

STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS

**PROPOSED  
HIGHWAY PLANS**

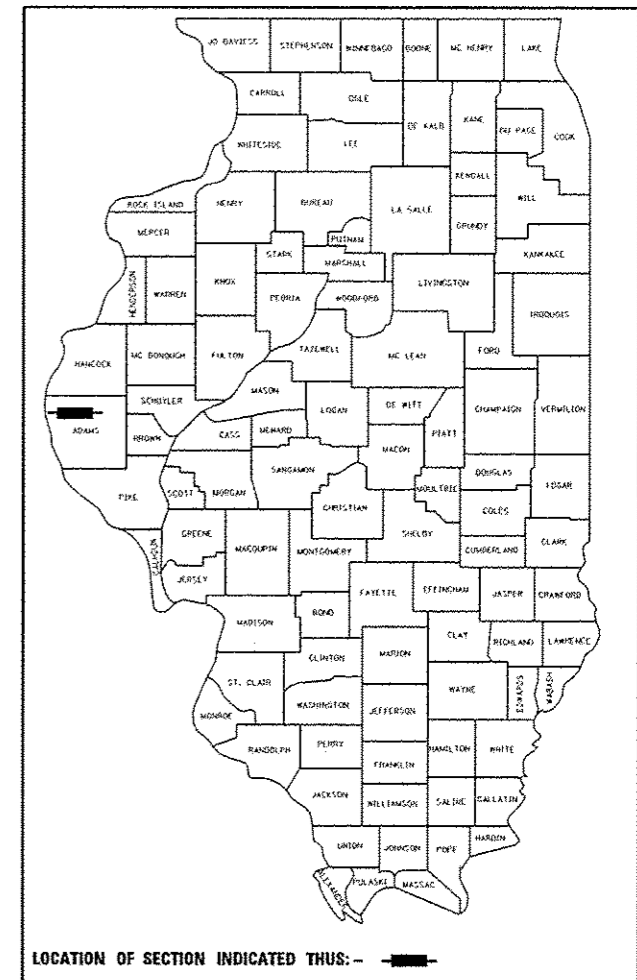
FAP ROUTE 63 (US 24)  
SECTION (1)CR-1, (2)CR  
PROJECT ACF-0063 (061)  
STRUCTURE RECONSTRUCTION  
ADAMS COUNTY

FOR INDEX OF SHEETS, AND HIGHWAY STANDARDS SEE SHEET NO. 2

F.A.P. RTE. 63	SECTION (1)CR-1, (2)CR	COUNTY ADAMS	TOTAL SHEETS 43	SHEET NO. 1
FED. ROAD DIST. NO. 6		ILLINOIS	CONTRACT NO. 72C12	

\* 43-2 = 41

D-96-086-08

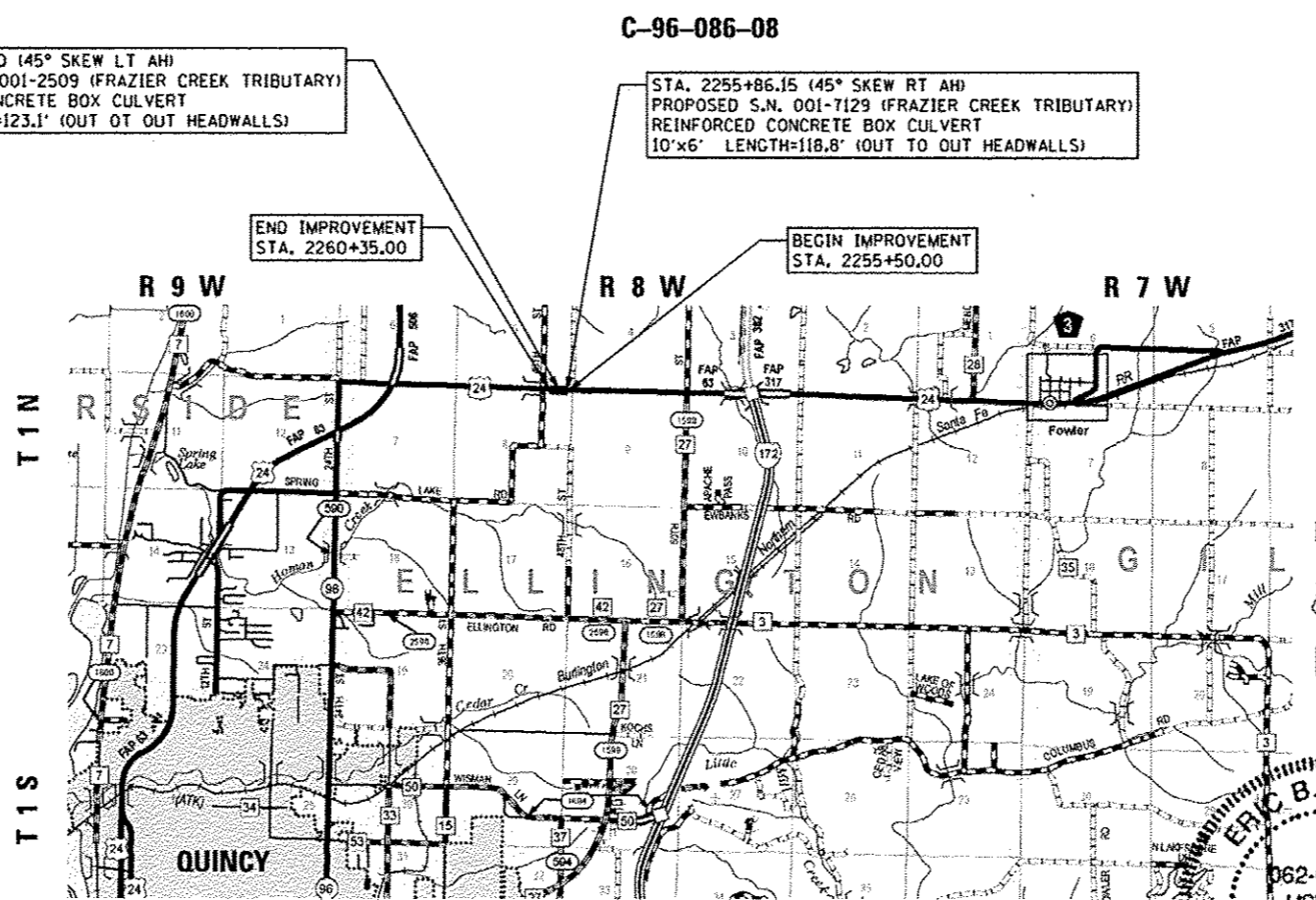


STA. 2259+94.00 (45° SKEW LT AH)  
PROPOSED S.N. 001-2509 (FRAZIER CREEK TRIBUTARY)  
REINFORCED CONCRETE BOX CULVERT  
12'x6' LENGTH=123.1' (OUT TO OUT HEADWALLS)

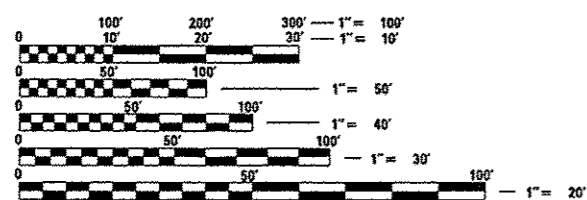
STA. 2255+86.15 (45° SKEW RT AH)  
PROPOSED S.N. 001-7129 (FRAZIER CREEK TRIBUTARY)  
REINFORCED CONCRETE BOX CULVERT  
10'x6' LENGTH=118.8' (OUT TO OUT HEADWALLS)

END IMPROVEMENT  
STA. 2260+35.00

BEGIN IMPROVEMENT  
STA. 2255+50.00



DESIGN DESIGNATION:  
FAP 63  
MINOR ARTERIAL (NON-URBAN)  
ADT = 3650 (2012)  
PV = 87.12%  
SU = 4.66%  
MU = 8.22%



FULL SIZE PLANS HAVE BEEN PREPARED USING STANDARD ENGINEERING SCALES. REDUCED SIZED PLANS WILL NOT CONFORM TO STANDARD SCALES. IN MAKING MEASUREMENTS ON REDUCED PLANS, THE ABOVE SCALES MAY BE USED.

J.U.L.I.E.  
JOINT UTILITY LOCATION INFORMATION FOR EXCAVATION  
1-800-892-0123  
OR 811

SENIOR TEAM ENGINEER: MARK DUST (217) 785-0597  
TEAM MANAGER: KEN ANDERSON (217) 524-7546

CONTRACT NO. 72C12

LOCATION MAP  
SCALE: 1" = 4000'

GROSS/NET LENGTH OF SECTION = 485.00 FT = 0.092 MILES

12-27-13

ERIC B. BARNES  
062-052141  
LICENSED PROFESSIONAL ENGINEER  
DATE 12/13  
REGISTERED PROFESSIONAL ENGINEER  
STATE OF ILLINOIS NO. 062-052141  
LICENSE EXPIRES NOVEMBER 30, 2015

STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS

SUBMITTED *October 25, 2013*

*Sagan L. Prichell*  
DEPUTY DIRECTOR OF HIGHWAYS, REGION ENGINEER

*Dec 6, 2013*  
*John D. Baranzelli, PE*  
ENGINEER OF DESIGN AND ENVIRONMENT

*Dec 6, 2013*  
*Omer Osman, PE*  
DIRECTOR OF HIGHWAYS, CHIEF ENGINEER

PLANS PREPARED BY:  
**KLINGNER & ASSOCIATES, P.C.**

Engineers • Architects • Surveyors  
158 North 2nd Street, Quincy, IL 62450  
1508 Farm Green Road, Normal, IL 62450  
1809 N. 4th Street, Suite 100, Burlington, IL 62018  
141 North Prairie Street, Sibley, IL 62450  
Internet Address: www.klingner.com  
STATE OF ILLINOIS DESIGN FIRM # 1842738

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OF THE STATE OF ILLINOIS**

**INDEX OF SHEETS**

SHEET NO.	DESCRIPTION
1	COVER SHEET
2	SHEETS INDEX & GENERAL NOTES
3-5	SUMMARY OF QUANTITIES
6	SCHEDULE OF QUANTITIES
7-8	TYPICAL SECTIONS
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* 17-21	STRUCTURE PLANS (S.N. 001-7129)
* 22-27	STRUCTURE PLANS (S.N. 001-2509)
28-29	MISCELLANEOUS DETAILS
30-43	CROSS SECTIONS - FAP RTE 63 (US 24)

\* DELETE SHEETS 20 & 25



**STANDARDS**

STANDARD NOS.			
000001-06	666001-01	701201-04	BLR 22-7
200001-07	701001-02	701901-03	
442201-03	701006-05	780001-04	
515001-03	701011-04	BLR 21-9	

**RATES OF APPLICATION TABLE**

AGGREGATE (SURFACE, BASE, SUBBASE, OR BACKFILL)	2.05 TON / CU YD
STONE DUMPED RIPRAP	1.50 TON / CU YD
<b>HOT-MIX ASPHALT:</b>	
BITUMINOUS MATERIALS (PRIME COAT)	0.00038 TON / SQ YD (on pavement)
BITUMINOUS MATERIALS (PRIME COAT)	0.001425 TON / SQ YD (on aggregate)
AGGREGATE PRIME COAT	0.002 TON / SQ YD
SURFACE / BINDER (112 lbs)	0.056 TON / SQ YD • IN
<b>SEEDING AREAS:</b>	
MULCH METHOD	2.0 TON / ACRE
AGRICULTURAL GROUND LIMESTONE	2.0 TON / ACRE
NITROGEN FERTILIZER NUTRIENT	90 LB / ACRE
PHOSPHORUS FERTILIZER NUTRIENT	90 LB / ACRE
POTASSIUM FERTILIZER NUTRIENT	90 LB / ACRE
TEMPORARY EROSION CONTROL SEEDING	100 LB / ACRE

**COMMITMENTS**

1. FIELD/RESIDENT ENGINEER SHALL CONTACT STUDIES AND PLANS CONCERNING ANY MAJOR PLAN CHANGE TO MAKE SURE NO PREVIOUS COMMITMENTS (NOT LISTED) WERE MADE AFFECTING THE DESIGN, AND ALLOW AN IMPROVED DESIGN FOR FUTURE PROJECTS.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FOLLOWING THE REQUIREMENTS OF AN NPDES STORMWATER PERMIT FOR CONSTRUCTION ACTIVITY FOR THIS PROJECT.

**GENERAL NOTES**

1. THE THICKNESS OF BITUMINOUS MIXTURES SHOWN ON THE PLANS IS NOMINAL THICKNESS. DEVIATIONS FROM THE NOMINAL THICKNESS WILL BE PERMITTED WHEN SUCH DEVIATIONS OCCUR DUE TO IRREGULARITIES IN THE EXISTING SURFACE OR BASE ON WHICH THE BITUMINOUS MIXTURE IS PLACED.
2. THE CONTRACTOR SHALL PROTECT AND CAREFULLY PRESERVE ALL PROPERTY MARKERS AND MONUMENTS UNTIL THE OWNER, AUTHORIZED AGENT, OR LAND SURVEYOR HAS WITNESSED OR OTHERWISE REFERENCED THEIR LOCATION. WHERE SECTION OR SUB-SECTION MONUMENTS ARE ENCOUNTERED, THE ENGINEER SHALL BE NOTIFIED BEFORE SUCH MONUMENTS ARE REMOVED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR HAVING AN AUTHORIZED SURVEYOR RE-ESTABLISH ANY SECTION OR SUB-SECTION MONUMENTS DESTROYED BY HIS OPERATIONS.
3. ALL DISTURBED AREAS WITHIN THE RIGHT-OF-WAY SHALL BE SEEDED, FERTILIZED, AND MULCHED AS SHOWN IN THE PLANS AND AS DIRECTED BY THE ENGINEER.
4. DO NOT INCLUDE MULCH OR EMULSIFIED ASPHALT ON EROSION CONTROL BLANKET AREAS.
5. THE LOCATION OF BURIED AND ABOVE GROUND UTILITIES SHOWN ARE APPROXIMATE, AND ARE SHOWN FOR CONTRACTOR INFORMATIONAL USE ONLY, AND ARE NOT TO BE REFERENCED FOR CONSTRUCTION PURPOSES. THE IMPLIED PRESENCE OR ABSENCE OF UTILITIES IS NOT TO BE CONSTRUED BY THE OWNER, ENGINEER, CONTRACTOR, OR SUBCONTRACTORS TO BE AN ACCURATE AND COMPLETE REPRESENTATION OF UTILITIES THAT MAY OR MAY NOT EXIST ON THE CONSTRUCTION SITE. BURIED AND ABOVE GROUND UTILITY LOCATIONS, IDENTIFICATION, AND MARKING ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. REROUTING, DISCONNECTION, PROTECTION, ETC. OF ANY UTILITIES MUST BE COORDINATED BETWEEN THE CONTRACTOR, UTILITY COMPANY, AND OWNER. SITE SAFETY, INCLUDING THE AVOIDANCE OF HAZARDS ASSOCIATED WITH BURIED AND ABOVE GROUND UTILITIES, REMAINS THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
6. ANY REFERENCE TO A STANDARD IN THESE PLANS SHALL BE INTERPRETED TO MEAN THE EDITION AS INDICATED BY THE SUB-NUMBER IN THE INDEX OF SHEETS.
7. ANY EXISTING ROAD SIGNS THAT INTERFERE WITH CONSTRUCTION WILL BE REMOVED OR RELOCATED AS DIRECTED BY THE ENGINEER. AFTER THE CONSTRUCTION IS COMPLETED, THE CONTRACTOR WILL REPLACE THE SIGNS AS DIRECTED BY THE ENGINEER. THIS WORK WILL NOT BE PAID SEPARATELY BUT SHALL BE CONSIDERED INCLUDED IN THE CONTRACT AND NO COMPENSATION WILL BE ALLOWED.

8. THE FOLLOWING MIXTURE REQUIREMENTS ARE APPLICABLE FOR THIS PROJECT:

LOCATION(S):	US 24
MIXTURE USE(S):	PATCHING
AC/PG:	PG 64-22
DESIGN AIR VOIDS:	4.0% @ N DESIGN=70
MIXTURE COMPOSITION:	IL 19.0
FRICITION AGGREGATE	N/A



**GENERAL NOTES**

9. SEEDING WILL NOT BE PERMITTED AT ANY TIME WHEN THE GROUND IS FROZEN, WET, OR IN AN UNTILLABLE CONDITION. LOCATIONS TO BE SEEDED SHALL BE DETERMINED BY THE ENGINEER.
10. ACCESS TO ALL SIDEROADS SHALL BE MAINTAINED AT ALL TIMES UNLESS OTHERWISE NOTED IN THE PLANS.
11. SHOULD THE CONTRACTOR REQUEST OLD/EXISTING STRUCTURE PLANS, THEY CAN CONTACT THE SENIOR TEAM ENGINEER OR TEAM MANAGER AS SHOWN ON THE COVER SHEET.
12. IN ADDITION TO FIELD SURVEYS, PLAN DIMENSIONS AND DETAILS RELATIVE TO THE EXISTING FACILITIES HAVE BEEN TAKEN FROM EXISTING PLANS AND ARE SUBJECT TO CONSTRUCTION VARIATIONS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY SUCH DIMENSIONS AND DETAILS IN THE FIELD. SUCH VARIATIONS SHALL NOT BE A CAUSE FOR ADDITIONAL COMPENSATION DUE TO A CHANGE IN THE SCOPE OF WORK, HOWEVER, THE CONTRACTOR WILL BE PAID FOR THE QUANTITY ACTUALLY FURNISHED AT THE UNIT PRICE BID FOR THE WORK.
13. ALL SAW CUTS NECESSARY TO COMPLETE THE WORK IN THESE PLANS SHALL BE INCLUDED IN THE COST FOR THE VARIOUS PAY ITEMS INVOLVED. THE MINIMUM SAW CUT DEPTH IN THE PAVEMENT SHALL BE 1 1/2" UNLESS OTHERWISE SPECIFIED IN A DETAIL SHOWN IN THE PLANS.
14. UNLESS DIRECTED BY THE ENGINEER, PAVEMENT MARKING LINES SHALL NOT BE LAID DIRECTLY OVER A LONGITUDINAL CRACK OR JOINT NOR OVER A TAR OR ASPHALT PAINTED LINE. THE EDGE OF A CENTERLINE OR LANE LINE SHALL BE OFFSET A MINIMUM DISTANCE OF 2" FROM A LONGITUDINAL CRACK OR JOINT. EDGE LINES SHALL BE APPROXIMATELY 2" FROM THE EDGE LINE OF PAVEMENT. SEE SECTION 780 OF THE STANDARD SPECIFICATIONS FOR TRAFFIC CONTROL ITEMS.

DISTRICT SIX	
EXAMINED <u>10/11</u>	20 <u>13</u>
<i>Bill or Ryan</i>	
OPERATIONS ENGINEER	
EXAMINED <u>OCT 16</u>	20 <u>13</u>
<i>Jimmy Lee</i>	
PROJECT IMPLEMENTATION ENGINEER	
EXAMINED <u>October 21</u>	20 <u>13</u>
<i>Laura R. Macmillan</i>	
PROGRAM DEVELOPMENT ENGINEER	

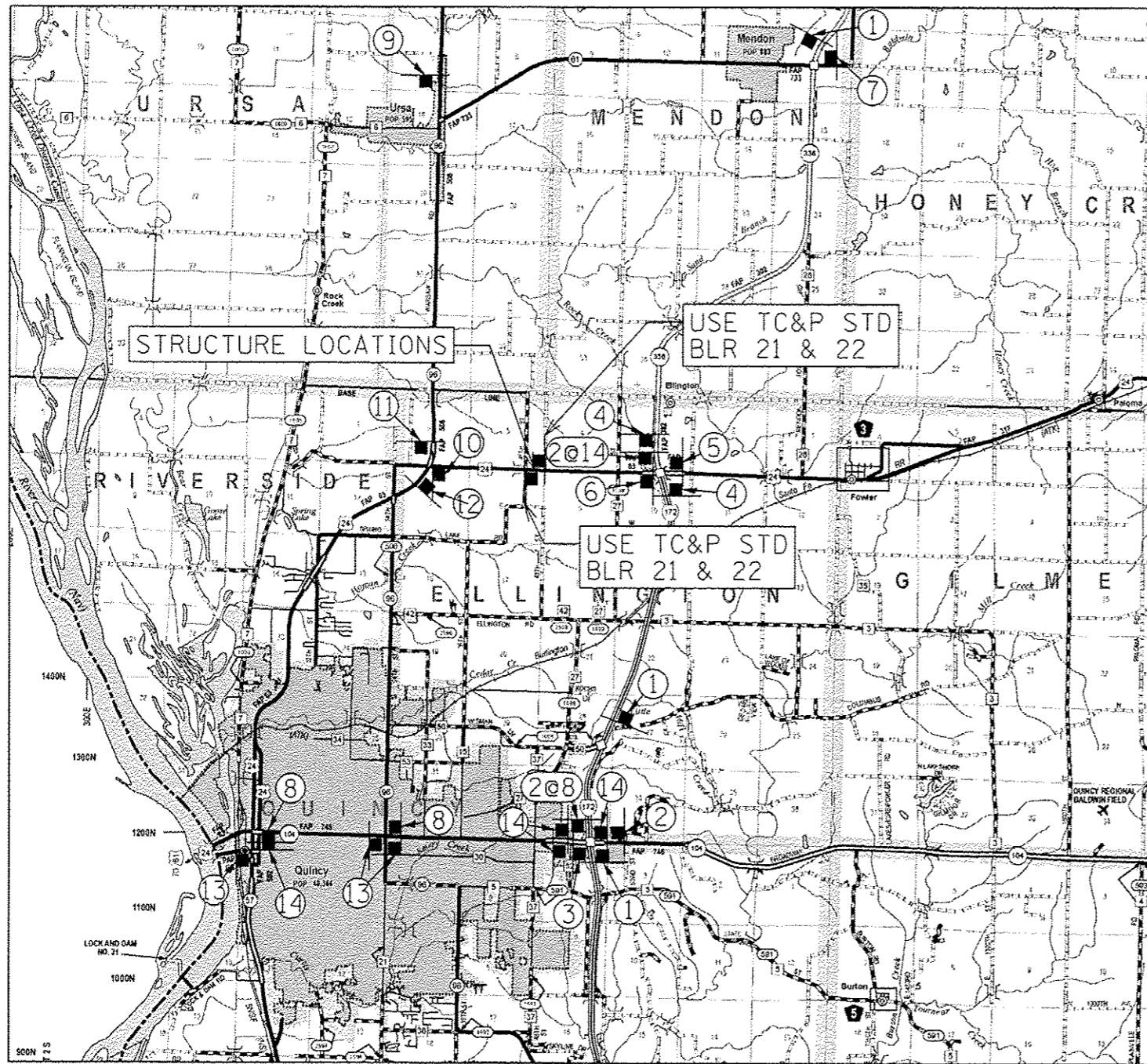
12-27-13

FILE NAME :	USER NAME : ebb	DESIGNED -	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	SHEET INDEX & GENERAL NOTES	F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
q:\805\1000\224\101-us 24 over from creek - structure plans\101-7098 & s-	DR:\911\cadd\sheet\0672012-sht-GenNotes	CHECKED -	REVISED -			63	(1)CR-1, (2)CR	ADAMS	43	2
PLOT SCALE : 50.0000' / IN.	DATE -	REVISED -	REVISED -			CONTRACT NO. 72C12				
PLOT DATE : 10/21/2013	DATE -	REVISED -	REVISED -			SCALE: none	SHEET NO. 1 OF 1 SHEETS STA. TO STA.	FED. ROAD DIST. NO. 6 ILLINOIS FED. AID PROJECT		

CODE NO.	ITEM	UNIT	TOTAL QUANTITY	CONSTRUCTION CODE		
				80% FED 20% STATE ROADWAY	80% FED 20% STATE BRIDGE	80% FED 20% STATE BRIDGE
				0004	0040	0040
				RURAL	S. N. 001-7129	S. N. 001-7130
28001000	AGGREGATE (EROSION CONTROL)	TON	27	27		
28100707	STONE DUMPED RIPRAP, CLASS A4	SQ YD	1363	1363		
28100709	STONE DUMPED RIPRAP, CLASS A5	SQ YD	610	610		
28200200	FILTER FABRIC	SQ YD	1973	1973		
40201000	AGGREGATE FOR TEMPORARY ACCESS	TON	15	15		
44000100	PAVEMENT REMOVAL	SQ YD	159	159		
44201747	CLASS D PATCHES, TYPE IV, 8 INCH	SQ YD	100	100		
44201783	CLASS D PATCHES, TYPE IV, 11 INCH	SQ YD	431	431		
50100300	REMOVAL OF EXISTING STRUCTURES NO. 1	EACH	1		1	
50100400	REMOVAL OF EXISTING STRUCTURES NO. 2	EACH	1			1
50200400	ROCK EXCAVATION FOR STRUCTURES	CU YD	128			128
50800105	REINFORCEMENT BARS	POUND	9010	3980		5030
51500100	NAME PLATES	EACH	2		1	1
54003000	CONCRETE BOX CULVERTS	CU YD	100.1	47		53.1

14

12-27-13



**GENERAL NOTES**

- 1) FLAGS SHALL BE USED AT EACH DETOUR SIGN LOCATION.
- 2) STANDARD BLR 21/BLR 22 ADDRESS ROAD CLOSURE DETAILS WITHIN THE IMMEDIATE VICINITY OF THE FRAZIER CREEK STRUCTURES.
- 3) SIDE ROAD CLOSURES, IF NECESSARY, SHALL BE IN ACCORDANCE WITH TRAFFIC CONTROL AND PROTECTION STANDARD BLR-21.
- 4) ALL SIGNS SHALL BE FURNISHED, ERECTED, AND MAINTAINED BY THE CONTRACTOR.
- 5) THE LONGITUDINAL DIMENSIONS MAY BE ADJUSTED TO FIT FIELD CONDITIONS.
- 6) ALL SIGNS SHALL BE REMOVED WHEN NOT REQUIRED FOR FUTURE USE.
- 7) THIS TRAFFIC CONTROL AND PROTECTION SHALL BE PAID FOR ACCORDING TO THE CONTRACT UNIT COST PER LUMP SUM FOR TRAFFIC CONTROL AND PROTECTION, STANDARD BLR 21 (SPECIAL).
- 8) THE EXACT LOCATIONS OF ALL TRAFFIC CONTROL ITEMS SHALL BE APPROVED BY THE ENGINEER.
- 9) PRIOR TO THE CLOSURE OF US 24, THE CONTRACTOR SHALL NOTIFY LOCAL EMERGENCY SERVICES, ADAMS COUNTY ENGINEER, AND THE TOWNSHIP ROAD COMMISSIONER.

**ADAMS COUNTY ENGINEER:**

MR. JAMES FRANKENHOFF, P.E.  
101 NORTH 54TH STREET  
QUINCY, IL 62305

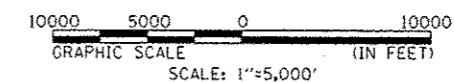
FAX: 217-223-9418  
PHONE: 217-223-0614  
MOBILE:  
E-MAIL: ACHD@ADAMS.NET

**ELLINGTON TOWNSHIP ROAD COMMISSIONER:**

MR. RICHARD OBERT  
6130 HORSESHOE VALLEY ROAD  
QUINCY, IL 62305

PHONE: 217-222-1953

- |   |  |  |  |  |   |  |
|---|--|--|--|--|---|--|
| ①<br>US 24 CLOSED<br>2 MILES WEST<br>OF I-172/IL 336<br>R11-3 (6045)<br>(2 SIGNS AT<br>EACH LOCATION) | ②<br>US 24 CLOSED<br>2 MILES WEST<br>OF I-172/IL 336<br>R11-3 (6060) | ③<br>US 24 CLOSED<br>2 MILES WEST<br>OF I-172/IL 336<br>R11-3 (6060) | ④<br>US 24 CLOSED<br>2 MILES WEST<br>R11-3 (6030)<br>(2 SIGNS AT<br>EACH LOCATION) | ⑤<br>US 24 CLOSED<br>2 MILES AHEAD<br>R11-3 (6030) | ⑥<br>US 24 CLOSED<br>1.7 MILES AHEAD<br>R11-3 (6030)                              | ⑦<br>US 24 CLOSED<br>2 MILES WEST<br>OF I-172/IL 336<br>R11-3 (6060)     |
| ⑧<br>DETOUR<br>US 24<br>M4-8(0) (2412)<br>W17-1100 (2409)<br>M6-1 (2115)                              | ⑨<br>US 24 CLOSED<br>1.5 MILES EAST<br>OF IL 96<br>R11-3 (6045)      | ⑩<br>US 24 CLOSED<br>1.5 MILES AHEAD<br>R11-3 (6030)                 | ⑪<br>US 24 CLOSED<br>1.5 MILES<br>R11-3 (6045)                                     | ⑫<br>US 24 CLOSED<br>1.5 MILES<br>R11-3 (6045)     | ⑬<br>US 24 CLOSED<br>1.5 MILES EAST<br>OF IL 96/US 24<br>JUNCTION<br>R11-3 (6060) | ⑭<br>DETOUR<br>US 24<br>M4-8(0) (2412)<br>W17-1100 (2409)<br>M6-3 (2115) |



REVISOR'S MARK: **REVISOR'S MARK** REVISED SHEET 12-27-13

FILE NAME =	USER NAME = abh	DESIGNED =	REVISED = EBB 12/04/13	<b>STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION</b>	<b>DETOUR PLAN</b>	F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
Q:\RFP\11082224\W01 - US 24 over Frazier Creek - Structure Plans\N 001-7090 & 0	DRAWN BY = GMD	CHECKED =	REVISED =			63	(1)CR-1, (2)CR	ADAMS	43	10
PLOT SCALE = 5000.0000' / IN.		DATE =	REVISED =			SCALE: 1"=5000'		SHEET NO. 1 OF 1 SHEETS		STA. TO STA.
PLOT DATE = 12/4/2013				SCALE: 1"=5000'		SHEET NO. 1 OF 1 SHEETS		STA. TO STA.	FED. ROAD DIST. NO. 6 [ILLINOIS] FED. AID PROJECT	



Benchmark: Chiseled "□" on south headwall; just west of N. 48th Street and U.S. 24 intersection, Sta. 2255+48.0, 34.0' Lt., Elev. 669.12.  
 Existing Structure: S.N. 001-7099 is a 6' by 6' reinforced concrete box culvert at a 45° skew originally built in 1955 as S.B.I. 31, Section (1.2.3)W.  
 The existing structure shall be removed and replaced. The roadway will be closed and traffic detoured during construction.  
 No Salvage.

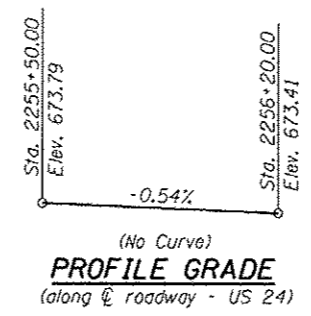
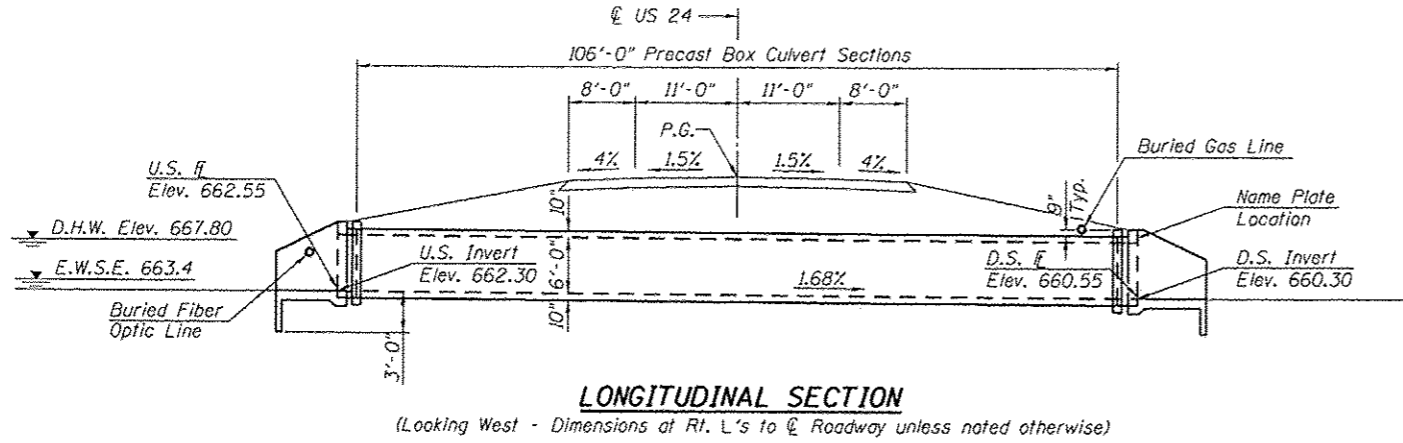
**INDEX OF SHEETS**

1. General Plan
2. General Data
3. Culvert Details
4. -
5. Boring Logs

**TOTAL BILL OF MATERIAL**

ITEM	UNIT	TOTAL
Removal of Existing Structures No. 1	Each	1
Name Plates	Each	1
Reinforcement Bars	Pound	3,980
Concrete Box Culverts	Cu. Yd.	47.0
Precast Concrete Box Culverts 10' X 6'	Feet	106
Granular Culvert Backfill	Cu. Yd.	916

\* The cost of Structure Excavation shall be included in the pay item for "Precast Concrete Box Culverts 10' X 6'"  
 \*\* The cost of Cast-In-Place End Sections shall be included in the respective individual pay items.



**WATERWAY INFORMATION**

Drainage Area = 0.44 mi<sup>2</sup>      Exist. Overlapping Elev. 673.4 @ Sta. 2256+86.1  
 Prop. Overlapping Elev.      @ Sta.

Flood Yr.	Freq. C.F.S.	Opening Sq. Ft.		Nat. H.W.E.	Head - Ft.		Headwater El.	
		Exist.	Prop.		Exist.	Prop.	Exist.	Prop.
10	290	30	50	667.0	2.2	0.0	669.2	667.0
Design	50	480	30	667.8	5.7	1.0	673.4	668.8
Base	100	570	35	667.9	5.8	2.3	673.8	670.2
Max. Calc.	500	790	40	668.5	5.8	3.6	674.2	672.0

10 Year Velocity Through Proposed Culvert = 8.8 fps

**DESIGN SCOUR ELEVATION TABLE**

Design Scour Elevation (ft.)	Upstream	Downstream
	659.30	657.30

**LOADING HL-93**

Allow 50#/sq. ft. for future wearing surface.

**DESIGN SPECIFICATIONS**

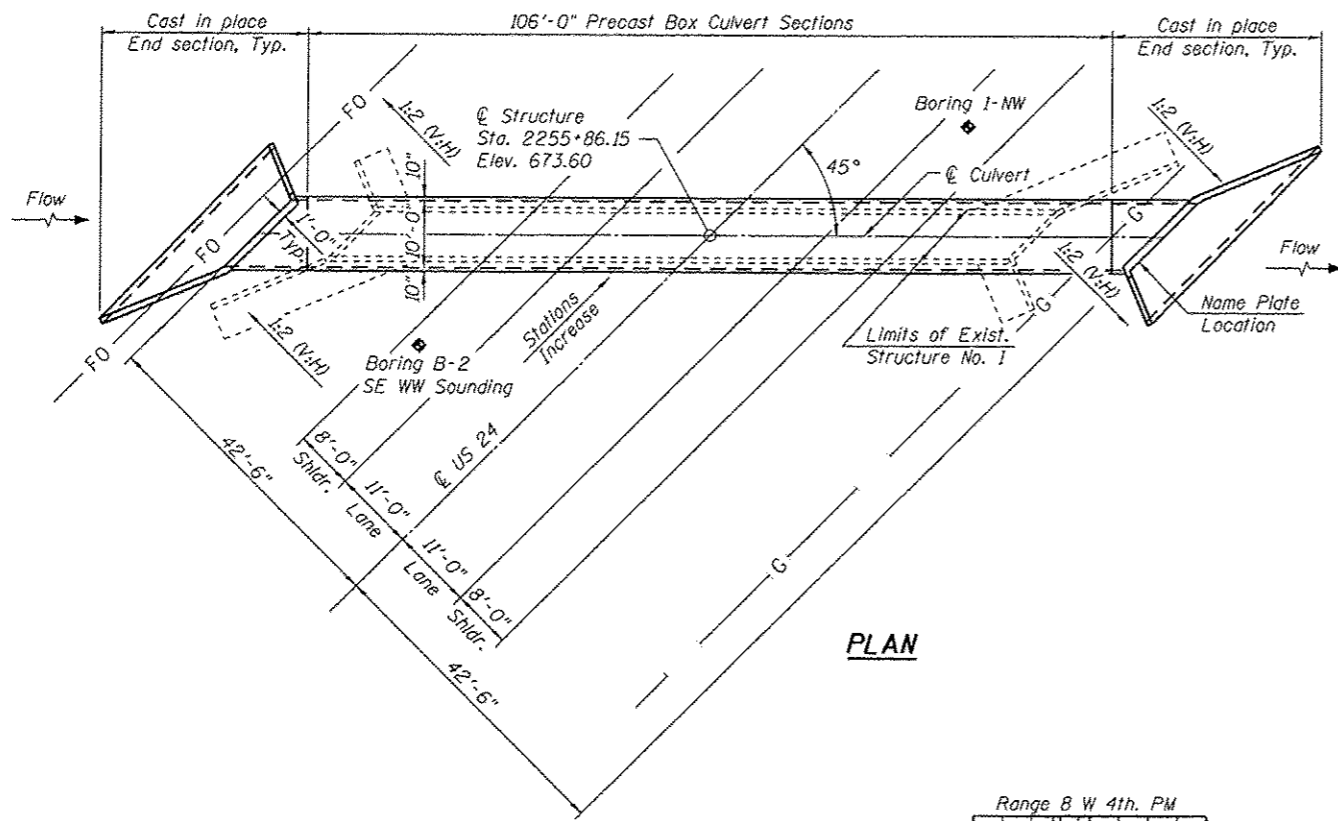
2012 AASHTO LRFD Specifications with 2013 interims

**DESIGN STRESSES**

- FIELD UNITS**  
 $f'_c = 3,500$  psi  
 $f_y = 60,000$  psi (Reinforcement)  
**PRECAST UNITS**  
 $f'_c = 5,000$  psi  
 $f_y = 65,000$  psi (welded wire fabric)

**GENERAL NOTES**

The precast concrete box culverts shall conform to the requirements of ASTM C1577.  
 Contact the District Geotechnical Engineer to verify foundation conditions meet plan requirements.  
 For riprap layout and quantities, see Roadway Plans.



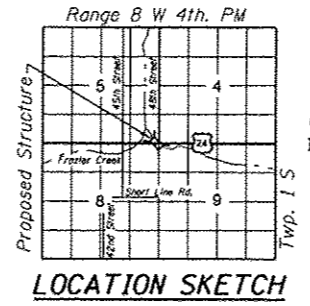
STATION 2255+86.15  
 BUILT 201. BY  
 STATE OF ILLINOIS  
 F.A.P. RTE. 63 SEC. 1(RS-5, CR-1.2.3) 2(RS-6)  
 LOADING HL-93  
 STRUCTURE NO. 001-7129

**NAME PLATE**  
 See Sta. 515001

**UTILITY LEGEND**  
 G = Buried Gas Line  
 FO = Buried Fiber Optic Line



Alan D. Lukens  
 Licensed Structural Engineer  
 State of Illinois No. 081-005167  
 License Expires 11/30/2014  
 Date: 12-4-13



REVISOR'S SHEET 12-27-13

**KLINGNER & ASSOCIATES, P.C.**  
 Engineers • Architects • Surveyors  
 100 N. 216 Street, Quincy, IL 62450  
 1000 Park Grove Road, Normal, IL 62451  
 1000 N. 14th Street, Suite 100, Springfield, IL 62761  
 100 North Kansas Street, Sibley, IL 62456  
 Internet Address: www.klingner.com  
 STATE OF ILLINOIS DESIGN FIRM # 1842738

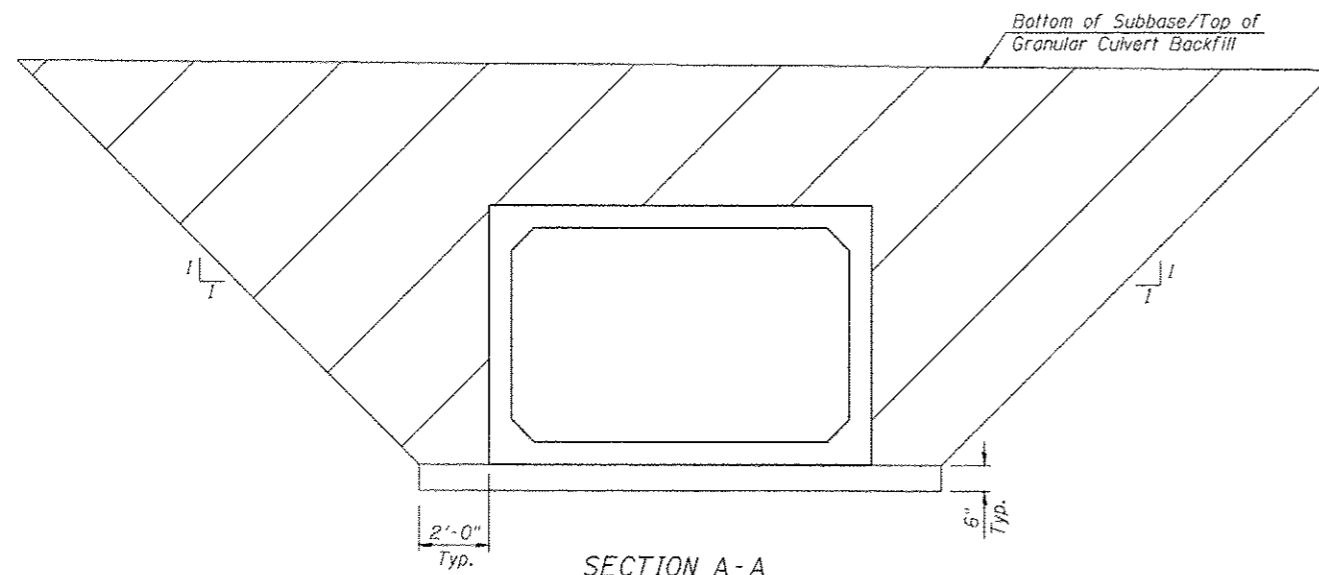
FILE NAME	USER NAME	DESIGNED	REVISED
G:\V08\Files\080224\WD 1 - US 24 over Frazier Creek - Structure Plans\S.N. 001-7099 & S.N. 001-7129 Design	RJP	SEB 10-28-13	SEB 10-30-13
	DRAWN	ADL	-
	CHECKED	RJP	-

STATE OF ILLINOIS  
 DEPARTMENT OF TRANSPORTATION

GENERAL PLAN  
 STRUCTURE NUMBER 001-7129  
 SHEET NO. 1 OF 5 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
63	(1)CR-1, (2)CR	ADAMS	43	17

CONTRACT NO. 72C12  
 ILLINOIS FED. AID PROJECT  
 Klingner & Associates P.C.

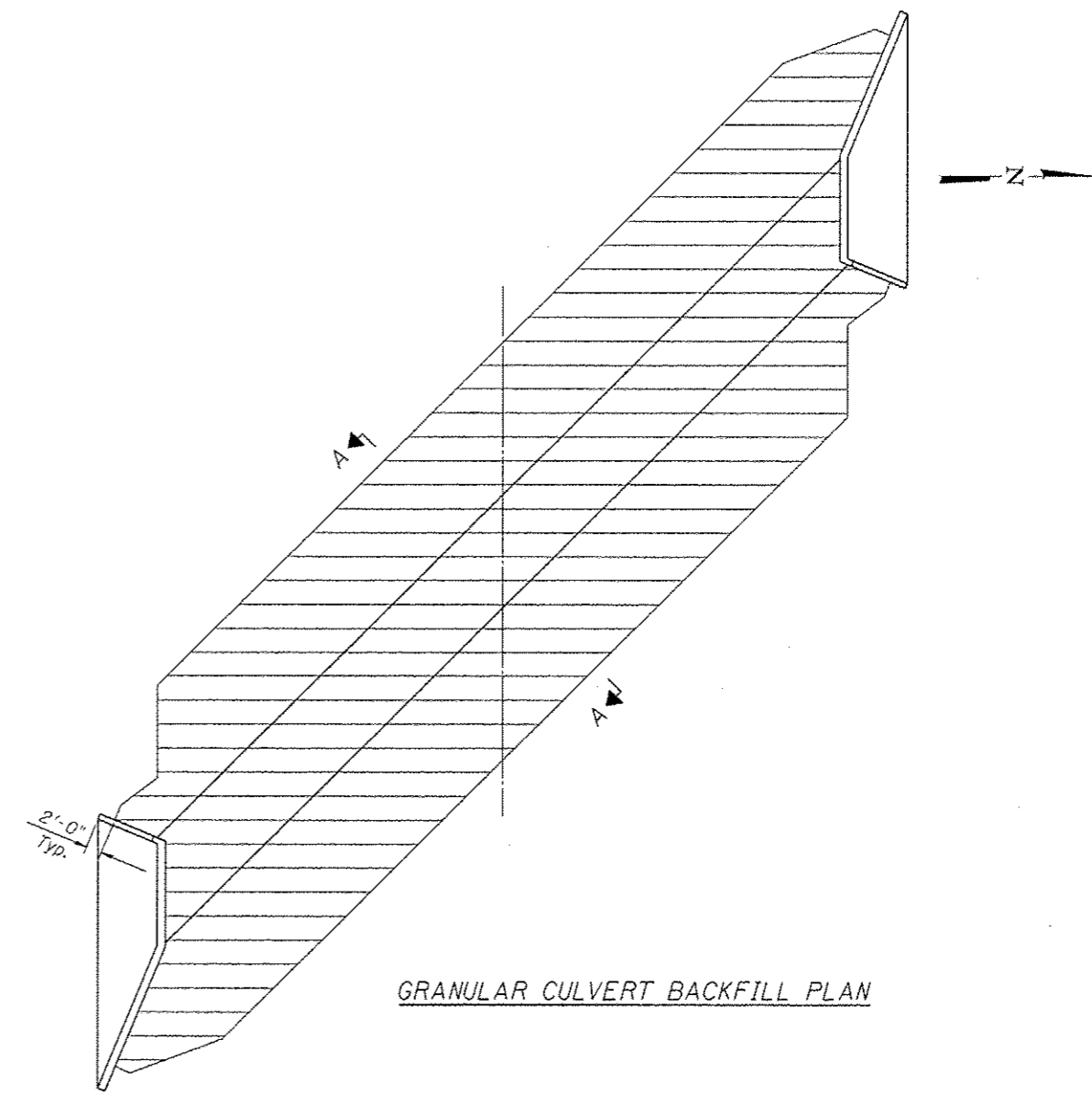


**SECTION A-A**

*Note:*  
The area below the box and apron shall be over excavated by 6 inches and filled with CA-7 or CA-11 to provide a level platform. Cost included with Concrete Box Culverts

**SEQUENCE OF CONSTRUCTION**

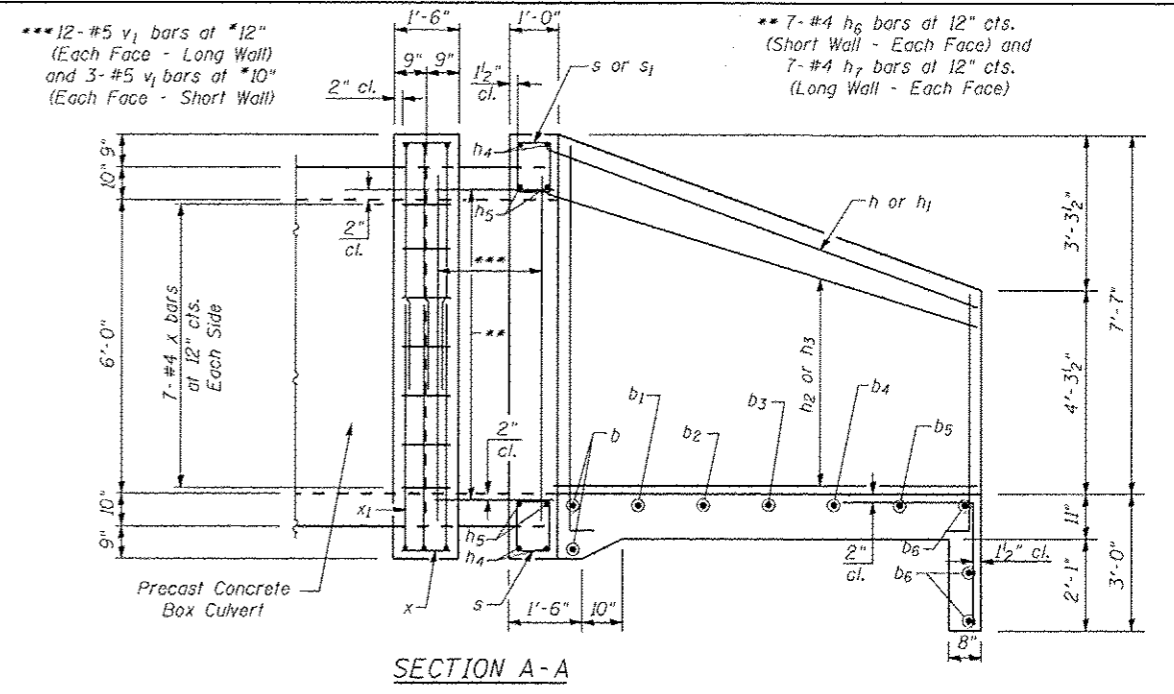
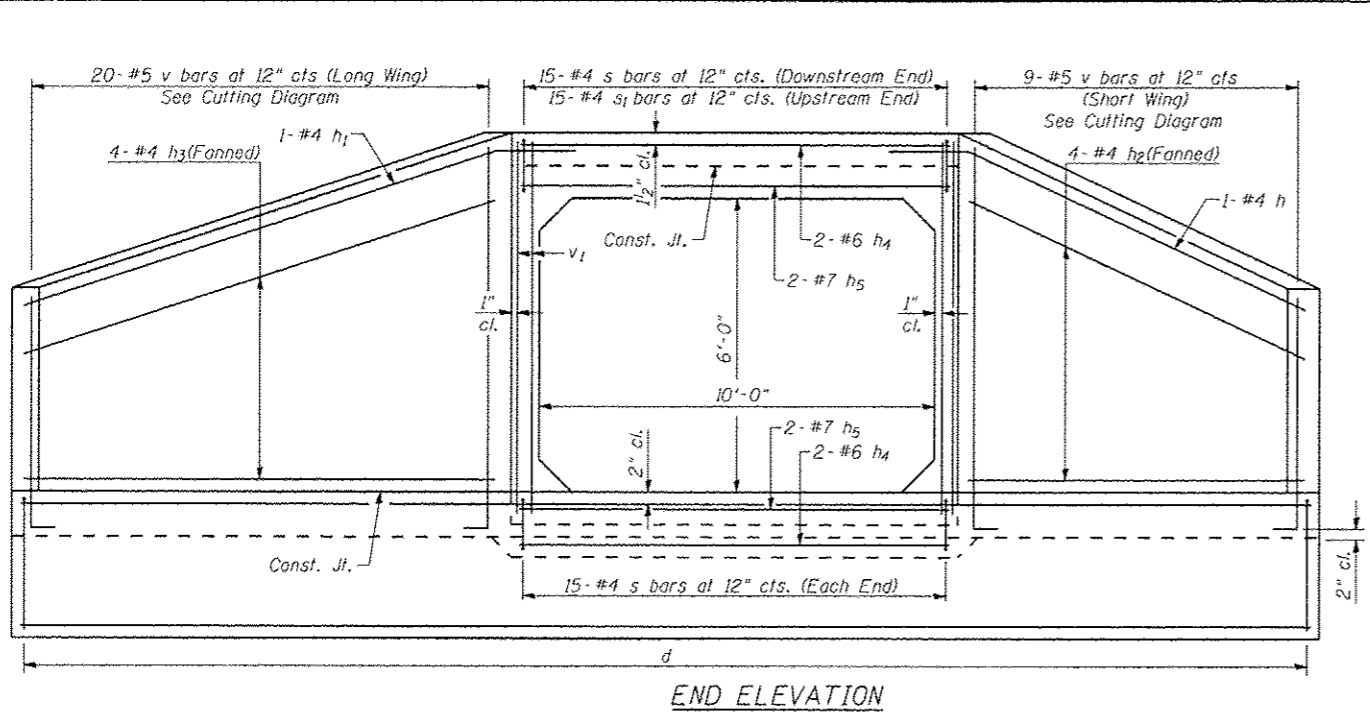
1. Remove existing culvert.
2. Construct proposed culvert.
3. Place Granular Culvert Backfill.
4. Pave roadway



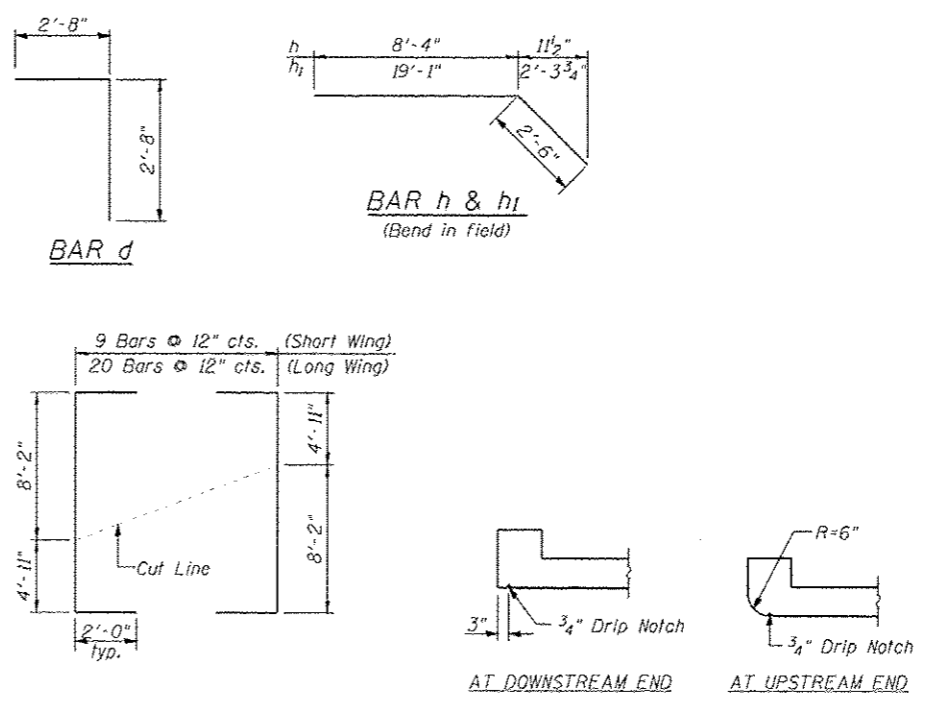
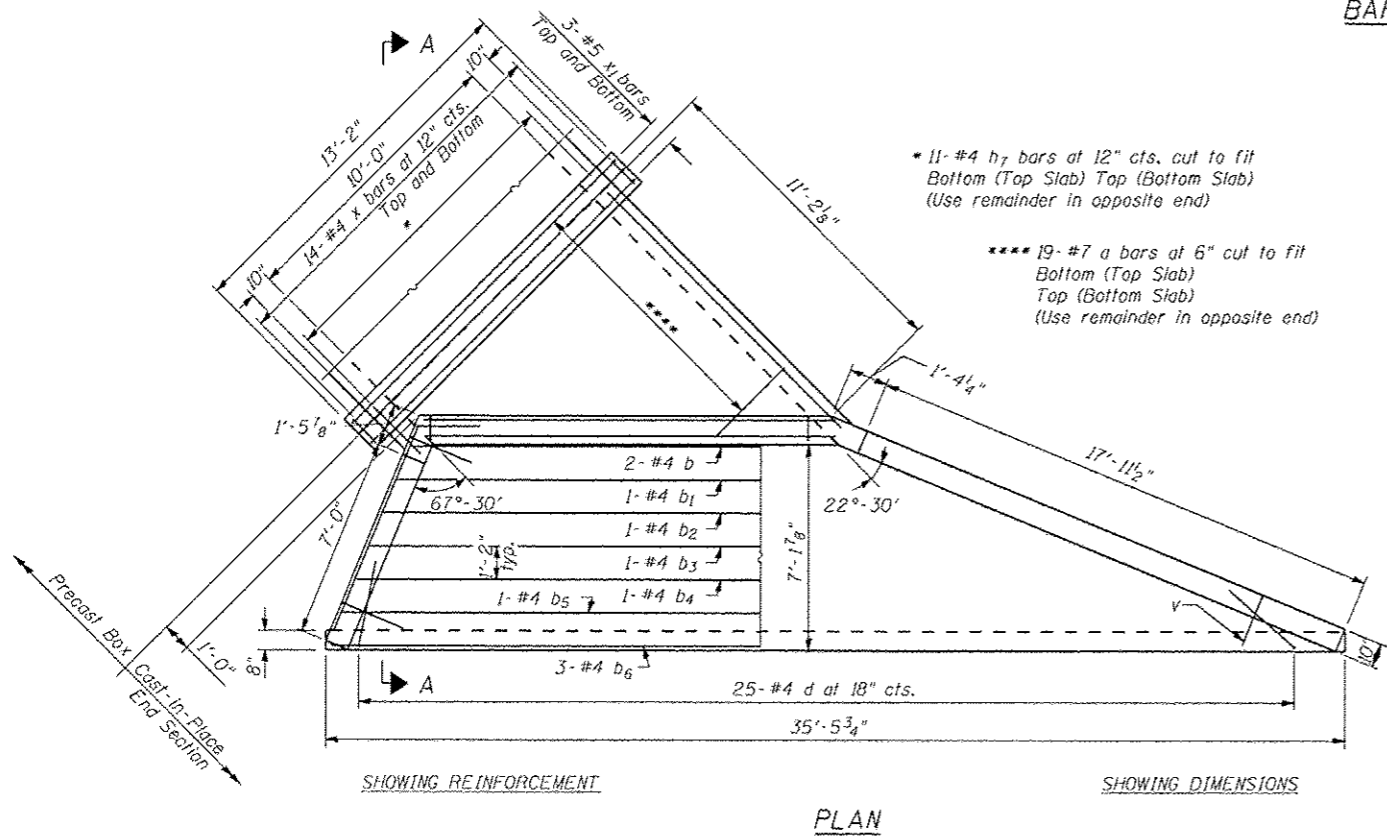
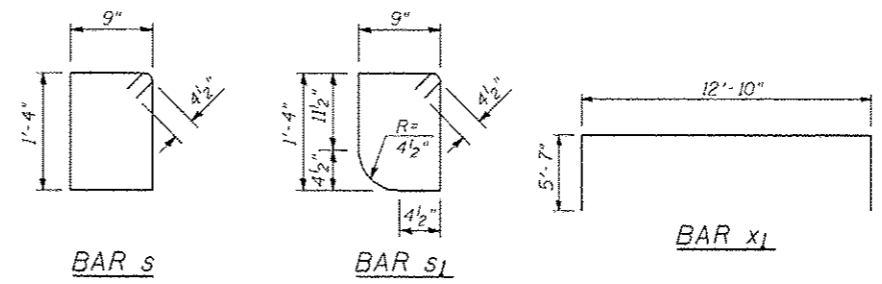
**GRANULAR CULVERT BACKFILL PLAN**

1 REVISED SHEET 12-27-13

FILE NAME :	USER NAME :	DESIGNED RJP	REVISED SEB 10-25-13	<b>STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION</b>	<b>GENERAL DATA STRUCTURE NUMBER 001-7129</b>	F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	
D:\08\files\082224\VD 1 - US 24 over Frontier Creek - Structure Plans\SN 001-709B & S	CHECKED CAD	DRAWN ADL	REVISED			63	(1)CR-1, (2)CR	ADAMS	43	18	
PLOT SCALE :	CHECKED RJP					CONTRACT NO. 72C12					
PLOT DATE :						ILLINOIS FED. AID PROJECT Klingner & Associates P.C.					



**NOTES:**  
 Bill of Material for 2 end sections.  
 Bar dimensions are out to out.  
 Not to scale or proper orientation.  
 Exposed edges shall be beveled  $\frac{3}{4}$ ".  
 Headwall at 45° skew to culvert  $\perp$ .  
 Minimum bar laps: #5 bar = 2'-2"



**BILL OF MATERIAL**

Bar	No.	Size	Length	Shape
a	38	#7	11'-4"	
b	4	#4	17'-0"	
b1	2	#4	20'-3"	
b2	2	#4	23'-5"	
b3	2	#4	26'-8"	
b4	2	#4	29'-10"	
b5	2	#4	33'-0"	
b6	6	#4	35'-2"	
d	50	#4	5'-4"	
h	2	#4	10'-10"	
h1	2	#4	21'-7"	
h2	8	#4	8'-2"	
h3	8	#4	19'-0"	
h4	8	#6	14'-3"	
h5	8	#7	14'-3"	
h6	28	#4	1'-10"	
h7	50	#4	11'-9"	
s	45	#4	4'-11"	
s1	15	#4	4'-9"	
v	29	#5	17'-1"	
v1	60	#5	7'-4"	
x	84	#4	1'-2"	
x1	12	#5	24'-0"	
Reinforcement Bars			Pound	3,890
Concrete Box Culverts			Cu. Yd.	47.0
Precast Concrete Box Culverts 10' X 6'			Feet	106

REVISED SHEET 12-27-13



Benchmark: Chiseled "□" on south headwall; just west of N. 48th Street and U.S. 24 intersection, Sta. 2255+48.0, 34.0' Lt., Elev. 669.12.  
 Existing Structure: S.N. 001-7098 was originally built as a 39'-6" box culvert at a 3° left ahead skew. The original year of construction is unknown. In 1955 the headwalls were removed and the structure was extended 6'-8" left and 4'-11" right under SBI Route 31, Section (1.2,3)W and (1.2,3)RS. The left extension was constructed at a 45° angle to the original box culvert and the right extension followed the existing 3° skew. In 1970 the headwalls were removed again and the structure was extended 27'-6" left and 27'-6" right under SBI Route 31, Section (1.2,3&4) RS-2. The right extension was constructed at a 45° angle to the original box culvert.  
 The existing structure shall be removed and replaced. The roadway will be closed to all traffic during construction.  
 No Salvage.

**INDEX OF SHEETS**

1. General Plan
2. General Data
3. Culvert Details
4. -
- 5.-6. Boring Logs

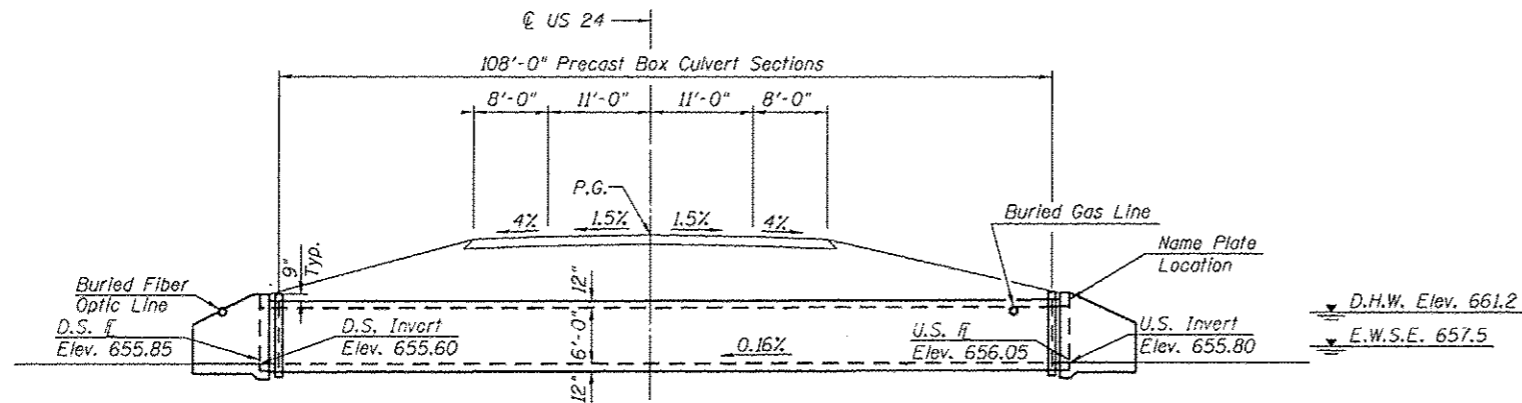
**TOTAL BILL OF MATERIAL**

ITEM	UNIT	TOTAL
Removal of Existing Structures No. 2	Each	1
Rock Excavation for Structures	Cu. Yd.	127
Name Plates	Each	1
Reinforcement Bars	Pound	5,030
Concrete Box Culverts	Cu. Yd.	53.1
Precast Concrete Box Culverts 12' X 6'	Feet	108
Granular Culvert Backfill	Cu. Yd.	1,192

**GENERAL NOTES**

The precast concrete box culverts shall conform to the requirements of ASTM C1577.  
 Contact District Geotechnical Engineer to verify foundation conditions meet plan requirements.  
 For riprap layout and quantity, see Roadway Plans.

\*The cost of Structure Excavation shall be included in the pay item for "Precast Concrete Box Culverts 12' X 6'"  
 \*\* The cost of Cast-In-Place End Sections shall be included in the respective individual pay items.



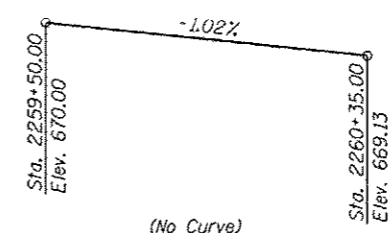
**LONGITUDINAL SECTION**

(Looking West - Dimensions at Rt. L's to @ Roadway unless noted otherwise)

**WATERWAY INFORMATION**

Flood	Freq. Yr.	Q C.F.S.	Opening Sq. Ft.		Head - Ft.		Headwater El.		
			Exist.	Prop.	Exist.	Prop.	Exist.	Prop.	
Design	10	390	50	50	660.2	0.7	0.7	660.9	660.9
Base	100	780	55	70	661.6	5.4	3.4	667.0	665.0
Max. Calc.	500	1,080	55	72	662.5	6.9	6.3	669.3	668.8

10 Year Velocity through Proposed Culvert = 9.1 fps



**PROFILE GRADE**  
(along @ roadway US Rte. 24)

**DESIGN SCOUR ELEVATION TABLE**

Design Scour Elevation (ft.)	Upstream	Downstream
	654.88	654.68

**LOADING HL-93**

Allow 50#/sq. ft. for future wearing surface.

**DESIGN SPECIFICATIONS**

2012 AASHTO LRFD Specifications with 2013 interims

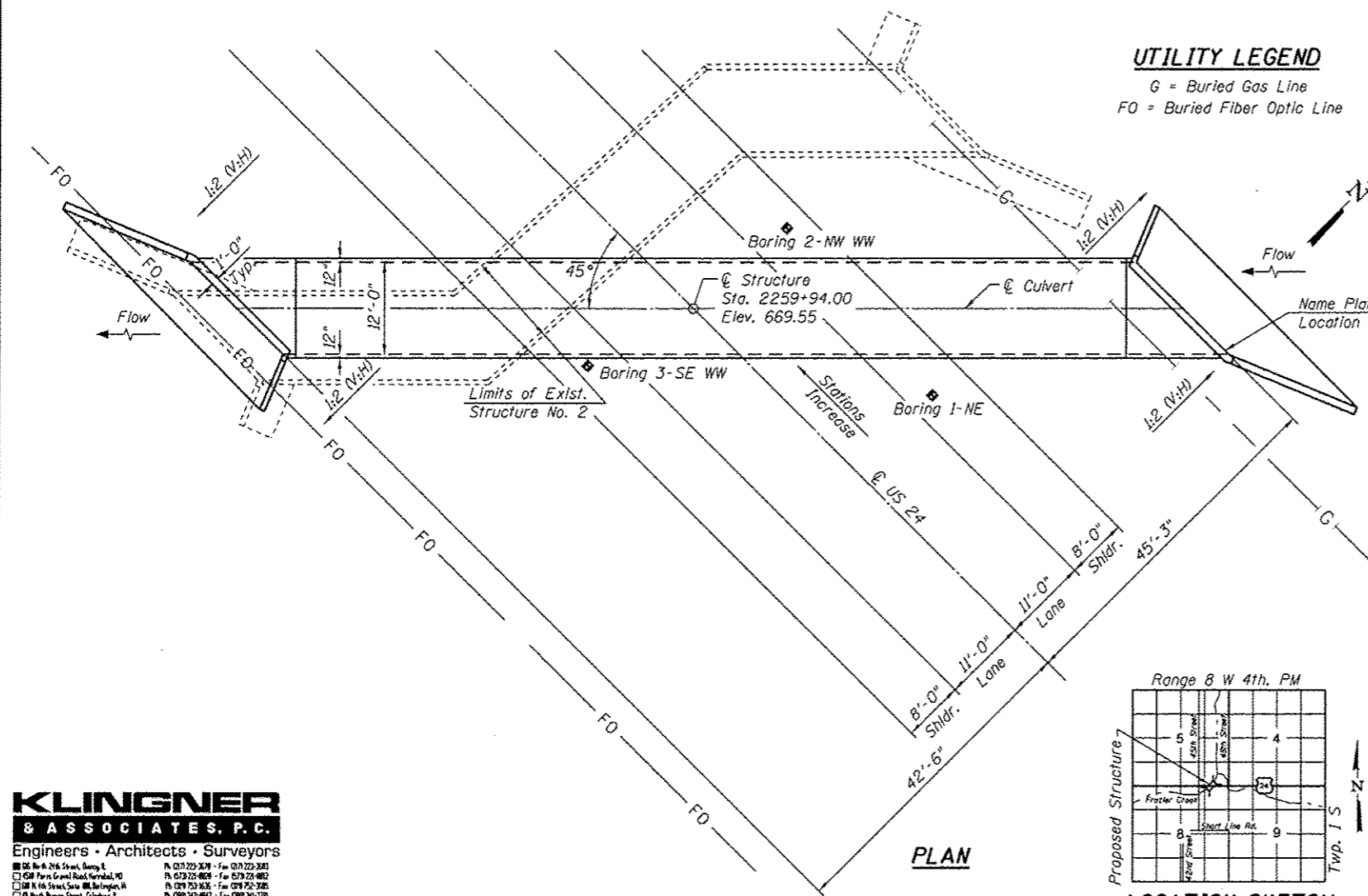
**DESIGN STRESSES**

**FIELD UNITS**

- $f'_c = 3,500$  psi
- $f_y = 60,000$  psi (Reinforcement)
- PRECAST UNITS**
- $f'_c = 5,000$  psi
- $f_y = 65,000$  psi (welded wire fabric)

**UTILITY LEGEND**

- G = Buried Gas Line
- FO = Buried Fiber Optic Line



**PLAN**

STATION 2259+94.00  
 BUILT 2011 BY  
 STATE OF ILLINOIS  
 F.A.P. RTE. 63 SEC. 1(RS-5, CR-1.2.3) 2(RS-6)  
 LOADING HL-93  
 STRUCTURE NO. 001-7130

**NAME PLATE**  
See Std. 515001



Alan D. Lukens  
 Licensed Structural Engineer  
 State of Illinois No. 081-005167  
 License Expires 11/30/2014



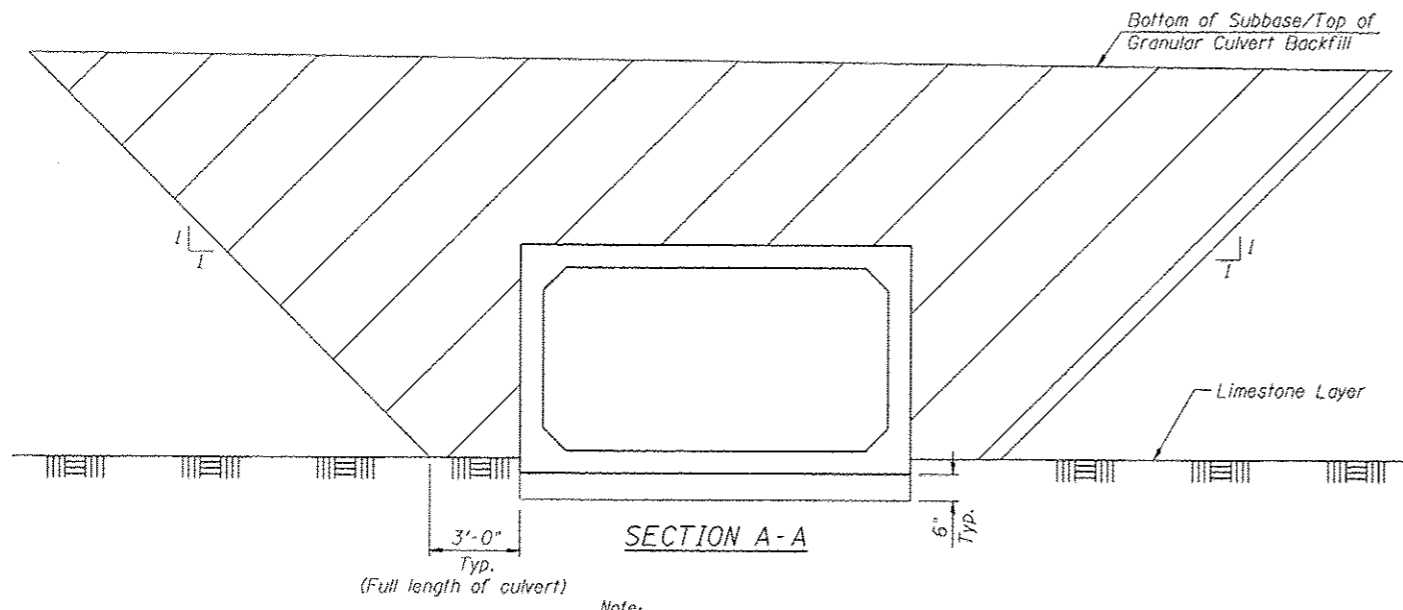
**LOCATION SKETCH**

**GENERAL PLAN & LONGITUDINAL SECTION**  
**US 24 OVER FRAZIER CREEK**  
**F.A.P. ROUTE 63**  
**SECTION 1(RS-5, CR-1.2.3) 2(RS-6)**  
**ADAMS COUNTY**  
**STATION 2259+94.00**  
**S.N. 001-7130**

REVISED SHEET 12-27-13

**KLINGNER & ASSOCIATES, P.C.**  
 Engineers - Architects - Surveyors  
 100 N. W. 216 Street, Quincy, IL 62450  
 1000 Park Grand Road, Normal, IL 62451  
 1000 N. 16 Street, Suite 100, Burlington, IL 62618  
 1000 N. 16 Street, Suite 100, Quincy, IL 62450  
 Internet Address: www.klingner.com  
 STATE OF ILLINOIS DESIGN FIRM # 1842738

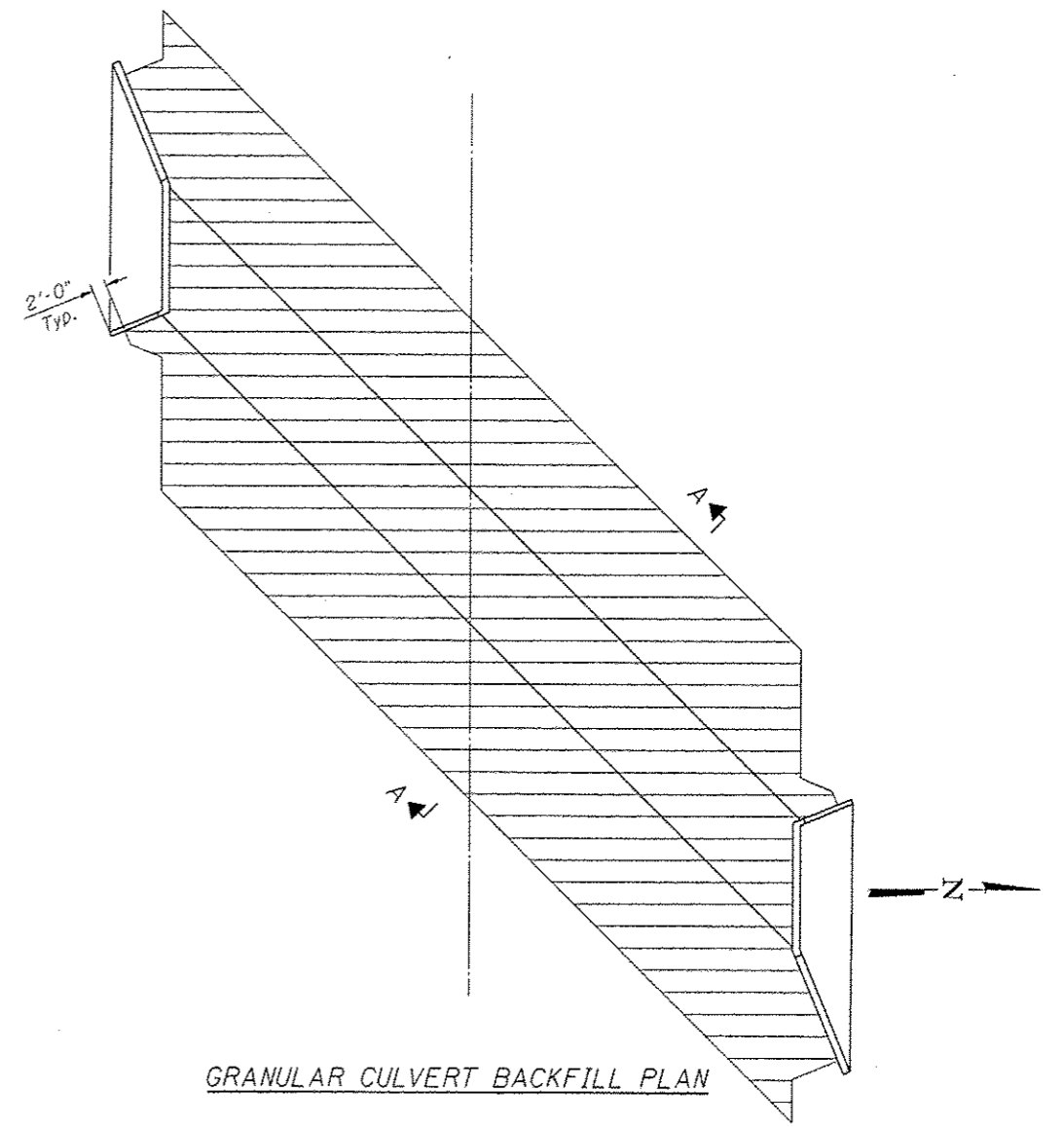
FILE NAME	USER NAME	DESIGNED	REVISIONS	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	GENERAL PLAN STRUCTURE NUMBER 001-7130	F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		RJP	SEB 10-28-13			63	11CR-1, 12CR	ADAMS	43	22
		ADL	SEB 10-30-13							
		RJP								
		ADL								



**SECTION A-A**

Note:  
The area below the box and apron shall be over excavated by 6 inches and filled with CA-7 or CA-11 to provide a level platform. Cost included with Concrete Box Culverts.

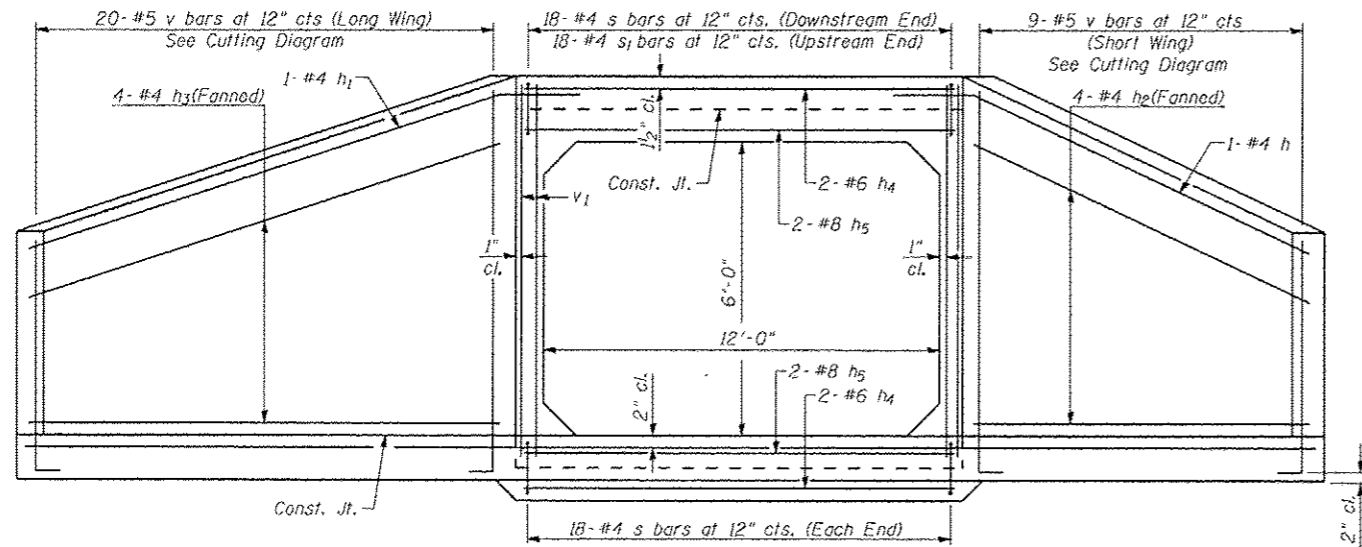
- SEQUENCE OF CONSTRUCTION**
1. Remove existing culvert.
  2. Removal of rock for bottom slab and toewall of culvert.
  3. Construct proposed culvert.
  4. Place Granular Culvert Backfill.
  5. Pave roadway



**GRANULAR CULVERT BACKFILL PLAN**

REVISOR'S MARK (triangle with 'A') REVISED SHEET 12-27-13

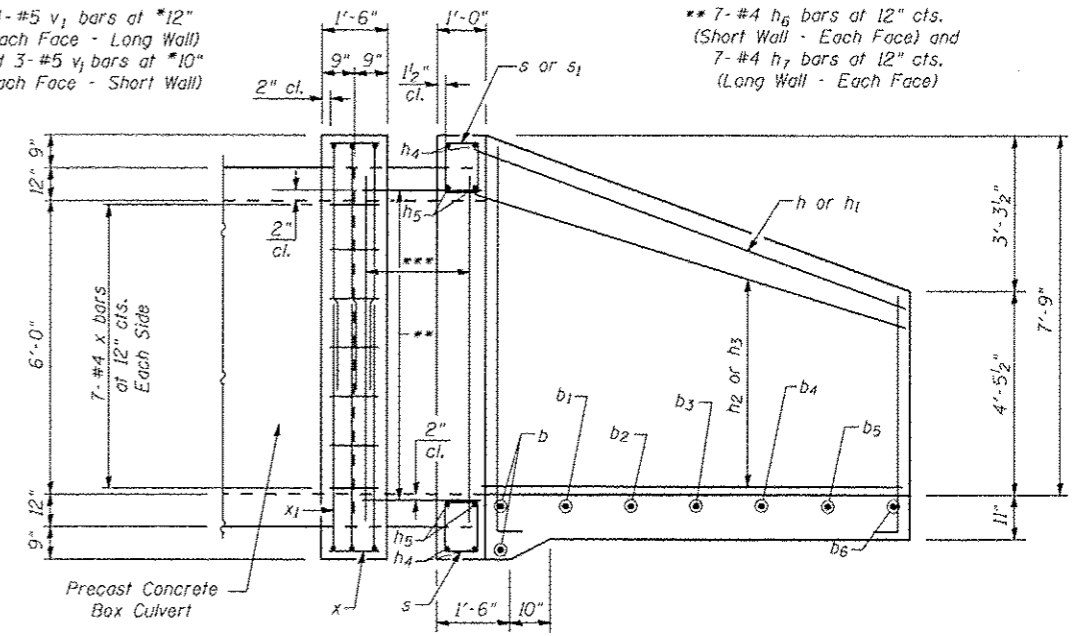
FILE NAME :	USER NAME :	DESIGNED <i>RJP</i>	REVISED <i>SEB 10-25-13</i>	<b>STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION</b>	<b>GENERAL DATA STRUCTURE NUMBER 001-7130</b>	F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	
	CHECKED <i>ADL</i>	REVISOR				63	(1)CR-1, (2)CR	ADAMS	43	23	
PLOT SCALE :	DRAWN <i>RJP</i>	REVISOR				CONTRACT NO. 72C12					
PLOT DATE :	CHECKED <i>ADL</i>	REVISOR				ILLINOIS FED. AID PROJECT Klingner & Associates P.C.					
					SHEET NO. 2 OF 6 SHEETS						



END ELEVATION

\*\*\*14-#5 v<sub>1</sub> bars at \*12"  
(Each Face - Long Wall)  
and 3-#5 v<sub>1</sub> bars at \*10"  
(Each Face - Short Wall)

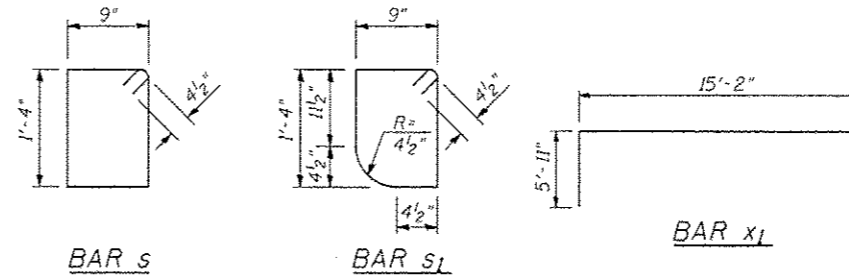
\*\*7-#4 h<sub>6</sub> bars at 12" cts.  
(Short Wall - Each Face) and  
7-#4 h<sub>7</sub> bars at 12" cts.  
(Long Wall - Each Face)



SECTION A-A

NOTES:

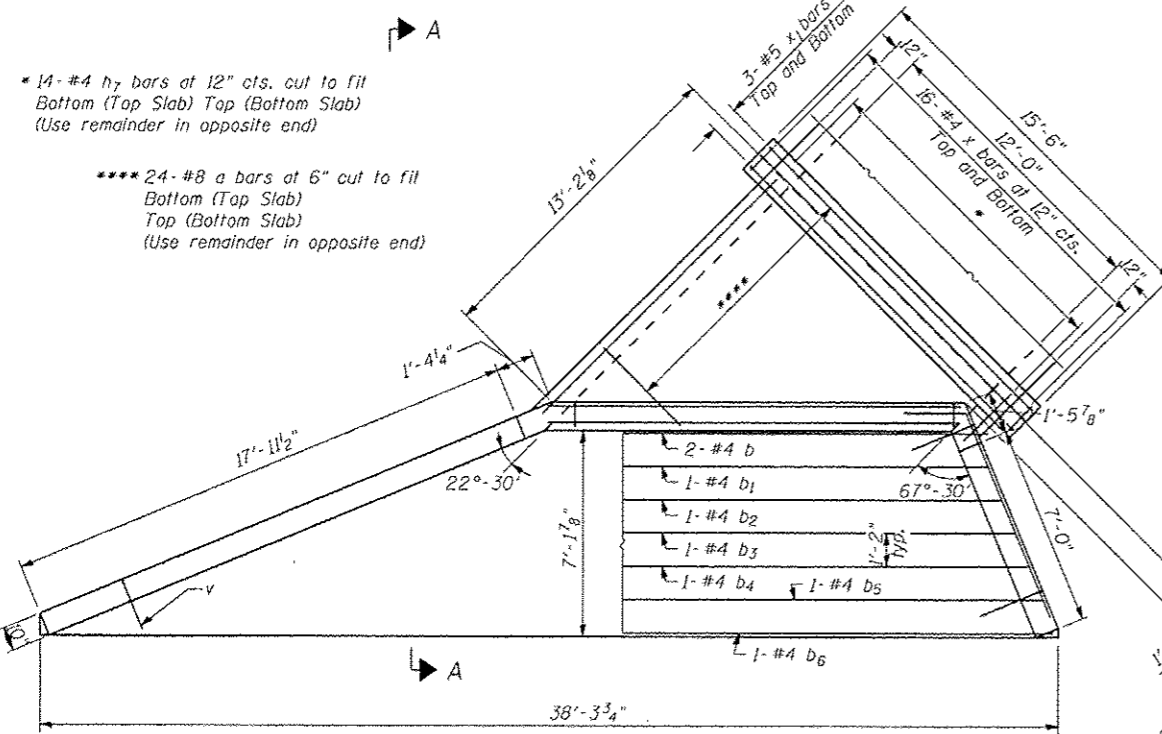
- Bill of Material for 2 end sections.
- Bar dimensions are out to out.
- Not to scale or proper orientation.
- Exposed edges shall be beveled 3/4".
- Headwall at 45° skew to culvert C.
- Minimum bar laps: #5 bar = 2'-2"



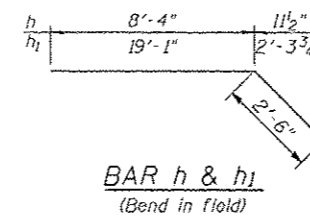
BAR s

BAR s<sub>1</sub>

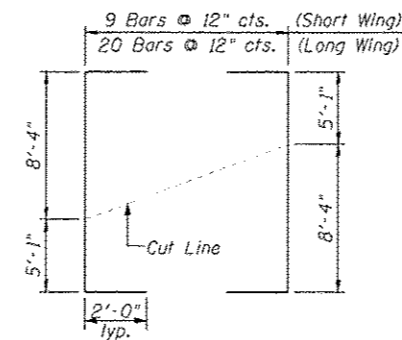
BAR x<sub>1</sub>



PLAN

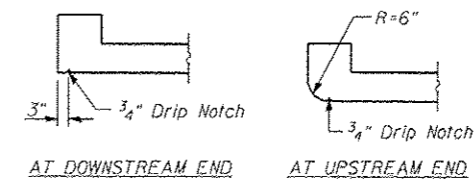


BAR h & h<sub>1</sub>  
(Bend in field)



FIELD CUTTING DIAGRAM

BAR v



SECTION THRU HEADWALL

BILL OF MATERIAL

Bar	No.	Size	Length	Shape
a	48	#8	13'-8"	
b	4	#4	19'-10"	
b <sub>1</sub>	2	#4	23'-1"	
b <sub>2</sub>	2	#4	26'-3"	
b <sub>3</sub>	2	#4	29'-6"	
b <sub>4</sub>	2	#4	32'-8"	
b <sub>5</sub>	2	#4	35'-10"	
b <sub>6</sub>	2	#4	38'-0"	
h	2	#4	10'-10"	
h <sub>1</sub>	2	#4	21'-7"	
h <sub>2</sub>	8	#4	8'-2"	
h <sub>3</sub>	8	#4	19'-0"	
h <sub>4</sub>	8	#6	17'-1"	
h <sub>5</sub>	8	#8	17'-1"	
h <sub>6</sub>	28	#4	1'-10"	
h <sub>7</sub>	56	#4	13'-9"	
s	54	#4	4'-11"	
s <sub>1</sub>	18	#4	4'-9"	
v	29	#5	17'-5"	
v <sub>1</sub>	68	#5	7'-8"	
x	92	#4	1'-2"	
x <sub>1</sub>	12	#5	27'-0"	
Reinforcement Bars			Pound	5,030
Concrete Box Culverts			Cu. Yd.	53.1
Precast Concrete Box Culverts 12' X 6'			Feet	108

REVISED SHEET 12-27-13

FILE NAME :	USER NAME :	DESIGNED RJP	REVISED SEB 10-25-13
D:\BBS\files\088224\101 - US 24 over F...	...	CHECKED ADL	REVISED SEB 10-30-13
PLOT SCALE :		DRAWN RJP	REVISED
PLOT DATE :		CHECKED ADL	REVISED

STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION

CULVERT DETAILS  
STRUCTURE NUMBER 001-7130

SHEET NO. 3 OF 6 SHEETS

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
63	(11CR-1, 12)CR	ADAMS	43	24
				CONTRACT NO. 72C12

ILLINOIS FED. AID PROJECT  
Klingner & Associates P.C.