GENERAL SUMMARY

TRU-99-13.48

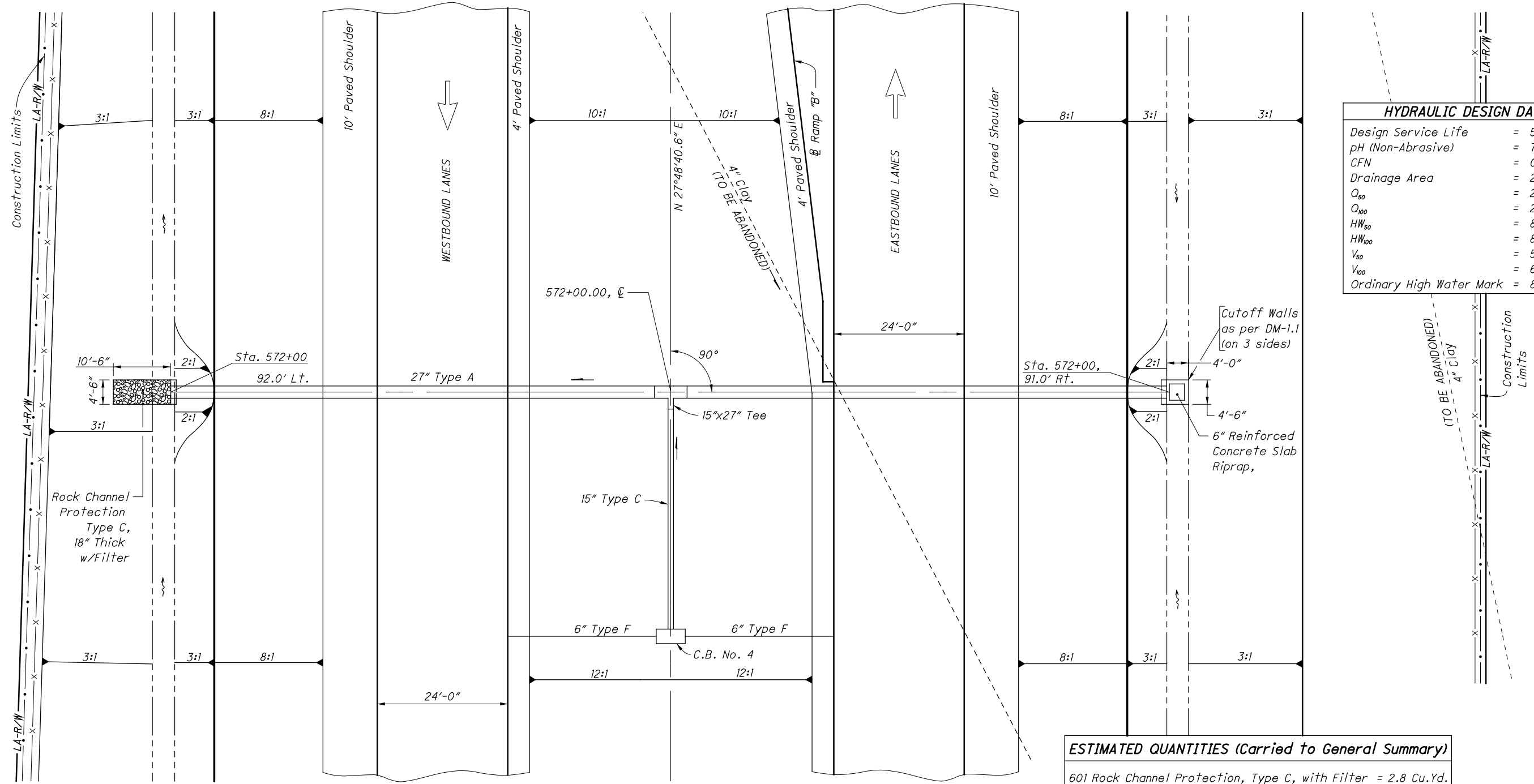
SHEET									ITEM	ITEM EXT.	GRAND TOTAL	UNIT	DESCRIPTION	SEE SHEET NO.
GEN	DEL	MRW	FRA1	FRA2	MAD	MRW	PIC	UNI						
5	15	16	17	18	19	20	21	22						
<b>TRAFFIC CONTROL</b>														
	209.9	48.6	12.2	12.6	34.2	152.7	100.6	120.2	642	00090	691	MILE	EDGE LINE, 4"	
	113.0	33.3	369.9	298.0	29.9	59.8	94.3		642	00094	885.2	MILE	EDGE LINE, 6"	
	70.0	32.7	273.0	314.1	22.2	30.6	59.6		642	00194	732	MILE	LANE LINE, 6"	
	106.0	23.4	8.4	6.7	17.4	79.7	50.1		642	00290	185.7	MILE	CENTER LINE	
	9201.0	3171.0	8512.0	4512.0	528.0		7548.0		642	00394	24271	FT	CHANNELIZING LINE, 12"	
		106.0	7689.0	5459.0	897.0		950.0		642	01508	14995	FT	DOTTED LINE, 6"	
<b>MAINTENANCE OF TRAFFIC</b>														
240									614	11110	240	HOUR	LAW ENFORCEMENT OFFICER WITH PATROL CAR FOR ASSISTANCE	
LS									642	20000	LS		TWO WAY RADIO EQUIPMENT	
<b>INCIDENTALS</b>														
LS									614	11000	LS		MAINTAINING TRAFFIC	4
LS									614	11001	LS		MAINTAINING TRAFFIC, AS PER PLAN	4
LS									624	10001	LS		MOBILIZATION, AS PER PLAN	

Calculated by: JJD  
Checked by: DAC

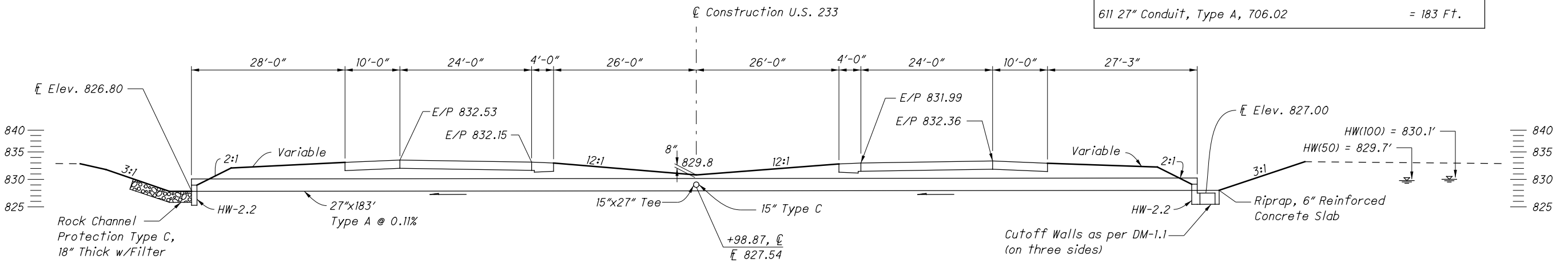


0 5 10 20  
HORIZONTAL SCALE IN FEET

HYDRAULIC DESIGN DATA	
Design Service Life	= 50 Yr.
pH (Non-Abrasive)	= 7.8
CFN	= 022339876
Drainage Area	= 28 Ac.
Q <sub>50</sub>	= 22 cfs
Q <sub>100</sub>	= 25 cfs
HW <sub>50</sub>	= 829.7'
HW <sub>100</sub>	= 830.1'
V <sub>50</sub>	= 5.6 fps
V <sub>100</sub>	= 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	= 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

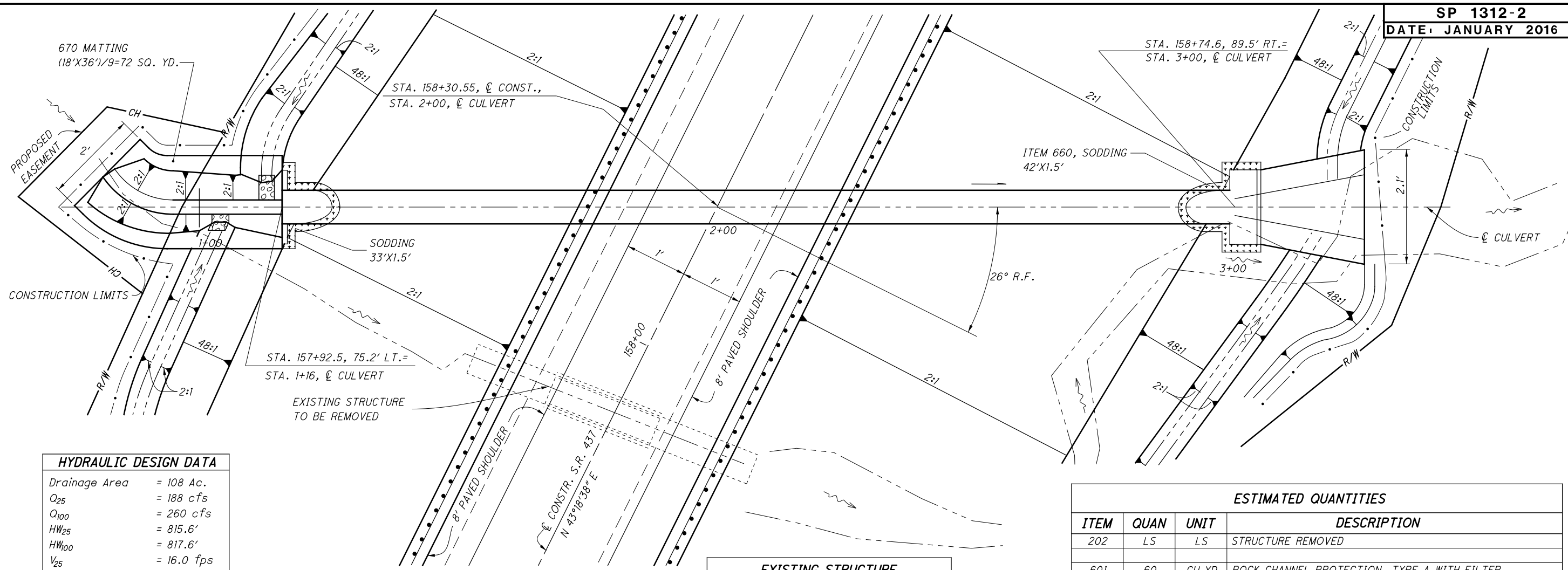


CALCULATED  
JOB  
CHECKED  
JOB

HORIZONTAL  
SCALE IN FEET

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

PRE-437-2.65



**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'
DESIGN SERVICE LIFE	= 75 YR
pH	= 7.5
ABRASIVE	
CFV	= 684379864

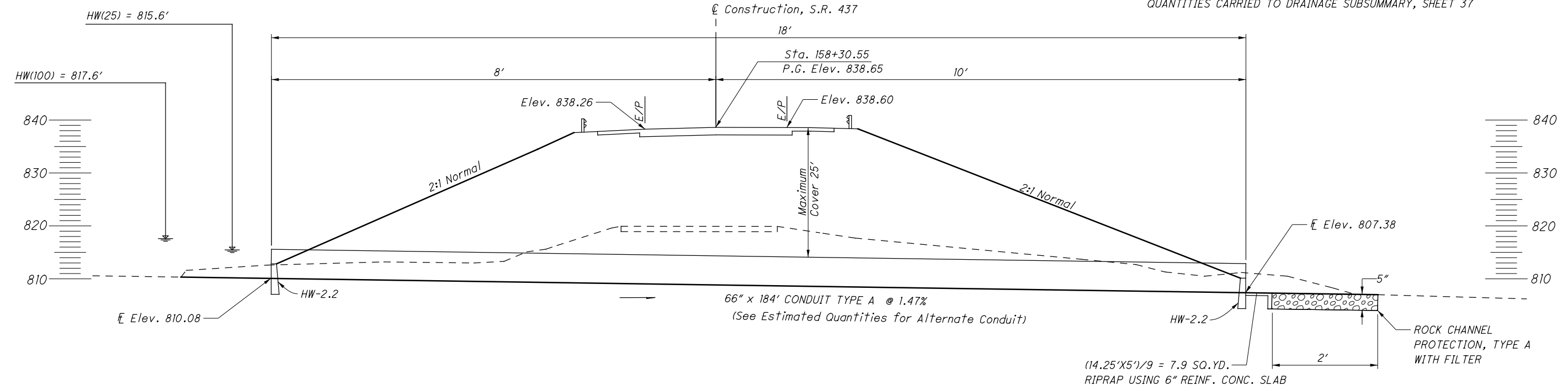
**EXISTING STRUCTURE**

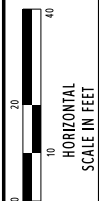
TYPE: STONE ARCH W/72" CMP EXTENSIONS  
 SIZE: 6'x5'x58' ARCH  
 SKEW: 4°14' R.F.  
 ALIGNMENT: TANGENT  
 DATE BUILT: 1908  
 CONDITION: POOR  
 CFN: 684379863

**ESTIMATED QUANTITIES**

ITEM	QUAN	UNIT	DESCRIPTION
202	LS	LS	STRUCTURE REMOVED
601	60	CU.YD	ROCK CHANNEL PROTECTION, TYPE A WITH FILTER
601	8	SQ.YD	RIPRAP USING 6" REINFORCED CONCRETE SLAB
602	5.9	CU.YD	CONCRETE MASONRY
611	184	FT.	66" CONDUIT, TYPE A, 706.02; OR 78", 707.01 (0.168) ALUMINIZED, 707.02 (0.138) ALUMINIZED, 707.03 (0.109) W/CFP, 707.04 (1") (0.079), 707.05 (0.109), 707.07 (0.109)
660	13	SQ.YD.	SODDING
670	72	SQ.YD.	DITCH EROSION PROTECTION MAT TYPE C

QUANTITIES CARRIED TO DRAINAGE SUBSUMMARY, SHEET 37





CHECKED  
KEY  
JOB

CULVERT PLAN AND PROFILE  
STA. 133+13.00

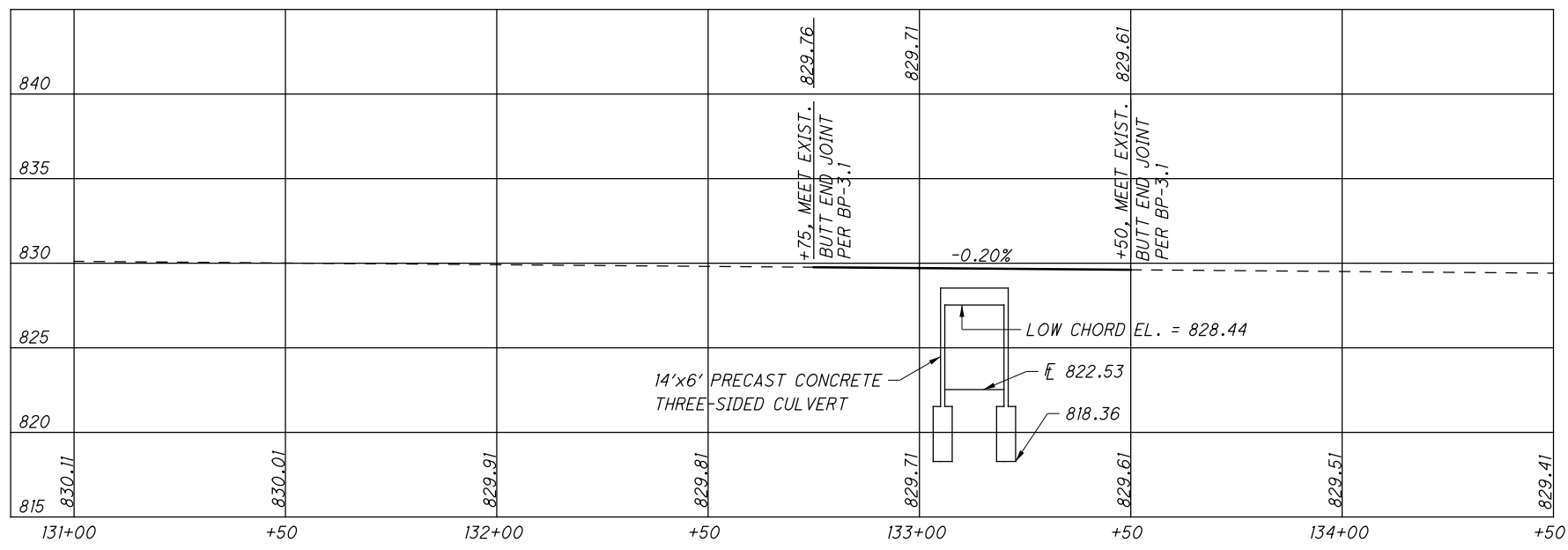
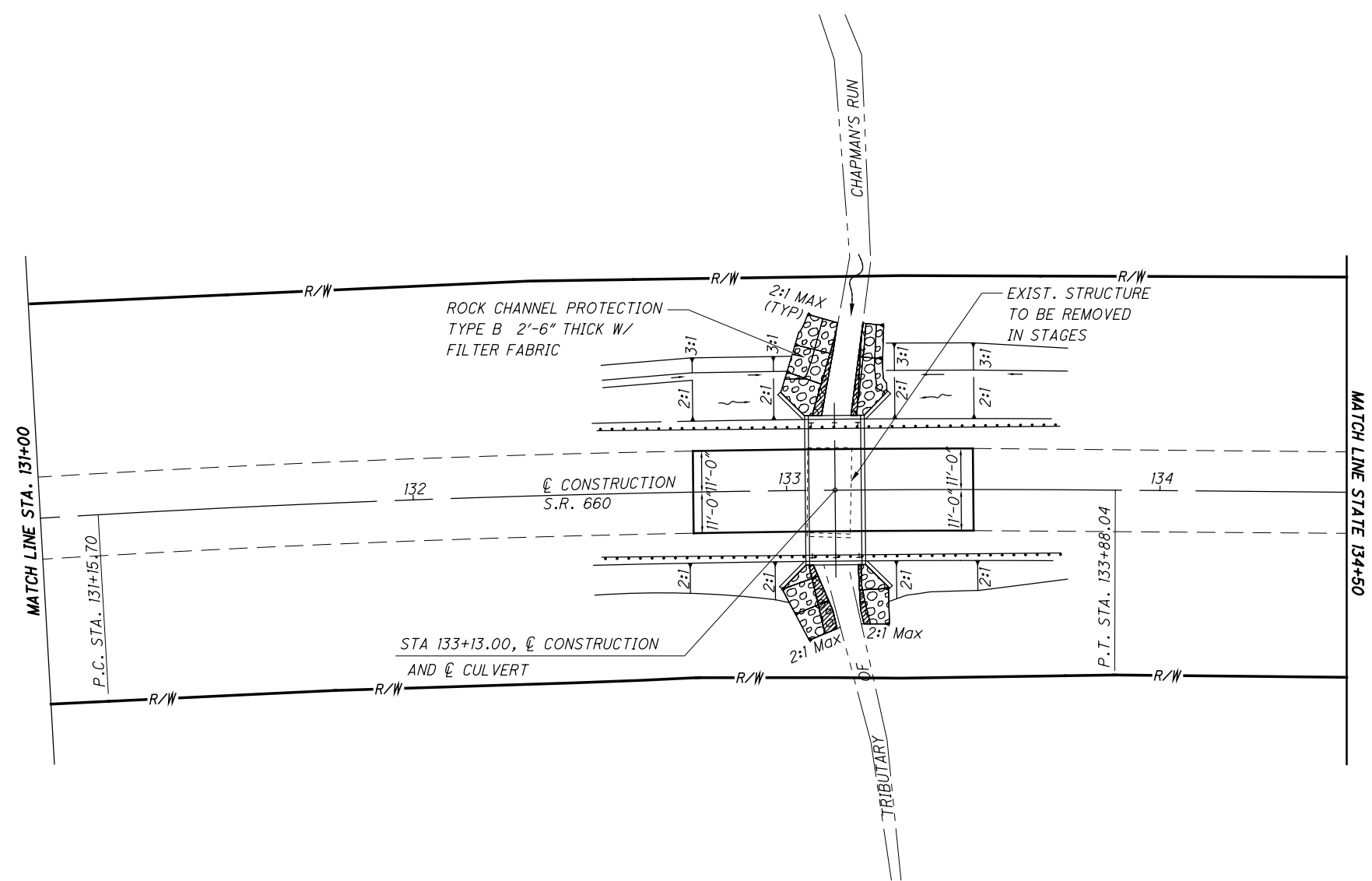
GUE-660-2.52



HYDRAULIC DATA	
DRAINAGE AREA: 0.79 SQ.MI.	
EXISTING WATERWAY OPENING: 60.0 SQ.FT.	
PROPOSED WATERWAY OPENING: 70.0 SQ.FT.	
ORDINARY HIGH WATER MARK: 822.9'	
SFN: 3006914	
DESIGN SERVICE LIFE: 75 YRS	
pH (NON-ABRASIVE): 7.4	
$Q_{10}$ = 297 CFS	$Q_{100}$ = 518 CFS
$V_{10}$ = 6.9 FPS	$V_{100}$ = 7.9 FPS
$HW_{10}$ = 827.8	$HW_{100}$ = 829.9

EXISTING STRUCTURE	
TYPE: CONCRETE SLAB ON GRAVITY WALL ABUTMENT	
SPAN: 12'-0"	
ROADWAY: 22'-5" F/F RAILS	
ALIGNMENT: CURVE	
APPROACH SLAB: NONE	
SUPERELEVATION: VARIES	
DATE BUILT: 1900	
STRUCTURE FILE NO. 3006514	
SKEW: 0° REFERENCE CHORD	
CONDITION: POOR	
LOADING: S-11.3(7)	

PROPOSED STRUCTURE	
TYPE: PRECAST REINFORCED CONCRETE FLAT-TOPPED THREE-SIDED CULVERT	
SPAN: 14'-0" F/F CULVERT	
ROADWAY: 34'-0" F/F RAILS	
ALIGNMENT: 1°19'11" CURVED TO THE RIGHT	
SUPERELEVATION: VARIES	
APPROACH SLAB: NONE	
SKEW: 0°	
WEARING SURFACE: ASPHALT CONCRETE	
LOADING: HL93 TRUCK & TANDEM	
SFN: 3006914	
DESIGN SERVICE LIFE: 75 YRS.	
pH (NON-ABRASIVE): 7.4	



**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**

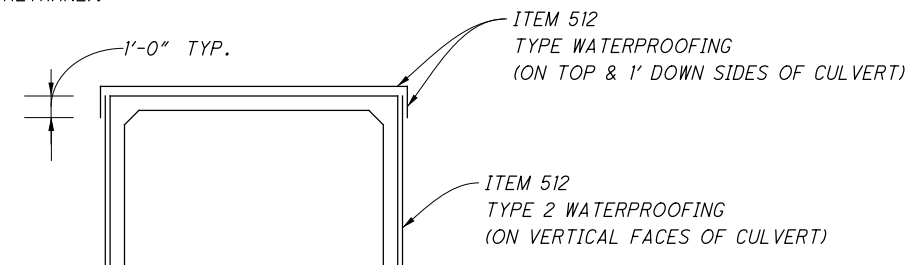
MEMBRANE WATERPROOFING (SHEET TYPE 2) SHALL BE APPLIED TO THE TOP SURFACE OF THE PRECAST CULVERT SECTIONS AND SHALL EXTEND VERTICALLY DOWN ALL SIDES FORTH PORTIONS OF THE CULVERT WHICH SHALL BE IN CONTACT WITH THE BACKFILL. THE EXTERIOR JOINT GAP ON THE TOP AND SIDES BETWEEN THE PRECAST CULVERT SECTIONS 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	LS		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  
CFN: 400931965  
CFN: 400931966

**PROPOSED STRUCTURE**

TYPE: 53"X83" ELLIPTICAL CONCRETE PIPE  
SKEW: 16° L.F.  
ALIGNMENT: TANGENT  
CFN: 400931967

**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'  
DESIGN SERVICE LIFE: 50 YRS  
pH: 6.8  
NON-ABRASIVE

**ESTIMATED QUANTITIES CARRIED TO GENERAL SUMMARY**

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

