

FOUNDATION AND BACKFILL DETAILS  
NO SCALE

- 1 All Granular Bedding under footings shall meet or exceed Mn/DOT Specification 3149.2F, Granular Bedding. Placement of this Granular Bedding shall follow Mn/DOT Spec. 2451.3D and compaction shall be no less than 100% maximum density, as per Mn/DOT Spec. 2105.3F1. Spacing of Excavation, Class-U, shall extend under arch and spanrail well only.
- 2 All granular backfill on both sides of the curved element from the outer edge of the footing on a 4:1 slope to the top of the curved element shall be compacted to not less than 95% of maximum density as per Mn/DOT Spec. 2105.3F1 (AAASHTO T 99). Granular backfill shall meet or exceed Mn/DOT Specification 3149.2D for Granular Backfill Material. All material shall be placed in 8" compacted lifts unless contractor can show he can obtain 95% density with greater lifts. Mn/DOT Spec. 2451.3C and 2451.3D will apply.

The backfill material on both sides of the structure is to be placed so that the difference in elevation on one side is never greater than 2 feet higher than the other side.

- 3 Hand compaction equipment is required in the area within 1 foot of the curved elements and within four feet adjacent to the spanrail walls and arch. All backfill shall be granular backfill as per Mn/DOT Spec. 3149.2D and filled to a maximum of 1 inch stone in the material. Compaction to 95% density is required per Mn/DOT Spec. 2105.3F1 (AAASHTO T 99).

**GENERAL CONSTRUCTION NOTES:**

- 1 To avoid excessive vibration in the arch, the following practice must be followed during the compaction operation:
  - a) Eccentric rotating weights of vibrating rollers shall rotate at least 20 revolutions per second.
  - b) Vibrating rollers shall not be started or stopped within 6 feet of the structure.
- 2 Excavate and stockpile suitable top soils and all other organic soils encountered below proposed embankment widening per Mn/DOT Spec. 2105.3C, for future use as slope dressing.
- 3 No fill shall be dumped within 3 feet of the precast elements.
- 4 Construction equipment heavier than 30 tons are not allowed to cross over or adjacent to precast elements until 1 foot of cover has been placed and compacted.
- 5 De-water as necessary below bottom of footings so excavate req. backfill, compaction and concrete work is completed below waterline.
- 6 Channel excavation will be considered as incidental to construction and no additional compensation will be made.

**HYDRAULIC DATA**

Stream Design Flood @ Basic Flood (100 yr. freq. Headwater Elev.)	1,000 CFS
Headwater Elev.	856.8
Overtopping Flood (116 X 100 - Yr. Freq.)	1,160 CFS
Headwater Elev.	857.2
Approximate Flowline Elev.	848.4
Waterway Opening of Structure	290 SQ. FT.

NOTE: For Existing Channel Condition

① INCLUDES 528 C.Y. FOR SUB-FOOTING EXCAVATION

SCHEDULE OF QUANTITIES		REINFORCED CONCRETE ARCH CONSTRUCTION				SUPPLEMENTAL AGREEMENT NO.1					
ITEM NO		2411.501	2411.541	2451.501	2451.503	2451.507	2557.501	2511.501	2511.504	2501.511	
ITEM		CONCRETE MIX NO 3 Y 43	REINFORCEMENT BARS	STRUCTURE EXCAVATION CLASS-U	GRANULAR BACKFILL (C.V.)	GRANULAR BEDDING (C.V.)	WIRE FENCE DESIGN CHAIN LINK	RANDOM RIPRAP CLASS-A	FILTER BLANKET TYPE-1	COMMON CHANNEL EXCAVATION	
UNIT		C.Y.	POUND	C.Y.	C.Y.	C.Y.	LIN. FT.	C.Y.	C.Y.	C.Y.	
QUANTITY		150	7,550	① 2,341 (P)	2,555 (P)	741 (P)	150	129 (P)	50 (P)	685 (P)	
		501.603	501.606	501.608	501.606	501.606					
		PRECAST REINFORCED CONCRETE ARCH (40' x 10")	PRECAST WINGWALLS	SPANDREL WALLS	PRECAST WINGWALLS	PRECAST WINGWALLS					
		90	4	2	4	4					
		LIN. FT.	EACH	EACH	EACH	EACH					

REVISED: NONE  
 DATE: 4/11/90  
 BY: A411/120  
 NOTES: MISC. 3/24/93  
 CHANNEL EXC. & BACKFILL  
 4/22/93



STATEMENT OF ESTIMATED QUANTITIES

ITEM NO.	ITEM	UNIT	TOTAL ESTIMATED QUANTITIES	TOTAL FINAL QUANTITIES
2021.501	MOBILIZATION	LUMP SUM	1	
2031.503	FIELD LABORATORY, TYPE D	EACH	1	
2101.501	CLEARING	ACRE	0.65	
2101.502	CLEARING	TREE	52	
2101.506	GRUBBING	ACRE	0.65	
2101.507	GRUBBING	TREE	47	
2104.501	REMOVE 24" STEEL PIPE CASING	LIN. FEET	50	
2104.501	REMOVE CURB AND GUTTER	LIN. FEET	116	
2104.501	REMOVE BITUMINOUS CURB	LIN. FEET	96	
2104.503	REMOVE SIDEWALK	SO. FT.	215	
2104.505	REMOVE BITUMINOUS PAVEMENT	SO. YARD	16260 (P)	
2104.521	SALVAGE PRECAST CONCRETE BARRIER	LIN. FT.	90	
2104.521	SALVAGE 21" R.C.P. SEWER	LIN. FT.	457	
2104.521	SALVAGE 24" D.I.P. BALL JOINT WATER MAIN	LIN. FT.	260	
2104.523	SALVAGE CASTINGS	EACH	3	
2105.501	COMMON EXCAVATION	CU. YD.	23161 (P)	
2105.505	MUCK EXCAVATION (RV)	CU. YD.	319	
2105.521	GRANULAR BORROW (SV)	CU. YD.	5695	
2105.525	TOPSOIL BORROW (LV)	CU. YD.	715	
2130.501	WATER	MGAL.	150	
2211.503	AGGREGATE BASE PLACED, CLASS 5	CU. YD.	4032 (P)	
2331.504	BITUMINOUS MATERIAL FOR MIXTURE (CONVENTIONAL OR RECYCLED)	TON	296	
2331.510	BINDER COURSE MIXTURE (CONVENTIONAL OR RECYCLED)	TON	3275	
2331.514	BASE COURSE MIXTURE (CONVENTIONAL OR RECYCLED)	TON	3275	
2331.531	TEMPORARY LANE MARKING	ROAD STATION	145	
2341.504	BITUMINOUS MATERIAL FOR MIXTURE	TON	151	
2341.508	WEARING COURSE MIXTURE	TON	2510	
0341.503	BITUMINOUS MIXTURE FOR DRIVEWAYS	SO. YD.	205	
2357.502	BITUMINOUS MATERIAL FOR TACK COAT	GALLON	2900	
2442.501	REMOVE OLD BRIDGE	LUMP SUM	1	
2501.511	12" C.M. PIPE CULVERT	LIN. FT.	12	
2501.515	12" C.M. PIPE APRONS	EACH	2	
2501.515	12" R.C. PIPE APRONS	EACH	1	
2501.515	15" R.C. PIPE APRONS	EACH	3	
2501.515	18" R.C. PIPE APRONS	EACH	1	
2503.541	12" R.C. PIPE SEWER, DESIGN 3006D CL.2	LIN. FT.	438	
2503.541	15" R.C. PIPE SEWER, DESIGN 3006D CL.2	LIN. FT.	1003	
2503.541	15" R.C. PIPE SEWER, DESIGN 3006D CL.4	LIN. FT.	69	
2503.541	18" R.C. PIPE SEWER, DESIGN 3006D CL.2	LIN. FT.	21	
2503.511	21" R.C. PIPE SEWER, CL. 2	LIN. FT.	16	
2503.571	INSTALL 21" R.C. PIPE SEWER	LIN. FT.	441	
2506.507	CONSTRUCT CATCH BASINS, DESIGN A OR F	LIN. FT.	21.4	
2506.507	CONSTRUCT CATCH BASINS, DESIGN C, OR H	LIN. FT.	70.5	
2506.511	RECONSTRUCT MANHOLES	LIN. FT.	175	
2506.516	CASTING ASSEMBLIES	EACH	23	
2506.521	INSTALL CASTINGS	EACH	2	
2506.522	ADJUST FRAME AND RING CASTINGS	EACH	11	
0411.603	STONE RETAINING WALL	SO. FT.	195	
0504.602	ADJUST WATER-GATE HOUSING	EACH	4	
2521.501	4" CONCRETE WALK	SO. FT.	1022	
2521.501	3" CONCRETE WALK (FOR MEDIAN)	SO. FT.	1020	
2531.501	CONCRETE CURB AND GUTTER, DESIGN B-612	LIN. FT.	490	
2531.501	CONCRETE CURB AND GUTTER, DESIGN B-618	LIN. FT.	10192	
2531.503	CONCRETE MEDIAN	SO. YD.	11	
2531.507	6" CONCRETE DRIVEWAY PAVEMENT	SO. YD.	53	

STATEMENT OF ESTIMATED QUANTITIES

ITEM NO.	ITEM	UNIT	TOTAL ESTIMATED QUANTITIES	TOTAL FINAL QUANTITIES
2575.501	ROADSIDE SEEDING	ACRE	3.3 (P)	
2575.502	SEED MIXTURE NO. 5	POUND	251	
2575.505	SODDING	SO. YD.	7983	
2575.511	MULCH MATERIAL TYPE 1	TON	6.7	
2575.519	DISC ANCHORING	ACRE	3.3 (P)	
2575.531	COMMERCIAL FERTILIZER ANALYSIS 10-10-10	TON	1.20	
	SANITARY SEWER CONSTRUCTION			
1.	3" PVC SEWER PIPE	LIN. FT.	130	
2.	4" E.H.C.I. SEWER PIPE	LIN. FT.	85	
3.	BREAK INTO EXISTING MANHOLE	EACH	2	
	WATER MAIN CONSTRUCTION			
1.	24" x 24" x 8" TAPPING TEE WITH 12" RESILIENT WEDGE VALVE	EACH	1	
2.	24" x 24" x 8" TAPPING TEE WITH 8" RESILIENT WEDGE VALVE	EACH	3	
3.	24" DUCTILE IRON PIPE	LIN. FT.	80	
4.	12" DUCTILE IRON PIPE	LIN. FT.	65	
5.	8" DUCTILE IRON PIPE	LIN. FT.	155	
6.	6" DUCTILE IRON PIPE	LIN. FT.	13	
7.	STANDARD HYDRANT	EACH	2	
8.	6" RESILIENT WEDGE VALVE	EACH	2	
9.	8" x 8" x 6" TEE	EACH	1	
10.	24" BENDS WITH BLOCKING	EACH	2	
11.	12" FLAG	EACH	1	
12.	8" FLAG	EACH	3	
13.	24" FLAG	EACH	1	
14.	1" SERVICE CONNECTION	EACH	1	
15.	1" COPPER SERVICE PIPE	LIN. FT.	20	
	WATER MAIN RELOCATION			
1.	INSTALL SALVAGED 24" WATER MAIN PIPE	LIN. FT.	260	
2.	2" EXTRUDED POLYSTYRENE INSULATION	SO. FT.	2100	
3.	4" URETHANE PIPE WRAP WITH 6 MILL POLY VAPOR BARRIER	TON	150	
4.	GRANULAR BACKFILL WITHIN INSULATION BOX	EACH	63	
5.	24" x 24" x 6" TEE	EACH	1	
6.	24" SLEEVE	EACH	2	
7.	HYDRANT EXTENSION	EACH	1	
8.	PEA GRAVEL	TON	30	
9.	WATER MAIN TESTING	LUMP SUM	1	

- ① FOR FRONT YARD AREAS TO BE SODDED.
- ② FOR DUST CONTROL.
- ③ INCLUDES 144 CU. YD. FOR STREET APPROACHES.
- ④ INCLUDES 72 TON FOR STREET APPROACHES.
- ⑤ INCLUDES 54 TON FOR STREET APPROACHES.
- ⑥ INCLUDES SODDED AREAS.

SPECIAL DETAILS

THE CONTRACTOR SHALL REMOVE SUFFICIENT TOPSOIL MATERIAL WITHIN THE EXCAVATION AREAS AND AREAS ON WHICH REPAIRMENT WILL BE PLACED. STOCKPILE IF NECESSARY, AND USE IT FOR TOPSOIL COVERING ON THE NEW SLOPES AND DITCH BORDERS. THIS WILL REQUIRE APPROXIMATELY 2111 CU. YDS. TO PROVIDE A MINIMUM COVER OF 3". THIS WORK SHALL BE CONSIDERED AS INCIDENTAL TO COMMON EXCAVATION APPROXIMATELY 319 CU. YDS. OF MUCK EXCAVATION MATERIAL IS TO BE USED AS TOPSOIL COVERING TO PROVIDE A MINIMUM COVER OF 3" ON THE NEW SLOPES ADJACENT TO THE EXCAVATION AREA. THIS WORK SHALL BE CONSIDERED AS INCIDENTAL TO MUCK EXCAVATION AND NO ADDITIONAL COMPENSATION WILL BE MADE THEREFORE.

REMOVAL OF BITUMINOUS PAVEMENT IN PLACE IS BASED ON AN AVERAGE WIDTH OF 29.6 FEET AND QUANTITIES COMPUTED ON THE BASIS OF SQUARE YARDS IN PLACE. STREET APPROACHES AND PRIVATE ENTRANCES ARE INCLUDED IN THE BITUMINOUS PAVEMENT REMOVAL QUANTITIES.

STANDARD PLATES

PLATE NO.	DESCRIPTION
0003A	SPECIFICATION REFERENCE TO STANDARD PLATES.
3000L	REINFORCED CONCRETE PIPE
3004D	CASKET JOINT FOR R.C. PIPE
3040F	CORRUGATED METAL PIPE CULVERT
3100F	CONCRETE APRON FOR REINFORCED CONCRETE PIPE
3123H	METAL APRONS FOR C.M. PIPE
4000H	MANHOLE OR CATCH BASIN
4002D	MANHOLE OR CATCH BASIN
4005K	MANHOLE OR CATCH BASIN
4006K	MANHOLE OR CATCH BASIN
4011D	PRECAST CONCRETE BASE
4101B	RING CASTING FOR MANHOLE OR CATCH BASIN
4110D	COVER CASTING FOR MANHOLE
4126E	CATCH BASIN FRAME CASTING
4149C	GRADE CASTING FOR CATCH BASIN
4161E	CURB BOX CASTING FOR CATCH BASIN
4180G	MANHOLE OR CATCH BASIN STEP
7035J	CONCRETE WALK AND CURB RETURNS AT ENTRANCES
7036C	PEDESTRIAN CURB RAMP
7100E	CONCRETE CURB AND GUTTERS
7110E	CURB AND GUTTER CONSTRUCTION AT CATCH BASIN
7111E	INSTALLATION OF CATCH BASIN CASTINGS
8000H	STANDARD BARRICADES
9102C	SODDING AT PIPE CULVERT ENDS

CLEARING AND GRUBBING		
STATION (TO STATION)	LOC.	CLEARING GRUBBING TREE (ACRE) (TREE) (ACRE)
10 <sup>+</sup> 25+90	63 LT.	1
10 <sup>+</sup> 26+00	52 LT.	1
10 <sup>+</sup> 26+06	56 LT.	1
10 <sup>+</sup> 27+52	44 RT.	1
10 <sup>+</sup> 27+57	44 RT.	1
10 <sup>+</sup> 27+95	36 RT.	2
10 <sup>+</sup> 27+95	43 RT.	1
10 <sup>+</sup> 27+97	45 RT.	1
10 <sup>+</sup> 28+00	43 LT.	2
10 <sup>+</sup> 28+06	39 RT.	1
10 <sup>+</sup> 28+06	37 RT.	2
10 <sup>+</sup> 28+08	35 RT.	1
10 <sup>+</sup> 28+15	39 RT.	1
10 <sup>+</sup> 28+16	37 RT.	1
10 <sup>+</sup> 28+18	42 RT.	1
10 <sup>+</sup> 28+59	69 LT.	2
10 <sup>+</sup> 28+62	60 LT.	1
10 <sup>+</sup> 28+92	69 LT.	1
10 <sup>+</sup> 28+94	66 LT.	1
10 <sup>+</sup> 29+01	48 LT.	1
10 <sup>+</sup> 29+03	66 LT.	1
10 <sup>+</sup> 29+05	47 LT.	1
10 <sup>+</sup> 29+08	47 LT.	1
10 <sup>+</sup> 30+64	48 LT.	1
10 <sup>+</sup> 30+65	45 LT.	1
10 <sup>+</sup> 30+70	47 LT.	1
10 <sup>+</sup> 30+75	49 LT.	1
10 <sup>+</sup> 30+82	49 LT.	1
10 <sup>+</sup> 34+60	37 LT.	1
10 <sup>+</sup> 34+60	44	1
10 <sup>+</sup> 40+89	45 RT.	1
10 <sup>+</sup> 44+87	34 RT.	1
10 <sup>+</sup> 44+86-46+50	36-45 RT.	0.10
10 <sup>+</sup> 58+65	50 LT.	1
10 <sup>+</sup> 58+65	33 RT.	1
59+04	44 LT.	1
59+07	44 LT.	1
59+20	44 LT.	1
59+30	44 LT.	1
59+69	44 LT.	2
62+45-68+35	32-59 RT.	0.50
65+12	58 LT.	4
65+20	48 LT.	2
65+30	46 LT.	1
65+31	52 LT.	1
67+42-67+77	44-56 LT.	0.05
TOTALS		52.065 47.065

MISCELLANEOUS REMOVALS

SVA. TO STA.	LOC.	DESCRIPTION	UNIT	UNIT	UNIT
LT.	RT.	CONC. C. & G.	CONC. WALK	CONC. WALK	CONC. WALK
10 <sup>+</sup> 20+18-20+28	RT.	CONC. C. & G.	10'		
10 <sup>+</sup> 34+80-34+93	RT.	CONCRETE WALK			55
10 <sup>+</sup> 34+94	RT.	CONC. C. & G.	16'		
10 <sup>+</sup> 35+24	RT.	CONC. C. & G.	16'		
10 <sup>+</sup> 35+24-35+36	RT.	CONCRETE WALK			60
10 <sup>+</sup> 43+55	RT.	CONC. C. & G.	34'		
10 <sup>+</sup> 44+09	RT.	CONC. C. & G.	40'		
66+26	RT.	CONCRETE WALK			100
67+60-68+56	RT.	BITUMINOUS CURB	96'		
TOTAL			212		215

DRIVEWAY CONSTRUCTION

STATION	ADDRESS	REMARKS	BITUMINOUS			6" CONC. DRY. PAV.			BIT. PAVEMENT	
			SQ. YD.	WIDTH	DEPTH	WIDTH	DEPTH	WIDTH	DEPTH	WIDTH
10 <sup>+</sup> 23+45 RT.	11831	REMOVE BITUMINOUS TO 51' & REPLACE	53	16'	9	16'	36			
10 <sup>+</sup> 45+50 LT.	12110	PAVE TO PROPERTY LINE	-	14'	8	14'	40		26	
10 <sup>+</sup> 47+00 LT.	12128	REMOVE BIT. TO 51' & REPLACE	86	18'	10	18'	30			
10 <sup>+</sup> 56+69 RT.	12251	REMOVE BIT. TO 50' & REPLACE	33	14'	8	14'	30		45	
10 <sup>+</sup> 59+50 LT.		PAVE TO PROPERTY LINE	-	14'	8	14'				
10 <sup>+</sup> 60+13 RT.	12325	PAVE TO PROPERTY LINE	-	18'	10	18'			28	
TOTALS			172		53		106		99	

ADJUST FRAME & RING CASTINGS

STATION	LOC.	TYPE	REMARKS
10 <sup>+</sup> 23+15	31 RT.	M.H.	BELL TEL. CO.
10 <sup>+</sup> 31+20	31 RT.	M.H.	BELL TEL. CO.
10 <sup>+</sup> 31+94	42 RT.	M.H.	STORM SEWER
10 <sup>+</sup> 32+68	7 LT.	M.H.	SAN. SEWER
10 <sup>+</sup> 32+60	30 LT.	M.H.	SAN. SEWER
10 <sup>+</sup> 34+94	41 RT.	C.B.	STORM SEWER
10 <sup>+</sup> 35+24	42 RT.	C.B.	STORM SEWER
10 <sup>+</sup> 36+05	30 LT.	M.H.	SAN. SEWER
10 <sup>+</sup> 36+08	42 RT.	C.B.	STORM SEWER
10 <sup>+</sup> 39+41	29 RT.	M.H.	STORM SEWER
10 <sup>+</sup> 40+05	24 LT.	M.H.	SAN. SEWER
10 <sup>+</sup> 40+45	29 RT.	M.H.	BELL TEL. CO.
10 <sup>+</sup> 43+74	20 LT.	M.H.	SAN. SEWER
10 <sup>+</sup> 43+98	36 RT.	M.H.	STORM SEWER
10 <sup>+</sup> 45+26	28 RT.	M.H.	BELL TEL. CO.
10 <sup>+</sup> 57+66	35 RT.	M.H.	BELL TEL. CO.
67+06	28 RT.	M.H.	BELL TEL. CO.
67+20	28 RT.	M.H.	BELL TEL. CO.

CASTING ASSEMBLIES

ASSEMBLY	ITEM	CASTING NUMBER	QUANTITY
A	FRAME COVER	700-7 712	2
B	FRAME GRATE CURB BOX	801 810 821 B	21

GATE VALVES

STATION	LOCATION
10 <sup>+</sup> 34+97	13 RT.
10 <sup>+</sup> 34+91	51 RT.
10 <sup>+</sup> 43+85	35 RT.
10 <sup>+</sup> 44+25	20 RT.
TOTAL	4

RECONSTRUCT MANHOLES

STATION	TYPE	LOC.	LIN. FT.
10 <sup>+</sup> 34+05	SAN. SEWER	30' LT.	5.8'
10 <sup>+</sup> 40+05	SAN. SEWER	24' LT.	5.8'
10 <sup>+</sup> 43+74	SAN. SEWER	20' LT.	5.9'
TOTAL			17.50'

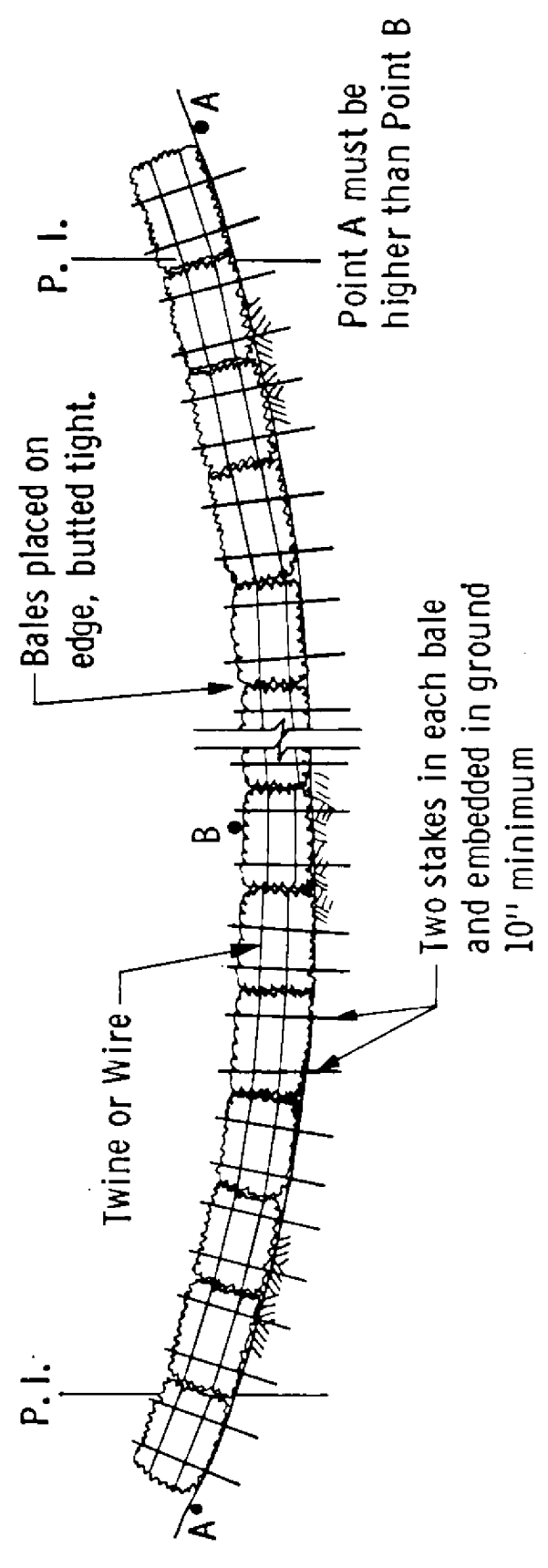
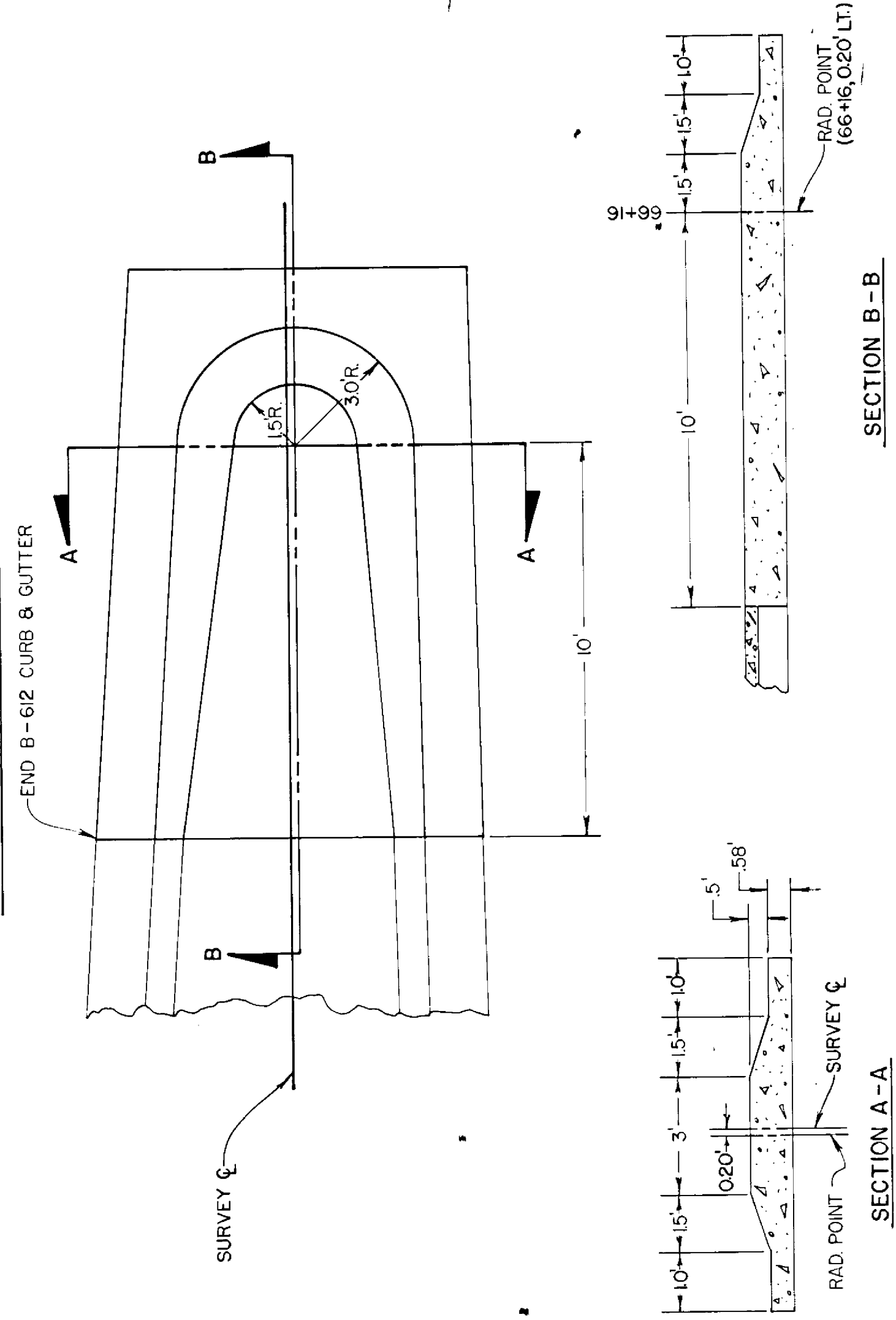
NOTE: SEE ST-94 SEWER FOR SCHEDULE FOR M.H. & C.B. INCLUDED WITH STORM SEWER WORK. BELL TEL. CO. WILL BE ADJUSTED BY OTHERS.

SODDING

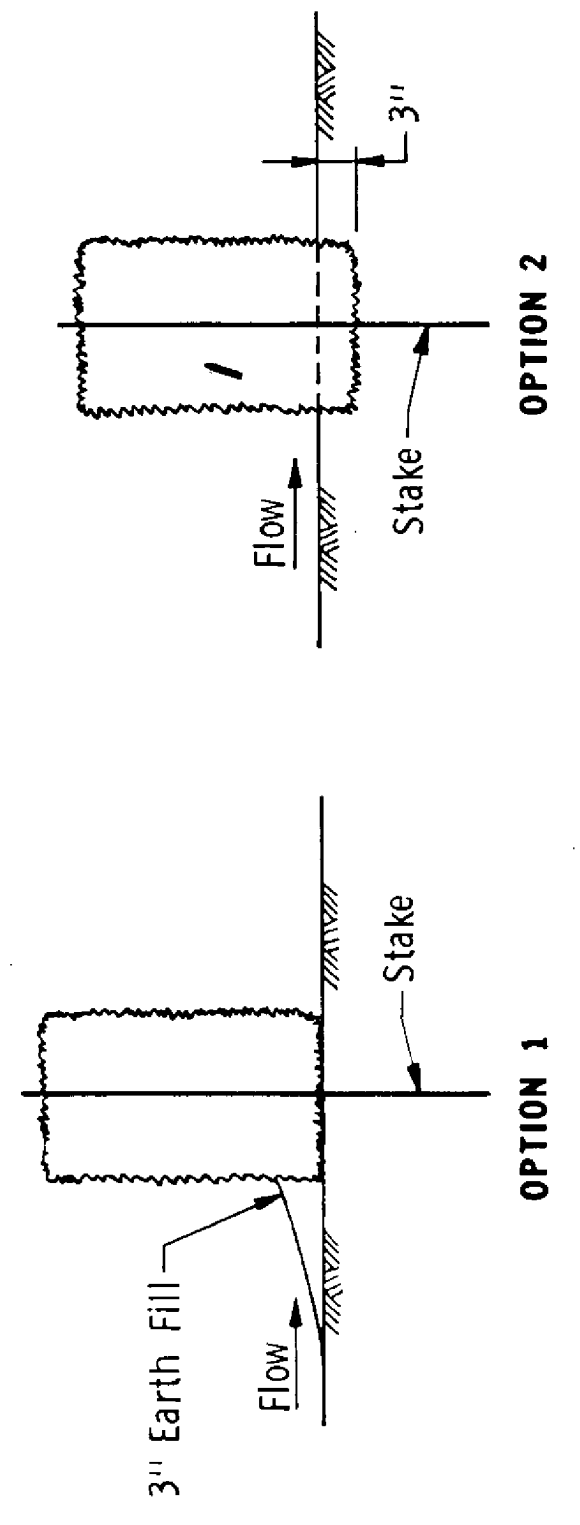
STATION	LOC.	S.Y.
10 <sup>+</sup> 21+16-28+17	27-31.5KT.	350
10 <sup>+</sup> 21+16-22+00	27-31.5KT.	50
10 <sup>+</sup> 22+00-22+37	27-45KT.	274
10 <sup>+</sup> 23+53-24+65	27-47KT.	249
10 <sup>+</sup> 24+65-28+17	27-31.5KT.	176
10 <sup>+</sup> 28+17-29+61	27-43KT.	238
10 <sup>+</sup> 28+17-29+61	27-45LT.	238
10 <sup>+</sup> 29+61-43+55	27-31.5KT.	697
10 <sup>+</sup> 29+61-34+94	27-31.5KT.	266
10 <sup>+</sup> 35+24-44+55	27-31.5KT.	416
10 <sup>+</sup> 44+09-44+50	27-31.5KT.	21
10 <sup>+</sup> 44+50-45+23	27-38LT.	89
10 <sup>+</sup> 44+09-51+00	27-52RT.	1919
10 <sup>+</sup> 45+37-46+93	27-38LT.	191
10 <sup>+</sup> 47+07-47+50	27-38LT.	55
10 <sup>+</sup> 47+50-68+56	27-31.5KT.	1053
10 <sup>+</sup> 50+50-56+00	27-31.5KT.	230
10 <sup>+</sup> 54+06-60+05	27-42KT.	87
10 <sup>+</sup> 56+19-60+05	27-42KT.	498
60+21-61+30	27-38KT.	133
61+30-68+56	27-31.5KT.	363
BRIDGE (REB) APPROACHES		155
CULVERT ENDS		17
STORM SEWER INLET & OUTLET		46
TOTAL		7983



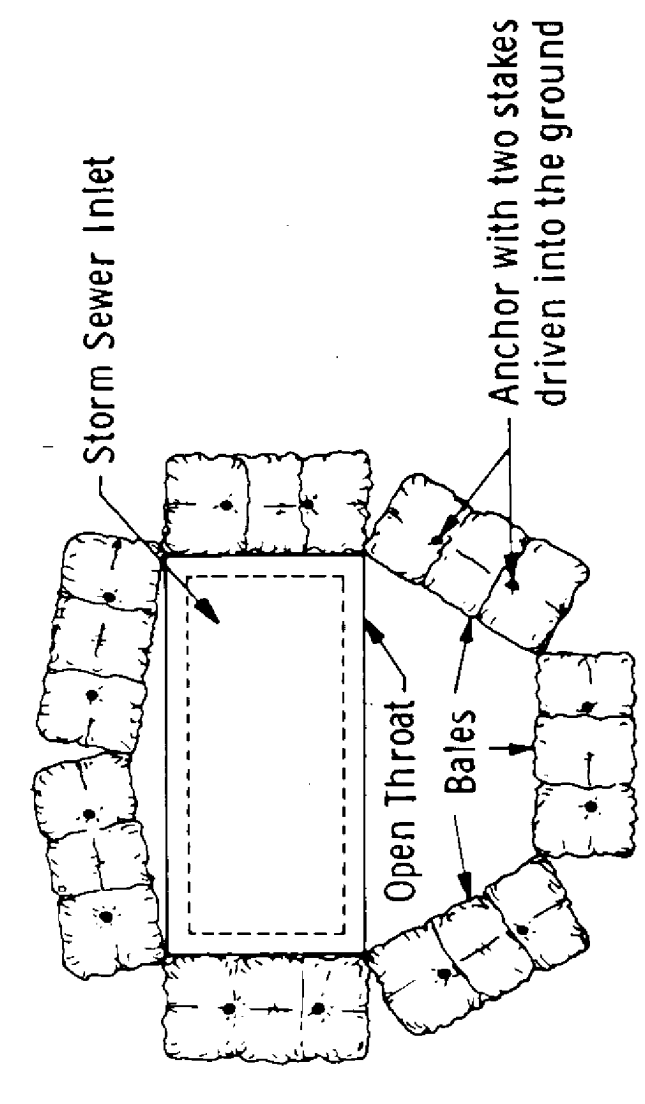
**MEDIAN NOSE DETAIL**



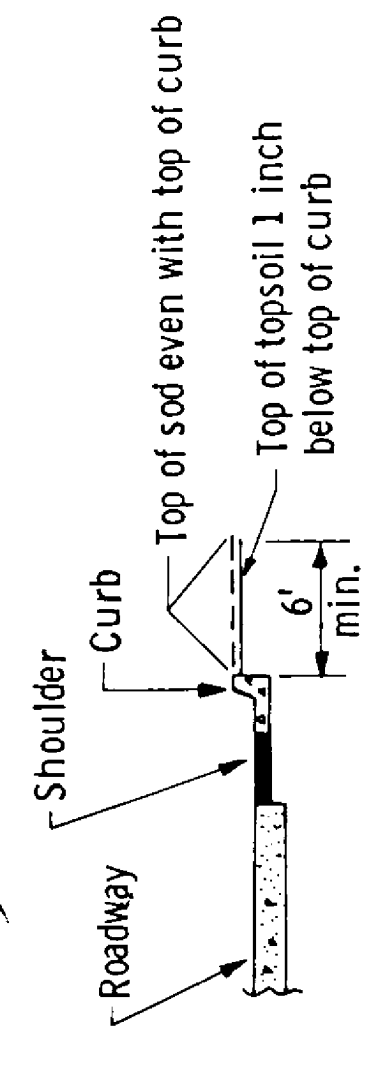
**BALE HAY OR STRAW DITCH CHECK**



**DITCH CHECK SECTIONS**



**BALE DIVERSION TO PROTECT STORM SEWER INLETS**

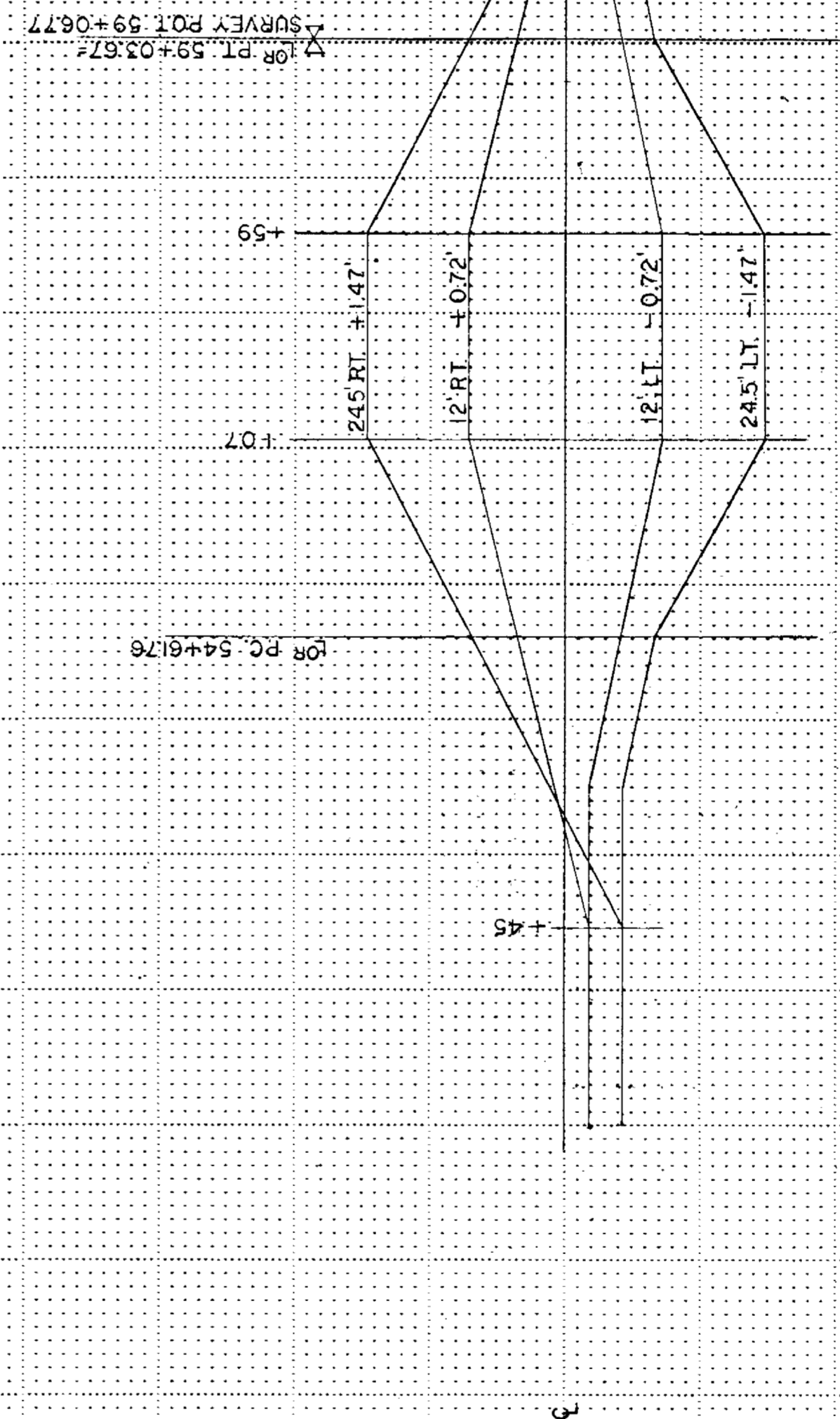
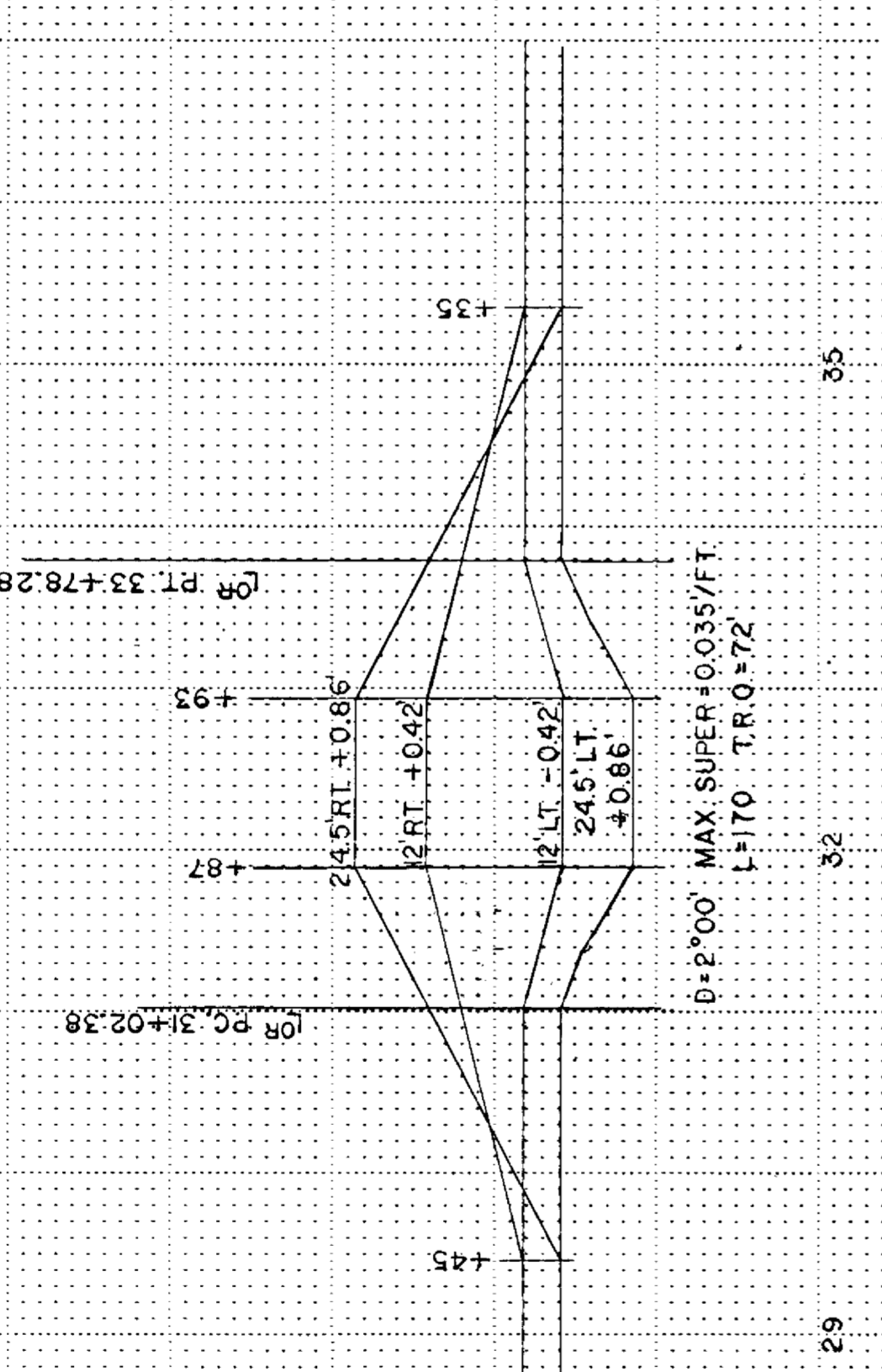
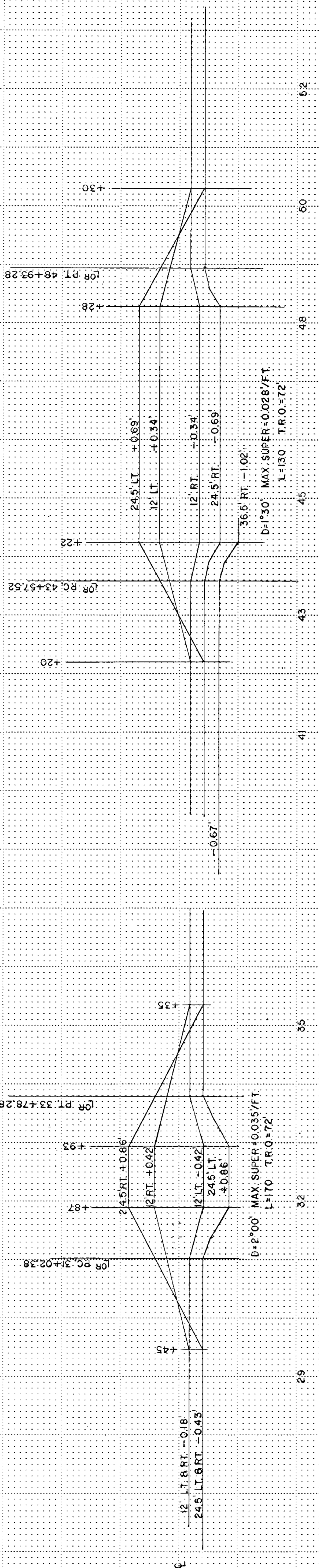


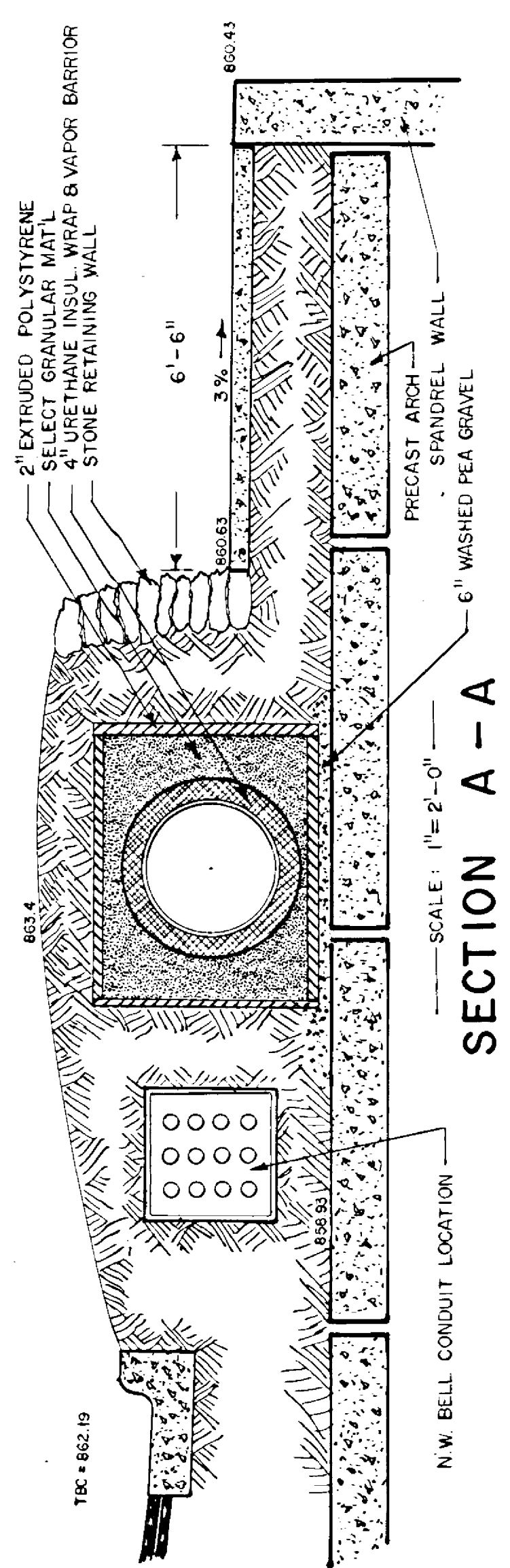
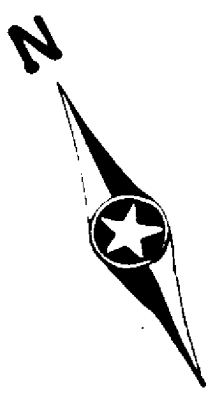
**SHAPING ADJACENT TO CURBS WHEN SOD IS PLACED**

FURNISHING & INSTALLING STORM SEWER

STRUCT NO	STATION	LOCATION	CONSTRUCTION		TOP OF CASTING OR INLET ELEV.	OUTLET ELEV.	CASTING ASSY. TYPE	REMOVE		ADJUST	RECON-STRUCT	21" RCP				CLASS	APRONS		DRAINS TO	INLET ELEV.	SODDING	REMARKS												
			M.H.	CB				EA	PIPE			L.F.	12" RCP	15" RCP	18" RCP		21" RCP	RCP					CMP	STR. NO.	NO. GRADE %	SQ. YD.								
			DESIGN	PAY HEIGHT								LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.																			
1	20+32	24.9' RT.	H	2.9	857.01	853.95	B					50'																						
2	20+32	24.9' LT.	H	3.1	857.01	853.70	B					19'																						
3	25+00	24.9' RT.	C OR G	3.9	858.51	854.40	B					50'										9												
4	25+00	24.9' LT.	C OR G	4.4	858.51	853.90	B					26'																						
5	31+43	24.9' RT.	C OR G	3.9	860.42	856.28	B					55'										9												
6	31+94	42' RT.			860.96	852.36						72'																						
7	31+94	24.9' LT.	C OR G	3.2	858.83	855.56	B					13'																						
9	34+94	55' RT.	C OR G	4.7	861.30	856.43																												
10	34+94	42' RT.				854.79																												
11	35+24	42' RT.				854.85																												
12	35+24	55' RT.	C OR G	4.7	861.42	856.48	A					13'																						
13	35+54	24.9' RT.	A OR F	5.3	861.75	856.30	F					35'																						
14	35+54	24.9' LT.	C OR G	4.8	861.75	856.80	B					50'																						
15	39+41	29.0' RT.			865.05	858.60	B					54'																						
16	39+41	24.9' LT.	C OR G	5.0	865.11	859.89	B																											
17	43+98	36' RT.				865.53																												
18	44+62	24.9' RT.	A OR F	5.5	872.80	867.15	B					16'	457'	441'																				
19	47+50	24.9' RT.	A OR F	5.3	877.81	872.33	B					64'																						
20	50+30	24.9' RT.	A OR F	5.3	883.44	877.93	B					288'																						
21	50+30	24.9' LT.	C OR C	4.6	883.44	878.68	B					280'																						
22	62+00	24.9' LT.	C OR G	3.9	881.25	877.12	B					50'																						
23	63+50	24.9' LT.	C OR G	3.8	880.23	876.22	B																											
24	64+70	12.9' LT. L/S	C OR G	3.9	879.38	875.26	B																											
25	64+80	12.9' LT. L/S	C OR G	3.6	879.47	875.70	B															11												
26	64+90	12.9' RT. L/S	C OR G	3.6	879.83	876.00	B																											
27	64+70	12.9' RT. L/S	C OR G	3.3	879.33	875.84	B																											
28	64+80	12.9' RT. L/S	C.G. OR H	3.2	879.42	876.04	B																											
TOTALS												438	1,003	69	21	16	657	441																46







SECTION A-A  
SCALE: 1"=2'-0"

PROPOSED & HANSON BLVD

29

30

CONTRACTOR MUST BEGIN INSTALLING BALL-JOINT PIPE AT CRESCENT OF BRIDGE ARCH AFTER PREPARING BASE & INSULATION (SEE DETAILS). JOINT DEFLECTION SHALL NOT EXCEED 1/2"

A

REMOVE & SALVAGE 24" BEND

REMOVE 24" 45° BEND SLEEVE TO RE-JOINT PIPES

N.W. BELL CONDUIT LOCATION

B6-18 CONC CURB & GUTTER

N.W. BELL CONDUIT (BY OTHERS)

24" SLIP JOINT PIPE

24" BALL-JOINT PIPE

24" SLIP JOINT PIPE

EXISTING 24" WATERMAIN LOCATION

INSTALL 24" BEND (AS NEEDED)

INSTALL 24" X 24" X 6" TEE  
6" LF. 6" O.D. IP  
6" RW VALVE  
8" - 6" HYD. ASSY. NUT = 863 B2  
1 EA. HYD. EXTENSION (AS REQUIRED)  
ROD ENTIRE ASSY.

862  
860  
858  
856  
854  
852  
850  
848

FINISHED PROFILE OVER WATERMAIN

REINSTALL 8 SECTIONS OF 24" BALL JOINT PIPE  
2" EXTRUDED POLYSTYRENE  
4" URETHANE PIPE WRAP  
2" EXTRUDED POLYSTYRENE  
6" WASHED PEA GRAVEL

FINISHED & PROFILE

REINSTALL 24" PIPE

REINSTALL 24" PIPE

MATCH EXISTING

SPANDEL WALL SECTION  
PRECAST CONC ARCH ELEMENTS

APPROXIMATE WATER TABLE ELEV.

+86 & BRIDGE STRUCTURE

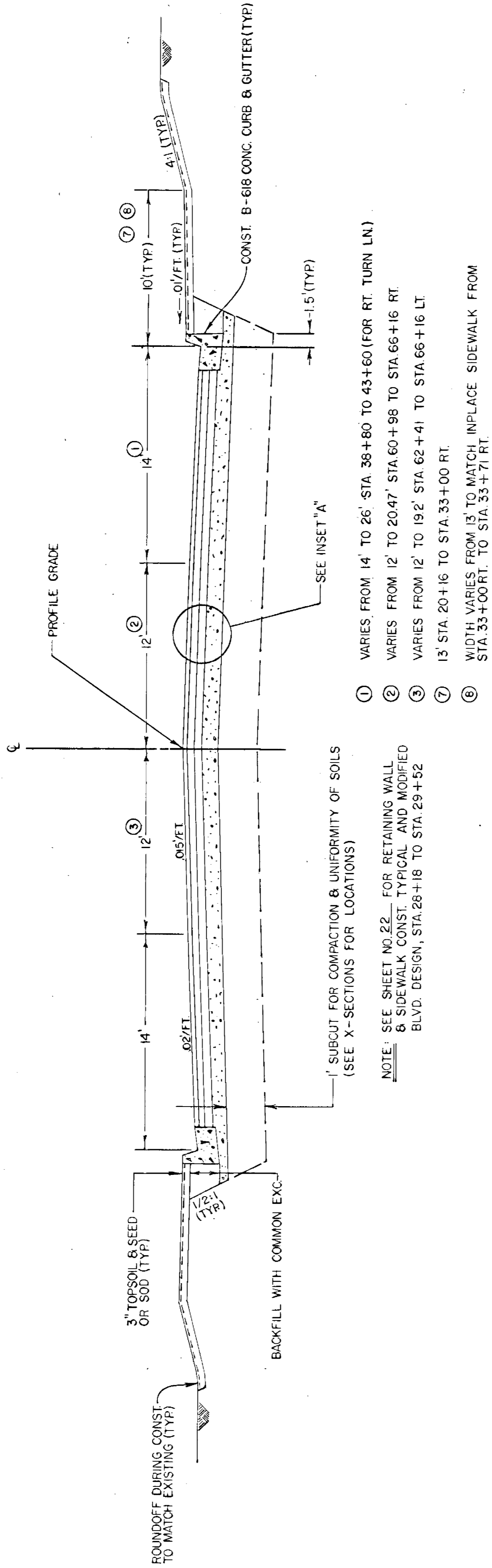
I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY CLOSE SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER OF MINNESOTA  
R. O. YOUNG  
DATE 2-20-85 REG. NO. 10119

CITY OF COON RAPIDS		WATERMAIN RELOCATION	
ENGINEERING DIVISION		HANSON BLVD AT COON CREEK	
DESIGNED: C.R.C.	SCALE: 1"=10'	DATE: 2-20-83	REVISIONS:
DRAWN: C.R.C.	VERT: 1"=2'		
CHECKED: W.R.O.			



TYPICAL SECTIONS

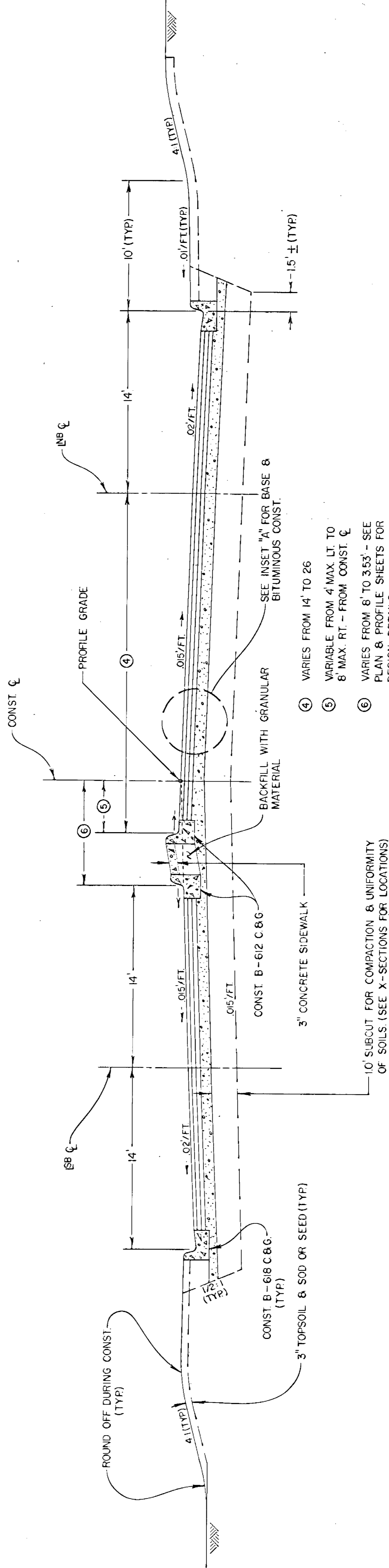
GRADING & BITUMINOUS  
STA. TO STA.  
20+16 - 66+16



- ① SUBCUT FOR COMPACTION & UNIFORMITY OF SOILS (SEE X-SECTIONS FOR LOCATIONS)
- NOTE: SEE SHEET NO. 22 FOR RETAINING WALL & SIDEWALK CONST. TYPICAL AND MODIFIED BLVD. DESIGN, STA. 28+18 TO STA. 29+52

- ① VARIES FROM 14' TO 26' STA. 38+80 TO 43+60 (FOR RT. TURN LN.)
- ② VARIES FROM 12' TO 20.47' STA. 60+98 TO STA. 66+16 RT.
- ③ VARIES FROM 12' TO 19.2' STA. 62+41 TO STA. 66+16 LT.
- ⑦ 13' STA. 20+16 TO STA. 33+00 RT.
- ⑥ WIDTH VARIES FROM 13' TO MATCH INPLACE SIDEWALK FROM STA. 33+00 RT. TO STA. 33+71 RT.

GRADING & BITUMINOUS  
STA. TO STA.  
66+16 - 68+56

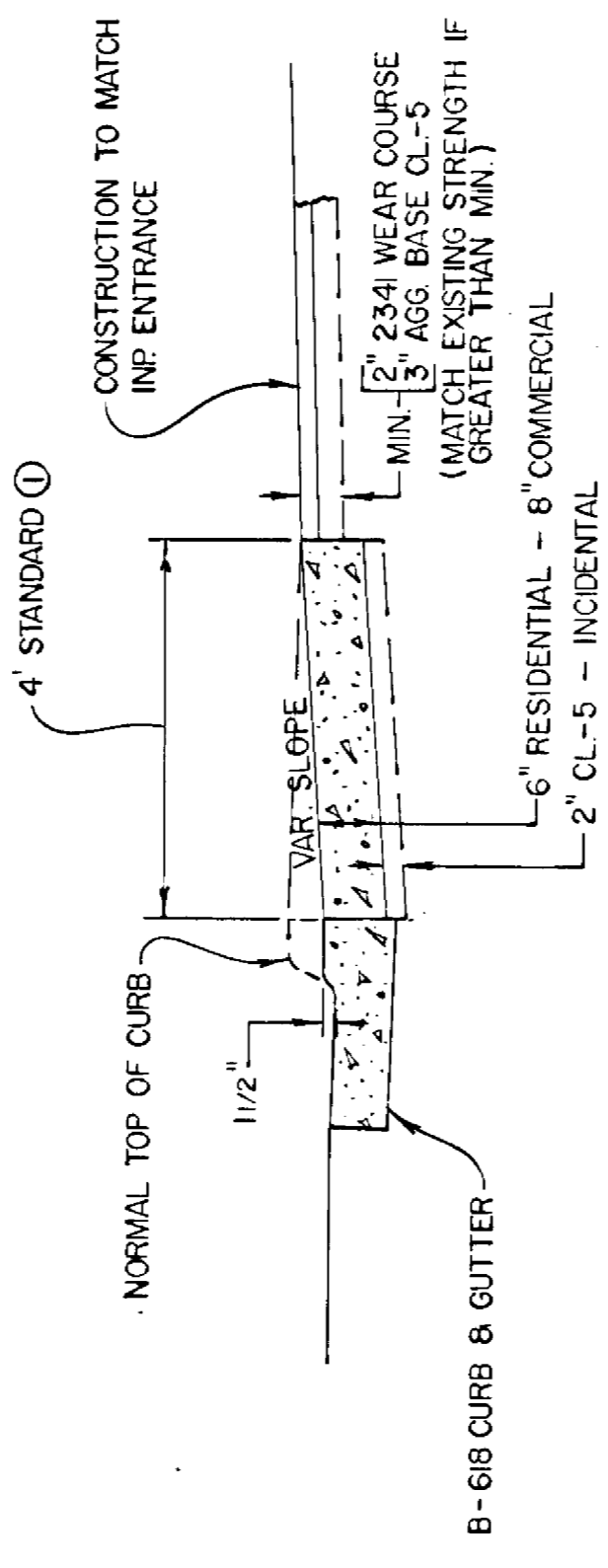
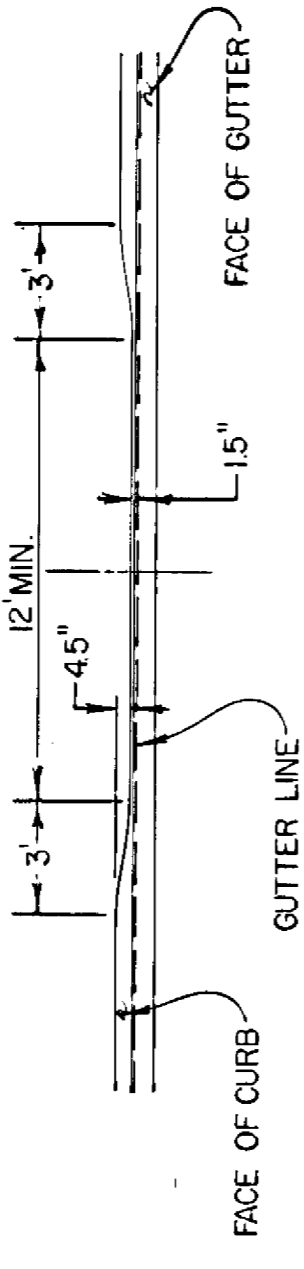
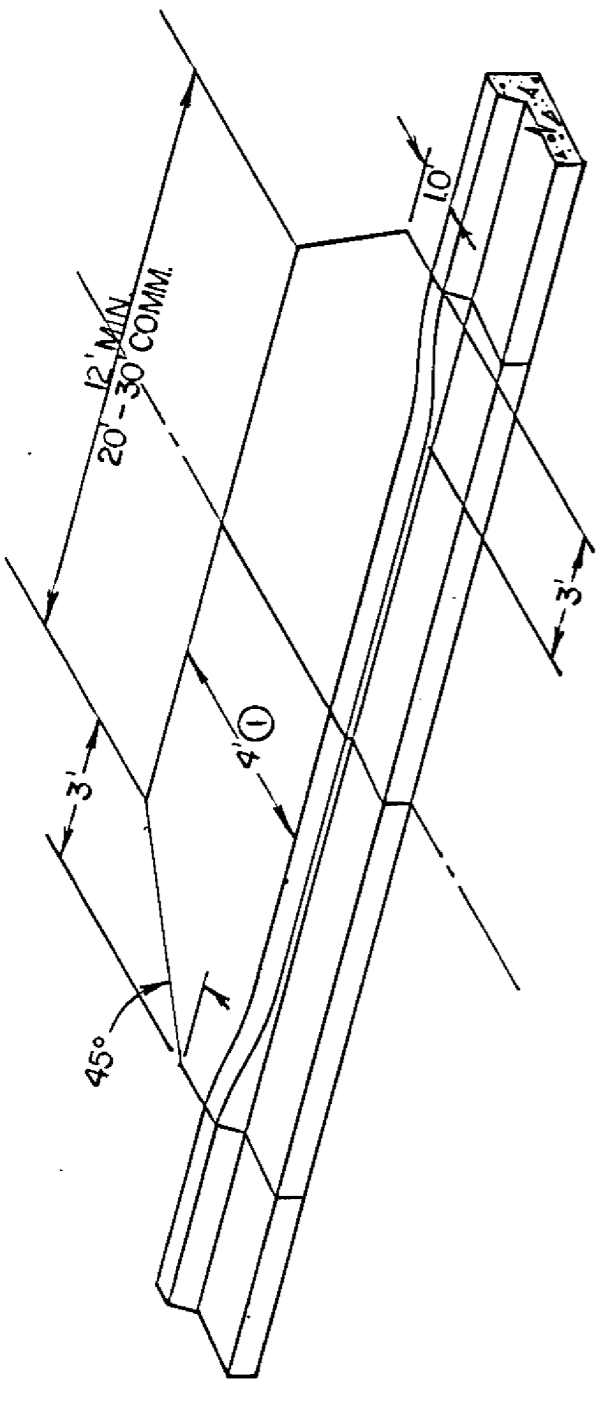


- ④ VARIES FROM 14' TO 26'
- ⑤ VARIABLE FROM 4' MAX. LT. TO 8' MAX. RT. - FROM CONST.  $\epsilon$
- ⑥ VARIES FROM 8' TO 3.53' - SEE PLAN & PROFILE SHEETS FOR DESIGN DETAILS.

① SUBCUT FOR COMPACTION & UNIFORMITY OF SOILS (SEE X-SECTIONS FOR LOCATIONS)

NOTE: SEE X-SECTIONS FOR MUCK EXCAVATION AREAS & LIMITS.

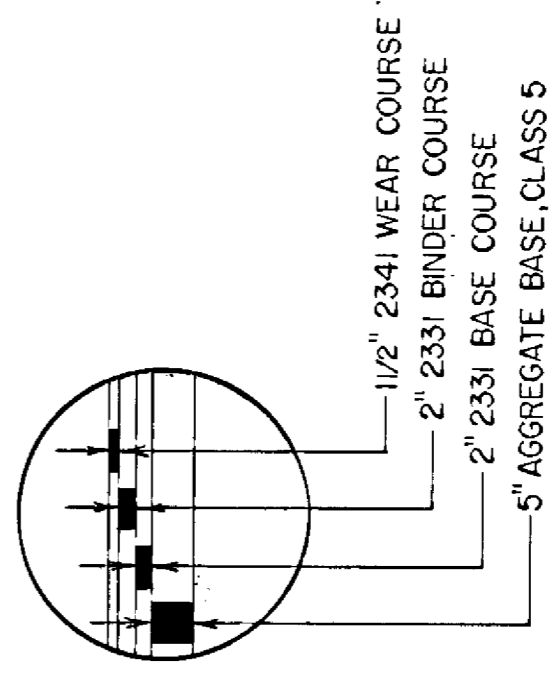
CONCRETE APRON DETAIL



① IN SIDEWALK AREAS EXTEND CONC. APRON TO MATCH SIDEWALK.

NOTE: ALSO SEE STD. PLATE NO. 7035 J

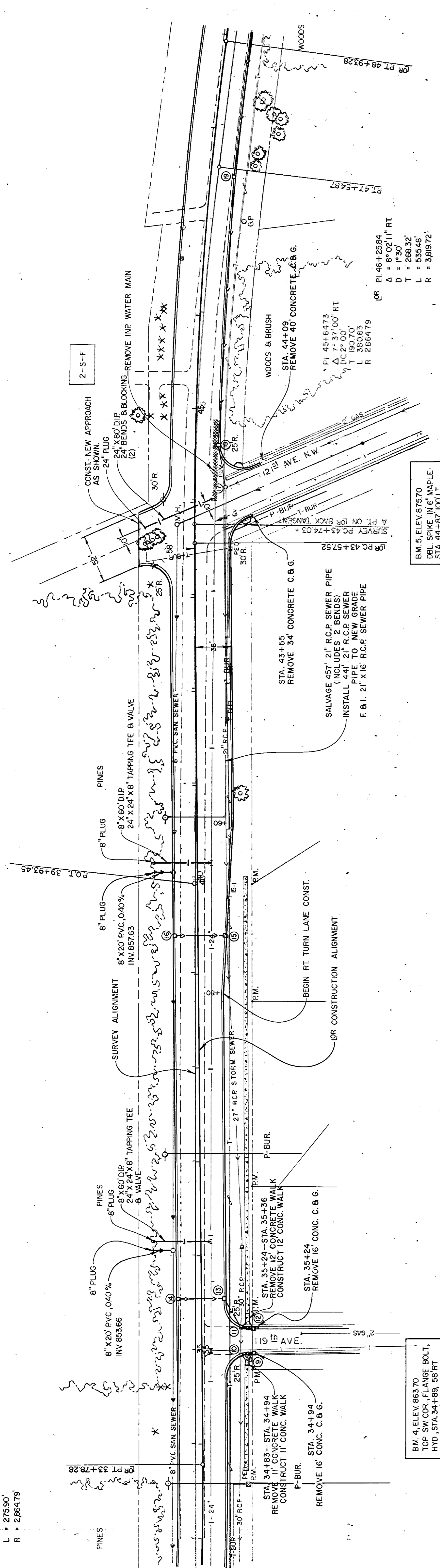
INSET "A"







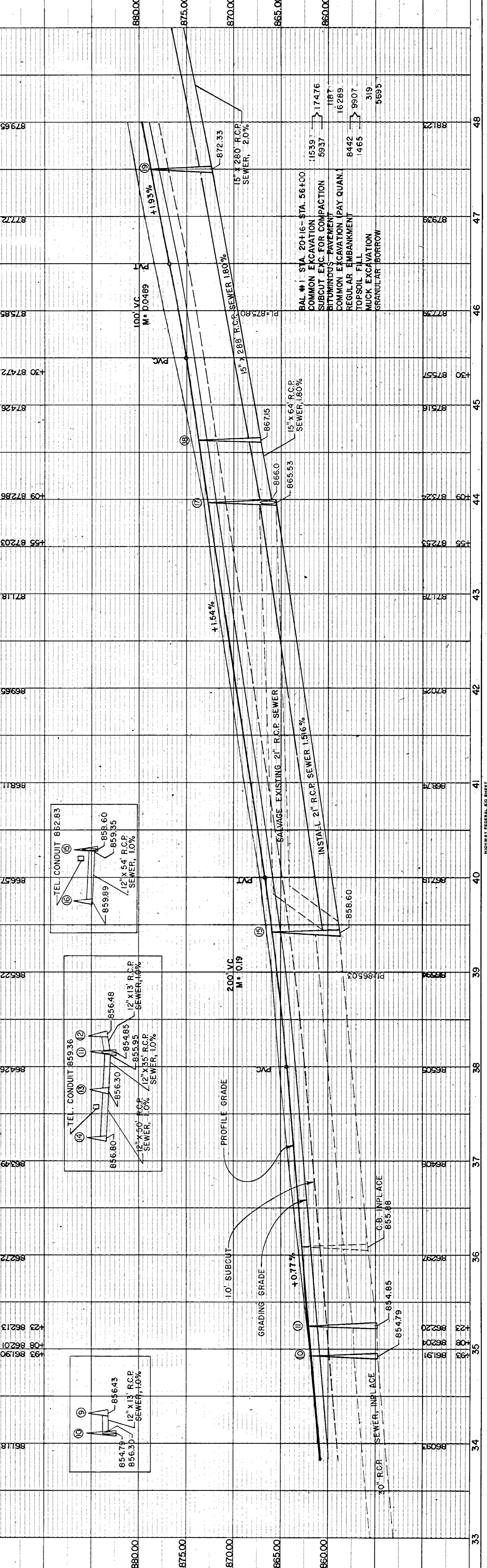
OR PI 32+40.44  
 Δ = 5°31'05" LT  
 D = 2°00'  
 T = 138.06'  
 L = 275.90'  
 R = 2,864.79'



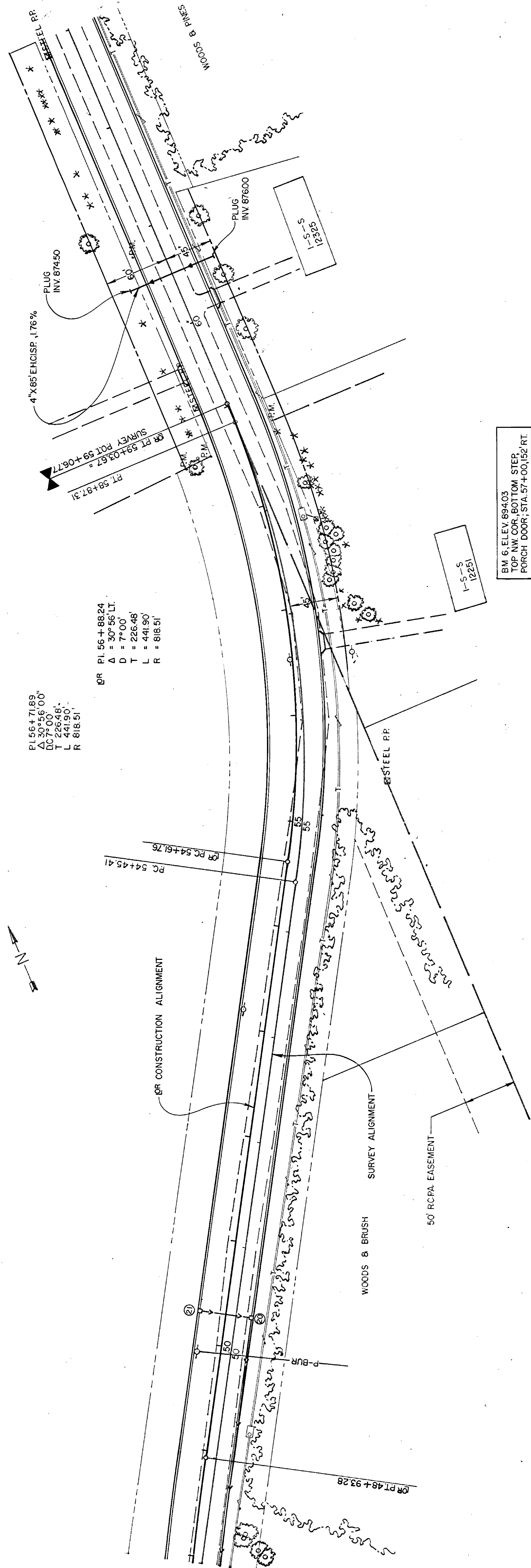
OR PI 46+25.84  
 Δ = 8°02'11" RT  
 D = 1°30'  
 T = 268.32'  
 L = 555.48'  
 R = 3,819.72'

BM 5, ELEV 87570  
 DBL SPIKE IN 6" MAPLE  
 STA. 44+87.00 LT

BM 4, ELEV 86370  
 TOP SW COR, FLANGE BOLT,  
 HD, STA. 34+83.58 RT





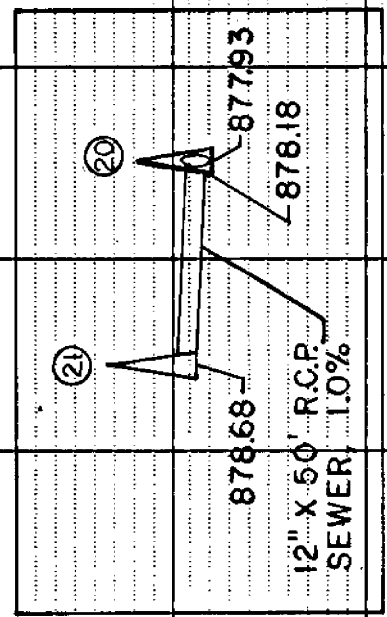
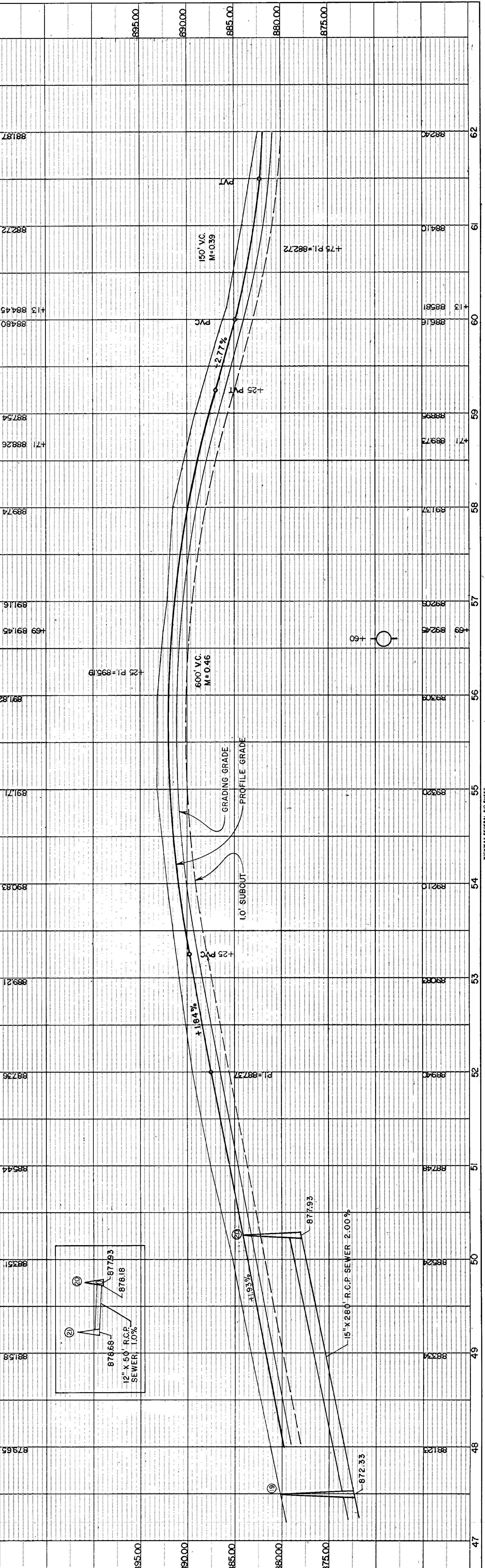


PI 56+88.24  
 $\Delta = 30^\circ 56' 00''$   
 $D = 770.00'$   
 $T = 226.48'$   
 $L = 441.90'$   
 $R = 818.51'$

OR PI 56+88.24  
 $\Delta = 30^\circ 56' 00''$   
 $D = 770.00'$   
 $T = 226.48'$   
 $L = 441.90'$   
 $R = 818.51'$

OR PI 46+25.84  
 $\Delta = 8^\circ 02' 11''$  RT.  
 $D = 1^\circ 30'$   
 $T = 268.32'$   
 $L = 535.48'$   
 $R = 3,819.72'$

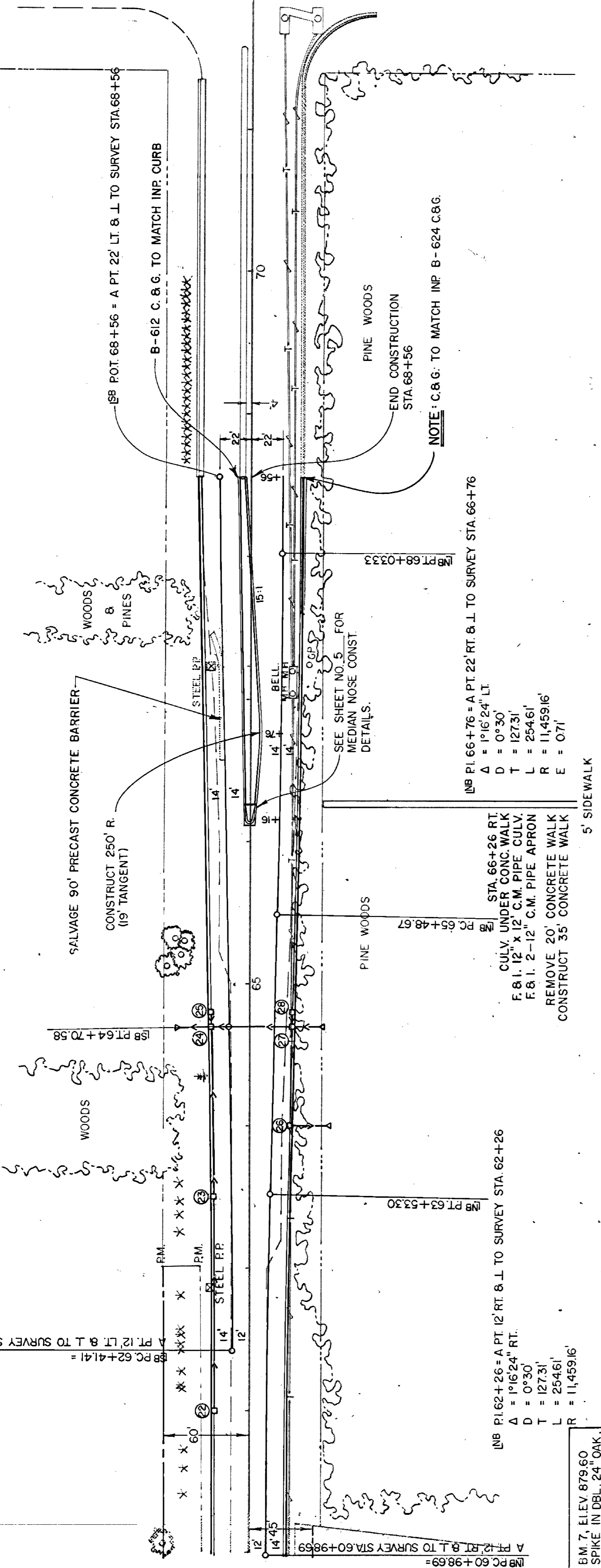
BM 6, ELEV. 894.03  
 TOP NW COR. BOTTOM STEP  
 PORCH DOOR; STA. 57+00.152 RT.





SB PI. 63+56 = A PT. 12' LT. & L. TO SURVEY STA. 63+56  
 Δ = 1°08'45" LT.  
 D = 0°30'  
 T = 114.59'  
 L = 229.17'  
 R = 11,459.16'

SB PI. 62+26 = A PT. 12' LT. & L. TO SURVEY STA. 62+26  
 Δ = 1°16'24" RT.  
 D = 0°30'  
 T = 127.31'  
 L = 254.61'  
 R = 11,459.16'

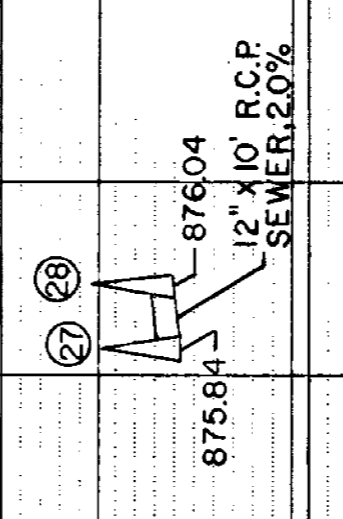
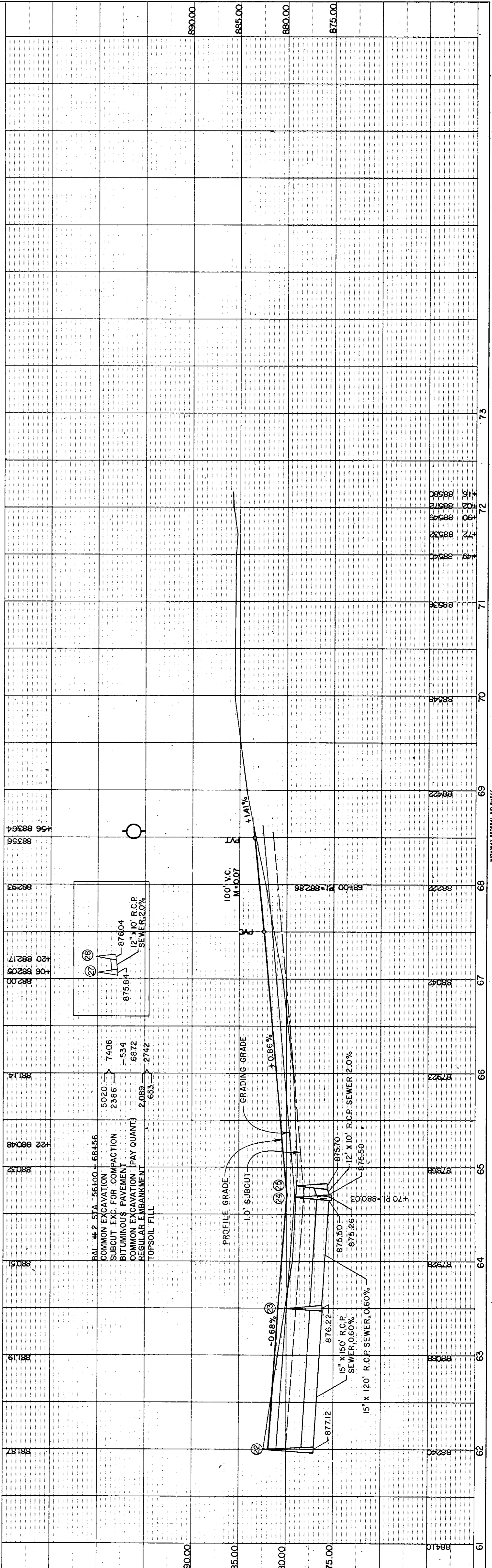
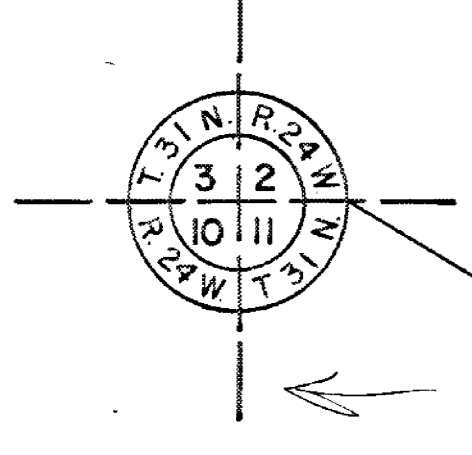


NOTE: C.B.G. TO MATCH INF. B-624 C.B.G.

BM. 7, ELEV. 879.60  
 SPIKE IN DBL. 24" OAK,  
 130 RT., STA. 64+20

STA. 66+26 RT.  
 Δ = 1°16'24" RT.  
 D = 0°30'  
 T = 127.31'  
 L = 254.61'  
 R = 11,459.16'

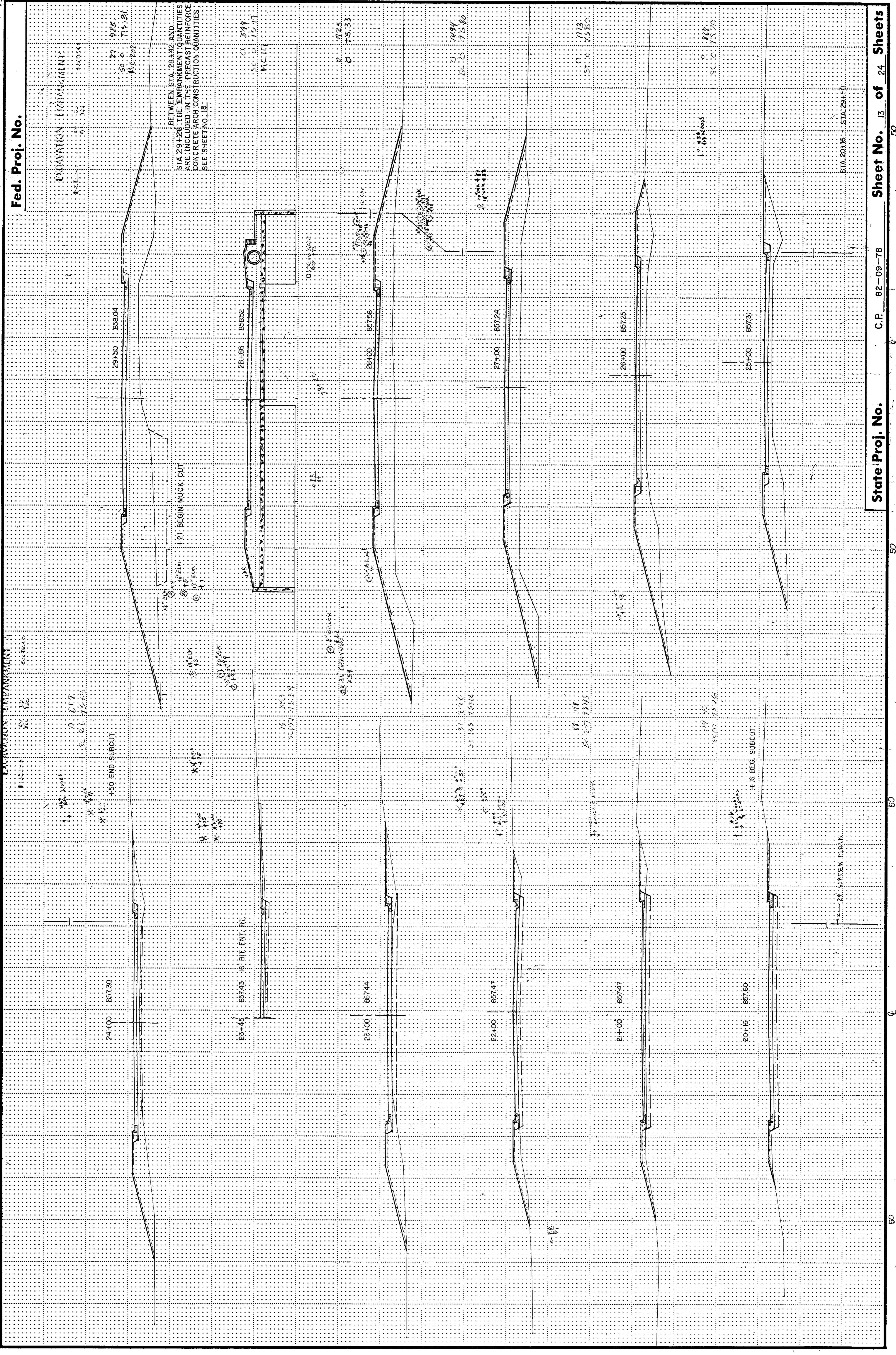
NB PI. 66+76 = A PT. 22' RT. & L. TO SURVEY STA. 66+76  
 Δ = 1°16'24" LT.  
 D = 0°30'  
 T = 127.31'  
 L = 254.61'  
 R = 11,459.16'



BAL. #2 STA. 56+00 - 68+56  
 COMMON EXCAVATION  
 SUBCUT EXC. FOR COMPACTION  
 BITUMINOUS PAVEMENT  
 COMMON EXCAVATION (PAY QUANT)  
 REGULAR EMBANKMENT  
 TOPSOIL FILL

5020 → 7406  
 2386 → 534  
 2,089 → 2742  
 653





REFURVE POST CROSS SECTION 1011 9/76

MSB





Fed. Proj. No.

EXCAVATION EMBANKMENT

EXCAVATION EMBANKMENT

Sheet No. 14 of 24 Sheets

C.P. 82-09-78

State Proj. No.

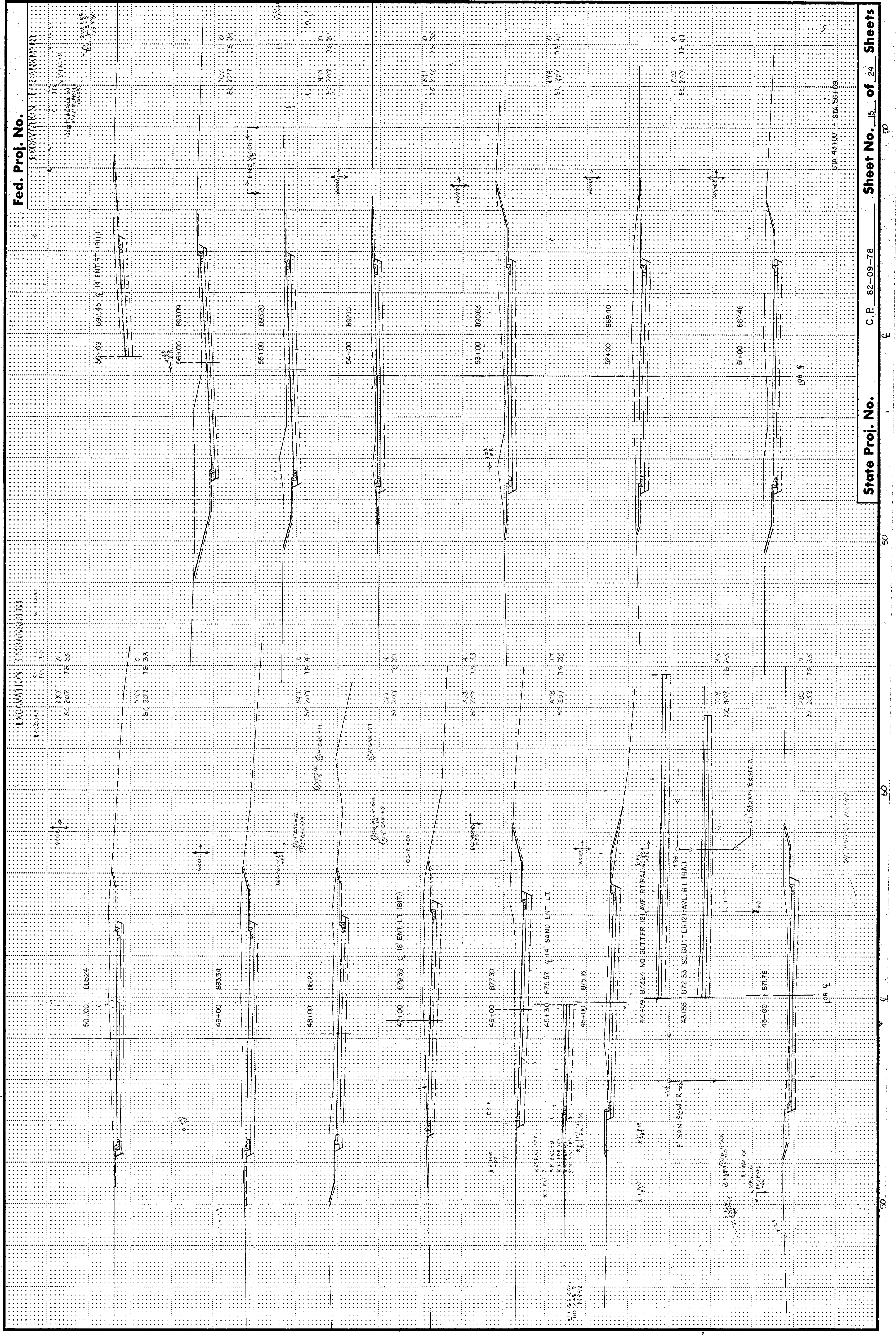
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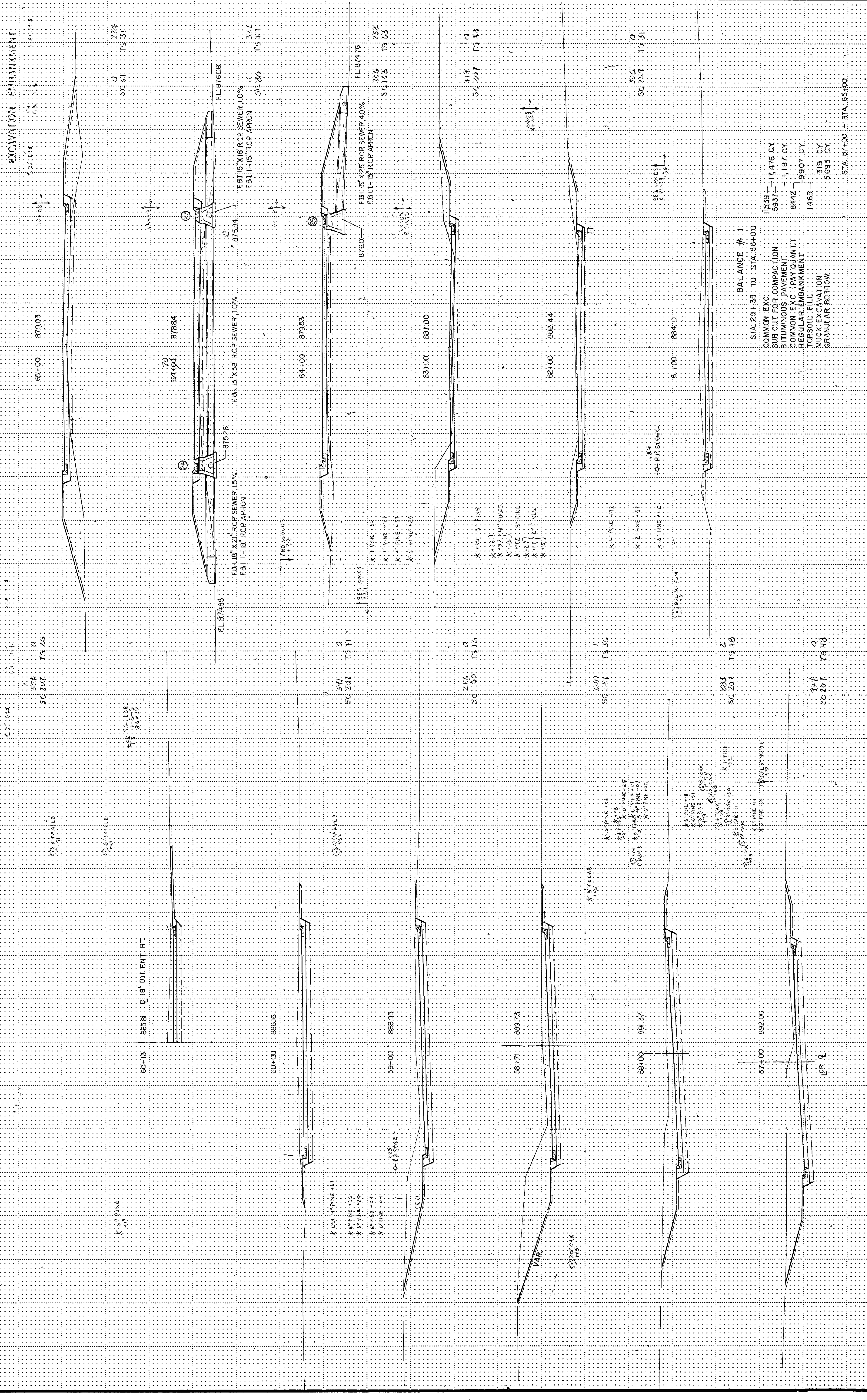
50





TELEPHONE POST CROSS SECTION 1017 9/78







68+56 883.64

+56 END SUBCUT

63 33  
56 154 15.75

68+00 882.83

+77 End Slopes

+12 886.90 Slopes

37 287  
35 181 15.82

→ Slopes

67+00 880.82

-0- PP. 5.12

0 0.00 0.00  
0 0.00 0.00

66+00 879.61

11 38  
10 23 11.58

70+00 885.19

65+31 879.20

65+22 879.10

11 38  
10 23 11.58

69+00 884.26

+12 886.90 Slopes

11 38  
10 23 11.58

BALANCE # 2  
STA 56+00 TO STA 68+56

COMMON EXC	5020	7406 CY
SUBCUT FOR COMPACTION	2386	534 CY
BITUMINOUS PAVEMENT		6872 CY
COMMON EXC. (PAY QUANT)		2089
REGULAR EMBANKMENT	653	2742 CY
TOPSOIL FILL		

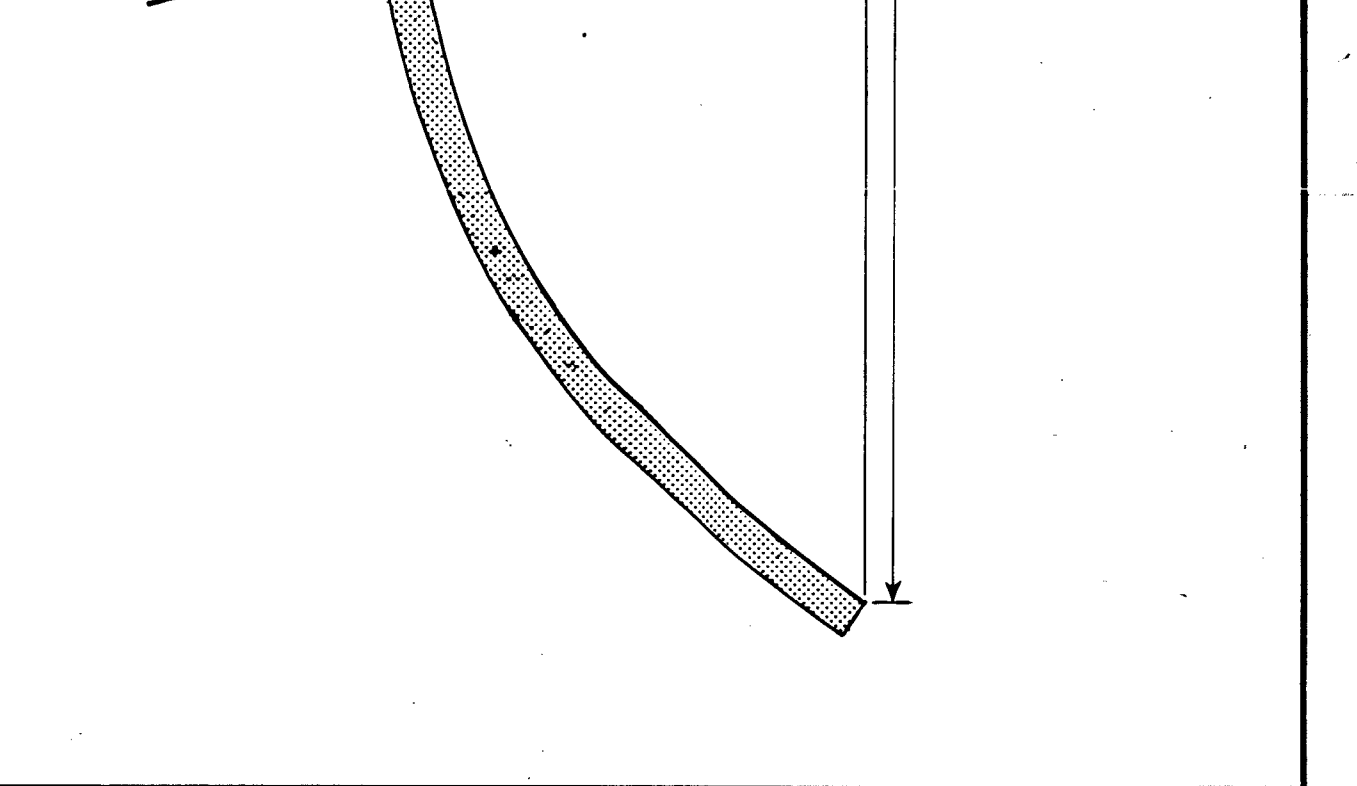
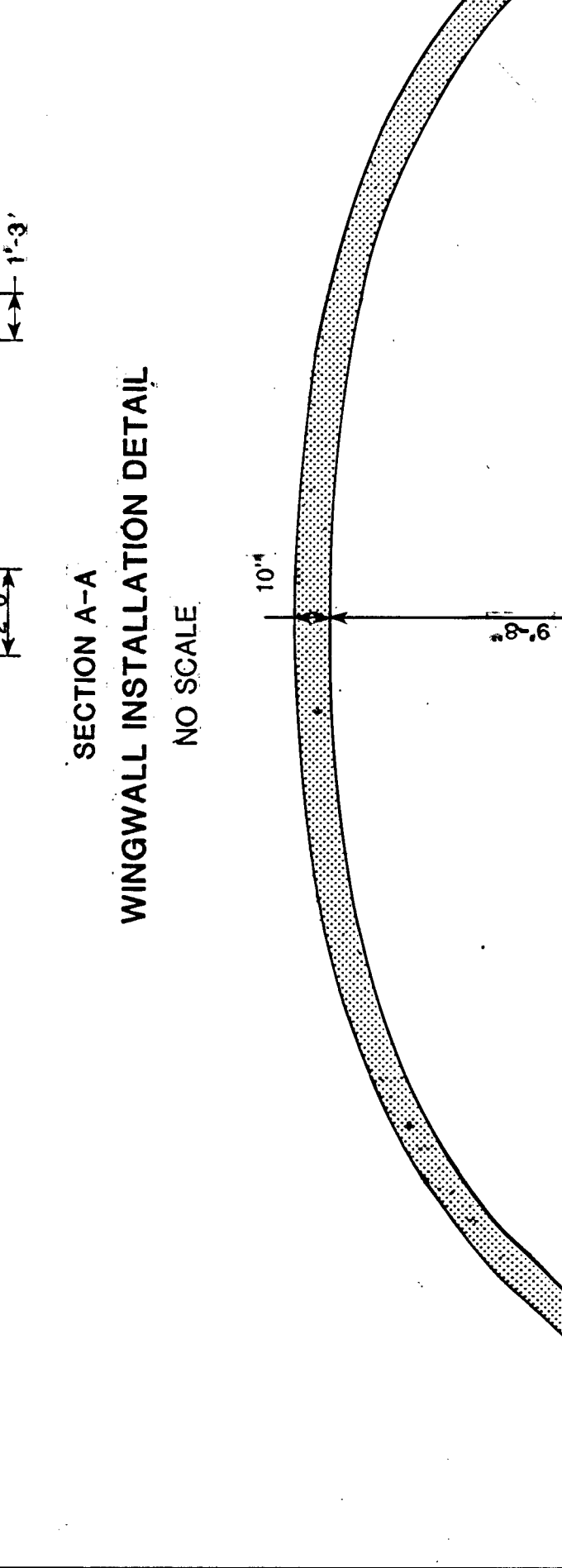
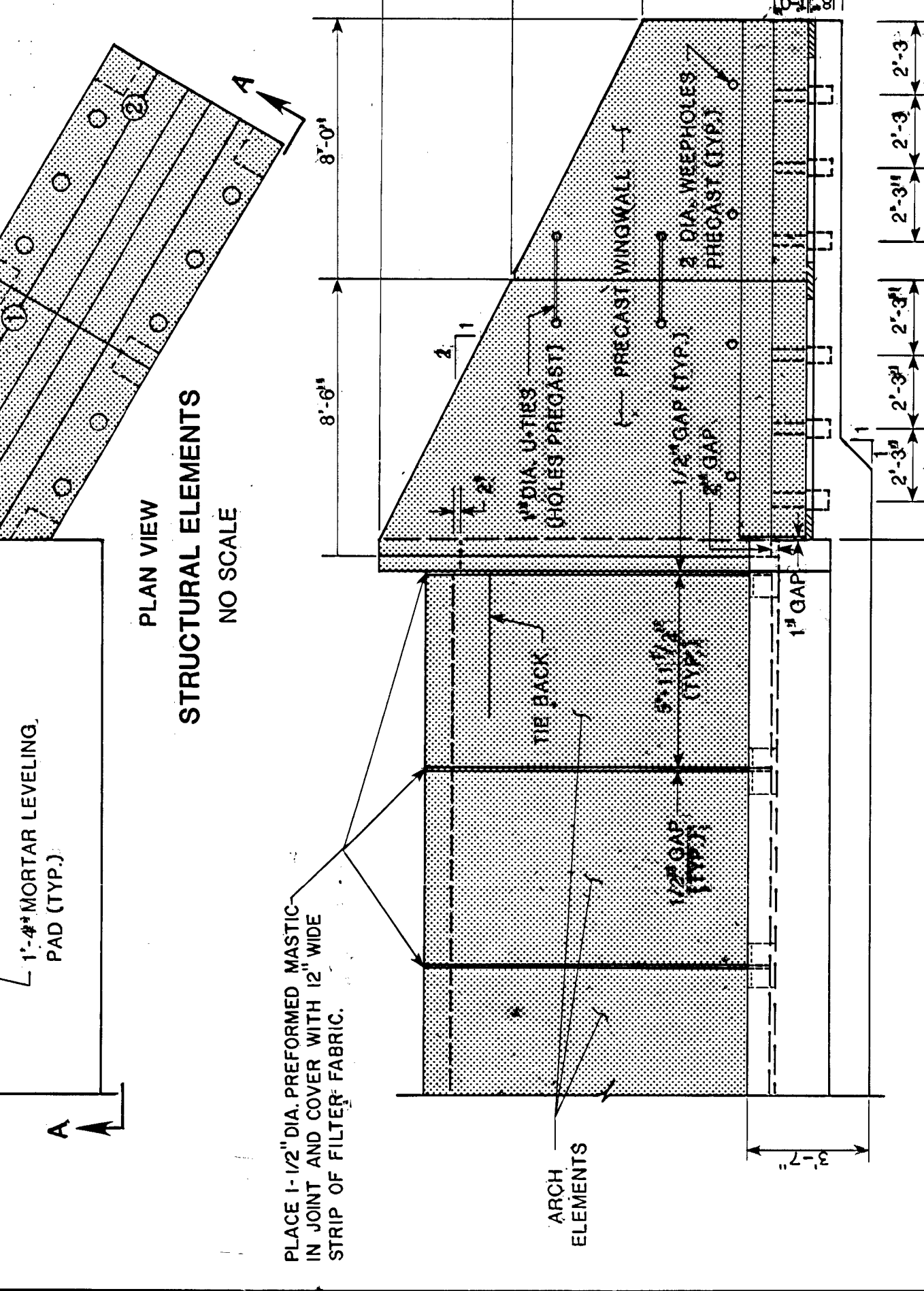
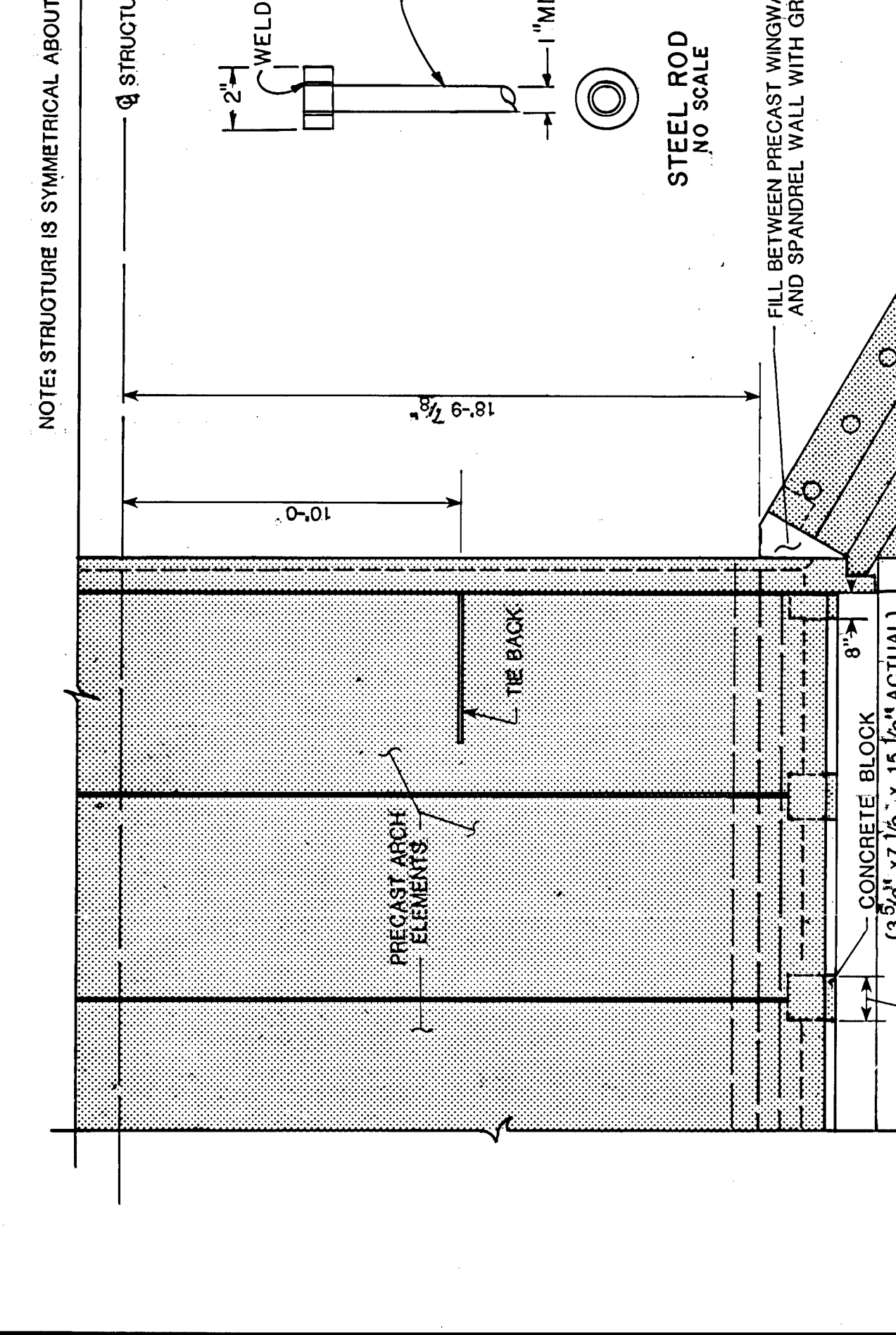
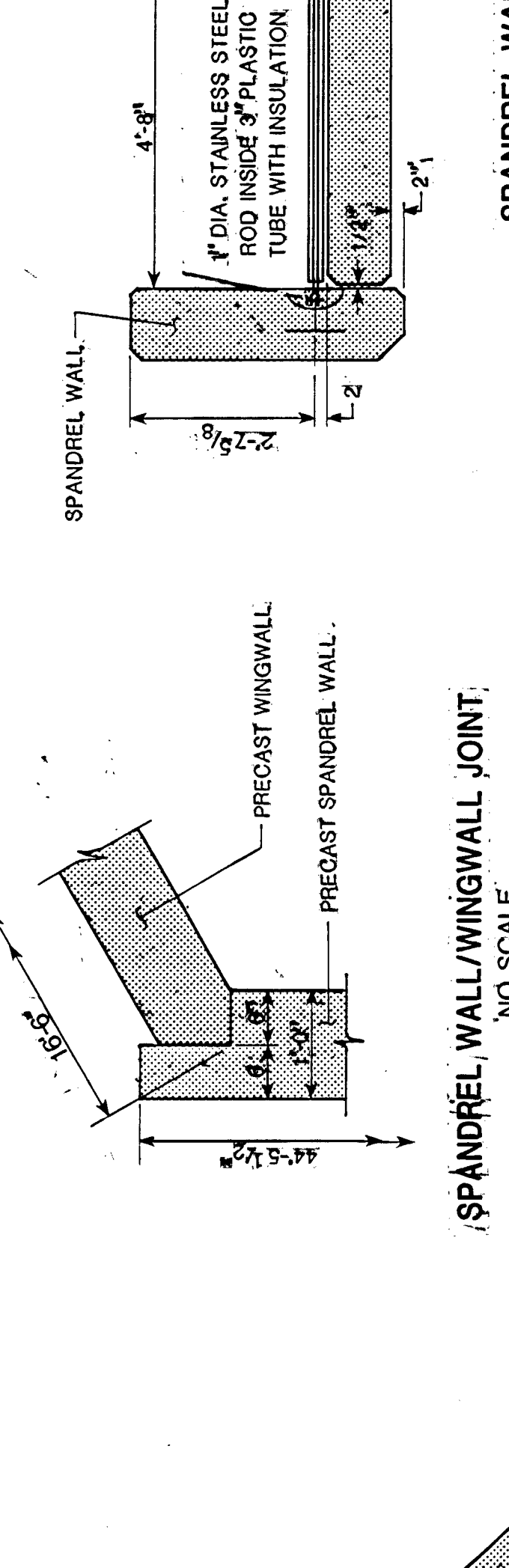
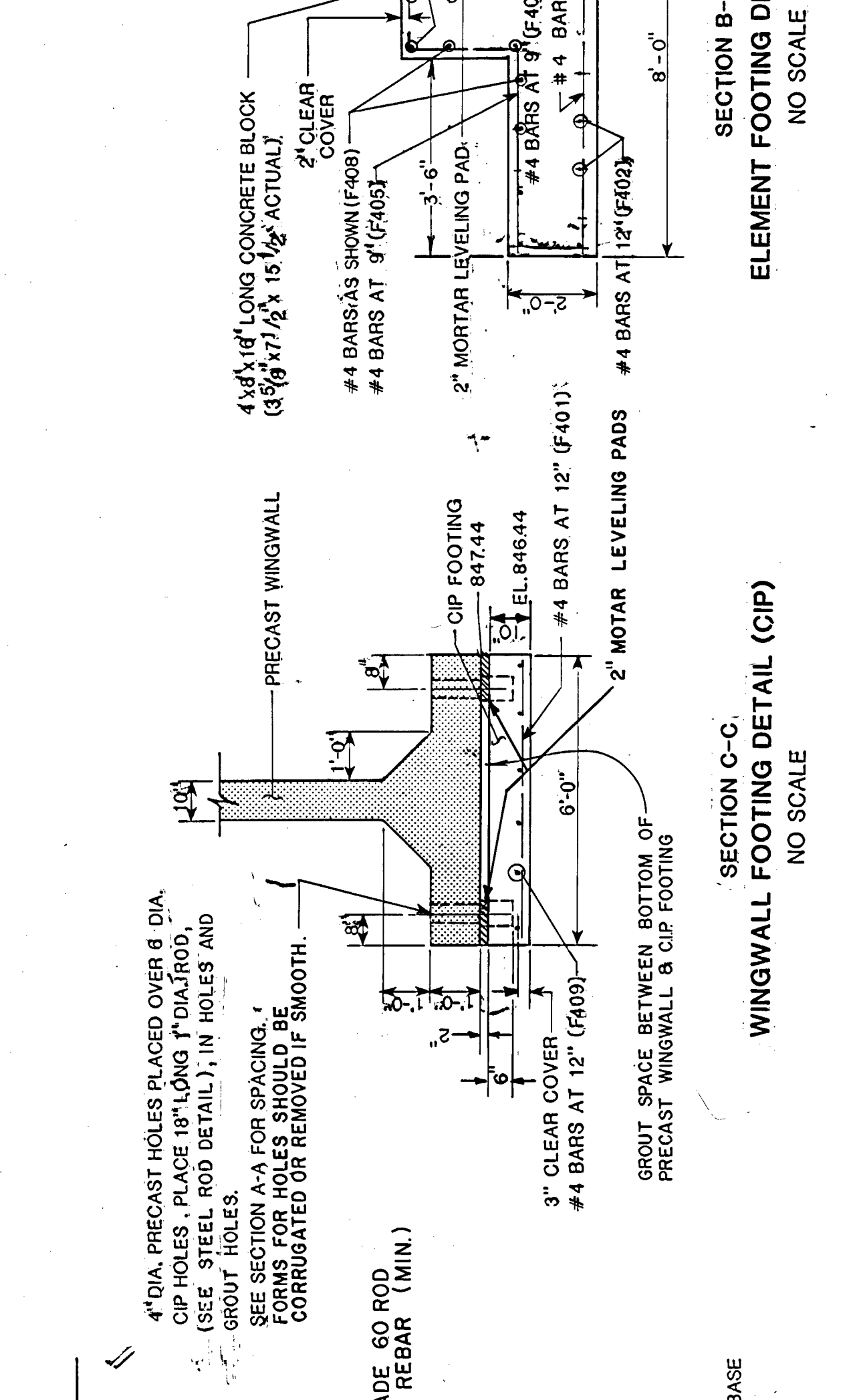
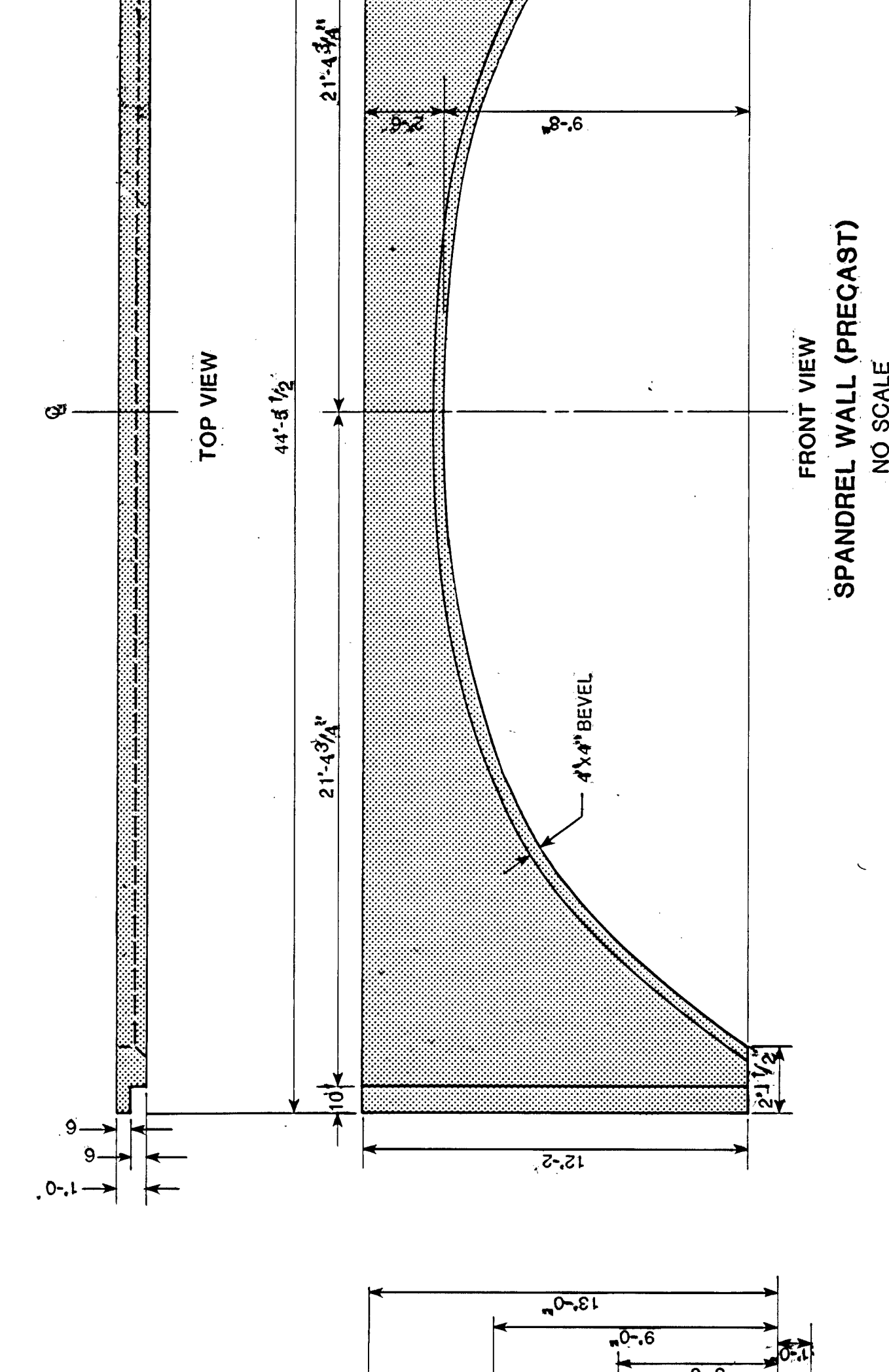
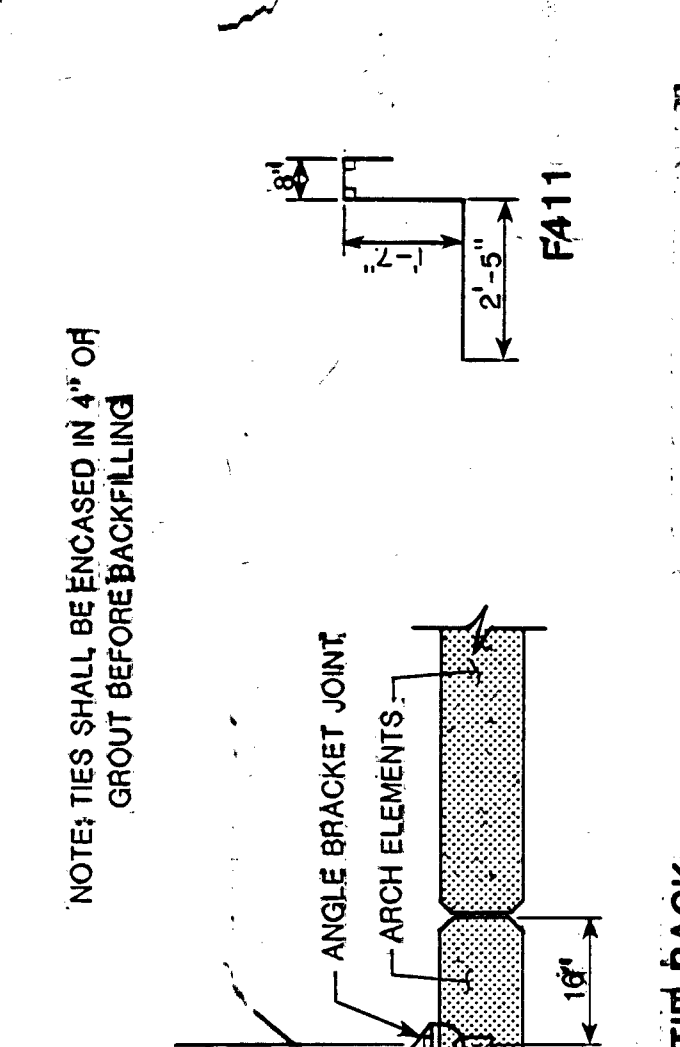
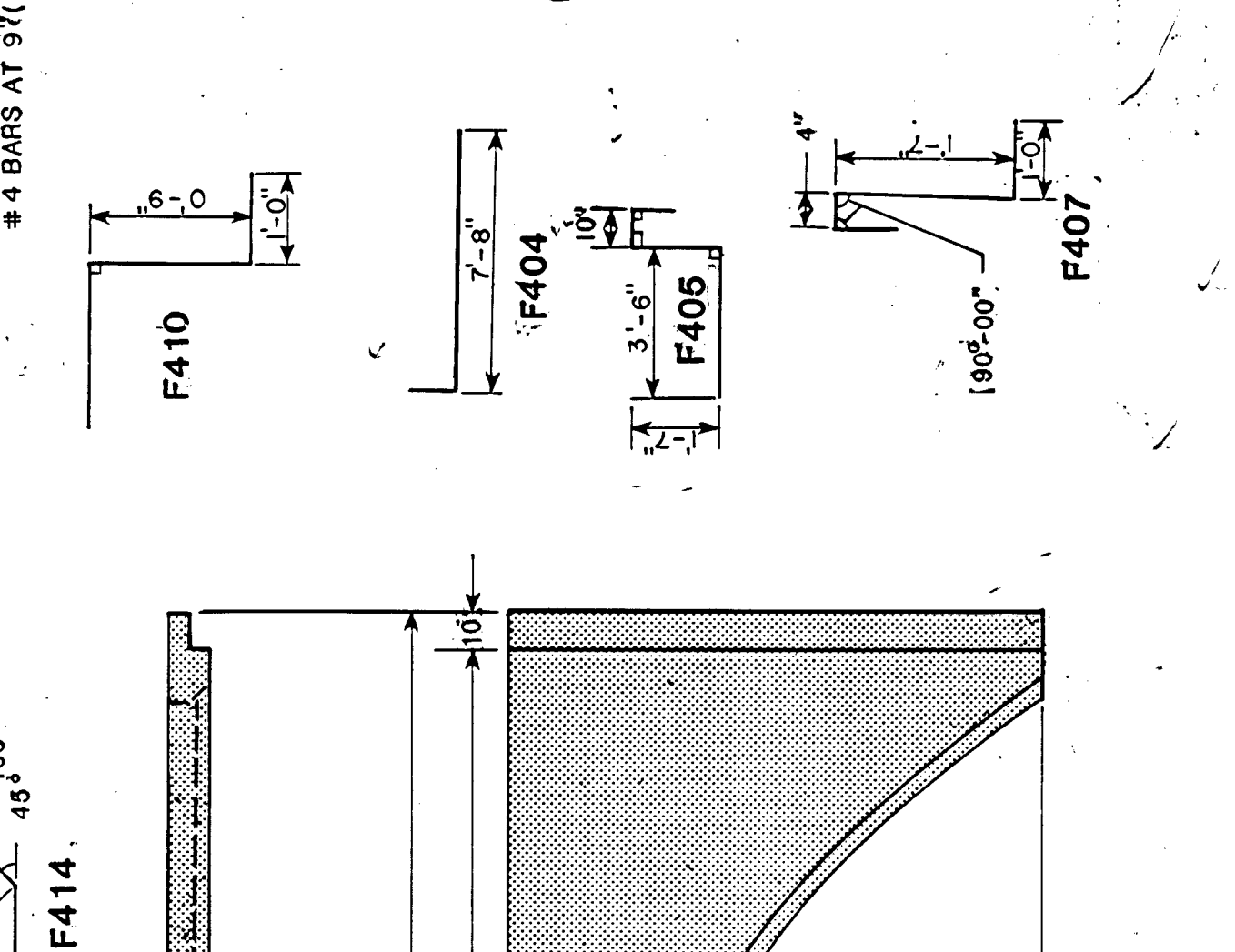
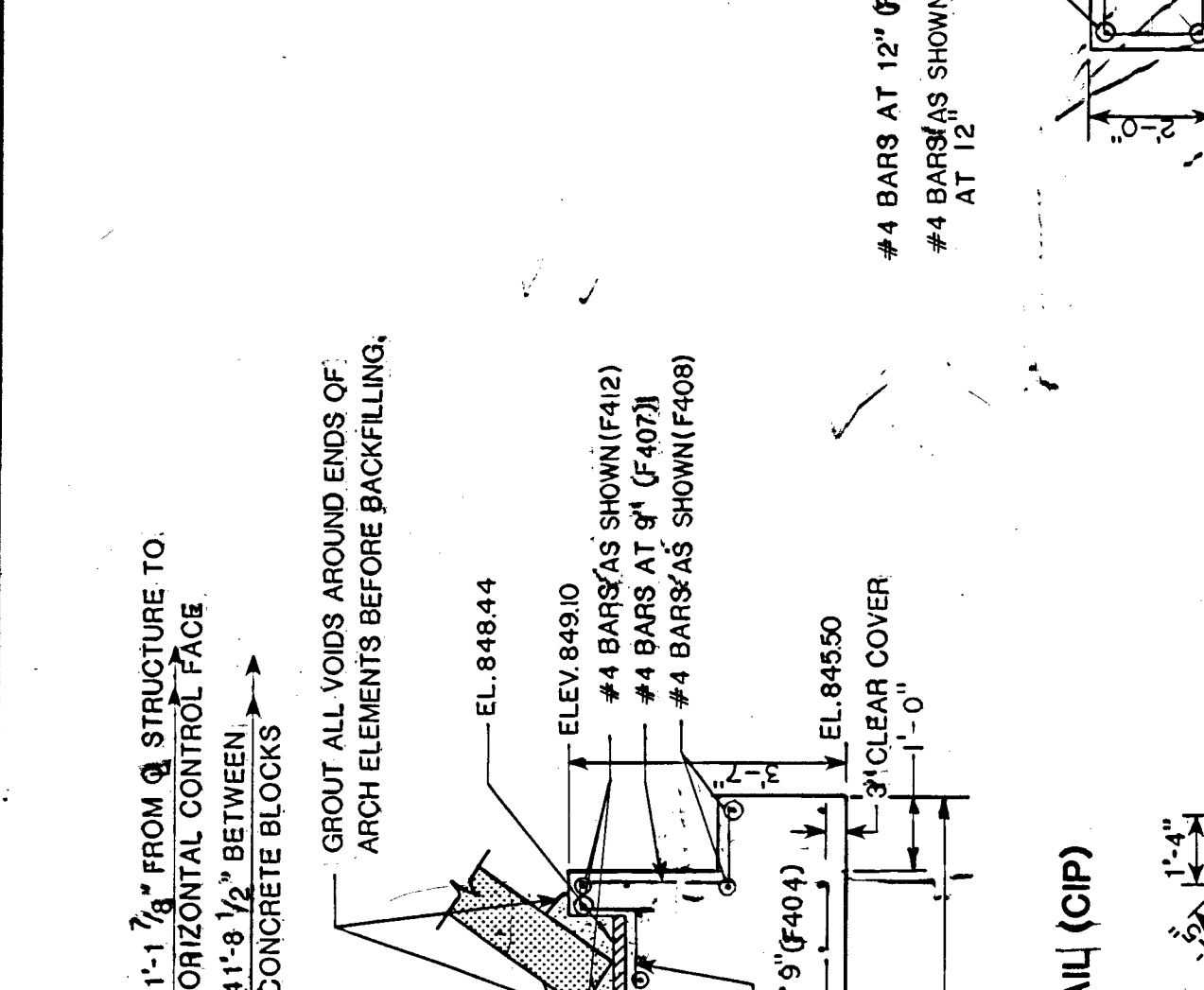
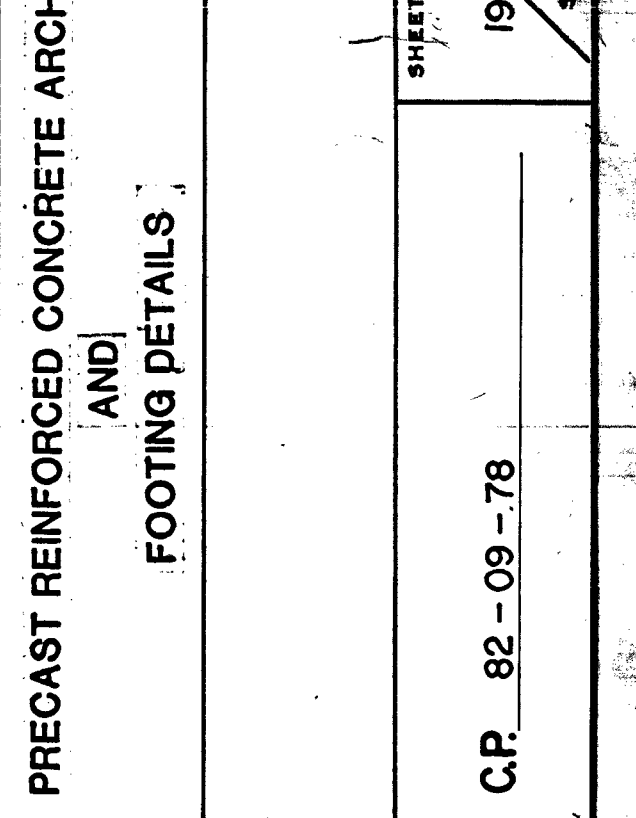
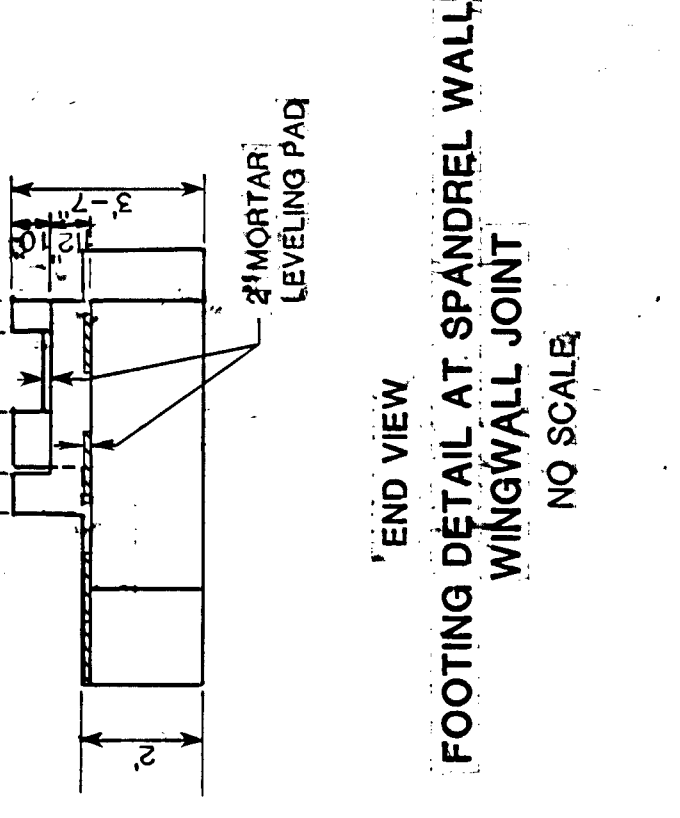
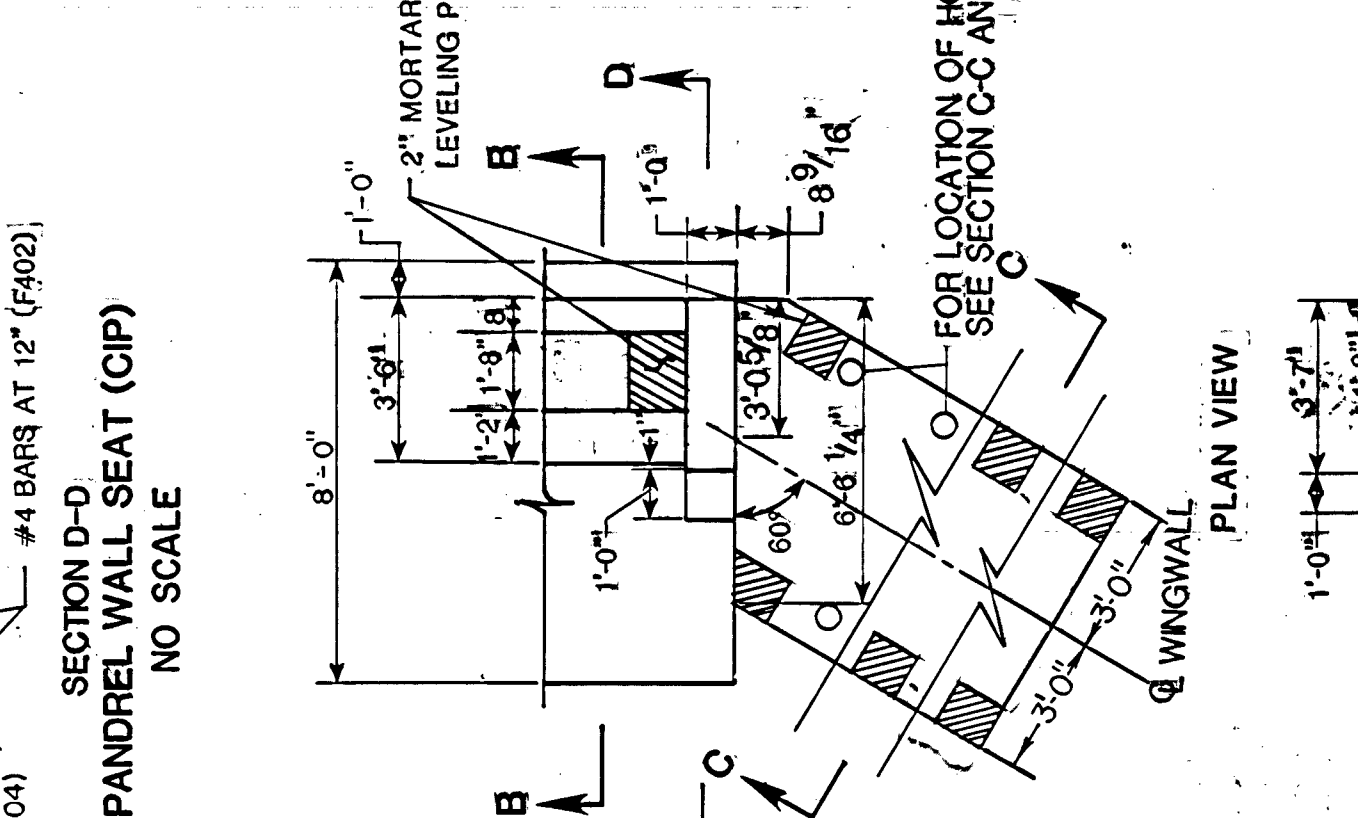
STA. 65+22 - STA. 71+00



**BILL OF REINFORCEMENT OF CIP ELEMENT FOOTING**

BAR NUMBER	LENGTH	SHAPE	LOCATION
F401	5'-8"	Srt.	Wingwall Element
F402	9'-8"	Srt.	Wingwall Element
F403	8'-8"	Bent	Element
F404	7'-1"	Srt.	Element
F405	2'-4"	Bent	Element
F407	4'-1"	Bent	Element
F408	9'-8"	Srt.	Element
F409	18'-4"	Srt.	Wingwall
F410	5'-6"	Bent	Spandrel
F411	8'	Srt.	Spandrel
F412	89'-8"	Element	Spandrel
F413	8'	Srt.	Spandrel
F414	5'-3"	Bent	Wingwall

NOTE: SEE SHEET NO. FOR PLAN VIEW OF REINFORCING DETAILS  
MINIMUM LAP SPICE FOR #4 BAR IS 16"



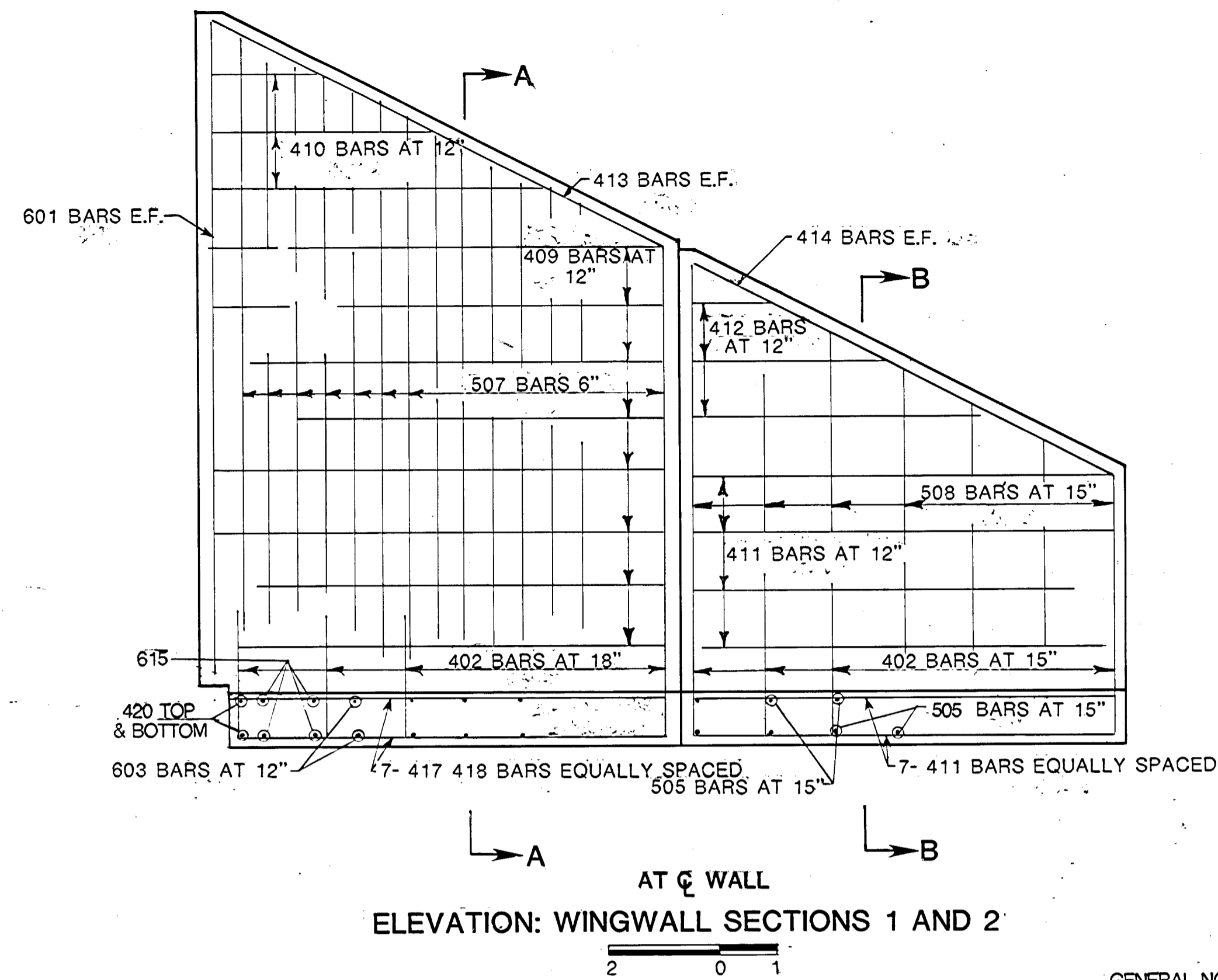
**FABRICATION, FABRICATOR AND CONSTRUCTION OF ARCH STRUCTURE AND APPURTENANCES SHALL BE IN ACCORDANCE WITH FABRICATORS RECOMMENDATIONS.**

REVISIONS	SCALE
MISC. 8/30/82	
MISC. 7/14/82	
MISC. 8/3/81	
MISC. 2/24/81	

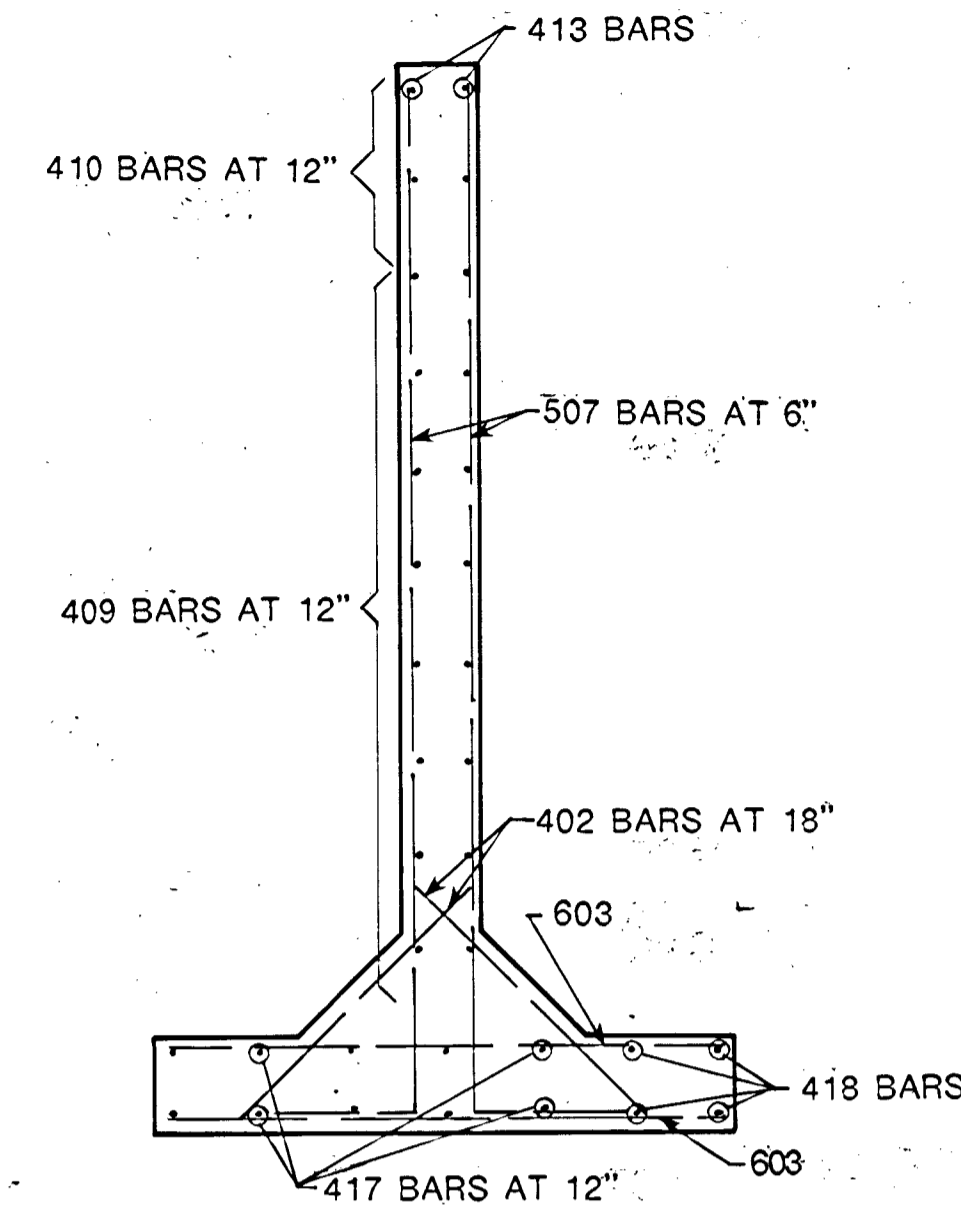
**LIST OF WEIGHTS**

ARCH ELEMENTS:	37,170 #
SPANDREL WALL	37,700 #
WINGWALL	9,780 #
	14,980 #

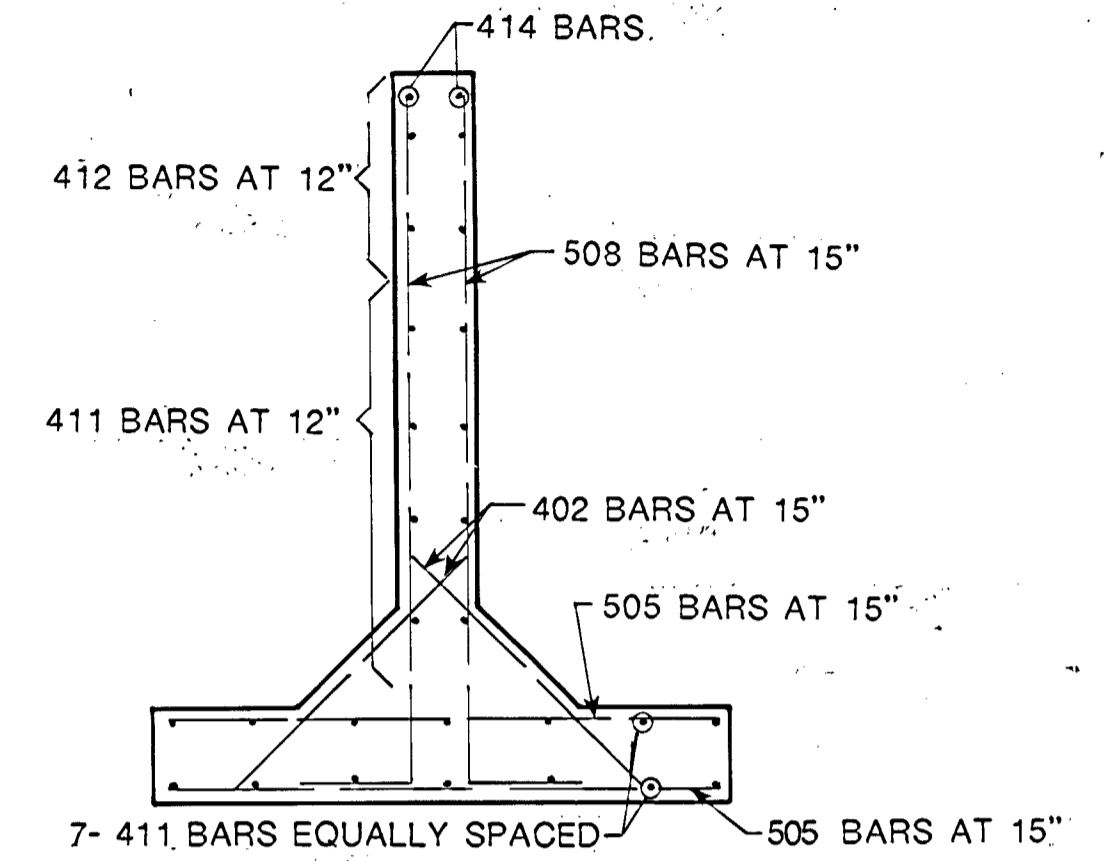
NOTE: SHADED AREAS INDICATE PRECAST SECTIONS.  
CLEAR COVER TO REINFORCEMENT FOR ALL CIP CONCRETE SHALL BE 3" FROM BOTTOM AND 2" FROM ALL OTHER SURFACES.  
MINIMUM LAP SPICE FOR #4 BARS IS 16".



AT  $\phi$  WALL  
ELEVATION: WINGWALL SECTIONS 1 AND 2



SECTION A-A  
WINGWALL SECTION 1



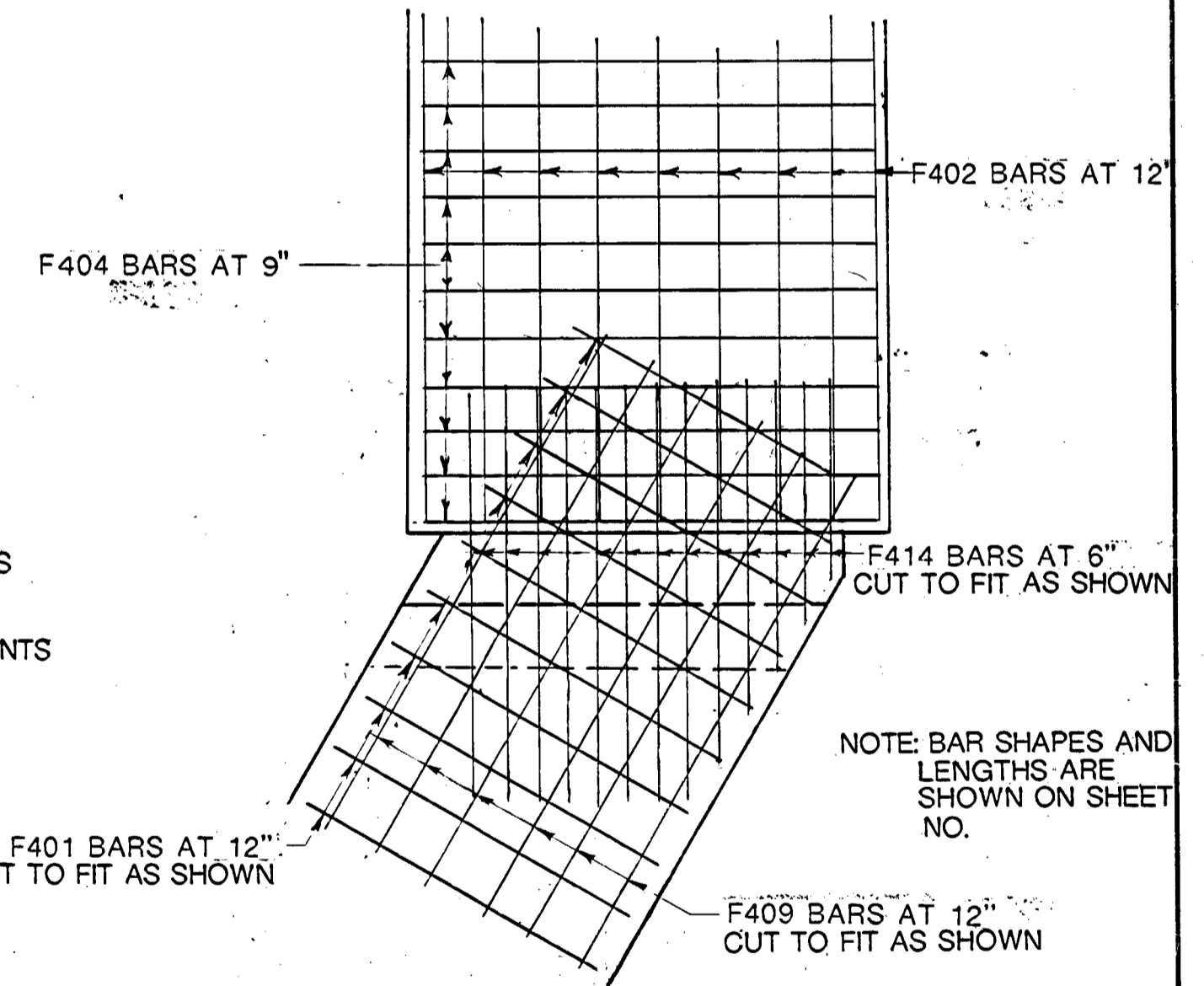
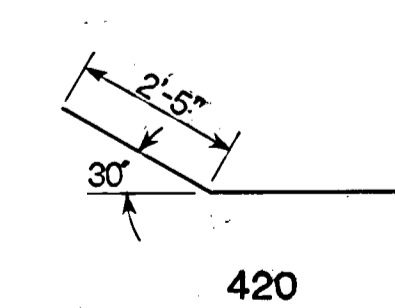
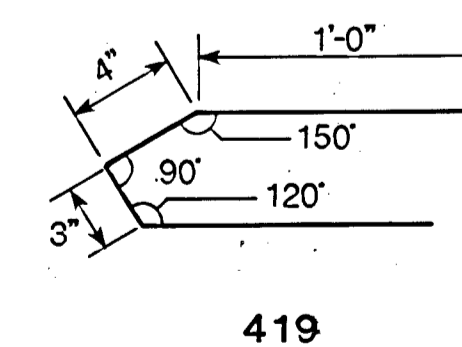
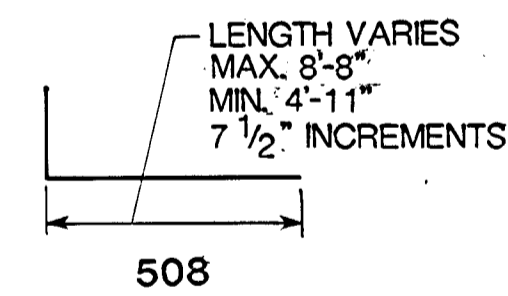
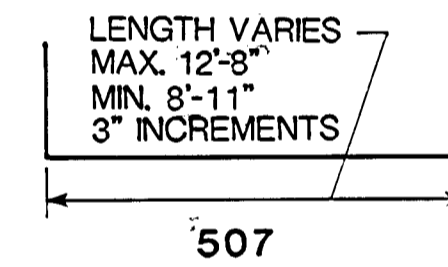
SECTION B-B  
WINGWALL SECTION 2



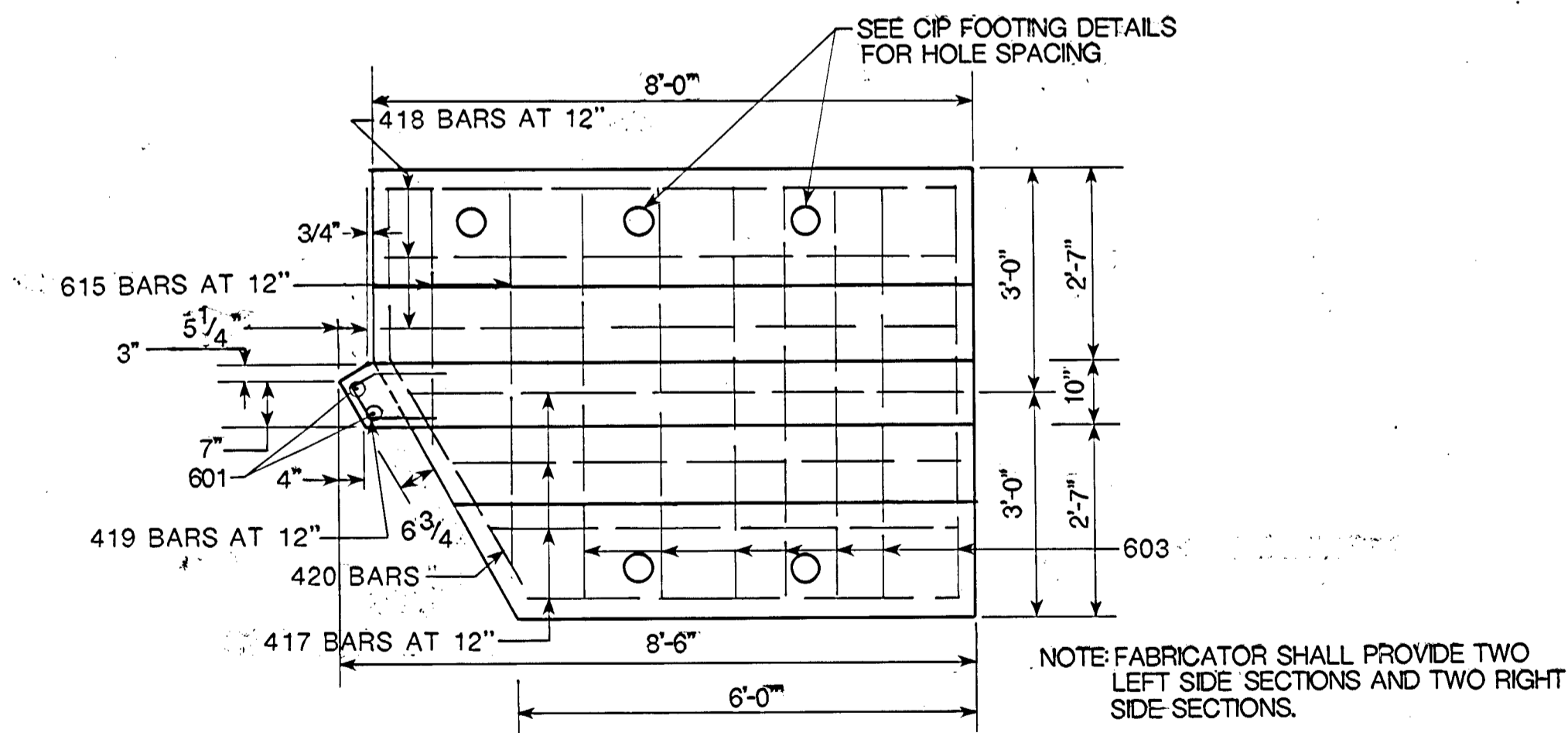
GENERAL NOTES FOR WINGWALL SECTIONS:  
 $f_c$  = 4200 PSI CONCRETE MIX NO. 3Y46  
 REINFORCEMENT STEEL ASTM A615 GRADE 60  
 CONCRETE COVER TO REINFORCEMENT: 2"

FINISH TOP EDGES ONLY WITH 3/4" BEVEL.  
 STEEL FABRIC CONFORMING TO REQUIREMENTS OF ASTM A185 OF EQUAL OR GREATER AREA MAY BE USED IN LIEU OF REINFORCING BARS SHOWN

PRECAST WINGWALL SECTIONS MUST BE FABRICATED WITH SUFFICIENT ACCURACY TO PROVIDE A UNIFORM BEARING ALONG THE VERTICAL FACE OF THE JOINT BETWEEN THE SPANDREL WALL AND THE WINGWALL



PLAN VIEW  
CIP FOOTING REINFORCEMENT  
NO SCALE



LAYOUT AND REINFORCEMENT DETAILS  
120° WINGWALL



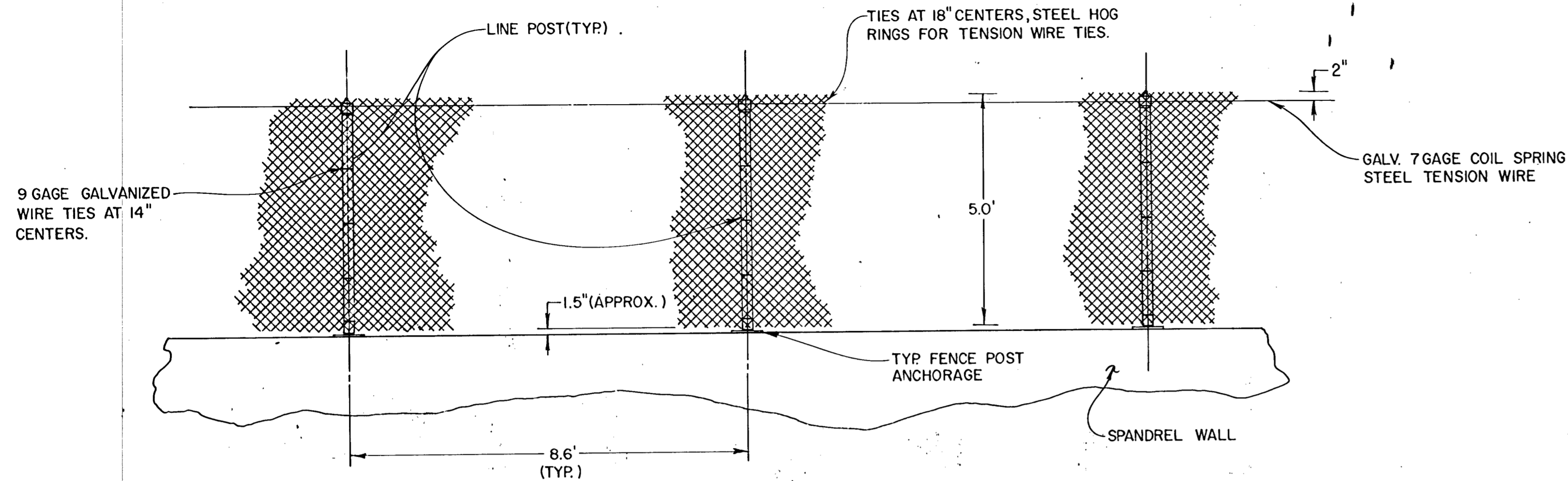
BILL OF REINFORCEMENT FOR ALL PRECAST WINGWALLS

BAR NUMBER	LENGTH	SHAPE	LOCATION
601	11'-8"	Strt.	Section 1
402	3'-0"	Strt.	Sections 1 & 2
603	5'-8"	Strt.	Section 1
505	5'-8"	Strt.	Section 2
507	8 Series of 16 Varies 10'-5" to 14'-2"	Bent	Section 1
508	8 Series of 7 Varies 6'-2" to 9'-11"	Bent	Section 2
409	64 7'-11"	Strt.	Section 1
410	8 Series of 3 Varies 5'-11" to 1'-11"	Strt.	Section 1
411	88 7'-3"	Strt.	Section 2
412	8 Series of 3 Varies 5'-8" to 1'-8"	Strt.	Section 2
413	8 8'-10"	Strt.	Section 1
414	8 8'-5"	Strt.	Section 2
615	8 Series of 2 Varies 5'-6" to 3'-9"	Strt.	Section 1
417	8 Series of 4 Varies 7'-5" to 5'-8"	Strt.	Section 1
418	24 7'-8"	Strt.	Section 1
419	48 2'-7"	Bent	Section 1
420	8 6'-2"	Bent	Section 1

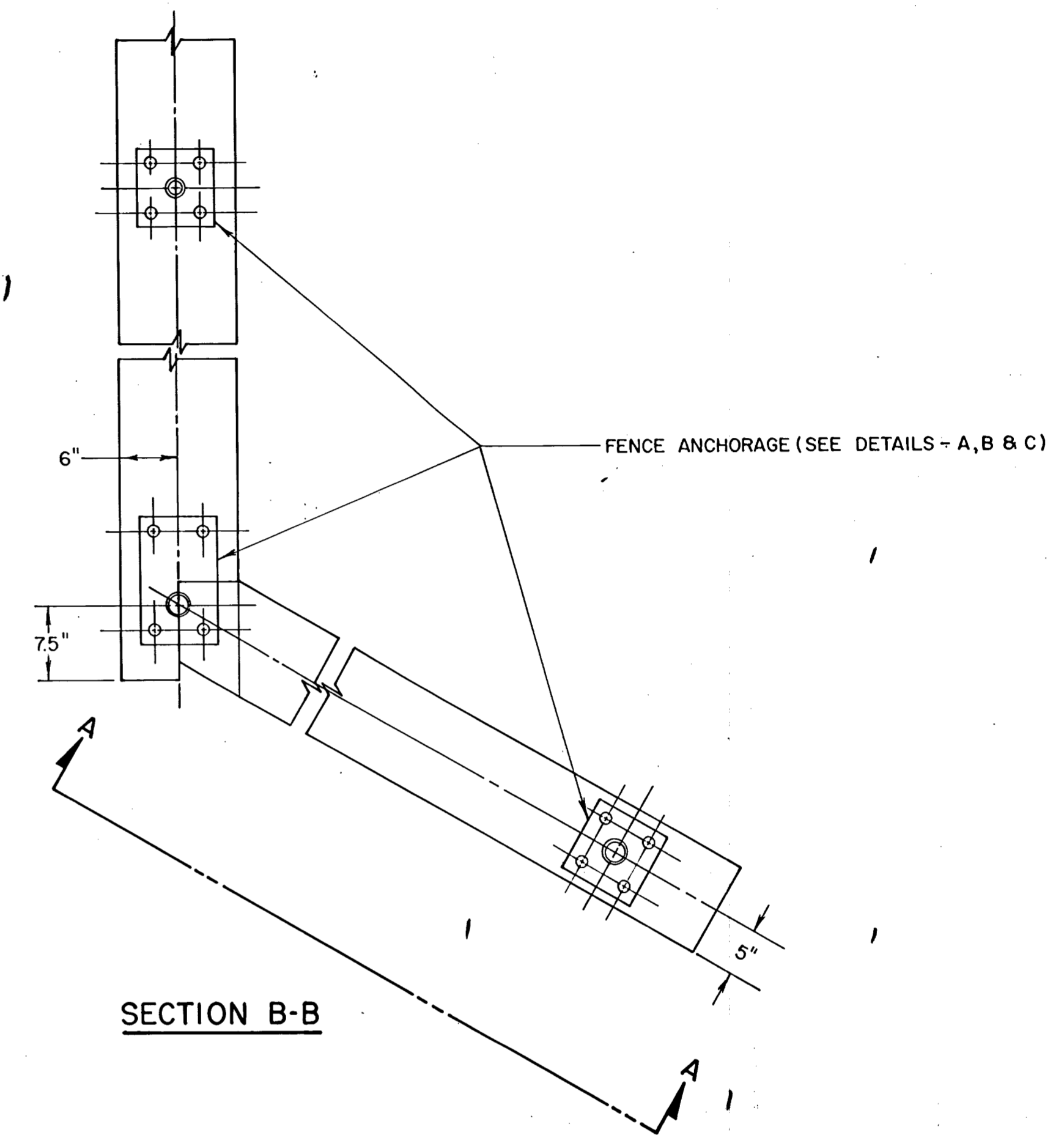
PRECAST REINFORCED CONCRETE ARCH  
PRECAST WINGWALL (120° ANGLE)  
REINFORCEMENT DETAILS

I HEREBY CERTIFY THAT THIS DRAWING OR PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  DATE: _____ REG. NO.: _____	REVISIONS MISC. 6/30/82 MISC. 7/14/82	SCALE: DWN. BY: _____ DATE: JUNE 23, 1982 DWG. NO.: A41/90 120° WW	SHEET NO. 20 OF 24 SHEETS
	C.P. 82-09-78		

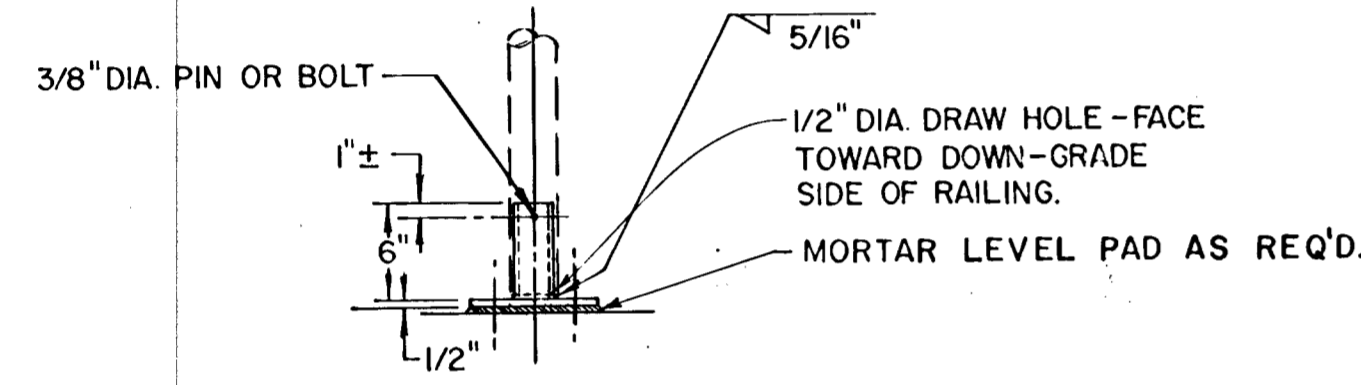




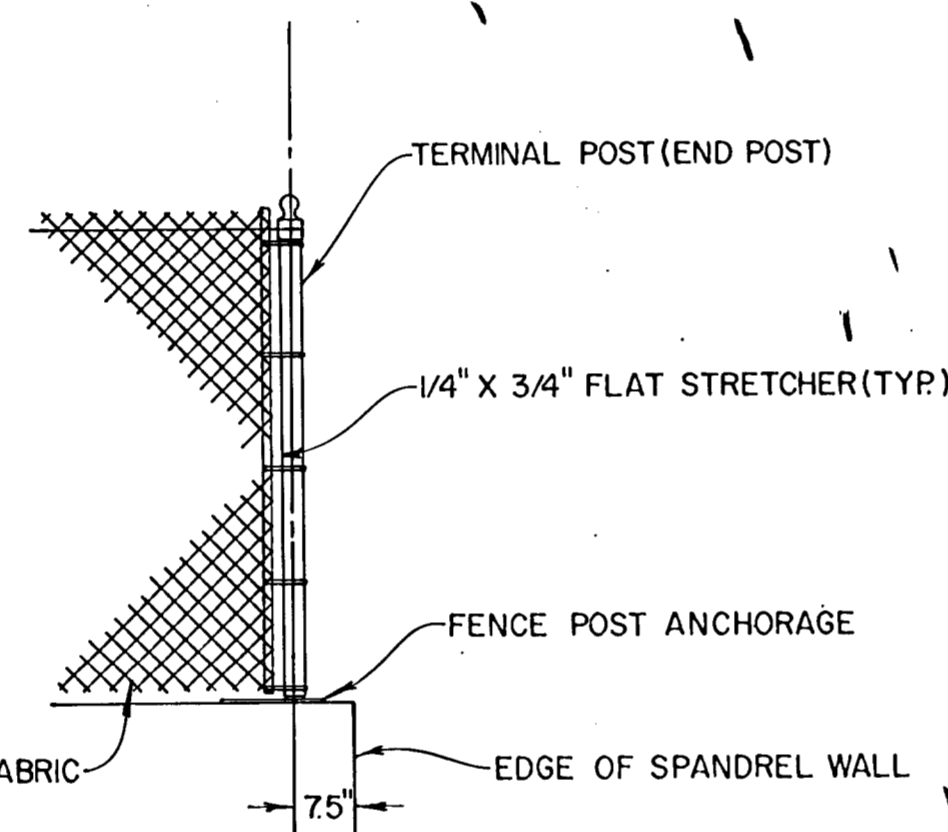
**LINE SECTION**



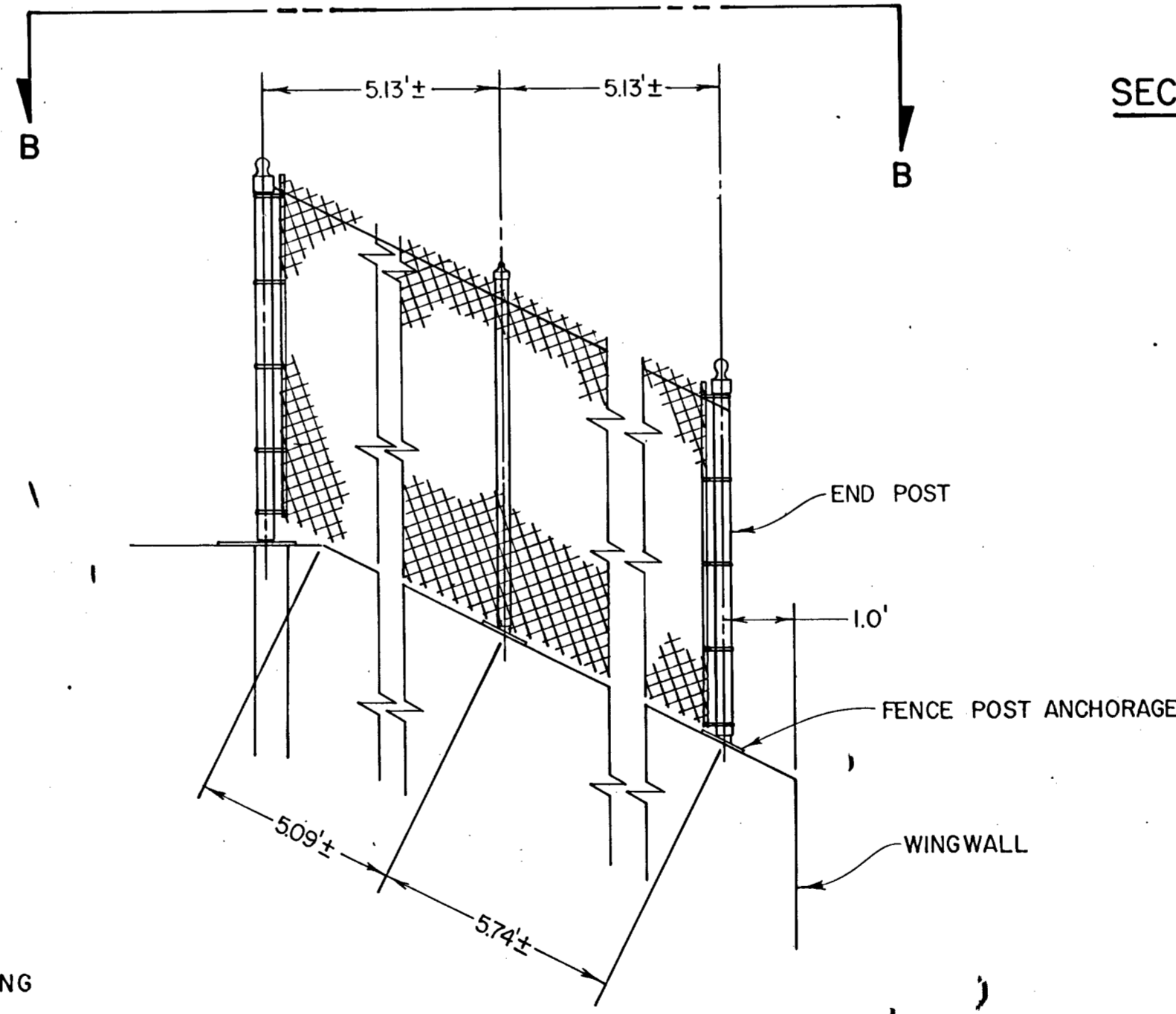
**SECTION B-B**



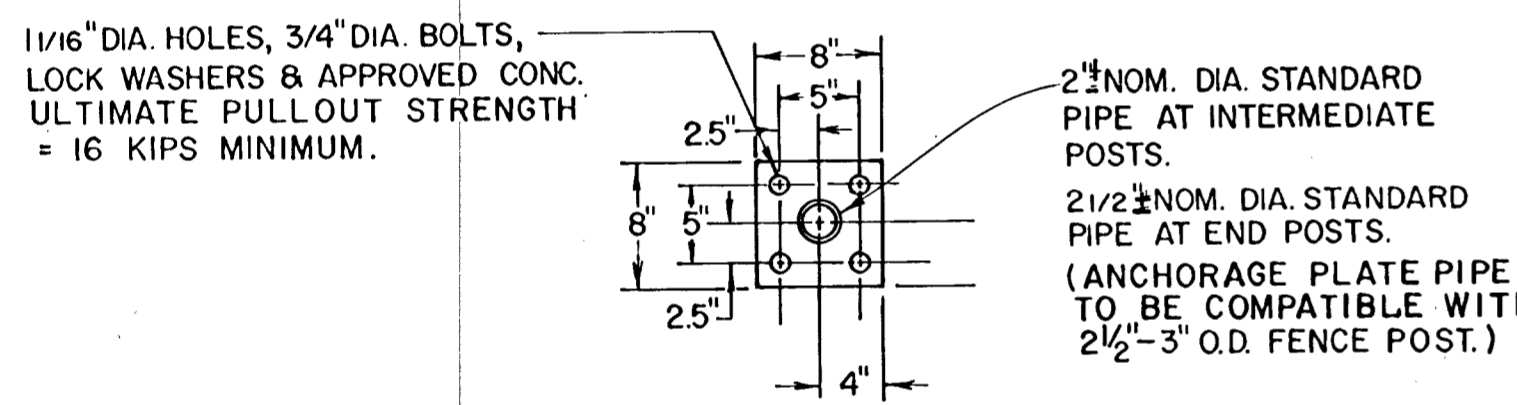
**DETAIL "A"**



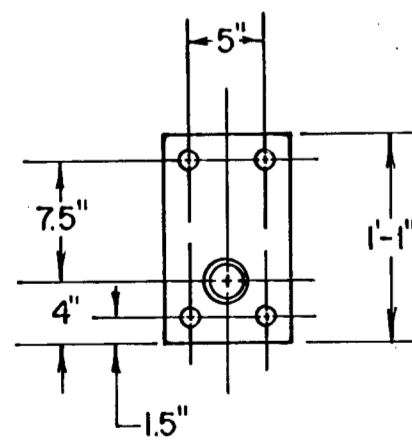
**END POST**



**SECTION A-A**

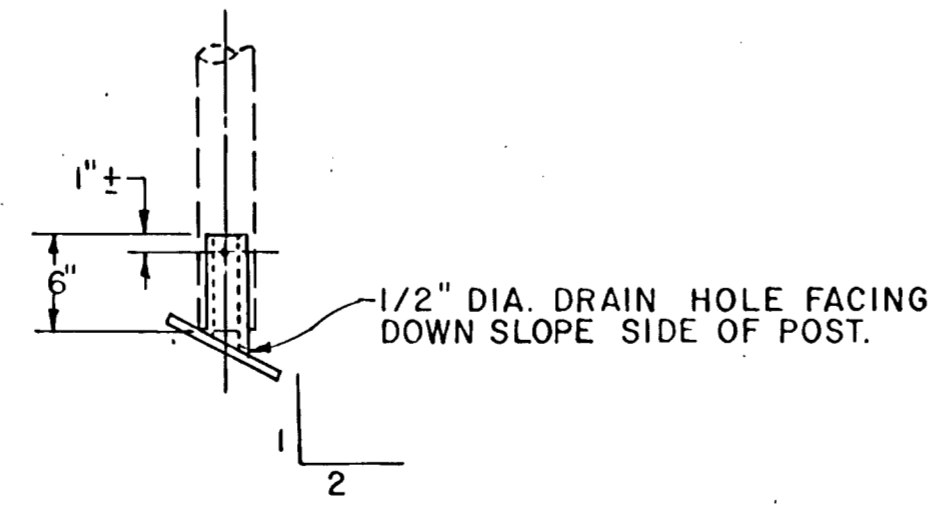


LINE POST ANCHORAGE DETAILS (SPANDREL WALLS)



**DETAIL "B"**

NOTE: SEE DETAIL "A" FOR DETAILS NOT SHOWN.



WINGWALL ANCHORAGE DETAIL

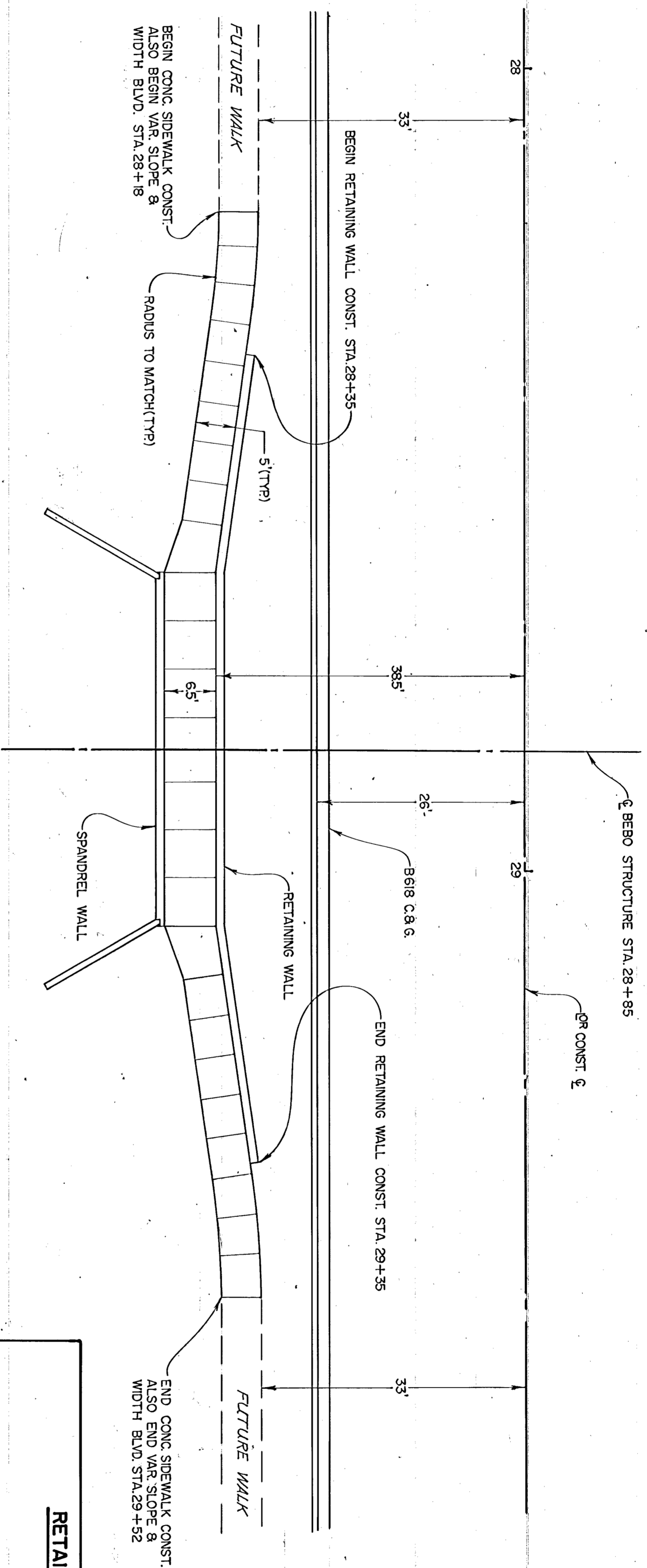
**DETAIL "C"**

NOTE: SEE DETAIL "A" FOR DETAILS NOT SHOWN.

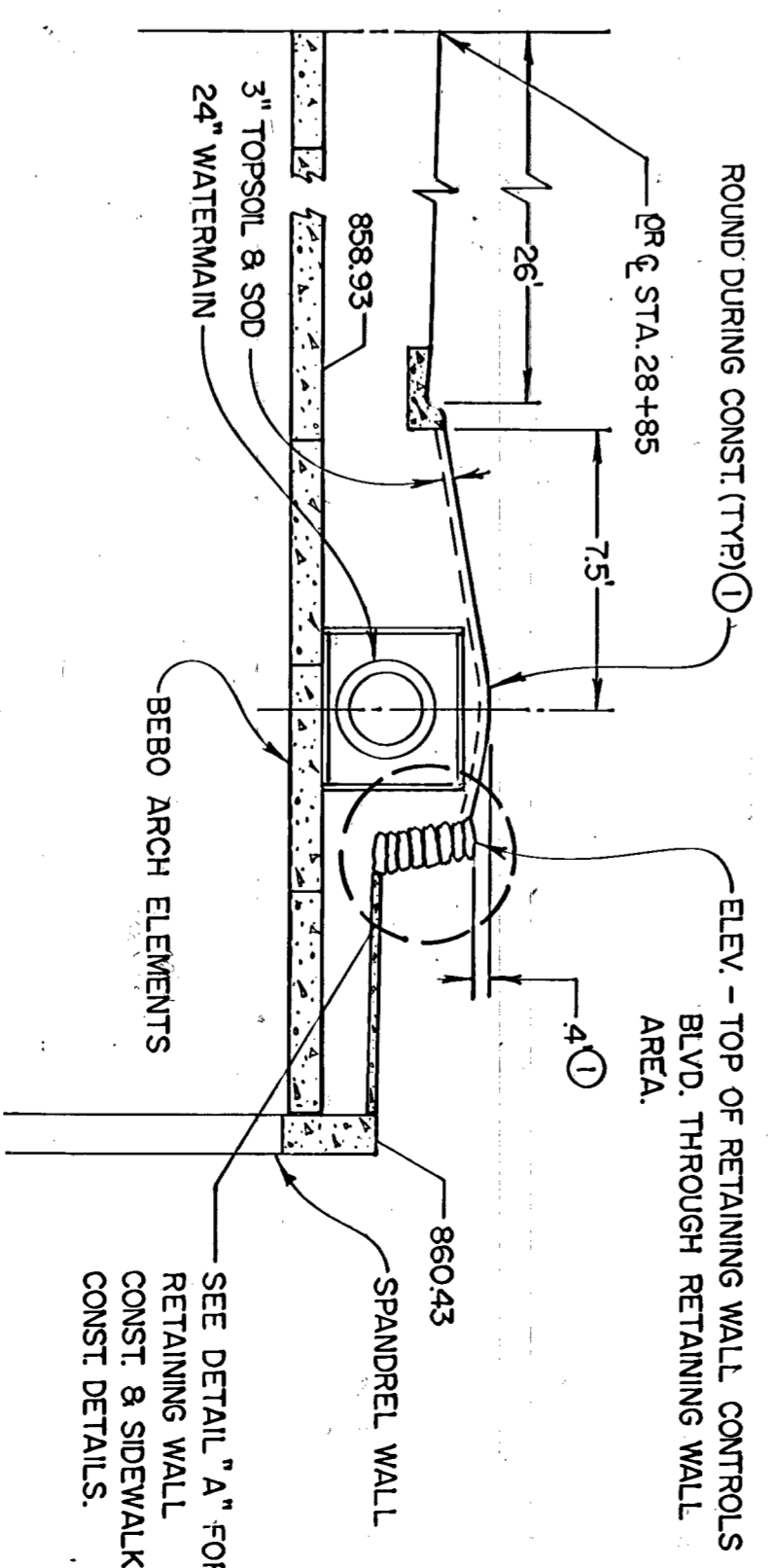
- GENERAL NOTES**
- FENCE MATERIALS & CONSTRUCTION SHALL CONFORM TO SPEC. 2557 AND THE FOLLOWING:
    1. TERMINAL POSTS (END, CORNER, OR PULL POSTS) SHALL BE 3" DIA., 7.58#/FT., 5' IN LENGTH & CONFORMING TO SPEC. 2557.2C2 & SPEC. 3406.
    2. LINE POSTS SHALL BE 2 1/2" DIA., 5.79#/FT., 5' IN LENGTH AND CONFORMING TO SPEC. 2557.2C2 & SPEC. 3406.
    3. HARDWARE & FITTINGS SHALL CONFORM TO SPEC. 2557.2D1 & SPEC. 3406.
    4. CHAIN LINK FABRIC, 9 GAGE, 2" MESH, WITH KNUCKLED SELVAGE TOP & BOTTOM, SHALL CONFORM TO REQUIREMENTS OF AASHTO 181 TYPE II, III, OR IV. CHAIN LINK FABRIC SHALL BE INSTALLED AS PER SPEC. 2557.3C1 EXCEPT THAT FABRIC SHALL BE INSTALLED ON THE SIDE OF THE LINE POSTS WHICH IS TOWARDS THE ROAD BED.
    5. ALL POSTS SHALL HAVE A MEANS TO SECURELY HOLD THE TOP TENSION WIRE IN PLACE & ALLOW FOR REMOVAL AND REPLACEMENT OF A POST WITHOUT DAMAGING THE TOP TENSION WIRE.
    6. WIRE TIES MAY BE 9 GAGE GALVANIZED STEEL OR 0.179" MIN. ALUMINUM ALLOY CONFORMING TO ASTM B211, ALLOY 1100 - H18. USE 12 1/2 GAGE GALVANIZED HOG RINGS FOR TENSION WIRE TIES.
    7. FENCE POST ANCHORAGE PLATES SHALL BE MANUFACTURED OF STRUCTURAL STEEL CONFORMING TO SPEC. 3306. STRUCTURAL STEEL PIPE CONFORMING TO SPEC. 3362 SHALL BE USED FOR FENCE POST MOUNT. ENTIRE ANCHORAGE PLATE & PINS OR BOLTS SHALL BE GALVANIZED IN ACCORDANCE WITH SPEC. 3394 & 3392.
    8. PAYMENT FOR FENCE MATERIALS & CONSTRUCTION WILL BE MADE UNDER SPEC. 2557.501 - WIRE FENCE DESIGN CHAIN LINK, LIN. FT. AND SHALL BE CONSIDERED TO INCLUDE POSTS, FABRIC, ANCHORAGE PLATES, AND ALL OTHER MATERIALS NEEDED FOR THE COMPLETE CONSTRUCTION OF THE FENCE AND NO ADDITIONAL COMPENSATION WILL BE MADE.



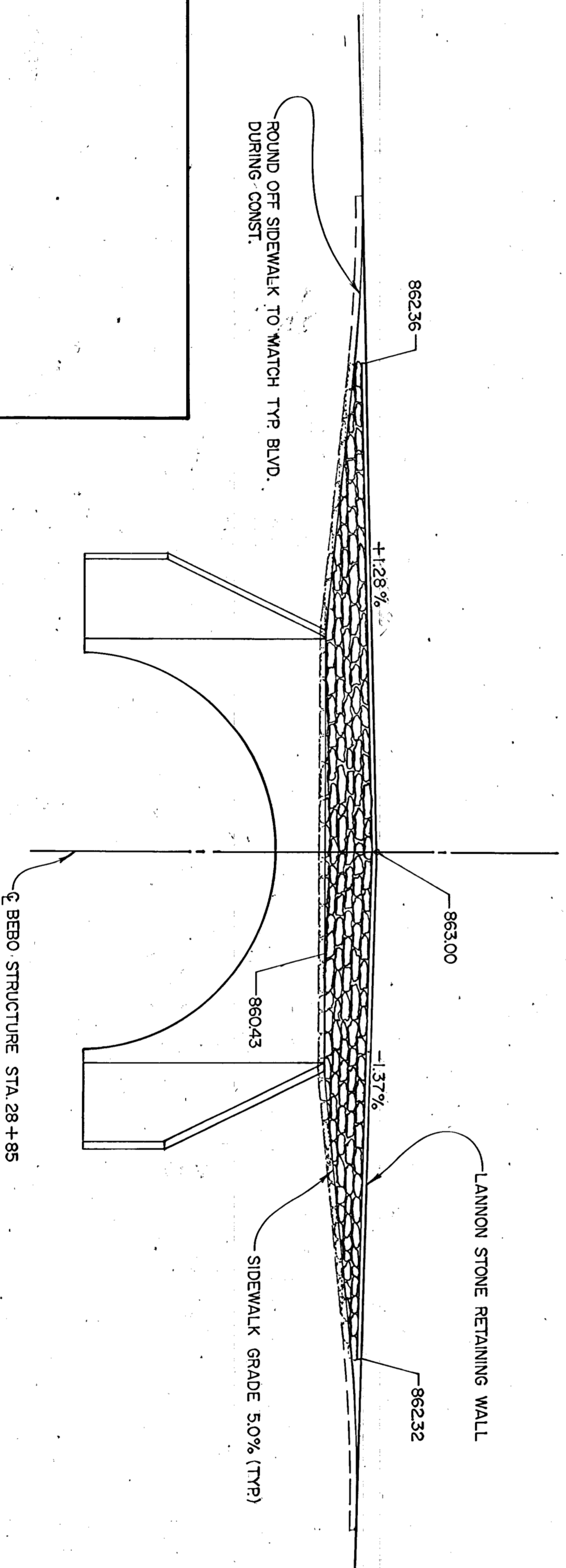
**RETAINING WALL & SIDEWALK CONST. DETAILS**



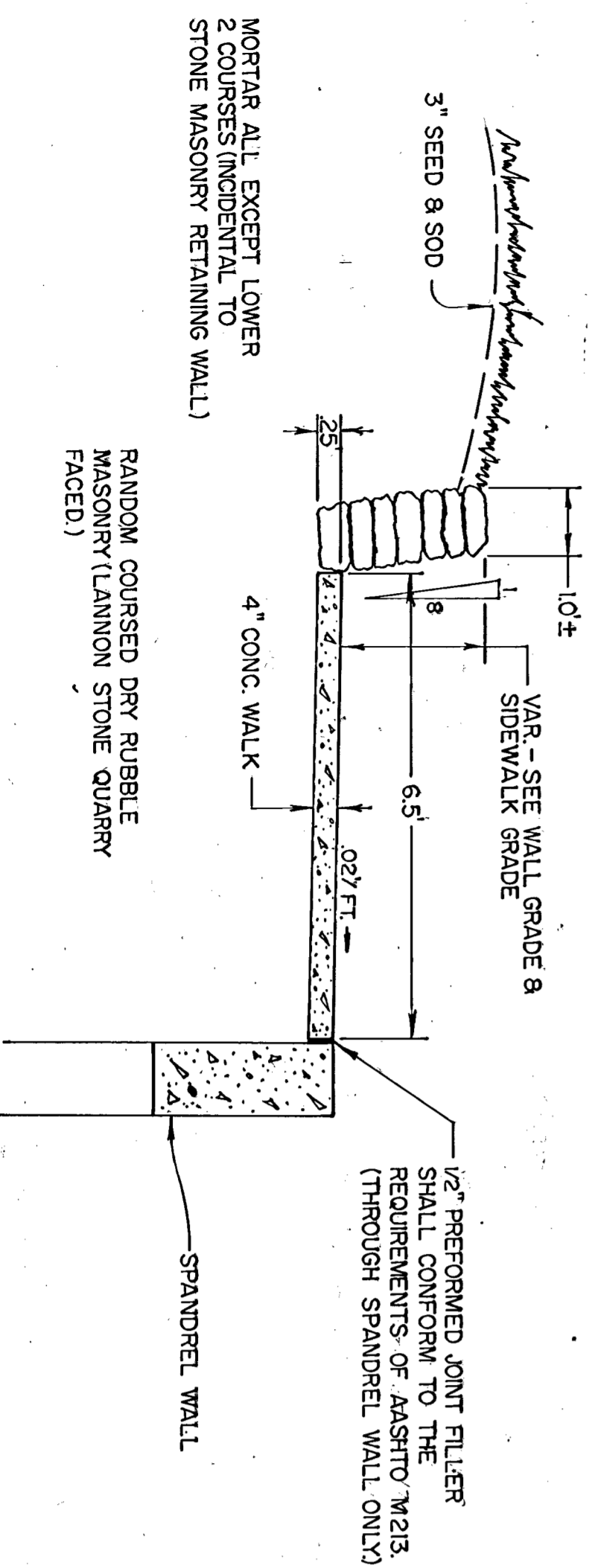
**RETAINING WALL TYPICAL SECTION**



① ROUNDING ON BLVD. & 4' RISE CONFINED TO AREA BETWEEN STA. 28+63 TO STA. 29+07. REMAINING BLVD. TO BE SLOPED FROM RETAINING WALL TO BACK OF CURB. RETAINING WALL GRADES ARE TO BE CARRIED THROUGH ENTIRE LENGTH OF VARIABLE BLVD. CONST.



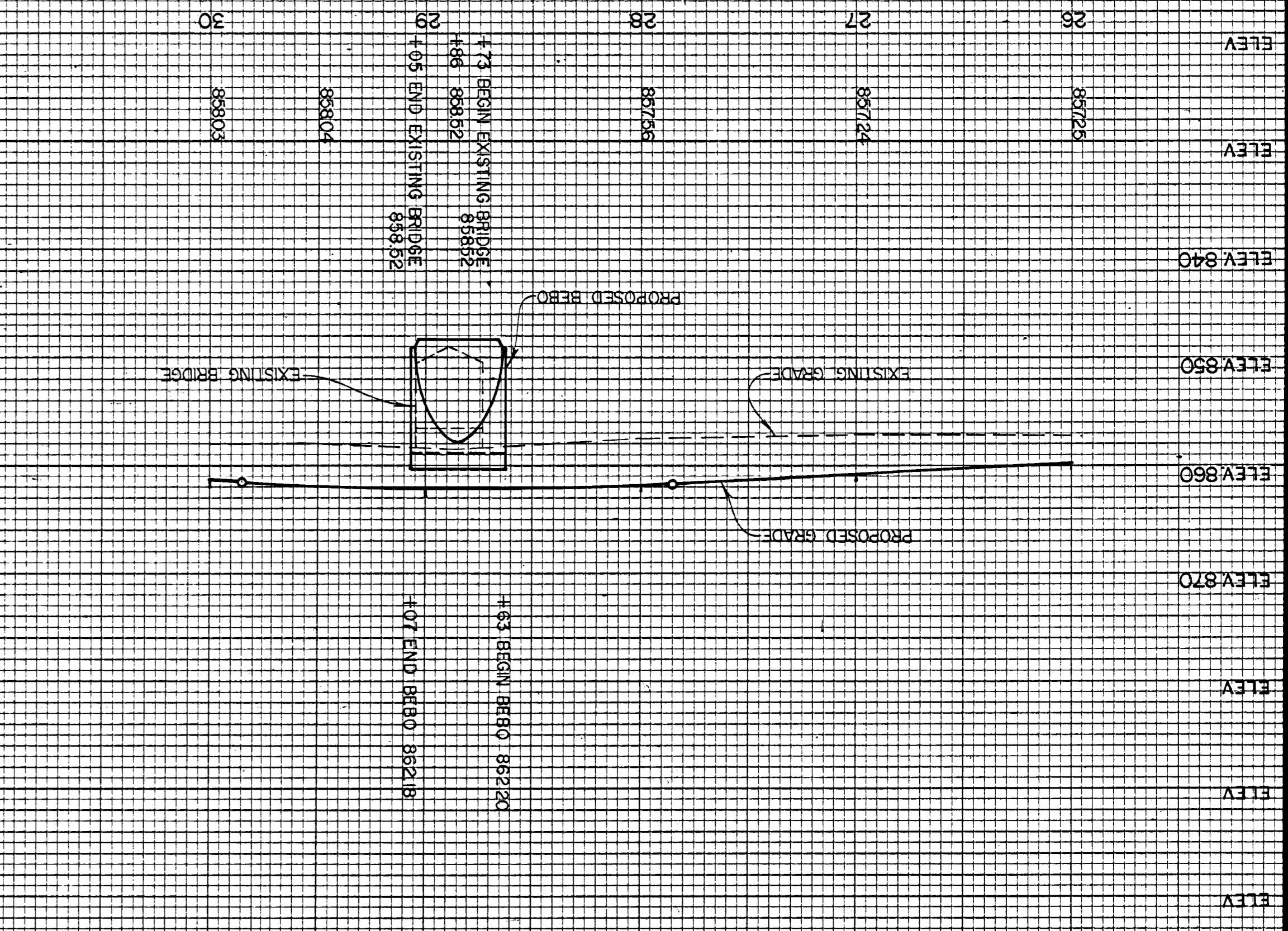
**DETAIL "A"**  
STA. 28+35 - STA. 29+35



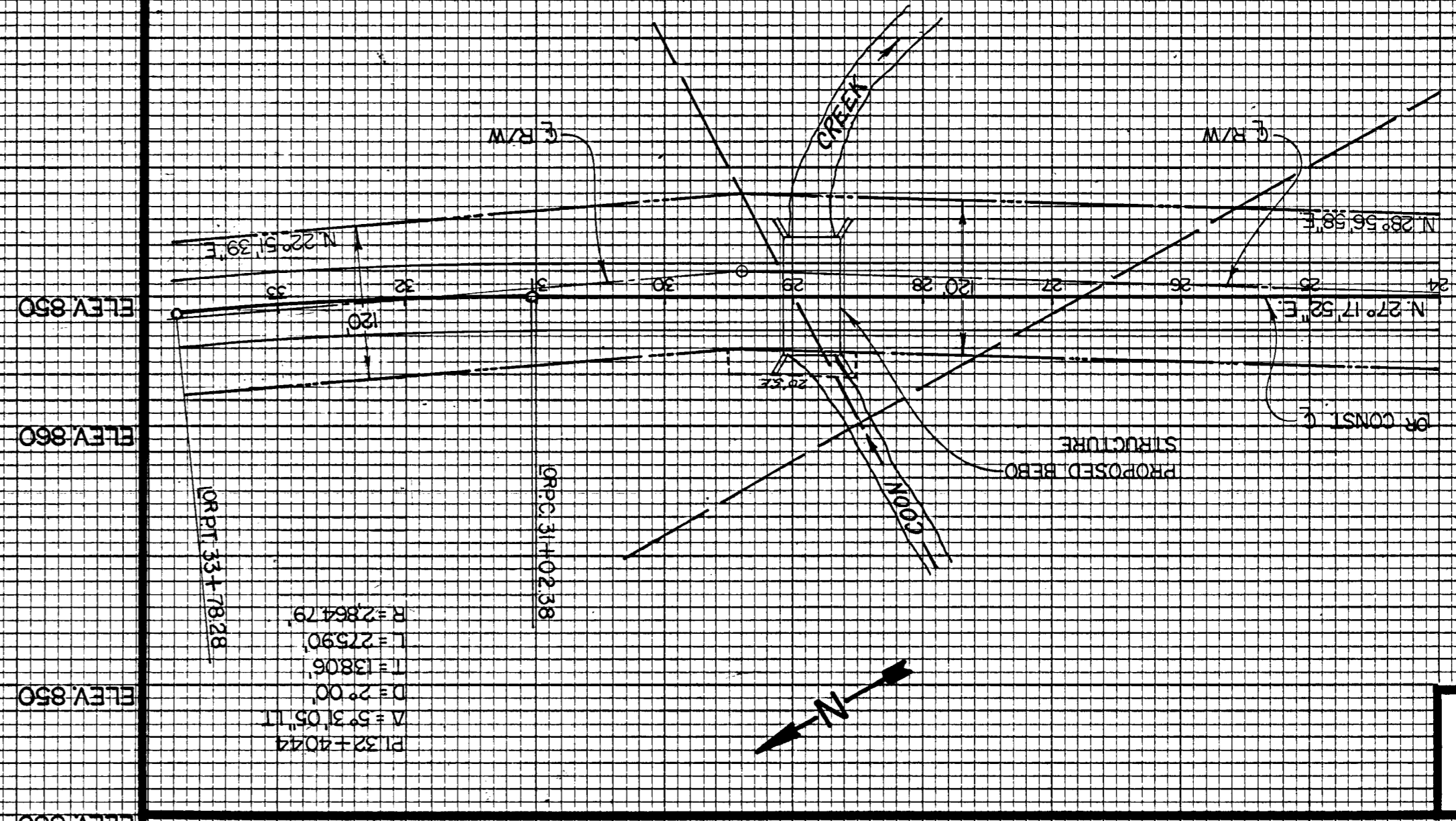
SCALE: VERT. 5'  
HORIZ. 10'



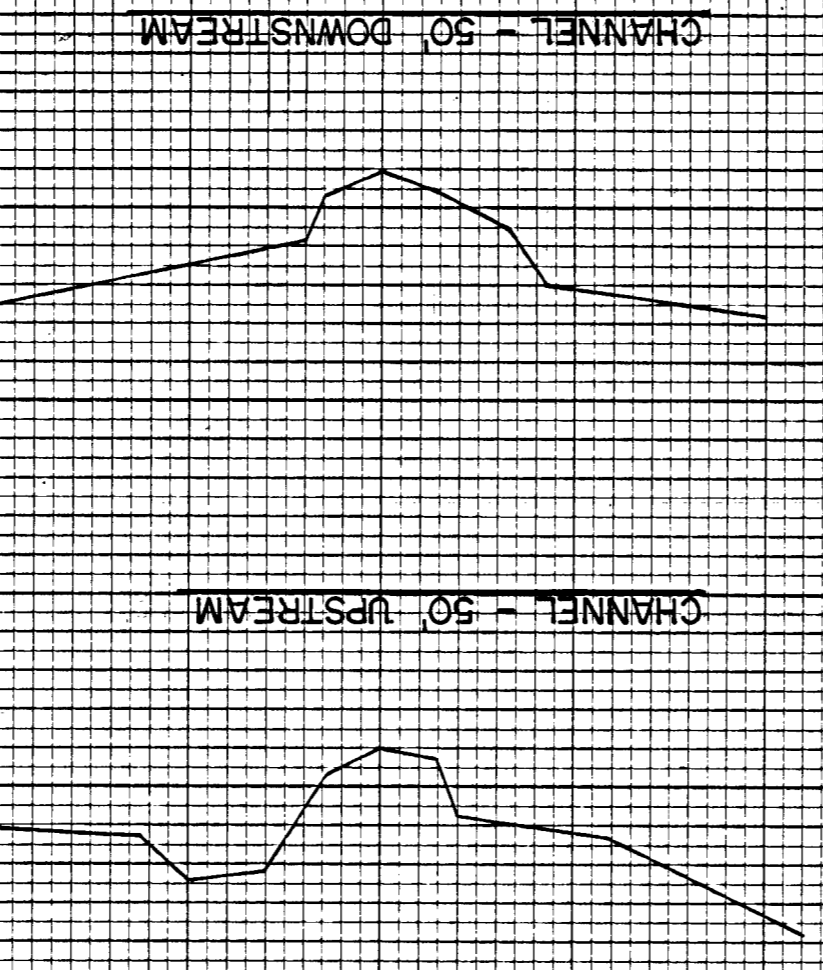
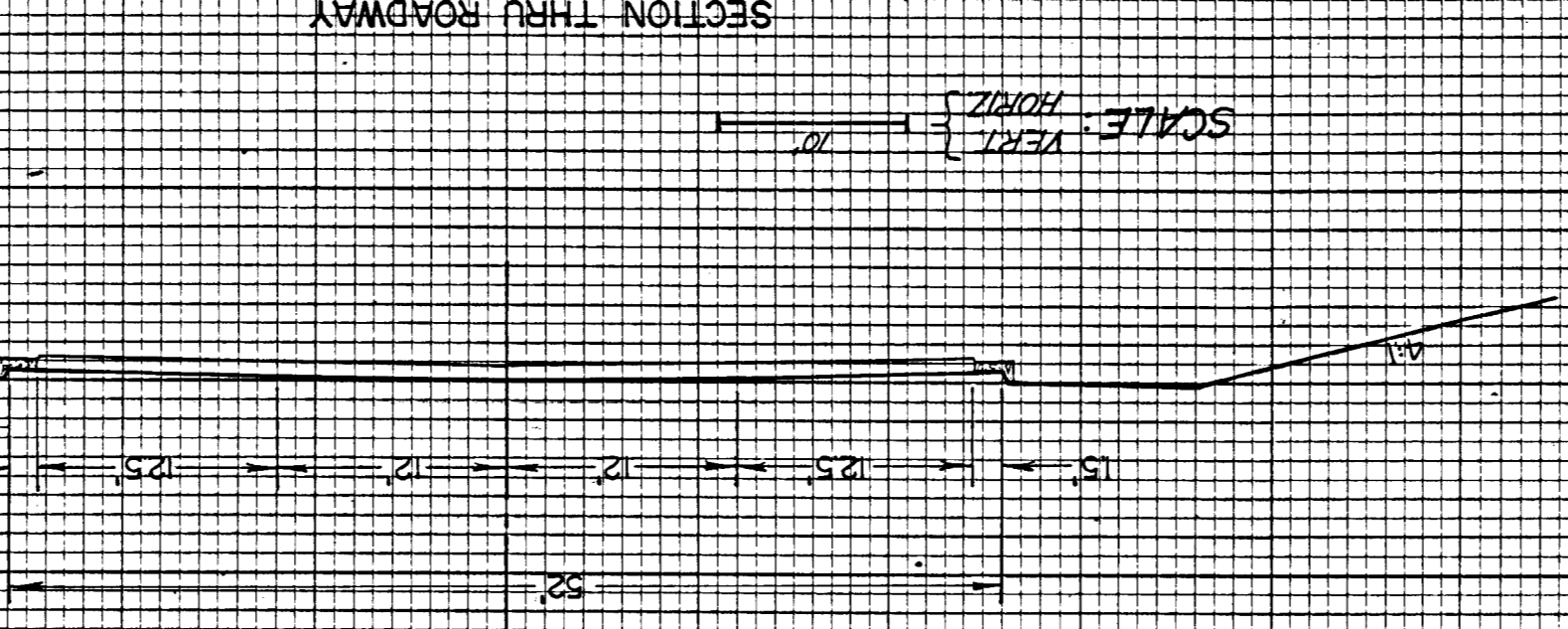
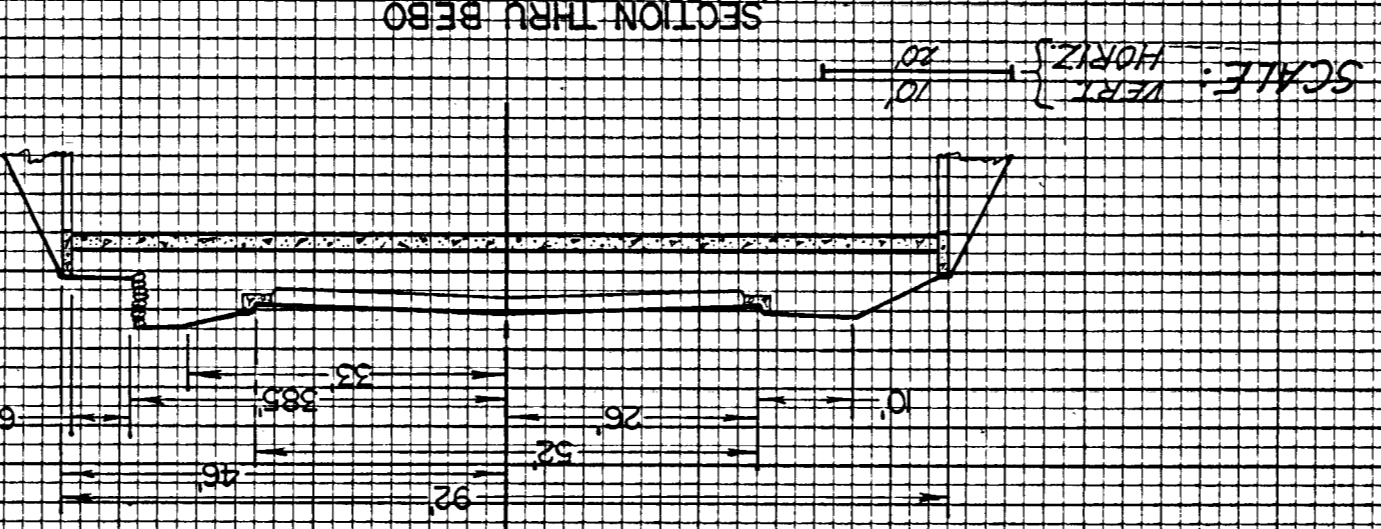
**CONTRACTED PROFILE**  
SCALE: HOR. 1" = 100' VER. 1" = 10'



**PLAN**  
SCALE: 1" = 100'



**TYPICAL SECTIONS & PERTINENT DATA**  
SCALES AS SHOWN

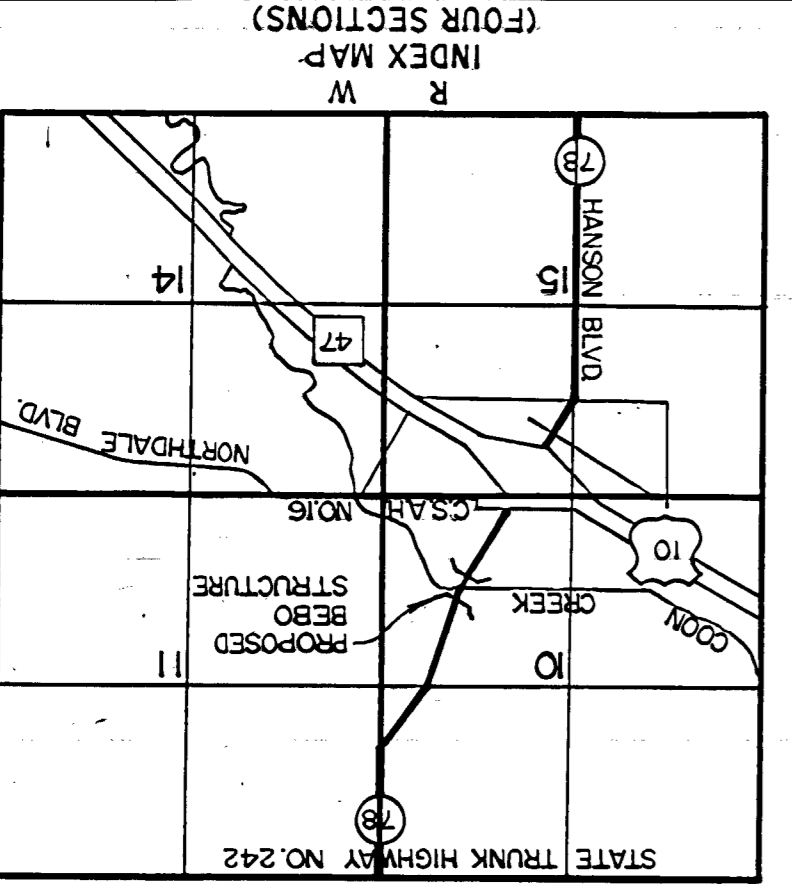


HORIZ SCALE 1" = 100'

Area No. Job No. State Proj. No. CP 82-09-78 Sheet No. 23 of 24 Sheets  
SEE SHEET OF SHEETS FOR PLAN AND PROFILE

Bench mark elevation 881.59 (M.S.L. 1929 Adj.)  
Location: Brass disk on N.W. corner of bridge at Highway 10 E. Co. Road 78 (Hanson Blvd.)

Fed. Proj. No.



FOLLOW SEPARATE "INSTRUCTIONS FOR PREPARATION OF BRIDGE SURVEYS" WHEN MAKING BRIDGE SURVEYS.  
DATA

- Preliminary recommendations of Engineer in charge of Bridge Survey: Net span length and type of bridge: 40' - 41/2" Reinforced Concrete Arch
- Width of roadway on bridge: 52' Face of curb to face of curb
- Number and width of sidewalks, if any
- Locate center of bridge at station 28 ± 85
- If a skew bridge is recommended, the angle of skew should be
- Is piling required? No
- Special features: Waterfalls, dams, exceptional floods, ice, driftwood, sliding banks, logging, etc. None
- Changes: In height or length from that of old bridge, and reasons why
- Other bridges in vicinity:
  - Over same stream (particularly structures which carry high water without overflow of roadway); give location, length, height above water, net cross-sectional area of high water stage and estimated age
  - Bridge No. 02530 (1st St. Ave., NW, over Coon Creek), 73' Ft. Single Span, Prestressed, conc. beams, 3' Ft. above high water; cross-sectional area = 368' Sq. Ft.
- Over or under same highway or railroad; give location, length, horizontal and vertical clearances and estimated age
- Reasons why these bridges are, or are not, fair indicators of what length the proposed bridge should be
- If structure is over a drainage ditch, is ditch gradient liable to be altered? Future clearance proposed to Eley, 845.2, with 9' bottom width
- Navigation clearances required, if any... None
- Information and evidence in regard to high water stages was obtained as follows: No
- Must contractor provide for traffic during construction of proposed bridge? No

HYDRAULIC ENGINEERS RECOMMENDATION  
Stream, or ditch design, COON CREEK, drainage area, 20.50, MILES (A.P.B.R.O.X.), Design, flood (50 yr. freq.), 820 C.F.S., Design highwater elev., 858.95, Design mean velocity, through structure, 3.2, F.P.S. Low superstructure, at or above, elev., 858.10, Flowline, elev., 848.60, Skew, angle, 0° Waterway, area req'd, below, elev., 855.95, 256.34, Ft. at rt. angles, to channel, in interest of flood plain, zoning, flood (100 yr. freq.) is 1000 C.F.S. of stage 858.80, and, mean velocity, of 3.6 F.P.S. with 0.01 Ft. swellhead. The above recommendation will provide a structure of adequate waterway, to pass regional flood within criteria established by the Department of Natural Resources.

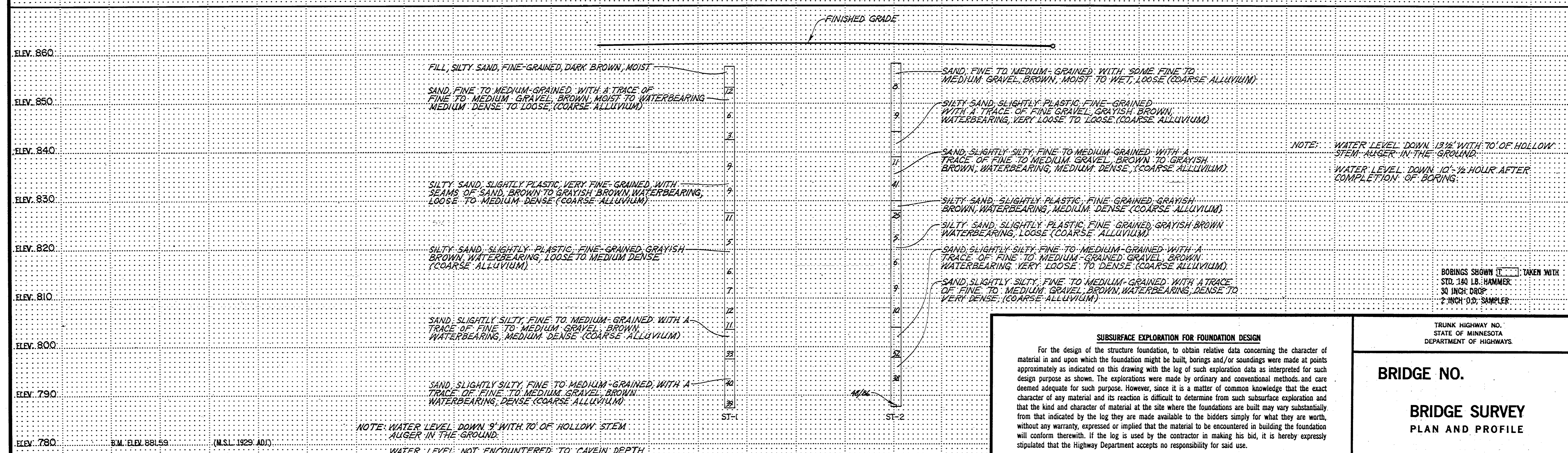
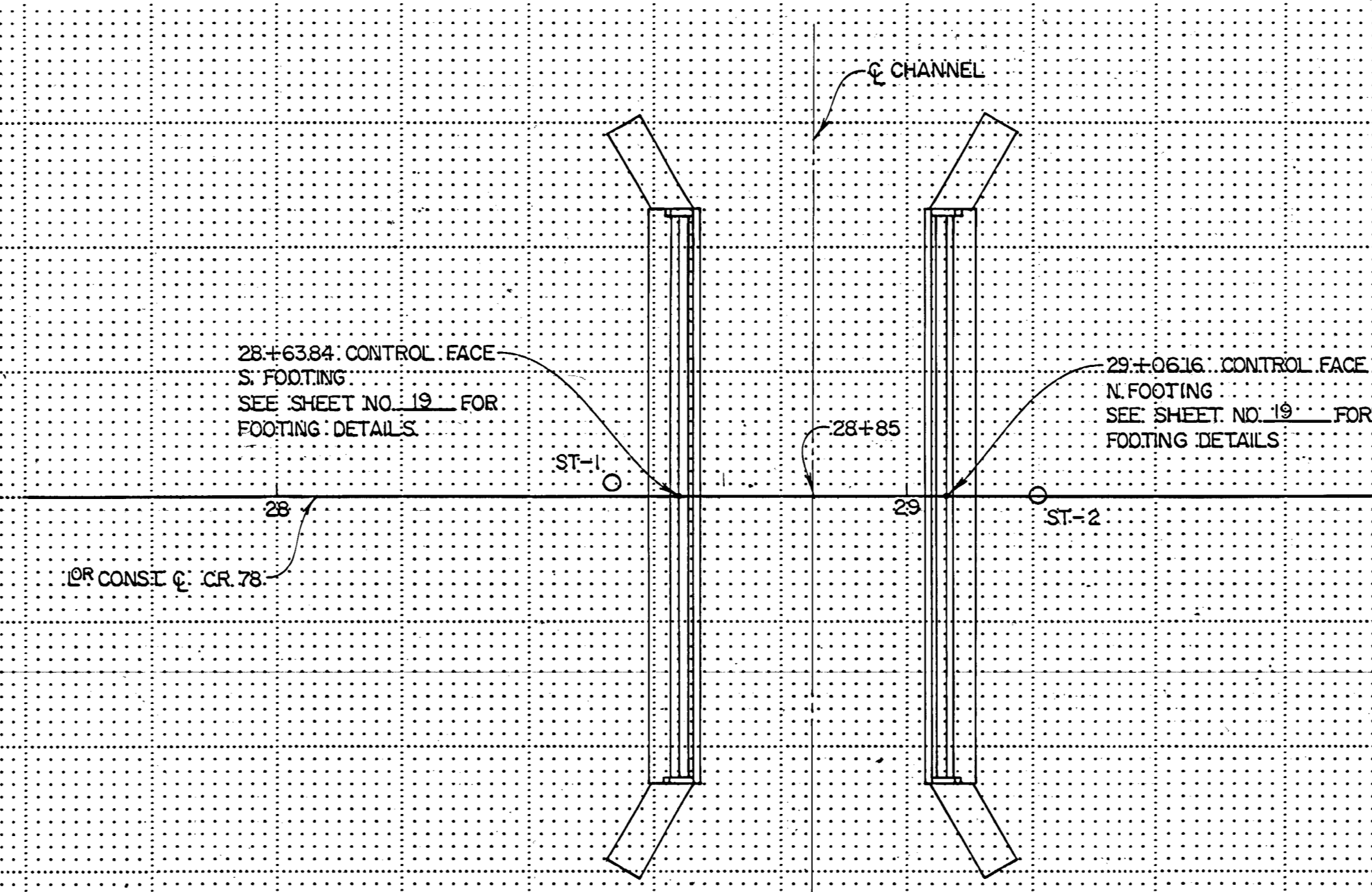
STATE OF MINNESOTA  
DEPARTMENT OF HIGHWAYS  
FOR  
BRIDGE SURVEY

PROPOSED BRIDGE LOCATED... MILES... OF  
(TOWN OR CITY) ... ON ... C.S.A.M. OR C.A.R. NUMBER) ... SEC. ... TWP. ... COUNTY ...

SHIPPING POINT  
Data obtained from... and the lowest water elevation to be... The above figures are for information purposes only. The state neither warrants nor represents that these figures for high water and low water are in any way indicative of the high water or low water to be expected or encountered during this construction.

DATE... PROJECT OR COUNTY ENGINEER... DISTRICT ENGINEER...





BORINGS SHOWN [ ] TAKEN WITH STD. 140 LB. HAMMER, 30 INCH DROP, 2 INCH O.D. SAMPLER

**SUBSURFACE EXPLORATION FOR FOUNDATION DESIGN**

For the design of the structure foundation, to obtain relative data concerning the character of material in and upon which the foundation might be built, borings and/or soundings were made at points approximately as indicated on this drawing with the log of such exploration data as interpreted for such design purpose as shown. The explorations were made by ordinary and conventional methods and care deemed adequate for such purpose. However, since it is a matter of common knowledge that the exact character of any material and its reaction is difficult to determine from such subsurface exploration and that the kind and character of material at the site where the foundations are built may vary substantially from that indicated by the log they are made available to the bidders simply for what they are worth, without any warranty, expressed or implied that the material to be encountered in building the foundation will conform therewith. If the log is used by the contractor in making his bid, it is hereby expressly stipulated that the Highway Department accepts no responsibility for said use.

TRUNK HIGHWAY NO. STATE OF MINNESOTA DEPARTMENT OF HIGHWAYS.

**BRIDGE NO.**

**BRIDGE SURVEY PLAN AND PROFILE**

SEE SHEET NO. FOR ADDITIONAL INFORMATION