

RCB CULVERT EXTENSION - SINGLE BOX
STPN-006-6(52)--2J-48

IOWA COUNTY

LETTING DATE
12/19/2017

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Highway Division

PLANS OF PROPOSED IMPROVEMENT ON THE

PRIMARY ROAD SYSTEM

IOWA COUNTY

RCB CULVERT EXTENSION - SINGLE BOX

US 6 RCB Culvert Extensions at Six Locations
From 0.4 Miles E. of County V-52 at Milepost 215.66
to 1.15 Miles E. of IA 220 at Milepost 228.11

SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.

Value Engineering Saves. Refer to Article 1105.14 of the Specifications.



NO PROJECT LENGTH SUMMARY

DESIGN DATA RURAL				
2013	AADT	1987	V.P.D.	
20--	AADT	--	V.P.D.	
20--	DHV	--	V.P.H.	
	TRUCKS	6	%	
	Total			
	Design ESALs	--		

For Project Location Map
Refer to Sheet A.2

DESIGN DATA URBAN				
2013	AADT	2227	V.P.D.	
20--	AADT	--	V.P.D.	
20--	DHV	--	V.P.H.	
	TRUCKS	6	%	
	Total			
	Design ESALs	--		

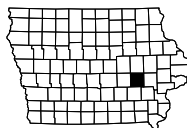
INDEX OF SEALS		
SHEET NO.	NAME	TYPE
A.1	Steven Scott Sweet	Primary Signature Block
V.1	Jacob J. Shaw	Structural Design

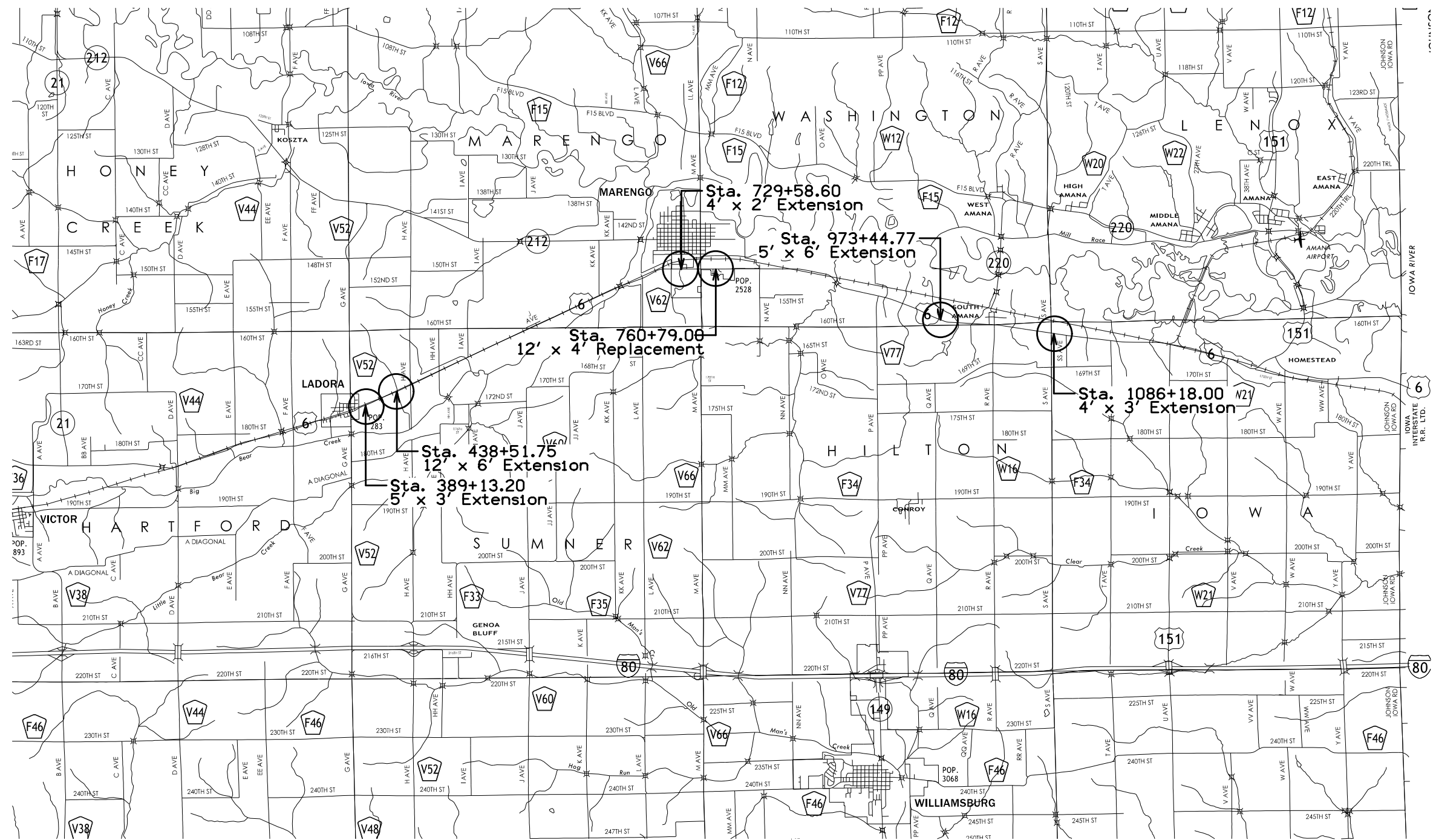
PRELIMINARY PLANS

Subject to change by final design.

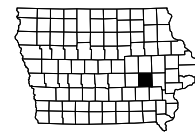
DM5 PLAN - Date: 6-6-17

TOTAL	84
PROJECT IDENTIFICATION NUMBER	
13-48-006-020	
PROJECT NUMBER	
STPN-006-6(25)--2J-48	
R.O.W. PROJECT NUMBER	

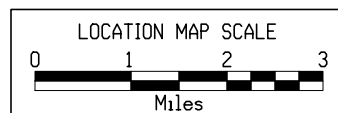


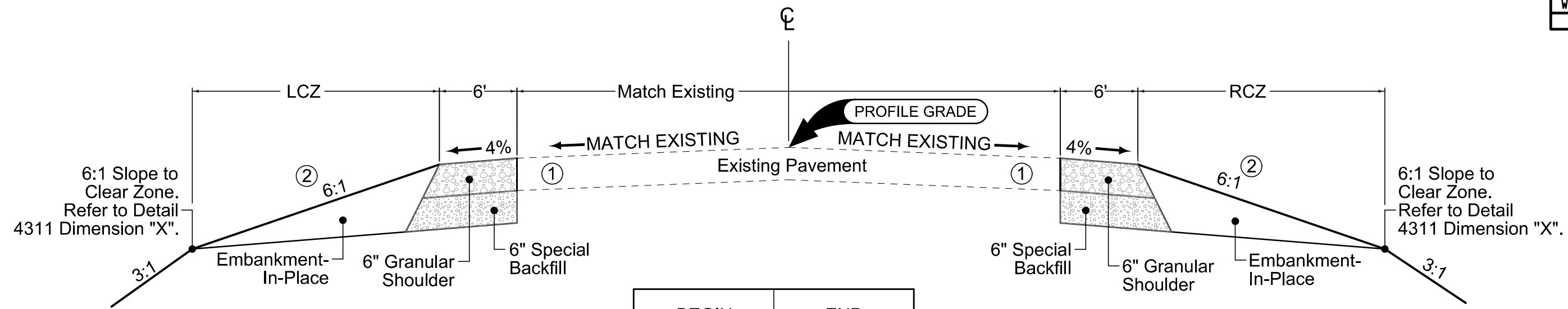


T-80N & T-81N



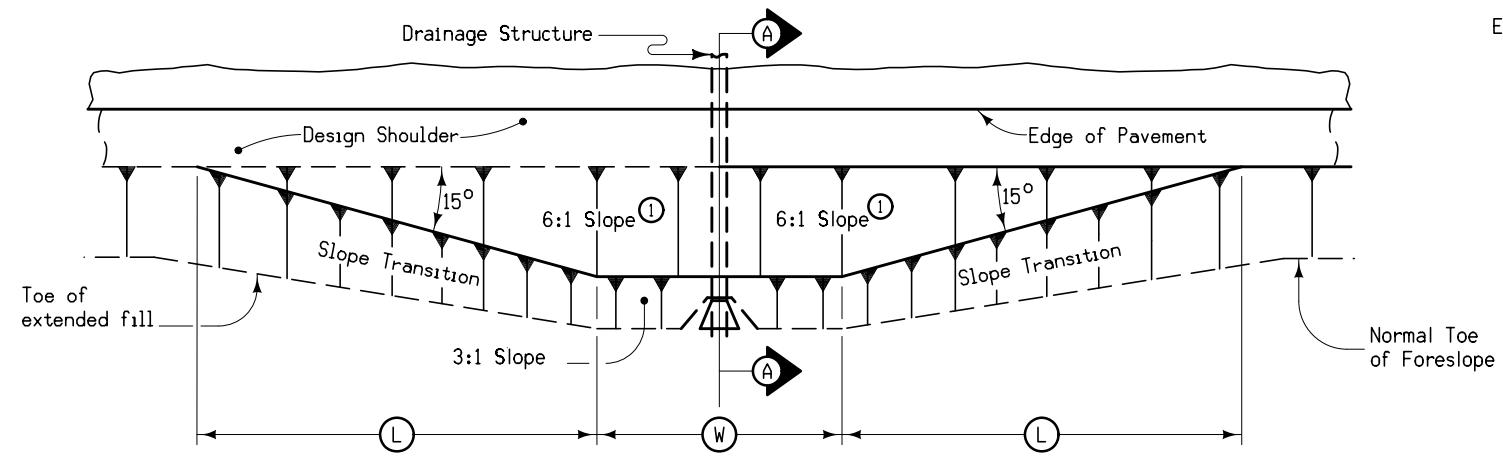
R-11W & R-10W



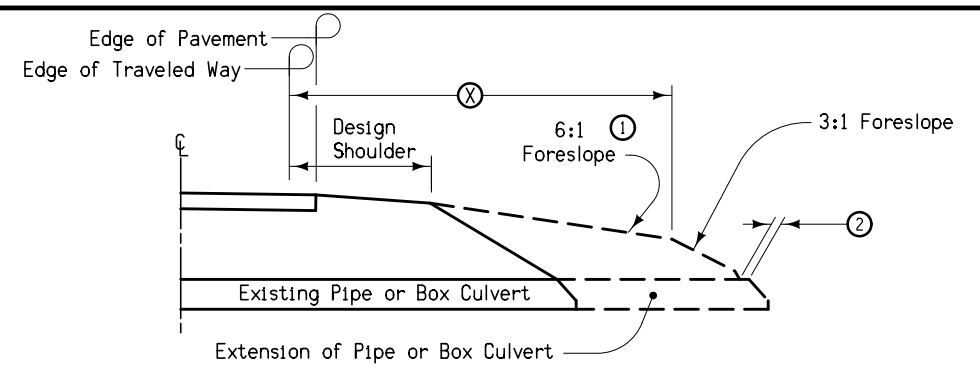


BEGIN STATION	END STATION
388+20	0+60
437+43	439+54
728+76	730+41
972+44	974+95
1085+40	1086+96

- ① Possible Full Depth PCC Patch. See D Sheets for locations.
- ② Slope may be flatter than 6:1. Refer to D Sheets and W Sheets.



PLAN VIEW

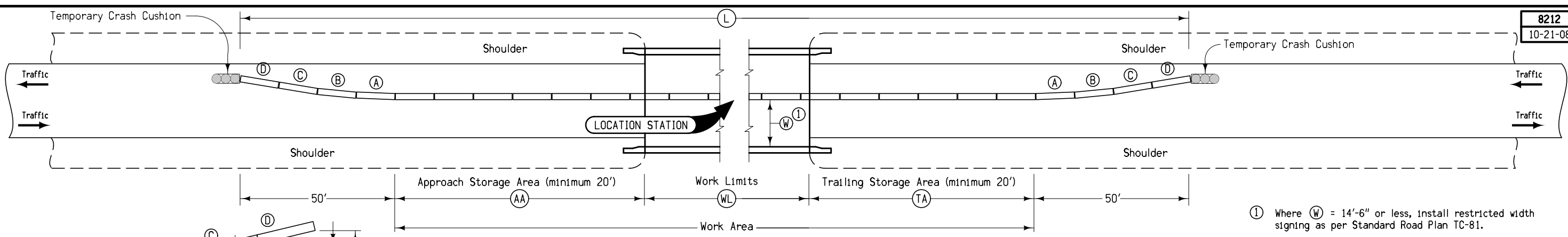


SECTION A-A

STRUCTURE LOCATION		(W)	(L)	(X)
STATION	SIDE	Feet	Feet	Feet
389+13.21	LT	45.4	70.1	24.0
389+13.21	RT	46.5	73.9	24.3
438+51.75	LT	54.0	73.2	25.4
438+51.75	RT	51.2	75.3	26.0
729+58.61	LT	39.5	49.3	10.8
729+58.61	RT	24.0	46.9	16.1
760+79.00	LT	53.5	20.3	5.7
760+79.00	RT	53.6	20.3	7.4
973+44.77	LT	51.1	101.5	24.3
973+44.77	RT	46.1	83.9	21.9
1086+18.00	RT	45.0	55.2	21.6

- Notes:
- At locations where an extended or newly constructed drainage structure extends beyond the normal foreslope cover, the foreslope shall be flattened as indicated so as to cover the structure. Minimum earth cover is 6".
 - ① 6:1 Maximum - Slope may be flatter.
 - ② 6" Minimum for pipe installations or to top of headwall on R.C.B.
 - (W) = Pipe or R.C.B. width plus 20 feet each side.

DETAILS OF
BARNROOF FORESLOPE
AT DRAINAGE STRUCTURE



① Where (W) = 14'-6" or less, install restricted width signing as per Standard Road Plan TC-81.

Station	Side	(AA)	(WL)	(TA)	(L)	Anchored X	(W) ①	Remarks
		Feet	Feet	Feet	Feet		Ft-Inches	
389+13.21	LT	25	25	25	175		13-5	
389+13.21	RT	25	25	25	175		13-5	
729+58.61	LT	25	25	25	175		16-0	
729+58.61	RT	25	25	25	175		16-0	
760+79.00	LT	25	37.5	25	187.5		13-0	
760+79.00	RT	25	37.5	25	187.5		13-0	
973+44.77	RT	25	25	25	175		15-0	

BARRIER OFFSETS FOR FLARE SECTIONS

TEMPORARY CONCRETE BARRIER LAYOUT
for Two-Way Traffic

100-1D 10-18-05
PROJECT DESCRIPTION
This project is for various RCB culvert extensions along US 6 from 0.4 miles East of County V-52 to 1.15 miles East of IA 220. It will involve PCC patching, grading, and granular shoulder construction.

100-0A 10-28-97					
ESTIMATED ROADWAY QUANTITIES (1 DIVISION PROJECT)					
Item No.	Item Code	Item	Unit	Total	As Built Qty.
1	2102-0425070	SPECIAL BACKFILL	TON	375.1	
2	2102-2625000	EMBANKMENT-IN-PLACE	CY	2035	
3	2102-2710070	EXCAVATION, CLASS 10, ROADWAY AND BORROW	CY	729	
4	2105-8425005	TOPSOIL, FURNISH AND SPREAD	CY	568	
5	2105-8425015	TOPSOIL, STRIP, SALVAGE AND SPREAD	CY	489	
6	2121-7425020	GRANULAR SHOULDERS, TYPE B	TON	346.3	
7	2213-2713300	EXCAVATION, CLASS 13, FOR WIDENING	CY	110.8	
8	2422-0360018	APRONS, UNCLASSIFIED, 18 IN. DIA.	EACH	2	
9	2422-1722018	CULVERT, UNCLASSIFIED ENTRANCE PIPE, 18 IN. DIA.	LF	60	
10	2507-6800061	REVTMENT, CLASS E	TON	302	
11	2507-3250005	ENGINEERING FABRIC	SY	531	
12	2527-9263109	PAINTED PAVEMENT MARKING, WATERBORNE OR SOLVENT-BASED	STA	37.95	
13	2527-9263180	PAVEMENT MARKINGS REMOVED	STA	36.26	
14	2528-8400048	TEMPORARY BARRIER RAIL, CONCRETE	LF	1250	
15	2528-8400256	TEMPORARY TRAFFIC SIGNALS	EACH	4	
16	2528-8445110	TRAFFIC CONTROL	LS	1	
17	2528-8445113	FLAGGERS	EACH	See Proposal	
18	2529-5070110	PATCHES, FULL-DEPTH FINISH, BY AREA	SY	185.5	
19	2529-5070120	PATCHES, FULL-DEPTH FINISH, BY COUNT	EACH	6	
20	2529-8174010	SUBBASE (PATCHES)	SY	185.5	
21	2533-4980005	MOBILIZATION	LS	1	
22	2551-0000110	TEMP CRASH CUSHION	EACH	14	
23	2602-0000020	SILT FENCE	LF	3421	
24	2602-0000030	SILT FENCE FOR DITCH CHECKS	LF	94.8	
25	2602-0000071	REMOVAL OF SILT FENCE OR SILT FENCE FOR DITCH CHECKS	LF	3515.8	
26	2602-0000101	MAINTENANCE OF SILT FENCE OR SILT FENCE FOR DITCH CHECK	LF	351.6	

100-4A 10-29-02		
ESTIMATE REFERENCE INFORMATION		
Item No.	Item Code	Description
1	2102-0425070	SPECIAL BACKFILL Item is for placement under granular shoulders. See detail WHKS-1 on Sheet B.1 and Tab. 112-9 on Sheet C.6 for details. Bid item quantity is increased 5% for irregularities.
2	2102-2625000	EMBANKMENT-IN-PLACE Item is for additional fill material required for grading. Bid item does not include shrinkage.
3	2102-2710070	EXCAVATION, CLASS 10, ROADWAY AND BORROW Item is for the total cut material required for grading.
4	2105-8425005	TOPSOIL, FURNISH AND SPREAD Item is for additional topsoil fill material required for grading. Proposed depth assumed at 12 inches.
5	2105-8425015	TOPSOIL, STRIP, SALVAGE AND SPREAD Item is for the total topsoil cut material required for grading. Existing depth assumed at 4 inches.
6	2121-7425020	GRANULAR SHOULDERS, TYPE B Item is for placement of 6" granular shoulders. See detail WHKS-1 on Sheet B.1 and Tab. 112-9 on Sheet C.6 for details. See D Sheets for locations.
7	2213-2713300	EXCAVATION, CLASS 13, FOR WIDENING Item is for removal of existing granular shoulders. See Tab. 112-9 on Sheet C.6 for details.
8	2422-0360018	APRONS, UNCLASSIFIED, 18 IN. DIA.
9	2422-1722018	CULVERT, UNCLASSIFIED ENTRANCE PIPE, 18 IN. DIA. See Tab. 102-3 on Sheet C.2.
10	2507-6800061	REVTMENT, CLASS E
11	2507-3250005	ENGINEERING FABRIC Item is for placement at RCB outlet and inlet. See V Sheets for details and locations.
12	2527-9263109	PAINTED PAVEMENT MARKING, WATERBORNE OR SOLVENT-BASED
13	2527-9263180	PAVEMENT MARKINGS REMOVED See Tab. 108-22 on Sheet C.5.

100-4A 10-29-02		
ESTIMATE REFERENCE INFORMATION		
Item No.	Item Code	Description
14	2528-8400048	TEMPORARY BARRIER RAIL, CONCRETE See Tab. 108-33 on Sheet C.4.
15	2528-8400256	TEMPORARY TRAFFIC SIGNALS See Tab. 108-28 on Sheet C.4.
16	2528-8445110	TRAFFIC CONTROL See Tab. 108-23A on Sheet J.1 for details.
17	2528-8445113	FLAGGERS
18	2529-5070110	PATCHES, FULL-DEPTH FINISH, BY AREA
19	2529-5070120	PATCHES, FULL-DEPTH FINISH, BY COUNT
20	2529-8174010	SUBBASE (PATCHES) See Tab. 102-6C on Sheet C.2.
21	2533-4980005	MOBILIZATION
22	2551-0000110	TEMP CRASH CUSHION See Tab. 108-30 on Sheet C.4.
23	2602-0000020	SILT FENCE See Tab. 100-17 on Sheet C.3 for details. Verify specific locations with the Engineer prior to placement. Bid item quantity is increased by 25% for field adjustments and replacement.
24	2602-0000030	SILT FENCE FOR DITCH CHECKS Refer to Tab. 100-18 on Sheet C.3. The tabulation includes estimated locations for placement of Silt Fence for Ditch Checks to address possible erosion during construction. Verify the specific locations with the Engineer prior to beginning placement. Bid item includes 50% additional quantity for field adjustments and replacements.
25	2602-0000071	REMOVAL OF SILT FENCE OR SILT FENCE FOR DITCH CHECKS This item is included for silt fence or silt fence for ditch check removal to allow for replacment (replacment to be paid seperately), or for areas that have achieved 70% permanent growth. Item is estimated at 100% of the total Tab. 100-0A quantity for Silt Fence and Silt Fence for Ditch Checks.
26	2602-0000101	MAINTENANCE OF SILT FENCE OR SILT FENCE FOR DITCH CHECK This item is included for clean-out of and repair of the silt fence and silt fence for ditch checks during the guardrail grading. Item is estimated at 10% of the total Tab. 100-0A quantity for Silt Fence and Silt Fence for Ditch Checks.

STANDARD ROAD PLANS

The following Standard Road Plans apply to construction work on this project.

Number	Date	Title
BA-401	04-16-13	Temporary Barrier Rail (Precast Concrete)
BA-500	04-19-16	Temporary Crash Cushions Sand Barrel
DR-651	04-18-17	Unclassified Pipe Culvert
EC-201	10-17-17	Silt Fence
EW-501	10-20-15	Rural Entrance
PM-110	04-16-13	Line Types
PR-102	04-21-15	Full Depth PCC Patch without Dowels
PR-103	10-21-14	Full Depth PCC Patch with Dowels
PR-140	04-21-15	Subbase Patches
PV-101	10-17-17	Joints
SI-882	10-18-16	Special Signs for Restricted Width Traffic Control Zones
TC-1	04-16-13	Work Not Affecting Traffic (Two-Lane or Multi-Lane)
TC-81	04-20-10	Restricted Width Signing (Less Than 14.5 Feet)
TC-202	04-21-15	Work Within 15 ft of Traveled Way
TC-213	04-17-12	Lane Closure with Flaggers
TC-217	10-18-16	Lane Closure with Signals and TBR

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108-28	TEMPORARY TRAFFIC SIGNALS	C.4
108-30	CRASH CUSHIONS	C.4
108-33	TEMPORARY BARRIER RAIL	C.4
111-25	INDEX OF TABULATIONS	C.2
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	511 TRAVEL RESTRICTIONS	J.1
	COORDINATED OPERATIONS	J.1

ACCESS POINTS AND SAFETY RAMPS

Refer to Cross-Sections

Length of unclassified pipe calculated is based on using Reinforced Concrete Pipe.

- ① Refer to MI-210
- ② Refer to EW-501.
- ③ Refer to EW-501 or EW-502.

*Predetermined for access point not constructed with this project.

Location	Type	Length of Opening ①			Pipe Culvert ③			Aprons	Driveway Surface Area		Driveway Surfacing Material	Remarks						
		Case	1½" Dropped Curb	3" Dropped Curb	W	PR ① ②	SR ②		H	Size			Pipe Length	Lt.	Rt.	HMA	PCC	
Station	Side	A, B, C, Safety Ramp, or Predetermined*	1 or 2	LF	LF	FT	FT	FT	FT	IN	LF	LF	LF	No.	SY	SY	TON	
438+15.00	Rt	C								18.0	60.0	25.0	35.0	2				See Sheet D.3 for additional Information.

FULL-DEPTH PATCHES

Possible Standards: PR-101, PR-102, PR-103, PR-104, PR-105 and PR-140.

Count	Location	Station or Milepost	Lane	Dimension			PCC Patches				HMA Patches	Composite HMA	Subbase Patches	Subbase Patch w/ 'EF' Joint	Patch Subdrain	'CD' Joints	'CT' Joints	'EF' Joints	Anchor Lugs Removal	Remarks	
				Length	Width	Patch Thickness	With Dowels	Without Dowels	C R C	Ramp with Dowels											
				L, R, or B	FT	FT	IN	PR-103	PR-102	PR-104											PR-105
1		389+13.26	L	14.5	9.8																
1		389+13.26	R	14.5	10.0																
1		729+58.60	L	11.5	10.0																
1		729+58.60	R	11.5	10.0																
1		761+01.19	B	30.0	32.0		106.7														
1		973+48.95	R	19.0	10.0																
6							106.7	78.8					185.5								Total

100-17
04-20-10

TABULATION OF SILT FENCES

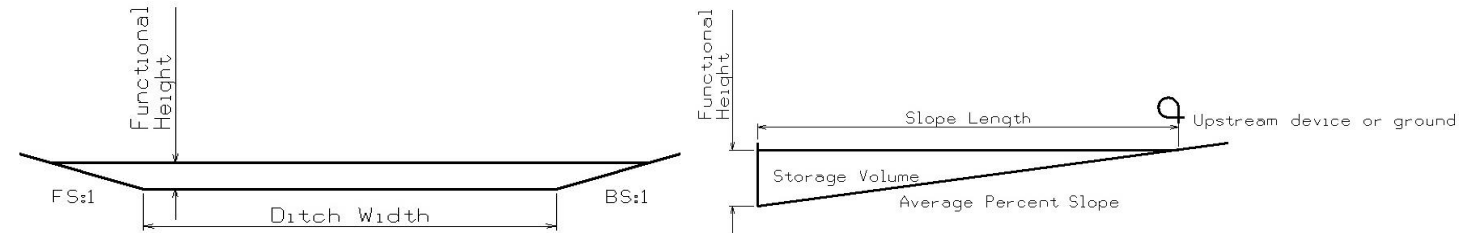
Refer to EC-201

Location			Length LF	Remarks
Begin Station	End Station	Side		
388+18.31	390+02.33	LT	195.6	
388+24.09	390+09.32	RT	197.9	
438+30.43	438+58.72	LT	75.3	
438+17.15	139+53.98	RT	148.1	
728+88.16	730+41.50	LT	195.2	
728+75.92	730+41.74	RT	324.7	
760+81.52	761+57.01	LT	73.7	
760+81.52	761+57.01	RT	77.7	
972+23.76	974+79.23	LT	451.4	
972+89.99	974+97.87	RT	441.2	
1085+40.60	1086+96.18	RT	556.0	
			2736.8	Total
			3421.0	Total +25%
			342.1	10% for Maintenance

100-18
10-18-16

SILT FENCES FOR DITCH CHECKS

Possible Standard: EC-201 Possible Detail: 570-4



* The functional height used in the volume equation is 85% of effective height. Effective height is 1.58 feet as shown on EC-201.
* Volume equation: $[0.5 * Spacing * (0.5 * H^2 * FS + DW * H + 0.5 * H^2 * BS)]$

Basin No.	Type	Location		Bid Items			Stormwater Storage Volume Summary					Remarks
		Station	Side	Installation LF	Maintenance LF	Removal LF	Foreslope FS:1	Backslope BS:1	Ditch Width FT	Avg. % Slope	Volume* CF	
10		728+79.23	Rt	26.8	2.7	26.8	6.5	4.6	4.6	1.5%	809.4	
16		974+05.16	Rt	10.9	1.1	10.9	1.9	2.3	2.5	4.7%	125.0	
16		974+40.16	Rt	8.0	0.8	8.0	1.5	2.5	0.0	4.7%	63.1	
16		974+75.16	Rt	24.2	2.4	24.2	2.3	3.0	13.6	4.7%	403.3	
17		1085+44.28	Rt	24.9	2.5	24.9	2.3	4.7	10.9	3.4%	471.4	
				94.8	9.5	94.8						Total

100-34
04-19-16

STORMWATER DRAINAGE BASIN

Basin No.	Station to Station	Side	Disturbed Area Acres	Discharge Point		Required Storage Volume CF	Remarks	
				Station	Side			
1	387+85.94	389+13.20	Lt	0.0	389+13.20	Lt	0.0	
2	387+76.21	389+13.20	Rt	0.0	389+13.20	Rt	0.0	
3	389+13.20	+51.22	Lt	0.0	389+13.20	Lt	0.0	
4	389+13.20	+60.53	Rt	0.0	389+13.20	Rt	0.0	
5	437+43.18	438+49.58	Lt	0.0	438+49.58	Lt	0.0	
6	438+31.72	438+54.68	Rt	0.0	438+54.68	Rt	0.0	
7	438+49.58	439+42.75	Lt	0.0	438+49.58	Lt	0.0	
8	438+54.68	439+53.55	Rt	0.0	438+54.68	Rt	0.0	
9	728+87.09	729+58.60	Lt	0.0	729+58.60	Lt	0.0	
10	728+76.05	729+58.60	Rt	0.0	729+58.60	Rt	0.0	
11	729+58.60	730+41.22	Lt	0.0	729+58.60	Lt	0.0	
12	729+58.60	730+41.22	Rt	0.0	729+58.60	Rt	0.0	
13	972+23.89	973+39.53	Lt	0.0	973+39.53	Lt	0.0	
14	972+72.09	973+50.54	Rt	0.0	973+50.54	Rt	0.0	
15	973+39.53	974+79.26	Lt	0.0	973+39.53	Lt	0.0	
16	973+50.54	974+95.43	Rt	0.0	973+50.54	Rt	0.0	
17	1085+40.59	1086+18.00	Rt	0.0	1086+18.00	Rt	0.0	
18	1086+18.00	1086+96.26	Rt	0.0	1086+18.00	Rt	0.0	

100-35
04-19-16

SUMMARY OF STORMWATER STORAGE

Basin No.	Item	Total Storage Volume Provided	Total Storage Volume Required	Remarks
		CF	CF	
1	N/A	0.0	0.0	
2	N/A	0.0	0.0	
3	N/A	0.0	0.0	
4	N/A	0.0	0.0	
5	N/A	0.0	0.0	
6	N/A	0.0	0.0	
7	N/A	0.0	0.0	
8	N/A	0.0	0.0	
9	N/A	0.0	0.0	
10	Silt Fence Ditch Checks	809.4	0.0	
11	N/A	0.0	0.0	
12	N/A	0.0	0.0	
13	N/A	0.0	0.0	
14	N/A	0.0	0.0	
15	N/A	0.0	0.0	
16	Silt Fence Ditch Checks	591.4	0.0	
17	Silt Fence Ditch Checks	471.4	0.0	
18	N/A	0.0	0.0	

108-28
08-01-08

TEMPORARY TRAFFIC SIGNALS

No.	Location Station	Type			Remarks
		One Lane Traffic	Haul Road	Intersection	
1	389+13.20	1			
2	729+58.60	1			
3	761+01.19	1			
4	973+45.02	1			
		4			Total

108-33
04-19-16

TEMPORARY BARRIER RAIL

Possible Standards: BA-400, BA-401

* Not a bid item. Anchorage requirements are based on TBR locations shown in the plans. TBR alignments that vary from what is shown in the plans may result in additional TBR sections requiring anchorage.

No.	Station to Station	Length LF	(Select One)		Anchored* (Y/N)	Modular Glare Screen System (Y/N)	Remarks	
			Steel BA-400	Concrete BA-401				
			1	388+31.95				389+94.45
2	388+31.95	389+94.45	175.0		X	No	No	
3	728+77.35	730+39.85	175.0		X	No	No	
4	728+77.35	730+39.85	175.0		X	No	No	
5	760+07.44	761+94.94	187.5		X	Yes	No	
6	760+07.44	761+94.94	187.5		X	Yes	No	
8	972+67.60	974+30.10	175.0		X	No	No	
			1250.0					Total

108-30
04-16-13

CRASH CUSHIONS

* Bid Item
 ① Lane(s) to which the installation is adjacent.
 ② Complete this section when using the Temporary Crash Cushion bid item and Earthwork is needed for Sand Barrel placement. Refer to BA-500

No.	Direction of Traffic	Location Station	Side	Obstacle Width FT	Crash Cushion (Select One)*					Sand Barrel Details ②					Earthwork*		Spare Parts Kit (Select One)*		Obstacle Description	Remarks
					Temporary	Temporary Redirective	Temporary Severe Use	Permanent	Permanent Severe Use	V	W	X	Y	Z	Excavation Class 10 CY	Embankment in Place CY	Permanent EACH	Permanent Severe Use EACH		
										Length	Length	Length	Length	Length						
										FT	FT	FT	FT	FT						
1	EB	388+31.95			1													Temporary Barrier Rail	WB Closed	
2	WB	389+94.45			1													Temporary Barrier Rail	WB Closed	
3	EB	388+31.95			1													Temporary Barrier Rail	EB Closed	
4	WB	389+94.45			1													Temporary Barrier Rail	EB Closed	
5	EB	728+77.35			1													Temporary Barrier Rail	WB Closed	
6	WB	730+39.85			1													Temporary Barrier Rail	WB Closed	
7	EB	728+77.35			1													Temporary Barrier Rail	EB Closed	
8	WB	730+39.85			1													Temporary Barrier Rail	EB Closed	
9	EB	760+07.44			1													Temporary Barrier Rail	WB Closed	
10	WB	761+94.94			1													Temporary Barrier Rail	WB Closed	
11	EB	760+07.44			1													Temporary Barrier Rail	EB Closed	
12	WB	761+94.94			1													Temporary Barrier Rail	EB Closed	
13	EB	972+67.60			1													Temporary Barrier Rail	EB Closed	
14	WB	974+30.10			1													Temporary Barrier Rail	EB Closed	
					14														Total	

PAVEMENT MARKING LINE TYPES

See PM-110

***MNY4 - Factor of 1.00 as value includes number of 4-inch passes to cover median nose area.

*BCY4 - Place on the same side of the roadway to match existing markings near the project.
**NPY4 - For estimating purposes only. No Passing Zone Lines will be located in the field.

BCY4: Broken Centerline (Yellow) @ 0.25
ELY4: Edge Line Left (Yellow) @ 1.00

DCY4: Double Centerline (Yellow) @ 2.00
SLW2: Stop Line (White) @ 6.00

NPY4: No Passing Zone Line (Yellow) @ 1.25

BLW4: Broken Lane Line (White) @ 0.25

ELW4: Edge Line Right (White) @ 1.00

Road ID	Station to Station		Dir. of Travel	Location Marking Type	Side			Length by Line Type (Unfactored)											Remarks				
					L	C	R	BCY4*	DCY4	NPY4**	BLW4	ELW4	ELY4	SLW2									
								STA	STA	STA	STA	STA	STA	STA	STA	STA	STA	STA		STA	STA	STA	STA
US 6	386+56.01	391+70.51	BOTH	Removal of Paint		X		5.15															
US 6	389+20.51	391+70.51	WB	Waterborne/Solvent Paint		X						2.50											
US 6	386+56.01	386+56.01	EB	Waterborne/Solvent Paint			X						0.12										
US 6	391+70.51	391+70.51	WB	Waterborne/Solvent Paint			X						0.12										
US 6	389+20.51	391+70.51	WB	Removal of Paint		X						2.50											
US 6	386+56.10	389+06.01	EB	Waterborne/Solvent Paint		X						2.50											
US 6	386+56.01	389+06.01	EB	Removal of Paint		X						2.50											
US 6	386+56.01	386+56.01	EB	Removal of Paint			X						0.12										
US 6	391+70.51	391+70.51	WB	Removal of Paint			X						0.12										
US 6	386+56.01	391+70.51	BOTH	Waterborne/Solvent Paint		X		5.15															
US 6	389+06.01	389+20.51	EB	Waterborne/Solvent Paint			X						0.15										
US 6	389+06.01	389+20.51	WB	Waterborne/Solvent Paint			X						0.15										
US 6	727+02.85	732+14.35	BOTH	Removal of Paint		X		5.12															
US 6	729+64.35	732+14.35	WB	Waterborne/Solvent Paint		X						2.50											
US 6	727+02.85	727+02.85	EB	Waterborne/Solvent Paint			X						0.12										
US 6	732+14.35	732+14.35	WB	Waterborne/Solvent Paint			X						0.12										
US 6	729+64.35	732+14.35	WB	Removal of Paint		X						2.50											
US 6	727+02.85	729+52.85	EB	Waterborne/Solvent Paint		X						2.50											
US 6	727+02.85	729+52.85	EB	Removal of Paint		X						2.50											
US 6	727+02.85	727+02.85	EB	Removal of Paint			X						0.12										
US 6	732+14.35	732+14.35	WB	Removal of Paint			X						0.12										
US 6	727+02.85	732+14.35	BOTH	Waterborne/Solvent Paint		X		5.12															
US 6	729+52.85	729+64.35	EB	Waterborne/Solvent Paint			X						0.12										
US 6	729+52.85	729+64.35	WB	Waterborne/Solvent Paint			X						0.12										
US 6	758+31.52	763+70.85	BOTH	Removal of Paint		X		5.39															
US 6	761+20.85	763+70.85	WB	Waterborne/Solvent Paint		X						2.50											
US 6	758+31.52	758+31.51	EB	Waterborne/Solvent Paint			X						0.12										
US 6	763+70.85	763+70.85	WB	Waterborne/Solvent Paint			X						0.12										
US 6	761+20.85	763+70.85	WB	Removal of Paint		X						2.50											
US 6	758+31.52	760+81.52	EB	Waterborne/Solvent Paint		X						2.50											
US 6	758+31.52	760+81.52	EB	Removal of Paint		X						2.50											
US 6	758+31.52	758+31.52	EB	Removal of Paint			X						0.12										
US 6	763+70.85	763+70.85	WB	Removal of Paint			X						0.12										
US 6	758+31.52	763+70.85	BOTH	Waterborne/Solvent Paint		X		5.39															
US 6	760+81.52	761+20.85	EB	Waterborne/Solvent Paint			X						0.39										
US 6	760+81.52	761+20.85	WB	Waterborne/Solvent Paint			X						0.39										
US 6	970+81.69	976+08.35	BOTH	Removal of Paint		X				5.27													
US 6	973+58.35	976+08.35	WB	Waterborne/Solvent Paint		X						2.50											
US 6	970+81.69	970+81.69	EB	Waterborne/Solvent Paint			X						0.12										
US 6	976+08.35	976+08.35	WB	Waterborne/Solvent Paint			X						0.12										
US 6	973+58.35	976+08.35	WB	Removal of Paint		X						2.50											
US 6	970+81.69	973+31.69	EB	Waterborne/Solvent Paint		X						2.50											
US 6	970+81.69	973+31.69	EB	Removal of Paint		X						2.50											
US 6	970+81.69	970+81.69	EB	Removal of Paint			X						0.12										
US 6	976+08.35	976+08.35	WB	Removal of Paint			X						0.12										
US 6	970+81.69	976+08.35	BOTH	Waterborne/Solvent Paint		X				5.27													
US 6	973+31.69	973+50.53	WB	Waterborne/Solvent Paint			X						0.19										
US 6	973+39.35	973+58.35	EB	Waterborne/Solvent Paint			X						0.19										
Factored Total: Waterborne/Solvent Paint								3.92	-	6.59	-	21.70	-	5.76	-	-	-	-	-	-	-		
Factored Total: Removal of Paint								3.92	-	6.59	-	20.00	-	5.76	-	-	-	-	-	-	-	-	
Bid Quantity: Painted Pavement Markings, Waterborne or Solvent-Based												37.96											
Bid Quantity: Pavement Markings Removed												36.26											

SHOULDERS

- ① Lane(s) to which the shoulder is adjacent.
- ② Bid Item
- ③ Applies only for Paved Shoulders constructed on project with existing granular shoulders.
- ④ Does not include shrink.

Calculations assume a HMA unit weight (lbs/cf) of 140, a Special Backfill unit weight (lbs/cf) of 140, and a Granular Shoulder unit weight (lbs/cf) of 140.

Road Identification	Direction Of Traffic	Location			Quantities																Remarks					
		Station to Station	Side	P Width FT	G Width FT	L Length FT	Class 13 Excavation CY	Hot Mix Asphalt		Binder TONS	Paved Shoulder SY	Reinforced Paved Shoulder SY	Special Backfill				Modified Subbase CY	Granular Shoulder		Earth Shoulder Construction Alternates						
								TON	TON/STA				HMA Alternate		PCC Alternate			TON	TON/STA	STA		HMA CY	PCC CY			
													TON	TON/STA	TON	TON/STA										
US 6	WB	388+20.05	389+99.37	RT		179.3	14.7					42.6	23.7				39.3	21.9								
US 6	EB	388+25.27	390+08.61	RT		183.3	13.7					43.5	23.7				40.2	21.9								
US 6	WB	437+43.18	439+42.75	RT		199.6	14.6					47.4	23.7				43.7	21.9								
US 6	EB	438+31.72	439+53.55	RT		121.8	6.7					28.9	23.7				26.7	21.9								
US 6	WB	728+87.09	730+41.22	RT		154.1	11.1					36.6	23.7				33.8	21.9								
US 6	EB	728+76.05	730+41.22	RT		165.2	12.1					39.2	23.7				36.2	21.9								
US 6	EB	760+81.52	761+57.01	RT		75.5	4.5					17.9	23.7				16.5	21.9								
US 6	WB	972+44.67	974+19.63	RT		175.0	9.1					41.5	23.7				38.3	21.9								
US 6	EB	972+72.09	974+43.22	RT		171.1	13.5					40.6	23.7				37.5	21.9								
US 6	EB	1085+40.59	1086+96.26	RT		155.7	10.8					36.9	23.7				34.1	21.9								
							110.8					375.1					346.3								Total	

232-3A
10-20-15

EROSION CONTROL (RURAL SEEDING)

Following the completion of work in a disturbed area, place seed, fertilizer, and mulch on the disturbed area lying 8 feet adjacent to shoulder and median as follows:

Use seed mix and fertilizer meeting the requirements of Article 2601.03,C,3 and Section 4169 of the Standard Specifications.

Use mulch meeting the requirements of Articles 2601.03,E,2,a and 4169.07,A of the Standard Specifications.

Preparing the seedbed and furnishing and applying seed, fertilizer, and mulch is incidental to mobilization and will not be paid for separately.

232-3B
10-20-15

EROSION CONTROL (URBAN SEEDING)

Following the completion of work in a disturbed area, place seed, fertilizer, and mulch on the disturbed area as follows:

Use seed mix and fertilizer meeting the requirements of Article 2601.03,C,4 and Section 4169 of the Standard Specifications.

Use mulch meeting the requirements of Articles 2601.03,E,2,a and 4169.07,A of the Standard Specifications.

Preparing the seedbed and furnishing and applying seed, fertilizer, and mulch is incidental to mobilization and will not be paid for separately.

232-3C
10-20-15

EROSION CONTROL (NATIVE GRASS SEEDING)

Following the completion of work in a disturbed area, place seed and mulch on the disturbed area lying 8 feet or more beyond the shoulder as follows:

SEED MIX:

- Big bluestem (*Andropogon gerardii*) 6 lbs. PLS/Acre (7.0 kg/ha)
- Indiangrass (*Sorghastrum nutans*) 6 lbs. PLS/Acre (7.0 kg/ha)
- Little bluestem (*Schizachyrium scoparium*) 6 lbs. PLS/Acre (7.0 kg/ha)
- Partridge Pea (*Chamaecrista fasciculata*) 4 lbs. PLS/Acre (4.5 kg/ha)
- Sideoats grama (*Bouteloua curtipendula*) 4 lbs. PLS/Acre (4.5 kg/ha)
- Canada wildrye (*Elymus canadensis*) 2 lbs. PLS/Acre (2.2 kg/ha)
- Switchgrass (*Panicum virgatum*) 1 lbs. PLS/Acre (1.1 kg/ha)
- Oats (*Avena sativa*) 32 lbs./Acre (36.0 kg/ha)

Furnish Big bluestem, Indiangrass, Canada wildrye and Little bluestem that is debarbed or equal to facilitate the application of seed.

Furnish seed certified as Source Identified Class (Yellow Tag) Source G0-Iowa. Oats are excluded from this requirement.

Use seed meeting requirements of Article 4169.02 of the Standard Specifications.

Use mulch meeting the requirements of Articles 2601.03,E,2,a and 4169.07,A of the Standard Specifications.

Preparing the seedbed and furnishing and applying seed and mulch is incidental to mobilization and will not be paid for separately.

281-1
10-18-16

SECTION 404 PERMIT AND CONDITIONS

Construct this project according to the requirements of U.S. Army Corps of Engineers Nationwide Permit 14, Permit No. XXXX-XXX. A copy of this permit is available from the Iowa DOT website (<http://www.envpermits.iowadot.gov/>). The U.S. Army Corps of Engineers reserves the right to visit the site without prior notice.

SURVEY SYMBOLS

- ⊙ INB Storm Sewer Beehive Intake
- PIP Pipe Culvert
- CUL Culvert
- PLG Location of General Photo
- TP TPD Telephone Pedestal
- BRG Bridge
- SIGN SI Sign
- x FW Wire Fence
- ⊙ TDC Tree Deciduous
- EP Edge of Paved Roads (ML or SR)
- SNP Unpaved Shoulder
- D Centerline Draw or Stream (Down)
- DU Centerline Draw or Stream (Up)
- BNK Stream Bank
- ENT Centerline BL of Entrance
- RR Centerline of Railroad Tracks
- CON Concrete or A/C Slab
- ENU Edge Unpaved Entrance & Parking
- T1 - TL1D Telephone Line Co. 1 - Quality D
- F0 - FO1D Fiber Optic Co. 1 - Quality D
- G - GL1D Gas Line Co. 1 - Quality D
- F02 - FO2D Fiber Optic Co. 2 - Quality D
- F03 - FO3D Fiber Optic Co. 3 - Quality D
- T2 - TL2D Telephone Line Co. 2 - Quality D
- W - WL1D Water Line Co. 1 - Quality D
- F04 - FO4D Fiber Optic Co. 4 - Quality D
- SOP Size of Pipe or Culvert
- PRO Profile Shot
- RRR Railroad Rail
- BD Bridge Deck
- BLS Bridge Low Steel

SURVEYED UTILITY OWNER SYMBOLS

- SUB-SURFACE MAPPING QUALITY LEVEL
 LEVEL (A) POTHOLE LOCATION OR ACTUAL XYZ Location
 LEVEL (B) UTILITY FLAG LOCATION
 LEVEL (C) PLOTTED FROM REFERENCE TO GROUND FEATURES
 LEVEL (D) PLOTTED FROM UTILITY MAPS OR HEARSAY
- T1 - COOPERATIVE TELEPHONE COMPANY
 - F0 - IOWA NETWORK SERVICES
 - G - ALLIANT ENERGY
 - F02 - MCI
 - F03 - MEDIACOM
 - T2 - WINDSTREAM COMMUNICATIONS
 - W - POWESHIEK WATER ASSOCIATION
 - F04 - SOUTH SLOPE COOPERATIVE

STA. 760+79.00 SURVEYED UTILITY OWNER SYMBOLS

- T2 - Windstream Telephone - Quality D
- T3 - Coon Creek Telephone - Quality D
- TV - Mediacom - Quality D
- G - Alliant Energy - Quality D
- E1 - Alliant Energy - Quality D
- F0 - Aureon Network Services - Quality D
- F05 - Windstream Communications - Quality D

PLAN VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

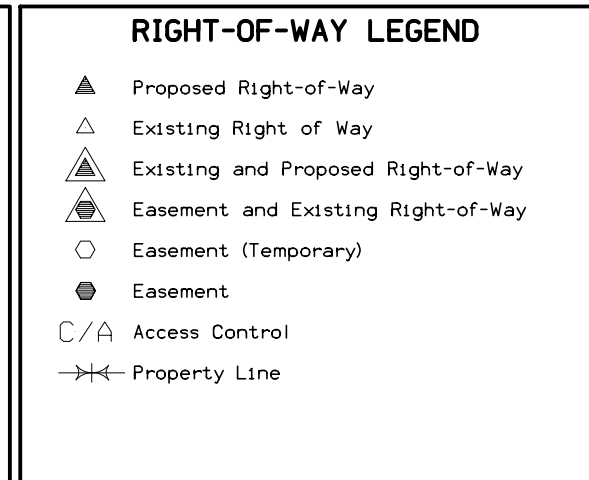
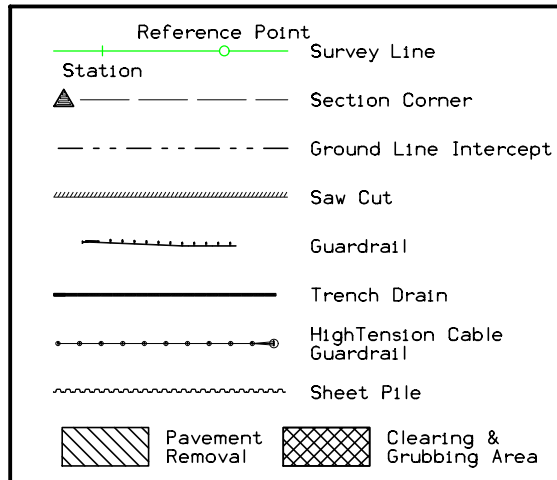
LINEWORK	Design Color No.	
Green	(2)	Existing Topographic Features and Labels
Blue	(1)	Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation
Magenta	(5)	Existing Utilities
SHADING		
Design Color No.		
Yellow	(4)	Highlight for Critical Notes or Features
Red	(3)	Delineates Restricted Areas
Lavender	(9)	Temporary Pavement Shading
Gray, Light	(48)	Proposed Pavement Shading
Gray, Med	(80)	Proposed Granular Shading
Gray, Dark	(112)	Proposed Grade and Pave Shading "In conjunction with a paving project"
Brown, Light	(236)	Grading Shading
Tan	(8)	Proposed Sidewalk Shading
Blue, Light	(230)	Proposed Sidewalk Landing Shading
Pink	(11)	Proposed Sidewalk Ramp Shading

PROFILE VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK	Design Color No.	
Green	(2)	Existing Ground Line Profile
Blue	(1)	Proposed Profile and Annotation
Magenta	(5)	Existing Utilities
Blue, Light	(230)	Proposed Ditch Grades, Left
Black	(0)	Proposed Ditch Grades, Median
Rust	(14)	Proposed Ditch Grades, Right

STA 760+79.00 SURVEY SYMBOLS

- PIP Pipe Culvert
- PLG Location of General Photo
- ⊙ IN Storm Sewer Intake
- TP TPD Telephone Pedestal
- OUT Tile Outlet
- MM Mile Marker Post
- PR Electric Riser Pole
- ⊙ STP Stump
- ⊙ TDC Tree Deciduous
- * TEV Evergreen Tree
- MIS Miscellaneous
- LC Lot Corner
- CUL Culvert
- TIL Tile Line
- FWD Wood Fence
- BLD Building or Foundation
- LIN Miscellaneous Line
- EP Edge of Paved Roads (ML or SR)
- SNP Unpaved Shoulder
- D Centerline Draw or Stream (Down)
- CU Back of Curb
- GU Gutter In Front of Curb



PLAN AND PROFILE

(COVERS SHEET SERIES D, E, F, & K)

Sumner TWP.
T-80N R-11W
SEC. 7

Sta. 389+10.17
Skew 0°
4.5' X 5' X 37' RCB
60" x 22.7' CMP Inlet
D.A. = 110 Ac - F
U.A.C.

Construct Granular Shoulder

STA. 0+82
END CONSTRUCTION

Construct 14.5' x 10'
Full Depth PCC Patch

Construct Granular Shoulder

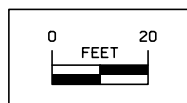
STA. 387+88
BEGIN CONSTRUCTION

Construct 14.5' x 10'
Full Depth PCC Patch

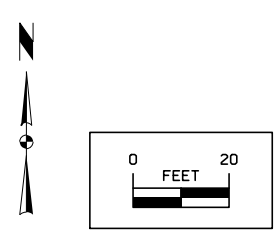
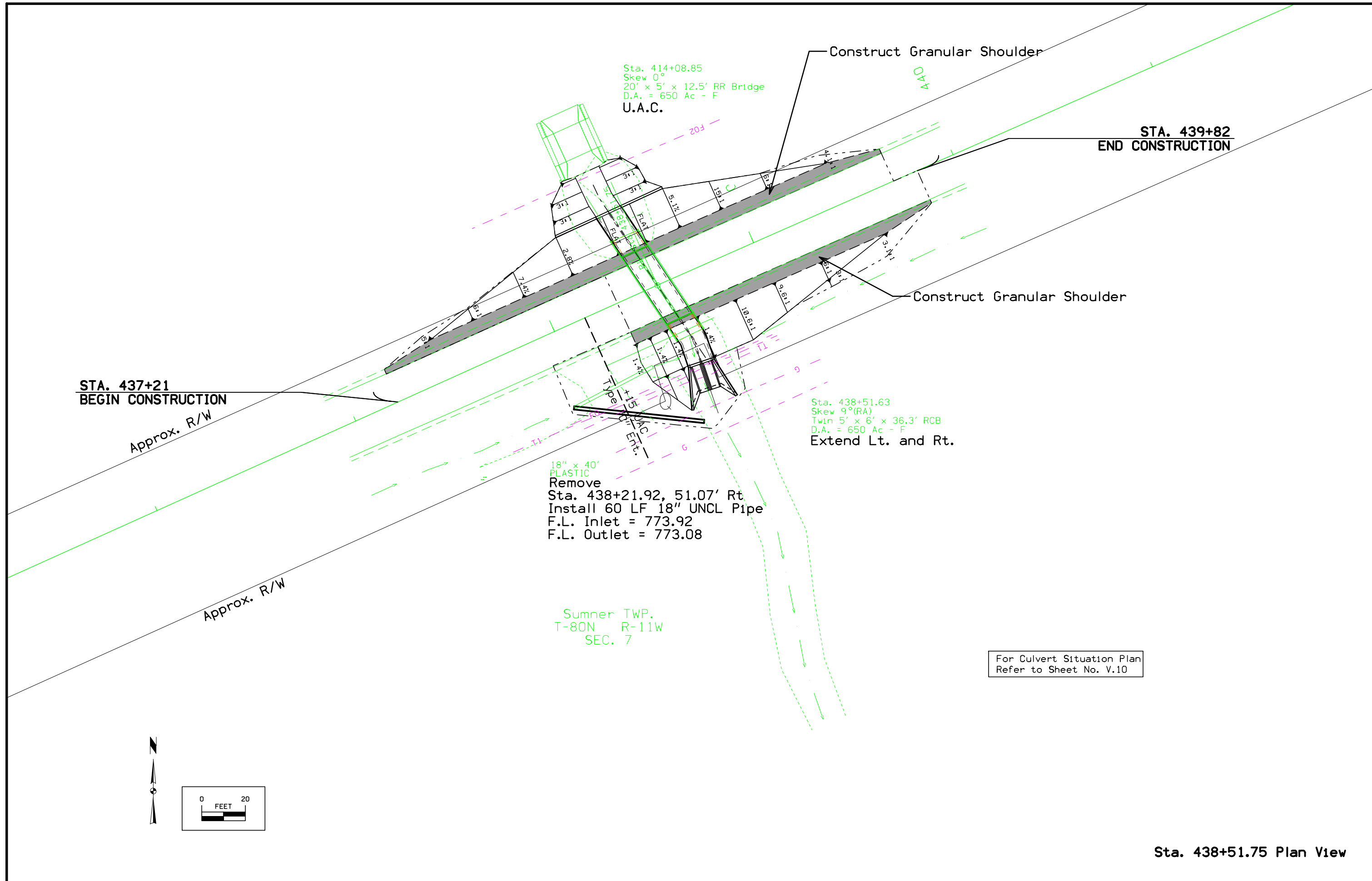
Sta. 389+13.20
Skew 0°
5' X 3' X 29.6' RCB
with 62" x 38" X 10' Elliptical RCP Each End
D.A. = 110 Ac - F
Remove 10' elliptical RCP
Extend Lt. and Rt.

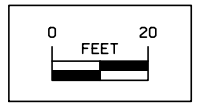
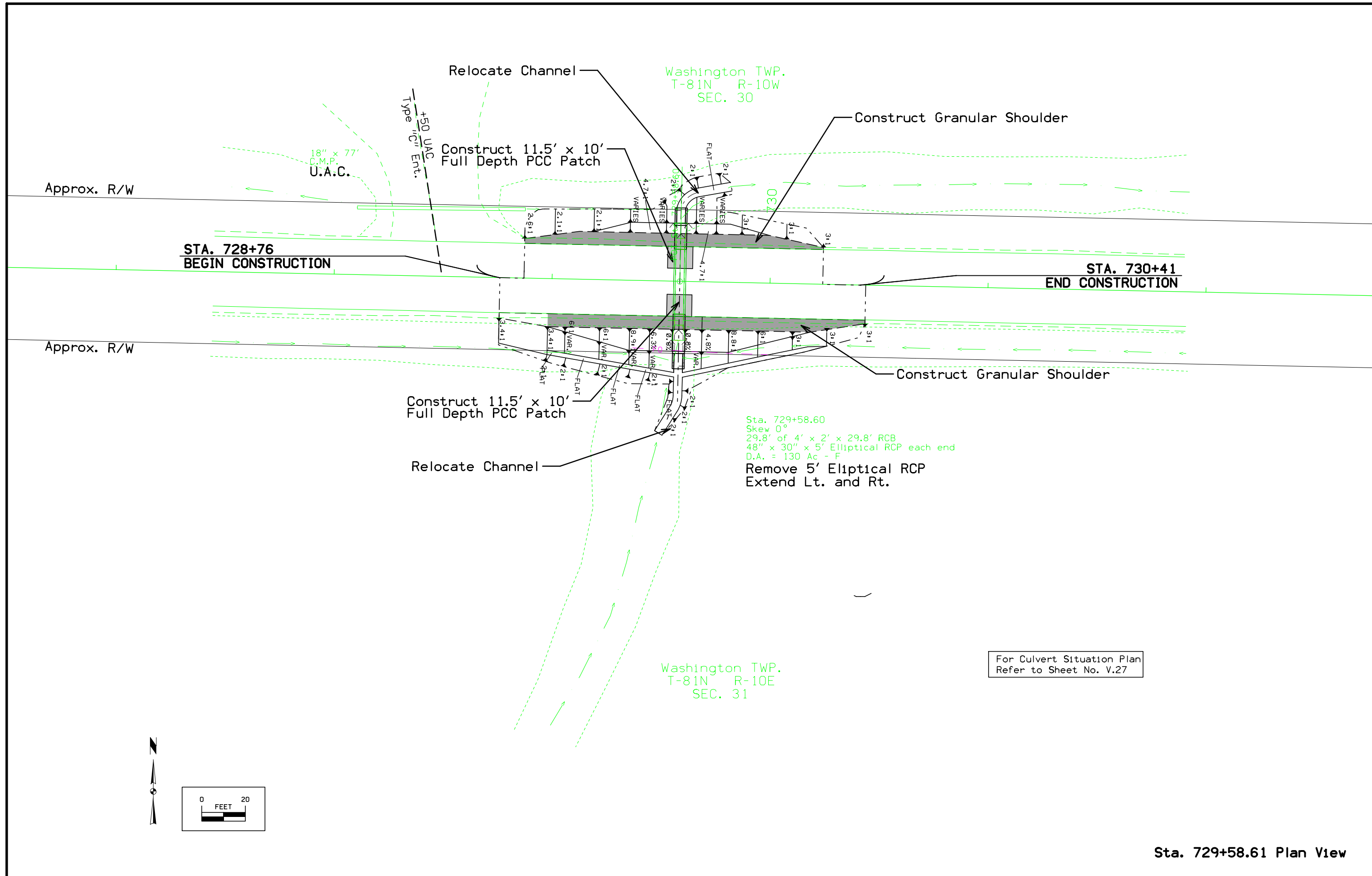
① Station Equation:
Sta. 389+48.15 BK =
Sta. 0+00.00 AH

For Culvert Situation Plan
Refer to Sheet No. V.4



Sta. 389+13.21 Plan View

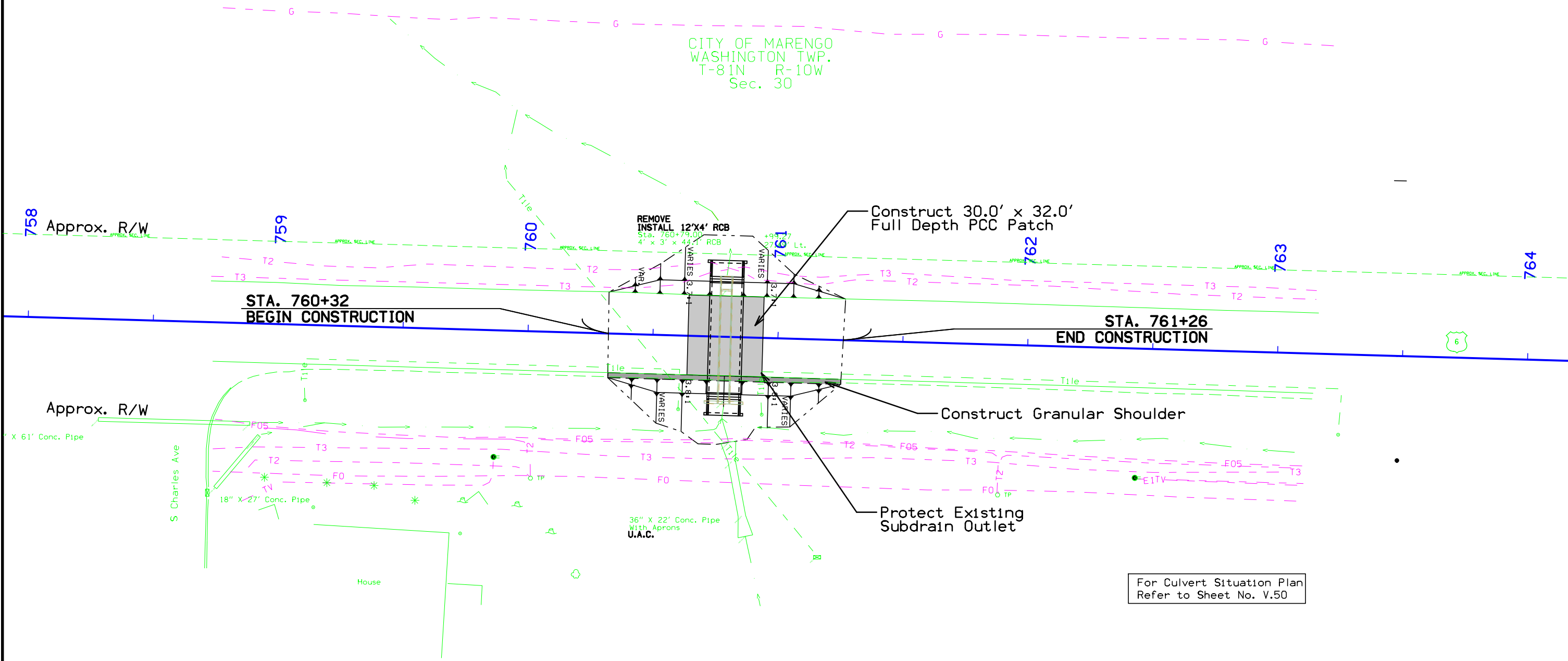




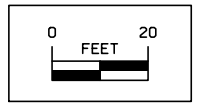
Sta. 729+58.61 Plan View

CITY OF MARENGO
WASHINGTON TWP.
T-81N R-10W
Sec. 30

CITY OF MARENGO
WASHINGTON TWP.
T-81N R-10W
Sec. 31



For Culvert Situation Plan
Refer to Sheet No. V.50



Sta. 760+79.00 Plan View

Washington TWP.
T-81N R-10W
SEC. 34

Relocate Channel

Construct Granular Shoulder

STA. 972+29
BEGIN CONSTRUCTION

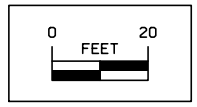
STA. 974+67
END CONSTRUCTION

Construct 19' x 10'
Full Depth PCC Patch

Sta. 973+43.00
Skew 19°(RA)
5' X 6' X 44.5' RCB
D.A. = 100 Ac - F
Extend Lt. and Rt.

Relocate Channel

Construct Granular Shoulder



For Culvert Situation Plan
Refer to Sheet No. V.37

Sta. 973+44.77 Plan View

STA. 1085+15
BEGIN CONSTRUCTION

Approx. R/W
STA. 1087+21
END CONSTRUCTION

+72 UAC
Type "C" Ent.

Construct Granular Shoulder

Approx. R/W

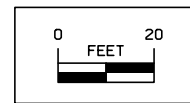
Relocate Channel

Sta. 1086+18.00
Key 0°
4' x 30' x 40.7' RCB,
42" x 28.5" RCP
D.A. = 45' Ac - F

Extend Rt.

Relocate Channel

Iowa TWP.
T-80N R-9W
SEC. 6



For Culvert Situation Plan
Refer to Sheet No. V.41

Sta. 1086+18.00 Plan View

Survey Information

General Information

Measurement units for this survey are US survey feet. This survey is for the extension of five culverts along U.S. Highway 6 from 0.42 miles east of County Road V-52 at Milepost 215.66 (Station 389+13.9) to 1.15 miles East of Iowa 220 at Milepost 228.11 (Station 1086+18.0) in Iowa County.

Vertical Control

Vertical datum for this survey is NAVD88 (Computed using Geoid 12a). The Ellipsoidal Height was computed at each culvert on one benchmark by averaging multiple observations with appropriate time span between from nearby Iowa RTN reference Stations. Addition benchmark and elevations on control points were then established using differential leveling.

Horizontal Control

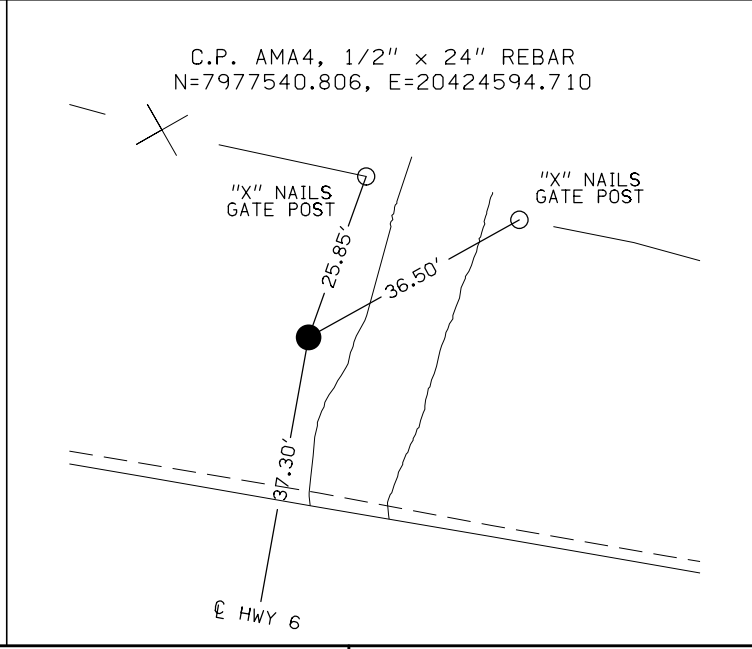
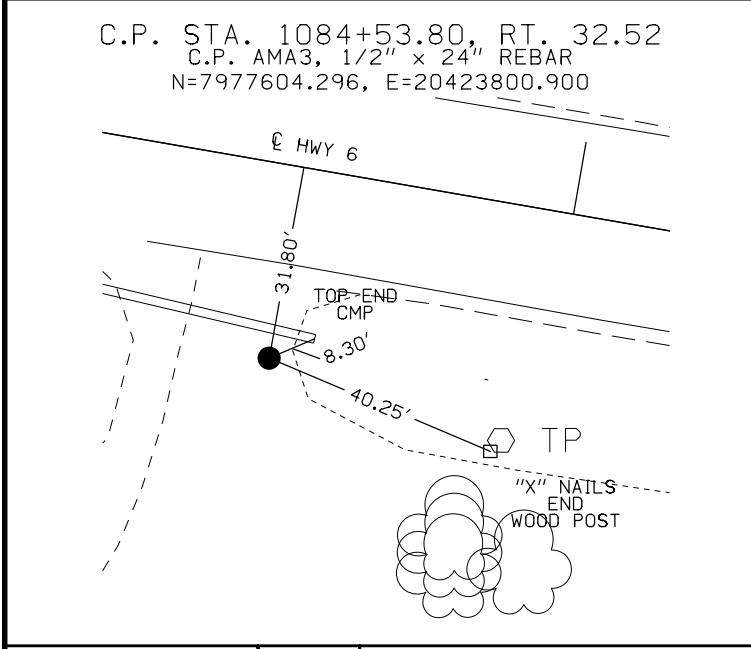
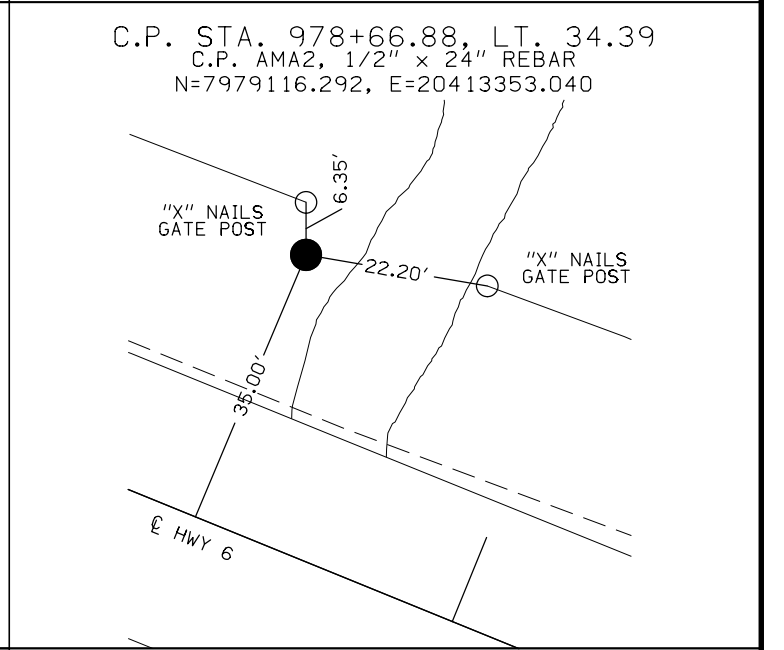
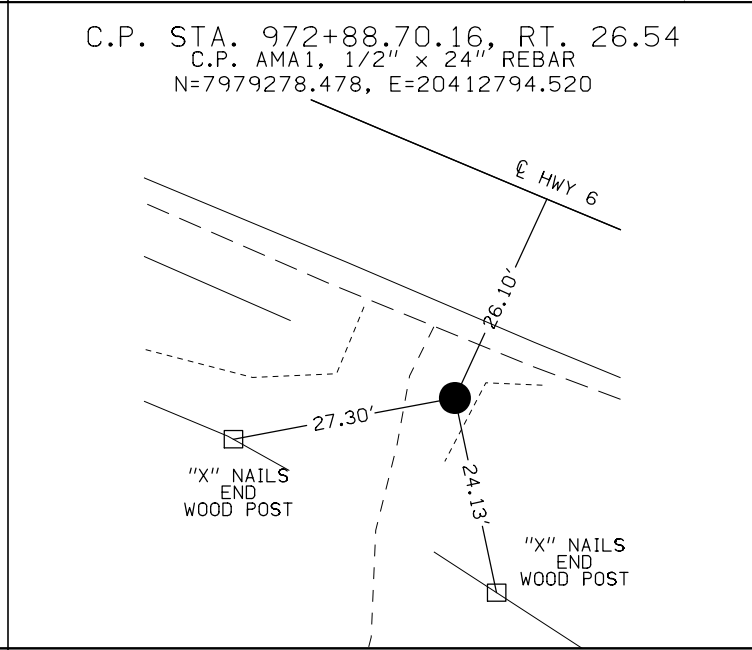
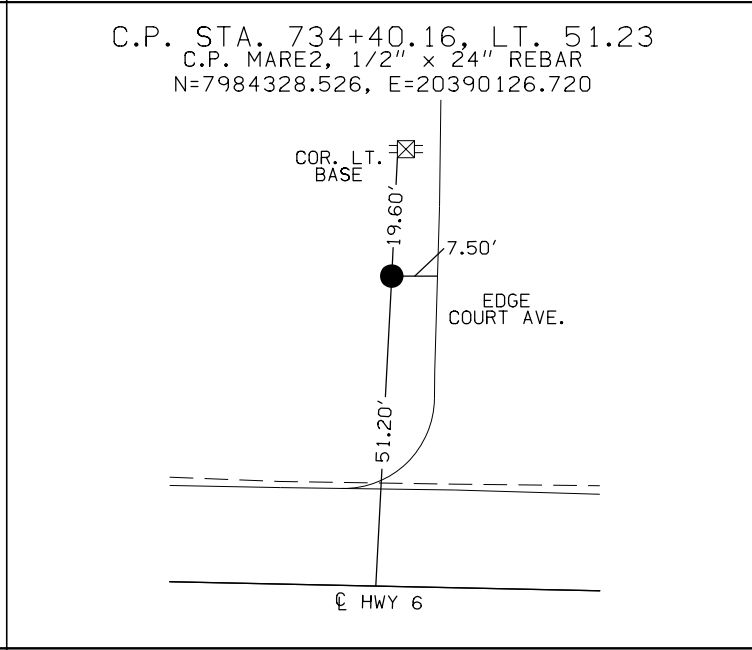
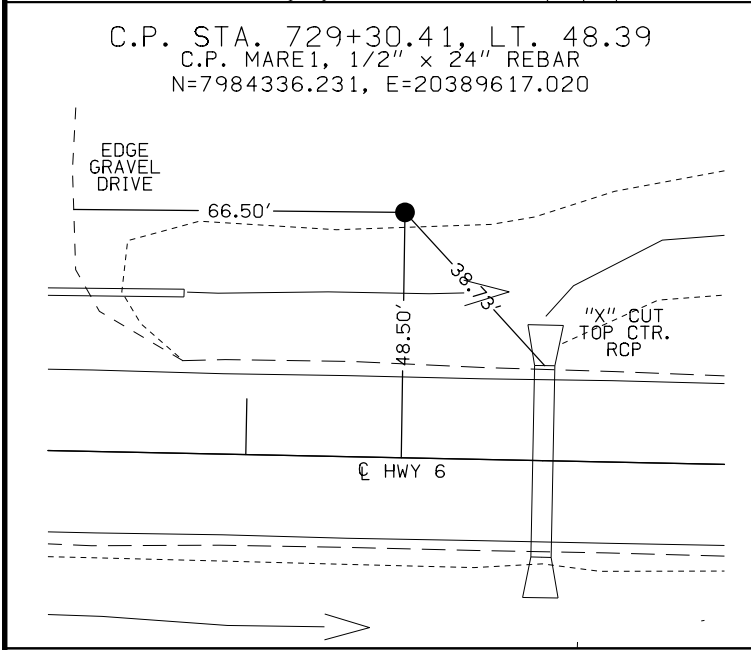
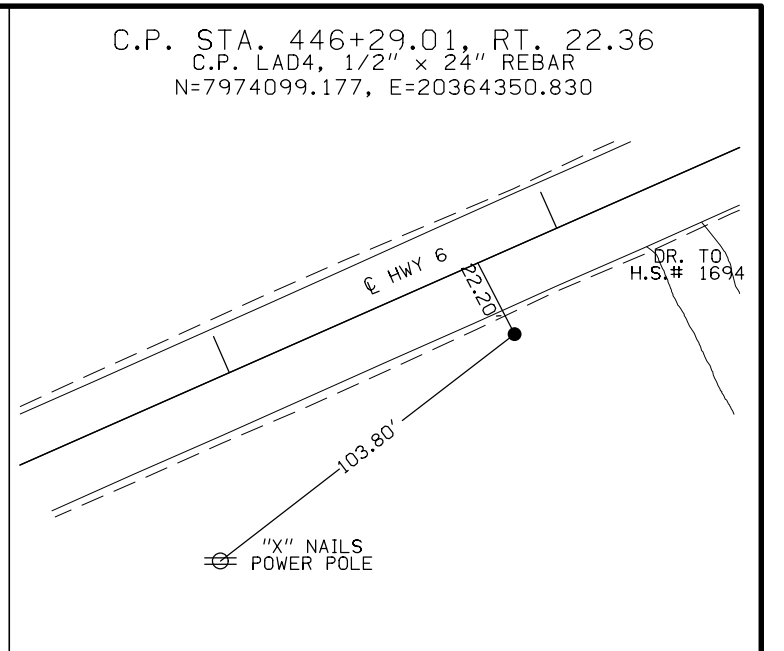
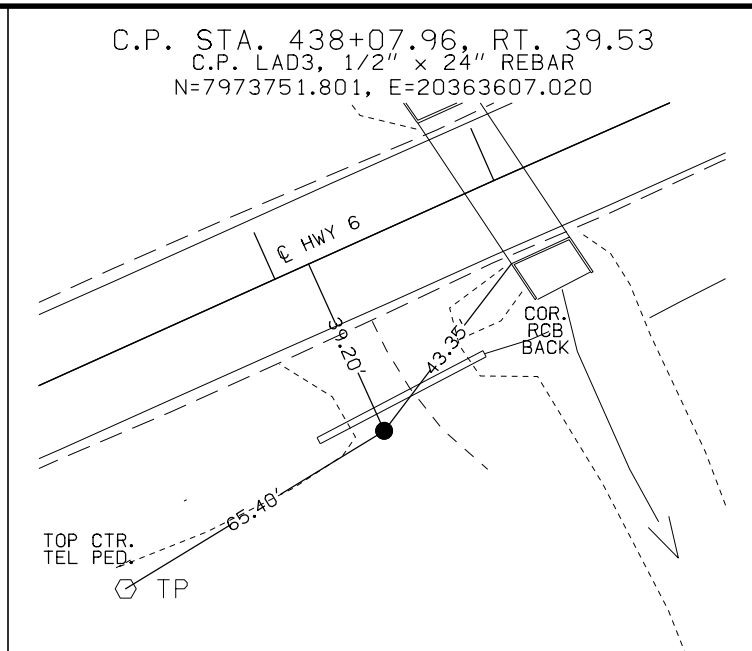
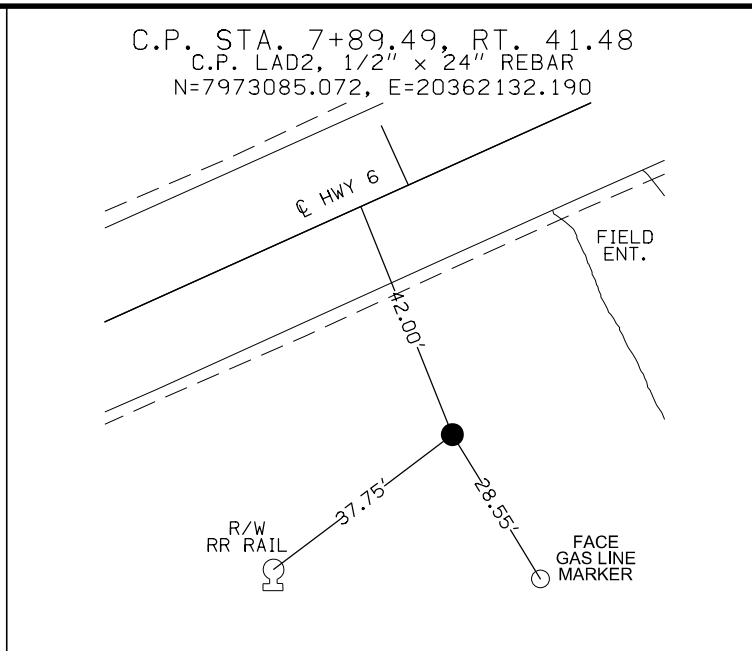
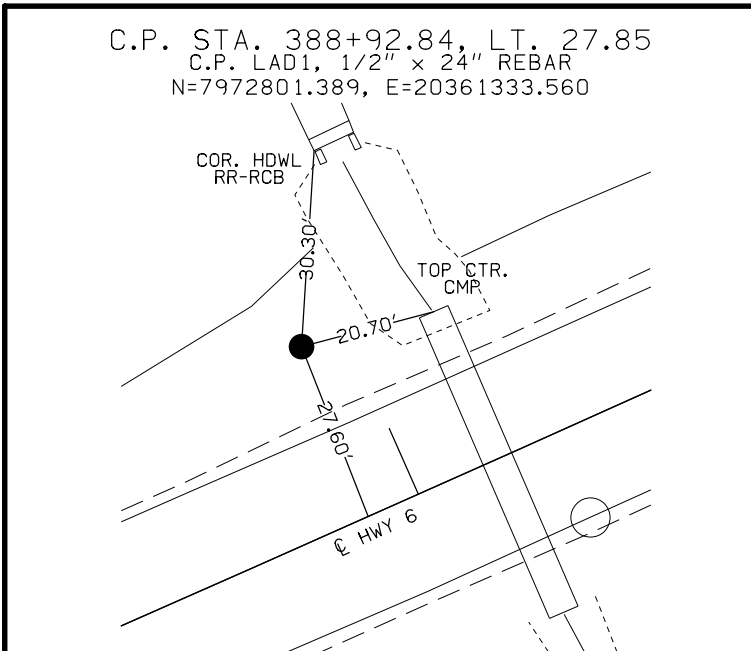
The project coordinate system for this survey is the Iowa Regional Coordinate System (IaRCS) Zone 10 (U.S. Survey Feet). The survey control is relative to IaRTN reference stations. Two control points were established at each culvert site.

Alignment Information

The horizontal alignment for this survey is a retrace of As-built Plans Iowa County U.S. Road No. 32 From Marengo Southwest to the Poweshiek County Line (February 1932) and As-built Plans Iowa County U.S. Road 32 from Marengo East to the Johnson County Line.

VERTICAL CONTROL

Point	North	East	Elevation	Station	Offset	Feature	Description
BM1	7972753.540	20361415.620	774.940	389+48.13	49.352	BM1	TOP OF RIGHT-OF-WAY RAIL
BM2	7972834.153	20361341.470	781.167	389+13.48	-54.554	BM2	SOUTHEAST TOP CORNER OF HEADWALL
BM3	7973858.000	20363585.800	781.300	438+32.24	-66.011	BM3	CUT X TOP OF CONCRETE HEADWALL
BM4	7973793.640	20363647.050	779.140	438+61.78	17.753	BM4	NORTHEAST TOP CORNER HEADWALL
Point	North	East	Elevation	Station	Offset	Feature	Description
BM5	7984308.910	20389644.510	740.850	729+58.46	-21.636	BM5	CUT X NORTH END OF REINFORCED CONCRETE PIPE
BM6	7984243.821	20390178.869	739.624	734+94.05	32.375	BM6	TOP OF RIGHT-OF-WAY RAIL ON THE SOUTH SIDE OF U.S. HWY 6
Point	North	East	Elevation	Station	Offset	Feature	Description
BM7	7979252.730	20412838.430	775.430	973+38.85	33.583	BM7	TOP OF RIGHT-OF-WAY RAIL ON THE SOUTH SIDE OF U.S. HWY 6
Point	North	East	Elevation	Station	Offset	Feature	Description
BM8	7977587.570	20423966.840	767.020	1086+20.15	20.621	BM8	CUT X TOP OF CONCRETE HEADWALL
BM9	7977510.787	20424285.631	770.932	Off Chain	Off Chain	BM9	TOP OF RIGHT-OF-WAY RAIL ON THE SOUTH SIDE OF U.S. HWY 6



Survey Information

Iowa County
 STPN-006-6(52)--2J-48
 US6 - 0.25 mile East From the Jct of US 6 & Co Rd. V66
 SAP 0872.1

General Information

Measurement units for this survey are US survey feet. This survey is for modification or replacement of a culvert structure. This project is a full DTM survey. This survey is along US 6. The project is on Iowa Zone 10 IaRCS coordinates.

Vertical Control

Vertical datum for this survey is identical to the AEOCOM survey established in 2016. This survey is relative to NAVD88 Ia RTN Datum.

Horizontal Control

Horizontal Control for this survey is identical to the AEOCOM survey established in 2016. This survey is relative to Iowa Zone 10 IaRCS coordinates

Alignment Information

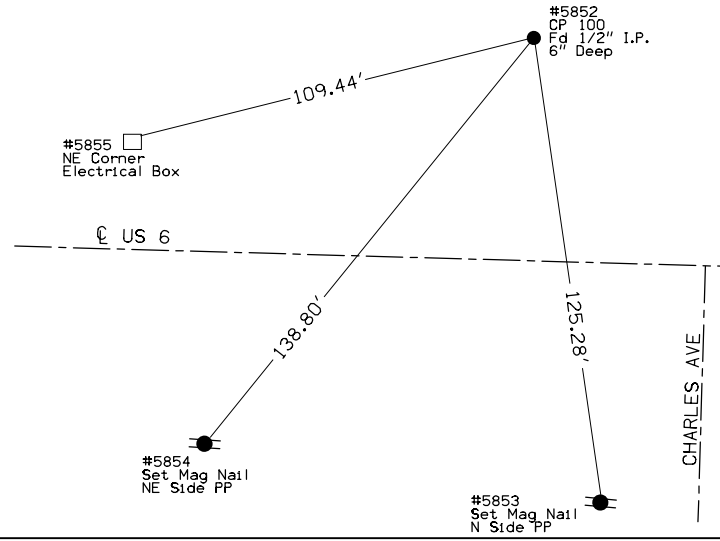
The horizontal alignment for this survey is a retrace of the existing US 6 centerline. The roadway was split both ahead and back of this structure, the stationing was established at the culvert.

P-619A 1929 Paving Plan. Survey stationing was equated to the AB plans at RCB culvert Sta 760+79.0, carried backward and forward throughout the project.

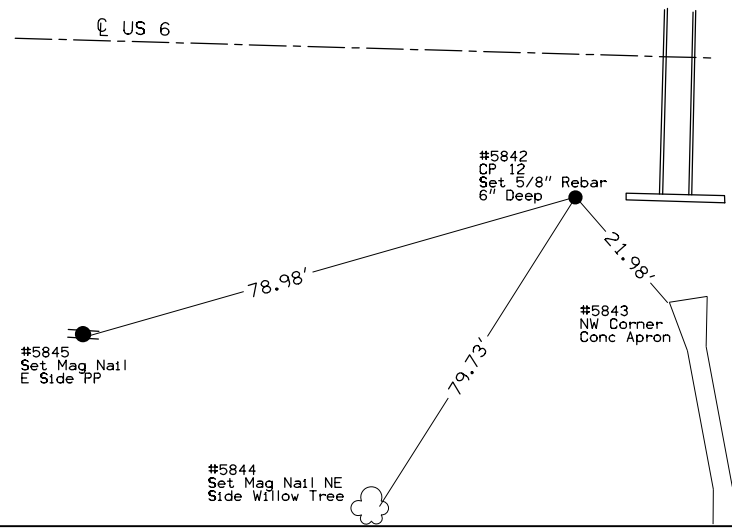
Vertical Control

BENCHMARKS	ELEVATION
No. 510 Sta. 759+87.786 50.06 Rt. Y:7984164.904 X:20392674.589 Fd RR Spk N Side PP-----	743.145
No. 511 Sta. 760+86.342 26.292 Rt. Y:7984185.857 X:20392773.782 Fd "X" on East end of Inlet Hdwl-----	745.076
No. 512 Sta. 760+90.447 78.757 Rt. Y:7984133.296 X:20392776.392 Fd "X" on Inlet APRON of 36" RCP-----	741.521
 MISCELLANEOUS LOCATIONS Bench Marks on Previous surveys	
No. 501 Sta.-----Y:7972753.540 X:20361415.620	TOP OF RIGHT-OF-WAY RAIL =AECOM BM1----- 774.940
No. 502 Sta.-----Y:7972834.153 X:20361341.470	SOUTHEAST TOP CORNER OF HEADWALL =AECOM Point Name BM2----- 781.167
No. 503 Sta.-----Y:7973858.000 X:20363585.800	CUT X TOP OF CONCRETE HEADWALL =AECOM Point Name BM3----- 781.300
No. 504 Sta.-----Y:7973793.640 X:20363647.050	NORTHEAST TOP CORNER HEADWALL =AECOM Point Name BM4----- 779.140
No. 505 Sta.-----Y:7984308.910 X:20389644.510	CUT X NORTH END OF REINFORCED CONCRETE PIPE =AECOM Point Name BM5----- 740.850
No. 506 Sta.-----Y:7984243.821 X:20390178.869	TOP OF RIGHT-OF-WAY RAIL ON THE SOUTH SIDE OF U.S. HWY 6 =AECOM Point Name BM6 ----- 739.624
No. 507 Sta.-----Y:7979252.730 X:20412838.430	TOP OF RIGHT-OF-WAY RAIL ON THE SOUTH SIDE OF U.S. HWY 6 =AECOM Point Name BM7 ----- 775.430
No. 508 Sta.-----Y:7977587.570 X:20423966.840	CUT X TOP OF CONCRETE HEADWALL =AECOM Point Name BM8----- 767.020
No. 509 Sta.-----Y:7977510.787 X:20424285.631	TOP OF RIGHT-OF-WAY RAIL ON THE SOUTH SIDE OF U.S. HWY 6 =AECOM Point Name BM9 ----- 770.932

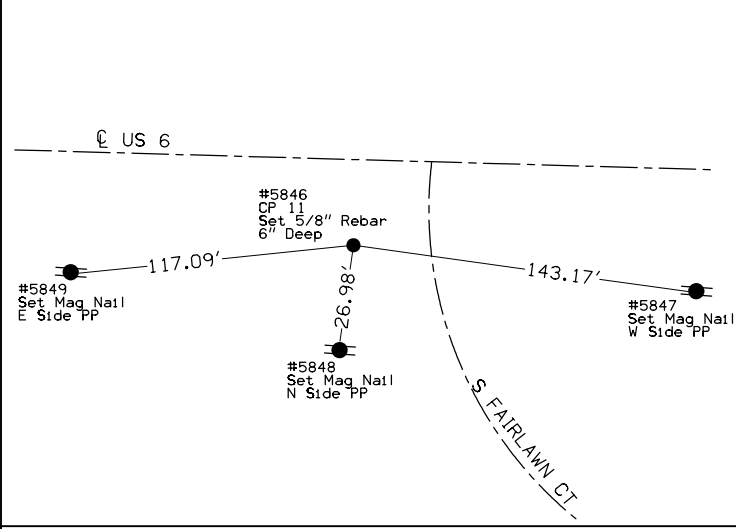
C.P. STA 758+11.38 LEFT 60.20
 C.P. 100, FD Iron Pin 6" Deep
 N=7984280.135 E=20392501.395



C.P. STA 760+63.39 RIGHT 26.65
 C.P. 12, Set Rebar 6" Deep
 N=7984186.157 E=20392750.831



C.P. STA 763+60.95 RIGHT 36.20
 C.P. 11, Set Rebar 6" Deep
 N=7984168.132 E=20393048.000



Sta. 389+10.17
 Skew 0°
 4.5' X 5' X 37' RCB
 60" x 22.7' CMP Inlet
 D.A. = 110 Ac - F

388+30
 C 32±EX R/W

388+95
 C 60'

389+30
 C 60'

0+60
 C 32 ±EX R/W

IOWA INTERSTATE RAILROAD, LTD.
 (2R)

389+30
 C 49±EX R/W

Sta. 389+13.20
 Skew 0°
 5' X 3' X 29.6' RCB
 with 62" x 38" X 10'
 Elliptical RCP Each End
 D.A. = 110 Ac - F




388+70
 C 49'±EX R/W

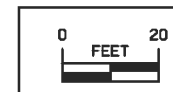
389+20
 C 65'
 389+05
 C 65'

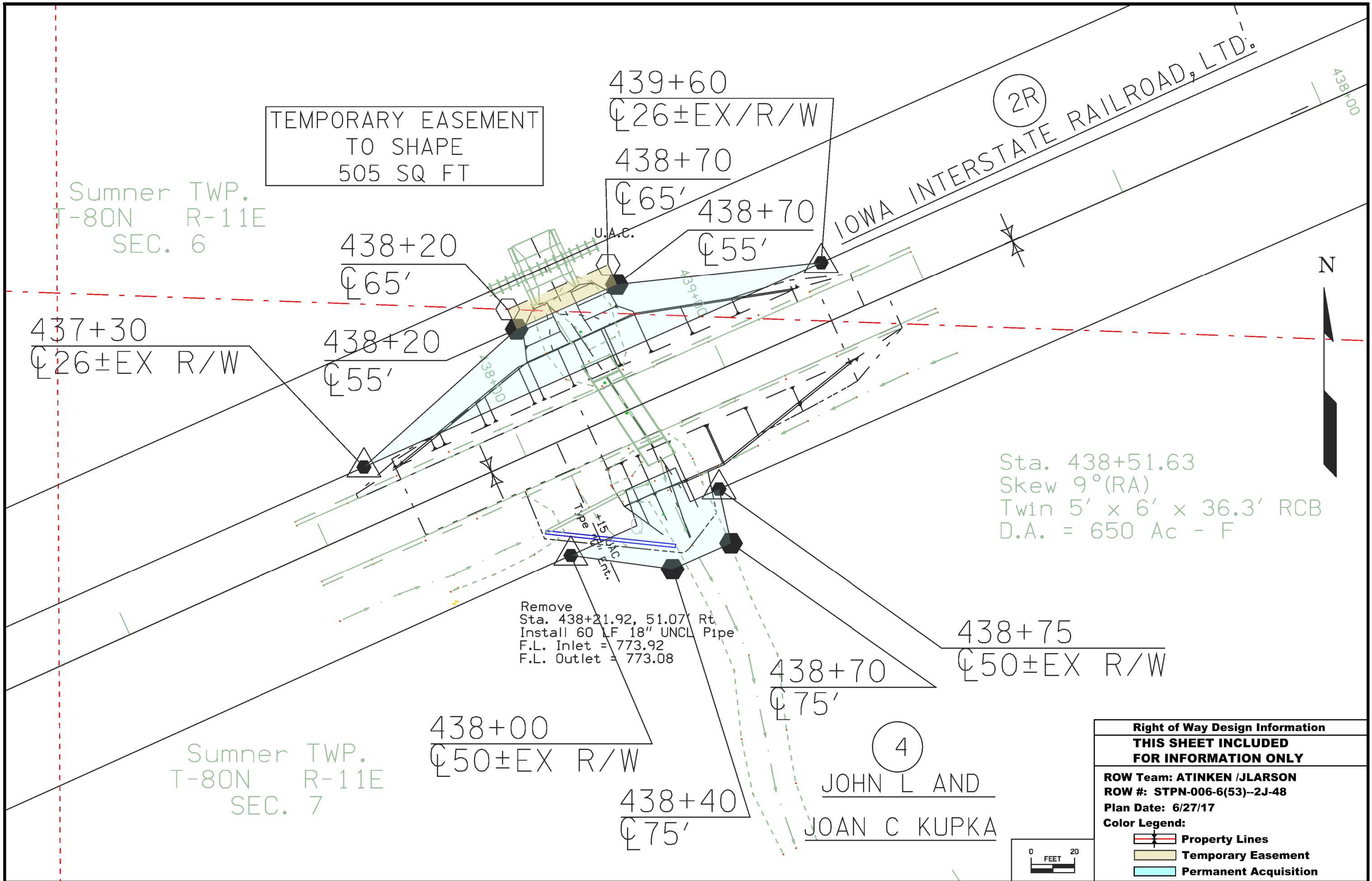
(I)
 AARON BUTLER
 BRIAN W. BUTLER
 BRENT M BUTLER

Sumner TWP.
 T-80N R-11W
 SEC. 7



Right of Way Design Information	
THIS SHEET INCLUDED FOR INFORMATION ONLY	
ROW Team: ATINKEN /JLARSON	
ROW #: STPN-006-6(53)--2J-48	
Plan Date: 6/27/17	
Color Legend:	
	Property Lines
	Temporary Easement
	Permanent Acquisition





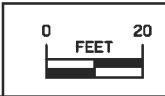
Sumner TWP.
T-80N R-11E
SEC. 6

Sumner TWP.
T-80N R-11E
SEC. 7

Sta. 438+51.63
Skew 9°(RA)
Twin 5' x 6' x 36.3' RCB
D.A. = 650 Ac - F

Remove
Sta. 438+21.92, 51.07 Rt.
Install 60 LF 18" UNCL Pipe
F.L. Inlet = 773.92
F.L. Outlet = 773.08

Right of Way Design Information	
THIS SHEET INCLUDED FOR INFORMATION ONLY	
ROW Team: ATINKEN /JLARSON	
ROW #: STPN-006-6(53)--2J-48	
Plan Date: 6/27/17	
Color Legend:	
	Property Lines
	Temporary Easement
	Permanent Acquisition



N

6

729+40
±33' EX R/W

729+60
±55'

729+80
±55'

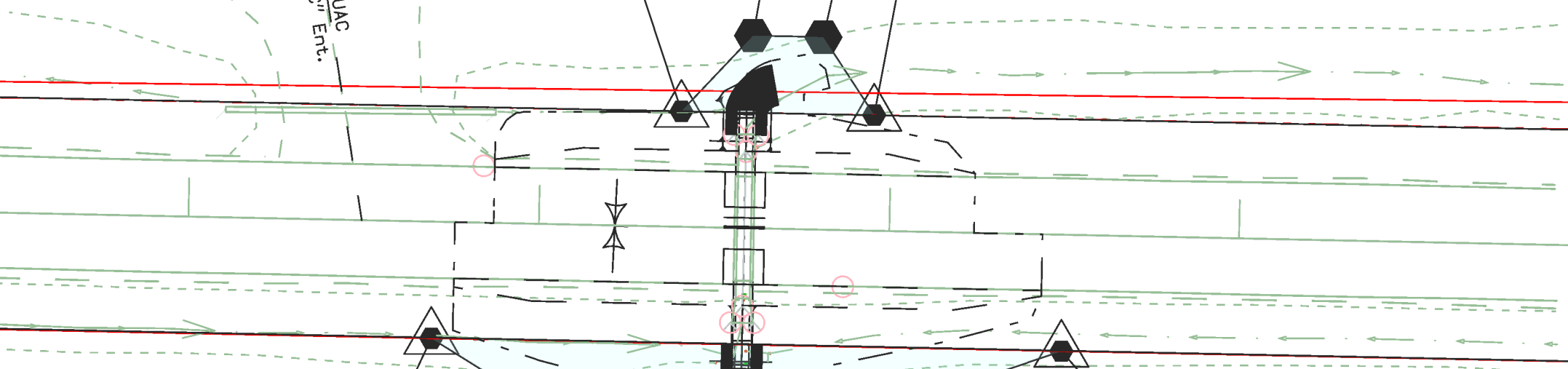
729+95
±33' EX R/W

Washington TWP.
T-81N R-10E
SEC. 30

2161 HIGHWAY 6 TRAIL, LLC

18" x 77'
C.M.P.

+50 UAC
Type "C" Ent.



728+70
±33' EX R/W

730+50
±33' EX R/W

5

J.D. KINZE, LLC

729+15
±60'

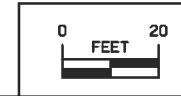
729+75
±60'

Washington TWP.
T-81N R-10E
SEC. 31

729+15
±75'

729+75
±75'

Sta. 729+58.60
Skew 0°
29.8' of 4' x 2' x 29.8' RCB
48" x 30" x 5' Elliptical RCP each end
D.A. = 130 Ac - F



Right of Way Design Information	
THIS SHEET INCLUDED FOR INFORMATION ONLY	
ROW Team: ATINKEN /JLARSON	
ROW #: STPN-006-6(53)--2J-48	
Plan Date: 6/27/17	
Color Legend:	
	Property Lines
	Temporary Easement
	Permanent Acquisition

9

KENNETH H. BERGER
AND CAROLYN S. BERGER

WASHINGTON TWP.
T-81N R-10W
Sec. 30



760+55 ϕ 34'±EX R/W
760+70 ϕ 50'
760+85 ϕ 50'
761+05 ϕ 34'±EX R/W

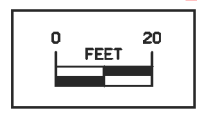
Sta. 760+79.00
4' x 4' x 44.1' RCB

36" X 22' Conc. Pipe
With Aprons
U.A.C.

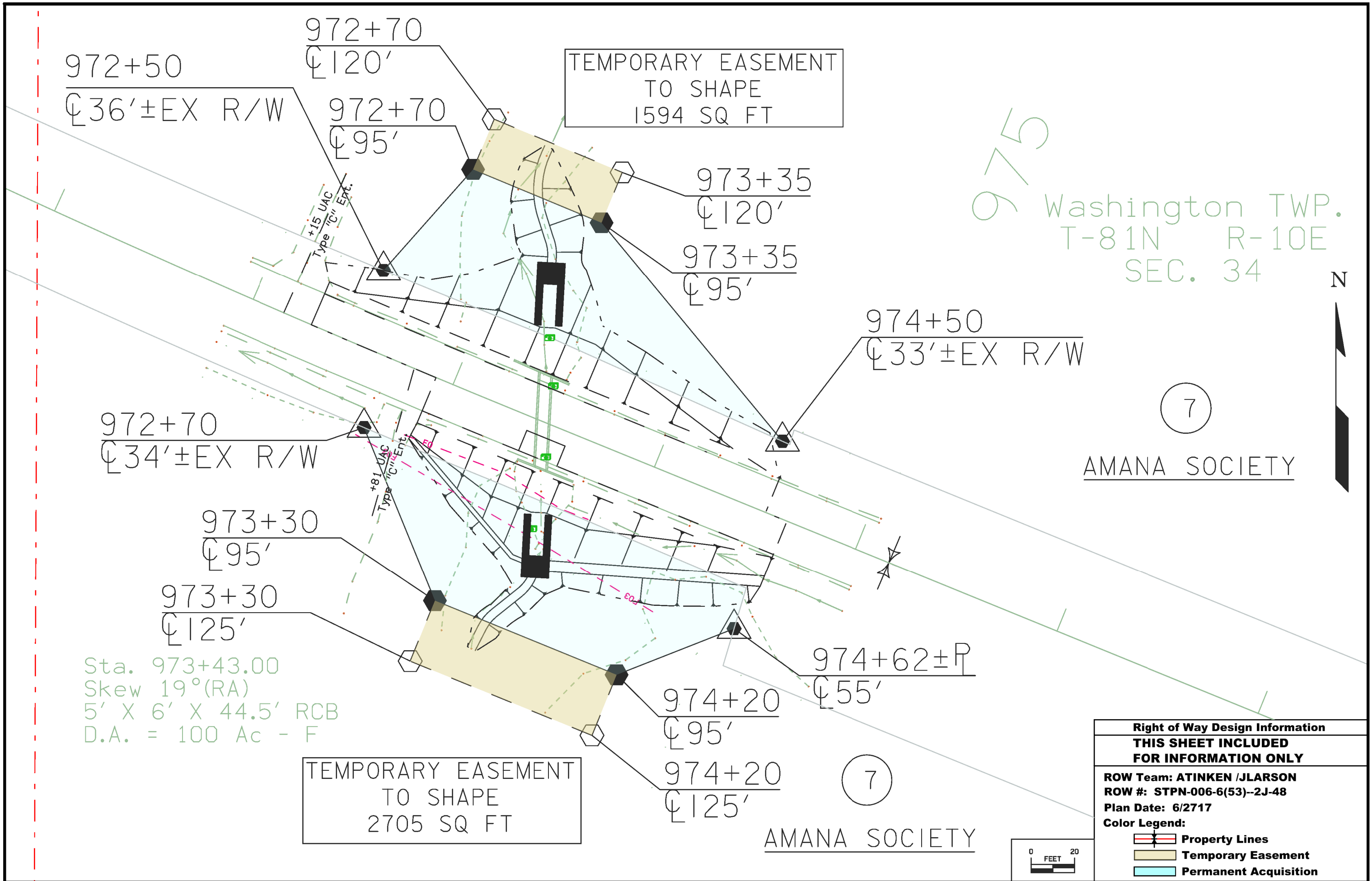
S Charles Ave

House

CITY OF MARENGO



Right of Way Design Information	
THIS SHEET INCLUDED FOR INFORMATION ONLY	
ROW Team: ATINKEN /JLARSON	
ROW #: STPN--141-2(64)--2J-67	
Plan Date: 6/27/17	
Color Legend:	
	Property Lines
	Temporary Easement
	Permanent Acquisition



Washington TWP.
T-81N R-10E
SEC. 34

AMANA SOCIETY

AMANA SOCIETY

Sta. 973+43.00
Skew 19°(RA)
5' X 6' X 44.5' RCB
D.A. = 100 Ac - F

Right of Way Design Information	
THIS SHEET INCLUDED FOR INFORMATION ONLY	
ROW Team: ATINKEN /JLARSON	
ROW #: STPN-006-6(53)--2J-48	
Plan Date: 6/2717	
Color Legend:	
	Property Lines
	Temporary Easement
	Permanent Acquisition

Iowa TWP.
T-80N R-9E
SEC. 6



1085+40
±35' EX R/W

1085+40
±115'

1085+95
±70'

1087+10
±35' EX R/W

1087+10
±115'

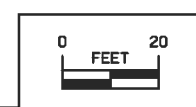
TEMPORARY EASEMENT
TO SHAPE
9575 SQ FT

Sta. 1086+18.00
Skew 0°
4' x 3' x 40.7' RCB,
42" x 28.5' RCP
D.A. = 45 Ac - F

8

DONALD D. AND
SHARON L. HUDEPOHL

1086+55
±70'



Right of Way Design Information	
THIS SHEET INCLUDED FOR INFORMATION ONLY	
ROW Team: ATINKEN /JLARSON	
ROW #: STPN-006-6(53)--2J-48	
Plan Date: 6/27/17	
Color Legend:	
	Property Lines
	Temporary Easement
	Permanent Acquisition

108-23A 08-01-08
TRAFFIC CONTROL PLAN
Traffic Control will be in accordance with Standard Road Plans TC-1, , TC-81, TC-202, TC-213, and TC-217.
Traffic will be maintained at all times. Contractor is allowed to utilize flaggers through the construction area using Standard Road Plan TC-213 during normal working hours.

111-01 04-17-12														
COORDINATED OPERATIONS														
Other work in progress during the same period of time will include the construction of the projects listed. Coordinate operations with those of other contractors working within the same area.														
<table border="1" style="width: 100%;"> <thead> <tr> <th style="width: 50%;">Project</th> <th style="width: 50%;">Type of Work</th> </tr> </thead> <tbody> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </tbody> </table>	Project	Type of Work												
Project	Type of Work													

108-25 10-21-14
511 TRAVEL RESTRICTIONS

Route	Direction	County	Location Description	Feature Crossed	Object Type	Maint. Bridge No., Structure ID, or FHWA No.	Type of Restriction	Existing Measurement	Construction Measurement	Construction Measurement as Signed	Projected As Built Measurement	Remarks
US 6	EB	IOWA	Culvert Sta. 389+13.21, East of County V52 in Ladora	Culvert	Barrier		Horizontal	14'-0"	13'-6"	13'-0"		
US 6	WB	IOWA	Culvert Sta. 389+13.21, East of County V52 in Ladora	Culvert	Barrier		Horizontal	14'-0"	13'-6"	13'-0"		
US 6	EB	IOWA	Culvert Sta. 760+79.00, East of County V52 in Ladora	Culvert	Barrier		Horizontal	12'-0"	11'-6"	11'-0"		
US 6	WB	IOWA	Culvert Sta. 760+79.00, East of County V52 in Ladora	Culvert	Barrier		Horizontal	12'-0"	11'-6"	11'-0"		

ESTIMATED QUANTITIES - CULVERTS


ITEM NO.	ITEM CODE	ITEM	UNIT	DESIGN 117	DESIGN 217	DESIGN 317	DESIGN 417	DESIGN 517	DESIGN 617	TOTALS	AS BUILT QUANTITY
1	2102-0425071	SPECIAL BACKFILL	CY	20	35	13	28	8	37	141	
2	2401-6750001	REMOVALS, AS PER PLAN	LS	1	1	1	1	1	1	1	
3	2402-0425030	GRANULAR BACKFILL	CY	19	88	---	---	---	72	179	
4	2402-2720000	EXCAVATION, CLASS 20	CY	222	530	61	78	46	406	1343	
5	2403-0100020	STRUCTURAL CONCRETE (RCB CULVERT)	CY	50.2	129.3	22.3	58.7	15.2	---	275.7	
6	2404-7775000	REINFORCING STEEL	LB	5667	18065	3255	8937	2166	---	38090	
7	2415-2111204	PRECAST CONCRETE BOX CULVERT, 12 FT. X 4 FT.	LF	---	---	---	---	---	44	44	
8	2415-2201204	PRECAST CONCRETE BOX CULVERT STRAIGHT END SECTION, 12 FT. X 4 FT.	EACH	---	---	---	---	---	2	2	
9	2418-0000010	TEMPORARY STREAM DIVERSION	EACH	---	1	---	---	---	1	2	

NEED INFO.

ITEM CODE ESTIMATE REFERENCE INFORMATION

- 1 RECLAIMED ASPHALT PAVEMENT (RAP) AND RECLAIMED HMA SHALL NOT BE USED FOR THE SPECIAL BACKFILL.
- 2 INCLUDES ALL WORK FOR REMOVAL AND OFF-SITE DISPOSAL AS DETAILED ON THE SITUATION PLANS. REMOVAL OF SCHEDULED ITEMS SHALL BE IN ACCORDANCE WITH SECTION 2401, OF THE STANDARD SPECIFICATIONS. ANY DAMAGE TO MATERIAL NOT TO BE REMOVED SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND REPAIRED AT NO EXTRA COST TO THE STATE.
- 3 ESTIMATED AT 1.7 TON/CY.
- 4 INCLUDES FILLING AND COMPACTING LOW AREAS AROUND PROPOSED CULVERT. INCLUDES EXCAVATION NECESSARY FOR GRANULAR BLANKET.
- 5 INCLUDES FURNISHING AND PLACING 1/8" MESH SIZE GALVANIZED HARDWARE CLOTH, ENGINEERING FABRIC, PREFORMED JOINT MATERIAL, AND POROUS BACKFILL FOR WEEPHOLES AND RETAINING WALL TO CULVERT JOINTS.
- 7 INCLUDES MATERIAL AND LABOR ASSOCIATED WITH PROVIDING AND INSTALLING THE CULVERT TIES, LIFTING HOLE PLUGS, ENGINEERING FABRIC, JOINT MATERIAL, AND GROUT AS REQUIRED.
- 8 INCLUDES MATERIAL AND LABOR ASSOCIATED WITH PROVIDING AND INSTALLING THE CULVERT TIES, LIFTING HOLE PLUGS, ENGINEERING FABRIC, JOINT MATERIAL, AND GROUT AS REQUIRED.
INCLUDES 0 DEGREE SKEW 2 PRECAST END SECTIONS, 2 PRECAST LINTEL BEAMS, AND 2 PRECAST CURTAIN WALLS.

STRUCTURAL DESIGN



I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Signature _____ Date _____
 Printed or Typed Name **Jacob J. Shaw**

My license renewal date is December 31, 2018

Pages or sheets covered by this seal: SHEETS V.I THRU V.5I

DESIGNS FOR

**RCB CULVERT EXTENSIONS
AND PRECAST CULVERT**

ESTIMATED CULVERT QUANTITIES

MULTIPLE LOCATIONS JUNE, 2017

IOWA COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

FILE NO. 31463



REVISION 11-15 - MODIFIED "DESIGN HISTORY" TABLE TO STATE "(INCLUDES THIS DESIGN)".
 REVISION 11-2016 - CHANGED THE SERIES DATE "IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2015", (WAS SERIES 2012).
 REVISION 02-2017 - CHANGED THE DESIGN STRESSES NOTE TO STATE "AASHTO LRFD" (WAS LRFD AASHTO).
 ENGLISHING\CULVERTS.DGN - 1043 - THIS SHEET REDRAWN 9-8-88

DESIGN 117					
SUMMARY OF REINFORCING STEEL					
LOCATION	QUANTITY	TOTAL			
23'-0 END SECTION	1577	1577			
HEADWALL 0° SKEW	963	963			
24'-9 END SECTION	1923	1923			
RETAINING WALLS	1110	1110			
5z1 BARS	94	94			
TOTAL (LBS.)		5667			
CONCRETE PLACEMENT QUANTITIES					
LOCATION	FOOTING	WALLS	SLAB	TOTAL	
23'-0 END SECTION	5.8	3.4	4.4	13.6	
HEADWALL 0° SKEW	4.0	1.6	0.9 *	6.5	
24'-9 END SECTION	7.2 ***	3.6	5.3**	16.1	
RETAINING WALLS	9.6	4.4	---	14.0	
TOTAL (C.Y.)		26.6	13.0	10.6	50.2

DESIGN 217					
SUMMARY OF REINFORCING STEEL					
LOCATION	QUANTITY	TOTAL			
HEADWALL 0° SKEW	3103	3103			
22'-0 BENT END SECTION	4680	4680			
21'-0 END SECTION	4863	4863			
RETAINING WALLS	5200	5200			
5z1 BARS	219	219			
TOTAL (LBS.)		18065			
CONCRETE PLACEMENT QUANTITIES					
LOCATION	FOOTING	WALLS	SLAB	TOTAL	
HEADWALL 0° SKEW	14.3	6.2	1.5 *	22.0	
22'-0 BENT END SECTION	9.9	10.2	10.8	30.9	
21'-0 END SECTION	11.8***	10.3	11.3**	33.4	
RETAINING WALLS	28.2	14.8	---	43.0	
TOTAL (C.Y.)		64.2	41.5	23.6	129.3

DESIGN 317					
SUMMARY OF REINFORCING STEEL					
LOCATION	QUANTITY	TOTAL			
17'-0 BARREL EXTENSION	1087	1087			
11'-0 BARREL EXTENSION	735	735			
HEADWALL 0° SKEW	680	680			
HEADWALL 0° SKEW	680	680			
5z1 BARS	73	73			
TOTAL (LBS.)		3255			
CONCRETE PLACEMENT QUANTITIES					
LOCATION	FOOTING	WALLS	SLAB	TOTAL	
17'-0 BARREL EXTENSION	3.8	1.5	2.9	8.2	
11'-0 BARREL EXTENSION	2.4	1.0	1.9	5.3	
HEADWALL 0° SKEW	2.8	0.7	0.9*	4.4	
HEADWALL 0° SKEW	2.8	0.7	0.9*	4.4	
TOTAL (C.Y.)		11.8	3.9	6.6	22.3

SPECIFICATIONS:

DESIGN: AASHTO LRFD 5th Ed, SERIES OF 2010.

CONSTRUCTION: IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2015, PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT.

- * INCLUDES PARAPET AND TOP OF WINGWALL.
- ** INCLUDES PARAPET
- *** INCLUDES CURTAIN WALL

DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 5th Ed, SERIES OF 2010. REINFORCING STEEL IN ACCORDANCE WITH AASHTO LRFD SECTION 5, GRADE 60. CONCRETE IN ACCORDANCE WITH AASHTO LRFD SECTION 5, f'c = 4.0 KSI.

STANDARDS:								
FOR DETAILS AND NOTES NOT SHOWN REFER TO THE FOLLOWING IOWA D.O.T. - HIGHWAY STANDARDS:								
DESIGN 117			DESIGN 417			DESIGN 617		
STANDARD	ISSUED	REVISED	STANDARD	ISSUED	REVISED	STANDARD	ISSUED	REVISED
RCB G2-12	4-12	12-16	RCB G2-12	4-12	12-16	PRCB G2-13	1-13	7-16
RCB 5-3-12	4-12	-	RCB 5-6-12	4-12	-	PRCB 12-13	1-13	-
PWH 0-1-12	4-12	12-16	PWH 0-1-12	4-12	12-16	PES 1-13-T3	1-13	7-16
PWH 0-2-12	4-12	12-16	PWH 0-2-12	4-12	12-16	PES 3-13-T3	1-13	7-16
PWH 0-3-12	4-12	7-16	PWH 0-3-12	4-12	7-16			
PWH 0-4-12	4-12	-	PWH 0-4-12	4-12	-			
PWH 0-9-12	4-12	7-16	PWH 0-9-12	4-12	7-16			

DESIGN 417					
SUMMARY OF REINFORCING STEEL					
LOCATION	QUANTITY	TOTAL			
HEADWALL 0° SKEW	2040	2040			
11'-0 END SECTION	1049	1049			
10'-0 BARREL SECTION	1152	1152			
10'-0 BARREL SECTION	1152	1152			
14'-0 END SECTION	1335	1335			
HEADWALL 0° SKEW	2040	2040			
5z1 BARS	125	125			
5r1 BARS	44	44			
TOTAL (LBS.)		8937			
CONCRETE PLACEMENT QUANTITIES					
LOCATION	FOOTING	WALLS	SLAB	TOTAL	
HEADWALL 0° SKEW	6.5	5.0	0.9 *	12.4	
11'-0 END SECTION	2.8	3.4	2.1	8.3	
10'-0 BARREL SECTION	2.5	3.1	1.9	7.5	
10'-0 BARREL SECTION	2.5	3.1	1.9	7.5	
14'-0 END SECTION	3.5	4.4	2.7	10.6	
HEADWALL 0° SKEW	6.5	5.0	0.9 *	12.4	
TOTAL (C.Y.)		24.3	24.0	10.4	58.7

DESIGN 517					
SUMMARY OF REINFORCING STEEL					
LOCATION	QUANTITY	TOTAL			
17'-0 BARREL EXTENSION	1235	1235			
HEADWALL 0° SKEW	889	889			
5z1 BARS	42	42			
TOTAL (LBS.)		2166			
CONCRETE PLACEMENT QUANTITIES					
LOCATION	FOOTING	WALLS	SLAB	TOTAL	
17'-0 BARREL EXTENSION	3.8	2.5	2.9	9.2	
HEADWALL 0° SKEW	3.5	1.6	0.9*	6	
TOTAL (C.Y.)		7.3	4.1	3.8	15.2

DESIGN HISTORY AT THIS SITE	
(INCLUDES THIS DESIGN)	
DES. NO.	TYPE OF WORK
X	X
X	X
X	X
X	X
X	X
X	NO INFORMATION AVAILABLE

DESIGNS FOR
RCB CULVERT EXTENSIONS AND PRECAST CULVERT CULVERT QUANTITIES
 MULTIPLE LOCATIONS JUNE, 2017
IOWA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 FILE NO. 31463



REVISED 11-2016 - ADDED THE WORD "THEREFORE" TO THE PARAGRAPH STATING THE HIGHWAY WILL NOT BE CLOSED, IN THE GENERAL NOTES.
 REVISED 02-2017 - UPDATED THE PARAGRAPH STATING THE HIGHWAY WILL NOT BE CLOSED, IN THE GENERAL NOTES TO MATCH WHAT IS WORDED IN THE DESIGN MANUAL. UPDATED PARAGRAPH DISCUSSING THE REMOVAL OF EXISTING CULVERT.
 ENGLISHINGLECULVERTS.DGN - 1043s2 - THIS SHEET ISSUED 10-08.

GENERAL NOTES:

IT IS THE INTENT OF THIS DESIGN TO EXTEND AND REPLACE MULTIPLE EXISTING REINFORCED CONCRETE BOX CULVERTS AS DETAILED ON THE INDIVIDUAL SITUATION PLANS. ELECTRONIC COPIES OF ORIGINAL DESIGN PLANS ARE AVAILABLE TO THE CONTRACTOR AS PART OF THE E-FILES SUPPLIED WITH THE CONTRACT DOCUMENTS. DIMENSIONS SHOWN ON THESE PLANS ARE BASED ON DESIGN PLANS (ORIGINAL DESIGN NO. -----). FAIN T LINES ON PLANS INDICATE EXISTING STRUCTURE.

NO INFORMATION AVAILABLE

UTILITY COMPANIES AND MUNICIPALITIES WHOSE FACILITIES ARE SHOWN ON THE PLANS OR KNOWN TO BE WITHIN THE CONSTRUCTION LIMITS SHALL BE NOTIFIED BY THE CONTRACTOR OF THE CONSTRUCTION STARTING DATE.

THE R.C.B. CULVERT EXTENSION SECTIONS ARE DESIGNED FOR HL-93 LIVE LOAD AND EARTH FILLS AS STATED ON THE INDIVIDUAL SITUATION PLANS. THIS DESIGN IS BASED ON LOAD AND RESISTANCE FACTOR DESIGN, ACCORDING TO THE 2010 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.

VERTICAL EARTH PRESSURE, $E_v=0.120$ kcf.
 HORIZONTAL EARTH PRESSURE, $E_{Hmax} = 0.060$ kcf MAX, $E_{Hmin} = 0.030$ kcf.

THE CONTRACTOR MAY SUBMIT ALTERNATE FROST TROUGH DIMENSIONS FOR APPROVAL. ANY ADDITIONAL COSTS DUE TO CHANGE IN THE FROST TROUGH DIMENSIONS IS TO BE PAID FOR BY THE CONTRACTOR.

FLOOR OF BARREL IS TO BE FINISHED SMOOTH. SIDES OF FOOTING ARE TO BE FORMED TO INSURE CORRECT LINE AND GRADE.

THE PERMISSIBLE CONSTRUCTION JOINT AT THE TOP OF THE WALLS MAY BE LOWERED AT THE CONTRACTOR'S OPTION WITH ENGINEER'S APPROVAL.

THE VERTICAL BARS IN THE WALLS MAY BE SPLICED ABOVE THE FOOTING AT THE CONTRACTOR'S OPTION AS FOLLOWS:

BAR SIZE NUMBER	4	5	6	7	8
MINIMUM SPLICE LENGTH	21"	26"	31"	41"	54"

THIS SPLICE, IF USED WILL BE AT THE CONTRACTOR'S EXPENSE.
 METAL BAR CHAIRS SPACED AT NOT OVER 3'-0 C.-C. IN EITHER DIRECTION ARE TO BE USED TO SUPPORT ALL SLAB AND FLOOR STEEL AS OUTLINED IN THE STANDARD SPECIFICATIONS.

THE REINFORCEMENT SUPPLIED FOR THIS STRUCTURE SHALL BE GRADE 60. REINFORCING BAR CLEARANCES WILL BE AS FOLLOWS:

EDGE CLEARANCES: 2" EXCEPT
 TOP OF FLOOR 2 1/4" TO NEAR TRANSV. REINF. BAR
 BOTTOM OF FLOOR 3 1/2" TO NEAR TRANSV. REINF. BAR
 END CLEARANCES:
 VERTICAL TOP 2"
 VERTICAL BOTTOM 3" OR 3 1/2" IF OVERALL HEIGHT OF THE CULVERT IS NOT TO A FULL INCH
 TRANSVERSE 2"

ALL REINFORCING BARS AND BARS NOTED AS DOWELS SUPPLIED FOR THIS STRUCTURE SHALL BE DEFORMED REINFORCEMENT UNLESS OTHERWISE NOTED OR SHOWN. CLASS 20 EXCAVATION MATERIAL UNSUITABLE FOR BACKFILLING SHALL BE DISPOSED OF IN A MANNER THAT WILL LEAVE THE SITE IN A NEAT CONDITION.

THE PRICE BID FOR "REMOVALS AS PER PLAN" SHALL INCLUDE THE COST FOR REMOVALS OF PORTIONS OF THE EXISTING CULVERT AS DETAILED ON THE INDIVIDUAL SITUATION PLANS, AND THE SETTING OF THE DOWEL REINFORCING BARS INTO EXISTING CONCRETE.

ALL DIMENSIONS AND DETAILS SHOWN ON THESE PLANS PERTINENT TO NEW CONSTRUCTION IN RELATION TO EXISTING PORTIONS OF THE STRUCTURE SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR BEFORE STARTING CONSTRUCTION.

THE REMOVAL OF THE EXISTING CULVERT SHALL BE AT THE FRONT FACE OF THE EXISTING PARAPET. REMOVALS SHALL BE ON A VERTICAL PLANE PARALLEL WITH THE FRONT FACE OF THE EXISTING PARAPET, AND TO THE WIDTH OF THE FLOOR OF THE PROPOSED EXTENSION. THE WALLS SHALL BE CUT NORMAL TO THE BARREL WALLS AND AS SHOWN ON THE "PART REMOVAL PLAN". THE REMOVAL LINE SHALL BE INITIATED WITH A 2 1/2"± DEEP SAW CUT ON THE TOP AND BOTH SIDES OF EACH WALL, AND ACROSS THE TOP OF THE FLOOR. THIS SAW CUT SHOULD CUT THRU ANY EXISTING LONGITUDINAL REINFORCING THEREBY FACILITATING A NEAT NON-SPALLED BREAK LINE. IF EXISTING TOP OF PARAPETS WILL BE WITHIN 0'-6 OF PROPOSED SUBGRADE ELEVATION, THE PARAPETS SHALL BE REMOVED DOWN TO AN ELEVATION 1"± ABOVE THE TOP OF THE EXISTING SLAB. ANY EXISTING PARAPET VERTICAL BARS EXPOSED DURING PARAPET REMOVAL SHALL BE CUT OFF FLUSH WITH THE PARAPET REMOVAL LINE AND PAINTED WITH TWO COATS OF ZINC RICH PAINT.

ALL REMOVALS SHALL BE CAREFULLY ACCOMPLISHED AND ANY CONCRETE DAMAGED BY THE CONTRACTOR THAT IS NOT TO BE REMOVED SHALL BE REPAIRED BY THE CONTRACTOR AT NO EXTRA COST TO THE STATE. REMOVALS SHALL BE IN ACCORDANCE WITH SECTION 2401 OF THE STANDARD SPECIFICATIONS.

THE PROPOSED CULVERT EXTENSION SHALL ABUT AGAINST THE FRONT FACE OF THE EXISTING PARAPET. 5z1 x 2'-6 DOWEL REINFORCING BARS WITH A 10" MINIMUM EMBEDMENT INTO EXISTING CONCRETE SHALL BE SET AROUND THE ENTIRE PERIPHERY OF THE EXISTING CULVERT. 5z1 DOWEL REINFORCING BARS SHALL BE CENTERED IN THE EXISTING SLAB, WALLS AND FLOOR. 5z1 DOWEL REINFORCING BARS SHALL BE AT 1'-0 MAXIMUM SPACING C.-C. OF DOWELS. 5z1 DOWEL REINFORCING BARS SHALL BE SET WITH POLYMER GROUT IN ACCORDANCE WITH ARTICLE 2301.03, E, OF THE STANDARD SPECIFICATIONS, AND CURRENT SUPPLEMENTAL SPECIFICATIONS OF THE IOWA D.O.T. HIGHWAY DIVISION.

THE ROADWAY WILL BE OPEN TO TRAFFIC DURING CONSTRUCTION. SINCE THE HIGHWAY WILL NOT BE CLOSED TO TRAFFIC DURING THIS CONSTRUCTION, THE CONTRACTOR MAY FEEL TEMPORARY SHORING (SHEET PILE OR OTHER) IS NECESSARY TO ENSURE THAT THE SHOULDER WILL NOT SLOUGH IN WHILE CULVERT IS BEING EXTENDED. HOWEVER, IF FOR ANY REASON SUCH SHORING IS DEEMED NECESSARY, THE CULVERT CONTRACTOR SHALL SUBMIT THE SHORING PLAN TO THE ENGINEER FOR APPROVAL. COST OF SHORING, IF REQUIRED, WILL BE CONSIDERED INCIDENTAL TO CONSTRUCTION AND NO DIRECT PAYMENT WILL BE MADE. THEREFORE, ALL MATERIAL USED FOR SHORING SHALL REMAIN THE PROPERTY OF THE CONTRACTOR. IN ADDITION TO THE REQUIREMENTS NOTED ABOVE, ARTICLE 1107.07, OF THE STANDARD SPECIFICATIONS, STILL APPLIES.

KEYWAY DIMENSIONS SHOWN ON THE PLANS ARE BASED ON NOMINAL DIMENSIONS UNLESS STATED OTHERWISE. IN ADDITION, THE BEVEL USED ON THE KEYWAY SHALL BE LIMITED TO A MAXIMUM OF 10 DEGREES FROM VERTICAL.

THESE BRIDGE PLANS LABEL ALL REINFORCING STEEL WITH ENGLISH NOTATION (501 IS 1/2 INCH DIAMETER BAR). ENGLISH REINFORCING STEEL RECEIVED IN THE FIELD MAY DISPLAY THE FOLLOWING "BAR DESIGNATION". THE "BAR DESIGNATION" IS THE STAMPED IMPRESSION ON THE REINFORCING BARS, AND IS EQUIVALENT TO THE BAR DIAMETER IN MILLIMETERS.

ENGLISH SIZE	3	4	5	6	7	8	9	10	11
BAR DESIGNATION	10	13	16	19	22	25	29	32	36

TRAFFIC WILL BE MAINTAINED AT ALL TIMES IN ACCORDANCE WITH THE TRAFFIC CONTROL PLANS SHOWN IN THESE PLANS.

ANY DIMENSIONAL TRANSITION REQUIRED BETWEEN EXISTING STRUCTURE AND THE EXTENSION SHALL BE MADE IN THE FIRST 3'-0 OF NEW WORK WITH A TRANSITION SLOPE OF 1:6 OR SHALLOWER.

WHEN DE-WATERING PRESENTS A PROBLEM FOR PLACING THE CURTAIN WALLS AS DETAILED, ALTERNATE METHODS SUCH AS STEEL SHEET PILE AND PRECAST CONCRETE WALLS MAY BE APPROVED BUT AT NO ADDITIONAL COST. THE CONTRACTOR IS TO SUBMIT TO THE ENGINEER FOR APPROVAL COMPLETE DRAWINGS OF THE PROPOSED CURTAIN WALL ALTERNATE BEFORE BEGINNING CONSTRUCTION.

ALL CONSTRUCTION JOINTS ARE TO BE FORMED WITH BEVELED 2x4 KEYWAYS, UNLESS NOTED OTHERWISE.

ALL EXPOSED CORNERS 90 DEGREES OR SHARPER TO BE FILLETED WITH A 3/4" DRESSED AND BEVELED STRIP.

ALL REINFORCING STEEL IS TO BE SECURELY WIRED IN PLACE BEFORE THE CONCRETE IS POURED.

A MINIMUM DEPTH OF FILL OF 4' ABOVE THE BOTTOM OF THE FOOTING IS REQUIRED ALONG THE FRONT FACE OF THE RETAINING WALL. THE CONTRACTOR SHALL PLACE FILL IN ACCORDANCE WITH SECTION 2402.03, H, OF THE SPECIFICATIONS. ALL EQUIPMENT, MATERIAL AND LABOR REQUIRED FOR PLACEMENT AND COMPACTION OF FILL SHALL BE CONSIDERED INCIDENTAL TO "EXCAVATION, CLASS 20."

STRUCTURAL CONCRETE FOR RETAINING WALL AND FOOTING SHALL BE CLASS "C". NO SOILS INFORMATION WAS PROVIDED FOR THESE SITES. THE RETAINING WALLS WERE DESIGNED BASED ON AN ASSUMED NOMINAL BEARING RESISTANCE FOR THE RETAINING WALL FOOTING OF 5.0 KSF (SERVICE AND FACTORED LRFD STRENGTH I LIMIT STATE).

FOOTING SHALL BEAR UPON FIRM UNDISTURBED SOIL. CONCRETE SHALL NOT BE PLACED ON SOFT, MUDDY, OR FROZEN SUB-GRADE. IF AREAS OF BEARING MATERIAL ARE DESIGNATED UNSUITABLE BY THE ENGINEER, FOR THE ASSUMED NOMINAL BEARING CAPACITY, OVER-EXCAVATION AND BACKFILL SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 2402.03, C, OF THE SPECIFICATIONS.

SHEAR KEY EXCAVATION SHOULD BE PERFORMED TO CREATE A 1'x1' SQUARE KEY AT THE LOCATION SHOWN. CONCRETE SHALL BE CAST DIRECTLY AGAINST UNDISTURBED EARTH; NO CONCRETE FORMS SHALL BE USED.

BACKFILLING OPERATIONS SHALL BE IN ACCORDANCE WITH SECTION 2402.03.H OF THE STANDARD SPECIFICATIONS. SECTION 2403.03.N SHALL BE FOLLOWED WITH RESPECT TO SUBJECTING WALLS AND FOOTINGS TO EXTERIOR LOADS.

ALL COSTS ASSOCIATED WITH THE RETAINING WALL TO CULVERT JOINTS, INCLUDING ALL PREFORMED JOINT MATERIAL, BITUMINOUS MATERIAL, ENGINEERING FABRIC SHALL BE CONSIDERED INCIDENTAL TO THE PRICE BID FOR "STRUCTURAL CONCRETE (RCB CULVERT)".

IT SHALL BE THE BRIDGE CONTRACTOR'S RESPONSIBILITY TO PROVIDE SITES FOR EXCESS EXCAVATED MATERIAL. NO PAYMENT FOR OVERHAUL WILL BE ALLOWED FOR MATERIAL HAULED TO THESE SITES.

CONSTRUCTION SHALL BE DONE IN STAGES WITH AT LEAST ONE LANE TRAFFIC MAINTAINED AT ALL TIMES IN ACCORDANCE WITH "TRAFFIC CONTROL PLAN" NOTE.

CONSTRUCTION STAGES I & II AS DETAILED ON THESE PLANS MAY BE REVERSED AT THE CONTRACTOR'S OPTION SUBJECT TO THE ENGINEER'S APPROVAL.

THE CLASS 20 EXCAVATION QUANTITY IS BASED ON THE ASSUMPTION THAT AT THE START OF CULVERT CONSTRUCTION, THE EXISTING GROUNDLINE SHOWN ON THE "SITUATION PLAN" ON DESIGN HAS REMAINED UNDISTURBED AND NO ROADWAY FILL HAS BEEN PLACED.

EXCEPT FOR DOWEL BARS 5r1, LONGITUDINAL REINFORCING IS NOT TO EXTEND THRU THE CONSTRUCTION JOINTS.

PRECAST NOTES:

THE PRECAST RCB CULVERT SECTIONS ARE DESIGNED FOR HL-93 LIVE LOAD AND EARTH FILLS OF VARYING HEIGHTS.

VERTICAL EARTH PRESSURE, $E_v=0.120$ kcf.
 HORIZONTAL EARTH PRESSURE, $E_{Hmax} = 0.060$ kcf MAX, $E_{Hmin} = 0.030$ kcf.
 THE PRECAST RCB CULVERT SECTIONS ARE DESIGNED FOR CLASS 2 EXPOSURE CONDITIONS.

THE CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR EDGE OR END OF REINFORCING BAR TO BE 1 1/2" MIN. AND 2" MAX. UNLESS OTHERWISE NOTED.

THE REINFORCEMENT SUPPLIED FOR THIS STRUCTURE SHALL BE PLAIN AND/OR DEFORMED WELDED WIRE REINFORCEMENT (WWR) $F_y = 65$ ksi, AND/OR GRADE 60 REINFORCING STEEL IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. THE REINFORCEMENT AREAS ARE BASED ON WELDED WIRE REINFORCEMENT. IF REINFORCING BARS ARE SUBSTITUTED FOR WELDED WIRE REINFORCEMENT, THE REINFORCEMENT AREAS SHALL BE INCREASED BY 8%. THE BARREL SECTIONS IN THESE STANDARDS WERE DESIGNED WITH PLAIN WWR, $F_y = 65$ ksi.

ALL DIMENSIONS ARE IN FEET AND INCHES UNLESS OTHERWISE NOTED OR SHOWN. ANY OF THE FOLLOWING COMBINATIONS OF REINFORCEMENT MAY BE USED:

- A. 1 OR 2 LAYERS OF WELDED WIRE REINFORCEMENT OR
- B. 1 LAYER OF WELDED WIRE REINFORCEMENT AND 1 LAYER OF REINFORCEMENT BARS OR
- C. 1 LAYER OF REINFORCEMENT BARS.

THE REINFORCEMENT SHALL BE DEVELOPED IN ACCORDANCE WITH AASHTO LRFD SPECIFICATIONS.

THE MAXIMUM SIZE OF REINFORCEMENT BARS SHALL BE #6, EXCEPT FOR PARAPET REINFORCEMENT AS DETAILED.

THE MAXIMUM WELDED WIRE REINFORCEMENT SIZE SHALL BE A W23/D23 PER LAYER (MAXIMUM OF 2 LAYERS).

THE SPACING CENTER TO CENTER OF THE TRANSVERSE WIRES OR BARS SHALL NOT BE LESS THAN 2" NOR MORE THAN 4". THE SPACING CENTER TO CENTER OF THE LONGITUDINAL WIRES OR BARS SHALL NOT BE MORE THAN 8".

WELDING WILL NOT BE ALLOWED ON REINFORCEMENT BARS OR WELDED WIRE REINFORCEMENT, EXCEPT THAT THE ORIGINAL WELDING REQUIRED TO MANUFACTURE THE WIRE REINFORCEMENT IS ACCEPTABLE.

WHEN REINFORCEMENT IS CUT, ADDITIONAL REINFORCEMENT SHALL BE ADDED ON BOTH SIDES OF THE CUT MEMBER TO REPLACE OR EXCEED THE CUT REINFORCEMENT.

BOXCAR SOFTWARE VERSION 3.1 WAS USED FOR THE DESIGN OF THE BARREL SECTIONS FOR THESE STANDARDS.

THE FIRST PRECAST BARREL SECTION ADJACENT TO THE OUTLET PRECAST END SECTION MAY BE A DOUBLE GROOVE BARREL TO FACILITATE PLACEMENT OF OUTLET END SECTIONS AND ALLOW INLET AND OUTLET END SECTIONS TO BE SIMILAR.

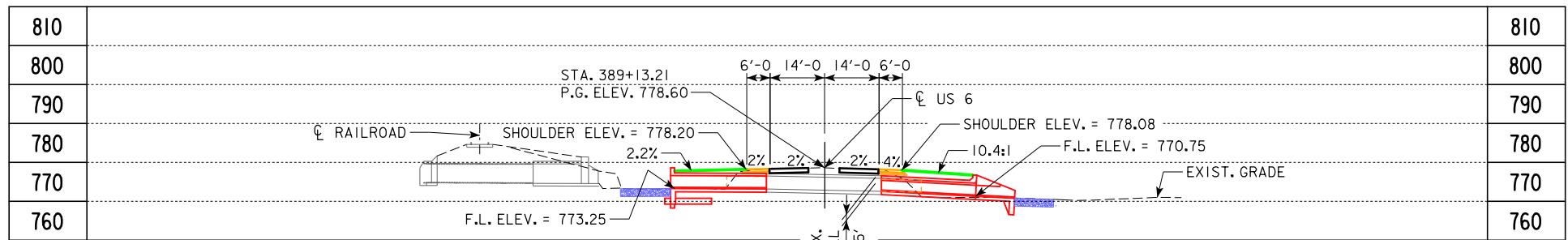
TRAFFIC CONTROL PLAN
 NOTE: THE ROADWAY WILL BE OPEN TO THRU TRAFFIC. REFER TO THE TRAFFIC CONTROL PLAN ON THE ROAD PLANS IN THESE PLANS.

NOTE:
 POLLUTION PREVENTION PLAN SHOWN ELSEWHERE IN THESE PLANS.

NOTE:
 ROADWAY QUANTITIES SHOWN ELSEWHERE IN THESE PLANS.

DESIGNS FOR
**RCB CULVERT EXTENSIONS
 AND PRECAST CULVERT
 GENERAL CULVERT DETAILS**
 MULTIPLE LOCATIONS JUNE, 2017
IOWA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 FILE NO. 31463





LONGITUDINAL SECTION ALONG CL CULVERT
DESIGN FILL HEIGHT = 3'-0"
ANTICIPATED SETTLEMENT = NEGLIGIBLE

NOTES:

IT IS THE INTENT OF THIS DESIGN TO EXTEND THE EXISTING 5' x 3' REINFORCED CONCRETE BOX CULVERT WITH CMP ENDS BY REMOVING THE CMP ENDS AND EXISTING HEADWALL AS REQUIRED AND ADDING A 5' x 3' x 23' REINFORCED CONCRETE BOX CULVERT EXTENSION WITH HEADWALL ON THE SOUTH END, AND A 5' x 3' x 23'-9 REINFORCED CONCRETE BOX CULVERT EXTENSION WITH RETAINING WALLS ON THE NORTH END.

THE RCB CULVERT EXTENSION IS DESIGNED FOR EARTH FILLS OF 3 FEET.

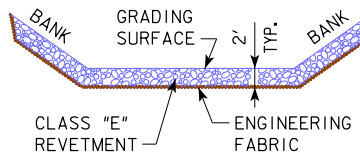
ALL UNITS ARE IN FEET UNLESS OTHERWISE NOTED OR SHOWN.

SEE ROAD SHEETS FOR ADDITIONAL INFORMATION ON PROPOSED GRADING LIMITS.

DRAINAGE THROUGH EXISTING CULVERT/CHANNEL MUST BE MAINTAINED THROUGHOUT CONSTRUCTION.

LIMITS OF EASEMENT TO BE DETERMINED.

HEADWALLS SHALL BE PLACED LEVEL.



ESTIMATED REVETMENT QUANTITIES INCLUDED WITH ROAD PLANS

LOCATION	REVETMENT CL. "E" (TON)	ENGINEERING FABRIC (SY)
INLET	23.4	34.3
OUTLET	21.9	39.4
TOTALS	45.3	73.7

HYDRAULIC DATA

DRAINAGE AREA = 48.2 ACRES
Q₅₀ = 247 CFS
ROLLING

UTILITIES LEGEND:

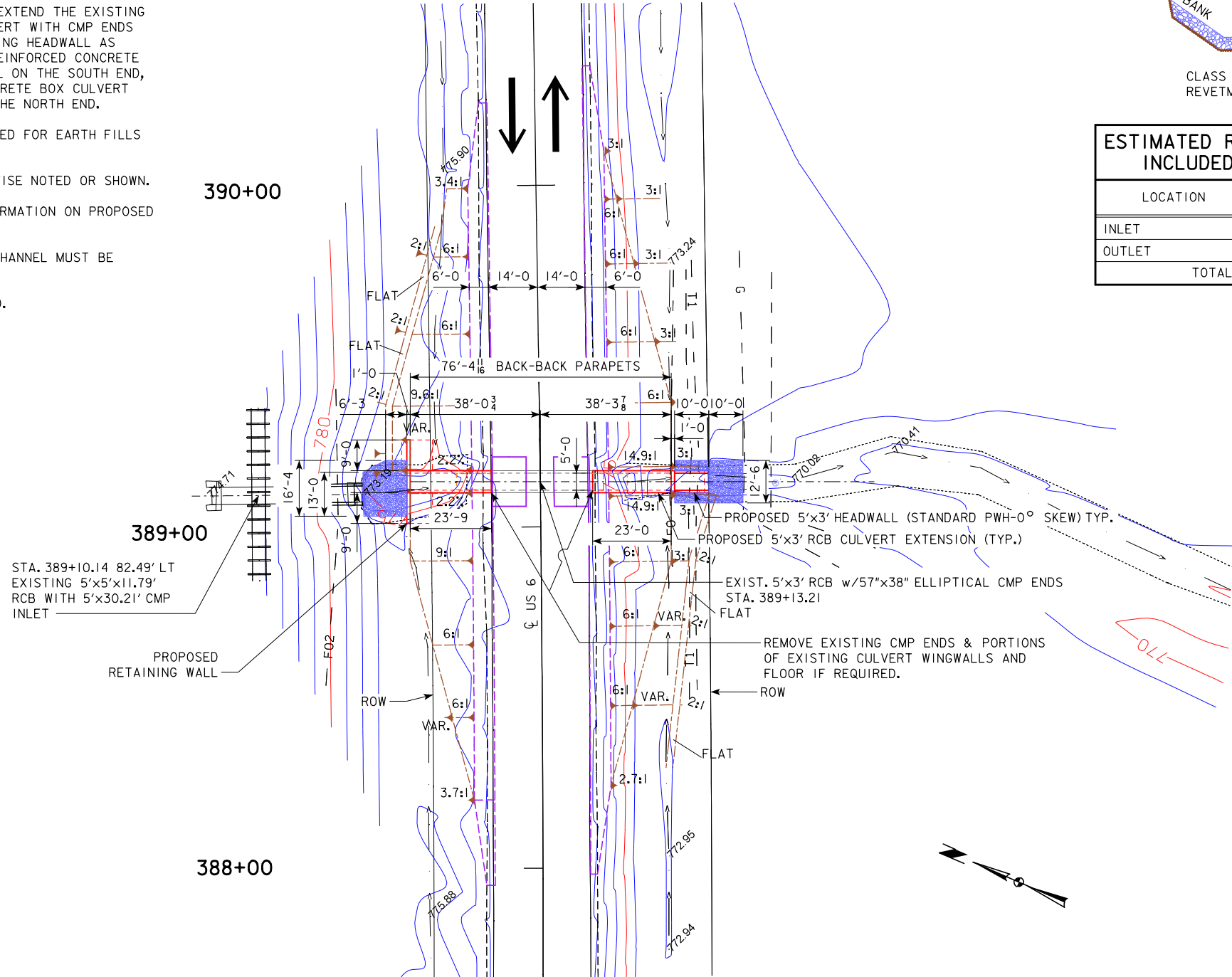
- T1 - COOPERATIVE TELEPHONE COMPANY
- F0 - IOWA NETWORK SERVICES
- G - ALLIANT ENERGY
- F02 - MCI
- F03 - MEDIACOM
- T2 - WINDSTREAM COMMUNICATIONS
- F04 - SOUTH SLOPE COOPERATIVE

LOCATION

ON US 6 OVER
DRAINAGE DITCH
T-80N R-11W
SECTION 7
SUMNER TOWNSHIP
IOWA COUNTY
LATITUDE 41.757539
LONGITUDE -92.174761

TRAFFIC ESTIMATE

2014 AADT 1500 V.P.D.

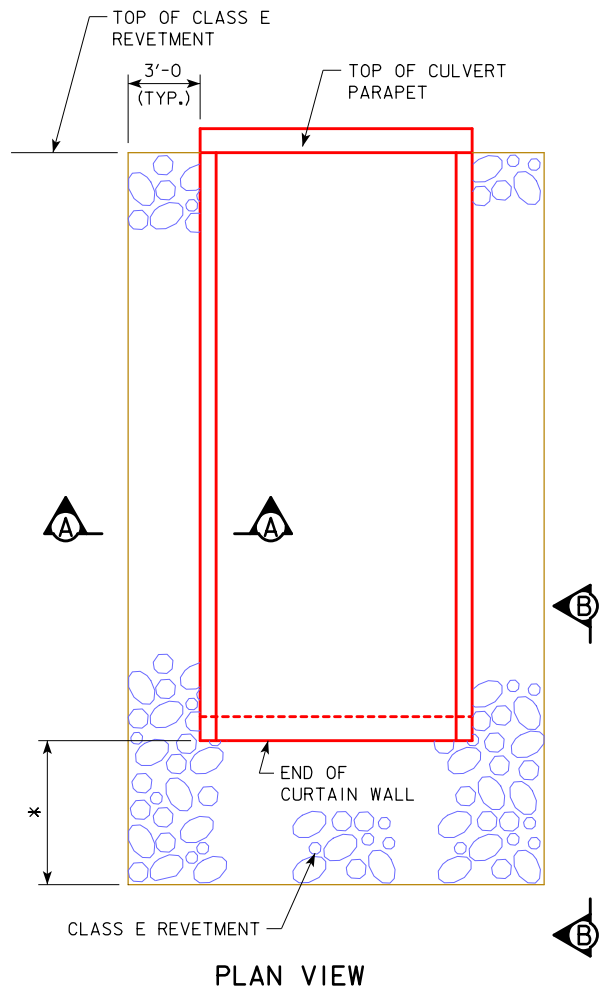


SITUATION PLAN

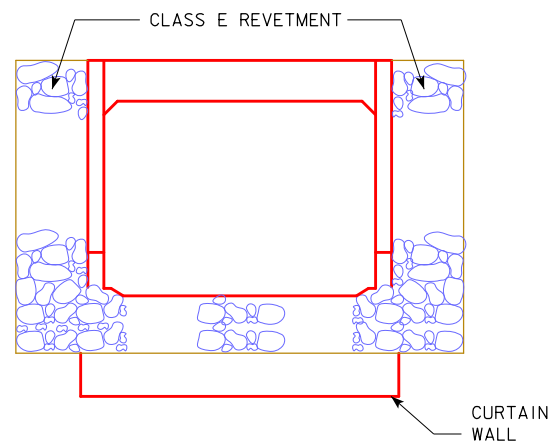
DESIGN FOR 0°
5'x3' REINFORCED CONCRETE BOX CULVERT EXTENSION
SITUATION PLAN
STATION 389+13.21 (US 6) JUNE, 2017
IOWA COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 1 OF 6 FILE NO. 31463 DESIGN NO. 117



* = SEE SITUATION PLAN FOR LIMITS OF REVETMENT AND ENGINEERING FABRIC.

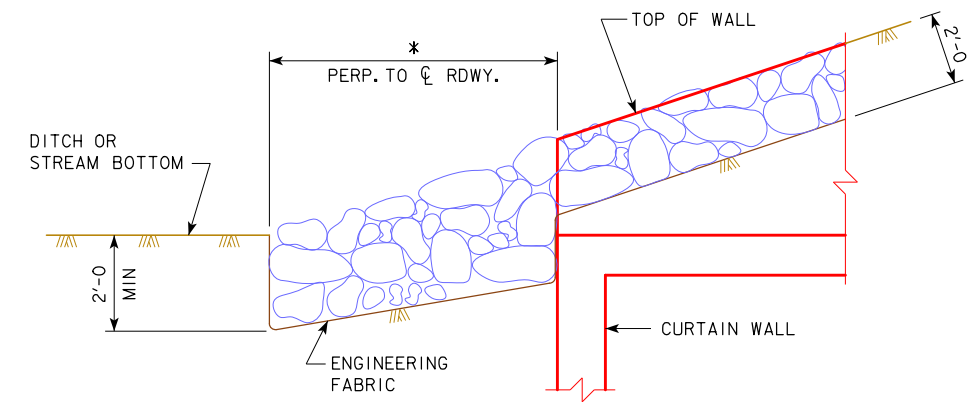


PLAN VIEW

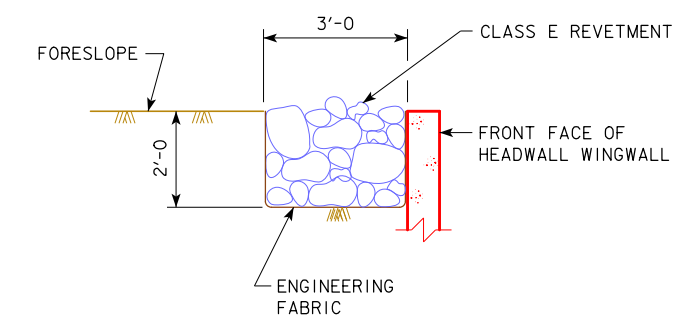


ELEVATION VIEW
0° SKEW HEADWALLS

* = SEE SITUATION PLAN FOR LIMITS OF REVETMENT AND ENGINEERING FABRIC.



VIEW B-B



SECTION A-A

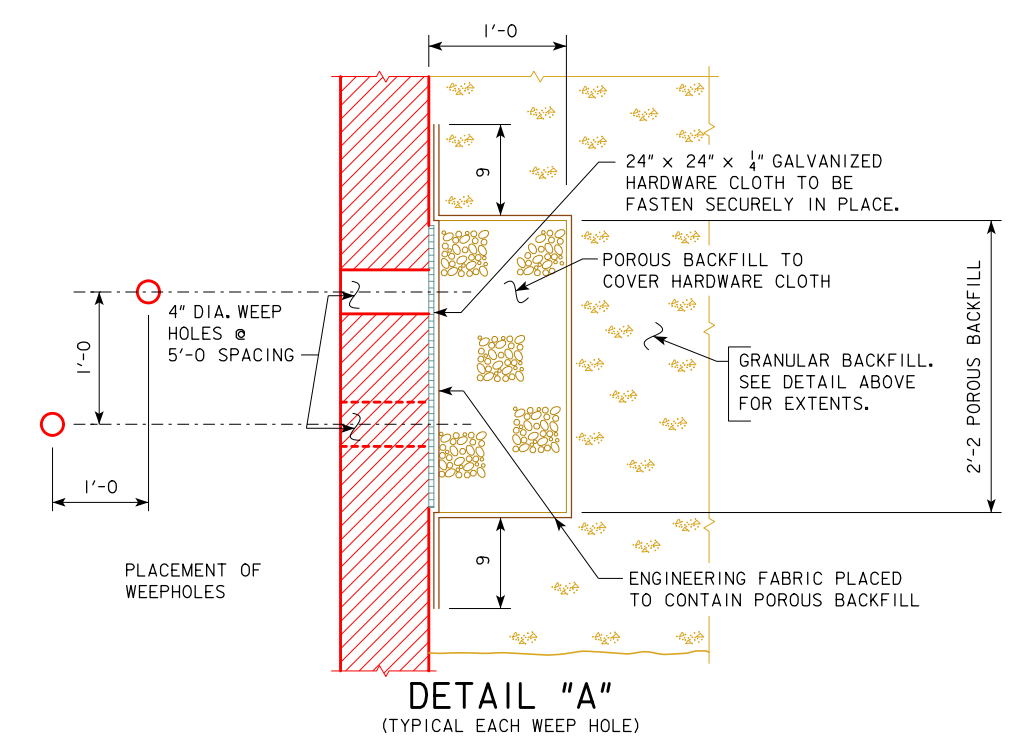
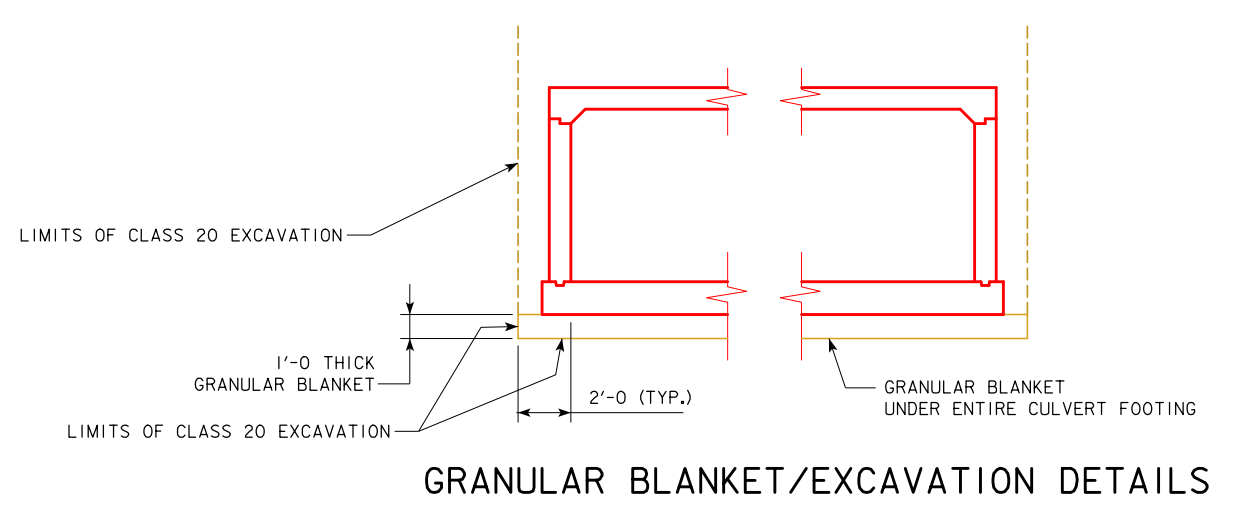
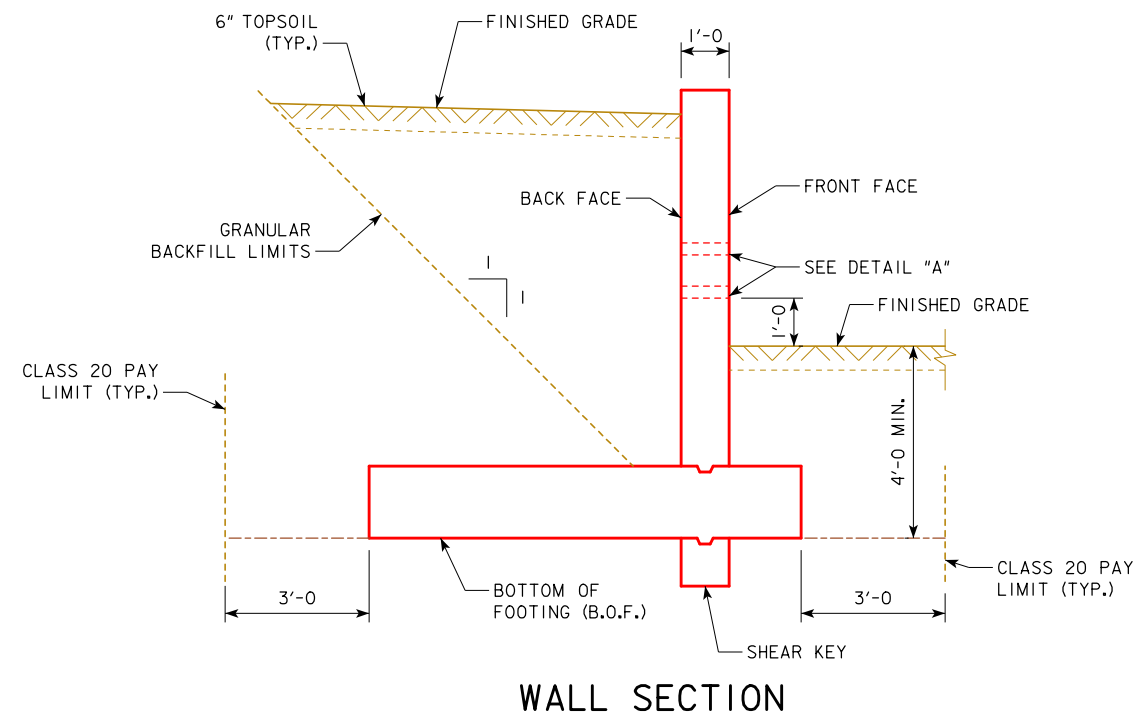
TYPICAL DETAILS

CONSTRUCTION NOTES:

CLASS E REVETMENT SHALL BE USED AND PLACED ACCORDING TO ARTICLE 2507.03, OF THE STANDARD SPECIFICATIONS.
THE ENGINEERING FABRIC SHALL MEET THE MATERIAL REQUIREMENTS IN ACCORDANCE WITH ARTICLE 4196.01, B, 3, OF THE STANDARD SPECIFICATIONS.

DESIGN FOR 0°
**5'x3' REINFORCED CONCRETE
 BOX CULVERT EXTENSION**
REVETMENT PROTECTION DETAILS
 STATION 389+13.21 (US 6) JUNE, 2017
IOWA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 2 OF 6 FILE NO. 31463 DESIGN NO. 117

REVISED 1-16 - ADDED NOTE "SEE CULVERT PLANS FOR LIMITS OF REVETMENT AND ENGINEERING FABRIC."
 REVISED 02-2017 - ADDED SECTION DIRECTORS "A-A" TO "ZERO SKEW" PLAN VIEW DETAIL.
 ENGLISHING\INGLCULVERTS.DGN - 1092 - THIS SHEET ISSUED 04-12.



ENGINEERING FABRIC TO BE SECURELY ATTACHED WITH ADHESIVE TO PERIMETER CONCRETE ON THE OUTSIDE OF HARDWARE CLOTH AND TO THE LIMITS SHOWN FOR THE POROUS BACKFILL. THIS COST TO BE INCLUDED IN THE PRICE BID FOR STRUCTURAL CONCRETE (RCB CULVERT).

24" x 24" x 1/4" MESH SIZE GALVANIZED HARDWARE CLOTH CENTERED ON WEEPHOLES. HARDWARE CLOTH, IN ACCORDANCE WITH ASTM A740, TO BE FIRMLY ATTACHED TO CONCRETE ON OUTSIDE FACE OF WALLS. THIS COST TO BE INCLUDED IN PRICE BID FOR STRUCTURAL CONCRETE (RCB CULVERT).

DESIGN FOR 0°

5'x3' REINFORCED CONCRETE BOX CULVERT EXTENSION

MISCELLANEOUS WALL DETAILS

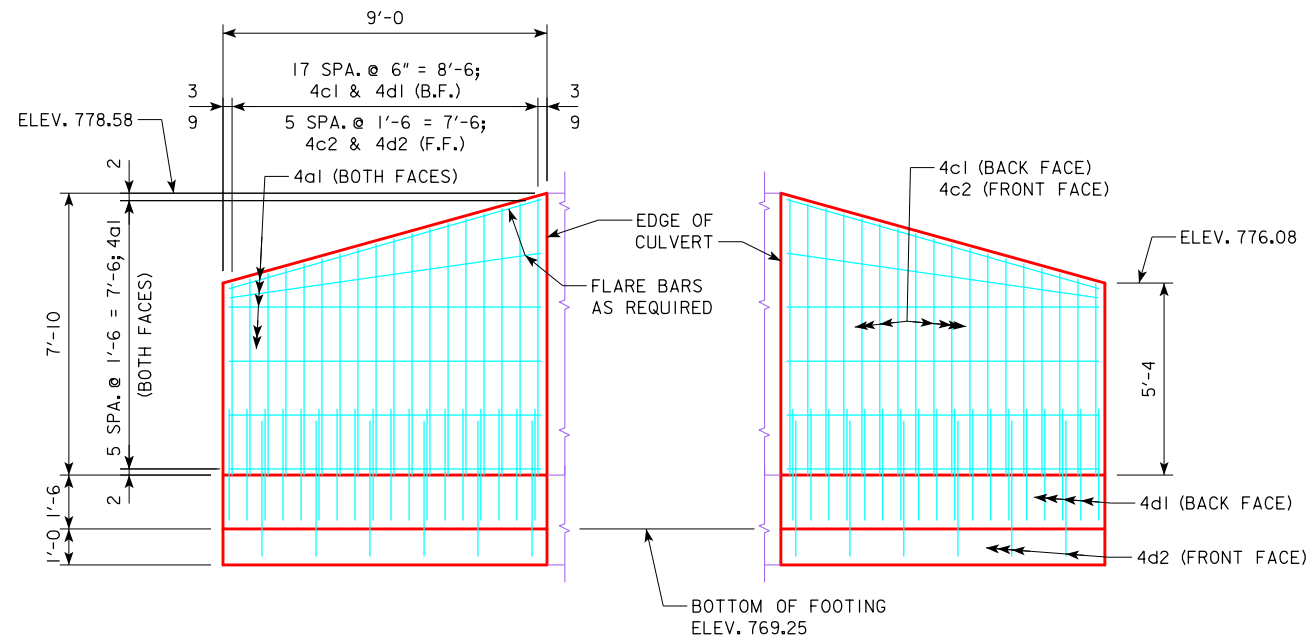
STATION 389+13.21 (US 6) JUNE, 2017

IOWA COUNTY

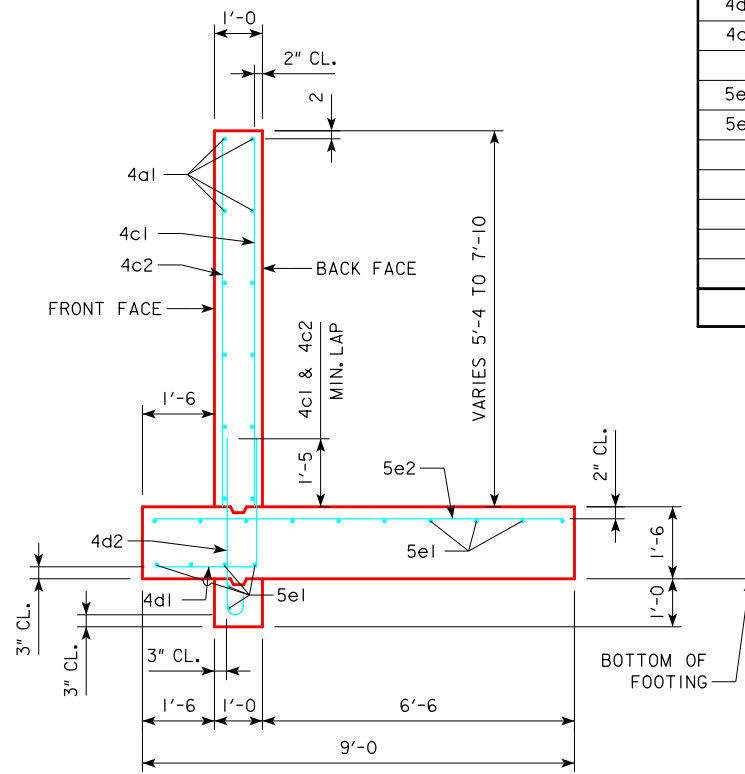
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 3 OF 6 FILE NO. 31463 DESIGN NO. 117

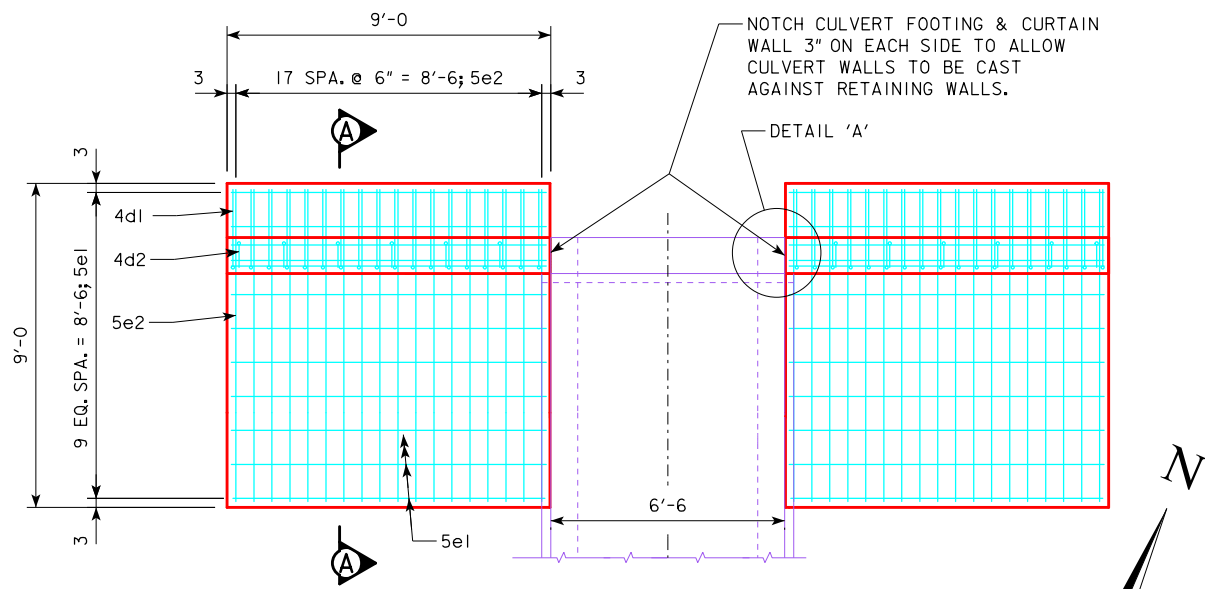




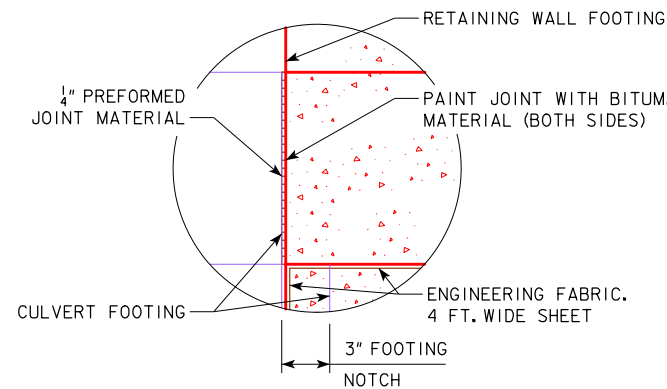
RETAINING WALL REINFORCING ELEVATION
(WALLS ARE SYMMETRICAL ABOUT C OF CULVERT)



SECTION A-A



RETAINING WALL PLAN
(FOOTINGS ARE IDENTICAL)



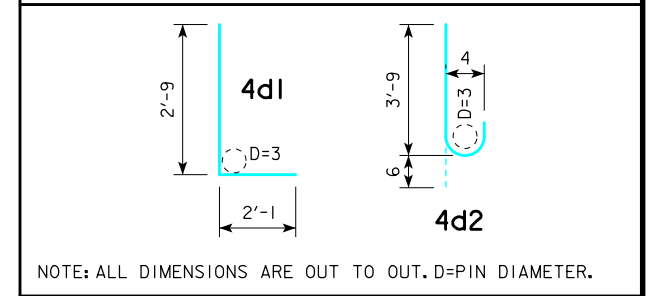
DETAIL 'A'

ENGINEERING FABRIC TO BE SECURELY ATTACHED WITH ADHESIVE TO THE CONCRETE ALONG THE FULL HEIGHT OF THE CULVERT WALL. INCLUDE THE COST OF ENGINEERING FABRIC & PREFORMED JOINT MATERIAL IN THE PRICE BID FOR "STRUCTURAL CONCRETE (RCB CULVERT)"

REINFORCING BAR LIST-ONE RETAINING WALL

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
4a1	WALL HORIZONTAL, BOTH FACES	—	12	8'-8	69
4c1	WALL, VERTICAL, BACK FACE	—	18	1 EACH 5'-2 TO 7'-8	77
4c2	WALL, VERTICAL, FRONT FACE	—	6	1 EACH 5'-2 TO 7'-8	26
4d1	WALL, VERTICAL, DOWEL, BACK FACE	—	18	4'-10	58
4d2	WALL, VERTICAL, DOWEL, FRONT FACE	—	6	4'-3	17
5e1	FOOTING & SHEAR KEY, LONGITUDINAL	—	16	8'-8	145
5e2	FOOTING HORIZONTAL, TOP	—	18	8'-8	163
REINFORCING STEEL - TOTAL (LBS.)					555

BENT BAR DETAILS



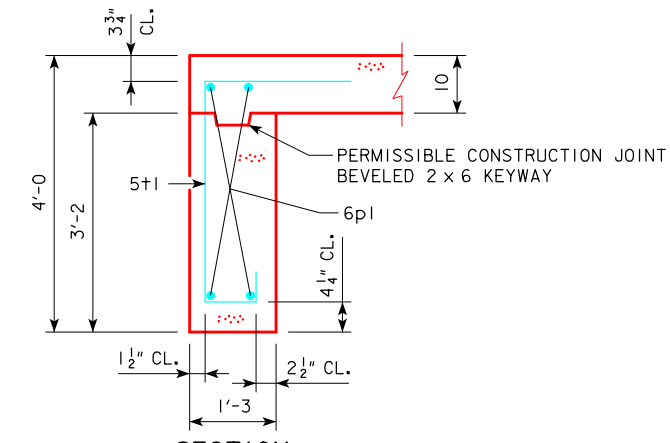
NOTE: ALL DIMENSIONS ARE OUT TO OUT. D=PIN DIAMETER.

CONCRETE PLACEMENT QUANTITIES ONE RETAINING WALL

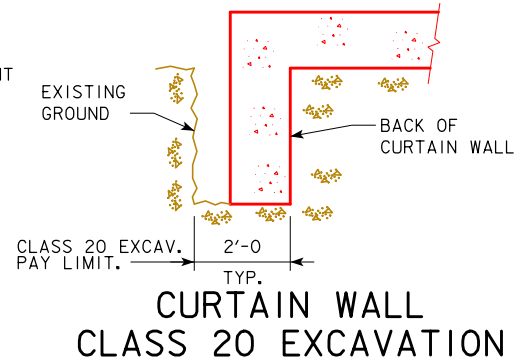
LOCATION	CY
FOOTING AND SHEAR KEY	4.8
WALL	2.2
TOTAL (C.Y.)	7.0

DESIGN FOR 0°
5'x3' REINFORCED CONCRETE BOX CULVERT EXTENSION
RETAINING WALL DETAILS

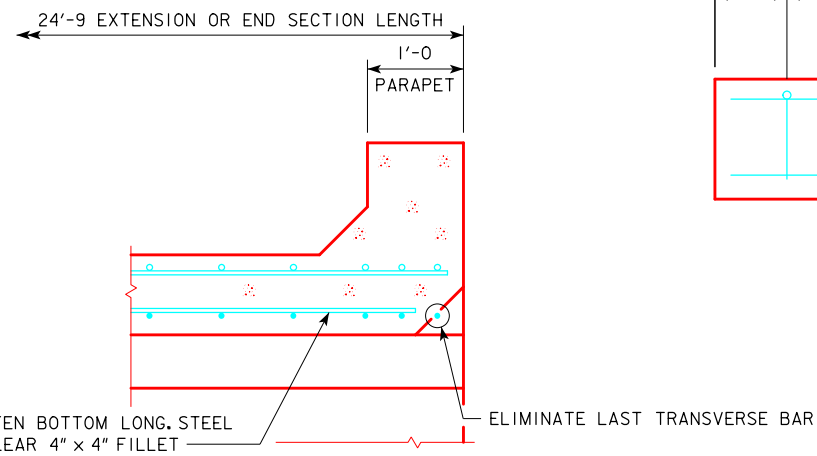
STATION 389+13.21 (US 6) JUNE, 2017
IOWA COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 4 OF 6 FILE NO. 31463 DESIGN NO. 117



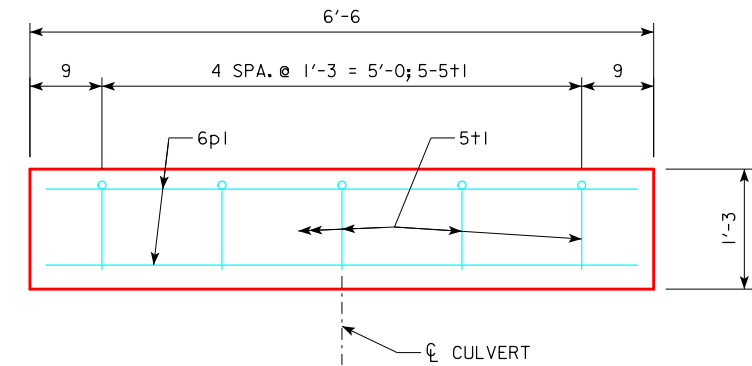
SECTION CURTAIN WALL DETAILS



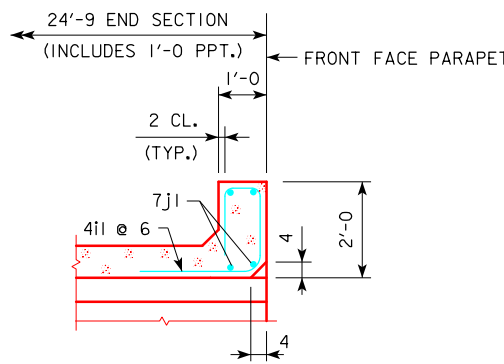
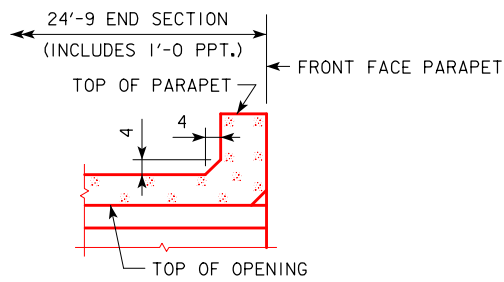
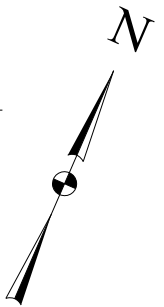
CURTAIN WALL CLASS 20 EXCAVATION



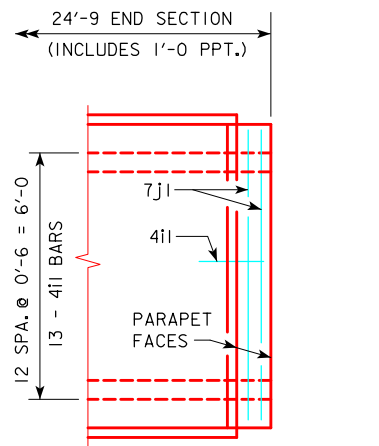
BARREL END SECTION AND PARAPET DETAILS



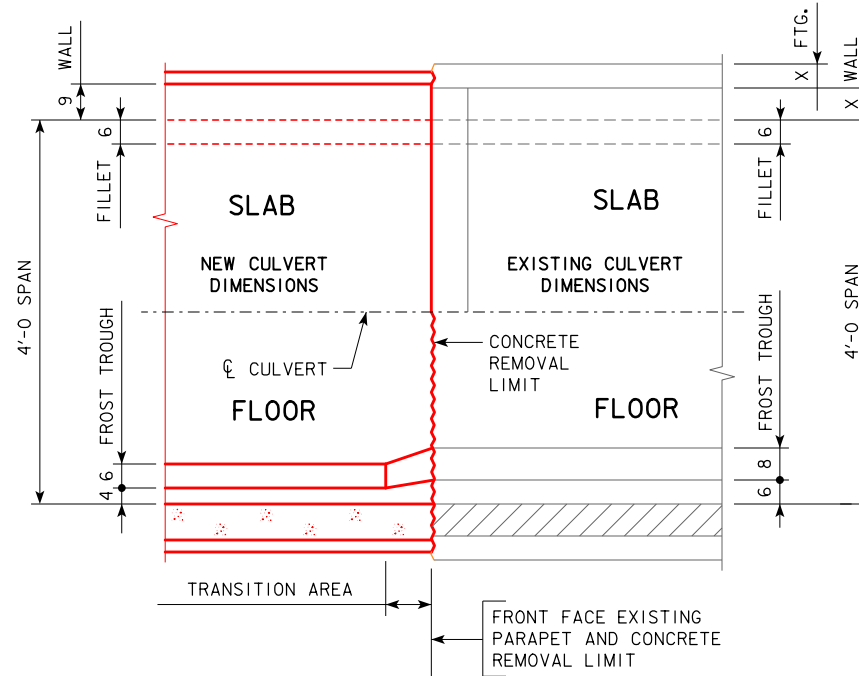
CURTAIN WALL PLAN



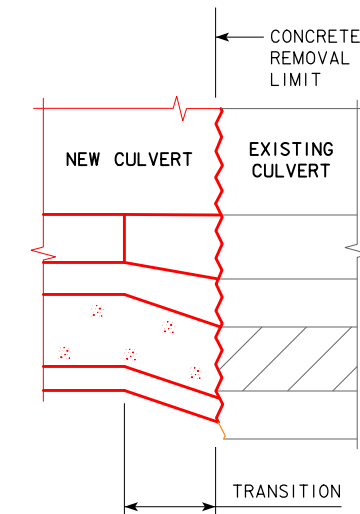
SECTION THRU PARAPET



PARAPET PLAN



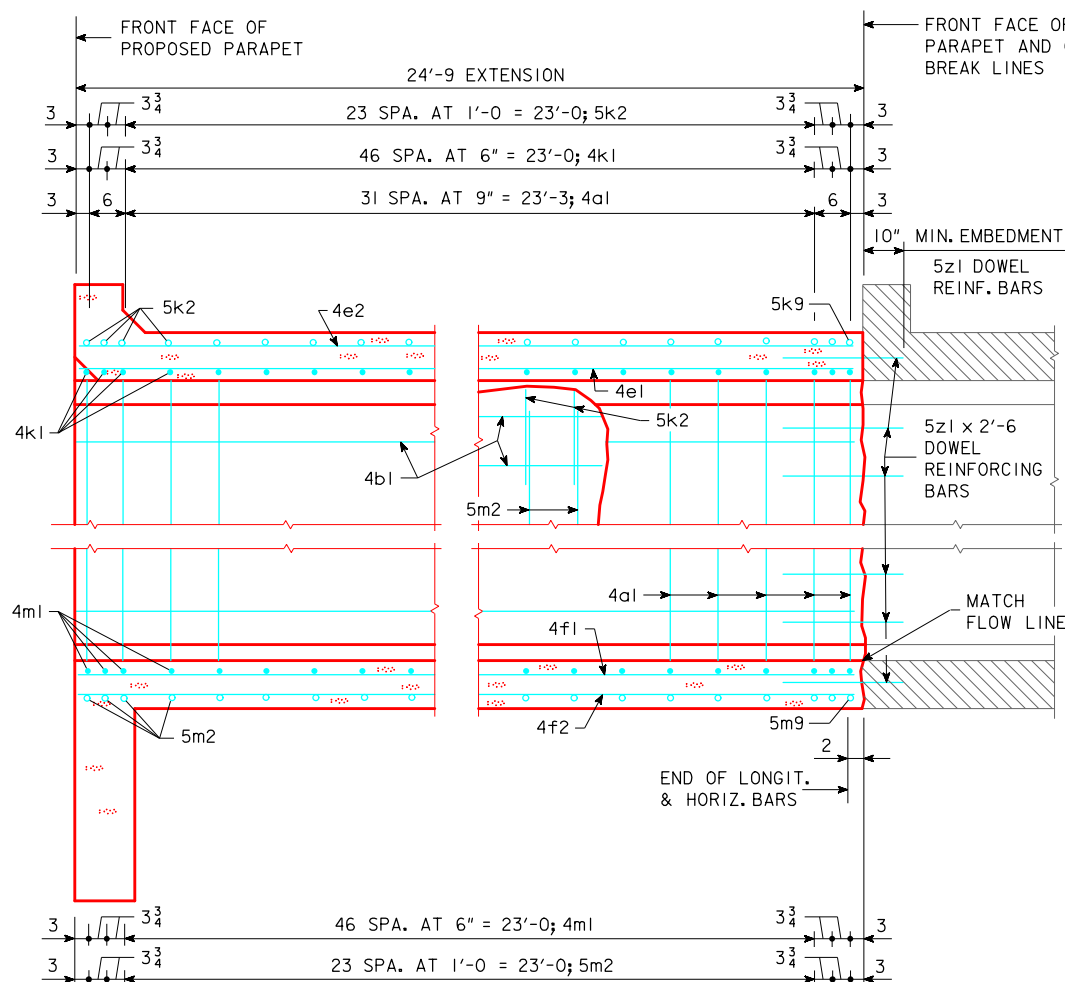
CONCRETE TRANSITION DETAILS (PLAN VIEW)



CONCRETE TRANSITION DETAILS (WALL TRANSITION SHOWN - TYPICAL FOR SLAB)

DESIGN FOR 0°
5'x3' REINFORCED CONCRETE BOX CULVERT EXTENSION
MISCELLANEOUS CULVERT DETAILS
 STATION 389+13.21 (US 6) JUNE, 2017
IOWA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 5 OF 6 FILE NO. 31463 DESIGN NO. 117

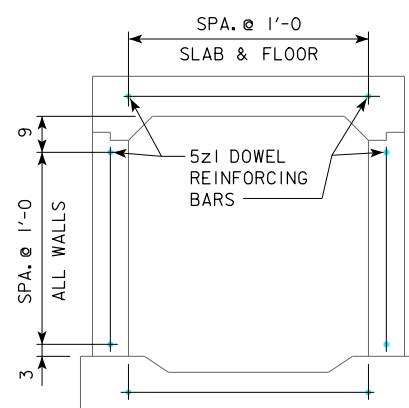
REVISED: CHANGED BRIDGE DESIGN MANUAL, SECTION 8 TO SECTION 7. (3-1-15)
 ENGLISHING/CULVERTS.DGN - 1047 - THIS SHEET ISSUED 03-12.



PART LONGITUDINAL SECTION
(ALONG CL OF CULVERT)

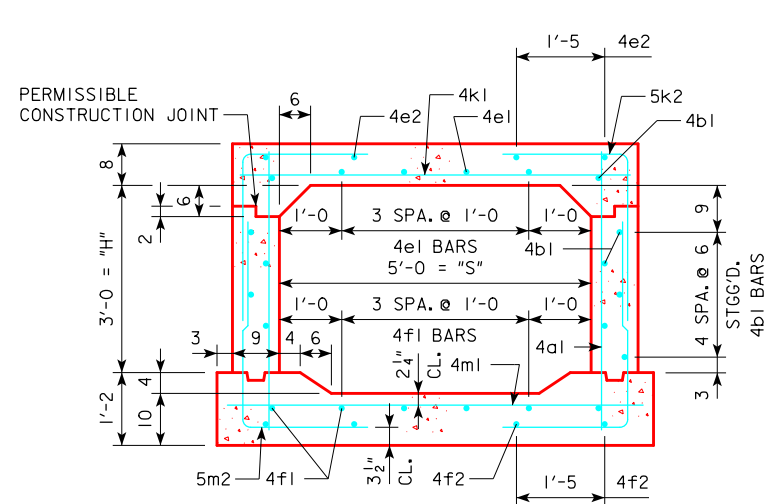
NOTE: ALL LONGITUDINAL BARREL STEEL SHALL EXTEND AT LEAST TO THE BACKFACE OF PARAPET.

CULVERT FOOTING MUST BE NOTCHED 3" ON EACH SIDE, AT PARAPET LOCATION, TO ALLOW RETAINING WALLS TO BE CAST AGAINST CULVERT WALLS. SEE DETAIL ON DESIGN SHEET 4.



SECTION NEAR EXTENSION
(SHOWING SPACING OF 5z1 DOWEL REINFORCING BARS)

REINFORCING STEEL EXTENSION DOWELS						
BAR	LOCATION	SHAPE	NO./JT.	TOTAL NO.	LENGTH	WEIGHT
5z1	TOP SLAB, CONST. JOINT		18	36	2'-6"	94



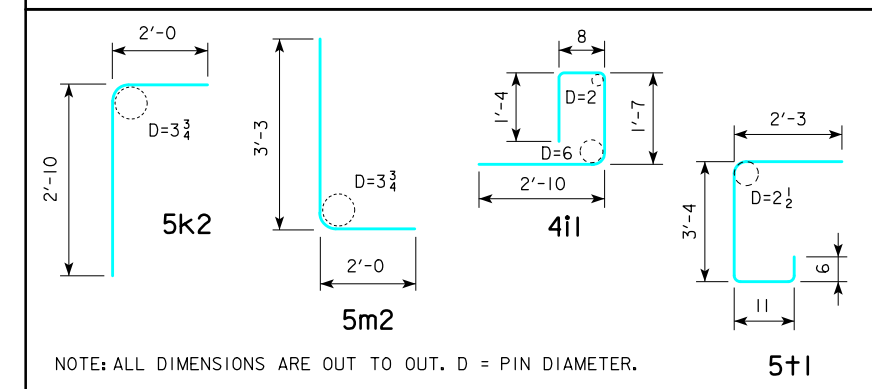
5 x 3 BARREL SECTION

NOTE:
ALL TRANSVERSE REINFORCING BARS AND HORIZONTAL LEGS OF CORNER BARS SHALL BE PLACED PARALLEL TO THE CONCRETE BREAK LINE AND NEW PARAPET EXCEPT AS SHOWN.
DIMENSIONS SHOWN FOR CL-CL OF TRANSVERSE BARS, VERTICAL WALL BARS, AND CORNER BARS ARE MEASURED ALONG CL CULVERT.
CONCRETE PER FOOT OF BARREL:
SLAB = 5.3 CU. YDS.
WALLS = 3.6 CU. YDS.
FLOOR = 7.2 CU. YDS.
TOTAL = 16.1 CU. YDS.

REINFORCING BAR LIST-ONE 24'-9 EXTENSION

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
4a1	WALLS, F.F.V.		68	4'-5"	201
4b1	WALLS, HORIZONTAL		12	24'-5"	196
4e1	SLAB, BOT., LONGIT.		4	24'-5"	65
4e2	SLAB, TOP, LONGIT.		4	24'-5"	65
4f1	FLOOR, TOP, LONGIT.		6	24'-5"	98
4f2	FLOOR, BOT., LONGIT.		4	24'-5"	65
4k1	SLAB, BOT., TRANS.		51	6'-2"	210
5k2	SLAB, TOP, CORNER		56	4'-10"	282
5k9	SLAB, TOP, TRANS., ENDS		2	6'-2"	13
4m1	FLOOR, TOP, TRANS.		51	6'-8"	227
5m2	FLOOR, BOT., CORNER		56	5'-3"	307
5m9	FLOOR, BOT., TRANS., ENDS		2	6'-8"	14
4i1	PARAPET, VERTICAL		13	6'-5"	56
7j1	PARAPET, HORIZONTAL		4	6'-2"	50
6p1	CURTAIN WALL, TRANS.		4	6'-2"	37
5t1	CURTAIN WALL, VERTICAL		5	7'-0"	37
REINFORCING STEEL - TOTAL (LBS.)					1923

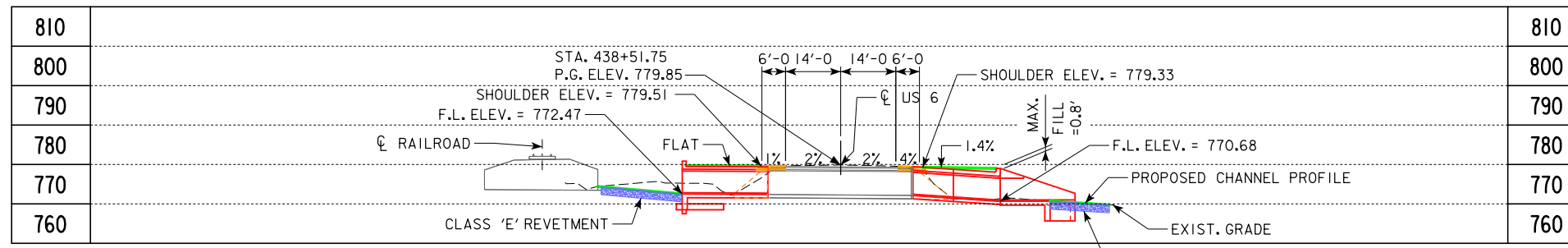
BENT BAR DETAILS



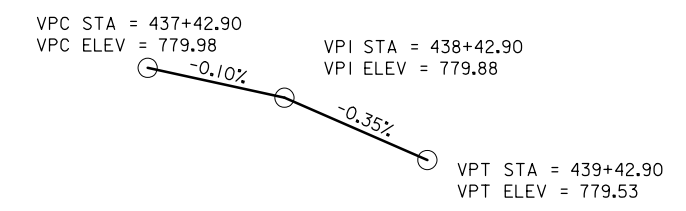
NOTE: ALL DIMENSIONS ARE OUT TO OUT. D = PIN DIAMETER.

DESIGN FOR 0°
5'x3' REINFORCED CONCRETE BOX CULVERT EXTENSION
24'-9 END BARREL DETAILS
STATION 389+13.21 (US 6) JUNE, 2017
IOWA COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 6 OF 6 FILE NO. 31463 DESIGN NO. 117





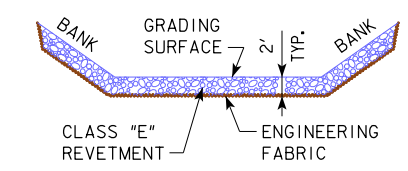
LONGITUDINAL SECTION ALONG CL CULVERT
DESIGN FILL HEIGHT = 0'
ANTICIPATED SETTLEMENT = NEGLIGIBLE



PROPOSED PROFILE GRADE ON US 6

NOTES:

- IT IS THE INTENT OF THIS DESIGN TO EXTEND THE EXISTING TWIN 5' x 6' REINFORCED CONCRETE BOX CULVERT WITH 9 DEGREE SKEW BY REMOVING THE HEADWALLS TO THE FACE OF THE PARAPET AND ADDING A TWIN 5' x 6' x 22' REINFORCED CONCRETE BOX CULVERT EXTENSION WITH HEADWALL ON THE SOUTH END, AND A TWIN 5' x 6' x 21' REINFORCED CONCRETE BOX CULVERT EXTENSION WITH RETAINING WALLS ON THE NORTH END.
- THE RCB CULVERT EXTENSION IS DESIGNED FOR EARTH FILLS OF 0 FOOT.
- ALL UNITS ARE IN FEET UNLESS OTHERWISE NOTED OR SHOWN.
- SEE ROAD SHEETS FOR ADDITIONAL INFORMATION ON PROPOSED GRADING LIMITS.
- DRAINAGE THROUGH EXISTING CULVERT/CHANNEL MUST BE MAINTAINED THROUGHOUT CONSTRUCTION.
- LIMITS OF EASEMENT TO BE DETERMINED.
- HEADWALLS SHALL BE PLACED LEVEL.



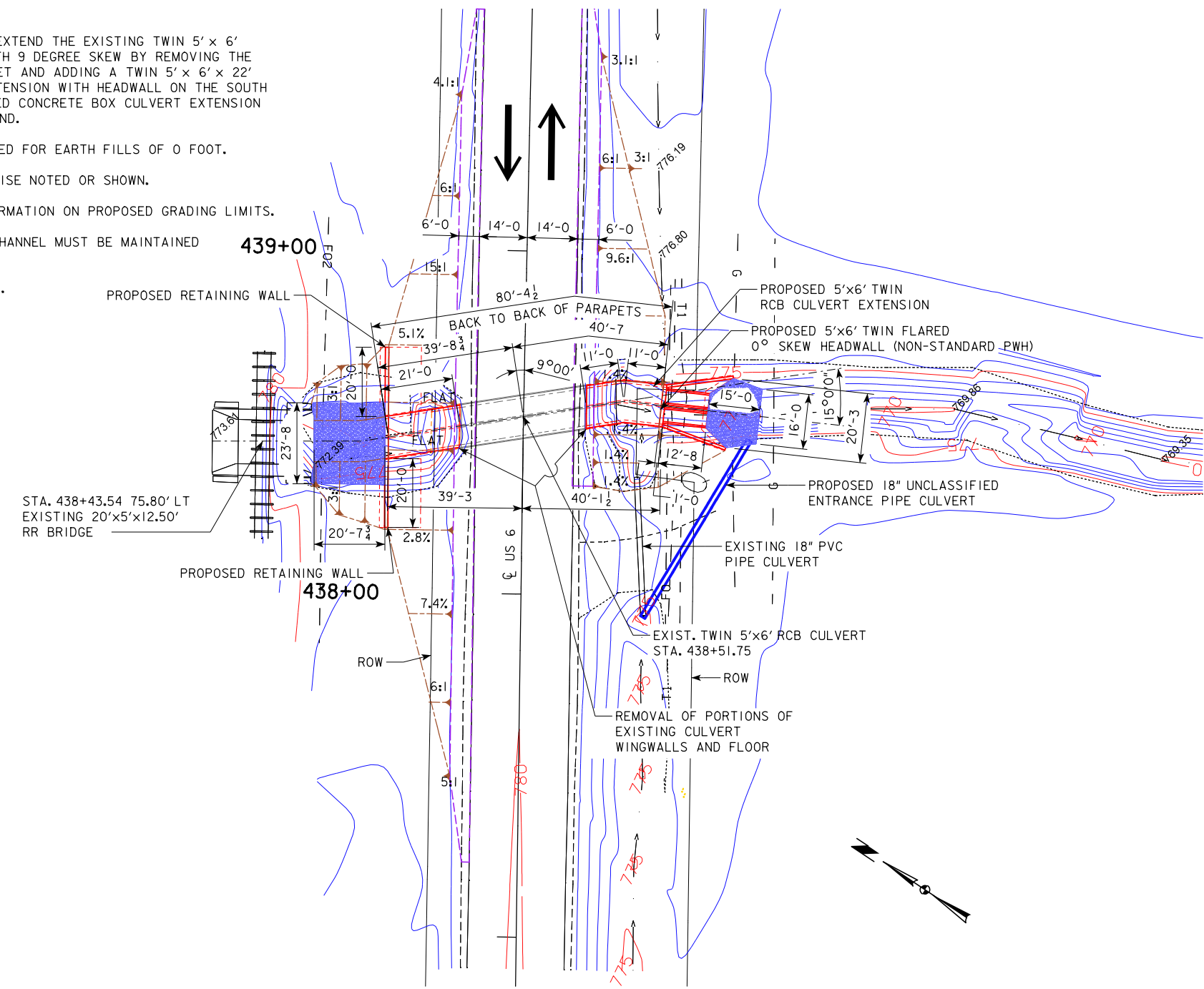
ESTIMATED REVETMENT QUANTITIES INCLUDED WITH ROAD PLANS		
LOCATION	REVETMENT CL. "E" (TON)	ENGINEERING FABRIC (SY)
INLET	58.2	74.5
OUTLET	30	41.5
TOTALS	88.2	116

HYDRAULIC DATA
DRAINAGE AREA = 563.2 ACRES
Q₅₀ = 976 CFS
ROLLING

- UTILITIES LEGEND:**
- T1 - COOPERATIVE TELEPHONE COMPANY
 - F0 - IOWA NETWORK SERVICES
 - G - ALLIANT ENERGY
 - F02 - MCI
 - F03 - MEDIATEL
 - T2 - WINDSTREAM COMMUNICATIONS
 - F04 - SOUTH SLOPE COOPERATIVE

LOCATION
ON US 6 OVER DRAINAGE DITCH
T-80N R-11W SECTION 7
SUMNER TOWNSHIP
IOWA COUNTY
LATITUDE 41.760364
LONGITUDE -92.166483

TRAFFIC ESTIMATE
2014 AADT 1500 V.P.D.



SITUATION PLAN

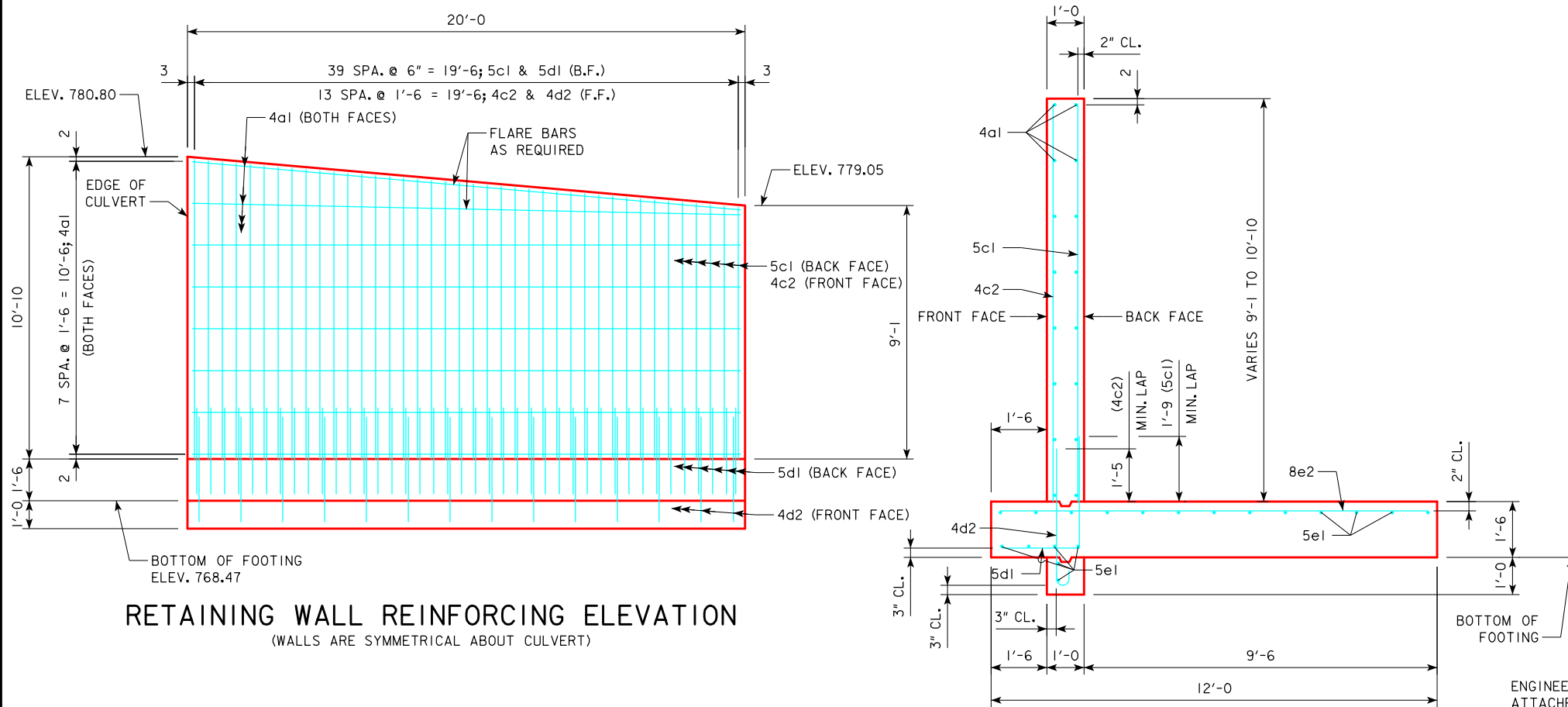
DESIGN FOR 9° SKEW (R.A.)
TWIN 5'x6' REINFORCED CONCRETE BOX CULVERT EXTENSION
SITUATION PLAN
STATION 438+51.75 (US 6) JUNE, 2017
IOWA COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 1 OF 17 FILE NO. 31463 DESIGN NO. 217



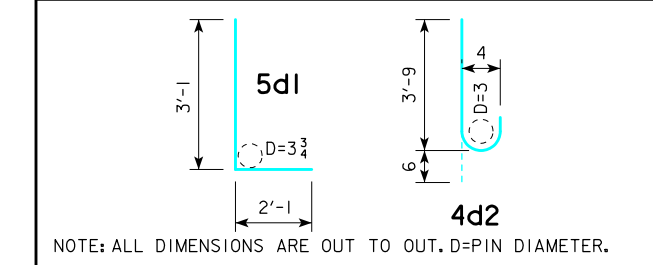
BENCH MARK NO. 4: STA. 438+61.78, NORTHEAST TOP CORNER HEADWALL 17.75' RT. ELEV. 779.14

REINFORCING BAR LIST-ONE RETAINING WALL

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
4a1	WALL HORIZONTAL, BOTH FACES		16	19'-8"	210
5c1	WALL, VERTICAL, BACK FACE		40	1 EACH 10'-7" TO 8'-11"	407
4c2	WALL, VERTICAL, FRONT FACE		14	1 EACH 10'-7" TO 8'-11"	91
5d1	WALL, VERTICAL, DOWEL, BACK FACE		40	5'-2"	216
4d2	WALL, VERTICAL, DOWEL, FRONT FACE		14	4'-3"	40
5e1	FOOTING & SHEAR KEY, LONGITUDINAL		19	19'-8"	390
8e2	FOOTING HORIZONTAL, TOP		40	11'-8"	1246
REINFORCING STEEL - TOTAL (LBS.)					2600



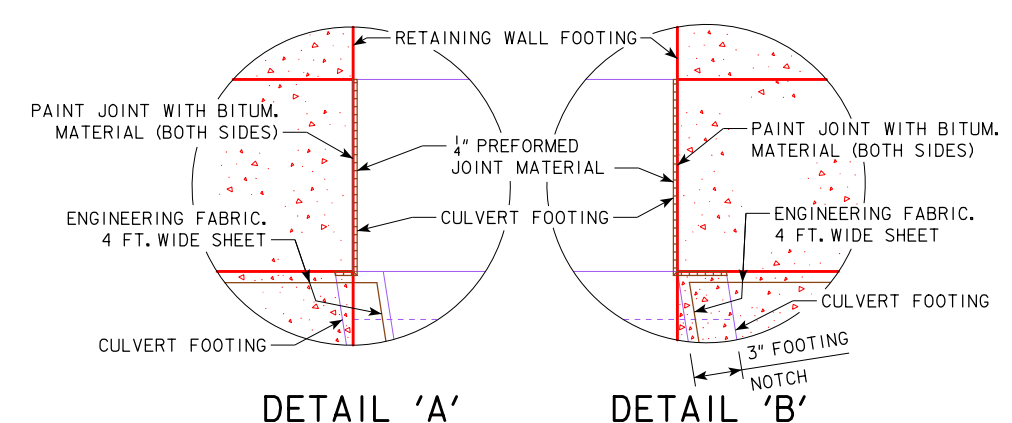
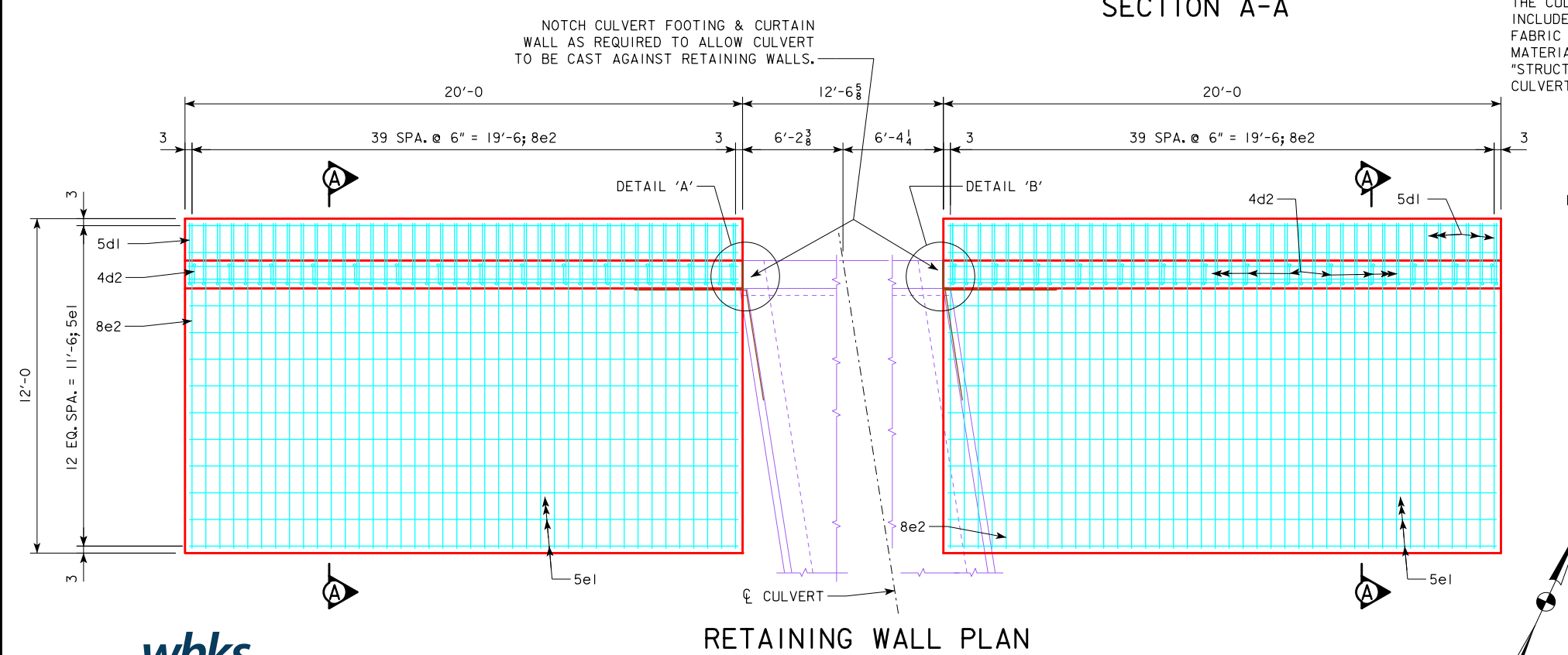
BENT BAR DETAILS



CONCRETE PLACEMENT QUANTITIES RETAINING WALLS

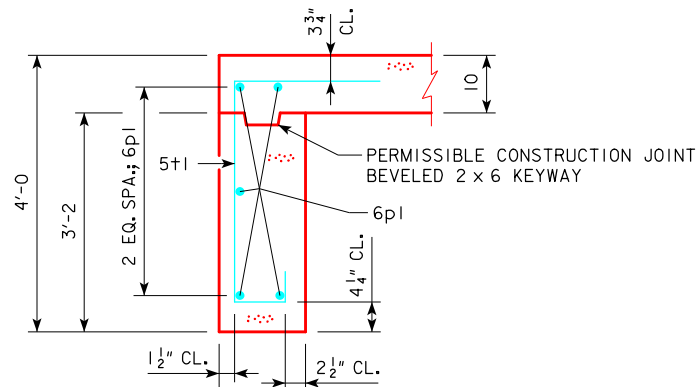
LOCATION	CY	
	EAST WALL	WEST WALL
FOOTING & SHEAR KEY	14.1	14.1
WALL	7.4	7.4
TOTAL (C.Y.)	21.5	21.5

ENGINEERING FABRIC TO BE SECURELY ATTACHED WITH ADHESIVE TO THE CONCRETE ALONG THE FULL HEIGHT OF THE CULVERT WALL. INCLUDE THE COST OF ENGINEERING FABRIC & PREFORMED JOINT MATERIAL IN THE PRICE BID FOR "STRUCTURAL CONCRETE (RCB CULVERT)"

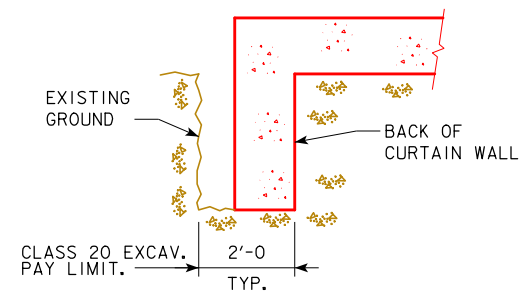


DESIGN FOR 9° SKEW (R.A.)
TWIN 5'x6' REINFORCED CONCRETE BOX CULVERT EXTENSION
RETAINING WALL DETAILS
 STATION 438+51.75 (US 6) JUNE, 2017
IOWA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 2 OF 17 FILE NO. 31463 DESIGN NO. 217

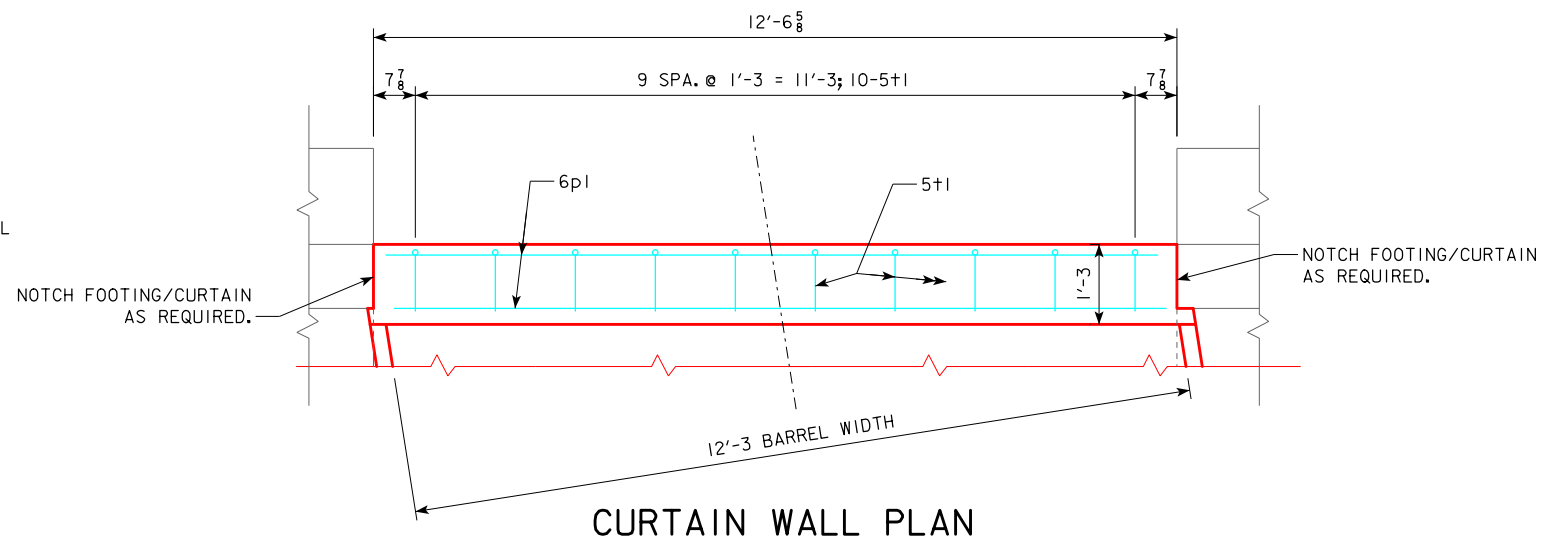




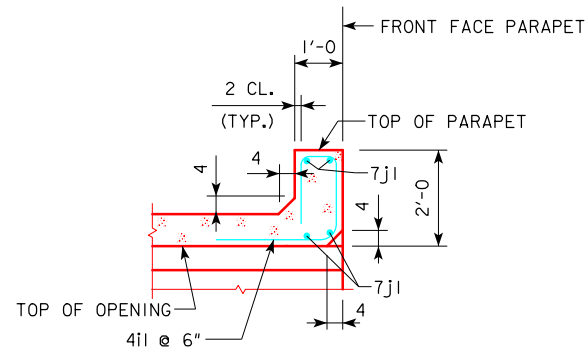
SECTION
CURTAIN WALL DETAILS



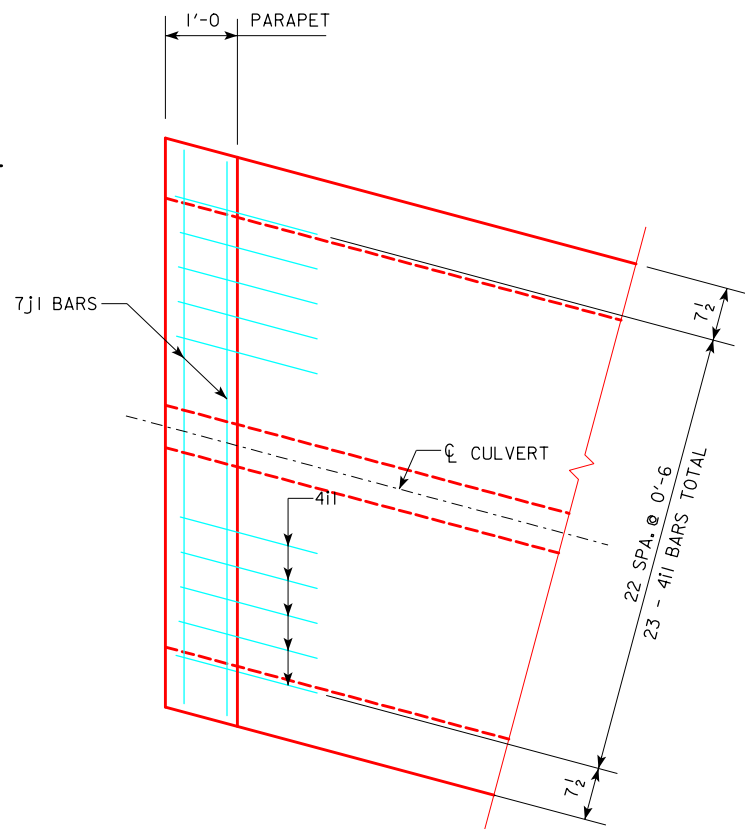
CURTAIN WALL
CLASS 20 EXCAVATION



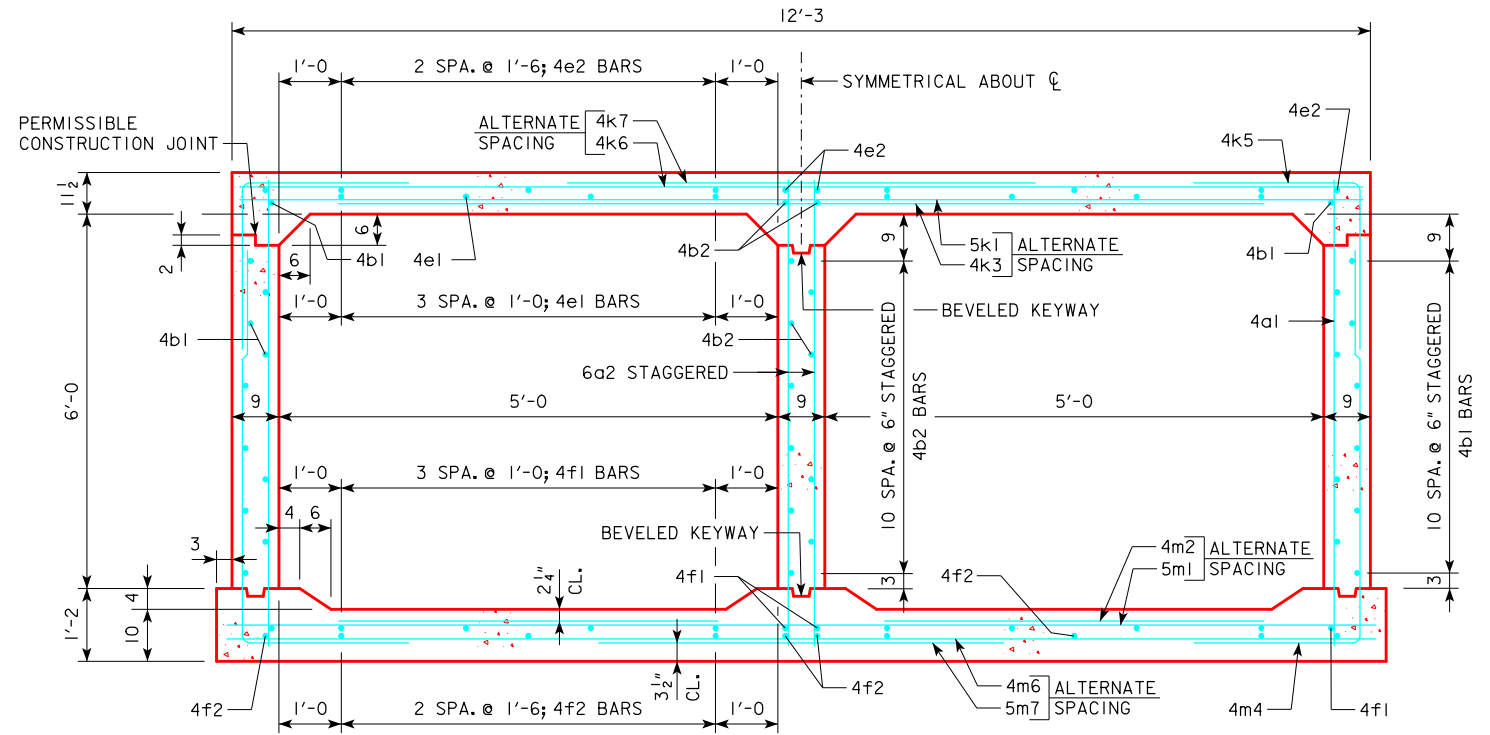
CURTAIN WALL PLAN



SECTION THRU PARAPET



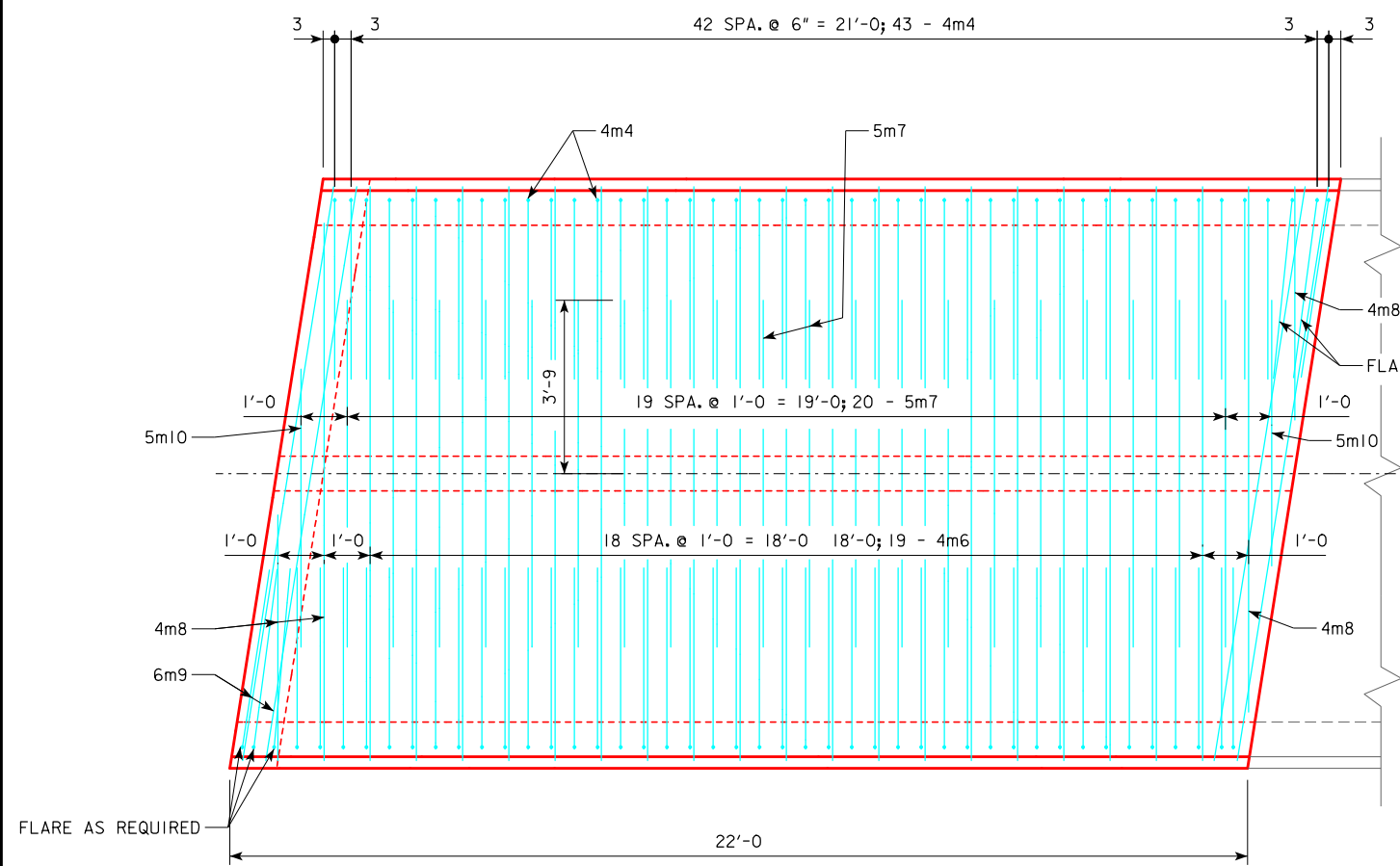
PARAPET PLAN



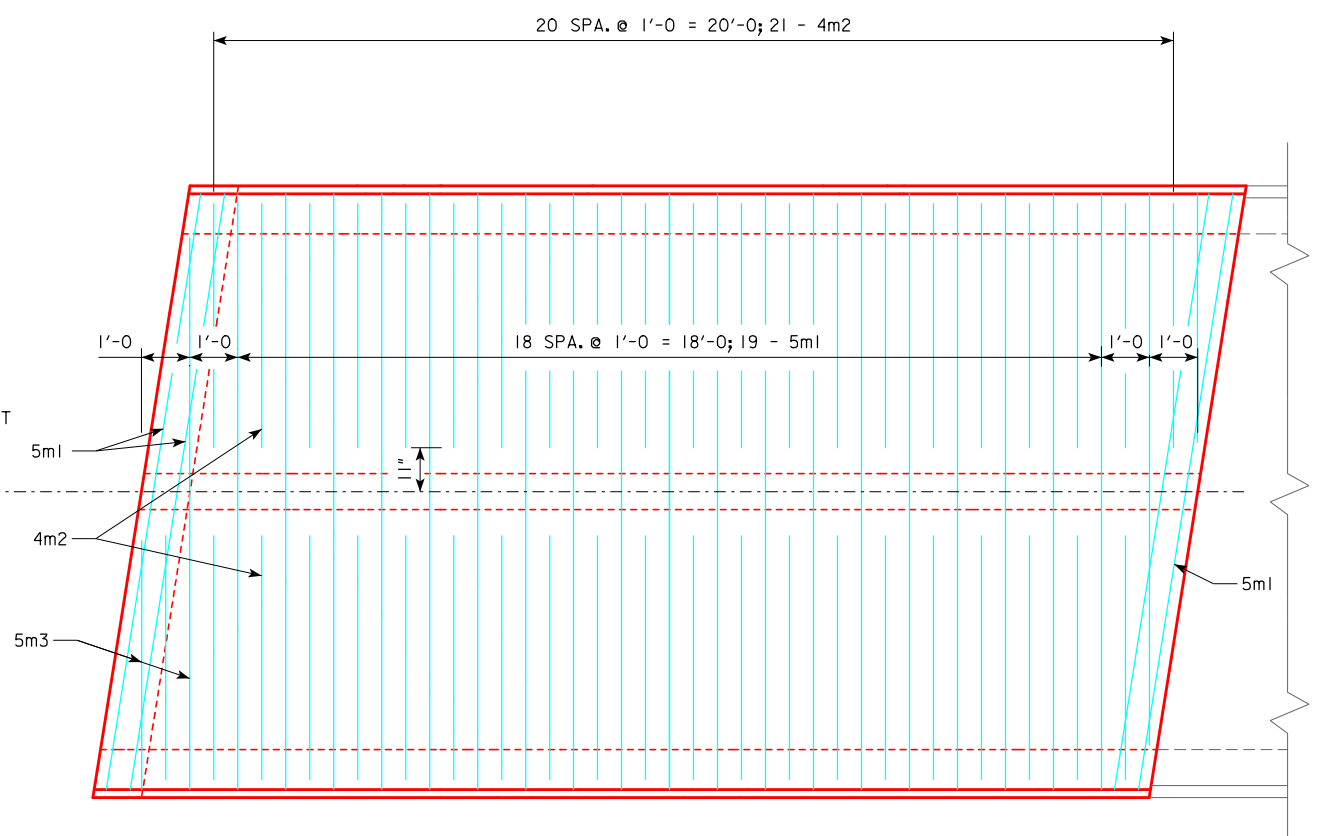
TWIN 5 x 6 END BARREL SECTION

DESIGN FOR 9° SKEW (R.A.)
**TWIN 5'x6' REINFORCED CONCRETE
 BOX CULVERT EXTENSION**
21'-0 CULVERT EXTENSION DETAILS
 STATION 438+51.75 (US 6) JUNE, 2017
IOWA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 3 OF 17 FILE NO. 31463 DESIGN NO. 217





PLAN VIEW - BOTTOM FLOOR
(LONGITUDINAL BARS NOT SHOWN)

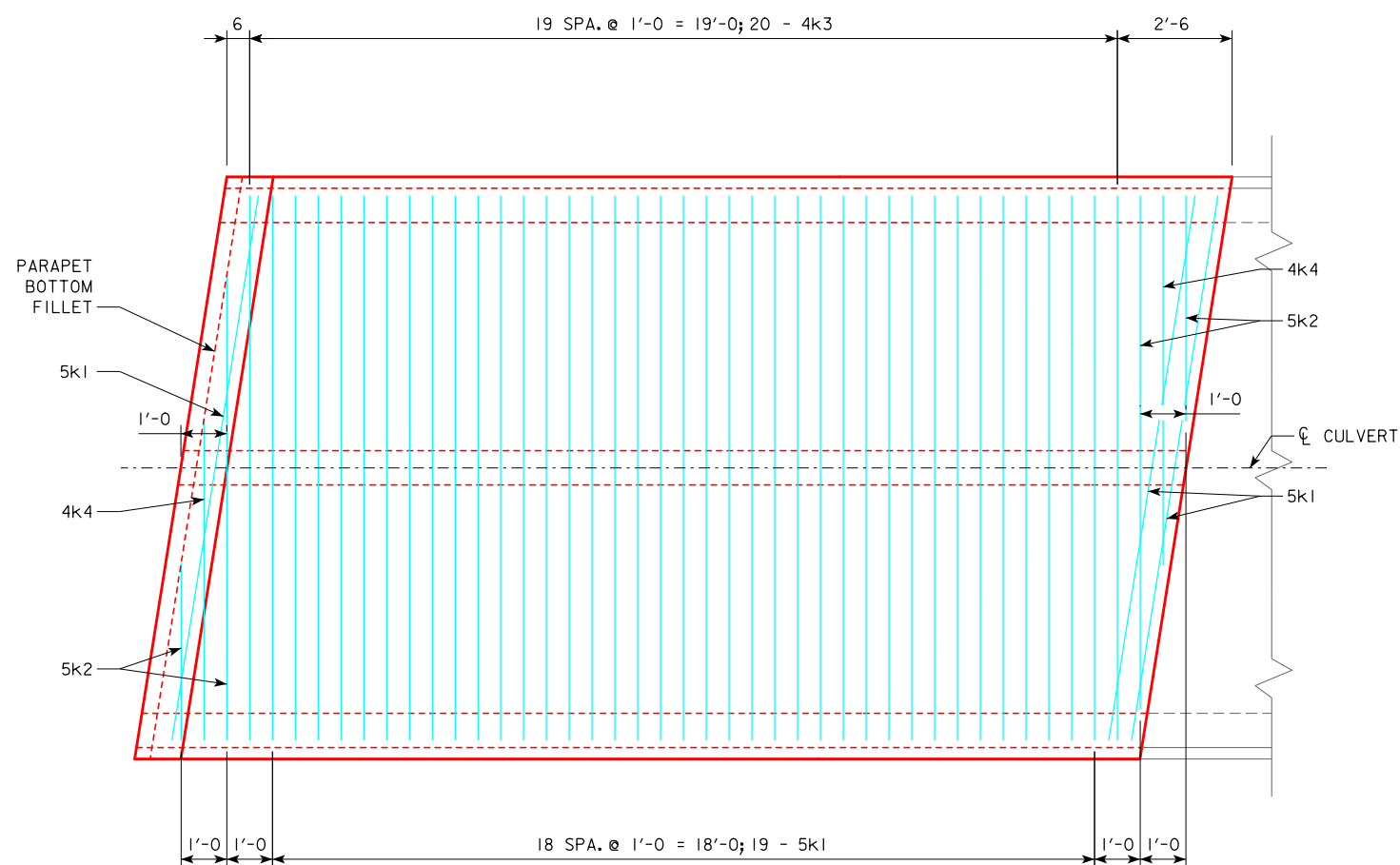


PLAN VIEW - TOP FLOOR
(LONGITUDINAL BARS NOT SHOWN)

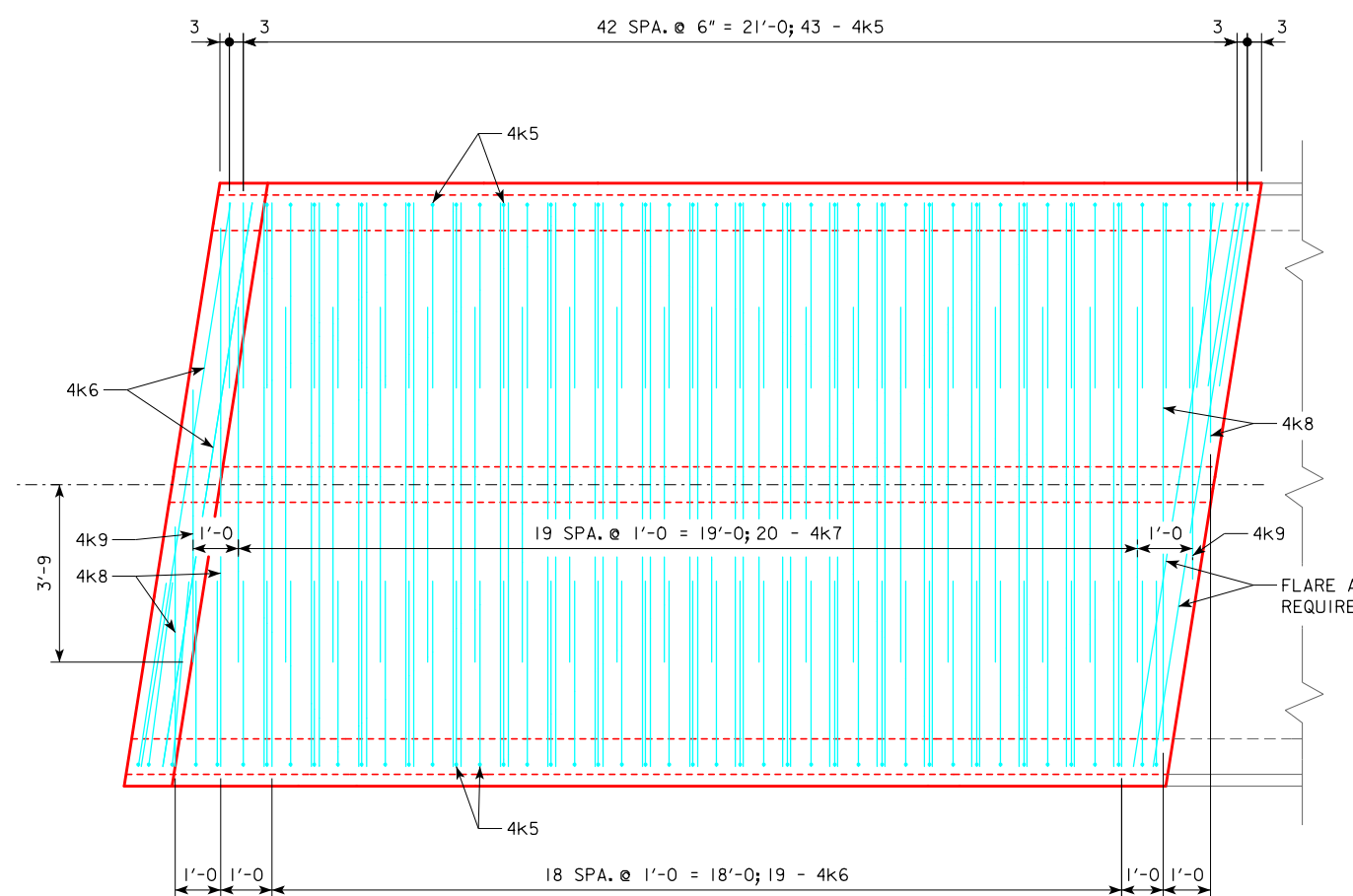
CULVERT FOOTING AND CURTAIN WALL SHALL BE NOTCHED AS REQUIRED, TO ALLOW CULVERT WALLS TO BE CAST AGAINST RETAINING WALLS. SEE DETAIL ON DESIGN SHEET 2.



DESIGN FOR 9° SKEW (R.A.)
**TWIN 5'x6' REINFORCED CONCRETE
 BOX CULVERT EXTENSION**
21'-0 CULVERT EXTENSION DETAILS
 STATION 438+51.75 (US 6) JUNE, 2017
IOWA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 4 OF 17 FILE NO. 31463 DESIGN NO. 217



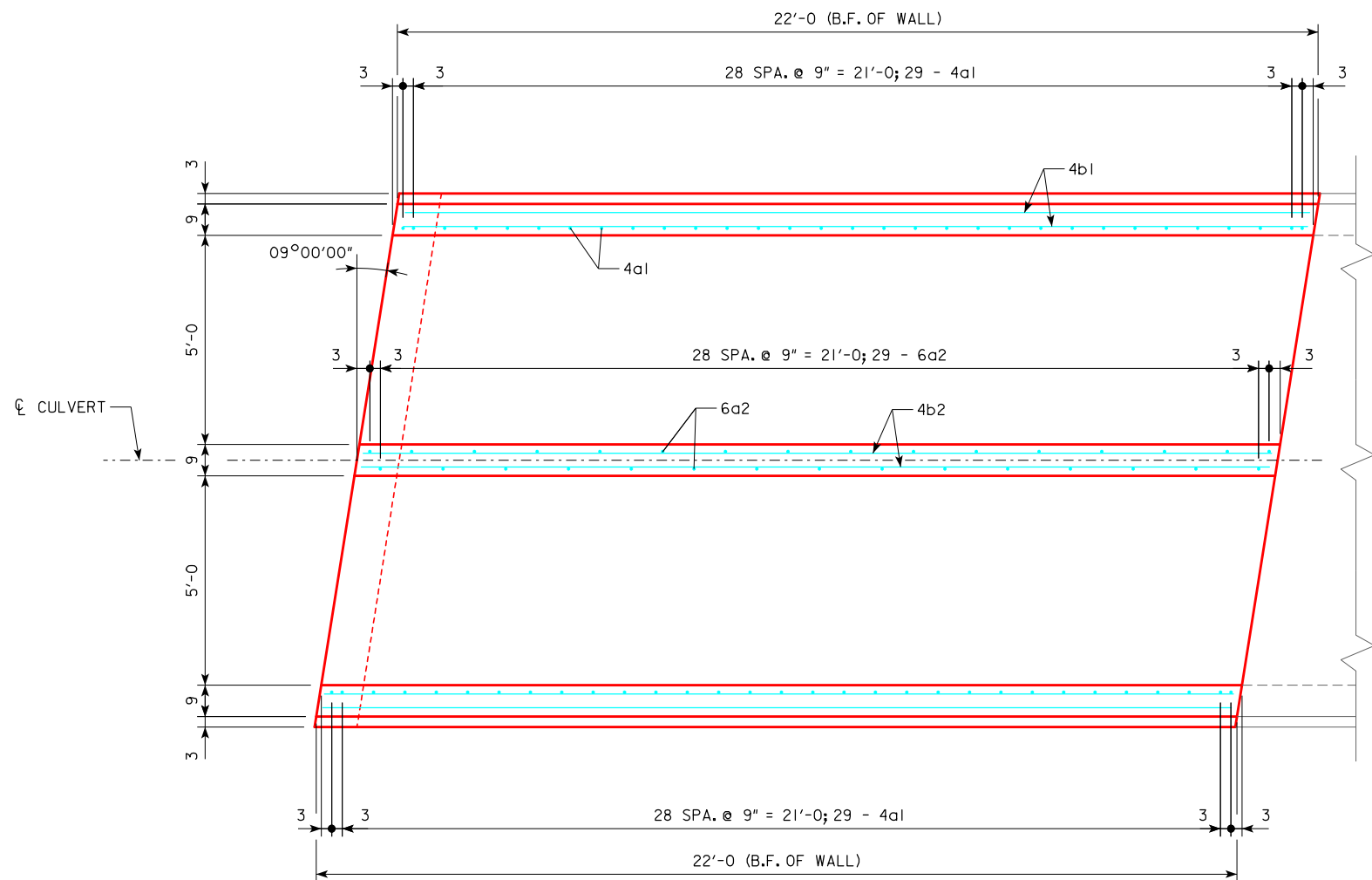
PLAN VIEW - BOTTOM SLAB
(LONGITUDINAL BARS NOT SHOWN)



PLAN VIEW - TOP SLAB
(LONGITUDINAL BARS NOT SHOWN)



DESIGN FOR 9° SKEW (R.A.)
**TWIN 5'x6' REINFORCED CONCRETE
 BOX CULVERT EXTENSION**
21'-0" CULVERT EXTENSION DETAILS
 STATION 438+51.75 (US 6) JUNE, 2017
IOWA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 5 OF 17 FILE NO. 31463 DESIGN NO. 217



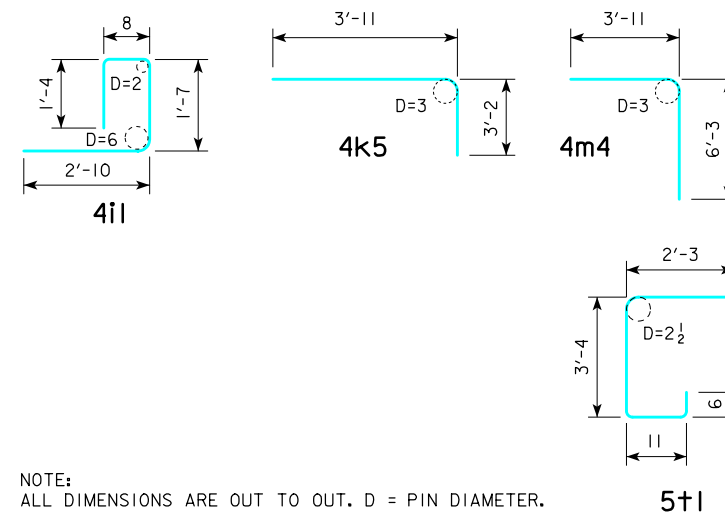
PLAN VIEW - WALL REINFORCING

(4m4 & 4k5 BARS NOT SHOWN)

DESIGN FOR 9° SKEW (R.A.)
**TWIN 5'x6' REINFORCED CONCRETE
 BOX CULVERT EXTENSION**
21'-0 CULVERT EXTENSION DETAILS
 STATION 438+51.75 (US 6) JUNE, 2017
IOWA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 6 OF 17 FILE NO. 31463 DESIGN NO. 217



BENT BAR DETAILS



NOTE:
ALL DIMENSIONS ARE OUT TO OUT. D = PIN DIAMETER.

CONCRETE PLACEMENT QUANTITIES 21'-0 END SECTION W/ PARAPET & CURTAIN WALL

LOCATION	CY
SLAB *	11.3
WALLS	10.3
FLOOR **	11.8
TOTAL (C.Y.)	33.4

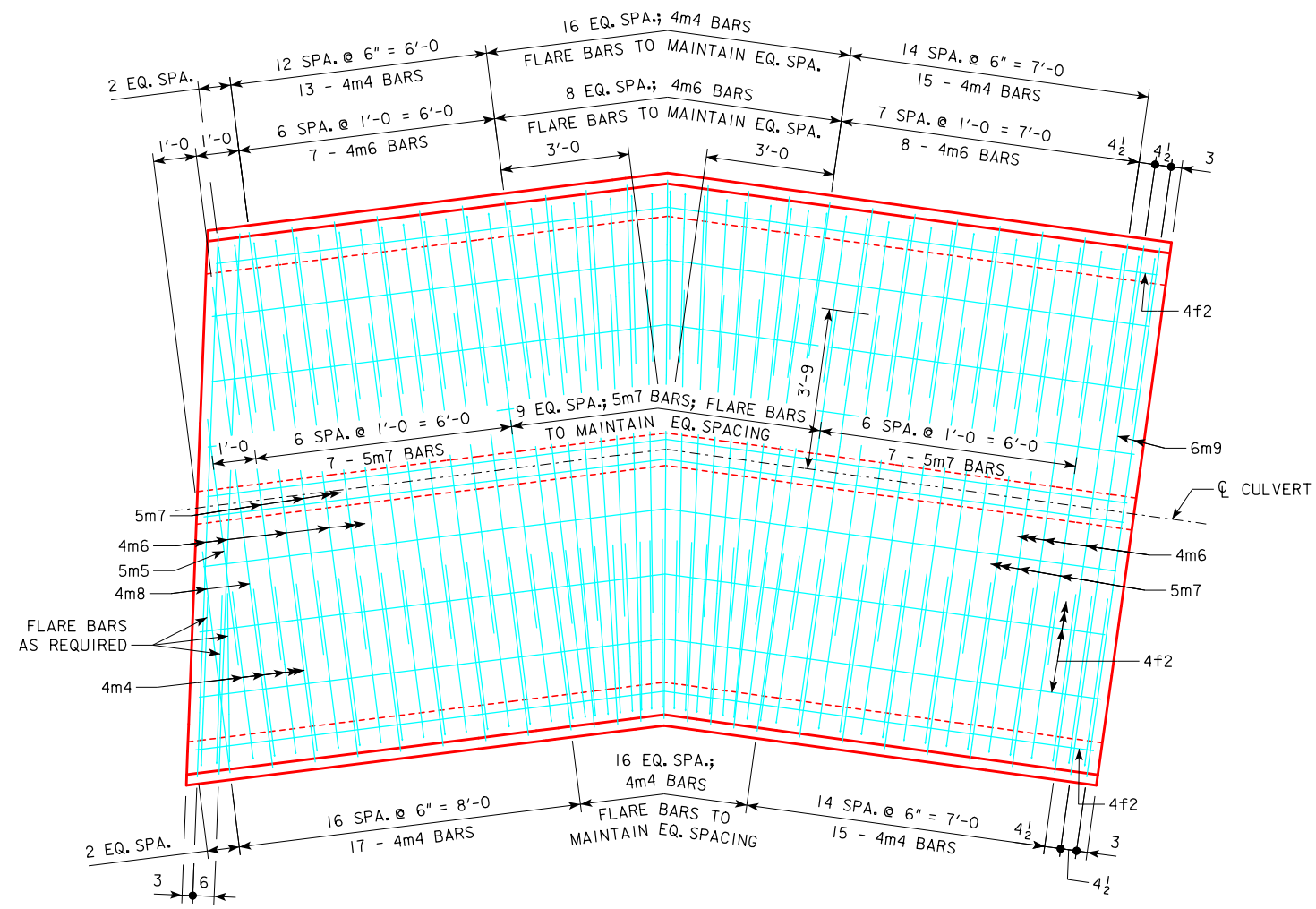
* INCLUDES PARAPET.
** INCLUDES CURTAIN WALL.

REINFORCING BAR LIST-21'-0 END SECTION W/ PARAPET & CURTAIN WALL

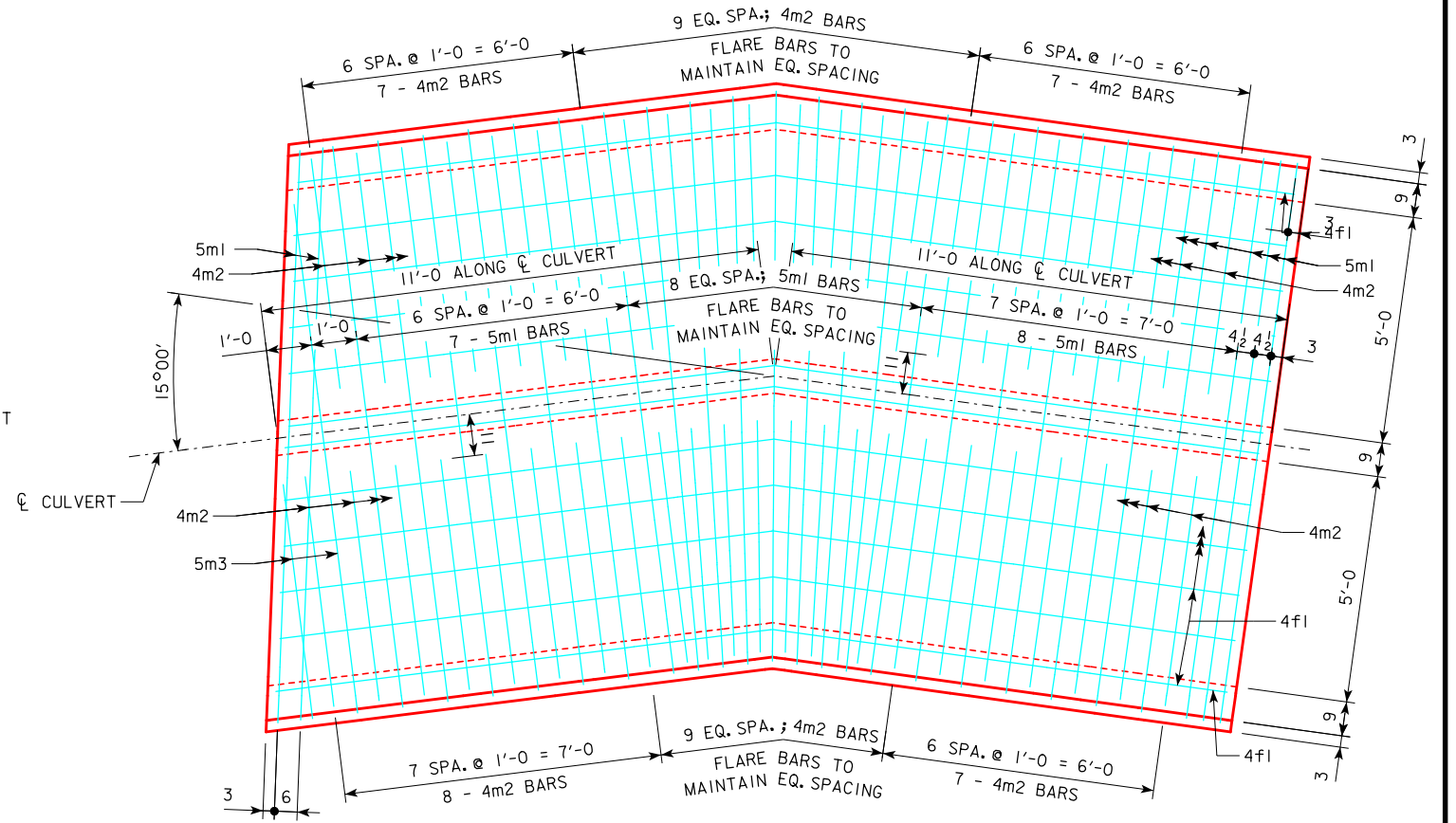
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
4a1	EXTERIOR WALLS, F.F.V.	—	62	7'-8	318
6a2	INTERIOR WALL, BOTH, F.V.	—	31	7'-8	357
4b1	EXTERIOR WALLS, HORIZONTAL	—	24	21'-8	347
4b2	INTERIOR WALL, HORIZONTAL	—	13	21'-8	188
4e1	SLAB, BOT., LONGIT.	—	8	21'-8	116
4e2	SLAB, TOP, LONGIT.	—	10	21'-8	145
4f1	FLOOR, TOP, LONGIT.	—	12	21'-8	174
4f2	FLOOR, BOT., LONGIT.	—	10	21'-8	145
5k1	SLAB, BOT., TRANS.	—	22	11'-11	273
5k2	SLAB, BOT., TRANS.	—	4	2 EACH 9'-1 TO 2'-9	25
4k3	SLAB, BOT., TRANS.	—	20	11'-11	159
4k4	SLAB, BOT., TRANS.	—	2	5'-11	8
4k5	SLAB, TOP, CORNER	—	90	7'-1	426
4k6	SLAB TOP, TRANS.	—	23	11'-11	183
4k7	SLAB TOP, TRANS.	—	20	7'-6	100
4k8	SLAB TOP, TRANS.	—	4	2 EACH 11'-4 TO 5'-0	22
4k9	SLAB, TOP, TRANS.	—	2	5'-9	8
5m1	FLOOR, TOP, TRANS.	—	23	12'-5	298
4m2	FLOOR, TOP, TRANS.	—	42	5'-1	143
5m3	FLOOR, TOP, TRANS.	—	4	2 EACH 11'-6 TO 5'-2	35
4m4	FLOOR, BOT., CORNER	—	90	10'-2	611
4m6	FLOOR, BOT., TRANS.	—	19	12'-5	158
5m7	FLOOR, BOT., TRANS.	—	20	7'-6	156
4m8	FLOOR, BOT., TRANS.	—	4	2 EACH 11'-6 TO 5'-2	22
6m9	FLOOR, BOT., ENDS	—	4	12'-6	75
5m10	FLOOR, BOT., TRANS.	—	2	6'-0	13
4il	PARAPET, VERTICAL	—	23	6'-5	99
7j1	PARAPET, HORIZONTAL	—	4	11'-11	97
6p1	CURTAIN WALL, TRANS.	—	5	11'-11	89
5+1	CURTAIN WALL, VERTICAL	—	10	7'-0	73
REINFORCING STEEL - TOTAL (LBS.)					4863



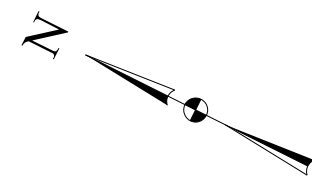
DESIGN FOR 9° SKEW (R.A.)
**TWIN 5'x6' REINFORCED CONCRETE
 BOX CULVERT EXTENSION**
21'-0 CULV. END SECTION QUANTITIES
 STATION 438+51.75 (US 6) JUNE, 2017
IOWA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 7 OF 17 FILE NO. 31463 DESIGN NO. 217



PLAN VIEW - BOTTOM FLOOR

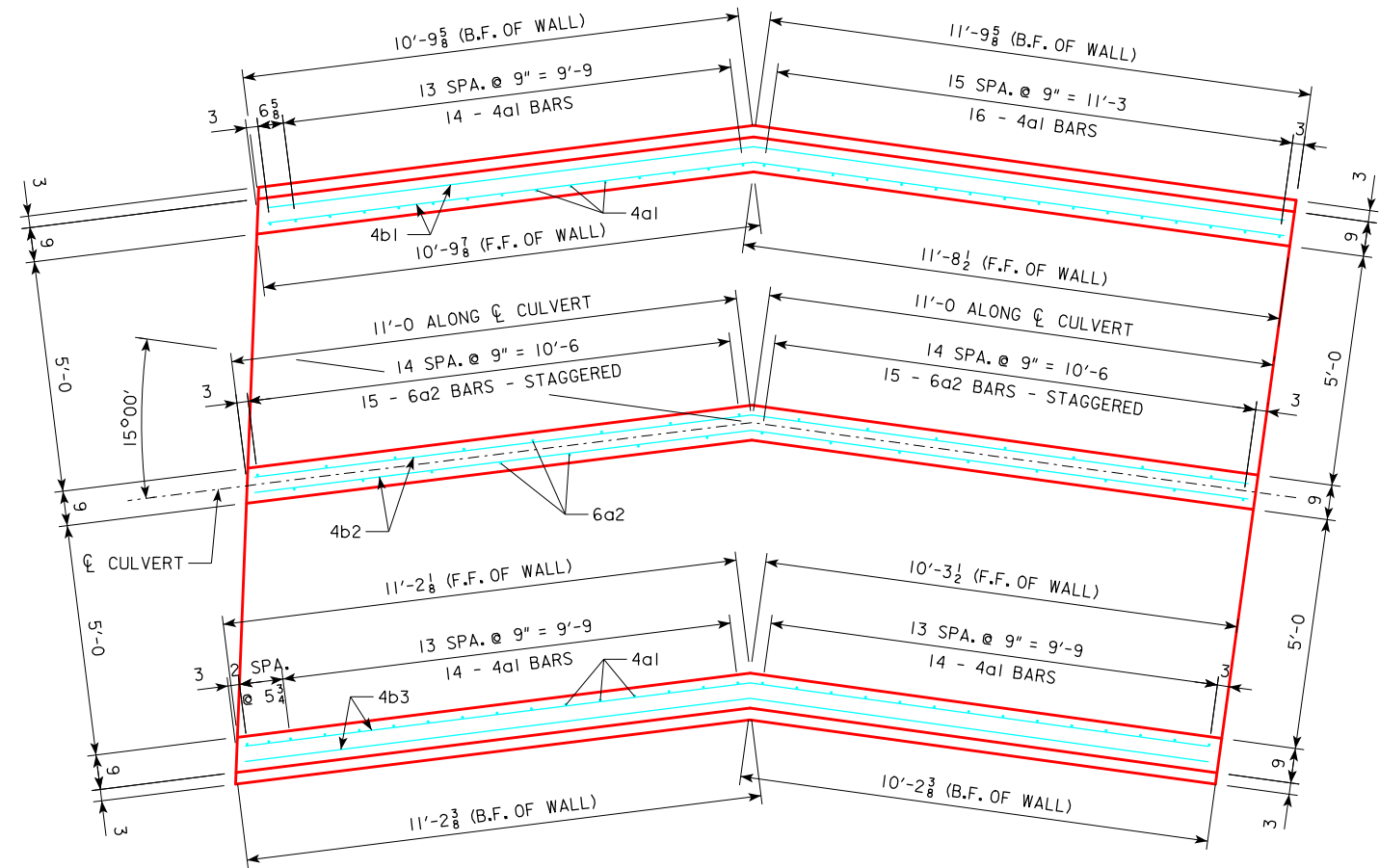


PLAN VIEW - TOP FLOOR

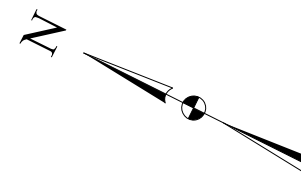


DESIGN FOR 9° SKEW (R.A.)
TWIN 5'x6' REINFORCED CONCRETE BOX CULVERT EXTENSION
22'-0 BENT BARREL PLAN
 STATION 438+51.75 (US 6) JUNE, 2017
IOWA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 8 OF 17 FILE NO. 31463 DESIGN NO. 217





PLAN VIEW - WALL REINFORCING
 (BAR SPACINGS ARE ALONG ϕ OF WALL)



DESIGN FOR 9° SKEW (R.A.)
**TWIN 5'x6' REINFORCED CONCRETE
 BOX CULVERT EXTENSION**
22'-0" BENT BARREL PLAN
 STATION 438+51.75 (US 6) JUNE, 2017
IOWA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 10 OF 17 FILE NO. 31463 DESIGN NO. 217



4e1 BAR DIMENSIONS			
DIM. 'a'	DIM. 'b'	DIM. 'c'	DIM. 'd'
10'-8	10'-11 ³ / ₈	2'-11 ¹ / ₄	11'-4
10'-8	10'-10 ³ / ₈	2'-11	11'-3
10'-9	10'-8 ¹ / ₂	2'-10 ³ / ₈	11'-1
10'-9	10'-7 ¹ / ₂	2'-10 ⁵ / ₈	11'-0
10'-10	10'-2 ⁵ / ₈	2'-8 ⁷ / ₈	10'-7
10'-10	10'-1 ³ / ₄	2'-8 ⁵ / ₈	10'-6
10'-11	9'-11 ³ / ₄	2'-8 ¹ / ₈	10'-4
10'-11	9'-10 ³ / ₄	2'-7 ⁷ / ₈	10'-3

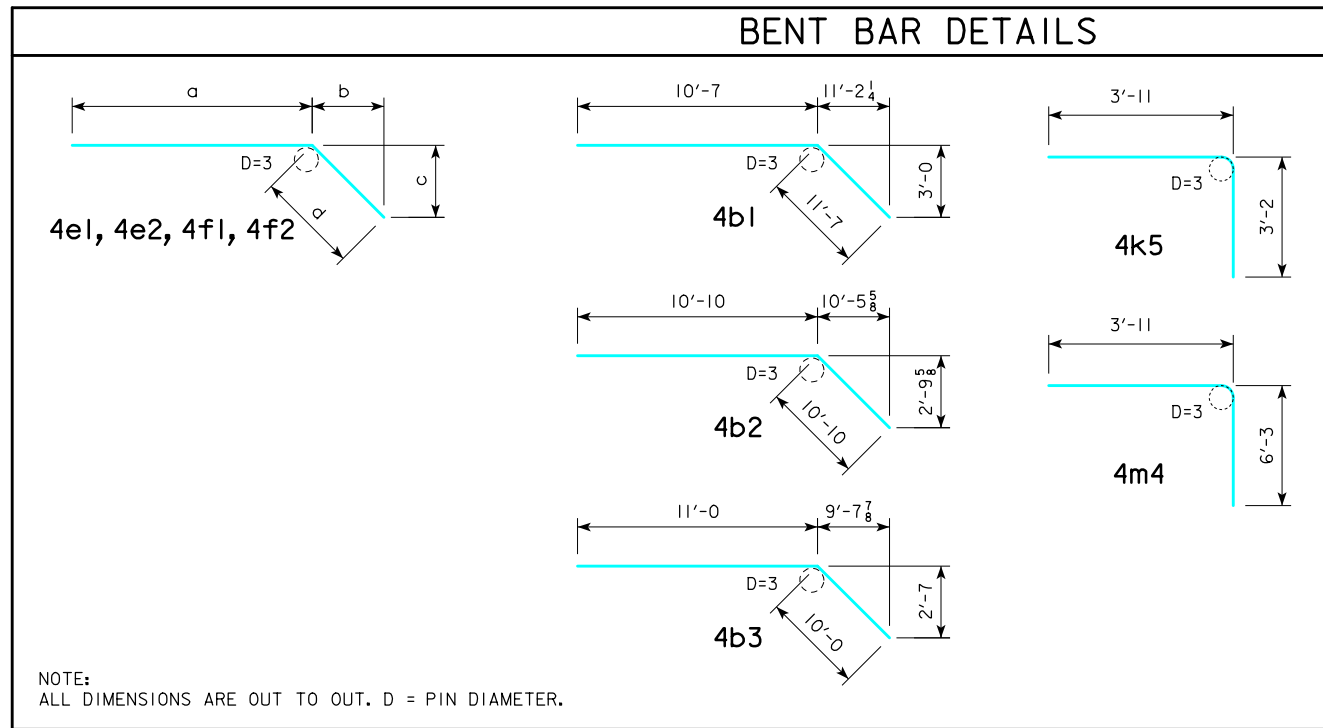
BARS ARE LISTED FROM NORTH TO SOUTH

4e2 & 4f2 BAR DIMENSIONS			
DIM. 'a'	DIM. 'b'	DIM. 'c'	DIM. 'd'
10'-7	11'-1 ¹ / ₄	2'-11 ³ / ₄	11'-6
10'-8	10'-11 ³ / ₈	2'-11 ¹ / ₄	11'-4
10'-8	10'-8 ¹ / ₂	2'-10 ³ / ₈	11'-1
10'-9	10'-7 ¹ / ₂	2'-10 ⁵ / ₈	11'-0
10'-9	10'-5 ⁵ / ₈	2'-9 ⁵ / ₈	10'-10
10'-10	10'-4 ⁵ / ₈	2'-9 ³ / ₈	10'-9
10'-10	10'-2 ⁵ / ₈	2'-8 ⁷ / ₈	10'-7
10'-11	9'-11 ³ / ₄	2'-8 ¹ / ₈	10'-4
10'-11	9'-10 ³ / ₄	2'-7 ⁷ / ₈	10'-3
11'-0	9'-8 ⁷ / ₈	2'-7 ³ / ₈	10'-1

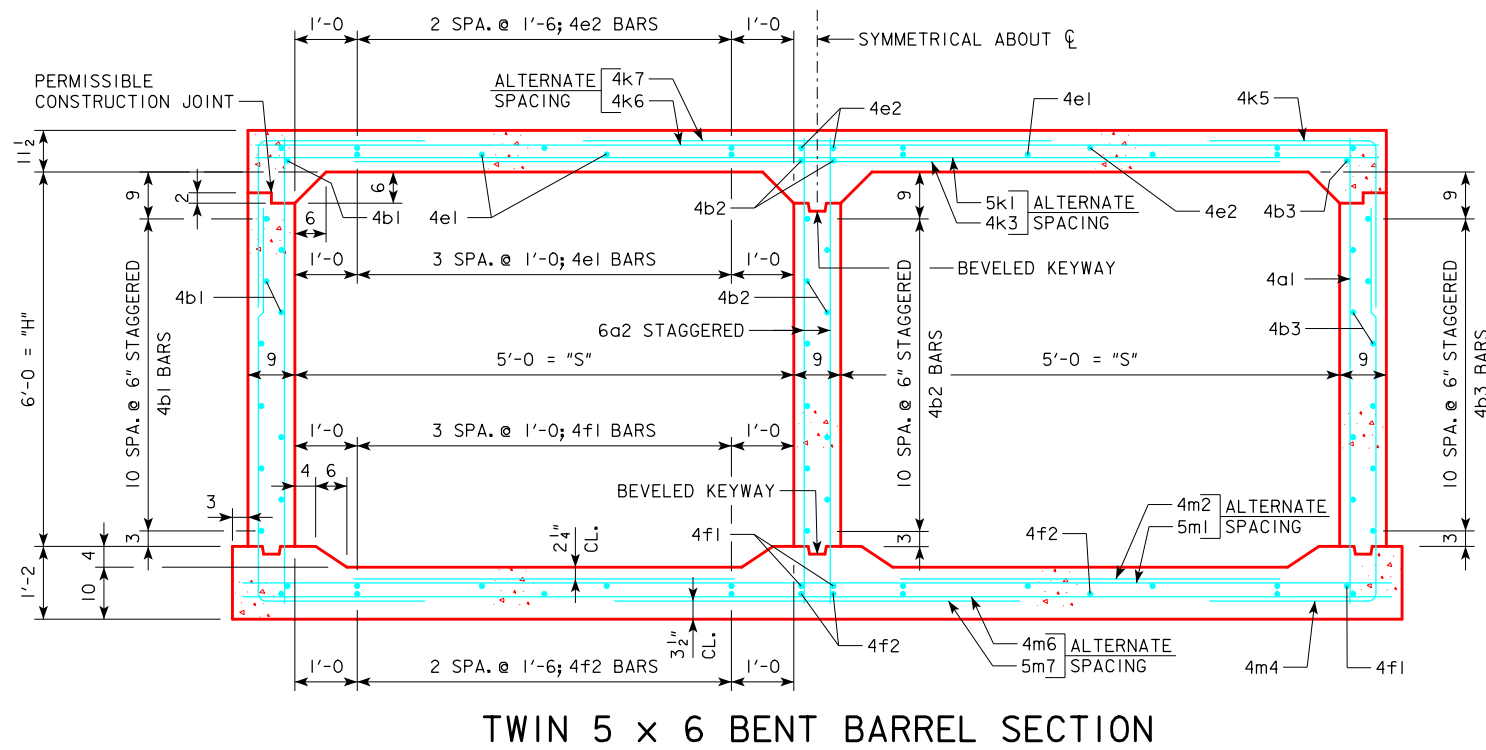
BARS ARE LISTED FROM NORTH TO SOUTH

4f1 BAR DIMENSIONS			
DIM. 'a'	DIM. 'b'	DIM. 'c'	DIM. 'd'
10'-7	11'-1 ¹ / ₄	2'-11 ³ / ₄	11'-6
10'-8	10'-11 ³ / ₈	2'-11 ¹ / ₄	11'-4
10'-8	10'-10 ³ / ₈	2'-11	11'-3
10'-9	10'-8 ¹ / ₂	2'-10 ³ / ₈	11'-1
10'-9	10'-7 ¹ / ₂	2'-10 ⁵ / ₈	11'-0
10'-9	10'-5 ⁵ / ₈	2'-9 ⁵ / ₈	10'-10
10'-10	10'-4 ⁵ / ₈	2'-9 ³ / ₈	10'-9
10'-10	10'-2 ⁵ / ₈	2'-8 ⁷ / ₈	10'-7
10'-10	10'-1 ³ / ₄	2'-8 ⁵ / ₈	10'-6
10'-11	9'-11 ³ / ₄	2'-8 ¹ / ₈	10'-4
10'-11	9'-10 ³ / ₄	2'-7 ⁷ / ₈	10'-3
11'-0	9'-8 ⁷ / ₈	2'-7 ³ / ₈	10'-1

BARS ARE LISTED FROM NORTH TO SOUTH



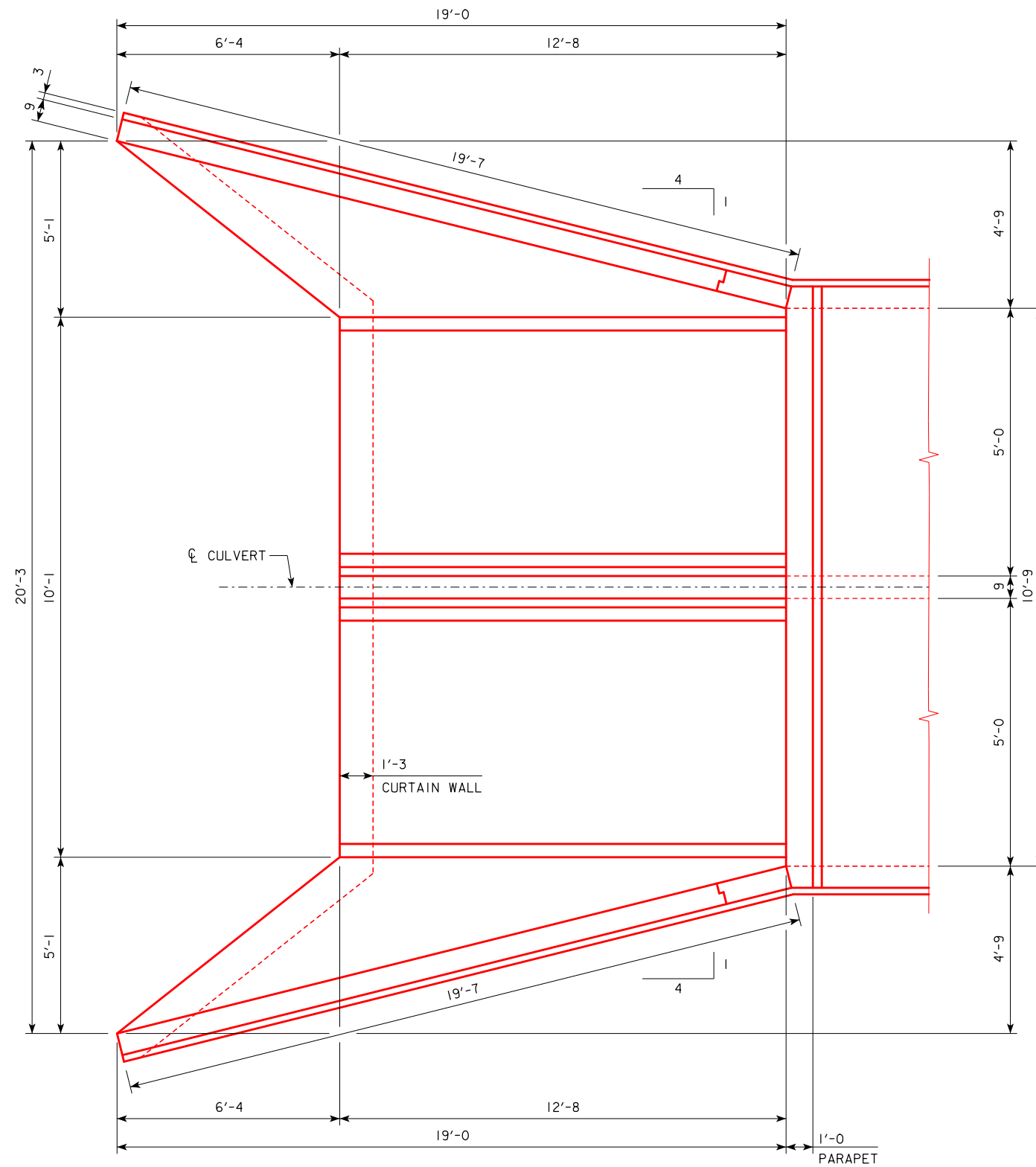
REINFORCING BAR LIST-ONE 22'-0 BENT BARREL					
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
4a1	EXTERIOR WALLS, F.F.V.		61	7'-8	312
6a2	INTERIOR WALLS, BOTH, F.V.		30	7'-8	345
4b1	EXTERIOR WALL, HORIZONTAL		12	22'-2	178
4b2	INTERIOR WALL, HORIZONTAL		13	21'-8	188
4b3	EXTERIOR WALL, HORIZONTAL		12	21'-0	168
4e1	SLAB, BOTT., LONGIT.		8	VARIES	115
4e2	SLAB, TOP, LONGIT.		10	VARIES	144
4f1	FLOOR, TOP, LONGIT.		12	VARIES	173
4f2	FLOOR, BOTT., LONGIT.		10	VARIES	144
5k1	SLAB, BOTT., TRANS.		26	11'-11	323
5k2	SLAB, BOTT., TRANS.		2	1 EACH 11'-0 TO 4'-11	17
4k3	SLAB, BOTT., TRANS.		22	11'-10	174
4k4	SLAB, BOTT., TRANS.		1	7'-9	5
4k5	SLAB, TOP, CORNER		98	7'-1	464
4k6	SLAB, TOP, TRANS.		26	11'-11	207
4k7	SLAB, TOP, TRANS.		22	7'-6	110
4k8	SLAB, TOP, TRANS.		2	1 EACH 11'-0 TO 4'-11	11
4k9	SLAB, TOP, TRANS.		1	5'-9	4
5m1	FLOOR, TOP, TRANS.		26	12'-5	337
4m2	FLOOR, TOP, TRANS.		45	5'-1	153
5m3	FLOOR, TOP, TRANS.		2	1 EACH 11'-3 TO 5'-2	17
4m4	FLOOR, BOTT., CORNER		98	10'-2	666
5m5	FLOOR, BOTT., TRANS.		1	5'-9	6
4m6	FLOOR, BOTT., TRANS.		24	12'-5	199
5m7	FLOOR, BOTT., TRANS.		22	7'-6	172
4m8	FLOOR, BOTT., TRANS.		2	1 EACH 11'-3 TO 5'-2	11
6m9	FLOOR, BOTT., TRANS.		2	12'-5	37
REINFORCING STEEL - TOTAL (LBS.)					4680



CONCRETE PLACEMENT QUANTITIES ONE 22'-0 BENT BARREL	
LOCATION	CY
SLAB	10.8
WALLS	10.2
FLOOR	9.9
TOTAL (C.Y.)	30.9

DESIGN FOR 9° SKEW (R.A.)
TWIN 5'x6' REINFORCED CONCRETE BOX CULVERT EXTENSION
22'-0 BENT BARREL DETAILS
 STATION 438+51.75 (US 6) JUNE, 2017
 IOWA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 11 OF 17 FILE NO. 31463 DESIGN NO. 217





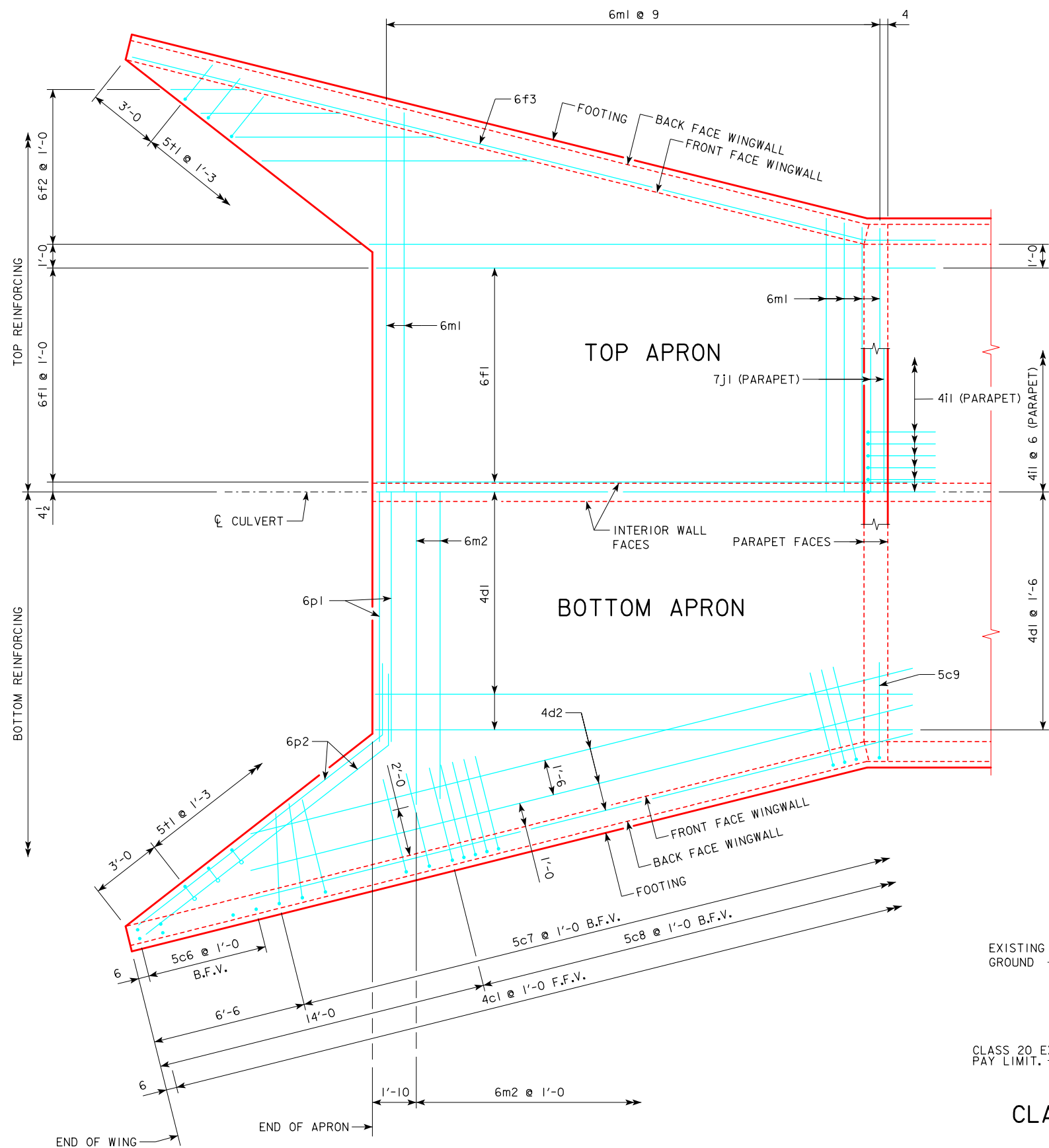
PLAN VIEW

NOTES:

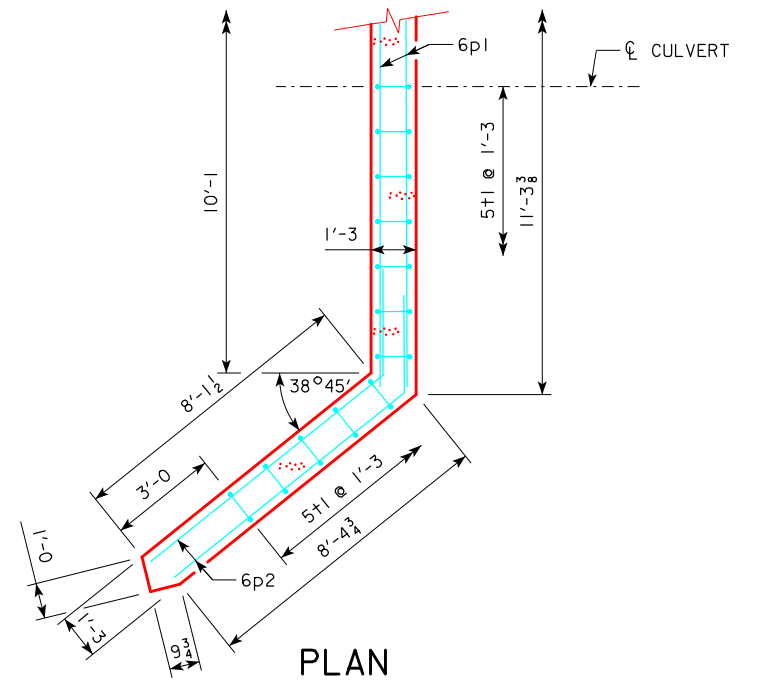
1. SEE SHEET V.3 FOR GENERAL INFORMATION, SPECIFICATIONS, AND DESIGN STRESSES.
2. SEE DESIGN SHEET 15 FOR HEADWALL NOTES.

DESIGN FOR 9° SKEW (R.A.)
**TWIN 5'x6' REINFORCED CONCRETE
 BOX CULVERT EXTENSION
 FLARED WING HEADWALL DETAILS**
 STATION 438+51.75 (US 6) JUNE, 2017
IOWA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 12 OF 17 FILE NO. 31463 DESIGN NO. 217

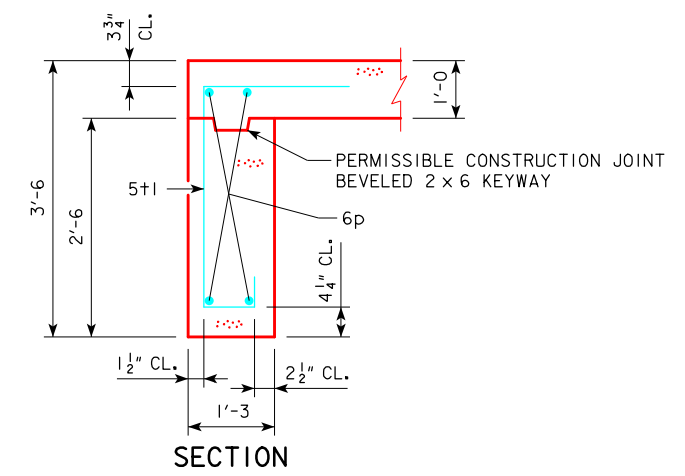




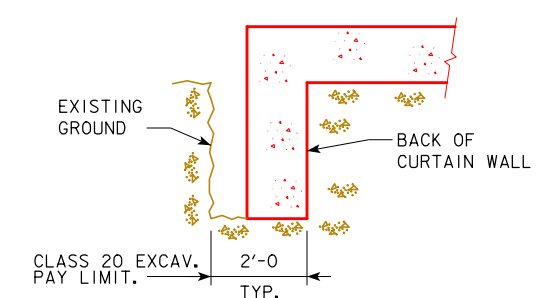
PLAN VIEW - TOP & BOTTOM OF APRON REINFORCING BARS



PLAN



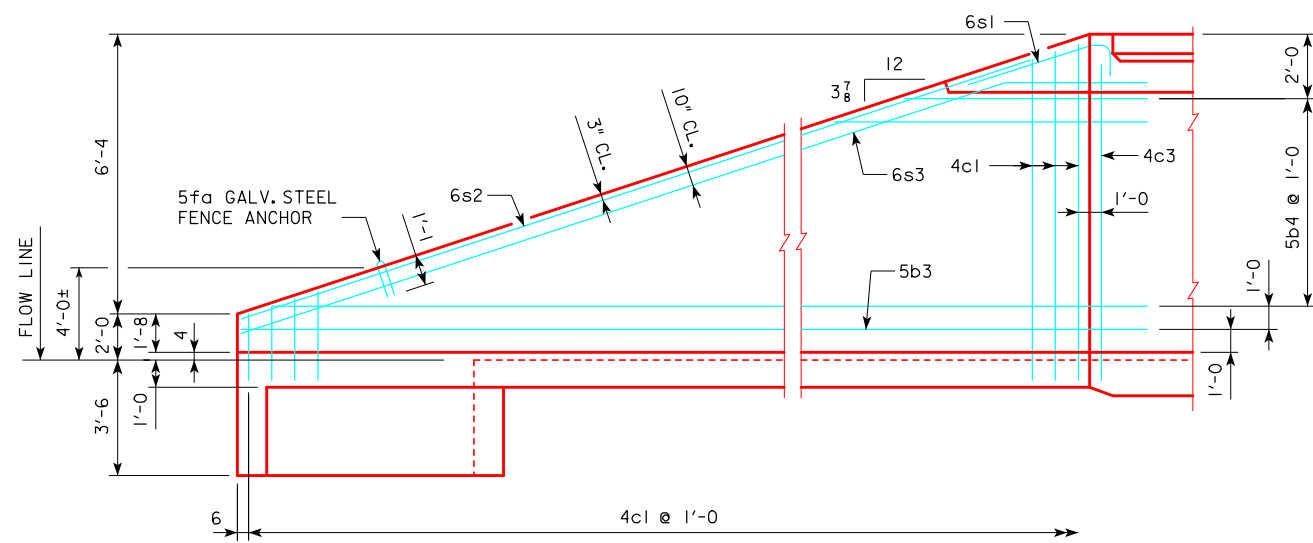
SECTION
CURTAIN WALL DETAILS



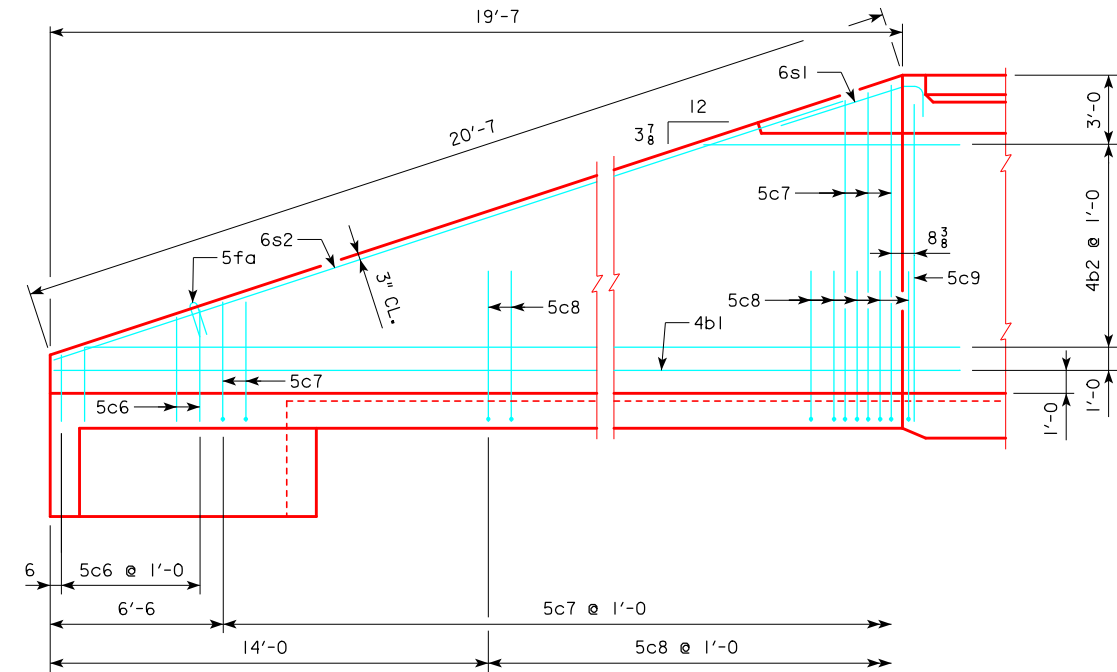
CURTAIN WALL
CLASS 20 EXCAVATION

DESIGN FOR 9° SKEW (R.A.)
**TWIN 5'x6' REINFORCED CONCRETE
 BOX CULVERT EXTENSION
 FLARED WING HEADWALL DETAILS**
 STATION 438+51.75 (US 6) JUNE, 2017
IOWA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 13 OF 17 FILE NO. 31463 DESIGN NO. 217

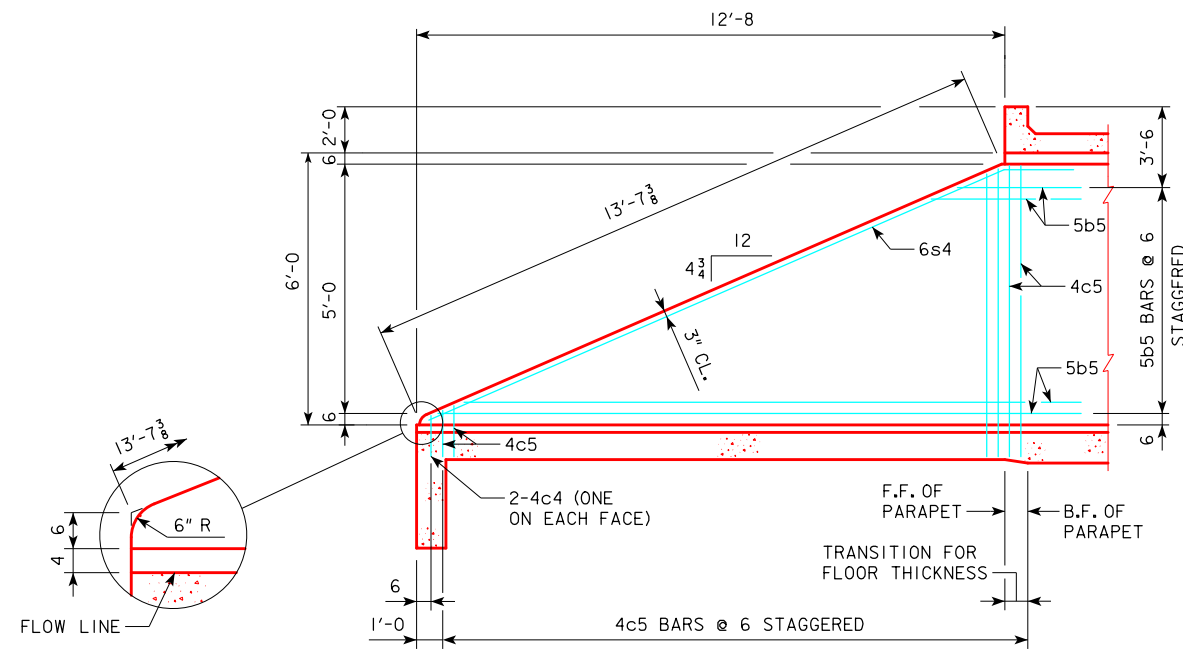




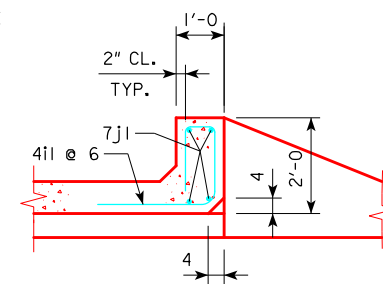
TYPICAL VIEW - FRONT FACE REINFORCING



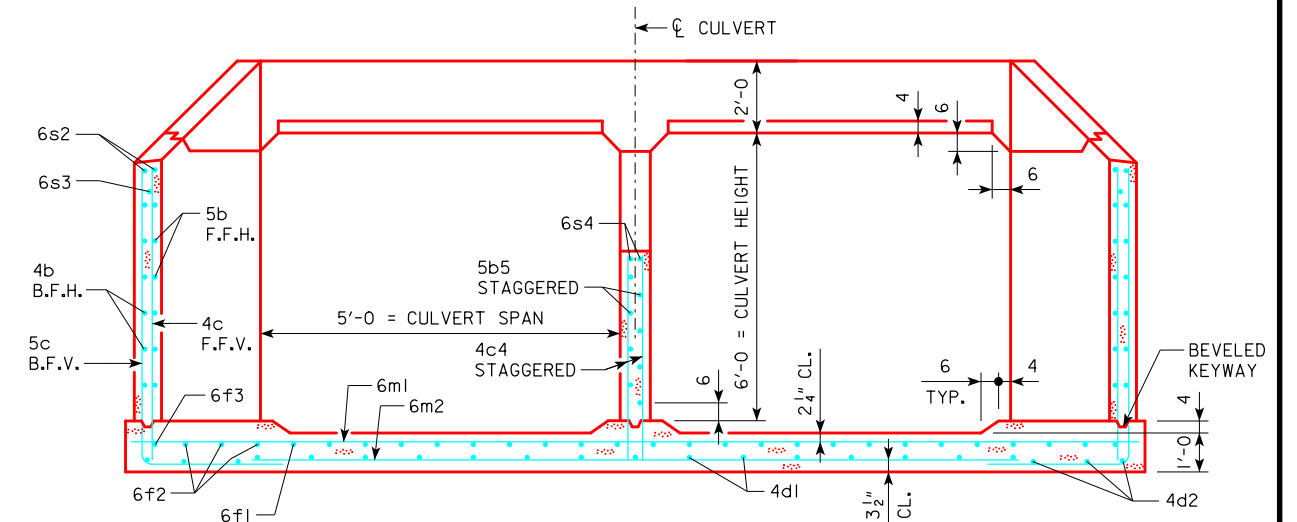
TYPICAL VIEW - BACK FACE REINFORCING



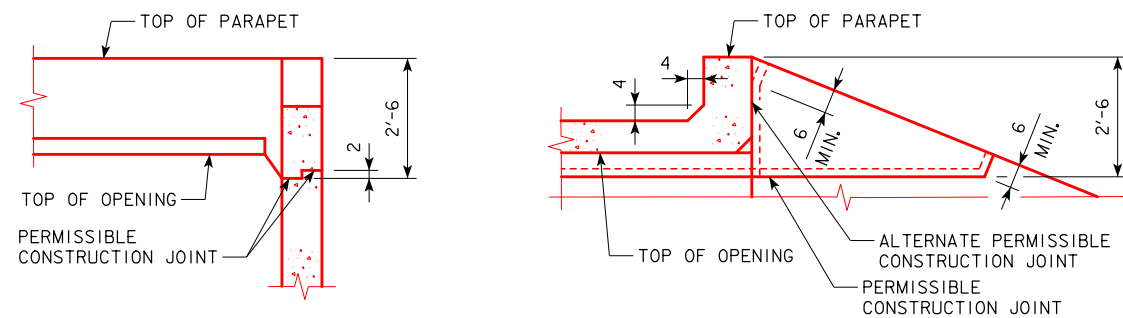
TYPICAL VIEW - INTERIOR WALL



SECTION THRU PARAPET



TYPICAL SECTION - NEAR CENTER OF APRON

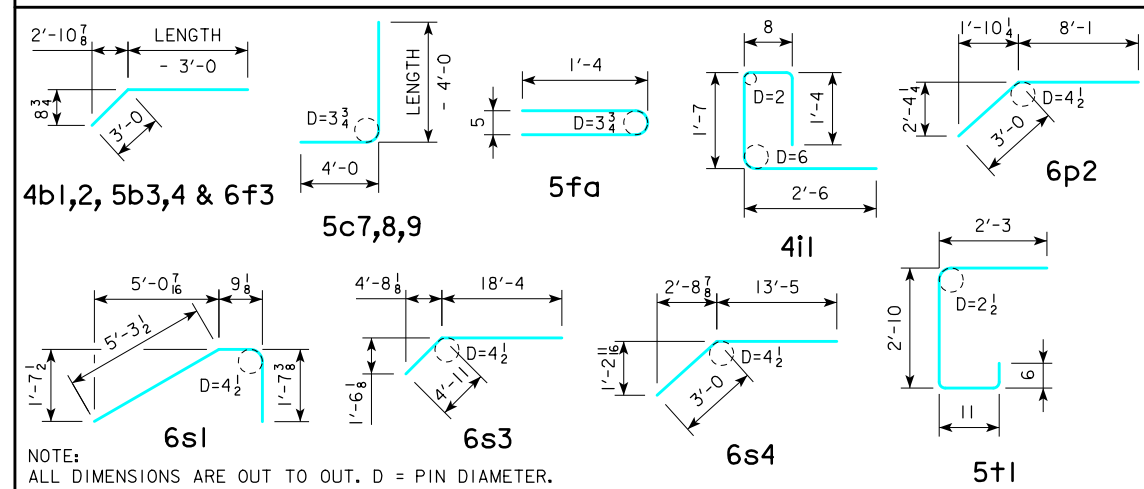


TOP OF WINGWALL DETAILS

DESIGN FOR 9° SKEW (R.A.)
**TWIN 5'x6' REINFORCED CONCRETE
 BOX CULVERT EXTENSION
 FLARED WING HEADWALL DETAILS**
 STATION 438+51.75 (US 6) JUNE, 2017
 IOWA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 14 OF 17 FILE NO. 31463 DESIGN NO. 217



BENT BAR DETAILS



CONCRETE PLACEMENT QUANTITIES ONE HEADWALL-SOUTH

LOCATION	CY
PARAPET *	1.5
WINGWALLS	6.2
APRON	14.3
TOTAL (C.Y.)	22.0

* INCLUDES PARAPET AND TOP OF WINGWALL.

HEADWALL NOTES:

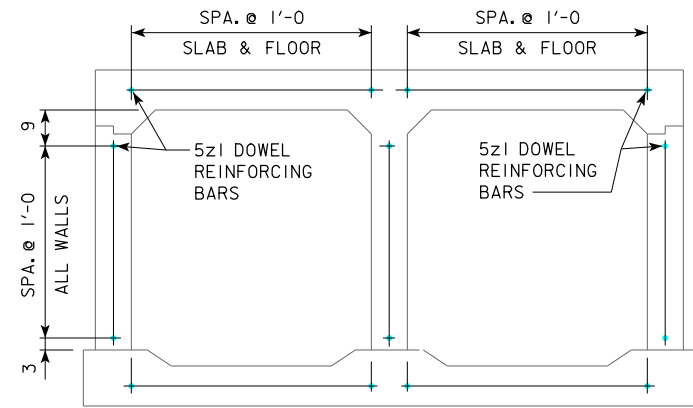
- SEE SHEET V.3 FOR GENERAL INFORMATION, SPECIFICATIONS, AND DESIGN STRESSES.
- THIS HEADWALL IS BASED ON A 3:1 SLOPE NORMAL TO CENTERLINE OF ROADWAY.
- THE SIDES OF THE FOOTING ARE TO BE FORMED TO INSURE CORRECT LINE AND GRADE.
- ALL SLAB AND FLOOR REINFORCING STEEL IS TO BE SUPPORTED BY BAR CHAIRS AT INTERVALS OF NOT MORE THAN 3'-0" IN EITHER DIRECTION AS OUTLINED IN THE STANDARD SPECIFICATIONS.
- CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN. CLEARANCE TO THE BOTTOM ENDS OF VERTICAL BARS SHALL BE 3 INCHES.
- CONCRETE QUANTITIES ARE ESTIMATED FROM BACK OF PARAPET.
- HORIZONTAL TAILS OF BARS "b" & "s" ESTIMATED TO EXTEND 2'-0" BEYOND BACK OF PARAPET (INTO END OF BARREL). LONGITUDINAL BARS "d", "6f1", AND "6f3" ESTIMATED TO PROJECT INTO END SECTION OF BARREL A MINIMUM OF 2'-0" BEYOND BACK OF PARAPET.

REINFORCING BAR LIST - SOUTH HEADWALL

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
5fa	FENCE ANCHOR (GALV.)		2	2'-10	6
4b1	WINGWALL, B.F.H.		2	22'-4	30
4b2	WINGWALL, B.F.H.		8	2 EACH 11'-7 TO 20'-11	87
5b3	WINGWALL, F.F.H.		2	22'-4	47
5b4	WINGWALL, F.F.H.		10	2 EACH 8'-7 TO 20'-11	154
5b5	INTERIOR WALL, BOTH F.H.		9	1 EACH 5'-1 TO 15'-3	95
4c1	WINGWALL, F.F.V.		40	2 EACH 2'-8 TO 8'-10	154
4c3	WINGWALL, F.F.V.		2	7'-7	10
4c4	INTERIOR WALL, BOTH F.V.		2	1'-7	2
4c5	INTERIOR WALL, BOTH F.V.		26	1 EACH 1'-9 TO 6'-8	73
5c6	WINGWALL, B.F.V.		12	2 EACH 2'-8 TO 4'-4	44
5c7	WINGWALL, B.F.V.		28	2 EACH 8'-8 TO 12'-10	314
5c8	WINGWALL, B.F.V.		14	10'-6	153
5c9	WINGWALL, B.F.V.		2	11'-7	24
4d1	APRON, LONGIT., BOTT.		7	15'-6	72
4d2	APRON, LONGIT., BOTT.		6	17'-5	70
6f1	APRON, LONGIT., TOP		10	15'-6	233
6f2	APRON, LONGIT., TOP		8	2 EACH 4'-7 TO 12'-10	105
6f3	APRON, LONGIT., TOP		2	22'-4	67
4i1	PARAPET, VERTICAL		21	6'-1	85
7j1	PARAPET, HORIZONTAL		4	11'-11	97
6m1	APRON, TRANS., TOP		18	1 EACH 12'-1 TO 18'-6	413
6m2	APRON, TRANS., BOTT.		12	1 EACH 6'-6 TO 12'-0	167
6p1	CURTAIN, HORIZONTAL		4	11'-0	66
6p2	CURTAIN, HORIZONTAL		8	11'-1	133
6s1	WING SLOPE, BOTH F.		4	7'-8	46
6s2	WING SLOPE, BOTH F.		4	18'-0	108
6s3	WING SLOPE, F.F.		2	23'-3	70
6s4	INTERIOR WALL, BOTH F.		2	16'-5	49
5+1	CURTAIN, VERTICAL		19	6'-6	129
REINFORCING STEEL - TOTAL (LBS.)					3103

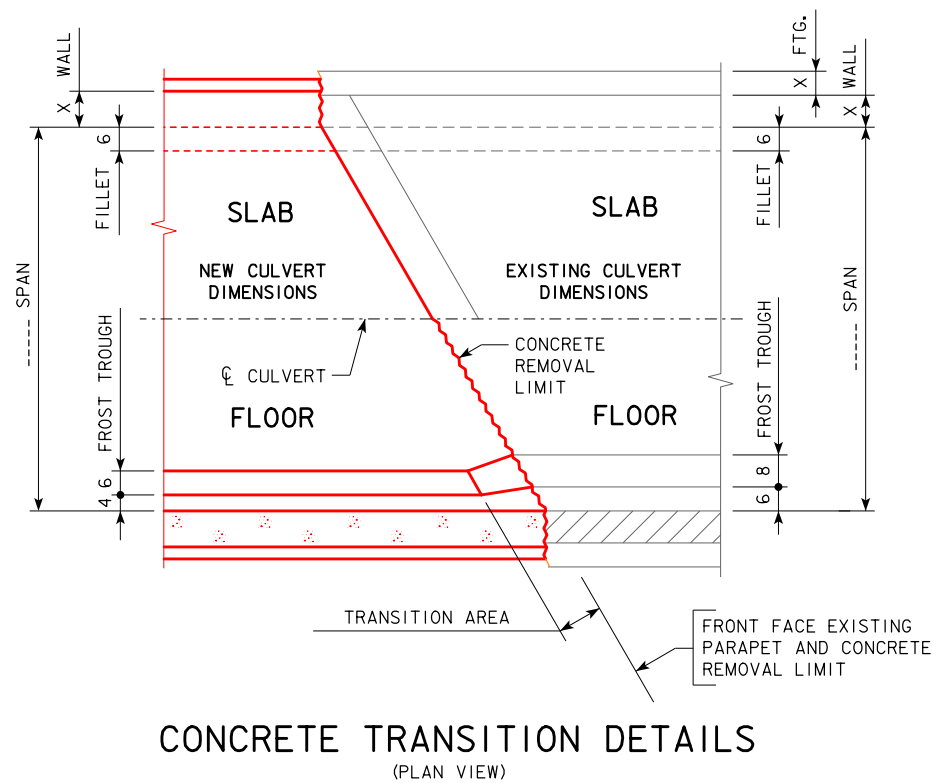
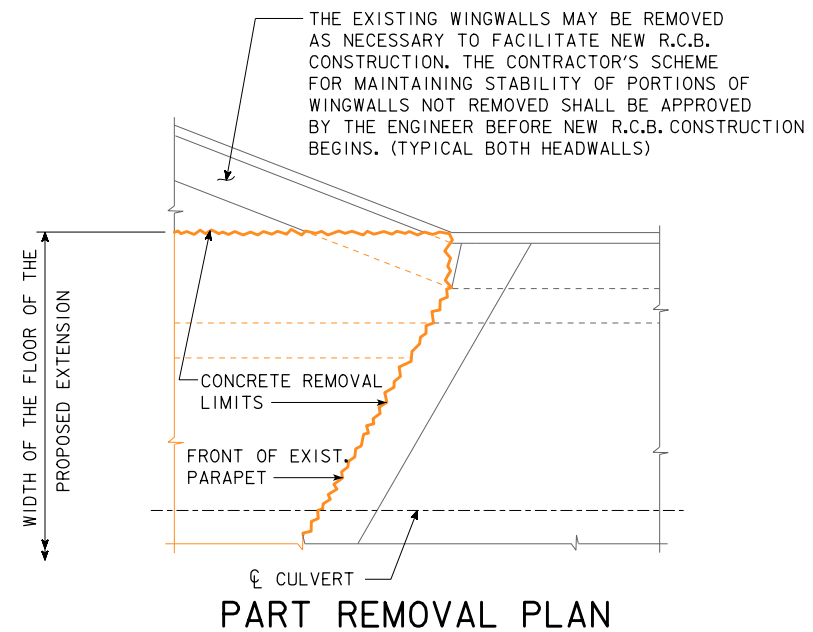


DESIGN FOR 9° SKEW (R.A.)
**TWIN 5'x6' REINFORCED CONCRETE
 BOX CULVERT EXTENSION**
FLARED WING HEADWALL QUANTITIES
 STATION 438+51.75 (US 6) JUNE, 2017
IOWA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 15 OF 17 FILE NO. 31463 DESIGN NO. 217

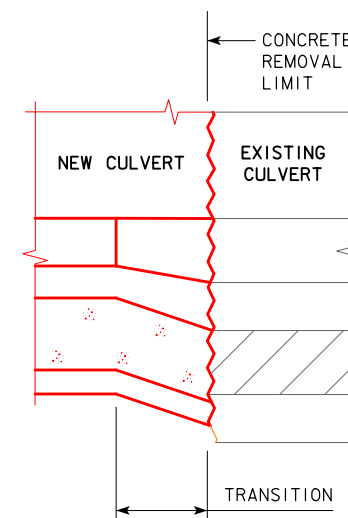


SECTION NEAR TWIN EXTENSION
(SHOWING SPACING OF 5z1 DOWEL REINFORCING BARS)

REINFORCING STEEL EXTENSION DOWELS						
BAR	LOCATION	SHAPE	NO./JT.	TOTAL NO.	LENGTH	WEIGHT
5z1	TOP SLAB, CONST. JOINT		42	84	2'-6	219



CONCRETE TRANSITION DETAILS
(PLAN VIEW)



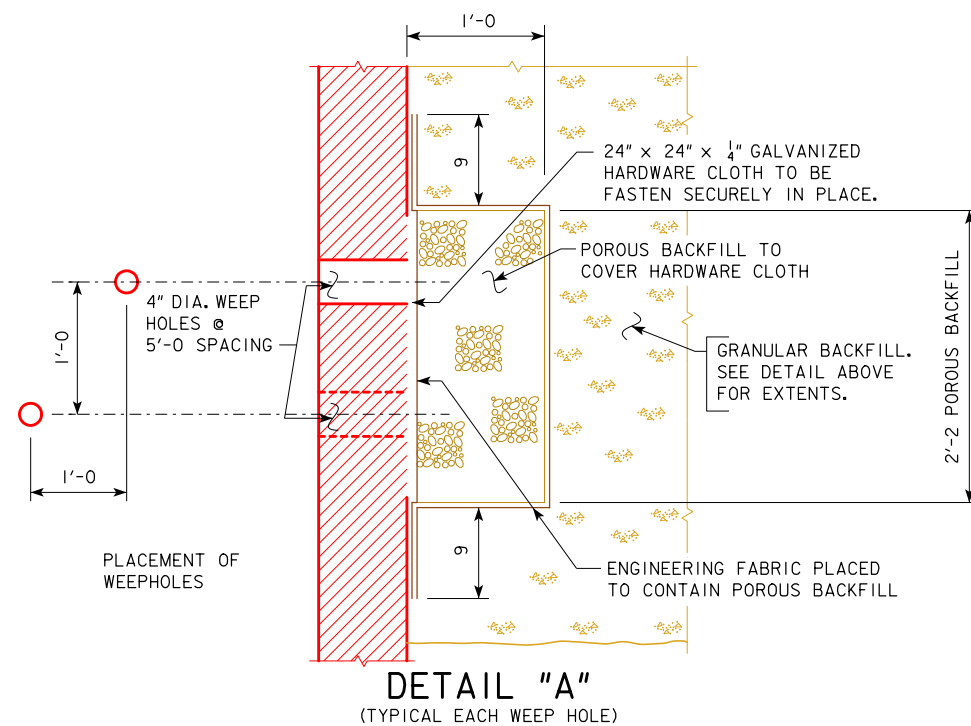
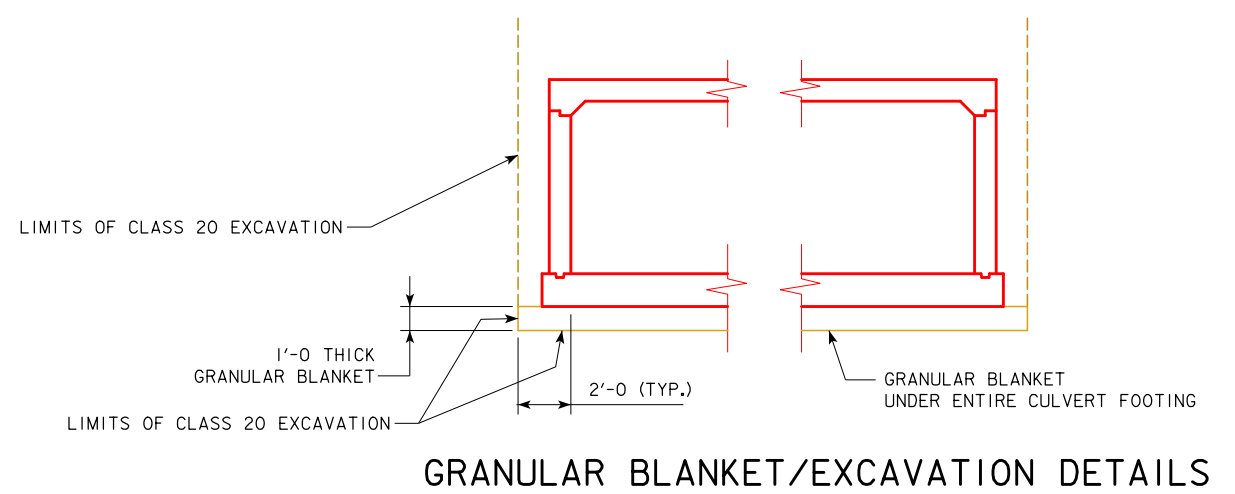
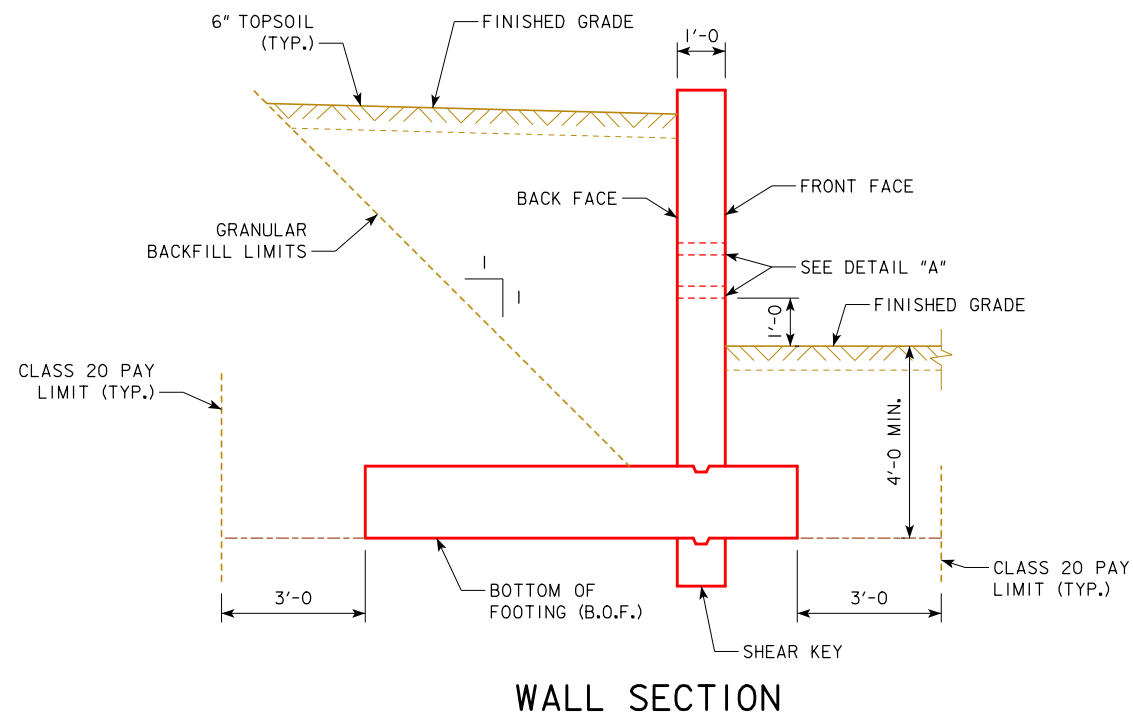
CONCRETE TRANSITION DETAILS
(WALL TRANSITION SHOWN - TYPICAL FOR SLAB)

NOTE: REFER TO THE BRIDGE DESIGN MANUAL, SECTION 7 FOR CULVERT EXTENSION DETAILS FOR TRANSITION INFORMATION.

NEW BARREL CONCRETE THICKNESSES SHALL BE MAINTAINED MINIMALLY WHEN TRANSITIONING TO MEET EXISTING BARREL INTERIOR SURFACES. OUTSIDE CONCRETE SURFACES DO NOT HAVE TO BE TRANSITIONED TO MATCH EXISTING SURFACES.

DESIGN FOR 9° SKEW (R.A.)
TWIN 5'x6' REINFORCED CONCRETE BOX CULVERT EXTENSION
CONCRETE TRANSITION DETAILS
 STATION 438+51.75 (US 6) JUNE, 2017
IOWA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 16 OF 17 FILE NO. 31463 DESIGN NO. 217

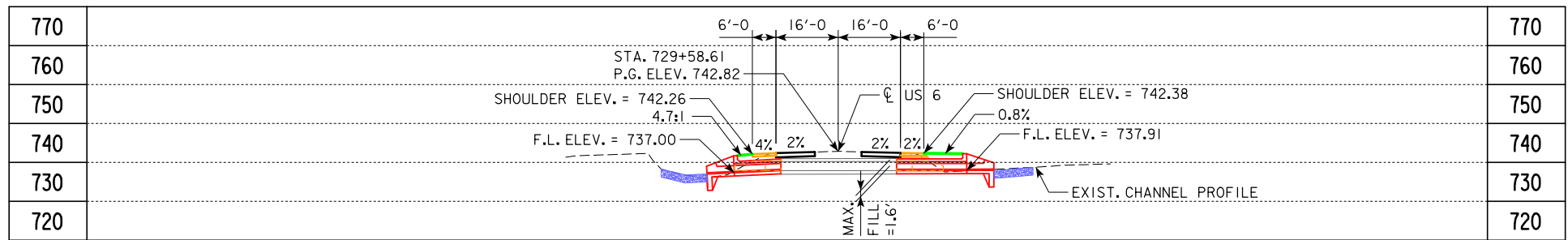




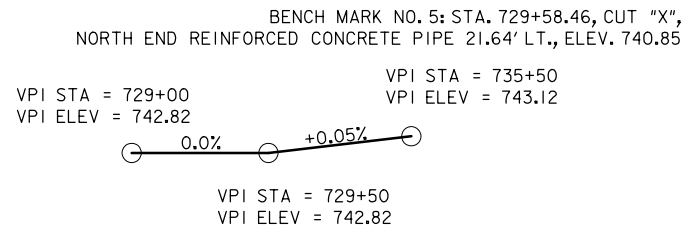
ENGINEERING FABRIC TO BE SECURELY ATTACHED WITH ADHESIVE TO PERIMETER CONCRETE ON THE OUTSIDE OF HARDWARE CLOTH AND TO THE LIMITS SHOWN FOR THE POROUS BACKFILL. THIS COST TO BE INCLUDED IN THE PRICE BID FOR STRUCTURAL CONCRETE (RCB CULVERT).

24" x 24" x 1/4" MESH SIZE GALVANIZED HARDWARE CLOTH CENTERED ON WEEPHOLES. HARDWARE CLOTH, IN ACCORDANCE WITH ASTM A740, TO BE FIRMLY ATTACHED TO CONCRETE ON OUTSIDE FACE OF WALLS. THIS COST TO BE INCLUDED IN PRICE BID FOR STRUCTURAL CONCRETE (RCB CULVERT).

DESIGN FOR 9° SKEW (R.A.)
**TWIN 5'x6' REINFORCED CONCRETE
 BOX CULVERT EXTENSION**
MISCELLANEOUS WALL DETAILS
 STATION 438+51.75 (US 6) JUNE, 2017
IOWA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 17 OF 17 FILE NO. 31463 DESIGN NO. 217

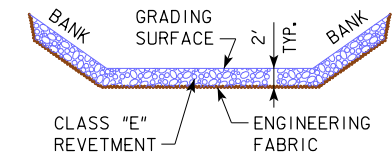


LONGITUDINAL SECTION ALONG ϕ CULVERT
 DESIGN FILL HEIGHT = 2'-0"
 ANTICIPATED SETTLEMENT = NEGLIGIBLE



PROPOSED PROFILE GRADE ON US 6

NOTES:
 IT IS THE INTENT OF THIS DESIGN TO EXTEND THE EXISTING 4' x 2' REINFORCED CONCRETE BOX CULVERT WITH 0 DEGREE SKEW BY REMOVING THE RCP ENDS AND EXISTING HEADWALL AS REQUIRED AND ADDING A 4' x 2' x 17' & 4' x 2' x 11' REINFORCED CONCRETE BOX CULVERT EXTENSIONS WITH HEADWALLS ON THE SOUTH AND NORTH ENDS RESPECTIVELY .
 THE RCB CULVERT EXTENSION IS DESIGNED FOR EARTH FILLS OF 2 FEET.
 ALL UNITS ARE IN FEET UNLESS OTHERWISE NOTED OR SHOWN.
 SEE ROAD SHEETS FOR ADDITIONAL INFORMATION ON PROPOSED GRADING LIMITS.
 DRAINAGE THROUGH EXISTING CULVERT/CHANNEL MUST BE MAINTAINED THROUGHOUT CONSTRUCTION.
 LIMITS OF EASEMENT TO BE DETERMINED.
 CULVERT LENGTH ON NORTH SIDE DOES NOT SATISFY CLEAR ZONE.
 HEADWALLS SHALL BE PLACED LEVEL.



ESTIMATED REVETMENT QUANTITIES INCLUDED WITH ROAD PLANS

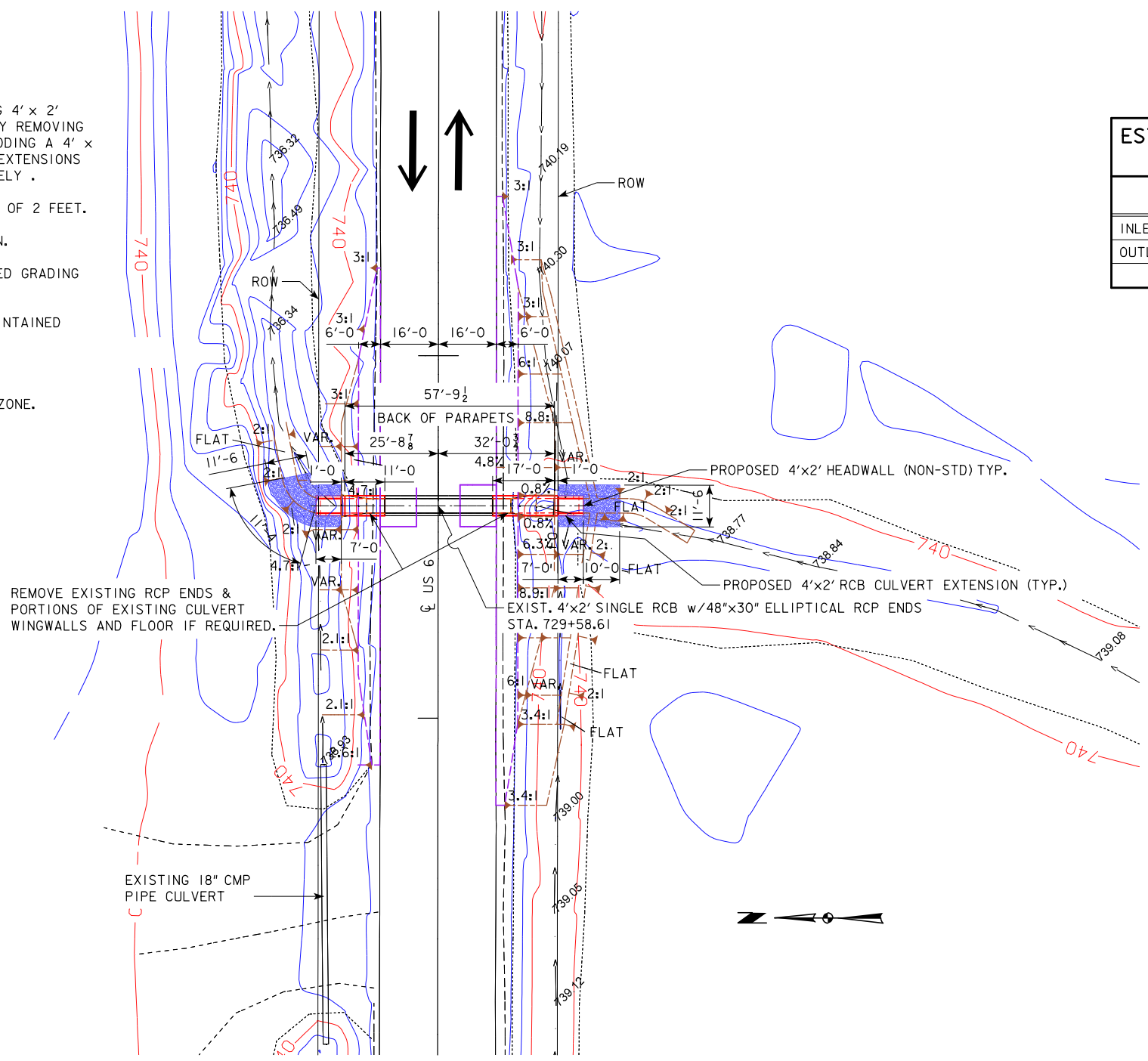
LOCATION	REVETMENT CL. "E" (TON)	ENGINEERING FABRIC (SY)
INLET	18.6	33.2
OUTLET	20.5	35.6
TOTALS	39.1	68.8

HYDRAULIC DATA
 DRAINAGE AREA = 748.8 ACRES
 $Q_{50} = 1,260$ CFS
 ROLLING

- UTILITIES LEGEND:**
- T1 - COOPERATIVE TELEPHONE COMPANY
 - F0 - IOWA NETWORK SERVICES
 - G - ALLIANT ENERGY
 - F02 - MCI
 - F03 - MEDIACOM
 - T2 - WINDSTREAM COMMUNICATIONS
 - F04 - SOUTH SLOPE COOPERATIVE

LOCATION
 ON US 6 OVER DRAINAGE DITCH T-8IN R-11W SECTION 25 & 36 MERANGO TOWNSHIP IOWA COUNTY LATITUDE 41.789505 LONGITUDE -92.071305

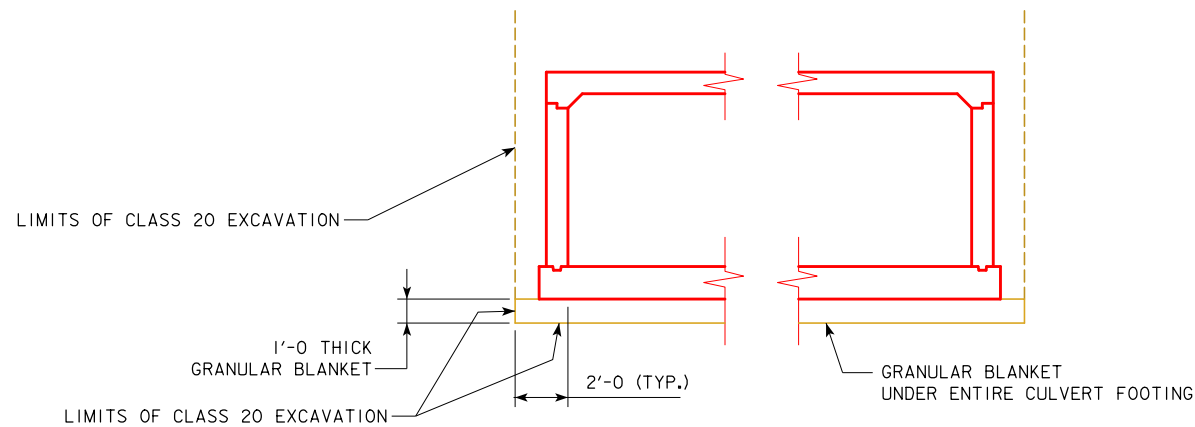
TRAFFIC ESTIMATE
 2014 AADT 3370 V.P.D.



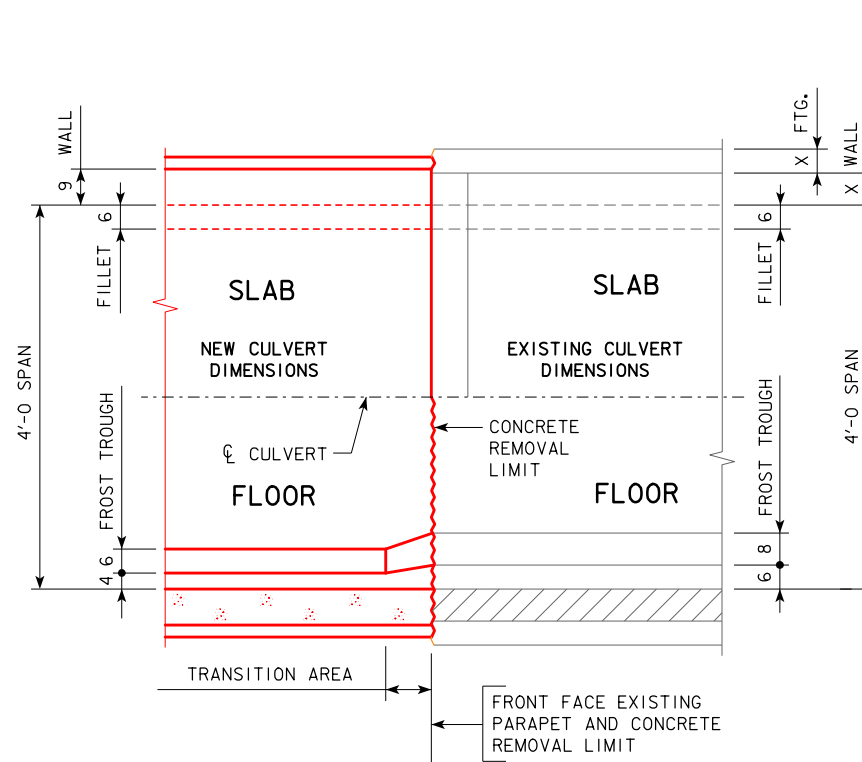
SITUATION PLAN

DESIGN FOR 0°
4'x2' REINFORCED CONCRETE BOX CULVERT EXTENSION SITUATION PLAN
 STATION 729+58.61 (US 6) JUNE, 2017
 IOWA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 1 OF 10 FILE NO. 31463 DESIGN NO. 317

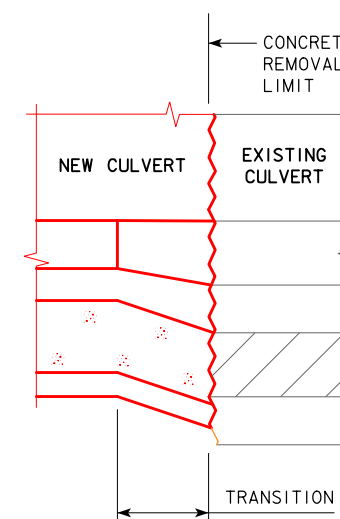




GRANULAR BLANKET/EXCAVATION DETAILS



CONCRETE TRANSITION DETAILS
(PLAN VIEW)



CONCRETE TRANSITION DETAILS
(WALL TRANSITION SHOWN - TYPICAL FOR SLAB)

NEW BARREL CONCRETE THICKNESSES SHALL BE MAINTAINED MINIMALLY WHEN TRANSITIONING TO MEET EXISTING BARREL INTERIOR SURFACES. OUTSIDE CONCRETE SURFACES DO NOT HAVE TO BE TRANSITIONED TO MATCH EXISTING SURFACES.

DESIGN FOR 0°

**4'x2' REINFORCED CONCRETE
BOX CULVERT EXTENSION**

MISCELLANEOUS CULVERT DETAILS

STATION 729+58.61 (US 6) JUNE, 2017

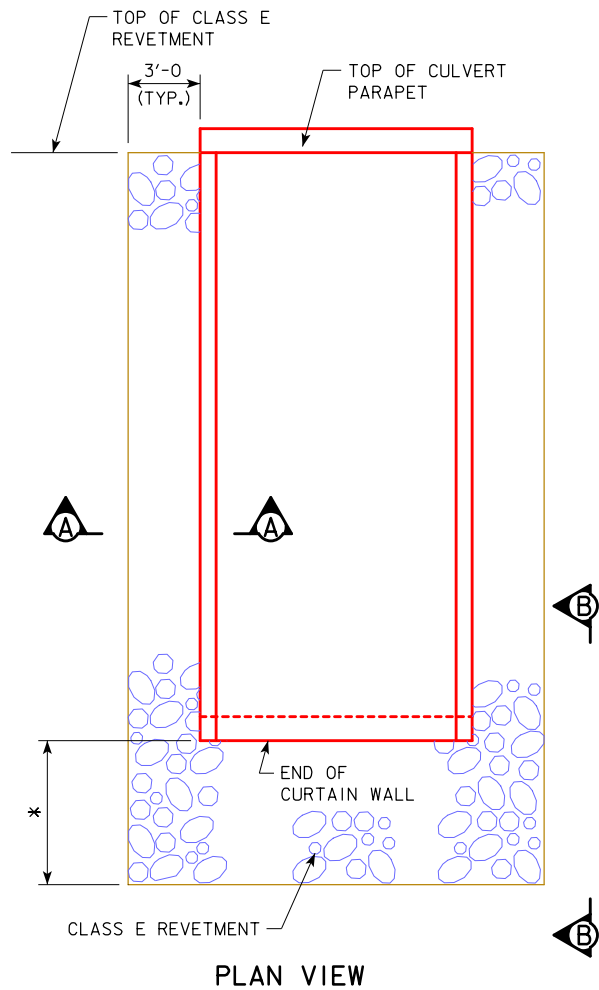
IOWA COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

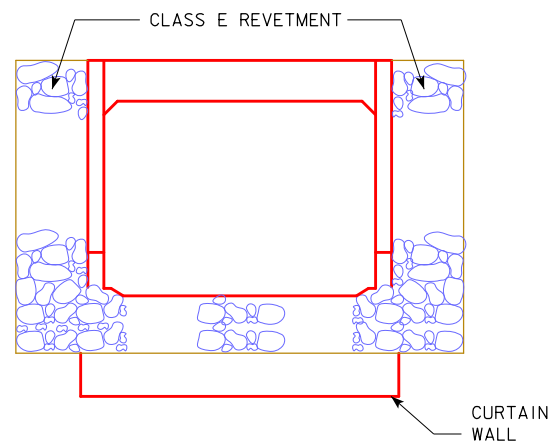
DESIGN SHEET NO. 2 OF 10 FILE NO. 31463 DESIGN NO. 317

REVISED: CHANGED BRIDGE DESIGN MANUAL, SECTION 8 TO SECTION 7. (3-1-15)
ENGLISHING/CULVERTS.DGN - 1047 - THIS SHEET ISSUED 03-12.

* = SEE SITUATION PLAN FOR LIMITS OF REVETMENT AND ENGINEERING FABRIC.

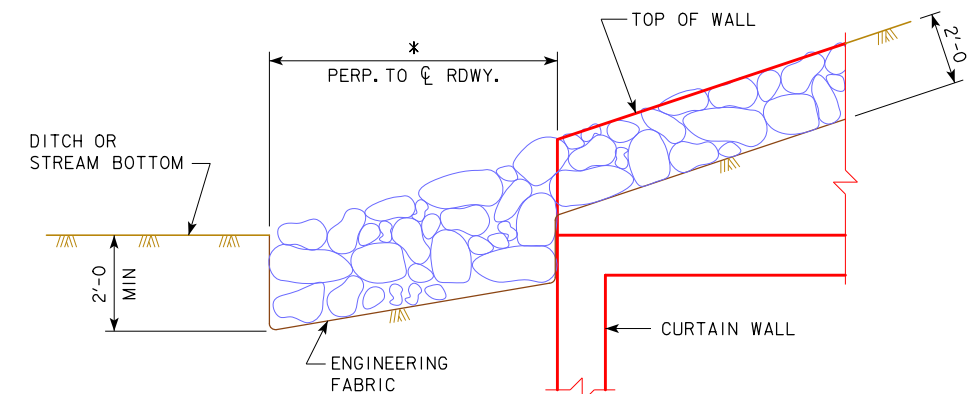


PLAN VIEW

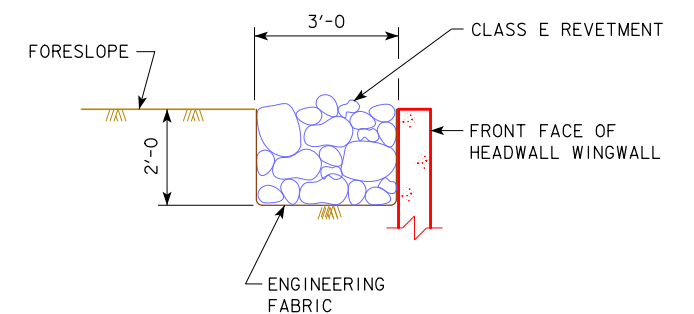


ELEVATION VIEW
0° SKEW HEADWALLS

* = SEE SITUATION PLAN FOR LIMITS OF REVETMENT AND ENGINEERING FABRIC.



VIEW B-B



SECTION A-A

TYPICAL DETAILS

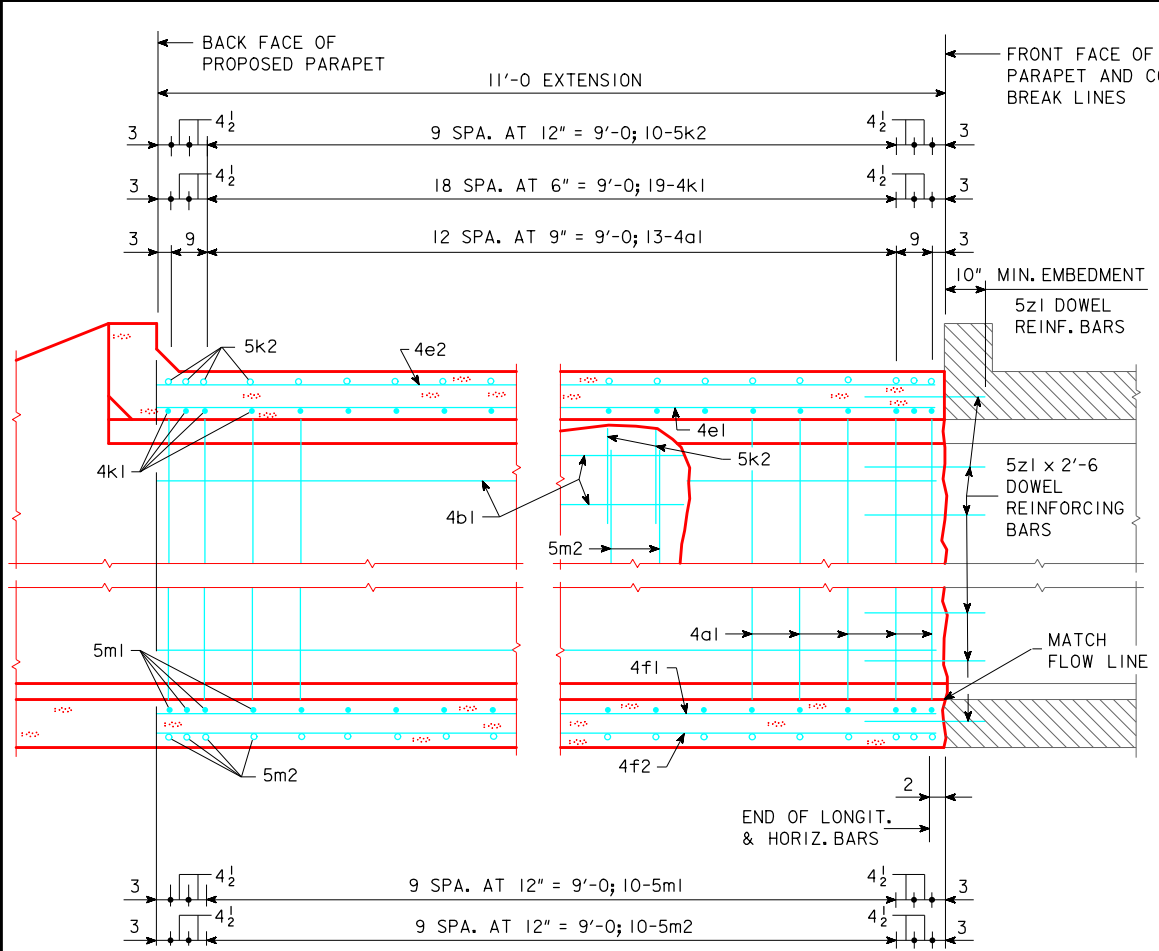
CONSTRUCTION NOTES:

CLASS E REVETMENT SHALL BE USED AND PLACED ACCORDING TO ARTICLE 2507.03, OF THE STANDARD SPECIFICATIONS.
THE ENGINEERING FABRIC SHALL MEET THE MATERIAL REQUIREMENTS IN ACCORDANCE WITH ARTICLE 4196.01, B, 3, OF THE STANDARD SPECIFICATIONS.

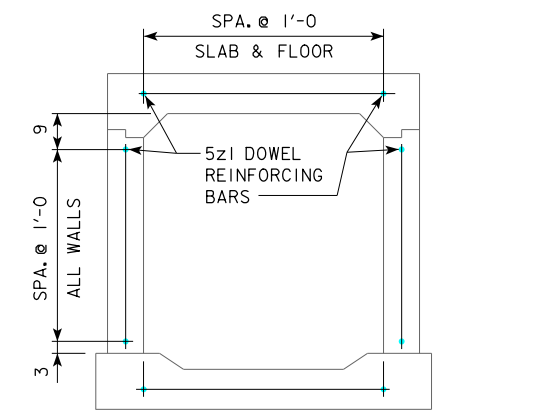
DESIGN FOR 0°
**4'x2' REINFORCED CONCRETE
 BOX CULVERT EXTENSION**
REVETMENT PROTECTION DETAILS
 STATION 729+58.61 (US 6) JUNE, 2017
IOWA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 3 OF 10 FILE NO. 31463 DESIGN NO. 317

REVISED 1-16 - ADDED NOTE "SEE CULVERT PLANS FOR LIMITS OF REVETMENT AND ENGINEERING FABRIC."
 REVISED 02-2017 - ADDED SECTION DIRECTORS "A-A" TO "ZERO SKEW" PLAN VIEW DETAIL.
 ENGLISHING\INGLCULVERTS.DGN - 1092 - THIS SHEET ISSUED 04-12.

CORRECTION 05-14 - ADDED THE BAR LABELS K9 & m9 TO THE PART LONGIT. SECTIONS. HEL044.S01 (ASTD01044.S01--LEP; THIS SHEET REDRAWN_DEVICE:ZHA0R(200,004) ARCH.TAPE NO. 15 DATE 9-8-88)

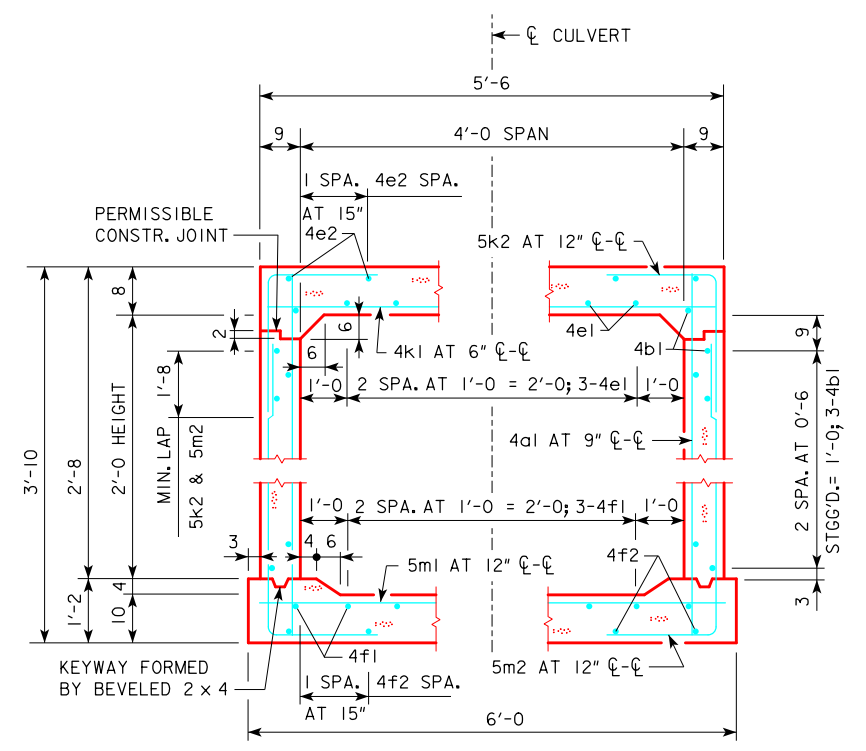


11'-0 BARREL PART LONGITUDINAL SECTION
(ALONG CL OF CULVERT)



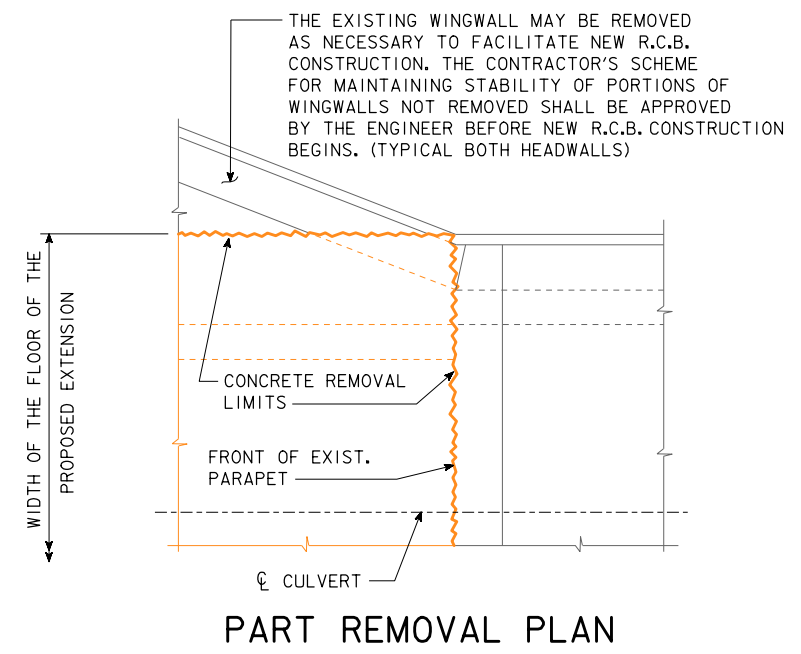
SECTION NEAR EXTENSION
(SHOWING SPACING OF 5z1 DOWEL REINFORCING BARS)

REINFORCING STEEL EXTENSION DOWELS						
BAR	LOCATION	SHAPE	NO./JT.	TOTAL NO.	LENGTH	WEIGHT
5z1	TOP SLAB, CONST. JOINT		14	28	2'-6	73



SECTION THRU BARREL
(NORMAL TO CL OF CULVERT)

NOTE:
ALL TRANSVERSE REINFORCING BARS AND HORIZONTAL LEGS OF CORNER BARS SHALL BE PLACED PARALLEL TO THE CONCRETE BREAK LINE AND NEW PARAPET EXCEPT AS SHOWN.
DIMENSIONS SHOWN FOR CL OF TRANSVERSE BARS, VERTICAL WALL BARS, AND CORNER BARS ARE MEASURED ALONG CL OF CULVERT.
CONCRETE PER FOOT OF BARREL:
SLAB = 1.9 CU. YDS.
WALLS = 1.0 CU. YDS.
FLOOR = 2.4 CU. YDS.
TOTAL = 5.3 CU. YDS.

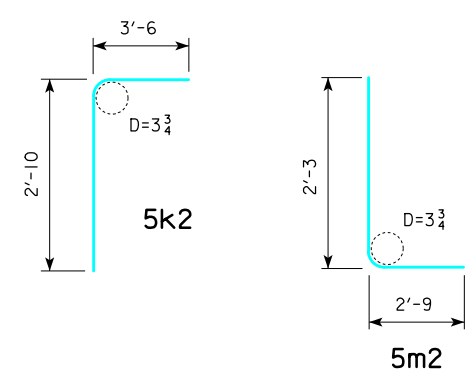


PART REMOVAL PLAN

REINFORCING BAR LIST-ONE 11'-0 EXTENSION

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
4a1	WALLS, F.F.V		30	3'-5	68
4b1	WALLS, F.F.H & B.F.H		8	10'-10	58
4e1	SLAB, BOTT. LONGIT.		3	10'-10	22
4e2	SLAB, TOP LONGIT.		4	10'-10	29
4f1	FLOOR, TOP LONGIT.		5	10'-10	36
4f2	FLOOR, BOTT LONGIT.		4	10'-10	29
4k1	SLAB, BOTT. TRANSV.		23	5'-2	79
5k2	SLAB, TOP CORNER		28	6'-4	185
5m1	FLOOR, TOP TRANSV.		14	5'-8	83
5m2	FLOOR, BOTT. CORNER		28	5'-0	146
REINFORCING STEEL - TOTAL (LBS.)					735

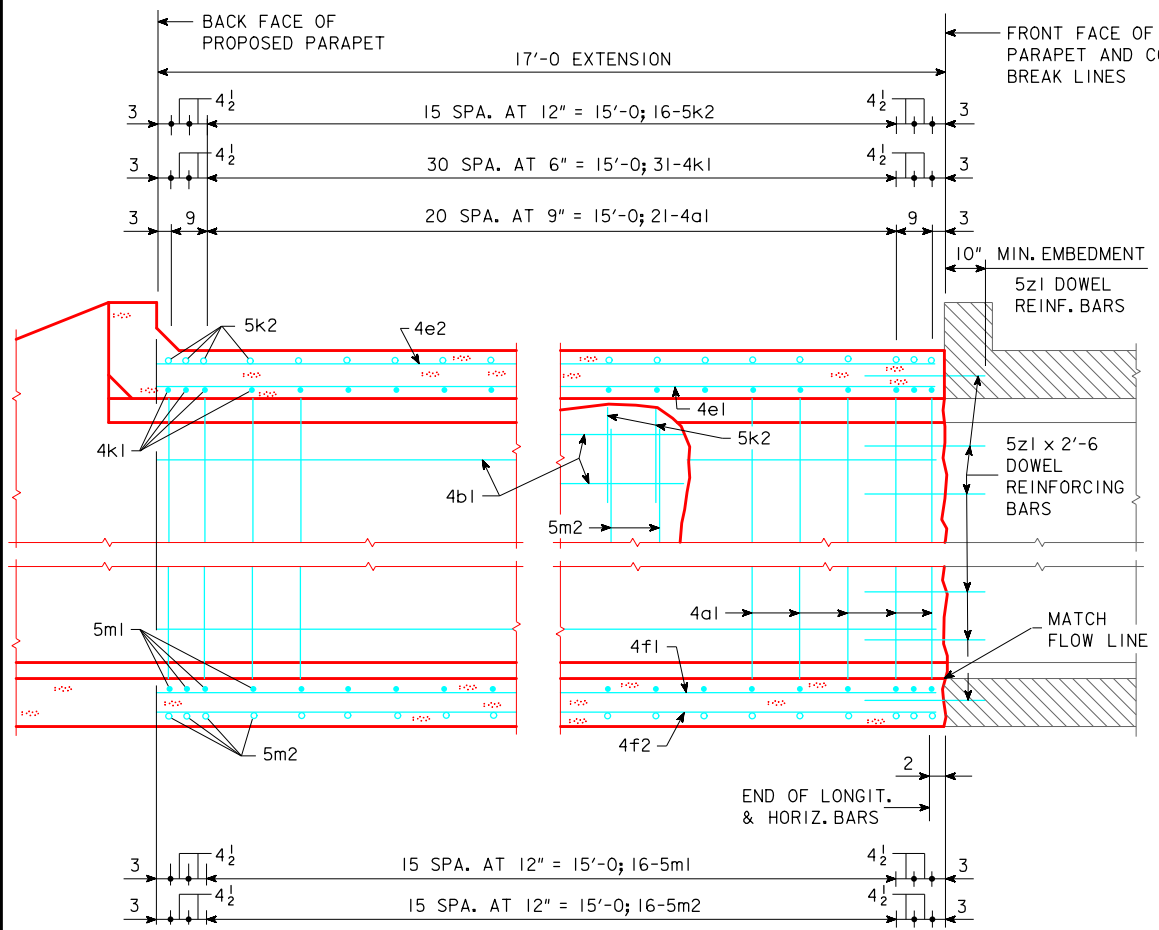
BENT BAR DETAILS



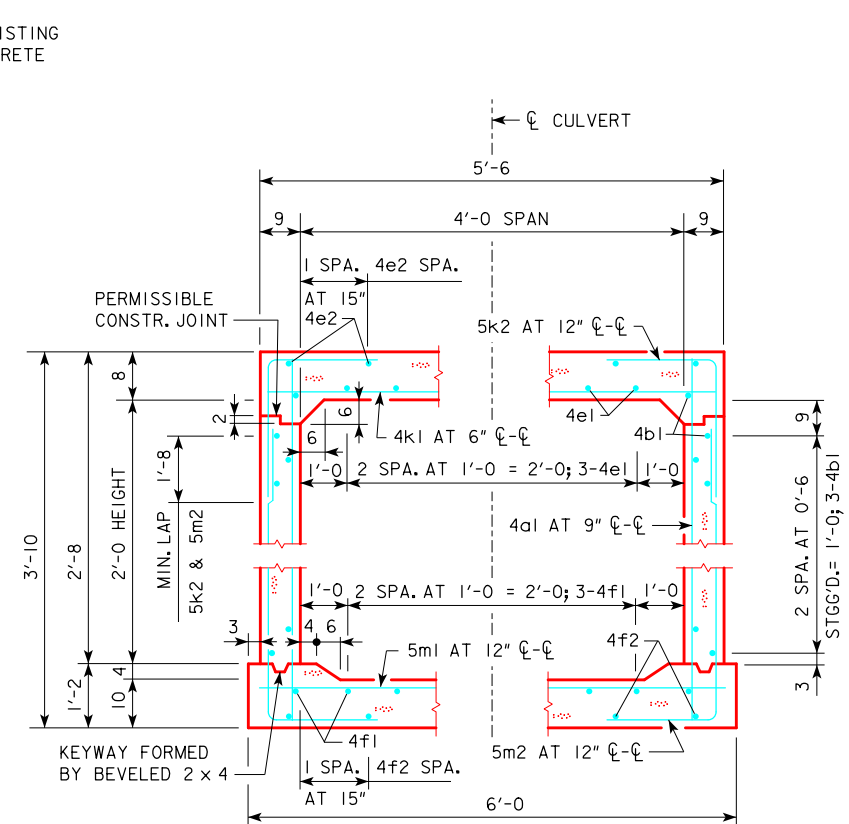
NOTE: ALL DIMENSIONS ARE OUT TO OUT. D = PIN DIAMETER.

DESIGN FOR 0°
**4'x2' REINFORCED CONCRETE
BOX CULVERT EXTENSION**
11'-0 CULVERT EXTENSION DETAILS
STATION 729+58.61 (US 6) JUNE, 2017
IOWA COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 4 OF 10 FILE NO. 31463 DESIGN NO. 317

CORRECTION 05-14 - ADDED THE BAR LABELS k9 & m9 TO THE PART LONGIT. SECTIONS. HEL044.S01 (ASTD01044.S01--LEP: THIS SHEET REDRAWN_DEVICE:ZHA0:200,004) ARCH.TAPE NO. 15 DATE 9-8-88)



17'-0 BARREL PART LONGITUDINAL SECTION
(ALONG CL OF CULVERT)



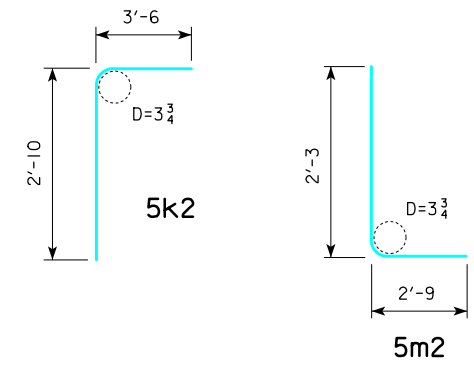
SECTION THRU BARREL
(NORMAL TO CL OF CULVERT)

NOTE:
ALL TRANSVERSE REINFORCING BARS AND HORIZONTAL LEGS OF CORNER BARS SHALL BE PLACED PARALLEL TO THE CONCRETE BREAK LINE AND NEW PARAPET EXCEPT AS SHOWN.
DIMENSIONS SHOWN FOR CL-CL OF TRANSVERSE BARS, VERTICAL WALL BARS, AND CORNER BARS ARE MEASURED ALONG CL OF CULVERT.
CONCRETE PER FOOT OF BARREL:
SLAB = 2.9 CU. YDS.
WALLS = 1.5 CU. YDS.
FLOOR = 3.8 CU. YDS.
TOTAL = 8.2 CU. YDS.

REINFORCING BAR LIST-ONE 17'-0 EXTENSION

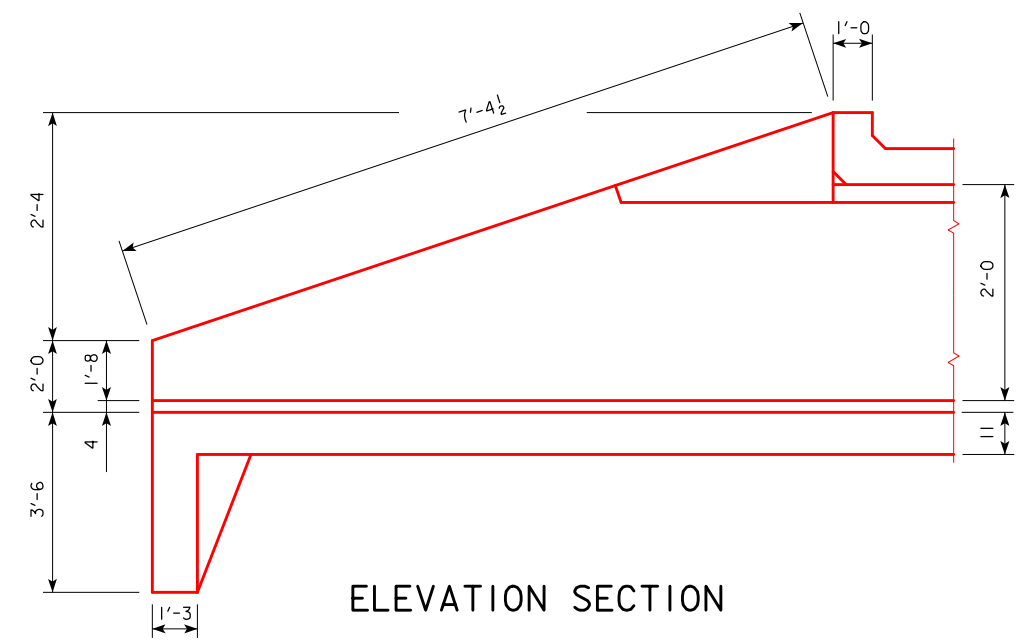
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
4a1	WALLS, F.F.V	—	46	3'-5	105
4b1	WALLS, F.F.H & B.F.H	—	8	16'-10	90
4e1	SLAB, BOT. LONGIT.	—	3	16'-10	34
4e2	SLAB, TOP LONGIT.	—	4	16'-10	45
4f1	FLOOR, TOP LONGIT.	—	5	16'-10	56
4f2	FLOOR, BOT. LONGIT.	—	4	16'-10	45
4k1	SLAB, BOT. TRANSV.	—	35	5'-2	121
5k2	SLAB, TOP CORNER	└	40	6'-4	264
5m1	FLOOR, TOP TRANSV.	—	20	5'-8	118
5m2	FLOOR, BOT. CORNER	└	40	5'-0	209
REINFORCING STEEL - TOTAL (LBS.)					1087

BENT BAR DETAILS

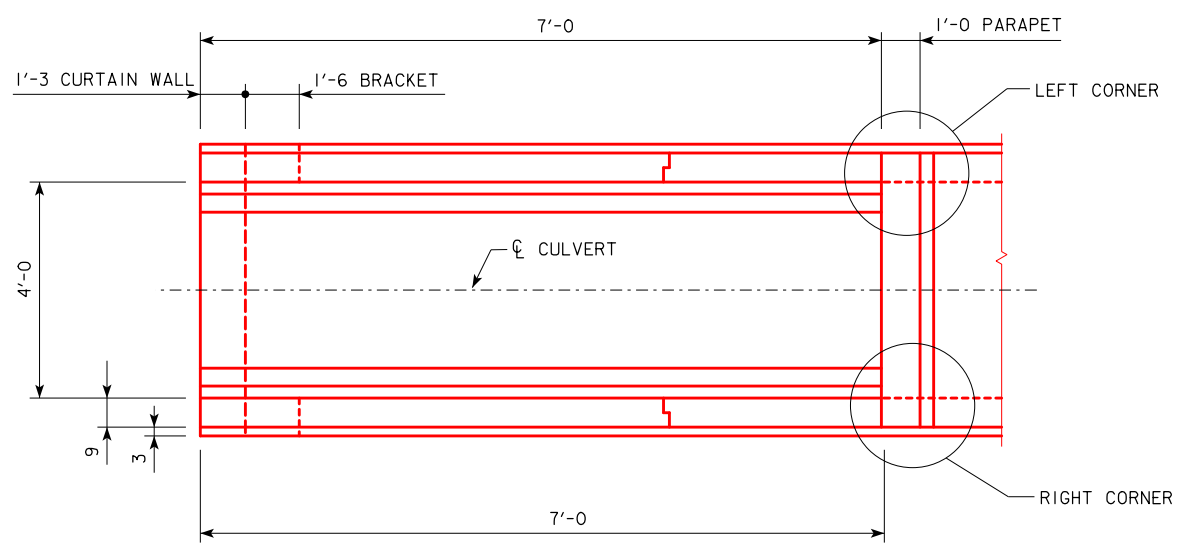


NOTE: ALL DIMENSIONS ARE OUT TO OUT. D = PIN DIAMETER.

DESIGN FOR 0°
**4'x2' REINFORCED CONCRETE
BOX CULVERT EXTENSION**
17'-0 CULVERT EXTENSION DETAILS
STATION 729+58.61 (US 6) JUNE, 2017
IOWA COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 5 OF 10 FILE NO. 31463 DESIGN NO. 317



ELEVATION SECTION



PLAN VIEW

- NOTES:**
1. SEE SHEET V.3 FOR GENERAL INFORMATION, SPECIFICATIONS, AND DESIGN STRESSES.
 2. SEE DESIGN SHEET 10 FOR HEADWALL NOTES.

DESIGN FOR 0°

**4'x2' REINFORCED CONCRETE
BOX CULVERT EXTENSION
PARALLEL WING DETAILS**

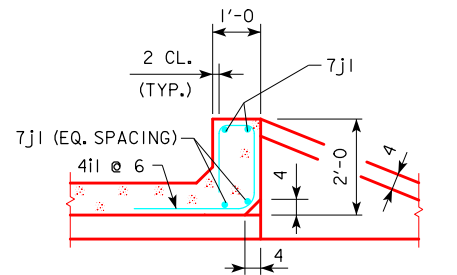
STATION 729+58.61 (US 6) JUNE, 2017

IOWA COUNTY

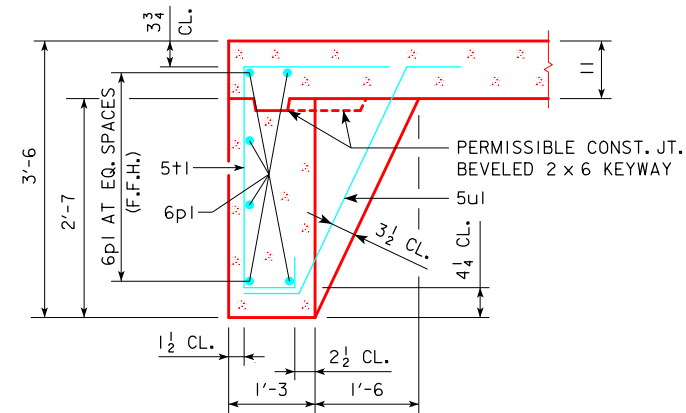
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 6 OF 10 FILE NO. 31463 DESIGN NO. 317

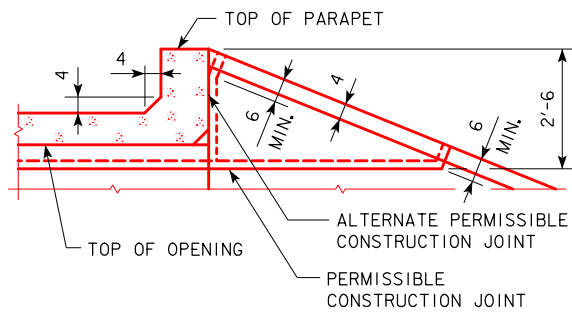
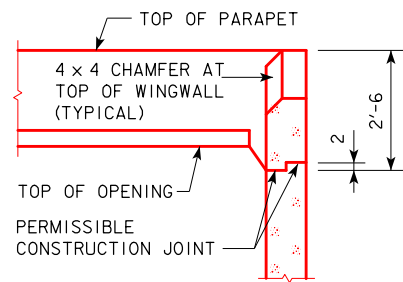




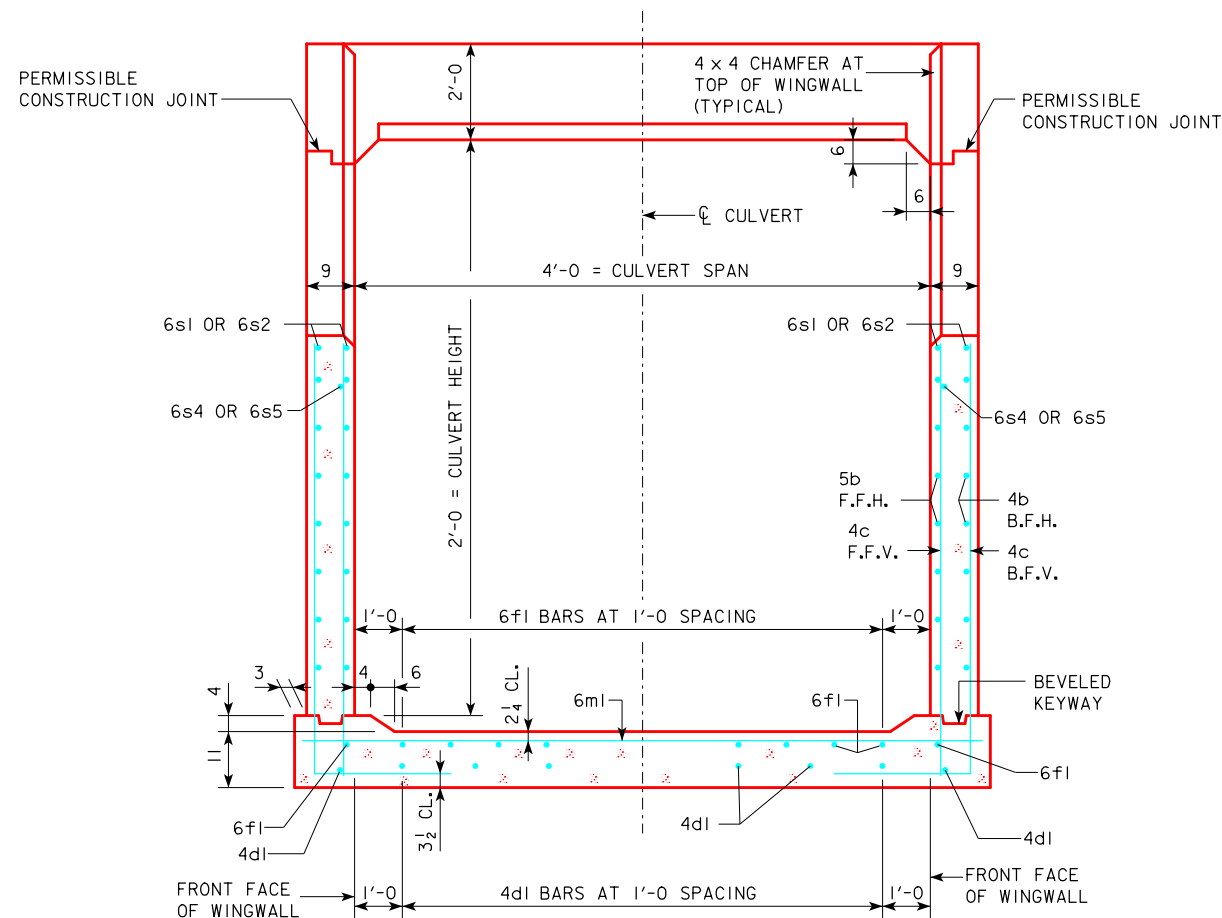
SECTION THRU PARAPET



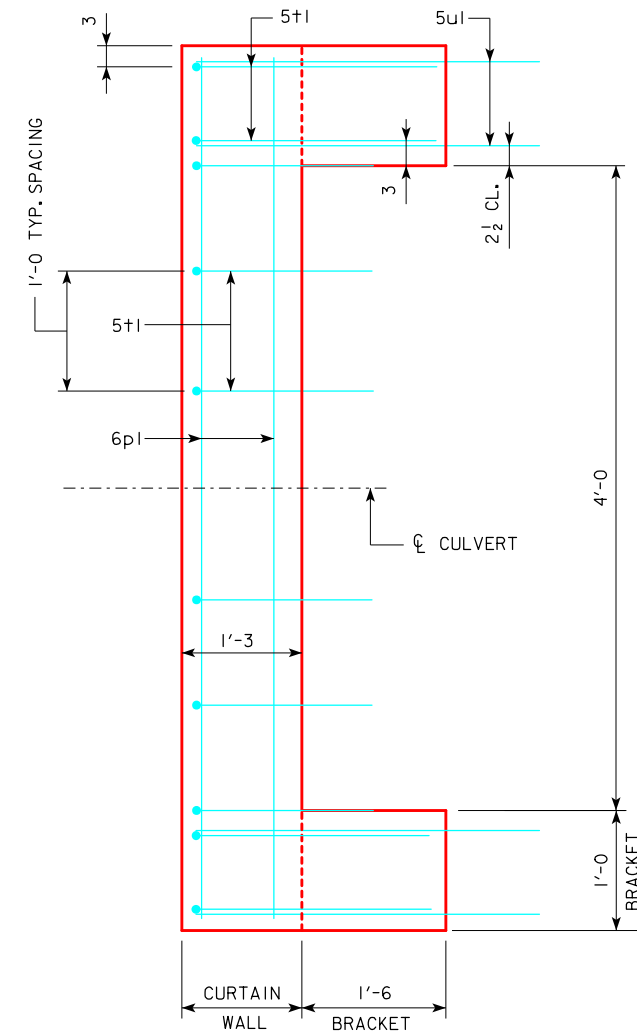
SECTION THRU CURTAIN WALL



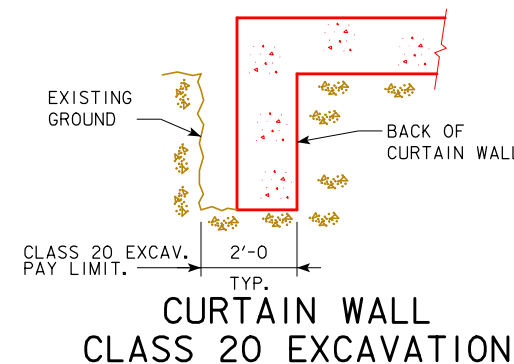
TOP OF WINGWALL DETAILS



TYPICAL CROSS SECTION - THRU HEADWALL



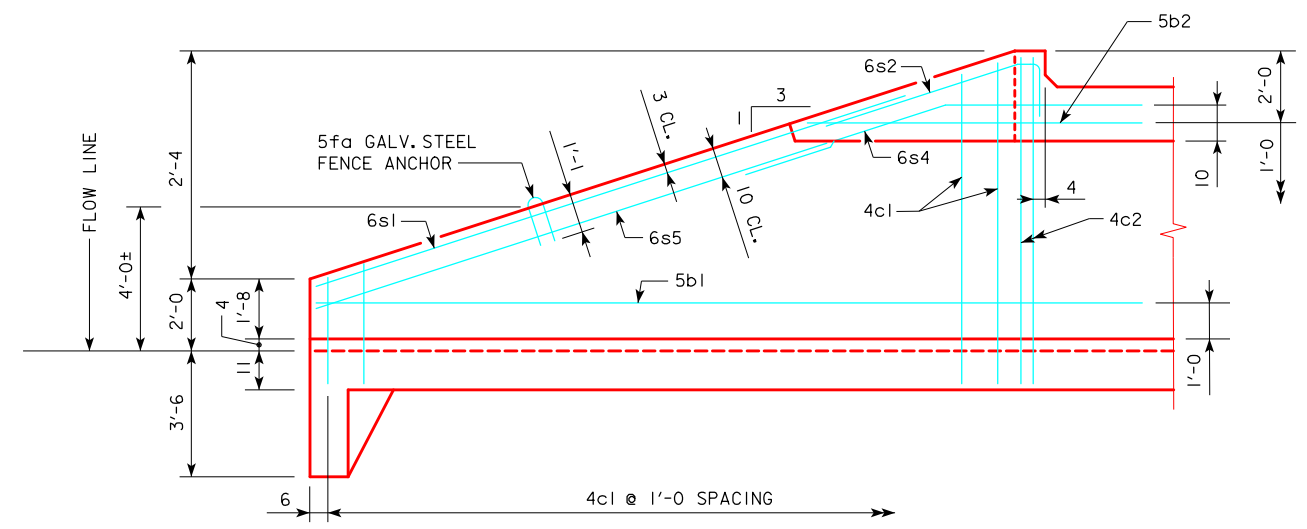
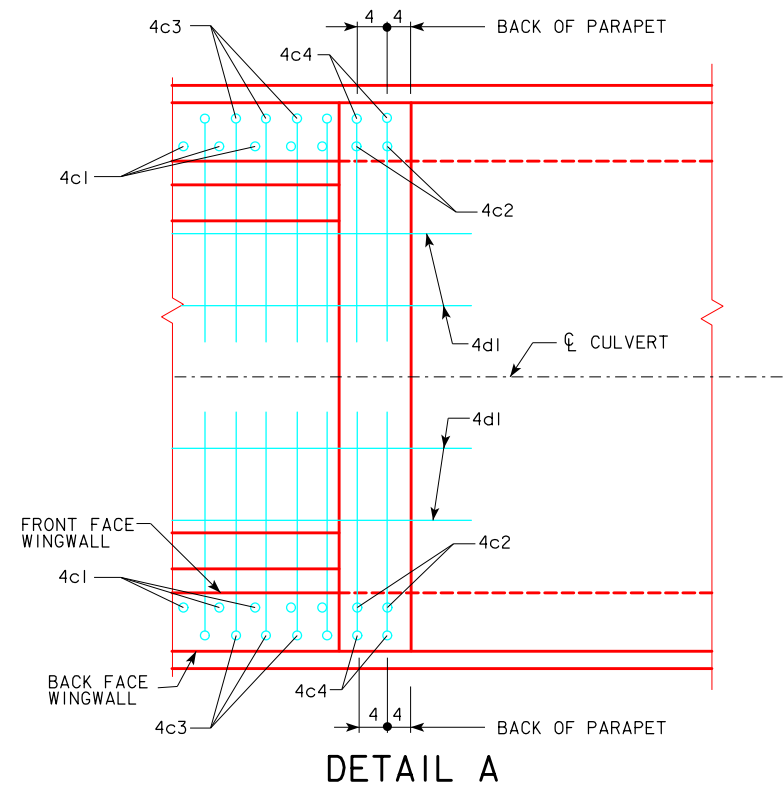
CURTAIN WALL DETAIL - PLAN VIEW
APRON IS NOT SHOWN



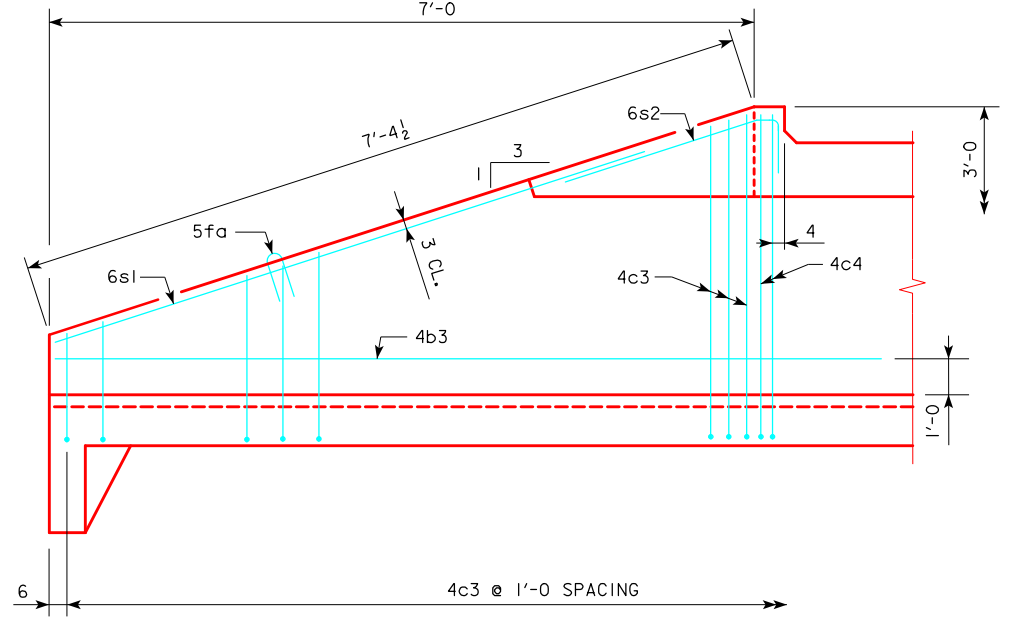
CURTAIN WALL
CLASS 20 EXCAVATION

DESIGN FOR 0°
**4'x2' REINFORCED CONCRETE
 BOX CULVERT EXTENSION**
PARALLEL WING HEADWALL DETAILS
 STATION 729+58.61 (US 6) JUNE, 2017
 IOWA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 7 OF 10 FILE NO. 31463 DESIGN NO. 317

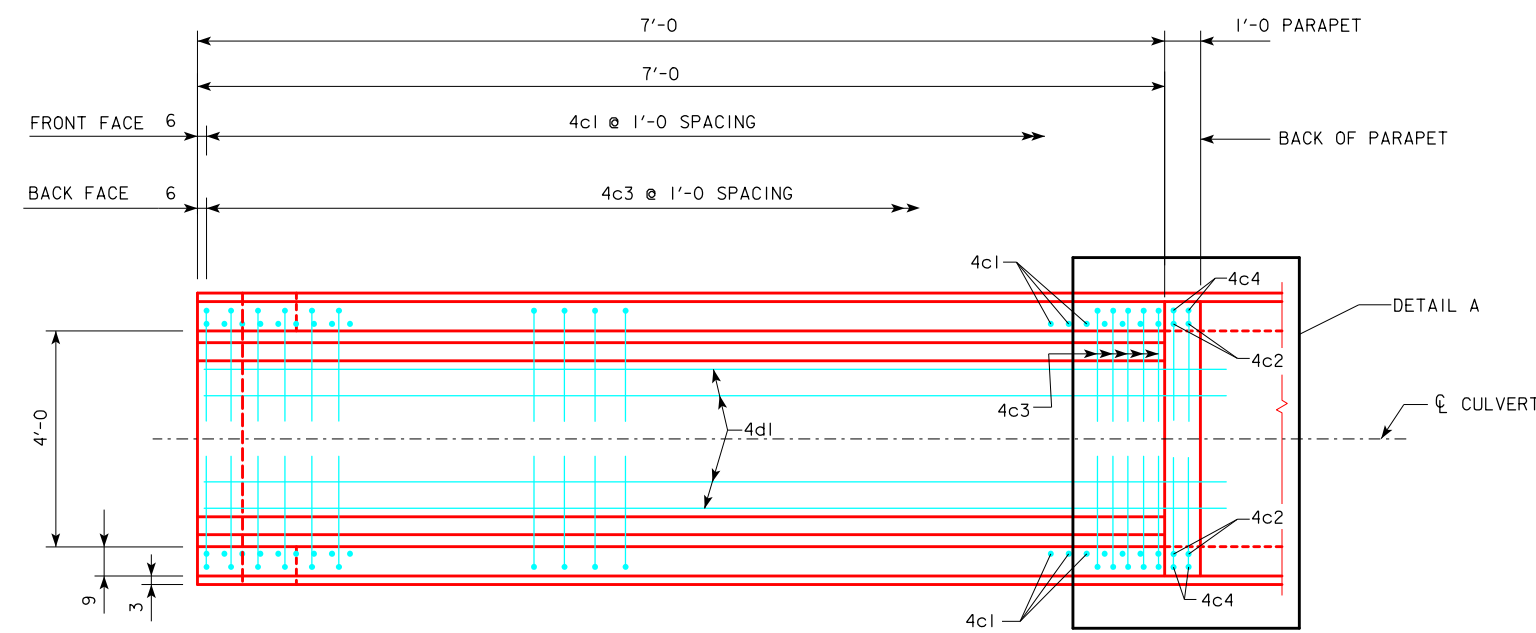




TYPICAL VIEW - FRONT FACE WINGWALL REINFORCING



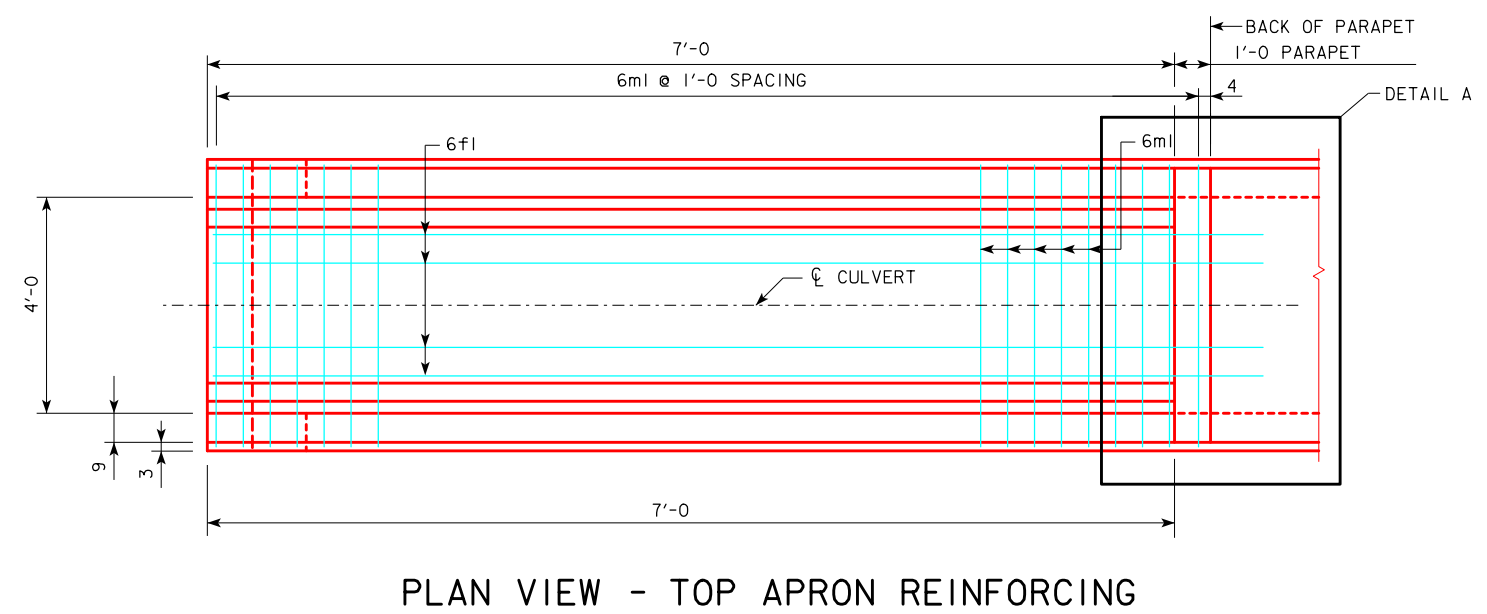
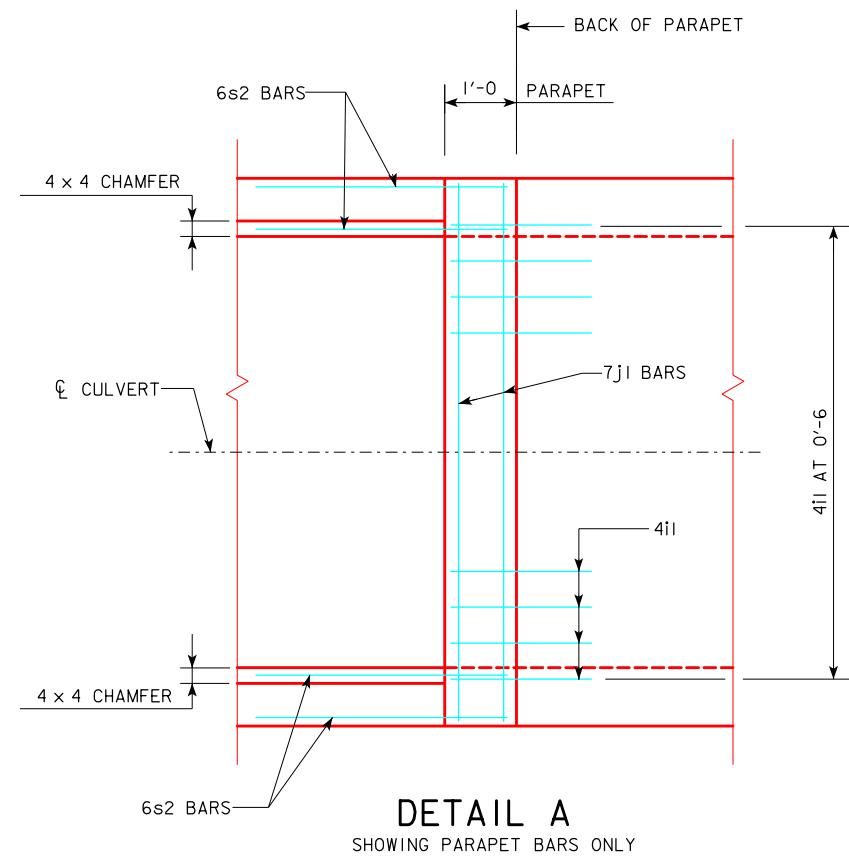
TYPICAL VIEW - BACK FACE WINGWALL REINFORCING



PLAN VIEW - BOTTOM APRON REINFORCING

DESIGN FOR 0°
**4'x2' REINFORCED CONCRETE
 BOX CULVERT EXTENSION**
PARALLEL WING HEADWALL DETAILS
 STATION 729+58.61 (US 6) JUNE, 2017
IOWA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 8 OF 10 FILE NO. 31463 DESIGN NO. 317

























DESIGN FOR 0°
**4'x2' REINFORCED CONCRETE
 BOX CULVERT EXTENSION
 PARAPET & APRON DETAILS**
 STATION 729+58.61 (US 6) JUNE, 2017
IOWA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 9 OF 10 FILE NO. 31463 DESIGN NO. 317



REINFORCING BAR LIST - ONE HEADWALL

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
5fa	FENCE ANCHOR (GALV.)		2	2'-10	6
5b1	WINGWALL, F.F.H.		2	9'-10	21
5b2	WINGWALL, F.F.H.		2	8'-10	18
4b3	WINGWALL, B.F.H.		2	9'-10	13
4c1	WINGWALL, F.F.V.		14	2 EACH 2'-6 TO 4'-6	33
4c2	WINGWALL, F.F.V.		4	4'-9	13
4c3	WINGWALL, B.F.V.		14	2 EACH 6'-1 TO 8'-1	66
4c4	WINGWALL, B.F.V.		4	8'-3	22
4d1	APRON, LONGIT., BOT.		5	9'-10	33
6f1	APRON, LONGIT., TOP.		5	9'-10	74
4i1	PARAPET, VERTICAL		9	6'-5	39
7j1	PARAPET, HORIZ.		4	5'-2	42
6m1	APRON, TRANS., TOP		8	5'-8	68
6p1	CURTAIN, HORIZ.		5	5'-8	43
6s1	WING SLOPE, BOTH F.		4	4'-1	25
6s2	WING SLOPE, BOTH F.		4	7'-9	47
6s4	WING SLOPE, F.F.		2	10'-0	30
6s5	WING SLOPE, F.F.		2	1'-9	5
5t1	CURTAIN, VERT.		9	6'-5	60
5u1	BRACKET, VERT.		4	5'-3	22
REINFORCING STEEL - TOTAL (LBS.)					680

CONCRETE PLACEMENT QUANTITIES ONE HEADWALL

LOCATION	CY
PARAPET *	0.9
WINGWALLS	0.7
APRON	2.8
TOTAL (C.Y.)	4.4

* INCLUDES PARAPET AND TOP OF WINGWALL.

HEADWALL NOTES:

THIS HEADWALL IS BASED ON A 3:1 SLOPE NORMAL TO CENTERLINE OF ROADWAY.

THE SIDES OF THE FOOTING ARE TO BE FORMED TO INSURE CORRECT LINE AND GRADE.

ALL EXPOSED CORNERS OF 90° OR SHARPER ARE TO BE FILLETED WITH A 3/4" DRESSED AND BEVELED STRIP.

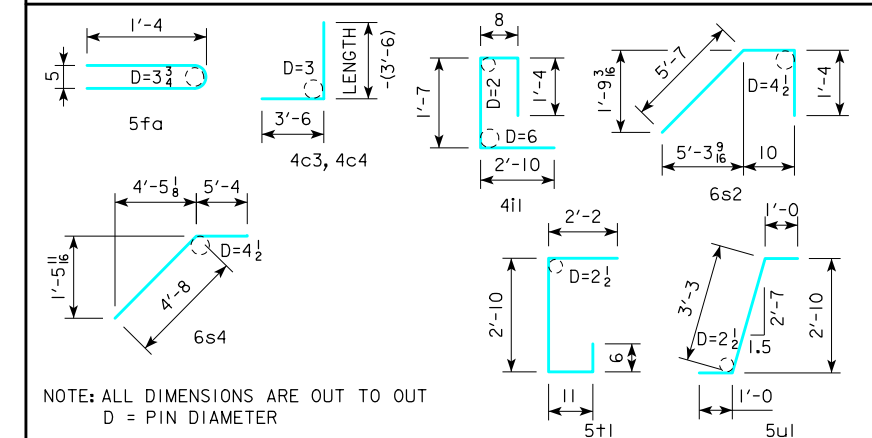
ALL REINFORCING IS TO BE SECURELY WIRED IN PLACE BEFORE THE CONCRETE IS POURED. ALL SLAB AND FLOOR REINFORCING STEEL IS TO BE SUPPORTED BY BAR CHAIRS AT INTERVALS OF NOT MORE THAN 3'-0 IN EITHER DIRECTION AS OUTLINED IN THE STANDARD SPECIFICATIONS.

CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN. CLEARANCE TO THE BOTTOM ENDS OF VERTICAL BARS SHALL BE 3 INCHES.

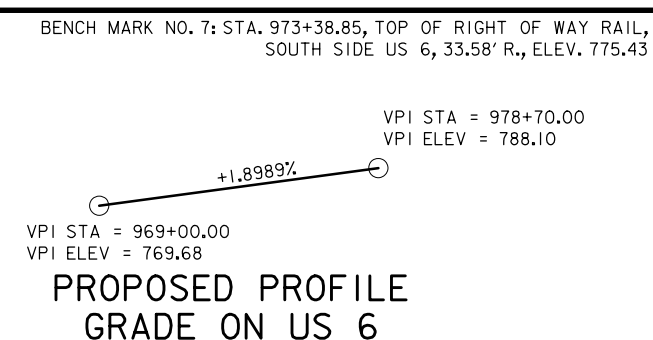
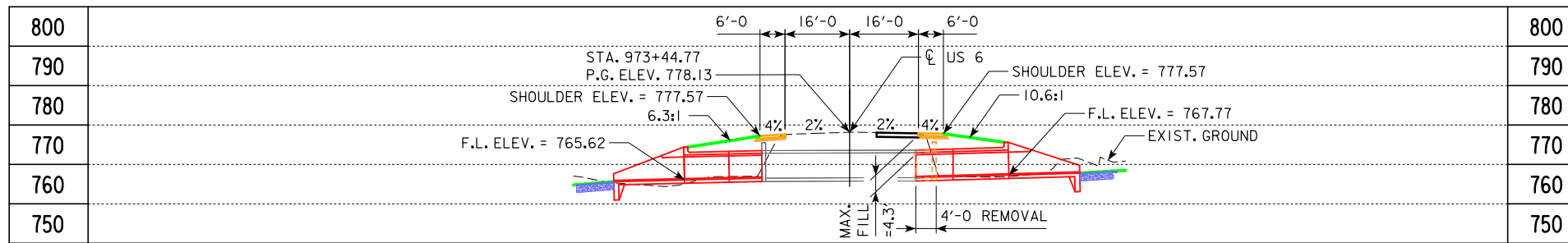
CONCRETE QUANTITIES ARE ESTIMATED FROM BACK OF PARAPET.

HORIZONTAL TAILS OF BARS "b" & "s" ESTIMATED TO EXTEND 2'-0 BEYOND BACK OF PARAPET (INTO END OF BARREL). LONGITUDINAL BARS "4d1" AND "6f1" ESTIMATED TO PROJECT INTO END SECTION OF BARREL A MINIMUM OF 2'-0 BEYOND BACK OF PARAPET. THE "LENGTH" COLUMN REFLECTS TOTAL NUMBER OF FEET NECESSARY TO MEET THESE REQUIREMENTS.

BENT BAR DETAILS



DESIGN FOR 0°
**4'x2' REINFORCED CONCRETE
 BOX CULVERT EXTENSION
 HEADWALL QUANTITIES**
 STATION 729+58.61 (US 6) JUNE, 2017
IOWA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 10 OF 10 FILE NO. 31463 DESIGN NO. 317



LONGITUDINAL SECTION ALONG ϕ CULVERT
DESIGN FILL HEIGHT = 5'-0
ANTICIPATED SETTLEMENT = NEGLIGIBLE

NOTES:

IT IS THE INTENT OF THIS DESIGN TO EXTEND THE EXISTING 5' X 6' REINFORCED CONCRETE BOX CULVERT WITH 19 DEGREE SKEW BY REMOVING 4' OF THE CULVERT AND THE CULVERT WINGWALLS ON THE SOUTH END AND REMOVING THE CULVERT WINGWALLS AS REQUIRED ON THE NORTH END AND ADDING A 5' X 6' X 24' & 4' X 2' X 21' REINFORCED CONCRETE BOX CULVERT EXTENSIONS WITH HEADWALLS ON THE SOUTH AND NORTH ENDS RESPECTIVELY.

THE RCB CULVERT EXTENSION IS DESIGNED FOR EARTH FILLS OF 5 FEET.

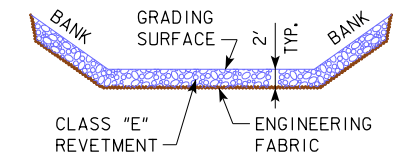
ALL UNITS ARE IN FEET UNLESS OTHERWISE NOTED OR SHOWN.

SEE ROAD SHEETS FOR ADDITIONAL INFORMATION ON PROPOSED GRADING LIMITS.

DRAINAGE THROUGH EXISTING CULVERT/CHANNEL MUST BE MAINTAINED THROUGHOUT CONSTRUCTION.

LIMITS OF EASEMENT TO BE DETERMINED.

HEADWALLS SHALL BE PLACED LEVEL.



ESTIMATED REVETMENT QUANTITIES INCLUDED WITH ROAD PLANS

LOCATION	REVETMENT CL. "E" (TON)	ENGINEERING FABRIC (SY)
INLET	28.5	53.6
OUTLET	28.5	53.6
TOTALS	57	107.2

HYDRAULIC DATA

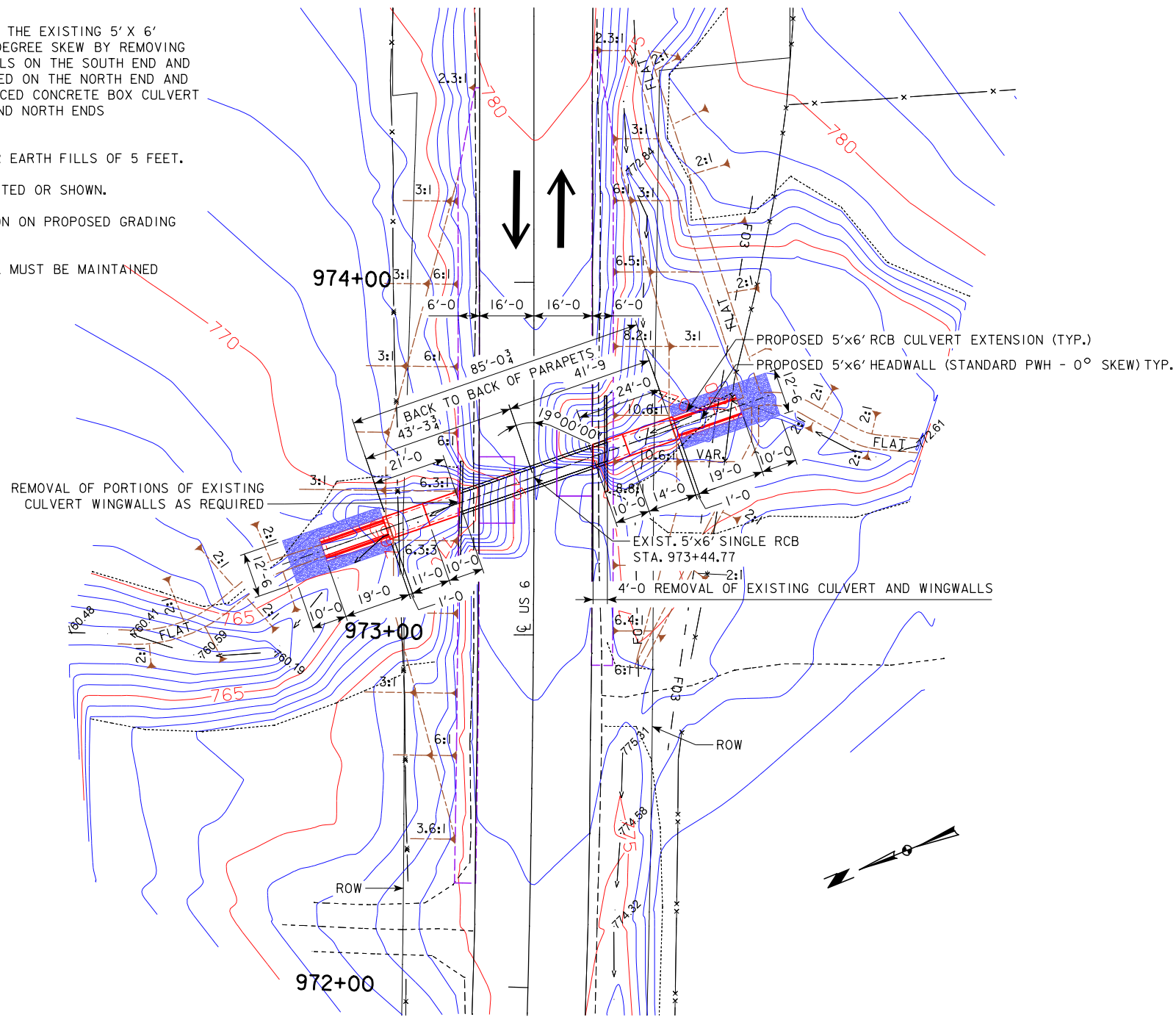
DRAINAGE AREA = 70.4 ACRES
Q₅₀ = 342 CFS
ROLLING

- UTILITIES LEGEND:**
- T1 - COOPERATIVE TELEPHONE COMPANY
 - F0 - IOWA NETWORK SERVICES
 - G - ALLIANT ENERGY
 - F02 - MCI
 - F03 - MEDIACOM
 - T2 - WINDSTREAM COMMUNICATIONS
 - F04 - SOUTH SLOPE COOPERATIVE
 - x- - FENCE

LOCATION **TRAFFIC ESTIMATE**

ON US 6 OVER 2014 AADT 2600 V.P.D.
DRAINAGE DITCH

T-80N R-10W
SECTION 34
WASHINGTON TOWNSHIP
IOWA COUNTY
LATITUDE 41.776044
LONGITUDE -91.986139



SITUATION PLAN

DESIGN FOR 19° SKEW (R.A.)

5'x6' REINFORCED CONCRETE BOX CULVERT EXTENSION

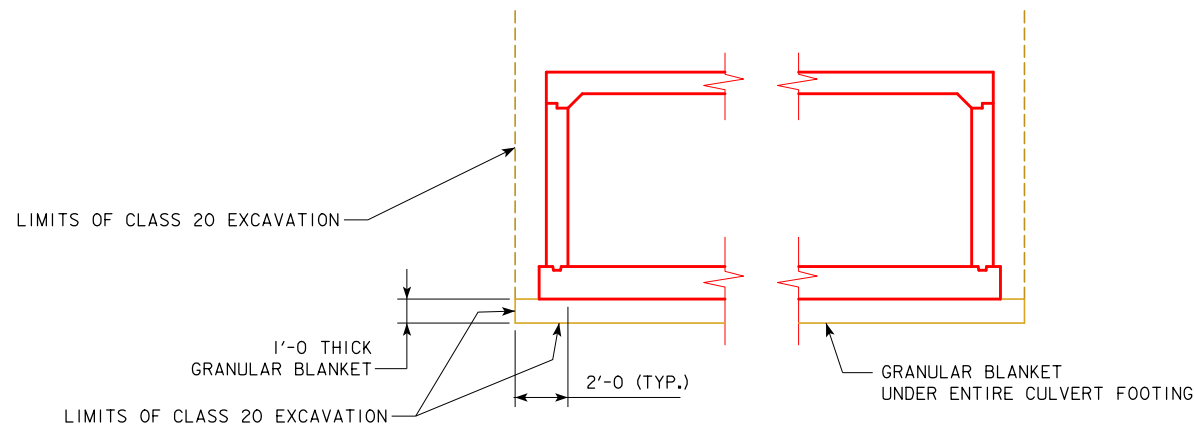
SITUATION PLAN

STATION 973+44.77 (US 6) JUNE, 2017

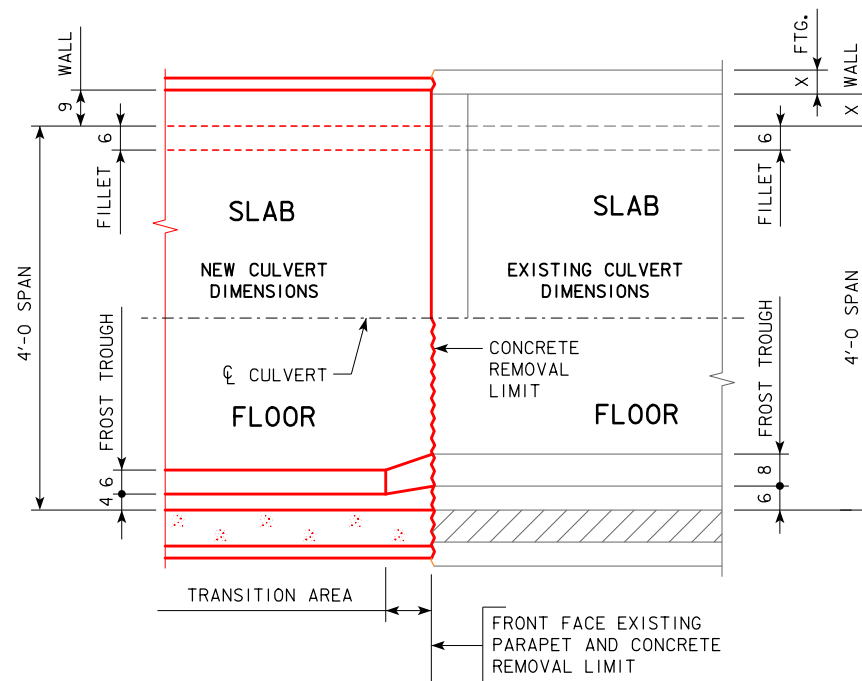
IOWA COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 1 OF 4 FILE NO. 31463 DESIGN NO. 417

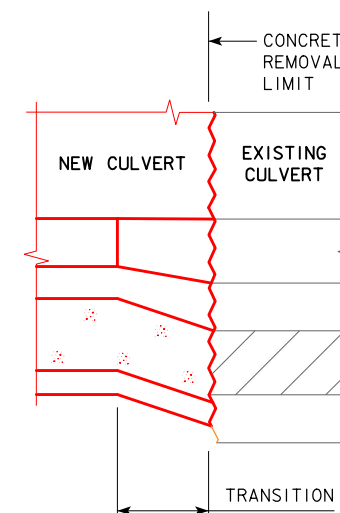




GRANULAR BLANKET/EXCAVATION DETAILS



CONCRETE TRANSITION DETAILS
(PLAN VIEW)



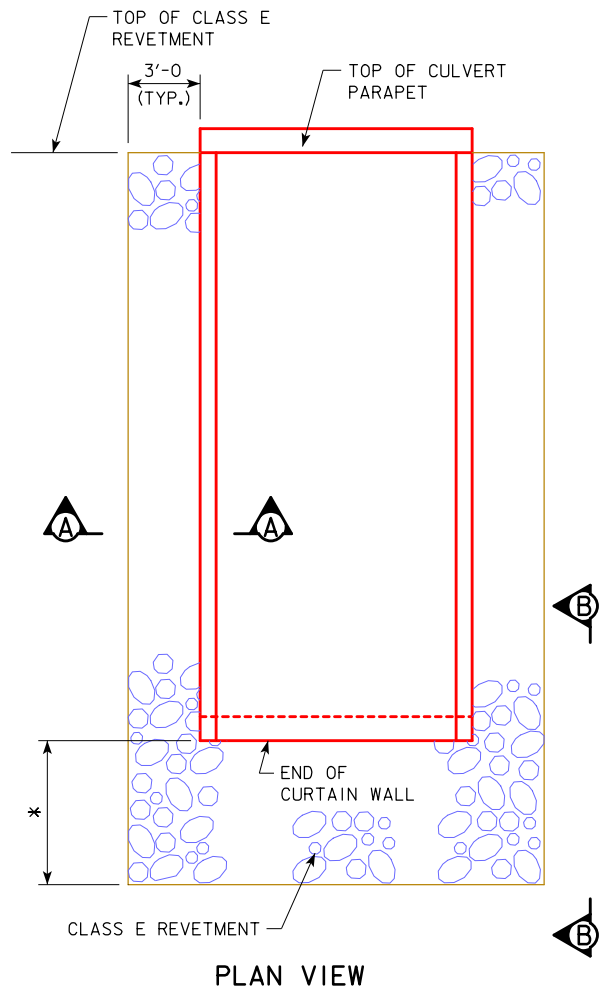
CONCRETE TRANSITION DETAILS
(WALL TRANSITION SHOWN - TYPICAL FOR SLAB)

NEW BARREL CONCRETE THICKNESSES SHALL BE MAINTAINED MINIMALLY WHEN TRANSITIONING TO MEET EXISTING BARREL INTERIOR SURFACES. OUTSIDE CONCRETE SURFACES DO NOT HAVE TO BE TRANSITIONED TO MATCH EXISTING SURFACES.

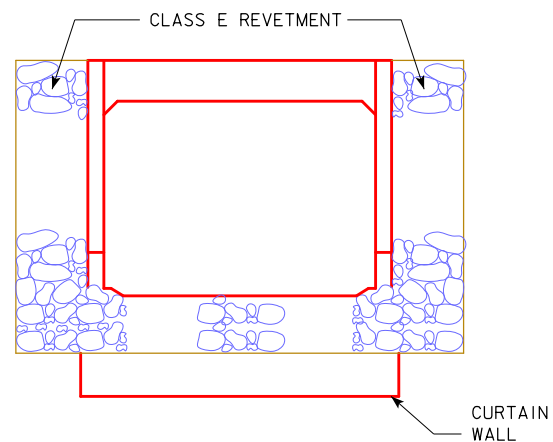
DESIGN FOR 19° SKEW (R.A.)
**5'x6' REINFORCED CONCRETE
 BOX CULVERT EXTENSION**
MISCELLANEOUS CULVERT DETAILS
 STATION 973+44.77 (US 6) JUNE, 2017
IOWA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 2 OF 4 FILE NO. 31463 DESIGN NO. 417

REVISED: CHANGED BRIDGE DESIGN MANUAL, SECTION 8 TO SECTION 7. (3-1-15)
 ENGLISHING/CULVERTS.DGN - 1047 - THIS SHEET ISSUED 03-12.

* = SEE SITUATION PLAN FOR LIMITS OF REVETMENT AND ENGINEERING FABRIC.

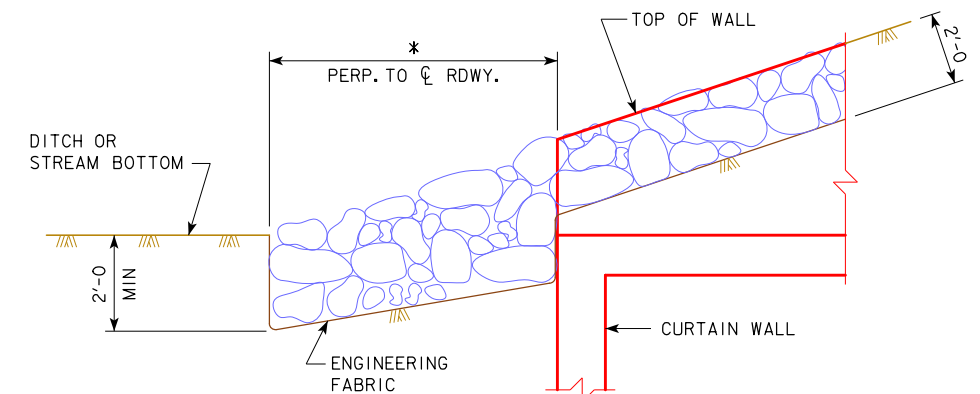


PLAN VIEW

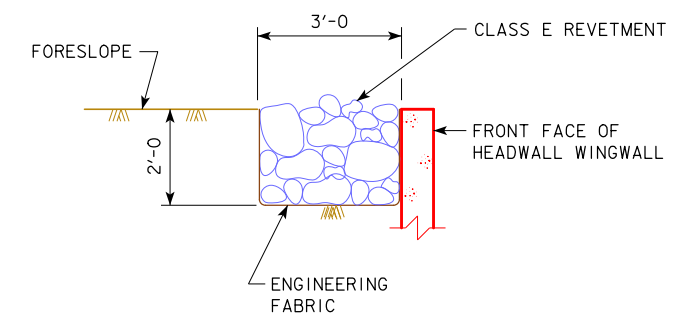


ELEVATION VIEW
0° SKEW HEADWALLS

* = SEE SITUATION PLAN FOR LIMITS OF REVETMENT AND ENGINEERING FABRIC.



VIEW B-B



SECTION A-A

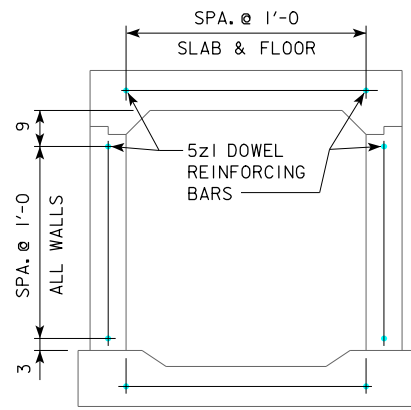
TYPICAL DETAILS

CONSTRUCTION NOTES:

CLASS E REVETMENT SHALL BE USED AND PLACED ACCORDING TO ARTICLE 2507.03, OF THE STANDARD SPECIFICATIONS.
THE ENGINEERING FABRIC SHALL MEET THE MATERIAL REQUIREMENTS IN ACCORDANCE WITH ARTICLE 4196.01, B, 3, OF THE STANDARD SPECIFICATIONS.

DESIGN FOR 19° SKEW (R.A.)
**5'x6' REINFORCED CONCRETE
 BOX CULVERT EXTENSION**
REVTMENT PROTECTION DETAILS
 STATION 973+44.77 (US 6) JUNE, 2017
IOWA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 3 OF 4 FILE NO. 31463 DESIGN NO. 417

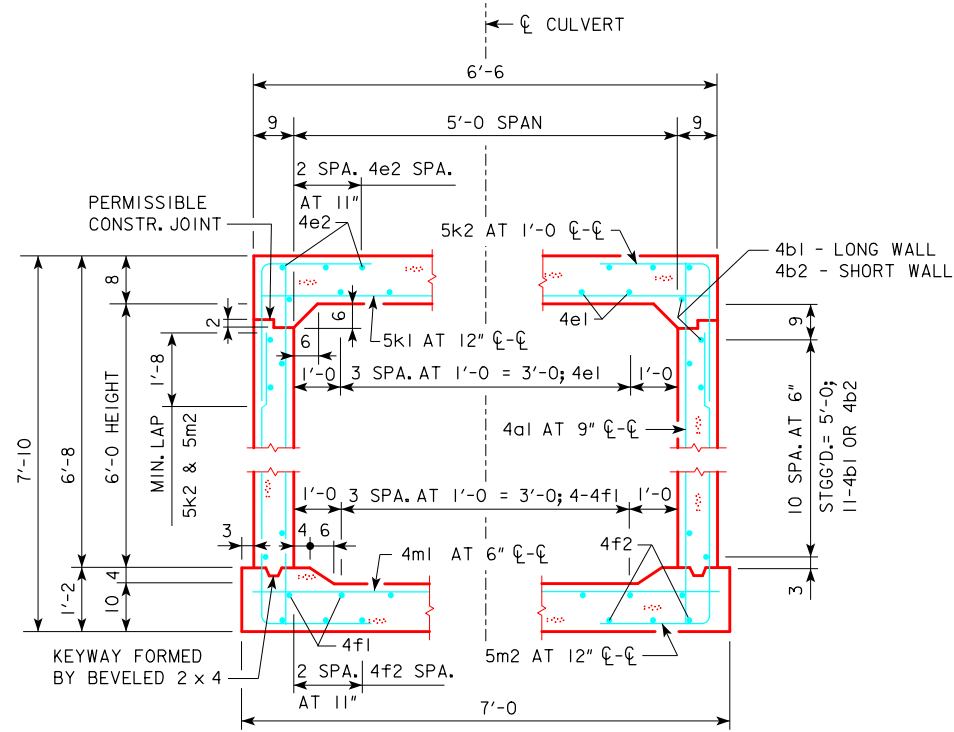
REVISED 1-16 - ADDED NOTE "SEE CULVERT PLANS FOR LIMITS OF REVETMENT AND ENGINEERING FABRIC."
 REVISED 02-2017 - ADDED SECTION DIRECTORS "A-A" TO "ZERO SKEW" PLAN VIEW DETAIL.
 ENGLISHING\CULVERTS.DGN - 1092 - THIS SHEET ISSUED 04-12.



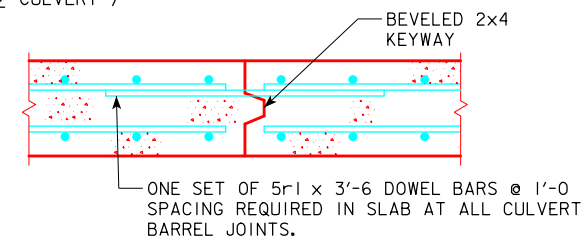
SECTION NEAR EXTENSION
(SHOWING SPACING OF 5z1 DOWEL REINFORCING BARS)

REINFORCING STEEL EXTENSION DOWELS

BAR	LOCATION	SHAPE	NO./JT.	TOTAL NO.	LENGTH	WEIGHT
5z1	TOP SLAB, CONST. JOINT		24	48	2'-6	125



SECTION THRU BARREL
(NORMAL TO CULVERT)



TOP SLAB CONSTRUCTION JOINT DETAIL

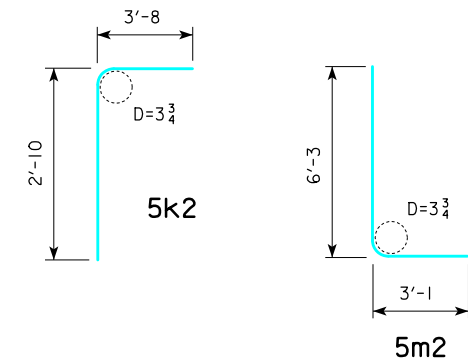
REINFORCING STEEL
TOP SLAB CONSTRUCTION JOINT

BAR	LOCATION	SHAPE	NO./JT.	TOTAL NO.	LENGTH	WEIGHT
5r1	TOP SLAB, CONST. JOINT		6	12	3'-6	44

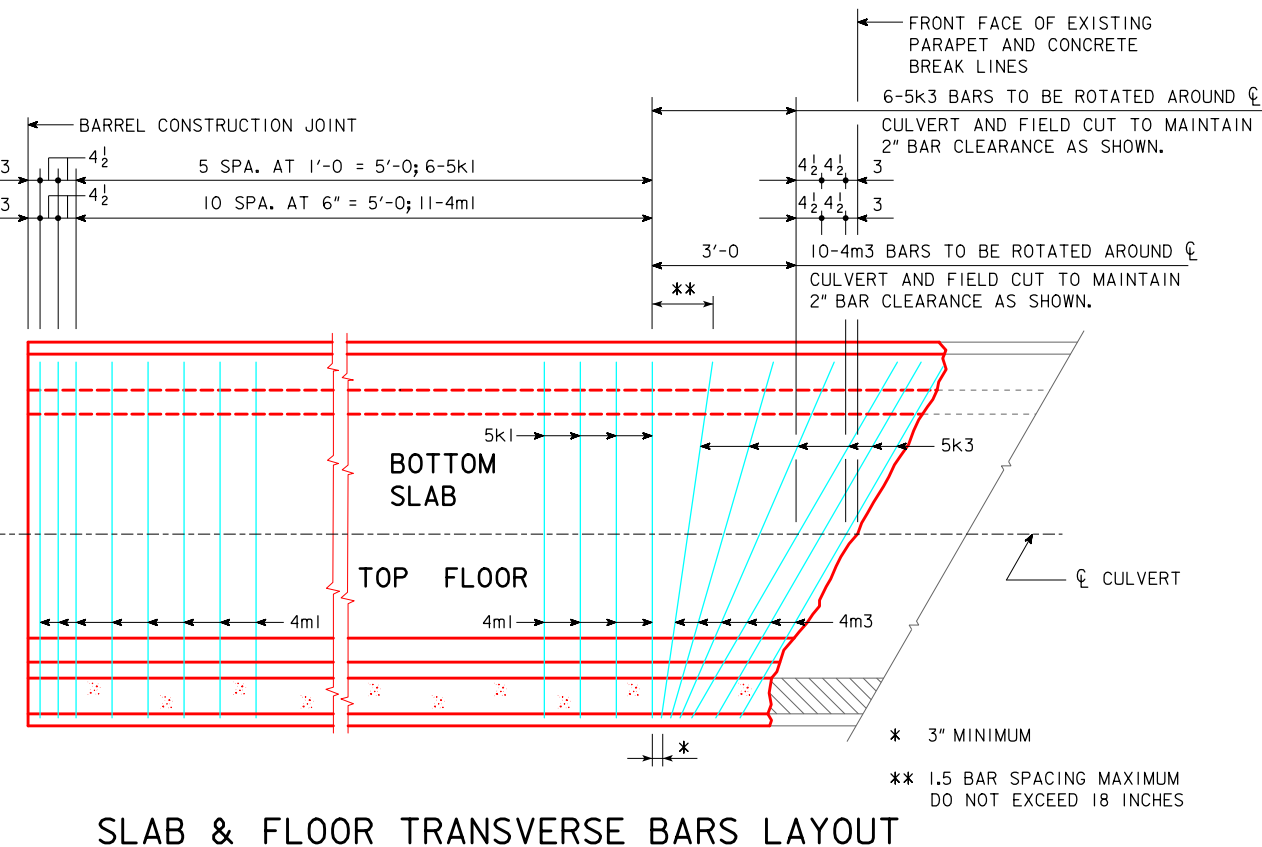
REINFORCING BAR LIST-ONE 10'-0 EXTENSION

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
4a1	WALLS, F.F.V		28	7'-5	139
4b1	LONG WALL, F.F.H. & B.F.H.		12	10'-7	85
4b2	SHORT WALL, F.F.H. & B.F.H.		12	8'-8	69
4e1	SLAB, BOTT. LONGIT.		6	1 EACH 8'-9 TO 10'-7	39
4e2	SLAB, TOP LONGIT.		6	1 EACH 8'-9 TO 10'-7	39
4f1	FLOOR, TOP LONGIT.		6	1 EACH 8'-9 TO 10'-7	39
4f2	FLOOR, BOTT. LONGIT.		6	1 EACH 8'-9 TO 10'-7	39
5k1	SLAB, BOTT. TRANSV.		8	6'-2	51
5k2	SLAB, TOP CORNER		28	6'-6	190
6k3	SLAB, BOTT. TRANSV. SKEWED		6	6'-5	58
4m1	FLOOR, TOP TRANSV.		13	6'-8	58
5m2	FLOOR, BOT. CORNER		28	9'-4	273
5m3	FLOOR, TOP TRANSV. SKEWED		10	7'-0	73
REINFORCING STEEL - TOTAL (LBS.)					1152

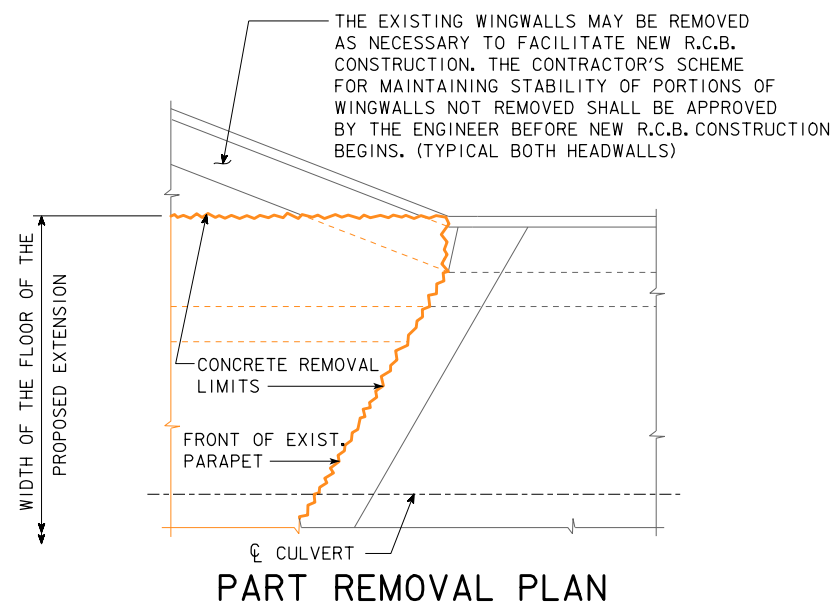
BENT BAR DETAILS



NOTE: ALL DIMENSIONS ARE OUT TO OUT. D = PIN DIAMETER.



SLAB & FLOOR TRANSVERSE BARS LAYOUT

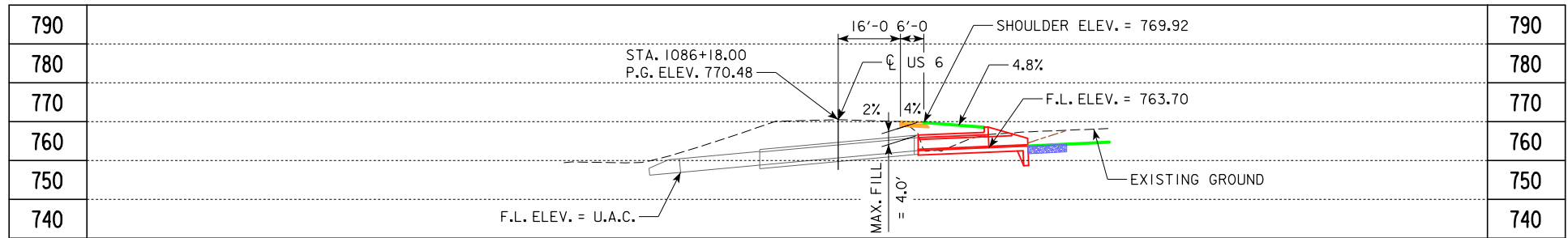


PART REMOVAL PLAN

NOTE:
ALL TRANSVERSE REINFORCING BARS AND HORIZONTAL LEGS OF CORNER BARS SHALL BE PLACED PARALLEL TO THE CONCRETE BREAK LINE AND NEW PARAPET EXCEPT AS SHOWN.
DIMENSIONS SHOWN FOR C-C OF TRANSVERSE BARS, VERTICAL WALL BARS, AND CORNER BARS ARE MEASURED ALONG C CULVERT.
CONCRETE PER FOOT OF BARREL:
SLAB = 1.9 CU. YDS.
WALLS = 3.1 CU. YDS.
FLOOR = 2.5 CU. YDS.
TOTAL = 7.5 CU. YDS.

DESIGN FOR 19° SKEW (R.A.)
**5'x6' REINFORCED CONCRETE
BOX CULVERT EXTENSION**
10'-0 CULVERT EXTENSION DETAILS
STATION 973+44.77 (US 6) JUNE, 2017
IOWA COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 4 OF 4 FILE NO. 31463 DESIGN NO. 417

CORRECTION 05-14 - ADDED THE BAR LABELS k9 & m9 TO THE PART LONGIT. SECTIONS. HEL044.S01 (ASTD01044.S01--LEP: THIS SHEET REDRAWN DEVICE:ZHA0R(200,004) ARCH.TAPE NO. 15 DATE 9-8-88)



BENCH MARK NO. 7: STA. 973+38.85, TOP OF RIGHT OF WAY RAIL, SOUTH SIDE US 6, 33.58' R., ELEV. 775.43

VPI STA = 1082+00.00
VPI ELEV = 770.52
-0.01%
VPI STA = 1092+00.00
VPI ELEV = 770.42

PROPOSED PROFILE GRADE ON US 6

LONGITUDINAL SECTION ALONG CL CULVERT

DESIGN FILL HEIGHT = 4'-0"
ANTICIPATED SETTLEMENT = NEGLIGIBLE

NOTES:

IT IS THE INTENT OF THIS DESIGN TO EXTEND THE EXISTING 4' x 3' REINFORCED CONCRETE BOX CULVERT WITH 0 DEGREE SKEW BY REMOVING THE CULVERT WINGWALLS AS REQUIRED AT THE SOUTH END AND ADDING A 4' x 3' x 17' REINFORCED CONCRETE BOX CULVERT EXTENSION AND HEADWALL ON THE SOUTH SIDE OF THE CULVERT ONLY.

THE RCB CULVERT EXTENSION IS DESIGNED FOR EARTH FILLS OF 4 FEET.

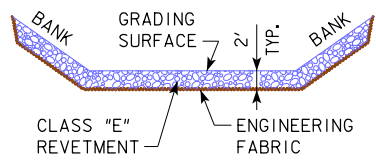
ALL UNITS ARE IN FEET UNLESS OTHERWISE NOTED OR SHOWN.

SEE ROAD SHEETS FOR ADDITIONAL INFORMATION ON PROPOSED GRADING LIMITS.

DRAINAGE THROUGH EXISTING CULVERT/CHANNEL MUST BE MAINTAINED THROUGHOUT CONSTRUCTION.

LIMITS OF EASEMENT TO BE DETERMINED.

HEADWALLS SHALL BE PLACED LEVEL.



ESTIMATED REVETMENT QUANTITIES INCLUDED WITH ROAD PLANS

LOCATION	REVETMENT CL. "E" (TON)	ENGINEERING FABRIC (SY)
INLET	20.7	37.9
OUTLET	0	0
TOTALS	20.7	37.9

HYDRAULIC DATA

DRAINAGE AREA = 35.6 ACRES
Q₅₀ = 161 CFS
ROLLING

UTILITIES LEGEND:

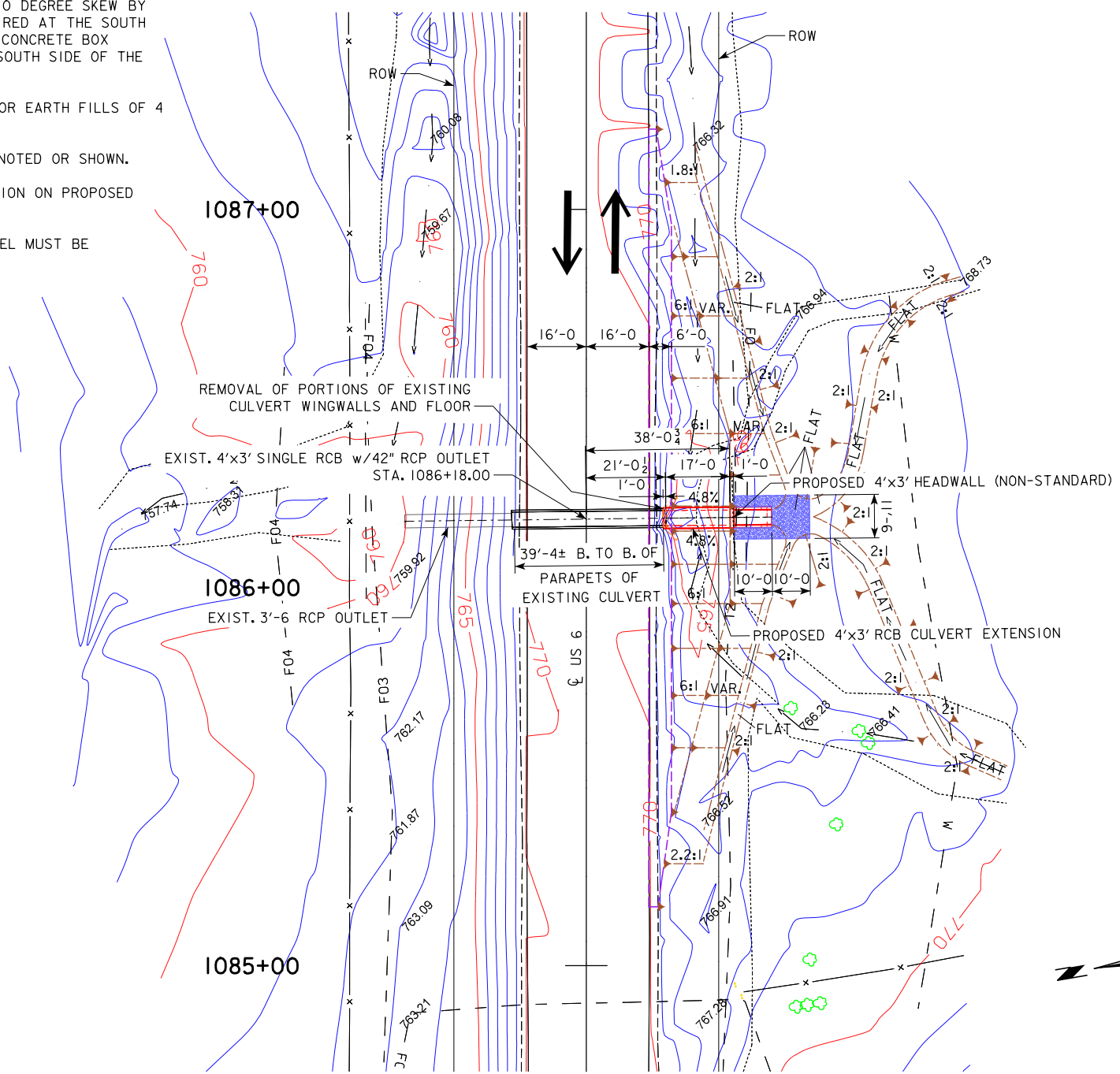
- T1 - COOPERATIVE TELEPHONE COMPANY
- F0 - IOWA NETWORK SERVICES
- G - ALLIANT ENERGY
- F02 - MCI
- F03 - MEDIACOM
- T2 - WINDSTREAM COMMUNICATIONS
- F04 - SOUTH SLOPE COOPERATIVE
- W - POWESHIK WATER ASSOCIATION
- x- - FENCE

LOCATION

ON US 6 OVER DRAINAGE DITCH
T-80N R-9W
SECTION 6
IOWA TOWNSHIP
IOWA COUNTY
LATITUDE 41.771544
LONGITUDE -91.945344

TRAFFIC ESTIMATE

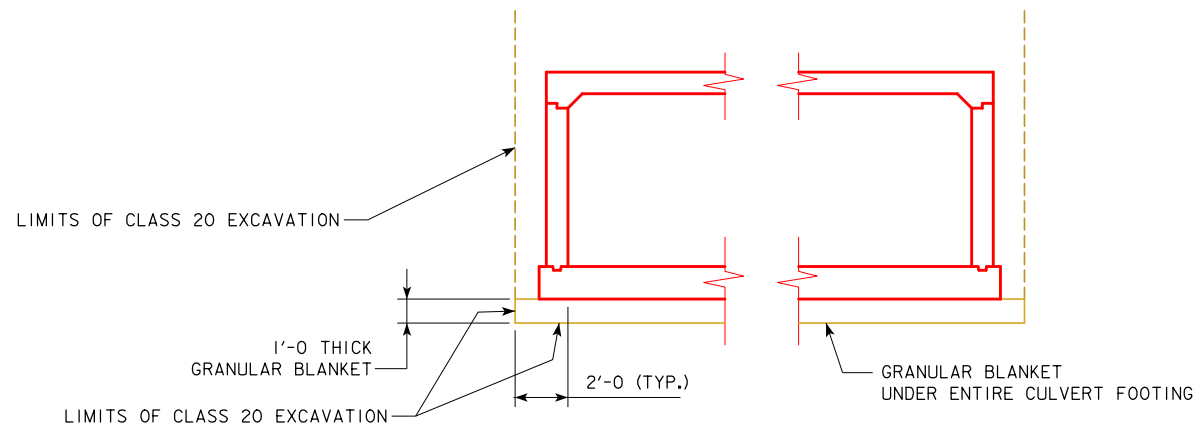
2014 AADT 2350 V.P.D.



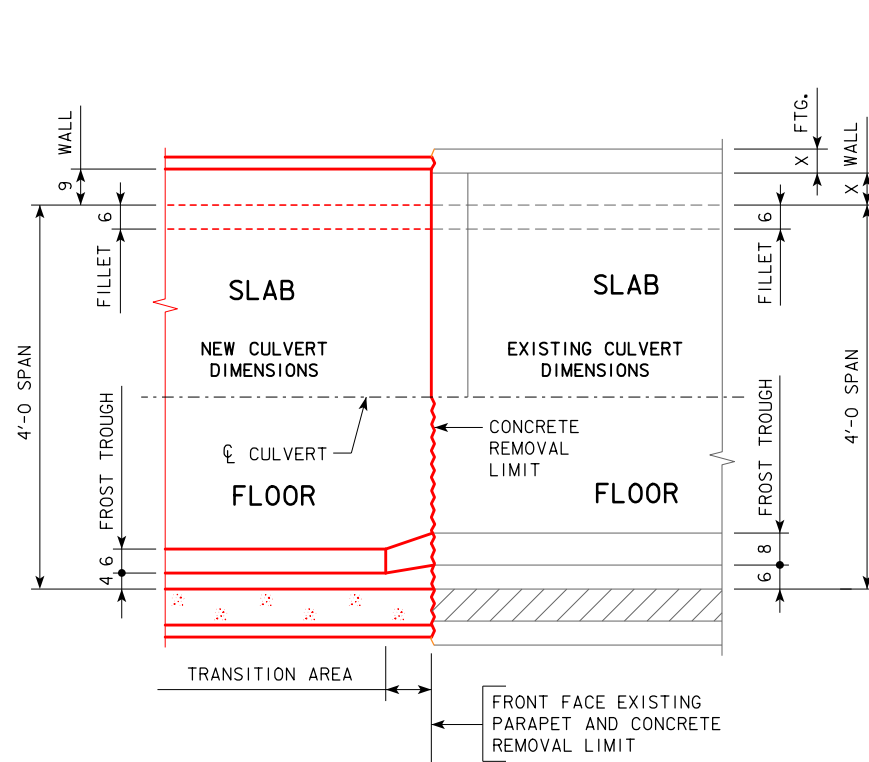
SITUATION PLAN

DESIGN FOR 0° SKEW
4'x3' REINFORCED CONCRETE BOX CULVERT EXTENSION SITUATION PLAN
STATION 1086+18.00 (US 6) JUNE, 2017
IOWA COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 1 OF 9 FILE NO. 31463 DESIGN NO. 517

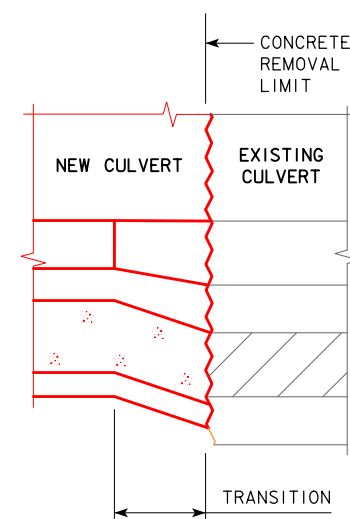




GRANULAR BLANKET/EXCAVATION DETAILS



CONCRETE TRANSITION DETAILS
(PLAN VIEW)

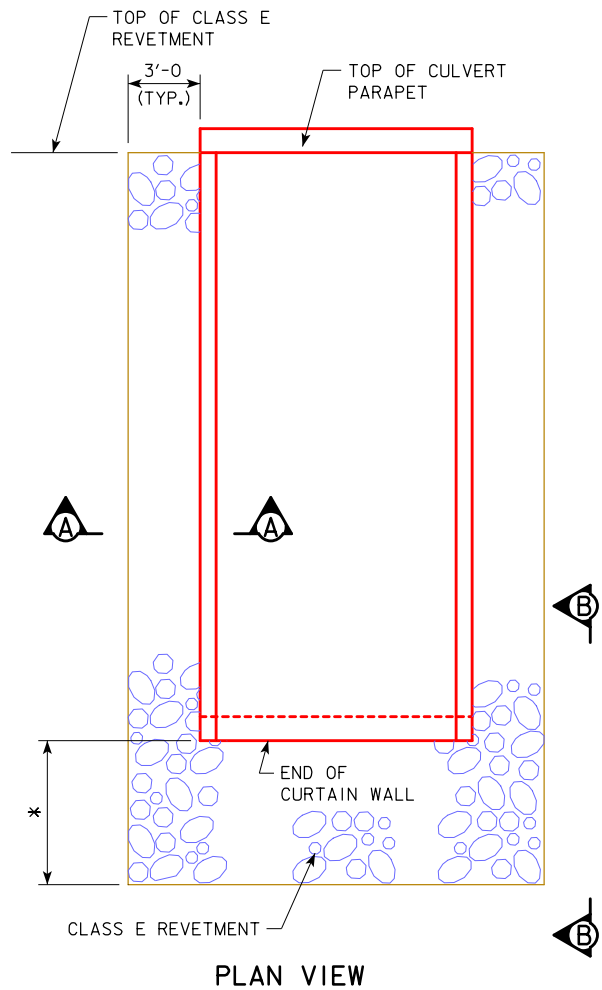


CONCRETE TRANSITION DETAILS
(WALL TRANSITION SHOWN - TYPICAL FOR SLAB)

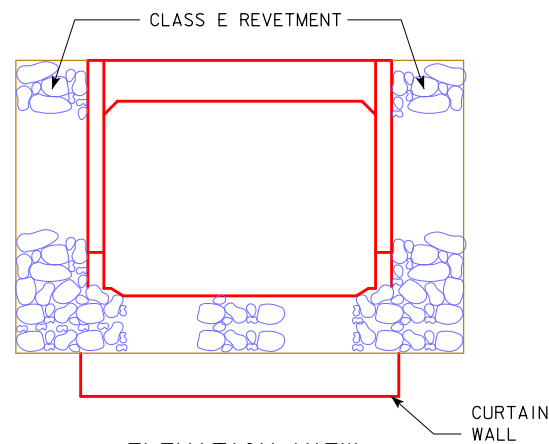
DESIGN FOR 0° SKEW
**4'x3' REINFORCED CONCRETE
 BOX CULVERT EXTENSION**
MISCELLANEOUS CULVERT DETAILS
 STATION 1086+18.00 (US 6) JUNE, 2017
IOWA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 2 OF 9 FILE NO. 31463 DESIGN NO. 517

REVISED: CHANGED BRIDGE DESIGN MANUAL, SECTION 8 TO SECTION 7. (3-1-15)
 ENGLISHING/CULVERTS.DGN - 1047 - THIS SHEET ISSUED 03-12.

* = SEE SITUATION PLAN FOR LIMITS OF REVETMENT AND ENGINEERING FABRIC.

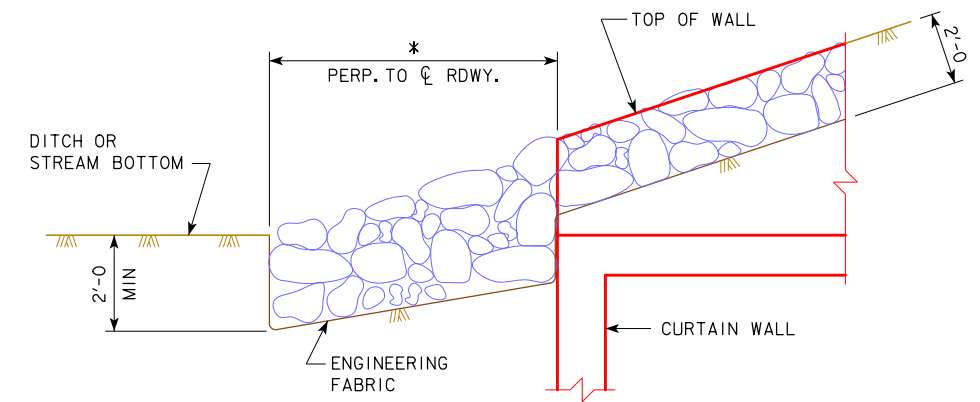


PLAN VIEW

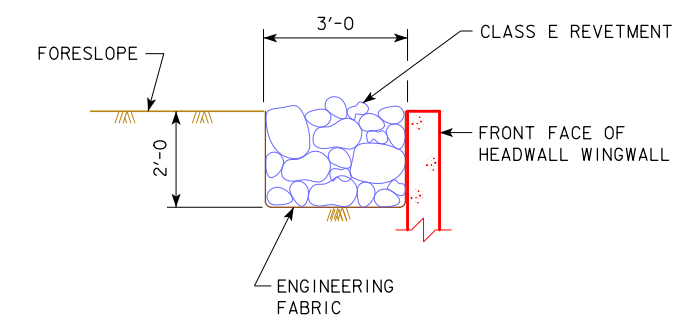


ELEVATION VIEW
0° SKEW HEADWALLS

* = SEE SITUATION PLAN FOR LIMITS OF REVETMENT AND ENGINEERING FABRIC.



VIEW B-B



SECTION A-A

TYPICAL DETAILS

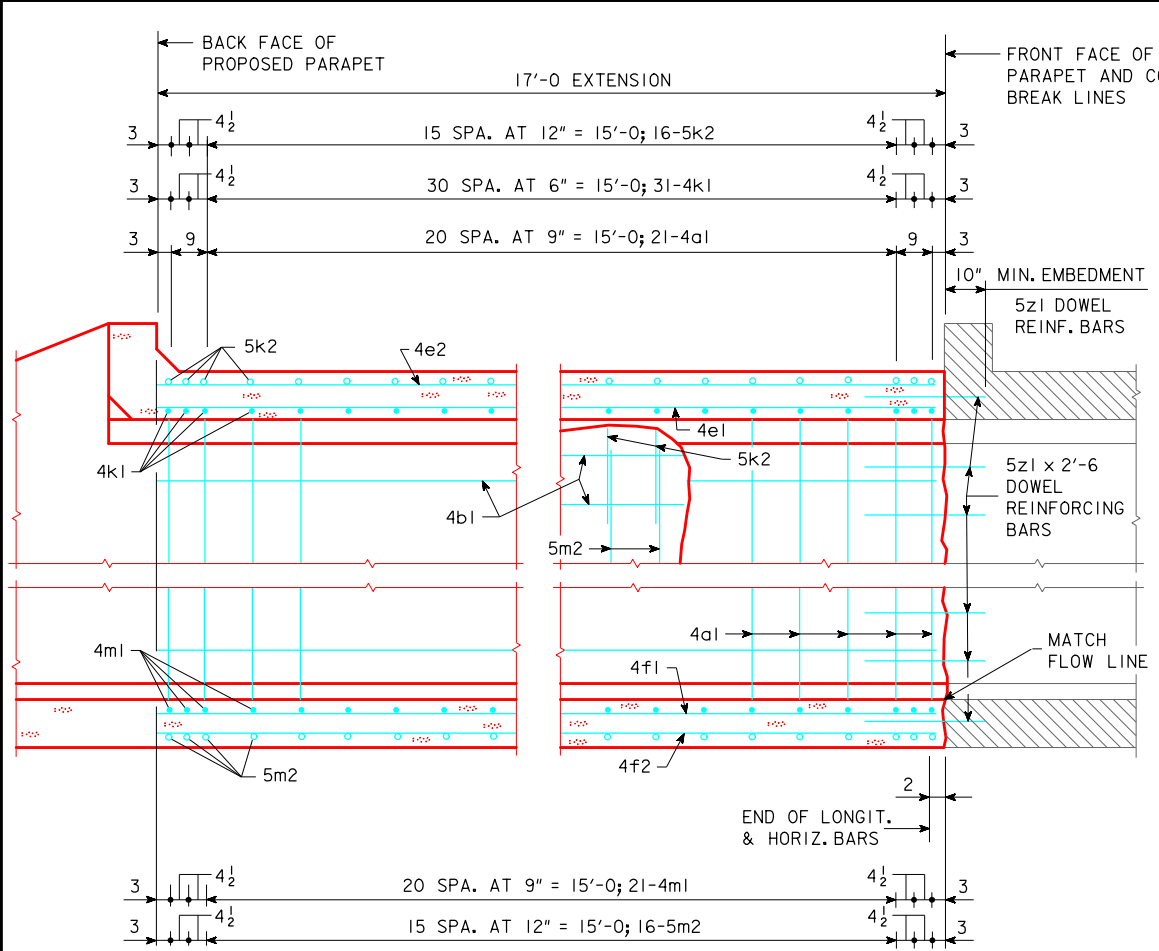
CONSTRUCTION NOTES:

CLASS E REVETMENT SHALL BE USED AND PLACED ACCORDING TO ARTICLE 2507.03, OF THE STANDARD SPECIFICATIONS.
THE ENGINEERING FABRIC SHALL MEET THE MATERIAL REQUIREMENTS IN ACCORDANCE WITH ARTICLE 4196.01, B, 3, OF THE STANDARD SPECIFICATIONS.

DESIGN FOR 0° SKEW
**4'x3' REINFORCED CONCRETE
 BOX CULVERT EXTENSION**
REVETMENT PROTECTION DETAILS
 STATION 1086+18.00 (US 6) JUNE, 2017
IOWA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 3 OF 9 FILE NO. 31463 DESIGN NO. 517

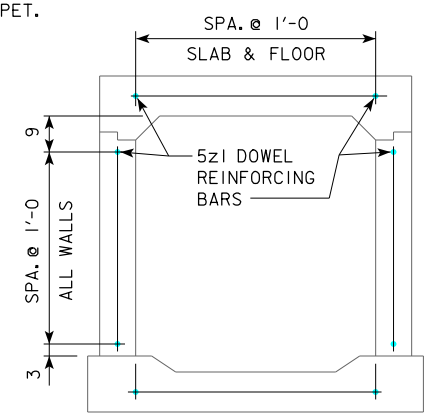
REVISED 1-16 - ADDED NOTE "SEE CULVERT PLANS FOR LIMITS OF REVETMENT AND ENGINEERING FABRIC."
 REVISED 02-2017 - ADDED SECTION DIRECTORS "A-A" TO "ZERO SKEW" PLAN VIEW DETAIL.
 ENGLISHING\INGLCULVERTS.DGN - 1092 - THIS SHEET ISSUED 04-12.

CORRECTION 05-14 - ADDED THE BAR LABELS K9 & m9 TO THE PART LONGIT. SECTIONS. HEL044.S01 (ASTD01044.S01--LEP: THIS SHEET REDRAWN, DEVICE:ZHA0R(200,004) ARCH.TAPE NO. 15 DATE 9-8-88)



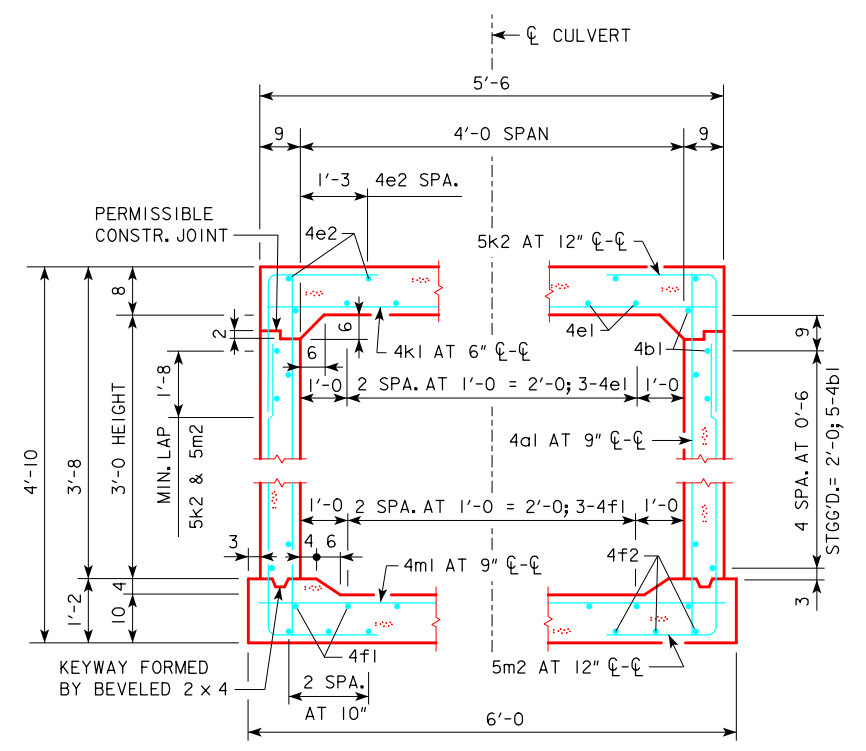
17'-0 BARREL PART LONGITUDINAL SECTION
(ALONG CL OF CULVERT)

NOTE: ALL LONGITUDINAL BARREL STEEL SHALL EXTEND AT LEAST TO THE BACK FACE OF PARAPET.



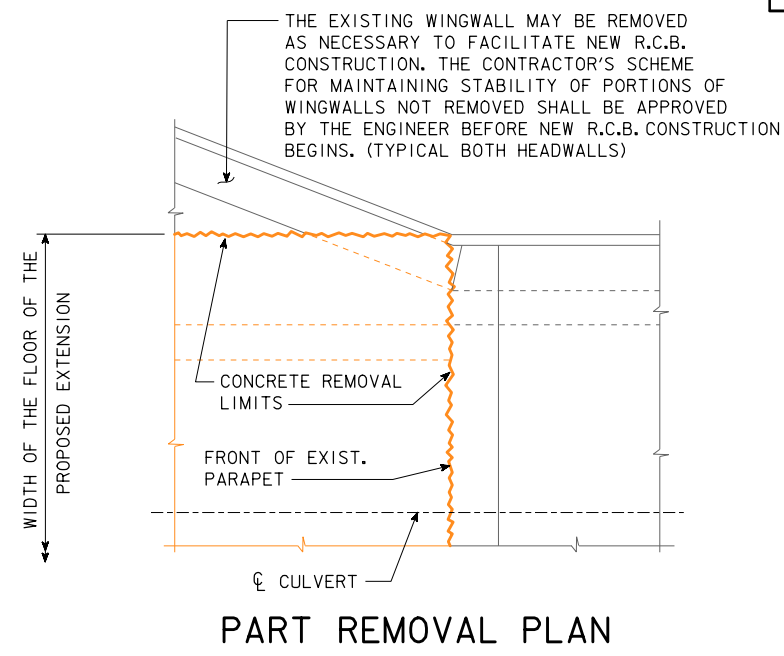
SECTION NEAR EXTENSION
(SHOWING SPACING OF 5z1 DOWEL REINFORCING BARS)

REINFORCING STEEL EXTENSION DOWELS						
BAR	LOCATION	SHAPE	NO./JT.	TOTAL NO.	LENGTH	WEIGHT
5z1	TOP SLAB, CONST. JOINT		16	16	2'-6	42



SECTION THRU BARREL
(NORMAL TO CL CULVERT)

NOTE:
ALL TRANSVERSE REINFORCING BARS AND HORIZONTAL LEGS OF CORNER BARS SHALL BE PLACED PARALLEL TO THE CONCRETE BREAK LINE AND NEW PARAPET EXCEPT AS SHOWN.
DIMENSIONS SHOWN FOR CL-CL OF TRANSVERSE BARS, VERTICAL WALL BARS, AND CORNER BARS ARE MEASURED ALONG CL CULVERT.
CONCRETE PER FOOT OF BARREL:
SLAB = 2.9 CU. YDS.
WALLS = 2.5 CU. YDS.
FLOOR = 3.8 CU. YDS.
TOTAL = 9.2 CU. YDS.

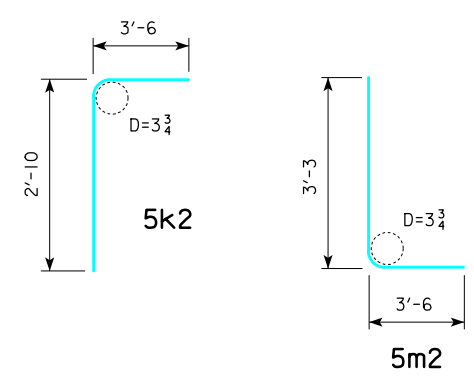


PART REMOVAL PLAN

REINFORCING BAR LIST-ONE 17'-0 EXTENSION

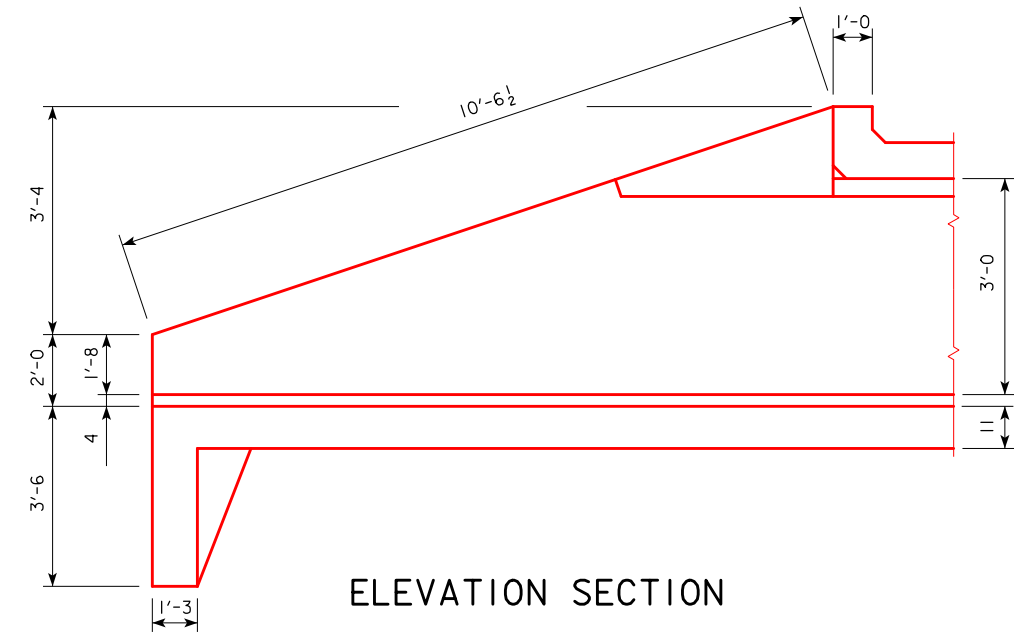
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
4a1	WALLS, F.F.V		46	4'-5	136
4b1	WALLS, F.F.H & B.F.H		12	16'-10	135
4e1	SLAB, BOT. LONGIT.		3	16'-10	34
4e2	SLAB, TOP LONGIT.		4	16'-10	45
4f1	FLOOR, TOP LONGIT.		5	16'-10	56
4f2	FLOOR, BOT. LONGIT.		6	16'-10	67
4k1	SLAB, BOT. TRANSV.		35	5'-2	121
5k2	SLAB, TOP CORNER		40	6'-4	264
4m1	FLOOR, TOP TRANSV.		25	5'-8	95
5m2	FLOOR, BOT. CORNER		40	6'-9	282
REINFORCING STEEL - TOTAL (LBS.)					1235

BENT BAR DETAILS

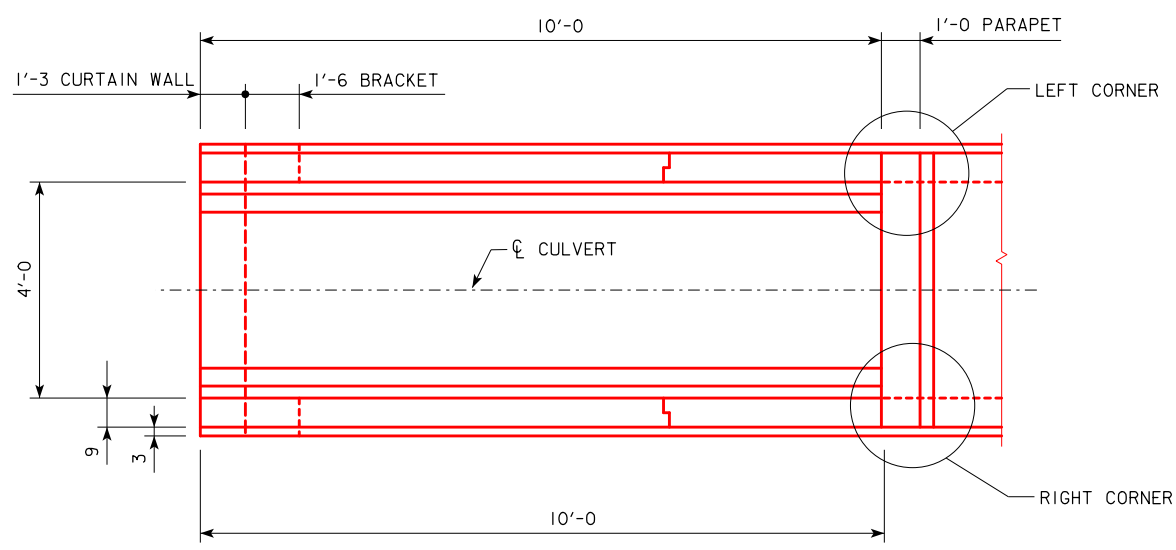


NOTE: ALL DIMENSIONS ARE OUT TO OUT. D = PIN DIAMETER.

DESIGN FOR 0° SKEW
4'x3' REINFORCED CONCRETE BOX CULVERT EXTENSION
17'-0 CULVERT EXTENSION DETAILS
 STATION 1086+18.00 (US 6) JUNE, 2017
IOWA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 4 OF 9 FILE NO. 31463 DESIGN NO. 517



ELEVATION SECTION

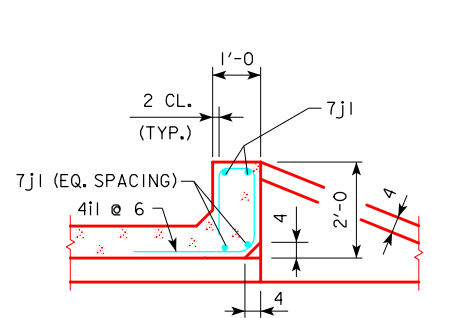


PLAN VIEW

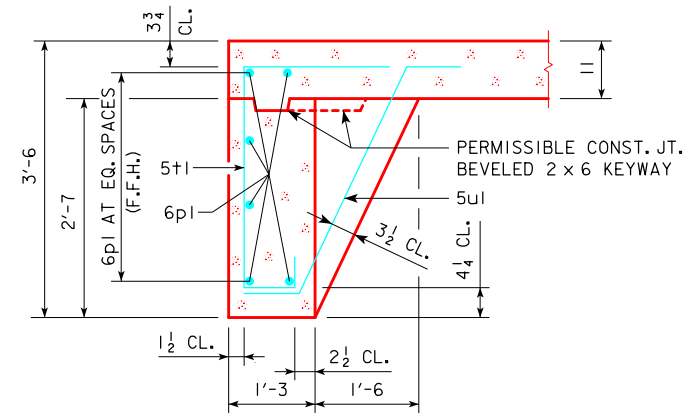
- NOTES:**
1. SEE SHEET V.3 FOR GENERAL INFORMATION, SPECIFICATIONS, AND DESIGN STRESSES.
 2. SEE DESIGN SHEET 9 FOR HEADWALL NOTES.

DESIGN FOR 0° SKEW
**4'x3' REINFORCED CONCRETE
 BOX CULVERT EXTENSION
 PARALLEL WING DETAILS**
 STATION 1086+18.00 (US 6) JUNE, 2017
IOWA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 5 OF 9 FILE NO. 31463 DESIGN NO. 517

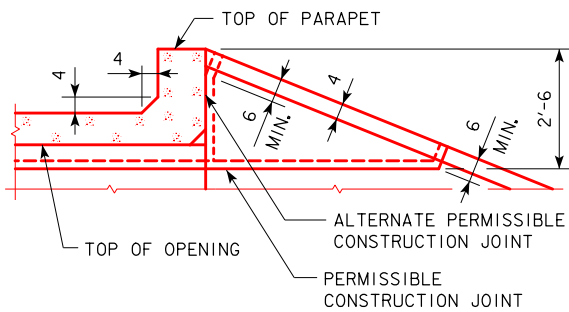
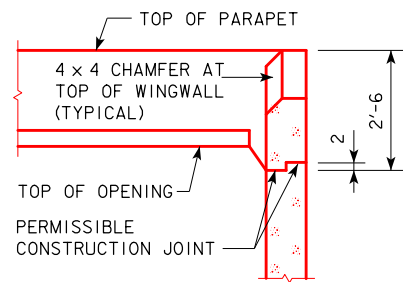




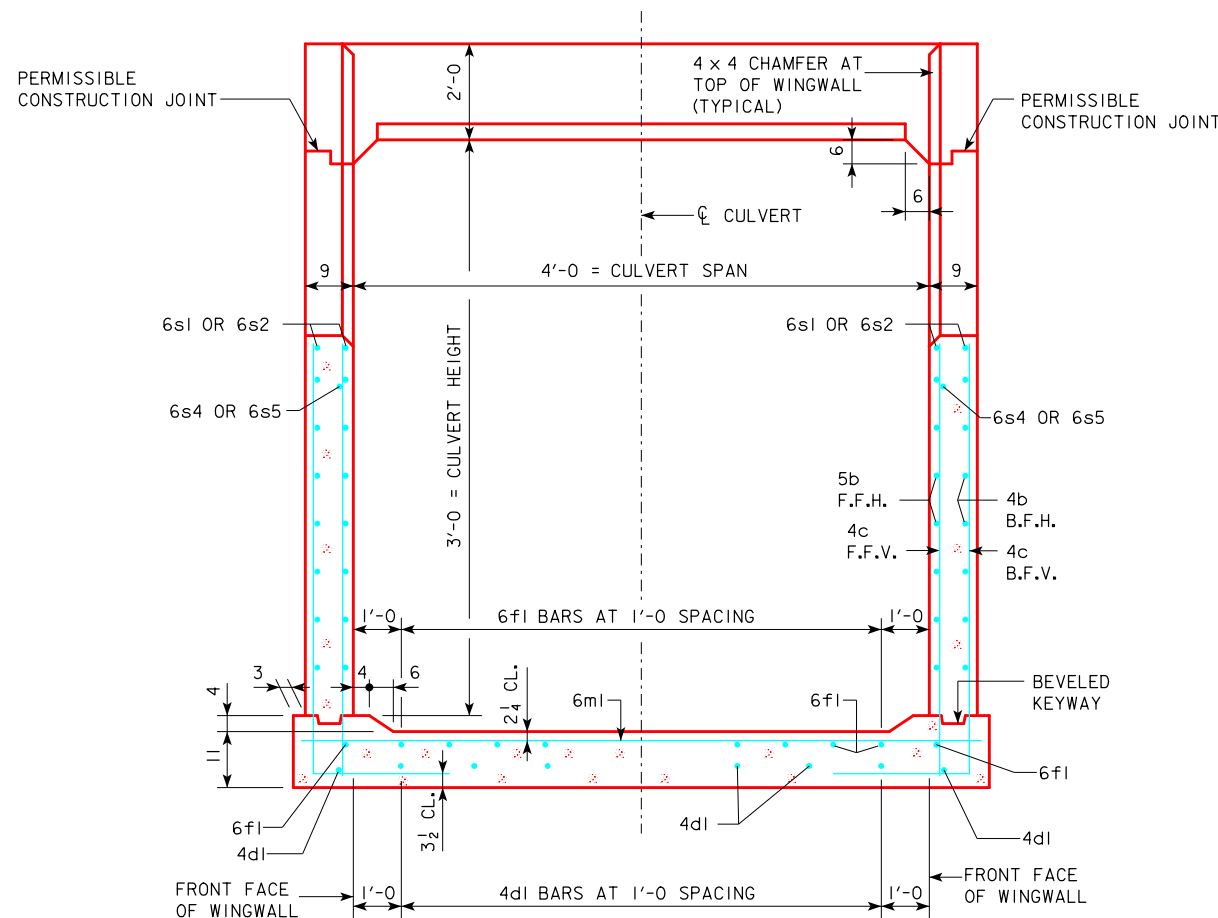
SECTION THRU PARAPET



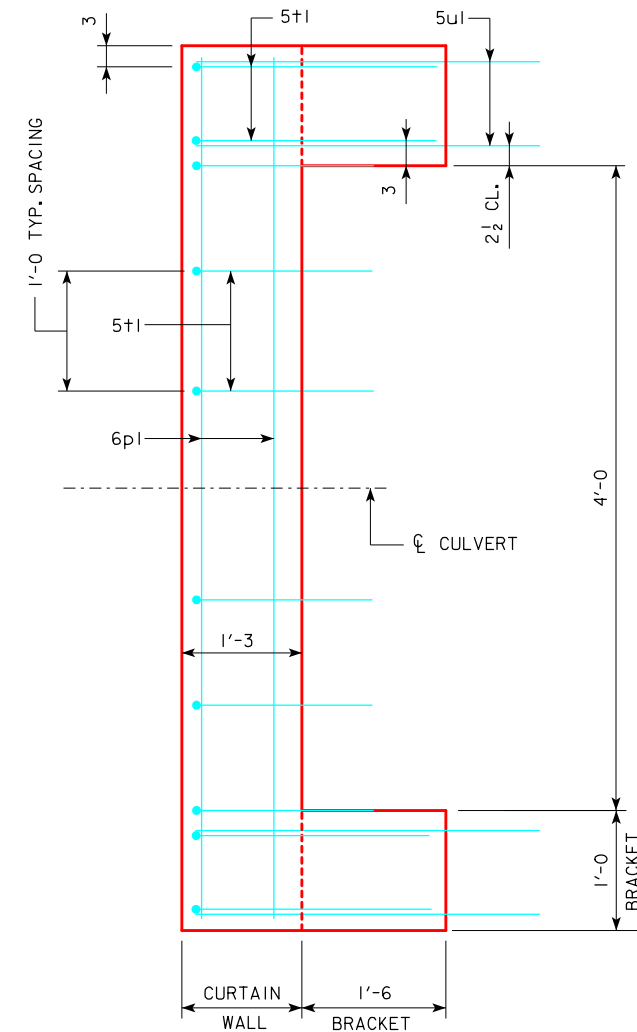
SECTION THRU CURTAIN WALL



TOP OF WINGWALL DETAILS

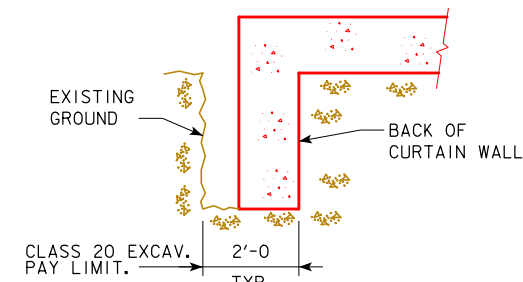


TYPICAL CROSS SECTION - THRU HEADWALL



CURTAIN WALL DETAIL - PLAN VIEW

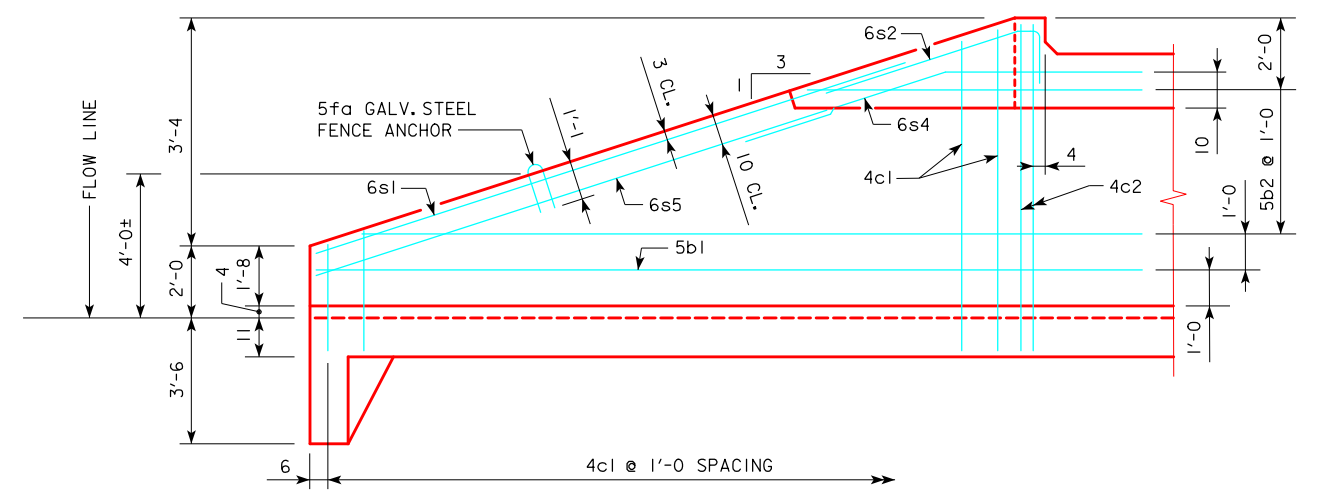
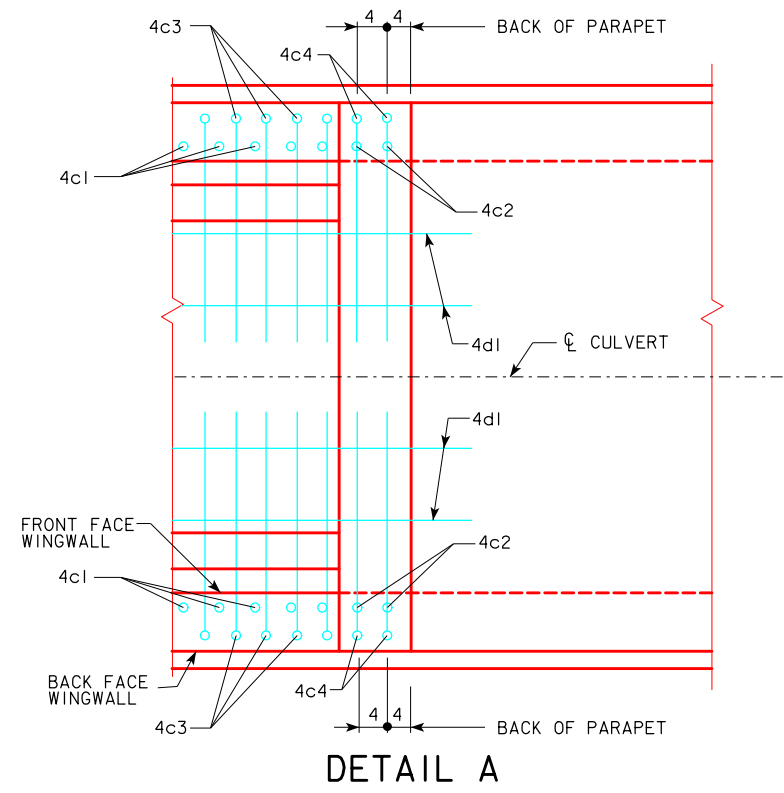
APRON IS NOT SHOWN



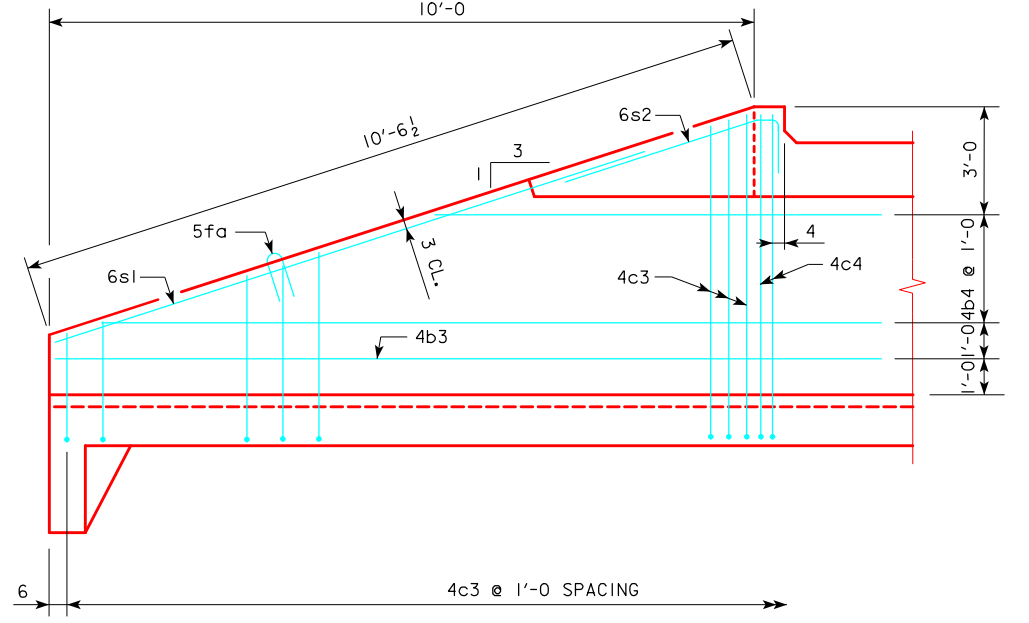
CURTAIN WALL CLASS 20 EXCAVATION

DESIGN FOR 0° SKEW
4'x3' REINFORCED CONCRETE BOX CULVERT EXTENSION
PARALLEL WING HEADWALL DETAILS
 STATION 1086+18.00 (US 6) JUNE, 2017
IOWA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 6 OF 9 FILE NO. 31463 DESIGN NO. 517

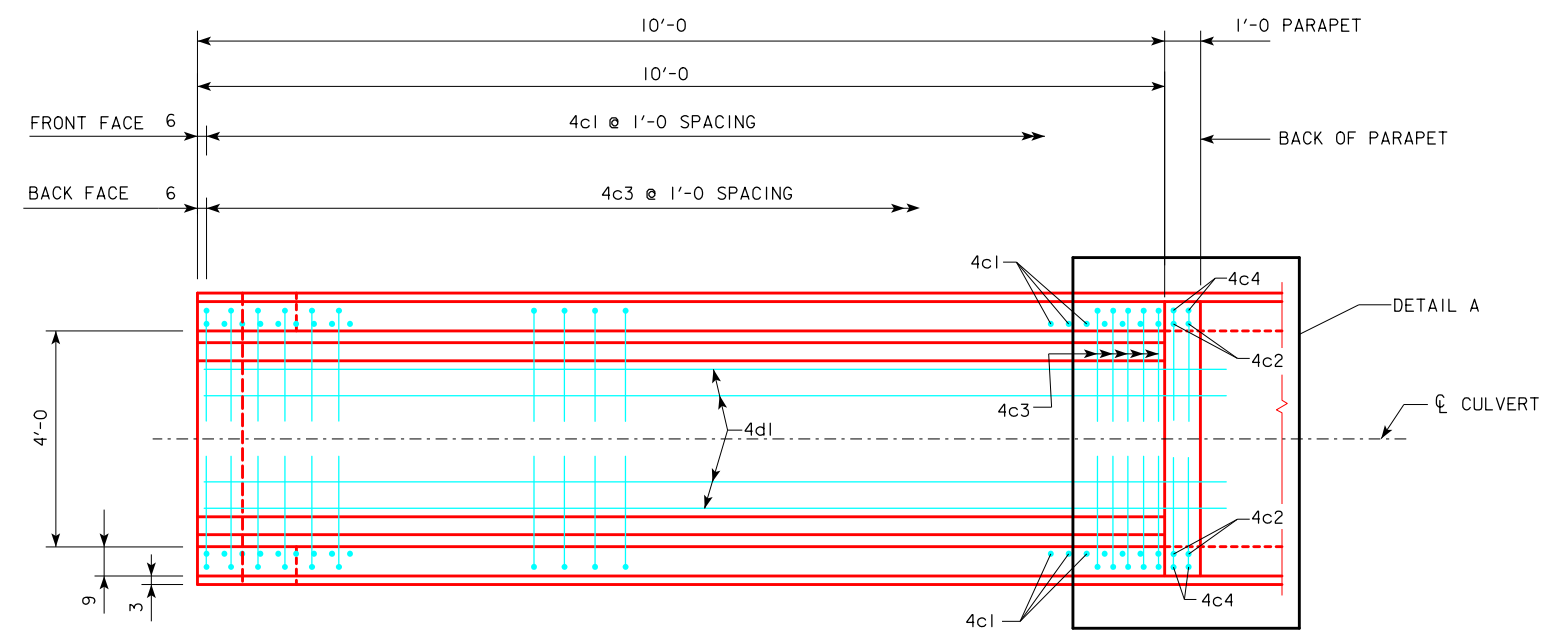




TYPICAL VIEW - FRONT FACE WINGWALL REINFORCING



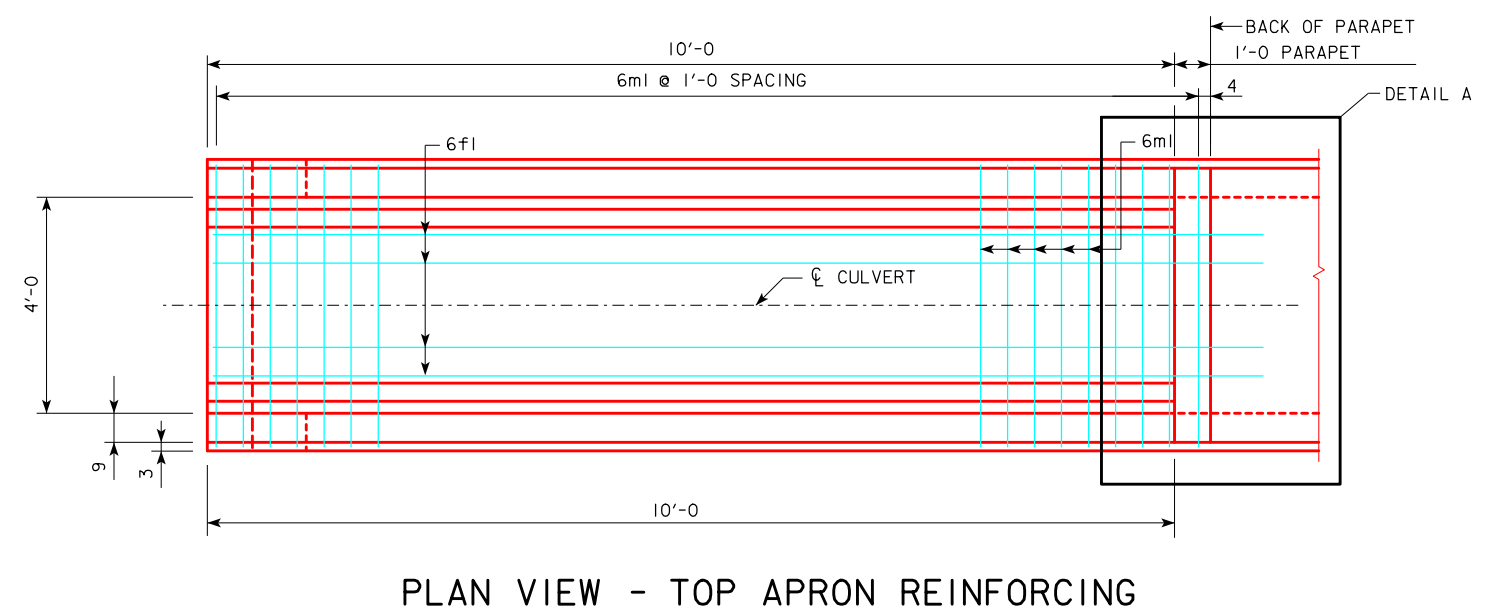
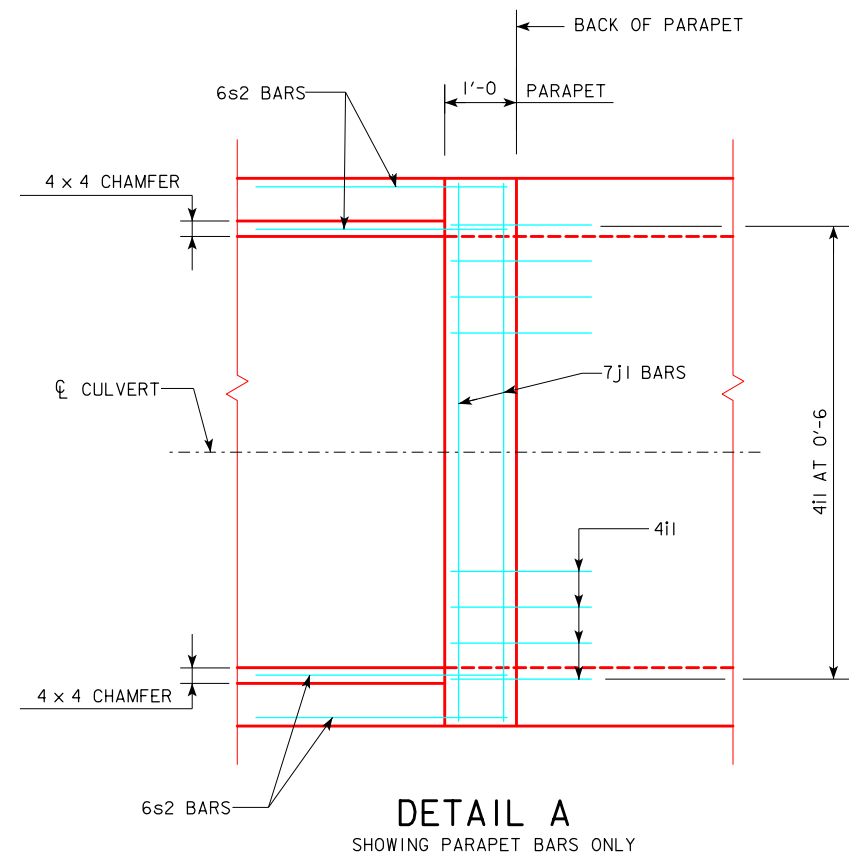
TYPICAL VIEW - BACK FACE WINGWALL REINFORCING



PLAN VIEW - BOTTOM APRON REINFORCING

DESIGN FOR 0° SKEW
**4'x3' REINFORCED CONCRETE
 BOX CULVERT EXTENSION**
PARALLEL WING HEADWALL DETAILS
 STATION 1086+18.00 (US 6) JUNE, 2017
IOWA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 7 OF 9 FILE NO. 31463 DESIGN NO. 517





DESIGN FOR 0° SKEW
**4'x3' REINFORCED CONCRETE
 BOX CULVERT EXTENSION
 PARAPET & APRON DETAILS**
 STATION 1086+18.00 (US 6) JUNE, 2017
IOWA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 8 OF 9 FILE NO. 31463 DESIGN NO. 517



REINFORCING BAR LIST - ONE HEADWALL

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
5fa	FENCE ANCHOR (GALV.)		2	2'-10	6
5b1	WINGWALL, F.F.H.		2	12'-10	27
5b2	WINGWALL, F.F.H.		4	2 EACH 8'-10 TO 11'-10	43
4b3	WINGWALL, B.F.H.		2	12'-10	17
4b4	WINGWALL, B.F.H.		2	11'-10	16
4c1	WINGWALL, F.F.V.		20	2 EACH 2'-6 TO 5'-6	53
4c2	WINGWALL, F.F.V.		4	5'-9	15
4c3	WINGWALL, B.F.V.		20	2 EACH 6'-1 TO 9'-1	101
4c4	WINGWALL, B.F.V.		4	9'-3	25
4d1	APRON, LONGIT., BOT.		5	12'-10	43
6f1	APRON, LONGIT., TOP.		5	12'-10	96
4i1	PARAPET, VERTICAL		9	6'-5	39
7j1	PARAPET, HORIZ.		4	5'-2	42
6m1	APRON, TRANS., TOP		11	5'-8	94
6p1	CURTAIN, HORIZ.		6	5'-8	51
6s1	WING SLOPE, BOTH F.		4	7'-3	44
6s2	WING SLOPE, BOTH F.		4	7'-9	47
6s4	WING SLOPE, F.F.		2	11'-0	33
6s5	WING SLOPE, F.F.		2	4'-11	15
5+1	CURTAIN, VERT.		9	6'-5	60
5u1	BRACKET, VERT.		4	5'-3	22
REINFORCING STEEL - TOTAL (LBS.)					889

CONCRETE PLACEMENT QUANTITIES ONE HEADWALL

LOCATION	CY
PARAPET *	0.9
WINGWALLS	1.6
APRON	3.5
TOTAL (C.Y.)	6.0

* INCLUDES PARAPET AND TOP OF WINGWALL.

HEADWALL NOTES:

THIS HEADWALL IS BASED ON A 3:1 SLOPE NORMAL TO CENTERLINE OF ROADWAY.

THE SIDES OF THE FOOTING ARE TO BE FORMED TO INSURE CORRECT LINE AND GRADE.

ALL EXPOSED CORNERS OF 90° OR SHARPER ARE TO BE FILLETED WITH A 3/4" DRESSED AND BEVELED STRIP.

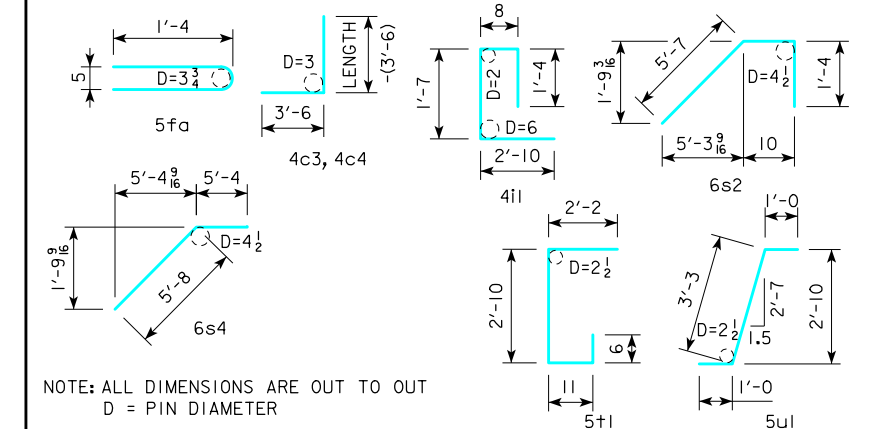
ALL REINFORCING IS TO BE SECURELY WIRED IN PLACE BEFORE THE CONCRETE IS POURED. ALL SLAB AND FLOOR REINFORCING STEEL IS TO BE SUPPORTED BY BAR CHAIRS AT INTERVALS OF NOT MORE THAN 3'-0 IN EITHER DIRECTION AS OUTLINED IN THE STANDARD SPECIFICATIONS.

CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN. CLEARANCE TO THE BOTTOM ENDS OF VERTICAL BARS SHALL BE 3 INCHES.

CONCRETE QUANTITIES ARE ESTIMATED FROM BACK OF PARAPET.

HORIZONTAL TAILS OF BARS "b" & "s" ESTIMATED TO EXTEND 2'-0 BEYOND BACK OF PARAPET (INTO END OF BARREL). LONGITUDINAL BARS "4d1" AND "6f1" ESTIMATED TO PROJECT INTO END SECTION OF BARREL A MINIMUM OF 2'-0 BEYOND BACK OF PARAPET. THE "LENGTH" COLUMN REFLECTS TOTAL NUMBER OF FEET NECESSARY TO MEET THESE REQUIREMENTS.

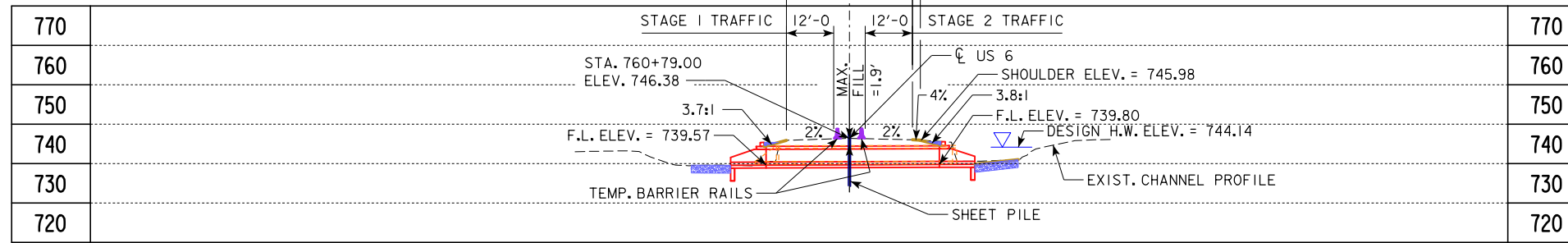
BENT BAR DETAILS



DESIGN FOR 0° SKEW
**4'x3' REINFORCED CONCRETE
 BOX CULVERT EXTENSION**
HEADWALL QUANTITIES
 STATION 1086+18.00 (US 6) JUNE, 2017
IOWA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 9 OF 9 FILE NO. 31463 DESIGN NO. 517



BENCH MARK NO. 511: STA. 760+86.34, FD "X", EAST END OF INLET HEADWALL 26.29' RT., ELEV. 745.08



LONGITUDINAL SECTION ALONG CL CULVERT
 DESIGN FILL HEIGHT = 2'-0"
 ANTICIPATED SETTLEMENT = NEGLIGIBLE

PROPOSED PROFILE GRADE ON US 6

VPI STA = 763+36
 VPI ELEV = 746.25
 -0.05%
 VPI STA = 755+77
 VPI ELEV = 746.63

NOTES:

IT IS THE INTENT OF THIS DESIGN TO REMOVE AND REPLACE THE EXISTING TWIN 4' x 3' REINFORCED CONCRETE BOX CULVERT WITH 0 DEGREE SKEW WITH A 12' x 4' x 45' PRECAST REINFORCED CONCRETE BOX CULVERT.

THE PRECAST RCB CULVERT IS DESIGNED FOR EARTH FILLS OF 2 FOOT.

ALL UNITS ARE IN FEET UNLESS OTHERWISE NOTED OR SHOWN.

SEE ROAD SHEETS FOR ADDITIONAL INFORMATION ON PROPOSED GRADING LIMITS.

DRAINAGE THROUGH EXISTING CULVERT/CHANNEL MUST BE MAINTAINED THROUGHOUT CONSTRUCTION.

LIMITS OF EASEMENT TO BE DETERMINED.

NORTH AND SOUTH SIDES DO NOT SATISFY CLEAR ZONE.

HEADWALLS SHALL BE PLACED LEVEL.

CULVERT IS TO BE BURIED 1'.

HYDRAULIC DATA

DRAINAGE AREA = 247.2 ACRES
 Q₅₀ = 281 CFS
 HW ELEV. = 744.14
 ROLLING

UTILITIES LEGEND:

- T1 - COOPERATIVE TELEPHONE COMPANY
- F0 - IOWA NETWORK SERVICES
- G - ALLIANT ENERGY
- F02 - MCI
- F03 - MEDIACOM
- T2 - WINDSTREAM COMMUNICATIONS
- W - POWESHIEK WATER ASSOCIATION
- F04 - SOUTH SLOPE COOPERATIVE

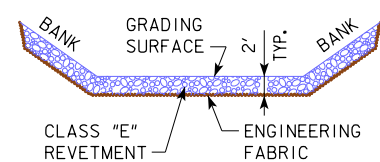
LOCATION

ON US 6 OVER DRAINAGE DITCH
 T-8IN R-10W
 SECTION 30
 CITY OF MERANGO
 WASHINGTON TOWNSHIP
 IOWA COUNTY
 LATITUDE
 LONGITUDE

TRAFFIC ESTIMATE

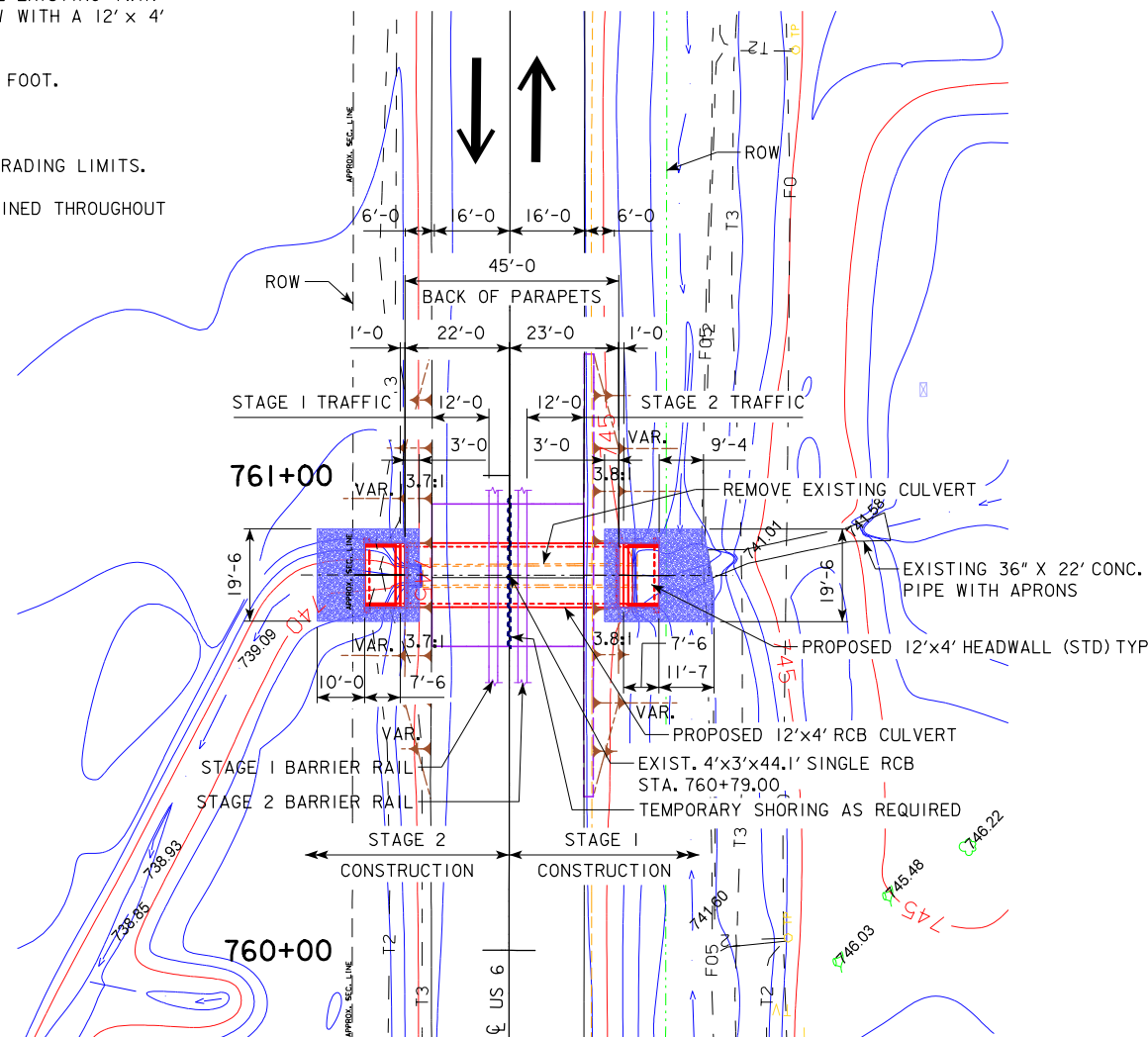
2014 AADT 3370 V.P.D.

NEED INFO.



ESTIMATED REVETMENT QUANTITIES INCLUDED WITH ROAD PLANS

LOCATION	REVETMENT CL. "E" (TON)	ENGINEERING FABRIC (SY)
INLET	38.2	64
OUTLET	36.1	61.8
TOTALS	74.3	125.8



SITUATION PLAN



DESIGN FOR 0° SKEW
12'x4' PRECAST REINFORCED CONC. BOX CULVERT
 SITUATION PLAN

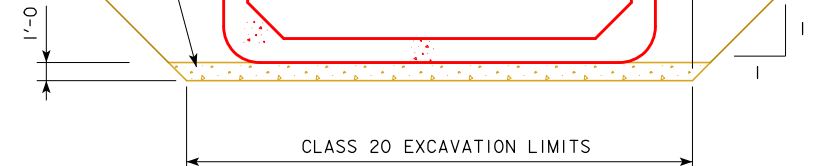
STATION 760+79.00 (US 6)
IOWA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 1 OF 2 FILE NO. 31463 DESIGN NO. 617

JUNE, 2017
NEED INFO.



REVISED 10-14 - CHANGED THE AREA OF THE REVETMENT TO INCLUDE THE AREA IN FRONT OF THE APRON. CHANGED THE DEPTH OF REVETMENT TO 2'-0".
 REVISED 12-15 - ADDED NOTE "SEE CULVERT PLANS FOR LIMITS OF REVETMENT AND ENGINEERING FABRIC."
 ENGLISH\IGNED\PRECASTCULVERTS.DGN - PEP 1-13 - THIS SHEET ISSUED 01-13.

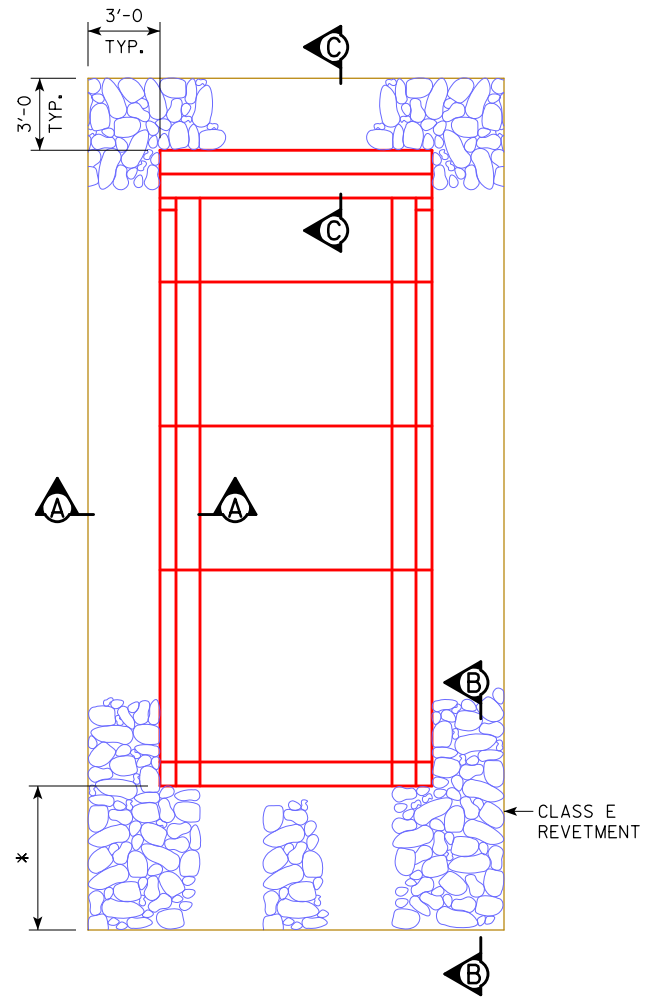
GRANULAR MATERIAL
(MAX. 3/8" SIZE
AGGREGATE)



GRANULAR BEDDING DETAIL

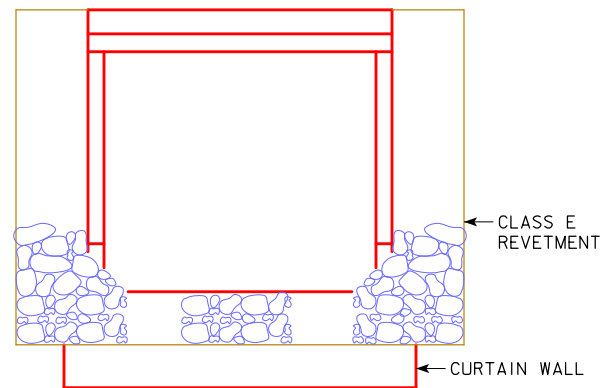
GRANULAR MATERIAL SHALL TERMINATE 3'-0 SHORT OF THE PRECAST CURTAIN WALL.

SEE STANDARD ROAD PLAN DR-111 FOR BACKFILLING REQUIREMENTS.

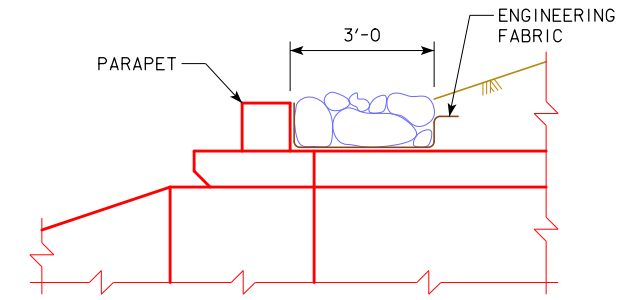


PLAN VIEW

* = SEE CULVERT PLANS FOR LIMITS OF REVETMENT AND ENGINEERING FABRIC.

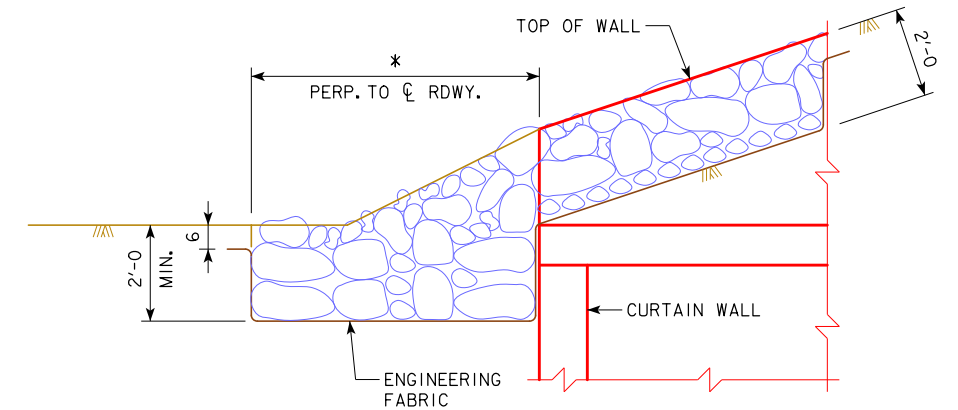


**ELEVATION VIEW
NON-SKEW END SECTIONS**

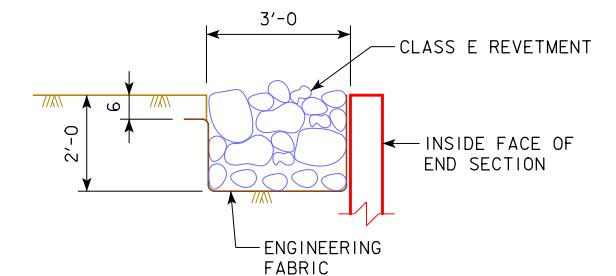


SECTION C-C

* = SEE CULVERT PLANS FOR LIMITS OF REVETMENT AND ENGINEERING FABRIC.



SECTION B-B



**SECTION A-A
TYPICAL DETAILS**

CONSTRUCTION NOTES:

CLASS E REVETMENT SHOULD BE USED AND PLACED ACCORDING TO ARTICLE 2507.03 OF THE STANDARD SPECIFICATIONS.

THE ENGINEERING FABRIC SHALL MEET THE MATERIAL REQUIREMENTS IN ACCORDANCE WITH ARTICLE 4196.01, B, 3 OF THE STANDARD SPECIFICATIONS.

DESIGN FOR 0° SKEW
**12'x4' PRECAST REINFORCED CONC.
BOX CULVERT**
EMBANKMENT PROTECTION DETAILS
 STATION 760+79.00 (US 6)
IOWA COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 2 OF 2 FILE NO. 31463 DESIGN NO. 617

LINE STYLE LEGEND OF CROSS SECTION SHEETS (ROAD)

- Existing Ground Line
- ===== Proposed Template
- ===== Proposed Topsoil Placement
- Additional Topsoil Removal
- Subgrade Treatment
- Granular Shoulder
- ===== Pavement
- Existing Pipe\RCB
- ===== Proposed Pipe\RCB
- ===== Proposed Dike
- ===== All Elements Associated with Proposed Entrances

LINE STYLE LEGEND OF CROSS SECTION SHEETS (SOILS)

- TS ----- Topsoil (Class 10)
- SLOPE DRESSING ----- Slope Dressing Only
- CL 10 ----- Class 10 Materials
- SEL LO ----- Select Loams And Clay-Loams
- SEL SA ----- Select Sand
- UNS A ----- Unsuitable Type A Disposal
- UNS B ----- Unsuitable Type B Disposal
- UNS C ----- Unsuitable Type C Disposal
- SHALE ----- Shale
- WASTE ----- Waste
- B&W LS ----- Broken and Weathered Rock
- ROCK ----- Solid Rock
- BLDRS ----- Boulders

Note: All layer lines and descriptions identify layers above the line.

Note: Vertical or near vertical lines connecting soil layers at edges of cross sections are only for the purpose of calculating template quantities and do not depict soil stratification.

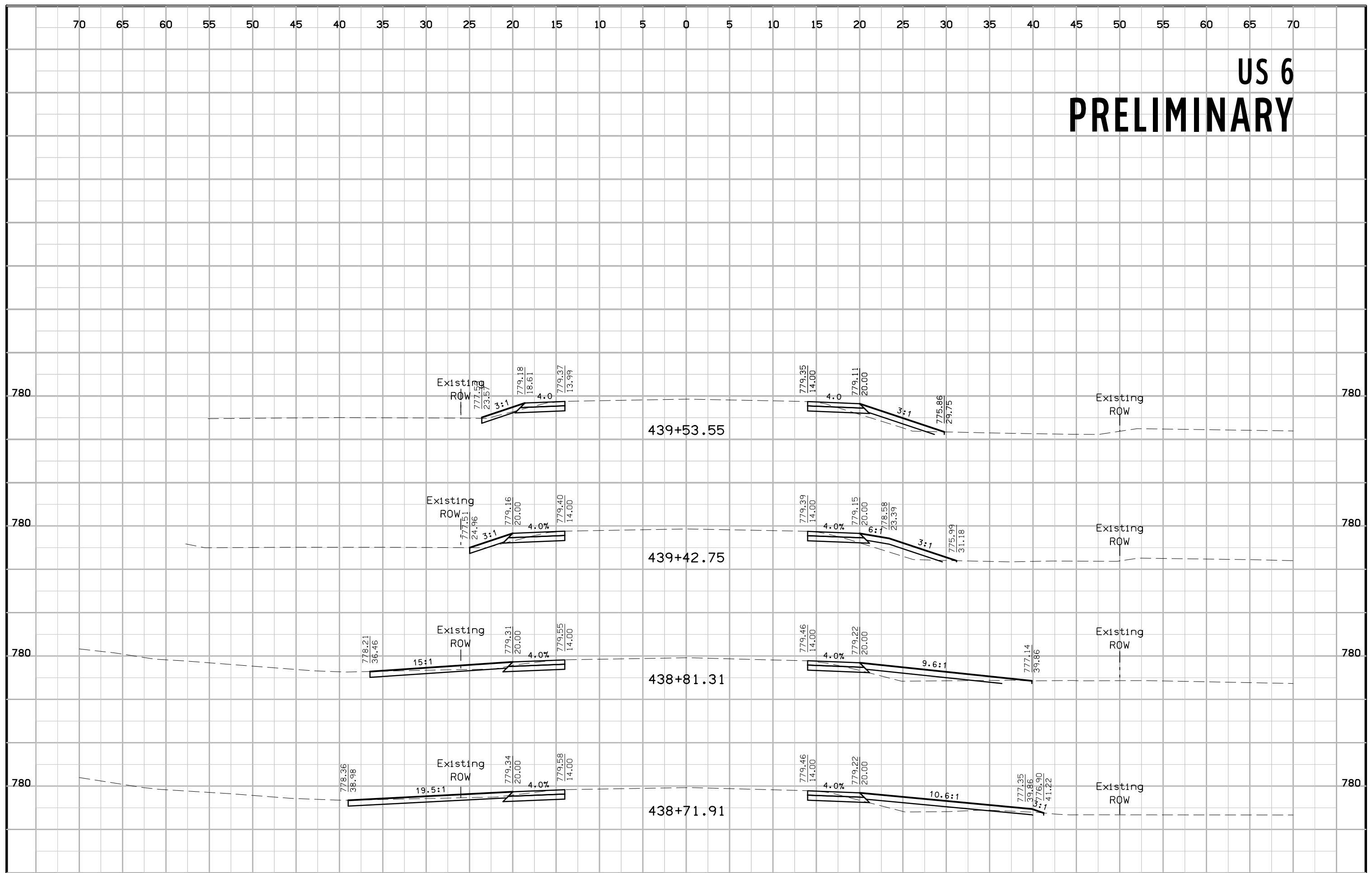
SYMBOL LEGEND OF CROSS SECTION SHEETS

- Existing ROW
----- Existing Right-of-Way Limit
- Proposed ROW
----- Proposed Right-of-Way Limit
- Temporary ROW
----- Temporary Right-of-Way Limit

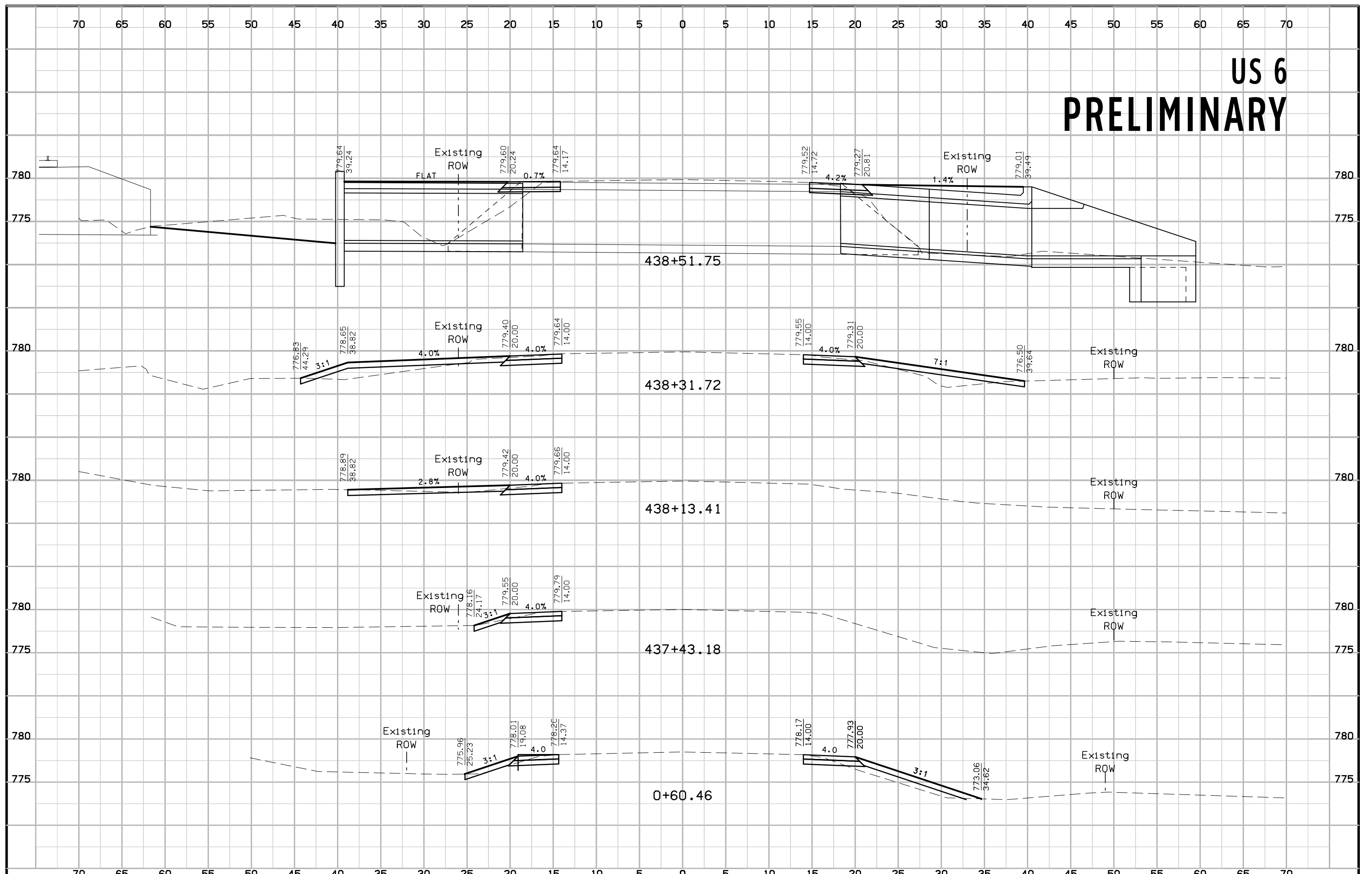
CROSS SECTION

(COVERS SHEET SERIES W, X, Y, & Z)

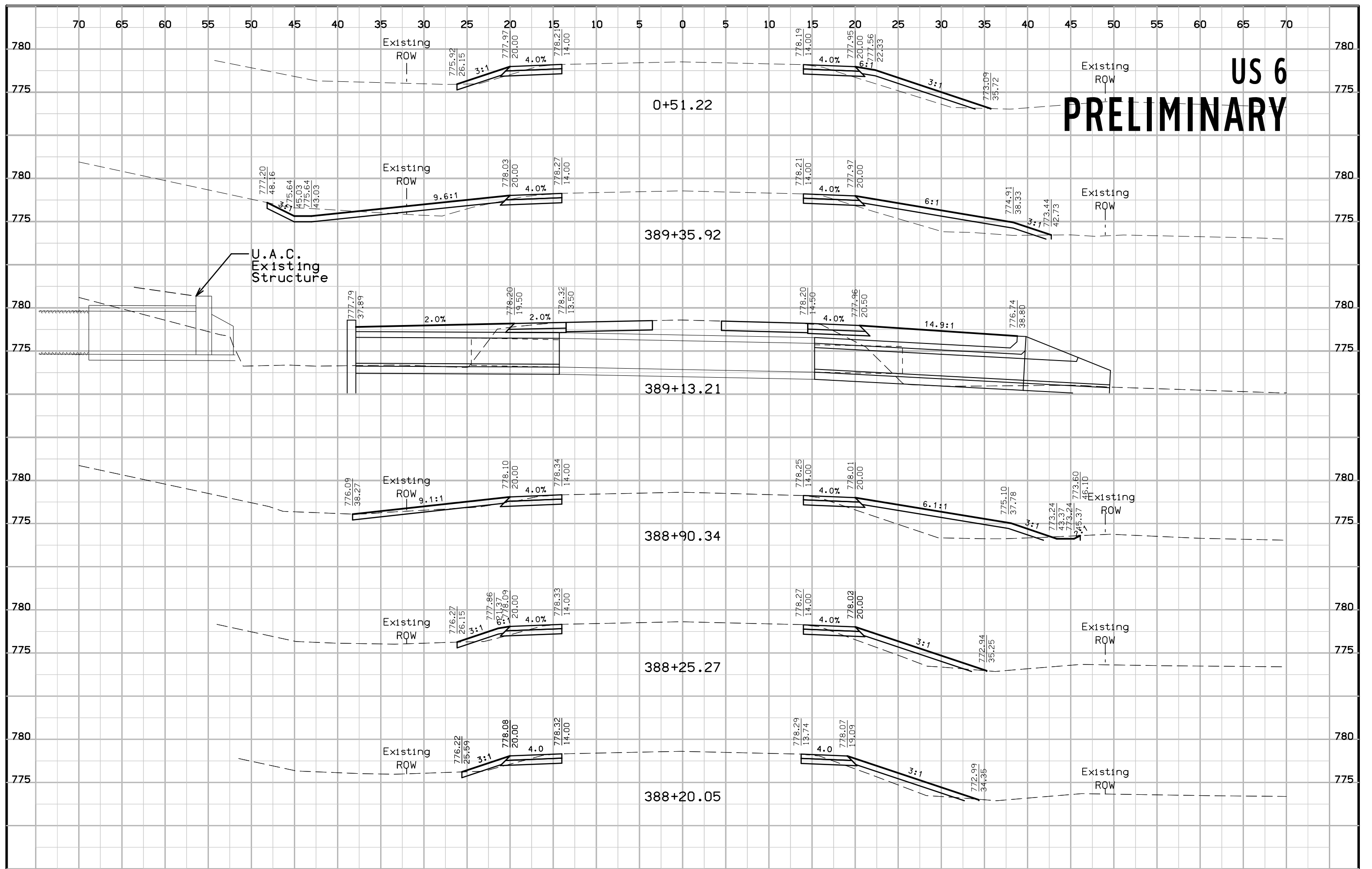
US 6 PRELIMINARY



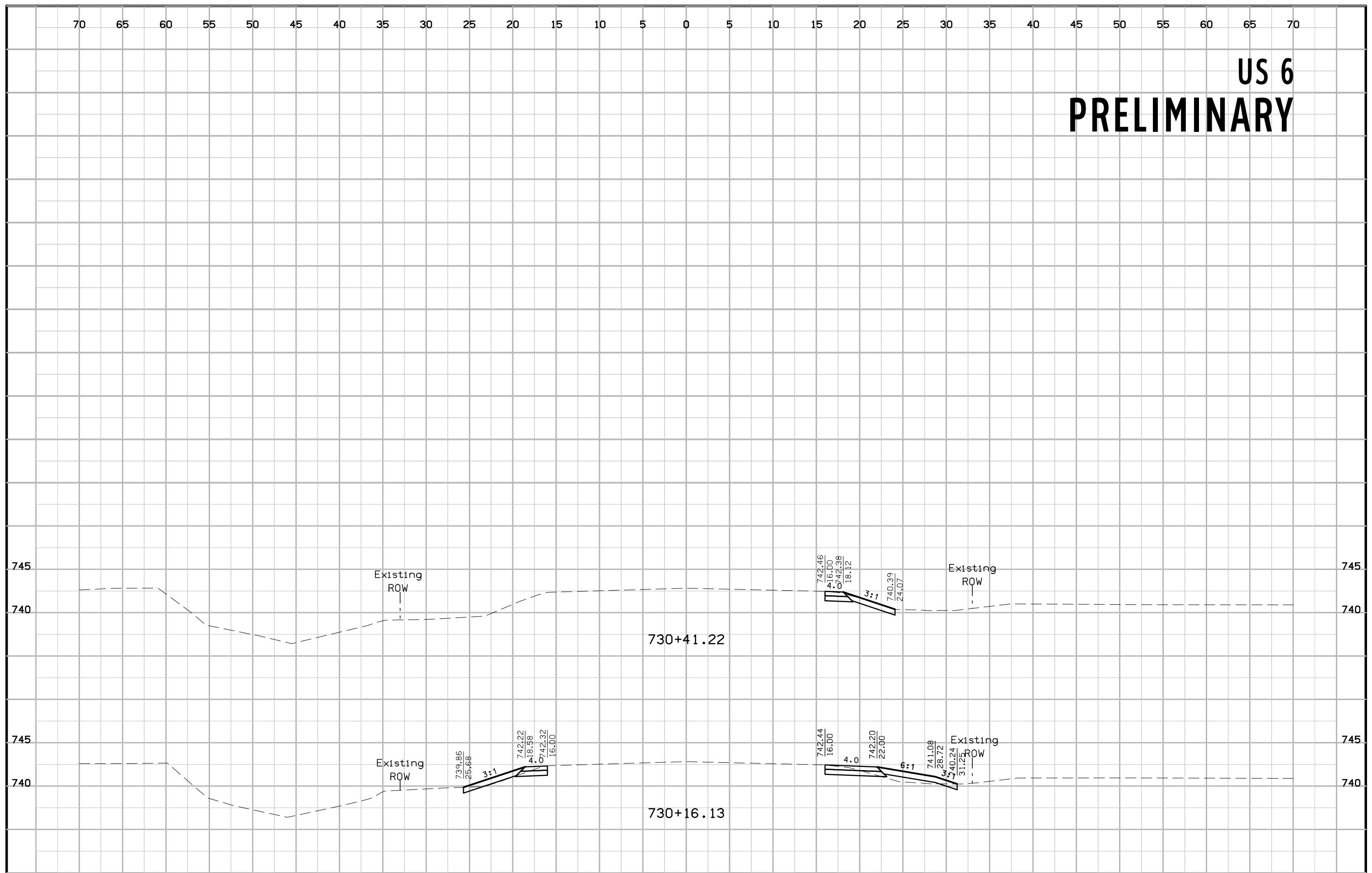
US 6 PRELIMINARY



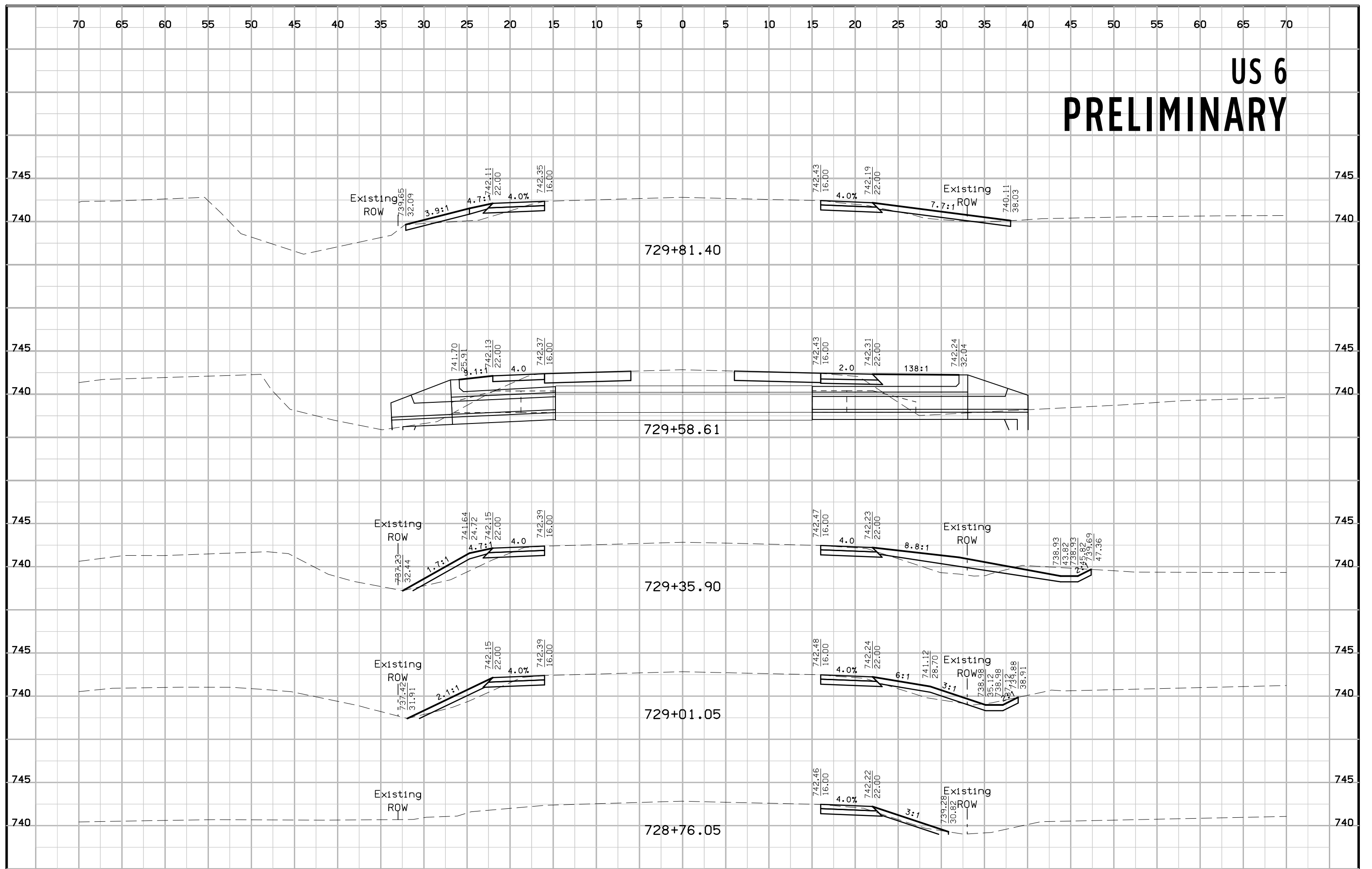
US 6 PRELIMINARY



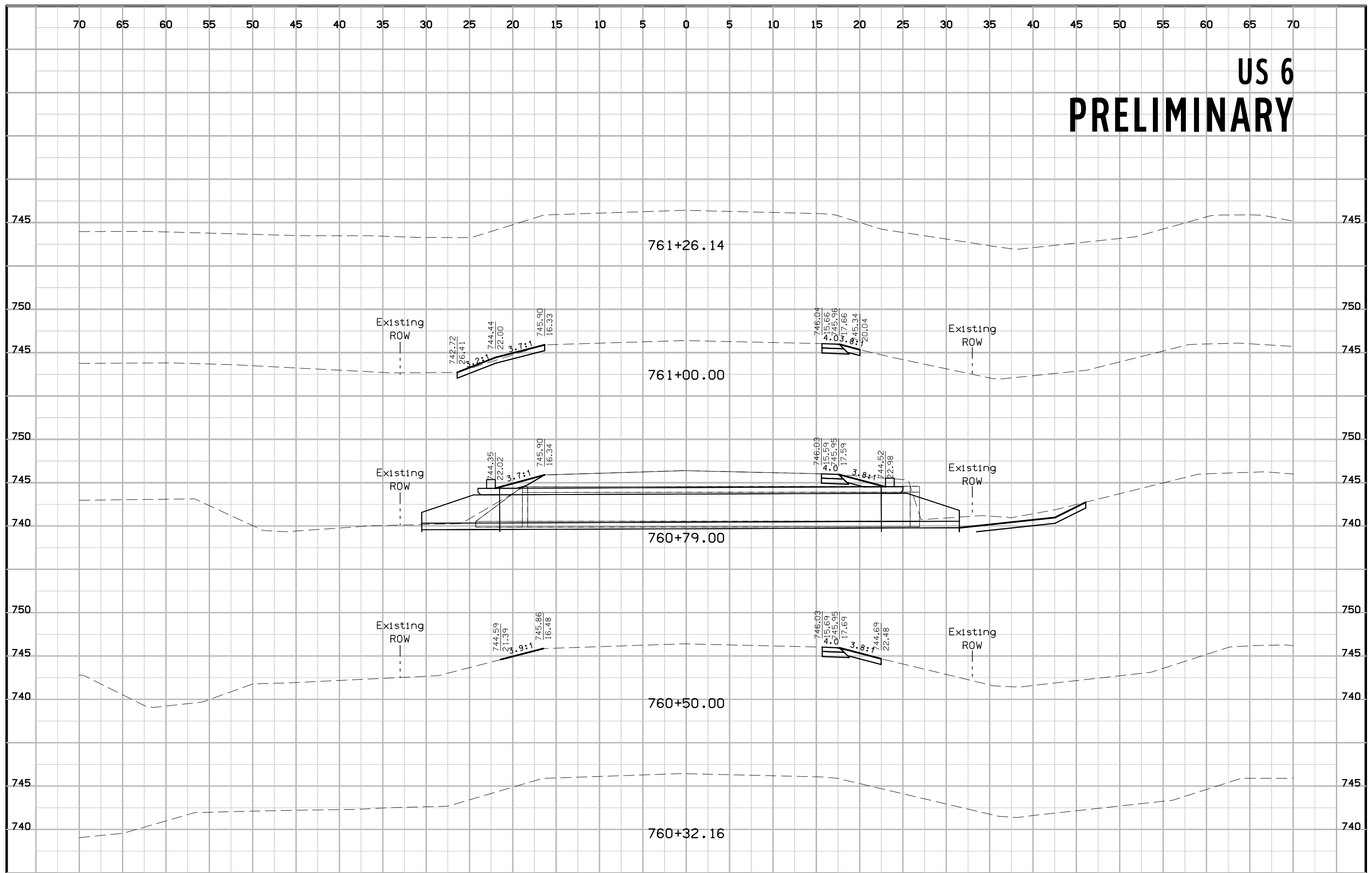
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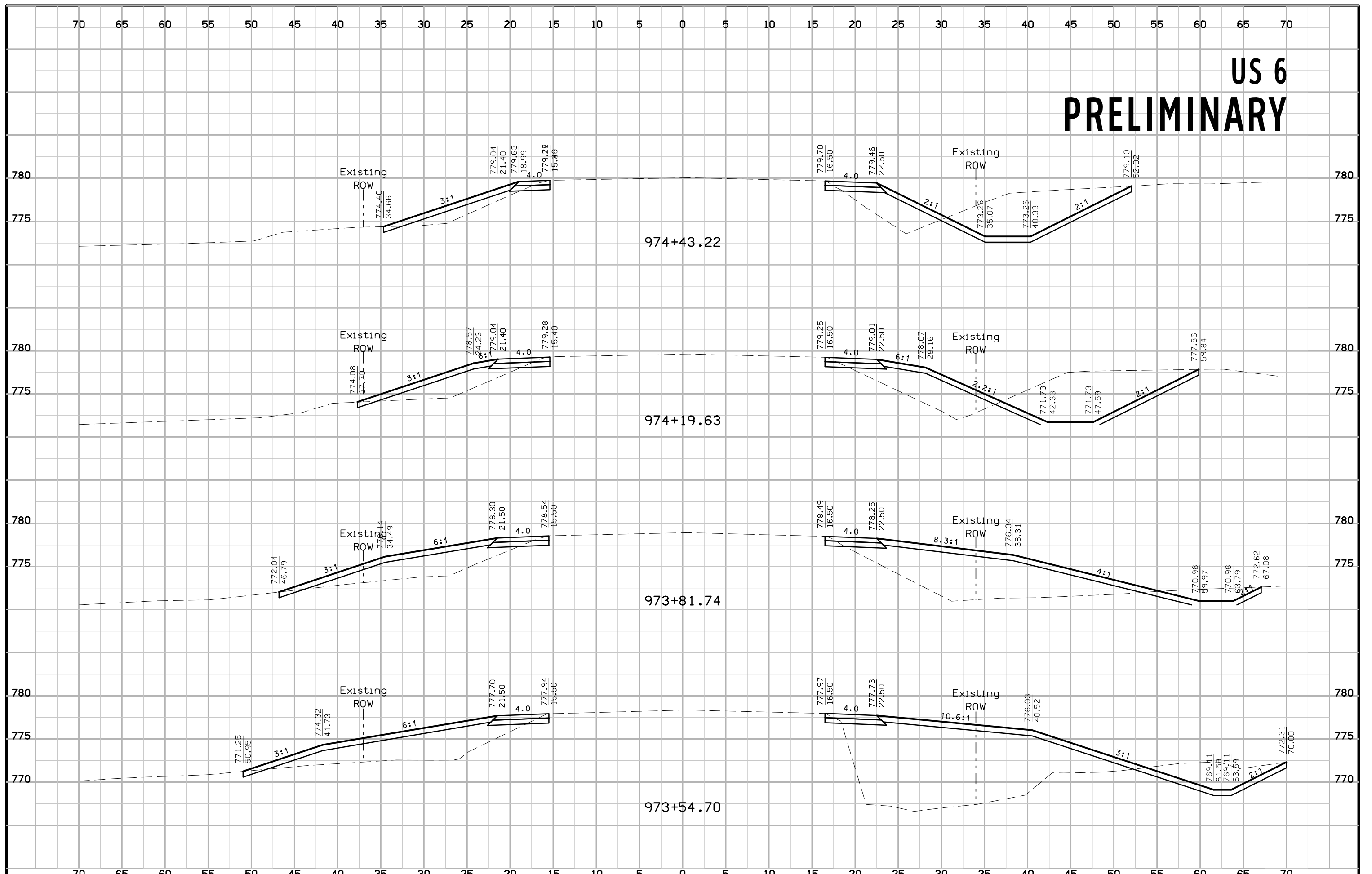
US 6 PRELIMINARY



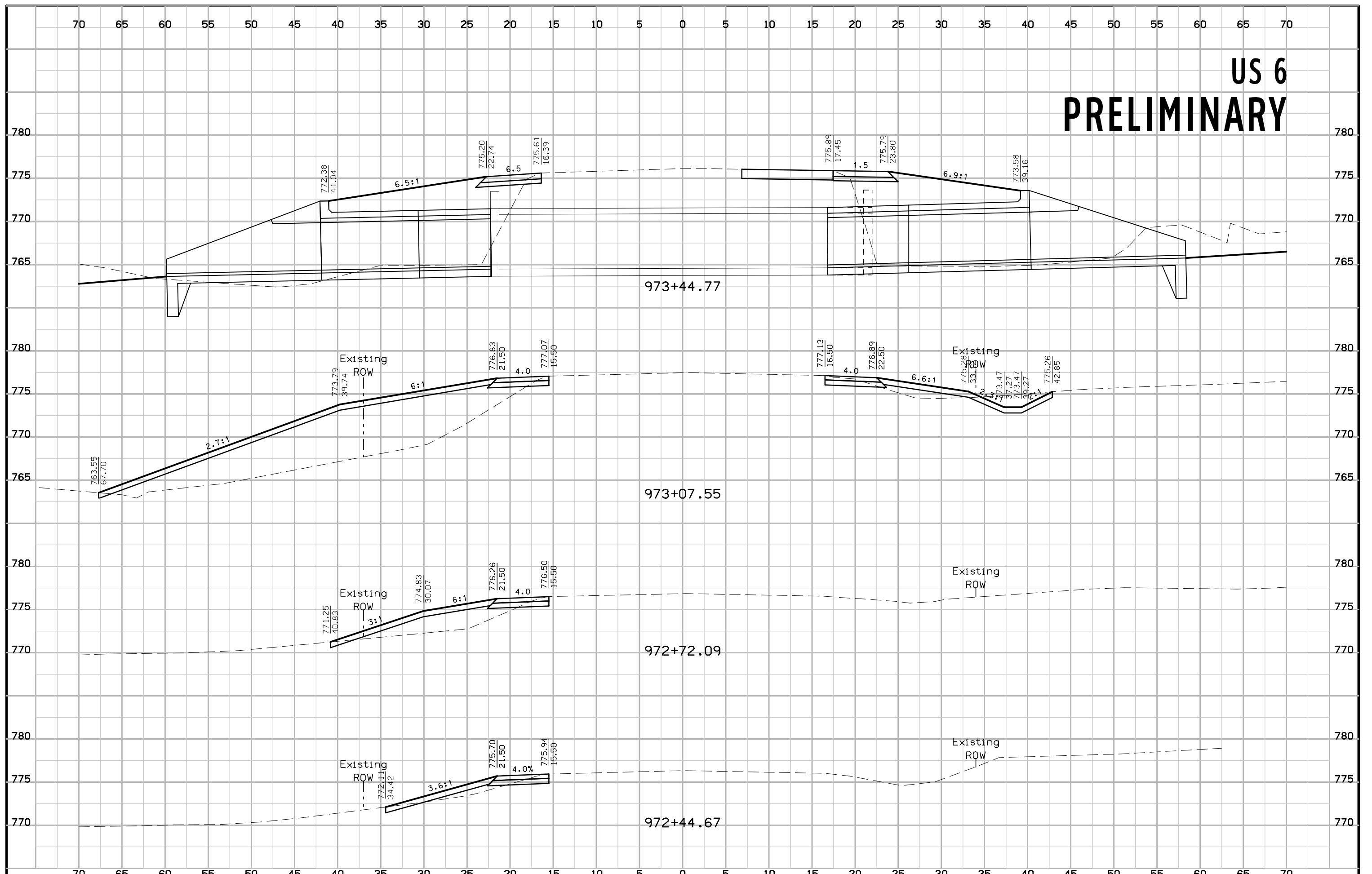
US 6 PRELIMINARY



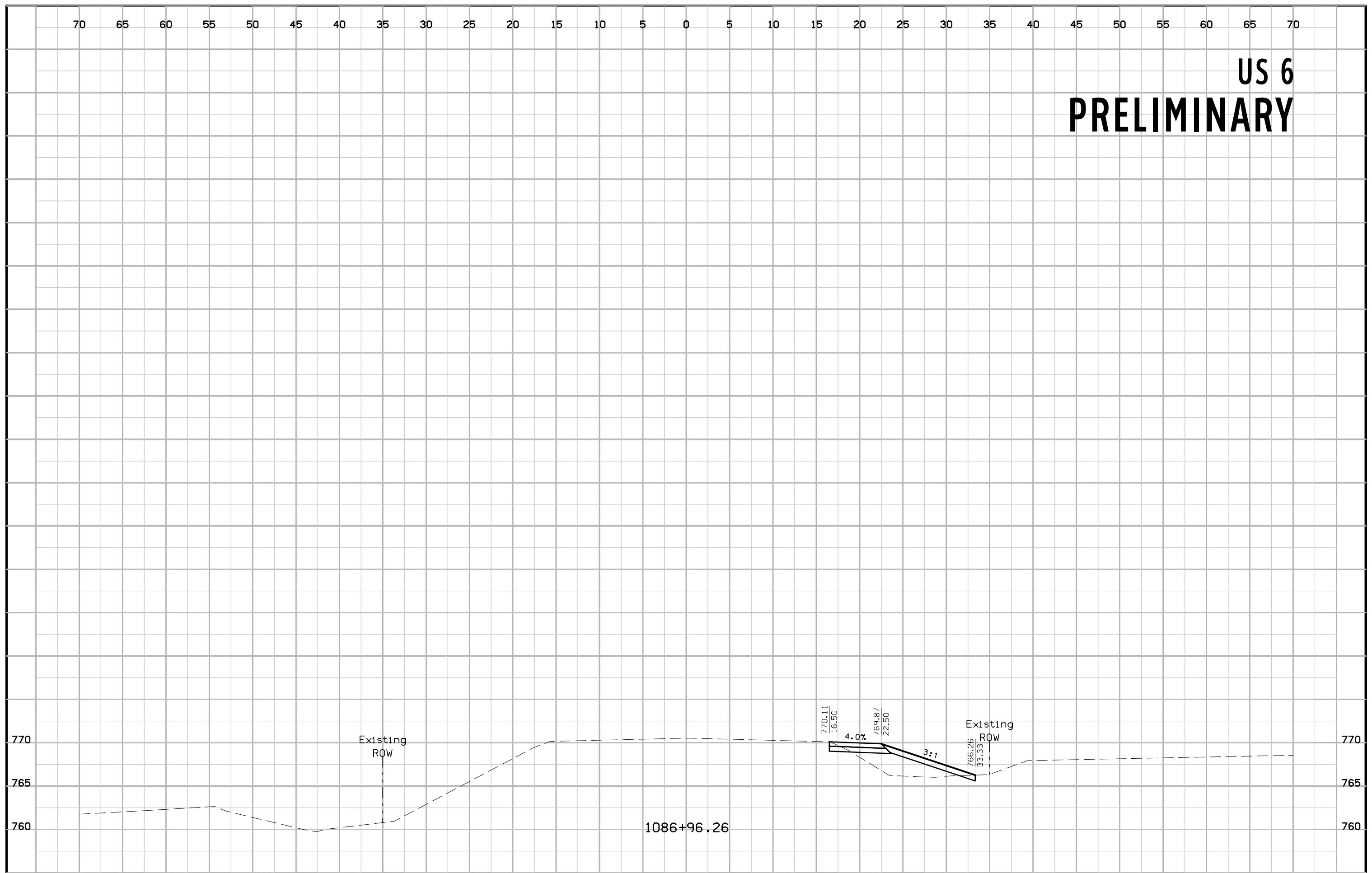
US 6 PRELIMINARY



US 6 PRELIMINARY



US 6 PRELIMINARY



US 6 PRELIMINARY

