

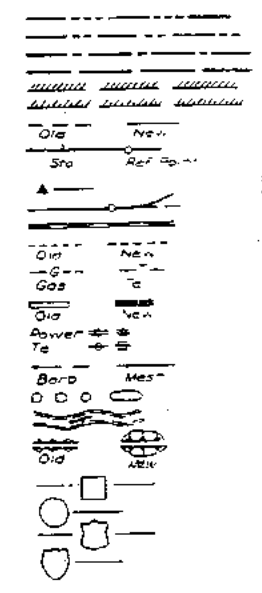
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**CRAWFORD COUNTY**  
 PROJECT NO. BROS-9024(17)--5F-24  
 Design No. 785  
 Design No. 685  
 18'-7"x12'-0"x118' STRUCTURAL PLATE PIPE ARCH CULVERT  
 96"x76' C.M.P. CULVERT

LETTING DATE FEB. 18, 1986

- State Line  
 Co. Line  
 Twp. Line  
 Sec. Line  
 Corp. Line  
 Urban Bars  
 R.O.W. Lines  
 Survey Line
- Sec. Corner  
 Profile Grade  
 Railroad  
 Field Tile  
 Underground Lines
- Culverts  
 Utility Poles  
 Fence  
 Trees Or Brush  
 Stream  
 Dike
- County Road No.  
 Primary Road No.  
 U. S. Road No.  
 Interstate Road No.

CONVENTIONAL SIGNS



IOWA  
 DEPARTMENT OF TRANSPORTATION

Highway Division

PLANS OF PROPOSED IMPROVEMENT ON THE

FARM TO MARKET SYSTEM  
 CRAWFORD COUNTY

PROJECT NO. BROS-9024(17)--5F-24  
 18'-7"x12'-0"x118' STRUCTURAL PLATE PIPE ARCH CULVERT  
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 96"x76' C.M.P. CULVERT

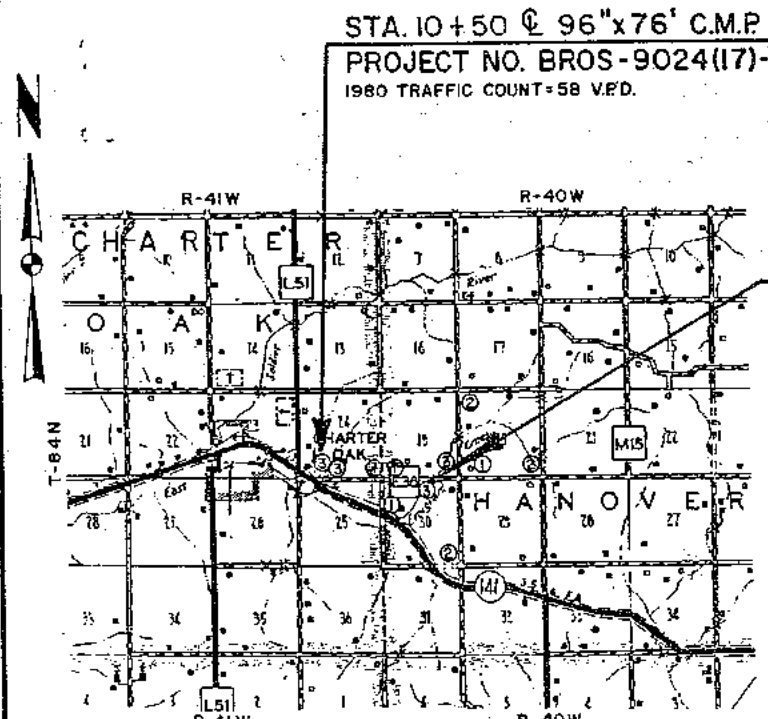
THE STANDARD SPECIFICATIONS, SERIES OF 1984,  
 OF THE IOWA DEPARTMENT OF TRANSPORTATION,  
 SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT  
 PLUS CURRENT SPECIAL PROVISIONS AND SUPPLEMENTAL SPECIFICATIONS

STATE	FED. ROAD DIST. NO.	ROUTE	SECTION	SHEET	TOTAL SHEETS
IOWA				1	7
PROJECT NUMBER					
BROS-9024(17)--5F-24					
FHWA NO. 129720 (DESIGN 685 AND 785)					
FHWA NO. 129490 (DESIGN 785)					

INDEX OF SHEETS	
NO.	DESCRIPTION
1	TITLE PAGE, INCLUDING CONVENTIONAL SIGNS, LOCATION MAP, MILEAGE SUMMARY, TRAFFIC CONTROL PLAN.
2	ESTIMATE OF QUANTITIES.
3	PLAN AND PROFILE SHEET FOR 96"x76' C.M.P. CULVERT TYPICAL CROSS SECTION DESIGN NO.
4	DESIGN SHEET FOR 96"x76' C.M.P. CULVERT
5	PLAN AND PROFILE SHEET FOR 18'-7"x12'-0"x118' STRUCTURAL PLATE PIPE ARCH CULVERT TYPICAL CROSS-SECTION DESIGN NO.
6	DESIGN SHEET FOR 18'-7"x12'-0"x118' STRUCTURAL PLATE PIPE ARCH CULVERT TYPICAL CROSS SECTION DESIGN NO.
7	520-26 SIGNING FOR TEMPORARY ROAD CLOSURES IN RURAL AREAS.

MILEAGE SUMMARY			
Sta. No.	LOCATION	LINE FT.	MILES
	STA. 14+00 TO 16+00	1500.00	0.284
	STA. 54+00 TO 64+00	1000.00	0.189

STANDARD PLANS					
The following Standard Plans shall be considered applicable to construction work on this project.					
IDENT	DATE	IDENT	DATE	IDENT	DATE
RF-21	11-22-74				



STA. 10+50 @ 96"x76' C.M.P. CULVERT 20° Lt. Ahead Skew  
 PROJECT NO. BROS-9024(17)--5F-24 Design No. 685  
 1980 TRAFFIC COUNT=58 V.P.D.

STA. 59+00 @ 18'-7"x12'-0"x118' STRUCTURAL PLATE PIPE ARCH CULVERT  
 35° Lt. Ahead Skew. PROJECT NO. BROS-9024(17)--5F-24 Design No. 785  
 1980 TRAFFIC COUNT=58 V.P.D.

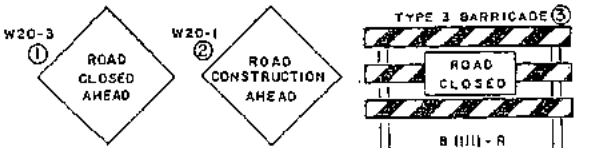
129491

ALL ADVANCED WARNING SIGNS, TYPE III BARRICADES, AND OTHER TRAFFIC CONTROL DEVICES FOR THIS PROJECT SHALL BE LOCATED AT THE BEGINNING AND END OF THE PROJECT, AND WHERE THE ROAD FOR CONSTRUCTION INTERSECTS OTHER PUBLIC ROADS AND SHALL INCLUDE ALL OTHER BARRICADES AND WARNING SIGNS NECESSARY TO PROTECT THE CONTRACTOR'S WORK AND EQUIPMENT, FOR THE PROVIDING FOR THE SAFETY OF THE TRAVELING PUBLIC. AND ALL SIGNS, BARRICADES, AND OTHER TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS", 1978.

THE LUMP SUM BID PRICE FOR TRAFFIC CONTROL SHALL INCLUDE THE FURNISHING, PLACING, MAINTENANCE AND REMOVAL BY THE CONTRACTOR.

THIS ROAD WILL BE CLOSED TO THROUGH TRAFFIC DURING CONSTRUCTION. LOCAL TRAFFIC TO ADJACENT PROPERTIES WILL BE MAINTAINED AS PROVIDED FOR IN ARTICLE 1207.06, 1984 STANDARD SPECIFICATIONS. TRAFFIC CONTROL DEVICES, PROCEDURES AND LAYOUTS SHALL BE AS PER PLAN SPECIFICATIONS FOR TRAFFIC CONTROL FOR STREET AND HIGHWAY CONSTRUCTION AND MAINTENANCE OPERATIONS, SPECIFICATION 1012.

SIGN TABULATION	
Type	Quantity
① W20-3	FOUR
② W20-1	THREE
③ B(III)-R	EIGHT



APPROVED

*[Signature]*  
*[Signature]*  
*[Signature]*  
*[Signature]*  
 BOARD OF SUPERVISORS

IOWA DEPARTMENT OF TRANSPORTATION  
 HIGHWAY DIVISION  
 AUTHORIZED FOR LETTING

DISTRICT LOCAL SYSTEMS ENGINEER DATE

DEPARTMENT OF TRANSPORTATION  
 IOWA  
 Highway Division

AUTHORIZED FOR LETTING  
*[Signature]* 1-3-86  
 DEPUTY CHIEF ENGINEER DATE

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED UNDER MY SUPERVISION AND THAT ENGINEERING DECISIONS WITH REGARD TO THE DESIGN WERE MADE BY ME OR BY OTHER DULY REGISTERED PROFESSIONAL ENGINEERS UNDER THE LAWS OF THE STATE OF IOWA.

*[Signature]* April 15, 1985  
 IOWA REGISTRATION NUMBER 5798 DATE

U.S. DEPT. TRANSPORTATION  
 FEDERAL HIGHWAY ADMINISTRATION

DIVISION ENGINEER DATE

**ESTIMATE OF QUANTITIES**

IN LETTING OF FEB. 17, 1986	PROJECT NO. BROS-9024 (17)--5F-24	LOCATION			DESCRIPTION TYPE AND SIZE	FURNISH AND PLACE LIN. FT.				CONCRETE STRUCT. CLASS "C" CU. YDS.	STEEL REINFORCING LBS.	GRANULAR BACKFILL TONS	EXCAVATION CLASS "10" CHANNEL CU. YDS.	EXCAVATION CLASS "20" RDWY. PIPE CU. YDS.	EXCAVATION CLASS "10" RDWY. & BORR. CU. YDS.	TOPSOIL STRIP, SALVAGE & SPREADING CU. YDS.	CLEARING AND GRUBBING % SCHE.	REMOVAL OF EXISTING STRUCTURES LUMP SUM	MOBILIZATION LUMP SUM
		SEC.	TWP.	STATION		CULVERT STRUCT. PLATE PIPE ARCH	CULVERT CORRUGATED METAL ROADWAY	CULVERT CORR. METAL RDWY. PIPE	CULVERT CORR. METAL ENTRANCE										
						223" X 144" DIA.	96" DIA.	24" DIA.	24" DIA.										
DESIGN NO. 685	BET. 24-25	T-84N R-41W	10+50	96" X 76" C.M.R. CULVERT 20° LT. AHEAD SKEW 3" X 1/2" CORR., 12 GAGE	---	76.0	96.0	70.0	16.8	1,609	129	---	112	6,271	1,000	---	LUMP SUM	LUMP SUM	
DESIGN NO. 785	BET. 19-30	T-84N R-40W	53+00	18'-7" X 12'-0" X 118" STRUCTURAL PLATE PIPE ARCH CULVERT 35° LT. AHEAD SKEW 8 GAGE.	95.1	---	46.0	64.0	46.1	3,611	448	484	973	10,109	1,496	\$ 50.00	LUMP SUM	LUMP SUM	
				<b>TOTAL</b>	① 95.1	② 76.0	③ 142.0	④ 134.0	62.9	5,220	⑤ 577	484	⑥ 1,085	⑦ 16,380	⑧ 2,496	\$ 50.00	LUMP SUM	LUMP SUM	

**ESTIMATE OF QUANTITIES CONT.**

	TRAFFIC CONTROL	RIP RAP CLASS "D"	ELBOWS, CORR. METAL PIPE 24" DIA.	SURFACING, GRANULAR CLASS C, ON ROAD
	LUMP SUM	TONS	NO.	TONS
DESIGN NO. 685	LUMP SUM	---	3	334
DESIGN NO. 785	LUMP SUM	70	1	226
<b>TOTAL</b>	LUMP SUM	70	4	⑨ 560

**NOTES: BROS-9024(17)--5F-24**

- ① CENTERLINE PAY LENGTH. HOOK BOLTS, AS PER PLAN, SHALL BE CONSIDERED INCIDENTAL TO FURNISHING AND PLACING OF STRUCTURAL PLATE PIPE ARCH CULVERT. INCLUDES 1 TEE FABRICATED INTO STRUCTURAL PLATE PIPE ARCH CULVERT AS SHOWN.
- ② CENTERLINE PAY LENGTH. HOOK BOLTS, AS PER PLAN, SHALL BE CONSIDERED INCIDENTAL TO FURNISHING AND PLACING OF CORRUGATED METAL PIPE CULVERT. INCLUDES 2 TEES FABRICATED INTO CORRUGATED METAL PIPE CULVERT.
- ③ 16 GAGE, RIVETED PIPE ONLY, 2' BANDS REQUIRED. INCLUDES 1-8° ELBOW, 1-10° ELBOW, 2-25° ELBOWS AND 3 TEES.
- ④ 16 GAGE, RIVETED PIPE ONLY, 2' BANDS REQUIRED.
- ⑤ BID PRICE FOR GRANULAR BACKFILL SHALL BE CONSIDERED FULL PAYMENT FOR ALL MATERIALS AND WORK INCORPORATED WITHIN THE BEDDING AREA. FURNISH AND PLACING CRUSHED STONE AS PER PLANS, PROVISIONS AND SPECIFICATIONS. GRANULAR MATERIAL SHALL BE CLASS "A" CRUSHED STONE AND SHALL MEET THE REQUIREMENTS OF 4120.04 OR CLASS "B" CRUSHED STONE AND SHALL MEET THE REQUIREMENTS OF 4120.05.
- ⑥ INCLUDES EXCAVATION FOR PLACEMENT OF RIP RAP.
- ⑦ TYPE "A" COMPACTION REQUIRED. NO OVERHAUL ALLOWED.
- ⑧ ON ALL BORROW BEYOND 45' RIGHT OF WAY, SALVAGE 8" TOPSOIL AND RESPREAD AFTER GRADING IS COMPLETED.
- ⑨ GRAVEL SHALL MEET THE REQUIREMENTS OF CLASS C GRAVEL IN ACCORDANCE WITH ARTICLE 4120.03. SHALL INCLUDE THE COST OF THE SPREADING OF GRAVEL ON ROAD SURFACE.

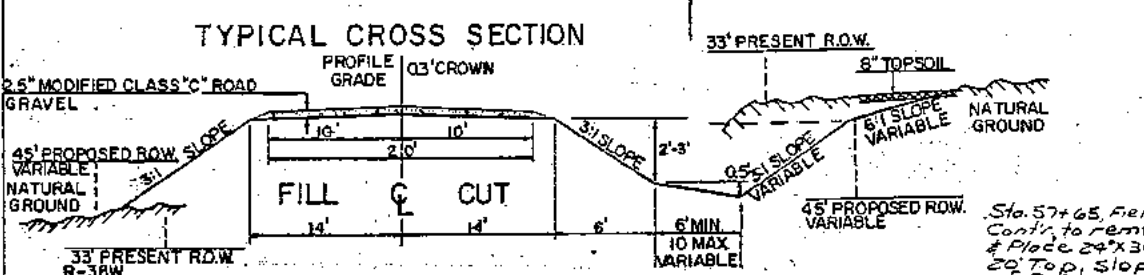
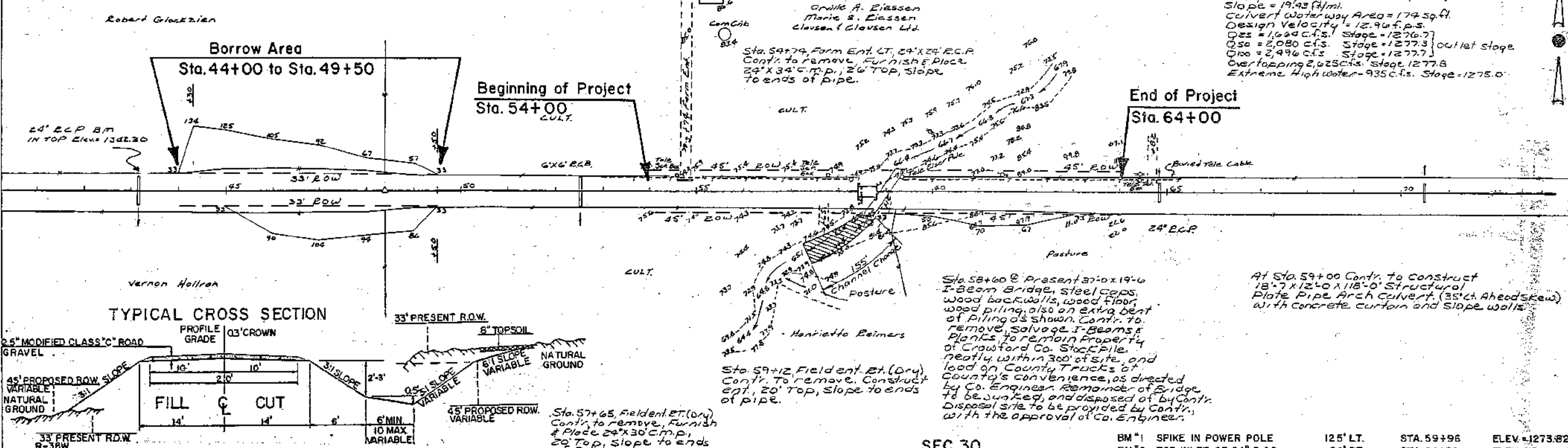
NOTE: CROSS SECTIONS FOR THIS PROJECT ARE AVAILABLE AT THE COUNTY ENGINEER'S OFFICE.

NOTE: ANY INCONVENIENCE INCURRED BY THE ROAD CONTRACTOR DUE TO ARCHAEOLOGICAL WORK SHALL BE CONSIDERED INCIDENTAL TO CLASS "10" ROADWAY AND BORROW.

NOTE: IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE WASTE AREAS OR DISPOSAL SITES FOR EXCESS MATERIAL WHICH IS NOT DESIRABLE TO BE INCORPORATED IN THE WORK INVOLVED ON THIS PROJECT. NO PAYMENT FOR OVERHAUL WILL BE ALLOWED FOR MATERIAL HAULED TO THESE SITES.

HANOVER TOWNSHIP  
T-84N R-40W  
SEC.19

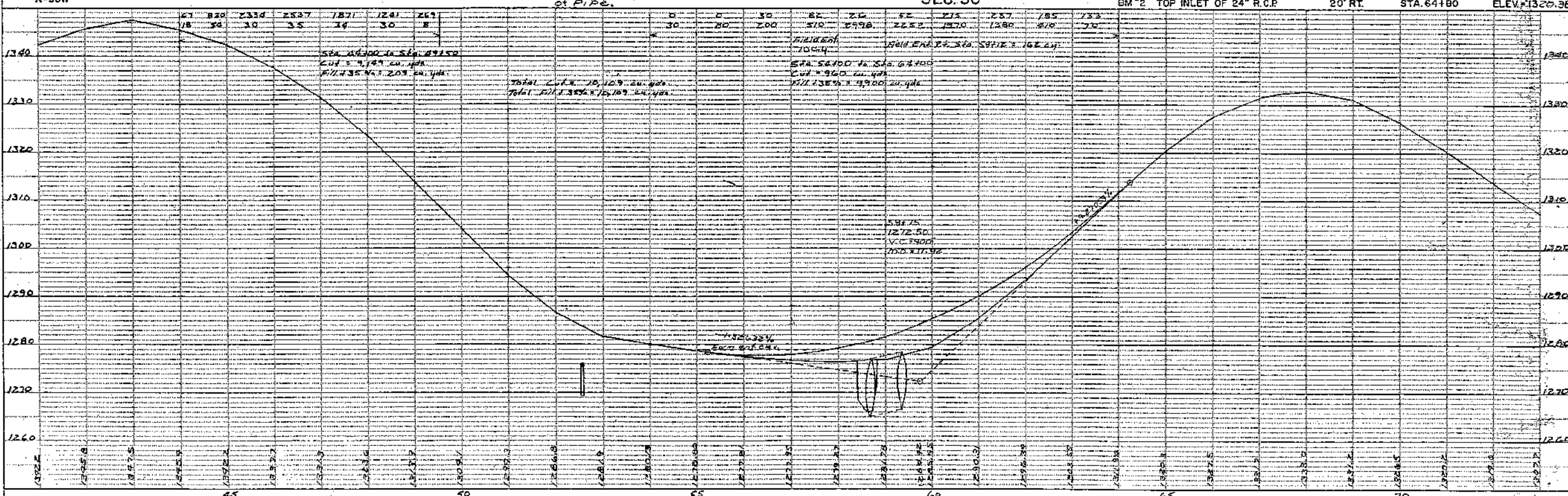
Hydraulic Data  
 Drainage Area = 3,180 Ac. (4.97 sq. mi.)  
 Design Discharge  $Q_{25} = 1,664$  c.f.s.  
 Design High Water = 1278.0 (inlet)  
 Slope = 19.43 ft/mi.  
 Culvert Waterway Area = 174 sq. ft.  
 Design Velocity = 12.96 ft. p.s.  
 $Q_{25} = 1,664$  c.f.s. Stage = 1276.7  
 $Q_{50} = 2,080$  c.f.s. Stage = 1277.3 } outlet stage  
 $Q_{100} = 2,496$  c.f.s. Stage = 1277.7  
 Overlapping 2,425 c.f.s. Stage 1277.8  
 Extreme High Water - 935 c.f.s. Stage = 1275.0



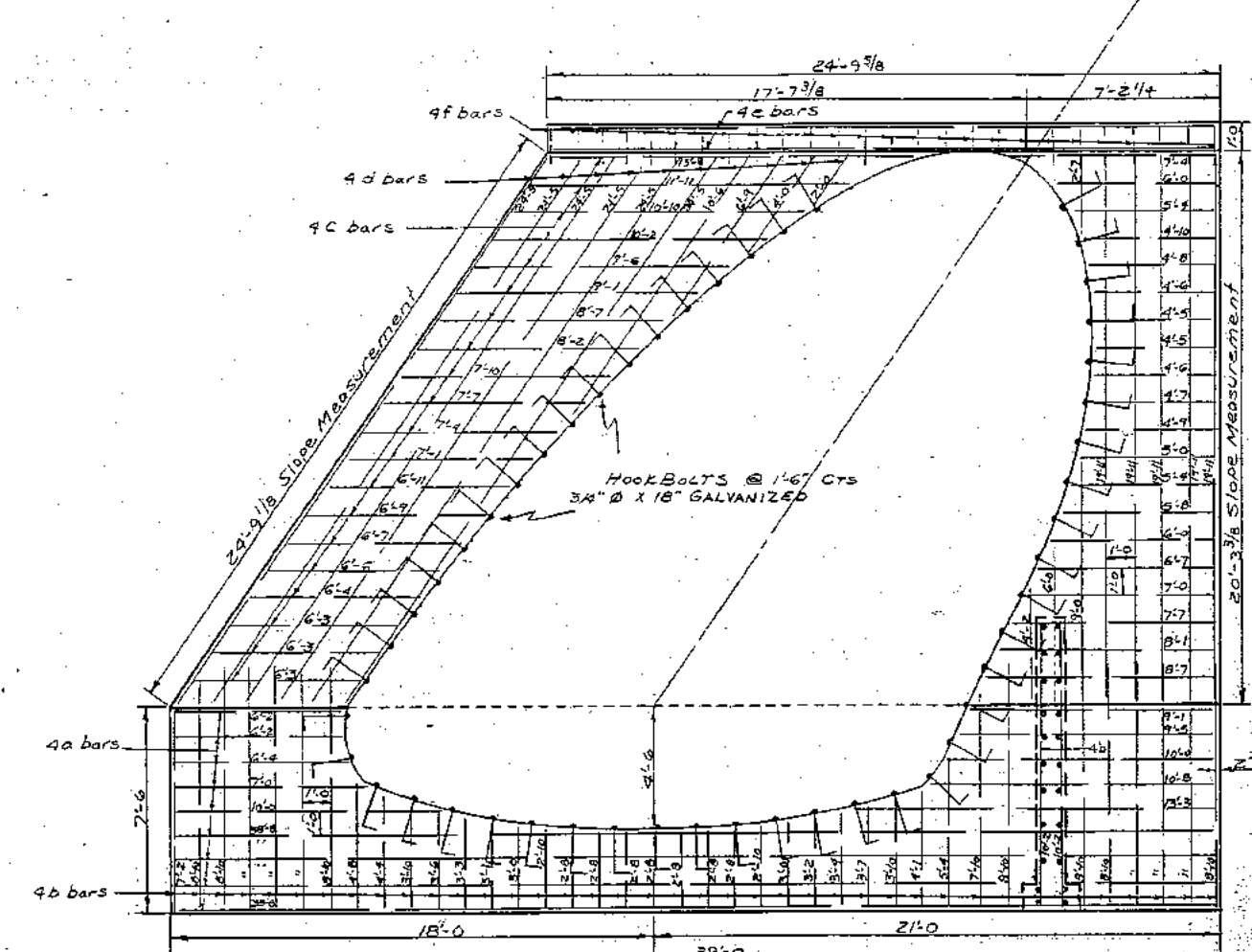
Sta. 57+65 Field ent. Pt. (Dry)  
 Contr. to remove, furnish  
 & Place 24\"/>

Sta. 58+00 @ Present 37'-0\"/>

At Sta. 59+00 Contr. to construct  
 18'-7\"/>



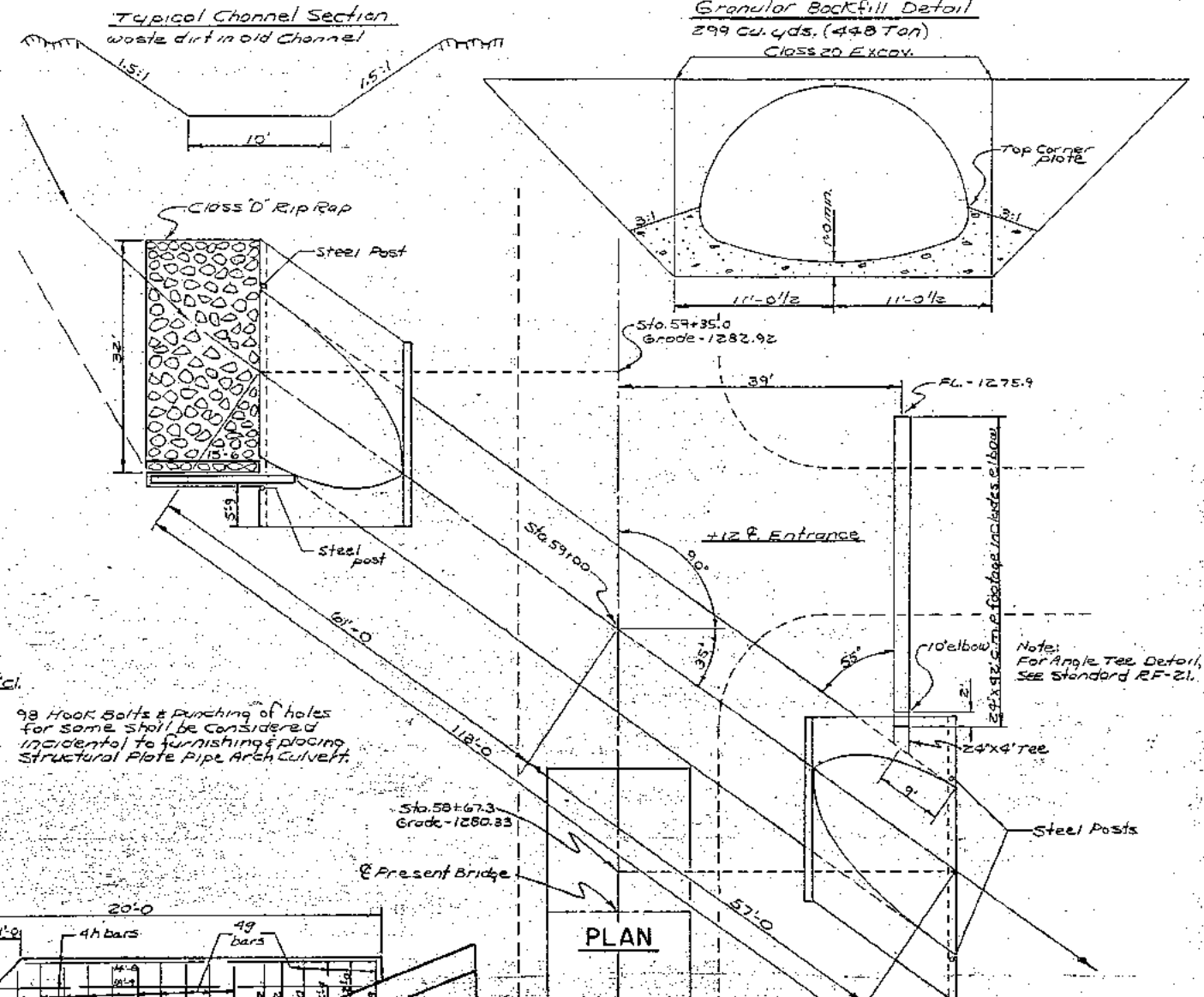
BM. No. SPICE in Power Pole 125' Lt. Sta. 59+96 Elev. - 1273.82



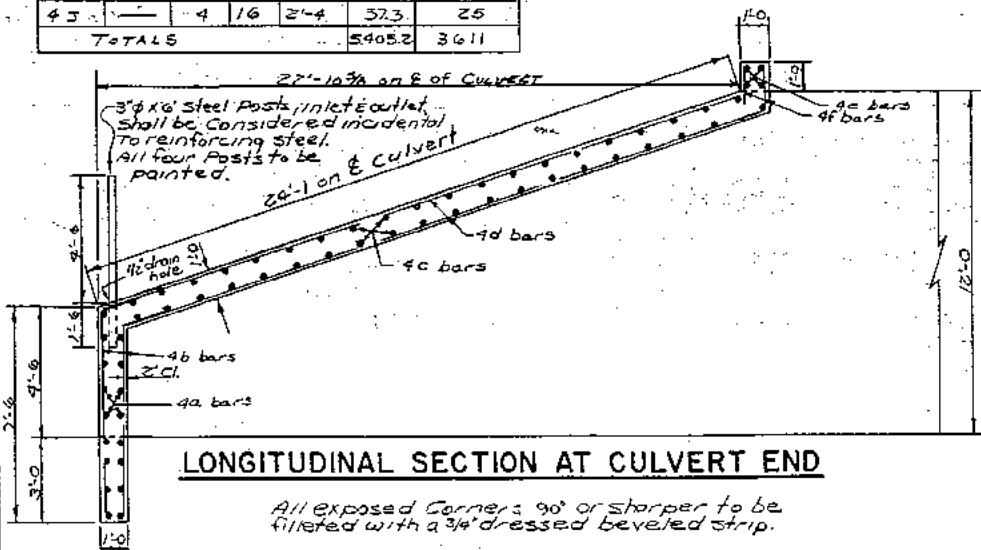
**END ELEVATION**

REINFORCING STEEL - INLET & OUTLET HEADWALLS						
MARK	SHAPE	SIZE	No.	LENGTH FEET	LINEAR FEET	WEIGHT LBS.
4a	—	4	52	SHOWN	940.8	628
4b	—	4	160	SHOWN	900.7	602
4c	—	4	160	SHOWN	1115.0	745
4d	—	4	76	SHOWN	1144.3	778
4e	—	4	16	24'-5"	390.7	261
4f	—	4	104	SHOWN	144.0	96
4g	—	4	38	SHOWN	316.2	211
4h	—	4	26	SHOWN	396.5	265
4j	—	4	16	2'-4"	52.3	25
<b>TOTALS</b>					<b>5405.2</b>	<b>3611</b>

Class C Structural Concrete Inlet & Outlet Headwalls  
46.1 cu. yds.

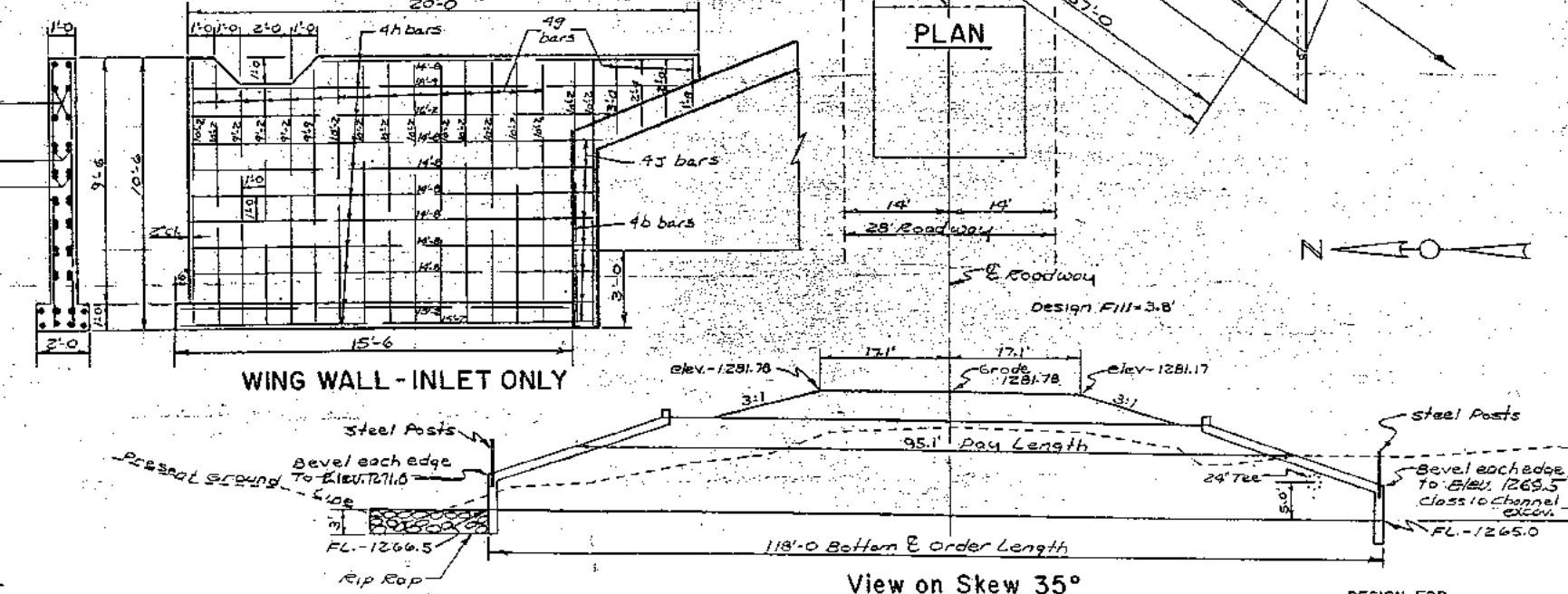


**PLAN**



**LONGITUDINAL SECTION AT CULVERT END**

All exposed corners 90° or sharper to be filleted with a 3/4" dressed beveled strip.

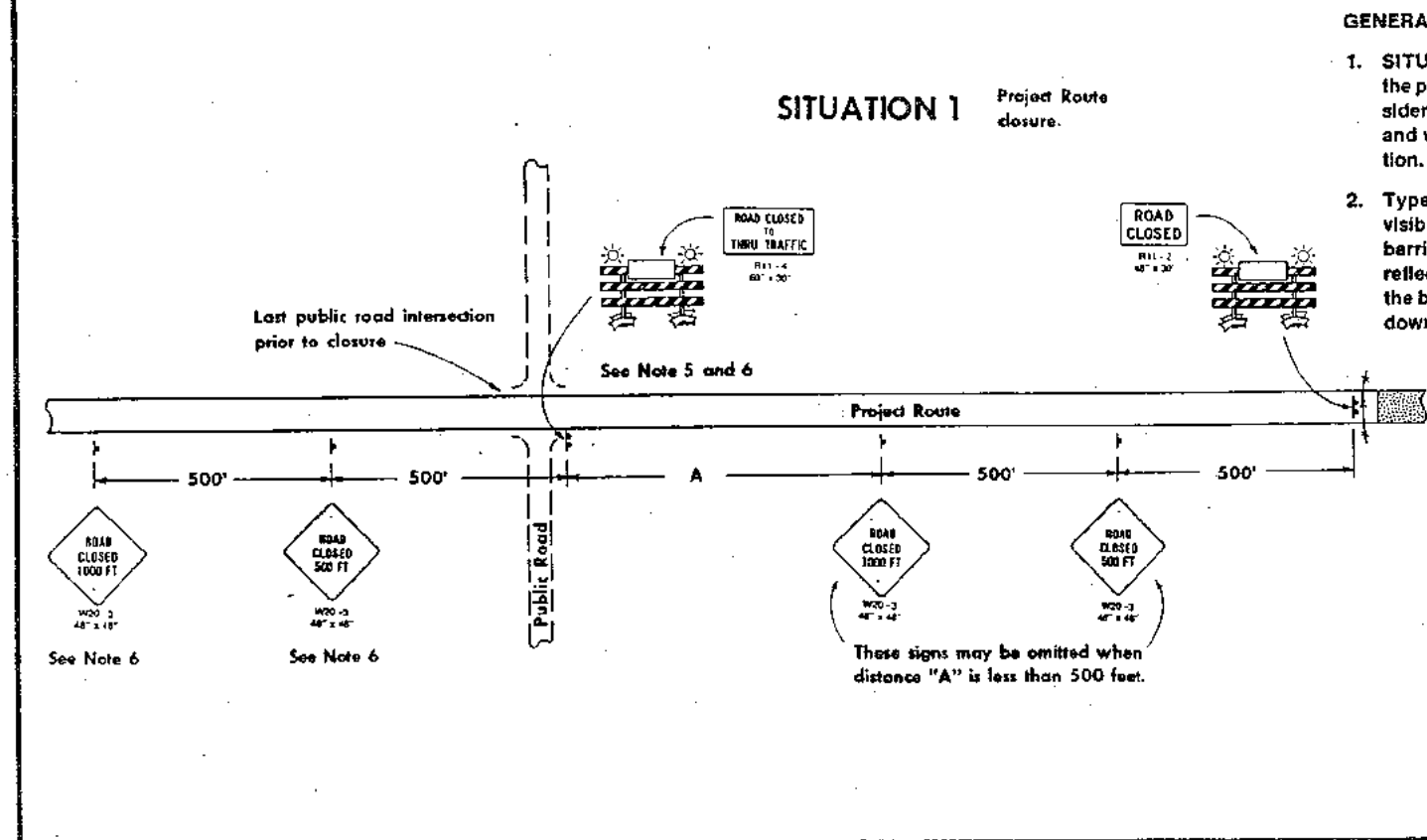
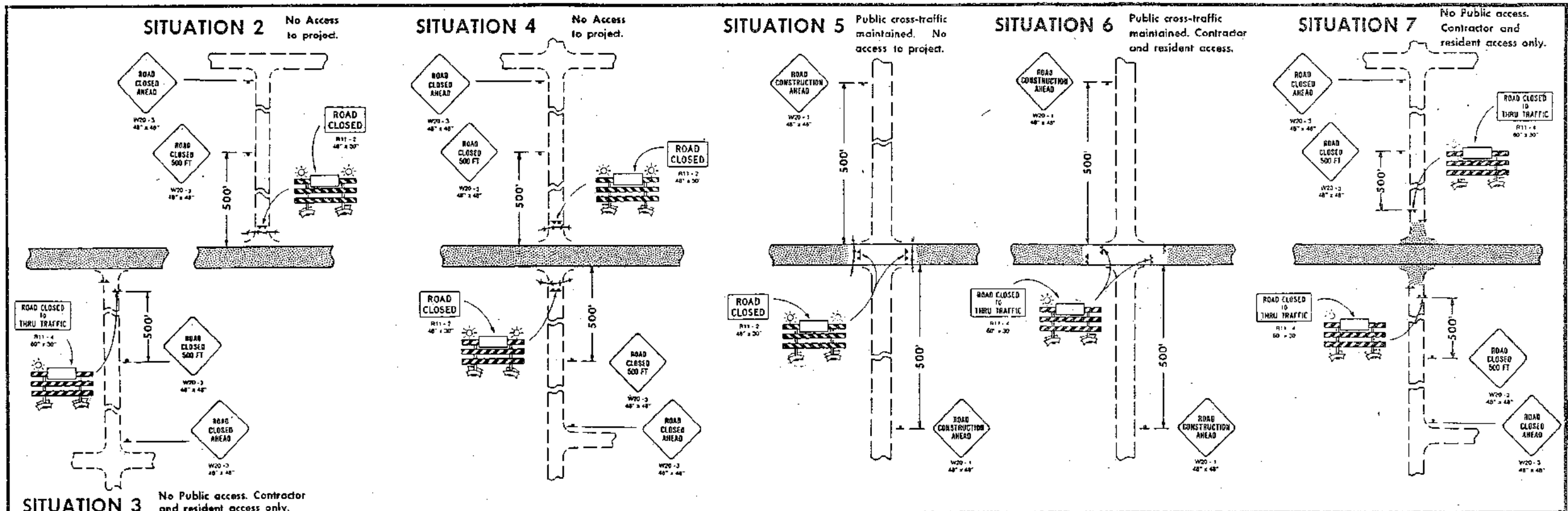


**WING WALL - INLET ONLY**

**LONGITUDINAL SECTION ALONG CULVERT**

View on Skew 35°

DESIGN FOR  
18'-7"x12'-0"x118' STRUCTURAL PLATE PIPE  
ARCH CULVERT 35° SKEW BETWEEN  
SECTIONS 19-30 T-84N, R-40W OVER  
EMIGRANT CREEK



**GENERAL NOTES**

- SITUATION 1 illustrates traffic control necessary to close the project route. SITUATIONS 2 through 7 are for signing of sideroads based on existing agreements and field conditions and will be selected by the engineer in charge of construction.
- Type "A" Low Intensity Flashing Warning Lights shall be visible to both directions of traffic. The back side of the barricade shall be reflectorized by a minimum of six yellow reflectors, one at each end of each rail, or at least one rail on the barricade will show reflectorized stripes properly sloped down toward the traffic side.
- All "Stop" and other regulatory signs on the sideroads are not to be disturbed. If a "Stop" or other regulatory sign must be removed, it will be relocated by the Contracting Authority.
- This layout does not include all barricades as may be required by Section 2518 of the Standard Specifications.
- In Situation 1, when distance "A" is less than 500 feet the barricade should be placed in the middle of the traffic lane approaching the work area. In this case, Note 2 shall apply. The barricade may be omitted if the distance to the work area is less than 400 feet.
- In Situation 1, if the intersection is the point of detour these two signs and barricade will become the responsibility of the contracting authority and may be modified by the contracting authority to fit detour signing.

**LEGEND**

- ▶ Traffic Sign
- ▬ Type III Barricade (Type "A" Low Intensity Flashing Warning Light Required for Nighttime Use)
- ☀ Type "A" Low Intensity Flashing Warning Light
- Work Area
- \*\*\* Slat Fence Barricade or Orange Plastic Safety Fence

**DETAIL SHEET** 520-26

Revision Date 1-23-85

**SIGNING FOR TEMPORARY ROAD CLOSURES IN RURAL AREAS (PROJECT ROUTE CLOSED TO TRAFFIC)**