PLAN SYMBOLS

STATE LINE
COUNTY LINE
TOWNSHIP OR RANGE LINE
SECTION LINE
QUARTER LINE
SIXTEENTH LINE
RIGHT OF WAY LINE
SLOPE EASEMENT (SE)
PRESENT RIGHT OF WAY LINE
CONTROL OF ACCESS LINE
PROPERTY LINES
VACATED PLATTED PROPERTY
CORPORATE HIGHWAY CENTER LINE
TRUNK HIGHWAY CENTER LINE (P.I., P.I., P.I.)
RETAINING WALL
RAILROAD
RAILROAD RIGHT OF WAY LINE
RIVER OR CREEK
DRY RUN
DRAINAGE DITCH
DRAIN TILE
CULVERT
DROP INLET
GUARD RAIL
BARBED WIRE FENCE
WOVEN WIRE FENCE
CHAIN LINK FENCE
RAILROAD SNOW FENCE
STONE WALL OR FENCE
HEDGE
RAILROAD CROSSING SIGN
RAILROAD CROSSING BELL
ELECTRIC WARNING SIGN
CROSSING GATE
MEANDER CORNER
SPRINGS
MARSH
TIMBER / ORCHARD / BRUSH / NURSERY (TIMBER)
CATCH BASIN (C.B.)
FIRE HYDRANT
CATTLE GUARD
OVERPASS (HIGHWAY OVER)
UNDERPASS (HIGHWAY UNDER)
BRIDGE
BUILDING (ONE STORY FRAME) 1-S-F 75

F – FRAME C – CONCRETE
S – STONE T – TILE
B – BRICK ST – STUCCO

IRON PIPE OR ROD
MONUMENT (STONE,CONCRETE,OR MEATAL)
WOODEN HUB
GRAVEL PIT (G)
SAND PIT (S)
BORROW PIT (B)
ROCK QUARRY (Q)

UTILITIES SYMBOLS

POWER POLE LINE
TELEPHONE POLE LINE
JOINT TELEPHONE AND POWER
ON POWER POLES
ON TELEPHONE POLES
ANCHOR
STEEL TOWER
STREET LIGHT
PEDESTAL
GAS MAIN (G)
WATER MAIN (W)
CONDUIT
TELEPHONE CABLE IN CONDUIT (T)
ELECTRIC CABLE IN CONDUIT (P)
TELEPHONE MANHOLE (T)
ELECTRIC MANHOLE (P)
BURIED TELEPHONE CABLE (T-BUR)
BURIED ELECTRIC CABLE (P-BUR)
AERIAL TELEPHONE CABLE (T-AE)
SEWER (SANITARY OR STORM)
SEWER MANHOLE

SCALES

PLAN . . . . . 100' (0 – 100')
PROFILE . . . . . 10' VERT. (0 – 10') 100' HORZ. (0 – 100')
CROSS-SECTION . . . . . 10' (0 – 10')

INDEX MAP . . . . . N.T.S.

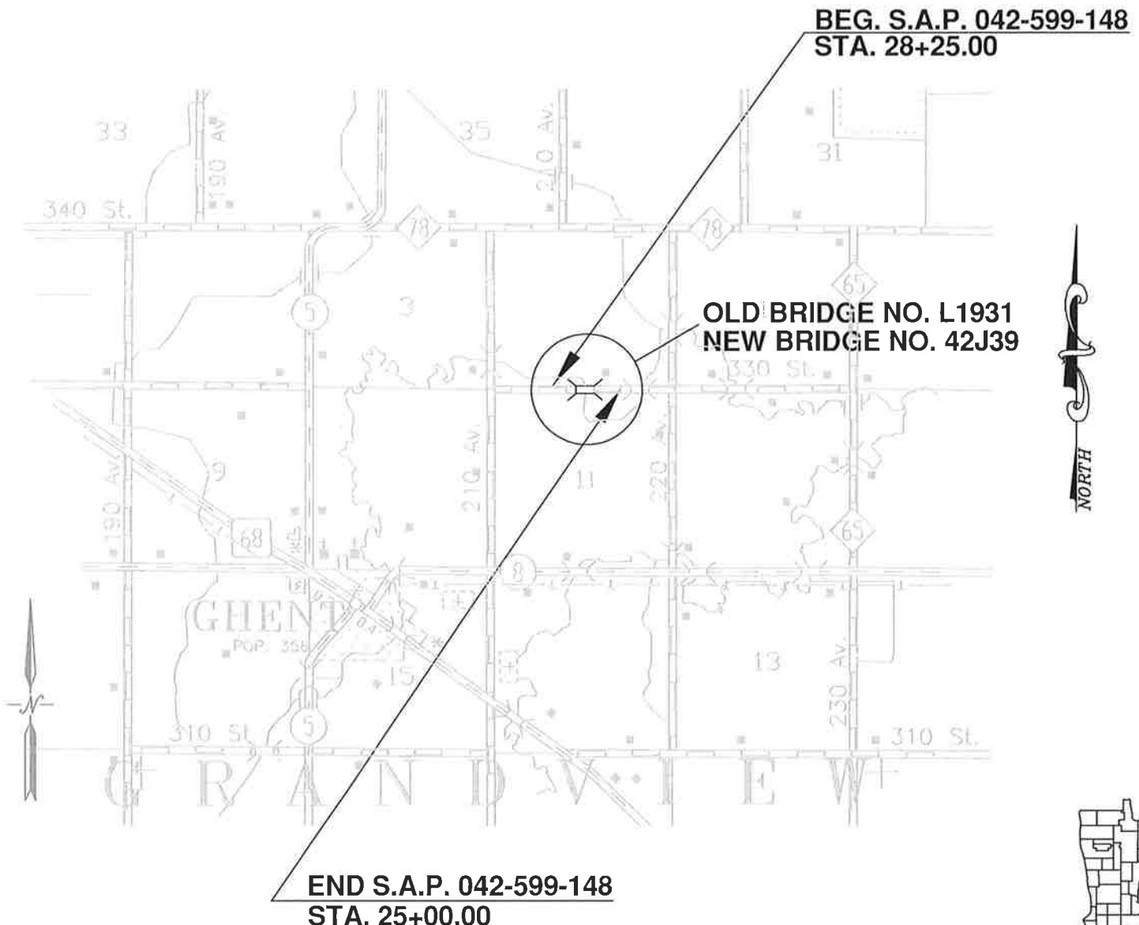
MINNESOTA DEPARTMENT OF TRANSPORTATION
LYON COUNTY

CONSTRUCTION PLAN FOR BRIDGE REPLACEMENT: BRIDGE NO. 42J39

LOCATED ON: 330TH ST. BETWEEN: 210TH AVENUE AND: 220TH AVE (1.5 MILES NE OF GHENT) (Geographical Description)
BEGINNING AT A POINT 2639.50' EAST OF THE N.E. COR. SEC. 10 T112N–R42W
TO A POINT 2694.50' EAST OF THE N.E. COR. SEC. 10 T112N–R42W (Legal Description)

STATE AID PROJECT NO. : 042–599–148

GROSS LENGTH:	325.00	FEET	0.062	MILES
BRIDGES–LENGTH:		FEET		MILES
EXCEPTIONS–LENGTH:		FEET		MILES
NET LENGTH:	325.00	FEET	0.062	MILES



MINN. PROJ. NO. .....

GOVERNING SPECIFICATIONS

THE 2016 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATION FOR CONSTRUCTION" SHALL GOVERN.

INDEX

THIS PLAN CONTAINS 07 SHEETS

DESIGN DESIGNATION

PROJ. SOIL FACTOR	= 100%
ADT (CURRENT YEAR) 2014	= 25
ADT (FUTURE YEAR) 2034	= 25
DESIGN LOADING	=
SOIL FACTOR:	= 100%
SHOULDER WIDTH:	= 1.0'
DESIGN SPEED:	= 30 MPH
HCADT:	=

FUNCTIONAL CLASSIFICATION: LOCAL COLLECTOR
NO. OF TRAFFIC LANES: 2 NO. OF PARKING LANES: 0

BASED ON STOPPING SIGHT DISTANCE:

HEIGHT OF EYE: 3.5' HEIGHT OF OBJECT: 2.5'
DESIGN SPEED NOT ACHIEVED AT:

STA TO STA MPH

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.

Signature: ..... Typed Name: Aaron VanMoer

Date: 6/20/17 License No. 50428

..... DATE: 6/20/17
Approved County Engineer

Recommened For Approval ..... DATE: 6/29/17
District State Aid Engineer: Reviewed For Compliance With State Aid Rules/Policy

..... DATE: 7/7/17
Approved for State Aid Funding – For State Aid Engineer

THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS UTILITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38–.2, ENTITLED "STANDARD GUIDELINES OF THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA."

ESTIMATED QUANTITIES

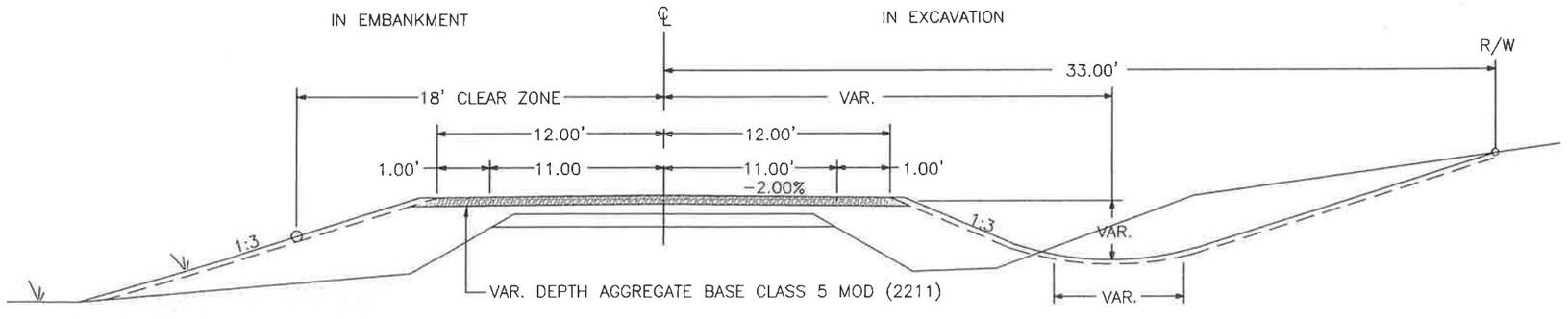
NOTES	SPECIFICATION NUMBER	ITEM	UNIT	RURAL (TWN BR)		TOTAL ESTIMATED QUANTITIES
				PARTICIPATING	NON-PARTICIPATING	
	2021 . 501	MOBILIZATION	LUMP SUM	1.00		1.00
1	2123 . 610	1.5 CU YD BACKHOE	HOUR		2.00	2.00
2	2211 . 501	AGGREGATE BASE CL. 5 MOD	TON		160.00	160.00
3,4,5	2412 . 511	12'x7' PRECAST CONCRETE BOX CULVERT	LIN FT	36.00		36.00
3,4,5	2412 . 511	12'x8' PRECAST CONCRETE BOX CULVERT	LIN FT	36.00		36.00
3,4,5	2412 . 512	12'x7' PRECAST CONC. BOX CULV END SECT	EACH	2.00		2.00
3,4,5	2412 . 512	12'x8' PRECAST CONC. BOX CULV END SECT	EACH	2.00		2.00
6	2442 . 501	REMOVE EXISTING BRIDGE	LUMP SUM		1.00	1.00
7	2451 . 515	COURSE AGGREGATE BEDDING (CV)	CU YD	120.00		120.00
8	2451 . 609	GRANULAR BACKFILL	TON	320.00		320.00
9	2511 . 502	RANDOM RIPRAP CLASS IV	TON	70.00		70.00
10	2563 . 601	TRAFFIC CONTROL	LUMP SUM	1.00		1.00
11	2573 . 533	SEDIMENT CONTROL LOG TYPE STRAW	LIN FT		80.00	80.00
12	2575 . 523	EROSION CONTROL BLANKET CATEGORY 3	SQ YD		160.00	160.00
13	2575 . 605	TURF ESTABLISHMENT	ACRE		0.30	0.30

CONSTRUCTION NOTES (ITEM SPECIFIC)

1. EQUIPMENT HOURS PROVIDED FOR ANY ADDITIONAL SHAPING OUTSIDE THE RIGHT OF WAY AND WITHIN TEMPORARY EASEMENTS. IF THE CONTRACTOR SHOULD CHOOSE TO USE A LARGER SIZED BACKHOE IT SHALL BE AT THE EXPENSE OF THE CONTRACTOR.
2. SHALL BE MODIFIED TO 6-12% PASSING THE #200 SIEVE. SHALL BE PLACED USING THE ORDINARY COMPACTION METHOD. PLACE AGGREGATE BASE STA. 25+00 TO STA. 28+25 (TOUCH DOWN POINTS) AS DIRECTED BY THE ENGINEER.
3. PLACE MASTIC AND FILTER CLOTH ENTIRE JOINT. ALL JOINTS SHALL BE TIED.
4. THE TOTAL UNIT PRICE SHALL INCLUDE EXCAVATION, BACKFILLING, GROUT, COFFERDAMS, DIVERSION CHANNELS, AND DEWATERING. ANY EXCESS EXCAVATION MATERIAL SHALL BECOME PROPERTY OF THE CONTRACTOR.
5. PRECAST CONCRETE BOX CULVERT SHALL BE CLASS 2. PRECAST CONC. BOX CULVERT END SECTIONS SHALL BE TYPE 1, 0° SKEW.
6. REMOVAL ITEMS SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE DISPOSED OF ACCORDING TO SPECIFICATION 2104.3 D.3. DISPOSAL WITHIN THE RIGHT OF WAY IS STRICTLY PROHIBITED.
7. COURSE AGGREGATE BEDDING SHALL BE PLACED UNDER THE BOX CULVERT TO THE APRON SECTIONS.
8. GRANULAR BACKFILL TO BE PLACED ON SIDES AND OVER THE BOX CULVERT.
9. GEOTEXTILE FABRIC MATERIAL SHALL BE INCLUDED IN THE TOTAL BID PRICE. RIPRAP SHALL BE CLASS IV QUARRY RUN MATERIAL.
10. THE CONTRACTOR SHALL COMPLETELY CLOSE OFF ROADWAY AS TO NOT ALLOW TRAFFIC DURING CONSTRUCTION. EXACT LOCATION OF TRAFFIC CONTROL DEVICES TO BE DETERMINED BY THE ENGINEER. EXISTING ACCESS TO RESIDENCES SHALL BE MAINTAINED THROUGHOUT THE PROJECT DURATION.
11. PLACE SEDIMENT CONTROL LOGS AS DIRECTED BY THE ENGINEER.
12. PLACE EROSION CONTROL BLANKET ON ALL EXPOSED AREAS OR AS DIRECTED BY THE ENGINEER.
13. NO ADDITIONAL COMPENSATION WILL BE MADE FOR MOBILIZATIONS DUE TO THE CONTRACTOR'S SCHEDULE. SEE "BASIS OF ESTIMATED QUANTITIES" FOR ADJUSTED TURF ESTABLISHMENT QUANTITIES AND RATES.

TYPICAL GRADING AND SURFACING SECTION

NOT TO SCALE
STA. 25+00.00 TO STA. 28+00.00



NOTE: PLACE AGGREGATE BASE CLASS 5M STA. 25+00 TO STA. 28+25 AS DIRECTED BY THE ENGINEER.

BASIS FOR ESTIMATED QUANTITIES

GRANULAR BACKFILL (2421)
GRANULAR BACKFILL: 1 C.Y. (CV) = 1.89 TONS

COURSE AGGREGATE BEDDING (CV) (2451)
COURSE AGGREGATE BEDDING: 1 C.Y. (CV) = 1.89 TONS

RANDOM RIPRAP CLASS IV (2511)
RANDOM RIP-RAP: 1 C.Y. = 1.40 TONS

AGGREGATE BASE CL. 5 MOD (2211)
AGGREGATE BASE CLASS 5 MOD: 140 LBS./CU.FT. DRY

TURF ESTABLISHMENT (2575)
SEEDING: 0.30 ACRES
SEED MIXTURE 25-142: 80 LBS./ACRE (ADJUSTED RATE) = 24.0 POUNDS
FERTILIZER TYPE 2: 200 LBS./ACRE = 60 POUNDS

STANDARD PLATES

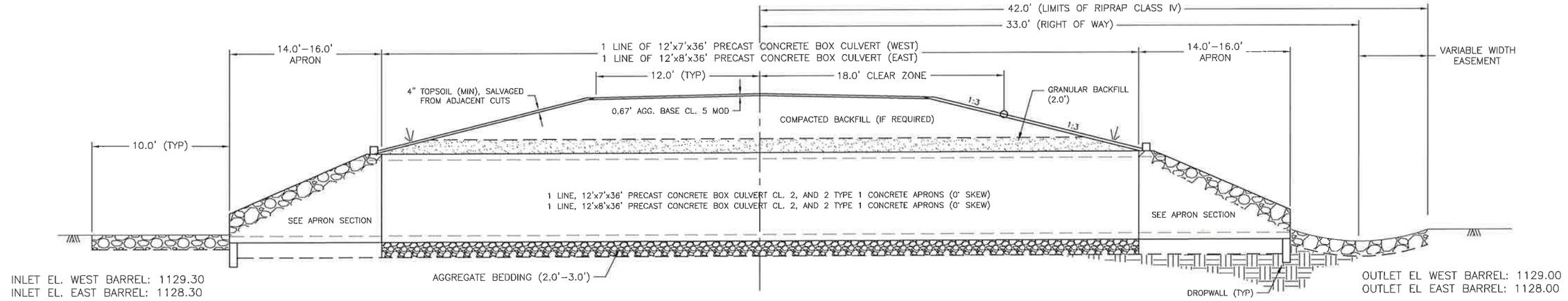
THE FOLLOWING STANDARD PLATES APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION, SHALL APPLY ON THIS PROJECT.

PLATE NO.	DESCRIPTION
3133 D	RIPRAP AT OUTLETS
3145 G	CONCRETE PIPE OR PRECAST BOX CULVERT TIES
8000 J	CHANNELIZERS

CERTIFIED BY _____ LIC. NO. 50428 DATE 6/20/17
LICENSED PROFESSIONAL ENGINEER

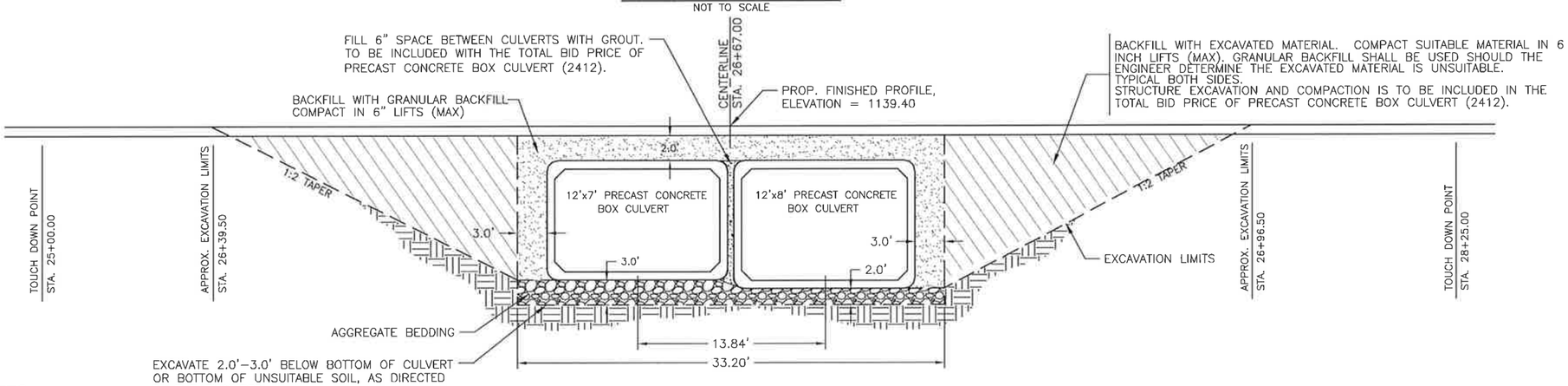
ELEVATION - BOX CULVERT SECTION

NOT TO SCALE



THRU CULVERT SECTION

NOT TO SCALE

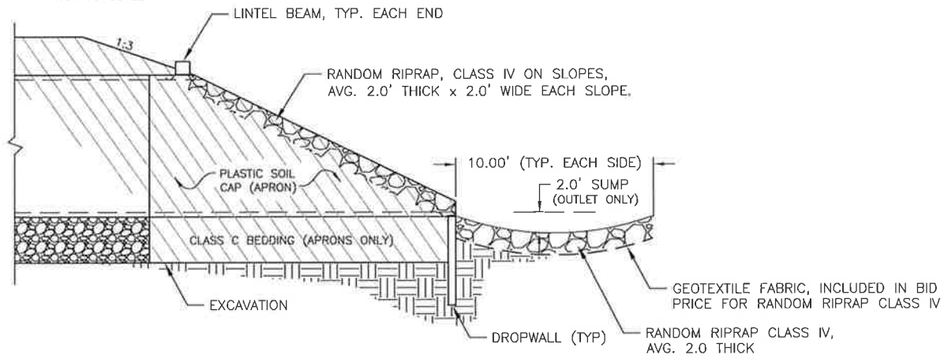


GENERAL CONSTRUCTION NOTES

1. NO VEHICLE TRAFFIC SHALL BE ALLOWED ABOVE CULVERT UNLESS 2.0' OF FILL HAVE BEEN PLACED.
2. ALL CONSTRUCTION SHALL BE COMPLETED WITHIN RIGHT OF WAY LIMITS OR EASEMENTS.
3. ALL MATERIALS, EQUIPMENT, AND LABOR REQUIRED TO CONSTRUCT COFFERDAMS, DIVERSIONARY CHANNELS, AND DEWATERING HOLES SHALL BE INCLUDED IN THE TOTAL BID PRICE OF CONCRETE BOX CULVERT.
4. SELECTED GRADING MATERIALS SHALL BE USED FOR ALL EMBANKMENT CONSTRUCTION AND SHALL CONSIST OF ALL SOILS ENCOUNTERED EXCEPT TOPSOILS, HIGHLY ORGANIC SOILS, DEBRIS, AND OTHER UNUSABLE MATERIALS. GRANULAR BACKFILL SHALL BE USED SHOULD THE ENGINEER DETERMINE THE EXCAVATED MATERIAL IS UNSUITABLE FOR EMBANKMENT.
5. THE CONTRACTOR SHALL SALVAGE TOPSOIL AND PLACE ON ALL AREAS THAT REQUIRE TURF ESTABLISHMENT. ALL SOILS SHALL BE PREPARED USING THE PROVISIONS OF MnDOT 2574.3 PRIOR TO SEEDING.
6. THE CONTRACTOR SHALL FILL THE 6" GAP BETWEEN CULVERT WITH GROUT. GROUT SHALL BE 1 PART PORTLAND CEMENT TO 3 PARTS SAND. GROUT SHALL BE TYPE 3A. ALL MATERIALS AND LABOR SHALL BE INCLUDED IN THE TOTAL BID PRICE OF THE CONCRETE BOX CULVERT.
7. RIPRAP MATERIALS SHALL BE CLASS IV AND QUARRY–RUN MATERIAL. GEOTEXTILE FABRIC SHALL BE PLACED UNDER THE ENTIRE RIPRAP AREA. GEOTEXTILE MATERIAL SHALL BE INCLUDED IN THE TOTAL BID PRICE OF RANDOM RIPRAP CLASS IV.
8. PLASTIC SOILS TREATMENT REQUIRED AT BOTH ENDS. COMPACT SELECT SOILS IN 6" (MAX) LIFTS.
9. PER DNR RECOMMENDATION, THE EASTERN BARREL (12'x8') WILL BURIED 1.0' BELOW THE NATURAL CHANNEL BOTTOM. THIS WILL ALLOW SEDIMENT TO PASS THROUGH THE EASTERN BARREL WHILE ENSURING THAT LESS SEDIMENT COLLECTS IN THE WEST BARREL. THE CULVERT ELEVATIONS SHALL BE VERIFIED AT THE TIME OF CONSTRUCTION STAKING. IF THE CULVERT POSITION OR ELEVATION IS NOT COMPATIBLE WITH THE EXISTING STREAM, THE ENGINEER SIGNING THESE PLANS SHALL BE NOTIFIED.
10. IT IS THE CONTRACTORS RESPONSIBILITY TO MAINTAIN THE TOWNSHIP ROAD AND RESTORE IT TO PRE–CONSTRUCTION CONDITION.
11. THE EXCAVATING CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL UNDERGROUND UTILITIES. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MAY BE CAUSED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE UNDERGROUND UTILITIES.
12. ALL EXPOSED SOILS MUST BE STABILIZED AS SOON AS POSSIBLE TO LIMIT SOIL EROSION BUT IN NO CASE LATER THAN SEVEN (7) DAYS AFTER CONSTRUCTION ACTIVITIES HAS TEMPORARILY OR PERMANENTLY CEASED. THE NORMAL WETTED PERIMETER MUST BE STABILIZED WITHIN 200 LINEAR FEET OF THE POINT OF DISCHARGE WITHIN 24 HOURS AFTER CONNECTING TO A SURFACE WATER.
13. ALL MATERIALS AND LABOR TO INSTALL DROPWALLS SHALL BE INCLUDED IN THE TOTAL BID PRICE FOR PRECAST CONCRETE BOX CULVERT (2412).
14. PLACE AGGREGATE BASE CLASS 5MOD STA. 25+00 TO STA. 28+25 AS DIRECTED BY THE ENGINEER.

APRON SECTION

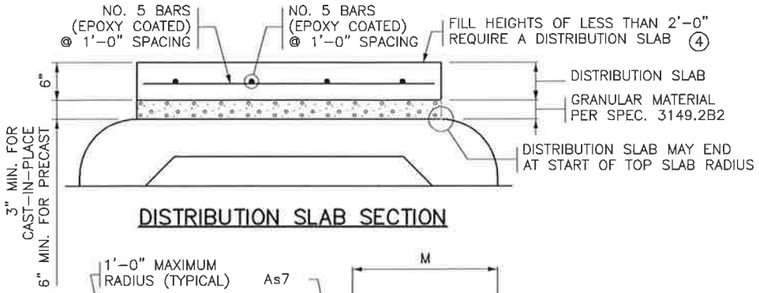
NOT TO SCALE



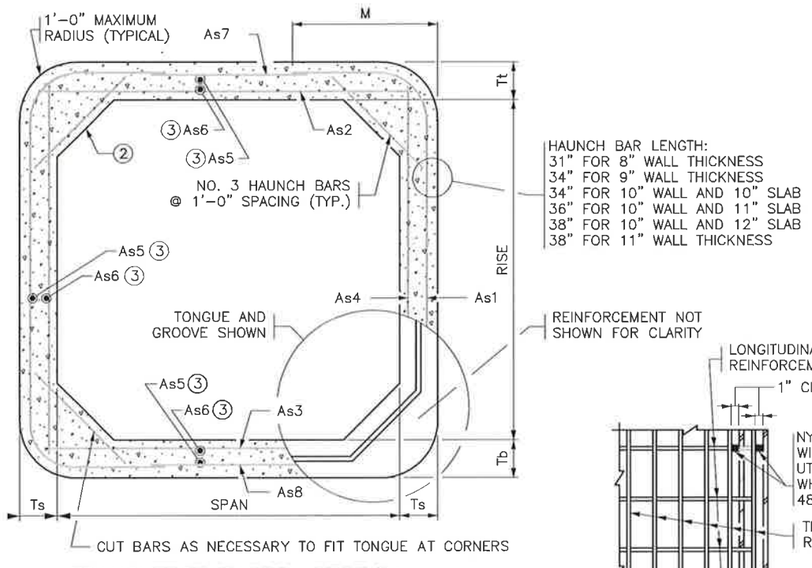
CERTIFIED BY _____ LIC. NO. 50428 DATE 6/20/17
LICENSED PROFESSIONAL ENGINEER

SECTION DETAILS

STATE AID PROJECT NO. 042–599–148 SHEET 03 OF 07 SHEETS

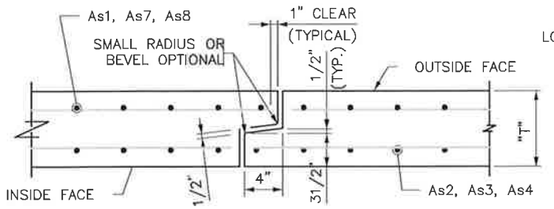


DISTRIBUTION SLAB SECTION

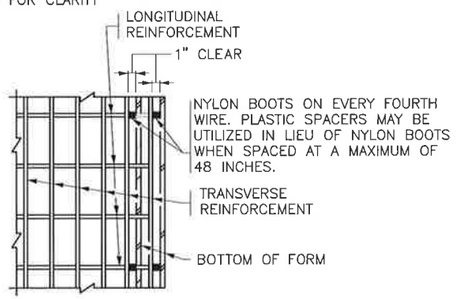


TRANSVERSE BARREL SECTION

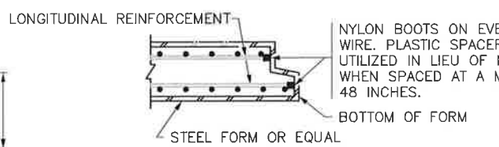
BAR REINFORCEMENT OPTION SHOWN



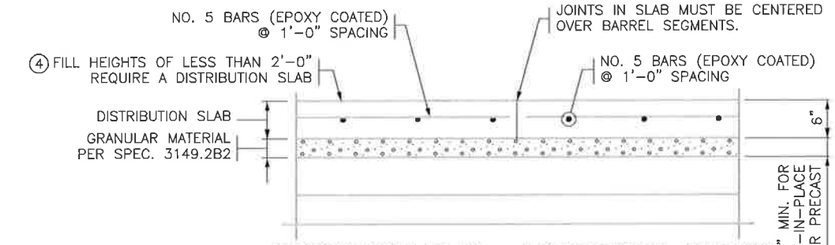
TONGUE AND GROOVE JOINT DETAIL



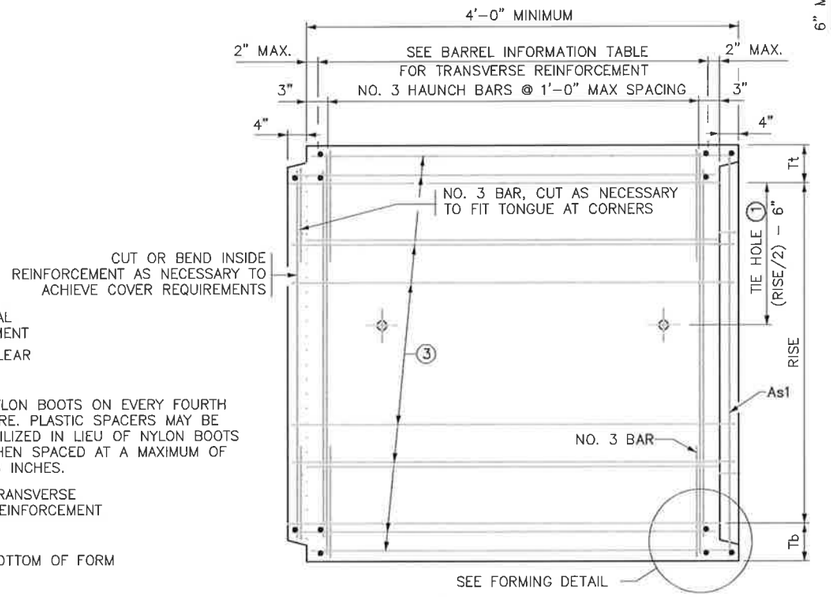
PLAN



SECTION FORMING DETAIL

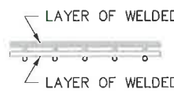


DISTRIBUTION SLAB – LONGITUDINAL SECTION



LONGITUDINAL BARREL SECTION

BAR REINFORCEMENT OPTION SHOWN



FABRIC LAYER DETAIL

WHEN MORE THAN ONE LAYER OF WELDED WIRE FABRIC IS USED TO OBTAIN THE REQUIRED REINFORCEMENT AREAS, THE WIRES OF THE WELDED WIRE FABRIC SHALL BE PLACED AS SHOWN

CONSTRUCTION NOTES

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

IF THE DISTANCE BETWEEN DOUBLE BARRELS IS LESS THAN 2'-0" USE EITHER PEA ROCK OR LEAN MIX BACKFILL (SPEC. 2520) BETWEEN THE CULVERTS AS APPROVED BY THE ENGINEER. IF PEA ROCK IS USED PROVIDE APPROVED GROUT SEEPAGE CUTOFF CORE, MINIMUM 12" THICK, BETWEEN THE CULVERT'S TWO ENDS. SEE STANDARD FIGURE 5-395.115 FOR DETAILS. MINIMUM DISTANCE BETWEEN THE BARRELS IS 6".

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

11/2" 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 WELDED WIRE FABRIC OR
(b) 1 LAYER OF WELDED WIRE FABRIC AND 1 LAYER OF REINFORCEMENT BARS OR
(c) 1 LAYER OF REINFORCEMENT BARS.
THE REINFORCEMENT SHALL BE DEVELOPED IN ACCORDANCE WITH AASHTO "LRFD BRIDGE DESIGN SPECIFICATIONS". IF BAR REINFORCEMENT IS SUBSTITUTED FOR WELDED WIRE FABRIC, THE AREA OF REINFORCEMENT SHALL BE INCREASED BY 8%, AND CONTRACTOR SHALL SUBMIT DESIGN CALCULATIONS VERIFYING COMPLIANCE WITH AASHTO 5.7.3.4. "CONTROL OF CRACKING BY DISTRIBUTION OF REINFORCEMENT".

THE MAXIMUM SIZE OF REINFORCEMENT BARS SHALL BE NO. 6. THE MAXIMUM WELDED WIRE FABRIC SIZE SHALL BE A W23 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 WELDED WIRE 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 SPEC. 3238.2A IS NOT REQUIRED UNLESS OPENINGS OR ATTACHMENTS ARE PLACED ON A BARREL SEGMENT.

COMPACT THE FIRST 1.5' (LOOSE) OF FILL ABOVE THE BOX WITH LIGHT COMPACTION EQUIPMENT SUCH AS PLATE COMPACTORS OR WALK BEHIND ROLLERS.

TRANSVERSE REINFORCEMENT IS PARALLEL TO THE CULVERT SPAN. LONGITUDINAL REINFORCEMENT IS PERPENDICULAR TO THE CULVERT SPAN.

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

(2) HAUNCH SIZES ARE TO BE 12" VERTICAL, 12" HORIZONTAL ON ALL BOX SIZES.

(3) LONGITUDINAL REINFORCEMENT DENOTED AS As5 AND As6 MUST BE PLACED IN ALL SLABS AND WALLS AND MUST BE 0.06 SQ. IN./FT. MIN.

(4) FILL HEIGHTS OF LESS THAN 2'-0" REQUIRE A DISTRIBUTION SLAB.

USE CONCRETE MIX 3Y43 FOR THE DISTRIBUTION SLAB.

CAST-IN-PLACE DISTRIBUTION SLABS SHALL BE 6" THICK. PROVIDE 3" MINIMUM GRANULAR MATERIAL PER SPEC. 3149.2B2 BETWEEN BARREL AND DISTRIBUTION SLAB.

PRECAST DISTRIBUTION SLABS SHALL BE 6" THICK AND MAY BE USED FOR FILL HEIGHTS OVER 1'-0". PROVIDE 6" MINIMUM GRANULAR MATERIAL PER SPEC. 3149.2B2 BETWEEN BARREL AND DISTRIBUTION SLAB.

THE WIDTH OF THE DISTRIBUTION SLAB SHALL EXTEND BETWEEN THE OUTSIDE EDGES OF THE SHOULDERS UNLESS DIRECTED BY THE ENGINEER.

PAYMENT FOR THE DISTRIBUTION SLAB AND GRANULAR MATERIAL BENEATH THE SLAB SHALL BE CONSIDERED INCIDENTAL.

IF DISTRIBUTION SLAB IS USED AS PAVEMENT SURFACE IT MUST BE REDESIGNED PER THE MnDOT PAVEMENT DESIGN MANUAL.

BARREL INFORMATION TABLE * * *

LOCATION	SIZE	CLASS	f'c (P.S.I.)	FILL HEIGHT RANGE (FT.)	DISTRIBUTION SLAB REQUIRED *	RECESSED TIE RODS REQUIRED * *	DIMENSIONS					WEIGHT (LBS./FT.)	WELDED WIRE FABRIC REINFORCEMENT											
							SPAN (FT.)	RISE (FT.)	Tt (IN.)	Tb (IN.)	Ts (IN.)		As1			As2		As3		As4		As7		As8	
													AREA (IN.!/FT.)	LENGTH (FT.)	M (FT.)	AREA (IN.!/FT.)	LENGTH (FT.)	AREA (IN.!/FT.)	LENGTH (FT.)	AREA (IN.!/FT.)	LENGTH (FT.)	AREA (IN.!/FT.)	LENGTH (FT.)	AREA (IN.!/FT.)	LENGTH (FT.)
4+29.34	12'x7'	2	5,000	3'-7'	NO	NO	12'	7'	9"	10"	8"	4875	0.61	13'-8"	2'-10"	0.80	12'-6"	0.82	12'-6"	0.20	7'-6"	0.24	10'-3"	0.24	10'-3"
4+42.66	12'x8'	2	5,000	3'-7'	NO	NO	12'	8'	9"	10"	8"	5075	0.57	14'-8"	2'-10"	0.84	12'-6"	0.87	12'-6"	0.20	8'-6"	0.24	10'-3"	0.24	10'-3"

* ALL CLASS 1 CULVERTS WITH FILL HEIGHTS OF LESS THAN 2'-0" REQUIRE A DISTRIBUTION SLAB. IF A DISTRIBUTION SLAB IS NOT REQUIRED, INDICATE "NO" IN THIS BOX.

* * FOR PEDESTRIAN CULVERT APPLICATIONS HIDE-AWAY OR RECESSED TIE CONNECTIONS ARE REQUIRED, SEE STANDARD PLATE 3145. IF REQUIRED, INDICATE "YES" IN THIS BOX.

* * * BOX CULVERTS WITH SPANS FROM 6 TO 14 FT. ARE DESIGNED FOR HL-93 LIVE LOADS (AASHTO LRFD 3.6.2.1) NOT INCLUDING THE DESIGN LANE LOAD. BOXES WITH SPANS OF 16 FT. ARE DESIGNED FOR HL-93 LIVE LOADS INCLUDING THE DESIGN LANE LOAD.

REVISION: 11-06-2013

APPROVED: MARCH 24, 2011
Nancy Daubenberger
STATE BRIDGE ENGINEER

STATE AID PROJECT NO 042-599-148

FIG. 5-395.101(A)

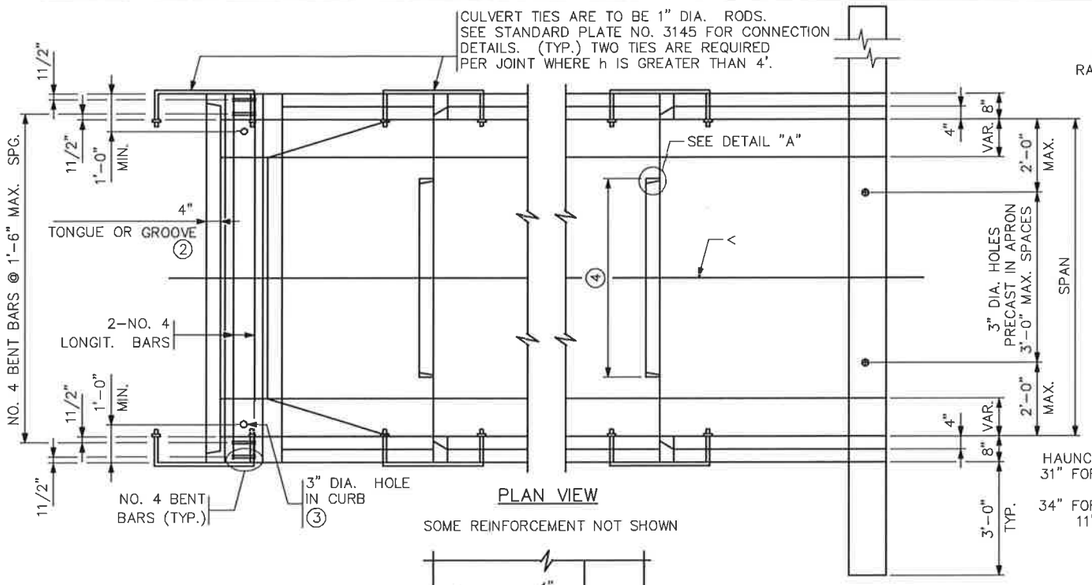
CERTIFIED BY
LICENSED PROFESSIONAL ENGINEER
DATE 6/20/17
NAME: Aaron VanMoer LIC. NO. 50428

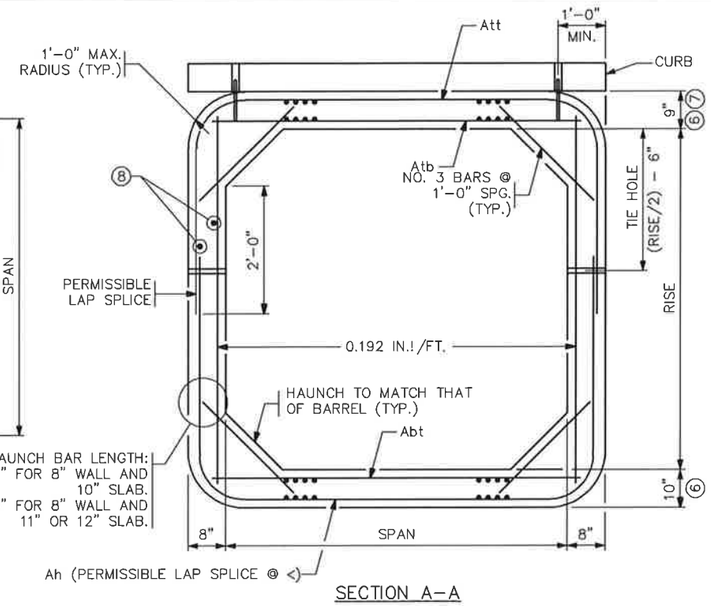
BARREL DETAILS

DES: DR: APPROVED:
CHK: CHK:

SHEET NO. 04 OF 07 SHEETS

BRIDGE NO. 42J39





SECTION A-A

CONSTRUCTION NOTES

SEE STANDARD 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.

SEE STANDARD 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 STANDARD 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".

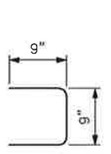
(4) 3'-6" MIN. TONGUE AND 3'-7" MIN. GROOVE FOR CULVERTS WITH 6'-0" SPANS. 5'-0" MIN. TONGUE AND 5'-1" MIN. GROOVE FOR CULVERTS WITH SPANS GREATER THAN 6'-0". CENTER TONGUE AND GROOVE ON < OF EACH APRON JOINT. TONGUE AND GROOVE JOINT ON ALL THREE SIDES OF APRON IS PERMISSIBLE.

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

(6) APRON TOP AND BOTTOM SLAB THICKNESS MAY BE 8" FOR CULVERTS WITH 6' SPANS ONLY. BOTTOM SLAB THICKNESS MAY BE INCREASED UP TO 2" MAX. PROVIDED CONCRETE COVER IS 11/2" MIN., 2" MAX.

(7) 10" MINIMUM TOP SLAB FOR 14' AND 16' SPANS.

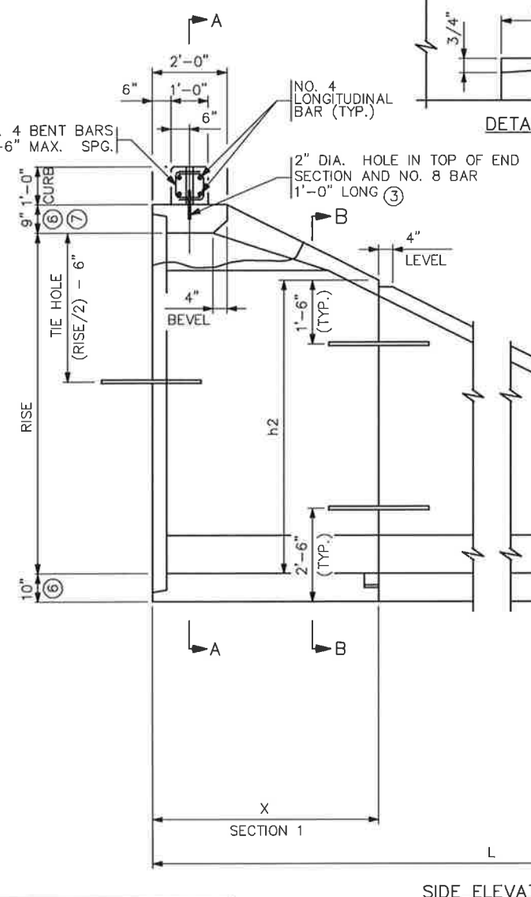
(8) LONGITUDINAL REINFORCEMENT PERPENDICULAR TO THE CULVERT SPAN SHALL HAVE A MINIMUM OF 0.06 SQUARE INCHES PER PERIPHERAL FOOT ON ALL FACES OF THE BARREL.

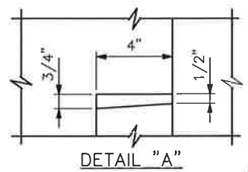


NO. 4 BENT BAR

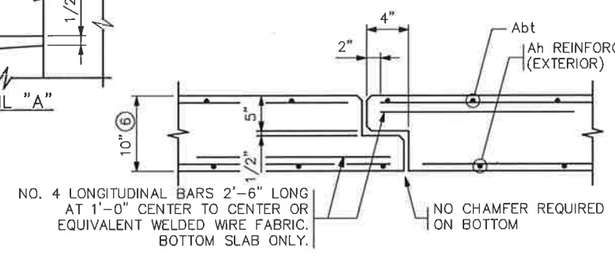
Att, Atb REINFORCEMENT		
SPAN (FT.)	Att (IN²/FT.)	Atb (IN²/FT.)
6	0.27	0.44
8	0.47	0.60
10	0.62	0.74
12	0.88	1.06
14	1.20	1.58
16	1.52	2.09

Abt REINFORCEMENT	
SPAN (FT.)	Abt (IN²/FT.)
6-10	0.20
12	0.30
14	0.39
16	0.39



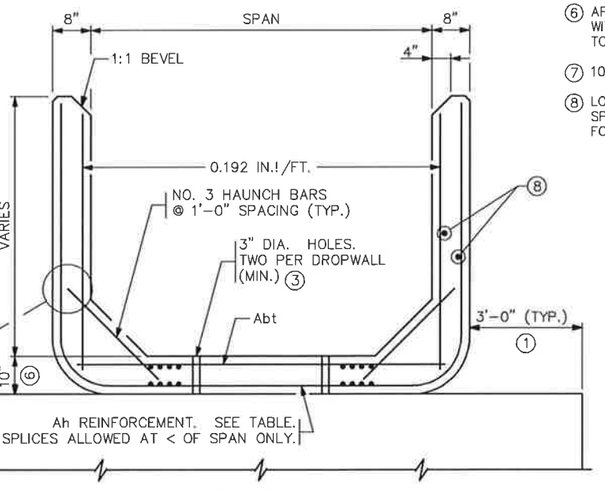


DETAIL "A"

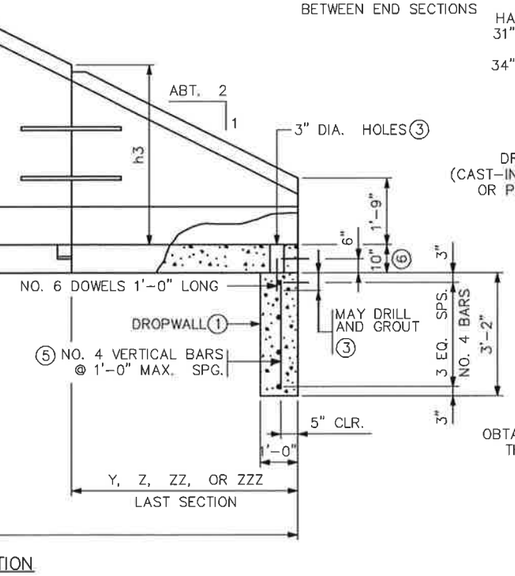


TONGUE AND GROOVE JOINT DETAIL

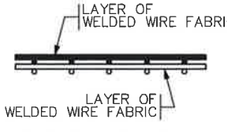
BETWEEN END SECTIONS



SECTION B-B



SIDE ELEVATION



FABRIC LAYER DETAIL

WHEN MORE THAN ONE LAYER OF WELDED WIRE FABRIC IS USED TO OBTAIN THE REQUIRED REINFORCEMENT AREAS, THE WIRES OF THE WELDED WIRE FABRIC SHALL BE PLACED AS SHOWN.

APRON DIMENSIONS & Ah REINFORCEMENT

RISE FT.	L FT.	SECTION 1 X	SECTION 1 Ah	h2	SECTION 2 Y	SECTION 2 Ah	h3	SECTION 3 Z	SECTION 3 Ah	h4	SECTION 4 ZZ	SECTION 4 Ah	h5	SECTION 5 ZZZ	SECTION 5 Ah	h6
4	8	8'(4')	0.192	1'-9"(3'-9")	(4')	(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'(4')	0.192	1'-9"(3'-9")	(4')	(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'(4')	0.192	1'-9"(3'-9")	(4')	(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'(4')	0.192	1'-9"(3'-9")	(4')	(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 (IN²/FT.) VALUES IN ( ) MAY BE USED FOR END SECTIONS WITH SPANS OF 14' AND 16' ONLY.

REVISION: 11-06-2013

APPROVED: MARCH 24, 2011
Nancy Dorbenberger
STATE BRIDGE ENGINEER

STATE AID PROJECT NO. 042-599-148

FIG. 5-395.102

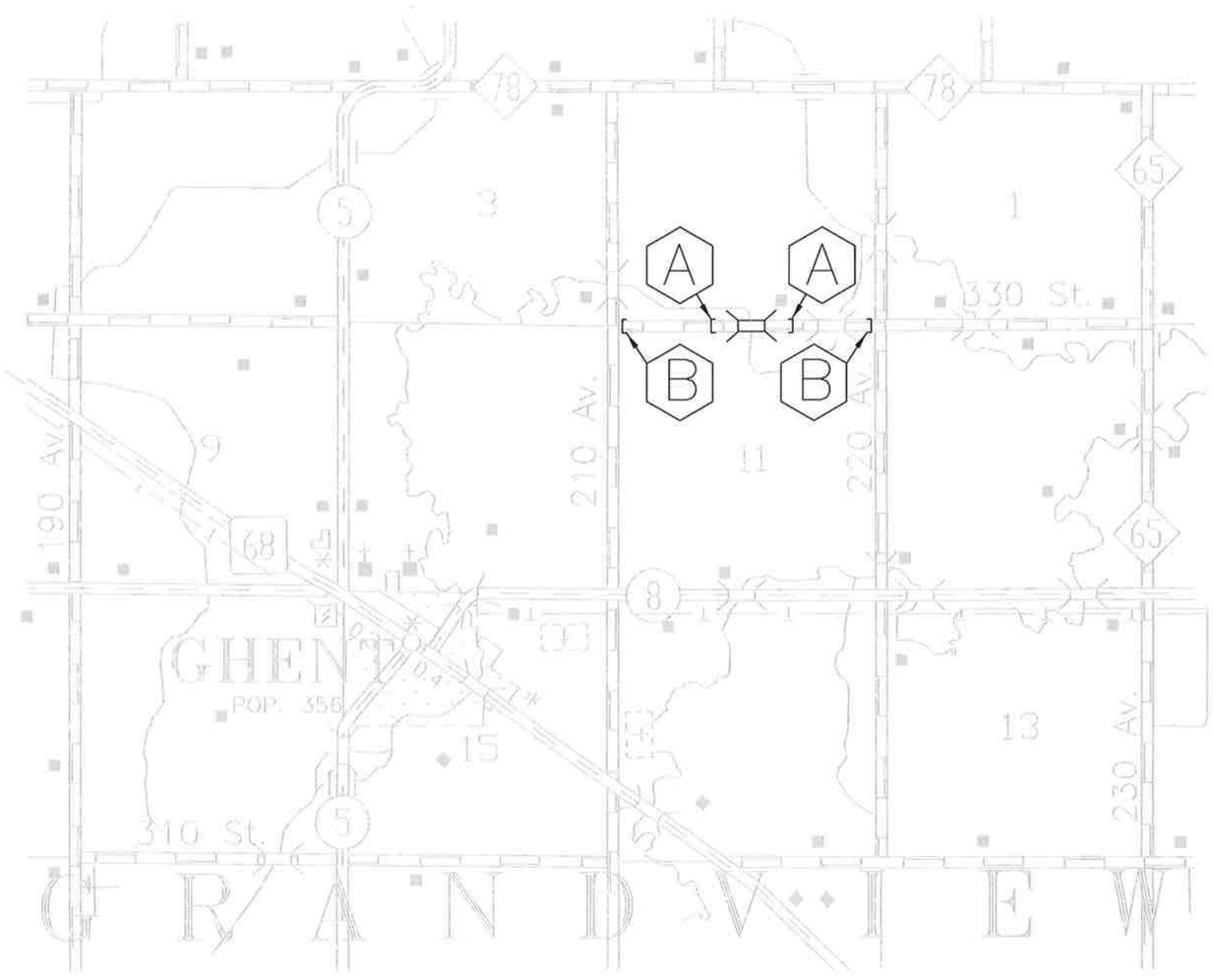
CERTIFIED BY NAME: _____ 6/20/17 DATE
LICENSED PROFESSIONAL ENGINEER
LIC. NO.: 50428

TITLE: PRECAST CONCRETE END SECTION TYPE I - SINGLE OR DOUBLE BARREL FOR SKEWS UP TO 71/2°

DES: | DR: | APPROVED:
CHK: | CHK:

SHEET NO. 05 OF 07 SHEETS

BRIDGE NO. 42J39



SIGN TABLE					
SIGN	SIGN NO.	QUANTITY	SIZE	COLOR	FLASHERS
	TYPE III BARRICADE	8	60"x48"	ORANGE ON WHITE	4
BRIDGE CLOSED	R11-2A	2	48"x30"	BLACK ON WHITE	
BRIDGE CLOSED 0.5 MILES AHEAD LOCAL TRAFFIC ONLY	R11-3C	2	60"x30"	BLACK ON WHITE	

TRAFFIC CONTROL PLAN

ALL COSTS INCURRED FOR MATERIALS, INSTALLATION, MAINTENANCE AND REMOVAL OF TRAFFIC CONTROL DEVICES AS SHOWN ON THIS SHEET AND RELATED WORK DURING CONSTRUCTION SHALL BE INCLUDED IN PRICE BID FOR ITEM "TRAFFIC CONTROL".

ALL TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE CURRENT EDITION OF THE MN MUTCD INLUDING THE CURRENT TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS FIELD MANUAL.

BARRICADE PLACEMENT TO BE DETERMINED IN THE FIELD SO AS NOT TO OBSTRUCT VISION TO OR FROM ROADWAY ENTRANCES.

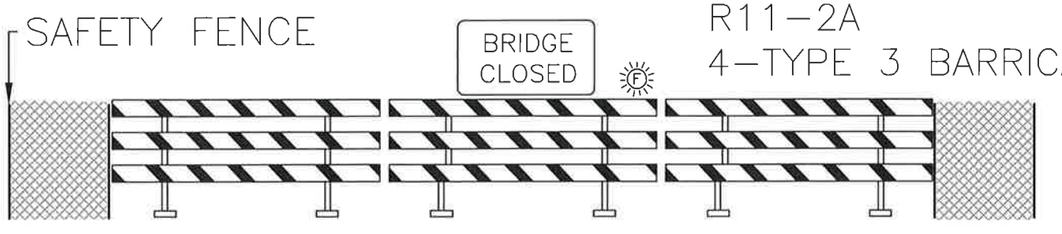
EXACT LOCATIONS OF TRAFFIC CONTROL DEVICES TO BE DETERMINED BY THE ENGINEER IN THE FIELD.

ALL TRAFFIC CONTROL DEVICES SHALL HAVE REFLECTIVE SHEETING.

THE USE OF TEMPORARY ORANGE CONSTRUCTION FENCING IS REQUIRED BY THE ENGINEER TO COMPLETELY CLOSE OFF ANY SPECIFIC WORK AREA.

A

SAFETY FENCE



R11-2A
4-TYPE 3 BARRICADES

B

R11-3C
1-TYPE 3 BARRICADE

CERTIFIED BY _____ LIC. NO. 50428 DATE 6/20/17
LICENSED PROFESSIONAL ENGINEER

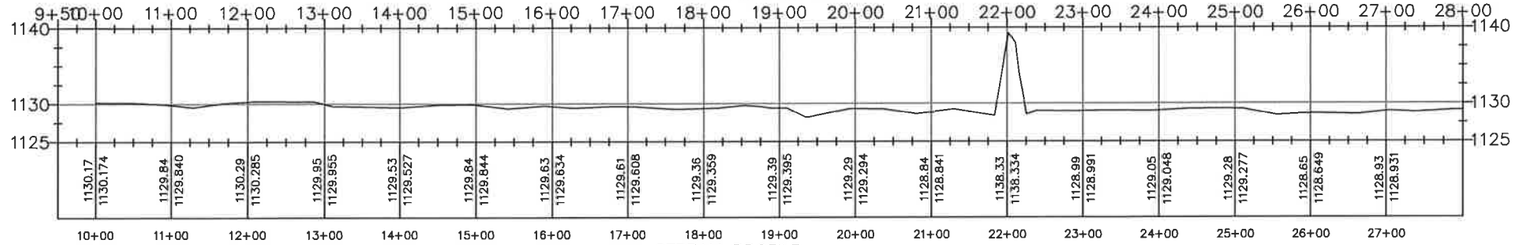
TRAFFIC CONTROL PLAN

STATE AID PROJECT NO. 042-599-148

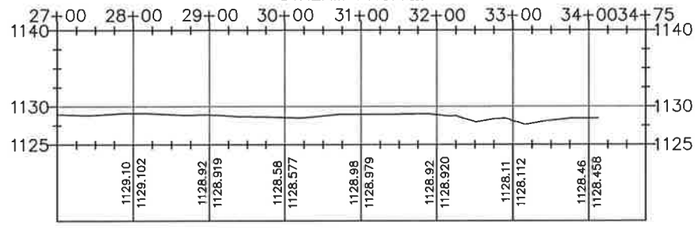
CONTRACTED PROFILE

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

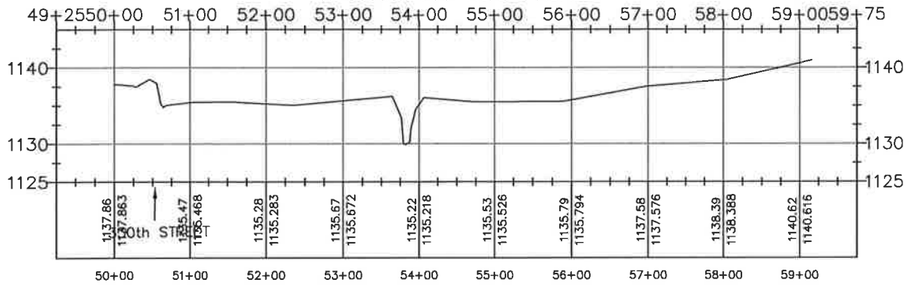
STREAM PROFILE



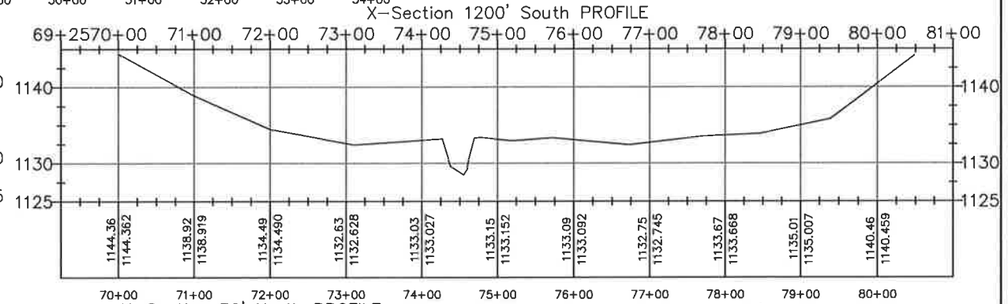
STREAM PROFILE



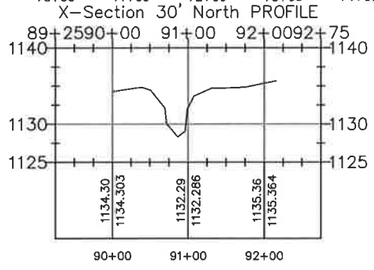
X-Section 700' North PROFILE



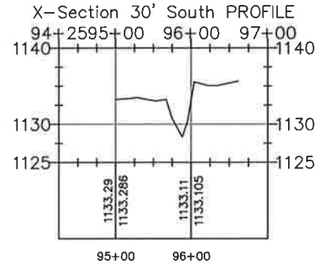
X-Section 1200' South PROFILE



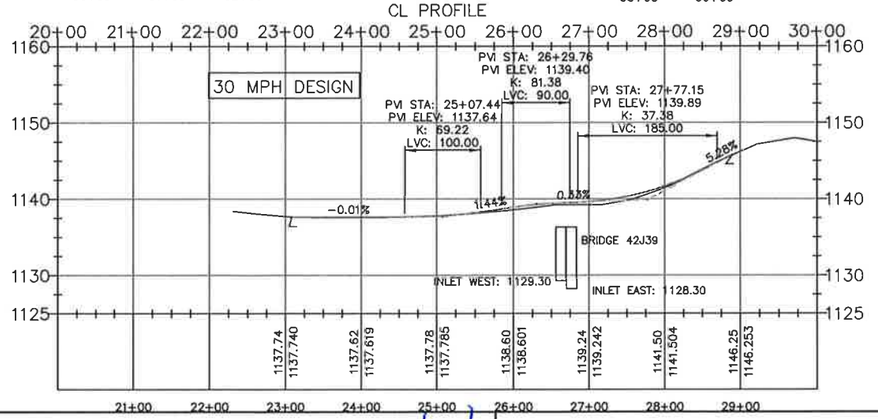
X-Section 30' North PROFILE

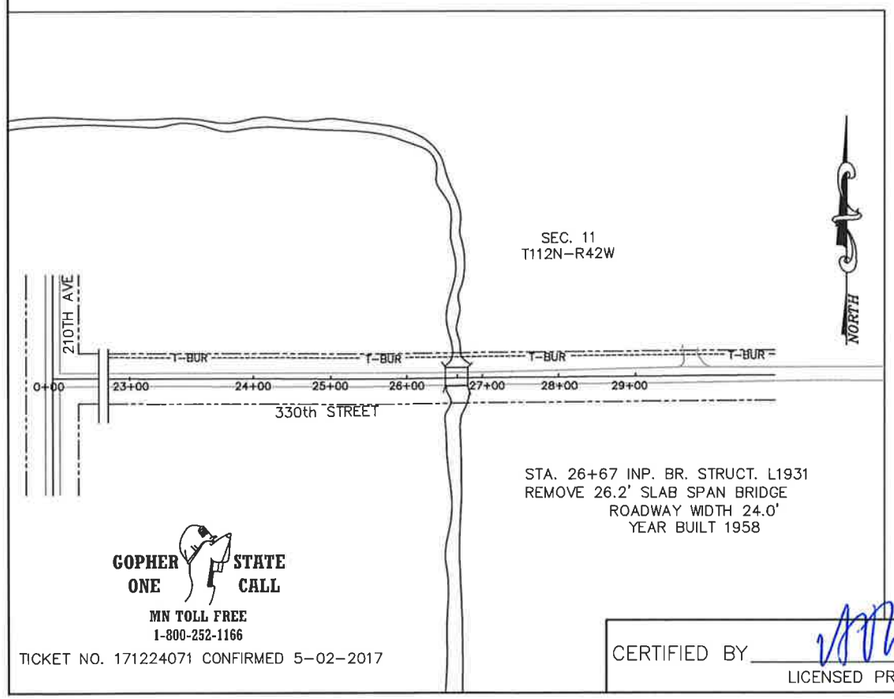


X-Section 30' South PROFILE



CL PROFILE





STA. 26+67 INP. BR. STRUCT. L1931
REMOVE 26.2' SLAB SPAN BRIDGE
ROADWAY WIDTH 24.0'
YEAR BUILT 1958

GOPHER STATE ONE CALL
MN TOLL FREE
1-800-252-1166
TICKET NO. 171224071 CONFIRMED 5-02-2017

LOCATION ENGINEER'S OBSERVATIONS AT BRIDGE SITE

1. Special features: Waterfalls, dams, floods, ice, debris, sliding banks, recreational boating.
   NONE
2. Other bridges or culverts over the same stream (particulary structures which carry high water without overflow of roadway) Given location, type, length, height above high water, cross-sectional area ect.
   UPSTREAM: BRIDGE 95438 (2 LINES 154" R.C.P. ARCH)
   DOWNSTREAM: BRIDGE L2428 (26'x26' TIMBER BEAM SPAN)
3. Apparent highwater elevation UNKNOWN Obtained from
4. Other data: Approx. velocity of water at time of survey

HYDRAULIC ENGINEER'S RECOMMENDATION

DATE 5-11-2015

Stream or ditch designation UNNAMED
Drainage area 12.8 SQ. MI.
Max. discharge on record UNK Design discharge (80 yr. freq.) 1410 C.F.S.
Max. observed highwater elevation UNK Design highwater elevation 1137.6
Design mean velocity through structure 9.9 F.P.S.
Low superstructure at or above elevation
Flowline elevation 1129.30 (INLET), 1129.00 (OUT) Skew angle 0
Water 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 1540 C.F.S. at stage 1135.3 and mean velocity of 10.1 F.P.S. with 2.6 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 ENGINEER'S RECOMMENDATION

DATE

Bridge survey sheets made from LYON COUNTY SURVEY

BENCH mark elevation 1140.00 (NAVD 88)
LOCATION N.E. COR. BRIDGE L1931

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

BRIDGE SURVEY

AT MILE POINT ON 330TH ST. (T.H.,C.S.A.H.,C.R. ect.)
PROPOSED BRIDGE LOCATED 1.6 MILES W OF
JCT CR 65
SEC. 11 TWP. T112N R R42W
TOWNSHIP GRANDVIEW COUNTY LYON

BRIDGE NO.
PROPOSED BR. NO. 42J39

CERTIFIED BY _____ LIC. NO. 50428 DATE 6/20/17
LICENSED PROFESSIONAL ENGINEER

BRIDGE SURVEY SHEET

STATE AID PROJECT NO. 042-599-148 SHEET 07 OF 07 SHEET