

CONVENTIONAL SIGNS

STATE LINE	=====	TIMBER	
COUNTY LINE	=====	BRUSH	
TOWNSHIP OR RANGE LINE	=====	ORCHARD	
SECTION LINE	=====	ROCK LEDGE	
QUARTER LINE	=====	SAND	
SIXTEENTH LINE	=====	EDGE OF CUT	
RIGHT-OF-WAY LINE	=====	TOE OF EMBANKMENT	
PROPERTY LINE (Except Land Lines)	=====	CATCH BASIN	
VACATED PLATTED PROPERTY	=====	MANHOLE	
CORPORATE OR CITY LIMITS	=====	FIRE HYDRANT	
TRUNK HIGHWAY CENTER LINE	=====	ARC LAMP	
RETAINING WALL		OTHER LAMPS (Same Kind)	
STEAM RAILROAD		RAILROAD CROSSING SIGN	
ELECTRIC RAILROAD		RAILROAD CROSSING BELL	
RAILROAD RIGHT-OF-WAY LINE		ELECTRIC WARNING SIGN	
CREEK		CROSSING GATE	
RAPIDS OR WATERFALL		CATTLE GUARD	
DRY RUN		OVERHEAD (Highway Over)	
DRAINAGE DITCH		UNDERPASS (Highway Under)	
HIGH TENSION LINE		ABUTMENT, WALL & PIER	
POWER POLE LINE		BRIDGE	
TELEPHONE OR TELEGRAPH LINE		BUILDING (One Story Frame)	
CULVERT		F-FRAME O-CONCRETE	
DROP INLET		S-STONE T-TILE	
GUARD RAIL		B-BRICK ST-STUCCO	
WIRE FENCE		IRON PIPE	
RAILROAD SNOW FENCE		STONE MONUMENT	
BOARD OR HIGHWAY SNOW FENCE		WOOD STAKE OR HUB	
STONE WALL OR FENCE		MEANDER CORNER	
HEDGE			
WATER PIPE			
SEWER PIPE			
DRAIN TILE			
GRAVEL PIT			
SAND PIT			
CLAY PIT			
ROCK QUARRY			
SPRINGS			
MARSH			
TRUNK HIGHWAY R/W			
RAILROAD R/W			
PRESENT ROAD R/W			

STATE OF MINNESOTA  
DEPARTMENT OF HIGHWAYS  
CONSTRUCTION PLAN FOR BITUMINOUS SURFACING  
**TRUNK HIGHWAY NO. 49 = 126**

BETWEEN JUNCTION T.H. 36 AND STATE AID ROAD 1  
A POINT 566.0' N. OF S.E. CORNER A POINT 1797.1' N. OF E 1/4 CORNER  
From SEC. 12 T.29N. R.23W. To SEC. 25 T.30N. R.23W.

MINNESOTA NO. SEC.	STATE PROJECT NO. S.P. 6214-09
GROSS LENGTH..... FEET..... MILES	GROSS LENGTH..... 19922.5 FEET..... 3.713 MILES
BRIDGES-LENGTH..... FEET..... MILES	BRIDGES-LENGTH..... 80.0 FEET..... 0.015 MILES
EXCEPTIONS-LENGTH..... FEET..... MILES	EXCEPTIONS-LENGTH..... 80.0 FEET..... 0.015 MILES
NET LENGTH..... FEET..... MILES	NET LENGTH..... 19842.5 FEET..... 3.758 MILES

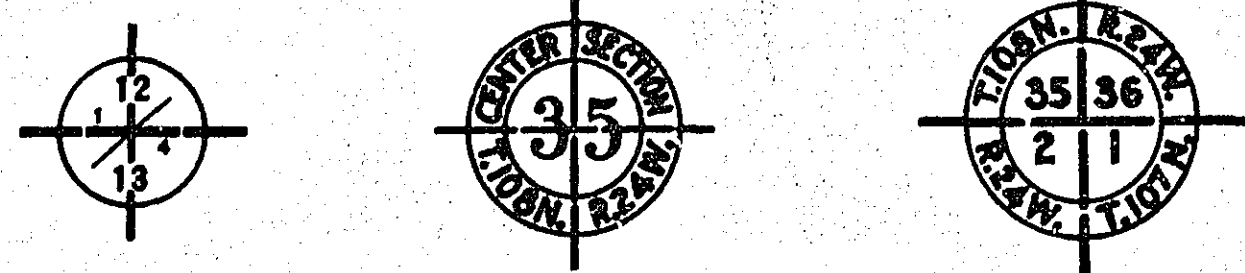
SCALES PLAN, 1 inch = 100 Feet  
PROFILE, Horz. 1 inch = 100 Feet, Vert. 1 inch = 10 Feet

LAYOUT  
Scale 1 inch = 4000 Feet

SPECIFICATIONS  
THE SPECIFICATIONS FOR HIGHWAY CONSTRUCTION DATED JULY 1, 1947, AND SUBMITTED FOR APPROVAL BY THE DIVISION ENGINEER OF THE PUBLIC ROADS ADMINISTRATION, OCTOBER 15, 1947, SHALL GOVERN.

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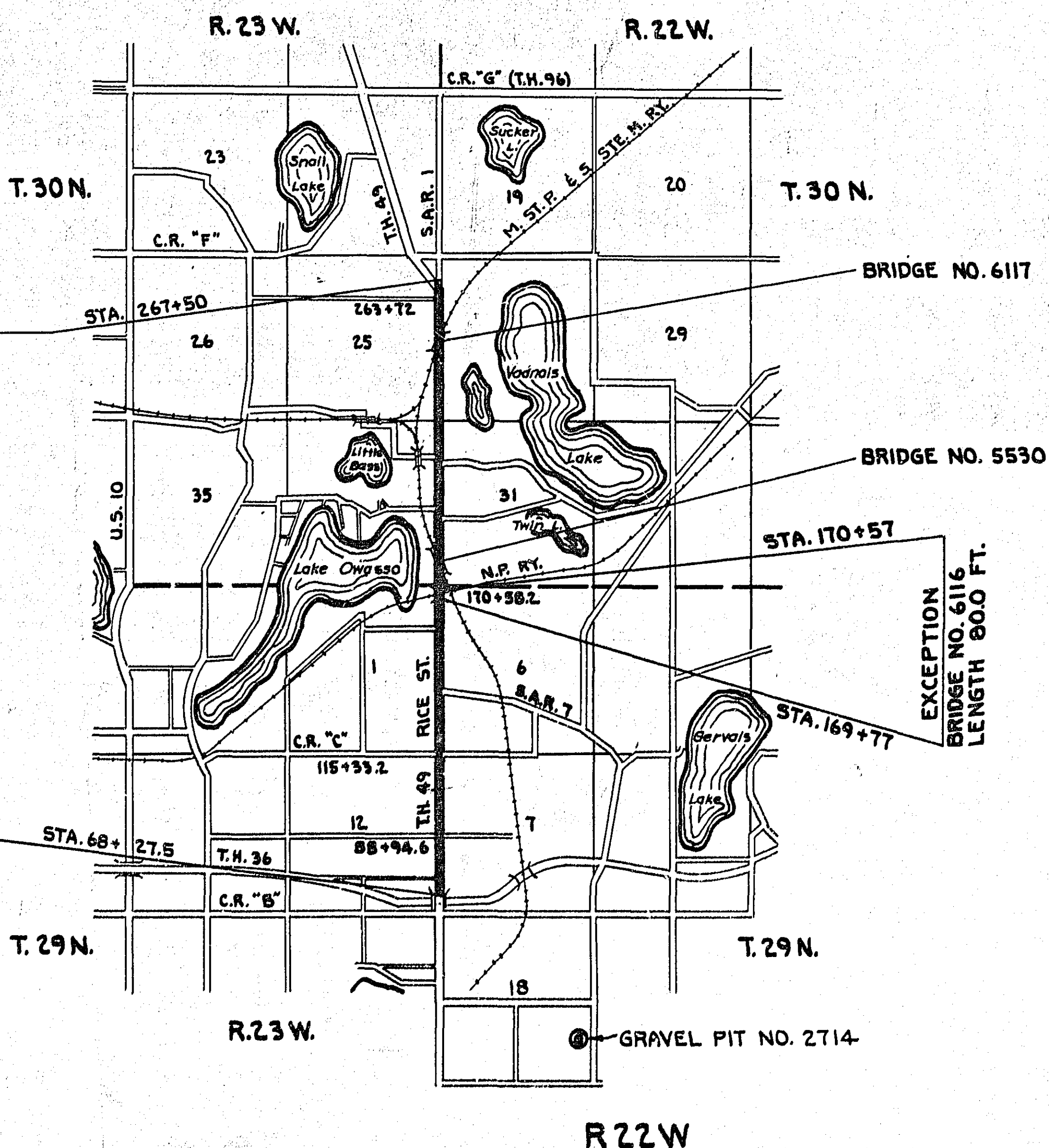
PIT DATA

GRAVEL PIT NO. 2714 Located in S. 1/2, N.E. 1/4 OF S.E. 1/4 & S. 1/2, S. 1/2, N. 1/2 OF N.E. 1/4 OF S.E. 1/4, SEC. 18, T.29N. R.22W. Dead Haul 1.95 MILES TO STA. 68+27.5

PIT NO.	Located in	Dead Haul
PIT NO.	Located in	Dead Haul
PIT NO.	Located in	Dead Haul

BEGIN RAMSEY CO. PROJECT  
END S.P. 6214-09 (T.H. 49=126)

BEGIN S.P. 6214-09 (T.H. 49=126)



Right of Way Approval: *S. Lee Green* 2-7-50  
ENGINEER OF LANDS & RIGHT OF WAY

Planned By: *R. M. Gault* 10-21-49  
ENGINEER OF PLANS

Recommended for Approval: *Fred Schmitt* 10-21-49  
ASSISTANT ENGINEER OF PLANS & SURVEYS

Recommended for Approval: \_\_\_\_\_ 19\_\_\_\_  
DISTRICT ENGINEER

Recommended for Approval: *F. F. Starman* 11-22-49  
ENGINEER OF PLANS & SURVEYS

Approved: 10-25-1949 *O. P. Tipp*  
CHIEF ENGINEER

RECOMMENDED FOR APPROVAL \_\_\_\_\_ 19\_\_\_\_

DISTRICT ENGINEER  
BUREAU OF PUBLIC ROADS  
DEPARTMENT OF COMMERCE

APPROVED \_\_\_\_\_ 19\_\_\_\_

DIVISION ENGINEER  
BUREAU OF PUBLIC ROADS  
DEPARTMENT OF COMMERCE

ENGINEER OF PLANS  
*E. O. J. Strup*  
DATE 10-21-49 REG. NO. 989

### ESTIMATED QUANTITIES

SPECIFICATION REFERENCE	ITEM	FINAL QUANTITIES	UNIT	TOTAL ESTIMATED QUANTITIES
2101.502	CLEARING	1	TREE	1
2101.507	GRUBBING	1	TREE	1
2104.501	REMOVE PORTABLE CULVERTS	174	LIN. FT.	188
2104.502	REMOVE PAVEMENT	1453.38	SQ. YD.	1338
2104.504	REMOVE CURB	174	LIN. FT.	174
2104.507	REMOVE CONCRETE STRUCTURE (STA.178+25)	0.87	CU. YD.	2
2104.511	REMOVE CATCH BASINS	1	STRUCTURE	1
104.556	REMOVE SHOULDER DRAINS (INCLUDES PIPE)	5	DRAIN	5
2105.503	CLASS 'C' EXCAVATION	812	CU. YD.	1134
2116.501	SUBGRADE EXCAVATION	1234	CU. YD.	1222
2123.501	LABORERS (GUTTER CLEANOUT)	201.5	HR.	125
2123.510	2-CUBIC YARD TRUCK (GUTTER CLEANOUT)	63	HR.	125
2501.511-15	FURNISH & INSTALL 15" C.M. PIPE CULVERTS	76	LIN. FT.	20
2501.521-24	FURNISH & INSTALL 24" S.C. PIPE CULVERTS	36	LIN. FT.	36
2501.531-15	INSTALL 15" C.M. PIPE CULVERTS	56	LIN. FT.	20
2501.536-15	INSTALL 15" S.C. PIPE CULVERTS	0	LIN. FT.	80
2503.501	TRENCH EXCAVATION 0' TO 6' DEEP	78.5	LIN. FT.	76
2503.512-18	FURNISH & INSTALL 18" REINFORCED CONCRETE PIPE SEWER	66.5	LIN. FT.	64
2506.501	EXCAVATION FOR CATCH BASINS	7.8	CU. YD.	9
2506.507	CONSTRUCT CATCH BASIN (DESIGN C OR G)	3.3	LIN. FT.	4
2506.516	FURNISH & INSTALL CASTING ASSEMBLIES	1	ASSEMBLY	1
2512.501	HAND PLACED RIPRAP	15	CU. YD.	29
2515.507	CONCRETE EROSION CONTROL STRUCTURES (SEE SHEETS 2 & 7)	45.23	CU. YD.	45
2515.541-18	FURNISH & INSTALL CONCRETE APRONS FOR 18" S.C. PIPE SEWER	2	APRON	2
2515.541-24	FURNISH & INSTALL CONCRETE APRONS FOR 24" S.C. PIPE CULVERTS	2	APRON	2
2531.501	CONCRETE CURB & GUTTER (DESIGN A 832) MODIFIED	140.95	LIN. FT.	143
2574.501	ROADSIDE SEEDING	0.03	ACRE	1
2576.501	AREA SODDING	2982	SQ. YD.	6500
2501.501	PIPE CULVERT EXCAVATION	20.6	CU. YD.	17
2123.503	MOTOR GRADER	5.5	HR.	0
2118.506	CRUSH, SCREEN AND LOAD GRAVEL	318.6	TON	2982
2118.521	STABILIZING	318.6	TON	2982
2122.501	GRAVEL PIT STRIPPING	4.69	CU. YD.	213
2122.508	GRAVEL HAUL (ZONE METHOD)	11554.52	TON MILE	11418
2130.501	WATER	4.8	M-GAL.	45
2201.511	SCREEN AND LOAD GRAVEL	3614.5	TON	2901
2201.521	SUB-BASE CONSTRUCTION	3614.5	TON	2901
2122.501	GRAVEL PIT STRIPPING	454	CU. YD.	206
2122.508	GRAVEL HAUL (ZONE METHOD)	16899.4	TON MILE	12668
2130.501	WATER	13	M-GAL.	44
2202.506	CRUSH SCREEN AND LOAD GRAVEL	859.1	TON	857
2202.521	GRAVEL BASE CONSTRUCTION	859.1	TON	857
2122.501	GRAVEL PIT STRIPPING	134	CU. YD.	61
2122.508	GRAVEL HAUL (ZONE METHOD)	4603.86	TON MILE	4665
2130.501	WATER	4	M-GAL.	13
2207.503	BITUMINOUS MATERIAL (RT-5, RT-6, RT-7)	2350	GAL.	2940
2207.512	BITUMINOUS STABILIZED BASE (2" THICK)	2600	SQ. YD.	2672
2302.515	CONCRETE BASE (TYPE 1,2,3 OR 4) STAND. STR.	0	SQ. YD.	192
2302.525	CONCRETE BASE (TYPE 1,2,3 OR 4) HIGH EARLY STRENGTH	920.05	SQ. YD.	613
* 2331.502	BITUMINOUS MATERIAL FOR TACK COAT (RT-2, RT-3, RT-4)	943	GAL.	3110
2331.504	BITUMINOUS MATERIAL FOR MIXTURE (AC-1)	140.86	TON	189
2331.511	BITUMINOUS MIXTURE	3962.75	TON	4724
2331.512	BITUMINOUS SURFACE	53824	SQ. YD.	61483
331.599	PATCHING MIXTURE	42	TON	75
2331.502	BITUMINOUS MATERIAL FOR TACK COAT (RT-2, RT-3, RT-4)	608	GAL.	2850
2331.504	BITUMINOUS MATERIAL FOR MIXTURE (AC-1)	19392	TON	214
2331.511	BITUMINOUS MIXTURE	4249	TON	4278
2331.512	BITUMINOUS SURFACE	55799	SQ. YD.	57043
2337.505	BITUMINOUS MATERIAL FOR SEAL COAT	6072	GAL.	5700
2337.506	SEAL COAT AGGREGATE	329.02	TON	200

STANDARD DETAIL PLATES ISSUED OCTOBER 1, 1947, AND APPROVED BY THE PUBLIC ROADS ADMINISTRATION APRIL 1, 1948, WITH REVISIONS APPROVED FEBRUARY 24, 1949, SHALL GOVERN.

THE FOLLOWING STANDARD DETAIL PLATES APPLY ON THIS PROJECT.

PLATE NO	STANDARD DETAIL PLATES
2500-2577	PAVING EQUIPMENT
3000-3001	REINFORCED SECTIONAL CONCRETE PIPE
3102	CONCRETE APRON FOR SECTIONAL CONCRETE PIPE CULVERT
4002A	MANHOLE OR CATCH BASIN (DESIGN C)
4006A	MANHOLE OR CATCH BASIN (DESIGN G)
4101	RING CASTING FOR MANHOLE OR CATCH BASIN (NO.700-7)
4142A	BEEHIVE GRATE CASTING FOR CATCH BASIN (NO.730-6)
4200	REINFORCED CONCRETE SEWER PIPE
4210-4211	CONCRETE MASONRY UNITS FOR CATCH BASIN CONSTRUCTION
4215	FOUNDATION FOR CATCH BASINS
7100	CONCRETE CURB & GUTTER DESIGN A (MODIFIED)
8000	STANDARD BARRICADE
9000	APPROACHES & ENTRANCES
9001A	BITUMINOUS SURFACING ON APPROACHES AND ENTRANCES
9102A	SODDING AT PIPE CULVERT ENDS

### BASIS FOR PLANNED QUANTITIES

**SUB-BASE**  
SUB-BASE ESTIMATED ON BASIS OF 130 LBS. DENSITY PER CU. FT.  
WATER FOR COMPACTION ESTIMATED ON BASIS OF 15 GAL'S PER TON.

**GRAVEL BASE**  
GRAVEL BASE ESTIMATED ON BASIS OF 140 LBS. DENSITY PER CU. FT.  
WATER FOR COMPACTION ESTIMATED ON BASIS OF 15 GAL'S PER TON.

**GRAVEL SURFACED SHOULDERS**  
GRAVEL FOR SHOULDERING ESTIMATED ON BASIS OF 140 LBS. DENSITY PER CU. FT. OR 15.16 TONS PER STA. FOR BOTH SIDES.  
WATER FOR COMPACTION ESTIMATED ON BASIS OF 15 GAL'S PER TON.

**BITUMINOUS STABILIZED BASE**  
BITUMINOUS MATERIAL FOR 2" STABILIZED BASE ESTIMATED ON THE BASIS OF 1.1 GAL'S PER SQ. YD.

**BITUMINOUS COURSES**  
**BINDER COURSE**  
BITUMINOUS MATERIAL FOR TACK COAT ESTIMATED ON THE BASIS OF 0.05 GAL'S PER SQ. YD.  
BITUMINOUS MIXTURE ESTIMATED ON BASIS OF 100 POUNDS PER SQ. YD. PER INCH OF DEPTH.  
BITUMINOUS MATERIAL FOR MIXTURE AC-1 (20-150 PENETRATION) ESTIMATED ON THE BASIS OF 4% OF THE MIXTURE BY WEIGHT.

**WEARING SURFACE (1/2" INCHES)**  
① BITUMINOUS MATERIAL FOR TACK COAT ESTIMATED ON THE BASIS OF 0.05 GAL'S PER SQ. YD.  
BITUMINOUS MIXTURE ESTIMATED ON THE BASIS OF 150 POUNDS PER SQ. YD.  
BITUMINOUS MATERIAL FOR MIXTURE AC-1 (20-150 PENETRATION) ESTIMATED ON THE BASIS OF 5% OF THE MIXTURE BY WEIGHT.

**SEAL COAT**  
BITUMINOUS MATERIAL ESTIMATED ON THE BASIS OF 0.1 GAL'S PER SQ. YD.  
AGGREGATE ESTIMATED ON BASIS OF 7-POUNDS PER SQ. YD.

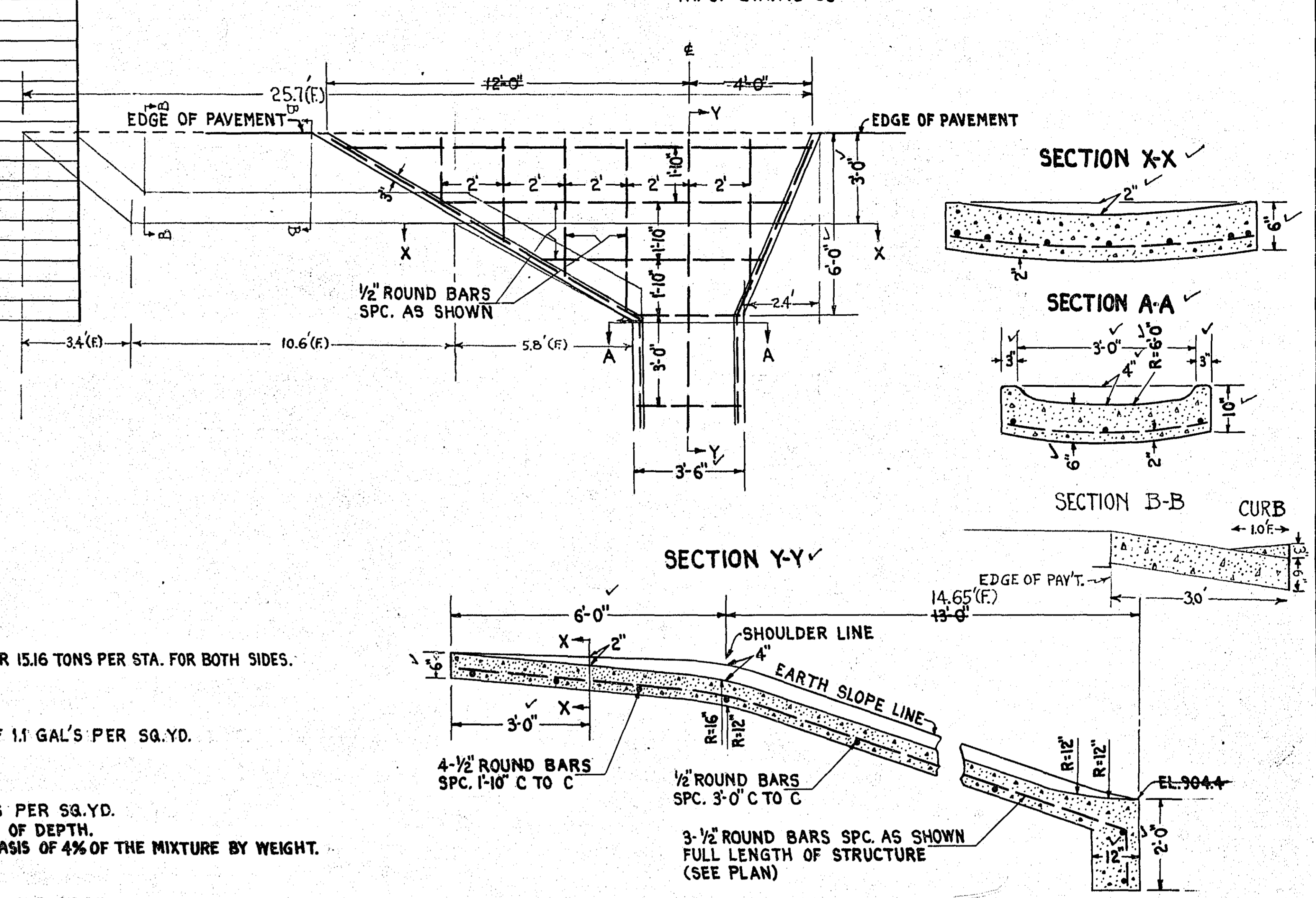
① TACK COAT TO BE APPLIED IF SO DIRECTED BY THE ENGINEER.

AGGREGATES FOR BITUMINOUS MIXTURE MAY BE OBTAINED FROM GRAVEL PIT NO. 2714.

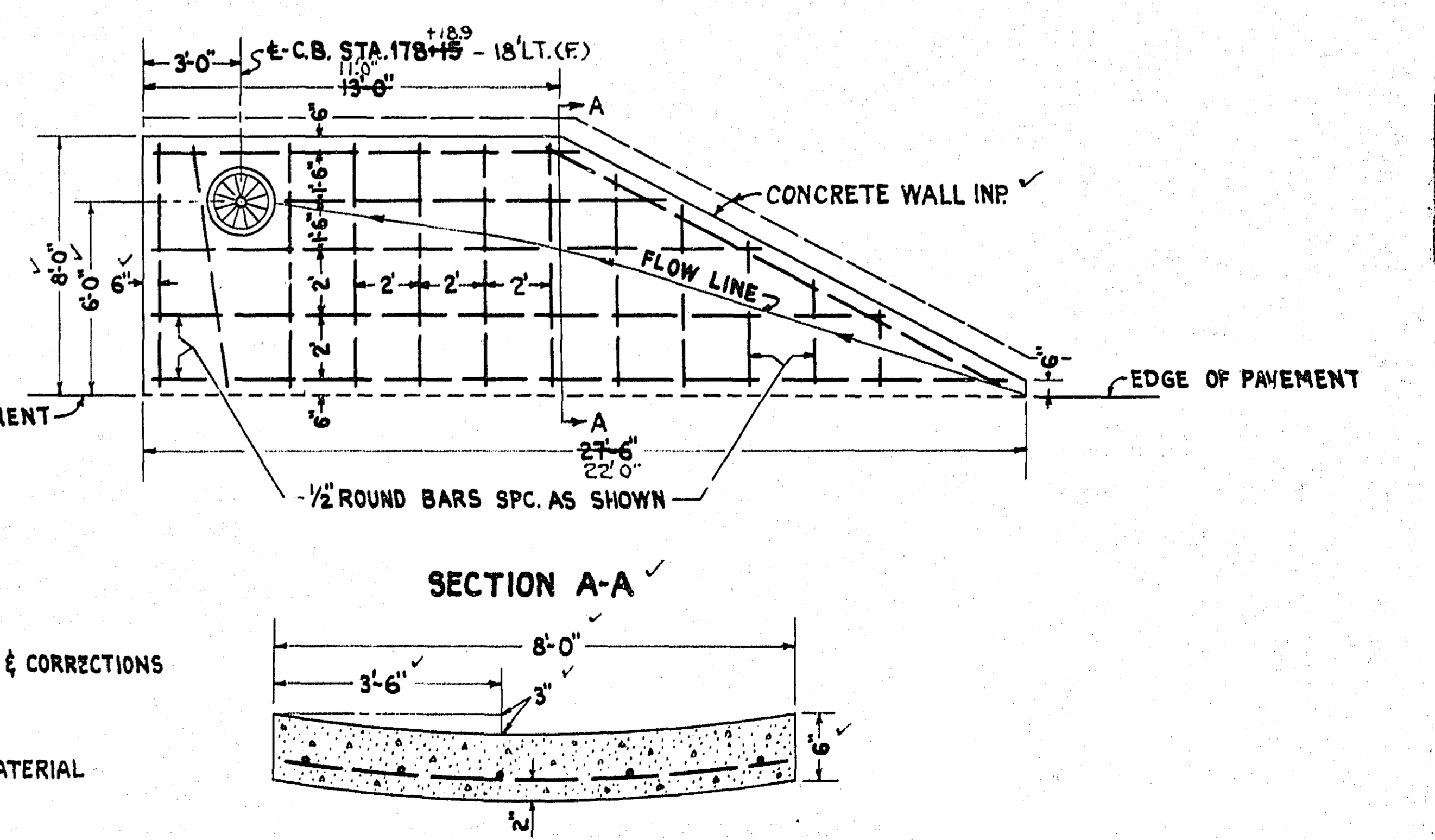
### FINAL QUANTITIES

SPECIFICATION REFERENCE	ITEM	UNIT	ESTIMATED QUANTITIES	FINAL QUANTITIES
	CONTRACTION JOINTS	LIN. FT.	—	168
	F. & I. TIE BARS	LB.	200	147
2104.502	REMOVE PAVEMENT	S.Y.	14	15.73
2503.514-15	F. & I. 15" C.M. PIPE CULVERT	LIN. FT.	148	152
2503.514-24	F. & I. 24" " " "	LIN. FT.	60	64
2503.501	TRENCHING 0' TO 6' DEEP	LIN. FT.	208	216
2506.501	C.B. & M.H. EXCAVATION	CU. YD.	24	21.9
2506.507	CONSTRUCT C.B. (DES. C OR G)	LIN. FT.	10	8.6
2506.516	F. & I. CASTING ASSEMBLY	No.	2	2
2302.525	CONCRETE BASE H.E. STRENGTH	S.Y.	14	15.73

### EROSION CONTROL STRUCTURE



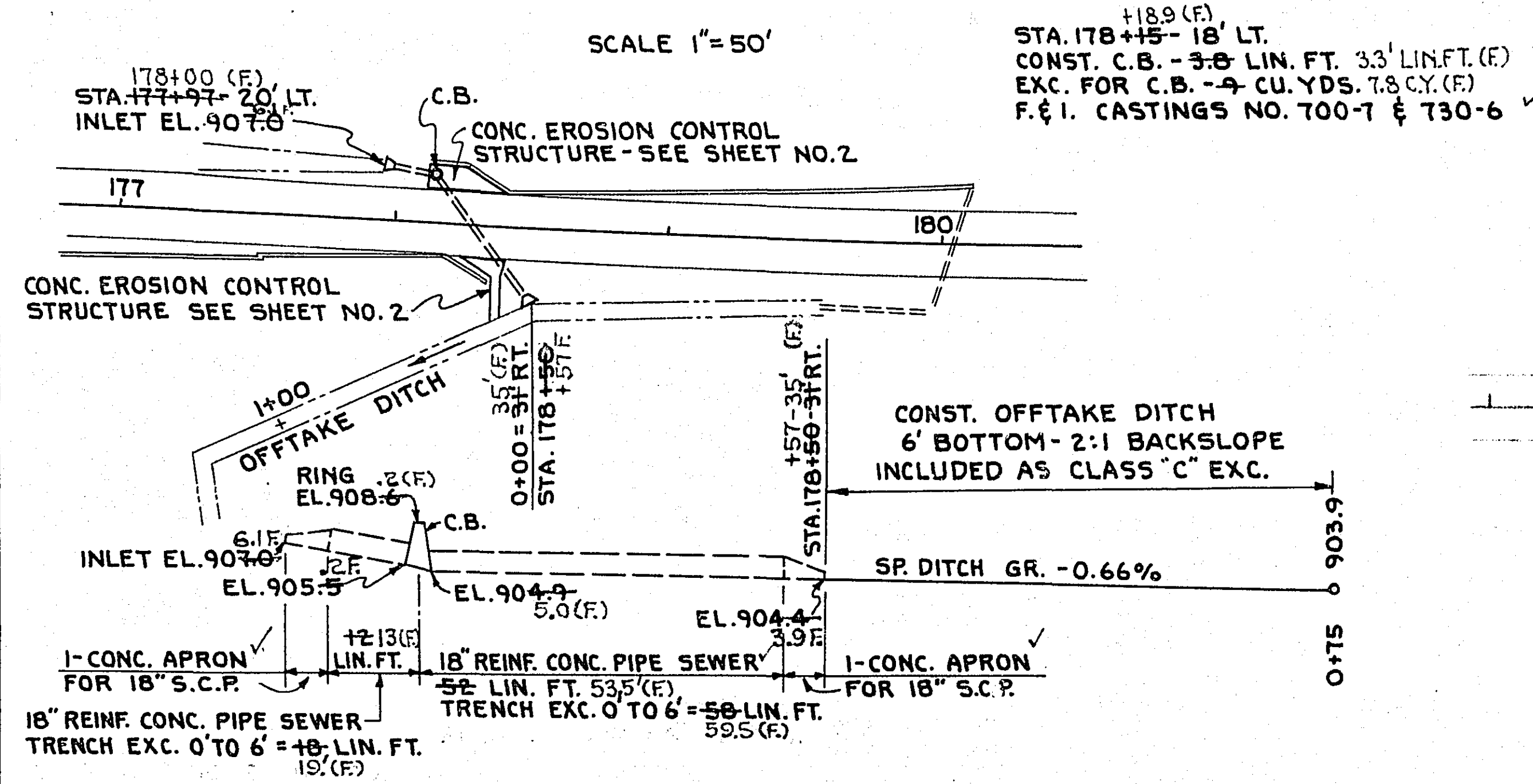
### EROSION CONTROL STRUCTURE



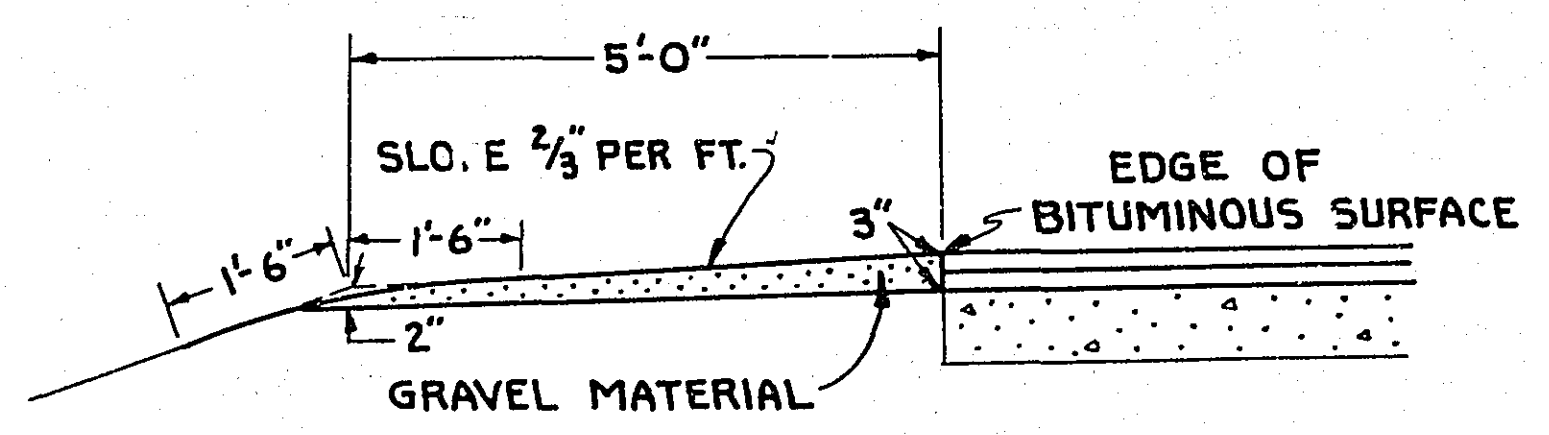
\* INCLUDES 260 GALLONS FOR ADDITIONAL TACK COAT OVER LEVELING COURSE.  
 ◊ ITEM 2331.511 INCLUDES 450 TONS OF BITUMINOUS MIXTURE (AVERAGE 2" DEPTH) TO BE USED FOR A LEVELING COURSE.  
 ◊ ITEM 2331.512 INCLUDES 4500 SQ. YDS. OF BITUMINOUS SURFACE FOR THE ABOVE LEVELING COURSE WHICH OCCURS BETWEEN THE FOLLOWING STATIONS  
 STA. 101+00 TO STA. 103+10    STA. 233+00 TO STA. 240+00  
 STA. 247+00 TO STA. 247+87    STA. 257+00 TO STA. 258+00

HAUL IN MILES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38		
GRAVEL SUB-BASE & CORRECTIONS TONS	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57		
GRAVEL SURFACED SHOULDERS TONS																																								
GRAVEL BASE TONS																																								
GRAVEL SHOULDERS TONS	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	
GRAVEL SHOULDERS TONS	160	168	176	184	192	200	208	216	224	232	240	248	256	264	272	280	288	296	304	312	320	328	336	344	352	360	368	376	384	392	400	408	416	424	432	440	448	456		

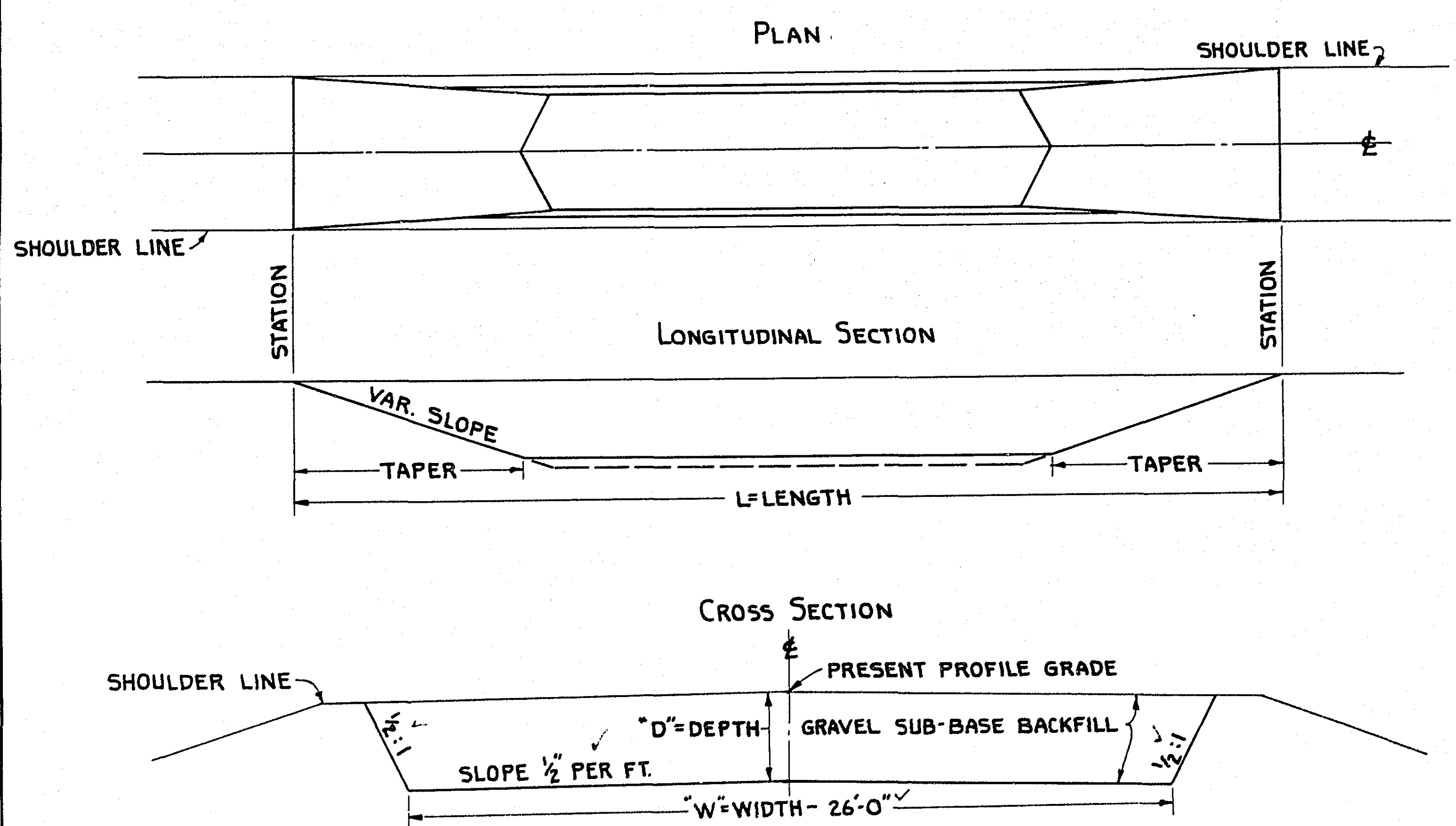
### DETAIL OF DRAINAGE AT BRIDGE NO. 5530



### DETAIL OF GRAVEL SHOULDERS

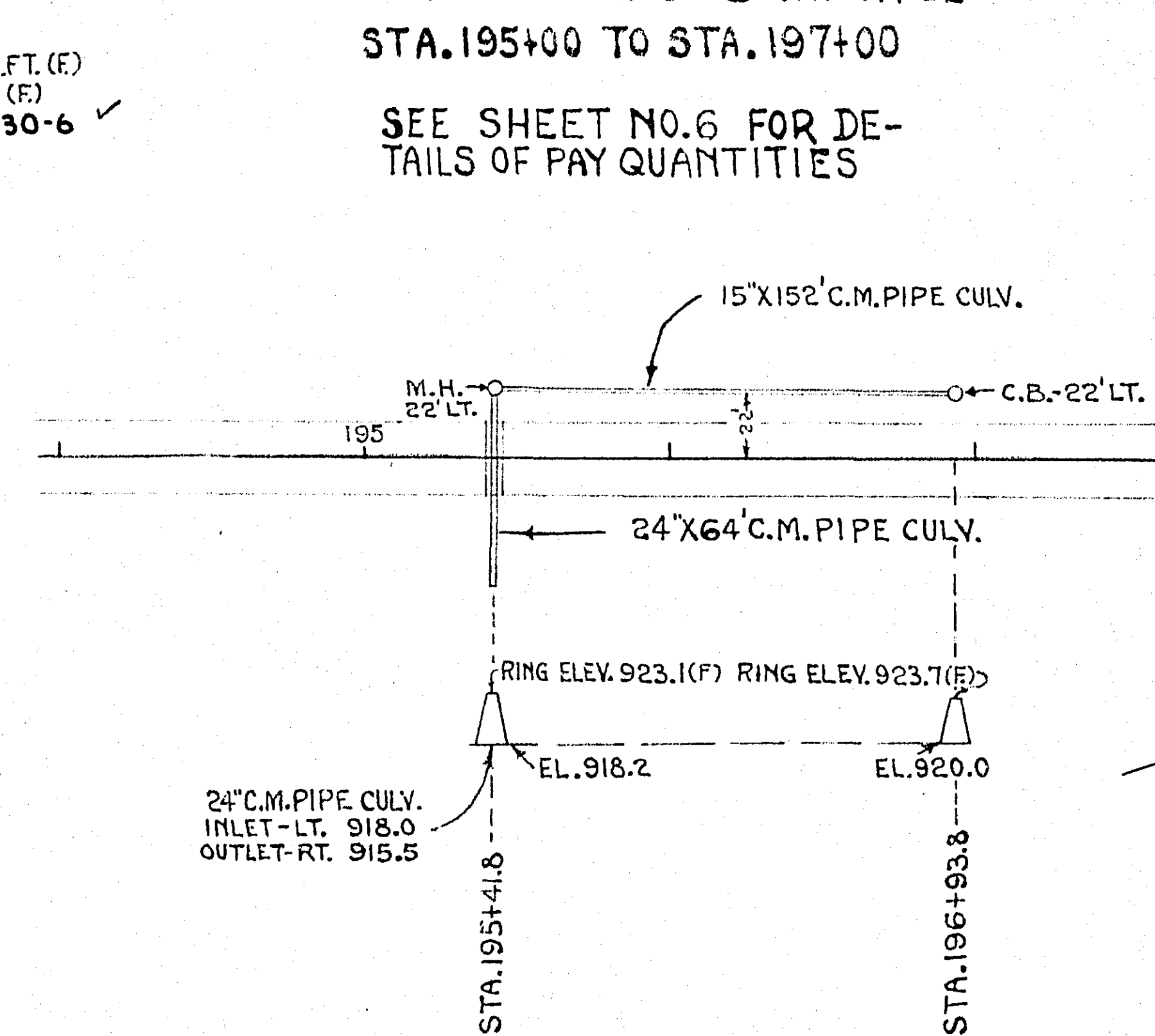


### TYPICAL SECTIONS FOR SUBGRADE CORRECTIONS

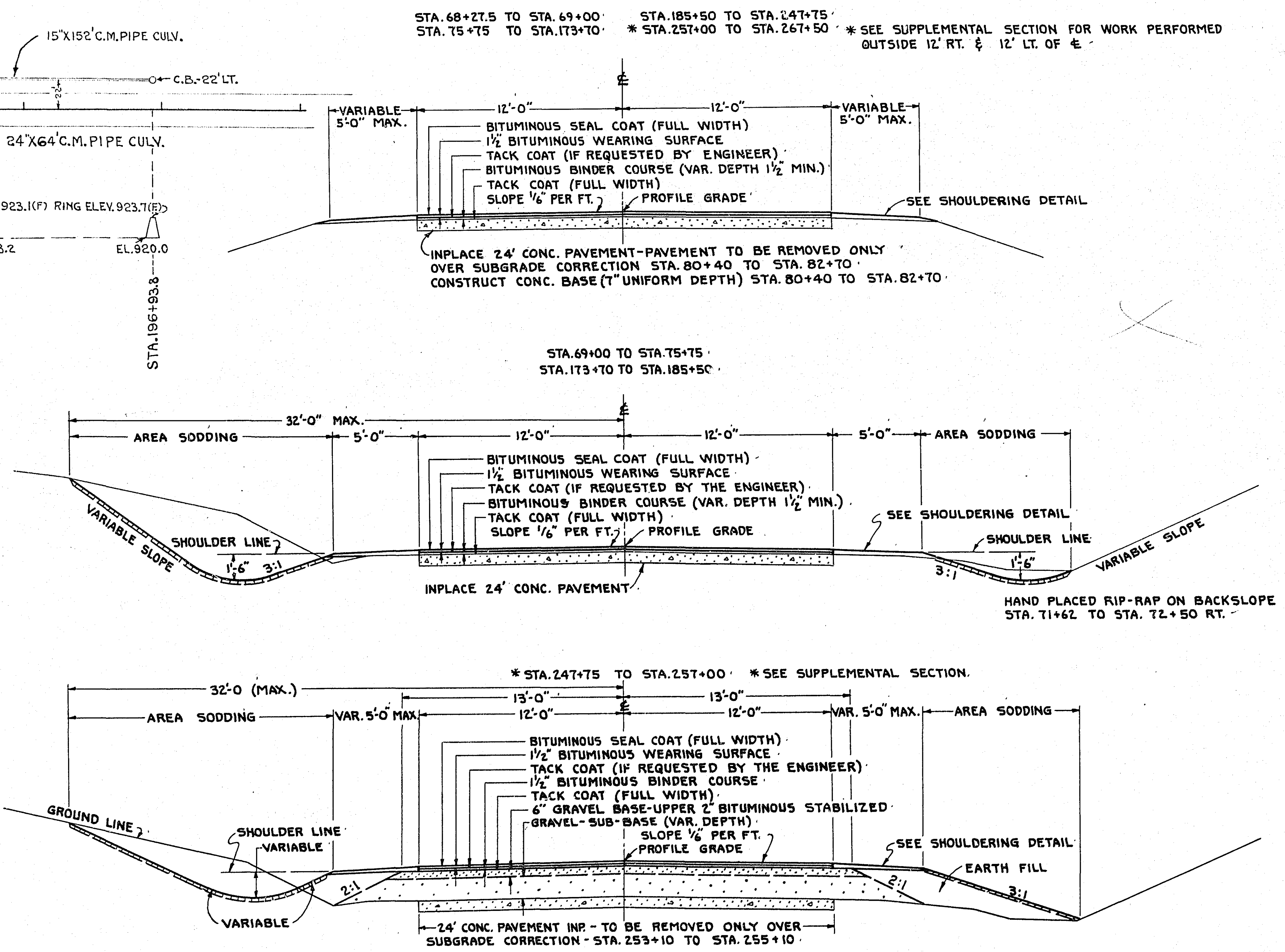


SUBGRADE CORRECTIONS					
STATION	STATION	"L" LENGTH	"D" DEPTH	"W" WIDTH OF BOTTOM	LENGTH OF 2 TAPERS
		FEET	FEET	FEET	FEET
80+40	82+70	230	4.0	26.0	160
253+10	255+10	200	4.5	26.0	80

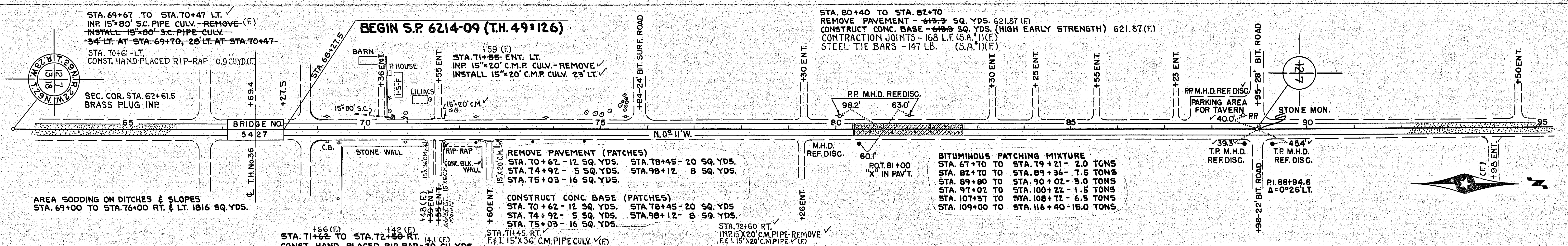
### S.A.#3(E) DETAIL OF DRAINAGE



### TYPICAL SECTIONS

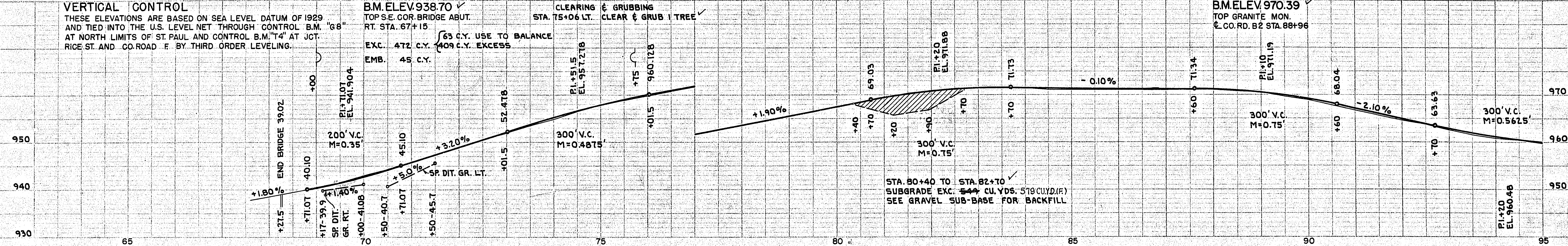


**BEGIN S.P. 6214-09 (T.H. 49=126)**

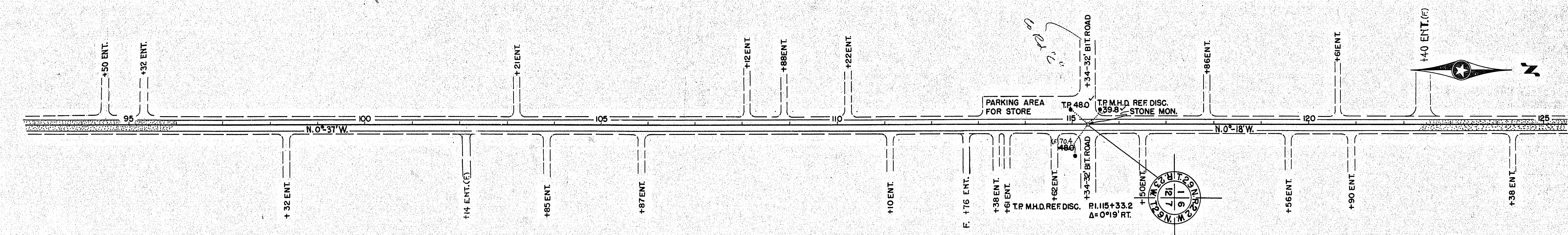


**VERTICAL CONTROL**  
 THESE ELEVATIONS ARE BASED ON SEA LEVEL DATUM OF 1929 AND TIED INTO THE U.S. LEVEL NET THROUGH CONTROL B.M. "G8" AT NORTH LIMITS OF ST. PAUL AND CONTROL B.M. "T4" AT JCT. RICE ST. AND CO. ROAD F BY THIRD ORDER LEVELING.

**B.M. ELEV. 938.70**  
 TOP S.E. COR. BRIDGE ABUT.  
 RT. STA. 67+15  
 EXC. 472 C.Y. 409 C.Y. EXCESS  
 EMB. 45 C.Y.

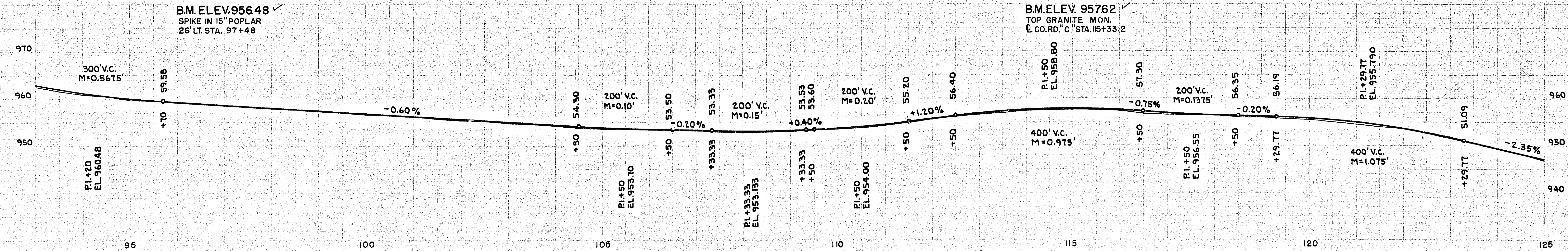


187-16



**B.M. ELEV. 956.48**  
 SPIKE IN 15" POPLAR  
 26' LT. STA. 97+48

**B.M. ELEV. 957.62**  
 TOP GRANITE MON.  
 @ CO. RD. "C" STA. 115+33.2



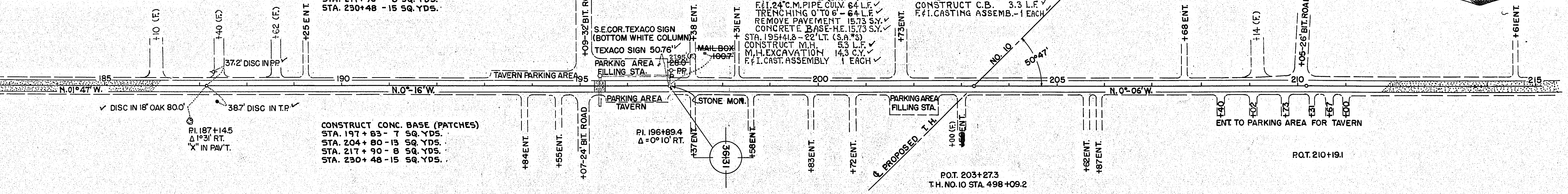


BITUMINOUS PATCHING MIXTURE  
STA. 182+50 TO STA. 207+22-6.5 TONS

REMOVE PAVEMENT (PATCHES)  
STA. 197+83 - 7 SQ. YDS.  
STA. 204+80 - 13 SQ. YDS.  
STA. 217+90 - 8 SQ. YDS.  
STA. 230+48 - 15 SQ. YDS.

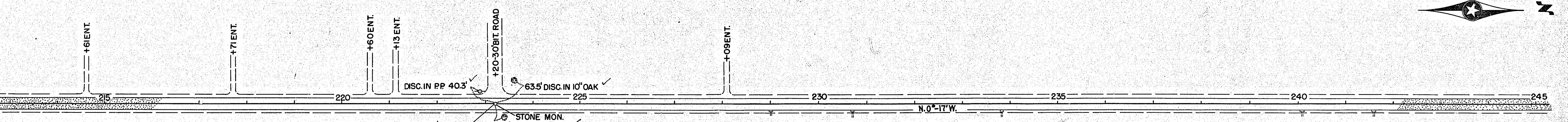
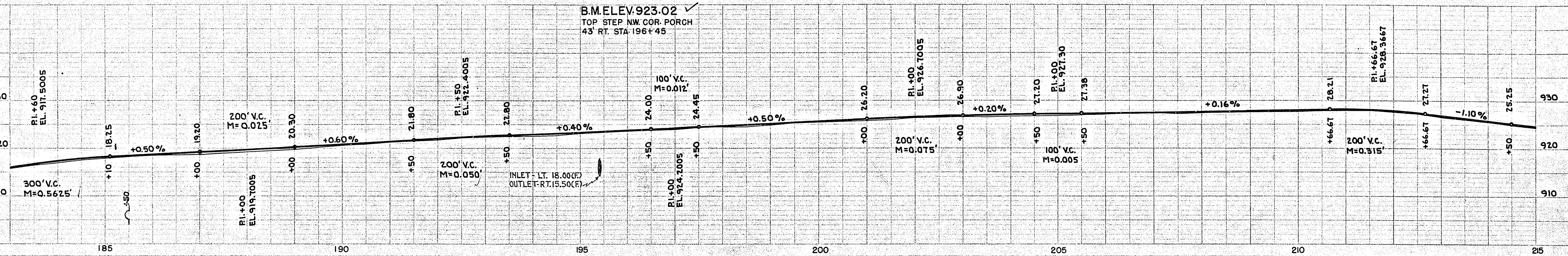
STA. 195+41.8 - 22' LT. TO 196+93.8 - 22' LT. (S.A.#3)  
F.F.I. 15" C.M. PIPE CULY, 152 L.F.  
TRENCHING 0' TO 6' - 152 L.F.  
STA. 195+41.8 (S.A.#3)  
F.F.I. 24" C.M. PIPE CULY, 84 L.F.  
TRENCHING 0' TO 6' - 84 L.F.  
REMOVE PAVEMENT 15.73 S.Y.  
CONCRETE BASE H.E. 15.73 S.Y.  
STA. 195+41.8 - 22' LT. (S.A.#3)  
CONSTRUCT M.H. 53 L.F.  
M.H. EXCAVATION 14.3 C.Y.  
F.F.I. CAST. ASSEMBLY 1 EACH

STA. 196+93.8 - 22' LT. (S.A.#3)  
C.B. EXCAVATION 7.6 C.Y.  
CONSTRUCT C.B. 3.3 L.F.  
F.F.I. CASTING ASSEMB. - 1 EACH



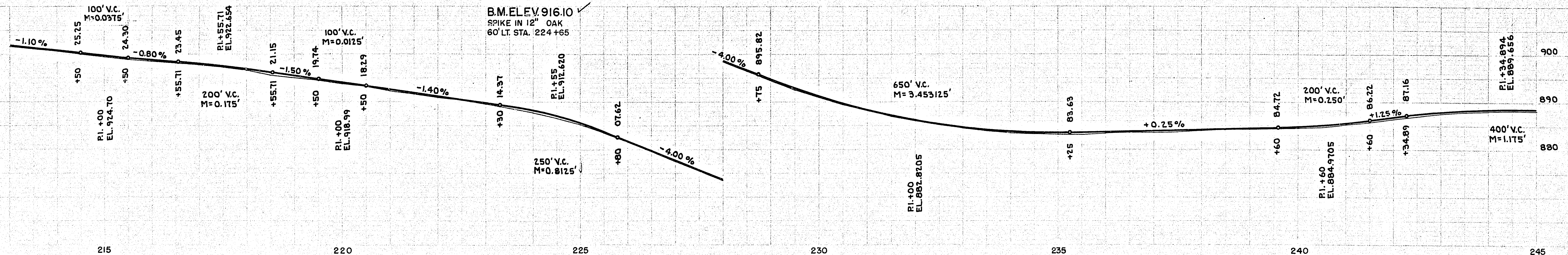
CONSTRUCT CONC. BASE (PATCHES)  
STA. 197+83 - 7 SQ. YDS.  
STA. 204+80 - 13 SQ. YDS.  
STA. 217+90 - 8 SQ. YDS.  
STA. 230+48 - 15 SQ. YDS.

B.M. ELEV. 923.02  
TOP STEP NW COR. PORCH  
43' RT. STA. 196+45



REMOVE SHOULDER DRAINS  
STA. 229+03 RT. - 1 DRAIN  
STA. 230+69 RT. - 1 DRAIN  
STA. 233+86 RT. - 1 DRAIN  
STA. 240+10 RT. - 1 DRAIN  
STA. 241+63 RT. - 1 DRAIN  
SEE SPECIAL PROVISIONS

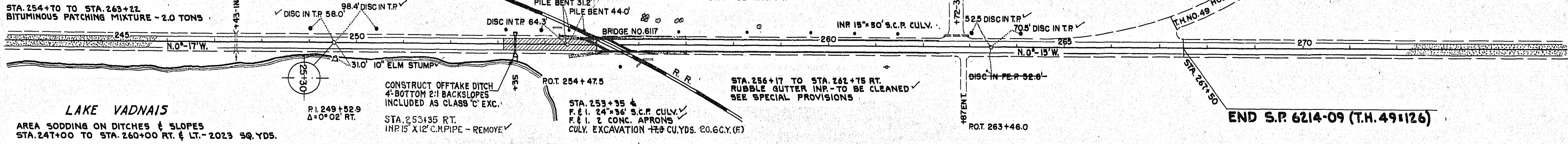
B.M. ELEV. 916.10  
SPIKE IN 12" OAK  
60' LT. STA. 224+65



REMOVE PAVEMENT  
 STA. 244+08 (PATCH) - 8 SQ. YDS. 533.33 (F)  
 STA. 253+10 TO STA. 255+10 - 533.33 SQ. YDS.  
 STA. 259+94 (PATCH) 10 SQ. YDS.  
 CONSTRUCT CONC. BASE (PATCHES)  
 STA. 244+28 - 8 SQ. YDS.  
 STA. 259+94 - 10 SQ. YDS.  
 STA. 254+10 TO STA. 263+22  
 BITUMINOUS PATCHING MIXTURE - 2.0 TONS

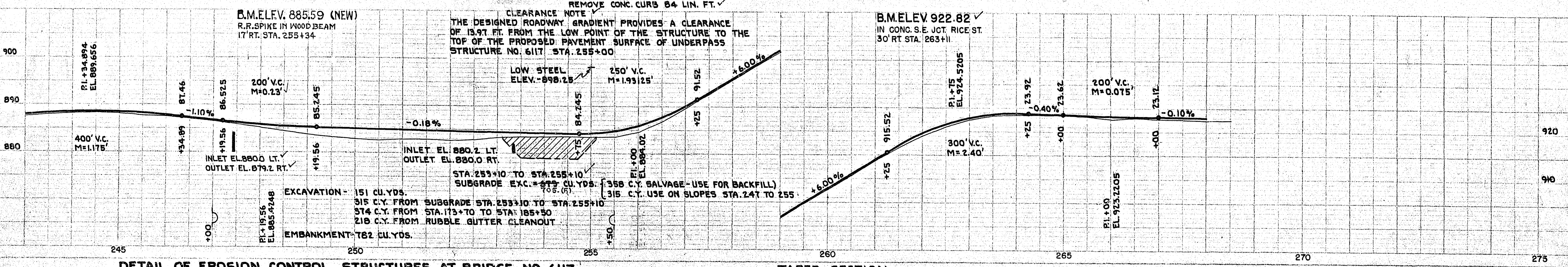
STA. 247+75 TO STA. 257+00 256+75 (F)  
 CONST. BITUMINOUS STABILIZED  
 BASE (2" THICK) 2672 SQ. YDS. 2.600. S.Y.(F)

STA. 255+54 TO STA. 262+50 LT.  
 RUBBLE GUTTER INP. TO BE CLEANED  
 SEE SPECIAL PROVISIONS  
 STA. 256+10 TO STA. 257+00 LT.  
 REMOVE CONC. CURB - 90 LIN. FT.



LAKE VADNAIS  
 AREA SODDING ON DITCHES & SLOPES  
 STA. 247+00 TO STA. 260+00 RT. & LT. - 2023 SQ. YDS.

END S.P. 6214-09 (T.H. 49126)



DETAIL OF EROSION CONTROL STRUCTURES AT BRIDGE NO. 6117

