

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

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 - TWIN BOX

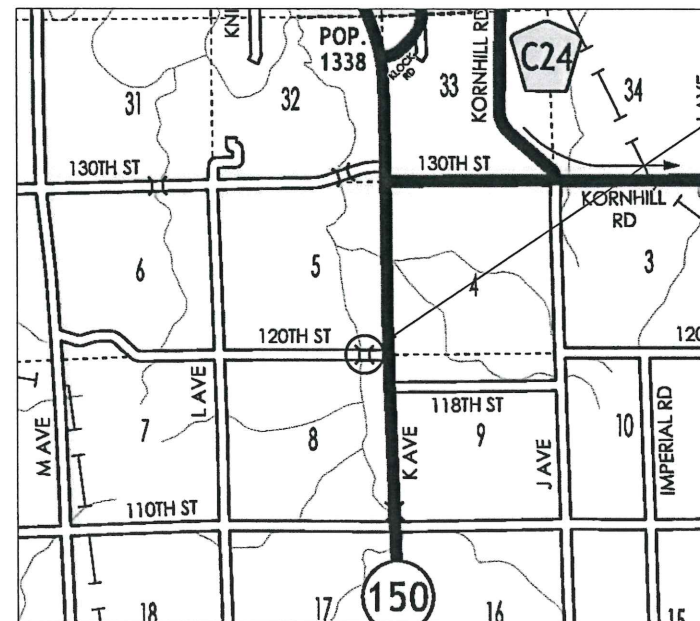
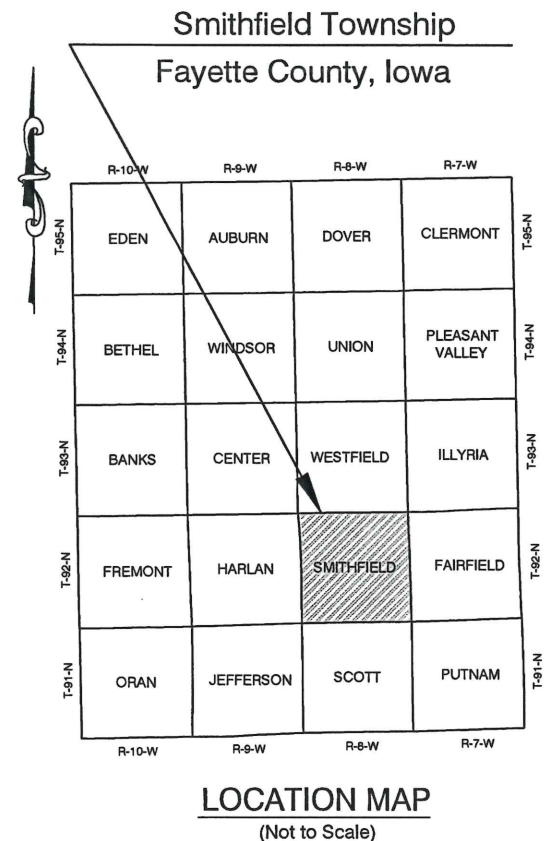
Refer to the Proposal Form for list of applicable Specifications.

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

HDP-C033(171)--71-33

Twin 12'x10'x35' RCB Culvert
0° Skew

On 120TH ST, Over ALEXANDER CR
S8 T92N R08W



STA. 45+15.00
PROPOSED TWIN 12'x10'x35' RCB CULVERT
0° SKEW
FHWA NO. 150221



Project Number: HDP-C033(171)--71-33

INDEX OF SHEETS (8 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.4	Flared Wing Headwall Details
V.1	Situation Sheet and Hydraulic Data

MILEAGE SUMMARY			
Div.	Location	Lin. Feet	Miles
1	Station 43+00.00 to 47+00.00	400.00	0.076
	TOTAL	400.00	0.076

Approved by the Fayette County Board of Supervisors

[Signature]
[Signature]
[Signature]

101-4		
DESIGN DATA RURAL		
2022 AADT	33	VPD
2042 AADT	35	VPD
Trucks		%

LUKE B. BOWDISH
Lic. No. 24108

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] 8/4/2026
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'x10'x35' RCB					
Item No.	Item Code	Item	Unit	Total	As Built Qty
0010	2402-2720000	Excavation, Class 20	CY	890	
0020	2403-0100020	Structural Concrete (RCB Culvert)	CY	170.4	
0030	2404-7775005	Reinforcing Steel, Epoxy Coated	LB	27,747	
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=2' 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
TWRCB G1-20	July 2020					
TWRCB G2-20	July 2020					
TWRCB G3-20	July 2020					
TWRCB 12-10-20	July 2020					
TWFWH G1-21	February 2021					

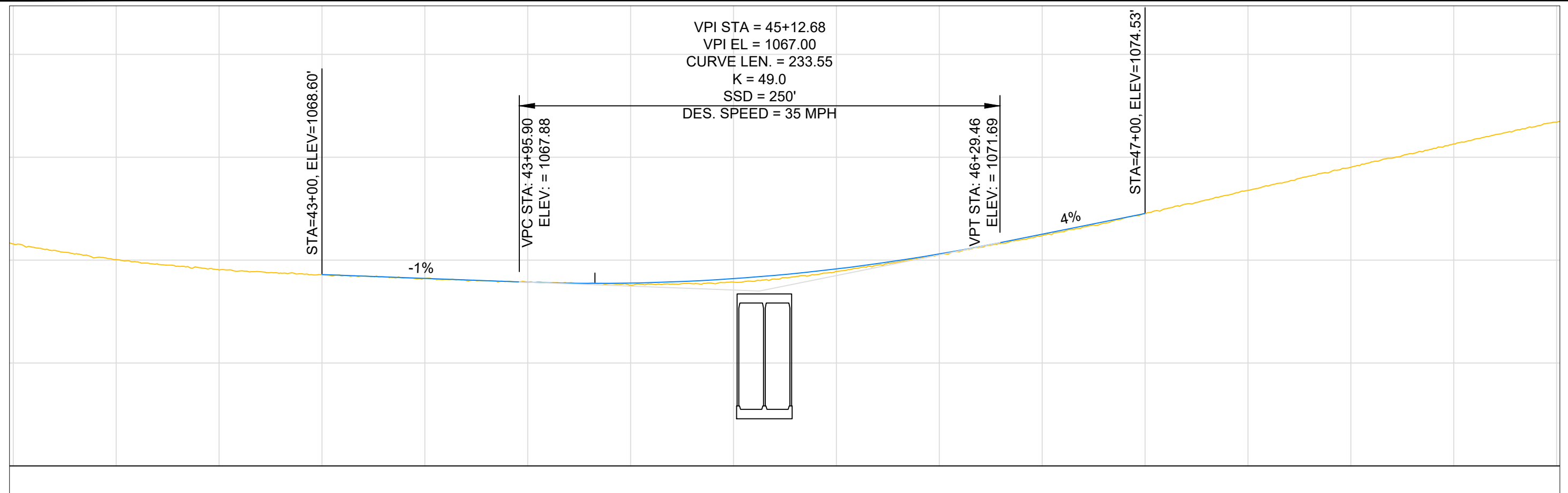
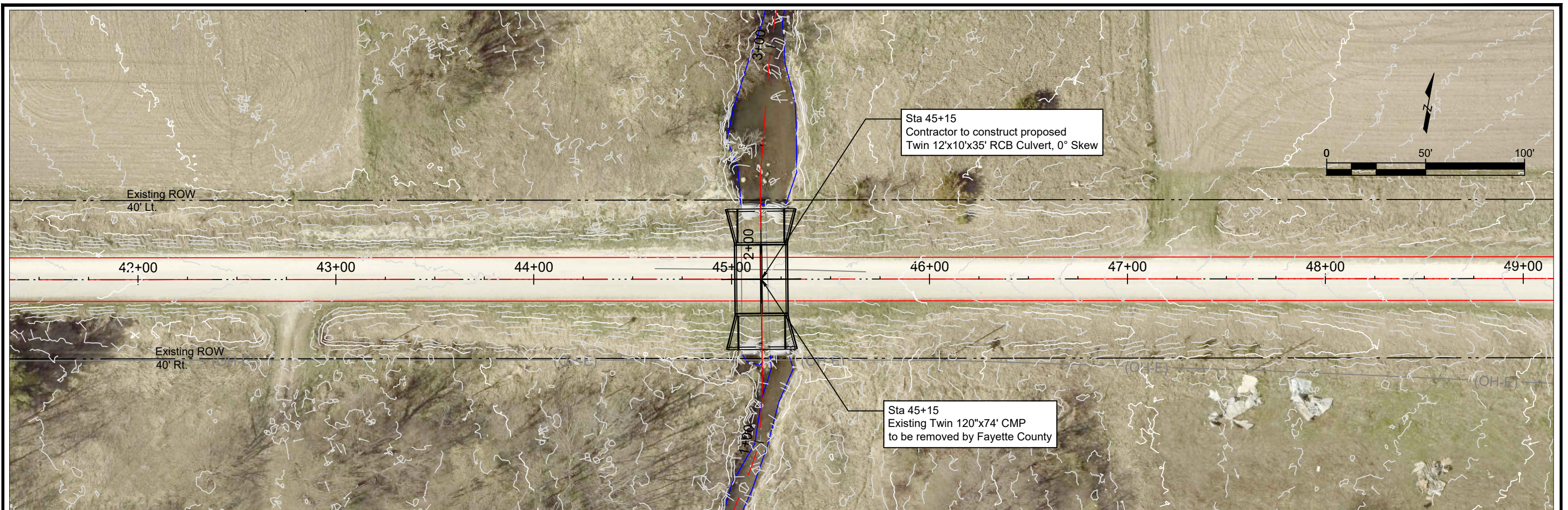
GENERAL NOTES

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	
Tw in 12'x10' Inlet; 0° Skew	2.0	8.3	27.6	37.9	5,769
35'-0 Barrel Section (Fill=2')	30.8	31.0	32.8	94.6	16,114
Tw in 12'x10' Outlet; 0° Skew	2.0	8.3	27.6	37.9	5,769
5r1 Constr. Joint Bars (1 Joints)	-	-	-	-	95
Totals:				170.4	27,747

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
43+00		1	West End of Bridge
47+00		1	East End of Bridge
52+00	1		East End
TOTALS	2	2	Locations to be Field Verified



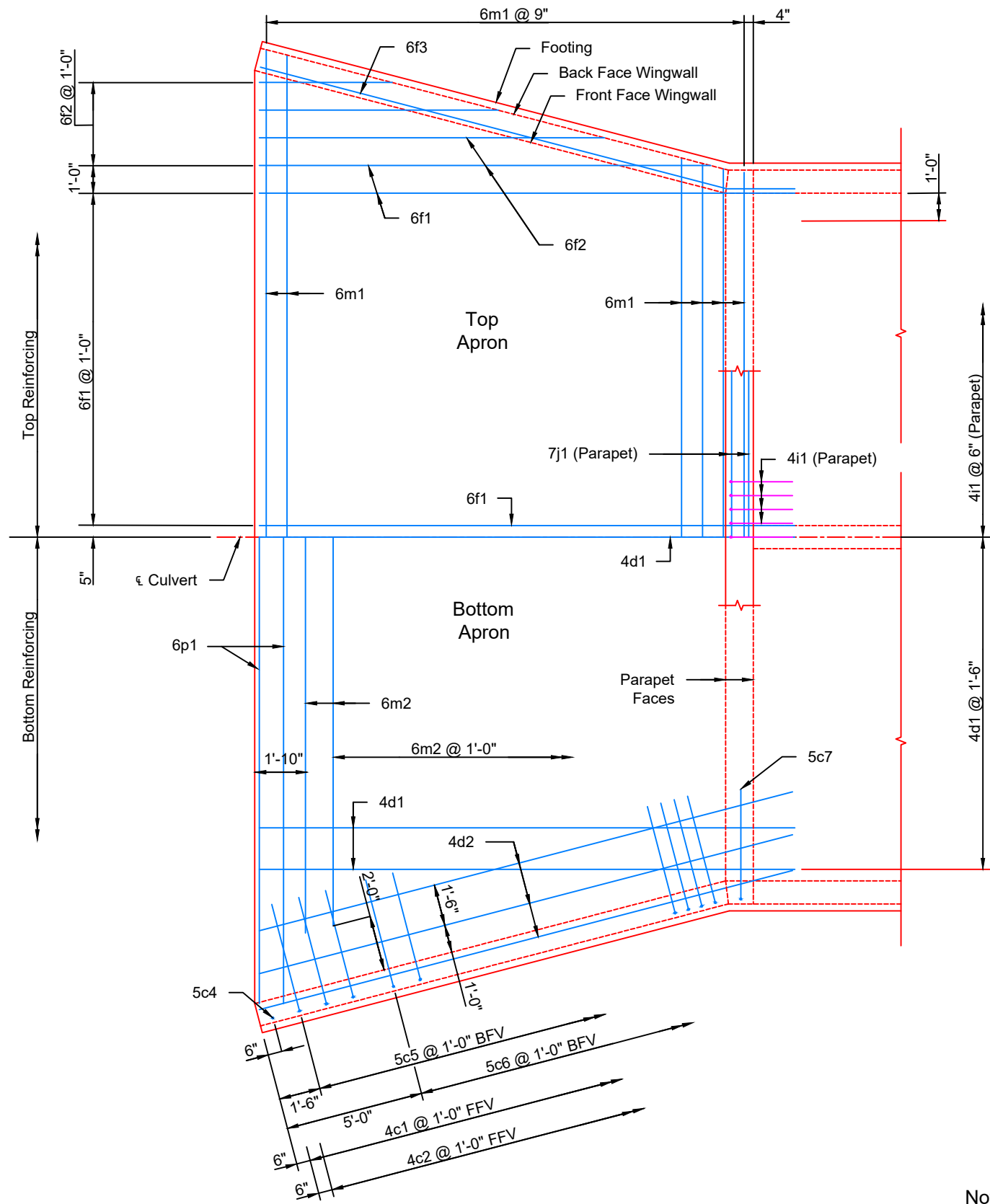


1. See Sheet TFWWH G1-21 for General Notes, Specifications, and Design Stresses.

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

Standard Design - Twin Reinforced Concrete Box Culverts Flared Wing Headwalls

TWFWH
0-1-21



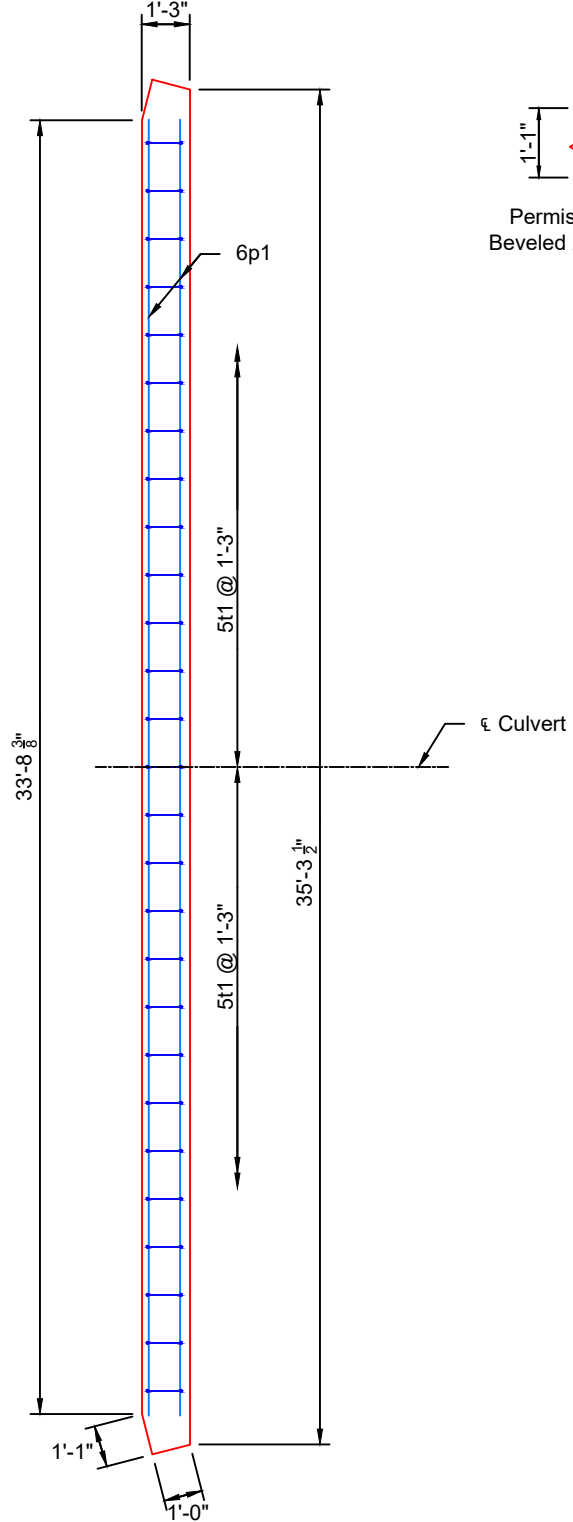
Plan View - Top & Bottom of Apron Reinforcing

Notes:

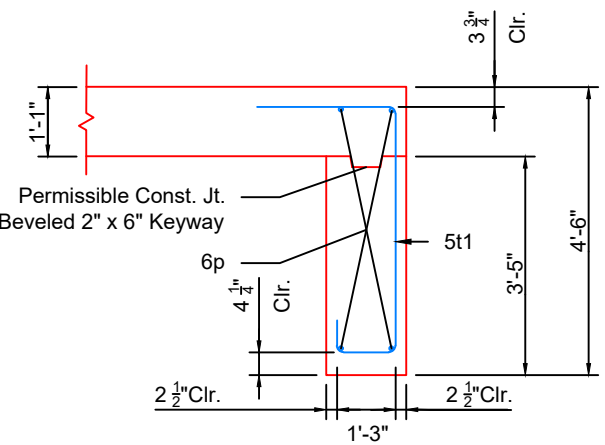
- See Sheet TWFWH G1-21 for General Notes, Specifications, and Design Stresses.
- Wingwall bars consistently referenced from end of wing.

Modifications:

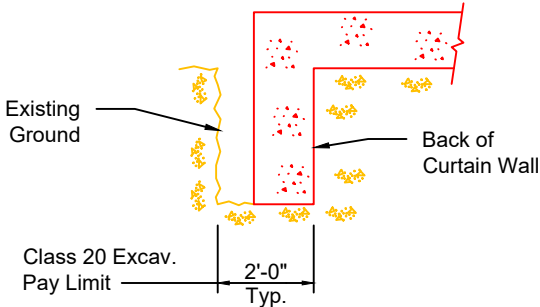
- Length of apron shortened.
- Wingwall slopes adjusted to 2:1.
- Interior wingwall removed from apron and rounded at parapet.



Curtain Wall Plan



Curtain Wall Details



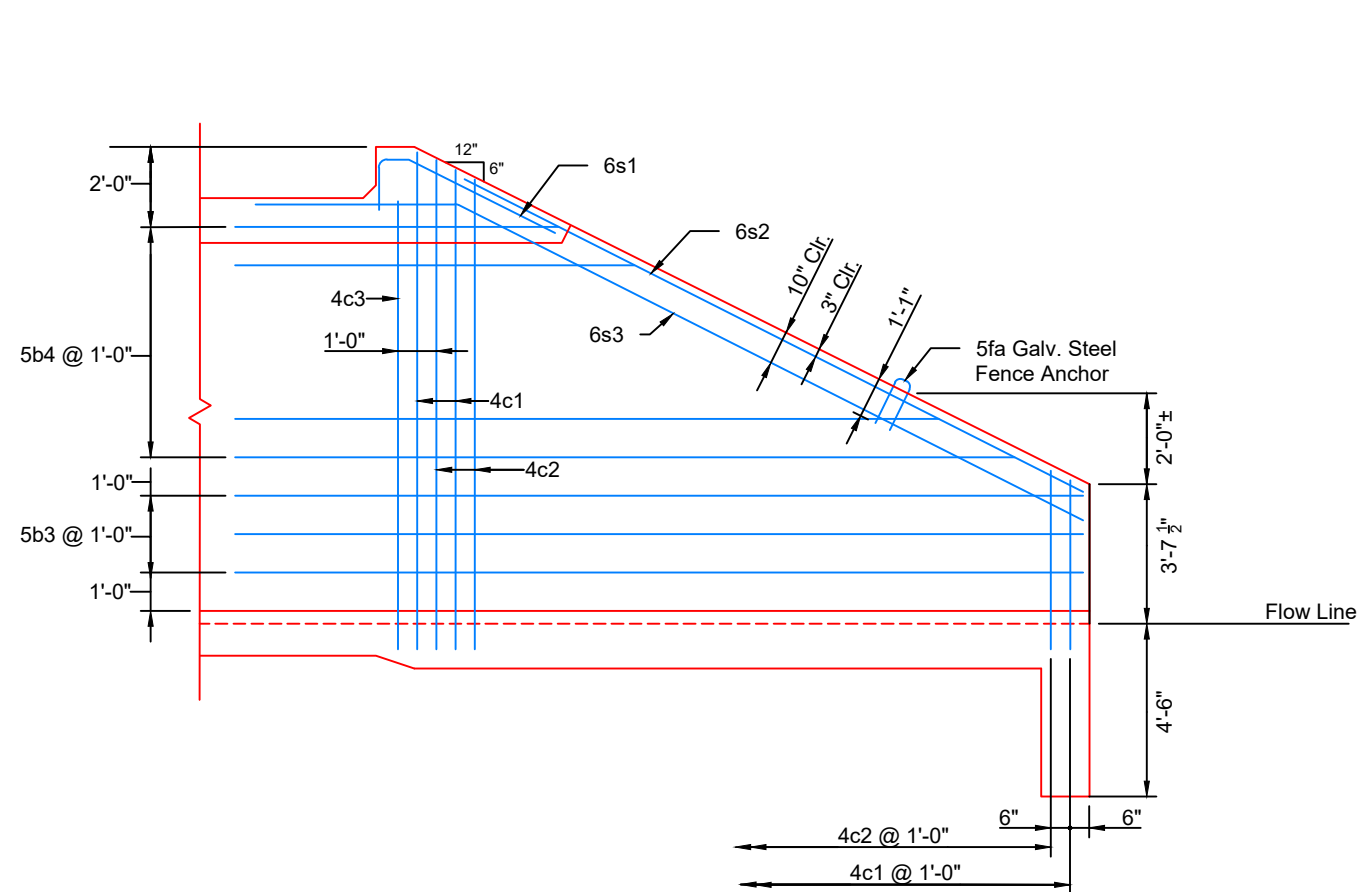
Curtain Wall
Class 20 Excavation

Modified

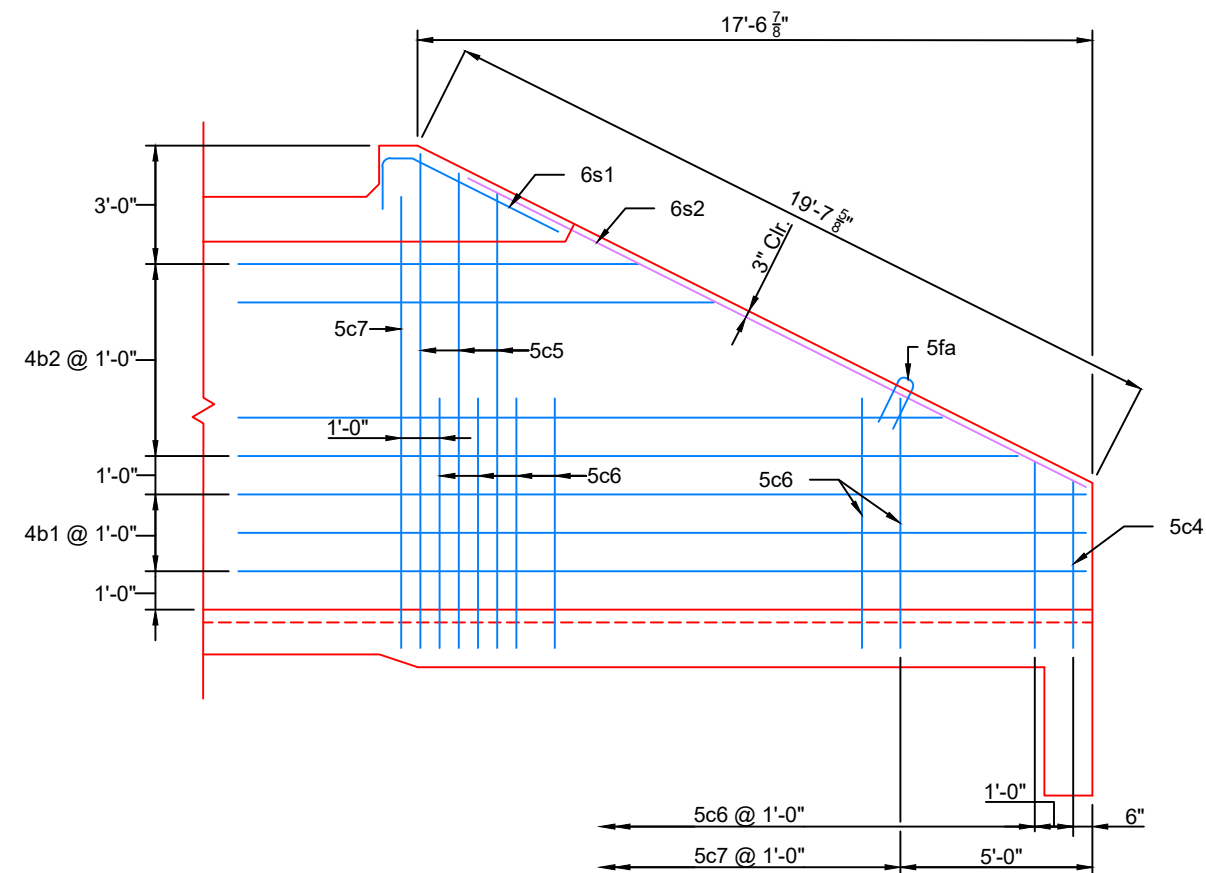
Standard Design - Twin Reinforced Concrete Box Culverts
Flared Wing Headwalls

Apron & Curtain
Wall Details
0° Skew

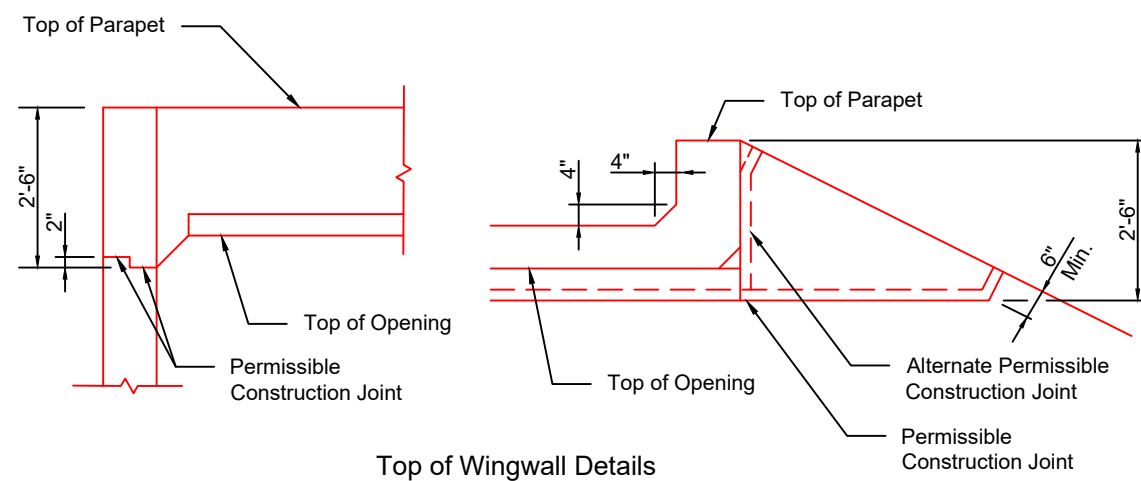
TWFWH
0-2-21



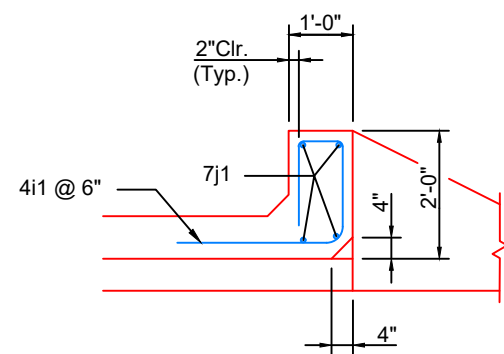
Typical View - Front Face Wingwall Reinforcing



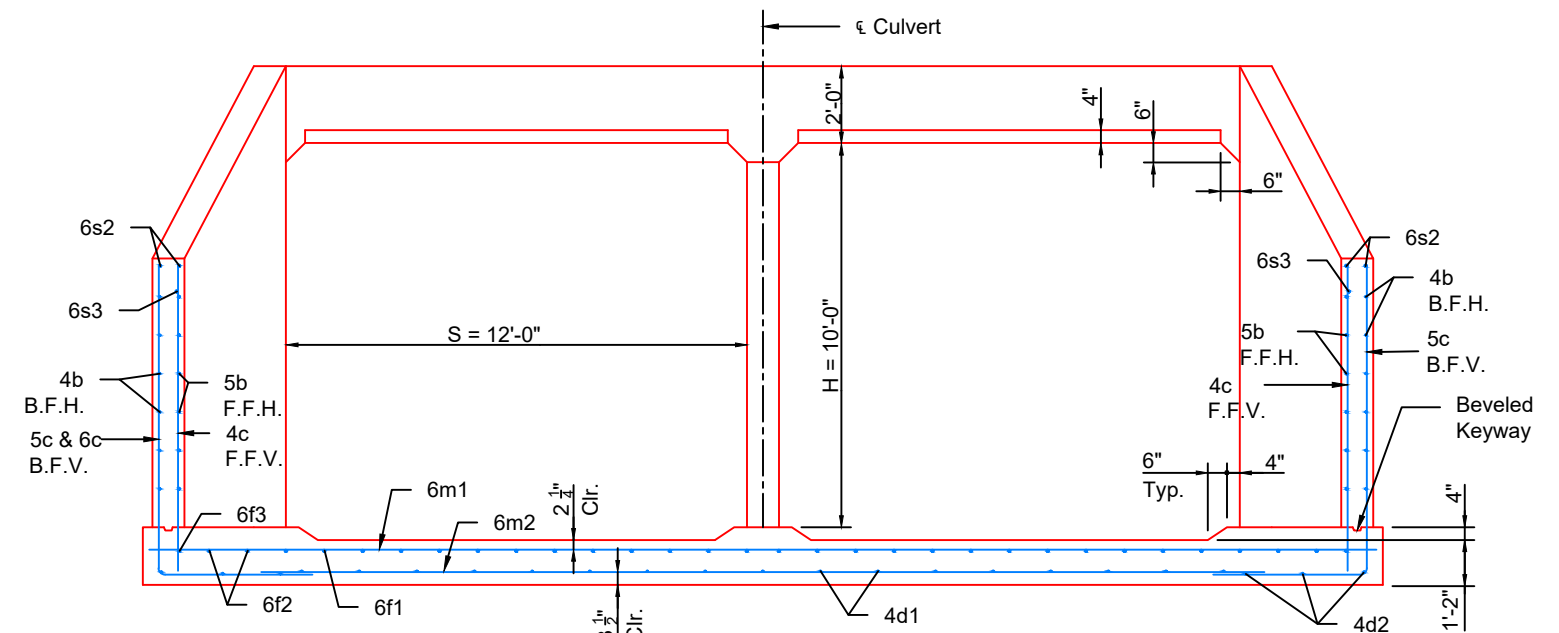
Typical View - Back Face Long Wingwall Reinforcing



Top of Wingwall Details



Section thru Parapet



Typical Section - Near Center of Apron

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.

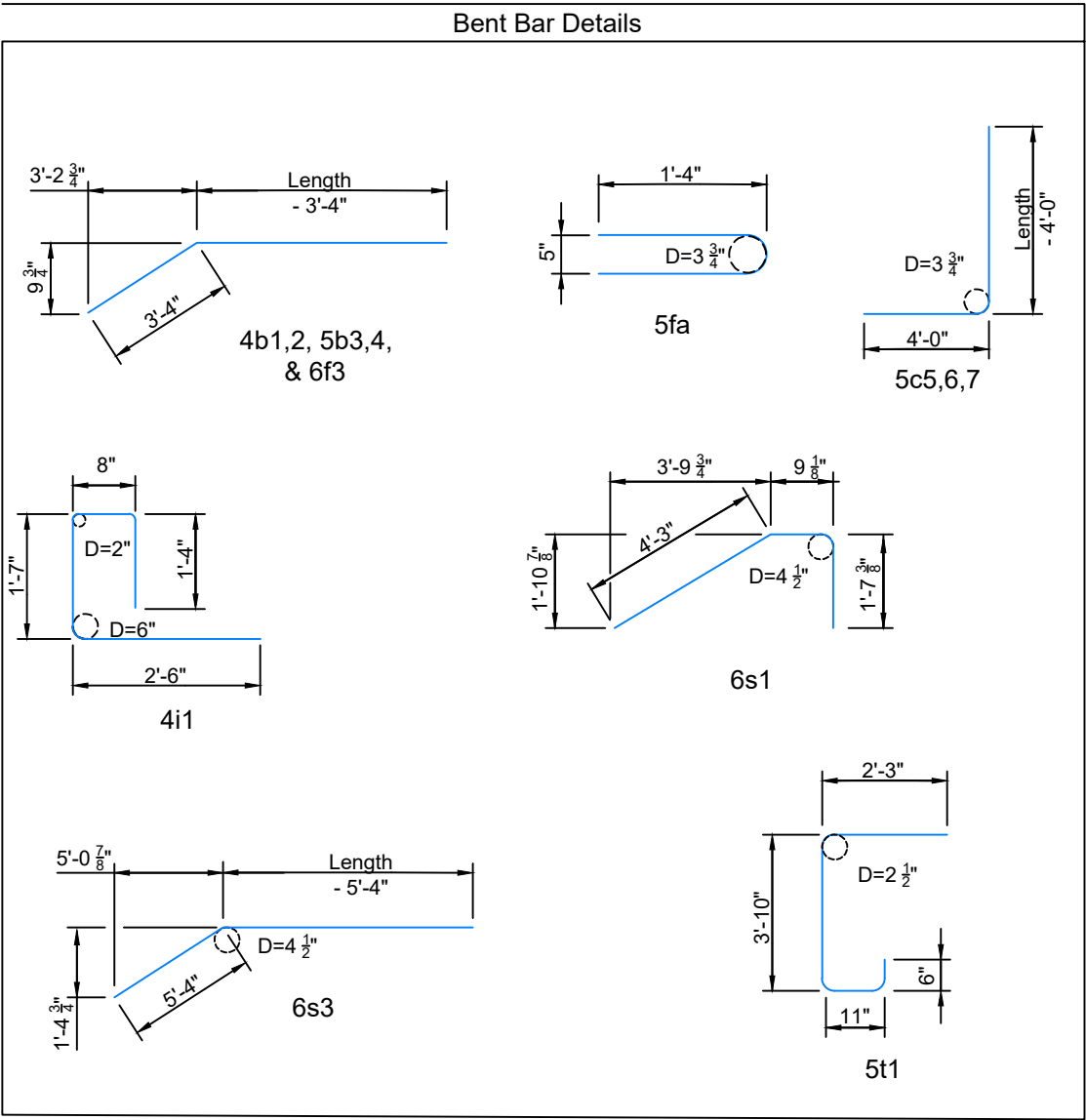
Modified

Standard Design - Twin Reinforced Concrete Box Culverts
Flared Wing Headwalls

Wingwall &
Parapet Details
0° Skew

TRFWH
0-3-21

Bill of Reinforcing for One Headwall 12'x10'					
Bar	Location	Shape	12' x 10'		
			No.	Length	Weight
5fa	Fence Anchor (Galv.)		2	2'-10	6
4b1	Wingwall, BFH		6	22'-1	89
4b2	Wingwall, BFH		12 Var.	2 Each 10'-5 to 20'-4	124
5b3	Wingwall, FFH		6	22'-1	138
5b4	Wingwall, FFH		14 Var.	2 Each 8'-5 to 20'-3	210
4c1	Wingwall, FFV		36 Var.	2 Each 4'-5 to 12'-11	208
4c2	Wingwall, FFV		34 Var.	2 Each 4'-8 to 12'-9	198
4c3	Wingwall, FFV		2	11'-8	16
5c4	Wingwall, BFV		2	4'-4	9
5c5	Wingwall, BFV		34 Var.	2 Each 8'-10 to 16'-10	456
5c6	Wingwall, BFV		26	10'-6	285
5c7	Wingwall, BFV		2	15'-9	33
4d1	Apron, Longit., Bott.		17	19'-4	220
4d2	Apron, Longit., Bott.		6	19'-11	80
6f1	Apron, Longit., Top		26	19'-4	755
6f2	Apron, Longit., Top		8 Var.	2 Each 4'-10 to 16'-4	126
6f3	Apron, Longit., Top		2	19'-10	60
4i1	Parapet, Vertical		49	6'-1	199
7j1	Parapet, Horizontal		4	26'-2	214
6m1	Apron, Trans., Top		24 Var.	26'-4 to 35'-2	1107
6m2	Apron, Trans., Bott.		17 Var.	20'-4 to 28'-7	624
6p1	Curtain, Horizontal		4	33'-9	203
6s1	Wing Slope, Both F.		2	6'-3	19
6s2	Wing Slope, Both F.		4	18'-0	108
6s3	Wing Slope, FF		2	23'-6	71
5t1	Curtain, Vertical		27	7'-6	211
Estimated Quantities One Headwall		Reinf. Steel		5769	
		Concrete	Parapet	2.0	37.9 CY
			Wingwalls	8.3	
			Apron	27.6	



* 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 TWFWH G1-21 for General Notes, Specifications, and Design Stresses.
2. This headwall is based on a 2:1 slope normal to centerline of roadway.
3. 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" and "6f1" 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.

Note:
All dimensions are out to out.
D = pin diameter.

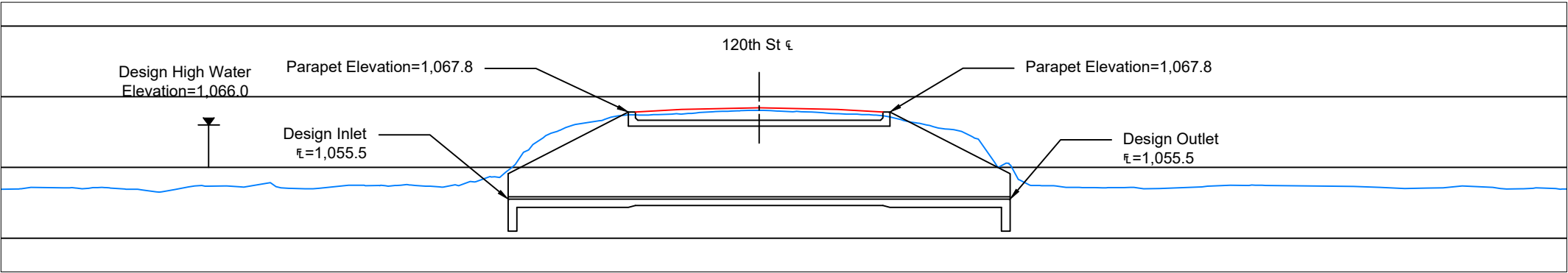
- Modifications:
1. Length of apron shortened.
 2. Wingwall slopes adjusted.
 3. Interior wingwall removed from apron and rounded at parapet.

Modified

Standard Design - Twin Reinforced Concrete Box Culverts
Flared Wing Headwalls

Quantity Tabulation
12'-0" Span
0° Skew

TWFWH
0-4-21



LONGITUDINAL SECTION ALONG ϵ CULVERT

DESIGN FILL HEIGHT = 2 FOOT

BENCH MARK: TO BE SET AT CONTRACTOR'S DESIRED LOCATION PRIOR TO CONSTRUCTION

TRAFFIC ESTIMATE

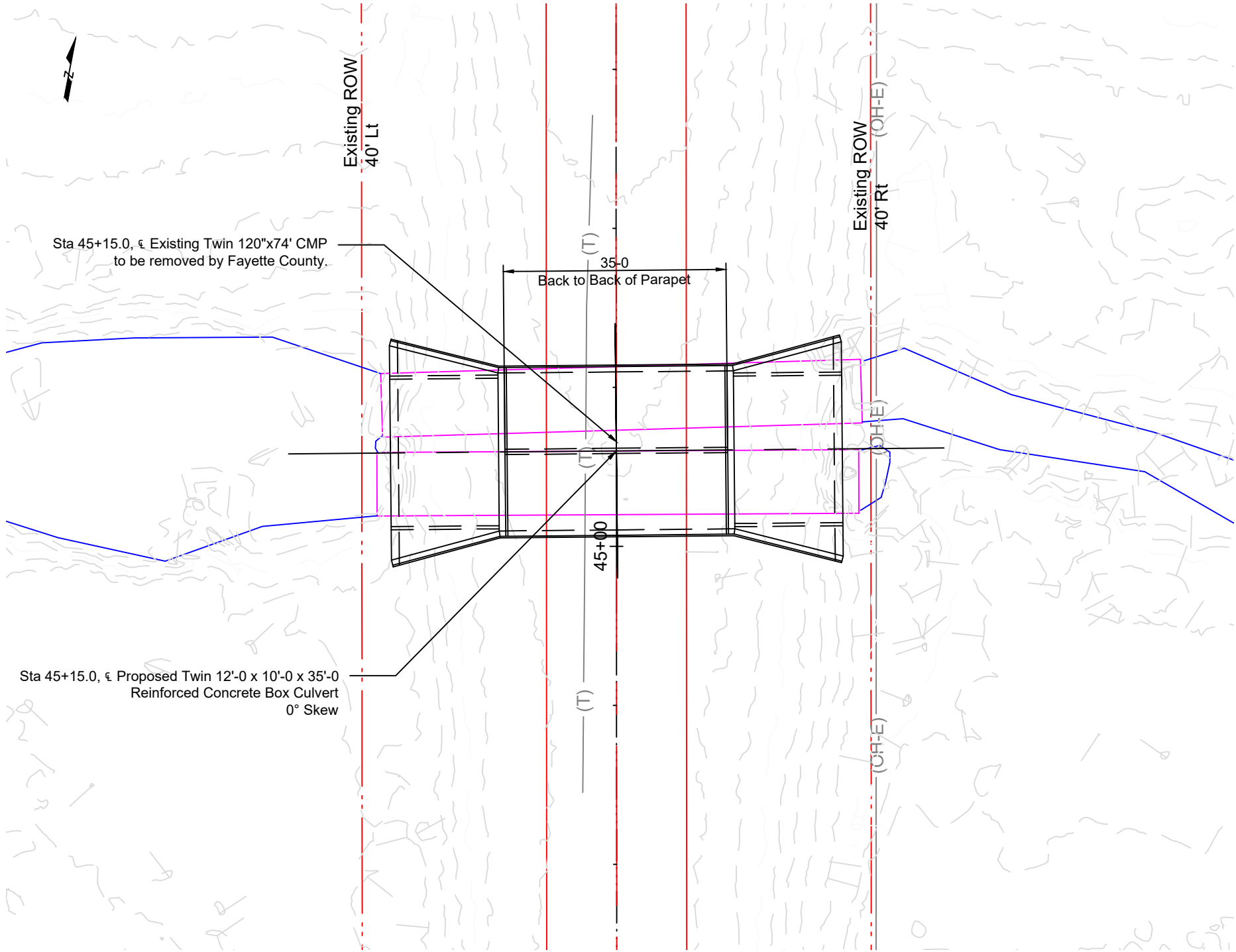
2022 ADT, 33 VPD

HYDRAULIC DATA

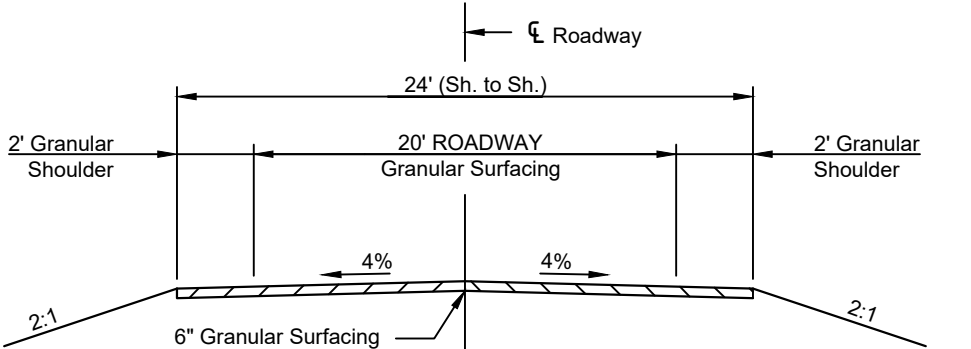
Drainage Area= 4.0 Sq. Mi.
Design Discharge, Q50= 2,140 CFS
Design High Water Elevation, Q50= 1066.0
Stream Slope = 12.5 Ft./Mi.
Design Velocity = 10.0 Ft/s
Q25 = 1,750 CFS Stage Elev. = 1,065.0
Q50 = 2,140 CFS Stage Elev. = 1,066.0
Q100 = 2,580 CFS Stage Elev. = 1,067.1
Q500 = 4,300 CFS Stage Elev. = 1072.6
Anticipated Scour Elev. = 1053.5

LOCATION

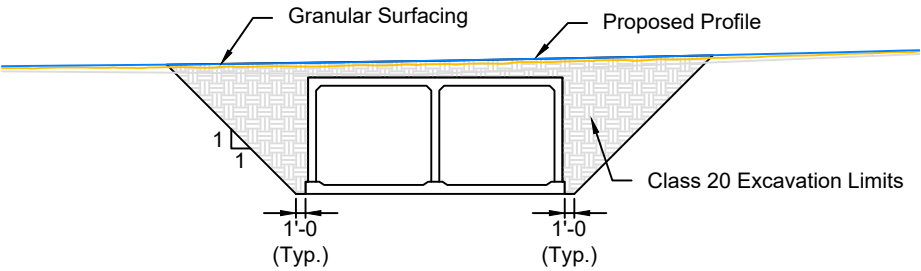
On 120th St. over Alexander Creek
T-92-N, R-8-W
Section 8
Smithfield Township
Fayette County
Latitude 42.80334471
Longitude -91.80800045



SITUATION PLAN



TYPICAL APPROACH SECTION



PROFILE CROSS SECTION
ALONG ROADWAY CENTERLINE

UTILITIES



DESIGN FOR 0° SKEW
TWIN 12'-0 X 10'-0 X 35'-0
REINFORCED CONCRETE BOX CULVERT
SITUATION PLAN
STA. 45+15.0
FAYETTE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

2026