MINNESOTA DEPARTMENT OF TRANSPORTATION
LINCOLN COUNTY

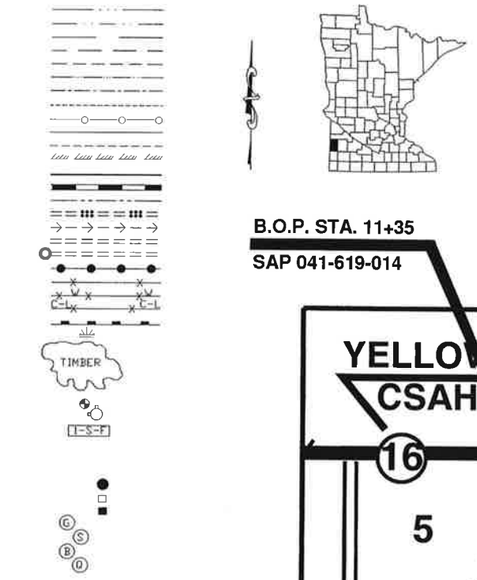
CONSTRUCTION PLAN FOR REPLACEMENT BRIDGE NO. L1988 WITH 1 LINE OF 14'x9' R.C. BOX CULVERT & 1 LINE OF 14'x10' R.C. BOX CULVERT

LOCATED ON C.S.A.H. 19 **BETWEEN** INTERSECTION OF 250TH AVE & 260TH AVE IN ALTA VISTA TOWNSHIP (Geographic description)

FROM NORTHWEST CORNER OF SEC. 22-T113N-R44W **TO** NORTHEAST CORNER OF SEC. 22-T113N-R44W (Legal description)

PLANS SYMBOLS

STATE LINE
COUNTY LINE
TOWNSHIP OR RANGE LINE
SECTION LINE
QUARTER LINE
PRESENT ROW
NEW ROW
TEMPORARY EASEMENT
CONTROL OF ACCESS LINE
PROPERTY LINES
VACATED PLATTED PROPERTY
CORPORATE OR CITY LIMITS
RETAINING WALL
RAILROAD
RAILROAD RIGHT-OF-WAY
DRAINAGE DITCH
DRAIN TILE
CULVERT
DROP INLET
GUARD RAIL
BARBED WIRE FENCE
WOVEN WIRE FENCE
CHAIN LINK FENCE
RAILROAD SNOW FENCE
SWAMP
TIMBER
ORCHARD
BRUSH
NURSERY
CATCH BASIN
FIRE HYDRANT
BUILDING (ONE STORY FRAME)
F - FRAME C - CONCRETE
S - STONE T - TILE
B - BRICK ST- STUCCO
IRON PIPE OR ROD
MONUMENT (STONE,CONC. OR METAL
WOODEN HUB
GRAVEL PIT
SAND PIT
BORROW PIT
ROCK QUARRY



UTILITIES SYMBOLS

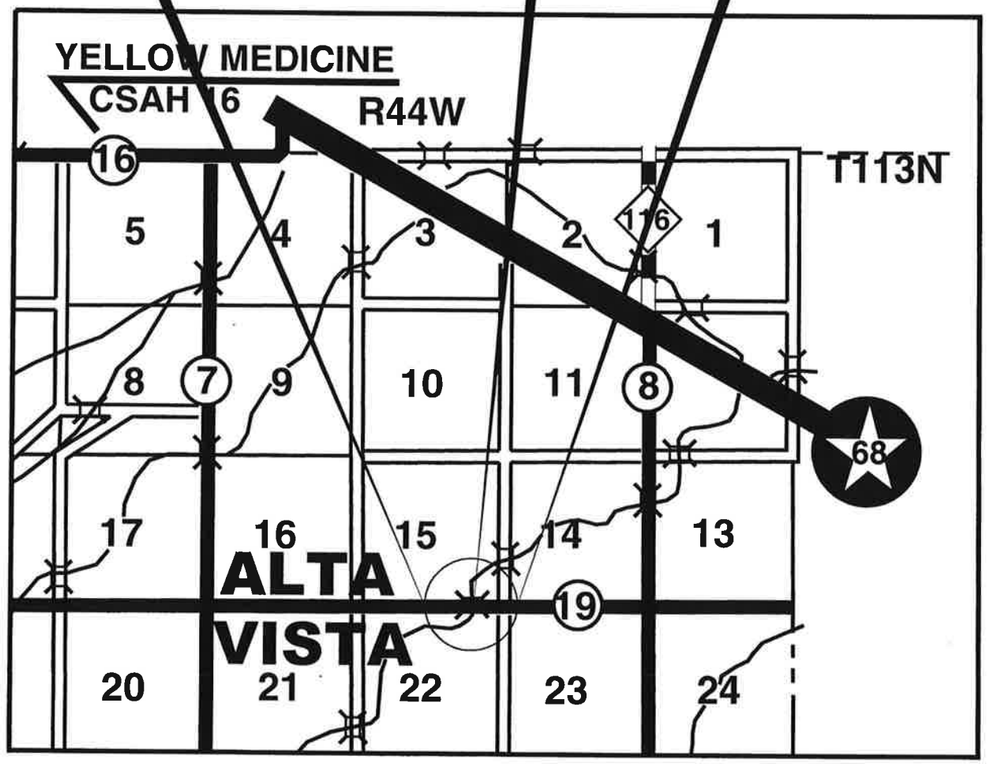
POWER POLE LINE — OHP
TELEPHONE LINE — TELE
JOINT TELEPHONE AND POWER LINE — OHP/T
ANCHOR
STEEL TOWER
STREET LIGHT
PEDESTAL (TELEPHONE CABLE TERMINAL)
GAS MAIN — G — G —
WATER MAIN — W — W —
CONDUIT
TELEPHONE CABLE IN CONDUIT — T —
ELECTRIC CABLE IN CONDUIT — P —
TELEPHONE MANHOLE
ELECTRIC MANHOLE
BURIED TELEPHONE CABLE — T-BUR
BURIED POWER CABLE — P-BUR
SEWER (SANITARY OR STORM)
SEWER MANHOLE
POWER POLE

S.A.P. 041-619-014 (BRIDGE)		
GROSS LENGTH	300 FT.	0.057MI.
BRIDGES-LENGTH	0 FT.	0 MI.
EXCEPTIONS-LENGTH	0 FT.	0 MI.
NET LENGTH	300 FT.	0.057 MI.

B.O.P. STA. 11+35
SAP 041-619-014

BRIDGE STA. 12+85
OLD BR. #L1988
NEW BR. #41J74
@ 30° SKEW

E.O.P. STA. 14+35
SAP 041-619-014



SCALE: 1 MILE

FEDERAL PROJECT NO. _____

SPECIFICATIONS

THE 2018 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.

INDEX

THIS PLAN CONTAINS 14 SHEETS

DESIGN DESIGNATION

R-VALUE _____
ADT (2019) 145
Proj. ADT (2039) 145
Proj. HCADT (2039) 9
Soil Factor 130
Shoulder Width 5 FT.

OR

FUNCTIONAL CLASSIFICATION MAJOR COLLECTOR
NO. OF TRAFFIC LANES 2 NO. OF PARKING LANES 0
DESIGN SPEED 50 MPH
BASED ON STOPPING SIGHT DISTANCE
HEIGHT OF EYE 3.5 FT. HEIGHT OF OBJECT 2.0 FT.
DESIGN SPEED NOT ACHIEVED AT: N/A
STA. _____ TO STA. _____

LOCAL AGENCY SIGNATURES:

Signature: Joseph M Wilson Typed or Printed Name: JOSEPH M. WILSON,
Design Engineer: I hereby certify that this plan was prepared by me or under my direct supervision, and that I am o duly Licensed Professional Engineer under the laws of the State of Minnesota.

Date: 5/02/19

License Number 54947

Joseph M Wilson Date: 5/02/19
Approved: Lincoln County Engineer

Todd Broadwell Date: 5/14/19
District State-Aid Engineer: Reviewed for Compliance with State-Aid Rules/Policy

Todd Broadwell Digitally signed by Todd Broadwell Date: 2020.12.16 12:47:30 -06'00'
State-Aid Engineer: Approved for State Aid Funding

ESTIMATED QUANTITIES

NOTES	ITEM NO.	ITEM	UNITS	TOTAL PARTICIPATING	TOTAL NON-PARTICIPATING	TOTAL ESTIMATED QUANTITIES
	2021.501	MOBILIZATION	LUMP SUM	1		1
	2104.503	SALVAGE FENCE	LIN FT		473	473
1	2104.504	REMOVE BITUMINOUS PAVEMENT	SQ YD		89	89
2	2104.507	REMOVE AGGREGATE	CU YD		56	56
	2211.509	AGGREGATE BASE CLASS 5	TON		350	350
3	2412.502	14X9 PRECAST CONCRETE BOX CULVERT END SECTION	EACH	2		2
3	2412.502	14X10 PRECAST CONCRETE BOX CULVERT END SECTION	EACH	2		2
4,5	2412.503	14X9 PRECAST CONCRETE BOX CULVERT	LIN FT	54		54
4,5	2412.503	14X10 PRECAST CONCRETE BOX CULVERT	LIN FT	54		54
6,7	2442.501	REMOVE EXISTING BRIDGE	LUMP SUM		1	1
8	2451.507	COARSE FILTER AGGREGATE (CV) (P)	CU YD	242		242
9	2451.609	GRANULAR BACKFILL	TON	1453		1453
10,11	2511.509	RANDOM RIPRAP CLASS V	TON	171		171
	2557.603	INSTALL FENCE	LIN FT		473	473
	2563.601	TRAFFIC CONTROL	LUMP SUM	1		1
	2572.503	TEMPORARY FENCE	LIN FT		653	653
	2573.503	SEDIMENT CONTROL LOG TYPE WOOD FIBER	LIN FT		45	45
	2575.504	EROSION CONTROL BLANKETS CATEGORY 3N	SQ YD		667	667
12	2575.505	SEEDING	ACRE		0.5	0.5
13	2575.505	DISK ANCHORING	ACRE		0.5	0.5
	2575.508	SEED MIXTURE 21-111	POUND		31	31
	2575.508	SEED MIXTURE 25-142	POUND		23	23
13	2575.509	MULCH MATERIAL TYPE 1	TON		1	1
14	2575.601	TURF ESTABLISHMENT (MOBILIZATION)	LUMP SUM		1	1

UTILITY CONTACTS

FRONTIER COMMUNICATIONS
2720 BROADWAY AVENUE
SLAYTON MN, 56172
(507)-836-8883

LINCOLN COUNTY ENVIRONMENTAL OFFICE
221 NORTH WALLACE AVENUE
P.O. BOX 66
IVANHOE, MN (507)694-1344

LYON-LINCOLN ELECTRIC CO-OP INC.
BOX 639 WEST HWY 14
TYLER, MN 56178
(507)247-5505

BASIS FOR PLANNED QUANTITIES

AGGREGATE SURFACING CLASS 5	140 LBS./CUBIC FOOT (CV)
QUARRY RUN RIP-RAP	1.3 TONS/CUBIC YARD
SEED MIXTURE 21-111	62 LBS./ACRE (PLS RATE)
SEED MIXTURE 25-142	45 LBS./ACRE (PLS RATE)
MULCH MATERIAL TYPE 1	2 TONS / ACRE
GRANULAR BACKFILL	1.8 TONS / CUBIC YARD

STANDARD PLATES

PLATE NO.	DESCRIPTION
8000 J	CHANNELIZERS TYPE A, TYPE B, TYPE C.

* THESE STANDARD PLATES ARE APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION AND SHALL APPLY ON THIS PROJECT.

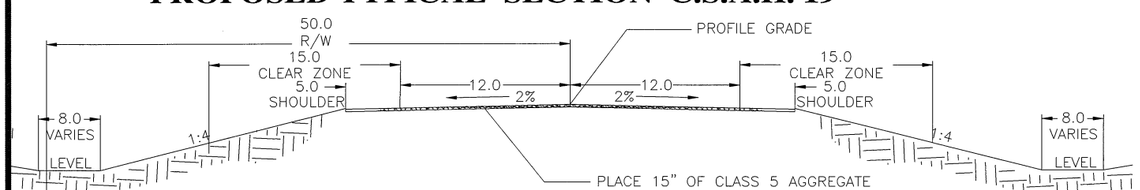
GENERAL CONSTRUCTION NOTES:

- 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".
- THE INFORMATION SHOWN ON THESE PLANS CONCERNING TYPE AND LOCATION OF UNDERGROUND UTILITIES ARE NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. THE CONTRACTOR IS RESPONSIBLE FOR MAKING THEIR OWN DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO.
- CONTRACTOR IS RESPONSIBLE FOR NOTIFYING GOPHER STATE ONE CALL PRIOR TO CONSTRUCTION (PHONE NO. 1-800-252-1166).
- CONTRACTOR SHALL COORDINATE WORK WITH OTHER UTILITY CONTRACTORS, WORK MAY BE ADJACENT AND WITHIN THE PROJECT LIMITS. NO COMPENSATION WILL BE MADE FOR THE COORDINATION WITH THE UTILITIES.
- CONTRACTOR SHALL MAINTAIN CONSTRUCTION WORK WITHIN THE PROJECT LIMITS AS SHOWN ON THE PLANS. ANY DAMAGE OUTSIDE THE CONSTRUCTION LIMITS SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
- (P) INDICATES PLANNED QUANTITY.

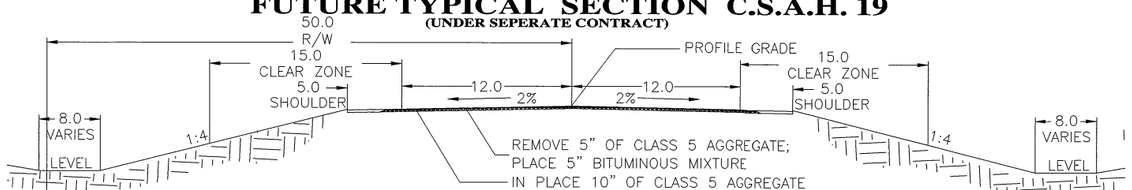
NOTES:

1. THE CONTRACTOR SHALL SALVAGE THE EXISTING BITUMINOUS SURFACE (APPROXIMATELY 5.0" OF BITUMINOUS) BETWEEN PROJECT STA. 11+35 AND 14+35. THE COST FOR REPLACEMENT FOR ANY BITUMINOUS REMOVED BEYOND THESE PROJECT STATIONS WILL BE AT THE CONTRACTOR'S EXPENSE. BITUMINOUS THICKNESS MAY VERY. SALVAGED BITUMINOUS PAVEMENT SHAL BE HAULED AND STOCKPILED AT SOOK PIT LOCATED IN THE NORTHWEST QUARTER OF SECTION 15 T111N, R44W IN LAKE STAY TOWNSHIP.
2. EXISTING AGGREGATE SHALL BE SALVAGED AND USED IN-PLACE OF GRANULAR BACKFILL MATERIAL. BID PRICE SHALL INCLUDE ALL COSTS TO SALVAGE, STOCKPILE AND PLACE THE MATERIAL. GRANULAR BACKFILL QUANTITY WAS REDUCED BY 100 TONS.
3. PRECAST CONCRETE BOX CULVERT END SECTIONS SHALL BE TYPE III FOR A 30° SKEW.
4. MASTIC JOINT SEALER SHALL BE APPLIED TO THE ENTIRE JOINT AREA AND TO LIFT HOLE PLUGS. GEOTEXTILE MATERIAL SHALL ALSO BE INSTALLED ON THE ENTIRE JOINT AREA OF THE PIPE. MASTIC JOINT SEALER, GEOTEXTILE MATERIAL, AND PIPE TIES SHALL BE INCLUDED IN THE BID PRICE FOR PRECAST CONCRETE BOX CULVERTS.
5. ALL EXCESS EXCAVATION SHALL BE DISPOSED OF BY THE CONTRACTOR. COST OF SAID DISPOSAL SHALL BE INCLUDED IN THE BID PRICE FOR PRECAST CONCRETE BOX CULVERT.
6. PRIOR TO PERFORMING EXCAVATION AND EMBANKMENT OPERATIONS WITHIN THE PROJECT LIMITS THE CONTRACTOR SHALL SALVAGE AND STOCKPILE THE TOPSOIL IN A LOCATION OF THE CONTRACTOR'S CHOICE, ON THE PROJECT SITE. UPON COMPLETION OF ALL GRADING OPERATIONS, THE CONTRACTOR SHALL DEPOSIT AND SPREAD THE TOPSOIL IN A UNIFORM LAYER ON THE SUBSOIL. THIS WORK SHALL BE INCLUDED IN THE BID PRICE FOR REMOVAL OF THE EXISTING STRUCTURE. ANY EXCAVATED ROCK IS INCLUDE IN THE BID PRICE FOR THE REMOVAL OF THE BRIDGE.
7. EXISTING BRIDGE BECOMES THE PROPERTY OF THE CONTRACTOR AND SHALL BE DISPOSED OF OFF SITE. THE CONCRETE AND TIMBER SHALL BE REMOVED AND DISPOSED OF AT AN APPROVED LANDFILL OR REUSED/RECYCLED ACCORDING TO LOCAL, STATE, AND FEDERAL REQUIREMENTS.
8. THE GRADATION FOR COARSE FILTER AGGREGATE SHALL CONFORM TO SPEC 3149 H.
9. BACKFILLING SHALL OCCUR IN LIFTS NOT EXCEEDING 0.5 FEET IN DEPTH. THE CONTRACTOR SHALL USE HAND OPERATED COMPACTION EQUIPMENT AROUND THE PIPE CULVERT TO ATTAIN DENSITY.
10. GEOTEXTILE FILTER SHALL CONFORM TO SPECS. 3601 AND 3733. INSTALLATION SHALL BE IN ACCORDANCE WITH SPEC. 2511. THIS ITEM IS INCLUDED IN THE BID PRICE FOR THE PLACEMENT OF RIP RAP.
11. THE CONTRACTOR SHALL USE QUARRY RUN RIP RAP.
12. THE AREAS TO BE SEEDED SHALL BE COMPRISED OF ALL DISTURBED AREAS WITHIN THE PROJECT LIMITS. PRIOR TO THE SEEDING OPERATION THE AREAS SHALL BE CLEARED OF ALL DEBRIS (INCLUDING TREE ROOTS, WEEDS, ROCKS, ETC.). ANY DEBRIS ENCOUNTERED WHILE PREPARING THE AREAS FOR SEEDING SHALL BE DISPOSED OF BY THE CONTRACTOR OFF THE PROJECT IN A SUITABLE DISPOSAL AREA PROVIDED BY THE CONTRACTOR AS APPROVED BY THE ENGINEER. THE PREPARATION FOR SEEDING, REMOVAL AND HAULING OF DEBRIS IS INCLUDED IN THE BID PRICE FOR SEEDING.
13. MULCH MATERIAL TYPE 1 SHALL BE USED IN DISTURBED AREAS IN WHICH BLANKET IS NOT USED AND SHALL BE DISK ANCHORED.
14. SEEDING OPERATIONS MAY REQUIRE MULTIPLE MOBILIZATIONS FOR THE SEEDING CONTRACTOR.

PROPOSED TYPICAL SECTION C.S.A.H. 19



FUTURE TYPICAL SECTION C.S.A.H. 19
(UNDER SEPERATE CONTRACT)



ESTIMATED QUANTITIES

CERTIFIED BY Joseph M Hilton LICENSED ENGINEER LIC. NO. 54947 DATE: 5/02/19

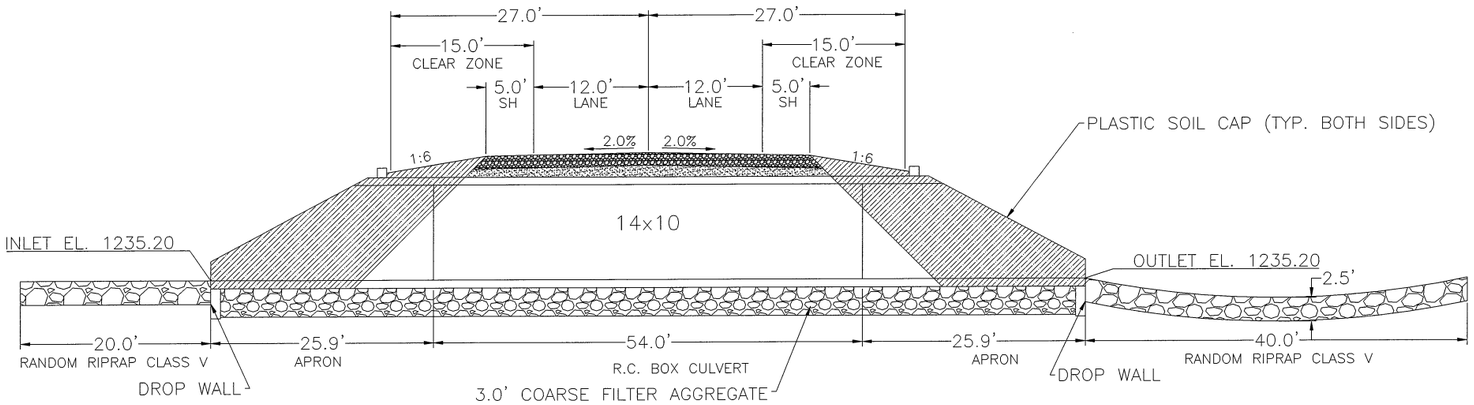
S.A.P. NO. 041-619-014 SHEET NO. 2 OF 14

ROADWAY

C.L. STA.12+94.14, EL. 1248.69

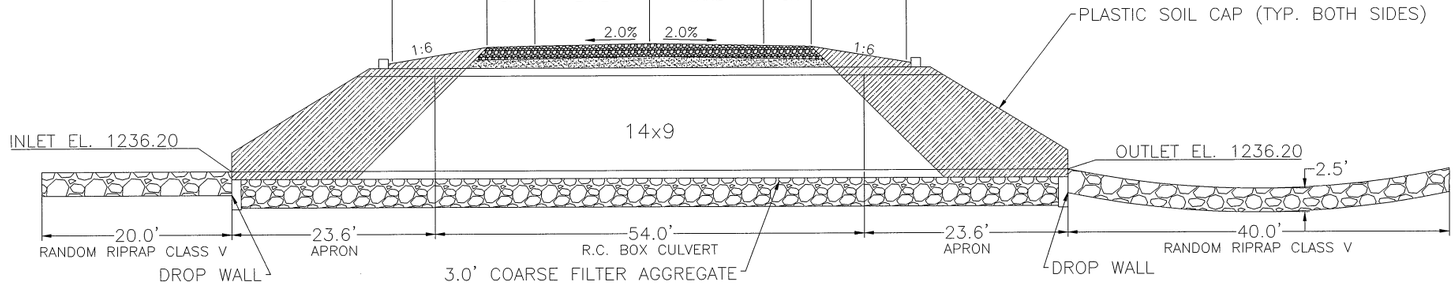
NO SCALE

SOUTH ⟷ NORTH



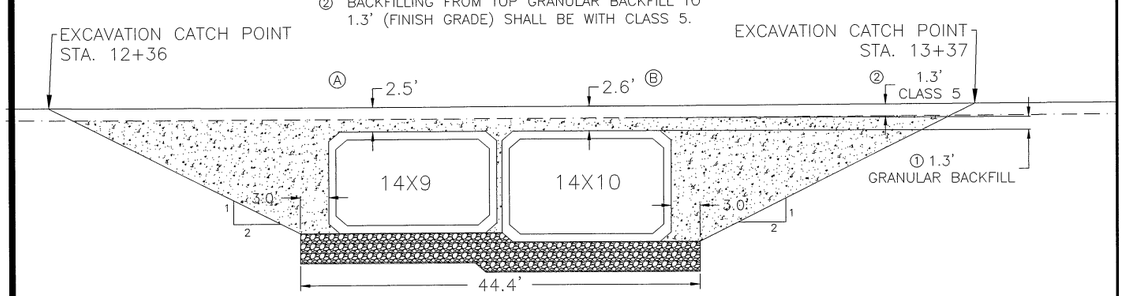
ROADWAY

C.L. STA.12+75.86, EL. 1248.62



NO SCALE

WEST ⟷ EAST



NOTES:

① BACKFILLING FROM BEDDING MATERIAL TO 1.3' OVER TOP OF PIPE SHALL BE WITH GRANULAR BACKFILL.

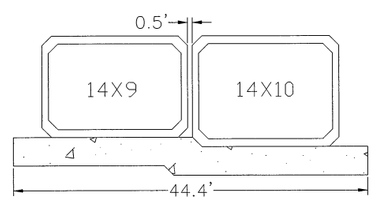
② BACKFILLING FROM TOP GRANULAR BACKFILL TO 1.3' (FINISH GRADE) SHALL BE WITH CLASS 5.

NOTES:

1. DROP WALLS ON 14 X 10 END SECTION SHALL EXTEND 3' BEYOND THE WALLS OF THE END SECTION ON THE OUTERMOST SIDE OF THE APRON.
2. DROP WALLS ON 14 X 9 PIPE END SECTION SHALL EXTEND 0.5' BEYOND THE WALL ON THE INNERMOST SIDE OF THE END SECTION. DROP WALLS SHALL BE INCLUDED IN THE BID FOR THE END SECTION.
3. CULVERTS SHALL BE PLACED AT A 0.5' SPACING BETWEEN THE LINES AND SHALL BE BACKFILLED WITH CONCRETE MIX NO. 1P62 AND SHALL CONFORM TO SPEC. 2461. CONCRETE MIX SHALL BE INCLUDED IN THE BID PRICE FOR THE PLACEMENT OF THE CULVERTS.

NO SCALE

WEST ⟷ EAST



DESIGN DATA

DESIGNED IN ACCORDANCE WITH 2017 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
HL-93 LIVE LOAD
BARREL A INSIDE WIDTH = 14 FT
BARREL INSIDE HEIGHT = 9 FT
BARREL B INSIDE WIDTH = 14 FT
BARREL A INSIDE HEIGHT = 10 FT
BARREL LENGTH = 54 FT EACH
EST. MIN. FILL DEPTH Ⓐ = 2.2 FT
EST. MAX. FILL DEPTH Ⓑ = 2.6 FT
SKEW ANGLE = 30°

DESIGN SPEED = 50 MPH
CURRENT ADT (2019) = 145
PROJECTED ADT (2039) = 145

HL-93 LRFR
BRIDGE OPERATING RATING FACTOR RF = 1.3

LIST OF SHEETS

CONSTRUCTION NOTES:

THE 2018 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.

ALL EXPOSED CONCRETE EDGES SHALL BE FORMED WITH A 1/2" OR 3/4" CHAMFER UNLESS OTHERWISE NOTED.

CONSTRUCTION SHALL BE IN ACCORDANCE WITH SPEC. 2411 AND 2412, EXCEPT AS NOTED.

REFER TO REMAINDER OF GRADING PLAN FOR SUPERSTRUCTURE EXCAVATION AND BACKFILL. SPEC. 2451.

THE BAR SIZES SHOWN IN THIS PLAN ARE IN U.S. CUSTOMARY DESIGNATIONS.

REFER TO TITLE SHEET FOR THE SUBSURFACE UTILITY INFORMATION.

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.

SIGNED: Joseph M. Wilson — LICENSED PROFESSIONAL ENGINEER — DATE: 5/4/19

NAME: JOSEPH M. WILSON — LIC NO. 54947

BRIDGE NO. 41J74

LOCATION: C.S.A.H. 19

MAIN 14 x 9 MNDOT STD. PRECAST CONCRETE CULVERT

MAIN 14 x 10 MNDOT STD. PRECAST CONCRETE CULVERT

IDENTIFICATION NO. 513

GENERAL PLAN AND ELEVATION

SEC. 22 & 15 - T 113 N - R 44 W

TOWNSHIP: ALTA VISTA, LINCOLN COUNTY

DES:	DR:
CHK:	CHK:

SCALE: 1"=30'

UNDERGROUND POWER —P—BUR—

125' TEMPORARY EASEMENT

STA.12+45

STA.14+35

FLOW

90' PROPOSED EASEMENT

STA.12+64

STA.13+60

EOA 13+01.16
@ 43.82' LT.
OUTLET EL. 1236.20

EOA 13+20.59
@ 45.82' LT.
OUTLET EL. 1235.20

50' ROW

15.0' CLEAR ZONE

5.0' SHOULDER

12.0' LANE

EXCAVATION CATCH POINT
STA. 12+46 LT.

EXCAVATION CATCH
POINT
STA. 13+47 LT.

B.O.P. 11+35

11+00

12+00

30°

13+00

14+00

E.O.P. 14+35

15+00

BITUMINOUS REMOVAL @ STA. 12+21

CENTER STA. 12+85

BITUMINOUS REMOVAL @ STA. 13+52

12.0' LANE

5.0' SHOULDER

EXCAVATION CATCH POINT
STA. 12+26 RT.

15.0' CLEAR ZONE

P—BUR

50' ROW

FLOW

EXCAVATION CATCH POINT
STA. 13+27 RT.

STA.13+05

EOA 12+67.69
@ 45.82' RT.
INLET EL. 1235.20

EOA 12+50.56
@ 43.82' RT.
INLET EL. 1236.20

75' PROPOSED EASEMENT

STA.11+35

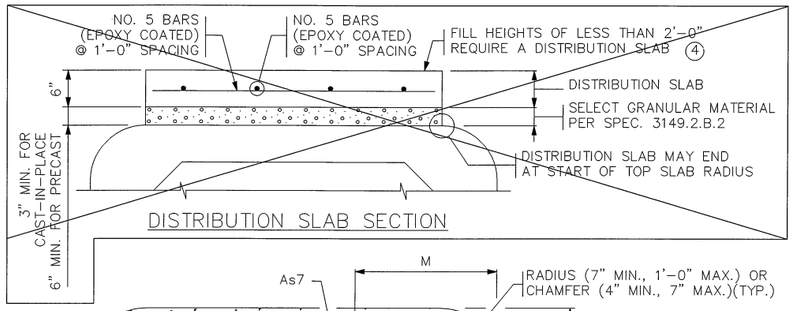
STA.13+35

95' TEMPORARY EASEMENT

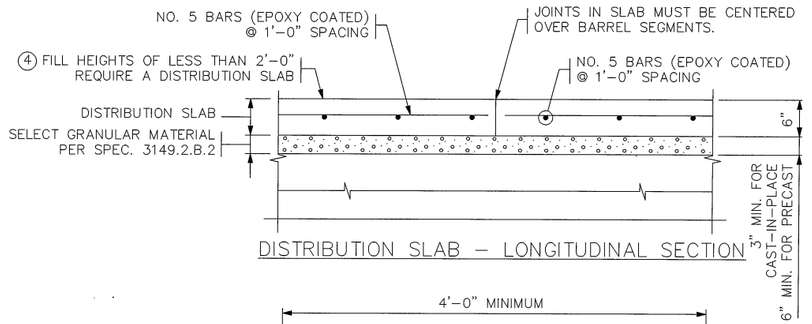
STAKEOUT

CERTIFIED BY Joseph M Gutshall LICENSED ENGINEER LIC. NO. 54947 DATE: 5/02/19

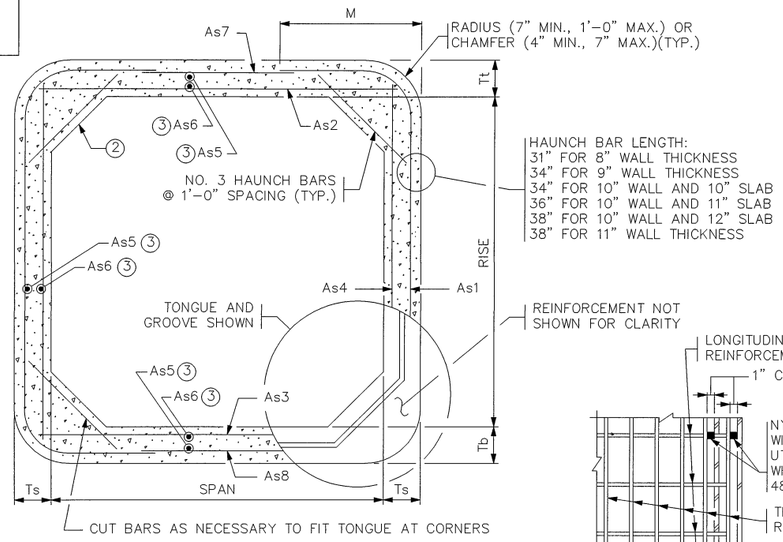
S.A.P. NO. 041-619-014 SHEET NO. 4 OF 14



DISTRIBUTION SLAB SECTION

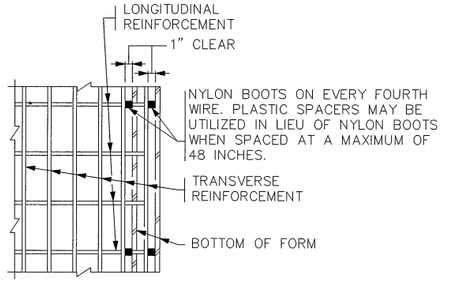


DISTRIBUTION SLAB – LONGITUDINAL SECTION

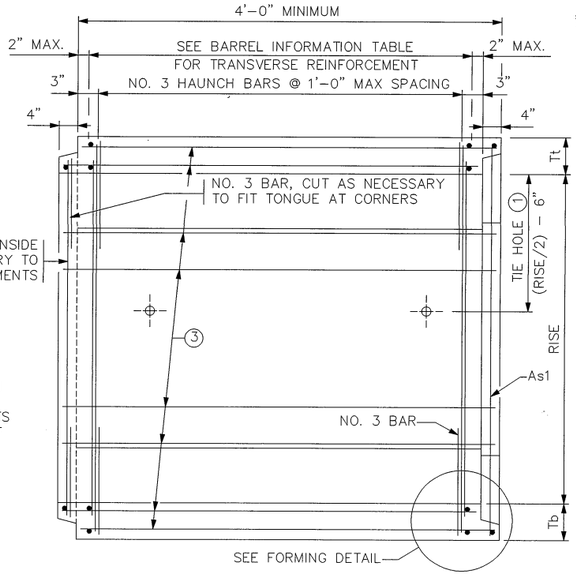


TRANSVERSE BARREL SECTION

BAR REINFORCEMENT OPTION SHOWN

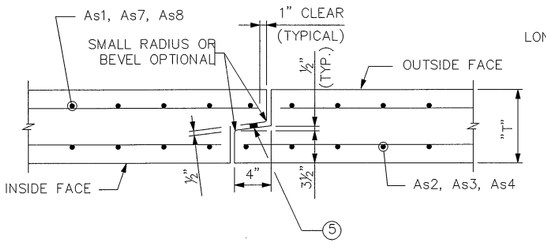


PLAN

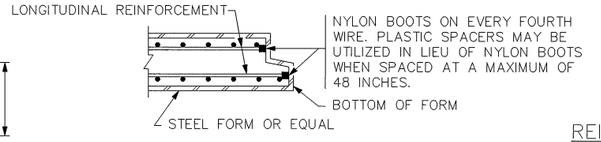


LONGITUDINAL BARREL SECTION

BAR REINFORCEMENT OPTION SHOWN

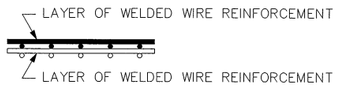


TONGUE AND GROOVE JOINT DETAIL



SECTION

FORMING DETAIL



REINFORCEMENT LAYER DETAIL

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

CONSTRUCTION NOTES

CONSTRUCT CULVERTS PER SPEC. 2412 EXCEPT AS NOTED.

REFER TO THE GENERAL PLAN AND ELEVATION SHEET FOR THE DISTANCE BETWEEN BARRELS OF ADJACENT BOXES AND TO STANDARD FIGURE 5-395.115 FOR MATERIAL REQUIREMENTS FOR FILL BETWEEN ADJACENT BOXES.

PROVIDE WELDED WIRE REINFORCEMENT, SHEAR REINFORCEMENT AND REINFORCEMENT BARS PER THE APPLICABLE REQUIREMENTS OF AASHTO M259.

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

ANY OF THE FOLLOWING COMBINATIONS OF STEEL REINFORCEMENT MAY BE USED:
(a) 1 OR 2 LAYERS OF WELDED WIRE REINFORCEMENT OR
(b) 1 LAYER OF WELDED WIRE REINFORCEMENT AND 1 LAYER OF REINFORCEMENT BARS OR
(c) 1 LAYER OF REINFORCEMENT BARS.
DEVELOP REINFORCEMENT IN ACCORDANCE WITH AASHTO "LRFD BRIDGE DESIGN SPECIFICATIONS". IF BAR REINFORCEMENT IS SUBSTITUTED FOR WELDED WIRE REINFORCEMENT, INCREASE THE AREA OF REINFORCEMENT BY 8%, AND SUBMIT DESIGN CALCULATIONS VERIFYING COMPLIANCE WITH AASHTO 5.7.3.4. "CONTROL OF CRACKING BY DISTRIBUTION OF REINFORCEMENT".

MAXIMUM SIZE OF REINFORCEMENT BARS IS NO. 6. THE MAXIMUM WELDED WIRE REINFORCEMENT SIZE IS W23 PER LAYER (MAXIMUM OF 2 LAYERS).

SPACE CENTER TO CENTER OF TRANSVERSE WIRES NOT LESS THAN 2" NOR MORE THAN 4". SPACE CENTER TO CENTER OF LONGITUDINAL WIRES NOT MORE THAN 8".

WHEN USING As1, As7, AND As8 REINFORCEMENT AS ONE CONTINUOUS CAGE WITH SPLICES OCCURRING IN THE CENTER OF THE TOP AND BOTTOM OF THE BOX SECTION, THE MIN. LAP LENGTH FOR THE As7 AND As8 IS 15".

WELDING IS NOT PERMITTED ON REINFORCEMENT BARS OR WELDED WIRE REINFORCEMENT, EXCEPT THAT THE ORIGINAL WELDING REQUIRED TO MANUFACTURE WIRE REINFORCEMENT IS ACCEPTABLE.

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

USE CONCRETE MIX NO. 3W82 WITH NO CALCIUM CHLORIDE ALLOWED.

SHOP DRAWING APPROVAL PER SPEC. 3238.2.A 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) USE 1" DIAMETER CULVERT TIES. SEE STANDARD PLATE NO. 3145 FOR DETAILS.

(2) USE 12" VERTICAL, 12" HORIZONTAL HAUNCHES ON ALL BOX SIZES.

(3) PLACE LONGITUDINAL REINFORCEMENT DENOTED AS As5 AND As6 IN ALL SLABS AND WALLS WITH A MINIMUM OF 0.06 SQ. IN./FT.

(4) ROADWAY OR SHOULDER FILL HEIGHTS OF LESS THAN 2'-0" REQUIRE A 6" THICK DISTRIBUTION SLAB WITH CONCRETE MIX 3S52.

PLACE CAST-IN-PLACE DISTRIBUTION SLABS WITH 3" MIN. SELECT GRANULAR MATERIAL PER SPEC. 3149.2.B.2 BETWEEN BARREL AND DISTRIBUTION SLAB.

PRECAST DISTRIBUTION SLABS MAY BE USED FOR FILL HEIGHTS OVER 1'-0". PROVIDE 6" MINIMUM SELECT GRANULAR MATERIAL PER SPEC. 3149.2.B.2 BETWEEN BARREL AND SLAB.

EXTEND THE WIDTH OF THE DISTRIBUTION SLAB TO THE OUTSIDE EDGES OF THE ROADWAY SHOULDERS UNLESS DIRECTED BY THE ENGINEER.

REDESIGN THE DISTRIBUTION SLAB PER THE MnDOT PAVEMENT DESIGN MANUAL IF IT IS USED AS PAVEMENT SURFACE.

PAYMENT FOR THE DISTRIBUTION SLAB AND SELECT GRANULAR MATERIAL BENEATH THE SLAB IS CONSIDERED INCIDENTAL.

(5) REFER TO SPEC. 2412 FOR SEALANT REQUIREMENTS.

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 REINFORCEMENT											
													As1			As2		As3		As4		As7		As8	
							SPAN (FT.)	RISE (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.)	LENGTH (FT.)
STA. 12+75.86	14'X9'	1	5000	<3	NO	NO	14'	9'	10"	10"	8"	5950	0.70	17'-2"	3'-6"	1.07	14'-6"	1.05	14'-6"	0.20	9'-6"	0.24	10'-11"	0.24	10'-11"
STA. 12+94.14	14'X10'	1	5000	<3	NO	NO	14'	10'	10"	10"	8"	6150	0.68	18'-1"	3'-6"	1.12	14'-6"	1.09	14'-6"	0.20	10'-6"	0.24	10'-11"	0.24	10'-11"

* 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: FEBRUARY 22, 2018

APPROVED: MARCH 24, 2011
Nancy Daubenberger
STATE BRIDGE ENGINEER

STATE AID PROJ. NO 041-619-014 (C.S.A.H 19) STA. 12+85

FIG. 5-395.101(A)

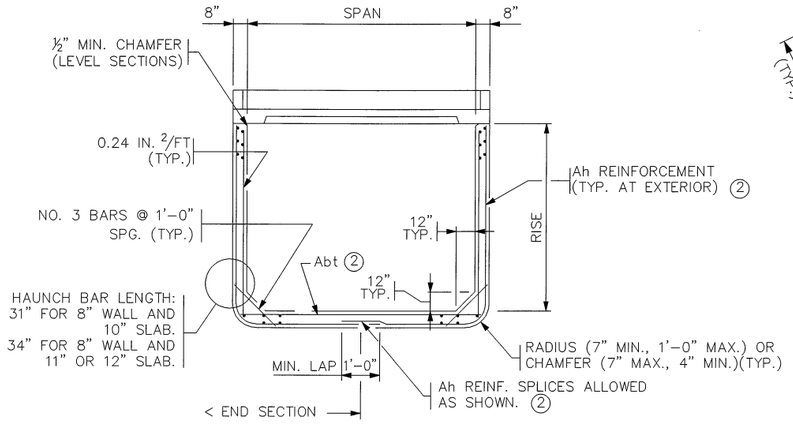
CERTIFIED BY Joseph M Wilson 5/02/19
LICENSED PROFESSIONAL ENGINEER — DATE
NAME: JOSEPH M. WILSON LIC. NO. 54947

TITLE: PRECAST CONCRETE BARREL DETAILS

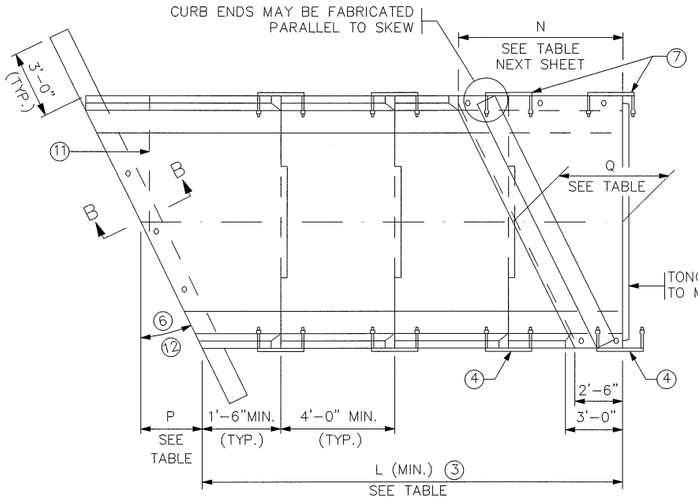
DES: | DR: | APPROVED:
CHK: | CHK:

SHEET NO. 5 OF 14 SHEETS

BRIDGE NO. 41J74

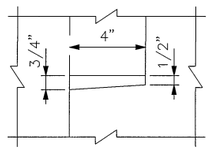


END VIEW



PLAN VIEW

SINGLE BARREL OPTION

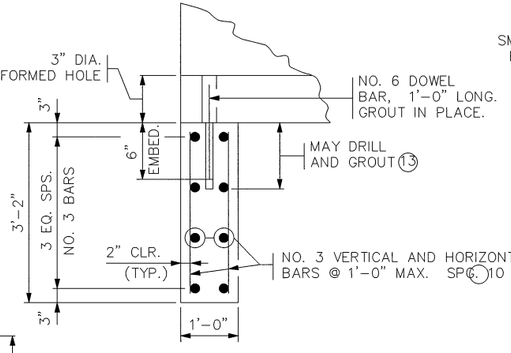


DETAIL "B"

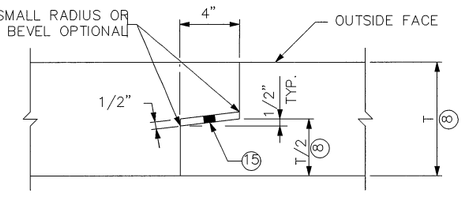
PLAN VIEW

DOUBLE-BARREL OPTION

DETAIL "A"

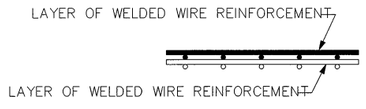


SECTION B-B



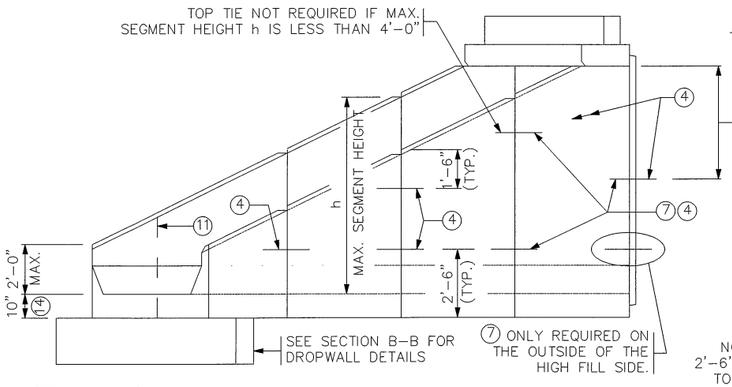
TONGUE AND GROOVE JOINT

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

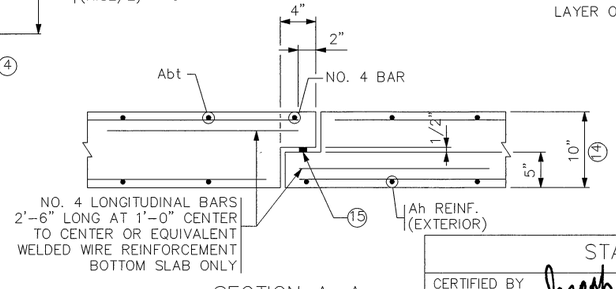


REINFORCEMENT LAYER DETAIL

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



ELEVATION



SECTION A-A

CONSTRUCTION NOTES

SEE STANDARD FIG. 5-395.101(A) AND FIG. 5-395.101(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.

USE CONCRETE MIX 3W82 WITH NO CALCIUM CHLORIDE ALLOWED.

USE DROPWALL CONCRETE MIX 3S52, OR 3Y82 IF PRECAST. LIMITS FOR DROPWALL EXCAVATION TO BE APPROXIMATELY THE SAME AS DROPWALL DIMENSIONS. FURNISHING AND INSTALLATION OF DROPWALL IS INCLUDED IN PRICE BID FOR END SECTIONS.

PLACE LONGITUDINAL REINFORCEMENT WITH A MINIMUM OF 0.06 SQ. IN. PER FT. ON BOTH FACES.

NO TONGUE OR GROOVE REQUIRED IN WALLS BETWEEN END SECTIONS.

SEE STANDARD FIG. 5-395.115 FOR EMBANKMENT PROTECTION.

(1) 81/8" @ 15°; 105/8" @ 30°; 1'-2" @ 45°

(2) SEE STANDARD FIG. 5-395.110(B) FOR REINFORCEMENT TABLES.

(3) NUMBER OF SECTIONS VARIES WITH CULVERT RISE.

(4) EXCEPT AS NOTED, USE 1" DIA. CULVERT TIES. SEE STANDARD PLATE NO. 3145 FOR DETAILS. TWO TIES ARE REQUIRED PER JOINT WHERE h IS GREATER THAN 4'.

(5) 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.

(6) FOR SKEW ANGLES OVER 71/2° UP TO 221/2°, USE A 15° SKEW END SECTION. FOR SKEW ANGLES OVER 221/2° UP TO 371/2°, USE A 30° SKEW END SECTION. FOR SKEW ANGLES OVER 371/2° 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. FOR MULTIPLE BARREL OPTION, ONLY INCLUDE EXTRA STRONG TIES ON THE OUTSIDE OF THE HIGH FILL SIDE. SEE STANDARD FIG. 5-395.110(B) FOR DETAILS.

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

(9) REFER TO THE GENERAL PLAN AND ELEVATION SHEET FOR THE DISTANCE BETWEEN BARRELS OF ADJACENT BOXES AND TO STANDARD FIGURE 5-395.115 FOR MATERIAL REQUIREMENTS FOR FILL BETWEEN ADJACENT BOXES.

(10) WELDED WIRE REINFORCEMENT OF EQUAL AREA MAY BE SUBSTITUTED FOR REBAR.

(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.

(12) FOR BOX CULVERTS WITH SPANS OF 16' THE MAXIMUM SKEW SHALL BE 30°.

(13) FILL HOLE WITH GROUT. GROUT CONSISTS OF 1 PART CEMENT AND 2 PARTS SAND. USE TYPE 1A AIR ENTRAINED PORTLAND CEMENT. GROUT MIX MAXIMUM SLUMP IS 4".

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

(15) REFER TO SPEC, 2412 FOR SEALANT REQUIREMENTS.

MIN. LENGTH L

RISE (FT.)	15° SKEW	30° SKEW	45° SKEW
4	7'-13/4"	7'-73/8"	8'-77/8"
5	9'-21/2"	9'-111/8"	11'-57/8"
6	11'-33/8"	12'-27/8"	14'-33/4"
7	13'-41/4"	14'-65/8"	17'-13/4"
8	15'-51/8"	16'-101/4"	19'-115/8"
9	17'-57/8"	19'-2"	22'-95/8"
10	19'-63/4"	21'-53/4"	25'-71/2"
11	21'-75/8"	23'-93/8"	28'-51/2"
12	23'-81/2"	26'-11/8"	31'-33/8"
13	25'-93/8"	28'-47/8"	34'-13/8"
14	27'-101/8"	30'-81/2"	36'-111/4"

LENGTH P

SPAN (FT.)	15° SKEW	30° SKEW	45° SKEW
6	0'-113/4"	2'-13/8"	3'-8"
8	1'-3"	2'-83/8"	4'-8"
10	1'-61/4"	3'-31/4"	5'-8"
12	1'-93/8"	3'-101/4"	6'-8"
14	2'-05/8"	4'-51/8"	7'-8"
16	2'-37/8"	5'-0"	(12)

LENGTH Q

SPAN (FT.)	15° SKEW	30° SKEW	45° SKEW
6	3'-53/4"	4'-73/8"	6'-2"
8	3'-9"	5'-23/8"	7'-2"
10	4'-0"	5'-91/4"	8'-2"
12	4'-33/8"	6'-41/8"	9'-2"
14	4'-65/8"	6'-111/8"	10'-2"
16	4'-97/8"	7'-61/8"	(12)

REVISION: FEBRUARY 22, 2018

APPROVED: MARCH 24, 2011
Nancy Dauberberger
STATE BRIDGE ENGINEER

STATE AID PROJ. NO 041-619-014 (C.S.A.H. 19) STA. 12+85

CERTIFIED BY Joseph M. Wilson LICENSED PROFESSIONAL ENGINEER 5/02/19 DATE

NAME: JOSEPH M. WILSON LIC. NO. 54947

TITLE: PRECAST CONCRETE END SECTION TYPE III - SINGLE OR DOUBLE BARREL FOR SKEWS 7½° TO 45°

DES: DR: APPROVED:

CHK: CHK:

SHEET NO. 6 OF 14 SHEETS

FIG. 5-395.110(A)

BRIDGE NO. 41J74

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

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

Abt REINFORCEMENT	
SPAN (FT.)	Abt (IN^2/FT.)
6–10	0.20
12	0.30
14	0.39
16	0.39

LINTEL BEAM REINFORCEMENT		
SPAN (FT.)	BOTTOM REINFORCEMENT	
	A1	A2
6	NO. 4 @ 1'–0"	NO. 4 @ 9"
8	NO. 4 @ 1'–1"	NO. 4 @ 6"
10	NO. 4 @ 9"	NO. 5 @ 6"
12	NO. 5 @ 9"	NO. 6 @ 6"
14	NO. 6 @ 9"	NO. 8 @ 6"
16	NO. 6 @ 9"	NO. 8 @ 6"

LENGTH N			
SPAN (FT.)	15° SKEW	30° SKEW	45° SKEW
6	4'–33/8"	6'–41/4"	9'–2"
8	4'–97/8"	7'–6"	11'–2"
10	5'–41/4"	8'–77/8"	13'–2"
12	5'–103/4"	9'–93/4"	15'–2"
14	6'–51/8"	10'–115/8"	17'–2"
16	6'–115/8"	12'–11/2"	NA (7)

LINTEL BEAM THICKNESS			
SPAN (FT.)	15° SKEW	30° SKEW	45° SKEW
≤12	9"	9"	9"
14	10" (8)	10" (8)	10" (8)
16	10" (8)	10" (8)	NA (7)

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.

GROUT CONSISTS OF 1 PART CEMENT AND 2 PARTS SAND. USE TYPE 1A AIR ENTRAINED PORTLAND CEMENT. GROUT MIX MAXIMUM SLUMP IS 4".

STRUCTURAL STEEL PER SPEC. 3306.

WELDING PER SPEC. 2471.

GALVANIZE STRUCTURAL STEEL PER SPEC. 3394.

GALVANIZE BOLTS, NUTS AND WASHERS PER SPEC. 3392.

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

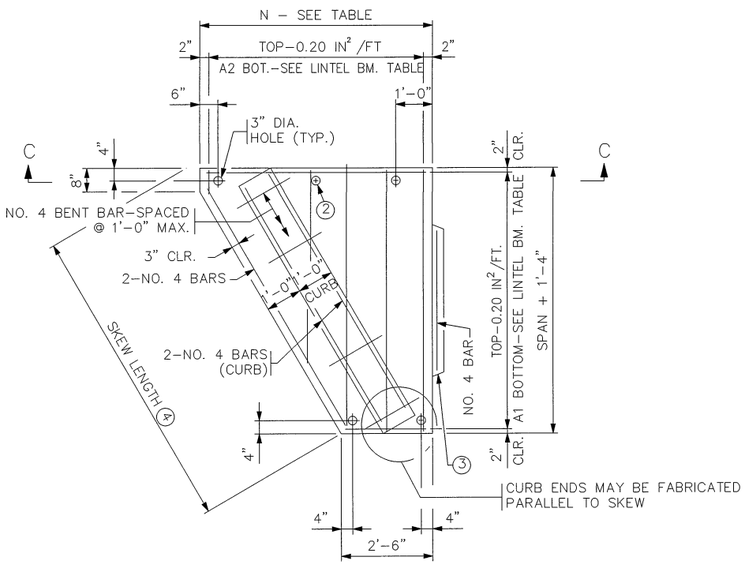
(4) FOR SKEW LENGTH UNDER 10' USE NO. 8 BARS. FOR SKEW LENGTH OF 10' TO 14' USE NO. 9 BARS. FOR SKEW LENGTH OVER 14' TO 18' USE NO. 10 BARS. FOR SKEW LENGTH OVER 18' TO 22' USE NO. 11 BARS OR EQUAL. SKEW LENGTH IS DISTANCE BETWEEN OUTSIDE FACES OF END SECTION ALONG LINTEL BEAM.

(5) SEE LINTEL BEAM THICKNESS TABLE ON THIS SHEET. USE LINTEL BEAMS WITH 5000 PSI 3W82 CONCRETE UNLESS OTHERWISE SPECIFIED.

(6) ALTERNATE BAR BEND MAY BE USED FOR NO. 4 BENT BARS.

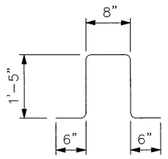
(7) FOR CULVERTS WITH SPANS OF 16' THE MAXIMUM SKEW IS 30°.

(8) ALTERNATIVELY A 9" THICKNESS MAY BE USED WITH 6500 PSI 3W82 CONCRETE.

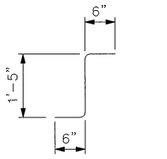


PLAN VIEW

LINTEL BEAM WITH INTEGRAL CURB

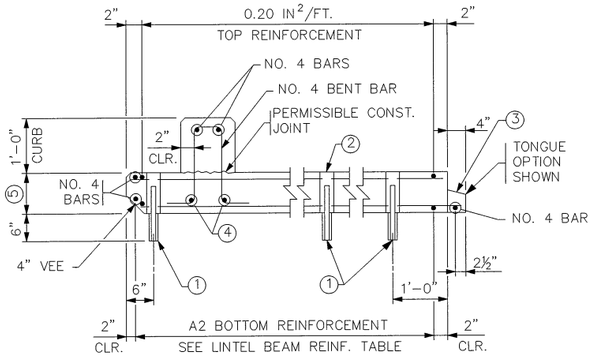


NO. 4 BENT BAR



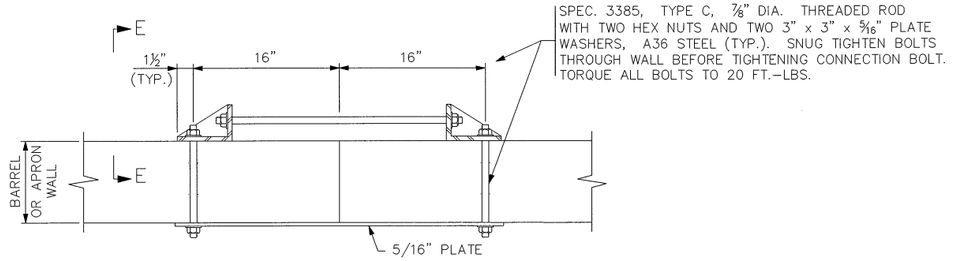
NO. 4 BENT BAR ALTERNATE

(6)
2 REQUIRED

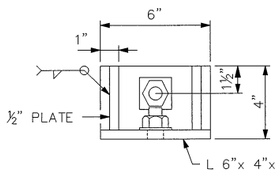


SECTION C–C

LINTEL BEAM WITH INTEGRAL CURB



PLAN VIEW



SECTION E–E

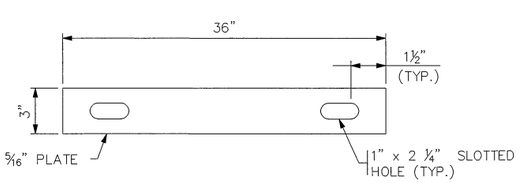
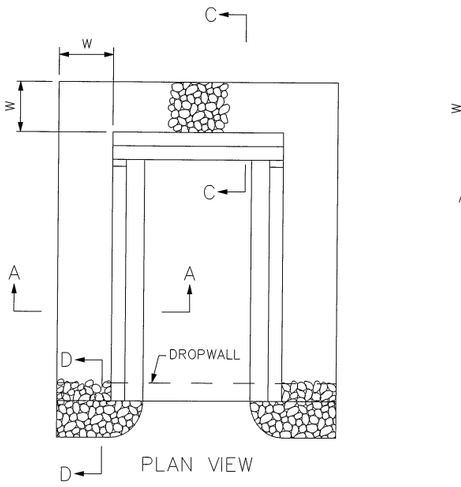


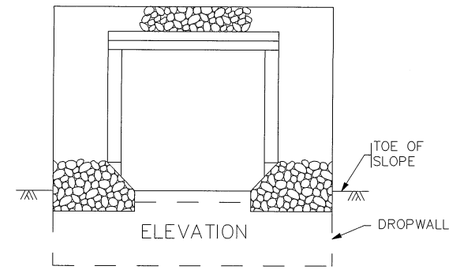
PLATE DETAIL

EXTRA STRONG CONNECTION DETAILS

REVISION: 10–09–2015
APPROVED: MARCH 24, 2011 Nancy Daubenberger STATE BRIDGE ENGINEER

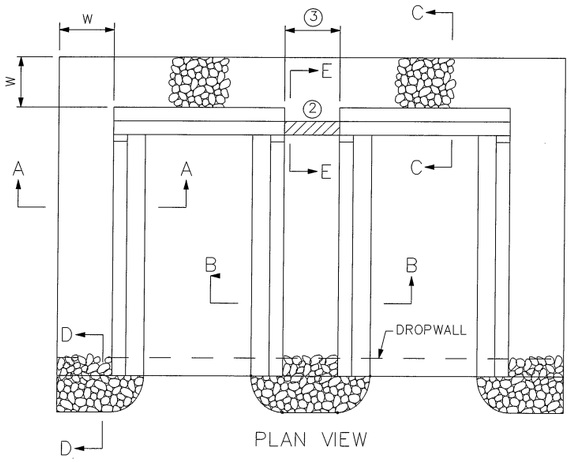
STATE AID PROJ. NO 041–619–014 (C.S.A.H. 19) STA. 12+85				FIG. 5–395.110(B)	
CERTIFIED BY Joseph M. Wilson LICENSED PROFESSIONAL ENGINEER 5/02/19 DATE	TITLE: PRECAST CONCRETE END SECTION TYPE III – SINGLE OR DOUBLE BARREL FOR SKEWS 7½° TO 45°	DES:	DR:	APPROVED:	BRIDGE NO. 41J74
NAME: JOSEPH M. WILSON LIC. NO. 54947		CHK:	CHK:		
		SHEET NO. 7 OF 14 SHEETS			

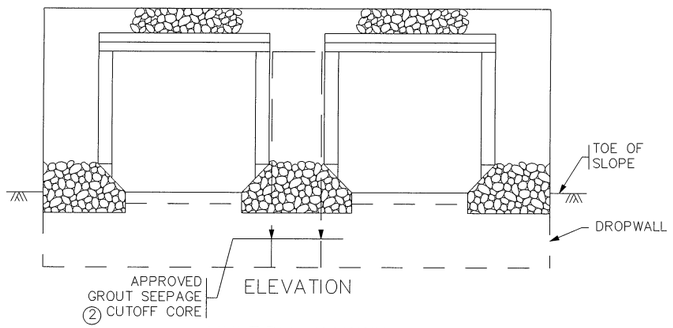




SINGLE BARREL

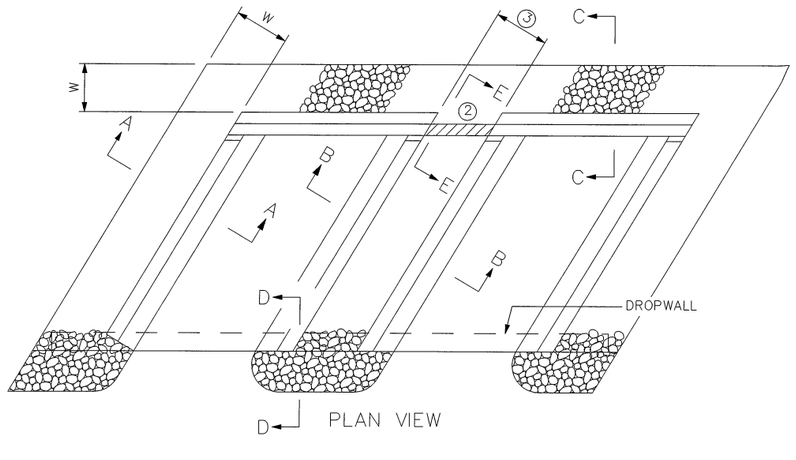
CLASS III OR IV SHOWN
FOR SKEWS UP TO 7½°

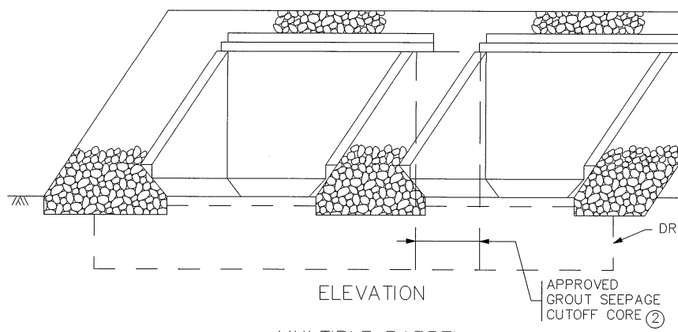




MULTIPLE BARREL

FOR SKEWS UP TO 7½°
CLASS III OR IV SHOWN
DOUBLE BARREL SHOWN





MULTIPLE BARREL

FOR SKEWS OVER 7½° CLASS III OR IV
SHOWN DOUBLE BARREL SHOWN, OTHER
BARREL CONFIGURATIONS SIMILAR.

CONSTRUCTION NOTES

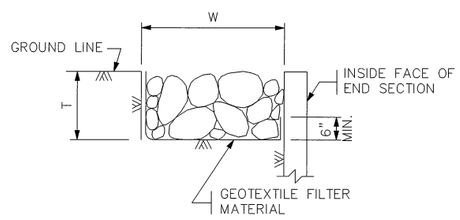
THIS PLAN SHEET IS FOR CULVERT EMBANKMENT PROTECTION ONLY. REFER TO THE GRADING PLANS FOR ADDITIONAL RIPRAP OR OTHER SCOUR PROTECTION MEASURES.

PROVIDE RIPRAP PER SPECS. 2511 AND 3601.

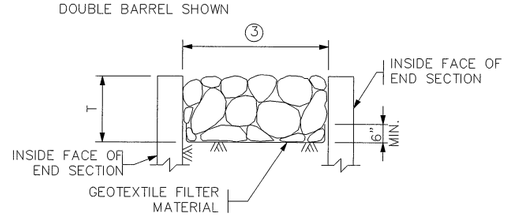
(1) FOR TYPE OF GEOTEXTILE FILTER MATERIAL REQUIRED, SEE SPEC. 3733. PROVIDE GEOTEXTILE STRIPS CONTINUOUS WITHOUT OVERLAPS, EXCEPT FOR THE TOP STRIP, WHICH SHOULD SHINGLE VERTICAL STRIPS. BURY THE TOP EDGE TO PREVENT UNDERMINING.

(2) 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 AND PROVIDE CLASS I GROUTED RIPRAP IN LIEU OF CLASS III RIPRAP.

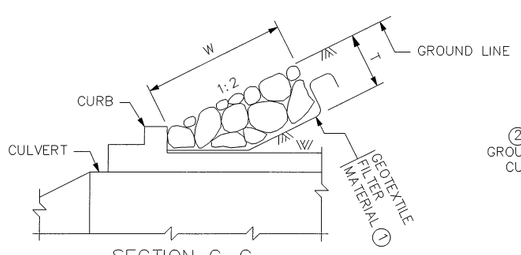
(3) REFER TO THE GENERAL PLAN AND ELEVATION SHEET FOR THE DISTANCE BETWEEN BARRELS OF ADJACENT BOXES.



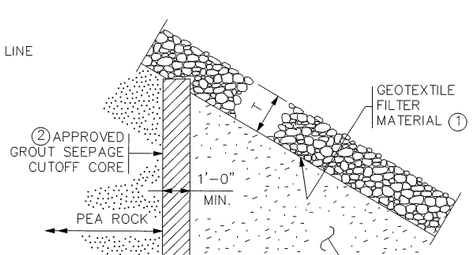
SECTION A–A



SECTION B–B

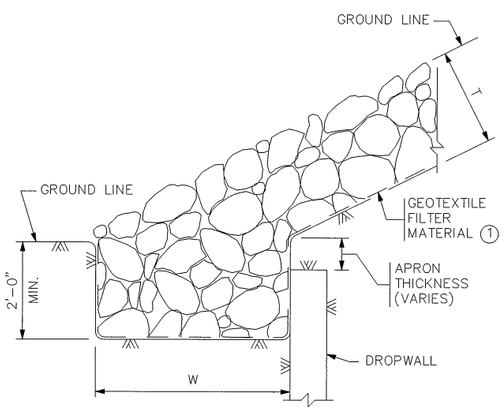


SECTION C–C



ELEVATION OF THE APPROVED GROUT SEEPAGE CUTOFF CORE IS TO BE THE SAME ELEVATION AS THE BOTTOM OF THE DROP WALL

SECTION E–E



SECTION D–D

RIPRAP CLASS

RIPRAP CLASS	RIPRAP CLASS	T	W
☐	III	1'–6"	3'–0"
☐	IV	2'–0"	4'–0"
☒	V	2'–6"	5'–0"

REVISION: 10-09-2015

APPROVED: SEPTEMBER 11, 2014
Nancy Daubenberger
STATE BRIDGE ENGINEER

STATE AID PROJ. NO 041–619–014 (C.S.A.H. 19) STA. 12+85

FIG. 5–395.115

CERTIFIED BY Joseph M Wilson 5/02/19
LICENSED PROFESSIONAL ENGINEER DATE

NAME: JOSEPH M. WILSON LIC. NO. 54947

TITLE: EMBANKMENT PROTECTION FOR BOX CULVERTS

DES: DR: APPROVED:
CHK: CHK:

SHEET NO. 8 OF 14 SHEETS

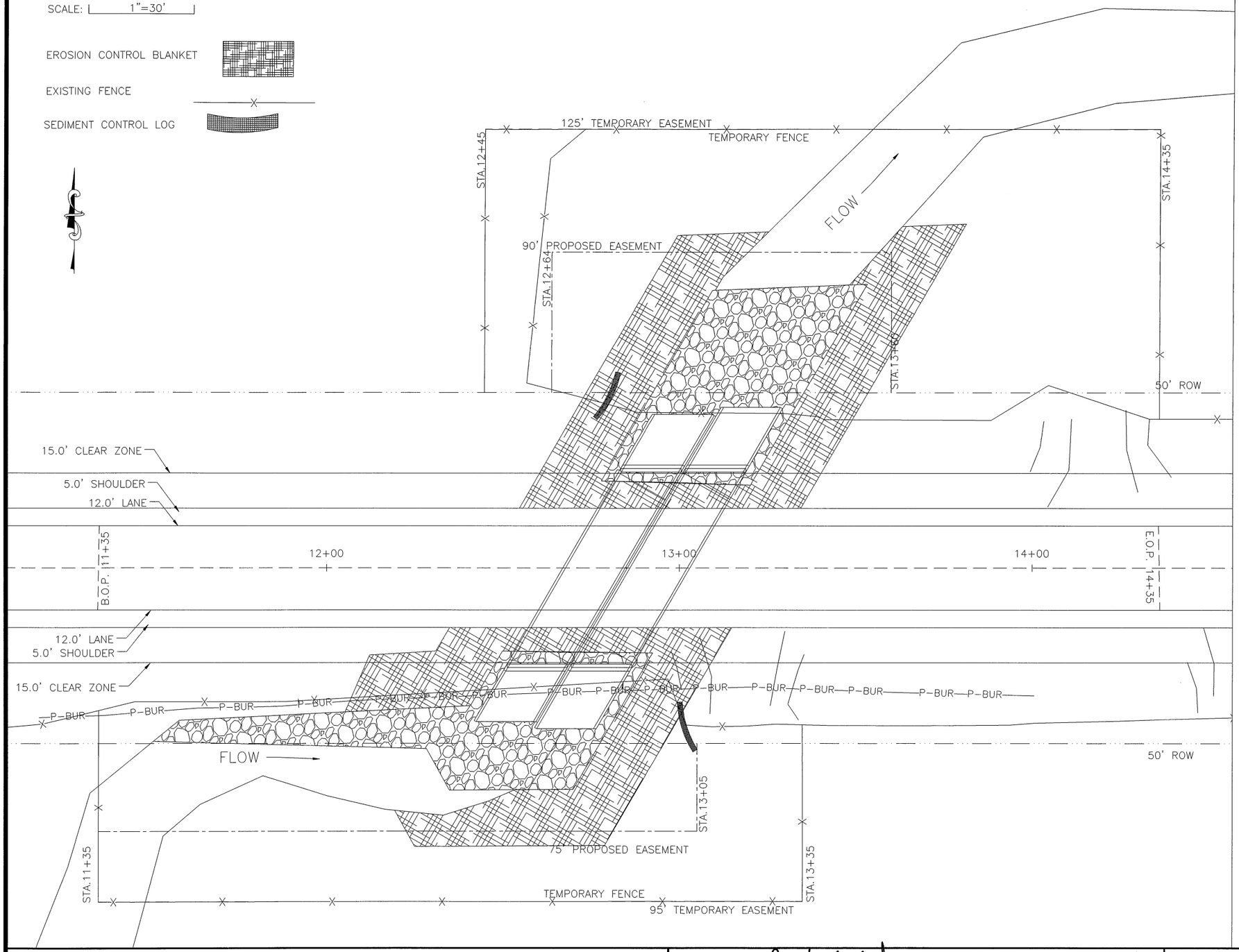
BRIDGE NO. 41J74

SCALE: 1"=30'

EROSION CONTROL BLANKET

EXISTING FENCE

SEDIMENT CONTROL LOG



FENCE QUANTITIES

STATION	SIDE	SALVAGE FENCE	INSTALL FENCE	TEMPORARY FENCE (1)
12+64 TO 14+30	LT.	263'	263'	349'
11+35 TO 13+35	RT.	210'	210'	304'
TOTALS =		473'	473'	653'

1. TEMPORARY QUANTITIES MAY ONLY BE NEEDED IF CATTLE ARE PRESENT

RANDOM RIPRAP CLASS V

STATION	SIDE	REMARKS	QUANTITY
12+78–13+53	RT.	OUTLET	85
11+51–12+92	LT.	INLET	86
		TOTAL	171

*1.3 TONS PER CUBIC YARD

EROSION CONTROL BLANKET, CATEGORY 3N

STATION	SIDE	REMARKS	SQ. YD.
12+54–13+81	RT.	OUTLET	370
12+05–13+15	LT.	INLET	297
		TOTAL =	667

*QUANTITIES MAY BE ADJUSTED BY ENGINEER IN THE FIELD

SEDIMENT CONTROL LOG TYPE WOOD FIBER

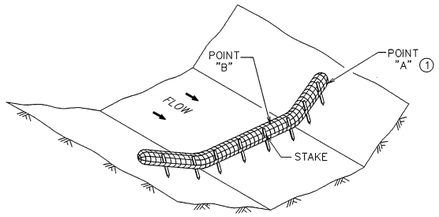
SIDE	REMARKS	LIN FT
LT.	OUTLET	15
RT.	INLET	30
	TOTAL =	45

*QUANTITIES MAY BE ADJUSTED BY ENGINEER IN THE FIELD

EROSION & SEDIMENT CONTROL PLAN

CERTIFIED BY _____ LICENSED ENGINEER LIC. NO. 54947 DATE: 5/02/19

S.A.P. NO. 041-619-014 SHEET NO. 9 OF 14



SEDIMENT CONTROL LOG TYPE WOOD FIBER, OR TYPE COMPOST ② ③

NOTES:

SEE SPECS. 2573, 3601, 3733, 3885, 3886 & 3889.

FOR DITCH CHECKS, PLACE SEDIMENT CONTROL LOG PERPENDICULAR TO FLOW AND IN A CRESCENT SHAPE WITH THE ENDS FACING UPSTREAM.

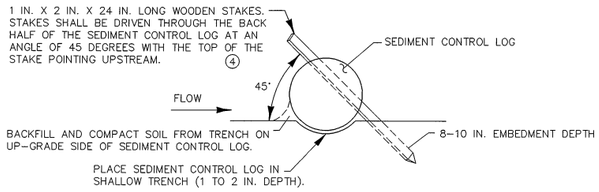
APPROXIMATE SPACING BETWEEN EACH DITCH CHECK SHOULD BE DETERMINED FROM THE FOLLOWING SPACING FORMULA:

$$\text{APPROXIMATE SPACING OF DITCH CHECKS (FT.)} = Y = \frac{\text{DITCH CHECK HEIGHT (FT)}}{\text{\% CHANNEL SLOPE}} \times 100$$

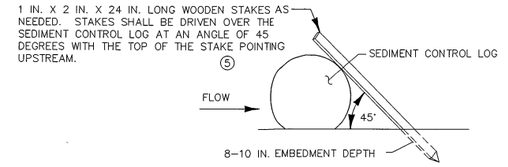
① POINT "A" MUST BE A MINIMUM OF 6 INCHES HIGHER THAN POINT "B" TO ENSURE THAT WATER FLOWS OVER THE DIKE AND NOT AROUND THE ENDS.

② DITCH GRADE 1.5% – 3%, MAX. FLOW VELOCITY 4.5 FT./SEC.. (SEDIMANT CONTROL LOG WITH EROSION CONTROL BLANKET)

③ DITCH GRADE 1.5% – 3%, MAX. FLOW VELOCITY 1.5 FT./SEC.. (SEDIMENT CONTROL LOG WITHOUT EROSION CONTROL BLANKET)



TYPES: STRAW, WOOD FIBER, OR COIR



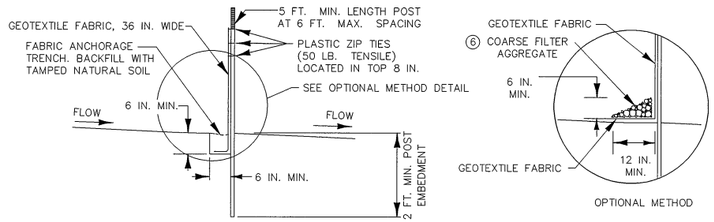
TYPES: WOOD CHIP, COMPOST, OR ROCK

NOTES:

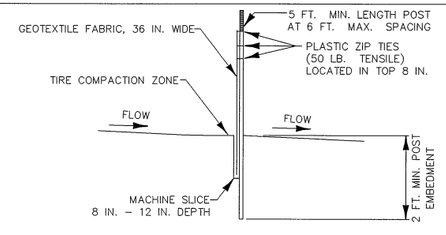
SEE SPECS. 2573, 3149, 3874, 3882, 3886, & 3897.

④ SPACE BETWEEN STAKES SHALL BE A MAXIMUM OF 1 FOOT FOR DITCH CHECKS OR 2 FEET FOR OTHER APPLICATIONS.

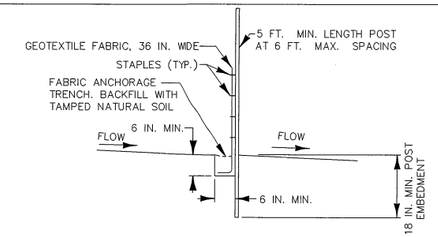
⑤ PLACE STAKES AS NEEDED TO PREVENT MOVEMENT OF SEDIMENT CONTROL LOGS PLACED ON SLOPES OR AS NEEDED DUE TO OTHER FACTORS. STAKES SHALL BE INCIDENTAL.



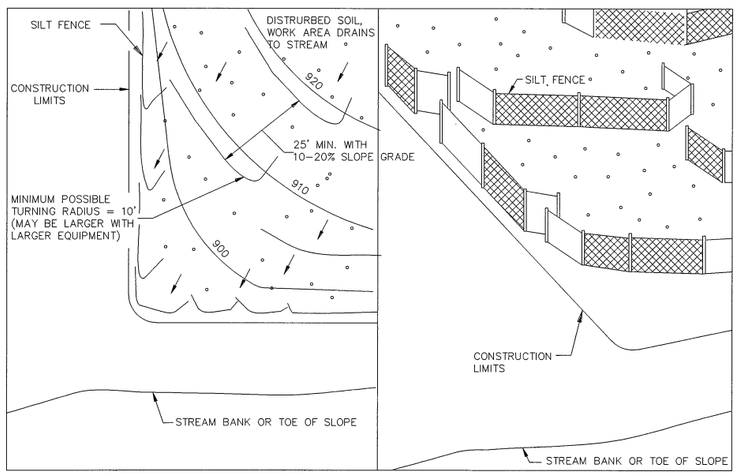
SILT FENCE TYPE HI ⑦
(HAND INSTALLED)



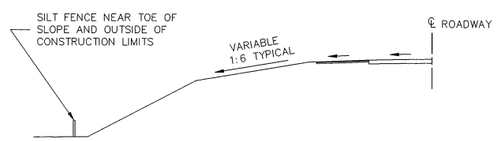
SILT FENCE TYPE MS ⑦
(MACHINE SLICED)



SILT FENCE TYPE PA ⑧
(PREASSEMBLED)



J-HOOK INSTALLATION



LOCATION AT TOE OF ROADWAY EMBANKMENT

NOTES:

SEE SPECS. 2573, 3149 & 3886.

⑥ COARSE FILTER AGGREGATE (SPEC. 3149) SHALL BE INCIDENTAL.

⑦ TO PROTECT AREAS FROM SHEET FLOW. MAXIMUM CONTRIBUTING AREA: 1 ACRE.

⑧ TO PROTECT AREAS FROM SHEET FLOW. MAXIMUM CONTRIBUTING AREA: 0.25 ACRE.

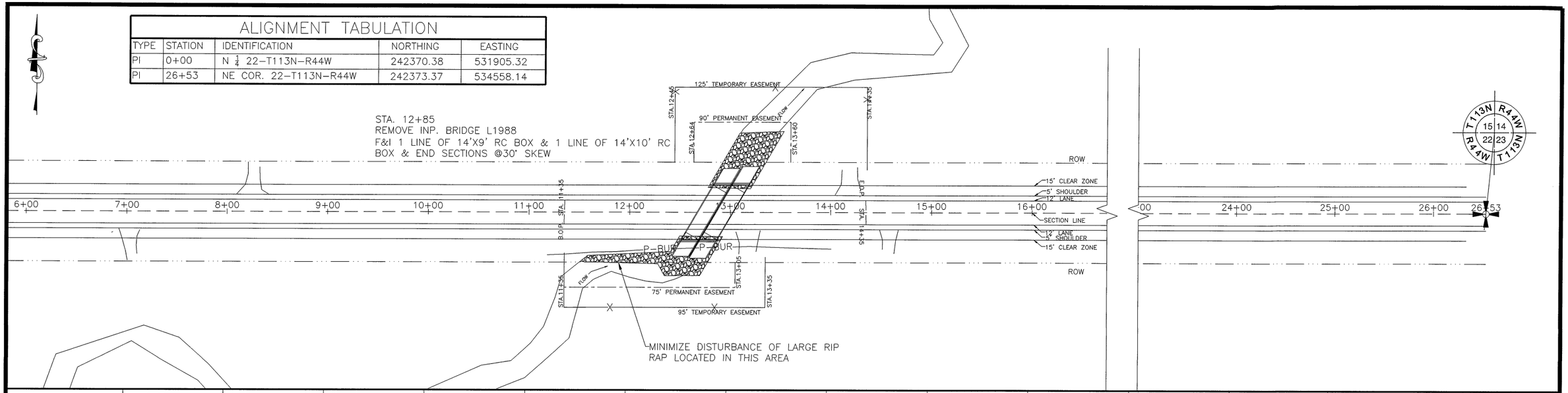
SEDIMENT CONTROL DETAILS

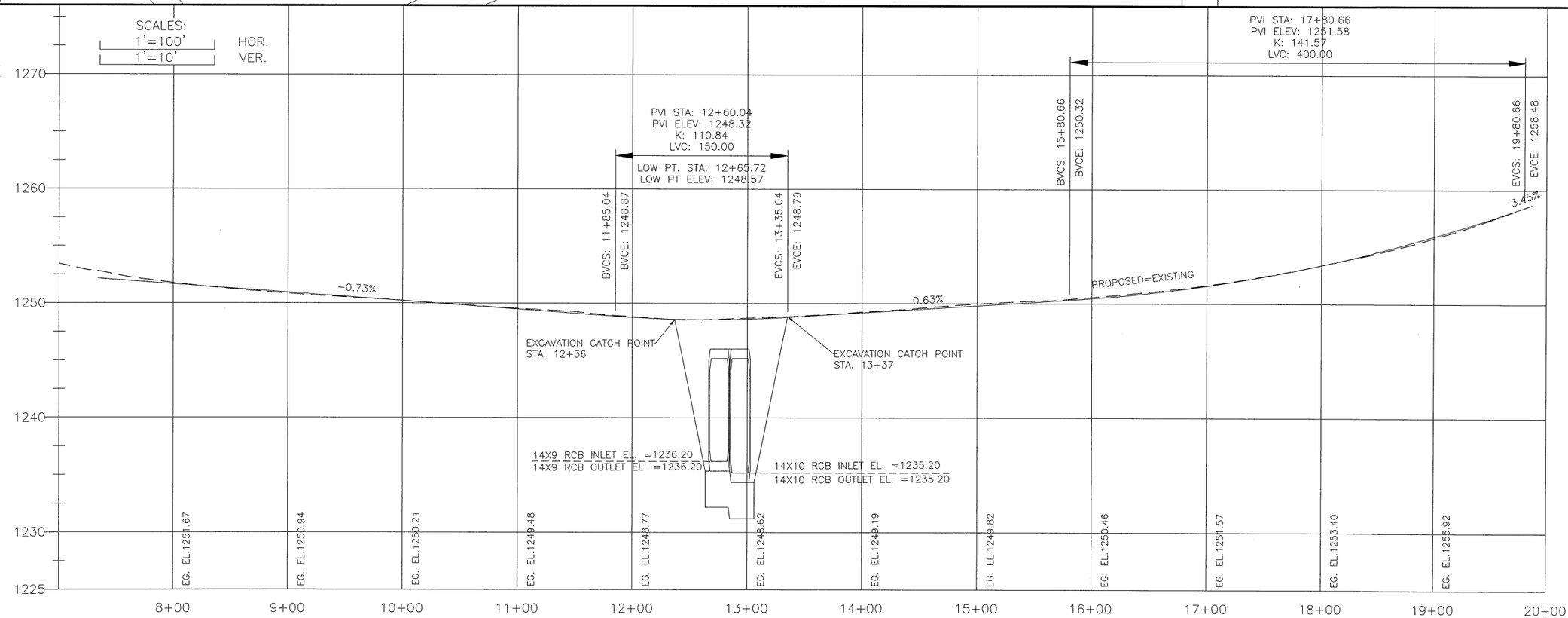
CERTIFIED BY Joseph M Ritter LICENSED ENGINEER LIC. NO. 54947 DATE: 5/02/19

S.A.P. NO. 041-619-014 SHEET NO. 10 OF 14

ALIGNMENT TABULATION

TYPE	STATION	IDENTIFICATION	NORTHING	EASTING
PI	0+00	N ¼ 22–T113N–R44W	242370.38	531905.32
PI	26+53	NE COR. 22–T113N–R44W	242373.37	534558.14





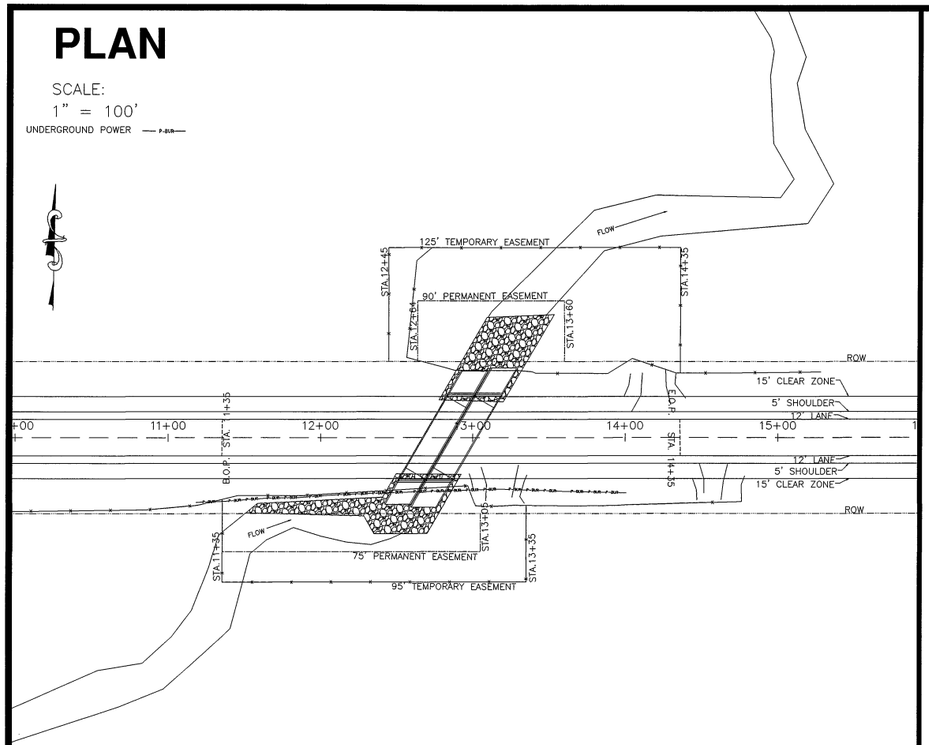
PLAN & PROFILE

CERTIFIED BY Joseph M Wilson LICENSED ENGINEER LIC. NO. 54947 DATE: 5/02/19

S.A.P. NO. 041–619–014 SHEET NO. 11 OF 14

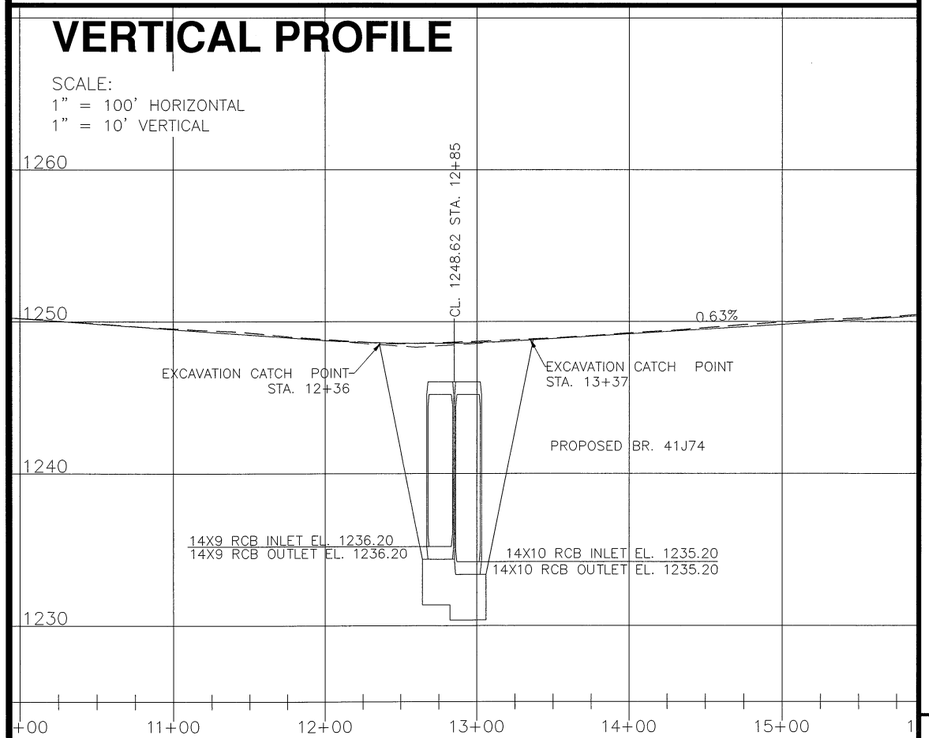
PLAN

SCALE:
1" = 100'
UNDERGROUND POWER —P—



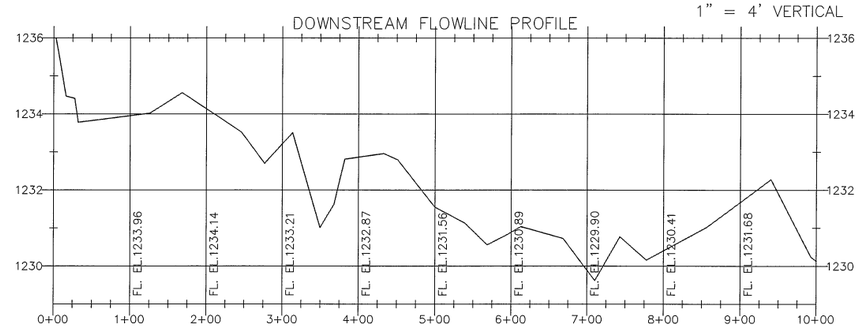
VERTICAL PROFILE

SCALE:
1" = 100' HORIZONTAL
1" = 10' VERTICAL

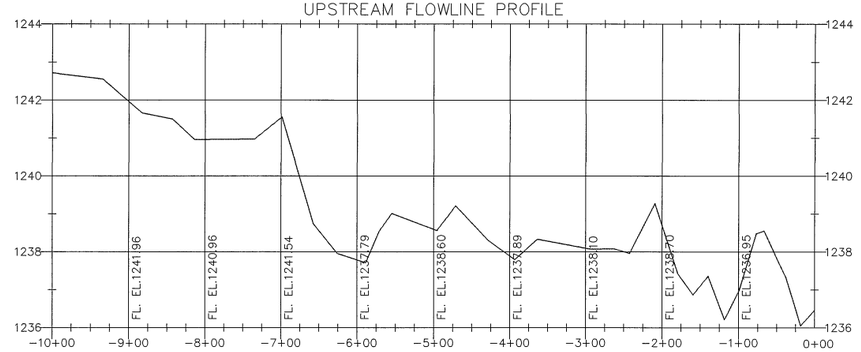


SCALE: 1" = 200' HORIZONTAL
1" = 4' VERTICAL

DOWNSTREAM FLOWLINE PROFILE

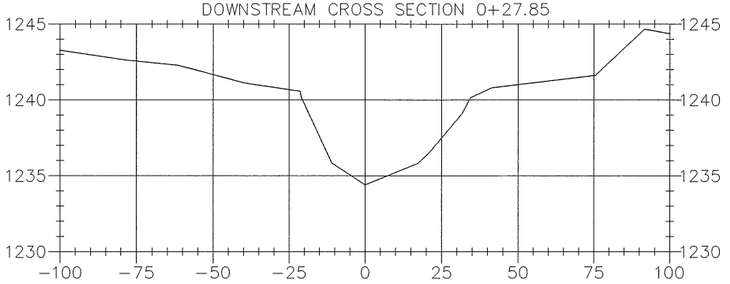


UPSTREAM FLOWLINE PROFILE

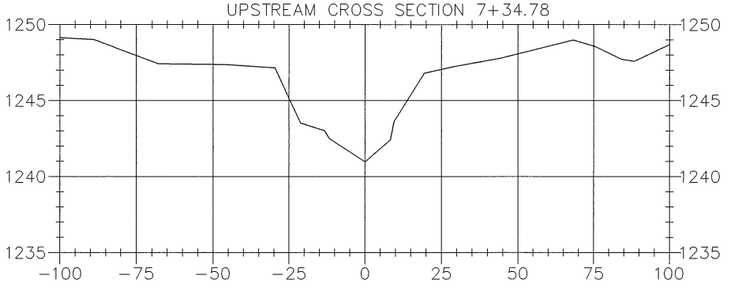


SCALE:
1" = 50' HORIZONTAL
1" = 10' VERTICAL

DOWNSTREAM CROSS SECTION 0+27.85

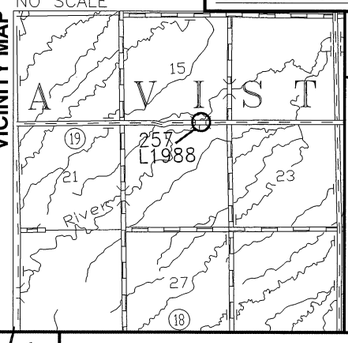


UPSTREAM CROSS SECTION 7+34.78



NO SCALE

VICINITY MAP



FEDERAL PROJ. NO.

LOCATION ENGINEER'S OBSERVATION AT BRIDGE SITE

1. SPECIAL FEATURES: WATERFALLS, DAMS, FLOODS, ICE DEBRIS, ETC... NONE
2. OTHER BRIDGES OR CULVERTS OVER THE SAME STREAM. GIVEN LOCATION, TYPE, ETC...
3. APPARENT HIGH WATER ELEVATION _____ OBTAINED FROM _____
4. OTHER DATA: APPROX. VELOCITY OF WATER AT TIME OF SURVEY

HYDRAULIC ENGINEER'S RECOMMENDATION

DATE: FEB, 17, 2017
STREAM OR DITCH DESIGNATION YELLOW MEDICINE RIVER
DRAINAGE AREA 65.24 SQ. MI.
MAX. FLOOD ON RECORD UNK. DESIGN FLOOD (100 YR. FREQ.) 2150 CFS
MAX. OBSERVED HIGHWATER ELEV. UNK. DESIGN HIGHWATER ELEV. 1246.94
DESIGN MEAN VELOCITY THROUGH STRUCTURE 13.5 FPS (AVG.)
LOW SUPERSTRUCTURE AT OR ABOVE ELEVATION 1245.2
FLOWLINE ELEVATION 1236.20 SKEW ANGLE 30°
BASIC FLOOD (100 YR. FREQ.): 2150 CFS
GREATEST (325 YR. FREQ.) FLOOD: 2836 CFS

ENGINEER'S RECOMMENDATION

INTALL 1 LINE OF 14'X9' RC BOX CULVERTS AT A 30° SKEW AND 1 LINE OF 14'X10' RC BOX CULVERTS WILL BE SET 1' BELOW NATURAL CHANNEL BOTTOM, THIS ALLOWING FOR FISH PASSAGE.

BRIDGE SURVEY SHEETS MADE FROM LINCOLN COUNTY HIGHWAY DEPARTMENT SURVEY
BENCHMARK ELEVATION 1320.34
LOCATION PORTER MN 081, LOCATED ON C.S.A.H. 19, 1 MILE EAST OF THE INTERSECTION OF C.S.A.H. 7 & C.S.A.H. 19.

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

BRIDGE SURVEY

AT STATION 12+85 ON C.S.A.H. 19
PROPOSED BRIDGE LOCATION 0.25 MILES WEST OF INTERSECTION OF 260TH AVE.
SEC. 15&22 TWP. 113N RNG. 44W
TOWNSHIP: ALTA VISTA
COUNTY: LINCOLN EXISTING BRIDGE NO. L1988
PROPOSED BRIDGE NO. 41J74

CERTIFIED BY Joseph M Gilbertson LICENSED ENGINEER LIC. NO. 54947 DATE: 5/02/19

S.A.P. NO. 041-619-014 SHEET NO. 12 OF 14

STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

PROJECT DESCRIPTION

S.A.P. 041-619-014 CONSISTS OF REMOVING THE EXISTING STRUCTURE (EXISTING BRIDGE L1988 OVER YELLOW MEDICINE RIVER MAIN BRANCH, LOCATED APPROXIMATELY 0.25 MI. WEST OF THE INTERSECTION OF C.S.A.H. 19 AND TWP. 260TH STREET AND REPLACING IT WITH 1 LINE OF 14'X9' RC BOX CULVERT AND 1 LINE OF 14'X10' RC BOX CULVERT (NEW BRIDGE #41J74). CONSTRUCTION ACTIVITY INCLUDES REMOVAL OF THE EXISTING STRUCTURE, INSTALLING THE NEW BOX CULVERT, BACKFILLING, AND GRADING. THE TOTAL NET LENGTH OF THE PROJECT IS 300 FEET. THE RECEIVING WATER FOR STORM WATER FROM THIS PROJECT IS UNNAMED STEAM.

PROJECT ENGINEER

THE PROJECT ENGINEER AND THE CONTRACTOR ARE RESPONSIBLE FOR THE IMPLEMENTATION OF THE SWPPP AND THE INSTALLATION, INSPECTION, AND MAINTENANCE OF THE EROSION PREVENTION AND SEDIMENT CONTROL BMP'S BEFORE AND DURING CONSTRUCTION.

TIMING AND BMP INSTALLATION

THE EROSION PREVENTION AND SEDIMENT CONTROL BMP'S SHALL BE INSTALLED AS NECESSARY TO MINIMIZE EROSION FROM DISTURBED SURFACES AND CAPTURE SEDIMENT ON SITE, AND SHALL MEET THE NPDES PERMIT PART IV CONSTRUCTION ACTIVITY REQUIREMENTS.

CALCULATIONS FOR STA. 11+35 TO 14+35 (BRIDGE REPLACEMENT AND GRADING)

WATER QUALITY VOLUMES

NEW IMPERVIOUS AREA 0.234-0.234 ACRES = 0.000 ACRES = 0.000 SQ. FT.

WATER QUALITY VOLUME 0.000 SQ. FT. * 1 IN. = 0.000 CU. FT.

SWPPP DESIGNER

KYRA GORES-LINCOLN COUNTY TECHNICIAN

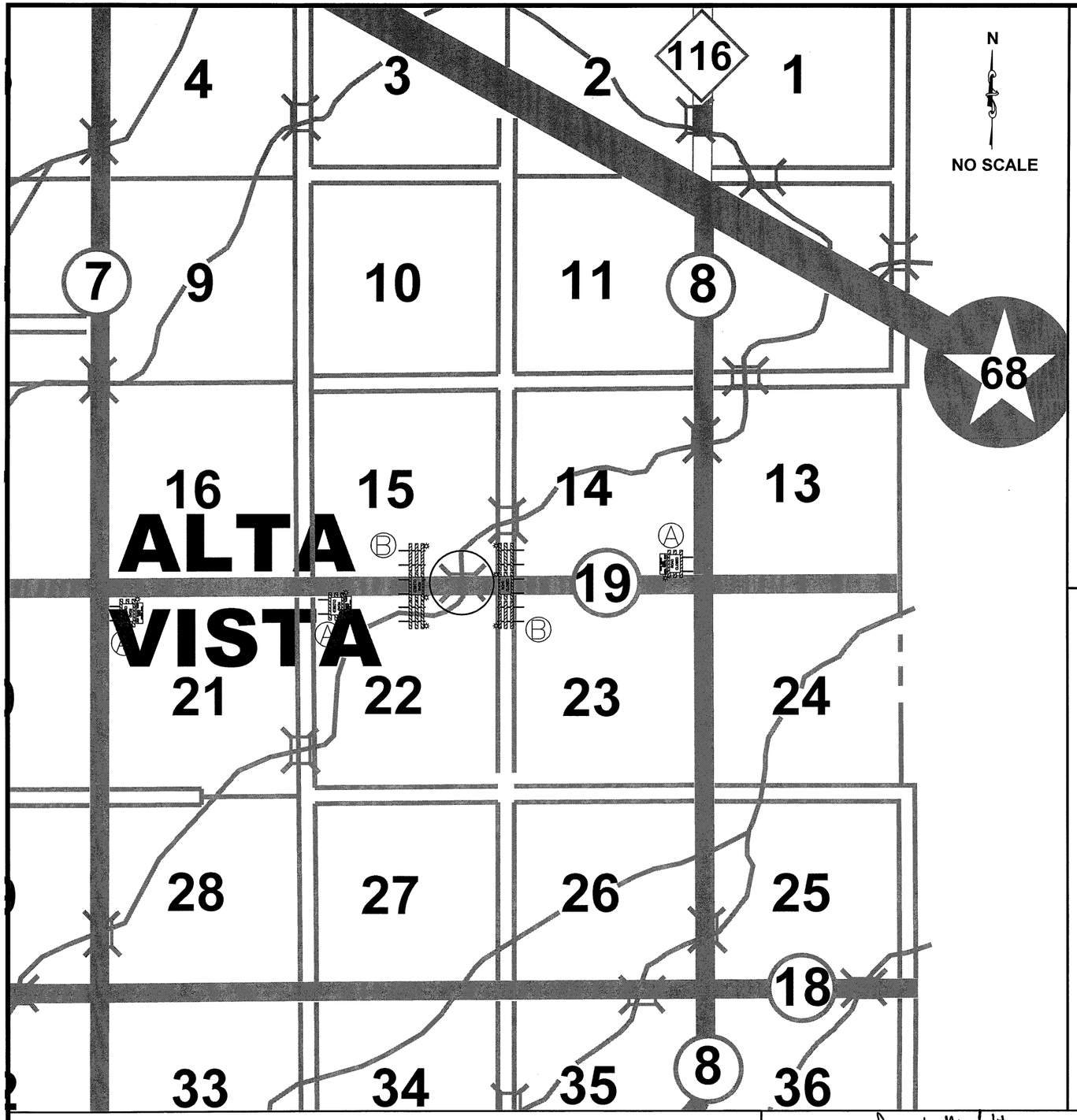
LOCATION OF SWPPP REQUIREMENTS IN PROJECT PLAN

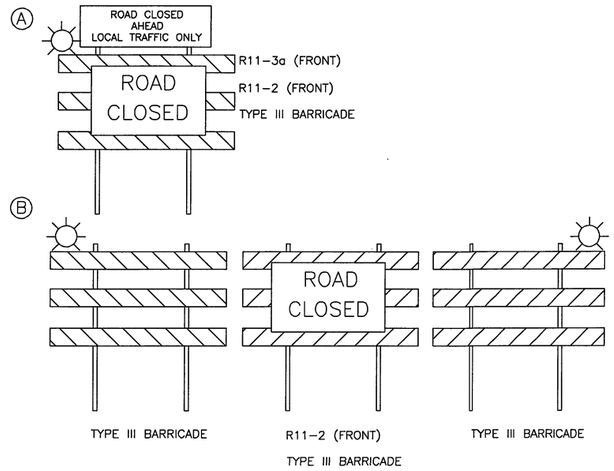
DESCRIPTION	TITLE	LOCATION
SUMMARY OF PERVIOUS AND IMPERVIOUS	SWPPP	SHEET 13
DIRECTION OF FLOW	EROSION & SEDIMENT CONTROL PLAN	SHEET 9
RECEIVING SURFACE WATERS	SWPPP	SHEET 13
FINAL STABILIZATION	EROSION & SEDIMENT CONTROL PLAN	SHEET 9
DRAINAGE TABULATION	SWPPP	SHEET 13
EROSION CONTROL TABULATION	EROSION & SEDIMENT CONTROL PLAN	SHEET 9
EROSION CONTROL SHEETS	EROSION & SEDIMENT CONTROL PLAN & EROSION CONTROL DETAILS	SHEETS 9-10
SEDIMENT CONTROL DETAILS	SEDIMENT CONTROL DETAILS	SHEET 10

AMENDING THE SWPPP

THE SWPPP MUST BE AMENDED TO RECORD CHANGES OR MODIFICATIONS TO PERMIT BMP'S OR OTHER STORM WATER TREATMENT SYSTEMS AND REMOVALS OF TEMPORARY BMP'S. CHANGES TO TEMPORARY BMP'S MAY BE RECORDED ON THIS SHEET. INCLUDE A BRIEF DESCRIPTION OF THE PROBLEM, LOCATION, NATURE OF ALTERATION, AND COMMENTS. THIS RECORD IS TO BE RETAINED FOR THREE YEARS AFTER PROJECT COMPLETION.

DATE REPORTED	STAFF (SHEET)	PLAN LOCATION (STATION)	PROJ. LOCATION	PROBLEM, SOLUTION, AND NOTES





NOTE:

CONTRACTOR SHALL INSTALL AND MAINTAIN ORANGE SAFETY FENCE OR OTHER MATERIAL ACCEPTED BY THE ENGINEER AS TO COMPLETELY BLOCK THE ROADWAY FROM SHOULDER PI TO SHOULDER PI AT BARICADE (B) LOCATIONS.

SIGN	SIGN NO.	QUANTITY	SIZE	COLOR	FLASHERS
	TYPE III BARRICADE	9	60" X 48"	ORANGE ON WHITE	7
ROAD CLOSED	R11-2	5	48" X 30"	BLACK ON WHITE	
ROAD CLOSED AHEAD LOCAL TRAFFIC ONLY	R11-3a	3	60" X 30"	BLACK ON WHITE	

ALL TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MINNESOTA MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES AND THE LATEST EDITION OF THE TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS FIELD MANUAL.

ALL NECESSARY TRAFFIC CONTROL DEVICES ON THIS PROJECT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

TRAFFIC CONTROL

CERTIFIED BY Joseph M Wilson LICENSED ENGINEER LIC. NO. 54947 DATE: 5/02/19

S.A.P. NO. 041-619-014 SHEET NO. 14 OF 14