

STATE	PROJECT NUMBER	SHEET	TOTAL SHEETS
N.D.	TB1501	1	10

CASS COUNTY HIGHWAY DEPARTMENT

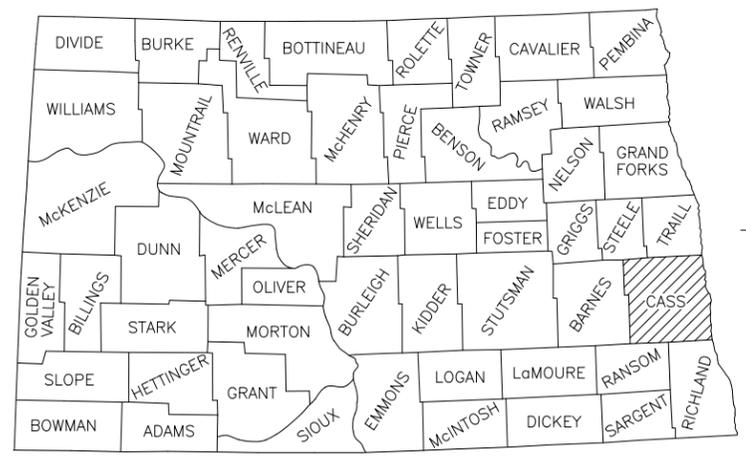
PLANS

FOR
COUNTY PROJECT NO. TB1501

BRIDGE NO. 9-113-24.0
STRUCTURE REPLACEMENT

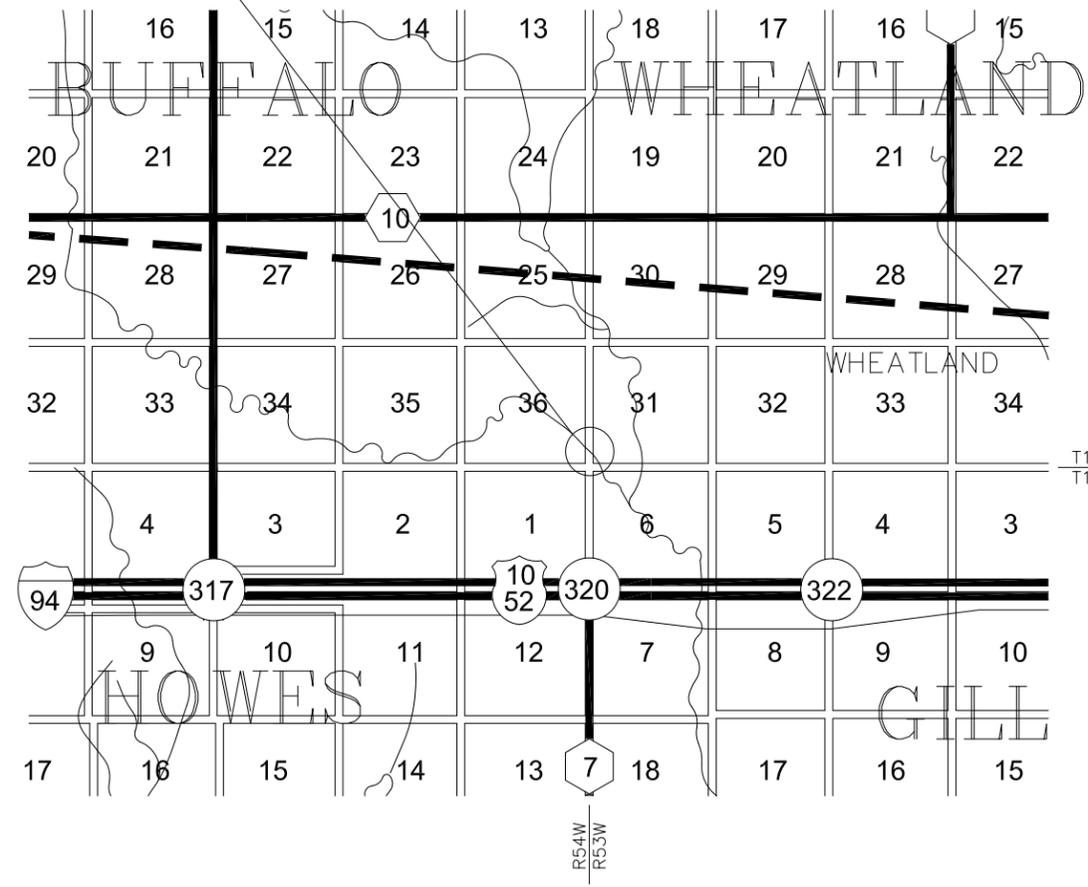
145TH AVENUE SE OVER A TRIBUTARY OF BUFFALO CREEK

GOVERNING SPECIFICATIONS:
2014 STANDARD SPECIFICATIONS ADOPTED BY
THE NORTH DAKOTA DEPARTMENT OF
TRANSPORTATION AND THE SUPPLEMENTAL
SPECIFICATIONS EFFECTIVE ON THE DATE THE
PROJECT IS ADVERTISED.



SKETCH MAP OF NORTH DAKOTA
SHOWING COUNTIES

PROJECT TB1501
SEC. 36, T140N, R54W.
BUFFALO TOWNSHIP
SEC. 36, T140N, R54W.
WHEATLAND TOWNSHIP

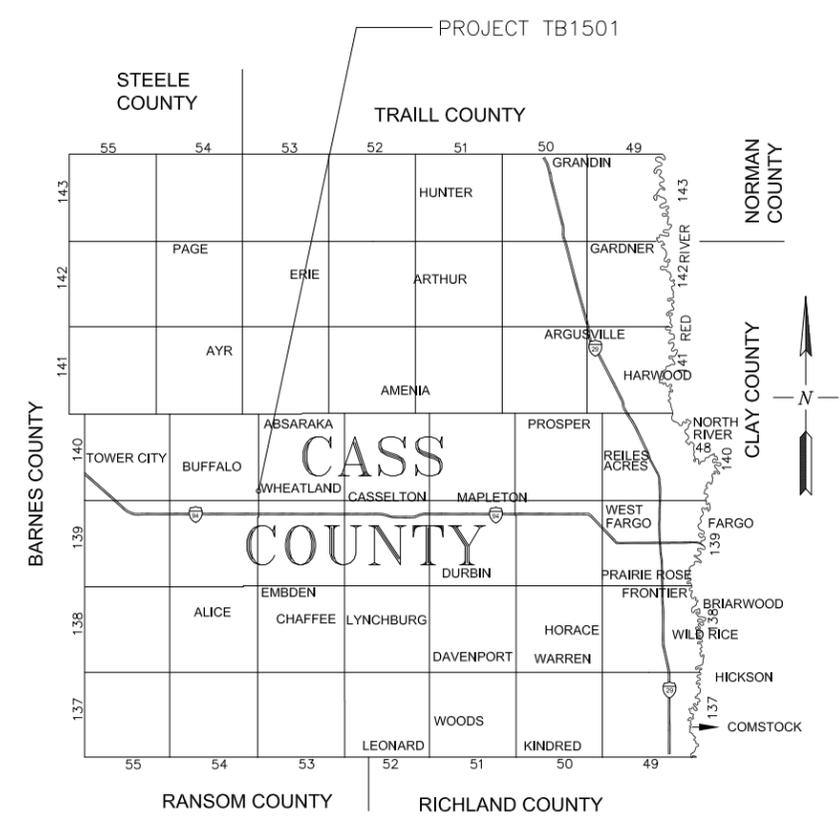


INDEX OF DRAWINGS

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2-3	CONSTRUCTION NOTES
4	ESTIMATED QUANTITIES
5-7	BOX CULVERT DETAILS
8-9	CONSTRUCTION SIGNING
10	PLAN AND PROFILE

STANDARD DRAWINGS

NUMBER	TITLE
D-704-7,8,9,10	CONSTRUCTION SIGNING
11,13,14,15,19	& BARRICADE DETAILS
21,22,26	
D-708-6	EROSION AND SILTATION CONTROLS



THIS DOCUMENT WAS ORIGINALLY ISSUED
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JASON P. BENSON
N.D. REG. NO. 7490
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CASS COUNTY HIGHWAY DEPARTMENT
PROJECT NO. TB1501
I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION.
JASON P. BENSON /s/ DATE: 02/20/2015
JASON P. BENSON N.D. REG. NO. 7490

TB15101: 36 BUFFALO - 31 WHEATLAND ON A TOWNSHIP ROAD OVER BUFFALO CREEK			ESTIMATED QUANTITIES	
ITEM	SPEC NO.	DESCRIPTION	UNIT	APPROX QUANTITY
1	103	CONTRACT BOND	LSUM	1
2	201	CLEARING AND GRUBBING	LSUM	1
3	202	REMOVAL OF STRUCTURE	EA	1
4	203	BORROW - EXCAVATION	CY	212
5	210	CLASS 2 EXCAVATION-BOX CULVERT (APPROXIMATELY 1,700 C.Y.)	EA	1
6	210	FLOWABLE FILL	CY	16
7	210	FOUNDATION FILL	CY	203
8	210	FOUNDATION PREPARATION-BOX CULVERT	EA	1
9	256	RIPRAP - GRADE 1	CY	75
10	302	AGGREGATE BASE COURSE CL 5	TON	527
11	302	AGGREGATE SURFACE COURSE CL 13	TON	207
12	638	12' X 6' PRECAST RCB	LF	172
13	638	12' X 6' PRECAST RCB END SECTION	EA	4
14	702	MOBILIZATION	LSUM	1
15	704	TRAFFIC CONTROL	LSUM	1
16	708	SEEDING - TYPE B - CLASS V	ACRE	1.00
17	708	FIBER ROLLS - 12IN	LF	200
18	708	MULCHING	ACRE	1.00
19	709	GEOTEXTILE FABRIC - TYPE S1	SY	405
20	709	GEOTEXTILE FABRIC - TYPE R1	SY	744

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CASS COUNTY HIGHWAY DEPARTMENT
PROJECT NO. TB1501
ESTIMATED QUANTITIES
SHEET 2 OF 10

Precast Reinforced Concrete Box Culvert: A precast reinforced concrete box culvert shall be installed at the existing centerline of the bridge per the plans for each individual project. The concrete box culverts shall be designed for at least two feet of fill.

The installation of each precast RCB shall satisfy the applicable portions of "AASHTO standard specifications for highway bridges," Division II, Section 27, and Section 2 along with Section 210 of the "North Dakota standard specifications for road and bridge construction." The contractor shall provide a 6-inch minimum thickness of bedding (screedable granular material) for a leveling course, and a 1' minimum thickness of 1.5-inch crushed rock for foundation fill under the RCB. Geotextile fabric type S1 shall be placed between the foundation fill and the sand bedding.

The design and manufacture of each precast RCB shall satisfy the applicable portion of "AASHTO LRFD bridge design specifications," section 12, and "AASHTO materials specification M259." The design shall also meet or exceed the following criteria:

Design load: HL-93
Fill height: 7 feet

The precast RCBs shall be comprised of barrel sections and end sections. The concrete used to make the sections shall have a minimum compressive strength of 4,000 psi.

The barrel sections shall not be any shorter than 4 feet long. The minimum thickness of the barrel parts is 10 inches for the roof and floor, and 8 inches for the walls. Any haunch or fillet at the inside corners of the barrel shall not exceed a triangular shape with 12 inch horizontal and 12 inch vertical legs. The barrel section joints shall be tongue and groove.

The end sections shall include a reinforced concrete parapet on the top of the roof, and a pre-cast or cast in place reinforced concrete cutoff wall below the floor. The parapet shall be 1' x 1' and shall be as long as the barrel section is wide. The cutoff walls shall be placed under the end of the apron and shall be a minimum of 8 inches thick (2' thick if cast in place), 2.5 feet deep, and 3 feet longer than the barrel sections are wide. Holes shall be cast at 3' centers through the floor of each end section and into the cutoff walls to receive 3/4" diameter dowels. Then the voids shall be filled with grout. The slope of the end sections shall not be any steeper than 2 to 1, measured perpendicular to the centerline of the roadway. The end of the section shall not be higher than 2' - 4" above the floor. The end sections shall be connected to the main barrel by the use of galvanized U-bolts or galvanized steel-bolted plates in such a manner that the inside corner surface is smooth. All costs for precast cutoff wall or construction of cast in place cutoff wall to be included in price bid for end sections.

An acceptable method shall tie all the RCB sections together. The ties should adequately hold the sections together under construction load and service load conditions. The sections shall be tied together with prestressing strands or galvanized steel U-bolts. There shall be a minimum of four strands at each joint placed at each outside corner. If the U-bolts are used, the four U-bolts will be located at the third points of the outside walls. All hardware shall either be hot-dipped galvanized according to section 854 of the "North Dakota Standard Specifications for Road and Bridge Construction" or mechanically galvanized according to ASTM B695. Prestressing cables shall be corrosion protected and their ends grouted.

The top and two outside surfaces of each barrel section joint shall be wrapped with a geotextile fabric that prevents soil from leaking through the joint. The geotextile fabric shall be a minimum of 24 inches wide and shall meet the requirements of geotextile fabric type S1. Geotextile fabric shall also be required at the outside of each cutoff wall vertical joint, if more than one unit is used. A groove should be made in the bedding 1" deep and 2" - 3" wide in front of each joint to prevent sand from being pushed into the joint during installation. Each joint shall also be sealed with 1 1/4" cord preformed plastic joint sealant (ASTM C-990) on the bottom and up 1/3 of the sides.

The costs of providing and installing the ties, the geotextile fabric, and joint sealant shall be included in the price bid for the precast RCBs.

The contractor shall submit shop drawings to the construction engineer for approval before the manufacture of the RCB sections. These shop drawings shall show a minimum of the following:

- Layout showing RCB placement and clearances.
- Type and strength of concrete and reinforcing steel.
- All concrete and reinforcing dimensions.
- Reinforcing steel clearances.
- Method of tying sections together.
- Method of covering and sealing the joints.
- Installation and handling instructions.

End sections are required on each end of both lines. Barrels shall be spaced 6 inches apart, and flowable fill or Type AE-3 concrete shall be used between the box culverts (including end sections). At each end, the flowable fill shall be capped with 6" of 3,000 psi concrete. The concrete cap, and any other additional items required for the installation of flowable fill shall be included in the price bid for flowable fill. Mix design for flowable fill shall be approved by engineer prior to placement.

Multiple Span Substitution: The Contractor may substitute one double span precast box culvert section for two single precast box culvert sections shown in the plans. The contractor will omit the grout between the sections of double precast box culvert sections.

Borrow - Excavation: Borrow material shall be obtained from a borrow site located by the contractor and approved by the engineer. The price bid for "BORROW-EXCAVATION" shall include all royalties, utility and fencing adjustments, environmental and cultural clearances, erosion control measures, site restoration and any other costs associated with obtaining, transporting and placing borrow material. The quantity for "BORROW-EXCAVATION" shall be measured for payment by cross section of the borrow area.

Clearing and Grubbing: The Contractor shall perform clearing and grubbing in any areas within the right of way necessary to construct the project. All activities shall be in accordance with section 201 of the Standard Specifications. No material generated may be buried or burned within the right of way limits and shall be disposed of off site at an approved site of the Contractor's choosing. Payment for clearing and grubbing shall be made on a lump sum basis.

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CASS COUNTY HIGHWAY DEPARTMENT
PROJECT NO. TB1501
CONSTRUCTION NOTES
SHEET 3 OF 10

Flowable Fill: CDF may be used between the walls of the individual lines of precast RCB culverts. CDF shall have a compressive strength of 150–300 psi. Type AE–3 concrete may be substituted for CDF for entire volume between box culverts. If concrete is used, no concrete cap is required and hook bars tying CDF and concrete cap may be omitted.

Class 2 Excavation–Box Culvert: All box culvert excavation, foundation fill excavation, channel excavation, riprap excavation, placement of ordinary backfill, compaction, water, and shaping of roadway inslopes and channel slopes shall be included in the unit price bid for “CLASS 2 EXCAVATION–BOX CULVERT”. Class 2 Excavation–Box Culvert shall be performed according to Section 210 of the standard specifications.

The suitability of material from on–site excavations for use as backfill will be determined by the engineer. The contractor shall remove and replace approximately 4” of topsoil over the excavation and embankment areas, except the 28’ roadbed. Backfill shall be placed and compacted in accordance with Section 203.04 E.3 of the Standard Specifications. If the excavated material is deemed not suitable for ordinary backfill, it shall become property of the contractor and disposed of outside of the road right–of–way, not adjacent to the construction site, and at a site approved by the engineer. All costs associated with excavation, hauling, depositing and leveling the waste material shall be included in the unit price bid for “CLASS 2 EXCAVATION–BOX CULVERT”.

Foundation Fill: The quantity for foundation fill was computed to a depth of 1.5’ below the box culvert (1’ minimum depth required); however, this may vary depending on the soil conditions. If additional rock is required to stabilize the foundation, it will be paid for as “FOUNDATION FILL.” The bed for the pre–cast sections shall consist of fine graded material approximately 6” in depth below the culvert. Geosynthetic material Type S1 shall be placed between foundation fill and graded bedding. All aggregate described above shall be included in the price bid for “FOUNDATION FILL.” Material will be accepted by Engineers Statement. No aggregate testing shall be required unless deemed necessary by the Engineer.

Foundation Preparation: The bidders shall be aware of the possible inundated conditions at this site before the bid opening. The cost of any cofferdams and dewatering the excavation shall be included in the bid for “FOUNDATION PREPARATION.”

Aggregates: The attention of the bidders is directed to M.S. 298.75 (Aggregate Material Tax), pursuant to the removal of aggregates from any deposit in Minnesota.

Haul Roads: The Contractor’s attention is directed to Section 107.08 of the Standard Specifications with regard to the use of public roads for hauling materials to the project. It shall be the Contractor’s responsibility to investigate the suitability of routes with the agency having control of the road prior to submitting a bid.

Removal of Structure: This bid item shall include all costs associated with the removal of the existing structures. The structure shall be removed in its entirety. All material shall be disposed of off–site at a location of the contractor’s choosing, approved by the engineer. Burial of the removed material will not be permitted.

Aggregate Base Class 5: The Class 5 aggregate backfill shall be compacted in layers not to exceed 6 inches using a hand–held vibratory plate compactor or hand–held mechanical tamper, or pneumatic roller to the top pipe. All equipment shall be operated to produce a uniform density throughout the entire section. The desired degree of compaction will be considered obtained when the surface is tightly bound and shows no rutting or displacement under equipment operation. Water shall be applied as needed to secure required results. All other aggregate pertaining to culverts shall be placed according to section 203.04 E3. Plan quantity includes 25% shrinkage.

Loose Rock Riprap And Geotextile Fabric Type RR: Excavation quantities for placement of loose rock riprap and geotextile fabric type RR shall be included in the price bid for “RIPRAP – GRADE 1” and not paid for separately. This item shall be placed at the locations shown on the plans. Exact dimensions to be determined by the Engineer in the field, and quantities may vary. Materials shall meet the requirements of section 256 of the Standard Specifications. Unit price will not be adjusted with increase or decrease in quantity.

Traffic Control: This item shall include all costs associated with flagging, and required signage for the sites to safely close the road. No official detour shall be posted. Temporary local access shall be maintained at all times.

Seeding: Seeding – Type B Class V shall meet the requirements of section 251 of the standard specifications except that the minimum amount of live seed per acre shall be modified as follows:

CLASS V	LBS LIVE SEED PER ACRE
Meadow Bromegrass	20
Intermediate Wheatgrass	20
Crested Wheatgrass	20
Tetraploid Int. Ryegrass	8
Creeping Alfalfa	12
Rye	<u>20</u>
TOTAL	100

Fiber Rolls 12IN: This item shall include all costs with placing and securing the 12IN fiber rolls for siltation and erosion control.

Geotextile Fabric – Type S1: This item shall include all costs associated with the placement of the geotextile fabric – Type S1. Actual surface area will be the measurement used for payment, no allowances made for overlapping.

Geotextile Fabric – Type R1: This item shall include all costs associated with the placement of the geotextile fabric – Type R1. Actual surface area will be the measurement used for payment, no allowances made for overlapping.

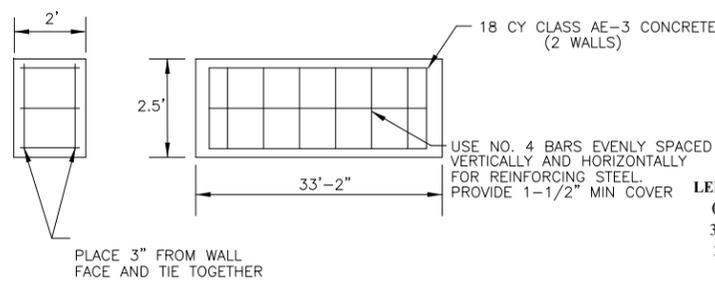
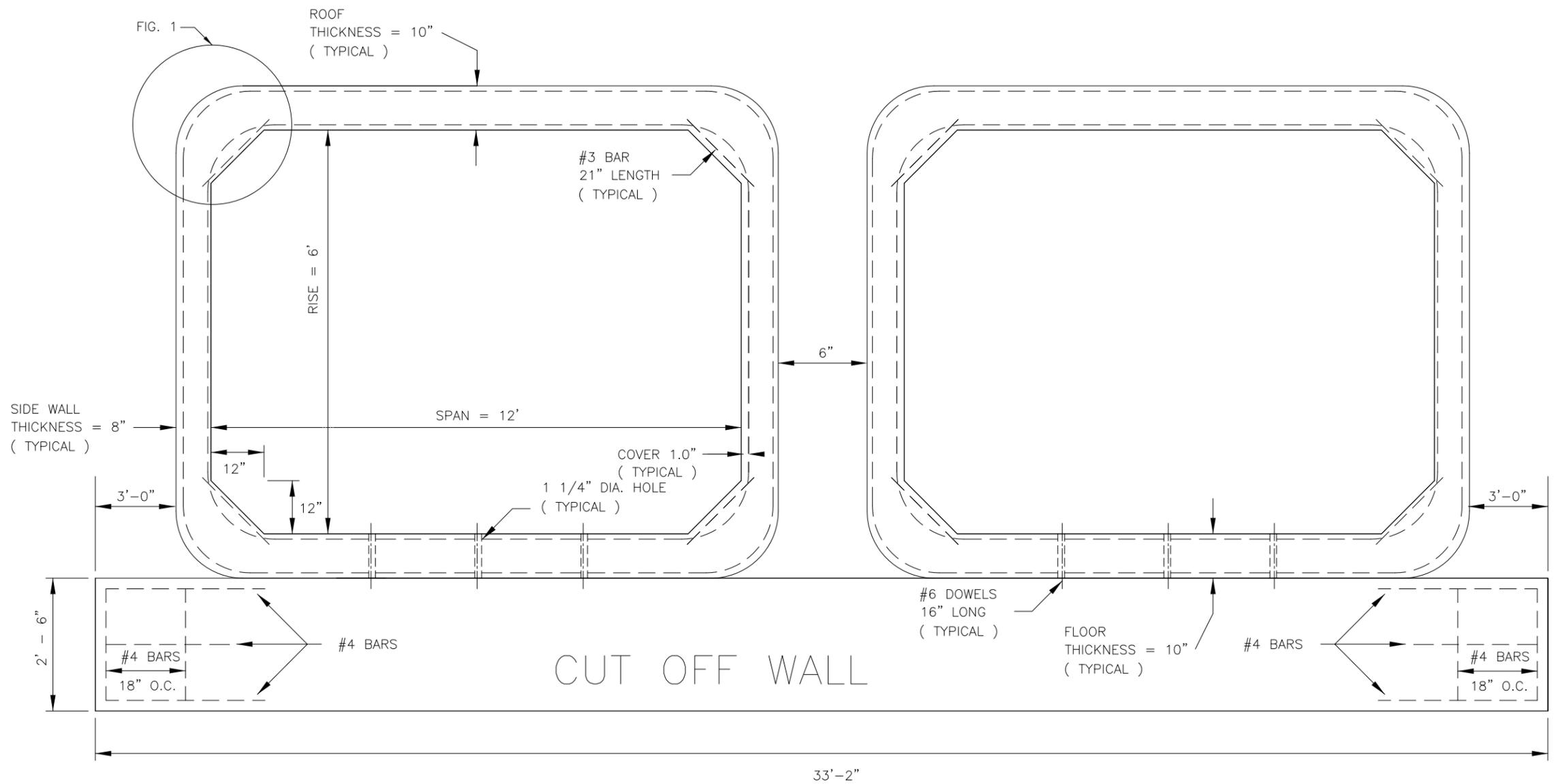
Weed Control: Successful bidders as part of their supply contract will be required as part of the bid acceptance to comply with the following:

1. All noxious weeds must be controlled within the pit and extraction area each year in compliance with North Dakota State Agriculture Department recommendations for noxious weed control.
2. The county weed officer shall inspect the pit and extraction area before any materials shall be removed and shall by written letter certify operator’s compliance with the North Dakota Department of Agriculture’s recommendations for noxious weed control.
3. Any questions concerning the certifications of compliance for noxious weed control and the requirements thereunder is available from the County Weed Officer (701–298–2388).

This request is made pursuant to section 4.1–47 of the North Dakota Century Code.

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CASS COUNTY HIGHWAY DEPARTMENT
PROJECT NO. TB1501
CONSTRUCTION NOTES
SHEET 4 OF 10



CAST IN PLACE CUTOFF WALL DETAIL
NOT TO SCALE

LENGTH (FT)	AMOUNT
32.67	12
2.25	44
1.5	24
TOTAL LENGTH	527

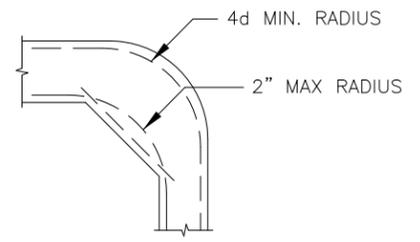
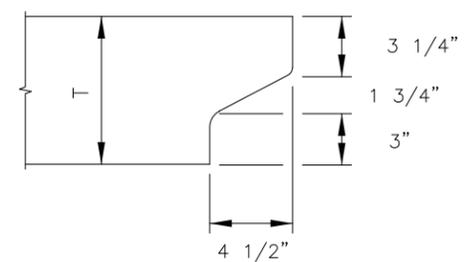


FIGURE 1



JOINT DETAIL

NOTES: 1. SECTIONS SHALL BE FASTENED USING TIE BARS.

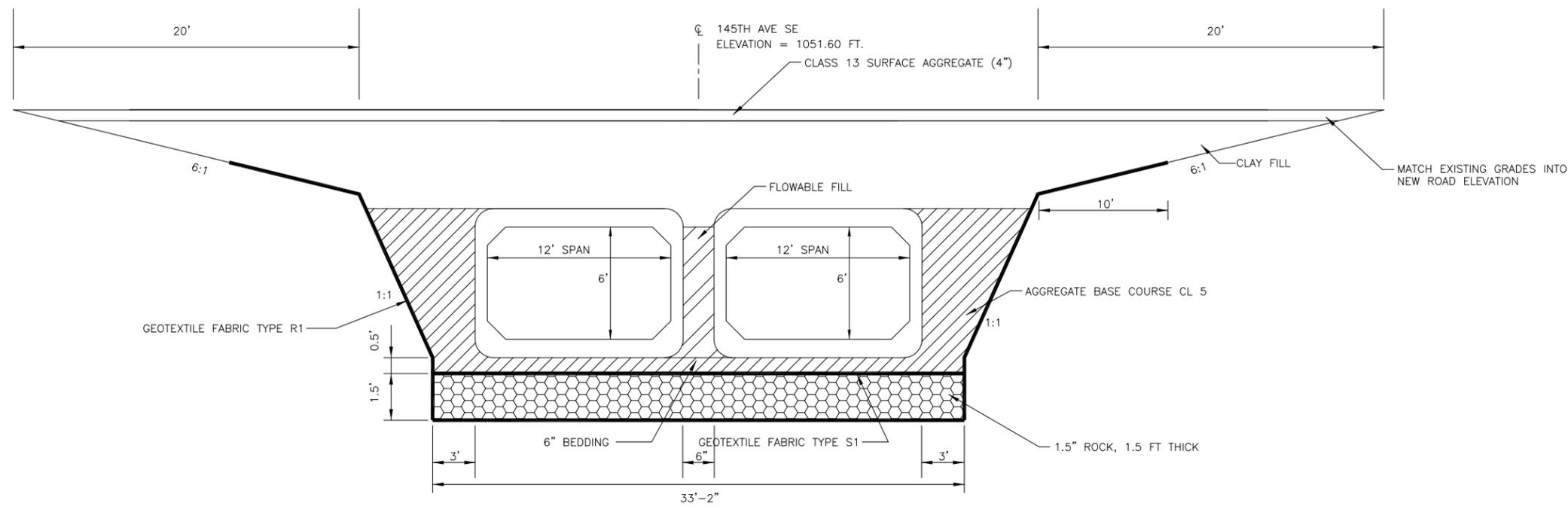
2. AREA OF STEEL UNITS ARE IN SQ. IN. PER FT. ALL LAPS SHALL BE 14" UNLESS OTHERWISE STATED. REINFORCING SHALL MEET AASHTO M-55, AND SHALL BE GRADE 60. IF WELDED WIRE FABRIC IS USED, IT SHALL HAVE A YIELD STRENGTH OF 65,000 POUNDS PER SQUARE INCH.

3. THE TOP AND TWO OUTSIDE OF ALL JOINTS TO BE COVERED WITH A GEOTEXTILE FABRIC 24" WIDE. THE FABRIC IS TO BE HELD IN PLACE DURING BACK FILL PLACEMENT.

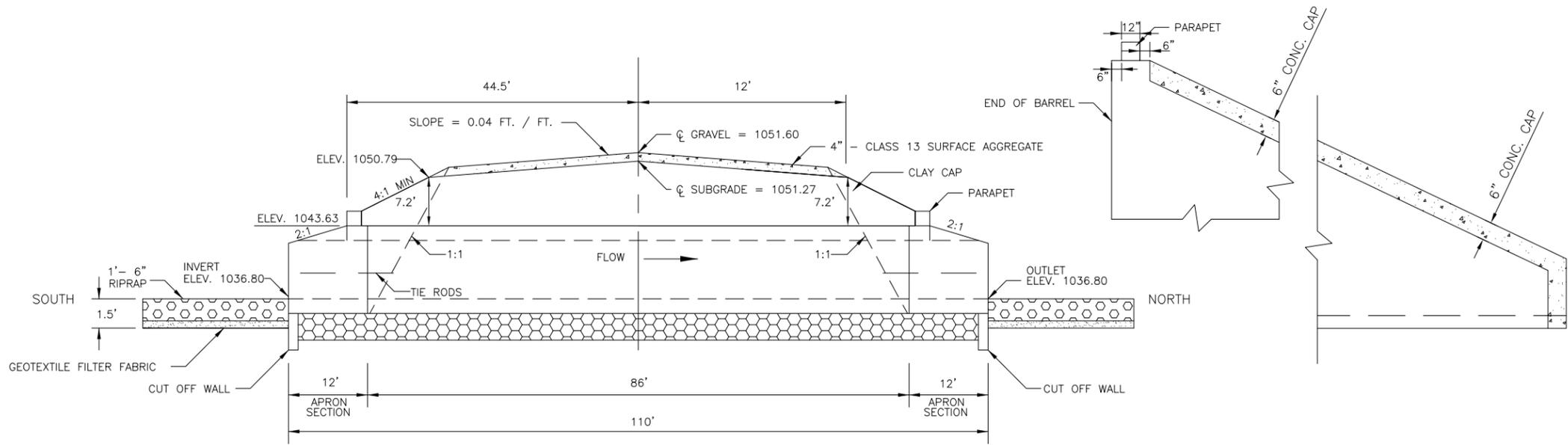
4. FLOOR HOLES ARE FOR ATTACHMENT TO CUT OFF WALL AND SHOULD BE USED AT END SECTIONS ONLY.

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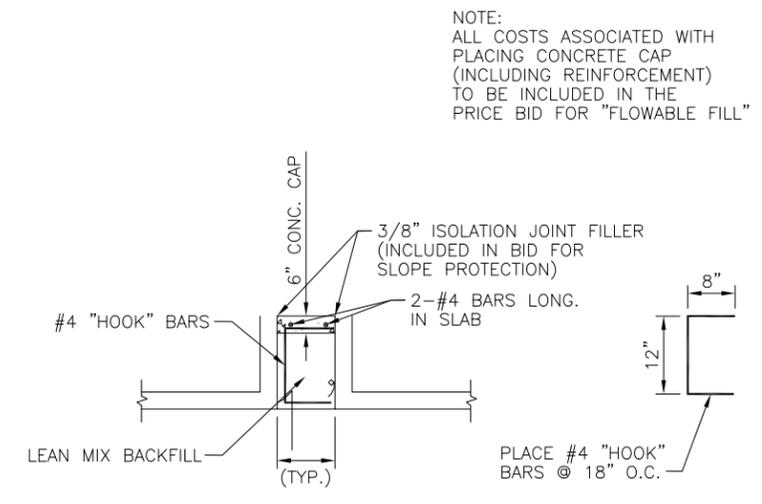
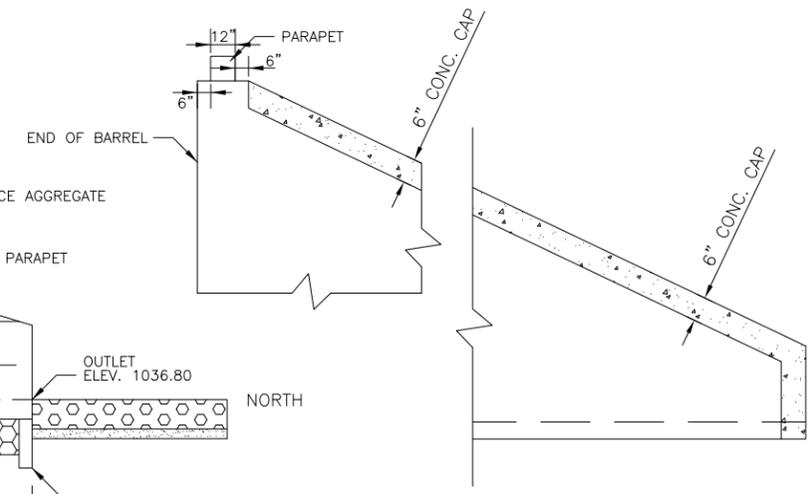
CASS COUNTY HIGHWAY DEPARTMENT
 PROJECT NO. TB1501
 BOX CULVERT DETAILS
 SHEET 5 OF 10



END VIEW
NOT TO SCALE



SIDE VIEW
NOT TO SCALE

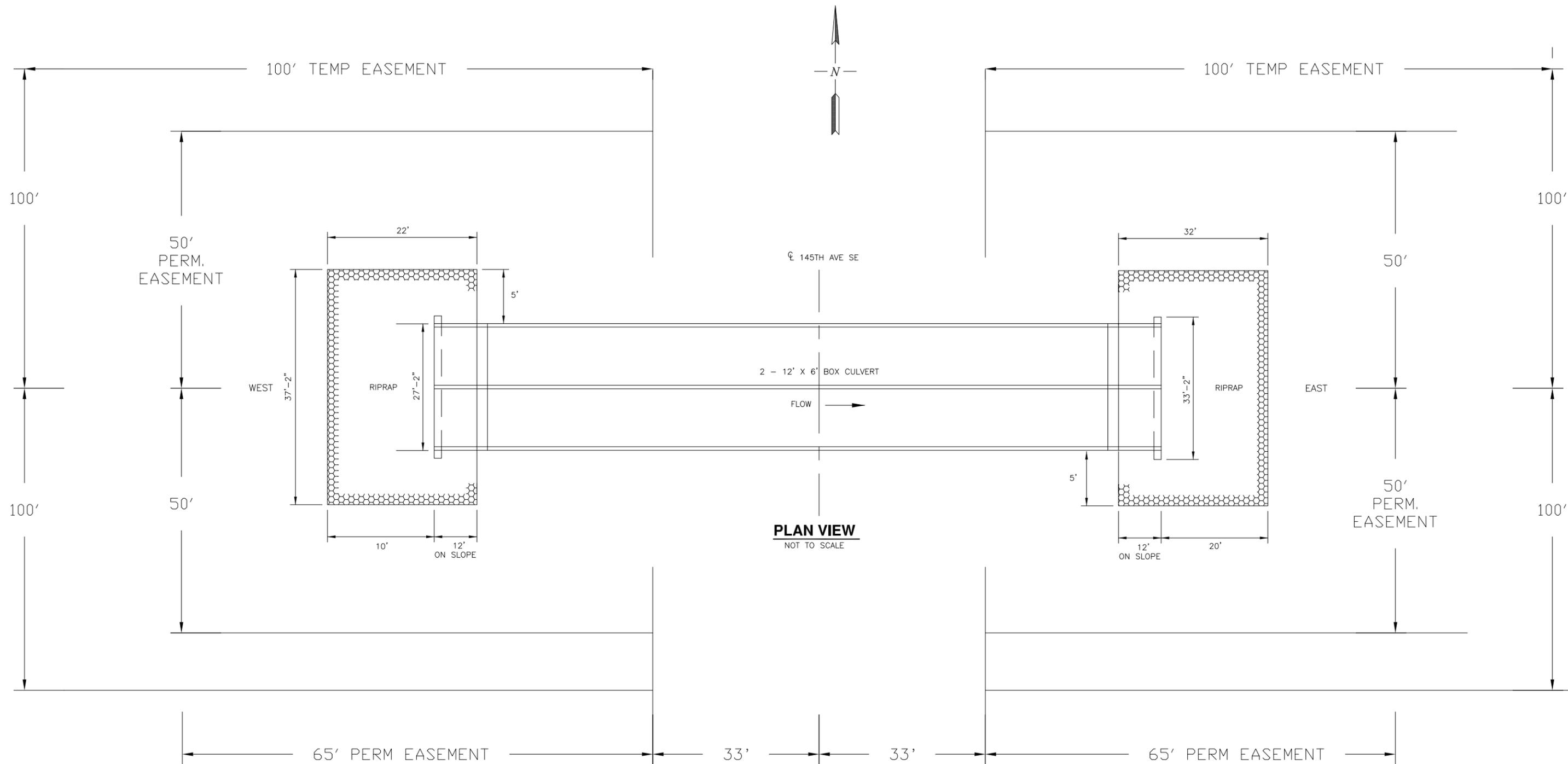


CONCRETE CAP DETAILS
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NOTE:
ALL COSTS ASSOCIATED WITH
PLACING CONCRETE CAP
(INCLUDING REINFORCEMENT)
TO BE INCLUDED IN THE
PRICE BID FOR "FLOWABLE FILL"

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PROJECT NO. TB1501
BOX CULVERT DETAILS
SHEET 6 OF 10



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CASS COUNTY HIGHWAY DEPARTMENT
PROJECT NO. TB1501
BOX CULVERT DETAILS
SHEET 7 OF 10

TRAFFIC CONTROL LEGEND

⇨ POST-MOUNTED SIGN

≡ TYPE III BARR.

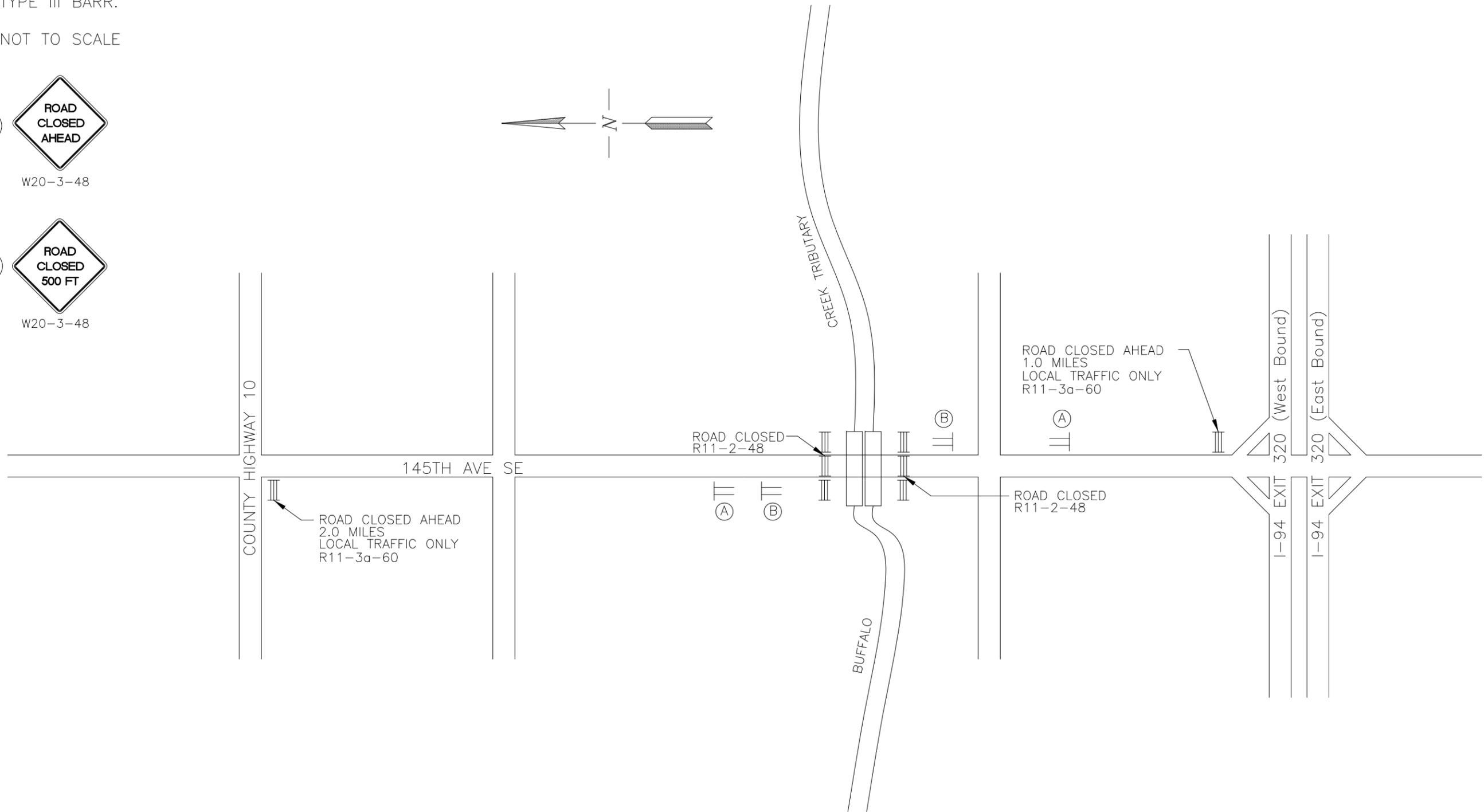
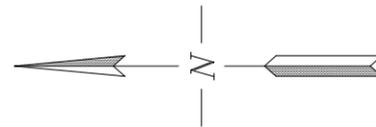
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W20-3-48



W20-3-48



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CASS COUNTY HIGHWAY DEPARTMENT
PROJECT NO. TB1501
TRAFFIC CONTROL LAYOUT
SHEET 8 OF 10

PROJECT NO. TB1501

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQ'D	UNITS PER AMOUNT	UNITS SUB-TOTAL
G20-1a-60	60" X 24"	ROAD WORK NEXT ___ MILES		34	
G20-2a-48	48" X 24"	END ROAD WORK		19	
G20-4-36	36" X 18"	PILOT CAR FOLLOW ME		18	
G20-50a-72	72" X 36"	ROAD WORK NEXT ___ MILES RT & LT ARROWS		37	
G20-52a-72	72" X 24"	ROAD WORK NEXT ___ MILES RT OR LT ARROWS		30	
G20-54-48	48" X 36"	OVERHEAD BRIDGE PAINTING		30	
G20-8-48	48" X 36"	TEMPORARY SURFACE NEXT ___ MILES		30	
M1-4-24	24" X 24"	ROUTE MARKER (POST AND INSTALLATION ONLY)		10	
M3-2-24	24" X 12"	EAST (MOUNTED ON ROUTE MARKER POST)		7	
M3-3-24	24" X 12"	SOUTH (MOUNTED ON ROUTE MARKER POST)		7	
M3-4-24	24" X 12"	WEST (MOUNTED ON ROUTE MARKER POST)		7	
M4-10-48	48" X 18"	DETOUR ARROW RIGHT or LEFT		23	
M4-8-24	24" X 12"	DETOUR (MOUNTED ON THE ROUTE MARKER POST)		7	
M5-1-21	21" X 15"	ARROW AHD AND RT or LT (MTD ON ROUTE MKR POST)		7	
M6-1-21	21" X 15"	ARROW RT or LT (MOUNTED ON ROUTE MARKER POST)		7	
R1-1-48	48" X 48"	STOP		32	
R1-1-30	30" X 30"	STOP		32	
R1-1a-18	18" X 18"	STOP and SLOW PADDLE Back to Back		5	
R1-2-48	48" X 48"	YIELD TO ONCOMING TRAFFIC		29	
R2-1-48	48" X 60"	SPEED LIMIT		39	
R2-1a-24	24" X 24"	MINIMUM FEE \$80		10	
R2-5a-48	48" X 60"	SPEED ZONE AHEAD		39	
R4-1-48	48" X 60"	DO NOT PASS		39	
R4-7-48	48" X 60"	KEEP RIGHT SYMBOL		39	
R4-8-48	48" X 60"	KEEP LEFT SYMBOL		39	
R10-6-48	48" X 72"	STOP HERE ON RED		16	
R11-2-48	48" X 30"	ROAD CLOSED	2	28	56
R11-2a-48	48" X 30"	STREET CLOSED		28	
R11-3a-60	60" X 30"	ROAD CLOSED ___ MILES AHEAD LOCAL TRAFFIC ONLY	2	31	62
R11-3b-60	60" X 30"	BRIDGE OUT ___ MILES AHEAD LOCAL TRAFFIC ONLY		31	
R11-3c-48	60" X 30"	STREET CLOSED		31	
R11-4a-60	60" X 30"	STREET CLOSED TO THRU TRAFFIC		31	
W1-1-48	48" X 48"	RIGHT or LEFT SHARP CURVE ARROW		35	
W1-2-48	48" X 48"	RIGHT or LEFT SHARP CURVE ARROW		35	
W1-3-48	48" X 48"	RIGHT or LEFT SHARP REVERSE CURVE ARROW		35	
W1-4-48	48" X 48"	RIGHT or LEFT REVERSE CURVE ARROW		35	
W1-6-48	48" X 24"	LARGE ARROW		26	
W3-1a-48	48" X 48"	STOP AHEAD SYMBOL		35	
W3-2a-48	48" X 48"	YIELD AHEAD SYMBOL		35	
W5-1-48	48" X 48"	ROAD NARROWS		35	

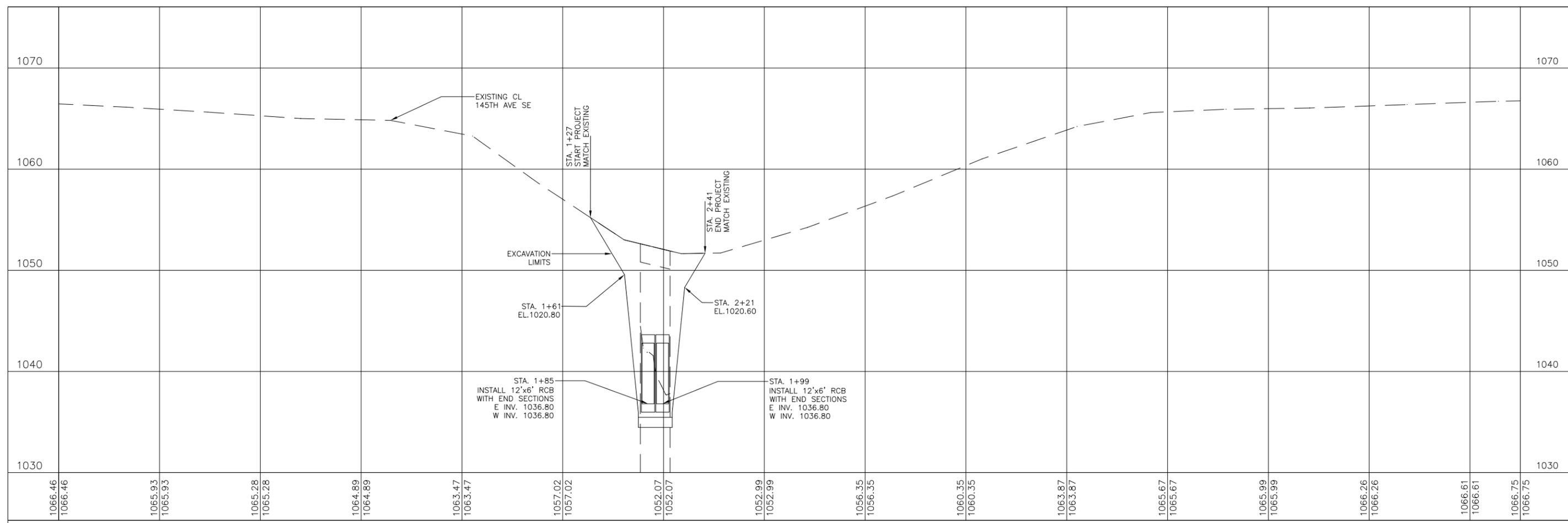
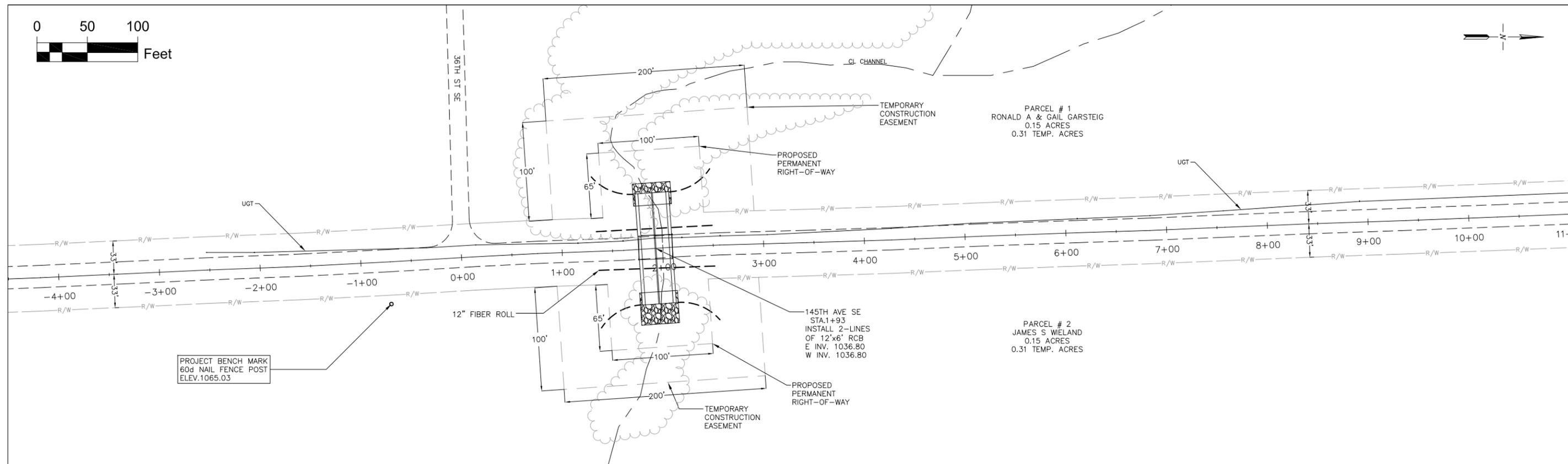
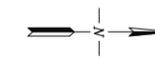
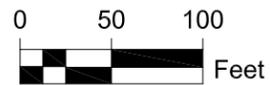
SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQ'D	UNITS PER AMOUNT	UNITS SUB-TOTAL
W6-3-48	48" X 48"	TWO WAY TRAFFIC SYMBOL		35	
W8-11-48	48" X 48"	UNEVEN LANES		35	
W8-1-48	48" X 48"	BUMP		35	
W8-3a-48	48" X 48"	PAVEMENT ENDS SYMBOL		35	
W8-53-48	48" X 48"	TRUCKS ENTERING HIGHWAY		35	
W8-54-48	48" X 48"	TRUCKS ENTERING AHEAD OR ___ FT.		35	
W8-55-48	48" X 48"	TRUCKS CROSSING AHEAD OR ___ FT.		35	
W8-9-48	48" X 48"	LOW SHOULDER		35	
W8-9a-48	48" X 48"	SHOULDER DROP OFF		35	
W13-1-24	24" X 24"	___ MPH ADVISORY SPEED PLATE		11	
W13-4-48	48" X 60"	RAMP ARROW		39	
W20-1a-48	48" X 48"	MEN WORKING SYMBOL		35	
W20-2-48	48" X 48"	DETOUR ___ FT.		35	
W20-3-48	48" X 48"	ROAD OR STREET CLOSED AHEAD or ___ FT.	4	35	140
W20-4-48	48" X 48"	ONE LANE ROAD AHEAD or ___ FT.		35	
W20-51-48	48" X 48"	EQUIPMENT WORKING		35	
W20-52-54	54" X 12"	NEXT ___ MILES		12	
W20-5-48	48" X 48"	RIGHT or LEFT LANE CLOSED AHEAD or ___ FT.		35	
W20-7a-48	48" X 48"	FLAGGING SYMBOL		35	
W20-7b-48	48" X 48"	BE PREPARED TO STOP		35	
W20-7k-24	24" X 18"	___ FEET		10	
W20-8-48	48" X 48"	STREET CLOSED		35	
W21-2-48	48" X 48"	FRESH OIL		35	
W21-4-48	48" X 48"	ROAD WORK ___ FT.		35	
W21-50-48	48" X 48"	BRIDGE PAINTING AHEAD OR ___ FT.		35	
W21-51-48	48" X 48"	MATERIAL ON ROADWAY		35	
W21-5-48	48" X 48"	SHOULDER WORK		35	
W22-7-48	48" X 48"	SINGLE LANE AHEAD or ___ FT.		35	
W22-8-48	48" X 48"	FRESH OIL LOOSE ROCK		35	

TOTAL UNITS 258

			SPEC&CODE	
				704-1000
TYPE III	8' LONG	BARRICADES	EACH	704-1052
TYPE II	2' MIN.	BARRICADES	EACH	704-1051
TYPE I	6' TO 10'	BARRICADES	EACH	704-1050
	18" X 36" MIN.	DELINEATOR DRUMS	EACH	704-1060
		TUBULARS MARKERS	EACH	704-1067

THIS DOCUMENT WAS ORIGINALLY ISSUED AND SEALED BY
 JASON P. BENSON
 N.D. REG. NO. 7490
 ON 02/20/2015 AND THE ORIGINAL DOCUMENT IS STORED AT THE CASS COUNTY HIGHWAY DEPARTMENT, WEST FARGO, ND

CASS COUNTY HIGHWAY DEPARTMENT
 PROJECT NO. TB1501
 TRAFFIC CONTROL LAYOUT
 SHEET 9 OF 10



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