MINNESOTA DEPARTMENT OF TRANSPORTATION

THE COUNTY OF OLMSTED

CONSTRUCTION PLAN FOR GRADING, AGGREGATE BASE & BR.L8954 REPLACEMENT

LOCATED ON C.R. 123 **BETWEEN** 60TH AVE. SE. ROCHESTER **AND** C.S.A.H. 19 **(GEOGRAPHIC DESCRIPTION)**

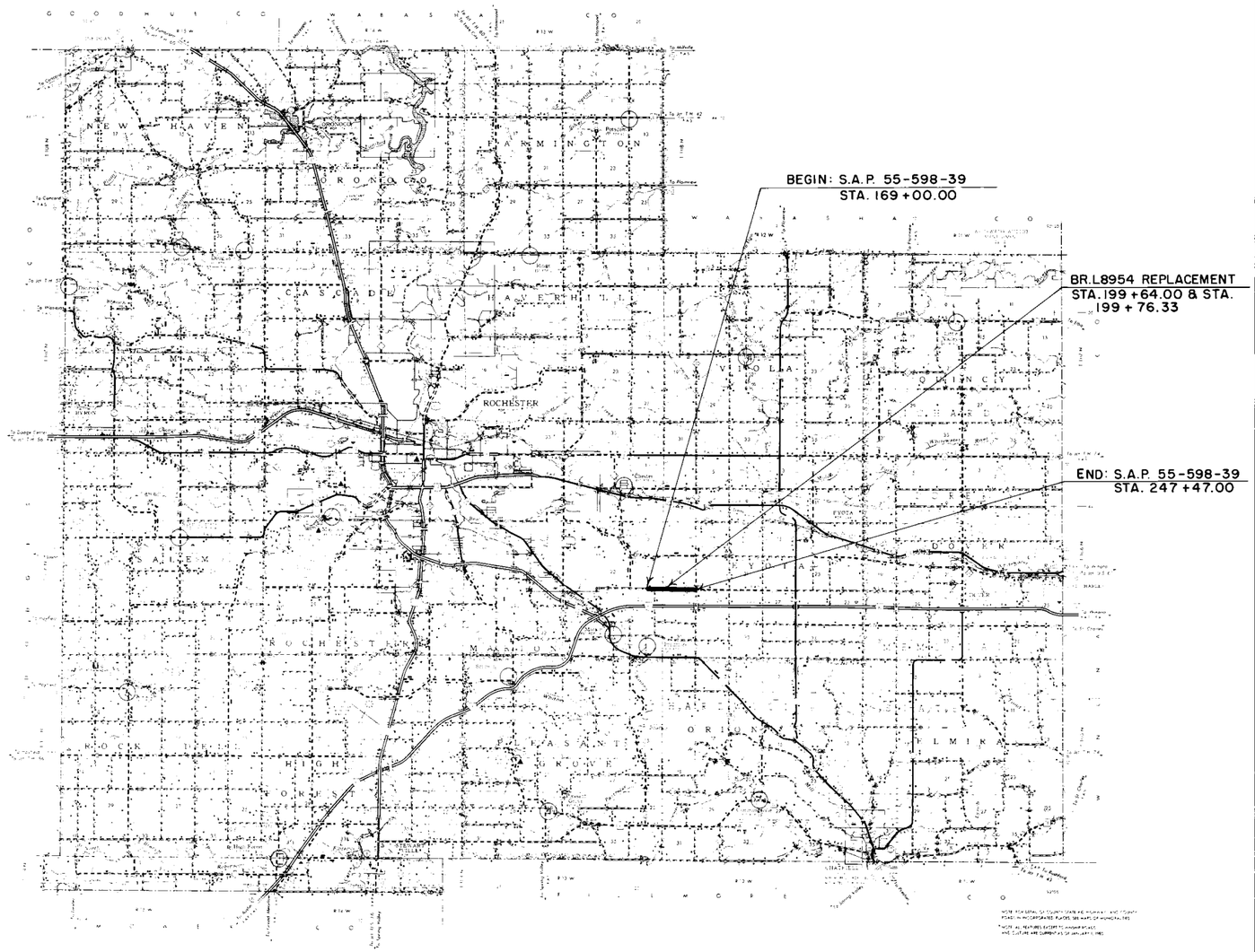
FROM 1/4 COR. 24-25 T106N-R13W **TO** 52.00' S.E. SEC. COR. 19-20-29-30 T106N-R12W **(LEGAL DESCRIPTION)**

~~**STATE PROJ. NO.**~~ S.A.P. 55-598-39

GROSS LENGTH	7,847.00	FEET	1.486 MILES
BRIDGES-LENGTH	0	FEET	0 MILES
EXCEPTIONS-LENGTH	0	FEET	0 MILES
NET LENGTH	7,847.00	FEET	1.486 MILES

STATE PROJ. NO.

GROSS LENGTH	FEET	MILES
BRIDGES-LENGTH	FEET	MILES
EXCEPTIONS-LENGTH	FEET	MILES
NET LENGTH	FEET	MILES



PLANS SYMBOLS

STATE LINE
COUNTY LINE
TOWNSHIP OR RANGE LINE
SECTION LINE
QUARTER LINE
SIXTEENTH LINE
RIGHT OF WAY LINE
PRESENT RIGHT OF WAY LINE
CONTROL OF ACCESS LINE
PROPERTY LINE (Except Land Lines)
VACATED PLATTED PROPERTY
CORPORATE OR CITY LIMITS
TRUNK HIGHWAY CENTER LINE
RETAINING WALL
RAILROAD
RAILROAD RIGHT-OF-WAY LINE
RIVER OR CREEK
DRY RUN
DRAINAGE DITCH
DRAIN TILE
CULVERT
DROP INLET
GUARD RAIL
BARBED WIRE FENCE
WOVEN WIRE FENCE
CHAIN LINK FENCE
RAILROAD SNOW FENCE
STONE WALL OR FENCE
HEDGE
RAILROAD CROSSING SIGN
RAILROAD CROSSING BELL
ELECTRIC WARNING SIGN
CROSSING GATE
MEANDER CORNER
SPRINGS
MARSH
TIMBER
ORCHARD
BRUSH
NURSERY
CATCH BASIN
FIRE HYDRANT
CATTLE GUARD
OVERPASS (Highway Over)
UNDERPASS (Highway Under)
BRIDGE
BUILDING (One Story Frame)
F-FRAME C-CONCRETE
S-STONE T-TILE
B-BRICK ST-STUCCO
IRON PIPE OR ROD
MONUMENT (STONE, CONCRETE OR METAL)
WOODEN HUB
GRAVEL PIT
SAND PIT
BORROW PIT
ROCK QUARRY
SLOPE EASEMENT

UTILITIES SYMBOLS

POWER POLE LINE
TELEPHONE OR TELEGRAPH POLE LINE
JOINT TELEPHONE AND POWER ON POWER POLES
ON TELEPHONE POLES
ANCHOR
STEEL TOWER
STREET LIGHT
PEDESTAL TELEPHONE CABLE TERMINAL
GAS MAIN
WATER MAIN
CONDUIT
TELEPHONE CABLE IN CONDUIT
ELECTRICAL CABLE IN CONDUIT
TELEPHONE MANHOLE
ELECTRIC MANHOLE
BURIED TELEPHONE CABLE
BURIED ELECTRICAL CABLE
AERIAL TELEPHONE CABLE
SEWER (SANITARY OR STORM)
SEWER MANHOLE

ALLPHSON, MPLS. 55405

SCALES

PLAN 0 100'
PROFILE 0 100' HORIZ. 0 10' VERT.
INDEX MAP 0 10,560'
CROSS SECTIONS 0 10'

MINN. PROJ. NO.

GOVERNING SPECIFICATIONS

THE 1988 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" AS AMENDED BY THE JANUARY 2, 1991, SUPPLEMENTAL SPECIFICATION SHALL GOVERN.

INDEX

SHEET NO. 1	TITLE SHEET AND LAYOUT MAP
SHEET NO. 2	ESTIMATE OF QUANTITIES & TYPICAL SECTIONS
SHEET NO. 3	STANDARD PLATES & INCIDENTAL ITEMS
SHEET NO. 4-6	PLAN AND PROFILE
SHEET NO. 7	TRAFFIC CONTROL
SHEET NO. 8-23	CROSS SECTIONS
SHEET NO. 24-27	BRIDGE SHEETS

DESIGN DESIGNATION

R
ΣN18[20]

ADT (Current Year)	= 342 (1992)	Design Speed	50 MPH
ADT (Future Year)	= 616 (2012)	Based on	STOPPING Sight Distance
DHV (Design Hr. Vol.)	=	Height of eye	3.5 Height of object 0.5
D (Directional Distr.)	= %	Design Speed not achieved at:	
T (Heavy Commercial)	= 6 %	STA. 244+98.63 TO STA. 247+47.00	MPH 40
SOIL FACTOR	130	STA.	TO STA. MPH
9 TON DESIGN (Alt.)		STA.	TO STA. MPH
SHOULDER WIDTH	4'		

I HEREBY CERTIFY THAT THIS 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 6/1/92 REG. NO. 10397 ENGR. Michael O'Sheehan

COUNTY Olmsted

Recommended for Approval _____ 19__
DISTRICT STATE AID ENGINEER

Recommended for Approval _____ 7/6 19 92
STATE AID PLANS AND SPECS ENGINEER

Approved 7/13 19 92 _____
ASST STATE AID ENGINEER

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
APPROVED
DIVISION ADMINISTRATOR DATE

STATE AID PROJ. NO. 55-598-39
~~**STATE PROJ. NO.**~~ C.R. 123 **SHEET NO.** 1 **OF** 27 **SHEETS**

AS BUILT PLANS

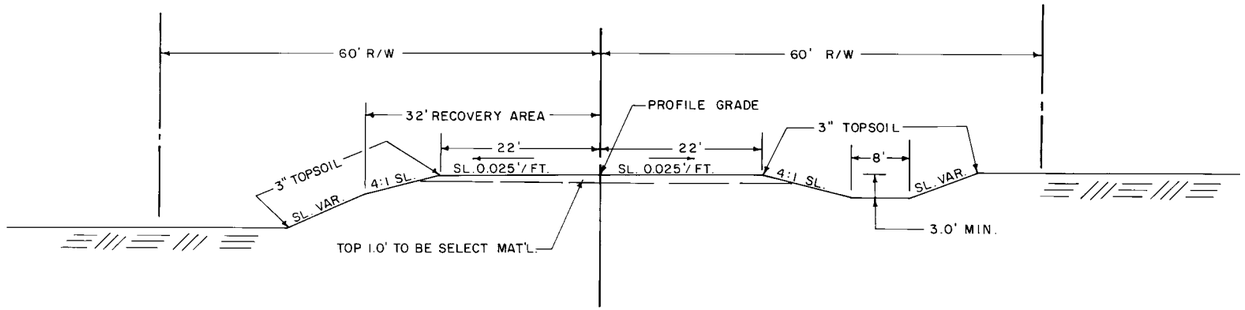
ESTIMATED QUANTITIES

	SPECIFICATION NO.	ITEM	UNIT	NON PARTICIPATING	PARTICIPATING	TOTAL ESTIMATED QUANTITIES
	2101.501	CLEARING	ACRE	1.0		1.0
	2101.502	CLEARING	TREE	58		58
	2101.506	GRUBBING	ACRE	1.0		1.0
	2101.507	GRUBBING	TREE	58		58
①	2104.501	REMOVE PIPE CULVERTS	LIN.FT.	393		393
	2104.513	SAWING BITUMINOUS PAVEMENT	LIN.FT.	154		154
②	2105.515	UNCLASSIFIED EXCAVATION (P)	CU.YD.	71,662		71,662
③	2130.501	WATER	(M)GAL.	30		30
④	2211.501	AGGREGATE BASE CLASS 2	TON	7,010		7,010
⑤	2211.501	AGGREGATE BASE CLASS 5 (MODIFIED)	TON	5,645		5,645
	2412.511	88 PRECAST CONCRETE BOX CULVERT (15' OVERFILL)	LIN. FT.		216	216
	2412.512	88 PRECAST CONCRETE BOX CULVERT END SECTION	EACH		4	4
⑥	2442.501	REMOVE OLD BRIDGE	LUMP SUM	1		1
	2451.507	GRANULAR BEDDING (C.V.) (P)	CU.YD.		104	104
	2501.511	18" C.S. PIPE CULVERT	LIN. FT.	316		316
	2501.511	30" C.S. PIPE CULVERT	LIN. FT.	36		36
	2501.511	36" R.C. PIPE CULVERT CLASS II	LIN. FT.	78		78
	2501.511	42" R.C. PIPE CULVERT CLASS II	LIN.FT.	106		106
	2501.511	42" R.C. PIPE CULVERT CLASS III	LIN.FT.	54		54
	2501.511	42" R.C. PIPE CULVERT CLASS IV	LIN.FT.	34		34
	2501.511	42" R.C. PIPE CULVERT CLASS V	LIN.FT.	104		104
	2501.511	60" R.C. PIPE CULVERT CLASS III	LIN.FT.	134		134
	2501.515	18" G.S. PIPE APRON	EACH	20		20
	2501.515	30" G.S. PIPE APRON	EACH	2		2
	2501.515	36" R.C. PIPE APRON	EACH	2		2
	2501.515	42" R.C. PIPE APRON	EACH	4		4
	2501.515	60" R.C. PIPE APRON	EACH	2		2
⑦	2511.502	RANDOM RIPRAP CLASS III	TON	51	67	118
	2575.501	SEEDING (P)	ACRE	13		13
⑧	2575.502	SEED, MIXTURE 500	POUND	650		650
⑨	2575.502	SEED, MIXTURE 1100	POUND	1,040		1,040
	2575.505	SODDING TYPE EROSIN	SQ.YD.	7,833		7,833
⑩	2575.511	MULCH MATERIAL TYPE 1	TON	26		26
	2575.519	DISK ANCHORING (P)	ACRE	13		13
⑪	2575.531	COMMERCIAL FERTILIZER, ANALYSIS 12-12-12	TON	1.3		1.3
	0563.601	TRAFFIC CONTROL	LUMP SUM	1		1

(P) PLAN QUANTITY

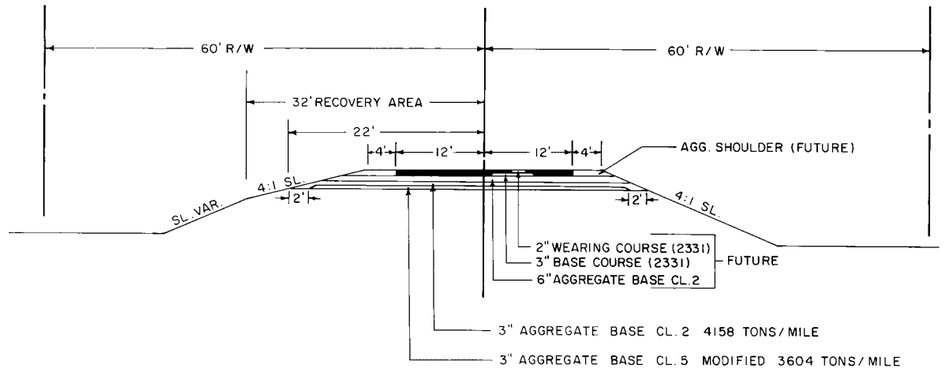
① REMOVAL OF CONCRETE HEADWALLS SHALL BE CONSIDERED INCIDENTAL TO REMOVAL OF PIPE CULVERTS.
② UNCLASSIFIED EXCAVATION INCLUDES SUBGRADE TREATMENT AS SHOWN IN THE PLANS.
5,066 CU. YDS. UNCLASSIFIED EXCAVATION TO BE USED AS SALVAGED TOPSOIL AND PLACED AS SHOWN IN THE PLANS.
③ WATER TO BE USED AS A DUST PREVENTATIVE AS DIRECTED BY THE ENGINEER.
④ INCLUDES 530 TONS FOR APPROACHES AND ENTRANCES, AND 300 TONS FOR TEMPORARY CONNECTIONS.
⑤ INCLUDES 40 TONS FOR 1 ROAD APPROACH, AND 250 TONS FOR TEMPORARY CONNECTIONS.
⑥ BRIDGE NO. L8954
⑦ PLACE RIPRAP ON 7.5" GRANULAR FILTER OR GEOTEXTILE FILTER MATERIAL, WHICH SHALL BE CONSIDERED INCIDENTAL AND NO DIRECT COMPENSATION WILL BE MADE THEREFORE.
⑧ APPLICATION RATE 50 POUNDS PER ACRE.
⑨ APPLICATION RATE 80 POUNDS PER ACRE.
⑩ APPLICATION RATE 2 TONS PER ACRE.
⑪ APPLICATION RATE 200 POUNDS PER ACRE.

TYPICAL GRADING SECTION



STA. 169+00.00 TO STA. 247+47.00

TYPICAL SURFACING SECTION



STA. 169+00.00 TO STA. 247+47.00

NOTE: ALL UTILITY POLES AND UNYIELDING OBJECTS SHALL BE RELOCATED OUTSIDE THE 32' RECOVERY AREA. (BY OTHERS)

NOTE: ALL DIMENSIONS AND SLOPES SHOWN ON TYPICAL SECTIONS ARE APPROXIMATE.

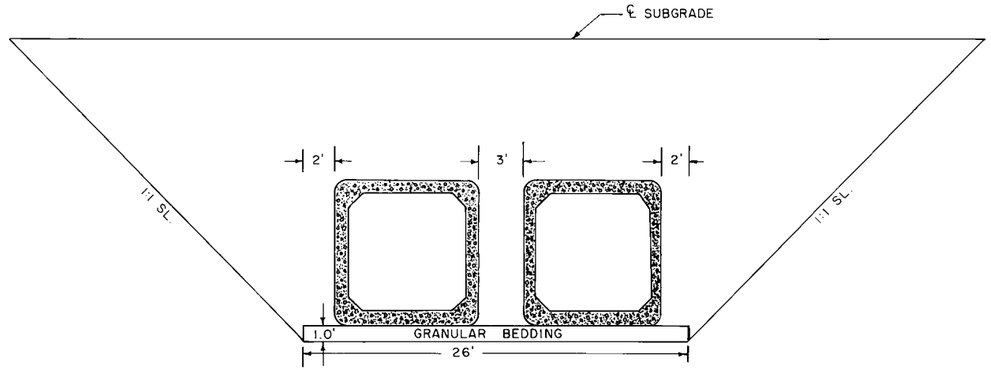
NOTE: ℄ CULVERT EXCAVATION WILL BE CONSIDERED INCIDENTAL AND NO COMPENSATION WILL BE MADE THEREFOR.

STANDARD PLATES

THE FOLLOWING STANDARD PLATES, APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION, SHALL APPLY ON THIS PROJECT.

PLATE NO.	DESCRIPTION
0005 A	SPECIFICATION REFERENCE TO STANDARD PLATES.
3000 L	REINFORCED CONCRETE PIPE.
3007 B	SHEAR REINFORCEMENT FOR PRECAST DRAINAGE STRUCTURES.
3040 F	CORRUGATED METAL PIPE CULVERT.
3100 G	CONCRETE APRON FOR REINFORCED CONCRETE PIPE.
3123 J	METAL APRON FOR C.S. PIPE.
3124 B	METAL APRON CONNECTION.
3133 B	RIPRAP AT R.C.P. OUTLETS.
3145 E	CONCRETE PIPE TIES. (EYE BOLT TIE)
3221 C	CORRUGATED STEEL PIPE COUPLING BAND.
8000 I	STANDARD BARRICADES.
9000 B	APPROACHES AND ENTRANCES.

BEDDING DETAIL

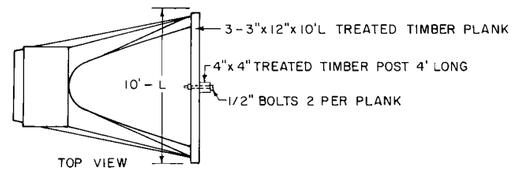


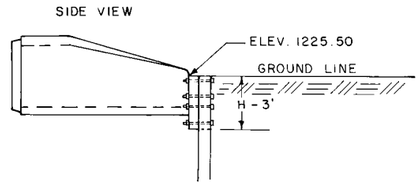
NOTE: CULVERT EXCAVATION WILL BE CONSIDERED INCIDENTAL AND WILL BE INCLUDED FOR PAYMENT UNDER UNIT PRICE FOR ITEM NO. 2412.511 AND ITEM NO. 2412.512.

SODDING LOCATIONS			SQ. YDS.
DITCH LINER		RT. STA. 182+50 TO STA. 187+50	667
"	"	LT. STA. 184+00 TO STA. 188+75	633
"	"	RT. STA. 191+00 TO STA. 197+50	867
"	"	LT. STA. 192+00 TO STA. 196+00	533
"	"	LT. STA. 205+50 TO STA. 212+00	867
"	"	RT. STA. 207+50 TO STA. 211+50	533
"	"	RT. STA. 214+00 TO STA. 220+00	800
"	"	LT. STA. 214+50 TO STA. 223+00	1,133
"	"	RT. STA. 240+00 TO STA. 247+00	933
"	"	LT. STA. 240+50 TO STA. 247+00	867
		TOTAL SQ. YDS. SOD	7,833

INCIDENTAL ITEMS

TIMBER WEIR CONSTRUCTION AT INLET OF R.C. PIPE APRON AT STA. 238+20
(NOT DRAWN TO SCALE)





℄ CULV. STA. 173+57
INPL. 36"x 46' CMP
WITH/LIMESTONE HDWL'S

REMOVE
36"x 78' R.C. PIPE CL. II
2-36" R.C. PIPE APRONS
PLACE CULV. ON "B" BEDDING

F.E. LT. STA. 175+55
INPL. 15"x 24' CMP
NO APRONS

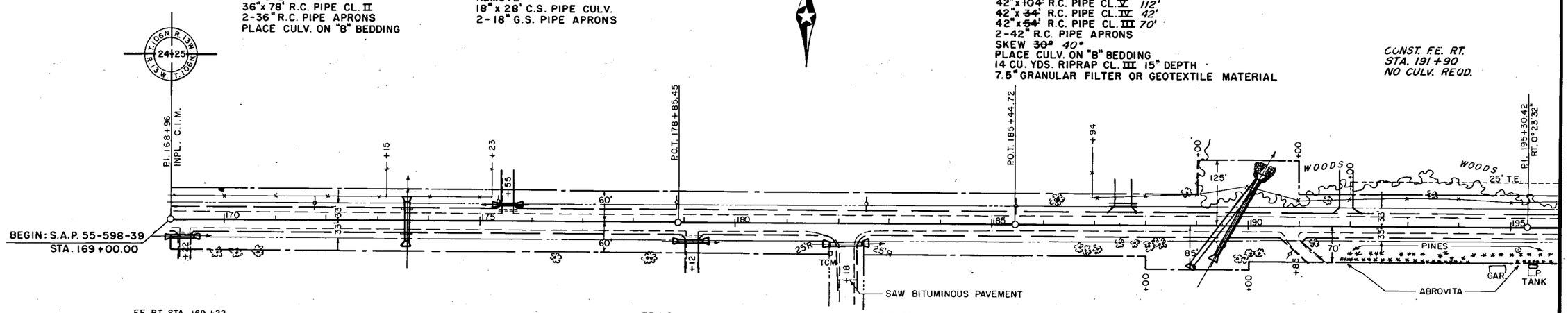
REMOVE
18"x 28' C.S. PIPE CULV.
2-18" G.S. PIPE APRONS

CONST. F.E. RT.
STA. 187+50
18"x 28' C.S. PIPE CULV.
2-18" G.S. PIPE APRONS

℄ CULV. STA. 189+75 *MOVE TO STA. 189+50*
INPL. 18"x 108' CMP

REMOVE
42"x ~~104'~~ R.C. PIPE CL. V *112'*
42"x ~~34'~~ R.C. PIPE CL. IV *42'*
42"x ~~54'~~ R.C. PIPE CL. III *70'*
2-42" R.C. PIPE APRONS
SKEW ~~30°~~ *40°*
PLACE CULV. ON "B" BEDDING
14 CU. YDS. RIPRAP CL. III 15" DEPTH
7.5" GRANULAR FILTER OR GEOTEXTILE MATERIAL

CONST. F.E. RT.
STA. 191+90
NO CULV. REQD.



F.E. RT. STA. 169+22
INPL. 15"x 24' CMP
NO APRONS

REMOVE
18"x 28' C.S. PIPE CULV.
2-18" G.S. PIPE APRONS

F.E. RT. STA. 179+12
INPL. 18"x 24' CMP
NO APRONS

REMOVE
18"x 28' C.S. PIPE CULV.
2-18" G.S. PIPE APRONS

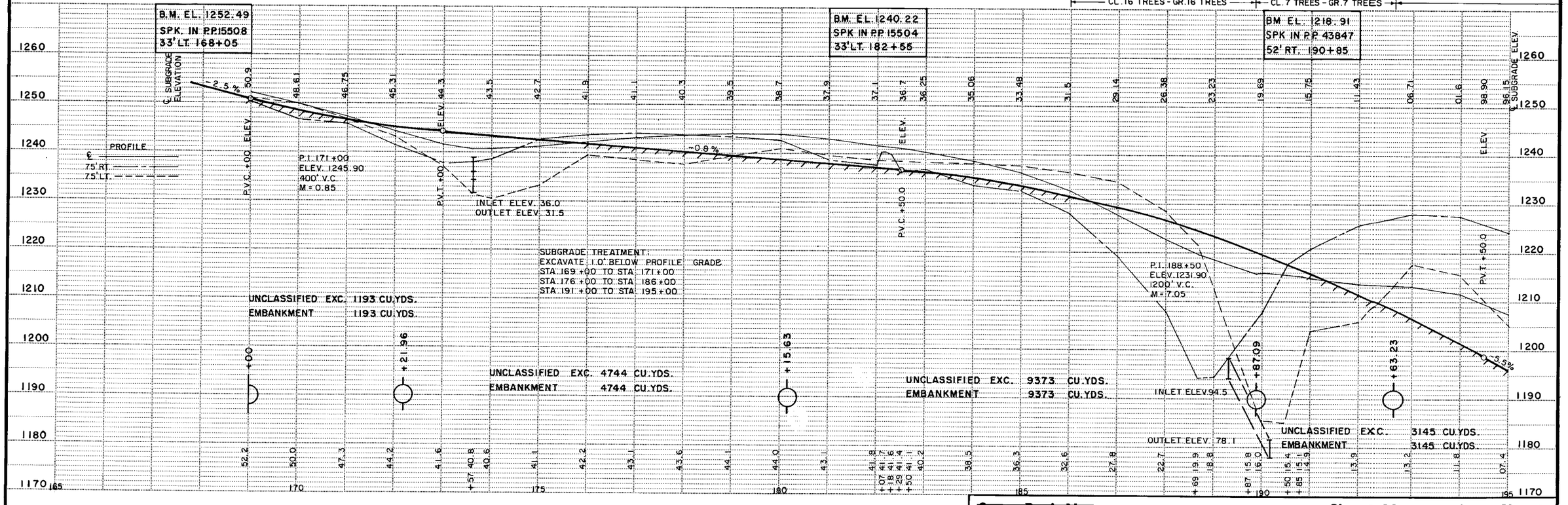
TWP. RD. RT. 182+18
NO CULV. INPL.

18"x 60' C.S. PIPE CULV.
2-18" G.S. PIPE APRONS

RES. DR. RT. STA. 190+85
NO CULV. INPL.

NO CULV. REQ'D.

CL. 0.1 ACRE - GR. 0.1 ACRE — CL. 0.1 ACRE - GR. 0.1 ACRE
CL. 16 TREES - GR. 16 TREES — CL. 7 TREES - GR. 7 TREES



~~State Proj. No.~~ S.A.P. 55-598-39 **Sheet No. 4 of 27 Sheets**

AS BUILT PLANS

BRIDGE L-8954 STA. 199+64 – ~~Remove~~
30' W x 17' L
7.7' x 17' OPENING
2-88"x108' P.C. BOX CULV.
4-88" P.C. BOX CULV. END SECTIONS
SEE PAGES 24-27
SKEW 6°
STA. 199+84 & STA. 199+96.33

FE. LT. 200+97
NO CULV. INPL.
MOVE TO ~~206+25~~ *202+30*
30"x 36' C.S. PIPE CULV.
2-30" G.S. PIPE APRONS

℄ CULV. STA. 212+78
INPL. 24"x72' CMP
REMOVE *MOVE TO 212+86*
42"x106' R.C. PIPE CL. II
2-42" R.C. PIPE APRONS
SKEW 38°
PLACE CULV. ON "B" BEDDING
14 CU. YDS. RIPRAP CL. III 15" DEPTH
7.5" GRANULAR FILTER OR GEOTEXTILE MATERIAL

T.10S. R.12W. 24 19 25 30 R.13W. T.10S.

P.I. 195+30.42
Δ RT. 0°23'32" C.I.M.

T.10S. R.12W. 19 30 R.13W. T.10S.

P.I. 220+82.77
Δ RT. 0°01'16" C.I.M.

WOODS — 25' T.E. — BRUSH — POT. 210+25.11 — POT. 217+01.62 — 5' T.E. — WOODS — PINES — PINES — GAR. — ABROVITA — WOODS — HO.

RES. DR. RT. 204+99
INPL. BR. 13' W x 25' L
25' x 8' OPENING
NO CHANGE

CONST. F.E. RT.
STA. 209+00
18"x28' C.S. PIPE CULV.
2-18" G.S. PIPE APRONS

F.E. RT. 220+21
NO CULV. INPL.
18"x28' C.S. PIPE CULV.
2-18" G.S. PIPE APRONS

CL. 0.3 ACRE — GR. 0.3 ACRE — CL. 20 TREES — GR. 20 TREES
CL. 0.3 ACRE – GR. 0.3 ACRE — CL. 14 TREES — GR. 14 TREES
CL. 0.2 ACRE — GR. 0.2 ACRE

B.M. EL. 1165.40
PUNCH MARK TOP
RAIL N.W. COR. BR

B.M. EL. 1166.78
N. EDGE 2" PIPE IN
DECK RES. BR. N.W.C.

B.M. EL. 1199.73
SPK IN P.P. LT.
STA. 213+64

B.M. EL. 1232.83
SPK IN P.P. 43.18 LT. STA. 220+34

℄ SUBGRADE ELEV.
PROFILE ℄
75' LT.
75' RT.
P.I. 203+00
ELEV. 1152.15
1150' V.C.
M = 14.95
P.I. 218+14.16
ELEV. 1226.361
800' V.C.
M = 3.1
PVC +25.0
PVT +75.0
PVC +14.16
-5.9 %
+4.9 %
+64.08
+89.68
INLET EL. 1194.0
OUTLET EL. 1183.5

UNCLASSIFIED EXC. 19,126 CU. YDS.
EMBANKMENT 19,126 CU. YDS.

OUTLET EL. ~~1150.5~~ EAST 1150.2 WEST 1150.7
INLET EL. ~~1150.8~~ 1150.5 1151.0

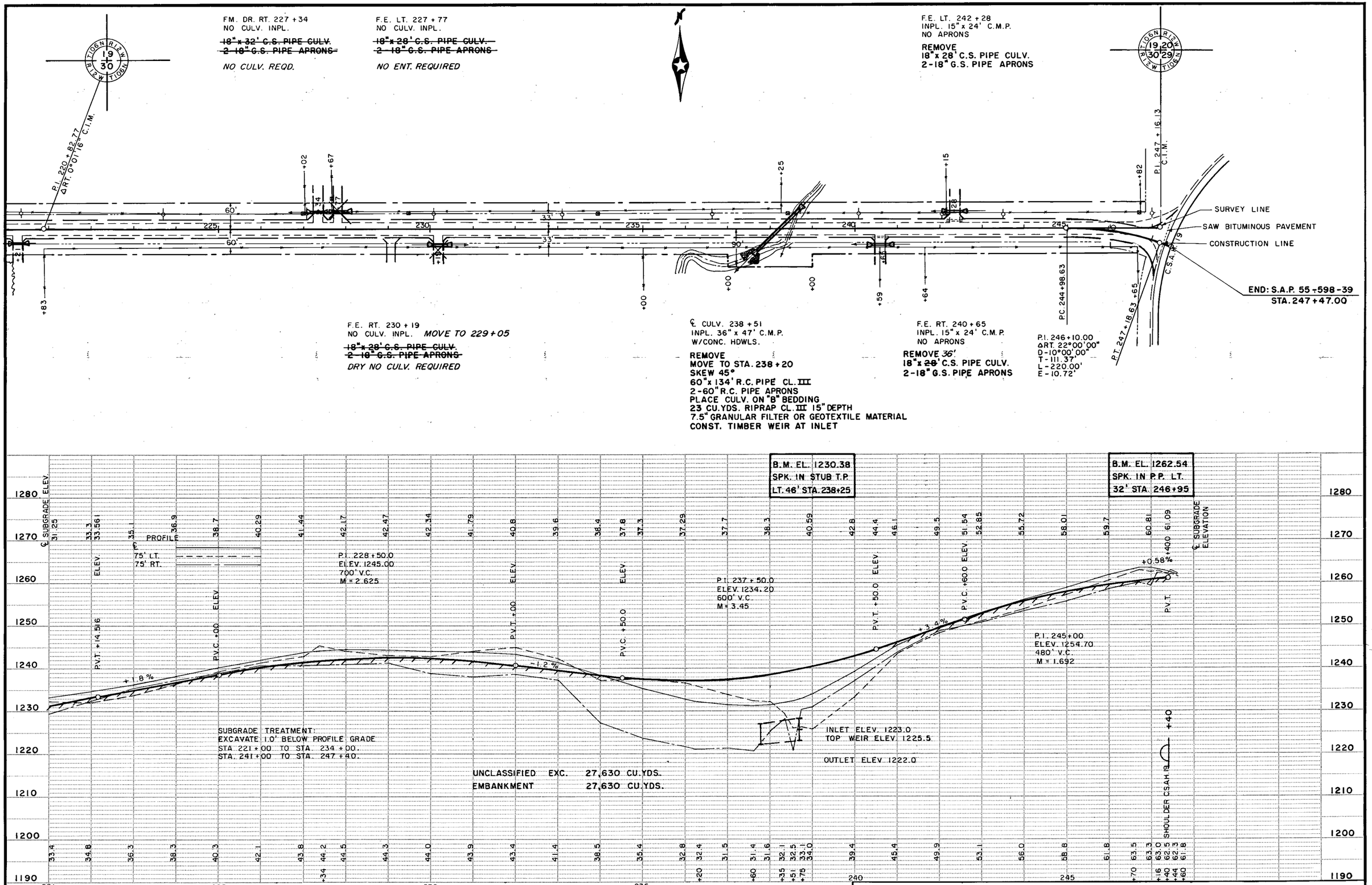
UNCLASSIFIED EXC. 6,451 CU. YDS.
EMBANKMENT 6,451 CU. YDS.

SUBGRADE TREATMENT:
EXCAVATE 1.0' BELOW PROFILE GRADE:
STA. 195+00 TO STA. 197+00
STA. 207+00 TO STA. 225+00

1220 1210 1200 1190 1180 1170 1160 1150 1140

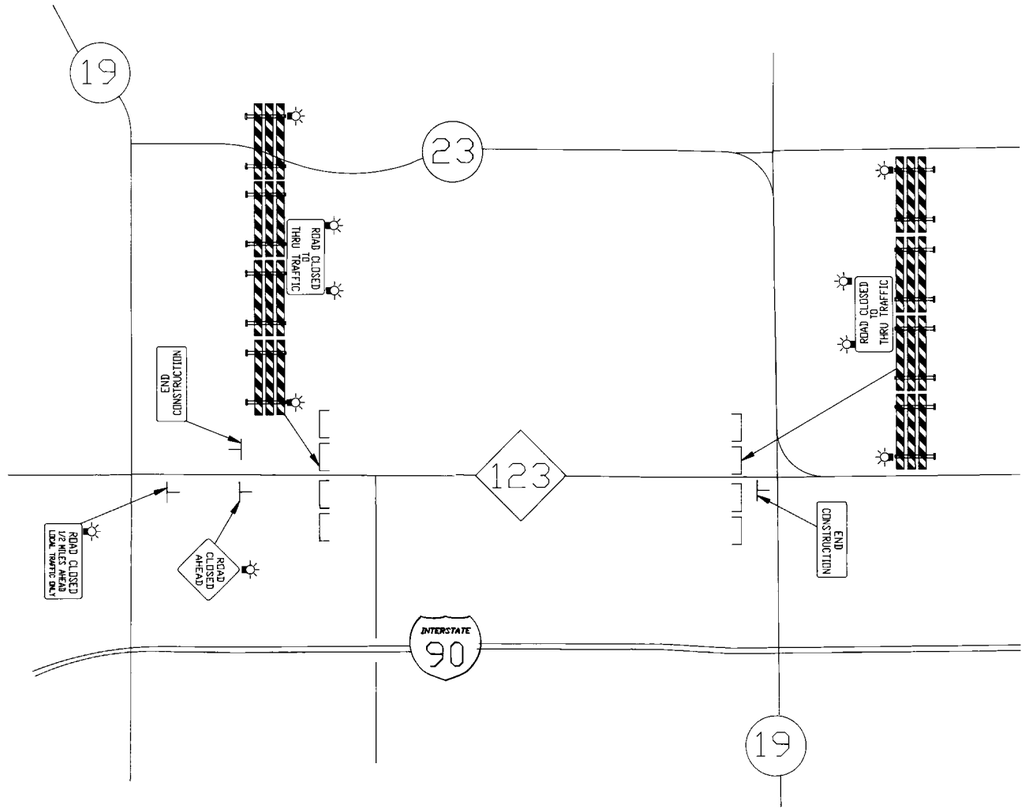
195 200 205 210 215 220

AS BUILT PLANS



~~State Proj. No.~~ S.A.P. 55-598-39 **Sheet No.** 6 **of** 27 **Sheets**

AS BUILT PLANS



ESTIMATE OF TRAFFIC CONTROL DEVICES									
DEVICE	NUMBER	SIZE	COLOR	QUANTITY	DEVICE	NUMBER	SIZE	COLOR	QUANTITY
ROAD CLOSED 1/2 MILES AHEAD LOCAL TRAFFIC ONLY	R11-3	60 x 30	BLK/WH	1	ROAD CLOSED AHEAD	W20-3	48 x 48	BLK/OR	1
ROAD CLOSED TO THRU TRAFFIC	R11-4	60 x 30	BLK/WH	1		TYPE III	MIN. 6'	OR & BLK	8
END CONSTRUCTION	G20-2	60 x 24	BLK/OR	2		TYPE A	FLASHING LAMP	AMBER	10

TRAFFIC CONTROL LEGEND

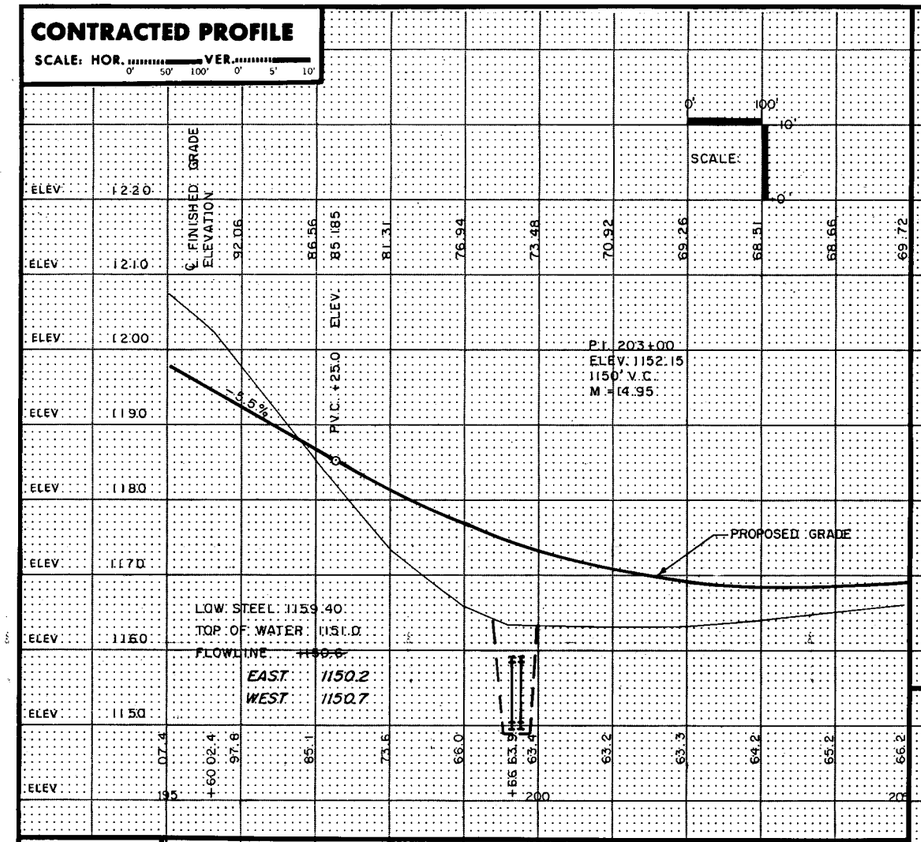
- ⊥ POST OR STAND MOUNTED SIGN
- ⌊⌋ TYPE III BARRICADE
- ☼ TYPE "A" AMBER FLASHING LAMP

TRAFFIC CONTROL NOTES

1. TRAFFIC CONTROL LAYOUTS NOT DRAWN TO SCALE.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TRAFFIC CONTROL ON THIS PROJECT.
3. THE LOCATION OF SIGNS AND DEVICES WILL BE STAKED BY THE ENGINEER IN THE FIELD.
4. ALL TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE MINNESOTA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES INCLUDING APPENDIX B DATED MARCH 1990.
5. CONSTRUCTION ZONE SIGNING SHALL ALSO BE THE RESPONSIBILITY OF THE CONTRACTOR AND WILL INCLUDE, BUT NOT BE LIMITED TO SIGNS FOR LANE CLOSURES, MACHINERY AHEAD, BUMP, DIP, LOOSE GRAVEL ETC. THE NUMBER AND LOCATION WILL BE DETERMINED BY THE CONTRACTORS OPERATION.

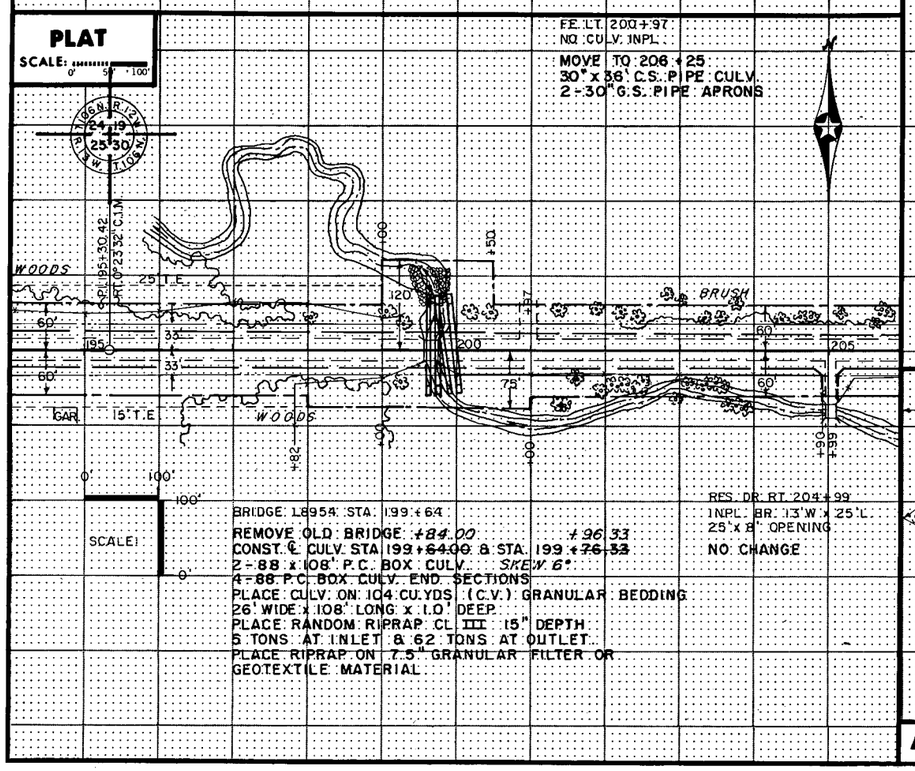
CONTRACTED PROFILE

SCALE: HOR. 0' 50' 100' VER. 0' 5' 10'



PLAT

SCALE: 0' 50' 100'



BRIDGE L8954 STA. 199+64

REMOVE OLD BRIDGE ~~+84.00~~ ~~+96.33~~

CONST. ℄ CULV. STA 199+64.00 & STA. 199+~~76.33~~

2-88 x 108" P.C. BOX CULV. *SKEW 6°*

4-88 P.C. BOX CULV. END SECTIONS

PLACE CULV. ON 104 CU.YDS. (C.V.) GRANULAR BEDDING 26' WIDE x 108" LONG x 1.0' DEEP.

PLACE RANDOM RIPRAP CL III 15" DEPTH 5 TONS AT INLET & 62 TONS AT OUTLET.

PLACE RIPRAP ON 7.5" GRANULAR FILTER OR GEOTEXTILE MATERIAL

RES. DR. RT. 204+99

INPL. BR. 13'W x 25'L

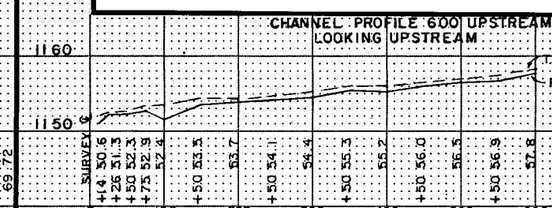
25'x 8" OPENING

NO CHANGE

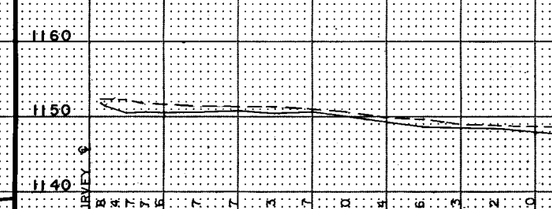
TYPICAL SECTIONS & PERTINENT DATA

SCALES AS SHOWN

CHANNEL PROFILE 600' UPSTREAM
LOOKING UPSTREAM



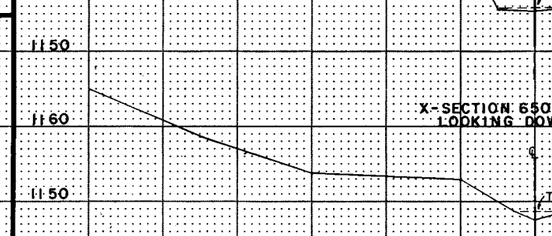
CHANNEL PROFILE 650' DOWNSTREAM
LOOKING DOWNSTREAM



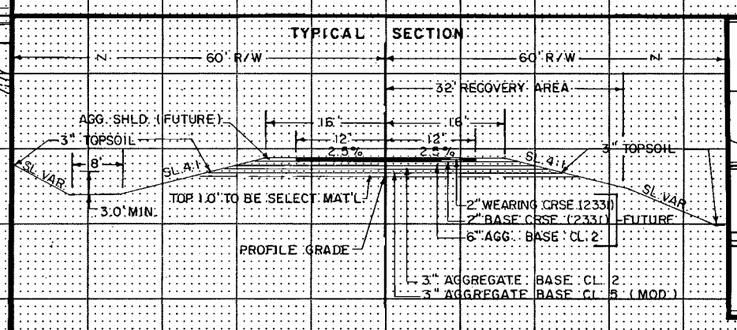
X-SECTION 400' UPSTREAM
LOOKING UPSTREAM

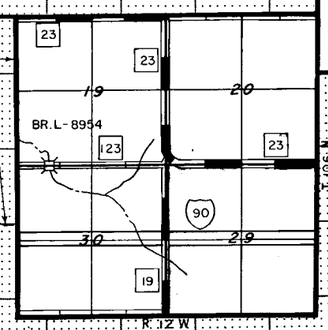


X-SECTION 650' DOWNSTREAM
LOOKING DOWNSTREAM



TYPICAL SECTION





Fed. Proj. No.

LOCATION ENGINEER'S OBSERVATIONS AT BRIDGE SITE

1. Special Features: Waterfalls, dams, floods, ice, debris, sliding banks, recreational boating.

2. Other bridges or culverts over the same stream (particularly structures which carry high water without overflow of roadway) :Given location, type, length, height above high water, cross-sectional area etc.

3. Apparent highwater elevation ..... Obtained from.....

4. Other data: Approx. velocity of water at time of survey.....

HYDRAULIC ENGINEERS RECOMMENDATION

DATE 8/7/90

Stream or ditch designation UNNAMED

Drainage area 3.4 SQ. MILES

Max. flood on record UNKNOWN Design flood (.25 yr. freq.) 1100 C.F.S.

Max. observed highwater elevation UNKNOWN Design highwater elevation 1159.5

Design mean velocity through structure 9.85 F.P.S. OUTLET

Low superstructure at or above elevation .....

Flowline elevation 1150.50 Skew angle NONE

Waterway area req'd. below elevation ..... = ...Sq. Ft. at Rt. angles to channel

In the interest of flood plain zoning the regional flood (100 yr. freq.) is 1735 C.F.S. at stage 1163.65 and mean velocity of 14.0 F.P.S. with 4.5 Ft. swellhead. The above recommendation will provide a structure of adequate waterway to pass the regional flood within criteria established by the Dept. of Natural Resources.

FOUNDATION ENGINEERS RECOMMENDATION

DATE .....

Bridge survey sheets made from: BRIDGE SURVEY CONDUCTED BY OLMSTED COUNTY

Bench mark elevation. 1165.40 (M.S.L. 1929 Adj.)

Location: PUNCH MARK TOP RAIL N.W. COR. BR. L8954 STA. 199+58.

MINNESOTA
DEPARTMENT OF TRANSPORTATION

BRIDGE SURVEY

AT MILE POINT 3+00.920 ON C.R. 123 (T.H., C.S.A.H., C.R. etc.)

PROPOSED BRIDGE LOCATED 0.8 MILES W OF JCT. CSAH 19

SEC. 19 TWP 106 R 12 W

TOWNSHIP EYOTA COUNTY OLMSTED

BRIDGE NO. ~~L 8954~~ 99659

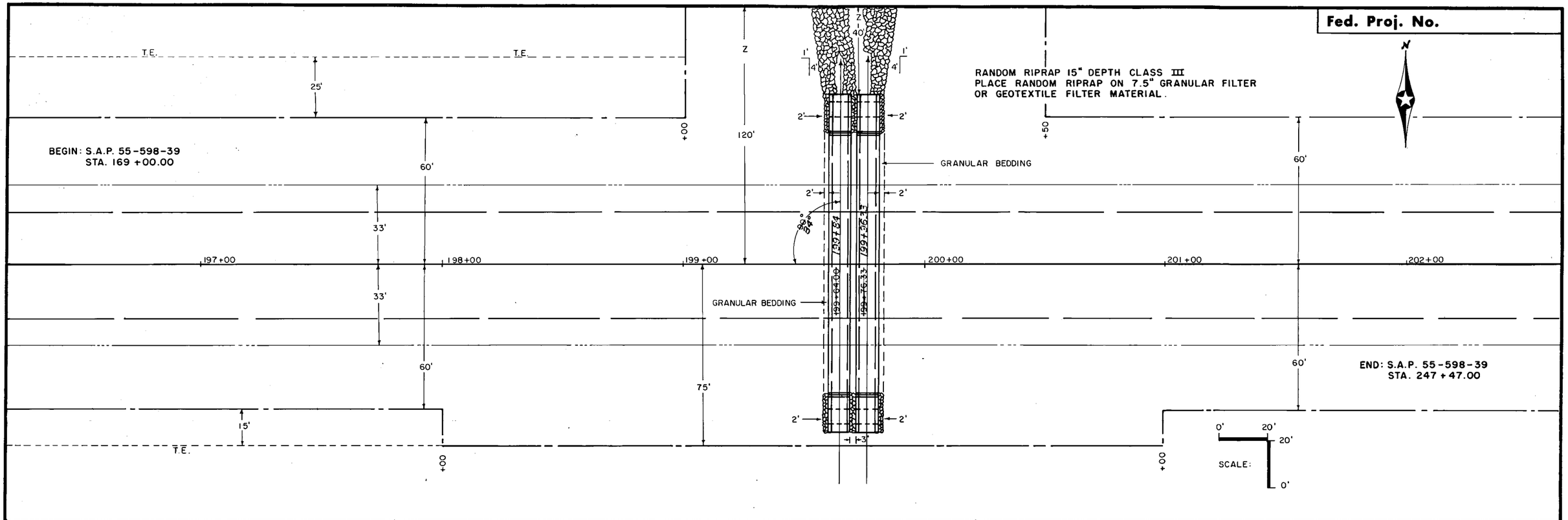
Area No. Job No.

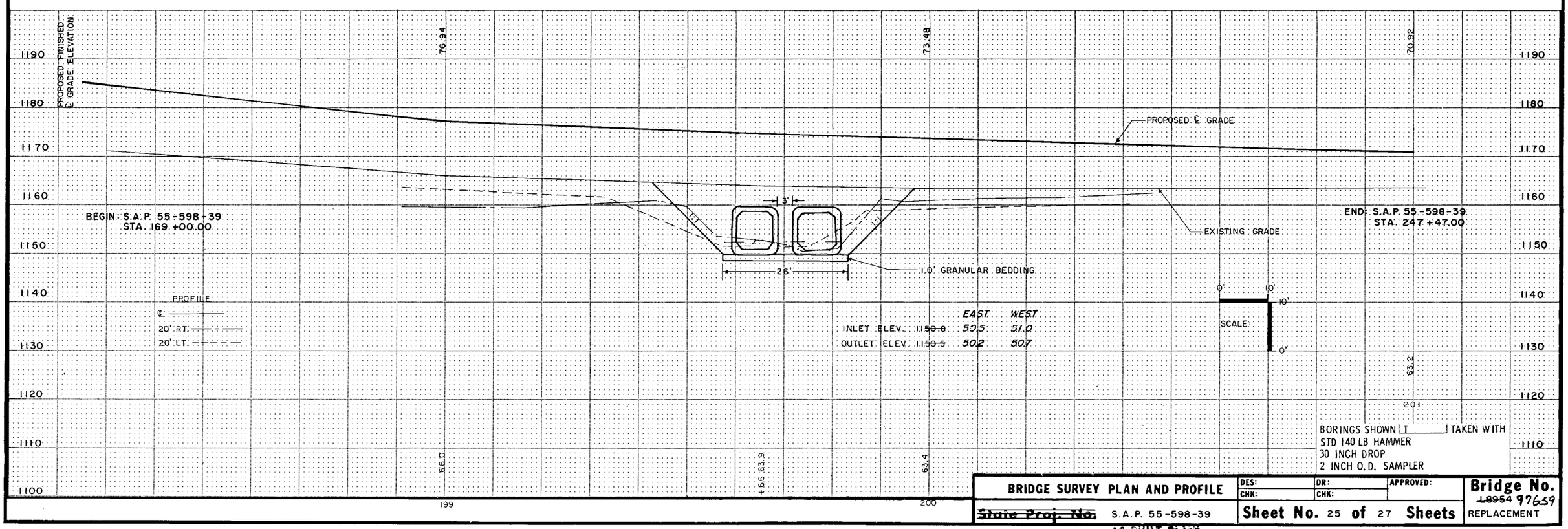
~~State Proj. No.~~ S.A.P. 55-598-39

Sheet No. 24 of 27 Sheets

AS BUILT PLANS

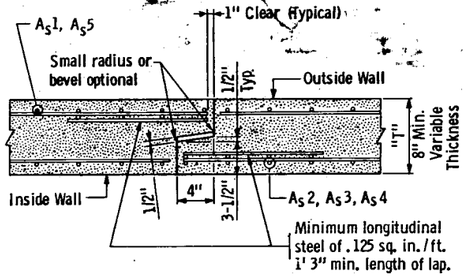
Fed. Proj. No.



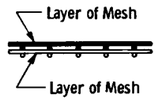


BRIDGE SURVEY PLAN AND PLOT	DES:	DR:	APPROVED:	Bridge No. ~~18954~~ 97659
	CHK:	CHK:		
~~State Proj. No.~~ S.A.P. 55-598-39	Sheet No. 25 of 27 Sheets			REPLACEMENT

AS BUILT PLANS

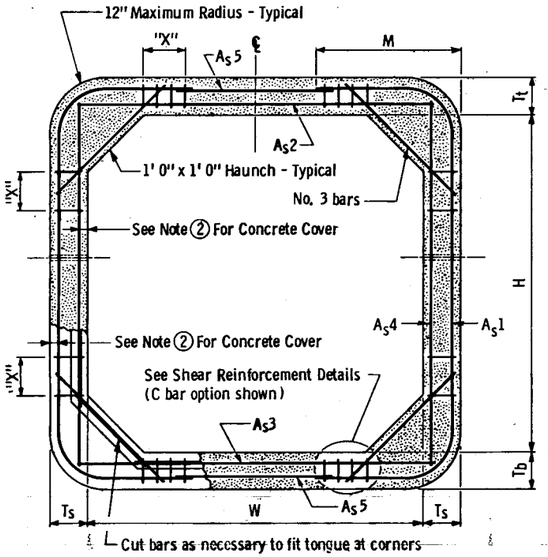


TONGUE AND GROOVE JOINT DETAIL



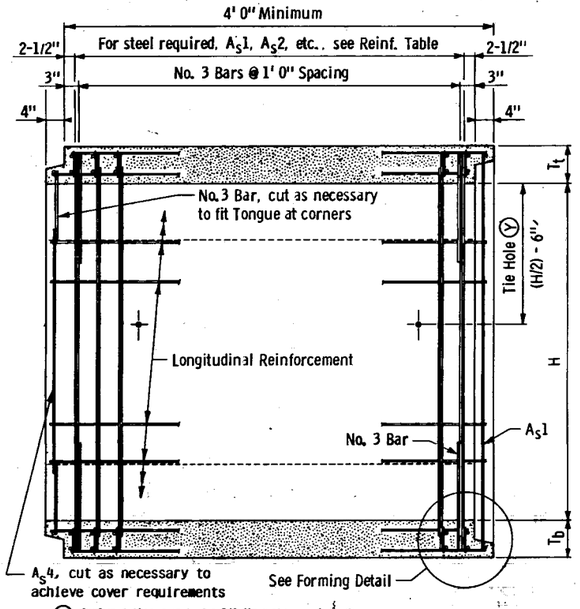
FABRIC LAYER DETAIL

When more than one layer of steel fabric is used to obtain the required reinforcement areas, the wires of the steel fabric shall be placed as shown



TRANSVERSE BARREL SECTION

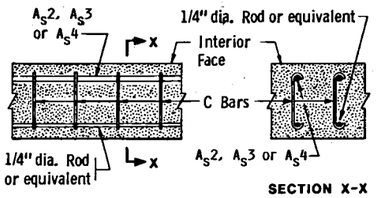
(Bar Reinforcement Option Shown)



(Y) Culvert ties are to be 1" diameter rods. See Standard Plate No. 3145 for connection details.
All holes in the barrels are to be approved by the engineer.

LONGITUDINAL BARREL SECTION

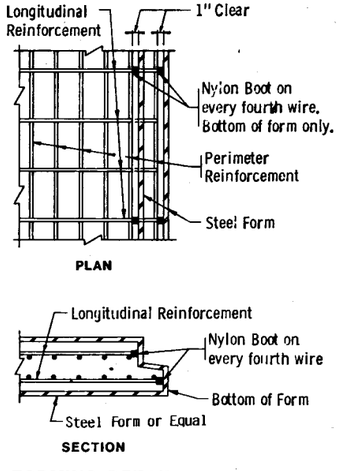
(Bar Reinforcement Option Shown)

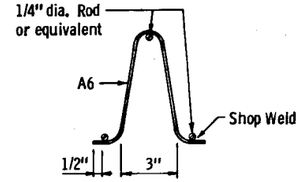


SHEAR REINFORCEMENT DETAIL

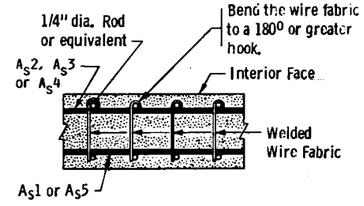
C BAR OPTION

C Bars shall have 135° Min. and 180° Max. hooks



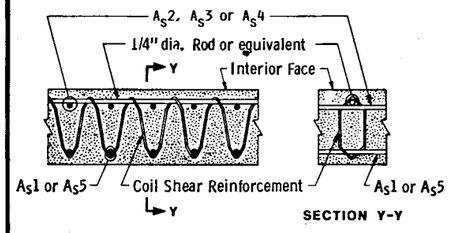


V BAR DETAIL



SHEAR REINFORCEMENT DETAIL

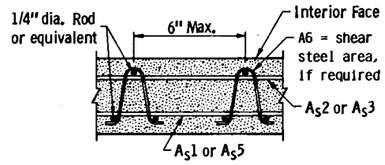
J BAR OPTION



SHEAR REINFORCEMENT DETAIL

COIL OPTION

FORMING DETAIL



SHEAR REINFORCEMENT DETAIL

V BAR OPTION

DIMENSION TABLE

Dimensions	Height of Overfill (F) 15'				
"W" (in Ft.)	8				
"H" (in Ft.)	8				
Tt (in inches)	9				
Tb (in inches)	10				
Ts (in inches)	8				
"M" (in inches)	29				
Weight (lbs./Ft.)	3990				

REINFORCEMENT TABLE

Reinforcement △	Height of Overfill (F) 15' *Area	Length	*Area	Length	*Area	Length	*Area	Length	*Area	Length
A_s1	0.385	13'4"								
A_s2	0.486	8'3"								
A_s3	0.521	8'3"								
A_s4	0.192	8'3"								
A_s5	0.192	6'0"								

* Square inches per lineal foot of barrel.
△ Areas shown are based on Fy = 65,000 P.S.I.
Increase area 8% for Fy = 60,000 when reinforcement bars are used in part or total.

SHEAR REINFORCEMENT TABLE

(F) Height of Overfill	Shear Reinforcement Requirements ◇ Top of Culvert **Area	Maximum Spacing	"X" (in inches)	Bottom of Culvert **Area	Maximum Spacing	"X" (in inches)	Side of Culvert **Area	Maximum Spacing	"X" (in inches)
15'	NONE	REQUIRED							

◇ When shear reinforcement is needed, a minimum shear steel of 0.06 sq. in. per sq. ft. shall be used.
** Square inches per linear foot of barrel.
"X" = Distance from end of haunch.

NOTES:

CONSTRUCTION

1. The steel fabric, shear reinforcement and reinforcement bars used shall conform to applicable requirements of AASHTO M 259.
2. 1-1/2" min. and 2" max. concrete cover on all reinforcement, including the shear reinforcement, except for tongue and groove detail.
3. One of the following combinations of steel reinforcement may be used:
   (a) 1 or 2 layers of mesh or
   (b) 1 layer of mesh and 1 layer of reinforcement bars or
   (c) 1 layer of reinforcement bars.
   The reinforcement shall be developed in accordance with applicable parts of sections 8.21 thru 8.33 of the AASHTO "Standard Specifications for Highway Bridges".
4. Longitudinal reinforcement parallel to the axis of the culvert shall have a min. of 0.06 square inches per peripheral foot on all faces of the barrel, except in tongue and groove.
5. The max. shear reinforcement spacing in the longitudinal direction shall be 6 inches.
6. The transverse steel areas in each face shall be a minimum of 0.192 sq. in. per linear feet of barrel.
7. The maximum size of reinforcement bars shall be No. 6. The maximum mesh size shall be 1/2" dia. per layer (maximum of 2 layers).
8. The spacing center to center of the circumferential wires shall not be less than 2 inches nor more than 4 inches. The spacing center to center of the longitudinal wires shall not be more than 8 inches.
9. Welding will not be allowed on reinforcement bars or steel fabric, except that the original welding required to manufacture wire fabric is acceptable.
10. When reinforcement is cut, additional reinforcement shall be added on both sides of the cut member to replace or exceed the cut steel.
11. Barrel sections which are cast with a draft in the forms shall be laid with the narrowest part of the section downstream.

BASIS OF DESIGN

A. The design shall be in accordance with 1989 and Interim AASHTO Design Specifications.
B. Live loads are based on HS25 or Military Loading as designated in FHWA PPM 20-4 Section 4C.
C. Maximum allowable Design Stresses
   F'c = 5000 P.S.I., N = 6
   Fy = 60,000 P.S.I. reinforcement bars
   Fy = 65,000 P.S.I. steel fabric
D. Load factor design according to AASHTO standard specification Group X = 1.3 $[B_D D + B_L (L+I) + B_E E_V + B_E E_L]$ shall be used where B_D = 1.00, B_E = 1.00, B_L = 2.09 E_V = Vertical earth pressure and E_L = Lateral earth pressure. The following values have been used for this structure:
   Unit Soil Weight 130 lbs. per cu. ft.
   Maximum lateral Pressure Coefficient 50% of soil weight
   Minimum lateral Pressure Coefficient 25% of soil weight
E. Concrete shall be Mix No. 3W36 with no calcium chloride allowed.
F. Minimum overfill shall be two (2) feet, unless a reinforced concrete slab is placed over barrels.

I HEREBY CERTIFY THAT THIS 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.

SIGNED.....

DATE..... REG. NO. .....

TRUNK HIGHWAY NO.
STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

BRIDGE NO. 97659

IDENTIFICATION NO. 113

PRECAST CONCRETE BOX CULVERT

SEC. 19 T 106 N R 12 W
EYOTA TOWNSHIP OLMSTED COUNTY
APPROVED:

BRIDGE ENGINEER ASSISTANT DIVISION DIRECTOR

DES.	DR.
CHK.	CHK.

Fed. Proj. No.

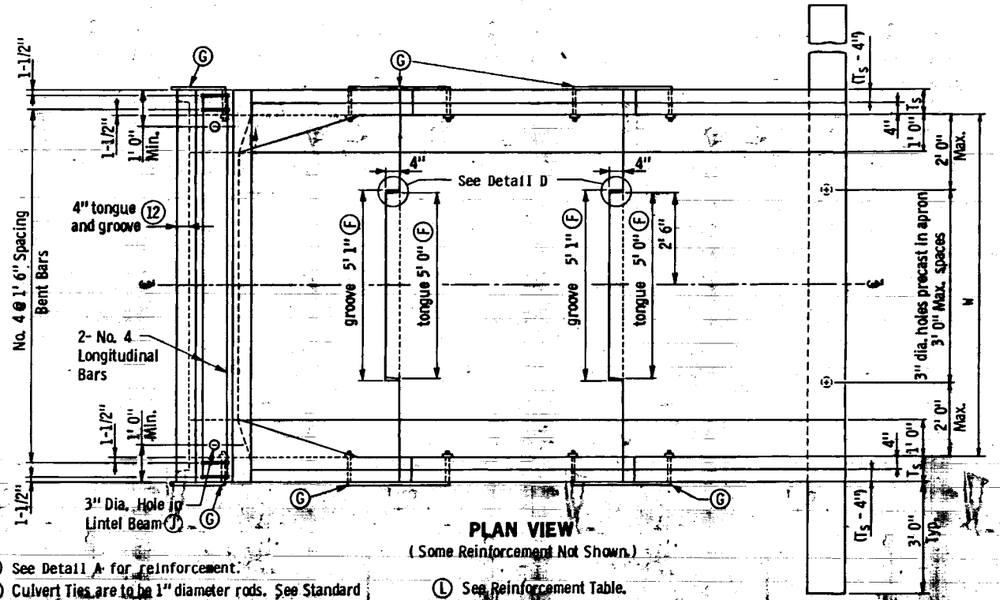
FIG. 5-397.701
Approved: November 3, 1987

BARREL DETAILS 88 P.C. BOX CULVERT

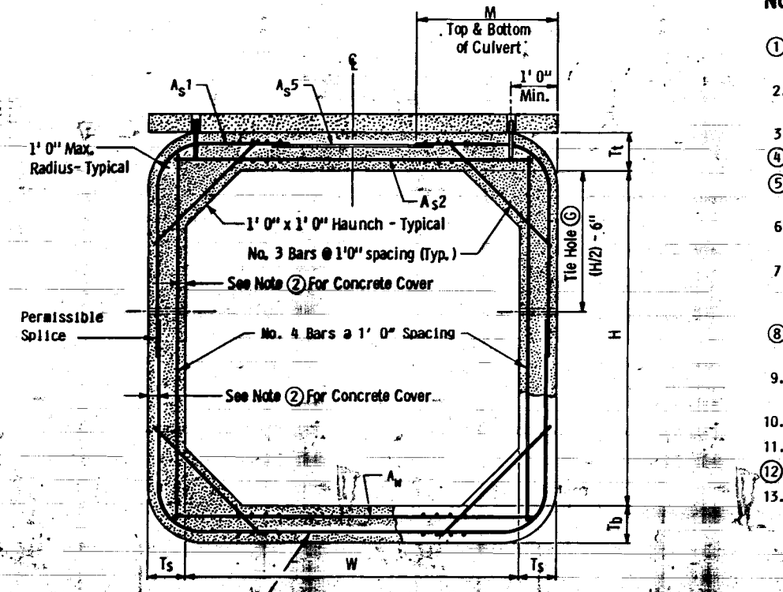
~~State Proj. No.~~ S.A.P. 55-598-39

Sheet No. 26 of 27 Sheets

AS BUILT PLANS

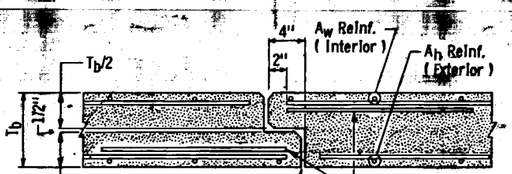


PLAN VIEW
(Some Reinforcement Not Shown.)

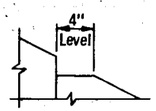


SECTION Y-Y

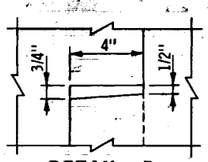
(F) See Detail A for reinforcement.
(G) Culvert Ties are to be 1" diameter rods. See Standard Plate No. 3145 for connection details.
(H) 2' 4" for the Tongue End (includes the 4" tongue).
(J) Grout shall consist of 1 part cement and 2 parts sand. Use Type 1A air entrained Portland Cement. Grout mix shall have a maximum slump of 4".
(K) 1" diameter by 1' 0" long steel dowel, 2" diameter hole in the top of the wingwall. Fill hole to top of Lintel Beam with an approved grout.
(L) See Reinforcement Table.



DETAIL A

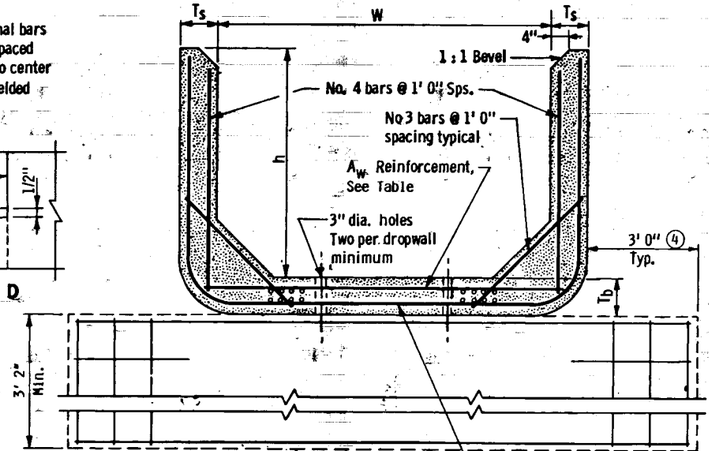


DETAIL B

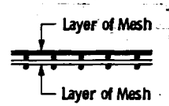


DETAIL D

SIDE ELEVATION



SECTION Z-Z



FABRIC LAYER DETAIL

When more than one layer of steel fabric is used to obtain the required reinforcement areas, the wire of the steel fabric shall be placed as shown in the Fabric Layer Detail.

FIG. 5-397.702
Approved: November 3, 1987

NOTES:

1. See " Precast Concrete Box Culvert " Standard Sheet No.5-397.701, for dimensions and construction notes, except as noted.
2. 1-1/2" minimum and 2" maximum concrete cover on all reinforcement, including the shear reinforcement, except for tongue and groove detail.
3. Concrete shall be mix No. 3W46 with no calcium chloride allowed.
4. Locate dropwall joints between multiple boxes.
5. Furnishing and installation of drop wall to be included in price bid of end sections.
6. See standard sheet No. 5-397.711 for alternate dropwalls for box culverts.
7. Longitudinal reinforcement parallel to the axis of the culvert shall have a minimum of 0.06 square inches per peripheral foot on all faces of the barrel, except in the tongue and groove.
8. As an option, Type III (Fig. 5-397.710) end section with lintel beam may be substituted for Section 1.
9. Limits for excavation for drop wall to be approximately the same as drop wall dimensions.
10. Drop wall to be concrete mix no. 1A43 or 3W43.
11. See embankment protection for box culverts, sheet 25 .
12. Check location to determine whether a tongue or a groove is used.
13. Finish all edges of concrete with 1/2" chamfer unless otherwise noted.

Aw and Ah REINFORCEMENT TABLE

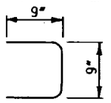
WIDTH W	Aw (Interior)	HEIGHT H	Ah (Exterior)
8 ft. or less	No. 4 @ 1' 0"	8 ft. or less	No. 4 @ 1' 0"
10 ft.	No. 4 @ 1' 0"	10 ft.	No. 5 @ 8"
12 ft.	No. 4 @ 9"	12 ft.	No. 6 @ 6"
14 ft.	No. 4 @ 6-1/2"	14 ft.	No. 7 @ 5-1/2"
16 ft.	No. 5 @ 8"	16 ft.	No. 7 @ 5"
18 ft.	No. 5 @ 6"	—	—
20 ft.	No. 6 @ 7"	—	—

NOTE: h is the highest vertical dimension of each section shown.

As REINFORCEMENT TABLE

WIDTH W	2 FT. FILL (Maximum)		
	As1	As2	As5
8 ft. or less	No. 5 @ 6"	No. 5 @ 7"	No. 5 @ 7"
10 ft.	No. 6 @ 6-1/2"	No. 6 @ 7-1/2"	No. 6 @ 7-1/2"
12 ft.	No. 6 @ 5"	No. 6 @ 6"	No. 6 @ 6"
14 ft.	No. 7 @ 5-1/2"	No. 7 @ 6-1/2"	No. 7 @ 6-1/2"
16 ft.	No. 8 @ 6"	No. 8 @ 7"	NO. 8 @ 7"
18 ft.	No. 8 @ 5"	No. 8 @ 5-1/2"	No. 8 @ 5-1/2"
20 ft.	No. 9 @ 5"	No. 9 @ 6"	No. 9 @ 6"

Based on T_t = 9", and H = 12 ft. maximum.



NO. 4 BENT BAR

WEIGHT CHART

Section	Weight
1	19732 Lbs.
2	13701 Lbs.
3	7136 Lbs.

TABLE OF DIMENSIONS FOR SLOPED END SECTIONS

Size H"	Size W"	L	M	S	X	Y	Z	Tt	Tb	Ts	As1 *	As2 *	As5 *
8	8	16	29"	2	6	4	1'9"	9"	10"	8"	*	*	*

* See As Reinforcement Table.

97659

PRECAST CONCRETE END SECTIONS TYPE I - SINGLE OR MULTI-BARREL FOR SKEWS UP TO 7-1/2°	DES: CHK:	DR: CHK:	APPROVED:
Sheet No. 27 of 27 Sheets			Bridge No ~~L-0954~~ REPLACEMENT S.A.P. 55-598-39

AS BUILT PLANS