

SECTION 404 PERMIT AND CONDITIONS

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

UTILITY CONTACTS

Hawkeye Telephone Company
Attn: Craig Schmitt
(563) 412-9765
craig.schmitt@hawkeyetelephone.com

Windstream Communications
Attn: Locate Desk
(800) 289-1901
locate.desk@windstream.com

IOWA
DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION
PLANS OF PROPOSED IMPROVEMENTS ON THE
SECONDARY ROAD SYSTEM
FAYETTE COUNTY
RCB CULVERT REPLACEMENT - TRIPLE BOX

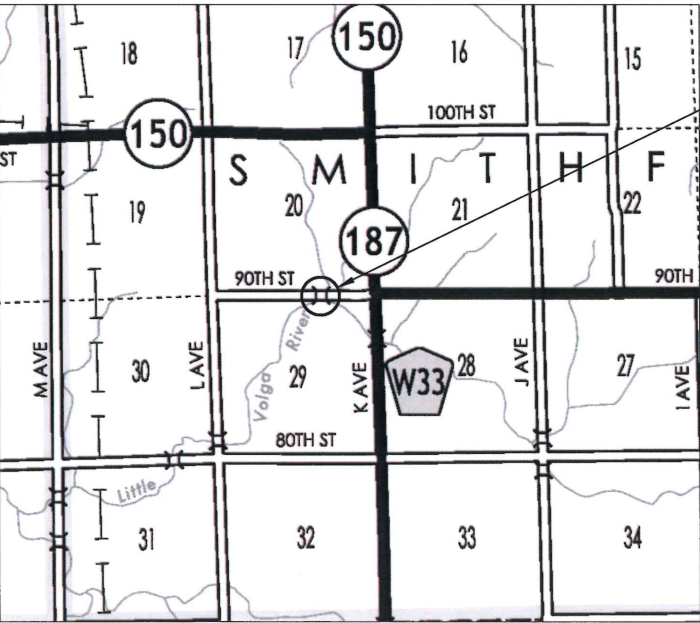
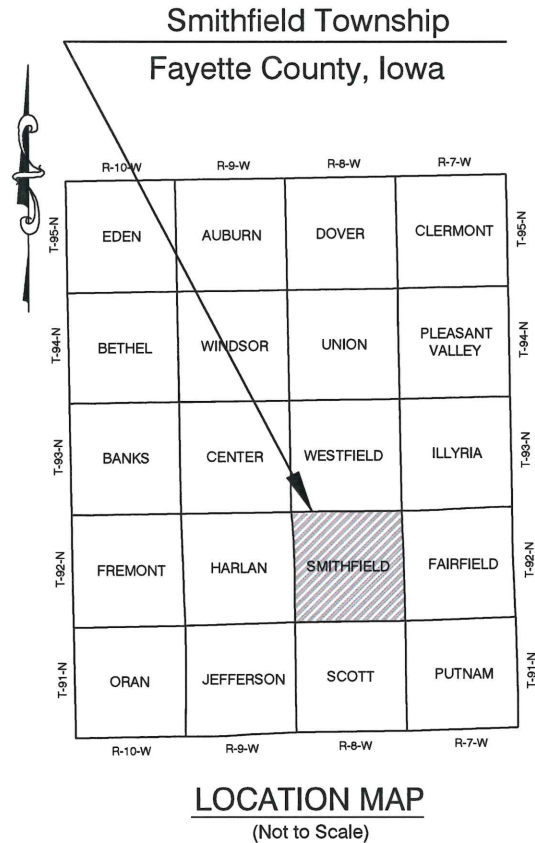
Refer to the Proposal Form for list of applicable Specifications.

See Sheet C.1 for applicable Standard Plans.
Scales: As Noted

HDP-CO33(174)--71-33

Triple 12'x7'x35' RCB Culvert
30° Skew, Lt. Ah.

On 90TH ST, Over SMALL STREAM
S29 T92N R08W



STA. 35+65.00
PROPOSED TRIPLE 12'x7'x35'
RCB Culvert 30° SKEW, Lt. Ah.
FHWA NO. 150341

Project Number: HDP-CO33(174)--71-33

INDEX OF SHEETS (10 Sheets)	
No.	Description
A.1	Title Sheet, Location Map and Mileage Summary
C.1	Estimated Project Quantities and Estimate Reference Notes
D.1	Plan and Profile
U.1-U.6	Flared Wing Headwall Details
V.1	Bridge Plan and Hydraulic Data

MILEAGE SUMMARY			
Div.	Location	Lin. Feet	Miles
1	Station 33+00.00 to 38+00.00	500.00	0.095
	TOTAL	500.00	0.095

Approved by the Fayette County Board of Supervisors

[Signature]
[Signature]
[Signature]

101-4		
DESIGN DATA RURAL		
2022 AADT	34	VPD
2042 AADT	35	VPD
Trucks		%



LUKE B. BOWDISH
24108
IOWA

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

[Signature] 8/4/2016
LUKE B. BOWDISH Lic. No. 24108 Date

My license renewal date is December 31, 2026

Pages or sheets covered by this seal:
ALL - SEE INDEX OF SHEETS

ESTIMATED QUANTITIES					
Twin 12'x7'35' RCB; 30° Skew					
Item No.	Item Code	Item	Unit	Total	As Built Qty
0010	2402-2720000	Excavation, Class 20	CY	1,115	
0020	2403-0100020	Structural Concrete (RCB Culvert)	CY	239.3	
0030	2404-7775005	Reinforcing Steel, Epoxy Coated	LB	30,567	
0040	2418-0000010	Temporary Stream Diversion	EACH	1	
0050	2528-2518000	Safety Closures	EACH	4	
0060	2528-8445110	Traffic Control	LS	1	
0070	2533-4980005	Mobilization	LS	1	

ESTIMATED REFERENCE INFORMATION		
Item No.	Item Code	Description
0010	2402-2720000	Excavation, Class 20
		Excess materials to be wasted on site. No payment for overhaul or fuel adjustments shall be made on this project.
0020	2403-0100020	Structural Concrete (RCB Culvert)
		All concrete shall consist of a Class "C" mix. The Contractor shall provide certified plant inspection.
0030	2404-7775005	Reinforcing Steel, Epoxy Coated
		Culvert barrel reinforcing quantities were estimated using the fill=1' formula.
0040	2418-0000010	Temporary Stream Diversion
0050	2528-2518000	Safety Closure
		See Sheet C.1 for tabulation.
0060	2528-8445110	Traffic Control
		All traffic control devices shall be in accordance with the current Manual on Uniform Traffic Control Devices (MUTCD) for Streets and Highways as adopted by the Iowa Department of Transportation per 761 of the Iowa Administrative Code (IAC), Chapter 130.
0070	2533-4980005	Mobilization

IOWA DEPT. OF TRANSPORTATION BRIDGE STANDARDS						
(May be obtained at the Iowa Department of Transportation Electronic Reference Library)						
Standard	Date Issued	Latest Revision		Standard	Date Issued	Latest Revision
TRRCB G1-20	July 2020					
TRRCB G2-20	July 2020					
TRRCB G3-20	July 2020					
TRRCB 12-7-20	July 2020					
TRFWH G1-21	February 2021					

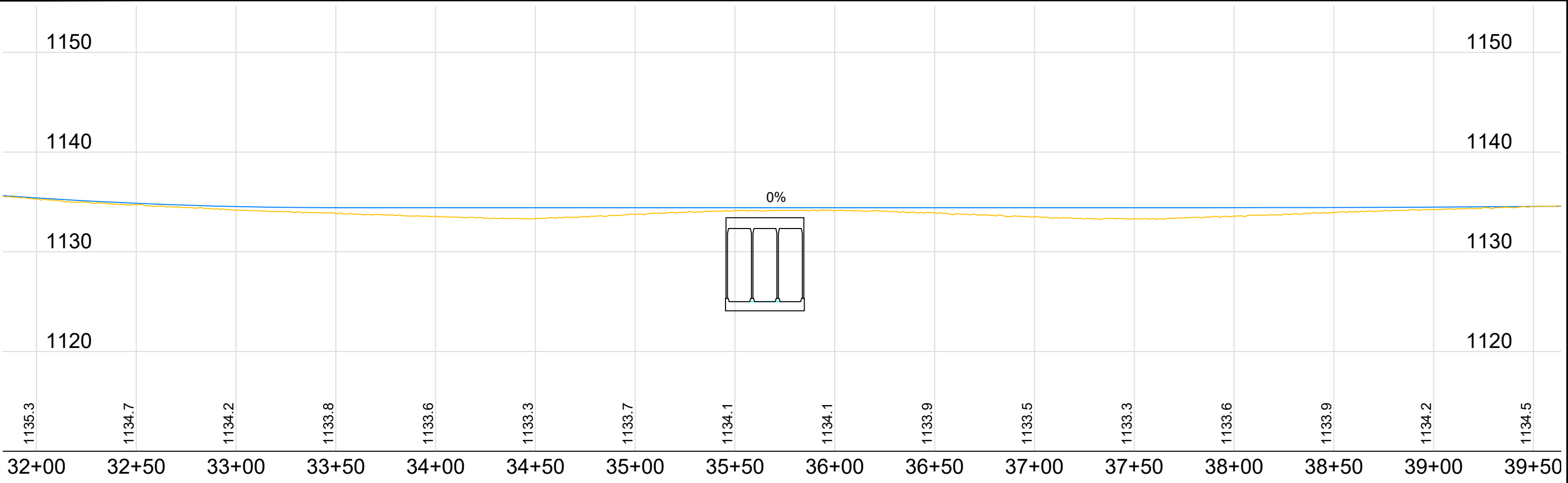
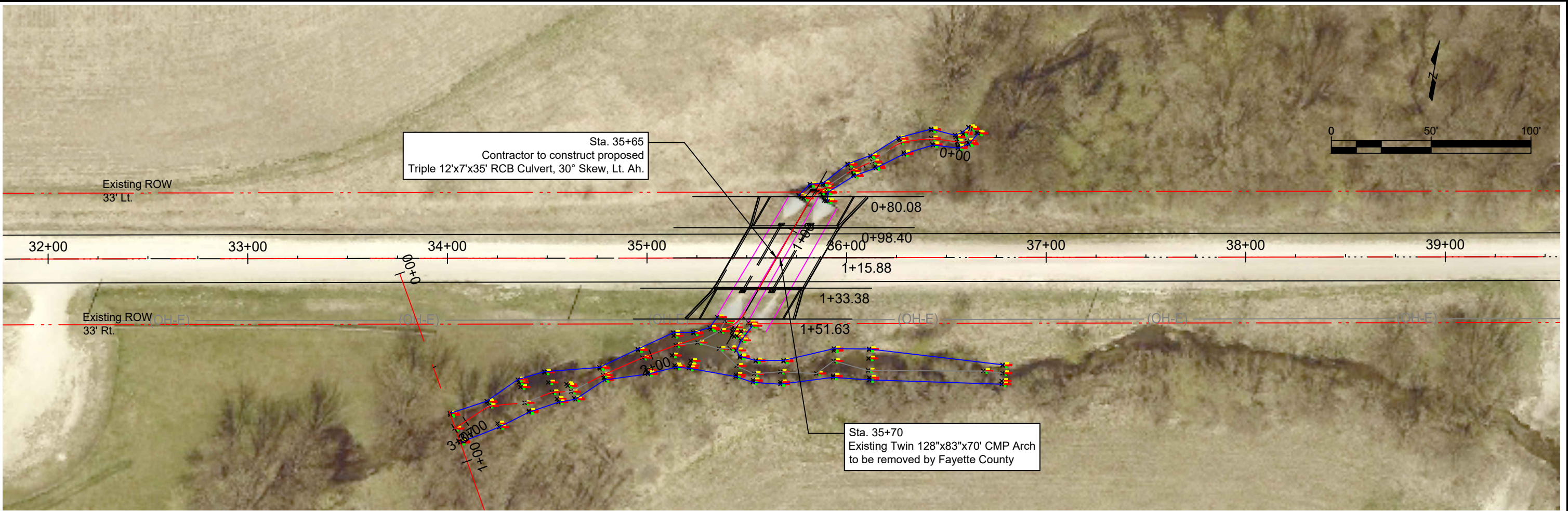
GENERAL NOTES

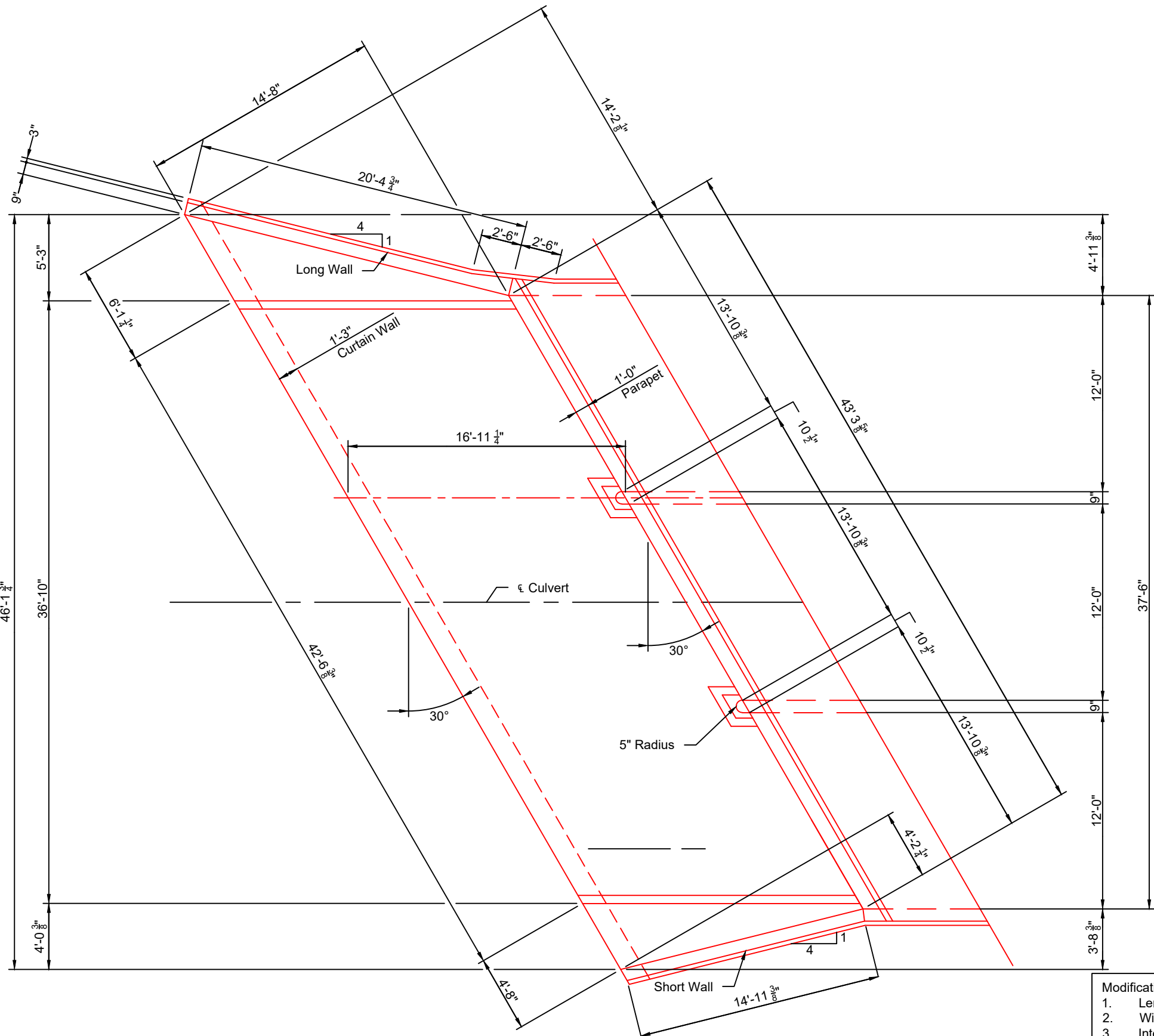
1. This culvert is designed for HL-93 live loading and shall be constructed in accordance with IDOT Culvert Standard Plans as listed on Sheet A.1.
2. It is the Contractor's responsibility to provide waste areas or disposal sites for material(s) which are not desirable for incorporation in the project. Contractor provided waste areas or disposal sites shall not impact wetlands or "Waters of the United States".
3. The Contractor shall use caution when working over and around tile lines. Breaks in a tile due to Contractor's carelessness will be replaced at the Contractor's expense. Any tile line disturbed or broken due to cuts will be replaced as directed by the Engineer and paid as extra work.
4. Contractor is to use due caution when working around ROW pins and survey control points which are marked with an oak hub and crossing lathe. Any pins disturbed by the Contractor will be replaced at the Contractor's expense.
5. Fayette County will perform removal of existing bridge, all earthwork except class 20, seeding and mulching, granular surfacing, erosion control, and construction staking for use by Contractor. If the Contractor wishes to start before the late start date, the Contractor is required to give sufficient notice to County (2 weeks minimum) in order to complete demolition and earthwork in advance of construction.
6. The Contractor shall confine all work to within the ROW as shown on the project plans. If the Contractor obtains permission from property owners for storage of equipment and/or materials on private property, copies of written agreements with the property owners will be provided to the Engineer for approval.

RCB Culvert Quantities					
Location	Concrete CY				Rein. Steel
	Slab	Walls	Floor	Total	
Triple 12'x7' Inlet; 30° Skew	4.0	6.4	42.8	53.2	7,179
35'-0 Barrel Section (Fill=1')	57.6	25.5	49.8	132.9	16,114
Triple 12'x7' Outlet; 30° Skew	4.0	6.4	42.8	53.2	7,179
5r1 Constr. Joint Bars (1 Joints)	-	-	-	-	95
Totals:				239.3	30,567

STANDARD ROAD PLANS		
The following Standard Road Plans apply to construction work on this project.		
Number	Date	Title
EW-402	4-18-17	Temporary Stream Diversion
TC-252	10-20-26	Routes Closed to Traffic

SAFETY CLOSURES			
Station	Closure Type		Remarks
	Road Qty.	Hazard Qty.	
1+00	1		West End
33+00		1	West End of Bridge
38+00		1	East End of Bridge
52+00	1		East End
TOTALS	2	2	Locations to be Field Verified





Plan View

Notes:

1. See Sheet TRFWH G1-21 for General Notes, Specifications, and Design Stresses.

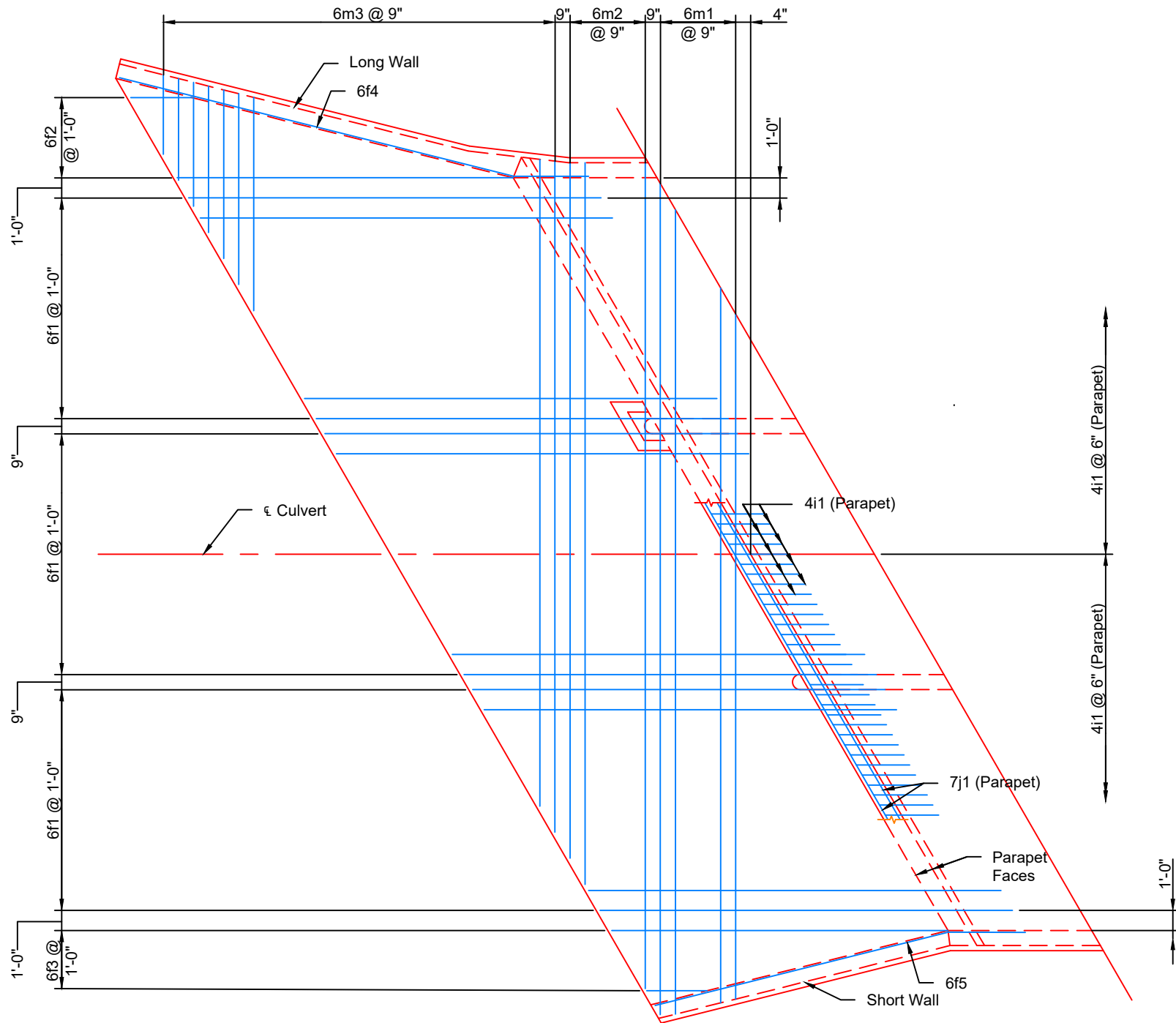
- Modifications:
1. Length of apron shortened.
 2. Wingwall slopes adjusted.
 3. Interior wingwall removed from apron and rounded at parapet.

Modified

Standard Design - Triple Reinforced Concrete Box Culverts
Flared Wing Headwalls

Dimension Plan
30° Skew

TRFWH
30-1-21

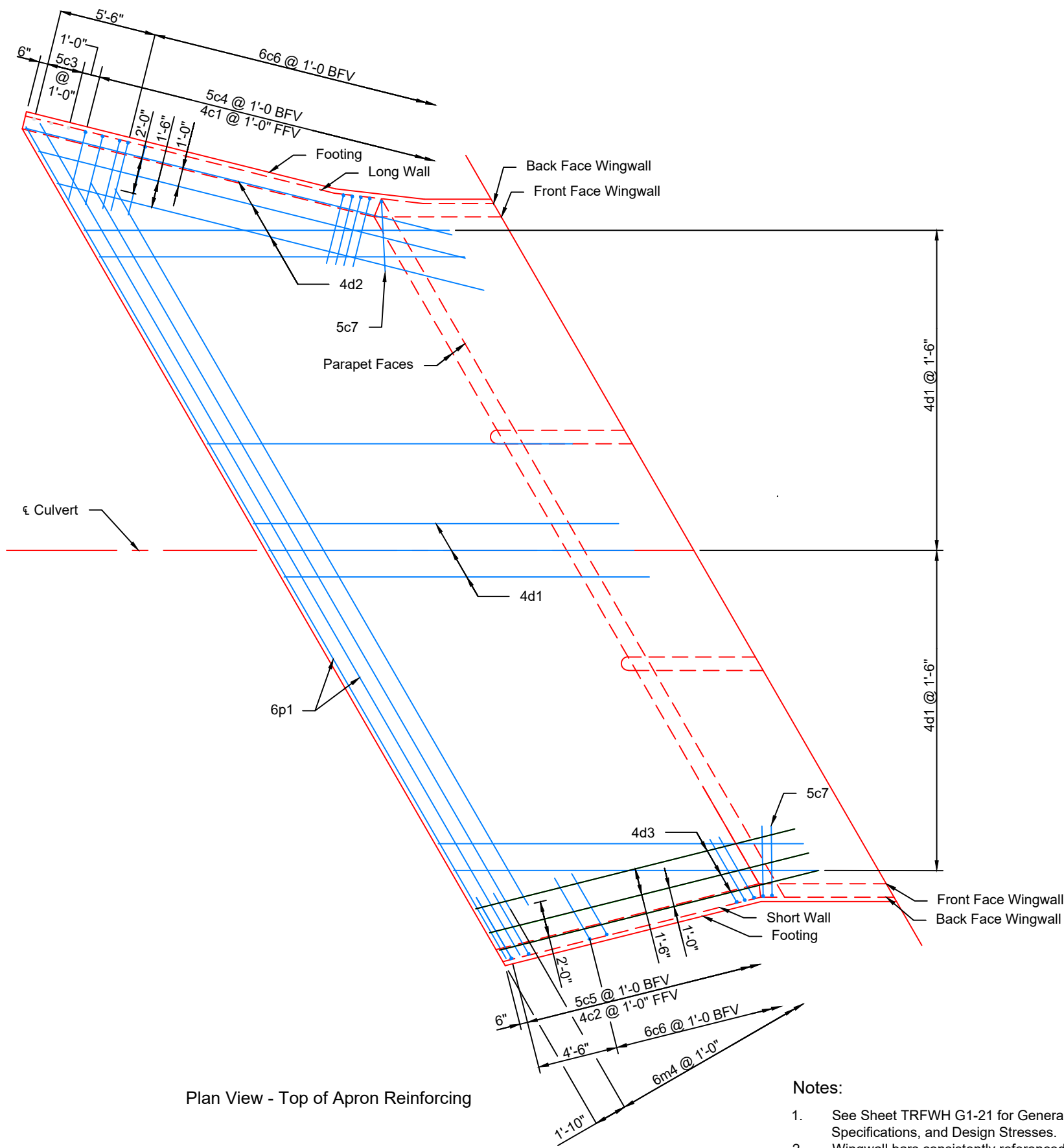


Plan View - Top of Apron Reinforcing

- Notes:
- 1. See Sheet TRFWH G1-21 for General Notes, Specifications, and Design Stresses.
 - 2. Wingwall bars consistently referenced from end of wing.
 - 3. For reinforcing in curtain wall see Curtain Wall Details on Sheet U.5.

- Modifications:
- 1. Length of apron shortened.
 - 2. Wingwall slopes adjusted.
 - 3. Interior wingwall removed from apron and rounded at parapet.

Modified	
Standard Design - Triple Reinforced Concrete Box Culverts Flared Wing Headwalls	
Top Apron Detail 30° Skew	TRFWH 30-3-21



Plan View - Top of Apron Reinforcing

Notes:

1. See Sheet TRFWH G1-21 for General Notes, Specifications, and Design Stresses.
2. Wingwall bars consistently referenced from end of wing.
3. For reinforcing in curtain wall see Curtain Wall Details on Sheet U.5.

Modifications:

1. Length of apron shortened.
2. Wingwall slopes adjusted.
3. Interior wingwall removed from apron and rounded at parapet.

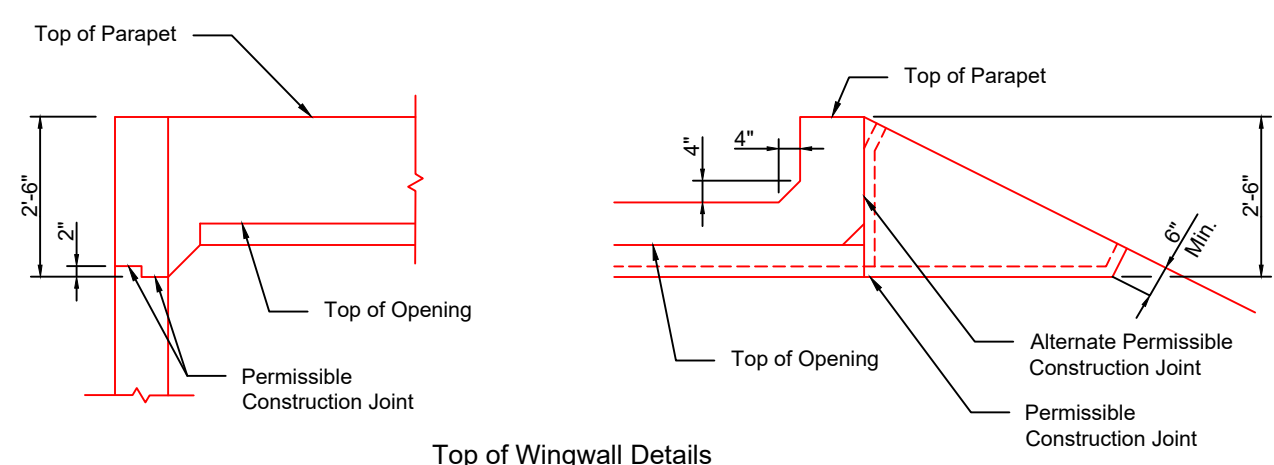
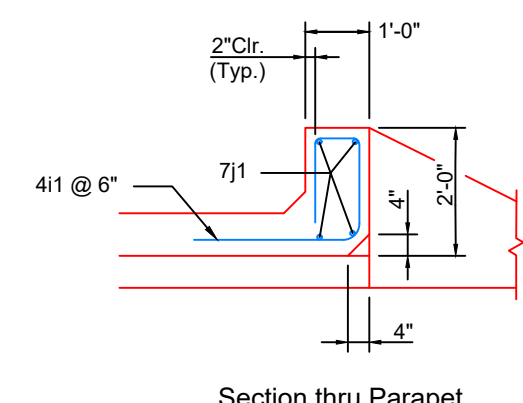
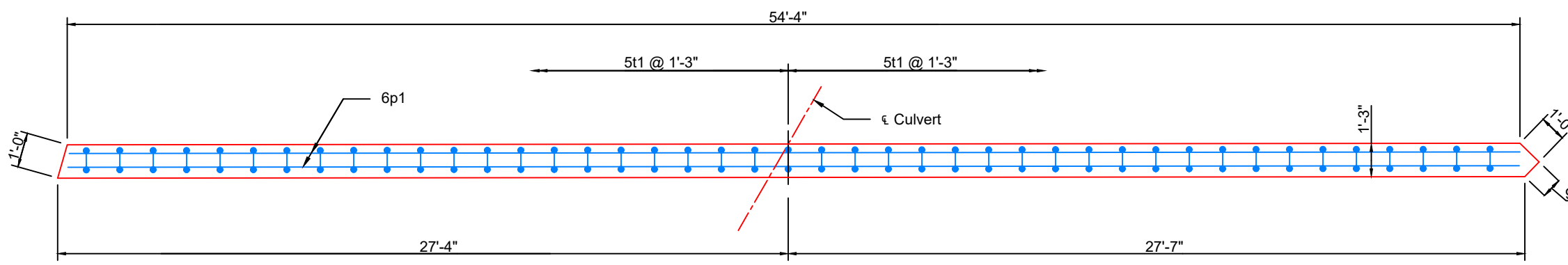
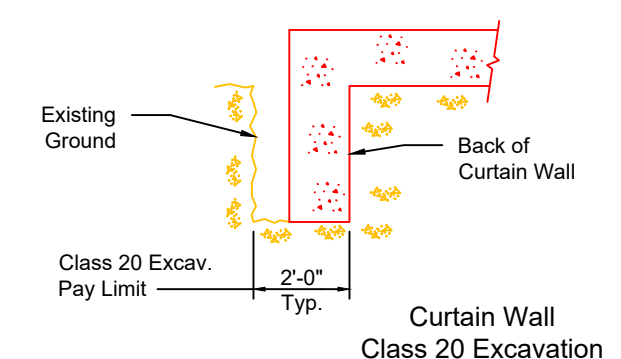
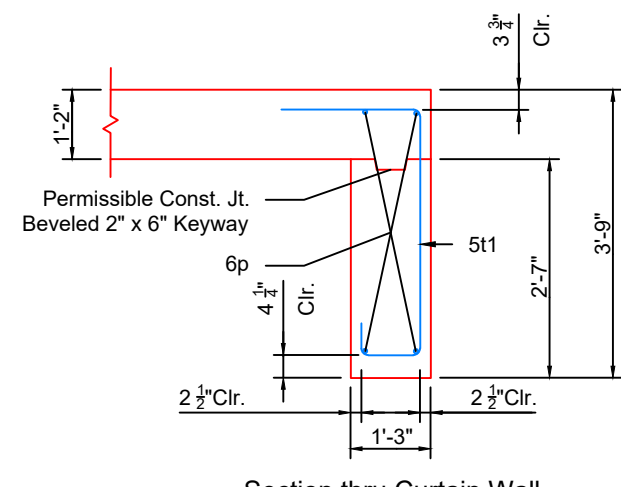
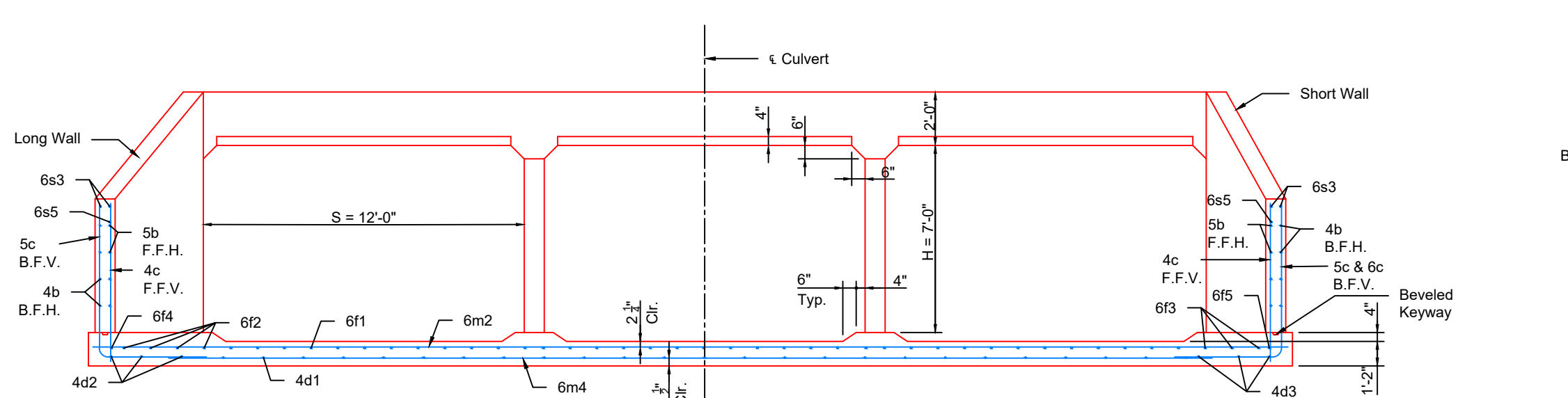
Modified

Standard Design - Triple Reinforced Concrete Box Culverts

Flared Wing Headwalls

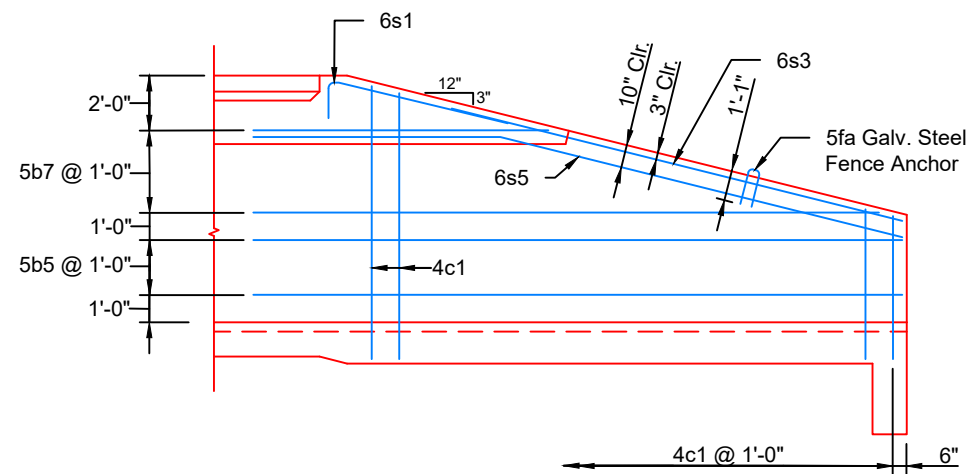
Bottom Apron Detail
30° Skew

TRFWH
30-4-21

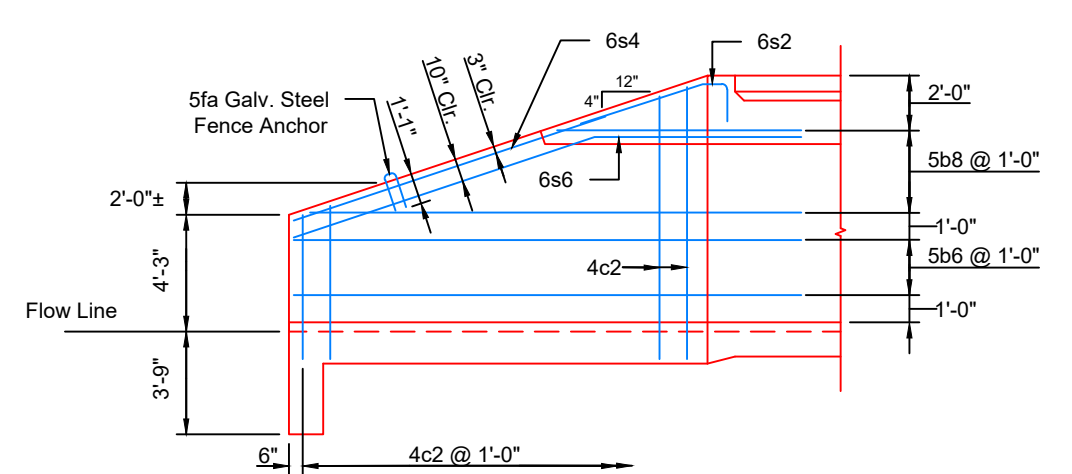


- Notes:
- See Sheet TRFWH G1-21 for General Notes, Specifications, and Design Stresses.
 - Wingwall bars consistently referenced from end of wing.

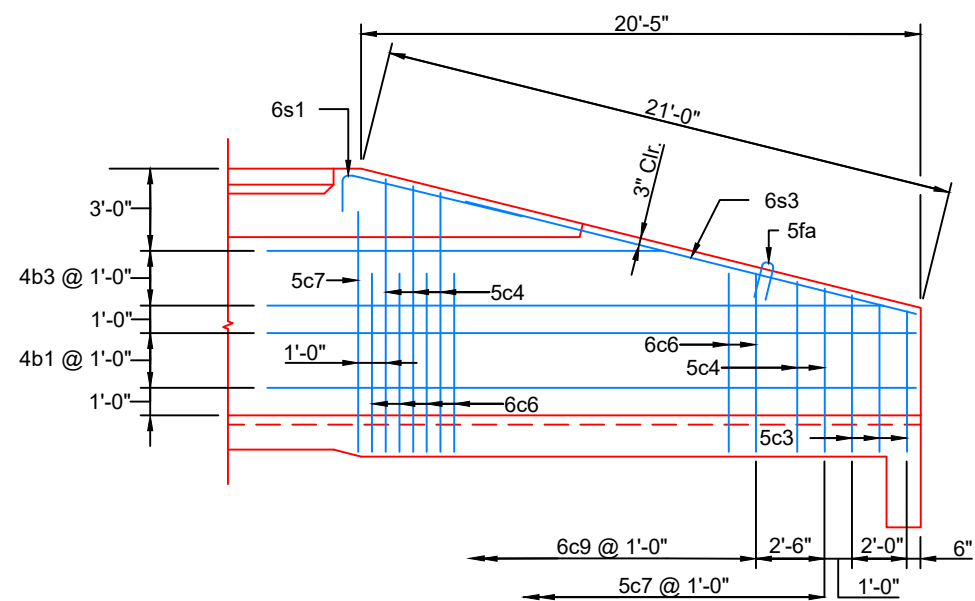
Modifications: 1. Length of apron shortened. 2. Wingwall slopes adjusted. 3. Interior wingwall removed from apron and rounded at parapet.	Modified	
	Standard Design - Triple Reinforced Concrete Box Culvert Flared Wing Headwalls	
	Parapet & Curtain Wall Details 30° Skew	TRFWH 30-5-21



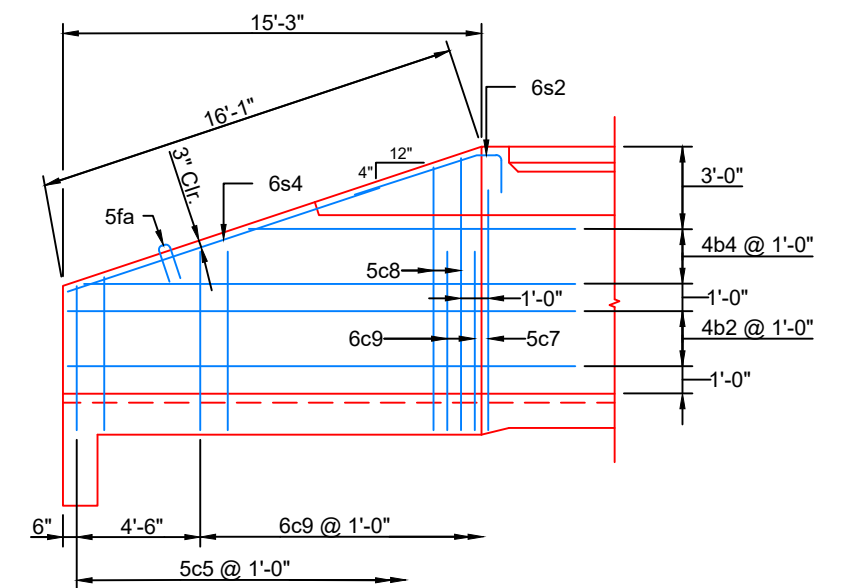
Typical View - Front Face Long Wingwall Reinforcing



Typical View - Front Face Short Wingwall Reinforcing



Typical View - Back Face Long Wingwall Reinforcing



Typical View - Back Face Short Wingwall Reinforcing

- Modifications:
1. Length of apron shortened.
 2. Wingwall slopes adjusted.
 3. Interior wingwall removed from apron and rounded at parapet.
- Notes:
1. Top of wall slope may be rounded in some instances.

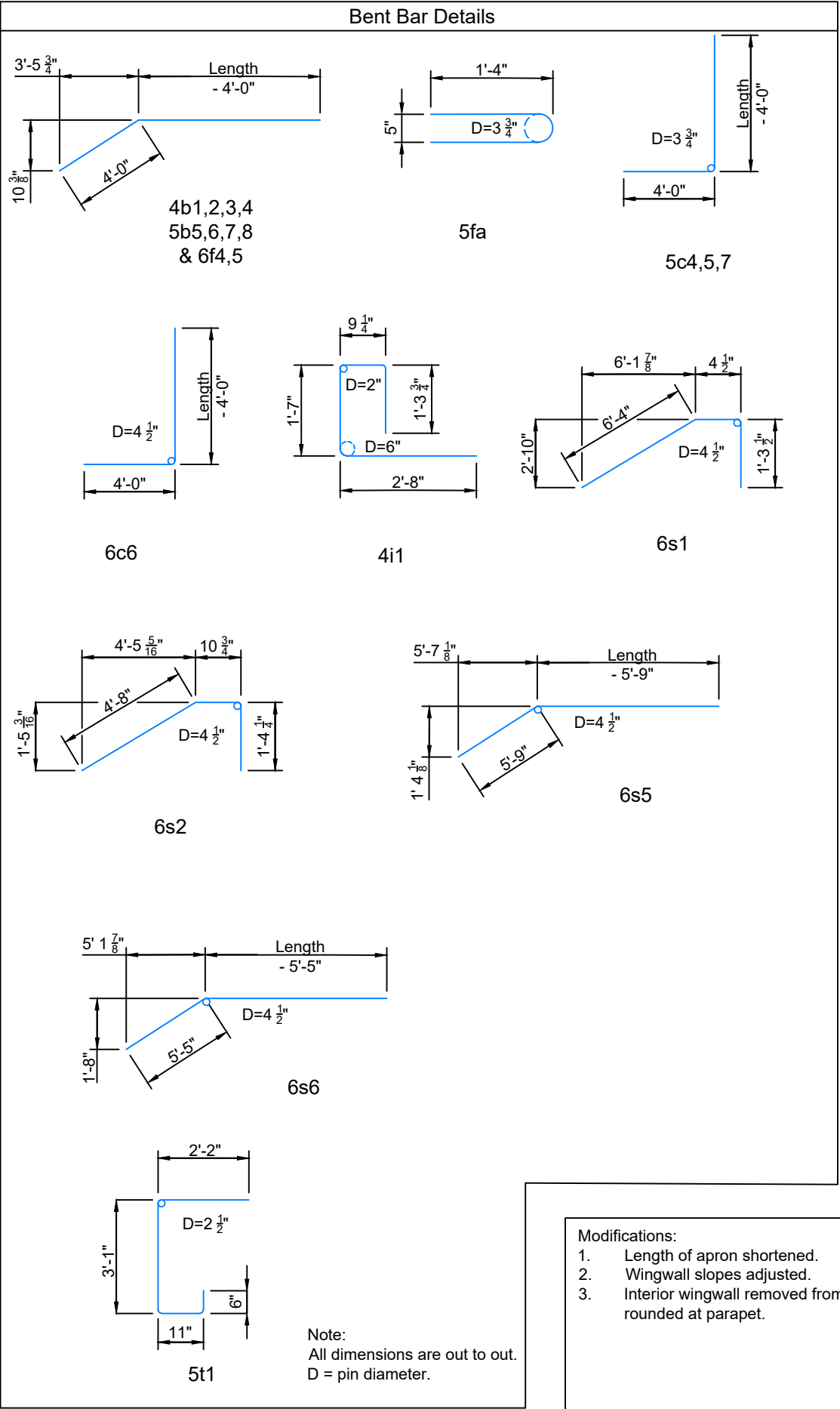
Modified

Standard Design - Triple Reinforced Concrete Box Culverts
Flared Wing Headwalls

Dimension Plan
30° Skew

TRFWH
30-6-21

Bill of Reinforcing for One Headwall 12'x7'					
Bar	Location	Shape	12' x 7'		
			No.	Length	Weight
5fa	Fence Anchor (Galv.)		2	2'-10	6
4b1	Wingwall, BFH Long		3	23'-8	47
4b2	Wingwall, BFH Short		3	18'-6	37
4b3	Wingwall, BFH Long		3 Var.	14'-5 to 22'-6	37
4b4	Wingwall, BFH Short		3 Var.	11'-11 to 17'-11	47
5b5	Wingwall, FFH Long		3	23'-8	74
5b6	Wingwall, FFH Short		3	18'-6	58
5b7	Wingwall, FFH Long		4 Var.	10'-9 to 22'-10	70
5b8	Wingwall, FFH Short		4 Var.	8'-11 to 17'-11	56
4c1	Wingwall, FFV Long		20 var.	5'-3 to 10'-0	102
4c2	Wingwall, FFV Short		15 Var.	5'-3 to 9'-11	76
5c3	Wingwall, BFV Long		3 Var.	5'-1 to 5'-8	17
5c4	Wingwall, BFV Long		17 Var.	9'-11 to 13'-11	212
5c5	Wingwall, BFV Short		15 Var.	9'-3 to 13'-11	181
6c6	Wingwall, BFV Long		15	10'-6	237
6c6	Wingwall, BFV Short		11	10'-6	174
5c7	Wingwall, BFV Long		1	12'-9	13
5c7	Wingwall, BFV Short		1	12'-9	13
4d1	Apron, Longit., Bott.		25	20'-4	340
4d2	Apron, Longit., Bott. Long		3	24'-9	50
4d3	Apron, Longit., Bott. Short		3	18'-6	37
6f1	Apron, Longit., Top		37	20'-4	1130
6f2	Apron, Longit., Top Long		5 Var.	3'-1 to 16'-9	74
6f3	Apron, Longit., Top Short		4 Var.	3'-0 to 16'-9	59
6f4	Apron, Longit., Top Long		1	24'-0	36
6f5	Apron, Longit., Top Short		1	18'-11	28
4i1	Parapet, Vertical		75	6'-4	317
7j1	Parapet, Horizontal		4	44'-7	383
6m1	Apron, Trans., Top		6 Var.	41'-8 to 42'-7	380
6m2	Apron, Trans., Top		6 Var.	34'-8 to 41'-2	342
6m3	Apron, Trans., Top		29 Var.	4'-0 to 33'-5	749
6m4	Apron, Trans., Bott.		14 Var.	38'-3 to 47'-2	938
6p1	Curtain, Horizontal		4	54'-4	326
6s1	Wing Slope, Both F., Long		2	8'-0	24
6s2	Wing Slope, Both F., Short		2	6'-11	21
6s3	Wing Slope, Both F., Long		2	16'-11	51
6s4	Wing Slope, Both F., Short		2	12	36
6s5	Wing Slope, FF Long		1	24'-1	36
6s6	Wing Slope, FF Short		1	19'-1	29
5t1	Curtain, Vertical		43	7'-6	336
Estimated Quantities One Headwall		Reinf. Steel	7179		
		Concrete	Parapet	4.0	53.2 CY
			Wingwalls	6.4	
			Apron	42.8	



- * Includes top of wingwall quantities.
- Note: Weight of bars over 40'-0" long include an allowance of 2'-5" for lap. Lengths shown for bars over 40'-0" long do not include lap.
- "Short" Denotes Short Wingwall
"Long" Denotes Long Wingwall
- Headwall Notes:
1. See Sheet TRFWH G1-21 for General Notes, Specifications, and Design Stresses.
 2. The sides of the apron are to be formed to ensure correct line and grade.
 4. All apron 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.
 5. 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.
 6. Concrete quantities are estimated from back of parapet.
 7. Horizontal tails of bars "b" & "s" estimated to extend 2'-5" beyond back of parapet (into end of barrel). Longitudinal bars "d", "6f1", "6f4" and "6f5" estimated to project into end section of barrel a minimum of 2'-5" beyond back of parapet. The "length" column reflects total number of feet necessary to meet these requirements.
 8. Dimensions are in feet and inches unless otherwise noted.

- Modifications:
1. Length of apron shortened.
 2. Wingwall slopes adjusted.
 3. Interior wingwall removed from apron and rounded at parapet.

Modified	
Standard Design - Triple Reinforced Concrete Box Culverts Flared Wing Headwalls	
Quantity Tabulation 12'-0" Span 30° Skew	TRFWH 30-7-21



DESIGN FILL HEIGHT = 1 FOOT