

**IOWA**  
**DEPARTMENT OF TRANSPORTATION**  
**Highway Division**

PLANS OF PROPOSED IMPROVEMENT ON THE

**FARM TO MARKET SYSTEM**  
**CRAWFORD COUNTY**

PROJECT NO. BRS-3230(1)--60-24  
TWIN 12'X8'X61'-0" R.C.B.

SCALES AS NOTED

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

INDEX OF SHEETS	
NO.	DESCRIPTION
1	TITLE PAGE, INCLUDING CONVENTIONAL SIGNS, LOCATION MAP, ESTIMATE OF QUANTITIES, AND MILEAGE SUMMARY.
2	PLAN AND PROFILE, AND TYPICAL CROSS SECTION.
3	GENERAL LAYOUT AND DETAILS.
4	16'-0 END SECTION DETAILS.
5	29'-0 INTERMEDIATE SECTION DETAILS.
6	520-26 SIGNING FOR TEMPORARY ROAD CLOSURES IN RURAL AREAS.

CROSS SECTIONS AVAILABLE AT COUNTY ENGINEERS OFFICE.

MILEAGE SUMMARY			
DIV.	LOCATION	LIN. FT.	MILES
	STA. 240+00 TO STA. 262+00	2,200	0.417

IN LETTING OF MAY 7, 1985	LOCATION				ESTIMATE OF QUANTITIES												
	DESIGN NO.	SEC.	TOWNSHIP	STATION	TYPE AND SIZE	CONCRETE STRUCTURAL CLASS "C"	STEEL REINFORCING	EXCAVATION CLASS "20"	EXCAVATION CLASS "10" ROADWAY & BORROW	EXCAV. CLASS "10" CHANNEL	STRIP, SALVAGE AND SPREAD TOPSOIL	GRANULAR BACKFILL	CULVERT CORR. METAL, ENT. PIPE 30' DIA.	CULVERT CORR. METAL, ENT. PIPE 24' DIA.	TRAFFIC CONTROL	REMOVAL OF EXISTING STRUCTURE	MOBILIZATION
	984	25 a 26	T-83 N R-37 W	248+35	TWIN 12'X8'X61'-0" R.C.B. 30° LT. AHEAD SKEW	CU. YDS.	LBS.	CU. YDS.	CU. YDS.	CU. YDS.	CU. YDS.	TONS	L.F.	L.F.	LUMP SUM	LUMP SUM	% OF ESTIMATE
						241.4	39,917	593	8,575	272	877	190	64.0	30.0	LUMP SUM	LUMP SUM	\$1,000.00

- ① TYPE "A" COMPACTION REQUIRED. NO OVERHAUL ALLOWED.
- ② ON ALL BORROW BEYOND 50' RIGHT OF WAY SALVAGE TOPSOIL 8" AND RESPREAD AFTER GRADING IS COMPLETED.
- ③ BID PRICE FOR GRANULAR BACKFILL SHALL BE CONSIDERED FULL PAYMENT FOR ALL MATERIALS AND WORK INCORPORATED WITHIN THE BEDDING AREA. FURNISH AND PLACE CRUSHED STONE AS PER PLAN, 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.
- ④ 16 GAGE, RIVETED PIPE ONLY, 2' BANDS REQUIRED.

NOTES: IT SHALL BE THE CONTRACTORS 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.

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

**STA. 248+35 TWIN 12'X8'X61'-0" R.C.B. (30° Lt. ahead skew) Design No. 984**

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 1107.08, 1984 STANDARD SPECIFICATIONS. TRAFFIC CONTROL DEVICES, PROCEDURES AND LAYOUTS SHALL BE AS PER PLAN SPECIFICATIONS FOR TRAFFIC CONTROLS FOR STREET AND HIGHWAY CONSTRUCTION AND MAINTENANCE OPERATIONS, SPECIFICATION 979

SIGN TABULATION	
Type	Quantity
① W20-3	TWO
② W20-1	SIX
③ B(III)-R	FOUR



APPROVED

*Don Jensen*

*LeRoy A. Hansohn*

*Martin Spiegel*

*Virgil E. Pedersen*

*Eileen Heiden*

BOARD OF SUPERVISORS

-115-

IOWA DEPARTMENT OF TRANSPORTATION  
HIGHWAY DIVISION

DISTRICT LOCAL SYSTEMS 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.

*H. Dale Wright* SEPT. 7, 1984  
IOWA REGISTRATION NUMBER 5798 DATE

DEPARTMENT OF TRANSPORTATION  
**Highway Division**

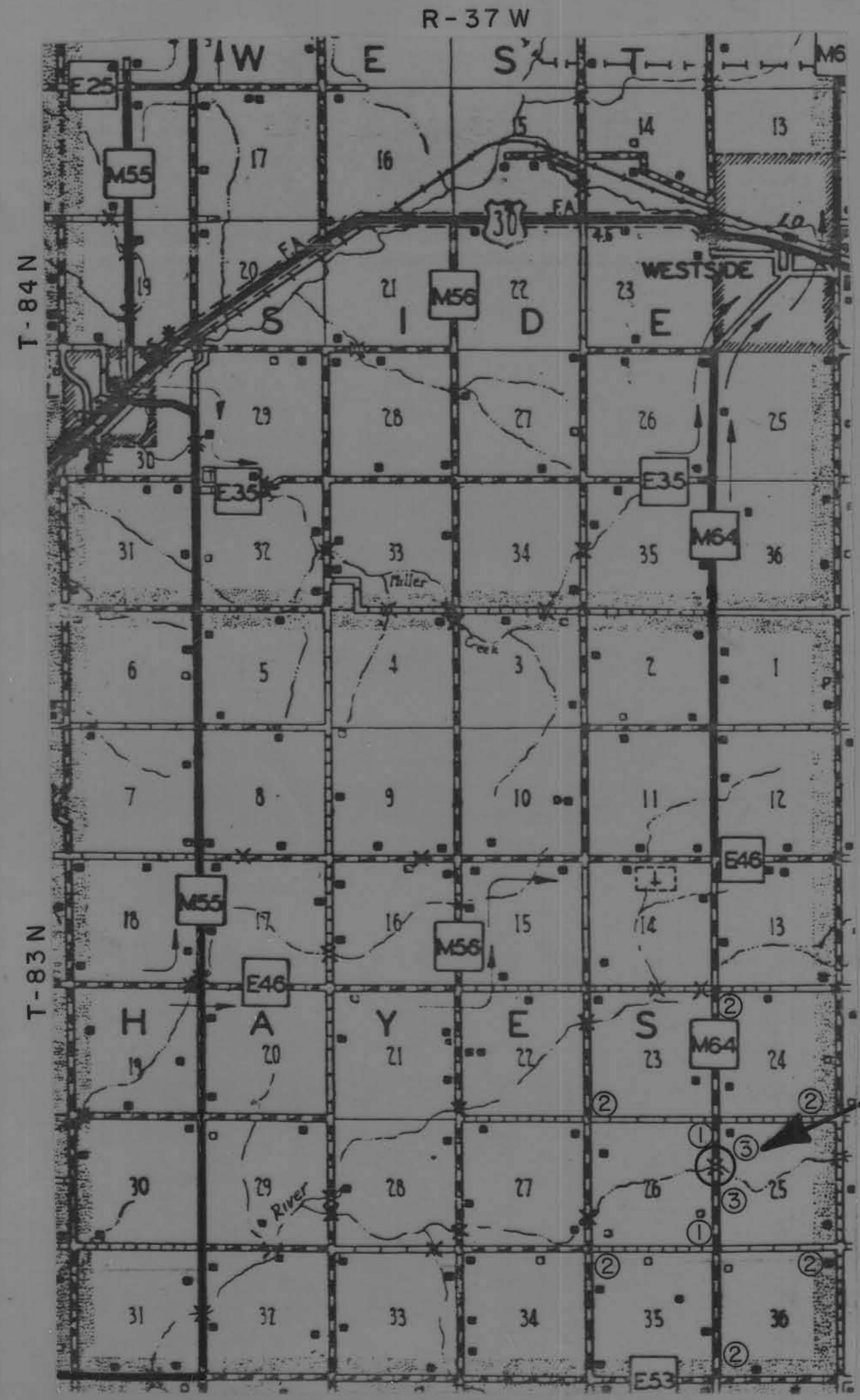
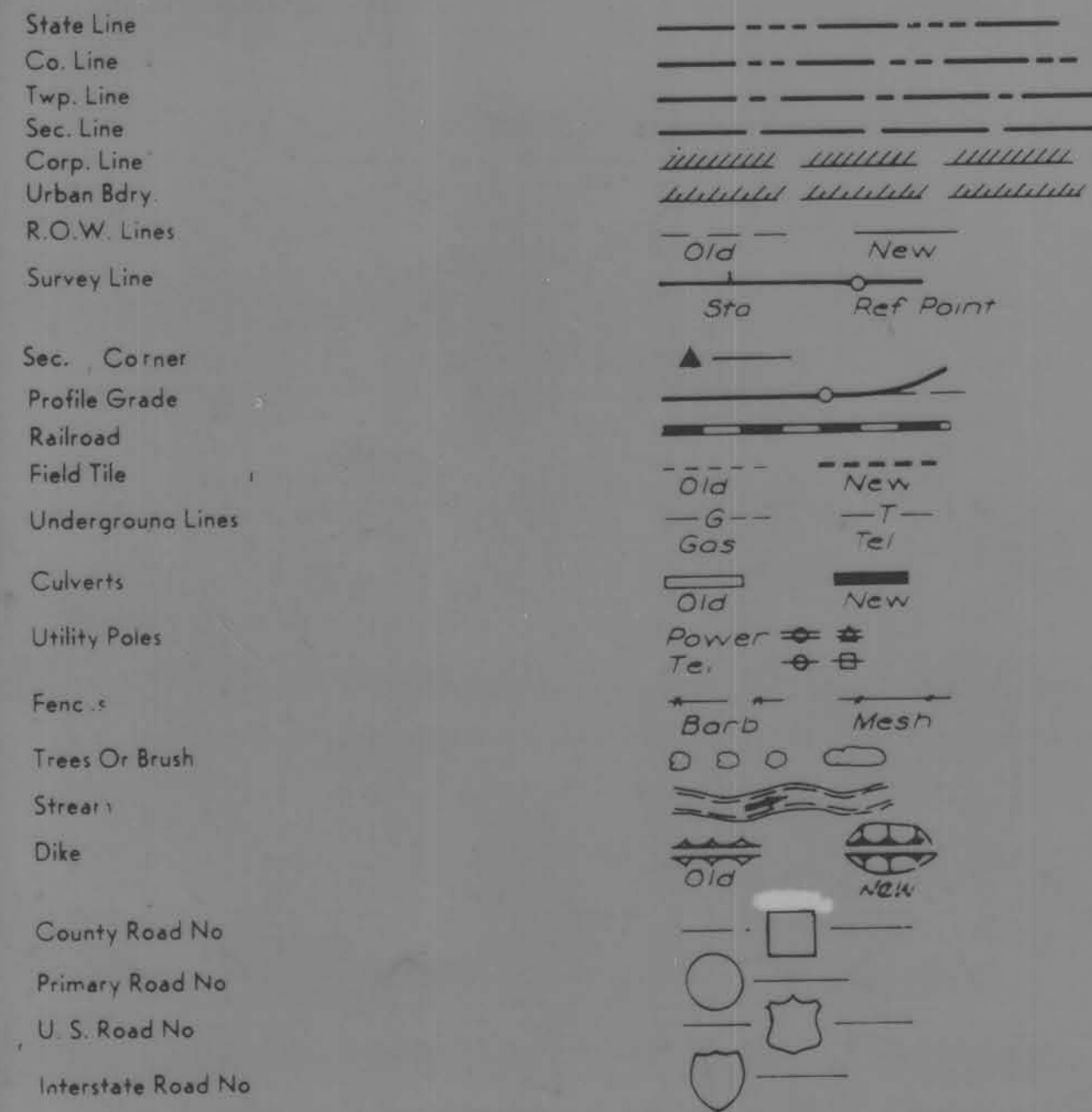
AUTHORIZED FOR LETTING  
*Langsholt* 3-11-85  
DEPUTY CHIEF ENGINEER DATE

U.S. DEPT. TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION

APPROVED

DIVISION ENGINEER DATE

CONVENTIONAL SIGNS



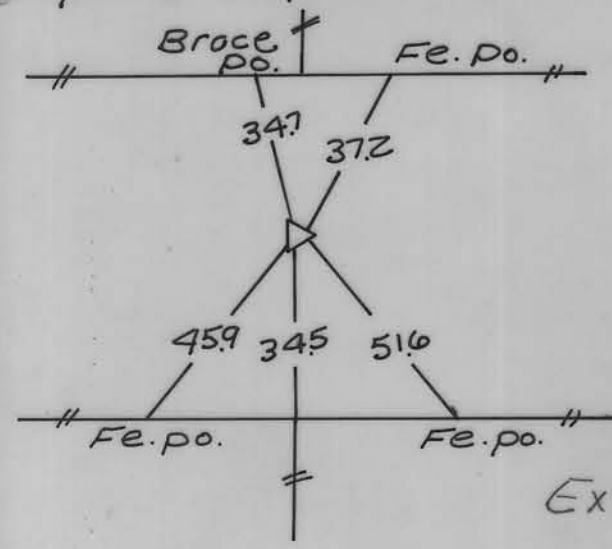
LOCATION MAP AND TRAFFIC CONTROL PLAN



1980 I.D.O.T. TRAFFIC COUNT = 105 V.P.D.

**CRAWFORD COUNTY**  
PROJECT NO. BRS-3230(1)--60-24  
TWIN 12'X8'X61'-0" R.C.B.  
LETTING DATE MAY 7, 1985  
127381

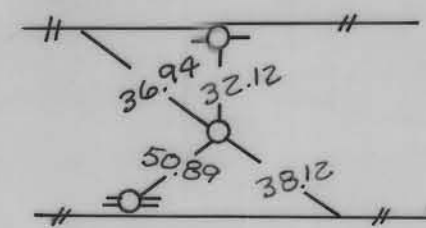
STA. 240+92.5 Sec. Cor.  
1" iron pin 6" deep Δ=0°06' RT.



**Hydraulic Data:**  
 Drainage Area - 2,277 Ac. (3.56 Sq. mi.)  
 Design Discharge - 1260 cfs  
 Design High Water - 1396.6  
 Slope - 9.0288 ft./mi.  
 Culvert Waterway Area - 192 sq. ft.

Q50 - 1,260 cfs. Stage - 1396.1  
 Q100 - 1,575 cfs. Stage - 1396.3  
 Q500 - 2,570 cfs. Stage - 1397.0  
 Extreme H.W. - 2,570 cfs. Stage - 1397.0

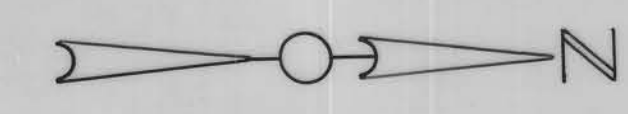
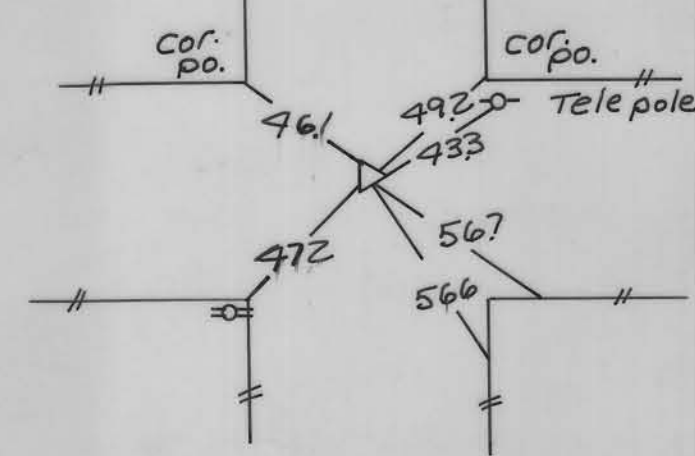
Sta. 258+14.31 Ref. To P.O.T. SPK Flush



**HAYES TOWNSHIP  
T-83N R-37W  
SEC. 26**

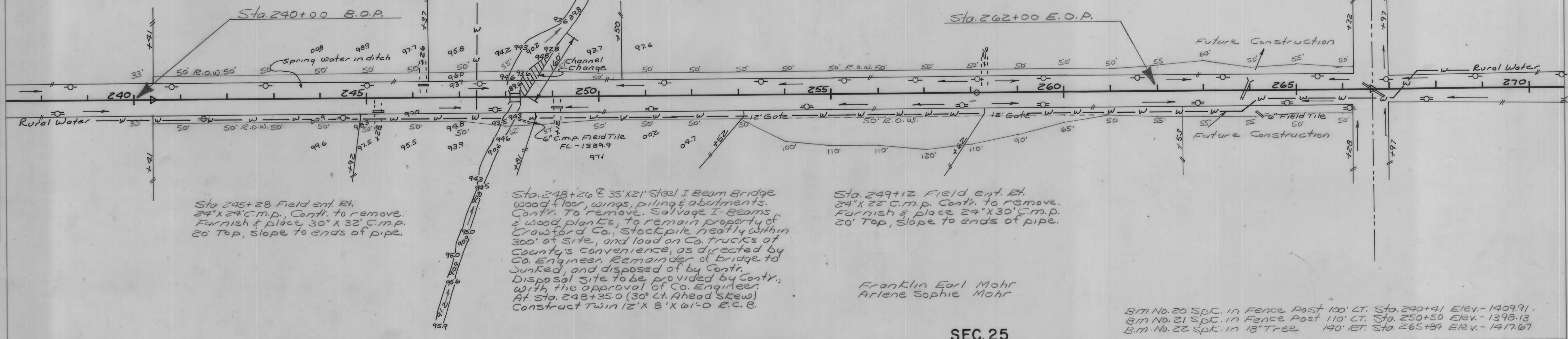
Laura Alwill

STA. 266+62.22 P.I. Govt Monu., wood Hub 8" deep  
Δ=0°10'50" LT.



Sta. 246+26 Field ent. Ct.  
24" x 18" C.M.P., Contr. to remove.  
Furnish & place 30" x 32" C.M.P.  
20' Top, Slope to ends of pipe.

Sta. 258+26 Field ent. Ct. (dry)  
Contr. to remove. Construct  
dry ent. 20' Top, 2:1 Fore Slopes.



Sta. 245+28 Field ent. Ct.  
24" x 24" C.M.P., Contr. to remove.  
Furnish & place 30" x 32" C.M.P.  
20' Top, Slope to ends of pipe.

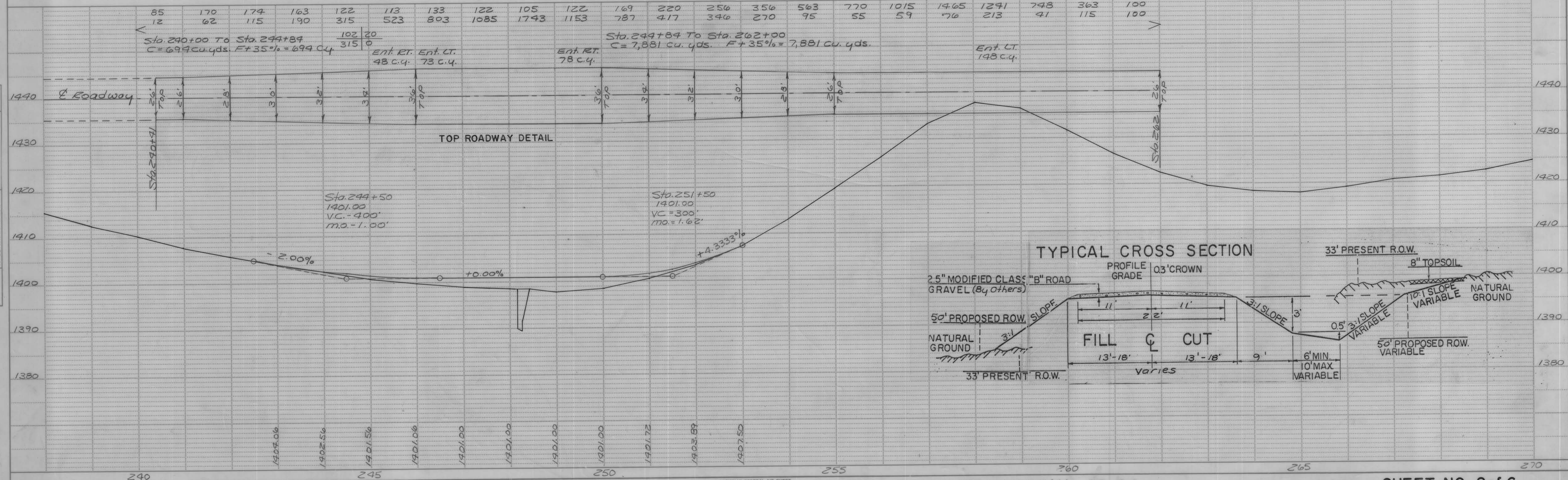
Sta. 248+26 35' x 21' Steel I Beam Bridge  
wood floor, wings, piling & abutments.  
Contr. to remove. Salvage I-Beams  
& wood planks, to remain property of  
Crawford Co., stockpile neatly within  
300' of site, and load on Co. trucks of  
County's convenience, as directed by  
Co. Engineer. Remainder of bridge to  
be junked, and disposed of by Contr.  
Disposal site to be provided by Contr.  
with the approval of Co. Engineer.  
At Sta. 248+35.0 (30° Lt. Ahead Skew)  
Construct Twin 12' x 8' x 61'-0" R.C.B.

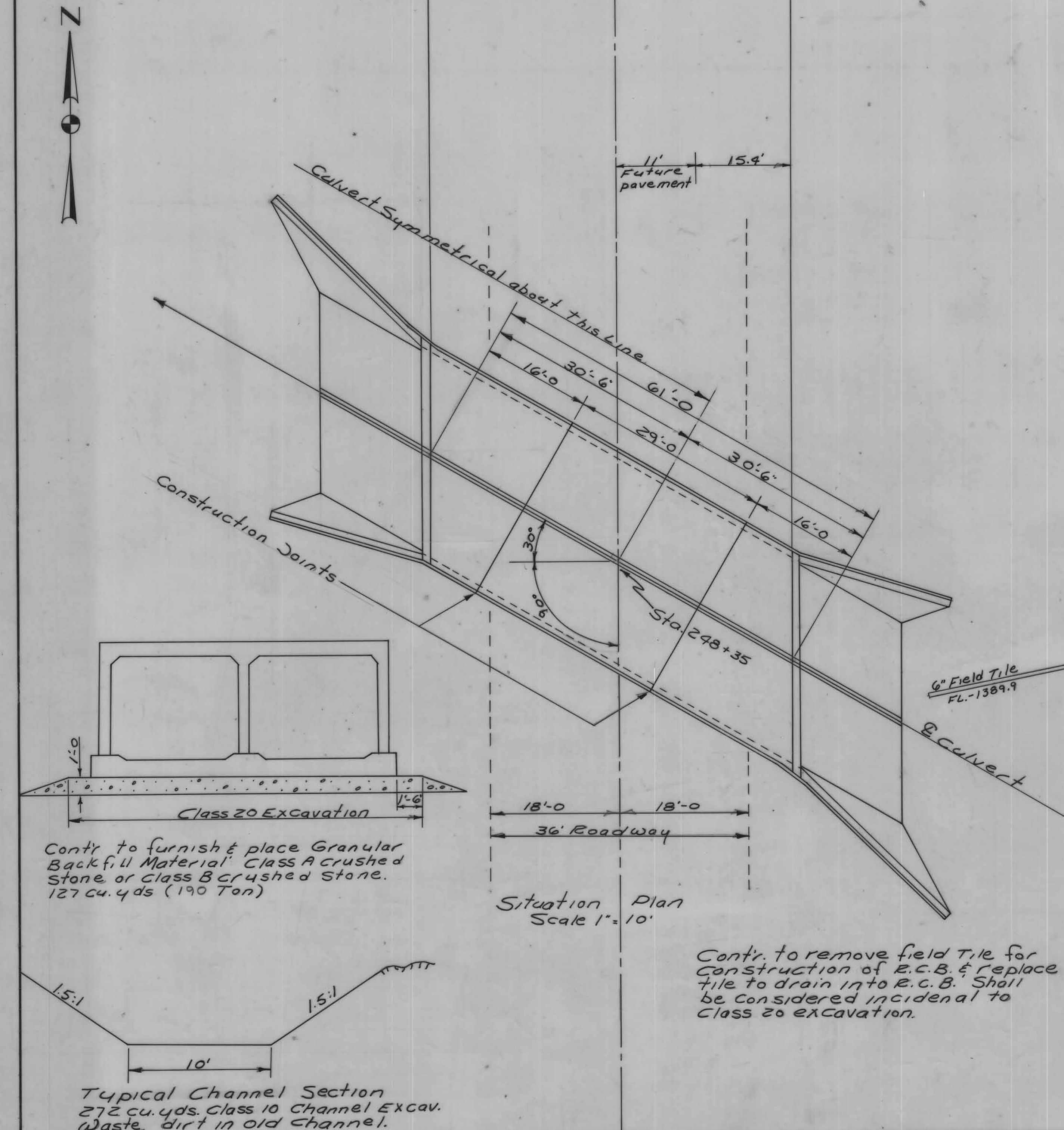
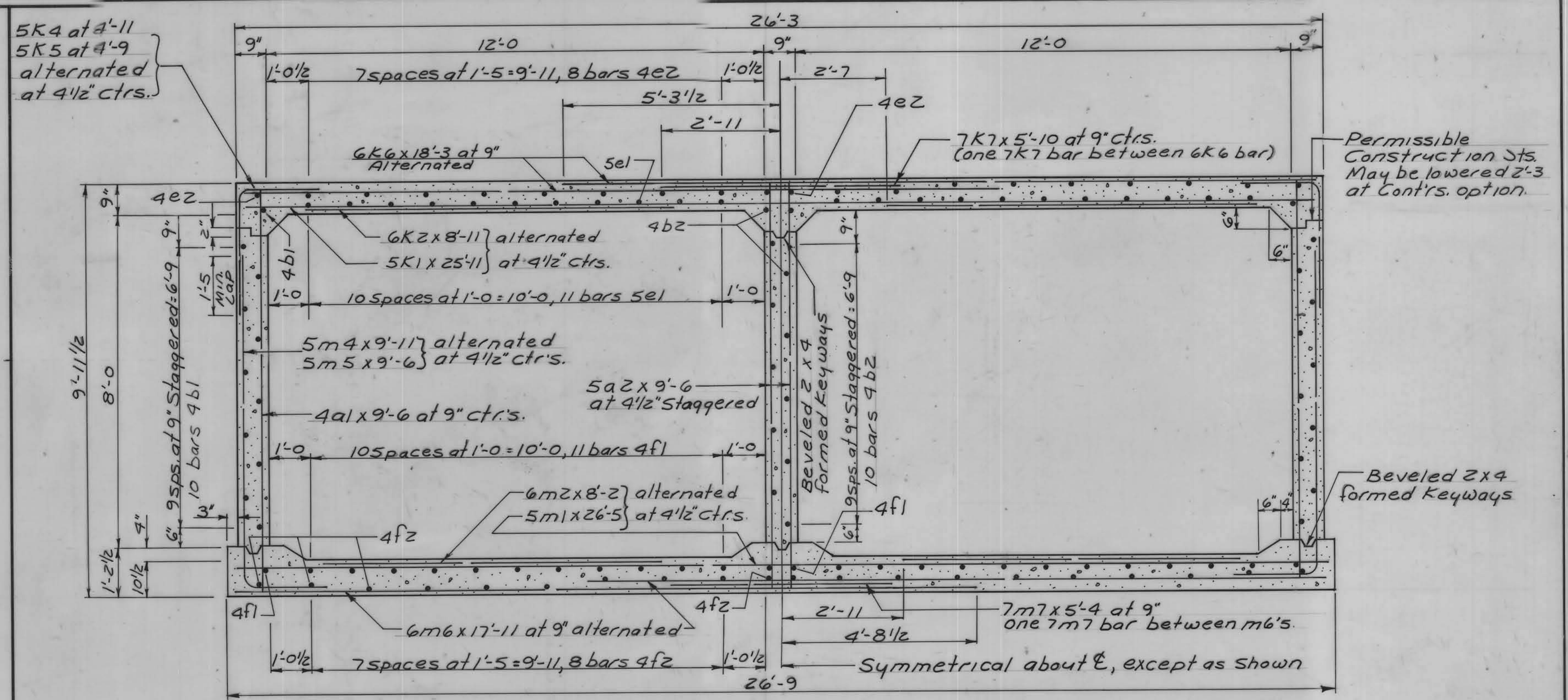
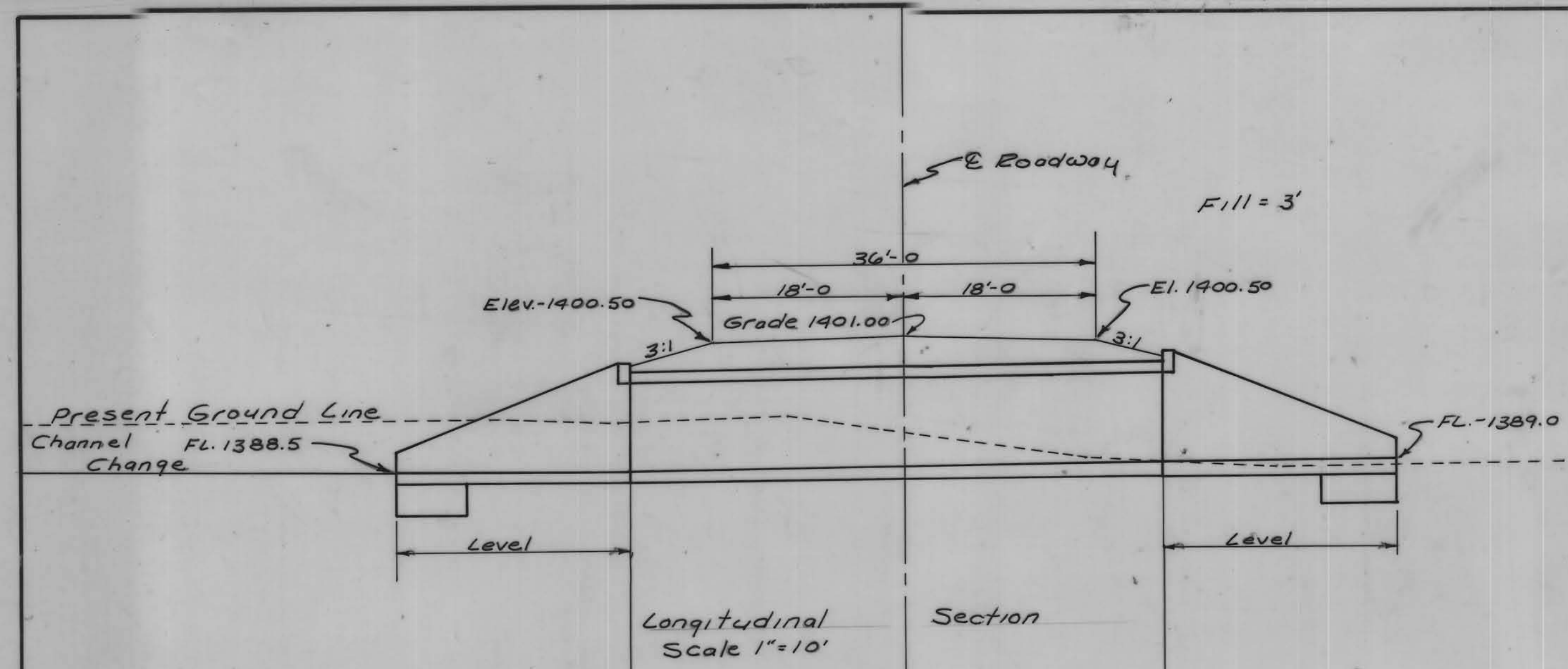
Sta. 249+12 Field ent. Ct.  
24" x 22" C.M.P. Contr. to remove.  
Furnish & place 24" x 30" C.M.P.  
20' Top, Slope to ends of pipe.

Franklin Earl Mohr  
Arlene Sophie Mohr

BM No. 20 Spk. in Fence Post 100' Lt. Sta. 240+41 Elev. - 1409.91  
 BM No. 21 Spk. in Fence Post 110' Lt. Sta. 250+50 Elev. - 1398.13  
 B.M. No. 22 Spk. in 18" Tree 140' Rt. Sta. 265+89 Elev. - 1417.67

**SEC. 25**





**CONCRETE PLACEMENT ESTIMATE OF REINF 29'-0 INTERMEDIATE SECTION**

SLAB	WALLS	FLOOR	TOTAL	CU. YDS.	BAR	LOCATION	SHAPE	NO.	LENGTH	LINEAR FEET			
										4	5	6	7
4a1	Exterior Walls F.F.V.	78	9'-6"	741.0									
5a2	Center Wall Both F.V.	77	9'-6"	731.5									
4b1	Walls Both F.H.	22	28'-8"	630.7									
4b2	Center Wall Both F.H.	12	28'-8"	344.0									
5e1	Bottom Slab Longit.	22	28'-8"	630.7									
4e2	Top Slab Longit.	20	28'-8"	573.3									
4f1	Top Floor Longit.	26	28'-8"	745.3									
4f2	Bottom Floor Longit.	20	28'-8"	573.3									
5k1	Bottom Slab Transv.	38	25'-11"	984.8									
6k2	" " "	78	8'-11"	675.5									
5k4	Top Slab Corner	77	4'-11"	378.6									
5k5	Top slab Corner	77	4'-9"	365.8									
6k6	Top Slab Transv.	39	18'-3"	711.8									
7k7	" " "	38	5'-10"	221.7									
5m1	Top Floor Transv.	38	26'-5"	1003.8									
6m2	" " "	78	8'-2"	637.0									
5m4	Bottom Floor Corner	77	9'-11"	763.6									
5m5	" " "	77	9'-6"	731.5									
6m6	Bottom Floor Transv.	38	17'-11"	680.8									
7m7	" " "	39	5'-4"	208.0									
5r1	Constr. Dowels	52	2'-10"	147.3									
									LENGTH	3607.6	5737.6	2725.1	429.7
									WEIGHT	24099	5984.3	4093.1	878.3
									TOTAL WEIGHT	13,365.6 Lbs.			

**DESIGN STRESSES:**  
DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SERIES OF 1977.  
REINFORCING STEEL IN ACCORDANCE WITH SECTION 1.5, GRADE 40  
CONCRETE IN ACCORDANCE WITH SECTION 1.5,  $f_c=3,500$  PSI.

**SPECIFICATIONS:**  
DESIGN: AASHTO SERIES OF 1977  
CONSTRUCTION: IOWA DEPARTMENT OF TRANSPORTATION SPECIFICATION SERIES OF 1984, PLUS CURRENT SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS.

**Edge Clearances:**  
Top of Floor 2" except  
2 1/4" to near trans. reinf. bar  
Bottom of Floor 3 1/2" to near trans. reinf. bar

**End Clearances:**  
Vertical, Top 2"  
Vertical, Bottom 3 1/2"  
Transverse 2"

Standard TWH 30 Required for Headwall Details

**PLACEMENT QUANTITIES**

Location	Concrete in Parts cu. yds.				Reinforcing Steel (Lbs.)
	Slab	Walls	Floor	Total	
Twin 12'x8'-30° SK. Hdwl (2)	* 5.80	23.00	69.60	98.40	12,000.0
16'-0 End Section (2)	25.18	20.28	29.56	75.02	14,551.4
29'-0 Section (1)	22.81	18.37	26.79	67.97	13,365.6
* parapet					
<b>Total</b>	<b>53.79</b>	<b>61.65</b>	<b>125.95</b>	<b>241.39</b>	<b>39,917.0</b>

DESIGN FOR  
**TWIN 12'x8'x6'-0 REINF CONC. BOX CULV. (30° SKEW)**  
GENERAL LAYOUT AND DETAILS  
**CRAWFORD COUNTY**

Note: Variable Length bars = One 16'-0 End Section

bars 5e1 each length

9'-1	12'-6	17'-0	20'-6
9'-8	13'-1	17'-7	21'-0
10'-3	13'-8	18'-2	21'-7
10'-10	14'-3	18'-9	22'-2
11'-4	14'-10	19'-4	
11'-11	16'-5	19'-11	

bars 4e2 each length

8'-3	12'-4	15'-9	19'-9
9'-1	13'-2	16'-5	20'-6
9'-11	14'-0	17'-3	21'-4
10'-9	14'-10	18'-1	22'-2
11'-6	15'-6	18'-11	23'-0

bars 6k3 each length

2'-6	8'-0	10'-6	14'-0
5'-3	10'-0	11'-9	16'-9

bars 6m3 each length

2'-6	5'-9	10'-4	13'-6
3'-2	7'-9	10'-11	15'-8
5'-2	8'-4	12'-11	

bars 4f1 each length

8'-5	12'-6	16'-5	20'-6
9'-1	13'-1	17'-0	21'-0
9'-8	13'-8	17'-7	21'-7
10'-3	14'-3	18'-2	22'-2
10'-9	14'-10	18'-9	22'-10
11'-4	15'-6	19'-4	
11'-11	15'-9	19'-11	

bars 5k8 each length

2'-0	8'-6	15'-0	21'-6
3'-3	9'-9	16'-3	22'-9
4'-7	11'-1	17'-7	24'-1
5'-11	12'-5	18'-10	25'-4
7'-2	13'-8	20'-2	

bars 5m8 each length

1'-6	8'-0	14'-6	21'-0
2'-9	9'-3	15'-9	22'-3
4'-1	10'-7	17'-1	23'-7
5'-4	11'-10	18'-4	24'-10
6'-8	13'-2	19'-8	

bars 4f2 each length

8'-3	12'-4	15'-9	19'-9
9'-1	13'-2	16'-5	20'-6
9'-11	14'-0	17'-3	21'-4
10'-9	14'-10	18'-1	22'-2
11'-6	15'-6	18'-11	23'-0

bars 6k9 each length

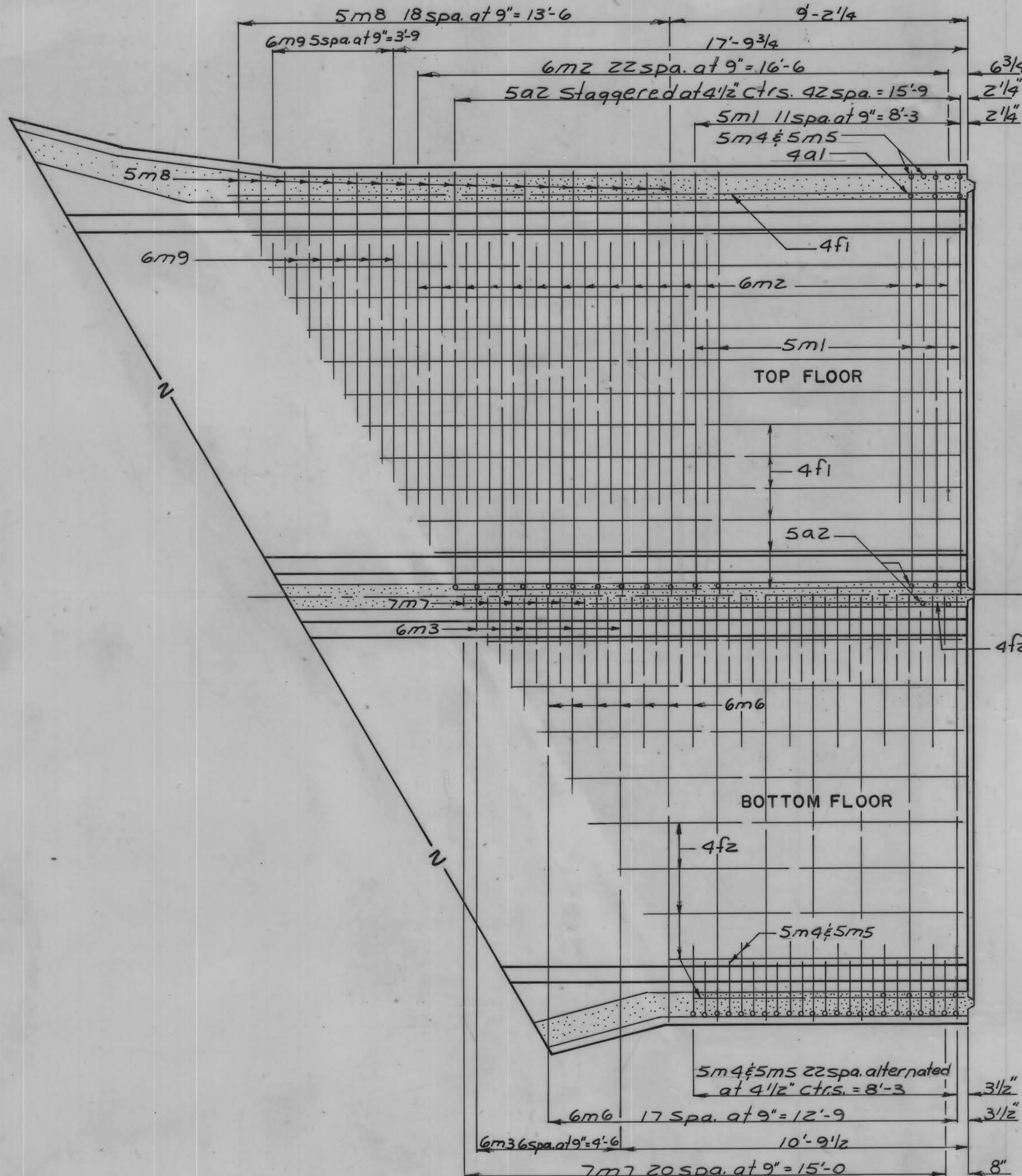
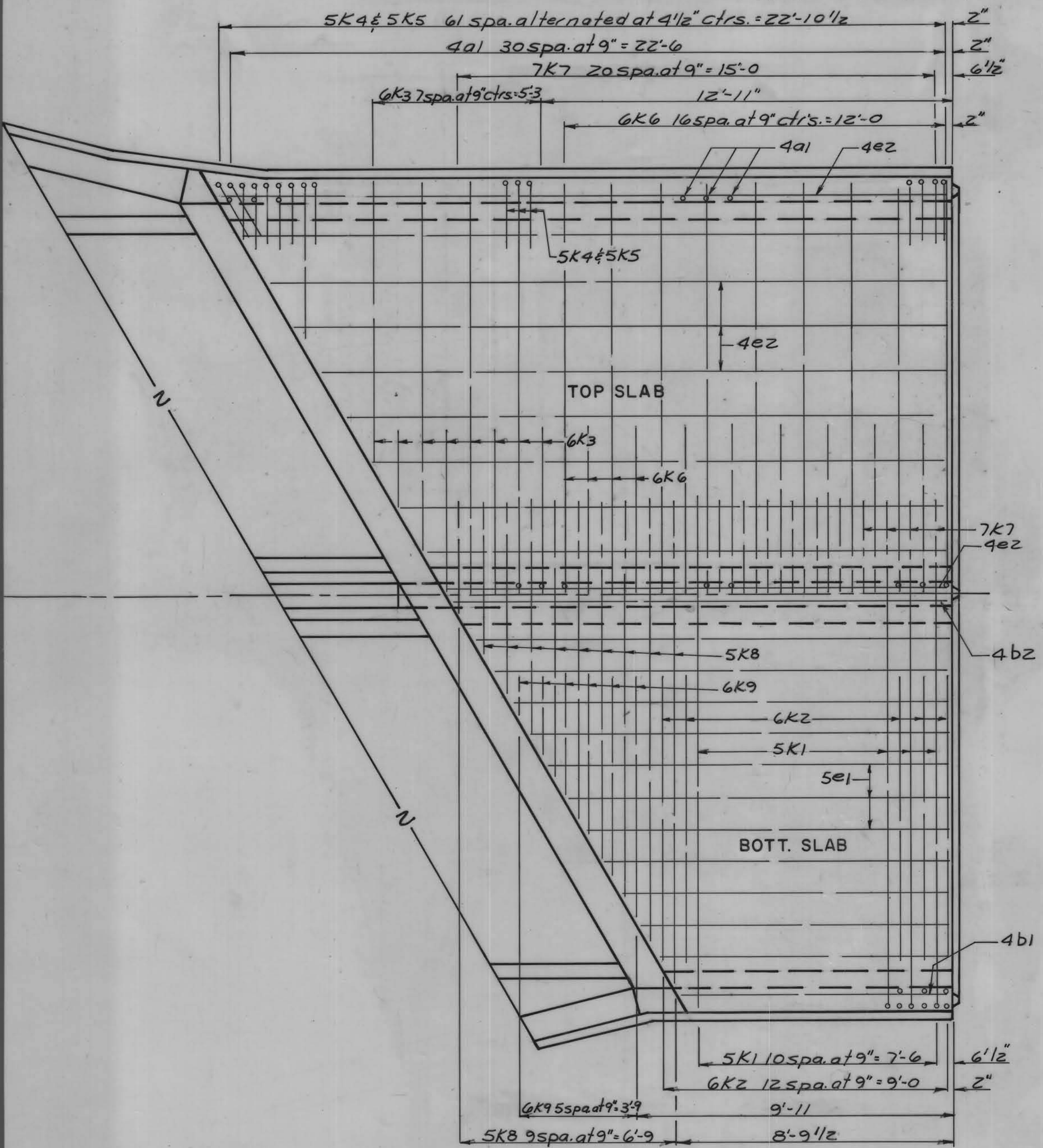
1'-3	3'-2	5'-1	7'-1
1'-11	3'-10	5'-10	7'-9
2'-6	4'-6	6'-5	

bars 6m9 each length

1'-3	2'-10	5'-2	6'-9
1'-6	3'-10	5'-5	7'-9
2'-6	4'-2	6'-5	

ESTIMATE OF REINF STEEL 16'-0 END SECTION

BAR	LOCATION	SHAPE	NO.	LENGTH	LINEAR FEET			
					4	5	6	7
4a1	Exterior Walls F.F.V.		43	9'-6	408.5			
5a2	Center wall both F.F.V.		43	9'-6		408.5		
4b1	Walls Both F.H. (Long Side)	—	11	5@23'-1 6@22'-10	252.4			
4b1	" " " (Short Side)	—	11	5@8'-2 6@8'-9	93.3			
4b2	Center wall both F.H.	—	12	6@16'-1 6@15'-10	191.5			
5e1	Bottom Slab Longit.	—	22	Listed		343.8		
4e2	Top Slab Longit.	—	20	Listed	312.5			
4f1	Top floor Longit.	—	26	Listed	406.3			
4f2	Bottom Floor Longit.	—	20	Listed	312.5			
5k1	Bottom Slab Transv.	—	11	25'-11		285.1		
6k2	" " "	—	37	8'-11			329.9	
6k3	Top Slab Transv.	—	8	Listed			78.8	
5k4	Top slab Corner	┌┐	42	4'-11		206.5		
5k5	" " "	┌┐	43	4'-9		204.3		
6k6	Top Slab Transv.	—	17	18'-3			310.3	
7k7	" " "	—	21	5'-10				122.5
5k8	Bottom Slab Transv.	—	19	Listed		259.8		
6k9	" " "	—	11	Listed			49.3	
5m1	Top Floor Transv.	—	12	26'-5		317.0		
6m2	" " "	—	36	8'-2			294.0	
6m3	Bottom Floor Transv.	—	11	Listed			96.0	
5m4	Bottom Floor Corner	└┘	43	9'-11		426.4		
5m5	" " "	└┘	42	9'-6		399.0		
6m6	Bottom Floor Transv.	—	16	17'-11			286.7	
7m7	" " "	—	21	5'-4				112.0
5m8	Top Floor Transv.	—	19	Listed		250.2		
6m9	" " "	—	11	Listed			47.6	
LENGTH					1977.0	3100.6	1492.6	234.5
WEIGHT					1320.6	3233.9	2241.9	479.3
TOTAL WEIGHT					7,275.7			

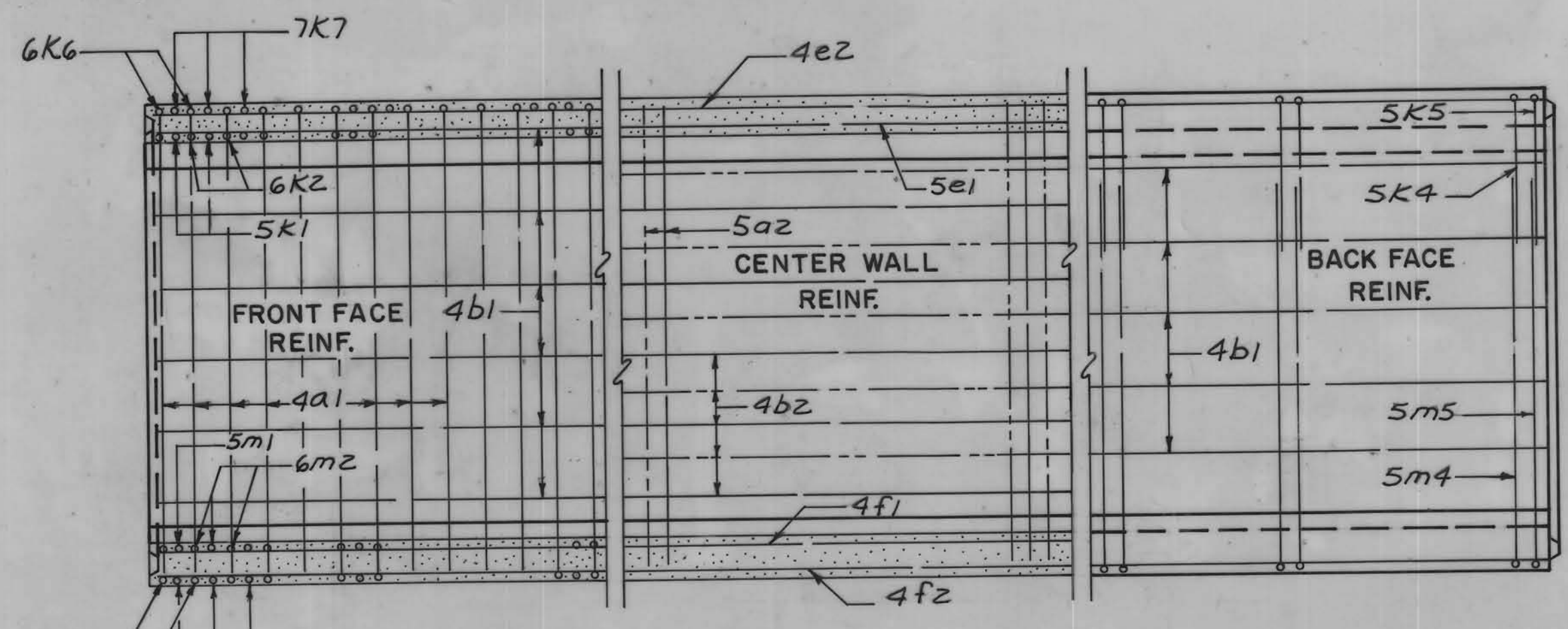


PLAN VIEW  
16'-0 END SECTION - (30° SKEW)

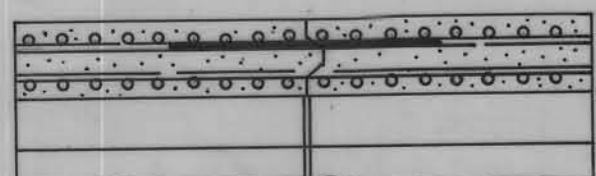
CONCRETE PLACEMENT 16'-0 END SECTION

SLAB	12.59 CU. YDS.
WALLS	10.14 CU. YDS.
FLOOR	14.78 CU. YDS.
TOTAL	37.51 CU. YDS.

DESIGN FOR  
TWIN 12'x 8'x 6'-0 REINF. CONC. BOX CULV.  
(30° SKEW)  
16'-0 END SECTION DETAILS  
CRAWFORD COUNTY



LONGITUDINAL SECTION ELEVATION



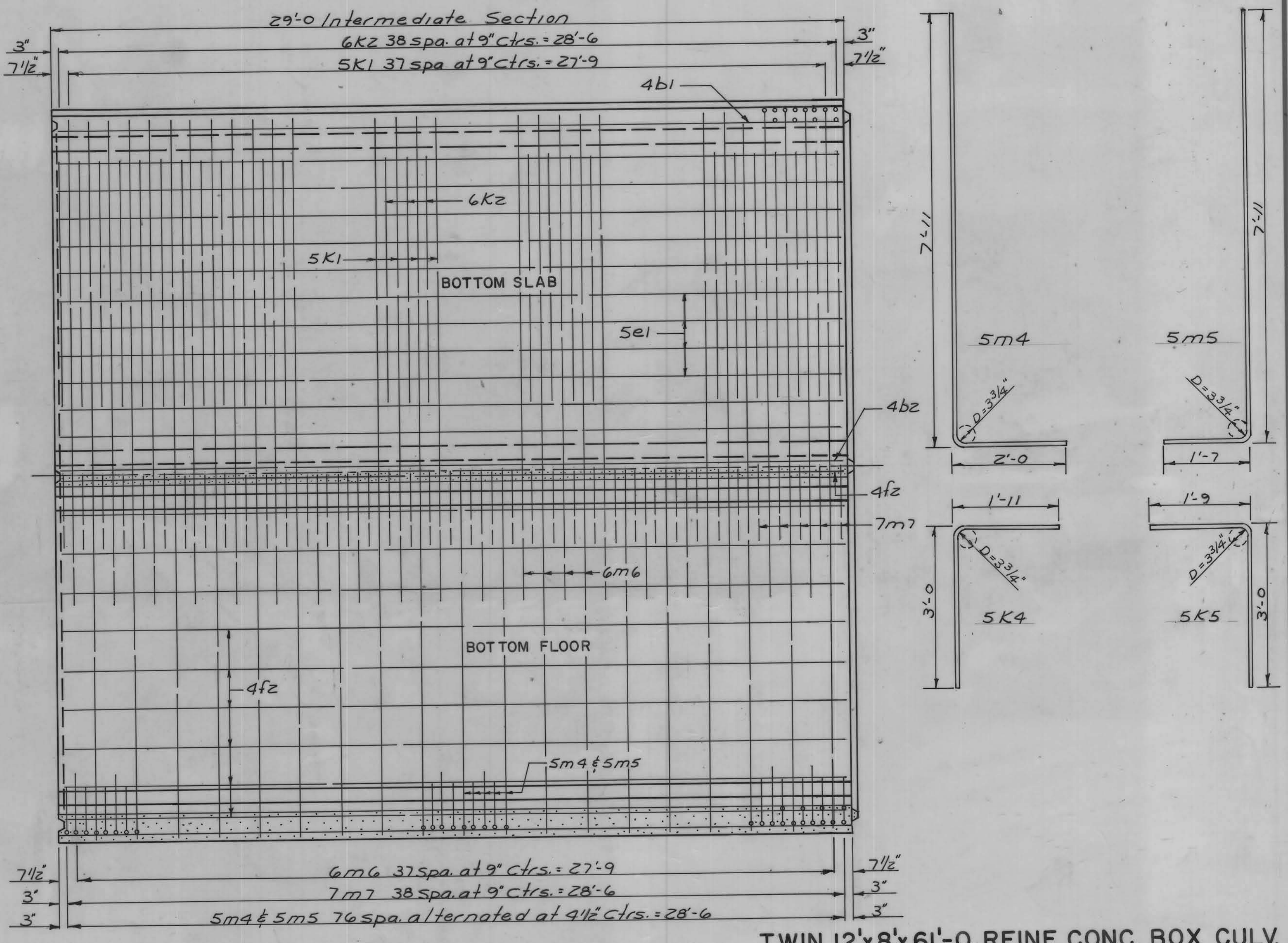
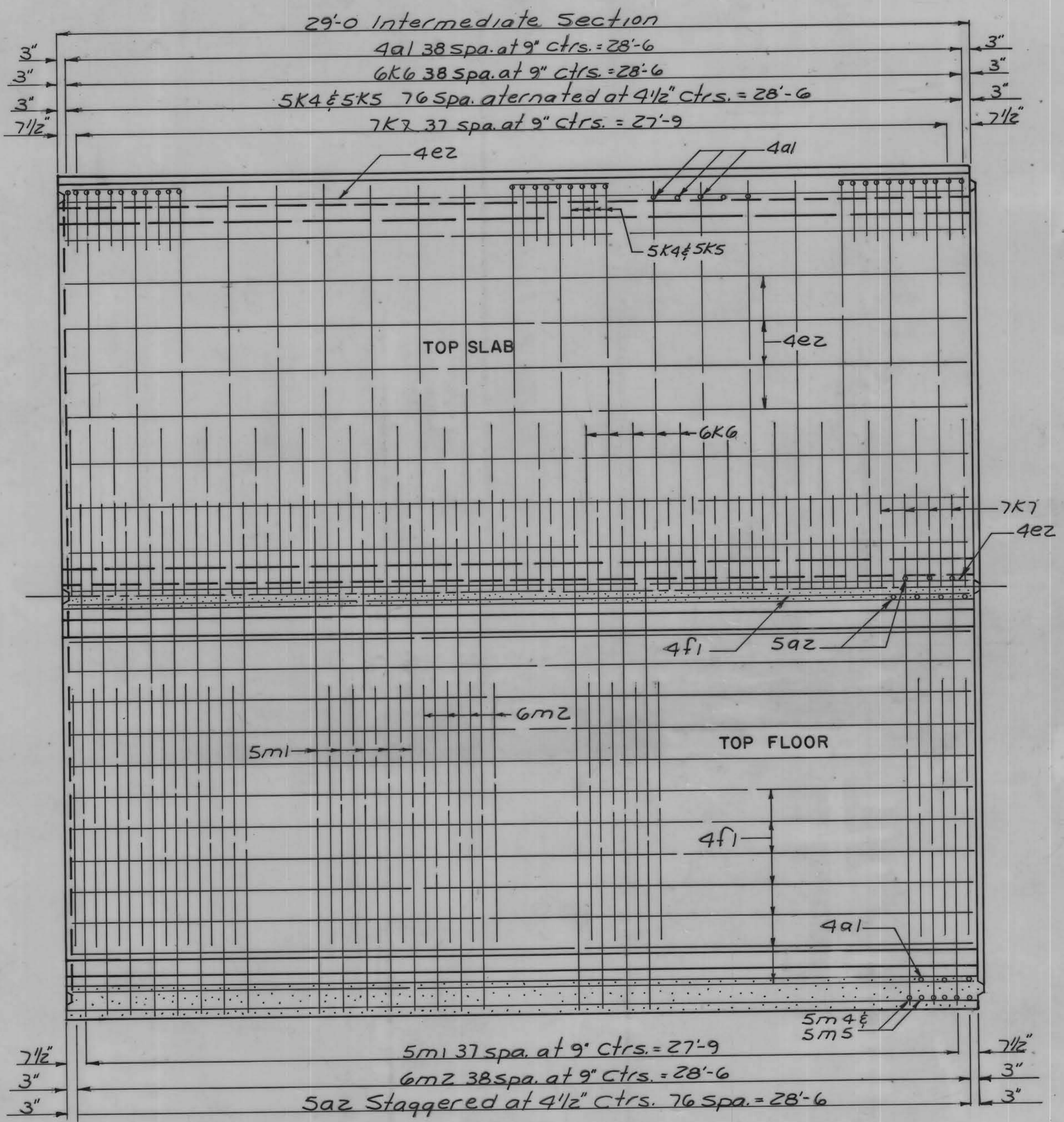
2-sets dowel bars "r", 5/2 bars, to be located near top slab. 5" x 2'-10 at 1'-0 c.c.

CONCRETE QUANTITIES PER FT. BBL.

SLAB	0.7867
WALLS	0.6335
FLOOR	0.9239
TOTAL	2.3441

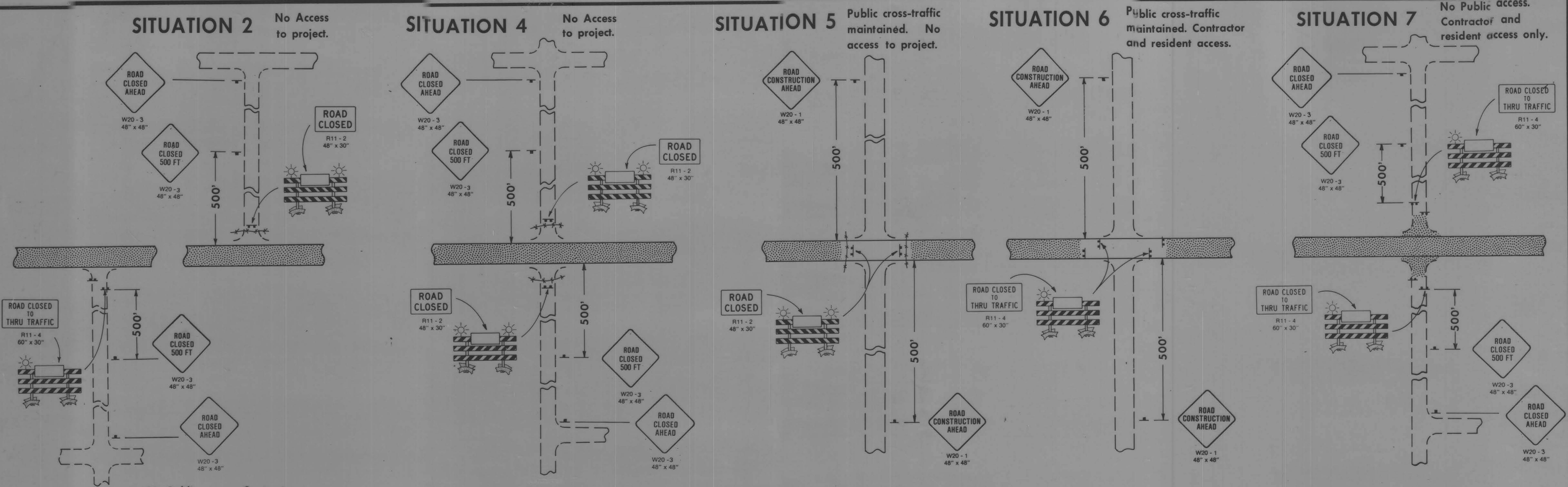
BARREL GENERAL NOTES:  
 THE RCB CULVERT SECTIONS ARE DESIGNED FOR HS20-44 LIVE LOAD AND EARTH FILLS OF 3 FT. FOR VERTICAL LOADS THE WEIGHT OF EARTH IS ASSUMED AS 140 pcf. FOR LATERAL EARTH LOADS EQUIVALENT FLUID PRESSURE IS ASSUMED AS 36 psf/ft.  
 METAL BAR CHAIRS SPACED AT NOT OVER 3'-0 C-C IN EITHER DIRECTION ARE TO BE USED TO SUPPORT ALL SLAB AND FLOOR STEEL AS OUTLINED IN THE STANDARD SPECIFICATIONS (ARTICLE 2404.07).  
 THE CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR EDGE OR END OF REINFORCING BAR TO BE 2" UNLESS OTHERWISE NOTED.  
 EXCEPT FOR DOWEL BARS "r", LONGITUDINAL REINFORCING IS NOT TO EXTEND THRU THE CONSTRUCTION JOINTS.  
 ALL REINFORCING STEEL IS TO BE SECURELY WIRED IN PLACE BEFORE THE CONCRETE IS POURED (ARTICLE 2404.06).  
 FLOOR OF BARREL IS TO BE FINISHED SMOOTH. SIDES OF FOOTING ARE TO BE FORMED TO INSURE CORRECT LINE AND GRADE.  
 ALL EXPOSED CORNERS 90° OR SHARPER TO BE FILLETED WITH A 3/4" DRESSED AND BEVELED STRIP.  
 THE PERMISSIBLE CONSTRUCTION JOINT AT THE TOP OF THE WALLS MAY BE LOWERED 2/3 AT THE CONTRACTOR'S OPTION.

GENERAL NOTES:  
 The reinforcement supplied for this structure may be grade 40, 50, or 60 reinforcement in accordance with the Standard Specifications. The design stresses for all grades are based on 40 grade reinforcement.

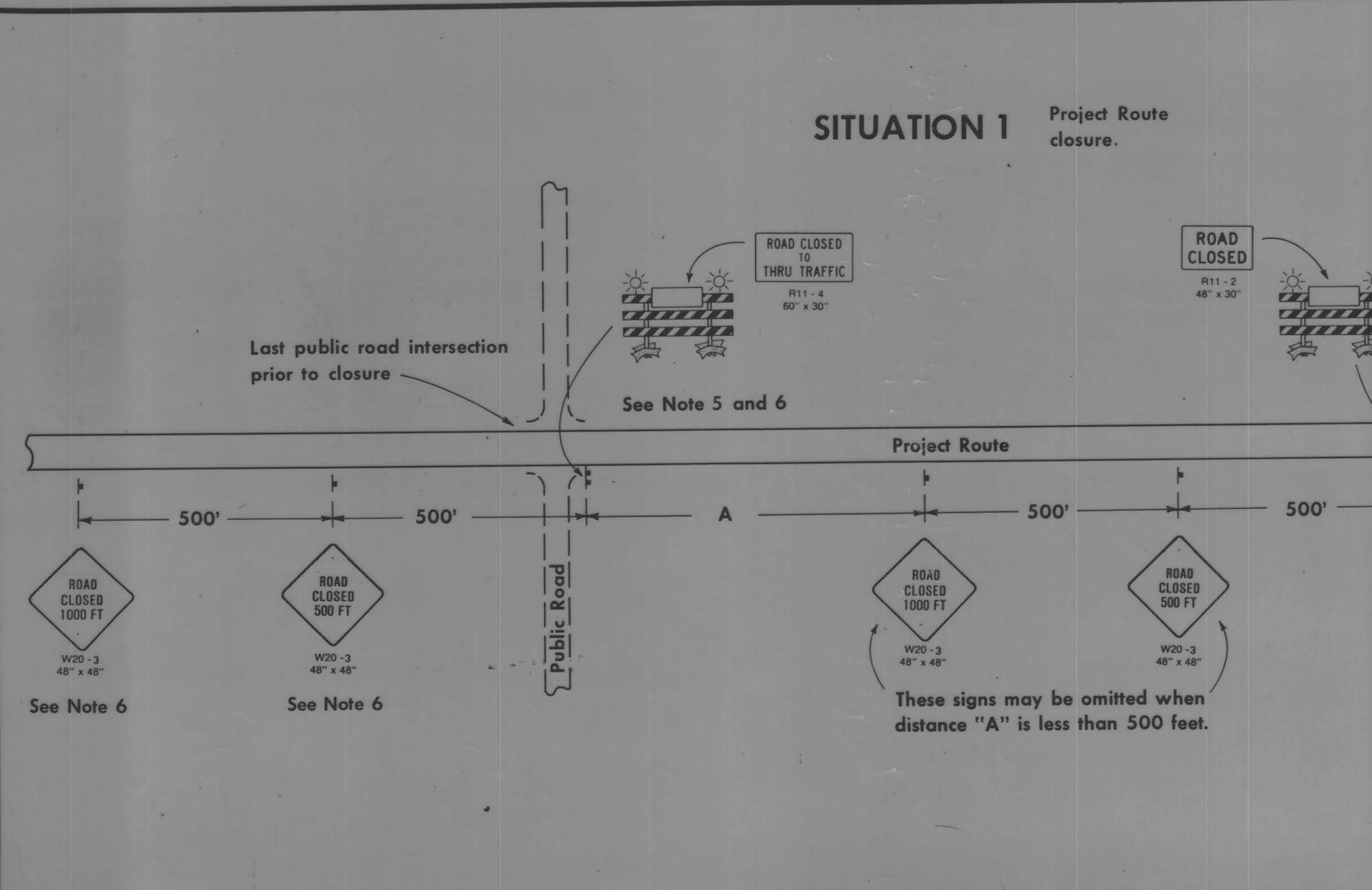


PLAN VIEW

TWIN 12'x8'x61'-0 REINF. CONC. BOX CULV. (30°SKEW)  
 29'-0 INTERMEDIATE SECTION DETAILS



**SITUATION 3** No Public access. Contractor and resident access only.



**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)**