

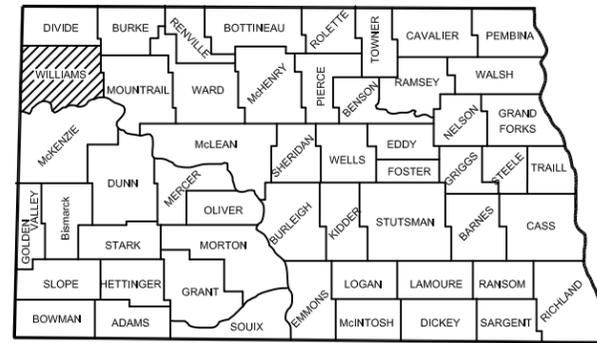
STATE	PROJECT NO.	PCN	SEC. NO.	SHEET NO.
ND	TEU-7-002(160)014	21137	1	1

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION
CITY OF WILLISTON
WILLISTON WELCOME SIGNS
TEU-7-002(160)014; PCN 21137
U.S. Route 2

JOB #29

Governing Specifications:
 2014 Standard adopted by the North Dakota Department of Transportation and the Supplemental Specifications effective on the date the project is advertised.

PROJECT NUMBER/DESCRIPTION	NET MILES	GROSS MILES
TEU-7-002(160)014	N/A	10.2

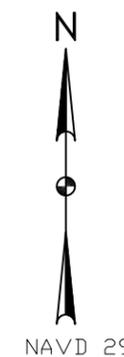


STATE OF NORTH DAKOTA

Williams County, North Dakota
 Concrete and Masonry Sign Construction, Site Electrical Work, Grading, Seeding,
 Traffic Control Signs & Incidentals



Basis of Survey:
 All coordinates are Williams County ground coordinates derived from the "North Dakota Coordinate System of 1983", NAD83 (CORS96), North Zone Combination factor (cf)=1.0000868, US foot. All vertical control is NGVD29. All units are English.



DESIGNERS
Cassie McNames, PE
Brett Gurholt PLA & Jenna Machado, LAIT
Chris Horner, PE & Chris Nelson, PE

APPROVED DATE: 3/30/16
 /s/ Robert Fode
 OFFICE OF PROJECT DEVELOPMENT
 ND DEPARTMENT OF TRANSPORTATION

APPROVAL OF CITY ENGINEER
 I, ROBERT HANSON, CITY ENGINEER, FOR THE CITY OF WILLISTON, NORTH DAKOTA, HEREBY APPROVE THESE PLANS FOR PROJECT NUMBER TEU-7-002(160)014 AS SHOWN ON THE ACCOMPANYING PLANS.
 /s/ Robert Hanson
 Robert Hanson, PE
 CITY ENGINEER
 WILLISTON, NORTH DAKOTA
 DATE: 3/28/16

I HEREBY CERTIFY THAT THE ATTACHED PLANS WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF NORTH DAKOTA.
 /s/ Cassie McNames
 Cassie McNames, PE
 PROFESSIONAL ENGINEER
 DATE: 3/28/16

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List of Standard Drawings

<u>STANDARD NO.</u>	<u>DESCRIPTION</u>
D-704-07	BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS: PERFORATED TUBE
D-704-08	BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS: U-CHANNEL POST
D-704-09	CONSTRUCTION SIGN DETAILS TERMINAL AND GUIDE SIGNS
D-704-10	CONSTRUCTION SIGN DETAILS REGULATORY SIGNS
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D-704-23	SHORT TERM URBAN DETOUR AND LANE CLOSURE ON A DIVIDED HIGHWAY LAYOUTS
D-704-50	PORTABLE SIGN SUPPORT ASSEMBLY

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EXISTING	PROPOSED	
		FIRE HYDRANT
		GATE VALVE
		CURB STOP
		BEND
		TEE
		CROSS
		REDUCER
		SANITARY MANHOLE
		CURB INLET
		CATCH BASIN (BEEHIVE)
		STORM MANHOLE
		FLARED END SECTION
		POWER POLE
		STREET LIGHT
		ELECTRICAL JUNCTION BOX
		TELEPHONE PEDESTAL
		SIGN POST
		GUY WIRE & ANCHOR
		TREE - CONIFEROUS/DECIDUOUS
		DRAINAGE DIRECTION
		CONCRETE
		ASPHALT
		RIP-RAP
		AGGREGATE SURFACE COURSE CL 13
		CONTOURS
		GUY POLE
		TV PEDESTAL
		SPRINKLER HEAD
		ROCK

EXISTING	PROPOSED	
		UNDERGROUND ELECTRIC
		UNDERGROUND TELEPHONE
		GAS LINE
		UNDERGROUND FIBER OPTIC
		UNDERGROUND CABLE TV
		OVERHEAD ELECTRIC POWERLINE
		CURB & GUTTER (CONCRETE)
		EDGE OF ASPHALT SURFACE
		WOODEN FENCE
		BARBED WIRE FENCE
		WATER MAIN
		SANITARY SEWER MAIN
		CULVERTS / STORM SEWER
		RETAINING WALL
		WETLANDS
		GRADING LIMITS
		PROPERTY LINE
		EASEMENT
		CONSTRUCTION EASEMENT
		RIGHT OF WAY
		CONTROL POINT
		PROPERTY PIN - FOUND/SET
		EDGE OF TREE CANOPY
		EROSION CONTROL BLANKET
		FIBER ROLL
		ASPHALT REMOVAL
		SILT FENCE
		CONCRETE REMOVAL
		TREE REMOVAL

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GENERAL NOTES

- 100-P01** **Project Scope of Work:** Scope of work includes but is not limited to mobilization, work zone traffic control, site demolition, protection of existing utilities, excavation, grading, construction of two (2) concrete and masonry community entrance signs to the City of Williston, and incidental work as shown in the plans. Each proposed sign location will be marked in the field by Engineer prior to any mobilization and site disturbance.
- 100-P02** **Existing Utilities and Coordination:** Bidders / Contractors shall be advised that at each sign location, there are existing utilities that may remain in place and the monument sign will span over the top of existing utilities. Utility providers in the area have been contacted and are aware of the proposed project, however require that the existing utility lines that will be spanned over be marked, potholed by non-destructive means or excavation and left exposed for the utility providers to visit the site(s) and obtain depth and document their existing conditions prior to construction. The following contact information is provided for coordination of such requirement;
- | | |
|-------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Gas / Electric:
MDU Resources
Paul Riely
701-572-1614
Email: Paul.Riely@mdu.com | Telecom/Fiberoptic:
Finley Engineering
Albert Keyser
615-713-0195 |
|-------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
- 100-P03** **Testing:** The contractor shall provide an approved independent testing laboratory, who shall be responsible for the required tests and proctors at the contractor's expense. The Engineer shall select all test locations. The contractor shall provide the engineer the original test results no later than 24 hours after the test was performed. All testing shall be incidental to the costs for the "Stone Sign" bid item. Costs for retesting of failed materials shall be paid by Contractor.
- 100-P04** **Product and Material Certifications:** No payment will be made for any items requiring certifications until those certifications have been received by the engineer. The engineer will provide a list of the items requiring certification to Contractor at the preconstruction conference.
- 100-P05** **Haul Road Restrictions:** The Contractor shall contact the appropriate State, County, or City Official to determine if there are any "No Haul Routes" prior to preparation of a bid for the work.

SECTION 200 – Earthwork and Erosion Controls

- 200-P01** **Excavation and Embankment:** Topsoil removal, excavation, Contractor furnished borrow, slope reconstruction, and imported topsoil shall be included and be incidental to the price bid for "Stone Sign". No separate measurement and payment will be made for excavation and embankment to achieve the grades and scope of work outlined in the plans.
- 200-P02** **Class II Seeding:** Class II Seeding shall include Hydraulic Mulch per section 253. Payment for mulching shall be incidental for the price per acre for Class II Seeding.

SECTION 700 – Miscellaneous Construction

- 702-100** **Mobilization:** All costs to prepare and move personnel, equipment, and materials to the two (2) separate project sites as shown in the plans shall be included in the bidders lump sum bid price for "Mobilization".
- 704-P01** **Work Zone Traffic Control:** The work zone traffic control for this project shall consist of a temporary lane closure at each site. The contractor shall limit the closure to daylight hours only. Work zone traffic control shall comply with NDDOT standard drawing D-704-23 Layout Type P. Quantities for traffic control have been included for work at two locations. The required traffic control signs and devices are included in the "Traffic Control Devices List" and will be measured and paid for at the Contract Unit Price for each device.
- 770-P01** **Existing Utilities:** Field verify the exact locations of existing underground utilities before commencing work. The contractor shall be fully responsible for any and all damages which might occur by failure to exactly locate and preserve any and all underground utilities.
- 770-P02** **Sign Luminaires:** The luminaire shall be LED. The linear LED luminaire shall be Insight Lighting type Medley Xi, model number MXI 6 40K 7 U CES 48" REM NO CC or Winona type Winline, model number WSL211W LSL 48" MSL4 200FMC 15DEG LLP6A 40K 24 CPF or an approved equivalent. Fixture finish color shall be colored to match the corrugated metal sign panel. Color to be approved in shop drawing submittals. Coordinate with the manufacturer to achieve the required temperature rating. Fixture shall be able to operate in temperatures as low as -30°C. Power supply for fixtures shall be able to operate at 120V. Fixture shall be surface mounted. Luminaires shall be aimed in the field in the presence of the engineer. Care shall be taken to hide lighting equipment as best as possible (Power supplies, boxes, conduit, etc.) All luminaires, by type specified, shall be by one manufacturer similar and equal. Bid item price for Sign Luminaires shall be included in the per each bid item price for "Lighting System".

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770-P03 Feedpoints: Provide and install a panelboard at each location as shown in the plans along with the required supports. Coordinate with Mountrail-Williams Electric Coop. (MVEC) for the new incoming electrical service. MVEC shall be responsible for providing service connections and conductors from the transformer to the meter. MVEC shall provide transformer, meter, metersocket and meter pedestal. Provide and install 2" conduit sweep for the service conductors from a point 24" below grade to the pedestal mounted metersocket. Exposed conduit shall be rigid steel. Install conductors from the metersocket to the Panelboard in conduit. The Contractor shall be responsible for any materials, labor, or cost imposed by MVEC for the new electrical service. Including but not limited to cable, trenching, backfilling, conduit sweeps and connections along with any fees imposed by MVEC. All additional materials, labor, and fees imposed by MVEC shall be included in the per each bid item price for "Lighting System".

Provide all the necessary breakers as shown in the panel schedule. Panelboard shall be 8 spaces minimum, NEMA 3R enclosure, mounted on Unistrut on the backside of each sign location as shown in the detail. The Panelboard shall be UL Listed and suitable for the purpose indicated. Main and neutral lug shall be copper, suitable for terminating copper conductors only. Phase, neutral and ground bus material shall be copper.

Provide a separate NEMA 3R rated box containing the lighting the lighting control equipment. A photocell shall be mounted on the box and shall control the on and off switching of the light circuits and have a three-to five minute delay. The lighting circuit relays shall be enclosed and shall normally be in the open position. The panelboard shall have circuit breakers as shown on the panel schedule in the plans. The box shall have a test switch that bypasses the photoelectric cell.

Install a GFCI receptacle in a NEMA 3R enclosure next to the Panelboard with the branch circuit conductors in conduit to the Panelboard. Receptacle shall have a weather resistant, in use cover.

All additional labor and materials including conduit, cable, receptacles, circuit breakers, panelboards and enclosures shall be included in the per each bid item price for "Lighting System".

990-1934 Stone Sign: Details indicate the materials and dimensions required to construct each welcome sign, consisting of poured in place footings, foundations, reinforcing steel, brick masonry veneer, steel framing, cladding, metal and precast caps and trim pieces, and a cut metal sign panel to be permanently affixed to the sign elevation on one side only (facing traffic entering the community).

The following information shall apply to the components of the welcome signs ("Stone Signs"):

Cut Metal Sign Panel:

Includes the words "Williston, EST. 1897" with graphics as shown at approximately 36" in height. Lettering / graphics will be supplied by Engineer to Contractor for fabrication and stud mounted to the corrugated steel panel in a permanent, tamper resistant, and weather-proof fashion. Contractor / fabricator shall submit shop drawings indicating details for size, production, installation, and anchoring to the corrugated steel panel prior to fabrication. Cut metal sign panel(s) shall be offset from face of corrugated steel panel to allow a backlighting or halo effect from the proposed lighting system behind the lettering. Lettering shall be waterjet cut or computer-driven routed for precision cutting of the proposed font.

Metal sign panel shall be Aluminum, 3/8" thick, with a baked enamel finish, color: Ivory. A sample shall be provided to Engineer for approval prior to fabrication.

Cast-In-Place Concrete:

Perform work in accordance with ACI 301 and ACI 318. Follow ACI 305R for concreting during hot weather conditions and ACI 306R for concreting during cold weather conditions.

Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete projects and that complies with ASTM C94 requirements for production facilities and equipment.

Provide form materials that provide a smooth, stain-free final appearance for exposed surfaces. Formwork shall comply with guidelines of ACI 347R and ACI 117.

Reinforcement shall be ASTM 615, grade 60, deformed billet-steel bars.

Mix Design: Provide mix design to meet the following requirements:

- a. Minimum 28 day compressive strength, f'c, shall be 4,500 psi.
- b. The maximum water to cement ration shall be 0.40. Use potable water.
- c. Cement shall be ASTM C150, Type I/II Portland.
- d. Fly Ash shall comply with ASTM C618, Class C or F, with a maximum of 25% of cementitious materials by weight.
- e. Water reducing admixtures are acceptable for use and must meet the requirements of ASTM C494. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.
- f. Total air content shall be 5-7 percent. Air entrainment admixtures shall meet ASTM C260.

Curing compound shall comply with ASTM C309.

For each pour or 50 CY or less of concrete, test, mold and cure four concrete test cylinders. Test one at 7 days, one at 14 days, and two at 28 days. Test the compressive

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strength of each cylinder according to ASTM C39. Perform one air test for each set of test cylinders following ASTM C231.

Precast Concrete:

Fabricator Qualifications: A firm that specializes in manufacturing the types of precast concrete specified in good standing in the PCI Plant Certification Program.

Precast concrete units shall comply with PCI MNL-120, PCI MNL-122, PCI-MNL 123, PCI-MNL 135, and ACI 318-11.

Mix Design: Provide mix design to meet the following requirements:

- a. Minimum 28 day compressive strength, f'c, shall be 4,500 psi.
- b. The maximum water to cement ration shall be 0.40. Use potable water.
- c. Cement shall be ASTM C150, Type I/II Portland.
- d. Fly Ash shall comply with ASTM C618, Class C or F, with a maximum of 25% of cementitious materials by weight.
- e. Water reducing admixtures are acceptable for use and must meet the requirements of ASTM C494. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.
- f. Total air content shall be 5-7 percent. Air entrainment admixtures shall meet ASTM C260.

Samples: Submit a 6"x6" mock up to illustrate finish of surfaces, color, texture, and workmanship. Once approved, mockup will become the standard upon which field product will be compared.

Provide Finish Type A: Ensure exposed-to-view finish surfaces of precast units are uniform in color and appearance.

Brick Veneer:

Product Information:

Running Bond Pattern: Red Velour Modular, Hebron Brick or Approved Equal
Soldier Course: Buckwheat Velour Modular, Hebron Brick or Approved Equal
Nominal Size: 7.625" x 2.25" x 3.625"

Performance Requirements:

- Must Meet ASTM C216-14, Type FBS, Grade SW
- Compressive Strength > 6,000 psi
- Use Brick Mortar Type 'N'
- Provide incidental veneer ties to concrete backup wall with a maximum vertical spacing of 16" and maximum horizontal spacing of 32", coordinate with cast in place concrete construction if necessary.

Corrugated Metal Panel:

Panel shall be 36" wide, with 4" rib, 1" depth, pre-finished galvanized steel, minimum 22 gauge (0.8 mm) thick. Panel edge profile shall be tongue and groove for flush seam. Exterior finish shall be PVF coated, color as selected from manufacturer's full range of standard and premium colors to match a medium brown color.

Submit product data and shop drawings for dimensions, panel profile and layout, and methods of anchorage to steel framing. Submit two samples of panel finish at 6" x 6" illustrating finish color, sheen, and texture.

Pre-Finished Metal Cap Flashing

Cap shall be Pre-Finished Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating or AZ50 coating; minimum 0.02 inch (0.6 mm) thick base metal, shop pre-coated with PVDF coating. Fluoropolymer Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system. Color: As selected from manufacturer's full range of standard and premium colors to match a medium brown color.

Fabricate metal flashings and sheet metal work other than aluminum in accordance with applicable SMACNA Architectural Sheet Metal Manual.

Form pieces in 10 foot maximum lengths. Make allowance for expansion at joints. Use maximum length sections possible to minimize joints.

Hem exposed edges on underside 1/2 inch. Miter and seal corners with sealant. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.

Fasteners:

Use hex-head stainless steel screws
#8 x 1 inch (minimum) long stainless steel suitable for metal flashing application.
Series 300 or 400 stainless.

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ENVIRONMENTAL COMMITMENTS

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ENVIRONMENTAL COMMITMENTS (EC): The North Dakota Department of Transportation, City of Williston and the Federal Highway Administration have made environmental commitments to secure approval of this project. The environmental commitments are as follows:

Wetland Impact Table							
Wetland Number		Wetland Type	Wetland Size (acres)	Wetland Feature	USACE Jurisdictional Wetlands	Impacts to Wetlands	
						Temp.	Perm.
NO WETLANDS PRESENT							
TOTALS:			0.00			0.00	0.00

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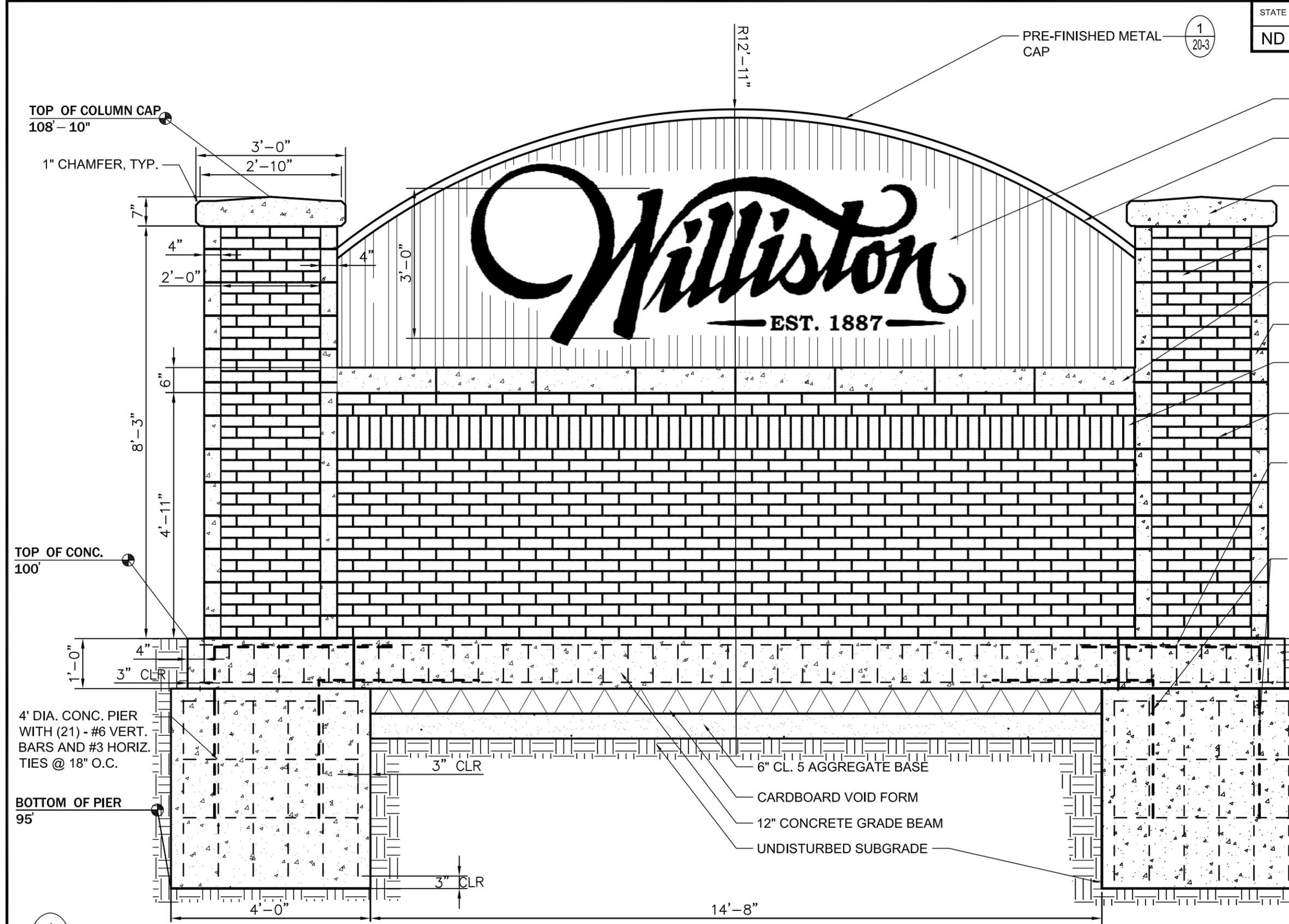
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ESTIMATE OF QUANTITIES

SPEC	CODE	ITEM DESCRIPTION	UNIT	TOTAL
103	0100	CONTRACT BOND	L SUM	1
251	0200	SEEDING CLASS II	ACRE	0.1
702	0100	MOBILIZATION	L SUM	1
704	0100	FLAGGING	MHR	80
704	1000	TRAFFIC CONTROL SIGNS	UNIT	1144
704	1060	DELINEATOR DRUMS	EA	44
704	1067	TUBULAR MARKERS	EA	22
704	1087	SEQUENCING ARROW PANEL – TYPE C	EA	2
770	0001	LIGHTING SYSTEM	EA	2
990	1934	STONE SIGN	EA	2

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- PRE-FINISHED METAL CAP (1/20-3)
- CUT METAL SIGN PANEL (2/20-3)
- STEEL SIGN ASSEMBLY & CAP (1/20-3)
- PRECAST CONCRETE CAP (2/20-2)
- SIGN COLUMN (1/20-2)
- PRECAST WALL CAP (1/20-3)
- PRECAST CONCRETE TRIM PIECES (3/20-2)
- BRICK SOLDIER COURSE, SEE PLAN NOTES FOR COLOR
- STANDARD BRICK VENEER, RUNNING BOND, SEE PLAN NOTES FOR COLOR
- 12" DEEP X 24" WIDE (40" WIDE @ COLS) GRADE BEAM REINFORCED WITH (4) - #6 HORZ. BARS TOP AND BOTTOM AND #4 TIES @ 6" O.C.
- (2) #5 HOOK BARS, 3'-0" X 3'-0. (TOP & BOT.)

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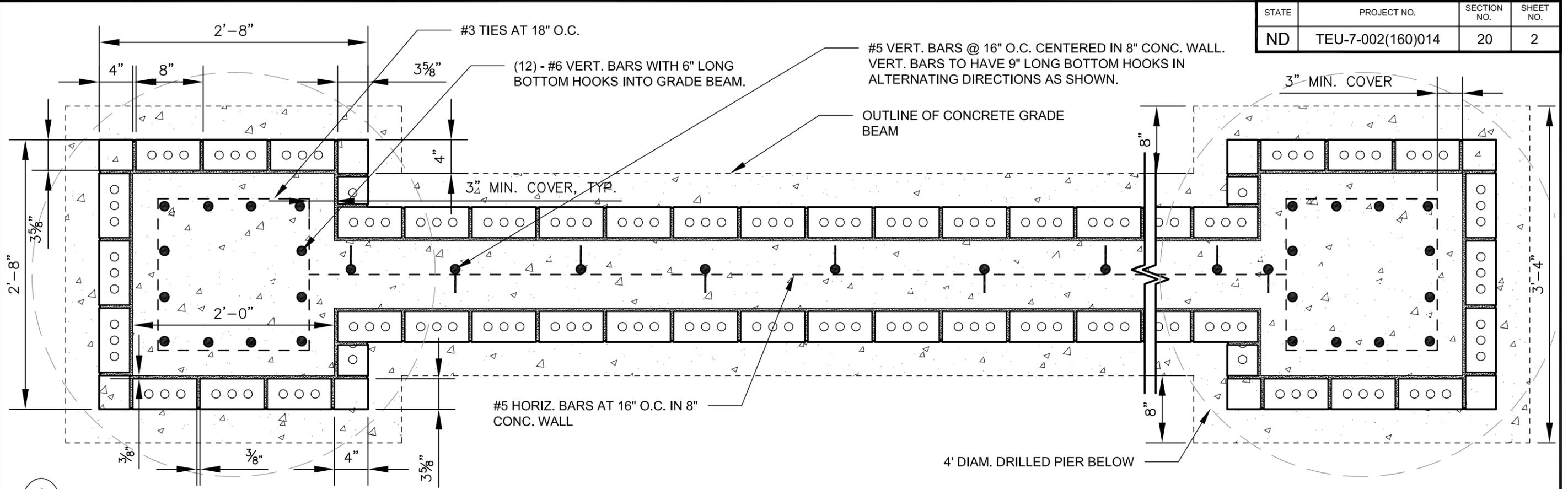
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CITY OF WILLISTON
WILLISTON, NORTH DAKOTA

DETAILS

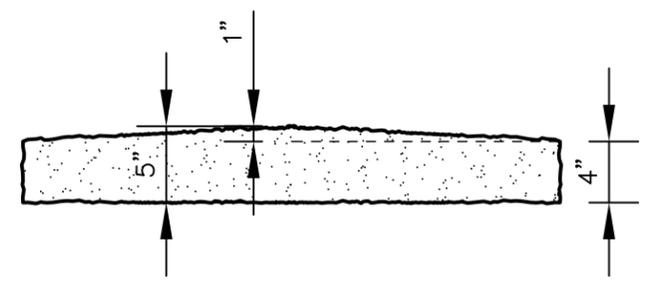
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1
20-1
WELCOME SIGN, ELEVATION DETAIL
1/2" = 1'-0"

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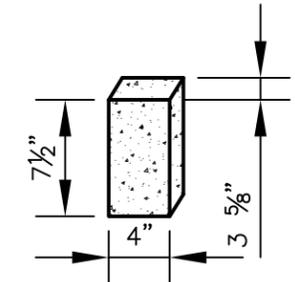
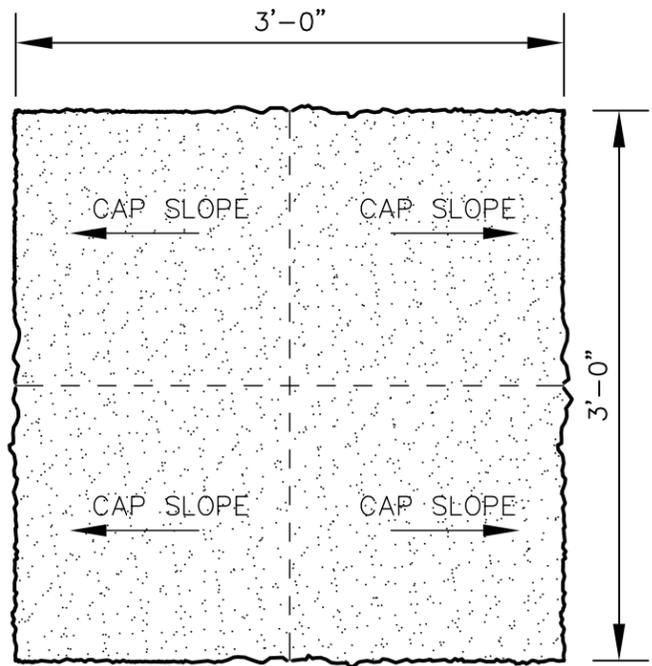


1
20-2
MONUMENT SIGN, SECTION DETAIL
1" = 1'-0"



NOTE: ANY LIFTING INSERTS OR POCKETS SHALL BE PATCHED & GROUTED FULL TO MATCH PRECAST CONCRETE AND PROVIDE A WEATHERPROOF SEAL.

2
20-2
PRECAST CONCRETE CAP, SECTION DETAIL
1" = 1'-0"



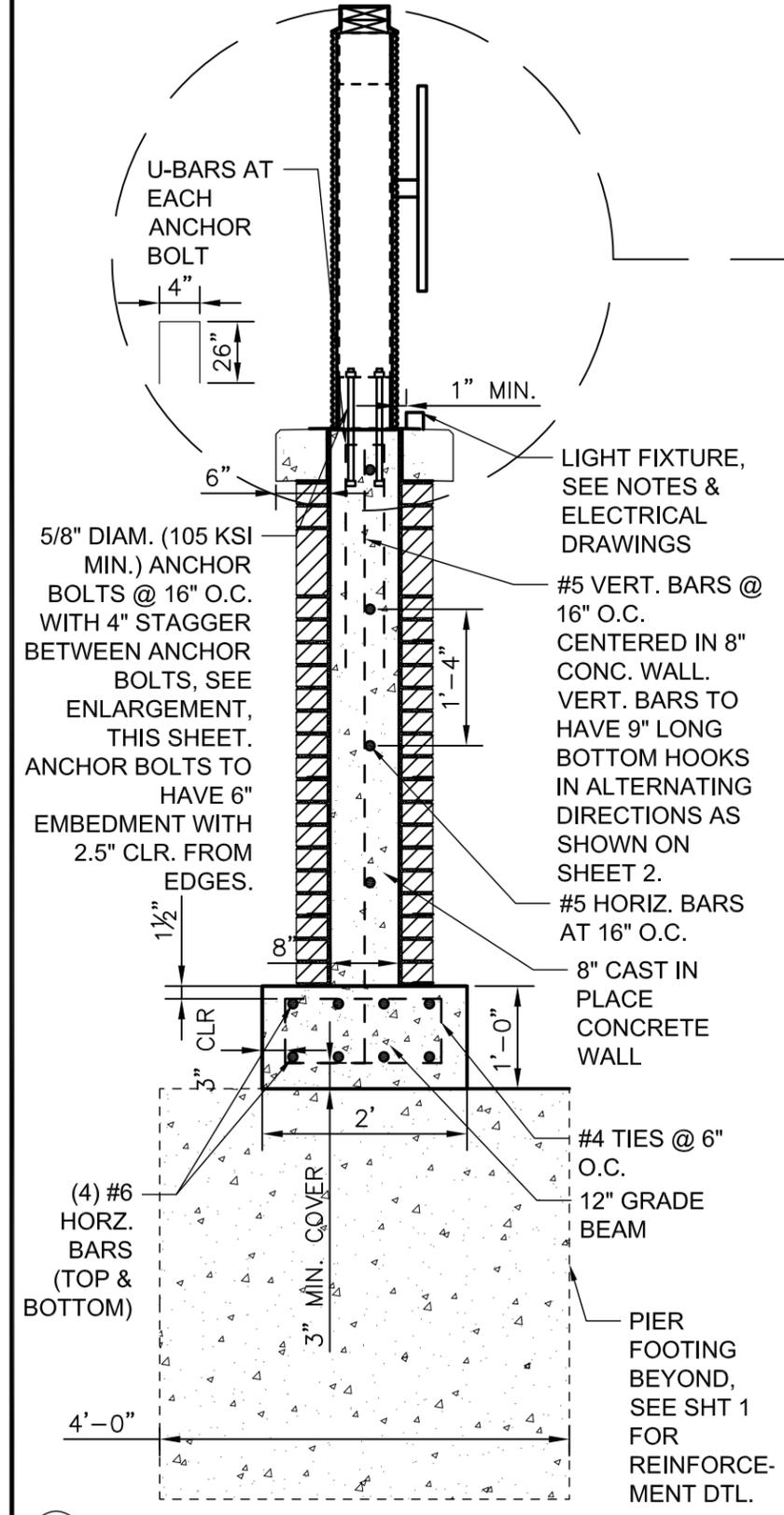
3
20-2
PRECAST CONCRETE TRIM PIECE DETAIL
1" = 1'-0"

NOTE: TRIM PIECE IS ROTATED 90°, DEPENDING ON CORNER PLACEMENT.

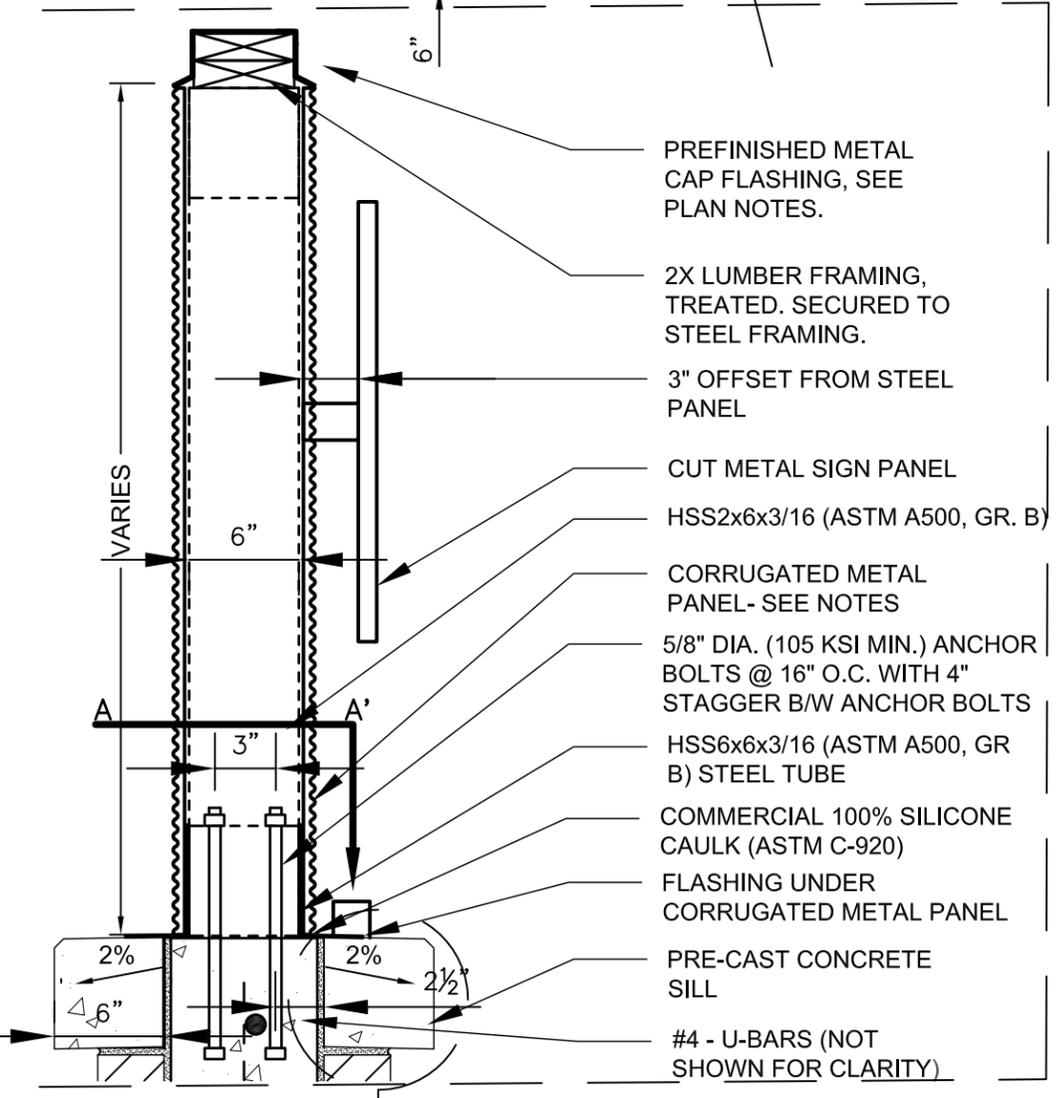
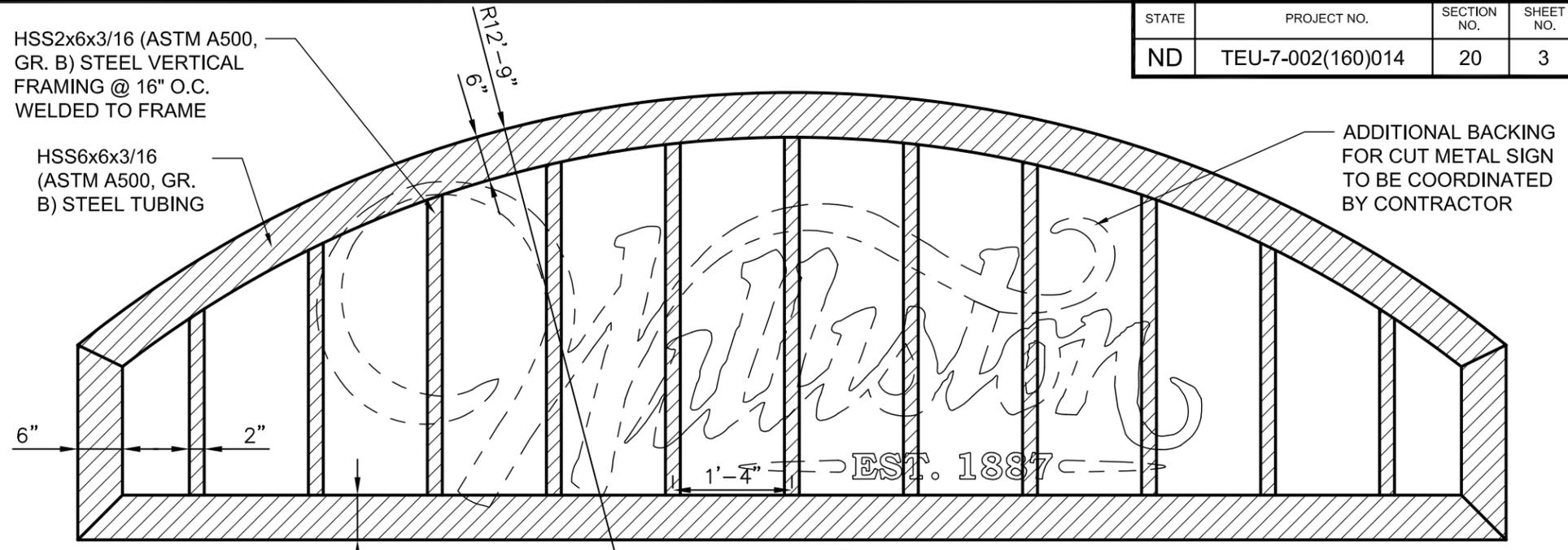
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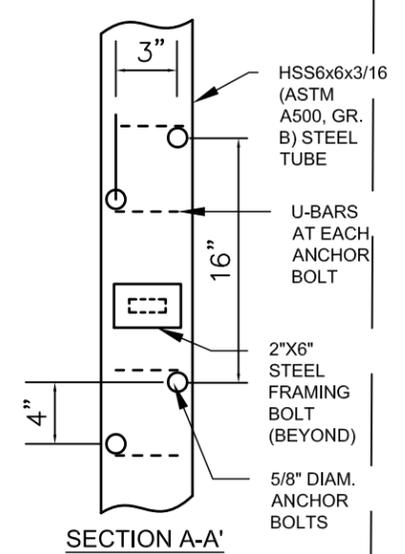
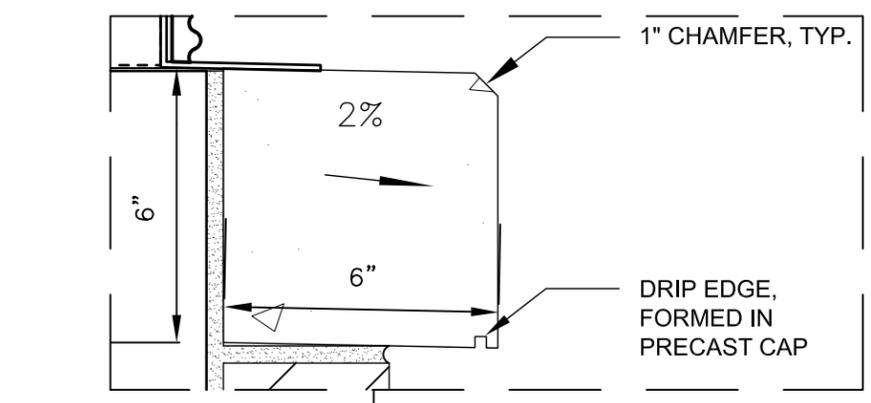
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1 ENTRY SIGN, SECTION DETAIL
20-3



2 6" STEEL FRAME DETAIL
20-3
1" = 1'-0"



SECTION A-A'

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NOTES:

1. UTILITIES SHALL BE LOCATED AND VERIFIED IN THE FIELD PRIOR AND DURING CONSTRUCTION.
2. LIGHTS SHALL BE CONTROLLED BY A PHOTOEYE CIRCUIT CONTROLLED BY AN H-O-A SWITCH MOUNTED IN AN ENCLOSURE. PHOTOEYE SHALL BE MOUNTED TO THE OUTSIDE OF THE ENCLOSURE.
3. SEE DETAIL FOR LIGHT MOUNTING AND CONDUIT ROUTING.
4. EXPOSED CONDUIT ON FRONT SIDE OF THE SIGN SHALL BE PAINTED TO MATCH THE SIGN SURFACE.
5. EXACT LOCATION OF CONDUIT, POWER SUPPLIES AND BOXES SHALL BE DETERMINED IN THE FIELD. CARE SHALL BE TAKEN TO KEEP EQUIPMENT OUT OF PLAIN VIEW.
6. PANELBOARD SHALL BE SURFACE MOUNTED ON BACK SIDE OF SIGN.
7. PROVIDE EXTERNAL MOUNTED WEATHERPROOF GFCI RECEPTACLE MOUNTED ON BACK SIDE OF SIGN. EXACT LOCATION TO BE DETERMINED IN THE FIELD.
8. CONDUCTORS FOR LIGHTING CIRCUIT SHALL BE (2) - #12 AWG Cu RHW AND #12 AWG Cu THW GND IN 3/4" RGS CONDUIT.
9. PROVIDE LIGHTS AS SHOWN IN THE DETAIL AND PLAN NOTES.

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-7-002(160)014	20	4

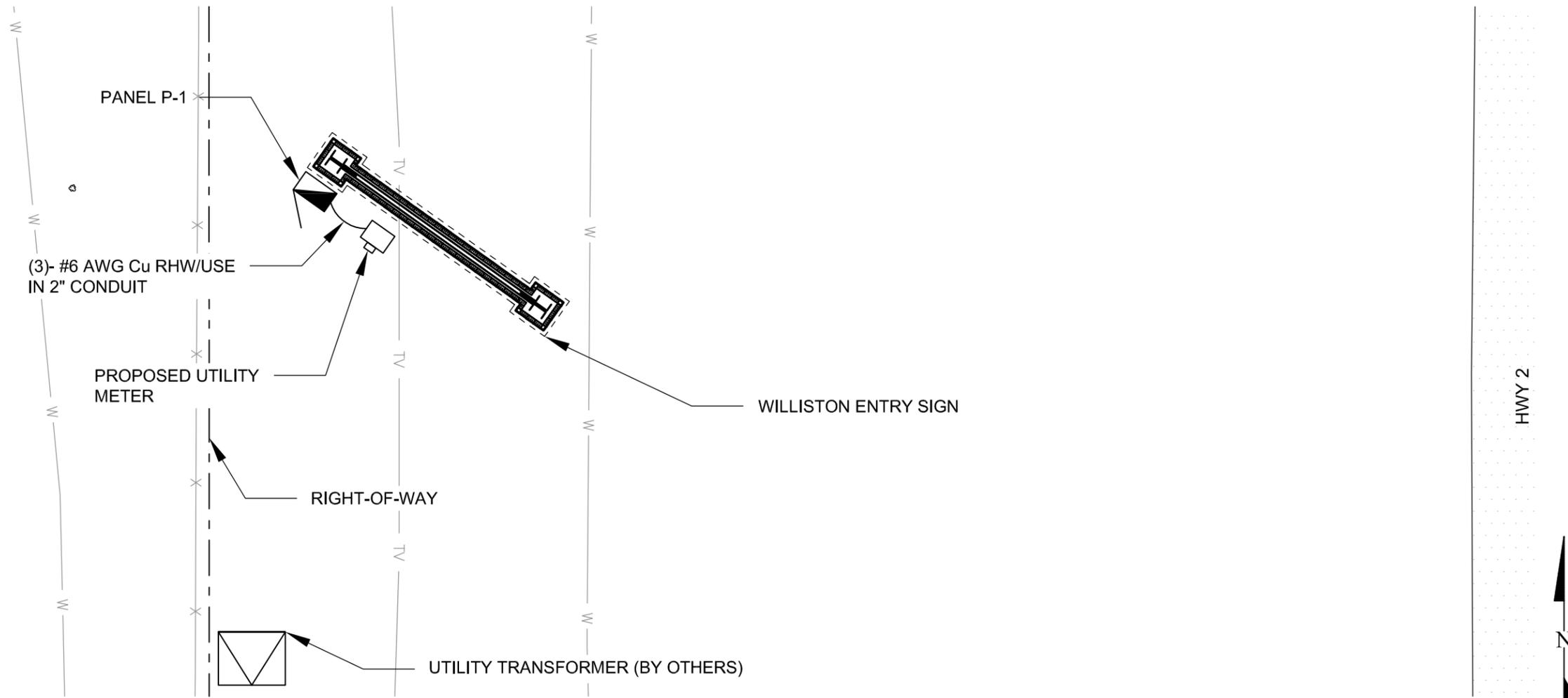
CKT	DESCRIPTION	BRK	V-A	AMPS	Φ	AMPS	V-A	BRK	DESCRIPTION	CKT
1	Lighting	20	90	0.8	A	0.1	12	20	Lighting Control Circuit	2
3	GFCI Receptacle	20	600	5.0	B			20	Spare	4
5	(Space)				A				(Space)	6
7	(Space)				B				(Space)	8

PANEL P1

60 Amp Main Breaker (not backfed), 120/240 Volt, 1Ø, fed from metersocket. **All breakers 10 kAIC minimum.
 NEMA 3R enclosure. 8 space minimum Panelboard. Fed from utility metersocket. UL SUSE rated.
 (3) - #6 AWG Cu RHW/USE service conductors in conduit from metersocket to Panelboard.
 Provide Typed Identifications according to NEC 408.
 Provide bonding according NEC.

Total Connected VA and Amps		702	0.9
			5.0

**Shown is the minimum AIC rating required. Contractor shall verify the exact fault current with the utility and provide equipment with larger fault current rating as required per NEC.



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1
20-4
ELECTRICAL PLAN, NORTH LOCATION



Revision	Date	Description

WILLISTON WELCOME SIGNS
CITY OF WILLISTON
WILLISTON, NORTH DAKOTA

ELECTRICAL DETAILS

DRWN. BY JM	CHKD BY BG	PROJECT NO. 1415125	DATE 03/28/2016
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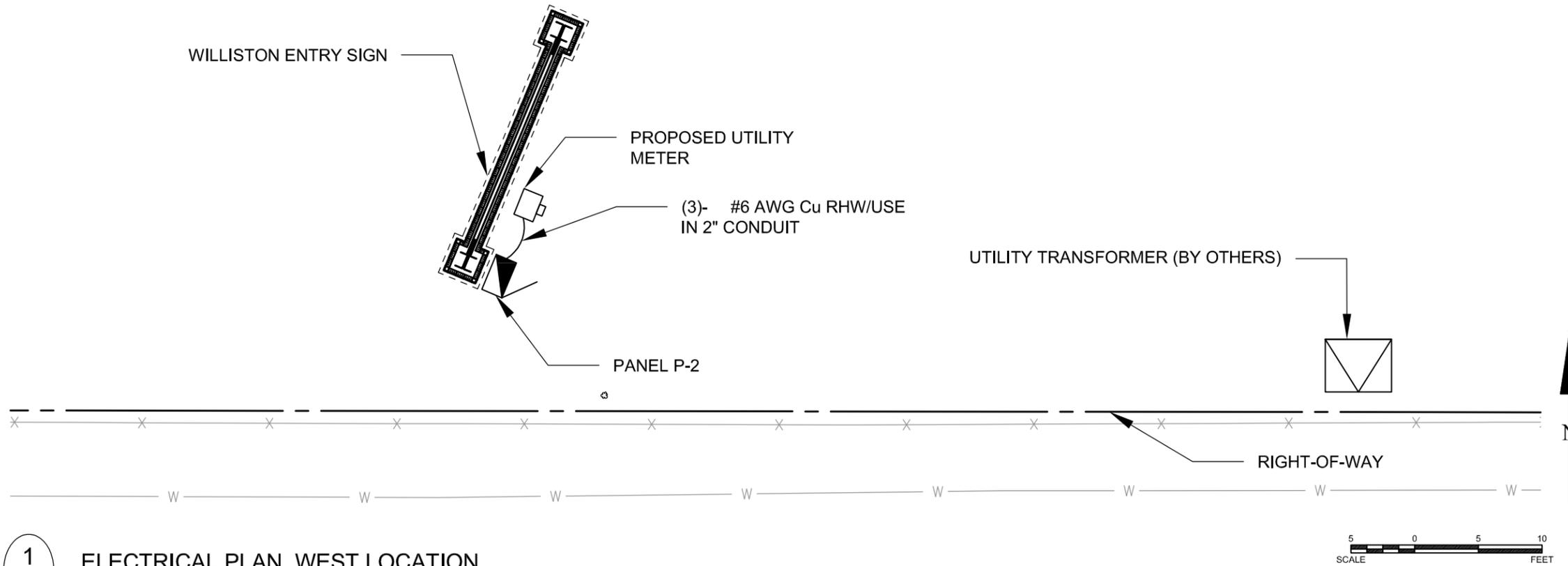
NOTES:

1. UTILITIES SHALL BE LOCATED AND VERIFIED IN THE FIELD PRIOR AND DURING CONSTRUCTION.
2. LIGHTS SHALL BE CONTROLLED BY A PHOTOEYE CIRCUIT CONTROLLED BY AN H-O-A SWITCH MOUNTED IN AN ENCLOSURE. PHOTOEYE SHALL BE MOUNTED TO THE OUTSIDE OF THE ENCLOSURE.
3. SEE DETAIL FOR LIGHT MOUNTING AND CONDUIT ROUTING.
4. EXPOSED CONDUIT ON FRONT SIDE OF THE SIGN SHALL BE PAINTED TO MATCH THE SIGN SURFACE.
5. EXACT LOCATION OF CONDUIT, POWER SUPPLIES AND BOXES SHALL BE DETERMINED IN THE FIELD. CARE SHALL BE TAKEN TO KEEP EQUIPMENT OUT OF PLAIN VIEW.
6. PANELBOARD SHALL BE SURFACE MOUNTED ON BACK SIDE OF SIGN.
7. PROVIDE EXTERNAL MOUNTED WEATHERPROOF GFCI RECEPTACLE MOUNTED ON BACK SIDE OF SIGN. EXACT LOCATION TO BE DETERMINED IN THE FIELD.
8. CONDUCTORS FOR LIGHTING CIRCUIT SHALL BE (2) - #12 AWG Cu RHW AND #12 AWG Cu THW GND IN 3/4" RGS CONDUIT.
9. PROVIDE LIGHTS AS SHOWN IN THE DETAIL AND PLAN NOTES.

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-7-002(160)014	20	5

PANEL P2										
60 Amp Main Breaker (not backfed), 120/240 Volt, 1Ø, fed from metersocket. **All breakers 10 kAIC minimum. NEMA 3R enclosure. 8 space minimum Panelboard. Fed from utility metersocket. UL SUSE rated. (3) - #6 AWG Cu RHW/USE service conductors in conduit from metersocket to Panelboard. Provide Typed Identifications according to NEC 408. Provide bonding according NEC.										
CKT	DESCRIPTION	BRK	V-A	AMPS	Φ	AMPS	V-A	BRK	DESCRIPTION	CKT
1	Lighting	20	90	0.8	A	0.1	12	20	Lighting Control Circuit	2
3	GFCI Receptacle	20	600	5.0	B			20	Spare	4
5	(Space)				A				(Space)	6
7	(Space)				B				(Space)	8
Total Connected VA and Amps			702	0.9						
				5.0						

**Shown is the minimum AIC rating required. Contractor shall verify the exact fault current with the utility and provide equipment with larger fault current rating as required per NEC.

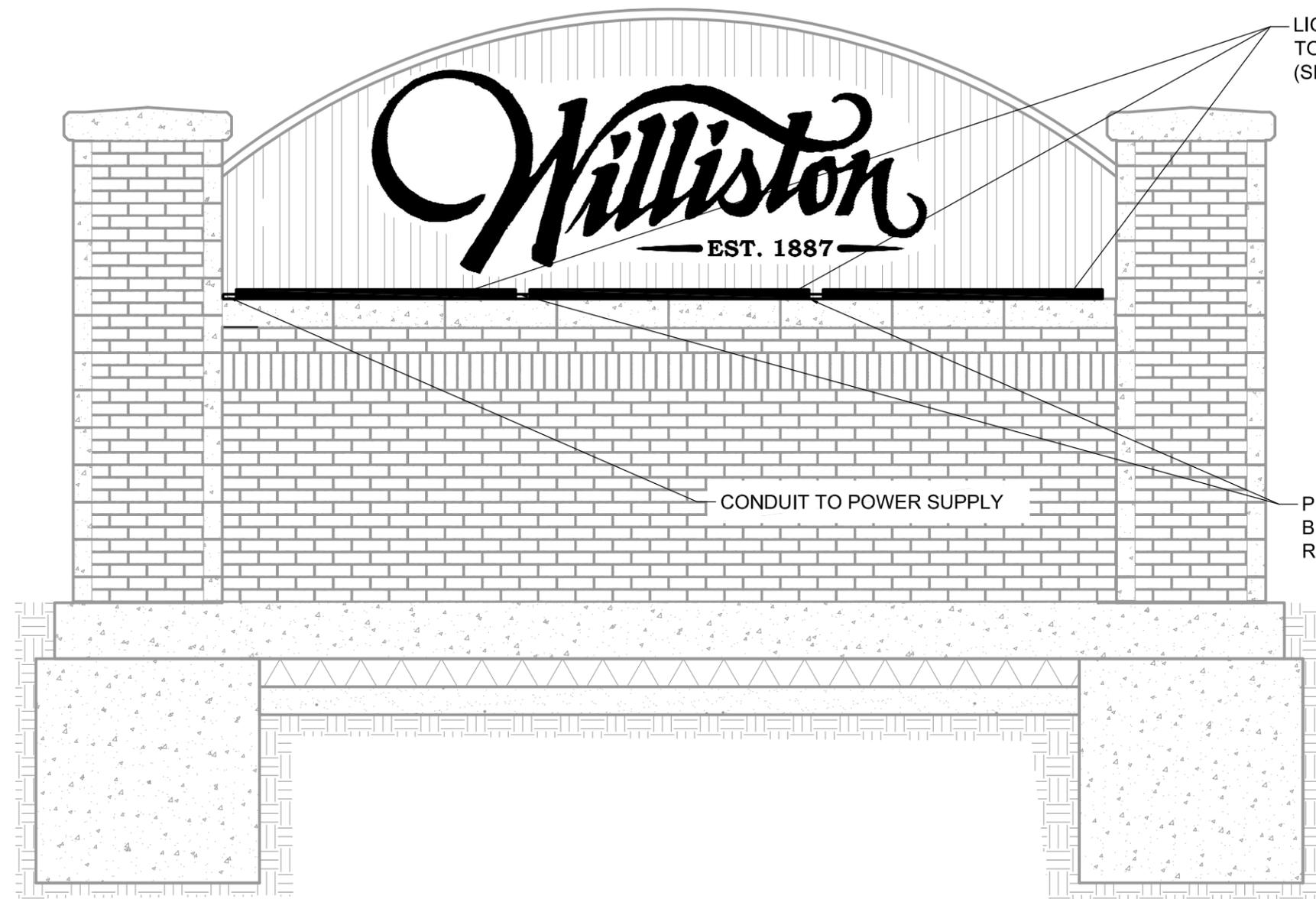


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1
20-5 ELECTRICAL PLAN, WEST LOCATION

Revision	Date	Description
WILLISTON WELCOME SIGNS CITY OF WILLISTON WILLISTON, NORTH DAKOTA		
		ELECTRICAL DETAILS
DRWN. BY JM	CHKD BY BG	PROJECT NO. 1415125
		DATE 03/28/2016

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-7-002(160)014	20	6



LIGHT FIXTURES MOUNTED TO AGGREGATE CAP, TYP. (SEE PLAN NOTES)

NOTES:

1. CONTRACTOR SHALL COORDINATE ALL MOUNTING STRUCTURES AND CONDUIT ROUTING WITH OTHER TRADES. EXACT ROUTING SHALL BE APPROVED PRIOR TO CONSTRUCTION.
2. ANY CONDUIT PENETRATIONS THROUGH THE SIGN SHALL BE SEALED TO PREVENT MOISTURE FROM ENTERING THE INSIDE OF THE SIGN.

CONDUIT TO POWER SUPPLY

PROVIDE HUBS OR CONDUIT BETWEEN FIXTURES AS REQUIRED.

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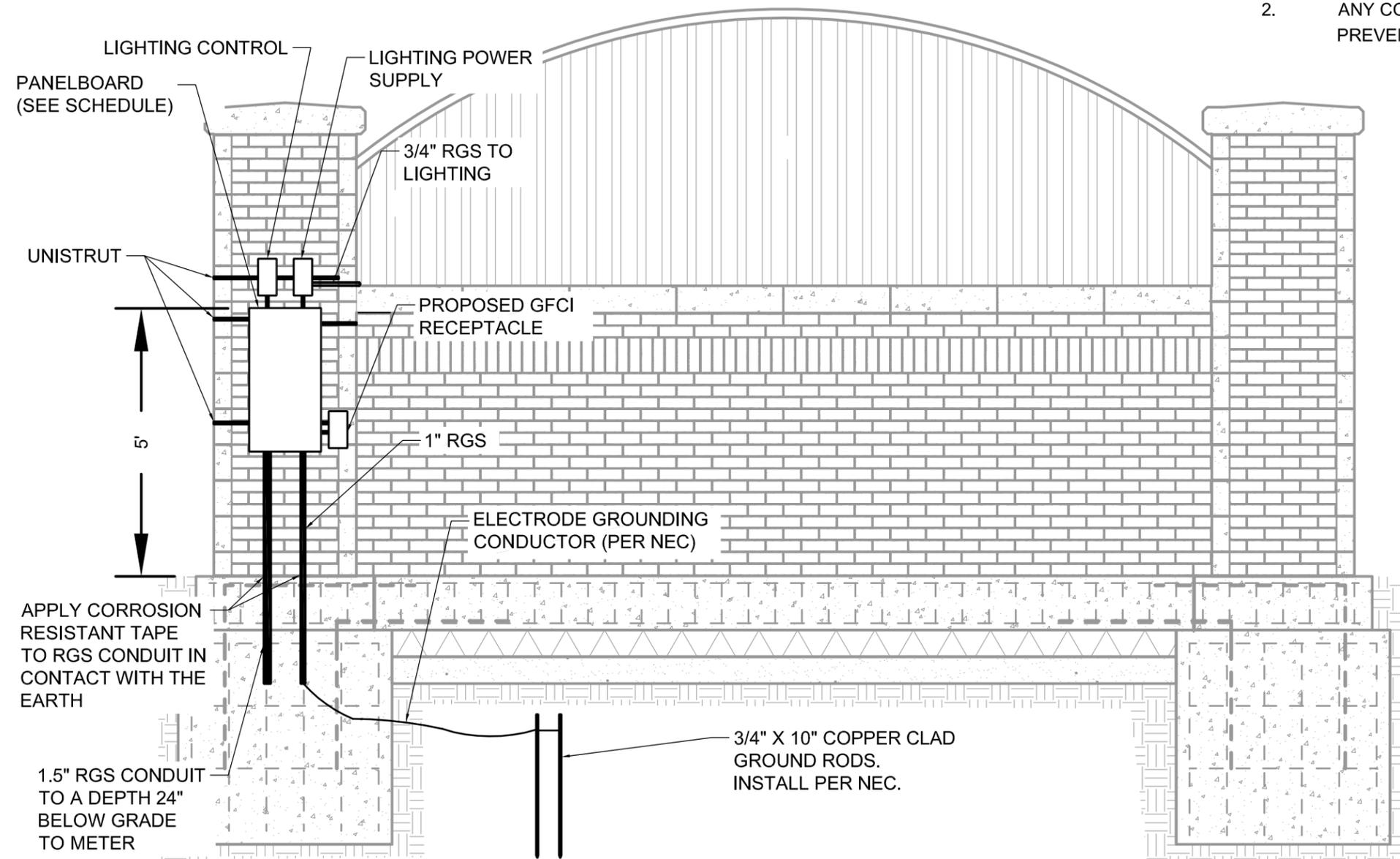
Revision	Date	Description
WILLISTON WELCOME SIGNS CITY OF WILLISTON WILLISTON, NORTH DAKOTA		
		ELECTRICAL DETAILS
DRWN. BY JM	CHKD BY BG	PROJECT NO. 1415125
		DATE 03/28/2016

1
20-6 ELECTRICAL PLAN, LIGHT FIXTURE INSTALLATION (NOT TO SCALE)

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-7-002(160)014	20	7

NOTES:

1. CONTRACTOR SHALL COORDINATE ALL MOUNTING STRUCTURES AND CONDUIT ROUTING WITH OTHER TRADES. EXACT ROUTING SHALL BE APPROVED PRIOR TO CONSTRUCTION.
2. ANY CONDUIT PENETRATIONS THROUGH THE SIGN SHALL BE SEALED TO PREVENT MOISTURE FROM ENTERING THE INSIDE OF THE SIGN.



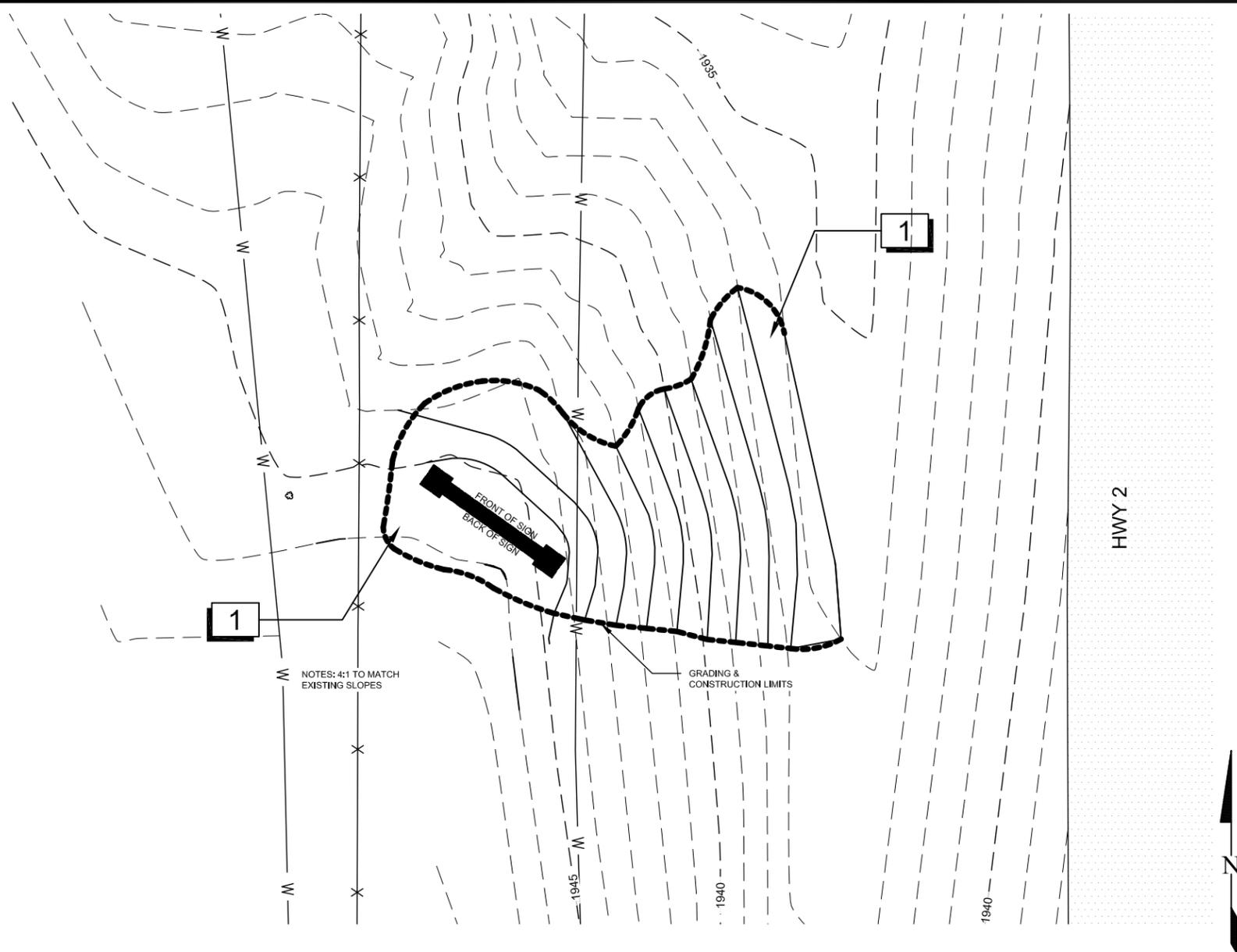
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Revision	Date	Description
WILLISTON WELCOME SIGNS CITY OF WILLISTON WILLISTON, NORTH DAKOTA		
		ELECTRICAL DETAILS
DRWN. BY	CHKD BY	PROJECT NO.
JM	BG	1415125
		DATE
		03/28/2016
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1
20-7 ELECTRICAL DETAIL, BACK SIDE OF SIGN

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-7-002(160)014	20	8

REFERENCE NOTES SCHEDULE	
SYM	DESCRIPTION
1	SEED DISTURBED AREAS WITH CL-II-EARLY SEASON MIX.



NOTES: 4:1 TO MATCH EXISTING SLOPES

GRADING & CONSTRUCTION LIMITS

HWY 2

ONE CALL BEFORE DIGGING
1-800-795-0555
CONTRACTOR TO LOCATE UTILITIES PRIOR TO PLANTING

1
20-8 WELCOME SIGN SITE PLAN, NORTH LOCATION

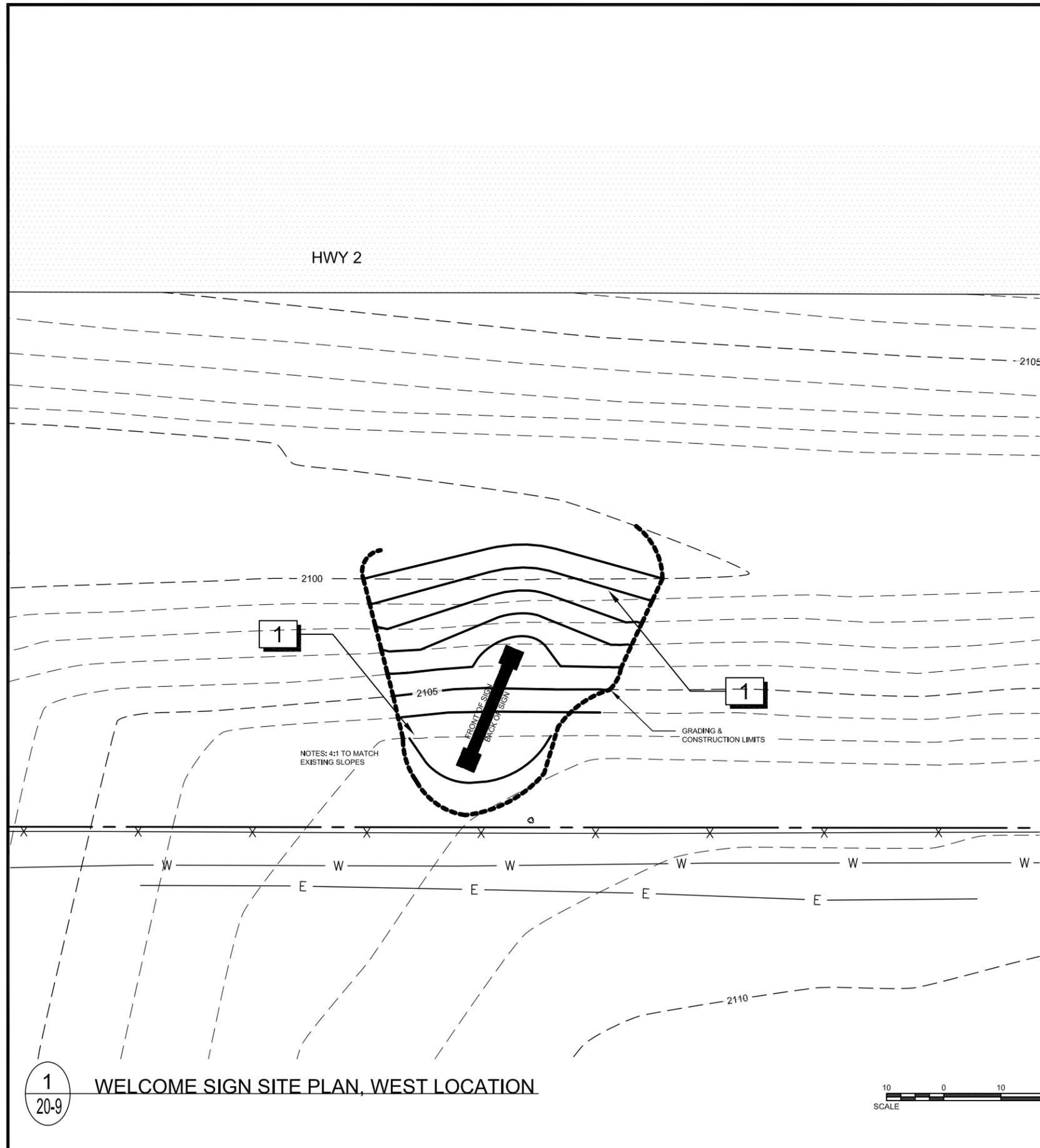


This document(s) was originally issued and sealed by Brett Gurholt, Registration Number 40 (Landscape Architect) on 3-28-16 and the original documents are stored at the North Dakota Department of Transportation.

Revision	Date	Description
WILLISTON WELCOME SIGNS CITY OF WILLISTON WILLISTON, NORTH DAKOTA		
		SITE PLAN NORTH LOCATION
DRWN. BY JM	CHKD BY BG	PROJECT NO. 1415125
		DATE 03/28/2016

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TEU-7-002(160)014	20	9

REFERENCE NOTES SCHEDULE	
SYM	DESCRIPTION
1	SEED DISTURBED AREAS WITH CL-II-EARLY SEASON MIX.



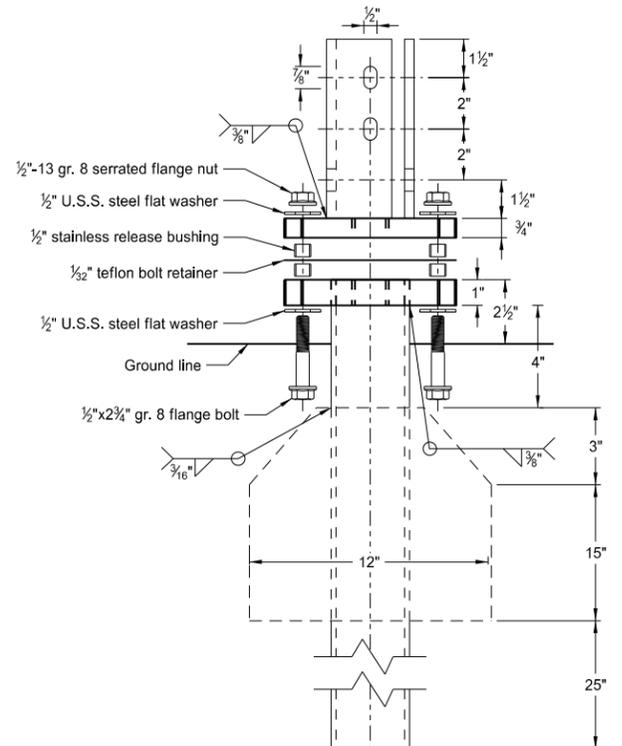
CONTRACTOR TO LOCATE UTILITIES PRIOR TO PLANTING

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Revision	Date	Description
WILLISTON WELCOME SIGNS CITY OF WILLISTON WILLISTON, NORTH DAKOTA		
		SITE PLAN WEST LOCATION
DRWN. BY	CHKD BY	PROJECT NO.
JM	BG	1415125
DATE	03/28/2016	

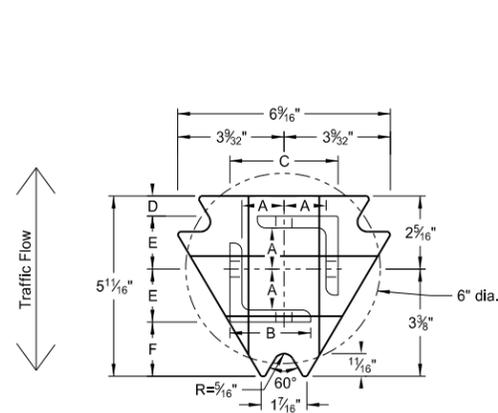
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1
20-9 WELCOME SIGN SITE PLAN, WEST LOCATION

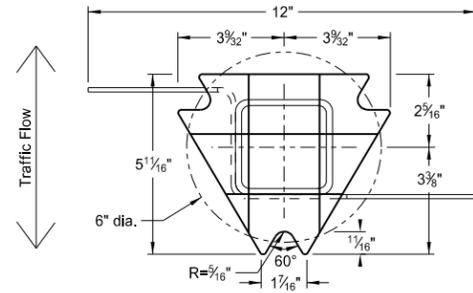


Multi-Directional Slip Base Assembly

Perforated Tube



Top Post Receiver
Plate - ASTM A572 grade 50
Angle Receiver - 2 1/2 x 2 1/2 x 3/8 ASTM A36 structural angle



Bottom Soil Stub
Tube - 3"x3"x7 gauge ASTM A500 grade B tube
Stabilizing Wing - 7 gauge H.R.P.O. ASTM A1011
Plate - ASTM A572 grade 50

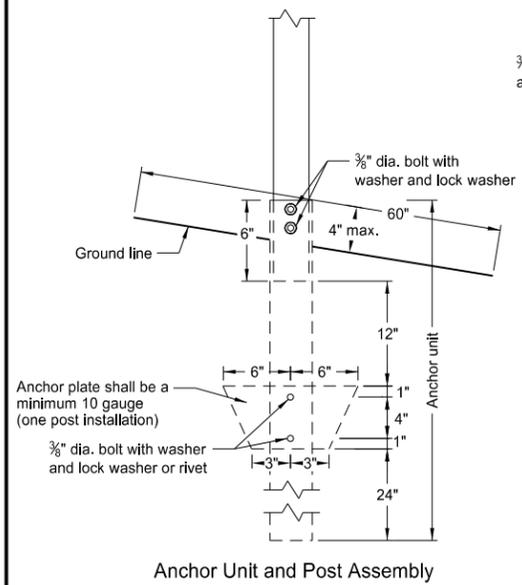
Notes:

1. Slip base bolts shall be torqued as specified by the manufacturer.
2. Anchor shall have a yield strength of 43.9 KSI and tensile strength of 59.3 KSI.
3. The 4" vertical clearance is required for the anchor or breakaway base. The 4"x60" measurement shall be made above and below post location and also back and ahead of the post.
4. When used in concrete sidewalk, anchor shall be same except without the wings.
5. Four post signs shall have over 7' between the first and the fourth posts.

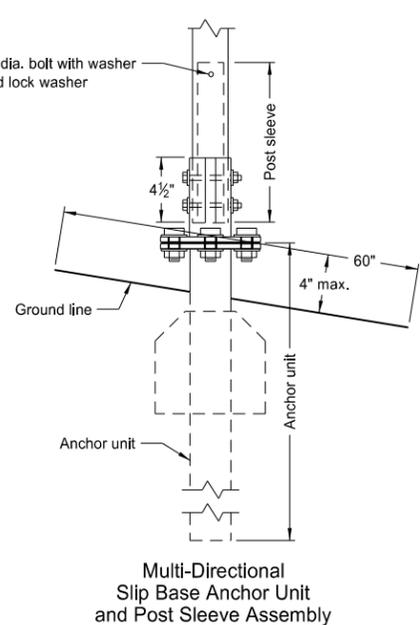
Telescoping Perforated Tube						
Number of Posts	Post Size in.	Wall Thickness Gauge	Sleeve Size in.	Wall Thickness Gauge	Slip Base	Anchor Size without Slip Base in.
1	2	12			No	2 1/4
1	2 1/4	12			No	2 1/2
1	2 1/2	12			(A)	3
1	2 1/2	10			Yes	
1	2 1/4	12	2	12	Yes	
1	2 1/2	12	2 1/4	12	Yes	
2	2	12			No	2 1/4
2	2 1/4	12			No	2 1/2
2	2 1/2	12			Yes	
2	2 1/2	12			Yes	
2	2 1/4	10	2	12	Yes	
2	2 1/2	12	2 1/4	12	Yes	
3 & 4	2 1/2	12			Yes	
3 & 4	2 1/2	10			Yes	
3 & 4	2 1/2	12	2 1/4	12	Yes	
3 & 4	2 1/4	12	2	12	Yes	
3 & 4	2 1/2	10	2 3/16	10	Yes	

Properties of Telescoping Perforated Tube						
Tube Size in.	Wall Thickness in.	U.S. Standard Gauge	Weight per Foot lbs.	Moment of Inertia in. ⁴	Cross Sec. Area in. ²	Section Modulus in. ³
1 1/2 x 1 1/2	0.105	12	1.702	0.129	0.380	0.172
2 x 2	0.105	12	2.416	0.372	0.590	0.372
2 1/4 x 2 1/4	0.105	12	2.773	0.561	0.695	0.499
2 3/16 x 2 3/16	0.135	10	3.432	0.605	0.841	0.590
2 1/2 x 2 1/2	0.105	12	3.141	0.804	0.803	0.643
2 1/2 x 2 1/2	0.135	10	4.006	0.979	1.010	0.785

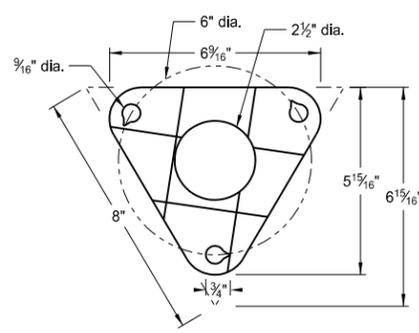
Top Post Receiver Data Table						
Square Post Sizes (B)	A	B	C	D	E	F
2 3/16"x10 ga.	1 9/64"	2 1/2"	3 1/32"	2 5/32"	1 33/64"	1 1/8"
2 1/2"x10 ga.	1 9/32"	2 1/2"	3 5/16"	5/8"	1 21/32"	1 3/4"



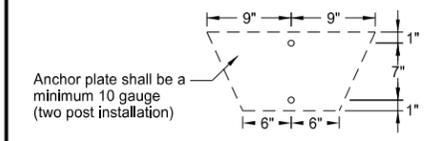
Anchor Unit and Post Assembly



Multi-Directional Slip Base Anchor Unit and Post Sleeve Assembly



Bolt Retainer for Base Connection
Bolt Retainer - 1/32" Reprocessed Teflon

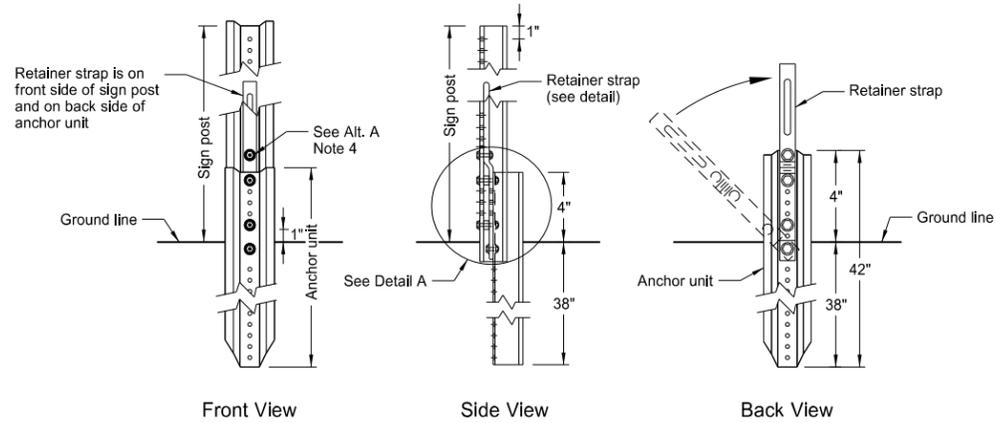
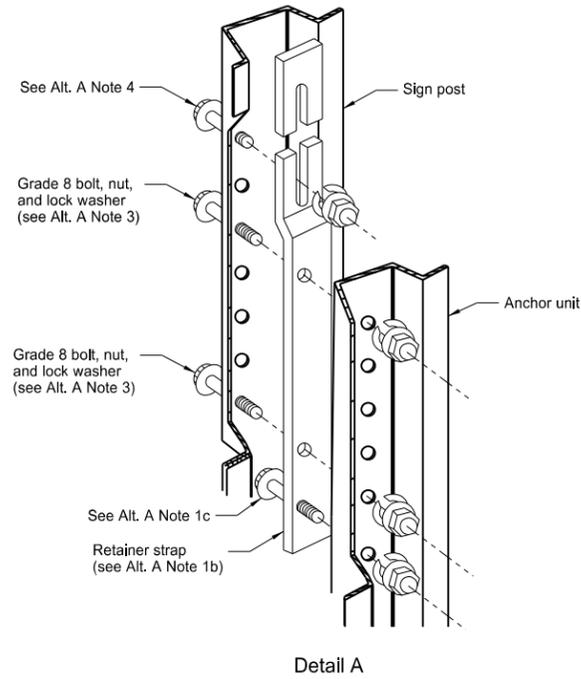


Anchor plate shall be a minimum 10 gauge (two post installation)

- (A) The breakaway base is required when the support is placed in weak soils. The Engineer shall determine if the soils are weak.
 (B) The 2 3/16"x10 ga. may be inserted into 2 1/2"x10 ga. for additional wind load.

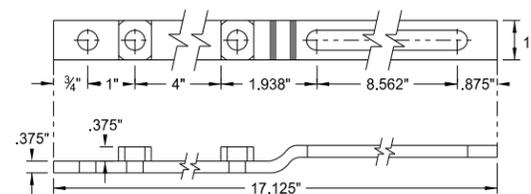
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION		This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 2/28/14 and the original document is stored at the North Dakota Department of Transportation
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U-Channel Post

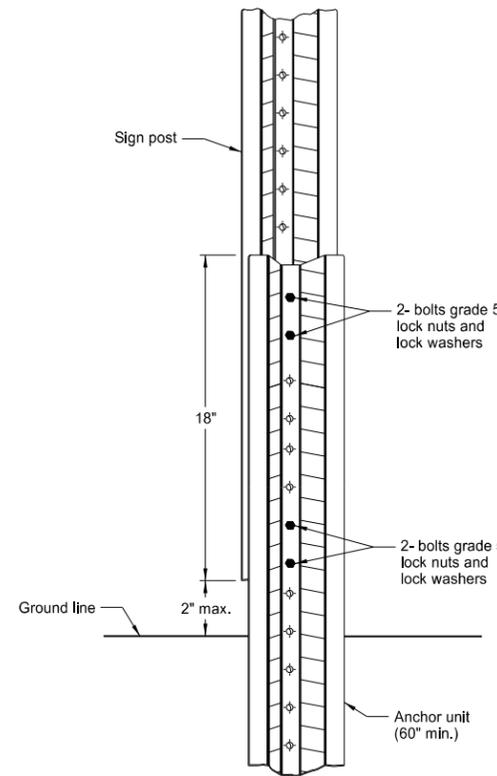


Breakaway U-Channel Detail Alternate A

A maximum of 2 posts shall be installed within 7'.

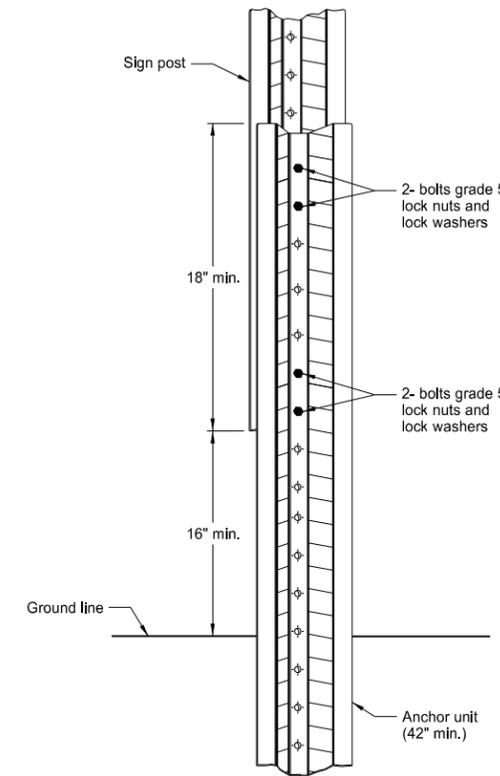


Retainer Strap Detail



Breakaway U-Channel Splice Detail Alternate B (2.5 and 3 lb/ft)

A maximum of 3 posts shall be installed within 7'.



Breakaway U-Channel Splice Detail Alternate C (2.5 and 3 lb/ft)

A maximum of 3 posts shall be installed within 7'.

Alternate A Steps of Installation:

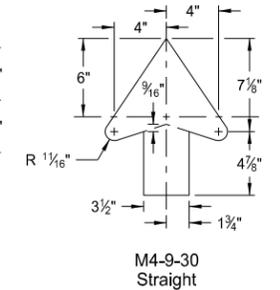
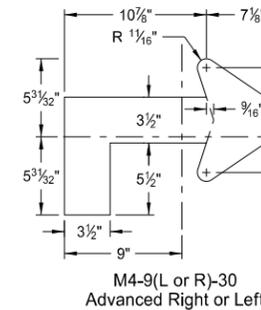
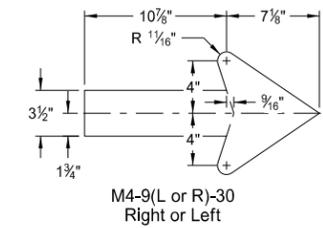
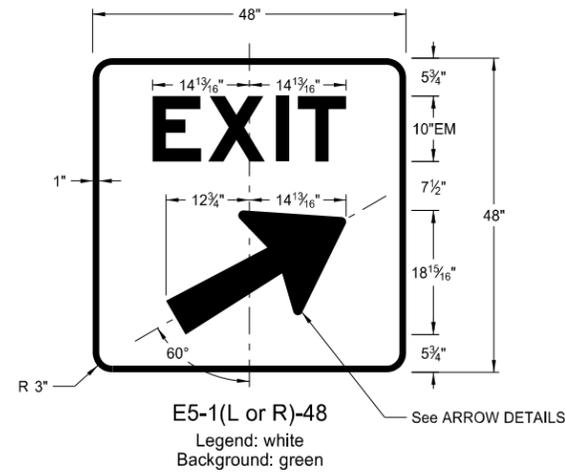
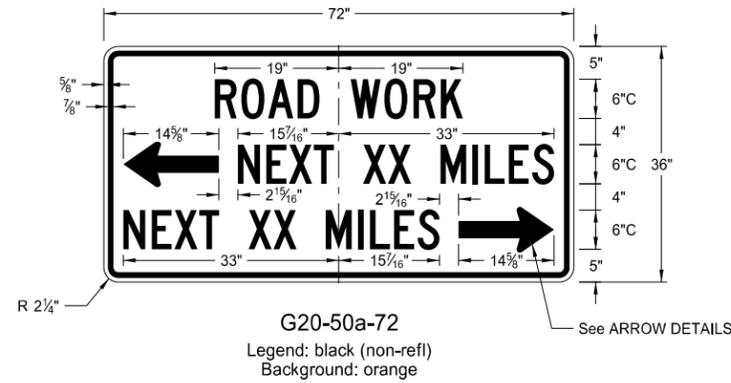
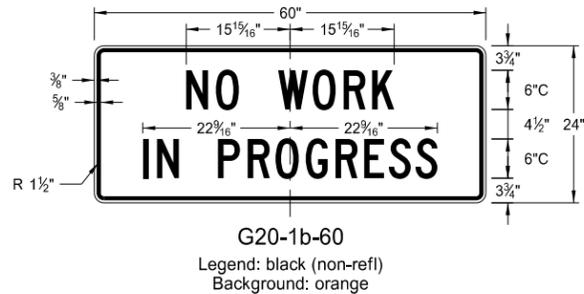
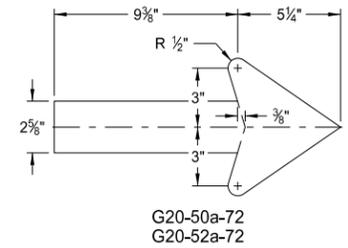
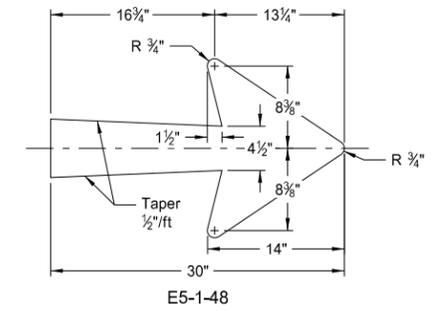
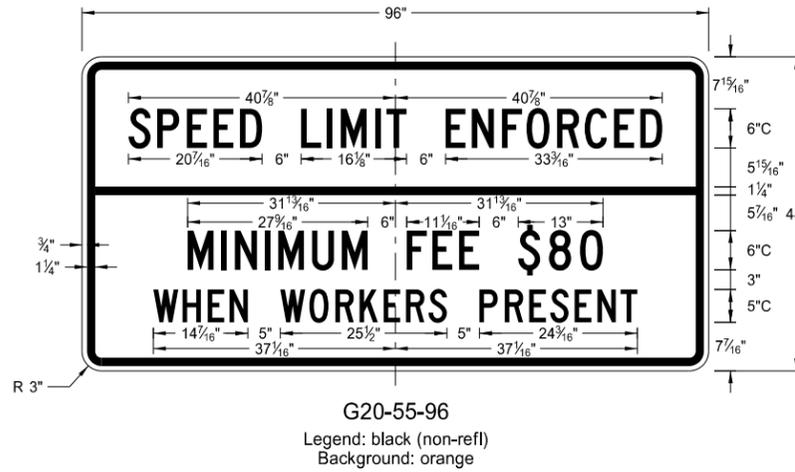
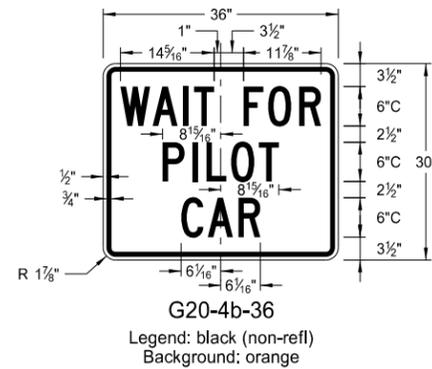
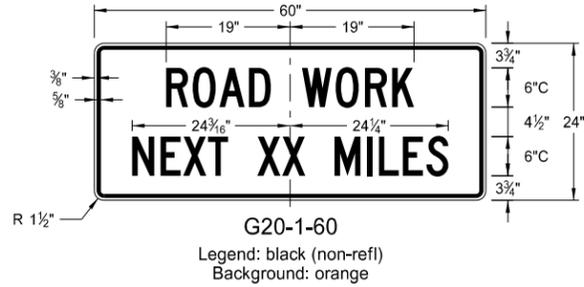
1. a) Drive anchor unit to within 12" of ground level.
b) Proper assembly established by lining up the bottom hole of retainer strap with the 6th hole from the top of the anchor unit.
c) Assemble strap to back of anchor unit using 5/16"x2" bolt, lock washer and nut.
d) Rotate strap 90° to left.
2. a) Drive anchor unit to 4" above ground.
b) Rotate strap to vertical position.
3. a) Place 5/16"x2" bolt, lock washer and nut in bottom of sign post to facilitate alignment of sign post with proper hole in anchor unit.
b) Alternately tighten two connector bolts.
4. Complete assembly by tightening 5/16"x2" bolt (this fastens sign post to retainer strap).
5. The base post, strap and sign post shall be properly nested. Proper nesting occurs when all flat surfaces of the base post, strap, and sign post at the bolts have full contact across the entire width.

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2-28-14	
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DATE	CHANGE

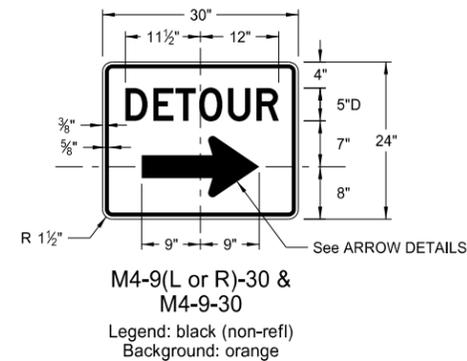
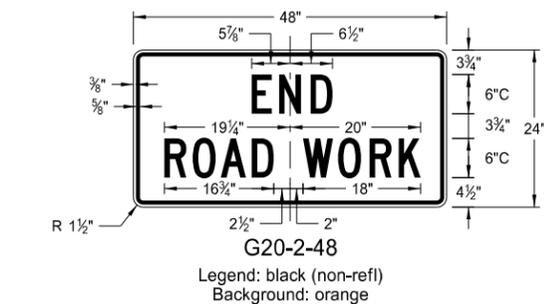
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CONSTRUCTION SIGN DETAILS
 TERMINAL AND GUIDE SIGNS

D-704-9



ARROW DETAILS



NOTES:

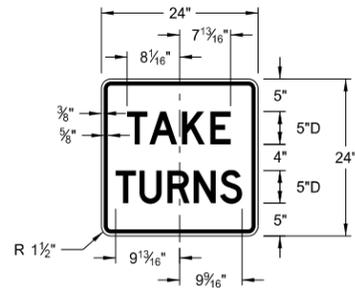
(A) Arrow may be right or left of the legend to indicate construction to the right or left.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE

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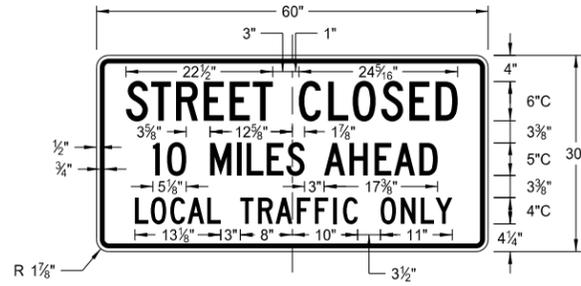
CONSTRUCTION SIGN DETAILS
REGULATORY SIGNS

D-704-10



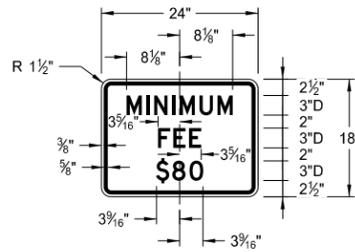
R1-50-24

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Background: white



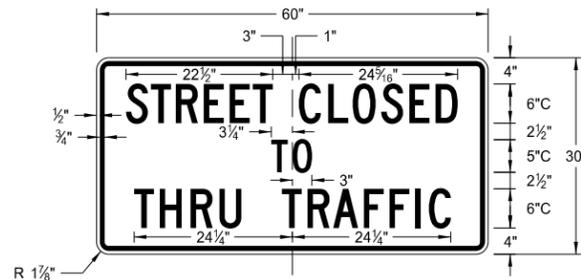
R11-3c-60

Legend: black (non-refl)
Background: white



R2-1a-24

Legend: black (non-refl)
Background: white



R11-4a-60

Legend: black (non-refl)
Background: white



R11-2a-48

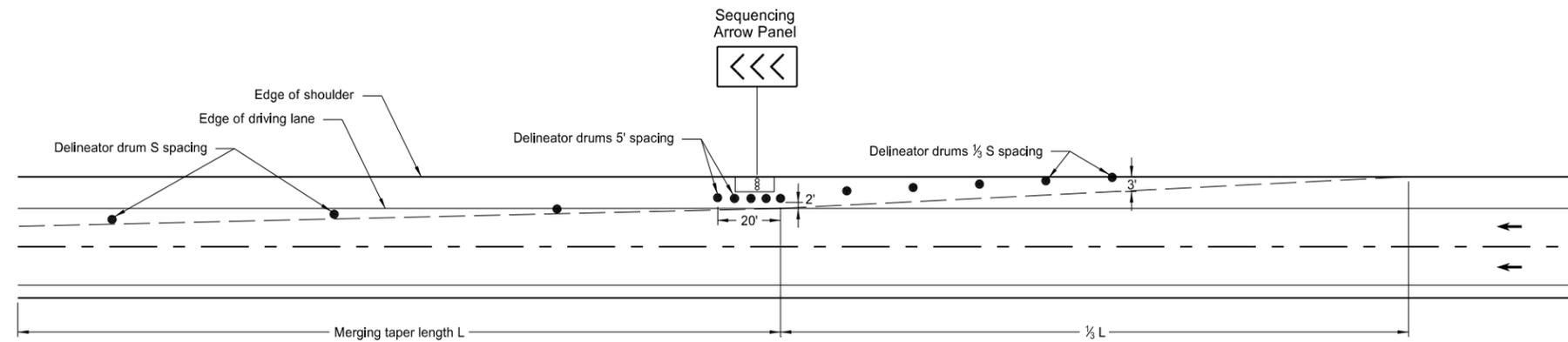
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NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE

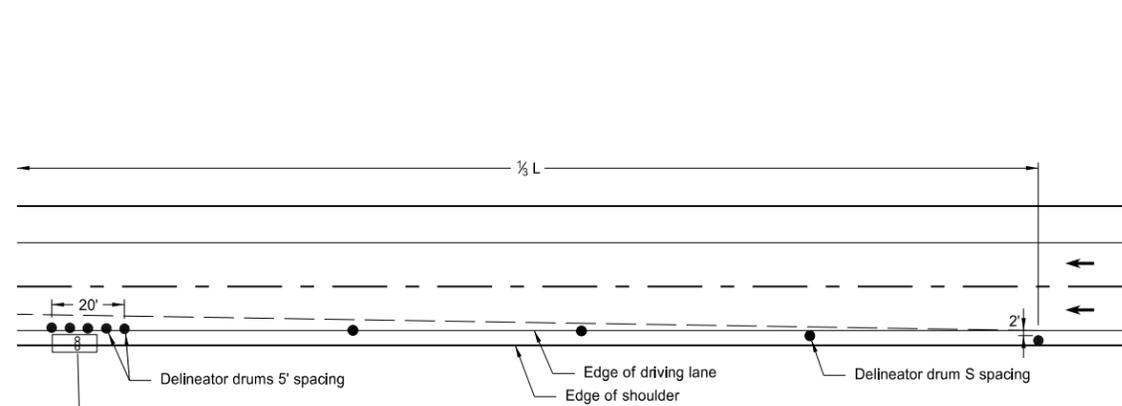
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SHOULDER CLOSURE TAPERS

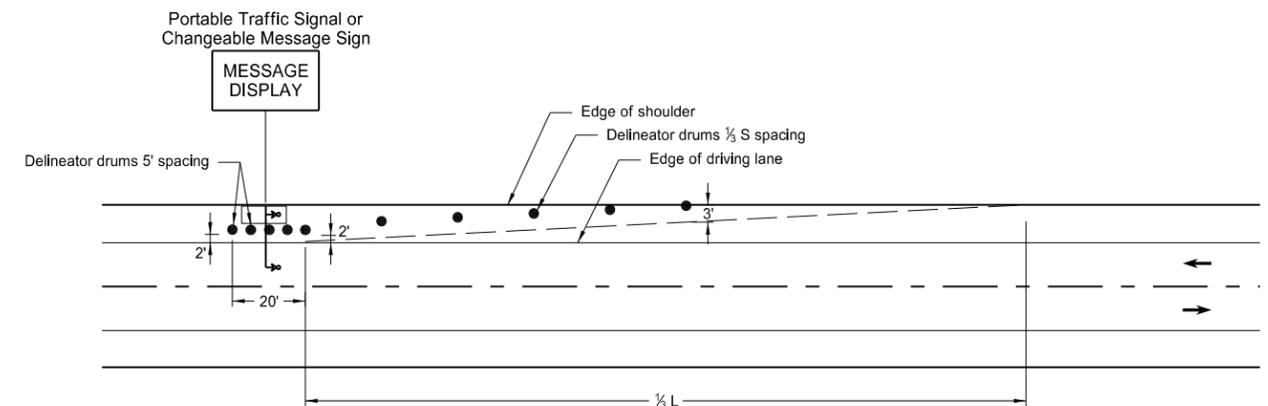
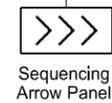
D-704-12



SHOULDER CLOSURE WITH LANE CLOSURE
(when shoulder is 8' or wider)



SHOULDER CLOSURE USED WITH LANE CLOSURE
(when shoulder is less than 8' wide)



PORTABLE TRAFFIC SIGNAL OR CHANGEABLE MESSAGE SIGN ON SHOULDER

KEY	
● Delineator Drum	∞ Sequencing Arrow Panel
• Message Display	↳ Portable Traffic Signal

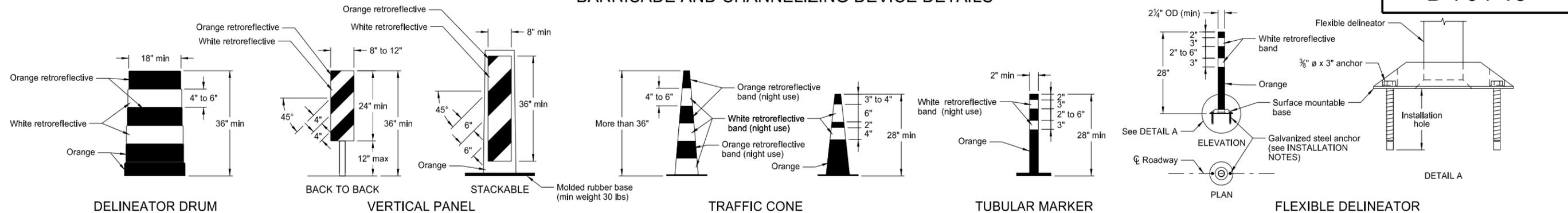
Notes:

- S = Posted Speed Limit in mph
W = Width of offset in feet
L = Taper length in feet
L = WS²/60 (40mph or less)
L = WS (45mph or more)
- If a shoulder taper is used, it should have a length of approximately 1/3L. If a shoulder is used as a travel lane, a normal merging or shifting taper should be used.
- When paved shoulders of 8 foot width or more are closed, channelizing devices shall be used to close the shoulder in advance to delineate the beginning of the work space and direct vehicular traffic to remain within the traveled way.

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BARRICADE AND CHANNELIZING DEVICE DETAILS



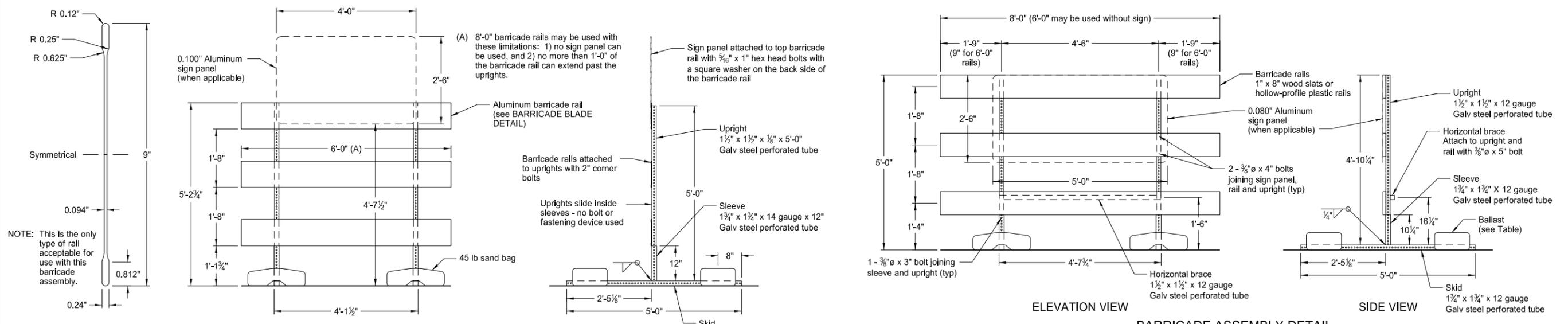
- INSTALLATION NOTES:**
1. Drill installation holes to diameter and depth as required by manufacturer's specifications.
 2. For removal, remove anchors and fill installation hole with an epoxy designed to bond to pavement surface.
 3. In lieu of bolted down base, the contractor may use an 8" x 8" butyl pad or hot melt butyl. Butyl shall be removed as close as possible to pavement surface.

The markings on drums shall be horizontal, circumferential, alternating orange and white retroreflective stripes 4" to 6" wide. Each drum shall have a minimum of two orange and two white stripes with the top stripe being orange. Any nonretroreflectORIZED spaces between the horizontal orange and white stripes shall not exceed 3" wide. Stripes shall not be placed on ribs or indentations in the drum. Drums shall have closed tops that will not allow collection of construction debris or other debris. Ballast shall not be placed on the top of a drum.

Markings for vertical panels shall be alternating orange and white retroreflective stripes, sloping downward in the direction vehicular traffic is to pass. Retroreflective sheeting shall be placed on both sides of panel and shall have a minimum of 270 square inches of retroreflective area facing vehicular traffic. Where the height of the retroreflective material on the vertical panel is 36 inches or more, a stripe width of 6 inches shall be used.

RetroreflectORIZATION of cones more than 36" in height shall be provided by alternating orange and white retroreflective stripes. Each cone shall have a minimum of two orange and two white stripes with the top stripe being orange. Any nonretroreflectORIZED space between the orange and white stripes shall not exceed 3" wide.

RetroreflectORIZATION of tubular markers more than 42" in height shall be provided by alternating four 4" to 6" wide orange and white stripes with the top stripe being orange.



NOTE: Markings for barricades shall be alternating orange and white retroreflective stripes, sloping downward in the direction traffic is to pass. Retroreflective sheeting shall be placed on both sides of the rails and shall have a minimum of 270 square inches of visible retroreflective area facing vehicular traffic. When the barricade length is less than 36", the rail stripe width shall be 4".

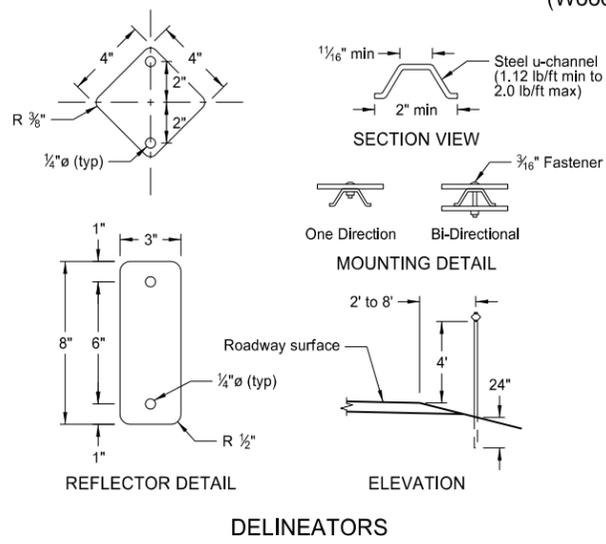
MINIMUM BALLAST
(For each side of barricade support)

Without Sign	4 - 25 lb sandbags
With Sign	6 - 25 lb sandbags

Note: The number of sandbags are based on a wind speed of 55 MPH. The sandbags are assumed to be placed at or near the ends of the skids.

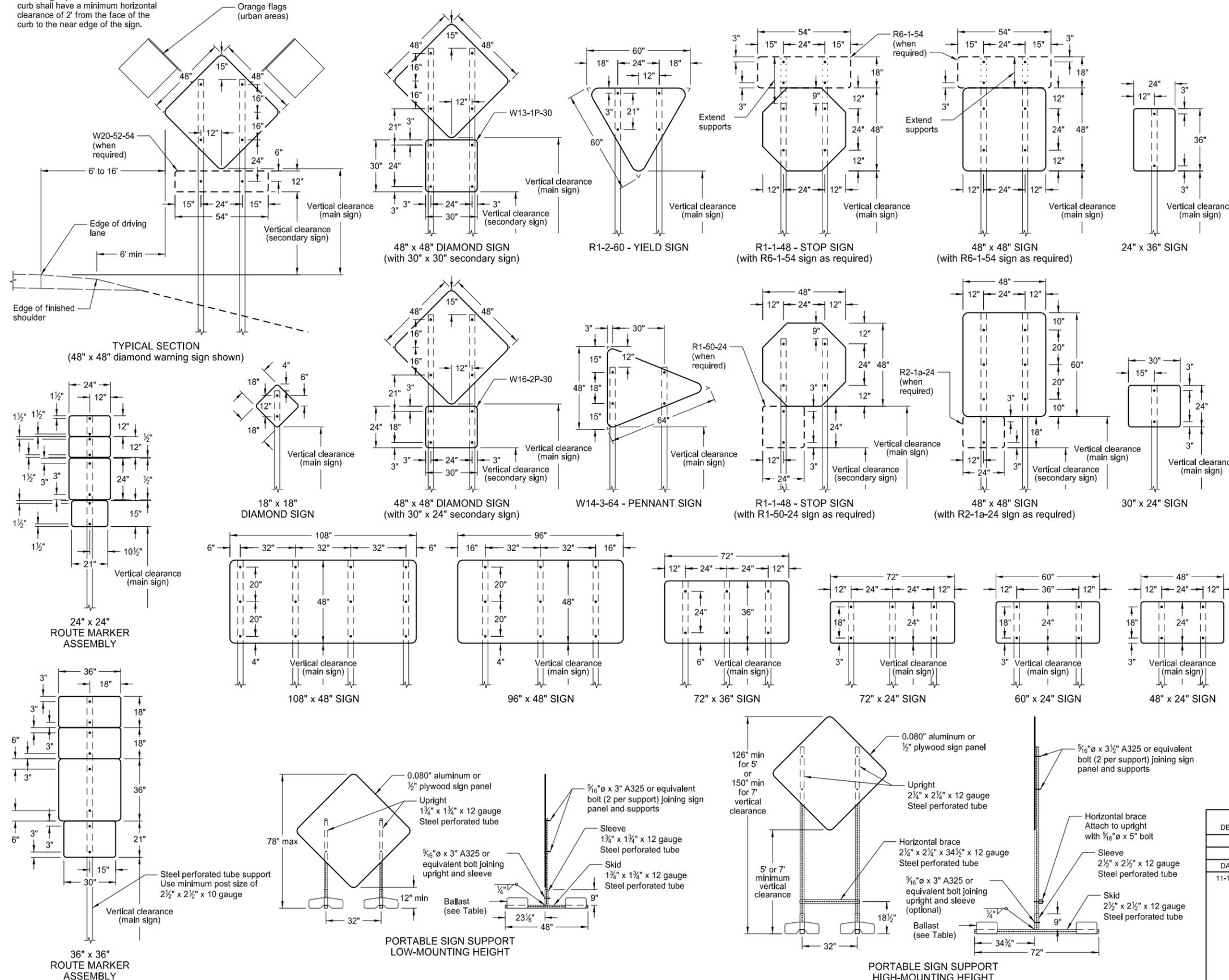
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CONSTRUCTION SIGN PUNCHING AND MOUNTING DETAILS

Note: Signs placed in sections with curb shall have a minimum horizontal clearance of 2' from the face of the curb to the near edge of the sign.



- NOTES:
1. Sign Supports: Supports shall be galvanized or painted. Minimum post sizes are 2.5 lb/ft u-channel or 2" x 2" x 12 gauge steel perforated tube, except where noted. When installing signs on u-channel, the minimum post size for assemblies containing a secondary sign is 3.0 lb/ft. Post sizes are based on a wind speed of 55 MPH.

Signs over 50 square feet should be installed on 2 1/2" x 2 1/2" perforated tube supports as a minimum.

Guy wires shall not be attached to sign supports. Wind beams may be attached to u-posts behind the sign panels.

2. Sign Panels: Provide sign panels made of 0.100" aluminum, 1/2" plywood, or other approved material, except where noted. All holes to be punched round for 3/8" bolts.

3. Alternate Messages: The signs that have alternate messages may have these alternate messages placed on a reflectorized plate (without a border) and installed and removed as required. (i.e. "Left" and "Right" message on a lane closure sign)

4. Route Marker Auxiliary Signs: Provide route marker auxiliary signs, such as the cardinal direction and directional arrows, with a background and legend that match the route marker they are used with:

Interstate - white legend on blue background
 Interstate Business Loop - white legend on green background
 US and State - black legend on white background
 County - yellow legend on blue background

5. Vertical Clearance: Install signs with a vertical clearance of 5'-0" (see TYPICAL SECTION.) In areas where parking or pedestrian movements are likely or the view of the sign may be obstructed, install signs with a vertical clearance of 7'-0" from the top of the curb or from the near edge of the driving lane in absence of a curb.

The vertical clearance to secondary signs is 1'-0" less than the vertical clearance as stated above.

Large signs having an area exceeding 50 square feet shall have a minimum clearance of 7'-0" from the ground at the post.

6. Portable Signs: Provide portable signs that meet the vertical clearance as stated above. Use portable signs when it is necessary to place signs within the pavement surface.

When portable signs are used for 5 days or less, low-mounting height (minimum 12" vertical clearance) sign supports may be used as long as the view of the sign is not obstructed. Time delays caused by unforeseen circumstances, such as equipment breakdown, rain, subgrade failures, etc., will not accrue towards the 5 day period. The R9-8 through R9-11a series, W1-5 through W1-8 series, M4-10, and E5-1 may be used for longer than 5 days.

Signs mounted to the portable sign supports shown in the LOW-MOUNTING HEIGHT and HIGH-MOUNTING HEIGHT Details shall have a maximum surface area of 16 square feet.

MINIMUM BALLAST
 (For each side of sign support base)

Sign Panel Mounting Height (ft)	Number of 25 lb sandbags for 4' x 4' sign panel
1'	6
5'	8
7'	10

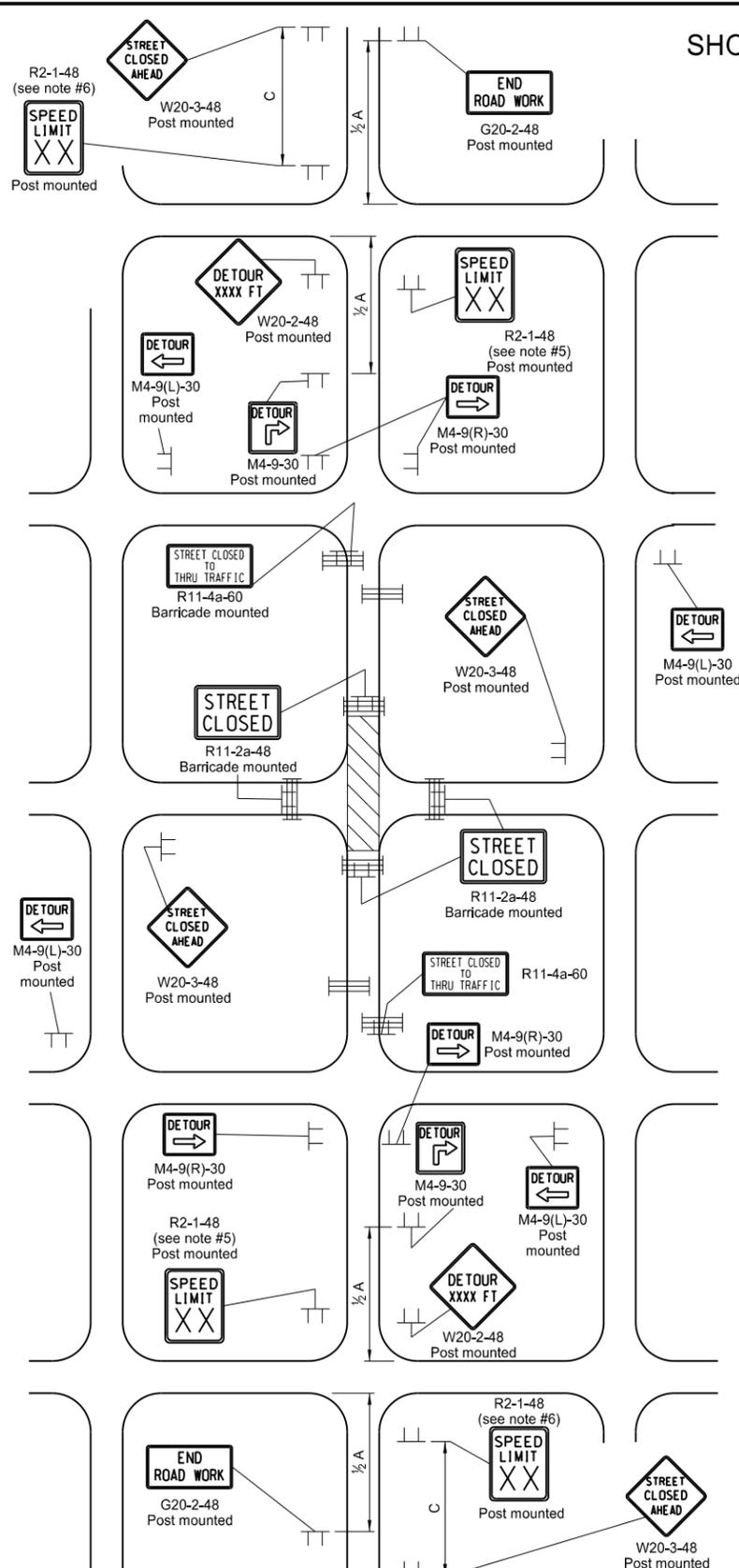
Note: The number of sandbags are based on a wind speed of 55 MPH. The sandbags are assumed to be placed at or near the ends of the skids.

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11-14-13	Revised Note 6.

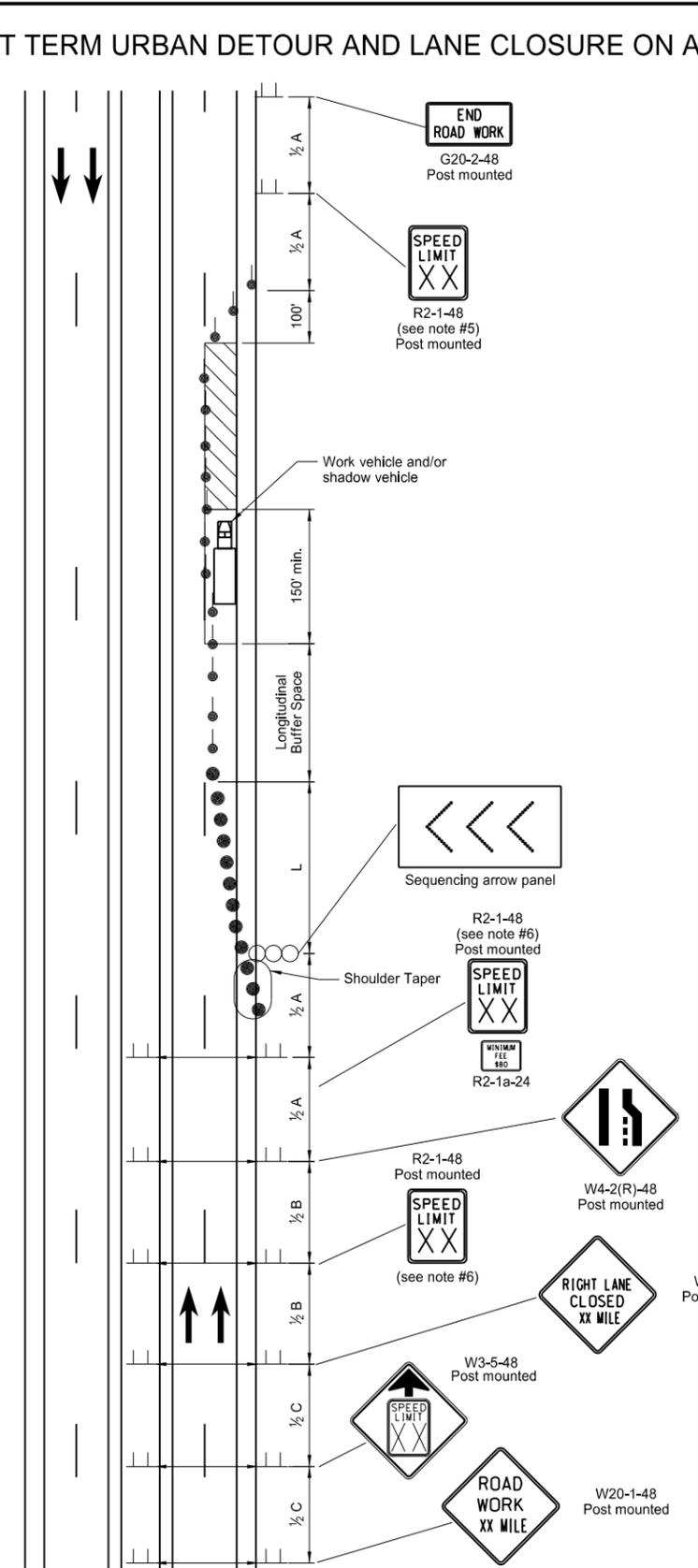
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SHORT TERM URBAN DETOUR AND LANE CLOSURE ON A DIVIDED HIGHWAY LAYOUTS

D-704-23



TYPE Q
DETOUR FOR A CLOSED STREET
 Where city streets are used for detouring traffic.
 Urban projects do not require the G20-55-96 and R2-1a-24 signs.



TYPE P
STATIONARY LANE CLOSURE ON A DIVIDED HIGHWAY
 4 lane divided roadway where 1/2 of roadway is closed.
 Short-term (more than 1 hour within a single daylight period.)

- Notes
- Variables
 - S = Numerical value of speed limit or 85th percentile.
 - W = The width of taper
 - L = Minimum length of taper, or $S \times W$ for freeways, expressways, and all other roads with speeds of 45 mph or greater, or $W \times S^2 / 60$ for urban, residential, and other streets with speeds of 40 mph or less.
 - Barricades placed on roadway shall be on a moveable assembly. Signs placed on the roadway shall be placed on skid mounted assemblies.
 - Delinicator drums used for tapering traffic shall be spaced at dimension "S". Delinicator drums or tubular markers used for tangents shall be spaced at 2 times "S".
 - Sequencing Arrow Panels
 - Panels should normally be placed at the beginning of the taper. Where shoulder width does not provide sufficient room the panel should be moved closer to the work area so that it can be placed on the roadway surface.
 - Type A shall be used on roadways with slow moving traffic speeds and low volume (25 mph or less and 750 ADT or less).
 - Type B shall be used on roadways with moderate traffic speeds and volumes (40 mph or less and 5000 ADT or less).
 - Type C shall be used on roadways with high traffic speeds and volumes (over 40 mph or over 5000 ADT).
 - The speed limit shall be re-established. The exact speed limit shall be determined in the field, dependent on location and conditions.
 - The reduced speed limit shall be determined dependent on the in place speed limit before construction. The speed limit reduction should not exceed 10 mph below the existing speed limit, unless the design speed of the work zone feature has been reduced below the 10 mph. In this case, the speed limit reduction shall not exceed 30 MPH. Where speed limits are to be reduced more than 30 MPH, a second speed limit sign shall be installed with the desired speed reduction but shall not exceed 30 MPH. The second speed limit sign shall be placed at 1/2 B.
 - When warning signs are used in urban areas and the signs are not portable, flags shall be installed. The flags shall be 24 inches square, mounted perpendicular to the edges of the diamond sign, and at such a distance above the edge so that when the flag is limp it will not touch the sign. Rural areas will not require flags.
 - Existing speed limit signs within a reduced speed zone shall be covered.
 - Obliterated or covered pavement marking shall be paid for as Obliteration of Pavement Marking. The covering shall be approved by the engineer.
 - Intersection control for Type Q may have to be changed on detour. The Engineer in the field shall determine what control is necessary.
 - Where necessary, safe speed to be determined by the Engineer. When parking is present, signs shall be placed so they are entirely visible above parked vehicles or placed at the edge of the parking area so they are visible to oncoming traffic. These signs may be skid mounted when placed on the roadway surface.
 - The contractor has the option of using portable sign supports in lieu of post mounted signs in accordance with the NDDOT Standard Specifications.

Speed (mph)	Length Min (feet)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820

Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 75 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

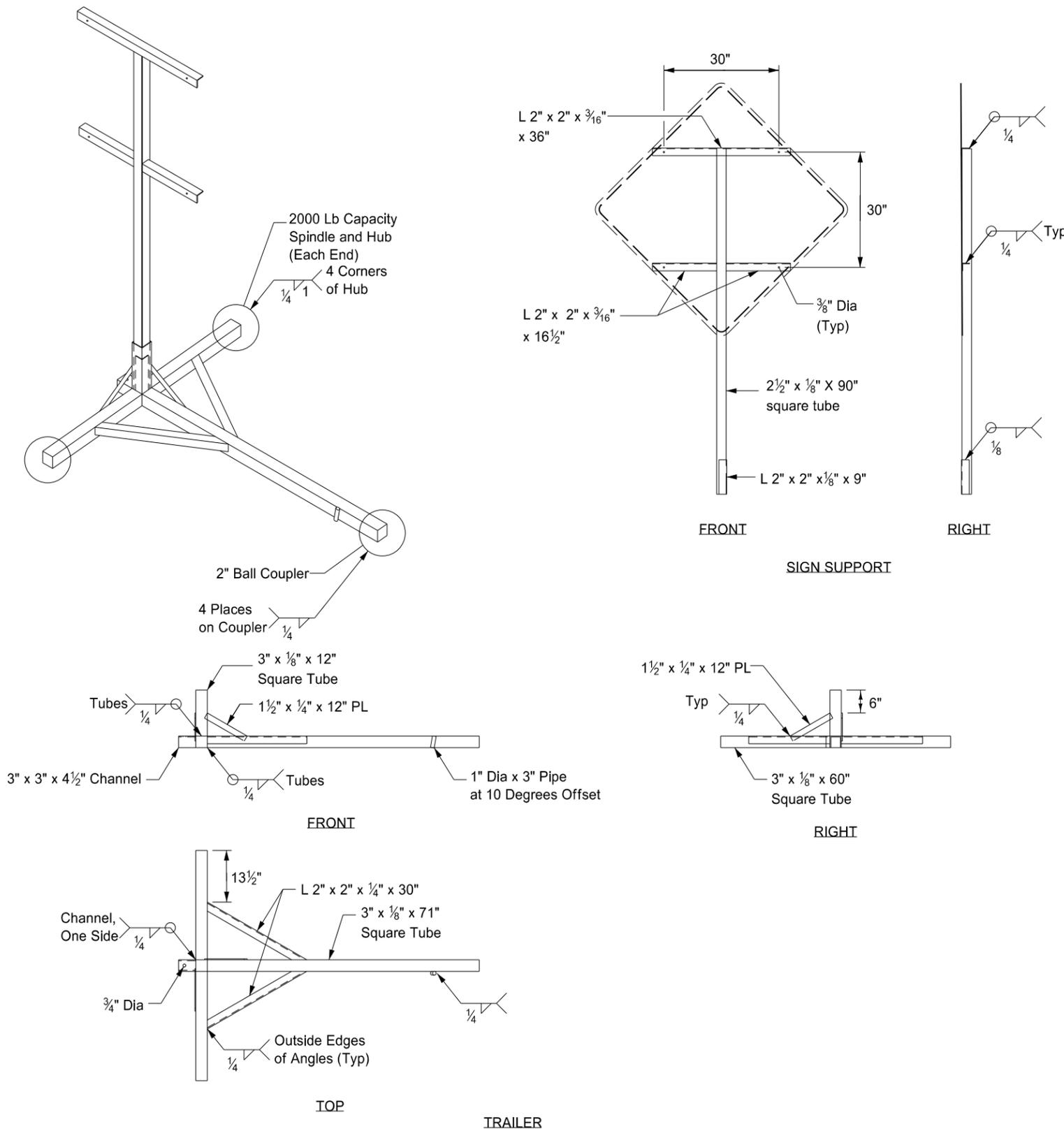
	Type III barricade		Work area
	Sign		Sequencing arrow panel
	Delineator Drum		Tubular Markers

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PORTABLE SIGN SUPPORT ASSEMBLY

D-704-50



Notes:

- ① The maximum weight of the assembly is 250 pounds.
- ② Use a 14" wheel and tire.
- ③ Automotive and equipment axle assemblies may not be used for trailer-mounted sign supports.
- ④ Other NCHRP 350 crash tested assemblies are acceptable.

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