MINNESOTA DEPARTMENT OF TRANSPORTATION

THE COUNTY OF OLMSTED

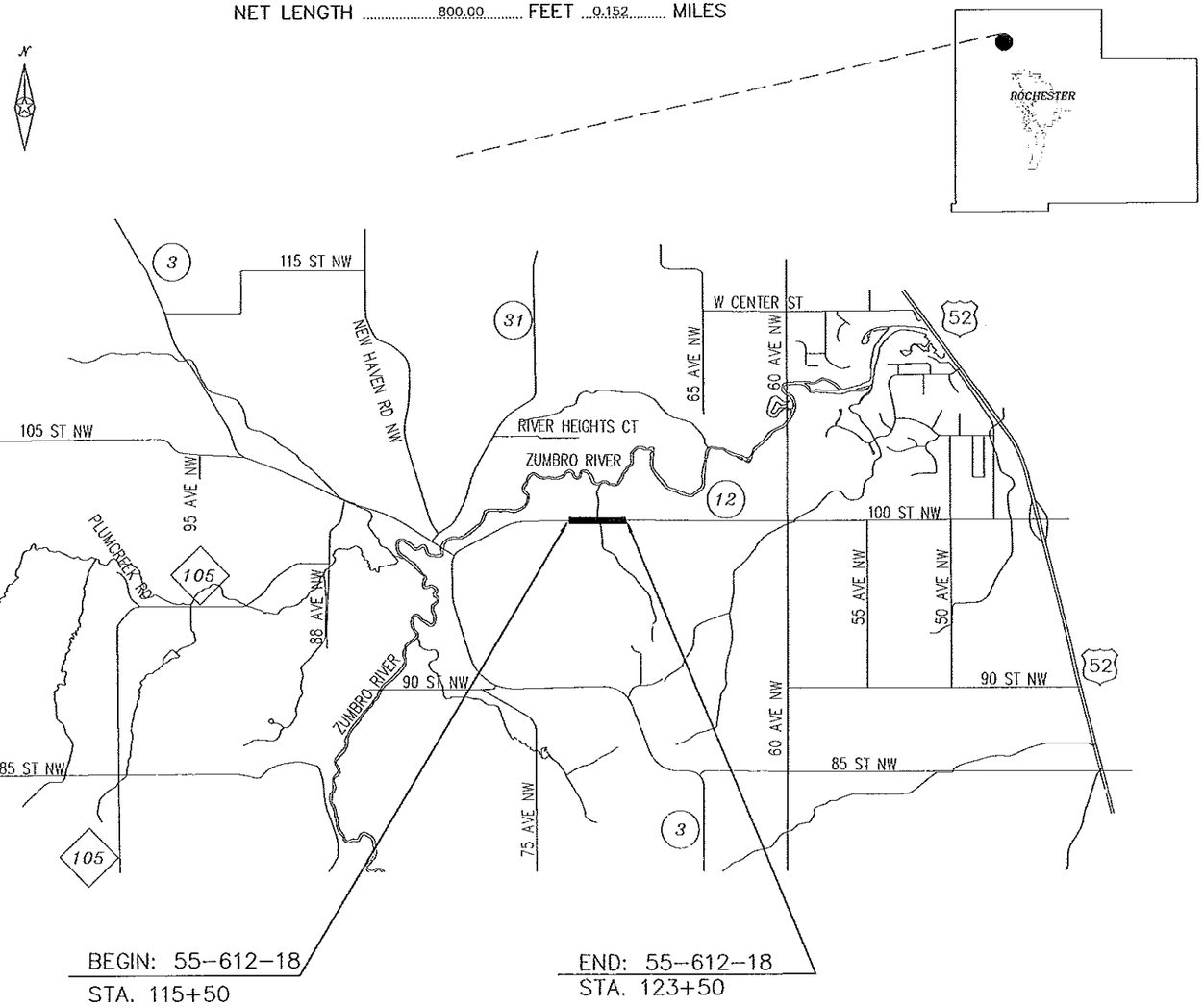
CONSTRUCTION PLAN FOR REPLACE BRIDGE NO. 89172 (NEW BR. NO. 55J49) AND APPROACH GRADING

LOCATED ON C.S.A.H. 12 (100th ST SW) BETWEEN C.S.A.H. 3 AND 60th AVE. N.W. (GEOGRAPHIC DESCRIPTION)

FROM APPROX. 200' EAST OF CENTER SECTION 23 T108N-R15W TO APPROX. 300' WEST OF EAST 1/4 SECTION 23 T108N-R15W (LEGAL DESCRIPTION)

S.A.P. NO. 55-612-18

GROSS LENGTH	800.00	FEET	0.152	MILES
BRIDGE-LENGTH	23.16	FEET	0.004	MILES
EXCEPTIONS-LENGTH	0.00	FEET	0.000	MILES
NET LENGTH	800.00	FEET	0.152	MILES



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

SCALES

PLAN 0 50'
PROFILE 0 50' HORIZ. 0 10' VERT.
CROSS SECTIONS 0 10' HORIZ. 0 10' VERT.
INDEX MAP ..... NOT TO SCALE

THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA.

MINN. PROJ. NO. .....

GOVERNING SPECIFICATIONS

THE 2005 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.

INDEX

SHEET NO. 1	TITLE SHEET
SHEET NO. 2	ESTIMATE OF QUANTITIES & TYPICAL SECTION
SHEET NO. 3	PLAN AND PROFILE
SHEET NO. 4 - 5	CROSS-SECTIONS
SHEET NO. 6 - 13	EROSION CONTROL SHEETS
SHEET NO. 14	BRIDGE SURVEY SHEET
SHEET NO. 15 -19	BRIDGE DETAIL SHEET
SHEET NO. 20	TRAFFIC CONTROL PLANS
SHEET NO. G1 - G2	APRON GRATE DESIGN

THIS PLAN CONTAINS 22 SHEETS.

DESIGN DESIGNATION: S.A.P. 55-612-18

R ..... $\Sigma N18_{(20)}$

ADT (Current Year) = 830(2007) Design Speed 50 MPH
ADT (Future Year) = 1328(2027) Based on STOPPING Sight Distance
DHV (Design Hr. Vol.) = ... Height of eye 3.5 FT. Height of object 2.0 FT
D (Directional Distr.) = ... Design Speed not achieved at: .....
T (Heavy Commercial) = 133 STA. ..... TO STA. ..... MPH .....
SUBGRADE = K=150 STA. ..... TO STA. ..... MPH .....
SOIL FACTOR = 1.30% .....

SHOULDER WIDTH 4 FT.

9 TON DESIGN

FUNCTIONAL CLASSIFICATION: MINOR COLLECTOR

DESIGN ENGINEER: I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION, AND THAT I AM A DULY LICENCED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

DATE 12/3/07 REG. NO. 19917

PRINTED NAME: KAYE M. BIENIEK

SIGNED NAME: Kaye M Bieniek
COUNTY DESIGN ENGINEER

DATE 12/3/07 REG. NO. 10397

Michael V. Sheehan
APPROVED: OLMSTED COUNTY ENGINEER

STATE AID APPROVALS:

Judy Schmidt DATE: 12-14-07
DISTRICT STATE AID ENGINEER: REVIEWED FOR COMPLIANCE WITH STATE AID RULES/POLICY

Judy Schmidt DATE: 12-14-07
APPROVED FOR STATE AID FUNDING: STATE AID ENGINEER

AS BUILT PLANS

S.A.P. NO. 55-612-18 C.S.A.H. 12 SHEET NO. 1 OF 20 SHEETS

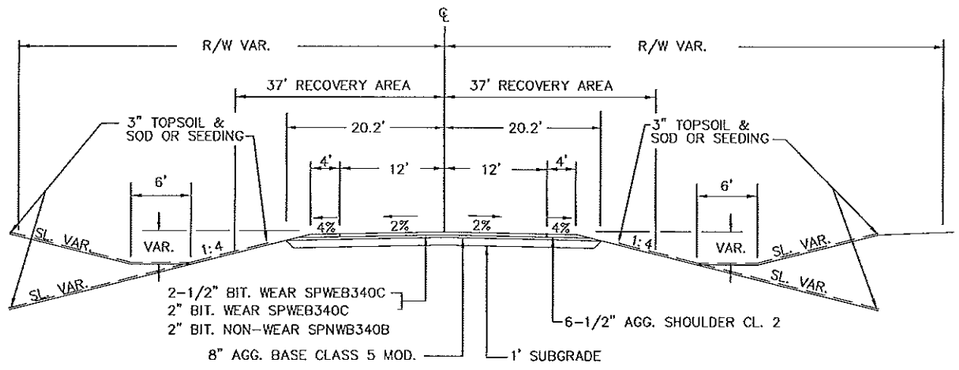
ESTIMATED QUANTITIES

	SPECIFICATION NO.	ITEM	UNIT	NON PARTICIPATING	PARTICIPATING	TOTAL ESTIMATED QUANTITIES
①	2101.511	CLEARING AND GRUBBING	LUMP SUM	1		1
	2104.501	REMOVE METAL CULVERT	LIN. FT.	28		28
②	2104.501	REMOVE FENCE	LIN. FT.	550		550
	2104.505	REMOVE BITUMINOUS PAVEMENT	SQ. YD.	2,134		2,134(P)
	2104.513	SAW BITUMINOUS PAVEMENT	LIN. FT.	48		48
	2105.515	UNCLASSIFIED EXCAVATION	CU. YD.	778		778(P)
	2105.523	COMMON BORROW (CV)	CU. YD.	6,436		6,436(P)
	2211.501	AGGREGATE BASE CL.5 MODIFIED	TON	1,465		1,465
③	2221.501	AGGREGATE SHOULDERING CL.2	TON	426		426
④	2360.501	TYPE SP 12.5 BITUMINOUS WEARING COURSE MIXTURE (3C)	TON	294		294
	2360.502	TYPE SP 12.5 BITUMINOUS NON-WEARING COURSE MIXTURE (3B)	TON	483		483
⑤	2402.521	STRUCTURAL STEEL (3306)	POUND		5,500	5,500(P)
⑥	2412.511	10'x 10' PRECAST CONC. BOX CULV.	LIN. FT.		204	204
	2412.512	10'x 10' 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.		118	118(P)
	2501.511	18" C.S. PIPE CULVERT	LIN. FT.	40		40
	2501.515	18" G.S. PIPE APRON	EACH	2		2
⑦	2511.501	RANDOM RIPRAP CL. IV	CU. YD.		412	412
	2520.501	LEAN MIX BACKFILL	CU. YD.		27	27(P)
	2563.601	TRAFFIC CONTROL	LUMP SUM	1		1
⑧	2573.502	SILT FENCE TYPE MACHINE SLICED	LIN. FT.	340		340
⑨	2575.523	EROSION CONTROL BLANKET CATEGORY 3	SQ. YD	1,845		1,845
⑩	2575.555	TURF ESTABLISHMENT	LUMP SUM	1		1
⑪	2580.603	INTERIM PAVEMENT MARKINGS	LIN. FT.	360		360

(P) PLAN

TYPICAL SECTION

STA. 115+50 TO STA. 123+50



NOTES: ALL UTILITY POLES AND UNYIELDING OBJECTS WILL BE LOCATED OUTSIDE THE 37 FT. RECOVERY AREA BY OTHERS.

BASIS OF PLANNED QUANTITIES

AGGREGATE BASE CLASS 5 –	140 LBS / CU. FT. COMPACTED
AGGREGATE SHOULDER CLASS 2 –	140 LBS / CU. FT. COMPACTED
BITUMINOUS MIX	110 LBS / SQ. YD./ 1" DEPTH

QUANTITY NOTES:

① APPROX. 0.2 ACRES WOODS.

② APPROX. LOCATION LT. STA. 117+15 TO STA. 121+00. SPEC. NO. 1903 DOES NOT APPLY TO ITEM NO. 2104.501 REMOVE FENCE.

③ 308 TON FOR MAINLINE AND 118 TON FOR ENTRANCES.

④ 545 TON FOR MAINLINE AND 3 TON FOR ENTRANCES.

⑤ FABRICATION AND GALVANIZING, PER SPEC 3394, OF SAFETY GRATE TO BE INCIDENTAL TO ITEM NO. 2402.521 STRUCTURAL STEEL. SEE SHEETS G1 & G2 FOR GRATE DETAIL.

⑥ SEE SHEET NO. 15 FOR PIPE CLASS.

⑦ PLACE RIPRAP ON 9" GRANULAR FILTER OR GEOTEXTILE MATERIAL WHICH SHALL BE CONSIDERED INCIDENTAL AND NO DIRECT COMPENSATION WILL BE MADE THEREFOR.

⑧ APPROX. LOCATION LT. STA. 119+00 TO STA. 120+20 AND RT. STA. 119+20 TO STA. 120+15. TO BE LOCATED IN THE FIELD BY THE ENGINEER. SPEC. NO. 1903 DOES NOT APPLY TO ITEM NO. 2573.502

⑨ PLACE BLANKET ON BACKSLOPE LT. 37' TO BOTTOM OF SLOPE STA. 117+50 TO STA. 121+50 AND RT. 37' TO BOTTOM OF SLOPE STA. 117+50 TO STA. 123+50. BLANKET TO BE LOCATED IN THE FIELD BY THE ENGINEER. SPEC. NO. 1903 DOES NOT APPLY TO ITEM NO. 2575.523.

⑩ APPROX. 2 ACRES

⑪ SPEC. NO. 1903 DOES NOT APPLY TO ITEM NO. 2580.603

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
3040F	CORRUGATED METAL PIPE CULVERT
3123J	METAL APRON FOR C.S. PIPE
3124B	METAL APRON CONNECTION
3145F	CONCRETE PIPE TIES
3221C	CORRUGATED STEEL PIPE COUPLING BAND
8000I	STANDARD BARRICADES
9000D	APPROACHES AND ENTRANCES

AS BUILT PLANS

CERTIFIED BY Kaye M Reinick LICENSED PROFESSIONAL ENGINEER REG. NO. 19917 12/3 2007

S.A.P. NO. 55-612-18

SHEET 2 OF 20 SHEETS

F.E. LT. STA. 114+08
18" X 32' R.C. PIPE CULV.
NO APRONS
NO CHANGE

F.E. LT. STA. ~~117+69~~ 118+90
NO CULV.
NO CHANGE

RES. DR. LT. STA. 126+04
18" X 32' C.M.P. CULV.
NO APRONS
NO CHANGE

RES. DR. RT. STA. 114+57
18" X 32' C.M.P. CULV.
2-18" C.S. PIPE APRONS
NO CHANGE

F.E. RT. STA. ~~117+42~~ 118+97
18" X ~~28'~~ 51' C.M.P. CULV.
2-18" C.S. PIPE APRONS

18"x 40' C.M. PIPE CULV.
2 - 18" G.S. PIPE APRONS

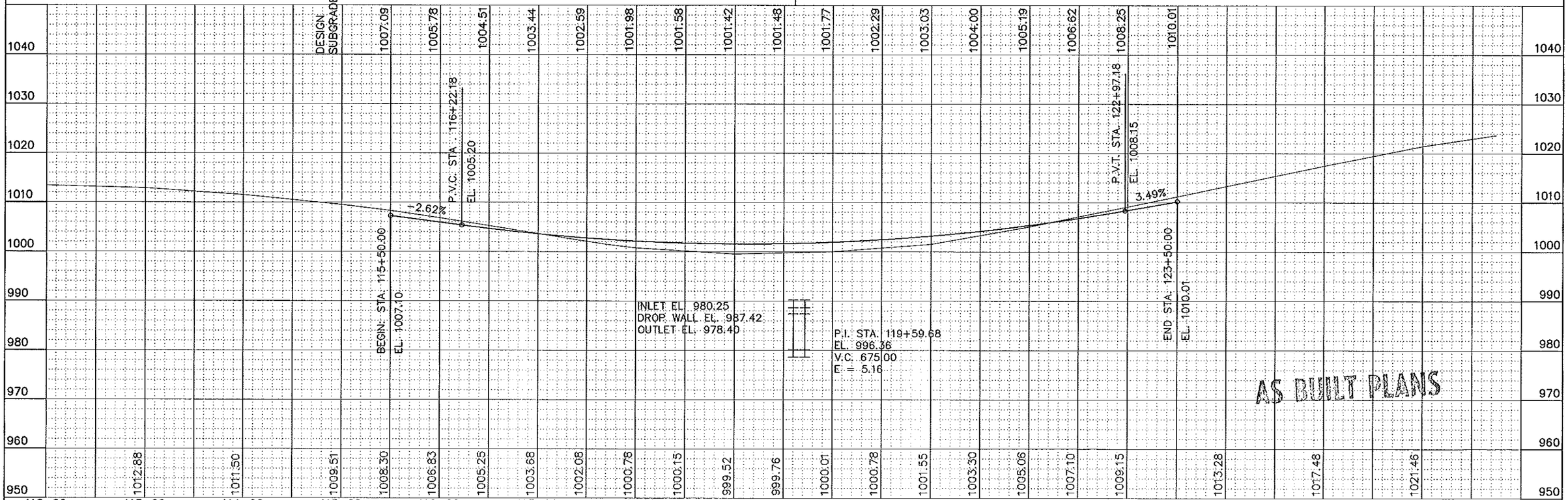
BR. NO. 89172 STA. 119+61
21' X 80' TIMBER BOX CULVERT

SEE SHEET NO. 14 FOR NEW BRIDGE INFORMATION

RES. DR. RT. STA. 126+74
18" X 56' C.M.P. CULV.
NO APRONS
NO CHANGE

NOTE: ALL R/W DIMENSIONS ARE BASED OFF THE SECTION LINE.

SCALES: HOR. 0 50' 100'
VER. 0 10' 20'



AS BUILT PLANS

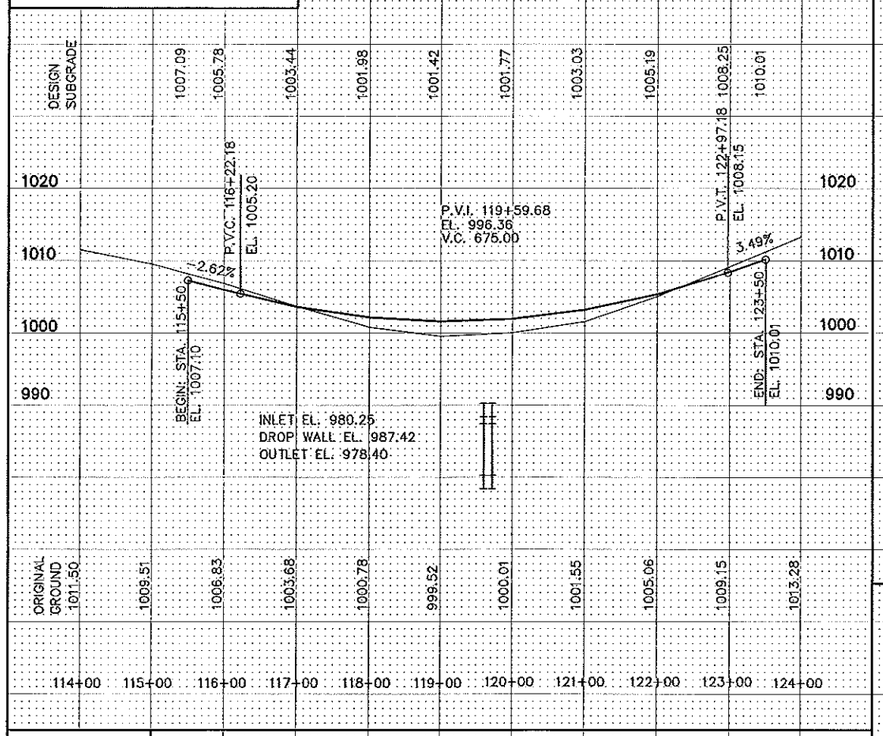
CERTIFIED BY Kaye M Bierwirth PROFESSIONAL ENGINEER REG. NO. 19917 12/3 2007

S.A.P. 55-612-18

SHEET 3 OF 20 SHEETS

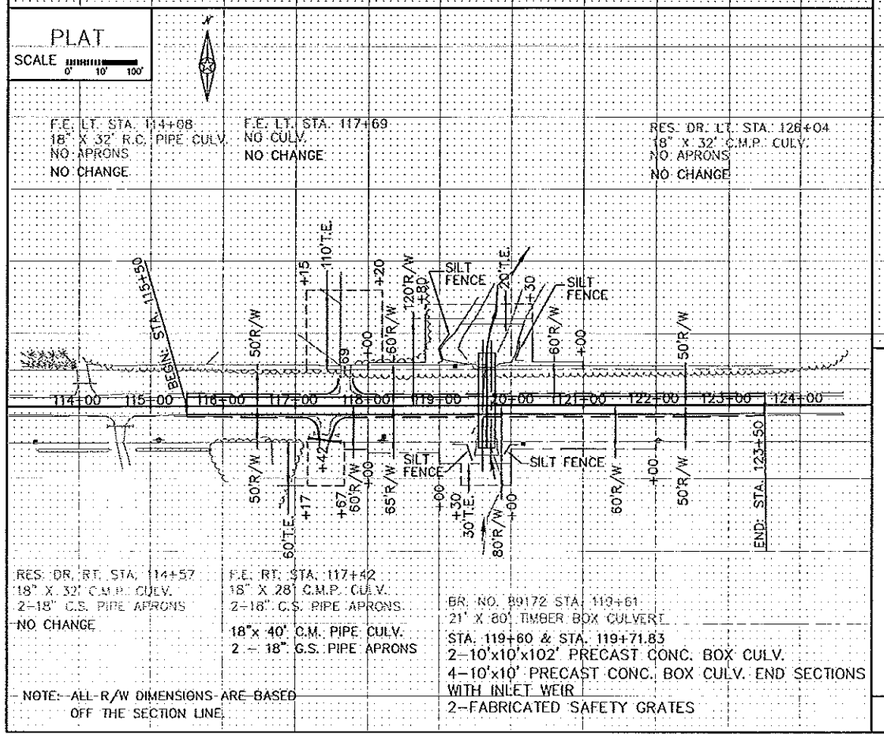
CONTRACTED PROFILE

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



PLAT

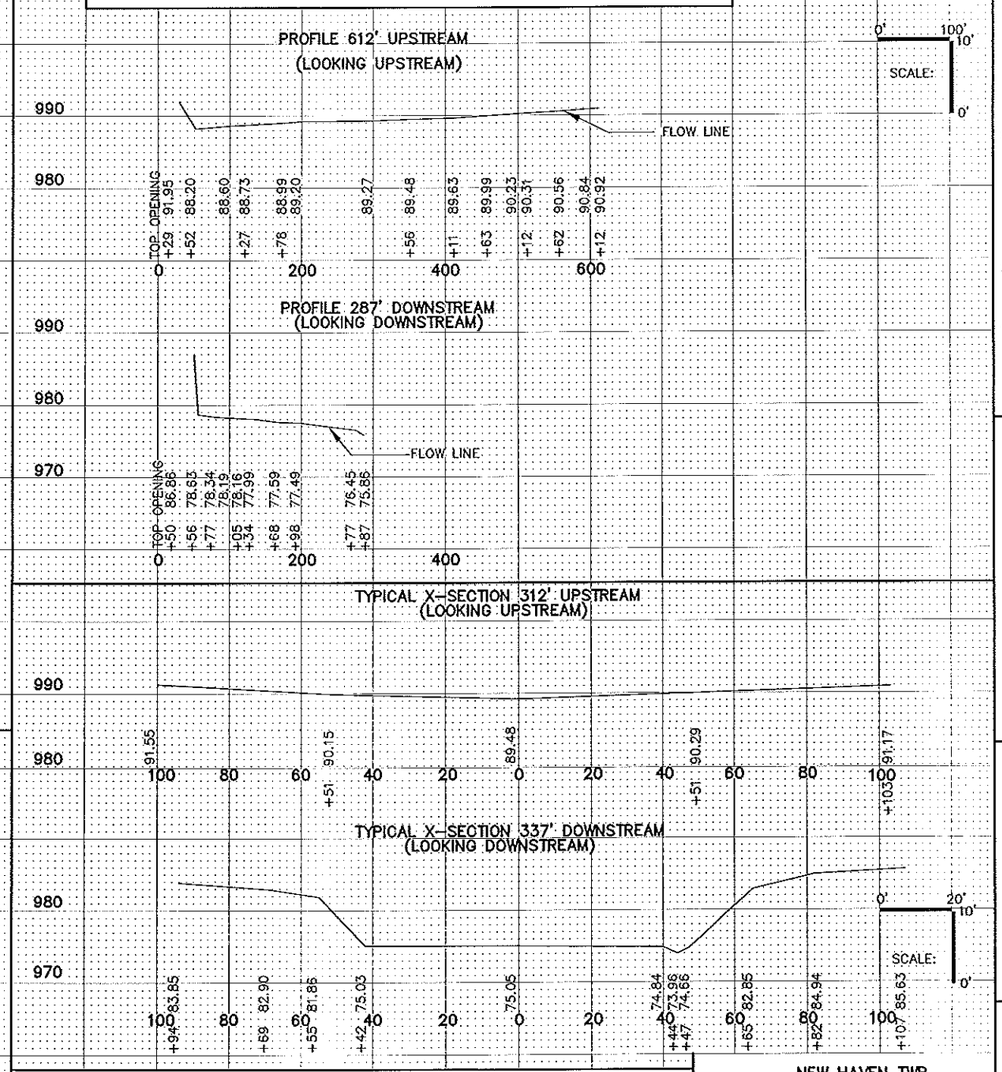
SCALE 0' 10' 100'

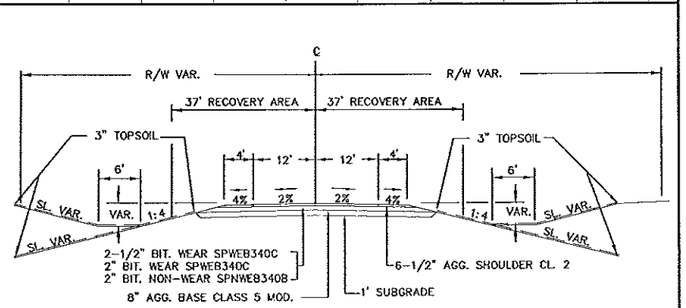


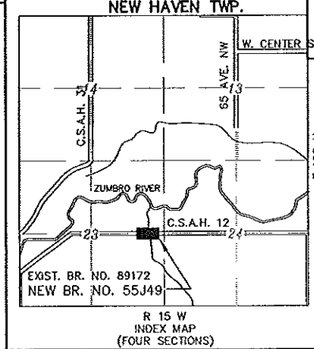
NOTE: ALL R/W DIMENSIONS ARE BASED OFF THE SECTION LINE

TYPICAL SECTIONS & PERTINENT DATA

SCALE AS SHOWN







CERTIFIED BY Kayne M Baierich REG. NO. 19517 12/3 2007
LICENSED PROFESSIONAL ENGINEER

S.A.P. 55-612-18

SHEET NO 14 OF 20 SHEETS

Fed. Proj. No.

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 6/24/03

Stream or ditch designation NO NAME
Drainage area 0.8 sq. mi.
Max. flood on record Unknown Design flood (Unknown yr. freq.) ..... C.F.S.
Max. observed highwater elevation Unknown Design highwater elevation 983.9
Design mean velocity through structure 13.3 F.P.S. Outlet
Low superstructure at or above elevation N/A
Flowline 980.2 Skew angle NO SKEW
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 1050 C.F.S. at stage 983.9 and mean velocity of 13.3 F.P.S. with 3.7 Ft. swellhead. The above recommendation will provide a structure of adequate waterway to pass the regional flood within criteria established by the Dept. of National Resources.

FOUNDATION ENGINEERS RECOMMENDATION
DATE .....

AS BUILT PLANS

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

Bench mark elevation ..... (M.S.L. 1929 Adj.)
Location: .....

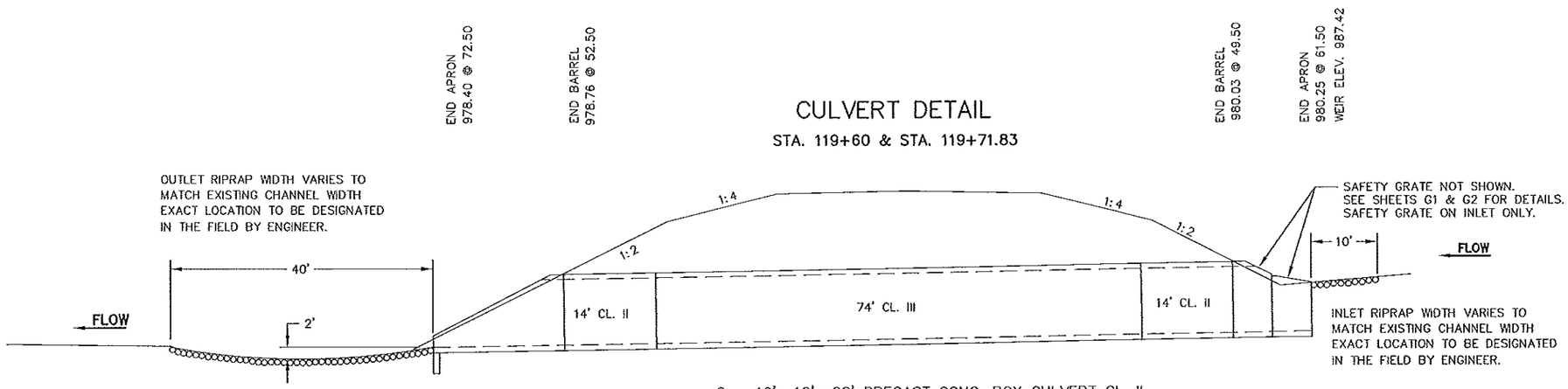
MINNESOTA
DEPARTMENT OF TRANSPORTATION

BRIDGE SURVEY

AT MILE POINT 0.8 MI. E. OF JCT C.S.A.H. 3
(T.H., C.S.A.H., C.R. etc.)
PROPOSED BRIDGE LOCATED 0.8 MILES EAST OF JCT. C.S.A.H. 3
SEC. 23 TWP. 108 R 15
TOWNSHIP NEW HAVEN COUNTY OLMSTED
BRIDGE NO. 55J49

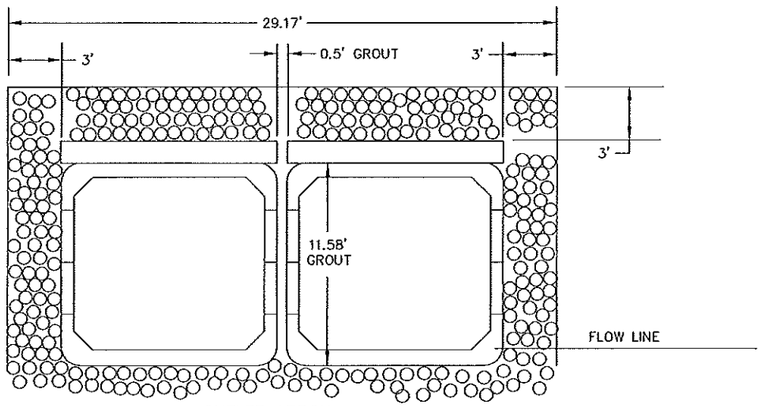
CULVERT DETAIL

STA. 119+60 & STA. 119+71.83

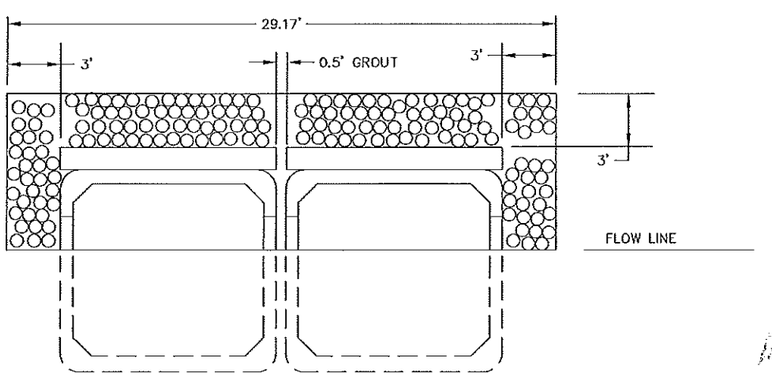


2 – 10'x 10'x 28' PRECAST CONC. BOX CULVERT CL. II
2 – 10'x 10'x 74' PRECAST CONC. BOX CULVERT CL. III
4– 10'x 10' PRECAST CONC. END SECTIONS

RIPRAP DETAIL



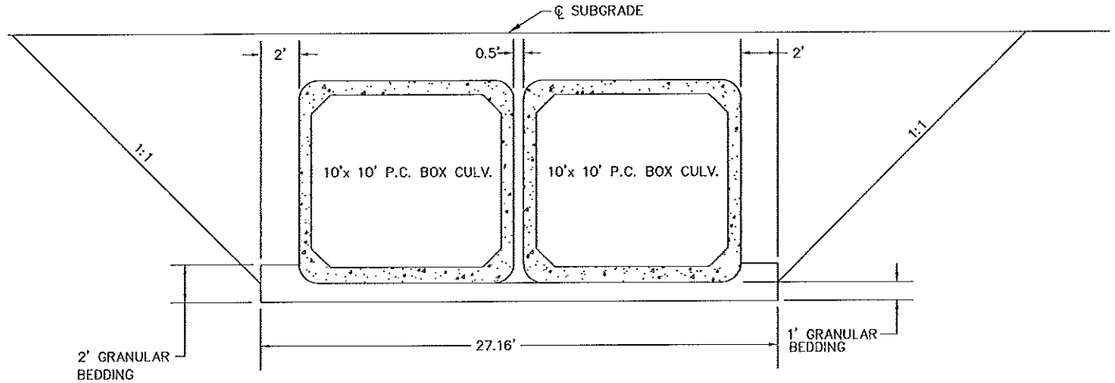
OUTLET APRON



INLET APRON

BEDDING DETAIL

STA. 119+60 & STA. 119+71.83



NOTES:

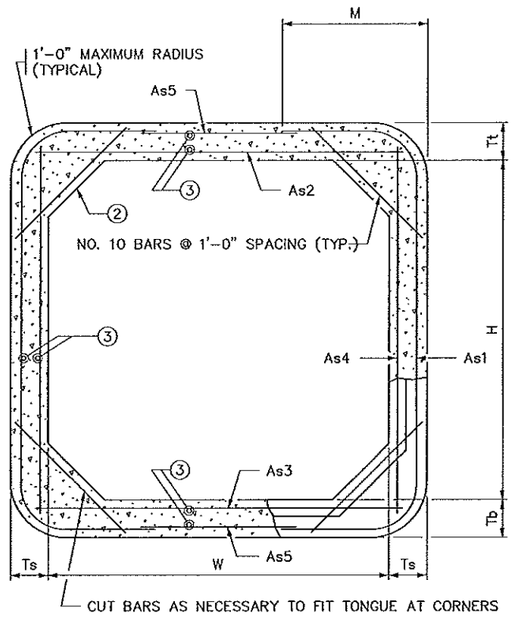
1. CULVERT EXCAVATION WILL BE CONSIDERED INCIDENTAL AND WILL BE INCLUDED FOR PAYMENT UNDER UNIT PRICE FOR ITEM NO. 2412.511 AND ITEM NO. 2412.512.
2. CULVERT TO BE BACK FILLED WITH EXCAVATION MATERIAL AND WILL BE CONSIDERED INCIDENTAL TO UNCLASSIFIED EXCAVATION AND NO DIRECT COMPENSATION WILL BE MADE.
3. ALL DIMENSIONS AND SLOPES SHOWN ON TYPICAL SECTION ARE APPROXIMATE.
4. GRANULAR BEDDING TO BE PLACED UNDER BARREL SECTIONS ONLY.
5. PLACE RIPRAP ON 9" GRANULAR FILTER OR GEOTEXTILE MATERIAL WHICH SHALL BE CONSIDERED INCIDENTAL AND NO COMPENSATION WILL BE MADE THEREFORE.
6. 0.5' BETWEEN BOX CULVERTS SHALL BE GROUTED WITH LEAN MIX BACKFILL, SEE ITEM NO. 2520.501, FROM INLET END OF APRON TO OUTLET END OF APRON.

AS BUILT PLANS

CERTIFIED BY Kaye M Bierwirth LICENSED PROFESSIONAL ENGINEER REG. NO. 19917 10/10 2007

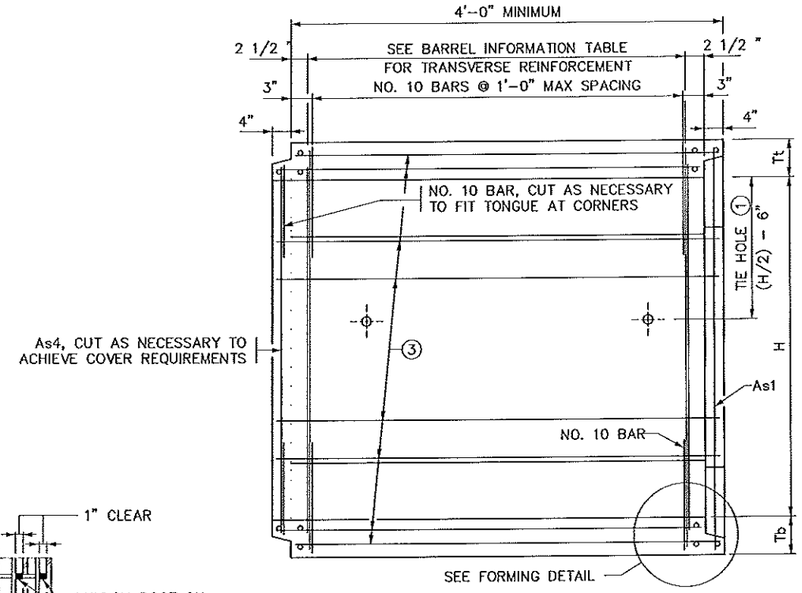
S.A.P. NO. 55-612-18

SHEET 15 OF 20 SHEETS



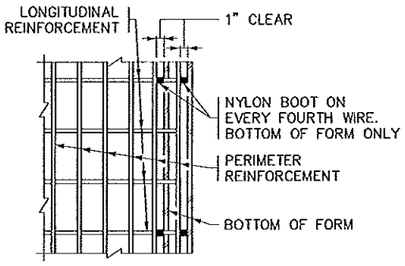
TRANSVERSE BARREL SECTION

BAR REINFORCEMENT OPTION SHOWN

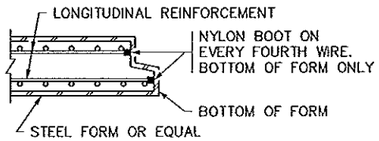


LONGITUDINAL BARREL SECTION

BAR REINFORCEMENT OPTION SHOWN

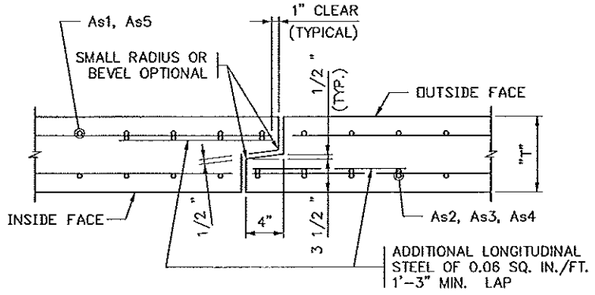


PLAN

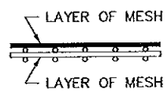


SECTION

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 MnDOT SPEC. 2412 EXCEPT AS NOTED.

FILL HEIGHTS OF LESS THAN 2'-0" REQUIRE A DISTRIBUTION SLAB. SEE FIG. 5-395.100(A) AND FIG. 5-395.100(B) FOR ADDITIONAL INFORMATION.

IF THE DISTANCE BETWEEN DOUBLE BARRELS IS LESS THAN 2'-0" USE EITHER PEA ROCK OR LEAN MIX BACKFILL(MnDOT SPEC. 2520) BETWEEN THE CULVERTS AS APPROVED BY THE ENGINEER. (ALSO, PROVIDE APPROVED GROUT SEEPAGE CORE, MINIMUM 12" THICK, BETWEEN THE CULVERT'S TWO ENDS.) MINIMUM DISTANCE REQUIRED IS 6".

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

1 1/2 " 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. 19. THE MAXIMUM MESH SIZE SHALL BE 1/2 " DIA. PER LAYER (MAXIMUM OF 2 LAYERS).

THE SPACING CENTER TO CENTER OF THE TRANSVERSE WIRES SHALL NOT BE LESS THAN 2" NOR MORE THAN 4". THE SPACING CENTER TO CENTER OF THE LONGITUDINAL WIRES SHALL NOT BE MORE THAN 8".

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.

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

SHOP DRAWING APPROVAL PER MnDOT SPEC. 3238.2A IS NOT REQUIRED UNLESS OPENINGS OR ATTACHMENTS ARE PLACED ON A BARREL SEGMENT.

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

② HAUNCH SIZE AS FOLLOWS:
6'-0" AND 8'-0" WIDTHS -- 6" TO 12"
10'-0" WIDTH -- 10" TO 12"
12'-0" AND 14'-0" WIDTHS -- 12"

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.)
119+60.00	10' x 10'	2	5000	2-8	10	10	9	10	8	4910	0.57	16'-9"	3'-3"	1.03	10'-6"	0.83	10'-6"	0.20	10'-6"	0.06	6'-9"
119+60.00	10' x 10'	3	5000	8-15	10	10	9	10	8	4910	0.83	16'-3"	3'-0"	1.17	10'-6"	1.31	10'-6"	0.20	10'-6"	0.06	7'-3"
119+71.83	10' x 10'	2	5000	2-8	10	10	9	10	8	4910	0.57	16'-9"	3'-3"	1.03	10'-6"	0.83	10'-6"	0.20	10'-6"	0.06	6'-9"
119+71.83	10' x 10'	3	5000	8-15	10	10	9	10	8	4910	0.83	16'-3"	3'-0"	1.17	10'-6"	1.31	10'-6"	0.20	10'-6"	0.06	7'-3"

REVISION:

APPROVED: DECEMBER 11, 2000
Donald J. Flemming
STATE BRIDGE ENGINEER

AS BUILT PLANS

S.A.P. 55-612-18 STA. 119+60.00 & STA. 119+71.83

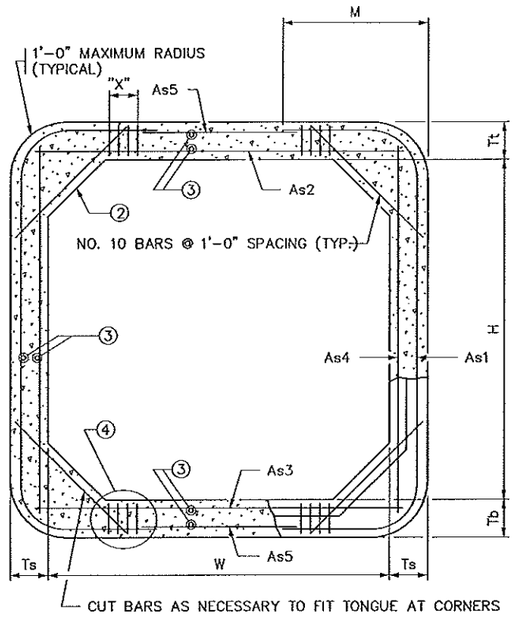
CERTIFIED BY Kaye M Berenick PROFESSIONAL ENGINEER
REG. NO. 19917 10/10 2007

TITLE: BARREL DETAILS

DES: DR: APPROVED:
CHK: CHK:
SHEET NO. 16 OF 20 SHEETS

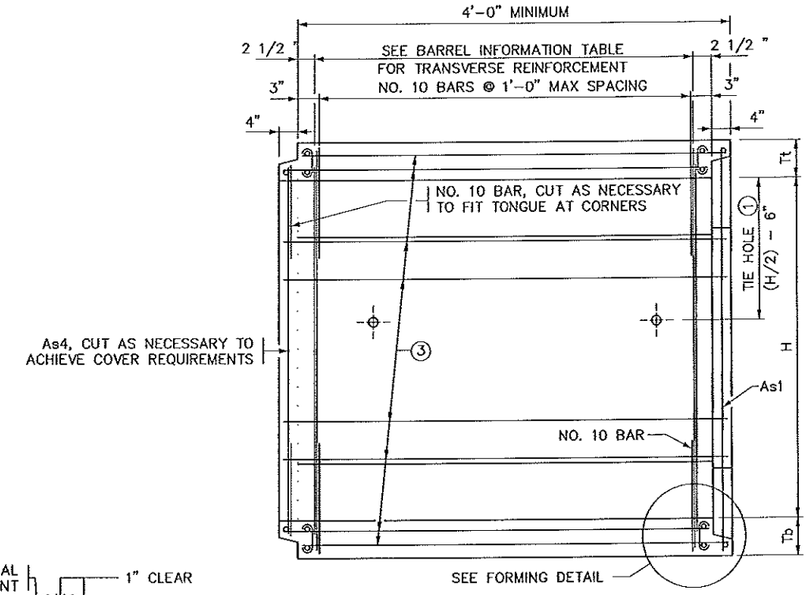
FIG. 5-395.101(A)

BRIDGE NO. 55J49



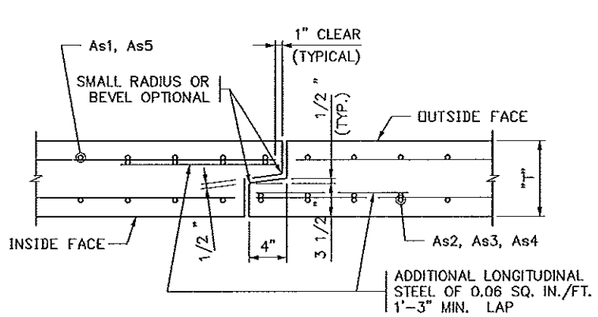
TRANSVERSE BARREL SECTION

BAR REINFORCEMENT OPTION SHOWN

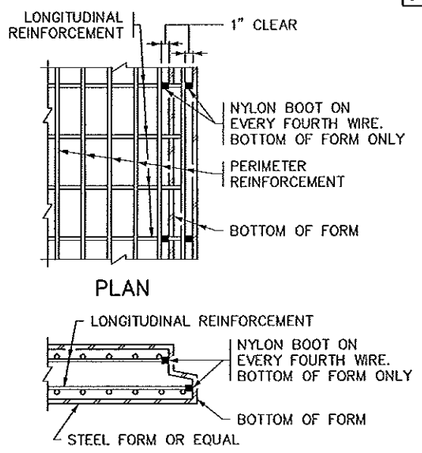


LONGITUDINAL BARREL SECTION

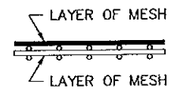
BAR REINFORCEMENT OPTION SHOWN



TONGUE AND GROOVE JOINT DETAIL



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

CONSTRUCTION NOTES

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

FILL HEIGHTS OF LESS THAN 2'-0" REQUIRE A DISTRIBUTION SLAB. SEE FIG. 5-395.100(A) AND FIG. 5--395.100(B) FOR ADDITIONAL INFORMATION.

IF THE DISTANCE BETWEEN DOUBLE BARRELS IS LESS THAN 2'-0" USE EITHER PEA ROCK OR LEAN MIX BACKFILL (MnDOT SPEC. 2520) BETWEEN THE CULVERTS AS APPROVED BY THE ENGINEER. (ALSO, PROVIDE APPROVED GROUT SEEPAGE CORE, MINIMUM 12" THICK, BETWEEN THE CULVERT'S TWO ENDS.) MINIMUM DISTANCE REQUIRED IS 6".

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

1 1/2 " 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. 19. THE MAXIMUM MESH SIZE SHALL BE 1/2 " DIA. PER LAYER (MAXIMUM OF 2 LAYERS).

THE SPACING CENTER TO CENTER OF THE TRANSVERSE WIRES SHALL NOT BE LESS THAN 2" NOR MORE THAN 4". THE SPACING CENTER TO CENTER OF THE LONGITUDINAL WIRES SHALL NOT BE MORE THAN 8".

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.

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

SHOP DRAWING APPROVAL PER MnDOT SPEC. 3238.2A IS REQUIRED.

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

(2) HAUNCH SIZE AS FOLLOWS:
6'-0" AND 8'-0" WIDTHS - 6" TO 12"
10'-0" WIDTH - 10" TO 12"
12'-0" AND 14'-0" WIDTHS - 12"

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

(4) SEE STANDARD PLATE NO. 3007 FOR SHEAR REINFORCEMENT OPTIONS. THE MAXIMUM SHEAR REINFORCEMENT SPACING IN THE LONGITUDINAL DIRECTION SHALL BE 6".

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		
										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.)	AREA (IN.²/FT.)	MAX. SPG. (IN.)	X (IN.)

AS BUILT PLANS

REVISION:
APPROVED: DECEMBER 11, 2000
Donald J. Flemming STATE BRIDGE ENGINEER

S.A.P. 55-612-18 STA. 119+60.00 & STA. 119+71.83

CERTIFIED BY Kaye M Briesnick PROFESSIONAL ENGINEER
REG. NO. 19917 10/10 2007

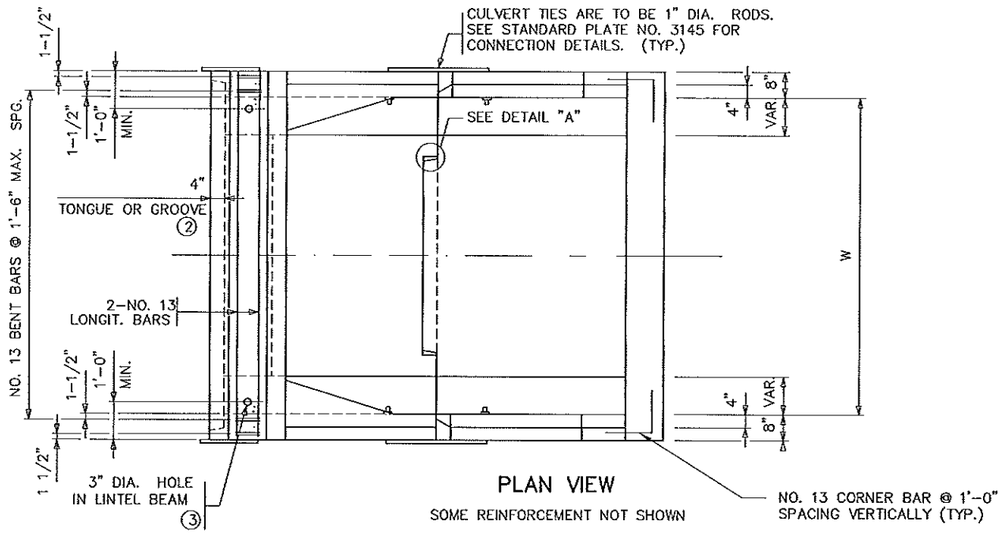
TITLE: BARREL DETAILS (SPECIAL DESIGN)

DES: DR: APPROVED:
CHK: CHK:

SHEET NO. 17 OF 20 SHEETS

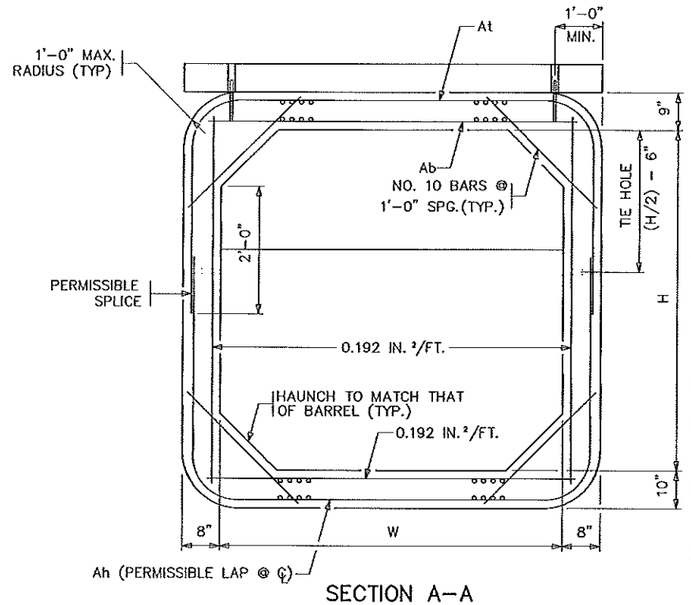
FIG. 5-395.101(B)

BRIDGE NO. 55J49



PLAN VIEW

SOME REINFORCEMENT NOT SHOWN



SECTION A–A

CONSTRUCTION NOTES

SEE FIG. 5-395.101(A) AND FIG. 5-395.101(B) FOR ADDITIONAL DIMENSIONS AND CONSTRUCTION NOTES.

ALL END SECTIONS REQUIRE CURB ON LINTEL BEAM.

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 AREA.

FINISH ALL EXPOSED EDGES OF CONCRETE WITH 1/2" OR 3/4" CHAMFER OR RADIUS UNLESS OTHERWISE NOTED.

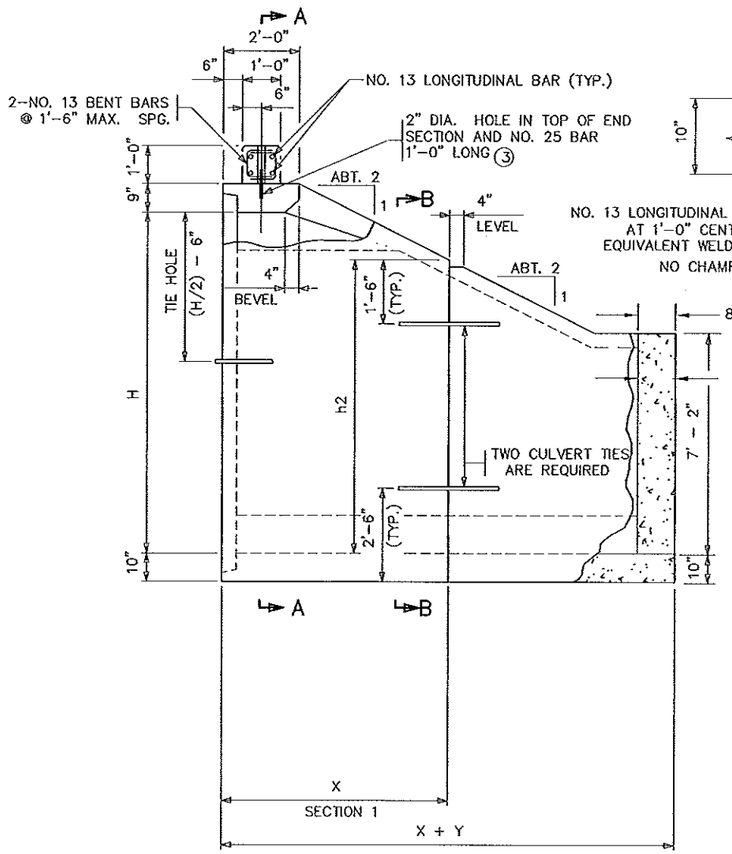
(1) ~~WITH DOUBLE BOXES LOCATE DROPWALL JOINTS BETWEEN END SECTIONS. SEE FIG. 5-395.111 FOR ALTERNATE DROPWALLS. LIMITS OF EXCAVATION FOR DROPWALL TO BE APPROXIMATELY THE SAME AS DROPWALL DIMENSIONS. DROPWALL TO BE CONCRETE MIX NO. 1A43 OR MIX NO. 3Y43. FURNISHING AND INSTALLATION OF DROPWALL TO BE INCLUDED IN PRICE BID FOR END SECTIONS. DROPWALL NOT REQUIRED FOR NON-WATERWAY USE.~~

(2) CHECK LOCATION TO DETERMINE WHETHER A TONGUE OR A GROOVE IS USED.

(3) FILL HOLE WITH GROUT. 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".

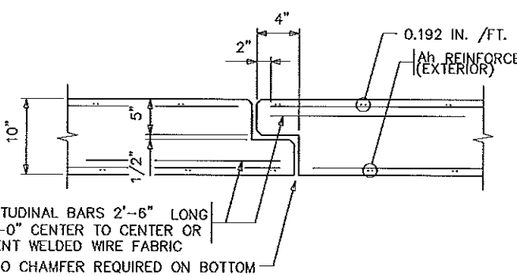
(4) 3'-6" TONGUE AND 3'-7" GROOVE FOR 6'-0" WIDE CULVERTS. 5'-0" TONGUE AND 5'-1" GROOVE FOR CULVERTS OVER 6'-0" WIDE. CENTER TONGUE AND GROOVE ON ℄ OF EACH APRON JOINT.

(5) SHOP DRAWING APPROVAL PER SPEC. 3238.2A IS REQUIRED.



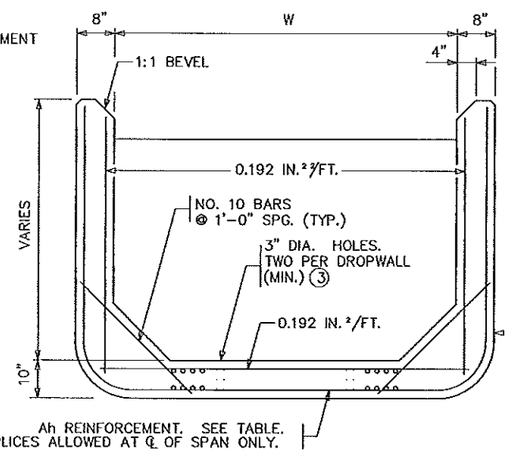
SIDE ELEVATION

GEOMETRY AND REINFORCING IN END WALL SHALL MATCH SIDEWALLS (SEE SECTION B–B)

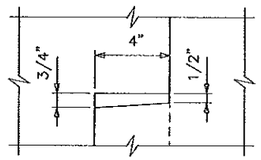


TONGUE AND GROOVE JOINT DETAIL

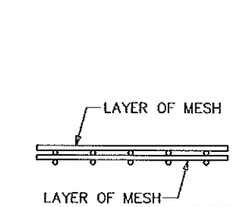
BETWEEN END SECTIONS



SECTION B–B

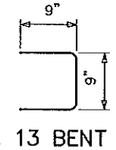


DETAIL "A"

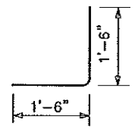


FABRIC LAYER DETAIL

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.



NO. 13 BENT BAR



NO. 13 CORNER BAR

At, Ab REINFORCEMENT		
WIDTH (FT.)	At (IN ²/FT.)	Ab (IN ²/FT.)
6	.27	.44
8	.47	.60
10	.62	.74
12	.88	1.06
14	1.20	1.58

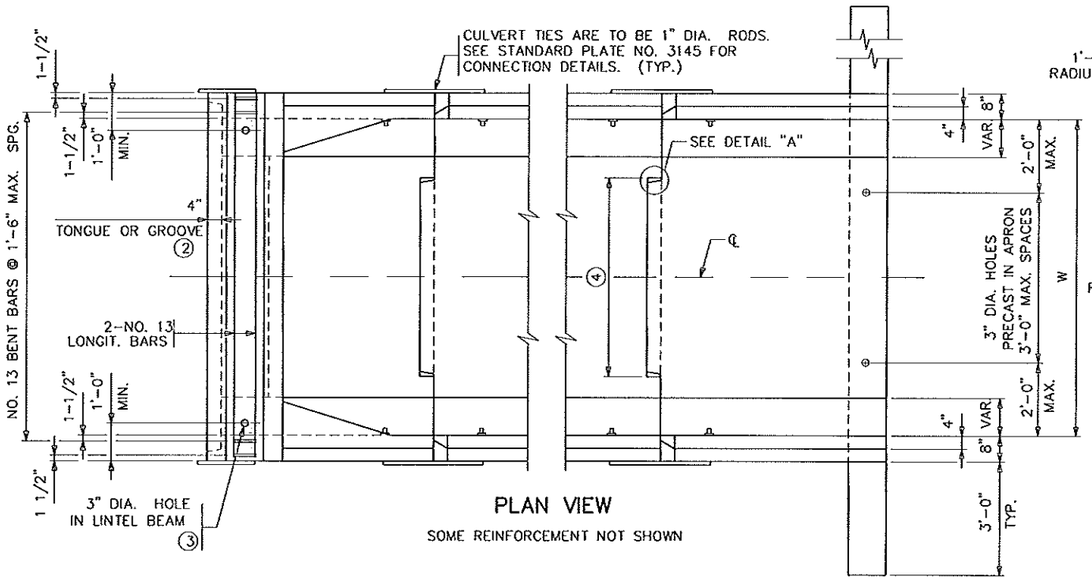
APRON DIMENSIONS & Ah REINFORCEMENT

H	L	SECTION 1		h2	SECTION 2		h3	SECTION 3		h4	SECTION 4		h5	SECTION 5		h6
FT.	FT.	X	Ah		Y	Ah		Z	Ah		ZZ	Ah		ZZZ	Ah	
4	8	8'	0.192	1'-9"												
5	10	6'	0.192	3'-9"	4'	0.192	1'-9"									
6	12	6'	0.192	4'-9"	6'	0.192	1'-9"									
7	14	6'	0.192	5'-9"	8'	0.192	1'-9"									
8	16	6'	0.20	6'-9"	6'	0.192	3'-9"	4'	0.192	1'-9"						
9	18	6'	0.29	7'-9"	6'	0.20	4'-9"	6'	0.192	1'-9"						
10	20	6'	0.42	8'-9"	6'	0.29	5'-9"	8'	0.192	1'-9"						
11	22	6'	0.60	9'-9"	6'	0.42	6'-9"	6'	0.192	3'-9"	4'	0.192	1'-9"			
12	24	6'	0.78	10'-9"	6'	0.60	7'-9"	6'	0.20	4'-9"	6'	0.192	1'-9"			
13	26	6'	1.03	11'-9"	6'	0.78	8'-9"	6'	0.28	5'-9"	8'	0.192	1'-9"			
14	28	6'	1.38	12'-9"	6'	1.03	9'-9"	6'	0.40	6'-9"	6'	0.192	3'-9"	4'	0.192	1'-9"

* NOTE: Ah IS AREA OF REINFORCEMENT PER FOOT OF LENGTH (IN ²/FT.)

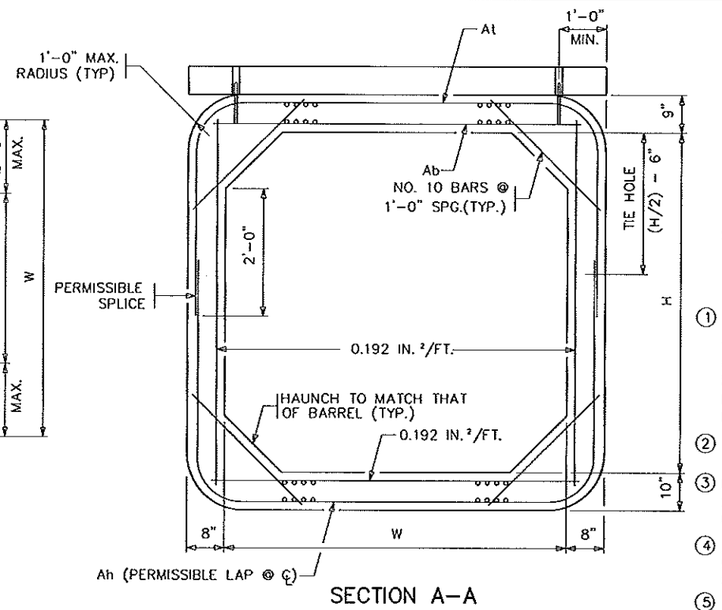
AS BUILT PLANS

REVISION: 06-30-2003	S.A.P. 55-612-18 STA. 119+60 & STA. 119+71.83 INLET APRONS ONLY		FIG. 5-395.102 (MODIFIED)
APPROVED: DECEMBER 11, 2000	CERTIFIED BY Kaye M Bierwirth PROFESSIONAL ENGINEER	TITLE: PRECAST CONCRETE END SECTION TYPE I - SINGLE OR DOUBLE BARREL FOR SKEWS UP TO 7-1/2°	DES: DR: APPROVED:
Donald J. Flemming STATE BRIDGE ENGINEER	REG. NO. 19919 12/3 20 07		CHK: CHK:
		SHEET NO. 18 OF 20 SHEETS	BRIDGE NO. 55J49



PLAN VIEW

SOME REINFORCEMENT NOT SHOWN



SECTION A–A

CONSTRUCTION NOTES

SEE FIG. 5-395.101(A) AND FIG. 5-395.101(B) FOR ADDITIONAL DIMENSIONS AND CONSTRUCTION NOTES.

ALL END SECTIONS REQUIRE CURB ON LINTEL BEAM.

ON ALL END SECTIONS FOR WATERWAYS, USE DROPWALLS ON INLET AND OUTLET ENDS.

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 AREA.

~~SEE FIG. 5-395.115 FOR EMBANKMENT PROTECTION.~~

FINISH ALL EXPOSED EDGES OF CONCRETE WITH 1/2" OR 3/4" CHAMFER OR RADIUS UNLESS OTHERWISE NOTED.

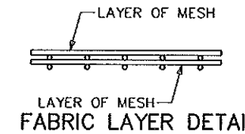
(1) WITH DOUBLE BOXES LOCATE DROPWALL JOINTS BETWEEN END SECTIONS. SEE FIG. 5-395.111 FOR ALTERNATE DROPWALLS. LIMITS OF EXCAVATION FOR DROPWALL TO BE APPROXIMATELY THE SAME AS DROPWALL DIMENSIONS. DROPWALL TO BE CONCRETE MIX NO. 1A43 OR MIX NO. 3Y43. FURNISHING AND INSTALLATION OF DROPWALL TO BE INCLUDED IN PRICE BID FOR END SECTIONS. DROPWALL NOT REQUIRED FOR NON-WATERWAY USE.

(2) CHECK LOCATION TO DETERMINE WHETHER A TONGUE OR A GROOVE IS USED.

(3) FILL HOLE WITH GROUT. 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".

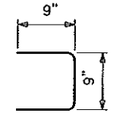
(4) 3'-6" TONGUE AND 3'-7" GROOVE FOR 6'-0" WIDE CULVERTS. 5'-0" TONGUE AND 5'-1" GROOVE FOR CULVERTS OVER 6'-0" WIDE. CENTER TONGUE AND GROOVE ON ℄ OF EACH APRON JOINT.

(5) AS AN ALTERNATE TO THE ONE LAYER MESH, PROVIDE TWO LAYERS OF REBAR OR WIRE MESH WITH THE STEEL AREA EQUAL TO HALF OF THE TEMPERATURE STEEL PER CODE REQUIREMENTS IN EACH FACE OF THE DROPWALL.

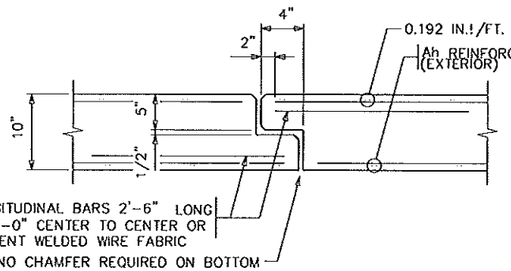


FABRIC LAYER DETAIL

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.



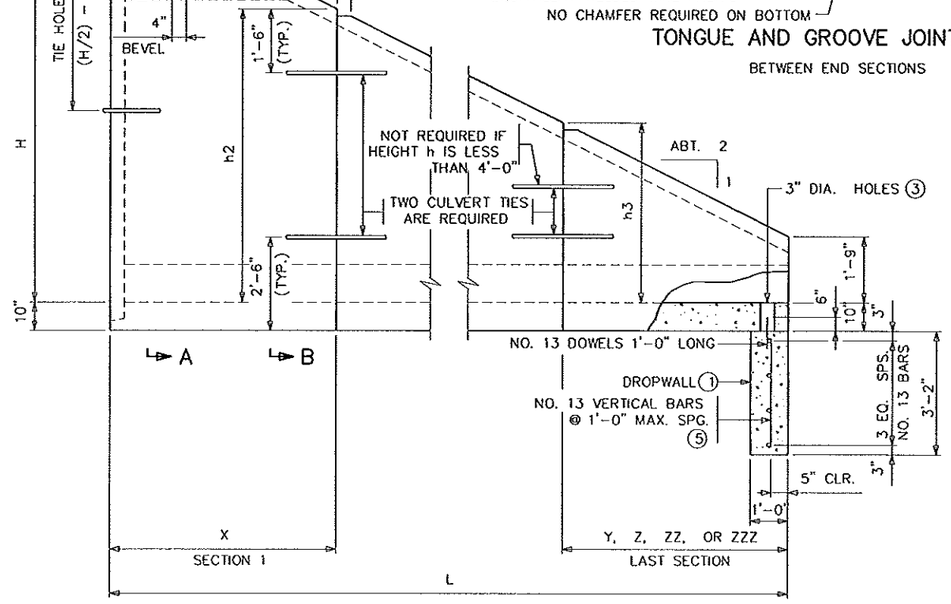
NO. 13 BENT BAR



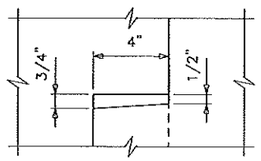
TONGUE AND GROOVE JOINT DETAIL

BETWEEN END SECTIONS

SECTION B–B



SIDE ELEVATION



DETAIL "A"

At, Ab REINFORCEMENT		
WIDTH (FT.)	At (IN ²/FT.)	Ab (IN ²/FT.)
6	.27	.44
8	.47	.60
10	.62	.74
12	.88	1.06
14	1.20	1.58

* APRON DIMENSIONS & Ah REINFORCEMENT

H	L	SECTION 1		h2	SECTION 2		h3	SECTION 3		h4	SECTION 4		h5	SECTION 5		h6
FT.	FT.	X	Ah		Y	Ah		Z	Ah		ZZ	Ah		ZZZ	Ah	
4	8	8'	0.192	1'-9"												
5	10	6'	0.192	3'-9"	4'	0.192	1'-9"									
6	12	6'	0.192	4'-9"	6'	0.192	1'-9"									
7	14	6'	0.192	5'-9"	8'	0.192	1'-9"									
8	16	6'	0.20	6'-9"	6'	0.192	3'-9"	4'	0.192	1'-9"						
9	18	6'	0.29	7'-9"	6'	0.20	4'-9"	6'	0.192	1'-9"						
10	20	6'	0.42	8'-9"	6'	0.29	5'-9"	8'	0.192	1'-9"						
11	22	6'	0.60	9'-9"	6'	0.42	6'-9"	6'	0.192	3'-9"	4'	0.192	1'-9"			
12	24	6'	0.78	10'-9"	6'	0.60	7'-9"	6'	0.20	4'-9"	6'	0.192	1'-9"			
13	26	6'	1.03	11'-9"	6'	0.78	8'-9"	6'	0.28	5'-9"	8'	0.192	1'-9"			
14	28	6'	1.38	12'-9"	6'	1.03	9'-9"	6'	0.40	6'-9"	6'	0.192	3'-9"	4'	0.192	1'-9"

NOTE: Ah IS AREA OF REINFORCEMENT PER FOOT OF LENGTH (IN ²/FT.)

AS BUILT PLANS

REVISION: 06-30-2003

APPROVED: DECEMBER 11, 2000

Donald J. Klemmy

STATE BRIDGE ENGINEER

S.A.P. 55-612-18 STA. 119+60.00 & STA. 119+71.83 OUTLET APRONS ONLY

FIG. 5-395.102 (MODIFIED)

CERTIFIED BY Kay M Bollerud PROFESSIONAL ENGINEER

REG. NO. 19917 10/10 20 07

DRG. PRECAST CONCRETE END SECTION TYPE I - SINGLE OR DOUBLE BARREL FOR SKEWS UP TO 7-1/2°

DES: DR: APPROVED:

CHK: CHK:

SHEET NO. 19 OF 20 SHEETS

BRIDGE NO. 55J49