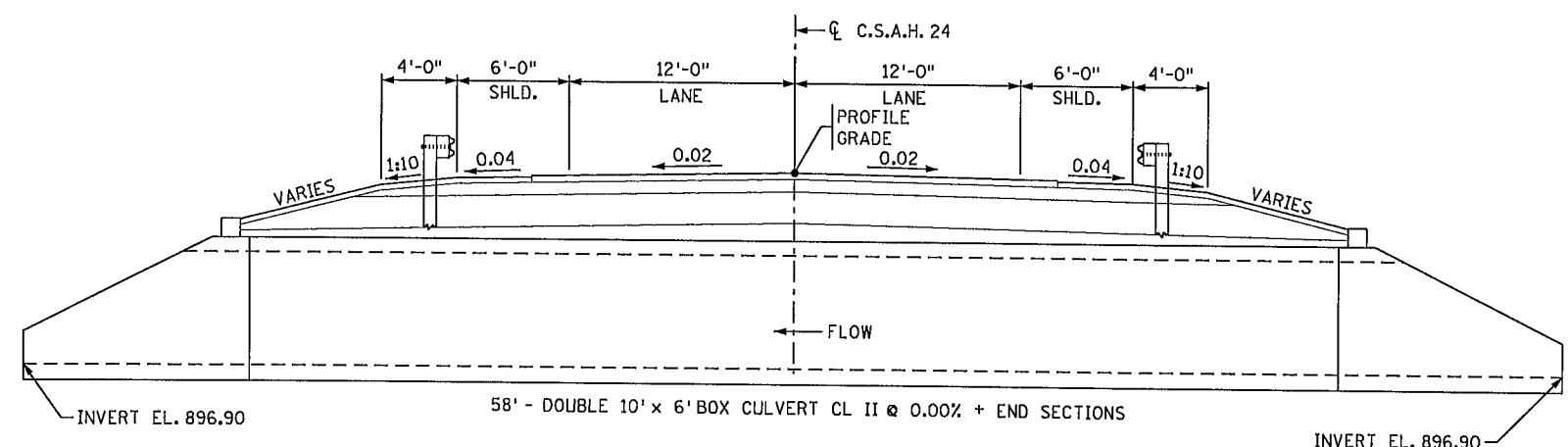


GENERAL PLAN - DOUBLE 10'-0" X 6'-0" PRECAST BOX CULVERT

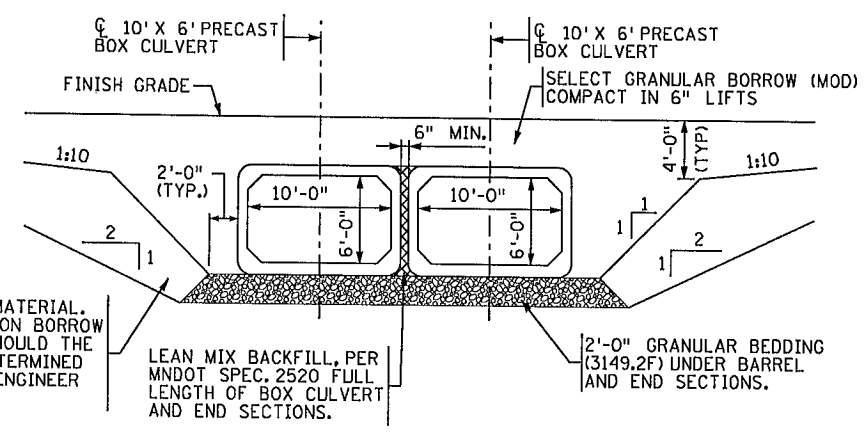
| DESIGN DATA | |
|--|-----------------------------|
| 2007 AND CURRENT INTERIM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS DESIGN LOADING HS25 LIVE LOAD | |
| INSIDE HEIGHT | 6'-0" |
| INSIDE WIDTH | 10'-0" |
| BARREL EXTENSION LENGTH | 58'-0" (EACH) |
| DESIGN FILL DEPTH | 2'-0" - 8'-0" |
| MAXIMUM ALLOWABLE DESIGN STRESSES: | |
| REINFORCED CONCRETE: | |
| f'_c | 5,000 P.S.I. $n = 8$ |
| f_y | 65,000 P.S.I. REINFORCEMENT |
| STRUCTURAL STEEL: | |
| f_y | 36,000 P.S.I. |
| STRUCTURAL STEEL MNDOT 3306 | |

| LIST OF SHEETS | |
|----------------|--|
| NO. | DESCRIPTION |
| B1 | GENERAL PLAN AND ELEVATION |
| B2 | PRECAST BOX CULVERT BARREL DETAILS |
| B3 | PRECAST CONCRETE END SECTION TYPE III |
| B4 | PRECAST CONCRETE END SECTION TYPE III |
| B5 | ALTERNATE DROPWALLS FOR BOX CULVERT |
| B6 | EMBANKMENT PROTECTION FOR BOX CULVERTS |
| B7 | BRIDGE SURVEY |
| B8 | BRIDGE SURVEY - PLAN & PROFILE |



GENERAL ELEVATION - DOUBLE 10'-0" X 6'-0" PRECAST BOX CULVERT

- NOTES:
- SEE SHEET 5 FOR RANDOM RIPRAP CLASS III EMBANKMENT PROTECTION.
 - AT BARREL JOINTS PROVIDE THREE-PLY JOINT WATERPROOFING PER SPEC 2481 ON OUTSIDE ON THE TOP AND WALLS. ALL BARREL JOINTS SHALL BE EFFECTIVELY SEALED WITH A PREFORMED RUBBER IN JOINTS.
 - SEE SHEET 2 FOR CONCRETE BOX DESIGN INFORMATION.



SECTION A-A THRU PRECAST BOX CULVERT

- NON-PARTICIPATING BRIDGE REMOVAL STATION 17+00.00
 - STRUCTURAL EXCAVATION SHALL INCLUDE CREEK BED EXCAVATION AND GRADING.
- BACKFILL WITH EXCAVATED MATERIAL. COMPACT IN 6" LIFTS. COMMON BORROW MATERIAL SHALL BE USED SHOULD THE EXCAVATED MATERIAL BE DETERMINED TO BE UNSUITABLE BY THE ENGINEER IN THE FIELD.

SCHEDULE OF QUANTITIES FOR BRIDGE


| ITEM NO. | 2451.601 | 2451.507 | 2511.501 | 2412.511 | 2412.512 | 2442.501 | 2511.515 | 2520.501 |
|----------|--------------------------------|-----------------------|-------------------------|---------------------------------------|---|---------------------------|---------------------------|-------------------|
| ITEM | STRUCTURE EXCAVATION CLASS U ② | GRANULAR BEDDING (LV) | RANDOM RIPRAP CLASS III | 10' X 6' PRECAST CONCRETE BOX CULVERT | 10' X 6' PRECAST CONCRETE BOX CULVERT END SECTION | REMOVE OLD BRIDGE 92730 ① | GEOTEXTILE FILTER TYPE IV | LEAN MIX BACKFILL |
| UNIT | LUMP SUM | CU. YD. | CU. YD. | LIN. FT. | EACH | LUMP SUM | SQ. YD. | CU. YD. |
| QUANTITY | 1 | 216 | 52 (P) | 116 | 4 | 1 | 100 | 10 |

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

LICENSED PROFESSIONAL ENGINEER: JAMES ARCHER
DATE: 12/16/10 REG NO.: 45501

**C.S.A.H. 24
ANOKA COUNTY
S.A.P. 02-624-25**

TITLE:
GENERAL PLAN AND ELEVATION

APPROVED: 
ANOKA COUNTY ENGINEER

DATE: 4/24/11

WSB
Associates, Inc.
701 Xenia Avenue
Suite 300
Minneapolis, MN 55416
763-541-4800
FAX 763-541-1700
INFRASTRUCTURE - ENGINEERS - PLANNERS

MINNESOTA DEPARTMENT OF TRANSPORTATION

**DOUBLE 10' X 6' CULVERT
GENERAL PLAN & ELEVATION**

Bridge No. 02J44

PROPOSED BRIDGE LOCATED ON
C.S.A.H 24 1/4 MILE EAST OF
JCT. C.S.A.H. 26 OVER
CEDAR CREEK.

SEC. 28 TWP. 34 N R. 23 W
EAST BETHEL TOWNSHIP ANOKA COUNTY

DES: JDA DR: BJR
CHK: BRL CHK: JDA

02J44

Sheet B1 of B8 Sheets

5/9/2011 12:21:57 PM K:\018993-00\Coord\Plan\BRO2J44\CBR02J44.dgn

CONSTRUCTION NOTES

CULVERTS TO BE CONSTRUCTED AS PER Mn/DOT 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 (Mn/DOT SPEC. 2520) BETWEEN THE CULVERTS AS APPROVED BY THE ENGINEER. 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".

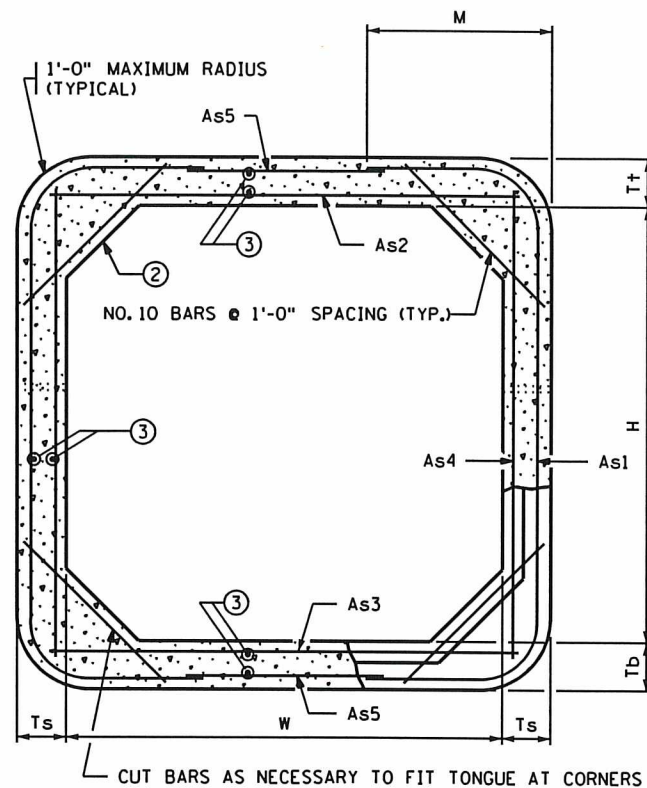
WELDING WILL NOT BE ALLOWED ON REINFORCEMENT BARS OR STEEL FABRIC, EXCEPT THAT THE ORIGINAL WELDING REQUIRED TO MANUFACTURE WIRE FABRIC IS ACCEPTABLE.

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

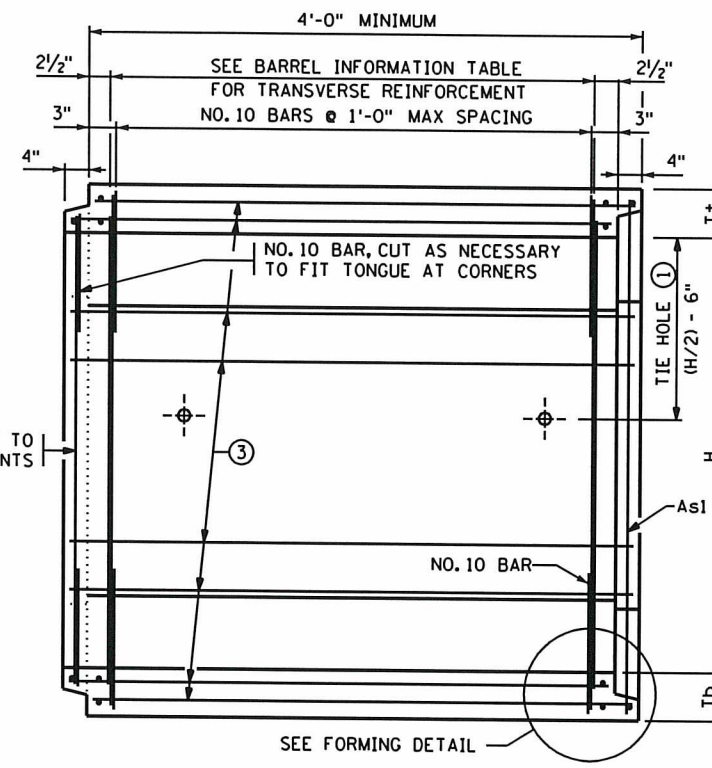
CONCRETE SHALL BE MIX NO. 3W36 WITH NO CALCIUM CHLORIDE ALLOWED.

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

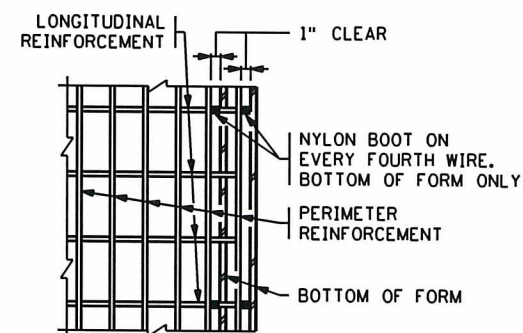
- ① CULVERT TIES ARE TO BE 1" DIAMETER RODS. SEE STANDARD PLATE NO. 3145 FOR CONNECTION DETAILS.
- ② HAUNCH SIZE AS FOLLOWS:
~~6'-0" AND 8'-0" WIDTHS - 6" TO 12"~~
 10'-0" WIDTH - 10" TO 12"
~~12'-0" AND 14'-0" WIDTHS - 12"~~
- ③ MINIMUM LONGITUDINAL STEEL SHALL BE 0.06 SQ. IN. /FT.



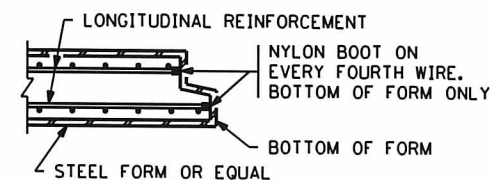
TRANSVERSE BARREL SECTION
BAR REINFORCEMENT OPTION SHOWN



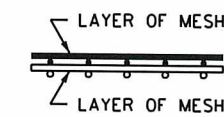
LONGITUDINAL BARREL SECTION
BAR REINFORCEMENT OPTION SHOWN



PLAN

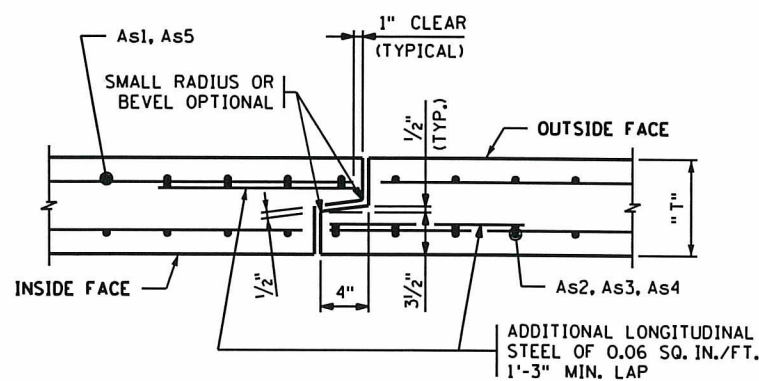


SECTION FORMING DETAIL



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

| BARREL INFORMATION | | | | | | | | | | | | | | | | | | | | | |
|--------------------|----------|-------|--------------|-------------------------|------------|---------|----------|----------|----------|-------------------|------------------------------|--------------|------------------------------|--------------|------------------------------|--------------|------------------------------|--------------|------------------------------|--------------|-------|
| LOCATION | SIZE | CLASS | f'c (P.S.I.) | FILL HEIGHT RANGE (FT.) | DIMENSIONS | | | | | WEIGHT (LBS./FT.) | STEEL FABRIC REINFORCEMENT | | | | | | | | | | |
| | | | | | W (FT.) | H (FT.) | Tt (IN.) | Tb (IN.) | Ts (IN.) | | As1 | | As2 | | As3 | | As4 | | As5 | | |
| | | | | | | | | | | | 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.) | LENGTH (FT.) | |
| 16+93.97 | 10' X 6' | 2 | 5000 | 2' - 8' | 10 | 6 | 9 | 10 | 8 | 4110 | 0.48 | 11'-9" | 2'-9" | 0.81 | 10'-6" | 0.68 | 10'-6" | 0.20 | 6'-6" | 0.06 | 7'-9" |
| 17+06.03 | 10' X 6' | 2 | 5000 | 2' - 8' | 10 | 6 | 9 | 10 | 8 | 4110 | 0.48 | 11'-9" | 2'-9" | 0.81 | 10'-6" | 0.68 | 10'-6" | 0.20 | 6'-6" | 0.06 | 7'-9" |
| | | | | | | | | | | | | | | | | | | | | | |

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

| NO | DATE | BY | CHK | REVISIONS |
|----|------|----|-----|-----------|
| | | | | |

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
 LICENSED PROFESSIONAL ENGINEER: JAMES ARCHER
 DATE: 12/16/10 REG NO: 45501

WSB
 & Associates, Inc.
 701 Xenia Ave. South
 Suite 300
 Minneapolis, MN 55416
 763-541-4800
 FAX 763-541-1700
 INFRASTRUCTURE - ENGINEERS - PLANNERS

C.S.A.H. 24
ANOKA COUNTY
S.A.P. 02-624-25

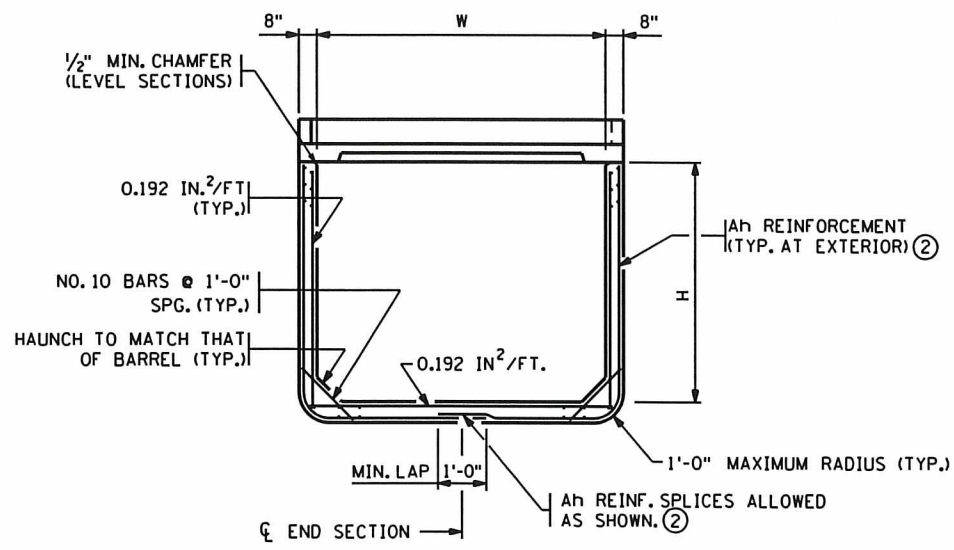
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BARREL DETAILS

DES: JDA DR: BJR
 CHK: BRL CHK: JDA
 Sheet B2 of B8 Sheets

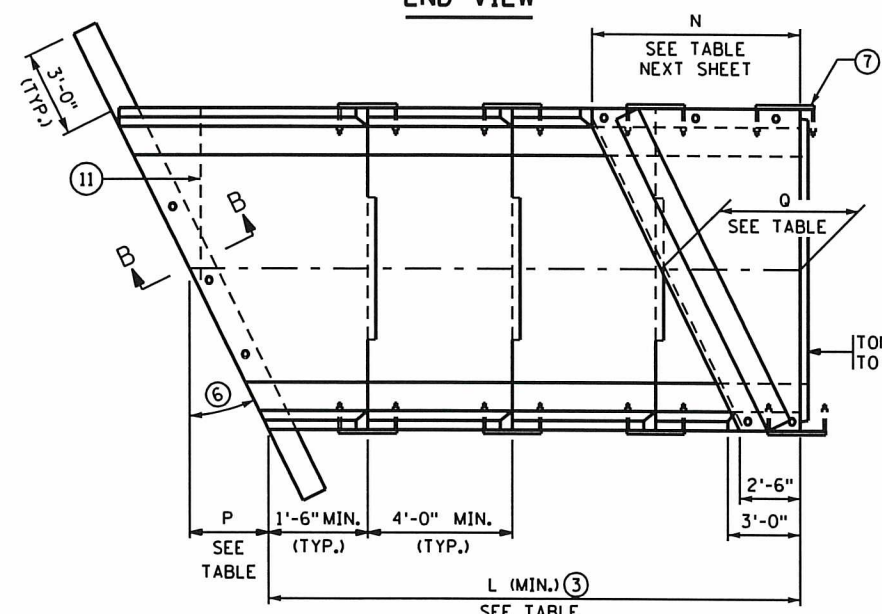
Bridge No.
02J44

FIG. 5-395.101(A)

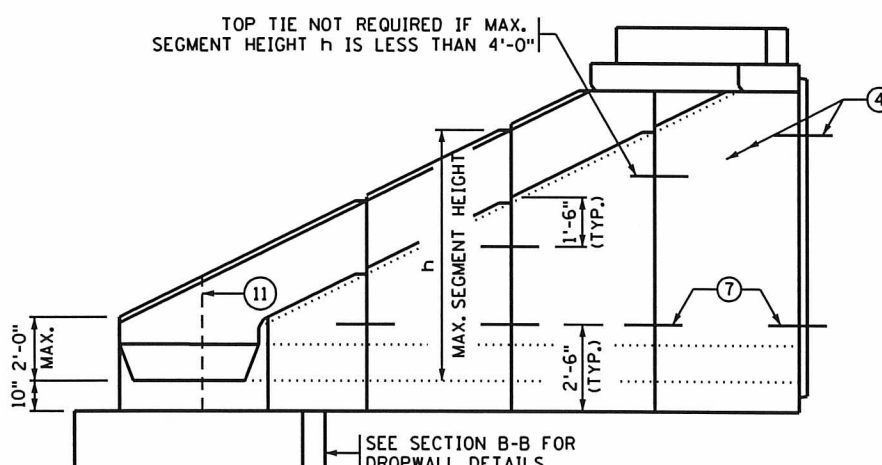
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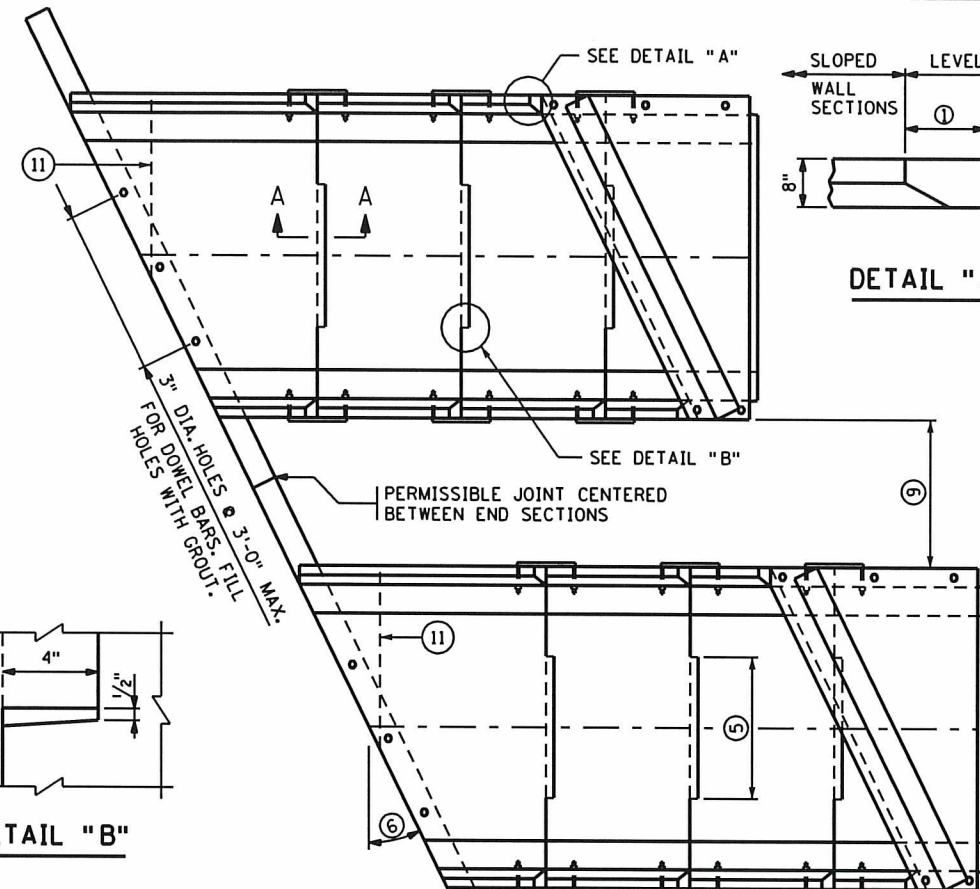
END VIEW



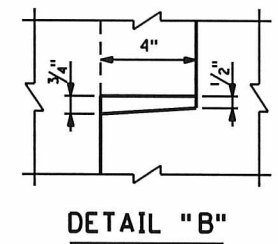
PLAN VIEW
SINGLE BARREL OPTION



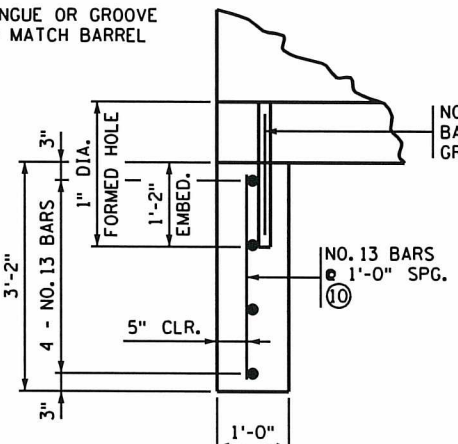
ELEVATION



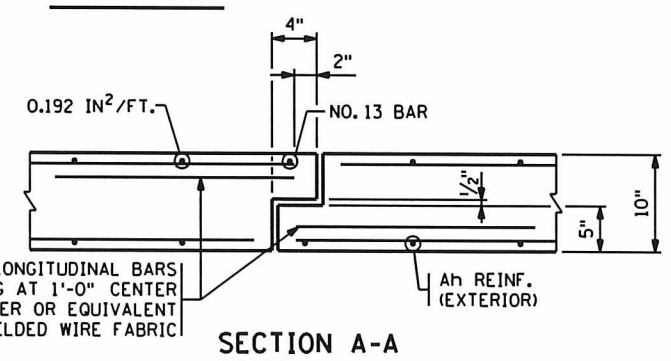
PLAN VIEW
DOUBLE-BARREL OPTION



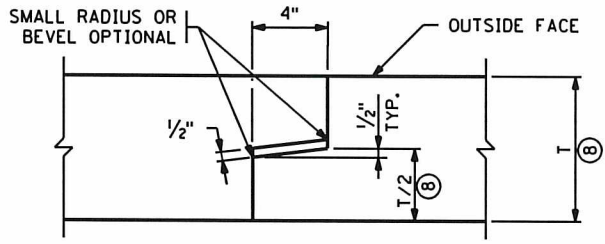
DETAIL "B"



SECTION B-B

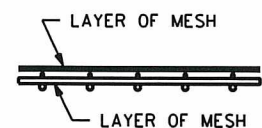


SECTION A-A



TONGUE AND GROOVE JOINT

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



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

- SEE FIG. 5-395.101(A) AND FIG. 5-393.101(B) FOR ADDITIONAL DIMENSIONS AND CONSTRUCTION NOTES.
- ON ALL END SECTIONS FOR WATERWAYS, USE DROPWALLS ON INLET AND OUTLET ENDS.
- FINISH ALL EXPOSED EDGES OF CONCRETE WITH 1/2" OR 3/4" CHAMFER OR RADIUS UNLESS OTHERWISE NOTED.
- PRECAST CONCRETE SHALL BE MIX NO. 3W36 WITH NO CALCIUM CHLORIDE ALLOWED.
- DROPWALL CONCRETE SHALL BE MIX NO. 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 FIG. 5-395.115 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 1/8" @ 15"; 10 5/8" @ 30"; 1'-2" @ 45"
- ② SEE FIG. 5-395.110(B) 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 AND GROOVE ON C 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 CONNECTION AT LOCATION SHOWN; REQUIRED ONLY ON HIGH FILL SIDE FOR 45° SKEW END SECTIONS OVER 6'-0" HIGH. SEE FIG. 5-395.110(B) FOR DETAILS.
- ⑧ DIMENSION "T" IS EQUAL TO Tt, Tb OR Ts.
- ⑨ IF THE DISTANCE BETWEEN DOUBLE BARRELS IS LESS THAN 2'-0" USE EITHER PEA ROCK OR LEAN MIX BACKFILL (Mn/DOT 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 BETWEEN DOUBLE BARRELS IS 6".
- ⑩ AS AN ALTERNATE TO THE ONE LAYER MESH CONTRACTOR MAY 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.
- ⑪ ON THE LAST SEGMENT OF THE 45° SKEWED APRONS, A TRANSVERSE JOINT IN THE BOTTOM IS PERMITTED. A SPECIAL TIE, SIMILAR TO THE SIDE TIE, MUST BE PROVIDED. THE TIE SHALL BE INSET AND THE SPACE FILLED WITH AN APPROVED GROUT.

| MIN. LENGTH L | | | | |
|----------------|-------------|-------------|-------------|--|
| HEIGHT H (FT.) | 15° SKEW | 30° SKEW | 45° SKEW | |
| 4 | 7'-1 3/4" | 7'-7 3/8" | 8'-7 7/8" | |
| 5 | 9'-2 1/2" | 9'-11 1/8" | 11'-5 5/8" | |
| 6 | 11'-3 3/8" | 12'-2 1/8" | 14'-3 3/4" | |
| 7 | 13'-4 1/4" | 14'-6 3/8" | 17'-1 3/4" | |
| 8 | 15'-5 1/8" | 16'-10 1/4" | 19'-11 5/8" | |
| 9 | 17'-5 7/8" | 19'-2" | 22'-9 5/8" | |
| 10 | 19'-6 3/4" | 21'-5 3/4" | 25'-7 1/2" | |
| 11 | 21'-7 5/8" | 23'-9 3/8" | 28'-5 1/2" | |
| 12 | 23'-8 1/2" | 26'-1 1/8" | 31'-3 3/8" | |
| 13 | 25'-9 3/8" | 28'-4 1/8" | 34'-1 3/8" | |
| 14 | 27'-10 1/8" | 30'-8 1/2" | 36'-11 1/4" | |

| LENGTH P | | | | |
|---------------|------------|------------|----------|--|
| WIDTH W (FT.) | 15° SKEW | 30° SKEW | 45° SKEW | |
| 6 | 0'-11 3/4" | 2'-1 3/8" | 3'-8" | |
| 8 | 1'-3" | 2'-8 3/8" | 4'-8" | |
| 10 | 1'-6 1/4" | 3'-3 1/4" | 5'-8" | |
| 12 | 1'-9 3/8" | 3'-10 1/4" | 6'-8" | |
| 14 | 2'-0 5/8" | 4'-5 1/8" | 7'-8" | |

| LENGTH Q | | | | |
|---------------|-----------|------------|----------|--|
| WIDTH W (FT.) | 15° SKEW | 30° SKEW | 45° SKEW | |
| 6 | 3'-5 3/4" | 4'-7 3/4" | 6'-2" | |
| 8 | 3'-9" | 5'-2 3/4" | 7'-2" | |
| 10 | 4'-0" | 5'-9 1/4" | 8'-2" | |
| 12 | 4'-3 3/8" | 6'-4 1/8" | 9'-2" | |
| 14 | 4'-6 5/8" | 6'-11 1/8" | 10'-2" | |

FIG. 5-395.110(A)

REVISED: 09-17-2004
 APPROVED: DECEMBER 11, 2000
 State Bridge Engineer

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
 LICENSED PROFESSIONAL ENGINEER: JAMES ARCHER
 DATE: 12/16/10 REG. NO.: 45501

701 Xenia Ave. South Suite 300 Minneapolis, MN 55416
 763-541-4800 FAX 763-541-1700
 WSB & Associates, Inc. INFRASTRUCTURE - ENGINEERS - PLANNERS

C.S.A.H. 24
 ANOKA COUNTY
 S.A.P. 02-624-25

TITLE:
 PRECAST CONCRETE
 END SECTION TYPE III

DES: JDA DR: BJR
 CHK: BRL CHK: JDA
 Sheet B3 of B8 Sheets
 Bridge No. 02J44

12/16/2010 11:06:24 AM K:\01898-00\cadd\plan\BR02J44\CBR02J44_DE T2.dgn

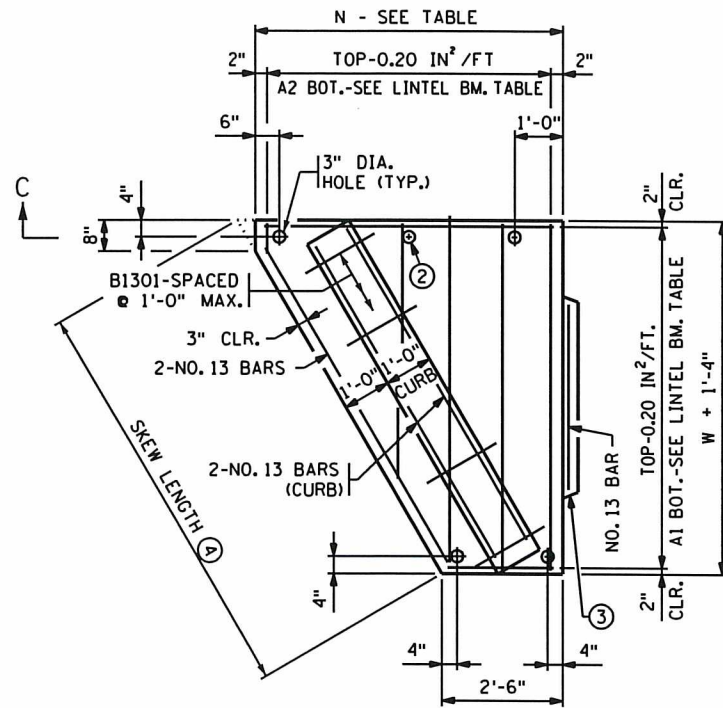
| Ah REINFORCEMENT | | |
|-------------------|---------------------------|----------|
| HEIGHT h (FT.) | Ah (IN ² /FT.) | |
| | 15° & 30° SKEW | 45° SKEW |
| 7 OR LESS | 0.192 | 0.192 |
| 8 | 0.20 | 0.24 |
| 9 | 0.29 | 0.36 |
| 10 | 0.42 | 0.53 |
| 11 | 0.60 | 0.75 |
| 12 | 0.78 | 0.98 |
| 13 | 1.03 | 1.36 |
| 14 | 1.38 | 1.85 |

| LINTEL BEAM REINFORCEMENT | | |
|---------------------------|----------------------|----------------|
| WIDTH W (FT.) | BOTTOM REINFORCEMENT | |
| | A1 | A2 |
| 6 | NO. 13 @ 1'-6" | NO. 13 @ 1'-4" |
| 8 | NO. 13 @ 1'-1" | NO. 13 @ 9" |
| 10 | NO. 13 @ 9" | NO. 13 @ 6" |
| 12 | NO. 16 @ 9" | NO. 16 @ 6" |
| 14 | NO. 19 @ 9" | NO. 22 @ 6" |

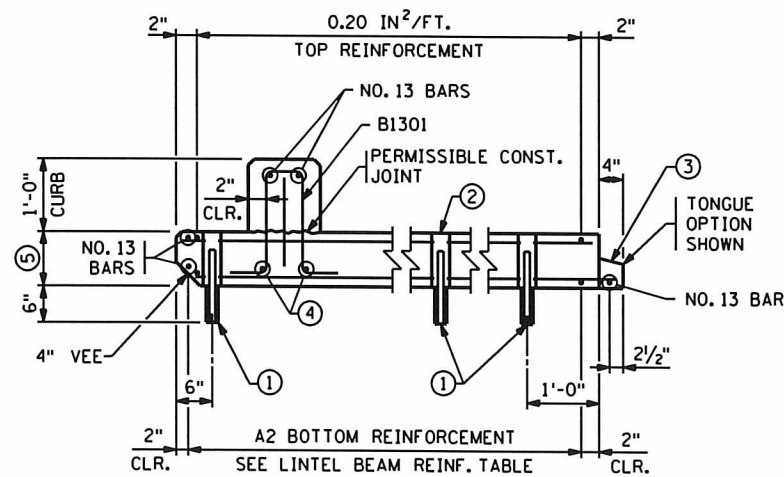
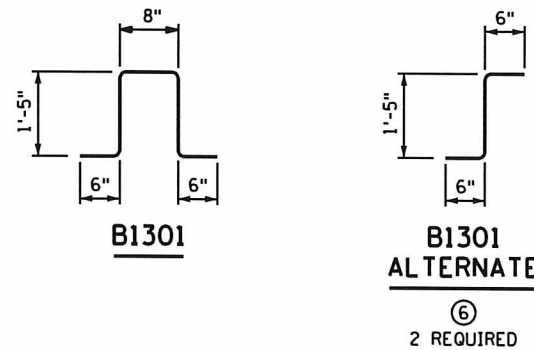
| LENGTH N | | | |
|------------------|-------------------------------------|--------------------------------------|------------------------------------|
| WIDTH W (FT.) | 15° SKEW | 30° SKEW | 45° SKEW |
| | 6 | 4'-3 ³ / ₈ " | 6'-4 ¹ / ₄ " |
| 8 | 4'-9 ⁷ / ₈ " | 7'-6" | 11'-2" |
| 10 | 5'-4 ¹ / ₄ " | 8'-7 ⁷ / ₈ " | 13'-2" |
| 12 | 5'-10 ³ / ₄ " | 9'-9 ³ / ₄ " | 15'-2" |
| 14 | 6'-5 ⁵ / ₈ " | 10'-11 ⁵ / ₈ " | 17'-2" |

CONSTRUCTION NOTES

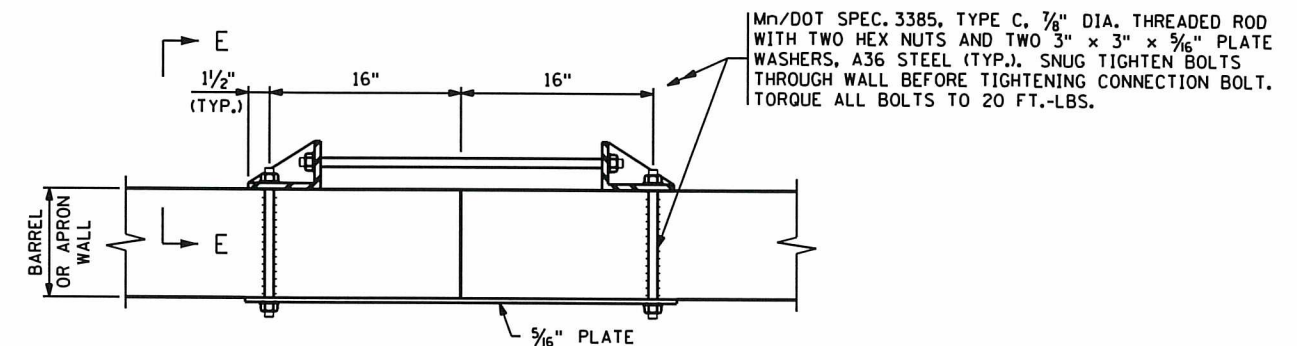
- ALL END SECTIONS REQUIRE CURB ON LINTEL BEAM.
- GROUT SHALL CONSIST OF 1 PART CEMENT AND 2 PARTS SAND. USE TYPE 1A AIR ENTRAINED PORTLAND CEMENT. GROUT MIX SHALL HAVE A MAXIMUM SLUMP OF 4".
- STRUCTURAL STEEL PER Mn/DOT SPEC. 3306.
- WELDING PER Mn/DOT SPEC. 2471.
- GALVANIZE STRUCTURAL STEEL PER Mn/DOT SPEC. 3394.
- GALVANIZE BOLTS, NUTS AND WASHERS PER Mn/DOT SPEC. 3392.
- ① NO. 25 DOWEL, 1'-0" LONG, 2" DIA. HOLE IN THE TOP OF THE WALL SECTION AND 3" DIA. HOLE IN THE LINTEL. FILL HOLE WITH GROUT.
- ② PROVIDE ADDITIONAL 3" HOLES AT 4'-0" MAXIMUM SPACING WHEN SIDE OF LINTEL BEAM IS OVER 6 FT.
- ③ CHECK THE LOCATION TO DETERMINE WHETHER A TONGUE OR A GROOVE IS USED. TONGUE AND GROOVE TO TERMINATE AT CULVERT RADIUS.
- ④ FOR SKEW LENGTH UNDER 10' USE NO. 25 BARS. FOR SKEW LENGTH OF 10' TO 14' USE NO. 29 BARS. FOR SKEW LENGTH OVER 14' TO 18' USE NO. 32 BARS. FOR SKEW LENGTH OVER 18' TO 22' USE NO. 36 BARS OR EQUAL. SKEW LENGTH IS DISTANCE BETWEEN OUTSIDE FACES OF END SECTION ALONG LINTEL BEAM.
- ⑤ FOR CULVERTS LESS THAN 14' WIDE, USE 9" LINTEL BEAM THICKNESS WITH 5000 P.S.I. CONCRETE. FOR 14' WIDE CULVERTS, WITH A 15° SKEW, USE 9" LINTEL BEAM THICKNESS WITH 5000 P.S.I. CONCRETE. FOR 14' WIDE CULVERTS, WITH A 30° OR 45° SKEW, USE 10" LINTEL BEAM THICKNESS WITH 5000 P.S.I. CONCRETE (OR USE 9" LINTEL BEAM THICKNESS WITH 6500 P.S.I. CONCRETE).
- ⑥ ALTERNATE BAR BEND MAY BE USED FOR B1301.



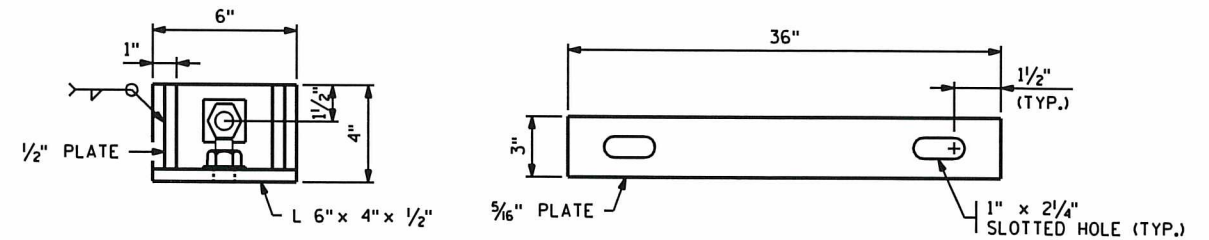
PLAN VIEW
LINTEL BEAM WITH INTEGRAL CURB



SECTION C-C



PLAN VIEW



SECTION E-E

PLATE DETAIL

EXTRA STRONG CONNECTION DETAILS

REVISED: 09-17-2004
 APPROVED: DECEMBER 11, 2000
Donald J. Blum
 STATE BRIDGE ENGINEER

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
 LICENSED PROFESSIONAL ENGINEER: JAMES ARCHER
 DATE: 12/16/10 REG NO: 45501

WSB
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 Suite 300
 Minneapolis, MN 55416
 763-541-4800
 FAX 763-541-1700
 INFRASTRUCTURE - ENGINEERS - PLANNERS

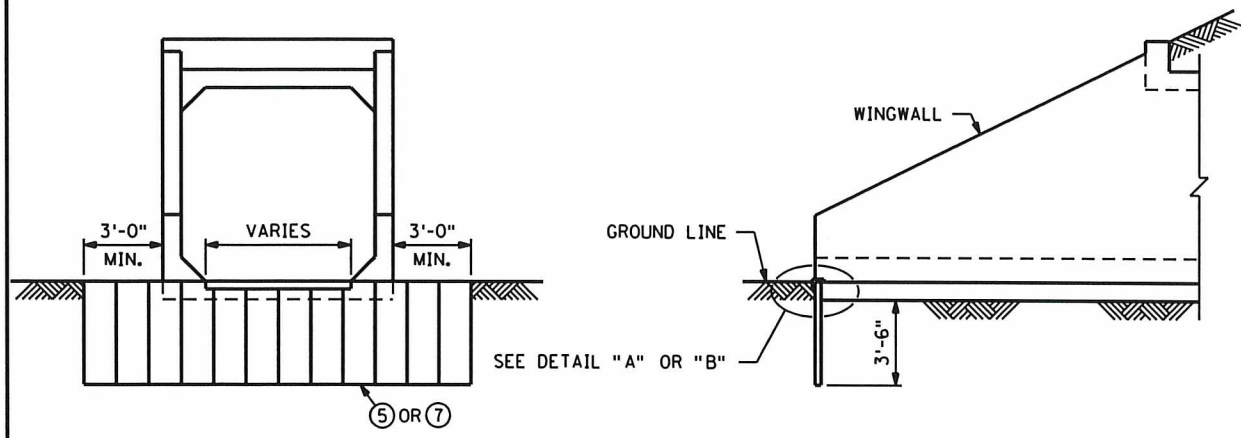
C.S.A.H. 24
ANOKA COUNTY
S.A.P. 02-624-25

TITLE:
PRECAST CONCRETE
END SECTION TYPE III

DES: JDA DR: BJR
 CHK: BRL CHK: JDA
 Sheet B4 of B8 Sheets

Bridge No.
02J44

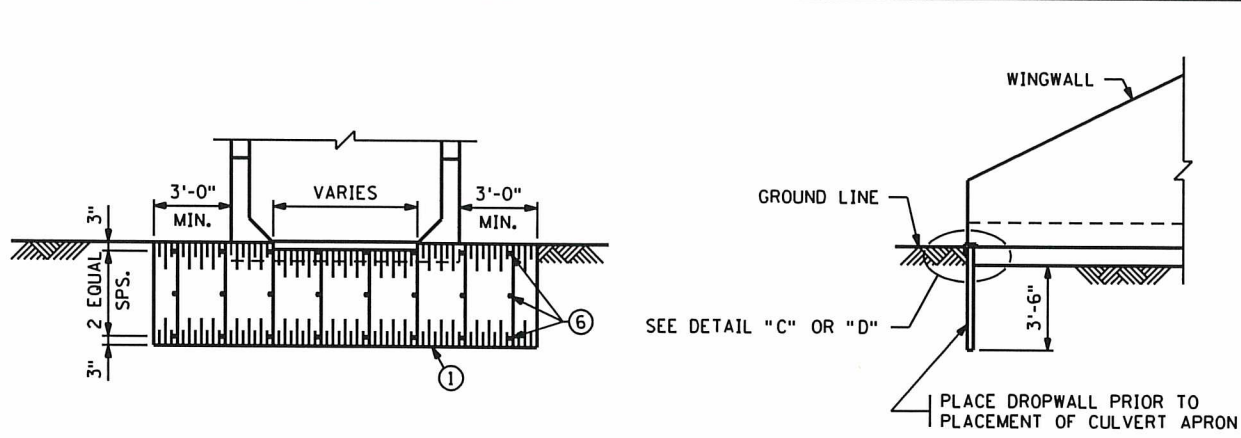
FIG. 5-395.110(B)



END VIEW

ELEVATION

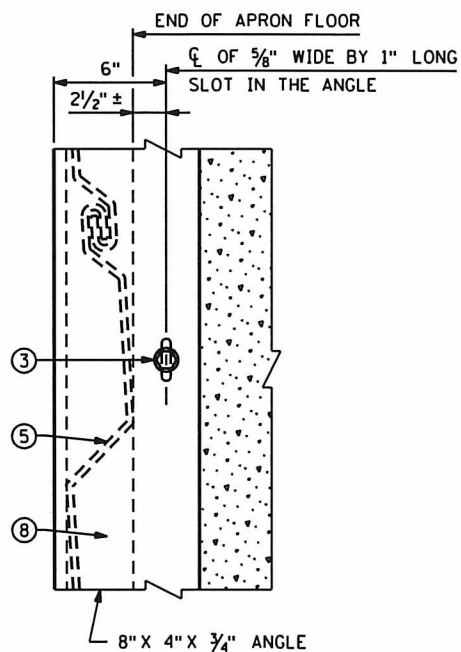
ALTERNATES 1 & 2 (STEEL SHEET PILING)



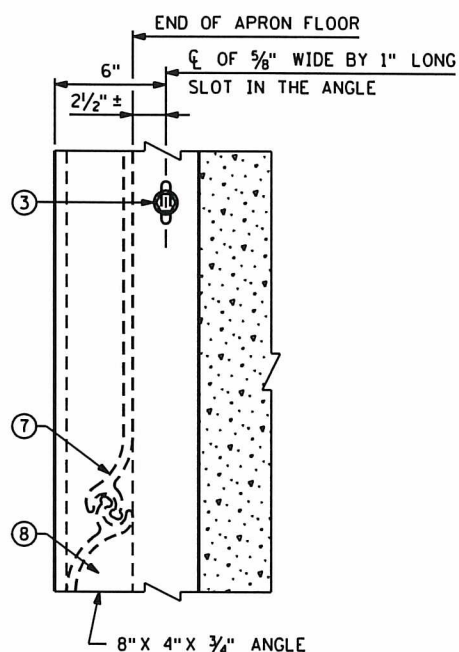
END VIEW

ELEVATION

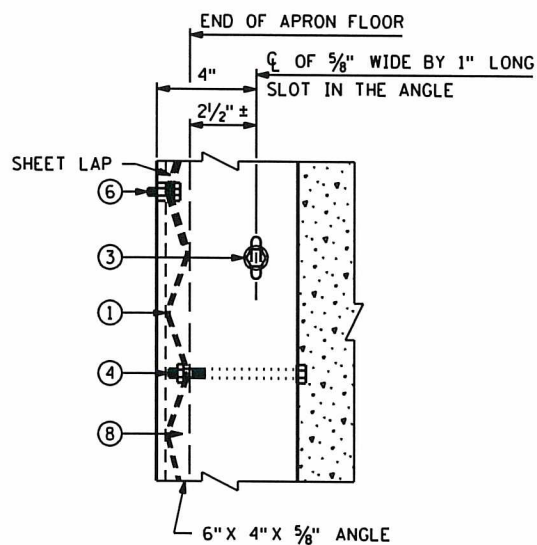
ALTERNATES 3 & 4 (GALVANIZED STEEL SHEETS)



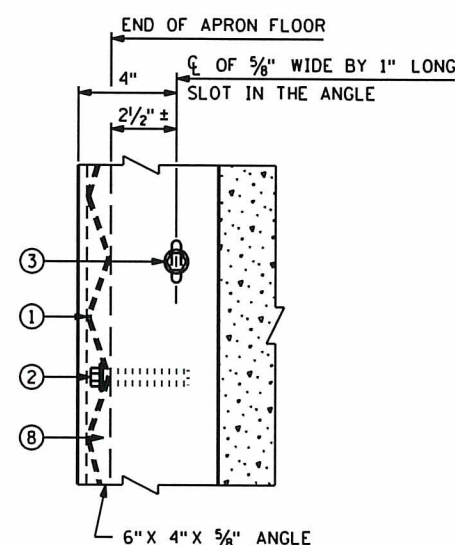
PLAN



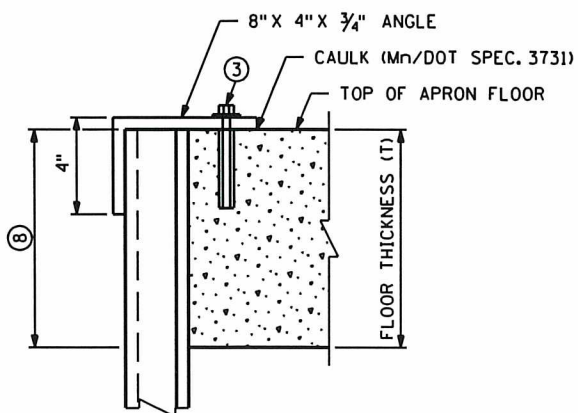
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PLAN



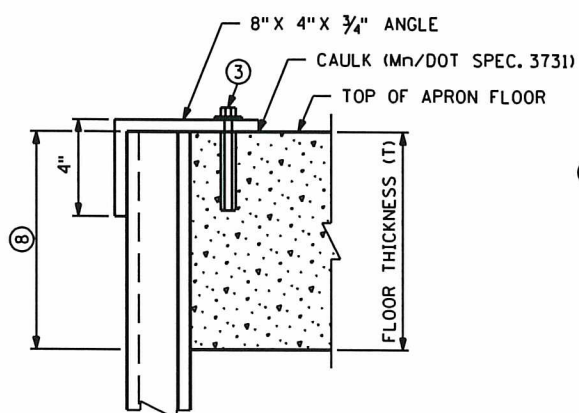
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ELEVATION

DETAIL "A" - ALTERNATE 1

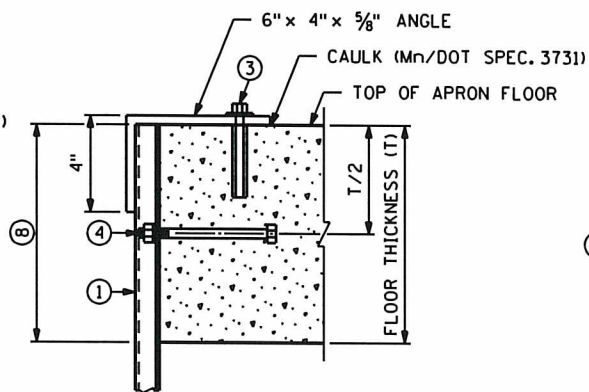
STEEL SHEET PILING SHOWN



ELEVATION

DETAIL "B" - ALTERNATE 2

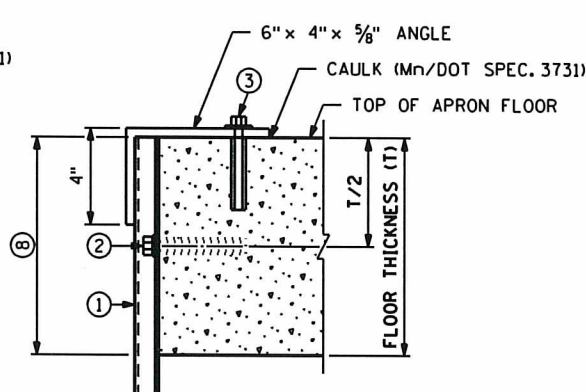
STEEL SHEET PILING SHOWN



ELEVATION

DETAIL "C" - ALTERNATE 3

ON NEW CONSTRUCTION ONLY



ELEVATION

DETAIL "D" - ALTERNATE 4

ON NEW OR OLD CONSTRUCTION

CONSTRUCTION NOTES

- GALVANIZE ALL FASTENERS AS PER Mn/DOT SPEC. 3392.
- BEFORE CULVERT PLANS ARE PREPARED, SAMPLES SHALL BE TAKEN FROM THE DRAINAGE AREA FOR PH DETERMINATION. THE SOIL AND WATER SHOULD HAVE A PH OF 6.5 OR MORE IF SHEET STEEL IS USED.
- ① 2 1/2" x 1/2" OR 2 3/8" x 1/2" CORRUGATED (12 GAGE) OR HEAVIER GALVANIZED STEEL SHEETS.
- ② FASTEN THE STEEL SHEETS TO THE FRONT EDGE OF THE APRON WITH 3/8" DIAMETER BY 4" LONG BOLTS AND APPROVED ANCHORAGES (10" ± CENTER TO CENTER, TO THE NEAREST VALLEY).
- ③ FASTEN THE 8" x 4" x 3/4" OR 6" x 4" x 5/8" ANGLE WITH 3/8" DIAMETER 4" LONG BOLTS, 1" O.D. WASHER AND AN APPROVED ANCHORAGE (2'-0" SPACING).
- ④ FASTEN THE STEEL SHEETS TO THE FRONT EDGE OF THE APRON WITH 3/8" DIAMETER 5" LONG BOLTS, NUT AND LOCK WASHER (10" ± CENTER TO CENTER, TO THE NEAREST VALLEY).
- ⑤ (12 GAGE) GALVANIZED CORRUGATED STEEL SHEET PILING, INTERLOCKING TYPE A.
- ⑥ 3/8" DIA. x 1" LONG BOLT WITH NUT, TO LAP STEEL SHEETS.
- ⑦ STEEL SHEET PILING, SECTION NO. MP-112 OR EQUAL.
- ⑧ FILL THE VOIDS AS SHOWN, WITH CONCRETE OR CONCRETE GROUT, AS APPROVED BY THE ENGINEER.

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

FIG. 5-395.111

| NO. | DATE | BY | CHK | REVISIONS |
|-----|------|----|-----|-----------|
| | | | | |
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| | | | | |

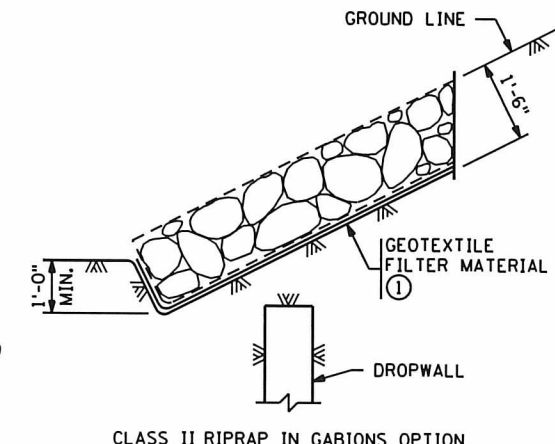
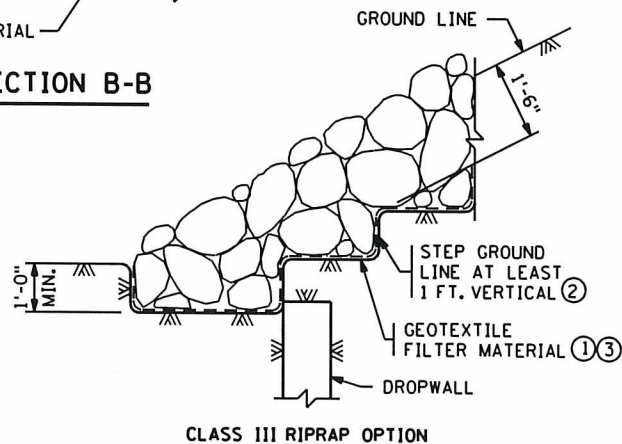
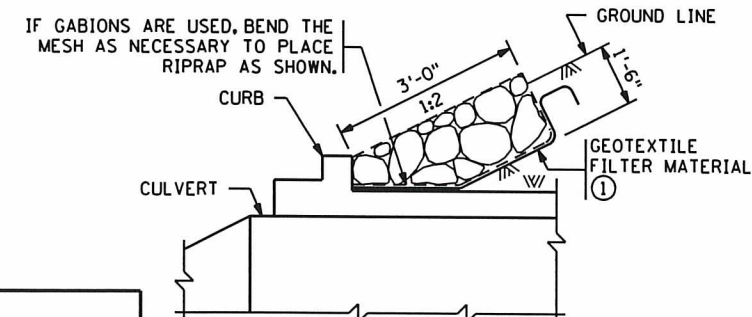
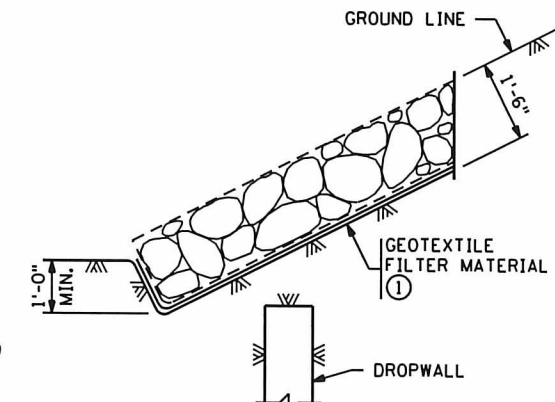
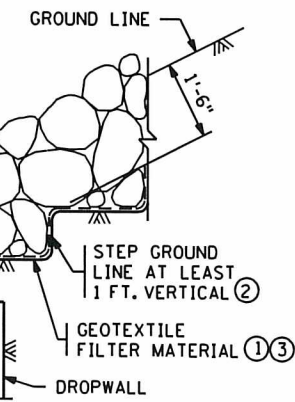
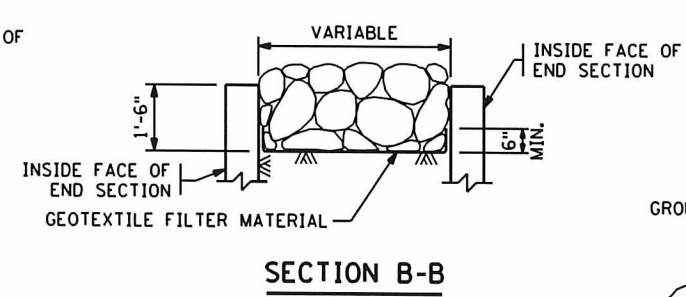
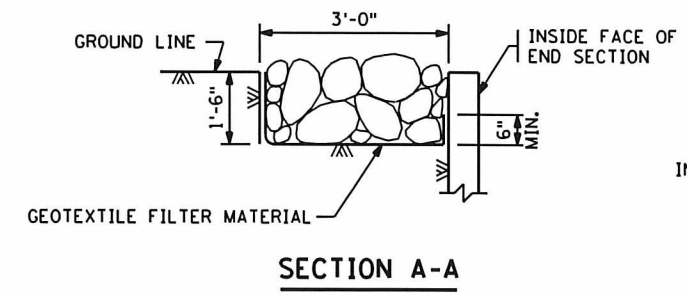
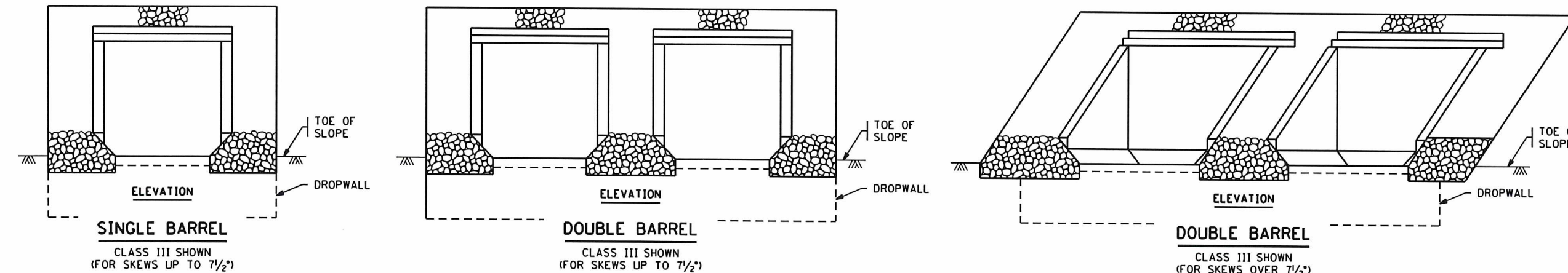
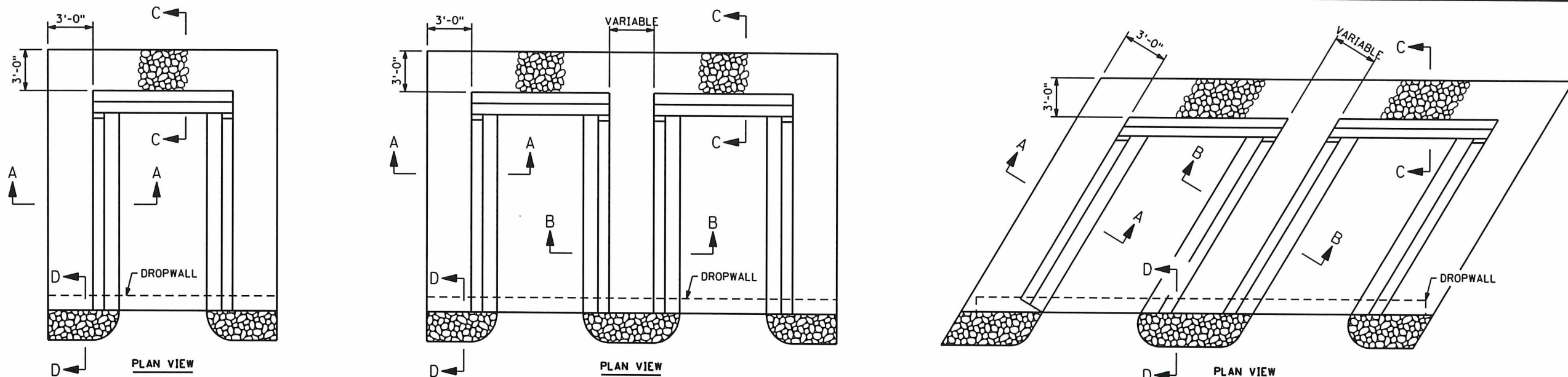
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LICENSED PROFESSIONAL ENGINEER: JAMES ARCHER
DATE: 12/10/10 REG NO: 45501

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& Associates, Inc.
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Minneapolis, MN 55416
763-541-4800
FAX 763-541-1700

C.S.A.H. 24
ANOKA COUNTY
S.A.P. 02-624-25

TITLE:
ALTERNATE DROPWALLS FOR BOX CULVERTS

| | | |
|-----------------------|----------|---------------------|
| DES: JDA | DR: BJR | Bridge No. 02J44 |
| CHK: BRL | CHK: JDA | |
| Sheet B5 of B8 Sheets | | |



- CONSTRUCTION NOTES**
- RIPRAP SHALL COMPLY WITH Mn/DOT SPECS. 2511 AND 3601. THE CONTRACTOR MAY USE EITHER CLASS III, WITH GEOTEXTILE FILTER MATERIAL, OR CLASS II ENCLOSED IN GABIONS, WITH GEOTEXTILE FILTER MATERIAL. 4" TO 8" DIA. ROCK MAY BE USED IN GABIONS, IF THE MESH OPENINGS ARE 4" OR LESS. GABIONS SHALL BE RIVER TYPE, CODE "D", 3 FT. WIDE X 1.5 FT. DEEP.
- FOR TYPE OF GEOTEXTILE FILTER MATERIAL REQUIRED, SEE Mn/DOT SPEC. 3733. GEOTEXTILE STRIPS SHOULD BE CONTINUOUS WITHOUT OVERLAPS, EXCEPT FOR THE TOP STRIP, WHICH SHOULD SHINGLE VERTICAL STRIPS. THE TOP EDGE SHOULD BE BURIED TO PREVENT UNDERMINING (Mn/DOT SPEC. 2511.3B).
 - SLOPES 1:2 TO 1:3 MUST BE STEPPED TO MINIMIZE SLIDING POTENTIAL.
 - IF SLOPES ARE NOT STEPPED, GRANULAR FILTER SHOULD BE USED.

REVISIONS:
 APPROVED: DECEMBER 11, 2000
 State Bridge Engineer

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
 LICENSED PROFESSIONAL ENGINEER: JAMES ARCHER
 DATE: 12/10/10 REG NO: 45501

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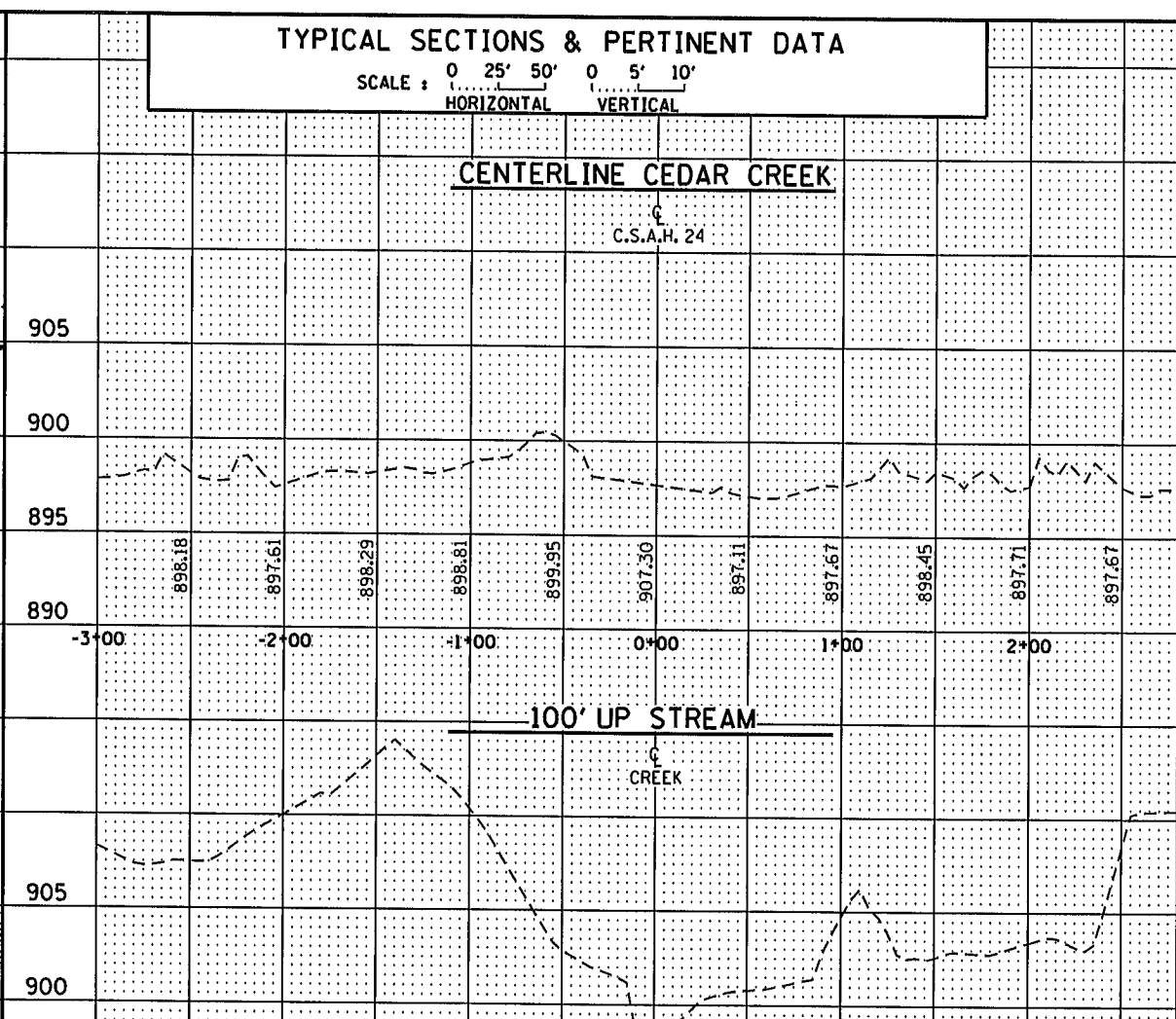
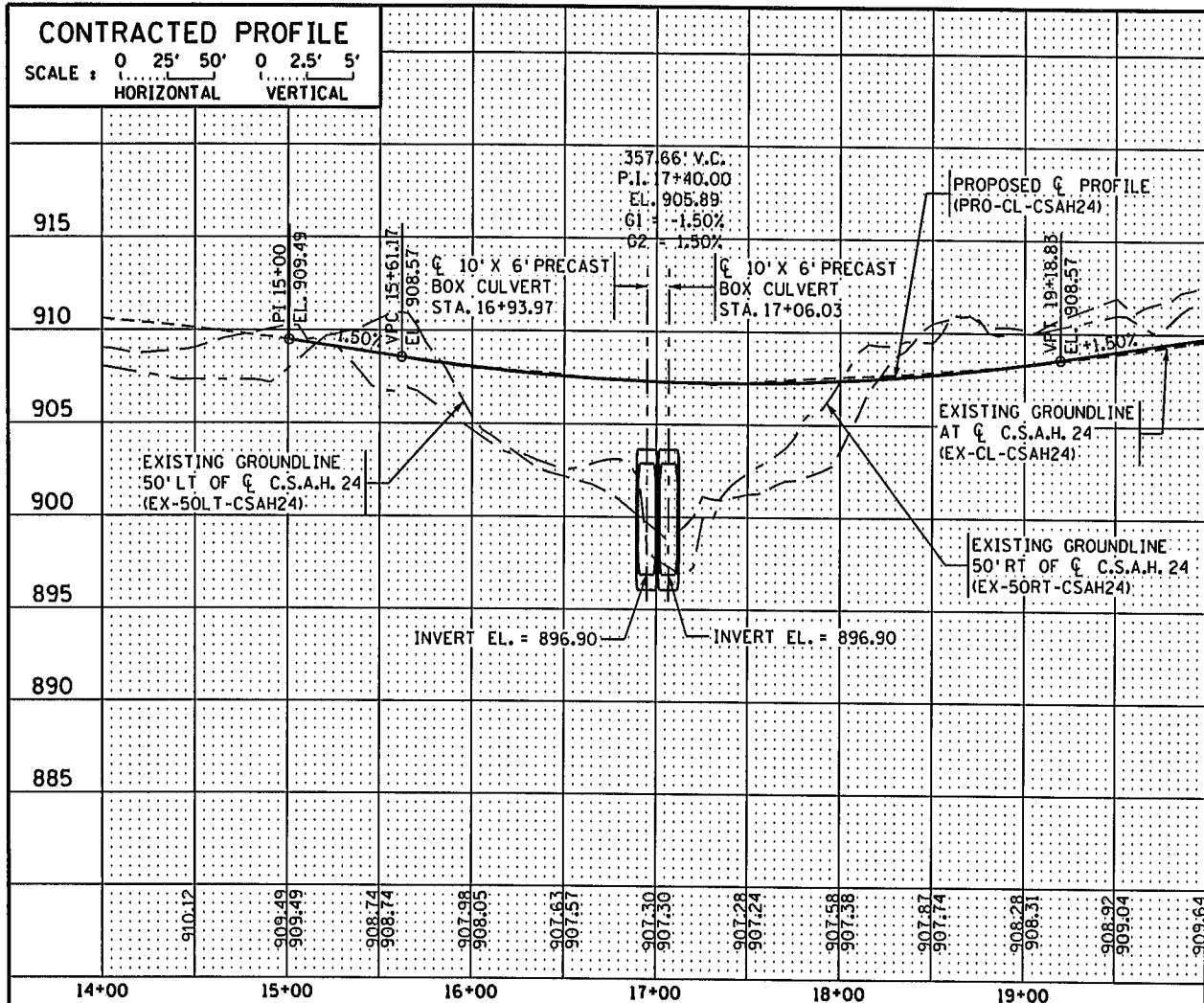
C.S.A.H. 24
ANOKA COUNTY
S.A.P. 02-624-25

TITLE:
EMBANKMENT PROTECTION FOR BOX CULVERTS

DES: JDA DR: BJR
 CHK: BRL CHK: JDA
 Sheet B6 of B8 Sheets
 Bridge No. 02J44

FIG. 5-395.115

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LOCATION ENGINEER'S OBSERVATIONS AT BRIDGE SITE

- SPECIAL FEATURES: NONE
- OTHER BRIDGES OR CULVERTS OVER THE SAME STREAM
UPSTREAM BRIDGE (C.R. 56):
13.7 FT SPAN PRECAST PIPE ARCH
82 SQ. FT. WATERWAY OPENING.
DOWNSTREAM BRIDGE (C.S.A.H. 26):
30 FT SPAN BRIDGE
200 SQ. FT. WATERWAY OPENING
- APPARENT HIGHWATER ELEVATION: UNKNOWN
- OTHER DATA: NONE

HYDRAULIC ENGINEERS RECOMMENDATION

DATE: 04/28/2010

STREAM OR DITCH DESIGNATION: CEDAR CREEK
DRAINAGE AREA: 17.5 SQ. MI.
MAX. FLOOD ON RECORD: C.F.S. UNKNOWN
MAXIMUM OBSERVED HIGHWATER ELEVATION: UNKNOWN
DESIGN FLOOD (100 YR. FREQ.): 328 C.F.S.
HEADWATER ELEVATION: 904.0 FT.
DESIGN MEAN VELOCITY THROUGH STRUCTURE: 2.7 F.P.S.
TOTAL STAGE INCREASE: 0.1 FT.
LOW MEMBER AT OR ABOVE ELEVATION: N/A FT.
WATERWAY AREA REQUIRED BELOW ELEV. 902.9 FT. = 120 SQ. FT. AT RIGHT ANGLES TO CHANNEL
BASIC FLOOD (100 YR. FREQ.): 328 C.F.S.
HEADWATER ELEVATION: 904.0 FT.
TOTAL STAGE INCREASE: 0.1 FT.
MEAN VELOCITY THROUGH STRUCTURE: 2.7 F.P.S.
FLOWLINE ELEVATION: 896.9 FT. SKEW ANGLE: 0°
ESTIMATED PRELIMINARY TOTAL SCOUR AT PIER EL. N/A FT. (500 YR. FREQ.)

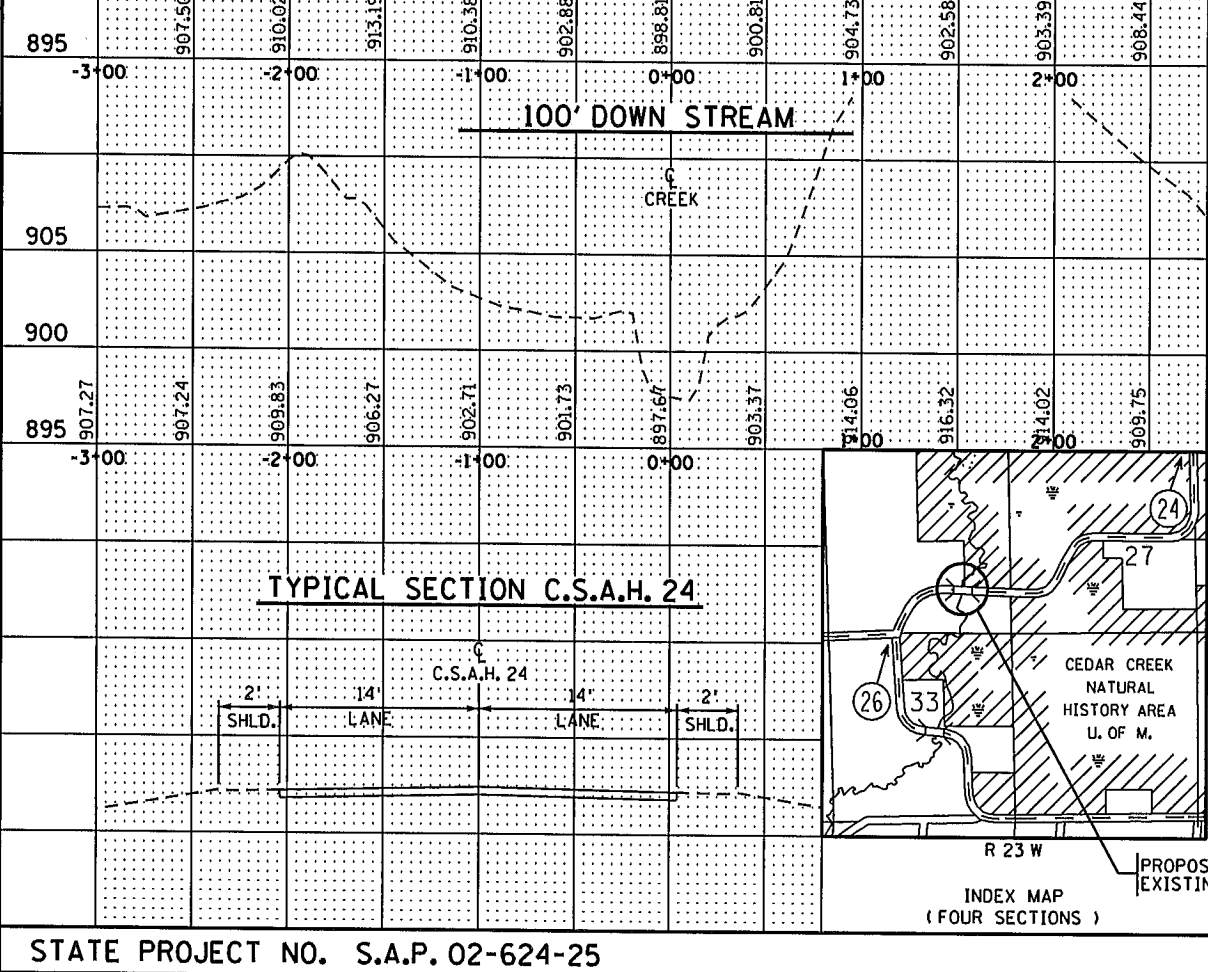
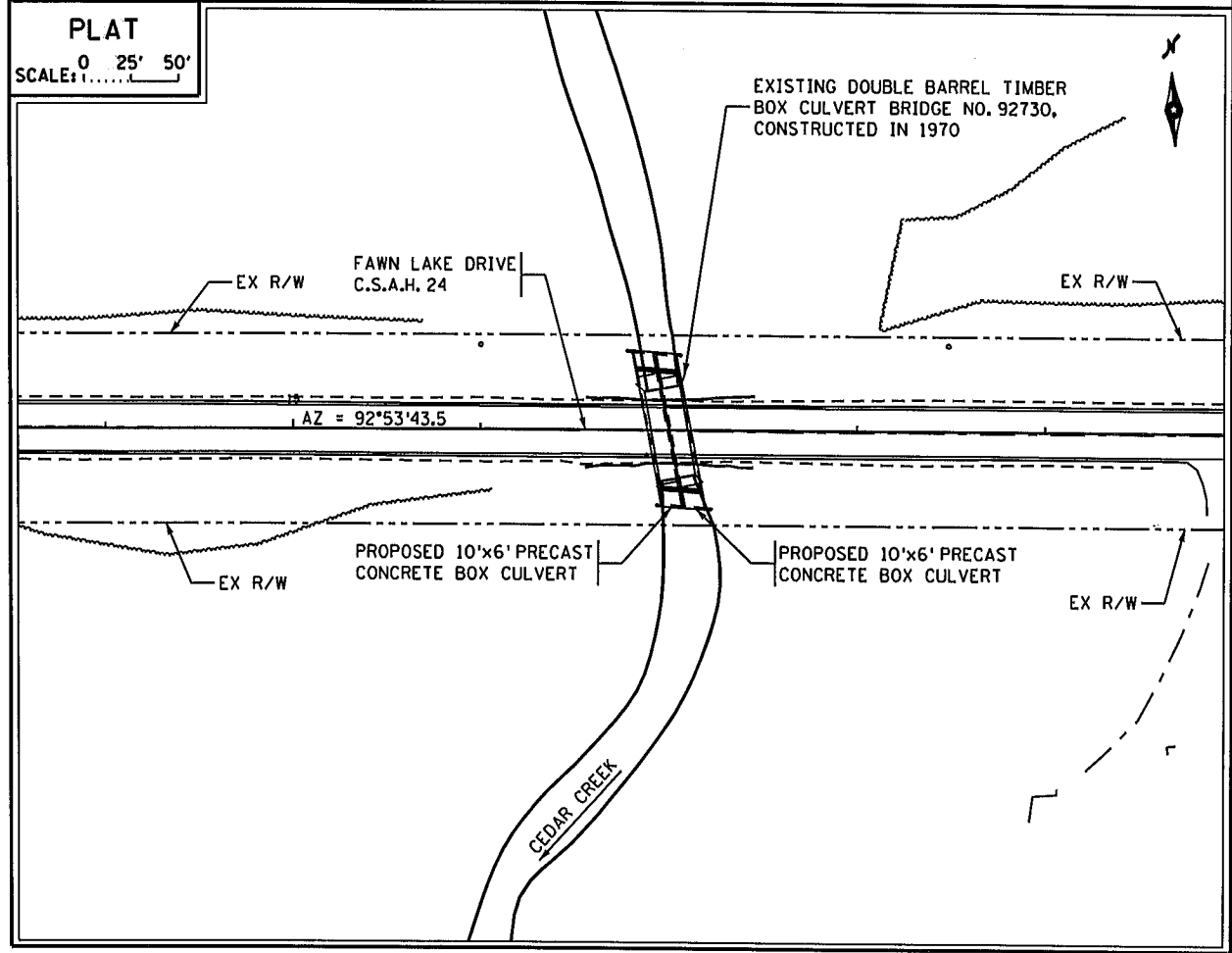
SCOUR CONFIRMATION RECOMMENDATION

DATE: 04/28/2010

TOTAL SCOUR AT PIER EL. N/A (500 YR. FREQ.)
SCOUR CODE: E

BRIDGE SURVEY SHEETS MADE FROM :
ANOKA COUNTY SURVEY ON 11/5/2009
BENCH MARK ELEVATION 905.846 (N.A.V.D. 88 ADJ.)
LOCATION: SURVEY CONTROL POINT 1000
44 FEET EAST OF SOUTHEAST
WINGWALL AND 6 FEET SOUTH
OF PAVEMENT. BRIDGE NO. 92730

MNDOT MONUMENT:
HORIZONTAL DATUM NAD 83 (96 ADJ)
VERTICAL DATUM IS NAVD 88

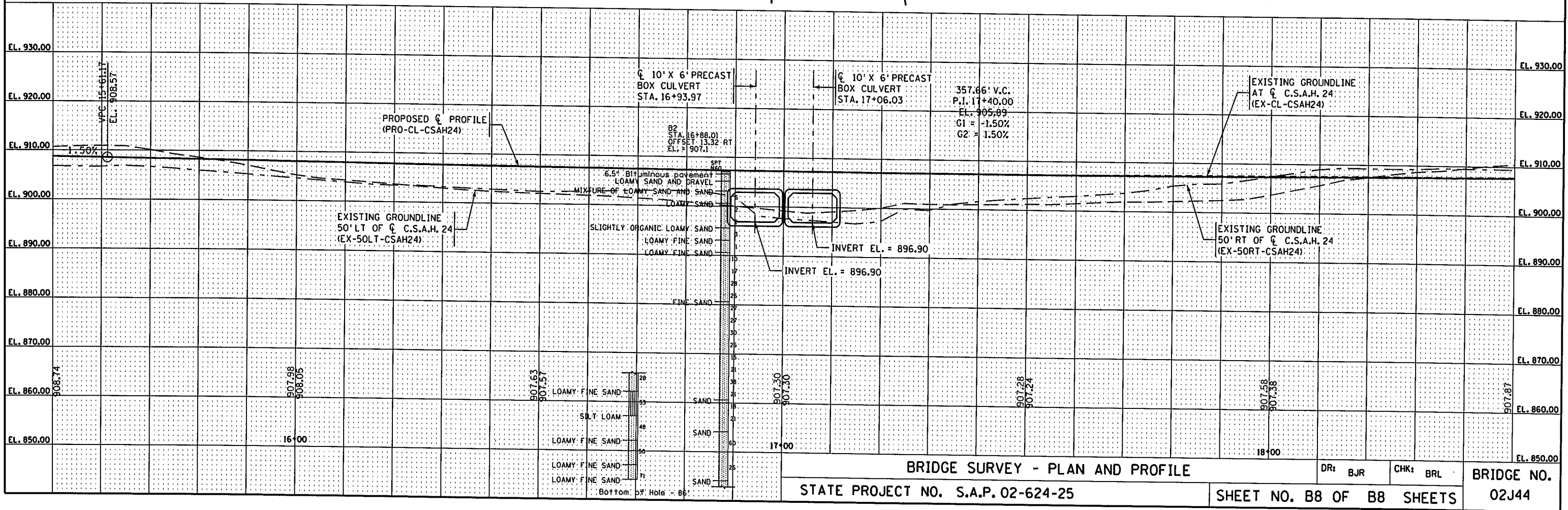
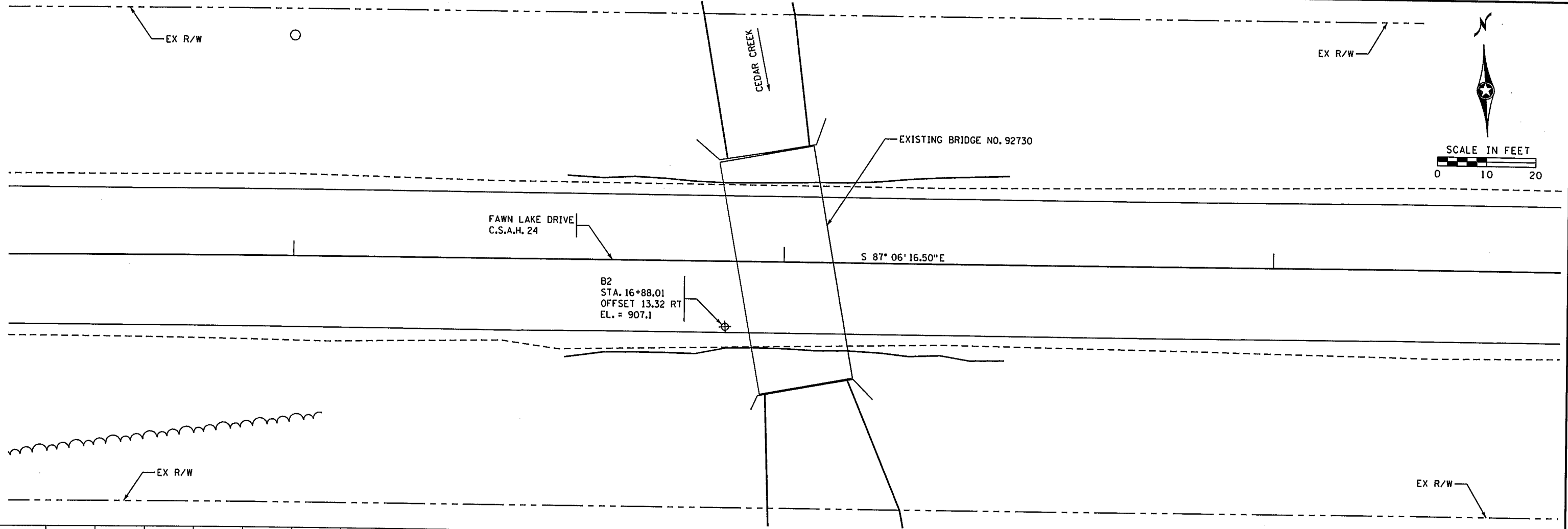


BRIDGE SURVEY

PROPOSED BRIDGE LOCATED ON
C.S.A.H. 24 1/4 MILE EAST OF
JCT. C.S.A.H. 26 OVER
CEDAR CREEK.

SEC 28 T 34 N R 23 W
COUNTY: ANOKA
TOWNSHIP: EAST BETHEL
BRIDGE NO. 02J44

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12/16/2010 10:06:54 AM K:\01698-00\cadd\p1698_02\44\CBR02\44_SURF2.dgn