MINNESOTA DEPARTMENT OF TRANSPORTATION

THE COUNTY OF OLMSTED

CONSTRUCTION PLAN FOR GRADING & PRECAST CONC. BOX CULVERT (BRIDGE NO. 55J15)

LOCATED ON TWP RD. 24 (60th AVE SW) BETWEEN C.R. 108 AND T.H. 30 (GEOGRAPHIC DESCRIPTION)

FROM 0.22 MILES N. OF SECTION COR. 25-30-36-31 T104-105N-R14W TO 0.11 MILES SOUTH OF QUART. CORNER 25 & 30 T104-105-N-R14W (LEGAL DESCRIPTION)

S.A.P. NO. 55-599-67

GROSS LENGTH	900	FEET	0.170	MILES
BRIDGE-LENGTH	0	FEET	0	MILES
EXCEPTIONS-LENGTH	0	FEET	0	MILES
NET LENGTH	900	FEET	0.170	MILES

MINN. PROJ. NO. .....

GOVERNING SPECIFICATIONS

THE 1988 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION". AS AMENDED BY THE MAY 2, 1994 SUPPLEMENT SPECIFICATION SHALL GOVERN.

INDEX

SHEET NO. 1	TITLE SHEET
SHEET NO. 2	ESTIMATE OF QUANTITIES & TYPICAL SECTION
SHEET NO. 3 - 4	BARREL DETAILS
SHEET NO. 5 - 6	PRECAST CONC. END SECTION
SHEET NO. 7	PLAN AND PROFILE
SHEET NO. 8	CROSS-SECTIONS
SHEET NO. 9	BRIDGE SURVEY SHEET
SHEET NO. 10	TRAFFIC CONTROL PLANS

THIS PLAN CONTAINS 10 SHEETS.

DESIGN DESIGNATION: S.A.P. 55-599-67

R ΣN18 (20)

ADT (Current Year) = <50 (1998) Design Speed 55 MPH

ADT (Future Year) = <50 (2018) Based on STOPPING Sight Distance

DHV (Design Hr. Vol.) = ... Height of eye 3.5 FT. Height of object 0.5 FT

D (Directional Distr.) = ... Design Speed not achieved at: .....

T (Heavy Commercial) = ... STA. ..... TO STA. ..... MPH .....

SUBGRADE = K=150 STA. ..... TO STA. ..... MPH .....

SOIL FACTOR = 130%

SHOULDER WIDTH 1 FT.

TOWNSHIP APPROVALS:

Rick Banlett — 7/10/98

APPROVED: TWP. CHAIRPERSON — DATE

LOCAL APPROVALS:

DESIGN ENGINEER: 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 6/22/98 REGISTRATION NUMBER 19917

Kaye M Briesnick

APPROVED: COUNTY DESIGN ENGINEER

DATE 6/23/98 REGISTRATION NUMBER 10397

Michael Kruse

APPROVED: OLMSTED COUNTY ENGINEER

STATE AID APPROVALS:

DATE: .....

DISTRICT STATE AID ENGINEER: REVIEWED FOR COMPLIANCE WITH STATE AID RULES/POLICY

TB — DATE: 8/7/98

APPROVED FOR STATE AID FUNDING:

STATE AID ENGINEER

JFC

PLAN SYMBOLS

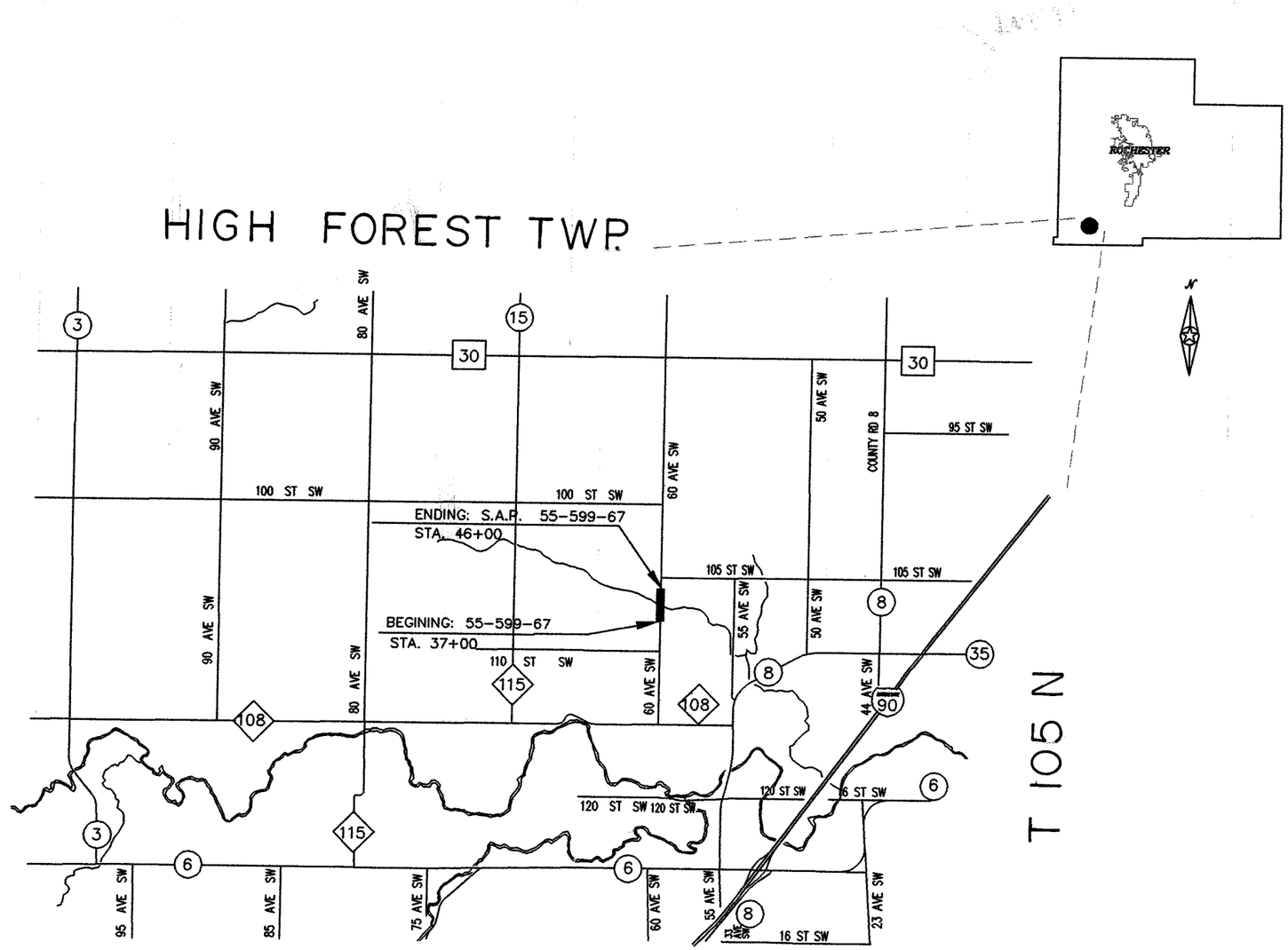
STATE LINE
COUNTY LINE
TOWNSHIP OR RANGE LINE
SECTION LINE
QUARTER LINE
SIXTEENTH LINE
RIGHT-OF-WAY LINE
PRESENT RIGHT-OF-WAY LINE
CONTROL OF ACCESS LINE
PROPERTY LINE (Except Land Lines)
VACATED PLATTED PROPERTY
CORPORATE OR CITY LIMITS
TRUNK HIGHWAY CENTER LINE
RETAINING WALL
RAILROAD
RAILROAD RIGHT-OF-WAY
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 POLE
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
ELECTRICAL MANHOLE
BURIED TELEPHONE CABLE
BURIED ELECTRICAL CABLE
AERIAL TELEPHONE CABLE
SEWER (SANITARY OR SEWER)
SEWER MANHOLE

EROSION CONTROL SYMBOLS

TEMPORARY SILT FENCE
RIP RAP DITCH CHECKS



S.A.P. NO. 55-599-67 HIGH FOREST SHEET NO. 1 OF 10 SHEETS

ESTIMATED QUANTITIES

	SPECIFICATION NO.	ITEM	UNIT	NON PARTICIPATING	PARTICIPATING	TOTAL ESTIMATED QUANTITIES
①	2101.511	CLEARING AND GRUBBING	LUMP SUM	1		1
②	2104.521	SALVAGE METAL PIPE CULVERT	LIN. FT.	26		26
	2105.515	UNCLASSIFIED EXCAVATION	CU. YD.	16		16 (P)
	2105.523	COMMON BORROW (CV)	CU. YD.	1615		1615 (P)
	2105.525	TOPSOIL BORROW (CV)	CU. YD.	180		180 (P)
	2412.511	8'x 4' PRECAST CONC. BOX CULV. CL. II	LIN. FT.		72	72
	2412.512	8'x 4' PRECAST CONC. BOX CULVERT END SECTION	EACH		4	4
	2442.501	REMOVE OLD BRIDGE	LUMP SUM	1		1
	2451.507	GRANULAR BEDDING (CV)	CU. YD.		44	44(P)
③	2511.501	RANDOM RIPRAP CL. III	CU. YD.		61	61

(P) PLAN

QUANTITY NOTES:

① APPROX. 2 TREES

② CULVERT TO BE SALVAGED AND DELIVERED TO THE TOWNSHIP AS DIRECTED BY THE ENGINEER.

③ PLACE RIPRAP ON 9" GRANULAR FILTER OR GEOTEXTILE MATERIAL WHICH SHALL BE CONSIDERED INCIDENTAL AND NO DIRECT COMPENSATION WILL BE MADE THEREFOR.

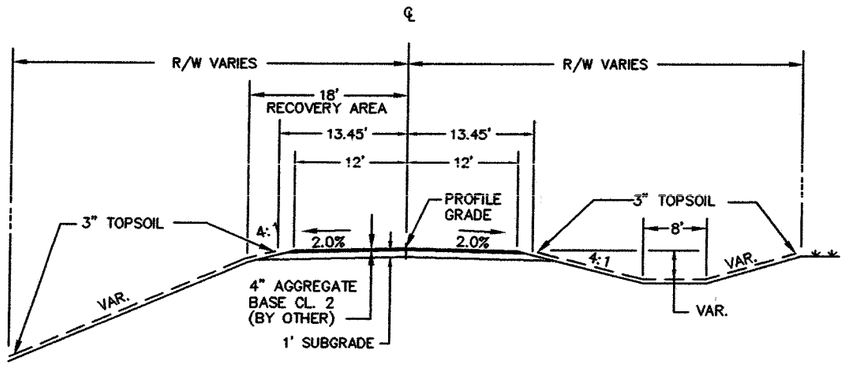
STANDARD PLATES

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

PLATE NO.	DESCRIPTION
	NUMERICAL INDEX OF STANDARD PLATES
3007 B	SHEAR REINFORCEMENT FOR PRECAST DRAINAGE STRUCTURES
3145 E	CONCRETE PIPE TIES
3221 C	CORRUGATED STEEL PIPE COUPLING BAND
8000 I	STANDARD BARRICADES

TYPICAL SECTION

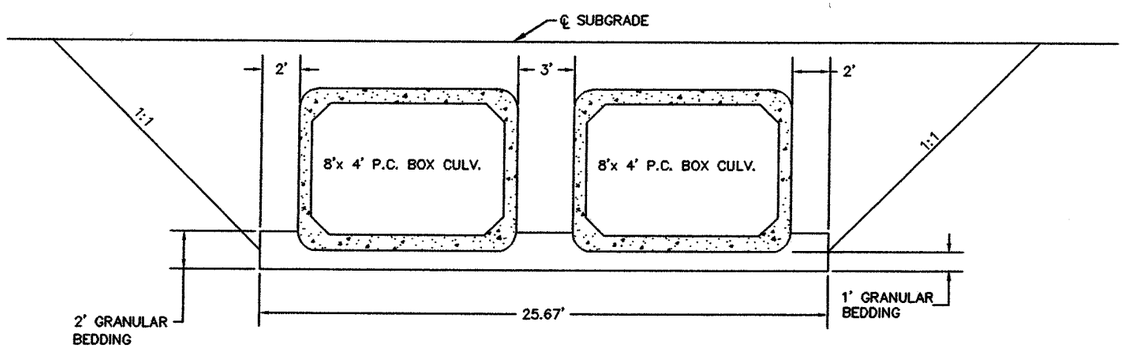
STA. 37+00 TO STA. 46+00



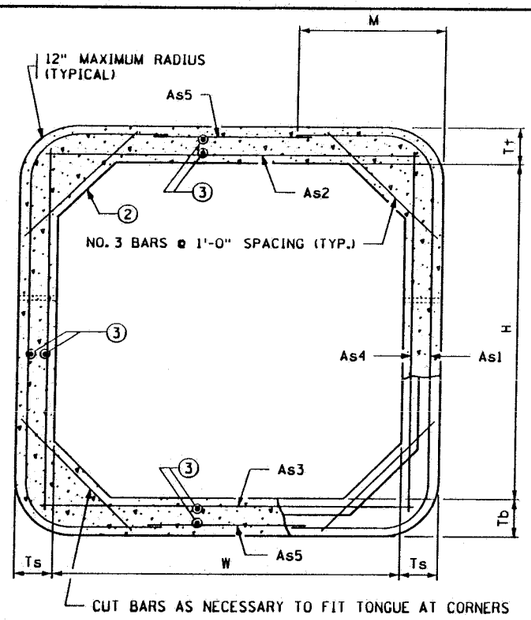
NOTES: ALL UTILITY POLES AND UNYIELDING OBJECTS WILL BE LOCATED OUTSIDE THE 18 FT. RECOVERY AREA BY OTHERS.

TURF ESTABLISHMENT BY OTHERS.

BEDDING DETAIL

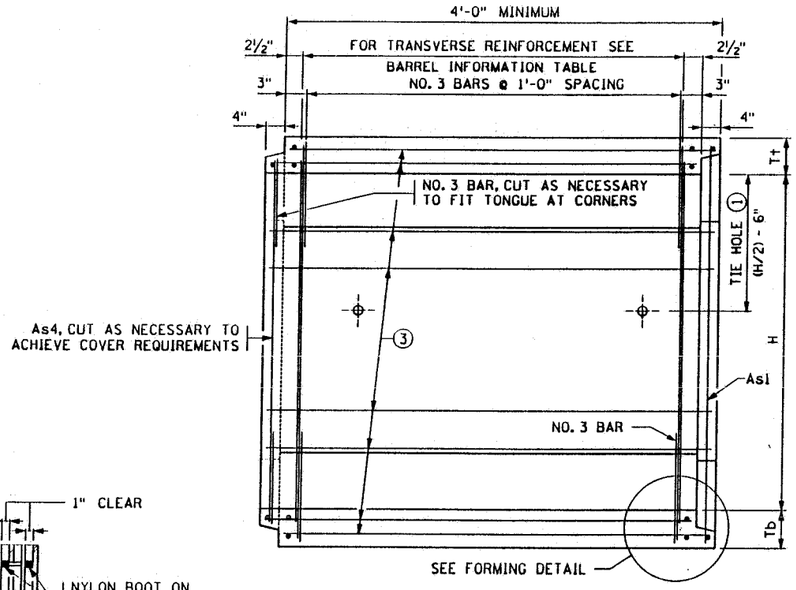


NOTES:
1. CULVERT EXCAVATION WILL BE CONSIDERED INCIDENTAL AND WILL BE INCLUDED FOR PAYMENT UNDER UNIT PRICE FOR ITEM NO. 2412.511 AND ITEM NO. 2412.512.
2. CULVERT TO BE BACKFILLED WITH EXCAVATION MATERIAL AND WILL BE CONSIDERED INCIDENTAL TO UNCLASSIFIED EXCAVATION AND NO DIRECT COMPENSATION WILL BE MADE.
3. ALL DIMENSIONS AND SLOPES SHOWN ON TYPICAL SECTION ARE APPROXIMATE.
4. GRANULAR BEDDING TO BE PLACED UNDER BARREL SECTIONS ONLY.



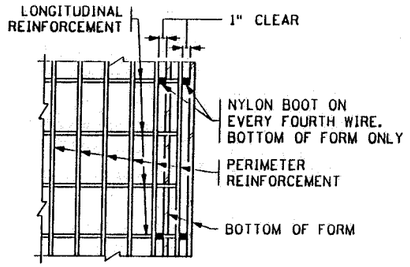
TRANSVERSE BARREL SECTION

(BAR REINFORCEMENT OPTION SHOWN)

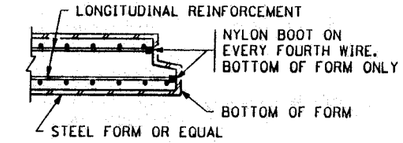


LONGITUDINAL BARREL SECTION

(BAR REINFORCEMENT OPTION SHOWN)

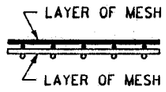


PLAN



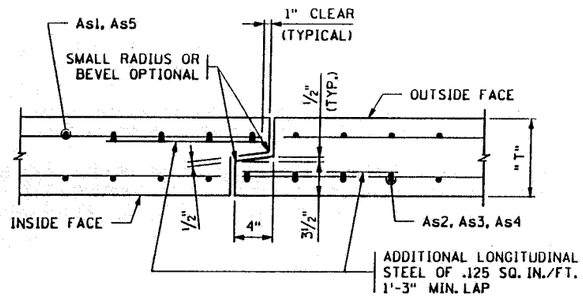
SECTION

FORMING 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



TONGUE AND GROOVE JOINT DETAIL

CONSTRUCTION NOTES:

CULVERTS TO BE CONSTRUCTED AS PER SPEC. 2412 EXCEPT AS NOTED.

THE STEEL FABRIC, SHEAR REINFORCEMENT AND REINFORCEMENT BARS SHALL CONFORM TO APPLICABLE REQUIREMENTS OF AASHTO M259.

1½" MIN. AND 2" MAX. CONCRETE COVER ON ALL REINFORCEMENT, INCLUDING SHEAR REINFORCEMENT, EXCEPT FOR TONGUE AND GROOVE DETAIL.

ANY 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 AASHTO "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES". IF BAR REINFORCEMENT IS SUBSTITUTED FOR WIRE MESH, THE AREAS OF REINFORCEMENT SHALL BE INCREASED BY 8%.

THE MAXIMUM SIZE OF REINFORCEMENT BARS SHALL BE NO. 6. THE MAXIMUM MESH SIZE SHALL BE ½" DIA. PER LAYER (MAXIMUM OF 2 LAYERS).

THE SPACING CENTER TO CENTER OF THE TRANSVERSE 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.

WELDING WILL NOT BE ALLOWED ON REINFORCEMENT BARS OR STEEL FABRIC, EXCEPT THAT THE ORIGINAL WELDING REQUIRED TO MANUFACTURE WIRE FABRIC IS ACCEPTABLE.

WHEN REINFORCEMENT IS CUT, ADDITIONAL REINFORCEMENT SHALL BE ADDED ON BOTH SIDES OF THE CUT MEMBER TO REPLACE OR EXCEED THE CUT STEEL.

BARREL SECTIONS WHICH ARE CAST WITH A DRAFT IN THE FORMS SHALL BE LAID WITH THE NARROWEST PART OF THE SECTION DOWNSTREAM.

CONCRETE SHALL BE MIX NO. 3W36 WITH NO CALCIUM CHLORIDE ALLOWED.

① CULVERT TIES ARE TO BE 1" DIAMETER RODS. SEE STANDARD PLATE NO. 3145 FOR CONNECTION DETAILS.

② HAUNCH SIZE AS FOLLOWS:
- 6 AND 8 FT. WIDTHS - 6 TO 12 INCHES
- 10 FT WIDTH - 10 TO 12 INCHES
- 12 FT WIDTH - 12 INCHES

③ MINIMUM LONGITUDINAL STEEL SHALL BE 0.06 SQ. IN. /FT.

BARREL INFORMATION

LOCATION	SIZE	CLASS	f'c (P.S.I.)	FILL HEIGHT RANGE (FT.)	DIMENSIONS					WEIGHT (LBS./FT.)	STEEL FABRIC REINFORCEMENT											
											As1			As2		As3		As4		As5	
					W (FT.)	H (FT.)	Tt (IN.)	Tb (IN.)	Ts (IN.)		AREA (IN.²/FT.)	LENGTH (FT.)	M (FT.)	AREA (IN.²/FT.)	LENGTH (FT.)	AREA (IN.²/FT.)	LENGTH (FT.)	AREA (IN.²/FT.)	LENGTH (FT.)	AREA (IN.²/FT.)	LENGTH (FT.)
42+31.70	8' x 4'	2	5000	2'-10'	8'	4'	9	10	8	3190	0.41	9'-3"	2'-6"	0.57	8'-8"	0.53	8'-8"	0.20	4'-8"	0.06	6'-3"
42+44.48	8' x 4'	2	5000	2'-10'	8'	4'	9	10	8	3190	0.41	9'-3"	2'-6"	0.57	8'-8"	0.53	8'-8"	0.20	4'-8"	0.06	6'-3"

CERTIFIED BY Kaye M Bronsch PROFESSIONAL ENGINEER
REG. NO. 19917 6/22 1998

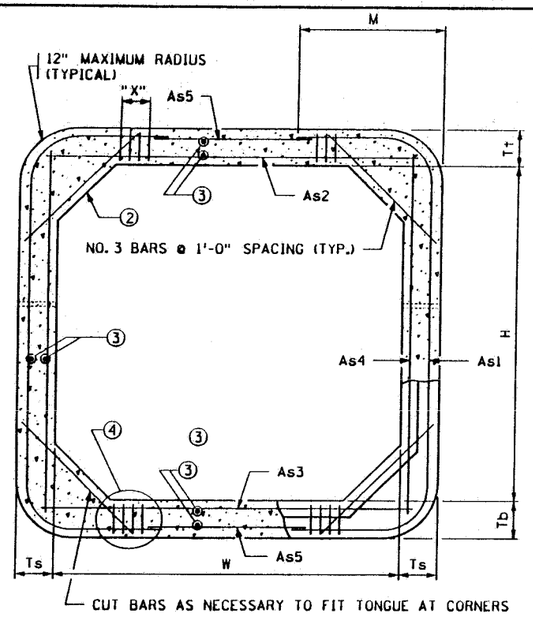
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CHK: ____ CHK: ____

STANDARD SHEET NO. 5-297.420 (1 OF 2)
STATE BRIDGE ENGINEER APPROVAL: AUGUST 10, 1995

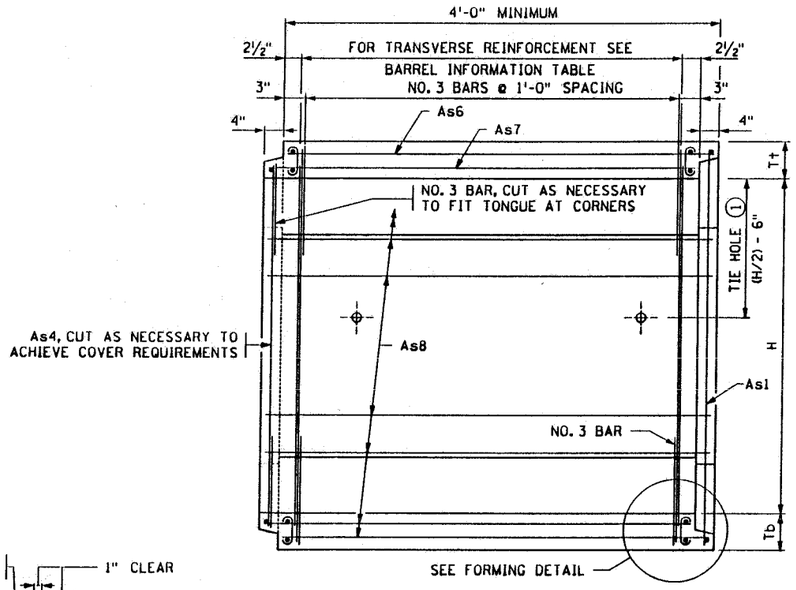
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STATE PROJ. NO. 55-599-67 SHEET NO. 3 OF 10 SHEETS

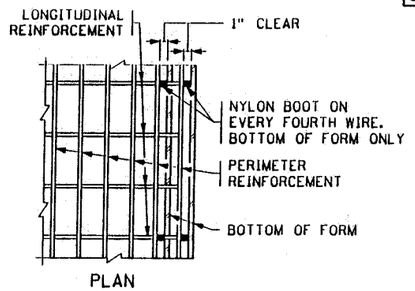
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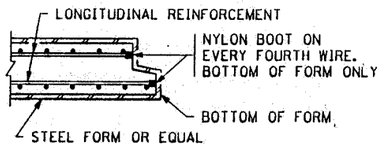
TRANSVERSE BARREL SECTION
(BAR REINFORCEMENT OPTION SHOWN)



LONGITUDINAL BARREL SECTION
(BAR REINFORCEMENT OPTION SHOWN)

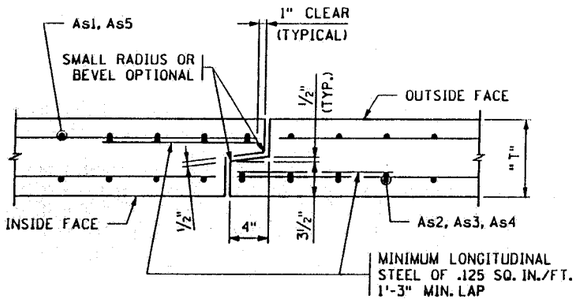


PLAN

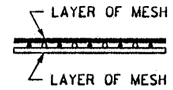


SECTION

FORMING DETAIL



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

CONSTRUCTION NOTES:

CULVERTS TO BE CONSTRUCTED AS PER SPEC. 2412 EXCEPT AS NOTED.

THE STEEL FABRIC, SHEAR REINFORCEMENT AND REINFORCEMENT BARS SHALL CONFORM TO APPLICABLE REQUIREMENTS OF AASHTO M259.

1½" MIN. AND 2" MAX. CONCRETE COVER ON ALL REINFORCEMENT, INCLUDING SHEAR REINFORCEMENT, EXCEPT FOR TONGUE AND GROOVE DETAIL.

ANY 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 AASHTO "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES". IF BAR REINFORCEMENT IS SUBSTITUTED FOR WIRE MESH, THE AREA OF REINFORCEMENT SHALL BE INCREASED BY 8%.

THE MAXIMUM SIZE OF REINFORCEMENT BARS SHALL BE NO. 6. THE MAXIMUM MESH SIZE SHALL BE ½" DIA. PER LAYER (MAXIMUM OF 2 LAYERS).

THE SPACING CENTER TO CENTER OF THE TRANSVERSE 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.

WELDING WILL NOT BE ALLOWED ON REINFORCEMENT BARS OR STEEL FABRIC, EXCEPT THAT THE ORIGINAL WELDING REQUIRED TO MANUFACTURE WIRE FABRIC IS ACCEPTABLE.

WHEN REINFORCEMENT IS CUT, ADDITIONAL REINFORCEMENT SHALL BE ADDED ON BOTH SIDES OF THE CUT MEMBER TO REPLACE OR EXCEED THE CUT STEEL.

BARREL SECTIONS WHICH ARE CAST WITH A DRAFT IN THE FORMS SHALL BE LAID WITH THE NARROWEST PART OF THE SECTION DOWNSTREAM.

CONCRETE SHALL BE MIX NO. 3W36 WITH NO CALCIUM CHLORIDE ALLOWED.

(1) CULVERT TIES ARE TO BE 1" DIAMETER RODS. SEE STANDARD PLATE NO. 3145 FOR CONNECTION DETAILS.

(2) HAUNCH SIZE AS FOLLOWS:
- 6 AND 8 FT. WIDTHS - 6 TO 12 INCHES
- 10 FT. WIDTH - 10 TO 12 INCHES
- 12 FT. WIDTH - 12 INCHES

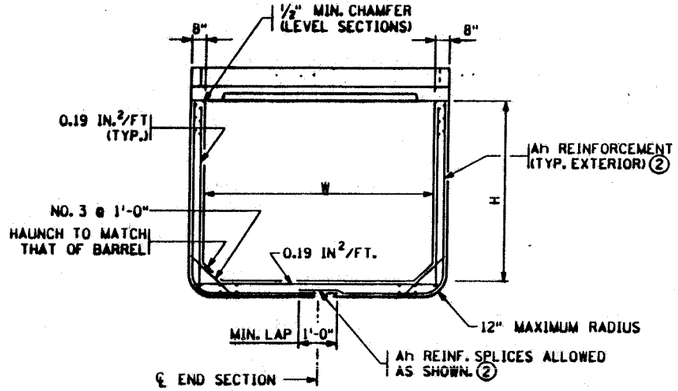
(3) MINIMUM LONGITUDINAL STEEL SHALL BE 0.06 SQ. IN./FT.

(4) SEE STANDARD PLATE 3007 FOR SHEAR REINFORCEMENT OPTIONS. THE MAXIMUM SHEAR REINFORCEMENT SPACING IN THE LONGITUDINAL DIRECTION SHALL BE 6 INCHES.

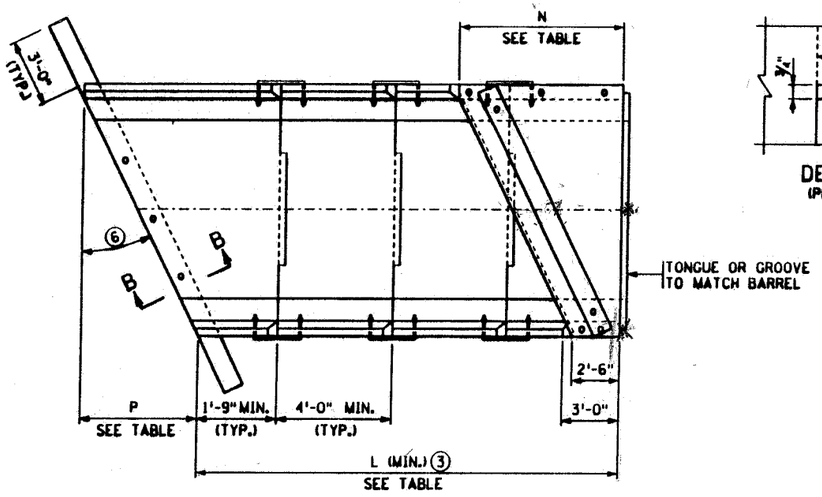
BARREL INFORMATION

LOCATION	SIZE	f'c (P.S.I.)	OVERFILL LIMITS (FT.)	DIMENSIONS					WEIGHT (LBS./FT.)	STEEL FABRIC REINFORCEMENT															(4) SHEAR REINFORCEMENT TOP AND BOTTOM OF BARREL		
				W (FT.)	H (FT.)	Tt (IN.)	Tb (IN.)	Ts (IN.)		As1			As2		As3		As4		As5		As6	As7	As8				
										AREA (IN.²/FT.)	LENGTH (FT.)	M (FT.)	AREA (IN.²/FT.)	LENGTH (FT.)	AREA (IN.²/FT.)	LENGTH (FT.)	AREA (IN.²/FT.)	LENGTH (FT.)	AREA (IN.²/FT.)	LENGTH (FT.)	AREA (IN.²/FT.)	AREA (IN.²/FT.)	AREA (IN.²/FT.)	AREA (IN.²/FT.)	MAX. SPG. (IN.)	X (IN.)

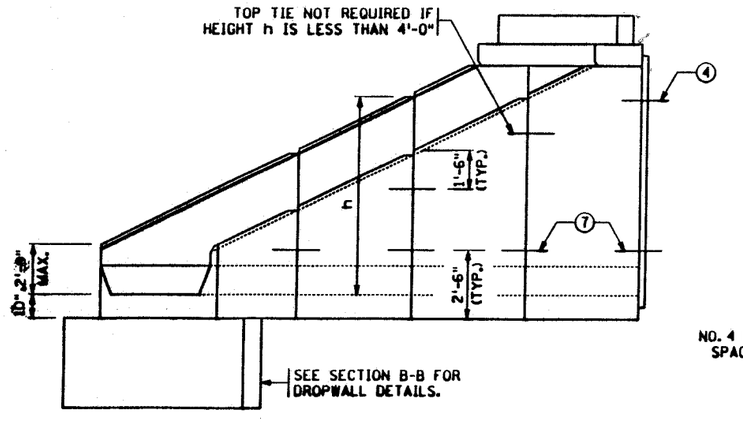
CERTIFIED BY Kay M Brenneke PROFESSIONAL ENGINEER
REG. NO. 19917 6/22 1998
DES: ____ DR: ____ APPROVED:
CHK: ____ CHK: ____
STANDARD SHEET NO. 5-297.420 (2 OF 2)
STATE BRIDGE ENGINEER APPROVAL: AUGUST 10, 1995
TITLE: BARREL DETAILS (SPECIAL DESIGNS)
STATE PROJ. NO. 55-599-67 SHEET NO. 4 OF 10 SHEETS
FILE NAME S4202H95.SPN
SERVER CA645I:/USR/STANDARDS



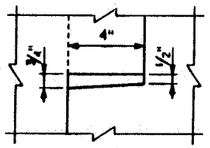
END VIEW



PLAN VIEW
SINGLE BARREL OPTION

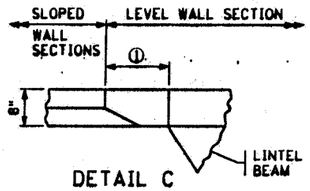


ELEVATION

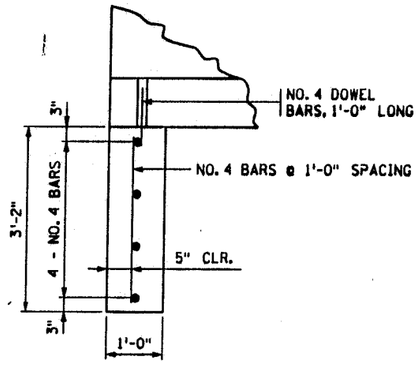


DETAIL B
(PLAN VIEW)

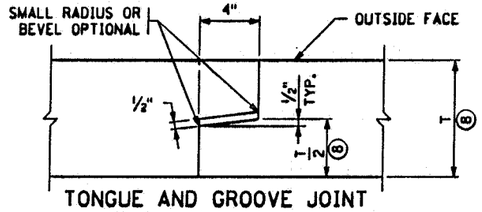
PLAN VIEW
MULTI-BARREL OPTION



DETAIL C

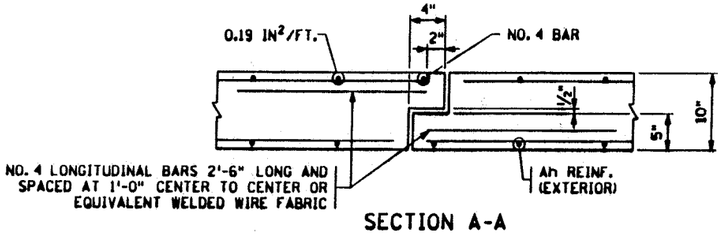


SECTION B-B

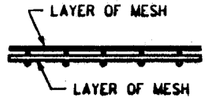


TONGUE AND GROOVE JOINT

MAKE DIMENSION OF TONGUE OR GROOVE ON ADJACENT PRECAST BARREL SECTIONS SO INSIDE WALLS ARE FLUSH.



SECTION A-A



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

NOTES:

SEE 5-297.420, FOR DIMENSIONS AND CONSTRUCTION NOTES, EXCEPT AS NOTED.

FINISH ALL VERTICAL EDGES OF CONCRETE WITH 1/2" CHAMFER OR RADIUS UNLESS OTHERWISE NOTED.

PRECAST CONCRETE SHALL BE MIX 3W36 WITH NO CALCIUM CHLORIDE ALLOWED.

DROPWALL CONCRETE SHALL BE MIX 1A43 OR 3Y43. LIMITS FOR DROPWALL EXCAVATION TO BE APPROXIMATELY THE SAME AS DROPWALL DIMENSIONS. FURNISHING AND INSTALLATION OF DROPWALL TO BE INCLUDED IN PRICE BID FOR END SECTIONS.

LONGITUDINAL REINFORCEMENT SHALL BE A MINIMUM OF 0.06 SQ. IN. PER FT. ON BOTH FACES.

NO TONGUE OR GROOVE REQUIRED IN WALLS BETWEEN END SECTIONS.

SEE 5-297.425 FOR EMBANKMENT PROTECTION.

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".

① 8 1/16" @ 15°; 10 5/16" @ 30°; 1'-2" @ 45°

② SEE 5-297.420 (2 OF 2) FOR REINFORCEMENT TABLES.

③ NUMBER OF SECTIONS VARIES WITH "H" DIMENSION.

④ EXCEPT AS NOTED, CULVERT TIES ARE TO BE 1" DIA RODS. SEE STANDARD PLATE NO. 3145 FOR DETAILS.

⑤ 3'-6" TONGUE AND 3'-7" GROOVE FOR 6'-0" WIDE CULVERTS. 5'-0" TONGUE AND 5'-1" GROOVE FOR CULVERTS OVER 6'-0" WIDE. CENTER TONGUE & GROOVE ON ℄ OF EACH APRON JOINT.

⑥ FOR SKEW ANGLES OVER 7 1/2° UP TO 22 1/2°, USE A 15° SKEW END SECTION. FOR SKEW ANGLES OVER 22 1/2° UP TO 37 1/2°, USE A 30° SKEW END SECTION. FOR SKEW ANGLES OVER 37 1/2° UP TO 45°, USE A 45° SKEW END SECTION.

⑦ PROVIDE EXTRA STRONG TIE @ BOTTOM CONNECTION BETWEEN BARREL & 1st APRON SEGMENT, AND 1st & 2nd APRON SEGMENTS; ONLY REQUIRED ON HIGH FILL SIDE FOR 45° SKEW END SECTIONS OVER 6'-0" HIGH. SEE 5-297.423 (2 OF 2) FOR DETAILS.

⑧ DIMENSION T IS EQUAL TO Tt, Tb OR Ts.

⑨ PROVIDE 2'-0" MIN. BETWEEN SEGMENTS.

LENGTH L

HEIGHT H (FT.)	15° SKEW	30° SKEW	45°SKEW
4	7'-6"	8'-6"	9'-0"
5	10'-0"	11'-0"	12'-0"
6	12'-0"	13'-6"	14'-6"
7	14'-0"	16'-0"	17'-6"
8	16'-0"	18'-0"	20'-6"
9	18'-6"	20'-6"	23'-6"
10	20'-6"	23'-0"	26'-0"
11	22'-6"	25'-6"	29'-0"
12	25'-0"	28'-0"	31'-6"

LENGTH P

WIDTH W (FT.)	15° SKEW	30° SKEW	45° SKEW
6	1'-9 3/8"	3'-10 1/4"	6'-8"
8	2'-3 7/8"	5'-0"	8'-8"
10	2'-10 1/4"	6'-1 7/8"	10'-8"
12	3'-4 3/4"	7'-3 3/4"	12'-8"

CERTIFIED BY Kaye M Brewer PROFESSIONAL ENGINEER
REG. NO. 19917 6/22 1998

DES:	DR:	APPROVED:
CHK:	CHK:	

STANDARD SHEET NO. 5-297.423 (1 OF 2)
STATE BRIDGE ENGINEER APPROVAL: AUGUST 10, 1995

TITLE: PRECAST CONC. END SECTION TYPE III- SINGLE OR MULTI-BARREL
FOR SKEWS 7 1/2° TO 45°

STATE PROJ. NO. 55-599-67 SHEET NO. 5 OF 10 SHEETS

SERVER CA645I1/USR/STANDARDS FILE NAME S423IH95.SPN

Ah REINFORCEMENT TABLE

HEIGHT h (FT.)	Ah (IN^2/FT.)	
	15° & 30° SKEW	45° SKEW
7 OR LESS	0.192	0.192
8	0.20	0.24
9	0.29	0.36
10	0.42	0.53
11	0.60	0.75
12	0.78	0.98

NOTE: h IS THE LARGEST VERTICAL DIMENSION OF THE SEGMENT.

LINTEL BEAM REINFORCEMENT TABLE

WIDTH W	BOTTOM REINFORCEMENT	
	A1	A2
6'	NO. 4 @ 1'-6"	NO. 4 @ 1'-4"
8'	NO. 4 @ 1'-1"	NO. 4 @ 9"
10'	NO. 4 @ 9"	NO. 4 @ 6"
12'	NO. 5 @ 9"	NO. 5 @ 6"

LENGTH N

WIDTH W (FT.)	15° SKEW	30° SKEW	45° SKEW
6	4'-3⅜"	6'-4¼"	9'-2"
8	4'-9⅞"	7'-6"	11'-2"
10	5'-4¼"	8'-7⅞"	13'-2"
12	5'-10¾"	9'-9¾"	15'-2"

NOTES:

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".

STRUCTURAL STEEL PER SPEC. 3306.

WELDING PER SPEC. 2471.

GALVANIZE STRUCTURAL STEEL PER SPEC. 3394.

GALVANIZE BOLTS, NUTS AND WASHERS PER SPEC. 3392.

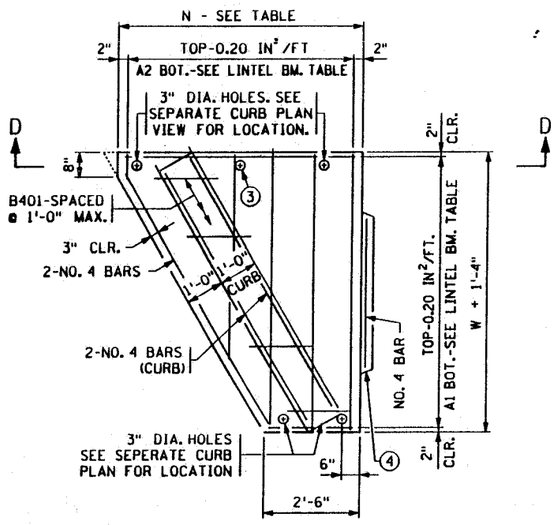
(1) NO. 8 DOWEL, 1'-0" LONG, 2" DIA. HOLE IN THE TOP OF THE WALL SECTION AND 3" DIA. HOLE IN THE LINTEL BEAM. FILL HOLE WITH GROUT.

(2) NO. 8 DOWEL, 1'-0" LONG, 2" DIA. HOLE IN THE TOP OF THE LINTEL BEAM AND 3" DIA. HOLE IN THE CURB. FILL HOLE WITH GROUT.

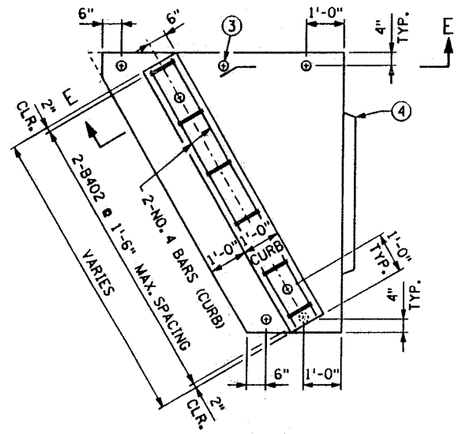
(3) CAST AN ADDITIONAL 3" HOLE AT MIDPOINT OF BEAM WHEN SIDE OF LINTEL BEAM IS OVER 6 FT.

(4) CHECK THE LOCATION TO DETERMINE WHETHER A TONGUE OR A GROOVE IS USED. TONGUE AND GROOVE TO TERMINATE AT CULVERT RADIUS.

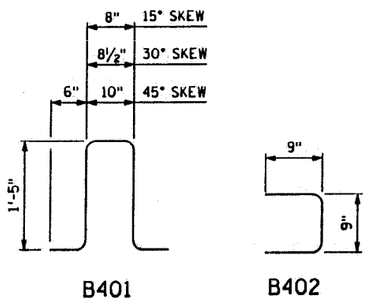
(5) FOR SKEW LENGTH UNDER 10' USE NO. 8 BARS. FOR SKEW LENGTH OF 10' TO 14' USE NO. 9 BARS. FOR SKEW LENGTH OVER 14' TO 18' USE NO. 10 BARS. FOR SKEW LENGTH OVER 18' TO 20' USE NO. 11 BARS, OR EQUAL. SKEW LENGTH IS DISTANCE ALONG LINTEL BEAM.

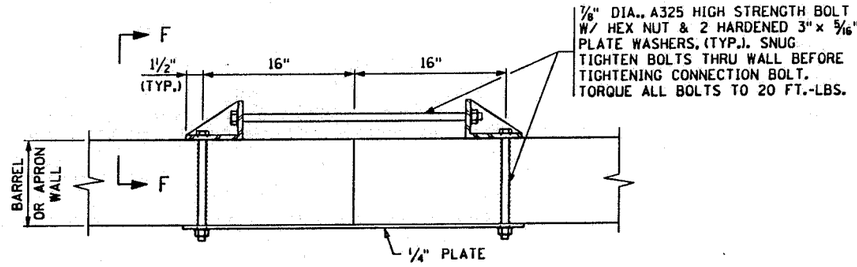


PLAN VIEW
(LINTEL BEAM WITH INTEGRAL CURB)

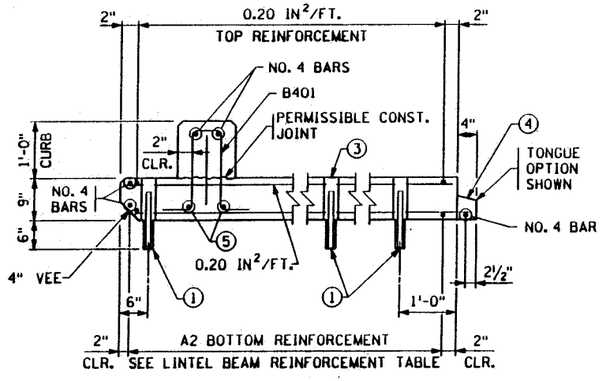


PLAN VIEW
(LINTEL BEAM WITH SEPARATE CURB)
SOME REINFORCEMENT NOT SHOWN

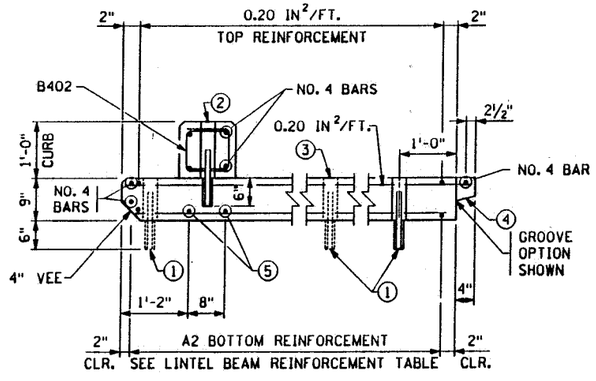




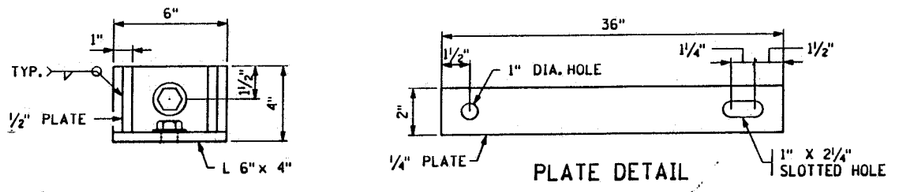
PLAN VIEW



SECTION D-D



SECTION E-E



SECTION F-F

PLATE DETAIL

EXTRA STRONG CONNECTION DETAILS

CERTIFIED BY Kayse M Brenneke PROFESSIONAL ENGINEER
REG. NO. 19917 6/22 1998
DES: ____ DR: ____ APPROVED:
CHK: ____ CHK: ____

STANDARD SHEET NO. 5-297.423 (2 OF 2)
STATE BRIDGE ENGINEER APPROVAL: AUGUST 10, 1995

TITLE: PRECAST CONC. END SECTION TYPE III-SINGLE OR MULTI-BARREL
FOR SKEWS 7½° TO 45°

STATE PROJ. NO. 55-599-67 SHEET NO. 6 OF 10 SHEETS

SERVER CA64S1z/USR/STANDARDS FILE NAME S4232H95.SPN

BR. L-6161 STA. 38+50
STEEL BEAM SPAN
10' LONG x 25' WIDE

REMOVE
NEW BRIDGE NO. 55J15 STA. 42+31.70 & STA. 42+44.48
2 - 8' x 4' x 36' PRECAST CONC. BOX CULVERT (SKEW 15°)
4 - 8' x 4' PRECAST CONC. END SECTIONS
SEE BRIDGE SURVEY SHEET NO. 9

BEGIN: 55-599-67
STA. 37+00

END: 55-599-67
STA. 46+00

33' R/W

20' T.E.

+20

+75

+00

25'

50'

80' R/W

PINE
WOODS

PLACE RIPRAP CL.III 2' AROUND OUTSIDE
OF OUTLET AND INLET END SECTIONS AND
3' AREA BETWEEN CULVERT ON BOTH END SECTIONS

℄ CULV STA. 42+28
57" x 26' SPAN C.M.P. CULVERT
NO APRONS

SALVAGE
26 LIN FT.

FINISHED GRADE

B.O.P. STA. 37+00
EL. 1254.33

P.V.C. 37+17.50
EL. 1254.05

P.V.T. 38+82.50
EL. 1252.40

P.V.C. 39+68.97
EL. 1252.05

P.V.T. 41+43.97
EL. 1251.70

P.I. 38+00
EL. 1252.73
V.C. 165.00
E 0.25

P.I. 40+56.47
EL. 1251.70
V.C. 175.00
E 0.09

P.I. 43+00
EL. 1251.70
V.C. 165.00
E 0.02

P.V.C. 42+17.50
EL. 1251.70

INLET EL. 1244.7
OUTLET EL. 1244.50

P.V.T. 43+82.50
EL. 1251.62

EOP STA = 46+00
EOP EL = 1251.40

1.60%

-0.40%

0.00%

-0.10%

1254.33 1252.98 1252.33 1251.94 1251.72 1251.70 1251.68 1251.60 1251.50 1251.40

1257.76 1255.96 1254.16 1252.79 1251.89 1250.79 1250.39 1250.25 1250.15 1250.45 1250.83 1251.43 1251.83 1252.33 1253.23

1260 1255 1250 1245

34+00 35+00 36+00 37+00 38+00 39+00 40+00 41+00 42+00 43+00 44+00 45+00 46+00 47+00 48+00 49+00

CERTIFIED BY Laurel Bennett PROFESSIONAL ENGINEER REG. NO. 19917 6/22 1998

S.A.P. 55-599-67

SHEET 7 OF 10 SHEETS

UNCLASSIFIED EXC. 16 CU. YDS.
EMBANKMENT 2185 CU. YDS. (LV)
COMMON BORROW 1615 CU. YDS. (CV)

NOTE: INDIVIDUAL CROSS SECTIONS DO NOT CONTAIN COMPACTION FACTOR.

42+00 — R/W — 1247.83 @ 23.87' — 1251.16 @ 13.45' — 1251.70 — NEW 80' R/W — 1251.10 @ 13.45' — 1248.06 @ 21.77'
FILL = 228
CUT = 0

41+00 — R/W — 1246.95 @ 24.08' — 1251.12 @ 13.45' — 1251.72 — 1251.12 @ 13.45' — 1247.23 @ 23.50' — R/W
FILL = 231
CUT = 0

40+00 — R/W — 1246.91 @ 24.58' — 1251.34 @ 13.45' — 1251.94 — 1251.34 @ 13.45' — 1247.20 @ 24.00' — R/W
FILL = 195
CUT = 0

39+00 — R/W — 1247.17 @ 24.84' — 1251.73 @ 13.45' — 1252.33 — 1251.73 @ 13.45' — 1247.89 @ 23.80' — R/W
FILL = 127
CUT = 4

38+00 — R/W — 1248.45 @ 23.58' — 1252.38 @ 13.45' — 1252.98 — 1252.38 @ 13.45' — 1247.82 @ 24.82' — R/W
FILL = 60
CUT = 9

37+00 — R/W — 1252 99 @ 16.37' — MATCH EXISTING 4:1 — 1254.33 — MATCH EXISTING 4:1 — 1248.56 @ 26.06' — R/W

42+00 — R/W — 1247.20 @ 27.85' — MATCH EXISTING 4:1 — 1251.40 — MATCH EXISTING 4:1 — 1247.33 @ 27.31' — R/W
FILL = 126
CUT = 8

45+00 — R/W — 1247.27 @ 27.97' — 1250.90 @ 13.45' — 1251.50 — 1250.90 @ 13.45' — 1246.93 @ 29.33' — R/W
FILL = 182
CUT = 0

44+00 — R/W — 1246.97 @ 26.66' — 1251.00 @ 13.45' — 1251.60 — 1251.00 @ 13.45' — 1247.71 @ 24.47' — R/W
FILL = 241
CUT = 0

43+00 — R/W — 1246.65 @ 27.87' — 1251.08 @ 13.45' — 1251.68 — 1251.08 @ 13.45' — 1248.29 @ 22.96' — R/W
FILL = 241
CUT = 0

42+28 — R/W — T.E. — 1251.08 @ 13.45' — 1251.70 — 1251.08 @ 13.45' — NEW 80' R/W

SEE SHEET 7 FOR RIPRAP LOCATION.

END OF BARREL EL. 1244.67 @ 18'
INLET EL. 1244.70 @ 25.5'

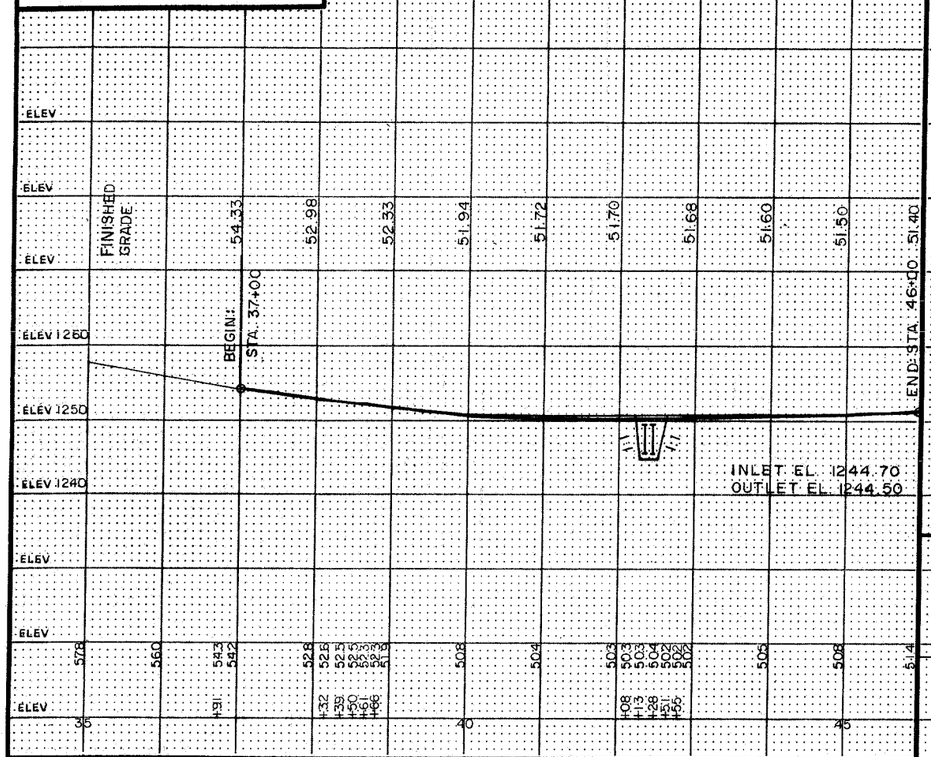
END OF BARREL EL. 1244.53 @ 18'
OUTLET EL. 1244.50 @ 25.5'

2 — 8'x 4' PRECAST CONC. BOX CULVERTS SKEW 15 °
4 — 8'x 4' PRECAST CONC END SECTIONS

NOTE: CROSS SECTION IS NOT ON ANGLE

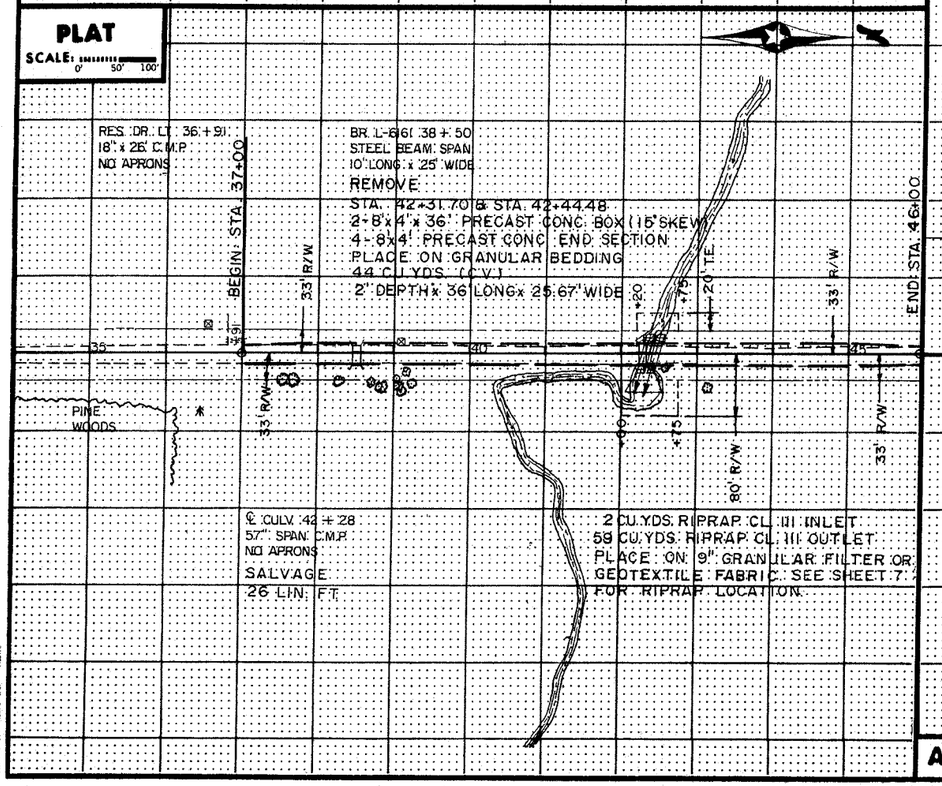
CONTRACTED PROFILE

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



PLAT

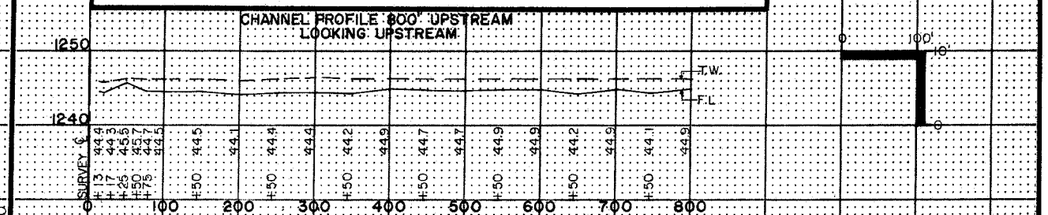
SCALE: 0' 50' 100'



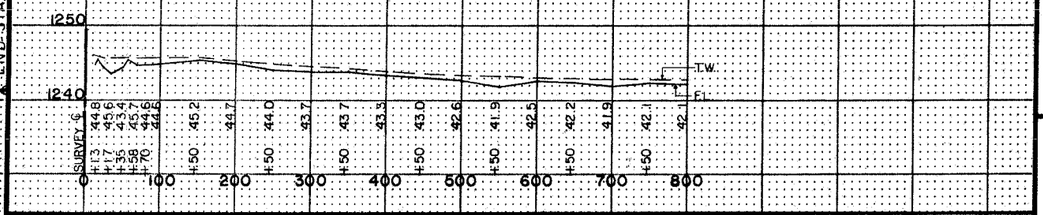
TYPICAL SECTIONS & PERTINENT DATA

SCALES AS SHOWN

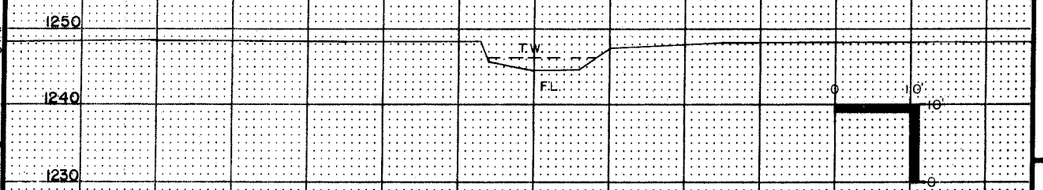
CHANNEL PROFILE 800' UPSTREAM
LOOKING UPSTREAM



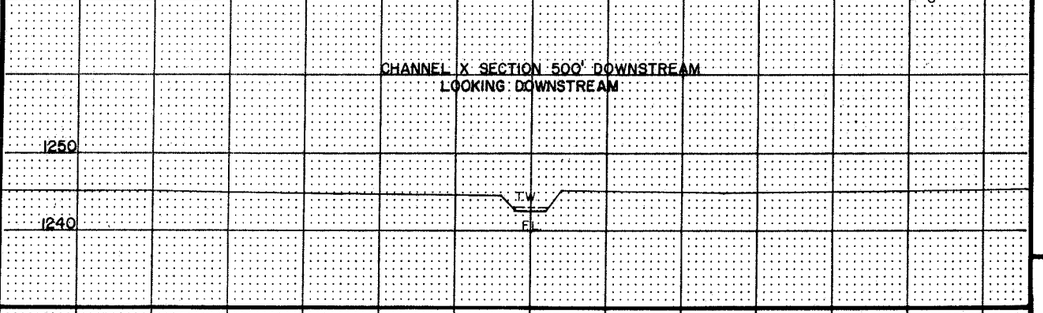
CHANNEL PROFILE 800' DOWNSTREAM
LOOKING DOWNSTREAM

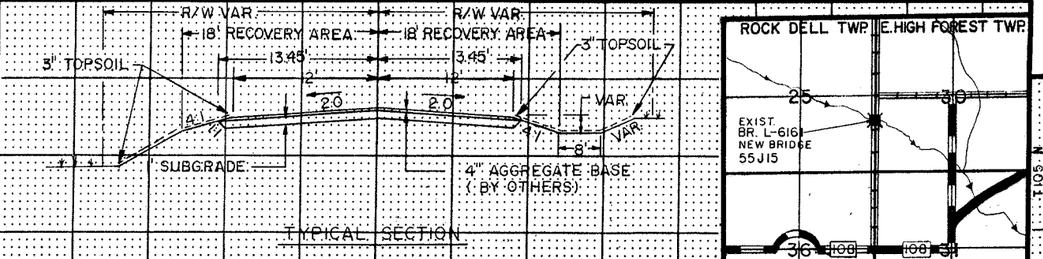


CHANNEL X SECTION 500' UPSTREAM
LOOKING UPSTREAM



CHANNEL X SECTION 500' 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 8/15/97

Stream or ditch designation ....UNAMED....
Drainage area ....2.8 SQ. MI....
Max. flood on record UNKNOWN Design flood (...25.... yr. freq.) ....500.... C.F.S.
Max. observed highwater elevation UNKNOWN Design highwater elevation 1248.40
Design mean velocity through structure ....8.3.... F.P.S. OUTLET
Low superstructure at or above elevation ....1248.5....
Flowline elevation ....1244.5.... Skew angle ....15°....
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 ....780.... C.F.S. at stage ....1248.7.... and mean velocity of ....8.6.... F.P.S. with ....1.7.... 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 ....1252.59.... (M.S.L. 1929 Adj.)
Location: Chiseled + on SE. corner of headwall on Br. L-6161.

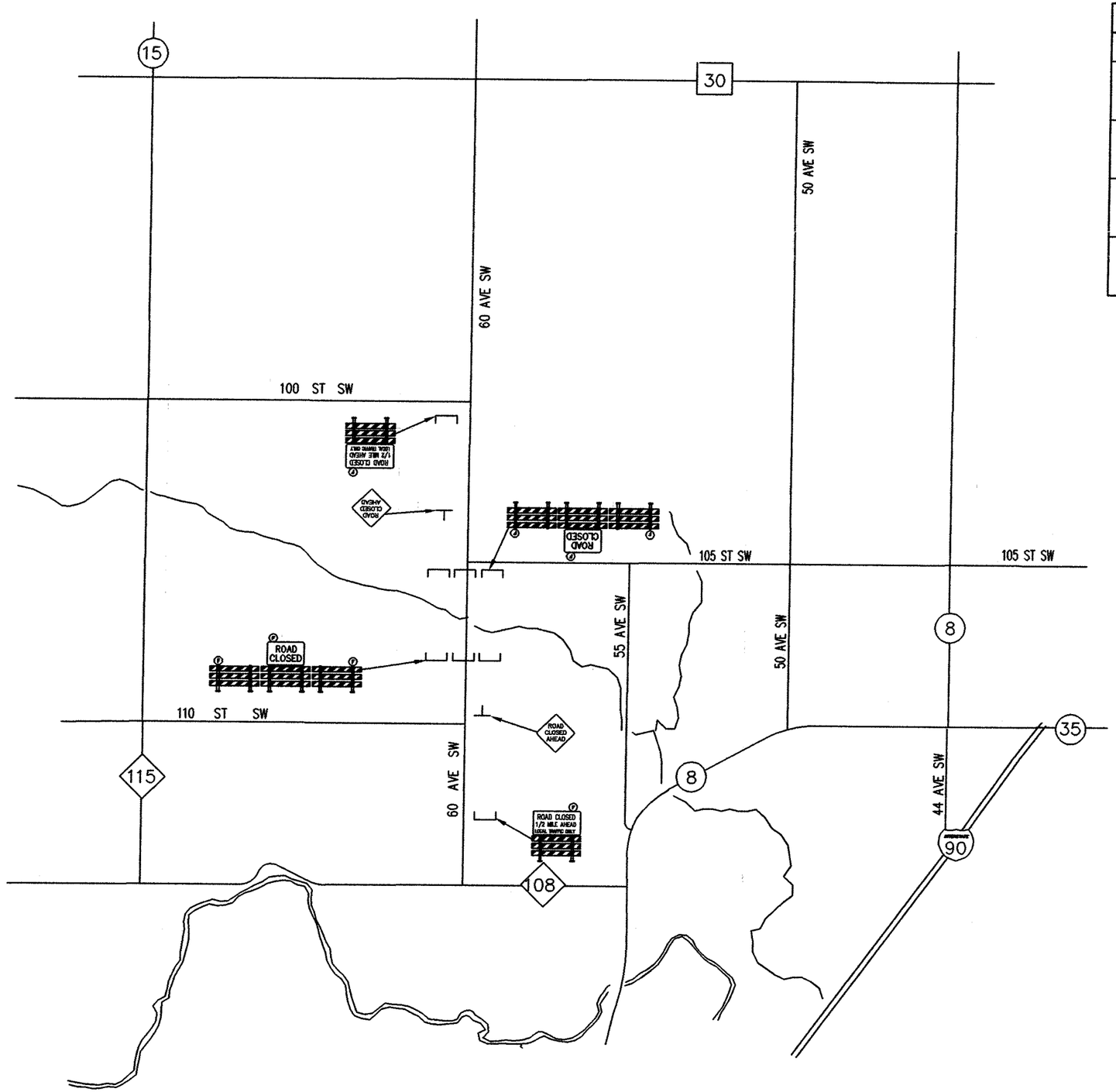
MINNESOTA
DEPARTMENT OF TRANSPORTATION

BRIDGE SURVEY

AT MILE POINT ....0.73.... ON ....TWP. 24 (60th AVE SW)....
(T.H., C.S.A.H., C.R. etc.)
PROPOSED BRIDGE LOCATED ....0.8.... MILES ....N.... OF
....ICT C.R. 108....
SEC. ....30.... TWP ....104-105.... R ....14 W....
TOWNSHIP ....HIGH FOREST.... COUNTY ....OLMSTED....
BRIDGE NO. ....55J15....

Area No. **Job No.** **State Proj. No.** 55-599-67 **Sheet No.** 9 of 10 Sheets

TELEDYNE ROST - 11842-2 8/97 MD178



N

ESTIMATE OF TRAFFIC CONTROL DEVICES

DEVICE	NUMBER	SIZE	COLOR	QUANTITY	DEVICE	NUMBER	SIZE	COLOR	QUANTITY
ROAD CLOSED	R11-2	48 x 30	BLK/WH	2		TYPE III	MIN. 6'	OR & BLK	8
ROAD CLOSED 1/2 MILE AHEAD LOCAL TRAFFIC ONLY	R11-3	60 x 30	BLK/WH	2	(F)	TYPE A	FLASHING LAMP	AMBER	8
ROAD CLOSED AHEAD	W20-3	48 x 48	BLK/OR	2					

TRAFFIC CONTROL LEGEND

- ⊥ POST OR STAND MOUNTED SIGN
- ⌊ TYPE III BARRICADE
- (F) TYPE "A" AMBER FLASHING LAMP

TRAFFIC CONTROL NOTES

1. THE LOCATION OF SIGNS AND DEVICES WILL BE STAKED BY THE ENGINEER IN THE FIELD.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR TRAFFIC CONTROL ON THIS PROJECT.
3. ALL TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE MINNESOTA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES INCLUDING THE TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS FIELD MANUAL DATED APRIL 1995.
4. CONSTRUCTION ZONE SIGNING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND WILL INCLUDE, BUT NOT BE LIMITED TO SIGNS FOR LANE CLOSURE, MACHINERY AHEAD, BUMP, DIP, LOOSE GRAVEL, ETC.. THE NUMBER AND LOCATION WILL BE DETERMINED BY THE CONTRACTORS OPERATION.
5. ALL BARRICADES ON THIS PROJECT SHALL BE REFLECTORIZED ON BOTH SIDES.

CERTIFIED BY Kayle M Brennick REG. NO. 19917 6/22 1998
PROFESSIONAL ENGINEER

S.A.P. 55-599-67 HIGH FOREST TWP.