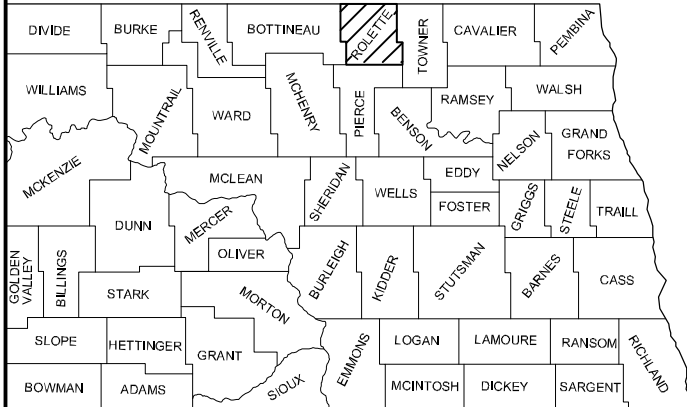
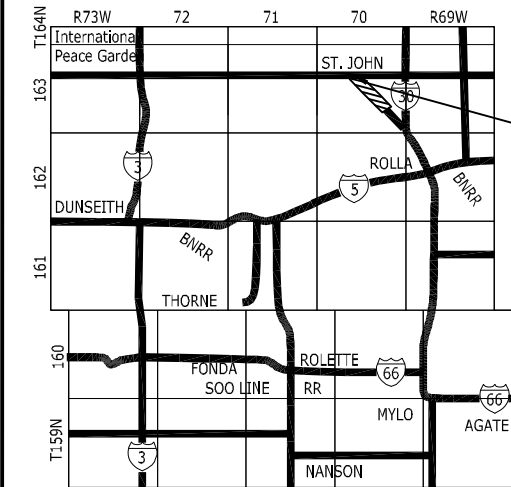


DESIGN DATA				
Traffic	Average Daily			Max.Hr.
Current      2017	Pass:      -	Trucks:      -	Total:      <750	-
Forecast      -	Pass:      -	Trucks:      -	Total:      <750	-
Clear Zone Distance:      -		Design Speed:      25 MPH		
Minimum Sight Dist. for Stopping:				
Minimum Sight Dist. for Safe Passing:    NA				
Sight Dist. for No Passing Zone:      NA				



ND COUNTY MAP



SKETCH MAP OF ROLETTE COUNTY

# ROLETTE COUNTY NORTH DAKOTA

Federal Aid Project: SC-CNOC-4006(066)  
Milling, Aggregate Base, Hot Bituminous Surfacing,  
Seal Coat, Sidewalk, Curb & Gutter

CMC Route 4006 Spur Beginning at Intersection  
of CMC 4006, Thence South to St. John City Limits

JOB #14

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	SC-CNOC-4006(066)	21924	1	1

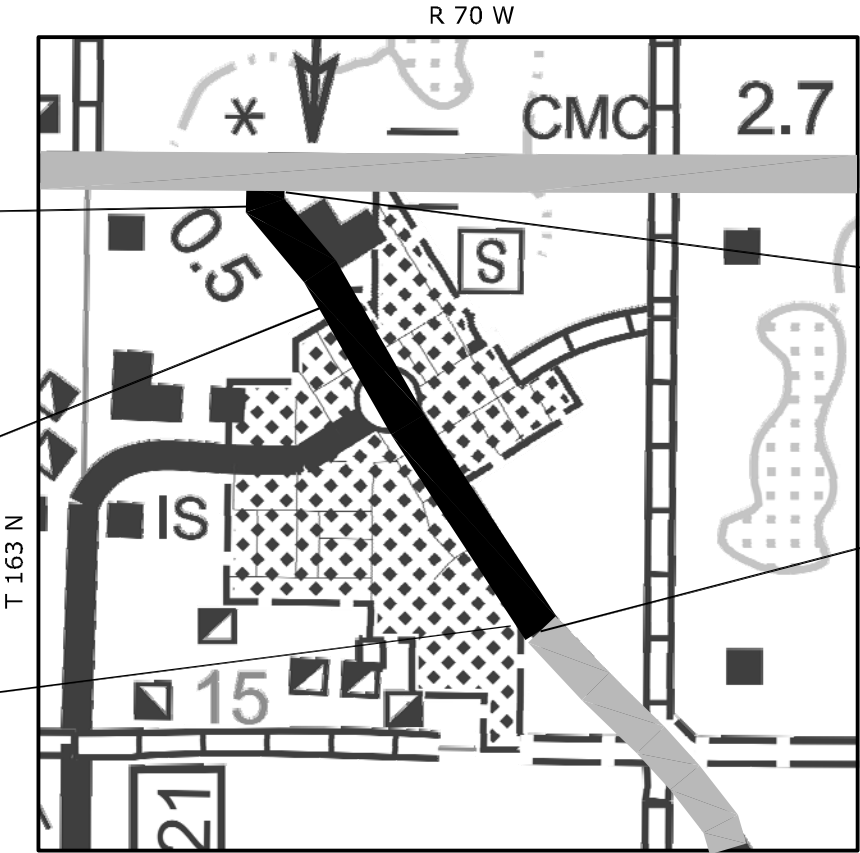
GOVERNING SPECIFICATIONS:  
2014 Standard Specifications adopted by the North Dakota  
Department of Transportation and the Supplemental Specifications  
effective on the date the project is advertised.

PROJECT NUMBER \ DESCRIPTION	NET MILES	GROSS MILES
SC-CNOC-4006(066) - Milling, Aggr. Base, HB Surfacing, Seal Coat, Sidewalk, Curb & Gutter	0.648	0.648

P.C. EQ 32+31.65 AHD  
32+36.55 BK

Sta. 19+47.25  
St. John City Limits - A Point  
1,929 Ft. East of the NW Cor.  
Sec. 15, Twp. 163 N., Rge. 70 W.

Sta. 0+80.55  
St. John City Limits - A Point 3,409  
Ft. East & 2,878 Ft. South of the  
NW Cor. Sec. 15, Twp. 163 N.,  
Rge. 70 W.




End Project SC-CNOC-4006(066) = Sta. 35+00.55  
= Sta. 0+00 on Project SC-4006(56)  
= A Point 1,063.2 Ft. West of the NE Corner  
of the NW 1/4 of Sec. 15, T163N, R70W

Begin Project SC-CNOC-4006(066) = Sta. 0+80.55  
= Sta. 34+20 on Project SC-4006(56)

PROJECT LOCATION

DESIGNERS
Kent Indvik, PE
Bradley Robertson, PLS
Donald Indvik, PE, PLS - Retired
Paula Lorenz



## Wold Engineering, P.C.

Consulting Engineers & Land Surveyors

915 East 11th Street ~ PO Box 237 ~ Bottineau, ND 58318  
316 Eastdale Drive ~ PO Box 1277 ~ Bismarck, ND 58502  
110 8th Avenue Southwest ~ Minot, ND 58701

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 ND.  APPROVED DATE 08-25-17  KENT D. INDVIK  Wold Engineering, P.C.	This document was originally issued and sealed by KENT D. INDVIK /s/ PE-4353 on 08-25-17 and the original document is stored at Wold Engineering, P.C. Bottineau, North Dakota
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10	1	Basis of Estimate
20	1	Pedestrian Curb Ramp Detail
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40	1-5	Removals
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LIST OF STANDARD DRAWINGS

<u>Standard No.</u>	<u>Description</u>
D-101-1, 2, 3	NDDOT Abbreviations
D-101-10	NDDOT Utility Company Abbreviations
D-101-20, 21	Line Styles
D-101-30, 31, 32	Symbols
D-704-3	Lane Markers (Spotting Tab for Seal Projects Only)
D-704-7, 8	Breakaway Systems for Construction Zone Signs
D-704-9-11	Construction Sign Details
D-704-12	Shoulder Closing Tapers
D-704-13	Barricade Details and Channelizing Devices
D-704-14	Construction Sign Punching and Mounting Details
D-704-15	Road Closure Layouts
D-704-20	Terminal and Seal Coat Sign Layouts
D-704- 22	Construction Truck and Temporary Detour Layouts
D-704-24	Shoulder Closures and Bridge Painting Layouts
D-704-26	Miscellaneous Sign Layouts
D-704-27	Traffic Control Plan For Moving Operations
D-704-30	Windrow Marking
D-706-01	Bituminous Laboratory
D-708-6	Erosion and Siltation Controls
D-748-1	Curb & Gutter and Valley Gutter
D-750-1	Concrete Driveway- Urban
D-750-2	Sidewalk
D-750-3	Curb Ramp Detail
D-754-23	Perforated Tube Assembly Details
D-754-24-74	(As Applicable) Sign Punching, Stringer and Support Location Details Regulatory, Warning and Guide Signs
D-754-86	911 Support Information and Sign Details
D-754-87	Sign Punching, Stringer and Support Location Details for Street Name Signs and 911 Signing
D-762-04	Pavement Marking
D-762-06	Short-Term Pavement Marking

NOTES

- 100-P01

**SCHEDULE:** The project as a whole has a completion date of October 1, 2018. The Hot Bituminous Pavement will be completed a minimum of 7 days prior to the Chip Seal Coat. As per NDDOT Std. Specs. Sec. 420.04.A, Chip Seal work will not be started after September 1.
- 100-P02

**UTILITIES:** Notice will be given to the utility companies a minimum of 2 weeks prior to work on the project. Utilities that the Engineer has been made aware of are shown on the plans. Other utilities may exist that are not shown. Power lines, telephone cables, rural water lines, and other utilities may be encountered on this project. The Contractor will be responsible to verify the locations and to notify all utility and pipeline companies to have the locations flagged and marked prior to beginning construction. Any charges by the utility companies for locates will be paid by the Contractor. The Contractor will be liable for any costs resulting from damage to utilities or pipelines.  
  
Utility companies will move or adjust conflicting facilities in conjunction with or prior to the highway construction. The Contractor will not be responsible for costs associated with the moving or adjustment of utilities on the project right of way.  
  
One-call Service: 1-800-795-0555  
  
Turtle Mountain Communications  
617 Main Ave  
Rolla, ND 58367  
(701)477-1101  
Contact: --  
  
Otter Tail Power Company  
226 S Main Ave  
Rugby, ND 58368  
(701)776-5223
- 100-P03

**GENERAL:** All salvaged signs and millings will be stockpiled and will become the property of Rolette County. They shall be taken to the County Shops in St. John & Rolla.
- 105-P01

**PAVEMENT PROTECTION:** The Contractor will protect the existing pavement outside the construction limits. The Contractor, at the Contractor’s expense, will repair any pavement damaged due to their operations before the project will be accepted. Repairs may include, but are not limited to: sawing, removals and additional hot bituminous pavement to damaged areas.
- 105-P02

**TYPICAL SECTION:** The dimensions shown for the bituminous pavement course are approximate. Plan quantities will be placed throughout except where the Engineer authorizes a change.

- 107-P01

**ENVIRONMENTAL PROTECTION:** Any land use by the Contractor outside the Right of Way limits, for any purpose, must be approved by the land owner and the Project Engineer.
- 203-P01

**COMMON EXCAVATION - SUBCUTS:** The material removed from the subcut areas will be properly disposed of off the Right of Way.
- 251-P01

**SEEDING—CLASS III:** Seeding will cover the entire disturbed areas along all sidewalks and back of curb and gutter after all backfill of suitable topsoil has been placed. All seeding costs will be included in the price bid for “Curb & Gutter – Type I”.  
  
The amount of pure live seed to be applied per acre will be as listed. Ten (10) pounds of oats per acre will be seeded as a nurse crop prior to or with the Class III seed. Seasonal limitations will be waived by the Engineer if moisture and weather conditions are acceptable.  

Grass Species	Pounds/Acre
Fairway Crested Wheatgrass	10
Brome Grass	8
Slender Wheatgrass	2
- 411-P01

**MILLING PAVEMENT SURFACE:** The Contractor will mill full depth of the existing pavement where indicated on plan. It is the responsibility of the Contractor to verify or accept the thickness of approximately 5.5 inches shown on plans.  
  
Payment for milling will be by the square yard based on a top width of 45 feet for the urban section. Sloughs or areas wider than these top widths, if present, will not be measured for payment but will be incidental to the bid item “Milling Pavement Surface”.  
  
The milled material will be produced in such a way that the maximum particle size is less than or equal to 1 ½ inches. The Contractor may use whatever means/methods of their choosing to remove any oversized milled material (greater than 1 ½ inches).  
  
All of the milled asphalt will be removed from the project and delivered to a site designated by Rolette County and will be property of the County. All costs associated with salvaging and delivering the millings will be included in the price bid for “Milling Pavement Surface”.
- 411-P02

**TEMPORARY ASPHALT WEDGES:** The Contractor will place temporary asphalt or milled material wedges at the milled taper locations to allow for the smooth passage of vehicles. All costs for labor, materials, and equipment to install and remove the wedges will be included in the unit price bid for “Milling Pavement Surface”.

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOC-4006(066)	6	2

NOTES

- 420-P01 SEAL COAT APPLICATION:** Class 41 cover coat material will be paid for actual quantity used up to plan quantity unless otherwise directed by the Engineer. Any excess chips along the shoulder or approaches after the final brooming will be removed by the Contractor. Initial light brooming will be done the following morning after the seal application.
- 420-P02 FOG COAT:** All approaches will be fog coated concurrent with the mainline fog coat application
- 420-P03 URBAN SECTION:** A pick up broom will be used for the final brooming prior to applying the fog coat. Excess cover coat material will be picked up and removed from the project. The costs associated with brooming and disposal of the cover coat material will be incidental to the bid item "Cover Coat Material CL 41".
- 430-P01 COMPACTION:** Compaction of hot bituminous pavement will be in accordance to NDDOT Std. Specs. Sec. 430.04 I.3 Ordinary Compaction. The compaction equipment used will include not less than two vibratory rollers.
- 430-P02 PG ASPHALT ACCEPTANCE:** PG Asphalt Cement will be accepted by certification. The asphalt binder supplier will certify that the product furnished to the project complies with SHRP binder specification for a PG58-28 binder. In order to supply asphalt material to this project by certification, the suppler will submit a letter to the Project Engineer stating that the supplier has an established quality control plan. This control plan must be in accordance with the January 2009 publication "Combined States Binder Group." Result of the required asphalt tests will be sent to Wold Engineering, P.C., PO Box 237, Bottineau, ND 58318.
- 430-P03 HOT BITUMINOUS PAVEMENT:** Superpave FAA 42 will have the aggregate and mix design properties as shown in NDDOT Std. Specs. Sec. Table 430-03, with this exception – the number of gyrations used in the mix design will be 50.
- 430-P04 CORED SAMPLES:** The Contractor will be required to provide Cored Samples – Bituminous Pavement, as per NDDOT Standard Specifications Section 430.05 C, for the purpose of depth checks. The required cores will consist of one (1) full depth core per mile, at locations determined by the Engineer. These samples will be delivered to Wold Engineering, P.C., PO Box 237, Bottineau, ND 58318. The cored samples will be included in the price bid for "Superpave FAA 42."
- 430-P05 APPROACH PAVING:** The lifts on the street approaches will be paved prior to or concurrent with the placement of each lift of mainline paving. An adequate transition to match existing conditions will be required.

- 430-P06 SAMPLING AND TESTING:** The Contractor will be responsible for conducting QC for all materials being used on the project. Test results will be submitted daily to the Project Engineer. The Contractor will be responsible for collecting a split sample for every sample collected on the project and furnish the Project Engineer with the split sample to conduct random QA testing. All testing will be in accordance with NDDOT Standard Specifications. The cost of this work will be included in the price bid for "Superpave FAA 42".
- 430-P07 ABUTTING PAVEMENT:** Where the new pavement will abut existing pavement, a full depth vertical joint will be made along the entire length of the joint. The vertical edge will be made by a saw cut only.
- 704-P01 TRAFFIC CONTROL FOR UNEVEN PAVEMENT:** The contractor has the option of making the paving lanes even at the end of each day's paving operation or signing for the uneven pavement and providing the following devices: Install "Uneven Lanes" signs (Sign No. W8-11-48) and a supplemental plate (Sign No. W20-52-54), identifying the distance, on the right shoulder (both directions) in advance of the beginning of the uneven pavement and at major intersections. A major intersection will be defined as a CMC, state, U.S. highway, or Interstate ramp. Install "Do Not Pass" signs (Sign No. R4-1-48) on the right shoulder (both directions) between the uneven lanes sign and the beginning of the uneven pavement and at major intersections. Install tubular markers spaced at two times the posted speed limit on the centerline where uneven pavement exists.

These traffic control devices will be left in place until the lanes are even. These signs and tubular markers are included in the "Traffic Control Devices List" and will be measured and paid for at the contract unit price for each device. No extra compensation will be allowed for relocation due to work progression.

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOC-4006(066)	6	3

NOTES

**704-P02 TRAFFIC CONTROL:** Traffic control for the milling and paving will consist of a temporary road closure, flagging, and a pilot car. Traffic Control Devices will comply with the following Standard Drawings:

1. Standard D-704-15, layout A: For temporary roadway closure during paving operations.
2. Standard D-704-20, layout G: For construction signing during paving operations. Sign G20-1b-60 will not be required. Signs R2-1-48 and R2-1a-24 are to be moved as the work area moves through the construction zone and should be placed a minimum of 500 feet in advance of flagging signs. Signs will be required at the junctions shown on the Traffic Control Layout.
3. Standard D-704-22, layouts K and L: For trucks hauling material.
4. Standard D-704-24, Type U: For shoulder work. Speed limits reduced to 40 MPH in work zone. Tubular markers will be used instead of traffic cones.
5. Standard D-704-26, layouts CC, EE, and GG: For paving operations.
6. Standard D-704-7,8,9,10,11,12,13, and 14 are applicable.

The required traffic control signs and devices are included in the “Traffic Control Devices List” and will be measured and paid at the contract unit price for each device.

Additional devices required to accommodate the Contractor’s operation will be the Contractor’s responsibility.

**704-P03 TRAFFIC CONTROL FOR SEAL COATS:** Traffic control for the seal coat will consist of a temporary road closure, flagging and a pilot car. Traffic control devices will comply with the following Standard Drawings:

1. Standard D-704-15, Layout A: For temporary roadway closures just beyond the daily work areas during seal coat operations. Intermediate flagging stations will require signs W20-7a-48 only.
2. Standard D-704-20, Layout H: For construction signing during seal coat operations.
3. Standard D-704-22, Layouts K and L: For trucks hauling material.
4. Standard Drawings D-704-7, 8, 9, 10, 11, 12, 13, and 14 are applicable.
5. Standard D-704-3, Lane Markers for Seal Jobs (Spotting Tabs)

Quantities are based on a 6 mile limitation for the sealing operations. The required traffic control signs, flaggers and pilot car operations are included in the lump sum bid item for “Traffic Control” and will not be measured and paid separately. Additional devices required to accommodate the Contractor’s operations will be the Contractor’s responsibility.

**704-P04 TRAFFIC CONTROL DURING WORKING AND NON-WORKING HOURS:** The Contractor will maintain one lane of traffic at the posted speed limit at all times during working hours. During non-working hours, the Contractor will leave the work area free of all hazards. The Contractor will open the roadway to two-way traffic during non-working hours. A minimum 24 foot roadway width will be required to maintain two lanes of traffic.

During paving and milling operations, flagging and pilot car will be used to maintain traffic during working hours. The traffic control devices for flagging will be removed at the end of each day and reinstalled when work commences.

**708-P01 STORM WATER AND EROSION CONTROL:** The Contractor is required to obtain a ND Dept. of Health Construction Permit. The Contractor will place erosion control devices as needed to comply with their permit and SWPPP. Erosion control materials will be in place before disturbing any area in a watershed. A supply of erosion control materials will remain on hand for repairs. Maintenance, removal, and resetting of fiber rolls will be included in the price bid for “Common Excavation – Subcut”. The Owner of the Permit will be Rolette County.

**754-P01 EXISTING SIGNS:** All existing signs and posts removed and not designated to be reset will be salvaged and delivered to the Rolette County shop located at St. John, ND. All costs associated with salvaging and delivering the signs will be included in the price bid for “Traffic Control Signs”.

**762-P01 SHORT TERM PAVEMENT MARKINGS:** The short term application will be applied immediately following completion of the paving operation on the entire mainline. No intermediate application will be necessary while Sign No. W8-12-48, No Center Stripe, is in place.

**762-P02 PERMANENT PAVEMENT MARKINGS:** Permanent pavement markings will be placed no sooner than 14 days and no later than 30 days after completion of the Short Term Pavement Markings.

**762-P03 PAVEMENT MARKINGS (SEAL COAT):** The short term application will be applied immediately following final brooming for the entire project. The permanent application will be no sooner than two weeks and no later than 30 days following the short term application. Lane markers (spotting tabs) will be installed as per Std. Dwg. D-704-3.

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ENVIRONMENTAL NOTES

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOC-4006(066)	6	4

**ENVIRONMENTAL NOTES (EN):** Rolette County, the North Dakota Department of Transportation and the Federal Highway Administration have made environmental commitments to secure approval of this project. The following environmental notes are requirements to comply with these commitments:

- EN #1** - Any waste material from this project will be disposed of properly.
- EN #2** - Dust will be minimized as much as possible during construction through the use of water. The Contractor will be required to submit a storm water permit before construction begins.
- EN #3** - The Contractor will contact the US Fish & Wildlife Service to confirm sources of water the Contractor wishes to use are not part of the USFWS refuge system, including wetland easements.
- EN #4** - Construction noise levels would be minimized by ensuring that construction equipment is equipped with a recommended muffler in good working order. Impact to noise levels would be minimized by limiting construction activities that occur during early morning or late evening hours.

PERMITS REQUIRED:

1. North Dakota Department of Health – NDPDES Permit  
*Status: To be obtained by the Contractor prior to construction, Owner is to be Rolette County.*

This document was  
Originally sealed by  
KENT D. INDVIK  
Registration Number  
PE-4353  
on 08-25-17  
The original document  
is stored at  
Wold Engineering, P.C.  
Bottineau, North Dakota

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOC-4006(066)	8	1

ESTIMATE OF QUANTITIES				
SPEC	CODE	DESCRIPTION	UNIT	TOTAL
103	0100	CONTRACT BOND	L SUM	1
202	0114	REMOVAL OF CONCRETE PAVEMENT	SY	1,698
202	0130	REMOVAL OF CURB & GUTTER	LF	3,080
203	0138	COMMON EXCAVATION - SUBCUT	CY	1,888
216	0100	WATER	M GAL	19
302	0120	AGGREGATE BASE COURSE CL 5	TON	3,933
401	0050	TACK COAT	GAL	860
401	0150	SS1H OR CSS1H OR MS1 EMULSIFIED ASPHALT	GAL	712
411	0105	MILLING PAVEMENT SURFACE	SY	8,960
420	0111	CRS2P EMULSIFIED ASPHALT	GAL	5,510
420	0125	COVER COAT MATERIAL CL 41	TON	170
430	0042	SUPERPAVE FAA 42	TON	2,570
430	5828	PG 58-28 ASPHALT CEMENT	TON	167
702	0100	MOBILIZATION	L SUM	1
704	0100	FLAGGING	MHR	126
704	1000	TRAFFIC CONTROL SIGNS	UNIT	1,137
704	1052	TYPE III BARRICADE	EA	4
704	1065	TRAFFIC CONES	EA	40
704	1100	TRAFFIC CONTROL (BITUMINOUS SEAL COAT)	L SUM	1
704	1185	PILOT CAR	HR	63
722	6140	ADJUST GATE VALVE BOX	EA	**5
722	6200	ADJUST MANHOLE	EA	7
748	0140	CURB & GUTTER - TYPE I	LF	3,204
748	1030	VALLEY GUTTER 72IN	SY	155
750	0100	SIDEWALK CONCRETE	SY	953
750	1000	DRIVEWAY CONCRETE	SY	286
750	2115	DETECTABLE WARNING PANELS	SF	141
762	0430	SHORT TERM 4IN LINE - TYPE NR	LF	6,480
762	0460	SHORT TERM PAINTED LINE - SEAL JOBS	LF	6,480
762	1104	PVMT MK PAINTED 4IN LINE	LF	12,628

\*\*NOTE: Only 2 Gate Valves in Main Street -  
Other 3 are 33' Rt or Lt



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Bottineau, North Dakota

ESTIMATE OF QUANTITIES

BASIS OF ESTIMATE - ROADWAY (RURAL- SEAL COAT)			
STA. 18+00 TO STA. 35+00 (0.321 miles)		DESCRIPTION	
QUANTITY PER MILE	WIDTH		
880	30'	GAL	EMULSIFIED ASPHALT FOR FOG SEAL AT 0.05 GAL/SY (SS1H, CSS1H OR MS1)
5914	24'	GAL	EMULSIFIED ASPHALT FOR SEAL COAT AT 0.42 GAL/SY (CRS2P)
176	24'	TON	COVER COAT MATERIAL AT 25 LBS/SY (CL 41)

BASIS OF ESTIMATE - (URBAN)			
STA. 0+80 TO STA. 18+00			DESCRIPTION
QUANTITY PER STA.	WIDTH	UNIT	
25	45'	GAL	EMUL. ASPH (SS-1H OR CSS-1H) FOR TACK AT 0.05 GAL/SQ YD (BTWN. BASE AND INTMDT. COURSE)
25	45'	GAL	EMUL. ASPH (SS-1H OR CSS-1H) FOR TACK AT 0.05 GAL/SQ YD (BTWN. INTMDT. AND SURFACE COURSE)
55.6	45'	TON	HOT BITUMINOUS PAVEMENT (SUPERPAVE FAA 42) AT 2.0 TON/CY (2" BASE COURSE)*
41.7	45'	TON	HOT BITUMINOUS PAVEMENT (SUPERPAVE FAA 42) AT 2.0 TON/CY (1.5" INTMDT. COURSE) *
41.7	45'	TON	HOT BITUMINOUS PAVEMENT (SUPERPAVE FAA 42) AT 2.0 TON/CY (1.5" SURFACE COURSE) *
3.61	-	TON	ASPHALT CEMENT (PG 58-28) FOR HOT BIT. PAVEMENT AT 6.5% OF HOT BIT (2" BASE COURSE) *
2.71	-	TON	ASPHALT CEMENT (PG 58-28) FOR HOT BIT. PAVEMENT AT 6.5% OF HOT BIT (1.5" INTMDT. COURSE) *
2.71	-	TON	ASPHALT CEMENT (PG 58-28) FOR HOT BIT. PAVEMENT AT 6.5% OF HOT BIT (1.5" SURFACE COURSE) *
25	45'	GAL	EMULSIFIED ASPHALT FOR FOG SEAL AT 0.05 GAL/SY (SS1H, CSS1H OR MS1)
210	45'	GAL	EMULSIFIED ASPHALT FOR SEAL COAT AT 0.42 GAL/SY (CRS2P)
6.25	45'	TON	COVER COAT MATERIAL AT 25 LBS/SY (CL 41)

\* The percentage of Bituminous Material to be used will be determined by laboratory tests from the aggregate stockpile by the CONTRACTOR and approved by the ENGINEER prior to project commencement.

Urban Section Base Preparation

\*Common Excavation (Subcut): 53' pay width \* 1,720' length \* 6.5" depth= 49,378 CF/27= 1828 CY + 60 CY(APP)=1,888  
CL. 5 Aggregate Base: 53' pay width \* 1,720' length \*7" depth= 53,177 CF/27= 1,969 CY @ 1.875 Ton/CY= 3,693 Ton  
Water for CL. 5 Aggregate Base: 5 Gal/Ton = 19 Mgal  
Milling Pavement Surface - 45 width \* 1,720' length= 8,600 SY + 360 SY(APP) = 8,960 SY

\* - Sta. 0+80 to Sta. 18+00

BASIS OF ESTIMATE STREET APPROACHES -- (6EA)		
DESCRIPTION	UNIT	
HOT BIT. PAVE. for BASE & SURF COURSES	TON	30
PG 58-28 ASPH. CEM. for HOT BIT. PAVE.	TON	2
CRS2P EMUL ASPHALT	GAL	35
CL 41 COVER COAT	TON	1
CL 5 AGGREGATE	TON	40

BASIS OF ESTIMATE - MARKING			
PAVEMENT MARKING PAINTED LINE (SHORT TERM AND PERM.) CENTERLINE: 4" YELLOW, 10 FT. LINES, 30 FT. SKIP 1320 LF/MILE BARRIER LINES: 4" YELLOW 4" BETWEEN LINES			
NPZ: STA. 0+80 to 5+40 LT = 460 LF      STA. 0+80 to 5+40 RT = 460 LF STA. 6+00 to 10+00 LT = 400 LF      STA. 6+00 to 10+00 RT = 400 LF STA. 10+60 to 14+60 LT = 400 LF      STA. 10+60 to 14+60 RT = 400 LF STA. 15+20 to 35+00 LT = 1980 LF      STA. 15+20 to 35+00 RT = 1980 LF TOTAL = 6,480 LF			
SHORT TERM 4IN LINE - TYPE NR			
			NPZ - 6,480 LF
			TOTAL = 6,480 LF
PVMT MARK PAINT 4IN LINE			
NPZ - 6,480 LF			
PERMANENT STRIPING SEAL COAT - 6,480 LF			
			TOTAL = 12,960 LF

FLAGGING & PILOT CAR		
Description	Basis	Quantity
Flagging (Paving)	60 MHR/Mile/Lift	126 MHR
Pilot Car (Paving)	30 Hr/Mile/Lift	63 Hr

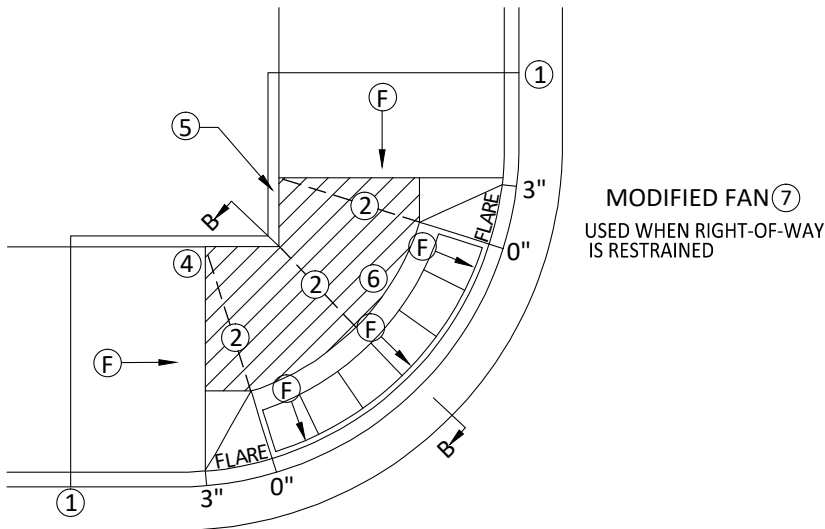
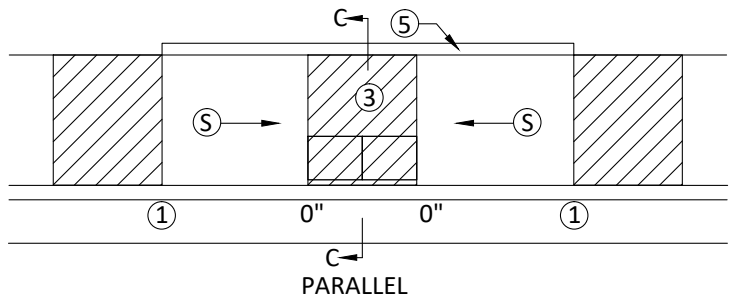
DETECTABLE WARNING PANEL **	
STATION	SF
5+45 LT	10
5+95 LT	25
5+95 RT	26
9+85 LT	10
9+85 RT	10
10+03 LT	10
10+03 RT	10
10+63 LT	10
10+63 RT	10
14+45 LT	10
14+45 RT	10
TOTAL:	141



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BASIS OF ESTIMATE

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOC-4006(066)	20	1



NOTES:

CONTRACTION JOINTS SHALL BE CONSTRUCTED ALONG ALL GRADE BREAKS WITHIN THE PAR 1/4" DEEP VISUAL JOINTS SHALL BE USED AT THE TOPS OF CONCRETE FLARES ADJACENT TO WALKABLE SURFACES.

ALL GRADE BREAKS WITHIN THE PAR SHALL BE PERPENDICULAR TO THE PATH OF TRAVEL, THUS BOTH SIDES OF A SLOPED WALKING SURFACE MUST BE EQUAL LENGTH.

TO ENSURE INITIAL RAMPS AND INITIAL LANDINGS ARE PROPERLY CONSTRUCTED, LANDINGS SHALL BE CAST SEPARATELY.

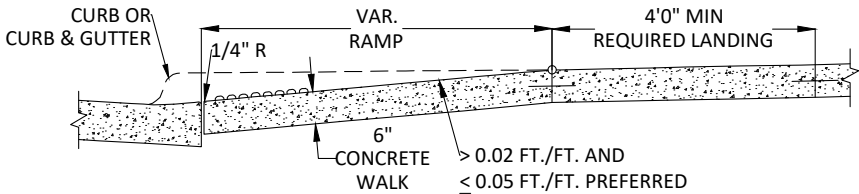
TOP OF CURB SHALL MATCH PROPOSED ADJACENT WALK GRADE.

WHEN THE BOULEVARD IS 4' WIDE OR LESS, THE TOP OF CURB TAPER SHALL MATCH THE RAMP SLOPES TO REDUCE NEGATIVE BOULEVARD SLOPES FROM THE TOP BACK OF CURB TO THE PAR.

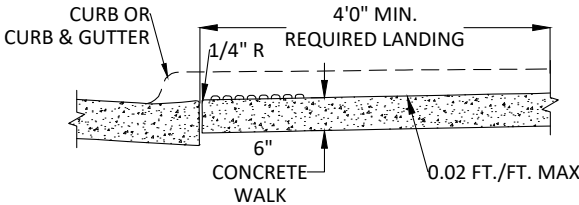
ALL RAMP TYPES SHOULD HAVE A MINIMUM 3' LONG RAMP LENGTH.

4' MINIMUM WIDTH OF DETECTABLE WARNING IS REQUIRED FOR ALL RAMPS. DETECTABLE WARNINGS SHALL CONTINUOUSLY EXTEND FOR A MIN. OF 24" IN THE PATH OF TRAVEL. DETECTABLE WARNING TO COVER ENTIRE WIDTH OF SHARED USE PATHS AND THE ENTIRE PAR WIDTH OF THE WALK. DETECTABLE WARNING SHOULD BE 6" LESS THAN THE PAR/TRAIL WIDTH. ARC LENGTH OF RADIAL DETECTABLE WARNINGS SHOULD NOT BE GREATER THEN 20 FEET.

RECTANGULAR DETECTABLE WARNINGS SHALL BE SETBACK 3" FROM THE BACK OF CURB. RADIAL DETECTABLE WARNINGS SHALL BE SETBACK 3" MINIMUM TO 6" MAXIMUM FROM THE BACK OF CURB.



SECTION B-B  
FAN



SECTION C-C  
PARALLEL/DEPRESSED CORNER

- ① MATCH FULL HEIGHT CURB.
- ② 4' MINIMUM DEPTH LANDING REQUIRED ACROSS TOP OF RAMP.
- ③ DETECTABLE WARNINGS MAY BE PART OF THE 4' X 4' MIN. LANDING AREA IF IT IS NOT FEASIBLE TO CONSTRUCT THE LANDING OUTSIDE OF THE DETECTABLE WARNING AREA.
- ④ THE GRADE BREAK SHALL BE PERPENDICULAR TO THE BACK OF WALK. THIS WILL ENSURE THAT THE GRADE BREAK IS PERPENDICULAR TO THE DIRECTION OF TRAVEL. (TYPICAL FOR ALL).
- ⑤ WHEN ADJACENT TO GRASS, GRADING SHALL ALWAYS BE USED WHEN FEASIBLE. V CURB, IF USED, SHALL BE PLACED OUTSIDE THE SIDEWALK LIMITS WHEN RIGHT OF WAY ALLOWS. WHEN ADJACENT TO PARKING LOTS, CONCRETE OR BITUMINOUS TAPERS SHOULD BE USED OVER V CURB TO REDUCE TRIPPING HAZARDS AND FACILITATE SNOW & ICE REMOVAL.
- ⑥ A 7' MINIMUM TOP RADIUS GRADE BREAK REQUIRED TO BE CONSTRUCTIBLE.
- ⑦ "S" SLOPES ON FANS SHALL ONLY BE USED WHEN ALL OTHER FEASIBLE OPTIONS HAVE BEEN EVALUATED AND DEEMED IMPRACTICAL.

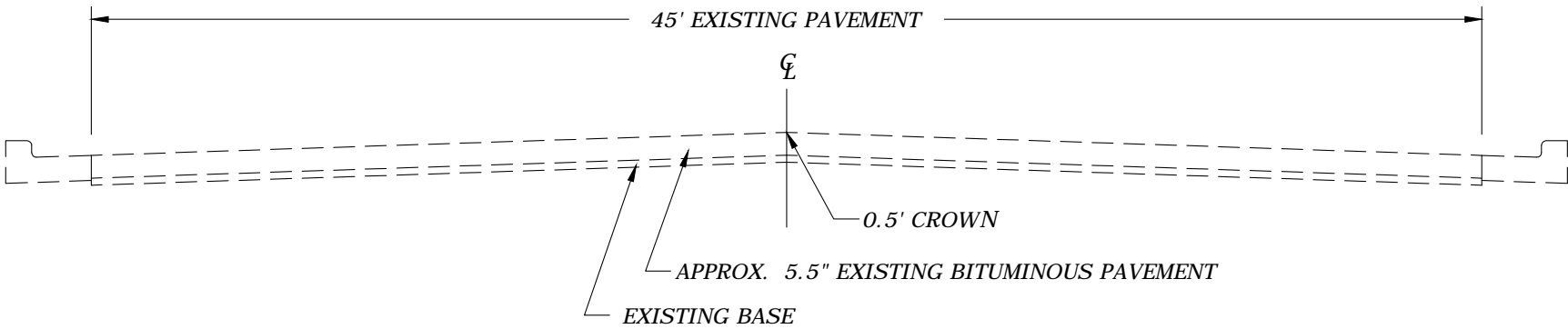
LEGEND
THESE LONGITUDINAL SLOPE RANGES SHALL BE THE STARTING POINT. IF SITE CONDITIONS WARRANT, LONGITUDINAL SLOPES UP TO 8.3% OR FLATTER ARE ALLOWED.
⑤ INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE BETWEEN 5.0% MINIMUM AND 8.3% MAXIMUM IN THE DIRECTION SHOWN AND THE CROSS SLOPE SHALL NOT EXCEED 2.0%
⑥ INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE GREATER THEN 2.0% AND LESS THAN 5.0% IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%
LANDING AREA - 4' X 4' MIN. (5' X 5' MIN. PREFERRED) DIMENSIONS AND MAX 2.0% SLOPE IN ALL DIRECTIONS. LANDING SHALL BE FULL WIDTH OF INCOMING PARS.
X" CURB HEIGHT



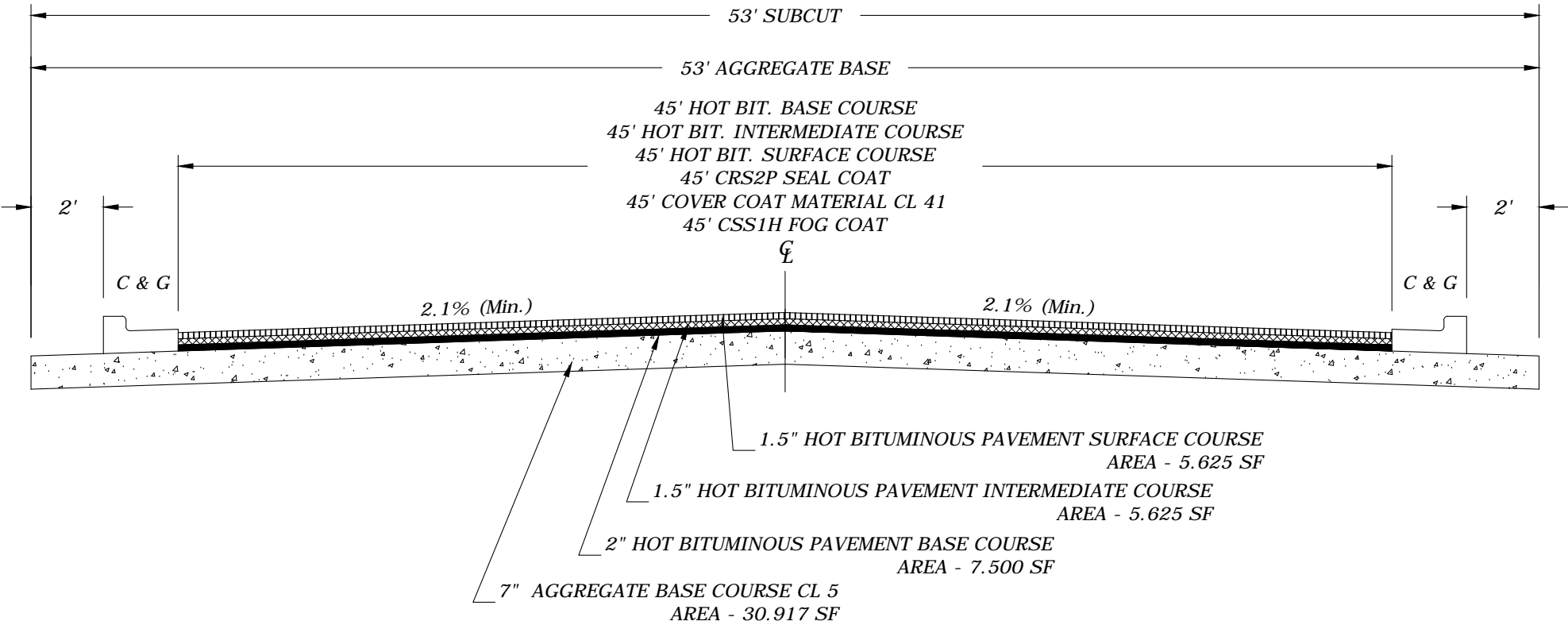
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PEDESTRIAN  
CURB RAMP  
DETAILS

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOC-4006(066)	30	1



**EXISTING TYPICAL SECTION (URBAN)**  
**STA. 0+ 80.55 (CITY LIMITS) TO 18+ 00**



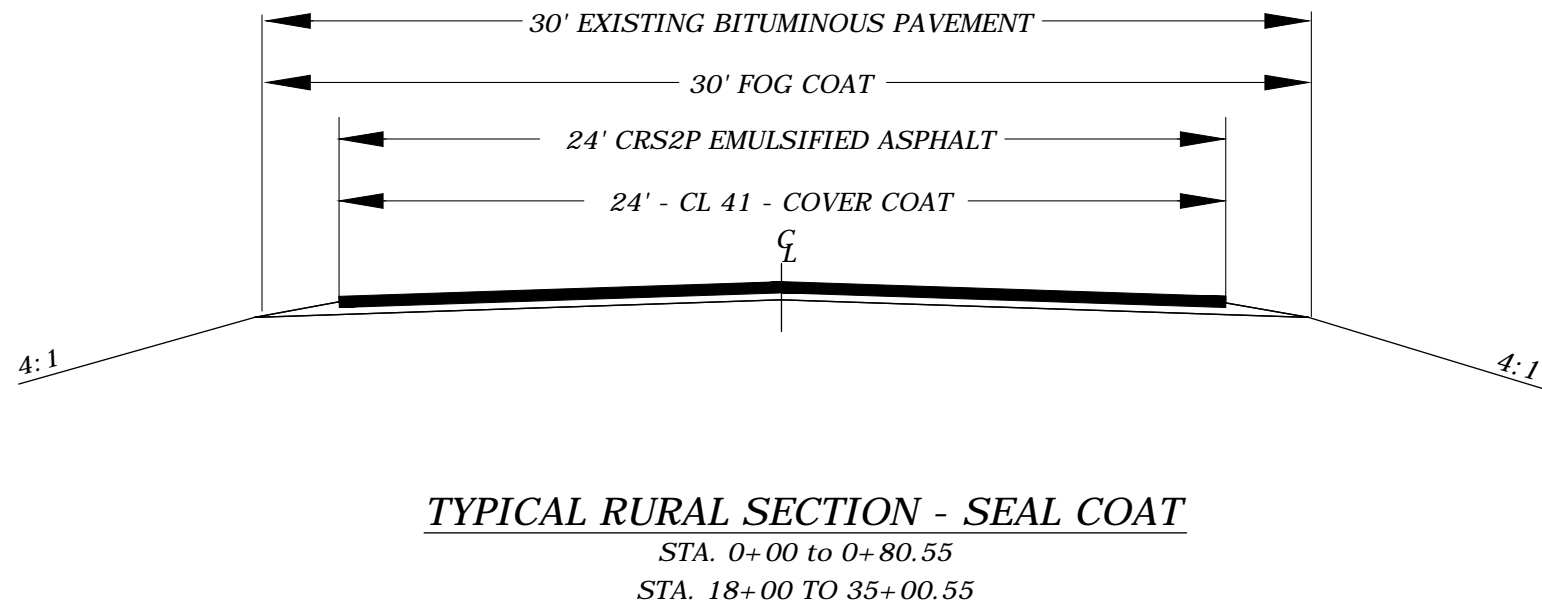
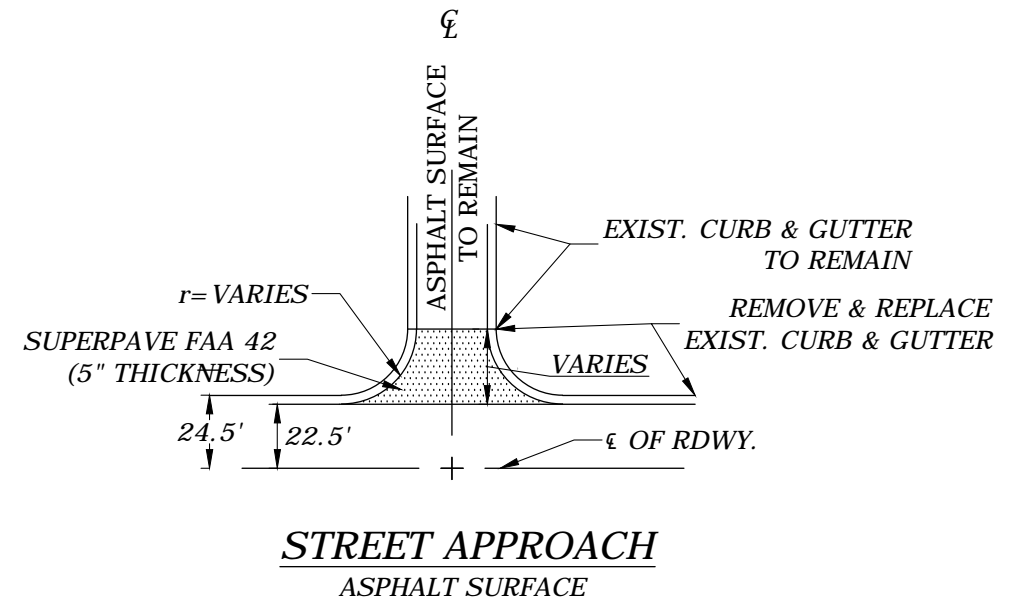
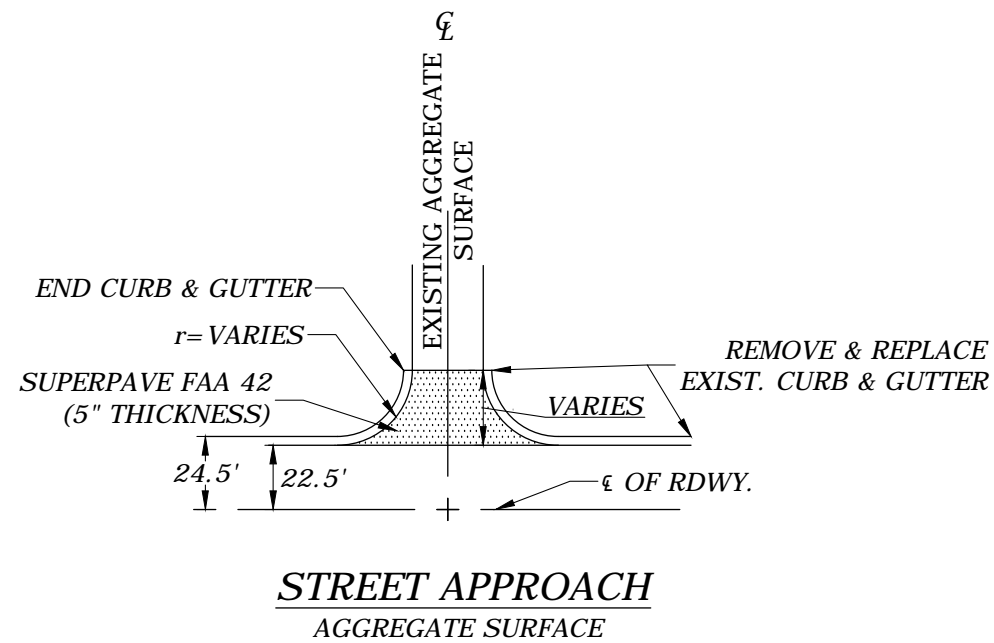
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Bottineau, North Dakota

C & G - Curb & Gutter - Type I

**PROPOSED TYPICAL SECTION (URBAN)**  
**STA. 0+ 80.55 (CITY LIMITS) TO 18+ 00**

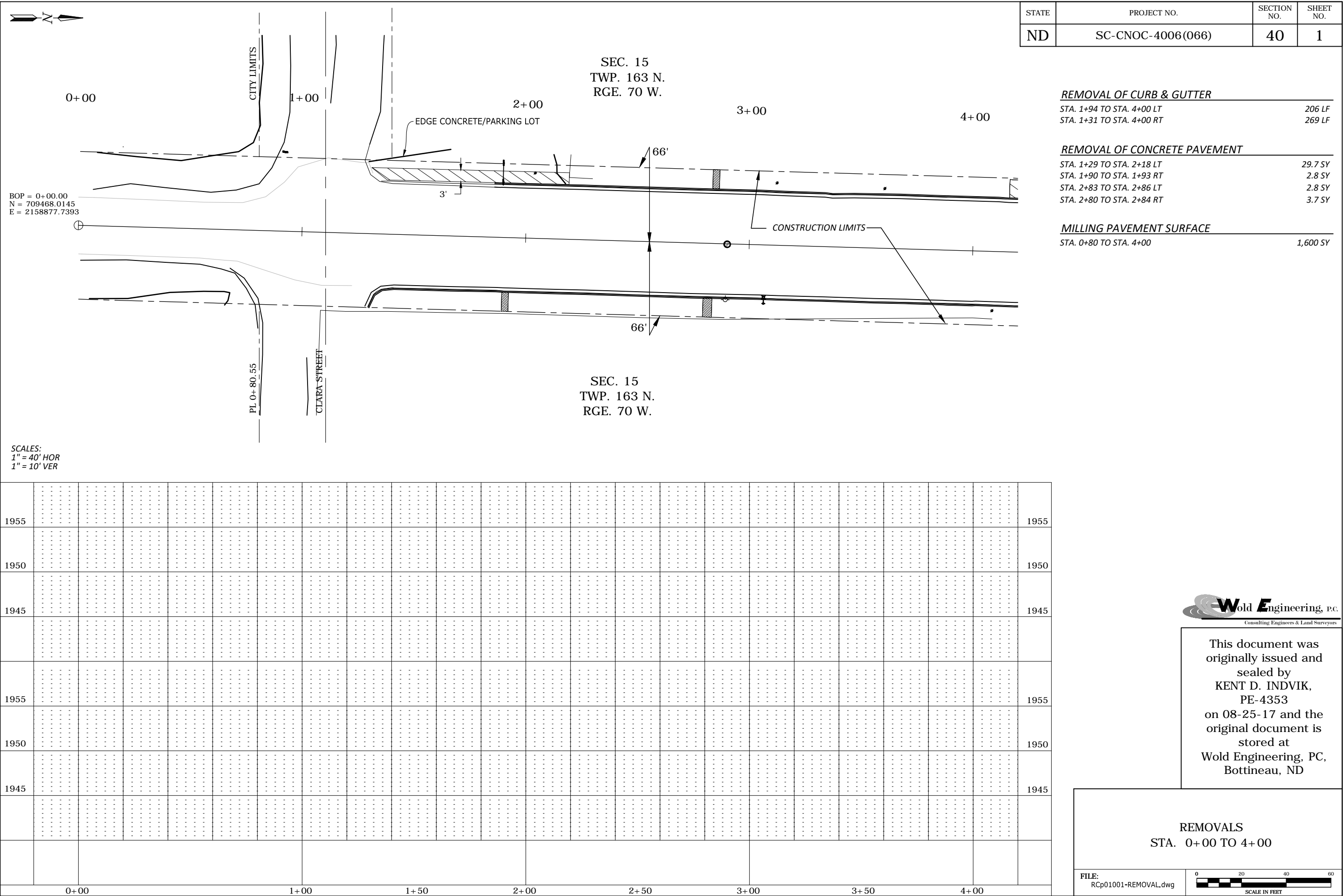
TYPICAL SECTIONS  
EXISTING &  
PROPOSED

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOC-4006(066)	30	2



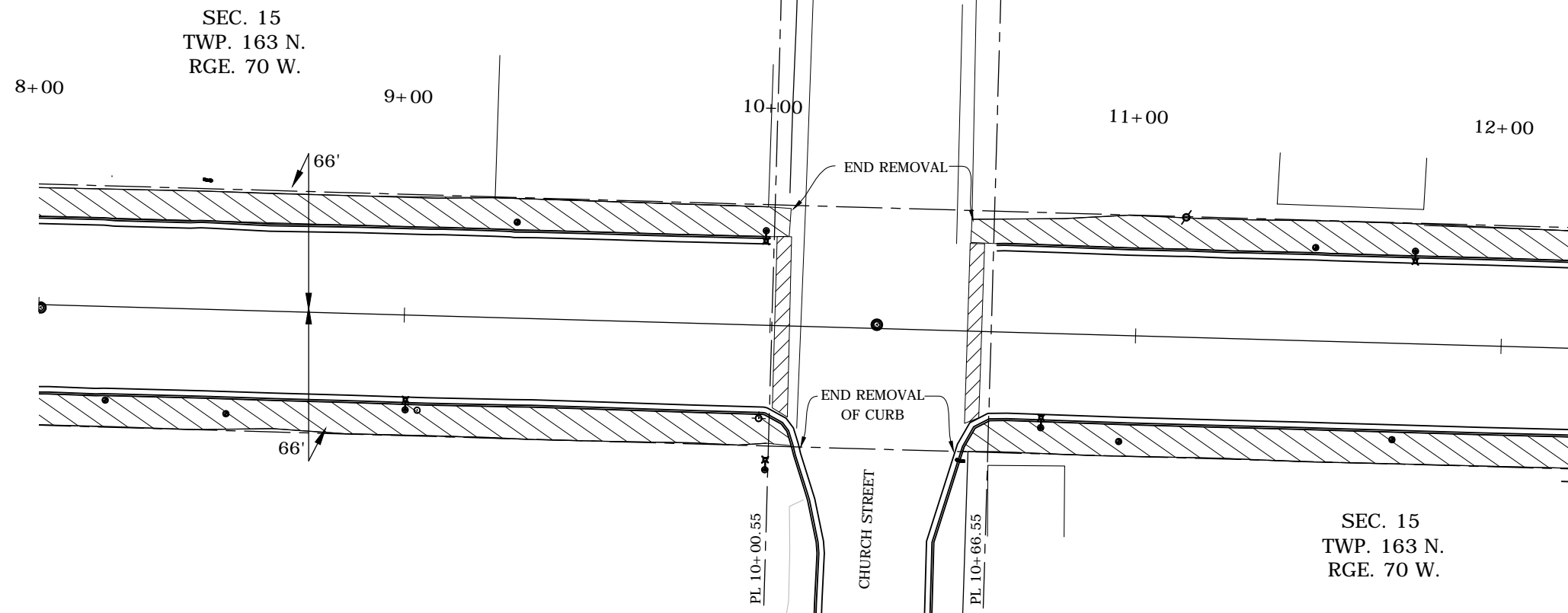
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TYPICAL SECTIONS  
APPROACHES &  
SEAL COAT

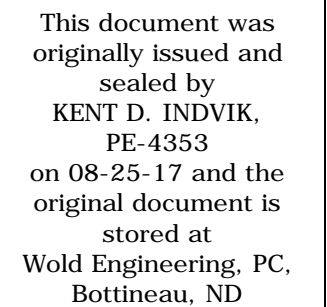




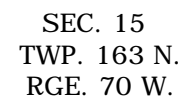


[illegible]

<u>REMOVAL OF CURB &amp; GUTTER</u>	
STA. 8+00 TO STA. 10+09 LT	151 LF
STA. 10+51 TO STA. 12+00 LT	153 LF
STA. 8+00 TO STA. 10+09 RT	151 LF
STA. 10+51 TO STA. 12+00 RT	153 LF
<u>REMOVAL OF CONCRETE PAVEMENT</u>	
STA. 8+00 TO STA. 10+09 RT	186.0 SY
STA. 8+00 TO STA. 10+09 LT	186.0 SY
STA. 10+51 TO STA. 12+00 LT	123.6 SY
STA. 10+51 TO STA. 12+00 RT	123.6 SY
STA. 10+09 CL	27.0 SY
STA. 10+51 CL	27.0 SY
<u>MILLING PAVEMENT SURFACE</u>	
STA. 8+00 TO STA. 12+00	2,120 SY



REMOVALS  
STA. 8+00 TO 12+00



### REMOVAL OF CURB & GUTTER

## REMOVAL OF CONCRETE PAVEMENT

### MILLING PAVEMENT SURFACE

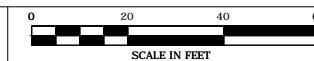
SCALES:  
1" = 40' HOR  
1" = 10' VER

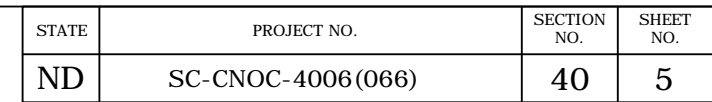
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REMOVALS  
STA. 12+00 TO 16+00

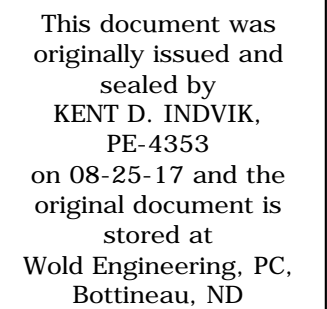
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RCp04001-REMOVAL.dwg



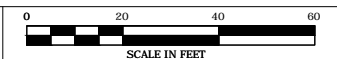


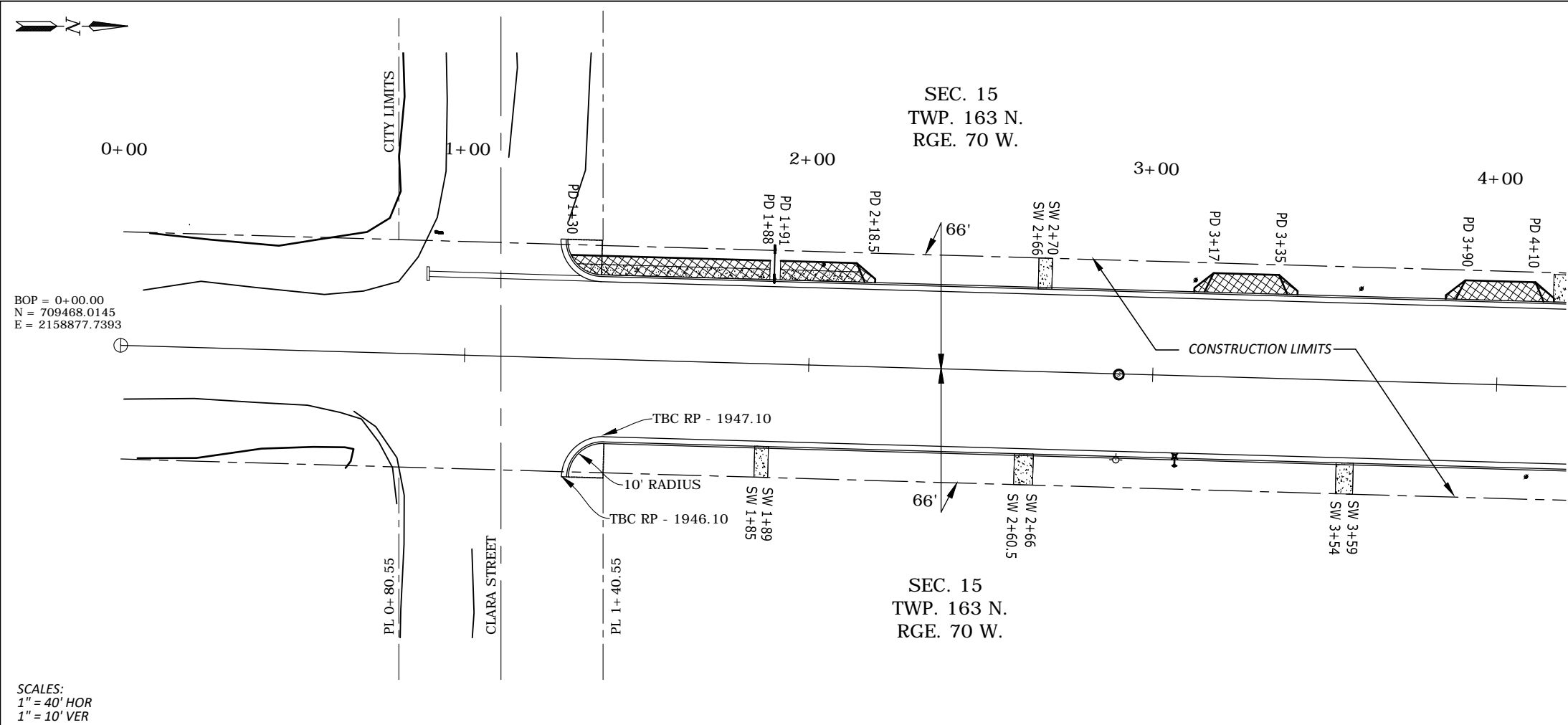
20+00

SEC. 15  
TWP. 163 N.  
RGE. 70 W.

[illegible]

FILE:  
RCp05001-REMOVAL.dwg





STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOC-4006(066)	60	1

**CURB & GUTTER - TYPE I**

STA. 1+41.55 TO STA. 4+00 RT	258.4 LF
STA. 1+41.55 10' RADIUS RT	15.8 LF
STA. 0+91 TO 4+00 LT	309.0 LF

**SIDEWALK CONCRETE**

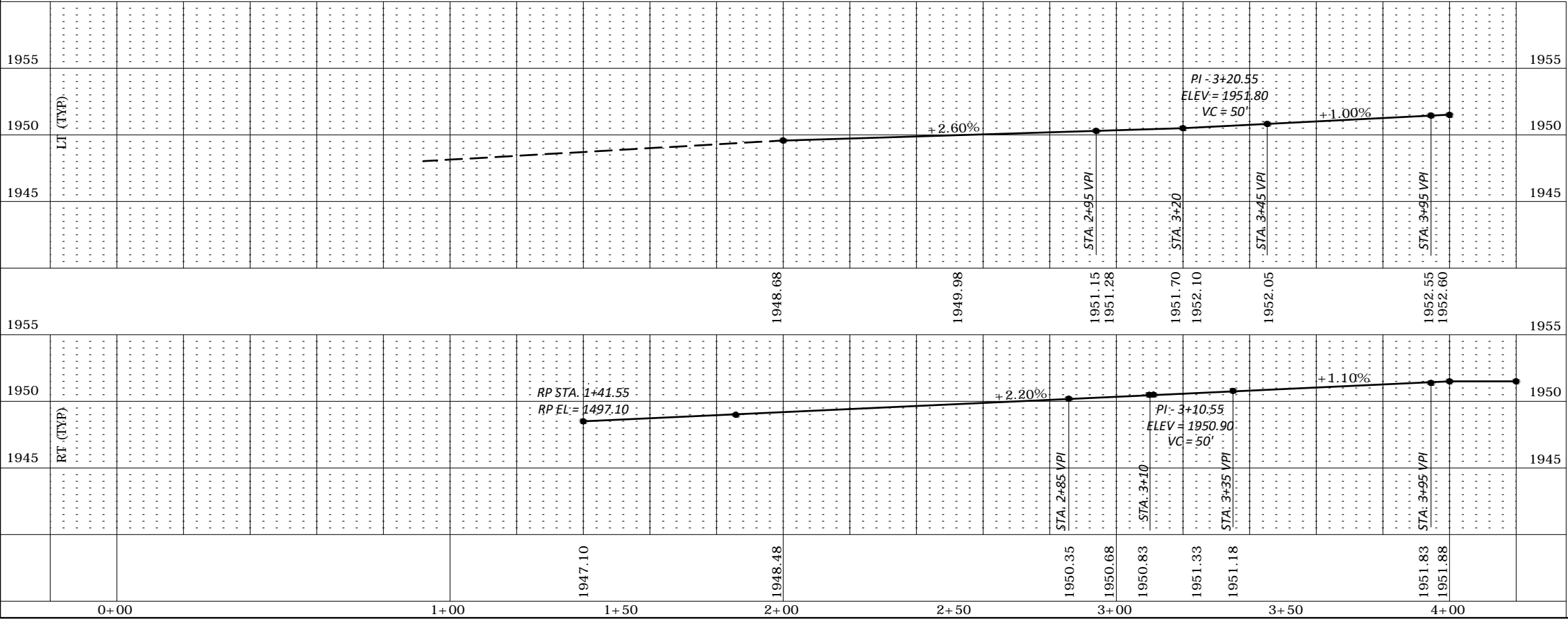
STA. 1+85 TO STA. 1+89 RT	3.56 SY
STA. 2+60.5 TO STA. 2+66 RT	4.89 SY
STA. 2+66 TO STA. 2+70 LT	3.56 SY
STA. 3+54 TO STA. 3+59 RT	4.44 SY

**ADJUST MANHOLE**

STA. 2+90.55 CL	1 EA
-----------------	------

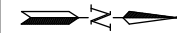
**DRIVEWAY CONCRETE**

STA. 1+30 TO STA. 1+88 LT	19.3 SY
STA. 1+93 TO STA. 2+18.5 LT	10.0 SY
STA. 3+11.5 TO STA. 3+40.5 LT	15.0 SY
STA. 3+84.5 TO STA. 4+15.5 LT	16.2 SY

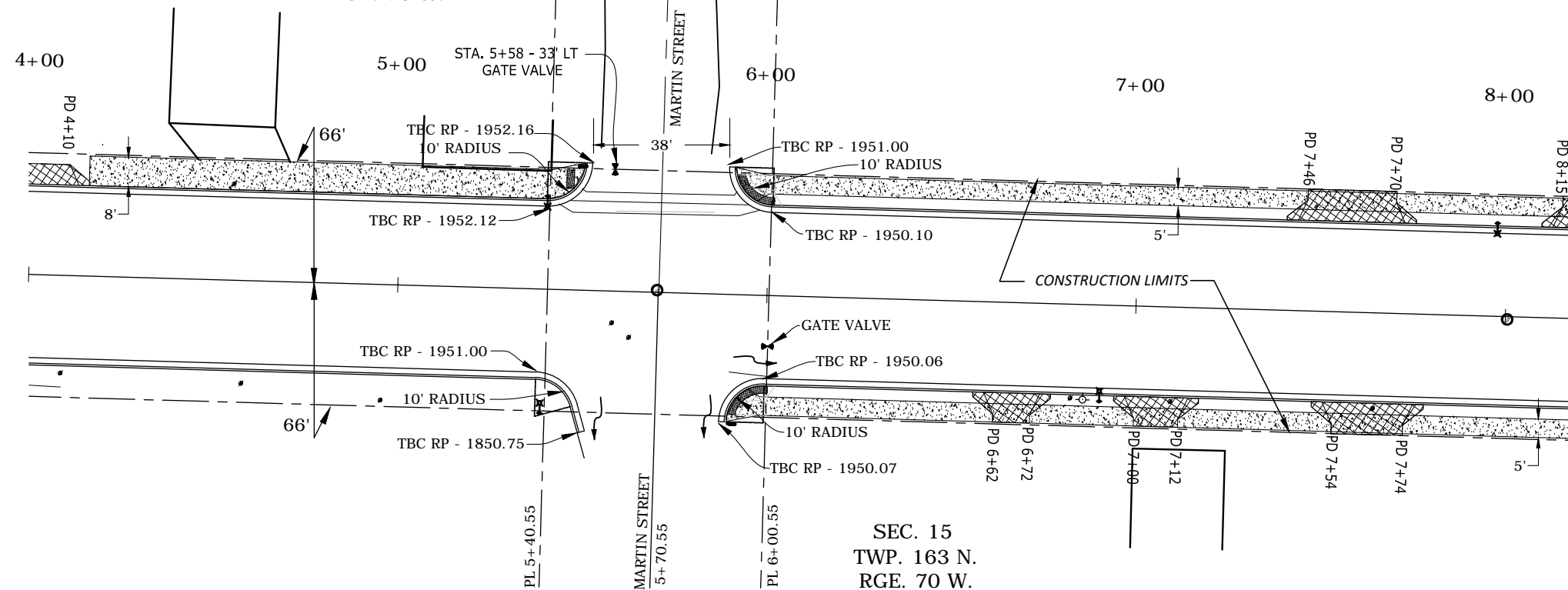


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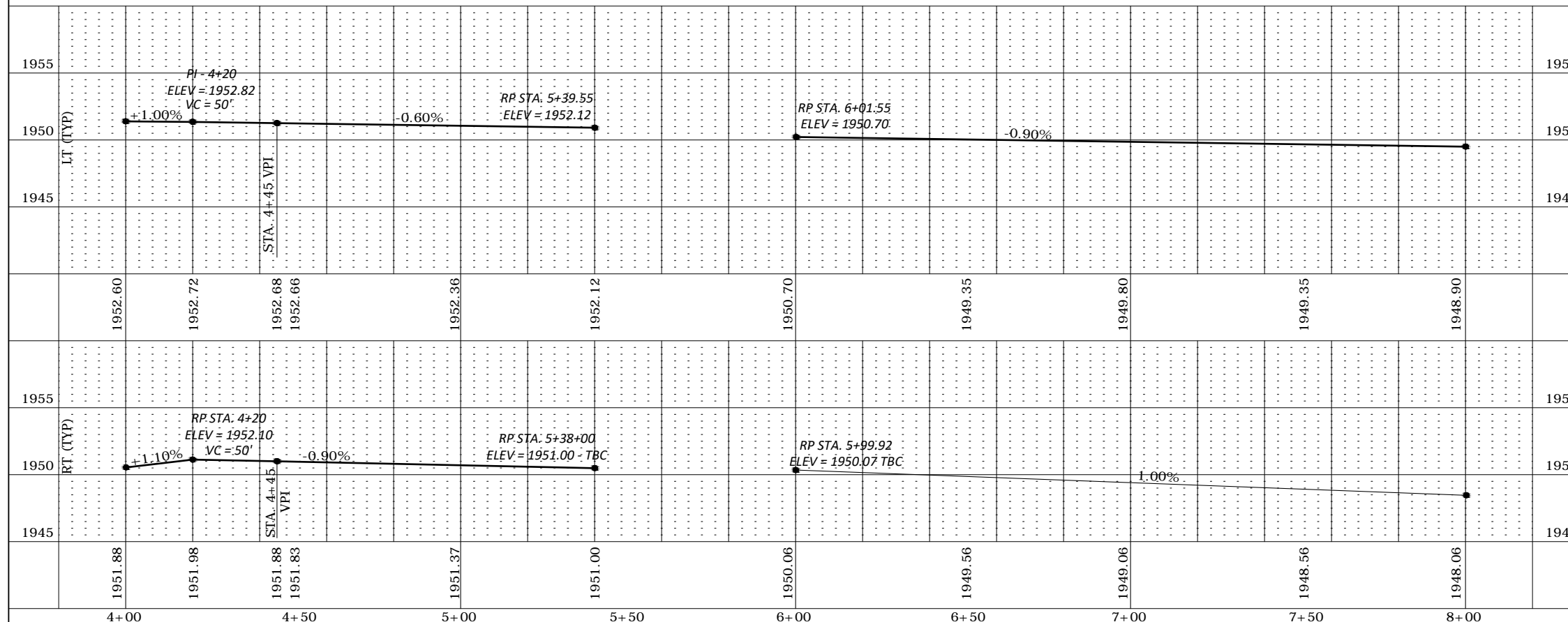
BENCH MARKS			
NO.	DESCRIPTION	LOCATION	ELEV.
PLAN & PROFILE STA. 0+00 TO 4+00			
FILE: RCp01001.dwg		0 200 400 600 SCALE IN FEET	



SEC. 15  
TWP. 163 N.  
RGE. 70 W.



SCALES:  
1" = 40' HOR  
1" = 10' VER



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOC-4006(066)	60	2

#### CURB & GUTTER - TYPE I

STA. 4+00 TO STA. 5+40.55 LT	140.6 LF
STA. 5+39.55 - 10' RADIUS LT	15.8 LF
STA. 6+01.55 TO STA. 8+00 LT	198.4 LF
STA. 6+01.55 - 10' RADIUS LT	15.8 LF
STA. 4+00 TO STA. 5+38.00 RT	138 LF
STA. 5+38.00 - 10' RADIUS RT	27.2 LF
STA. 5+99.92 TO 8+00 RT	200.1 LF
STA. 5+99.92 - 10' RADIUS RT	15.8 LF

#### ADJUST MANHOLE

STA. 5+70.55 CL	1 EA
STA. 8+00.55 CL	1 EA

#### VALLEY GUTTER 72IN

STA. 5+70.55 LT	30.0 SY
-----------------	---------

#### DRIVEWAY CONCRETE

STA. 6+62 TO STA. 6+72 RT	17.6 SY
STA. 7+00 TO STA. 7+12 RT	19.3 SY
STA. 7+40.5 TO STA. 7+75.5 LT	26.7 SY
STA. 7+48.5 TO STA. 7+79.5 RT	22.8 SY

#### SIDEWALK CONCRETE

STA. 4+10 TO STA. 5+49 LT	122.9 SY
STA. 5+91 TO STA. 7+46 LT	89.2 SY
STA. 5+91 TO STA. 6+62 RT	48.2 SY
STA. 6+72 TO STA. 7+00 RT	14.7 SY
STA. 7+12 TO STA. 7+54 RT	22.5 SY
STA. 7+70 TO STA. 8+15 LT	24.1 SY
STA. 7+74 TO STA. 8+00 LT	14.0 SY

#### ADJUST GATE VALVE BOX

STA. 5+58 - 33' LT	1 EA
STA. 6+00 - 12' RT	1 EA

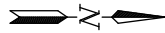
#### DETECTABLE WARNING PANEL

STA. 5+45 LT	10 SF
STA. 5+95 LT	25 SF
STA. 5+95 RT	26 SF

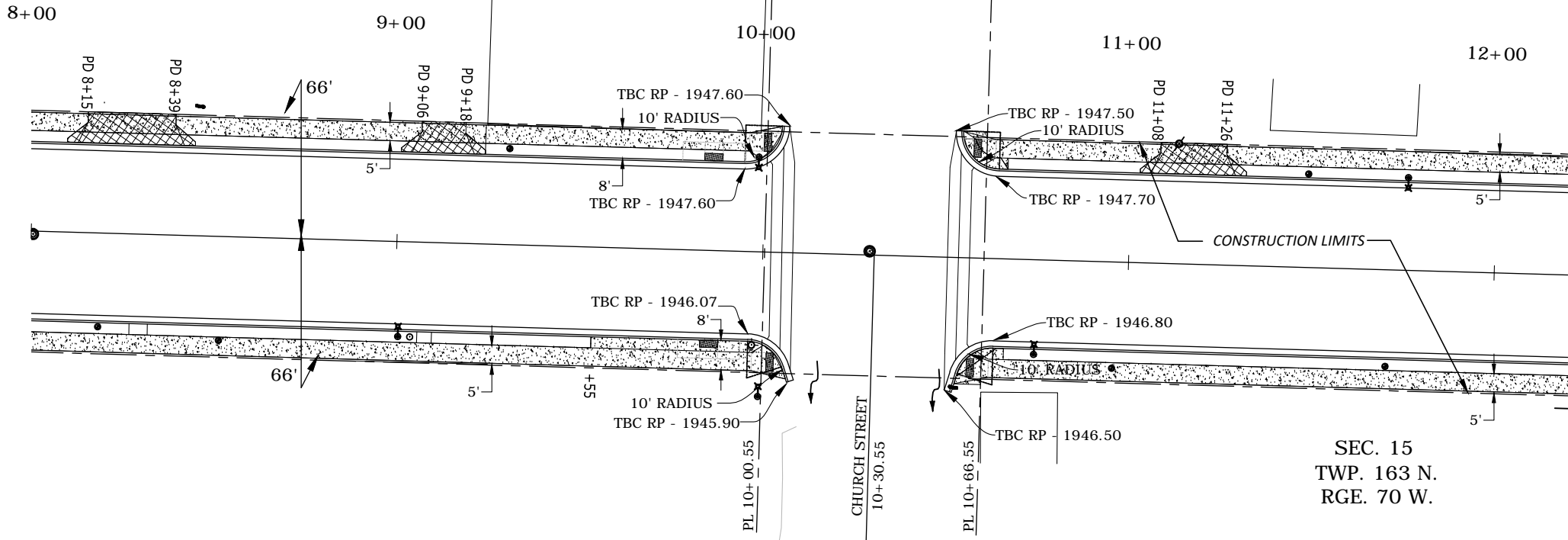


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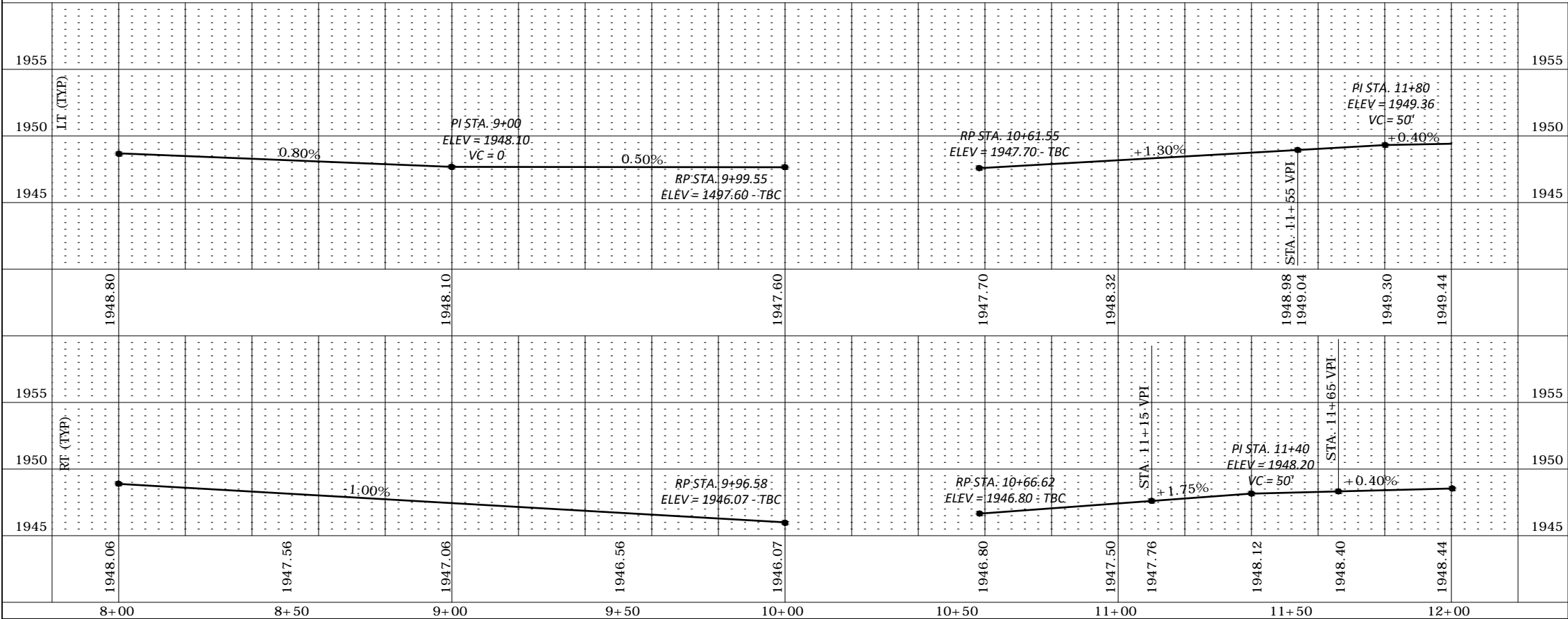
BENCH MARKS			
NO.	DESCRIPTION	LOCATION	ELEV.
PLAN & PROFILE STA. 4+00 TO 8+00			
FILE: RCp02001.dwg	 SCALE IN FEET		



SEC. 15  
TWP. 163 N.  
RGE. 70 W.



SCALES:  
1" = 40' HOR  
1" = 10' VER



STATE  
ND

PROJECT NO.  
SC-CNOC-4006(066)

SECTION NO.  
60

SHEET NO.  
3

**CURB & GUTTER - TYPE I**

STA. 8+00 TO STA. 9+99.55 LT	199.6 LF
STA. 9+99.55 - 10' RADIUS LT	15.8 LF
STA. 10+61.55 TO STA. 12+00 LT	138.4 LF
STA. 10+61.55 - 10' RADIUS LT	15.8 LF
STA. 8+00 TO STA. 9+96.58 RT	196.6 LF
STA. 9+96.58 - 10' RADIUS RT	16.7 LF
STA. 10+63.62 TO STA. 12+00 RT	133.4 LF
STA. 10+63.62 - 10' RADIUS RT	18.2 LF

**ADJUST MANHOLE**

STA. 10+30 CL	1 EA
---------------	------

**VALLEY GUTTER 72IN**

STA. 10+09 CL	34.7 SY
STA. 10+51 CL	34.7 SY

**DRIVEWAY CONCRETE**

STA. 8+09.5 TO STA. 8+44.5 LT	26.7 SY
STA. 9+06 TO STA. 9+18 LT	14.9 SY
STA. 11+02.5 TO STA. 11+31.5 LT	21.0 SY

**SIDEWALK CONCRETE**

STA. 8+39 TO STA. 10+06 LT	78.1 SY
STA. 8+00 TO STA. 9+55 RT	86.1 SY
STA. 9+55 TO STA. 10+09 RT	47.2 SY
STA. 10+57 TO STA. 11+08 LT	32.0 SY
STA. 10+57 TO STA. 12+00 RT	82.5 SY
STA. 11+26 TO STA. 12+00 LT	41.1 SY

**DETECTABLE WARNING PANEL**

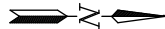
STA. 9+85 LT	10 SY
STA. 9+85 RT	10 SY
STA. 10+03 LT	10 SY
STA. 10+03 RT	10 SY
STA. 10+63 LT	10 SY
STA. 10+63 RT	10 SY

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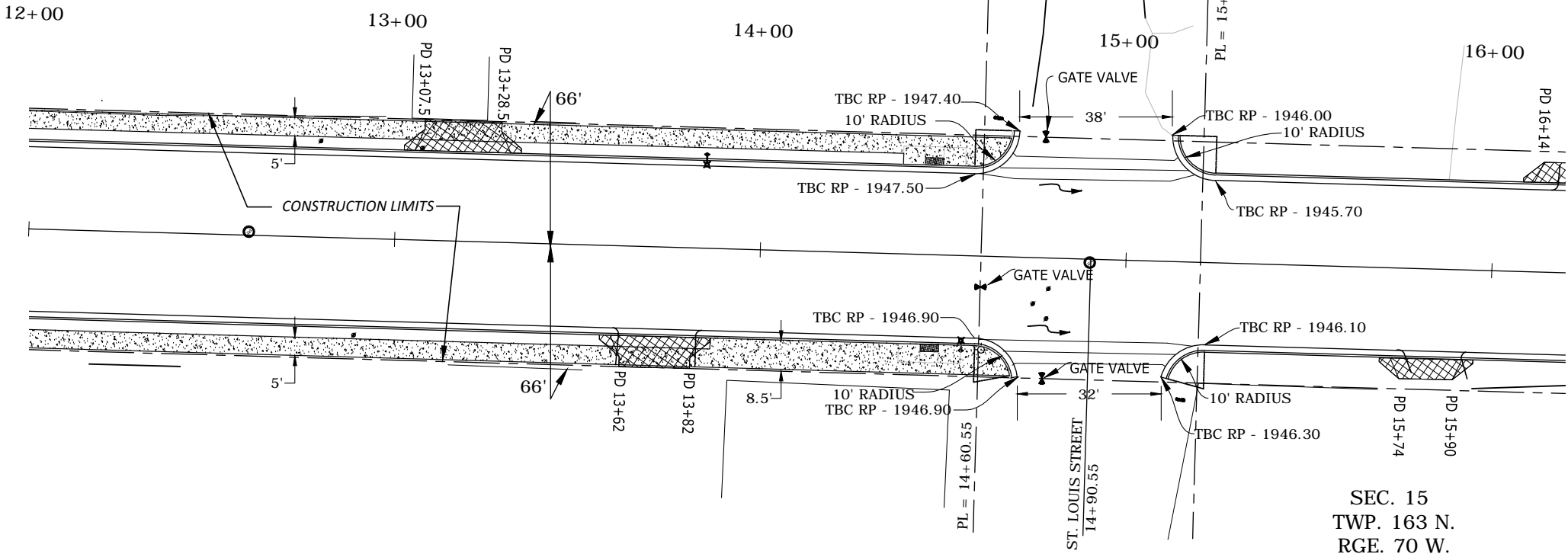
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BENCH MARKS			
NO.	DESCRIPTION	LOCATION	ELEV.

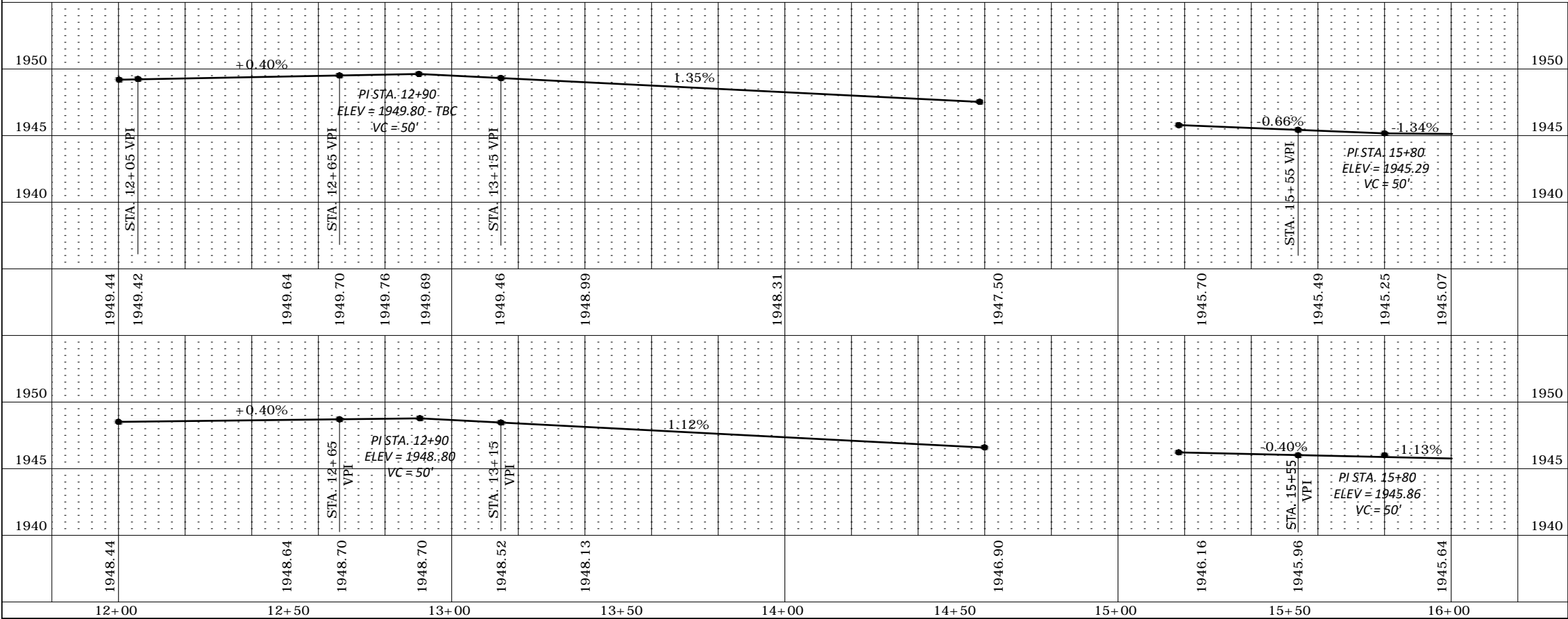
PLAN & PROFILE STA. 8+00 TO 12+00	
FILE: RCp03001.dwg	<p>SCALE IN FEET</p>



SEC. 15  
TWP. 163 N.  
RGE. 70 W.



SCALES:  
1" = 40' HOR  
1" = 10' VER



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOC-4006(066)	60	4

**CURB & GUTTER - TYPE I**

STA. 12+00 TO STA. 14+59.55 LT	259.6 LF
STA. 14+59.55 - 10' RADIUS LT	15.8 LF
STA. 15+21.55 TO STA. 16+00 LT	78.4 LF
STA. 15+21.55 - 10' RADIUS LT	15.8 LF
STA. 12+00 TO STA. 14+59.30 RT	259.3 LF
STA. 14+59.30 - 10' RADIUS RT	14.3 LF
STA. 15+22.15 TO STA. 16+00 RT	77.8 LF
STA. 15+22.15 - 10' RADIUS RT	13.3 LF

**ADJUST MANHOLE**

STA. 12+60 CL	1 EA
STA. 14+90 CL	1 EA

**VALLEY GUTTER 72IN**

STA. 14+90.55 LT	30 SY
STA. 14+90.55 RT	26 SY

**DRIVEWAY CONCRETE**

STA. 13+07.5 TO STA. 13+28.5 LT	13.1 SY
STA. 15+69.5 TO STA. 15+95.5 RT	13.7 SY
STA. 15+69.5 TO STA. 15+95.5 RT	13.7 SY

**SIDEWALK CONCRETE**

STA. 12+00 TO STA. 14+69 LT	152.6 SY
STA. 12+00 TO STA. 13+62 RT	81.4 SY

**ADJUST UTILITY APPURTENANCE (VALVE BOX)**

STA. 14+60 - 12' RT	1 EA
STA. 14+78 - 33' LT	1 EA
STA. 14+78 - 33' RT	1 EA

**DETECTABLE WARNING PANEL**

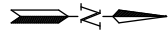
STA. 14+45 LT	10 SY
STA. 14+45 RT	10 SY



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BENCH MARKS			
NO.	DESCRIPTION	LOCATION	ELEV.
PLAN & PROFILE			
STA. 12+00 TO 16+00			
FILE: RCp04001.dwg	 SCALE IN FEET		





SEC. 15  
TWP. 163 N.  
RGE. 70 W.

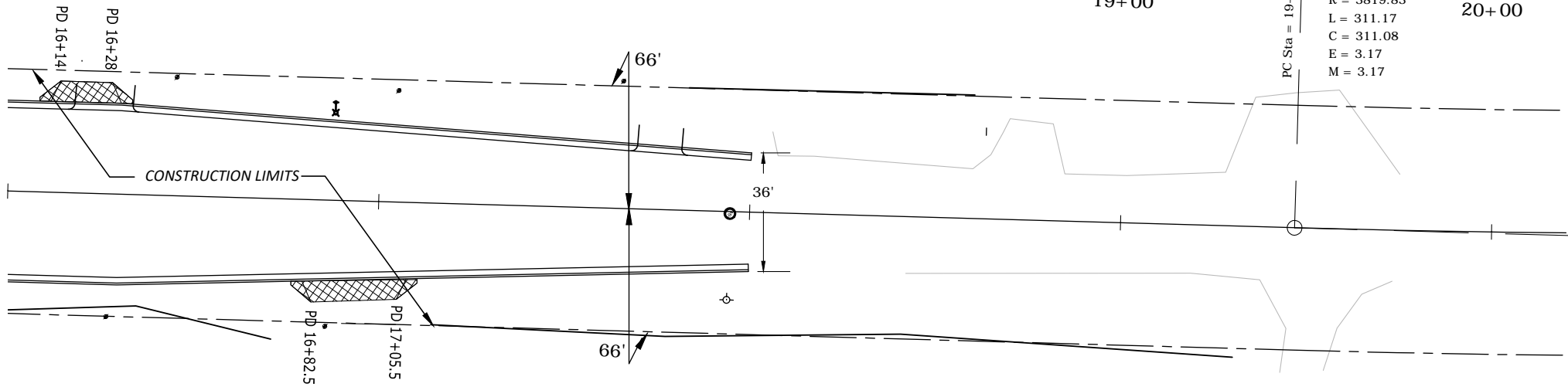
16+00

17+00

18+00

19+00

20+00



SEC. 15  
TWP. 163 N.  
RGE. 70 W.

SCALES:  
1" = 40' HOR  
1" = 10' VER

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOC-4006(066)	60	5

**CURB & GUTTER - TYPE I**

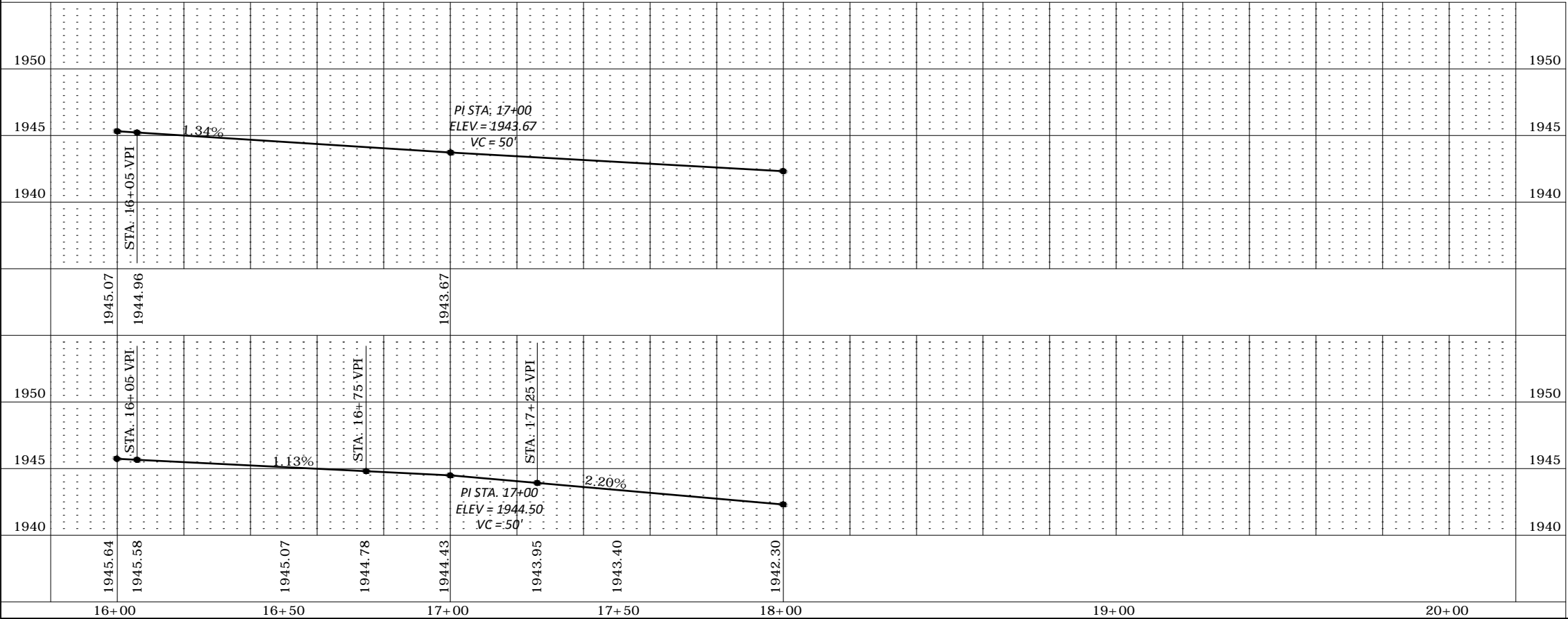
STA. 16+00 TO STA. 18+00 LT	200 LF
STA. 16+00 TO ST. 18+00 RT	200 LF

**ADJUST MANHOLE**

STA. 5+70.55 CL	1 EA
-----------------	------

**DRIVEWAY CONCRETE**

STA. 16+08.5 TO STA. 16+33.5	12.5 SY
STA. 16+82.5 TO STA. 17+05.5	11.3 SY

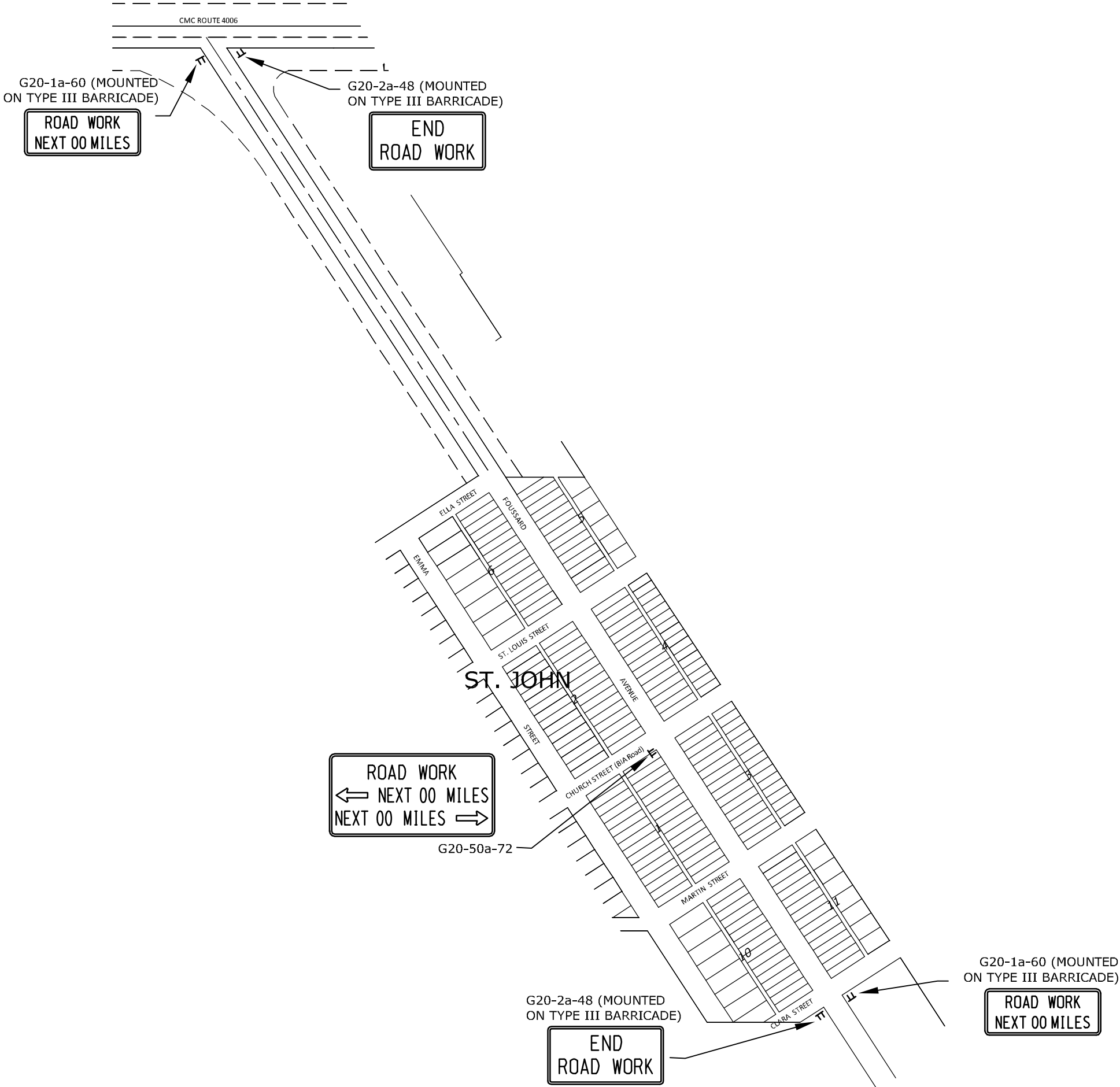


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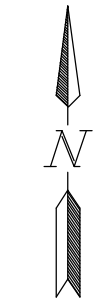
BENCH MARKS			
NO.	DESCRIPTION	LOCATION	ELEV.
PLAN & PROFILE STA. 16+00 TO E.O.P.			
FILE: RCp05001.dwg		0 20 40 60 SCALE IN FEET	



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-CNOC-4006(066)	100	2



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TRAFFIC CONTROL LAYOUT

?	This is a special text character used in the labeling of existing features. It indicates a feature that has an unknown characteristic, potentially based on: lack of description, location accuracy or purpose.		
Abn	abandoned	BV	butterfly valve
Abut	abutment	Byp	bypass
Ac	acres	C Gdrl	cable guardrail
Adj	adjusted	Calc	calculate
Aggr	aggregate	Cd	candela
Ahd	ahead	CIP	cast iron pipe
ARV	air release valve	CB	catch basin
Align	alignment	CRS	cationic rapid setting
Al	alley	C Gd	cattle guard
Alt	alternate	C To C	center to center
Alum	aluminum	Cl or C	centerline
ADA	Americans with Disabilities Act	Cm	centimeter
A	ampere	Ch	chain
&	and	Chnlk	chain-link
Appr	approach	Ch Blk	channel block
Approx	approximate	Ch Ch	channel change
ACP	asbestos cement pipe	Chk	check
Asph	asphalt	Chsld	chiseled
AC	asphalt cement	Cir	circle
Assmd	assumed	Cl	class
@	at	Cl	clay
Atten	attenuation	Cl F	clay fill
ATR	automatic traffic recorder	Cl Hvy	clay heavy
Ave	Avenue	Cl Lm	clay loam
Avg	average	Clnt	clean-out
ADT	average daily traffic	Clr	clear
Az	azimuth	Cl&gr	clearing & grubbing
Bk	back	Co S	coal slack
BF	back face	Comb.	combination
Bs	backsight	Coml	commercial
Balc	balcony	Compr	compression
B Wire	barbed wire	CADD	computer aided drafting & design
Barr	barricade	Conc	concrete
Btry	battery	Cond	conductor
Brg	bearing	Const	construction
BI	beehive inlet	Cont	continuous
Beg	begin	CSB	continuous split barrel sample
BM	bench mark	Contr	contraction
Bkwy	bikeway	Contr	contractor
Bit	bituminous	CP	control point
Blk	block	Coord	coordinate
Bd Ft	board feet	Cor	corner
BH	bore hole	Corr	corrected
BS	both sides	CAES	corrugated aluminum end section
Bot	bottom	CAP	corrugated aluminum pipe
Blvd	Boulevard	CMES	corrugated metal end section
Bndry	boundary	CMP	corrugated metal pipe
BC	brass cap	CPVCP	corrugated poly-vinyl chloride pipe
Brkwy	breakaway	CSES	corrugated steel end section
Br	bridge	CSP	corrugated steel pipe
Bldg	building	CSP	corrugated steel pipe
		C	coulomb
		Co	County
		Crse	course
		C Gr	course gravel
		CS	course sand
		Ct	Court
		Xarm	cross arm
		Xbuck	cross buck
		Xsec	cross sections
		Xing	crossing
		Xrd	Crossroad
		Crn	crown
		CF	cubic feet
		M3	cubic meter
		M3/s	cubic meters per second
		CY	cubic yard
		Cy/mi	cubic yards per mile
		Culv	culvert
		C&G	curb & gutter
		CI	curb inlet
		CR	curb ramp
		CS	curve to spiral
		C	cut
		Dd Ld	dead load
		Defl	deflection
		Defm	deformed
		Deg or D	degree
		DInt	delineate
		DIntr	delineator
		Depr	depression
		Desc	description
		Det	detail
		DWP	detectable warning panel
		Dtr	detour
		Dia	diameter
		Dir	direction
		Dist	distance
		DM	disturbed material
		DB	ditch block
		DG	ditch grade
		Dbl	double
		Dn	down
		Dwg	drawing
		Dr	drive
		Drwy	driveway
		DI	drop inlet
		D	dry density
		Ea	each
		Esmt	easement
		E	East
		EB	Eastbound
		Elast	elastomeric
		EL	electric locker
		E Mtr	electric meter
		Elec	electric/al
		EDM	electronic distance meter
		Elev or El	elevation
		Ellipt	elliptical
		Emb	embankment
		Emuls	emulsion/emulsified
		ES	end section
		Engr	engineer
		ESS	environmental sensor station
		Eq	equal
		Eq	equation
		Evgr	evergreen
		Exc	excavation
		Exst	existing
		Exp	expansion
		Expy	Expressway
		E	external of curve
		Extru	extruded
		FOS	factor of safety
		F	Fahrenheit
		FS	far side
		F	farad
		Fed	Federal
		FP	feed point
		Ft	feet/foot
		Fn	fence
		Fn P	fence post
		FO	fiber optic
		FB	field book
		FD	field drive
		F	fill
		FAA	fine aggregate angularity
		FS	fine sand
		FH	fire hydrant
		FI	flange
		Flrd	flared
		FES	flared end section
		F Bcn	flashing beacon
		FA	flight auger sample
		FL	flow line
		Ftg	footing
		FM	force main
		Fs	foresight
		Fnd	found
		Fdn	foundation
		Frac	fractional
		Frwy	freeway
		Frt	front
		FF	front face
		F Disp	fuel dispenser

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NDDOT ABBREVIATIONS

D-101-2

FFP	fuel filler pipes	IPn	Iron Pin	MC	medium curing	Ped	pedestal
FLS	fuel leak sensor	IP	Iron Pipe	M	mega	Ped	pedestrian
Furn	furnish/ed	Jt	joint	Mer	meridian	PPP	pedestrian pushbutton post
Gal	gallon	J	joule	M	meter	Pen.	penetration
Galv	galvanized	Jct	junction	M/s	meters per second	Perf	perforated
Gar	garage	K	kelvin	M	mid ordinate of curve	Per.	perimeter
Gs L	gas line	Kn	kilo newton	Mi	mile	PL	pipeline
G Reg	gas line regulator	Kpa	kilo pascal	MM	mile marker	PI	place
GMV	gas main valve	Kg	kilogram	MP	mile post	P&P	plan & profile
G Mtr	gas meter	Kg/m3	kilogram per cubic meter	MI	milliliter	PL	plastic limit
GSV	gas service valve	Km	kilometer	Mm	millimeter	PI	plate
GVP	gas vent pipe	K	Kip(s)	Mm/hr	millimeters per hour	Pt	point
GV	gate valve	LS	Land Surveyor (licensed)	Min	minimum	PCC	point of compound curve
Ga	gauge	LSIT	Land Surveyor In Training	Misc	miscellaneous	PC	point of curve
Geod	geodetic	Ln	lane	Mon	monument	PI	point of intersection
GIS	Geographical Information System	Lg	large	Mnd	mound	PRC	point of reverse curvature
G	giga	Lat	latitude	Mtbl	mountable	PT	point of tangent
GPS	Global Positioning System	Lt	left	Mtd	mounted	POC	point on curve
Gov	government	L	length of curve	Mtg	mounting	POT	point on tangent
Grd	graded/grade	Lens	lenses	Mk	muck	PE	polyethylene
Gr	gravel	Lvl	level	Mun	municipal	PVC	polyvinyl chloride
Grnd	ground	LB	level book	N	nano	PCC	Portland Cement concrete
GWM	ground water monitor	Lvlng	leveling	NGS	National Geodetic Survey	Lb or #	pounds
Gdrl	guardrail	Lht	light	NS	near side	PP	power pole
Gtr	gutter	LP	light pole	Neop	neoprene	Preempt	preemption
H Plg	H piling	Ltg	lighting	Ntwk	network	Prefab	prefabricated
Hdwl	headwall	Lig Co	lignite coal	N	newton	Prfmd	preformed
Ha	hectare	Lig Sl	lignite slack	N	North	Prep	preperation
Ht	height	LF	linear foot	NE	North East	Press.	pressure
HI	height of instrument	Liq	liquid	NW	North West	PRV	pressure relief valve
Hel	helical	LL	liquid limit	NB	Northbound	Prestr	prestressed
H	henry	L	litre	No. or #	number	Pvt	private
Hz	hertz	Lm	loam	Obsc	obscure(d)	PD	private drive
HDPE	high density polyethylene	Loc	location	Obsn	observation	Prod.	production/produce
HM	high mast	LC	long chord	Ocpd	occupied	Prog	programmed
HP	high pressure	Long.	longitude	Ocpy	occupy	Prop.	property
HPS	high pressure sodium	Lp	loop	Off Loc	office location	Prop Ln	property line
Hwy	highway	LD	loop detector	O/s	offset	Ppsd	proposed
Hor	horizontal	Lm	lumen	OC	on center	PB	pull box
HBP	hot bituminous pavement	Lum	luminaire	C	one dimensional consolidation		
HMA	hot mix asphalt	L Sum	lump sum	OC	organic content		
Hr	hour(s)	Lx	lux	Orig	original		
Hyd	hydrant	ML	main line	O To O	out to out		
Ph	hydrogen ion content	M Hr	man hour	OD	outside diameter		
Id	identification	MH	manhole	OH	overhead		
In or "	inch	Mkd	marked	PMT	pad mounted transformer		
Incl	inclinometer tube	Mkr	marker	Pg	pages		
IMH	inlet manhole	Mkg	marking	Pntd	painted		
ID	inside diameter	MA	mast arm	Pr	pair		
Inst	instrument	Matl	material	Pnl	panel		
Intchg	interchange	Max	maximum	Pk	park		
Intmdt	intermediate	MC	meander corner	PK	Parker-Kalon nail		
Intscn	intersection	Meas	measure	Pa	pascal		
Inv	invert	Mdn	median	PSD	passing sight distance		
IM	iron monument	MD	median drain	Pvmt	pavement		

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08-03-15	General Revisions

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NDDOT ABBREVIATIONS

D-101-3

Qty	quantity	SN	sign number	Tan	tangent	Wb	weber
Qtr	quarter	Sig	signal	T	tangent (semi)	WIM	weigh in motion
Rad or R	radius	Si Cl	silt clay	TS	tangent to spiral	W	west
RR	railroad	Si Cl Lm	silty clay loam	Tel	telephone	WB	westbound
Rlwy	railway	Si Lm	silty loam	Tel B	Telephone Booth	Wrng	wiring
Rsd	raised	Sgl	single	Tel P	telephone pole	W/	with
RTP	random traverse point	SC	slow curing	Tv	television	W/o	without
Rge or R	range	SS	slow setting	Temp	temperature	WC	witness corner
RC	rapid curing	Sm	small	Temp	temporary	WGS	world geodetic system
Rec	record	S	South	TBM	temporary bench mark	Z	zenith
Rcy	recycle	SE	South East	T	tesla		
RAP	recycled asphalt pavement	SW	South West	T	thinwall tube sample		
RPCC	recycled portland cement concrete	SB	Southbound	T/mi	tons per mile		
Ref	reference	Sp	spaces	Ts	topsoil		
R Mkr	reference marker	Spcl	special	Twp or T	township		
RM	reference monument	SA	special assembly	Traf	traffic		
Refl	reflectorized	SP	special provisions	TSCB	traffic signal control box		
RCB	reinforced concrete box	G	specific gravity	Tr	trail		
RCES	reinforced concrete end section	Spk	spike	Transf	transformer		
RCP	reinforced concrete pipe	SC	spiral to curve	TB	transit book		
RCPS	reinforced concrete pipe sewer	ST	spiral to tangent	Trans	transition		
Reinf	reinforcement	SB	split barrel sample	TT	transmission tower		
Res	reservation	SH	sprinkler head	Trans	transverse		
Ret	retaining	SV	sprinkler valve	Trav	traverse		
Rev	reverse	Sq	square	TP	traverse point		
Rt	right	SF	square feet	Trtd	treated		
R/W	right of way	Km2	square kilometer	Trmt	treatment		
Riv	river	M2	square meter	Qc	triaxial compression		
Rd	road	SY	square yard	TERO	tribal employment rights ordinance		
Rdbd	road bed	Stk	stake	Tpl	triple		
Rdwy	roadway	Std	standard	TP	turning point		
RWIS	roadway weather information system	N	standard penetration test	Typ	typical		
Rk	rock	Std Specs	standard specifications	Qu	unconfined compressive strength		
Rt	route	Sta	station	Ugrnd	underground		
Salv	salvage(d)	Sta Yd	station yards	USC&G	US Coast & Geodetic Survey		
Sd	sand	Stm L	steam line	USGS	US Geologic Survey		
Sdy Cl	sandy clay	SEC	steel encased concrete	Util	utility		
Sdy Cl Lm	sandy clay loam	SMA	stone matrix asphalt	VG	valley gutter		
Sdy Fl	sandy fill	SSD	stopping sight distance	Vap	vapor		
Sdy Lm	sandy loam	SD	storm drain	Vert	vertical		
San	sanitary sewer line	St	street	VC	vertical curve		
Sc	scoria	SPP	structural plate pipe	VCP	vitrified clay pipe		
Sec	seconds	SPPA	structural plate pipe arch	V	volt		
Sec	section	Str	structure	Vol	volume		
SL	section line	Subd	subdivision	Wkwy	walkway		
Sep	separation	Sub	subgrade	W	water content		
Seq	sequence	Sub Prep	subgrade preperation	WGV	water gate valve		
Serv	service	Ss	subsoil	WL	water line		
Sh	shale	SE	superelevation	WM	water main		
Sht	sheet	SS	supplement specification	WMV	water main valve		
Shtng	sheeting	Supp	supplemental	W Mtr	water meter		
Shldr	shoulder	Surf	surfacing	WSV	water service valve		
Sw	sidewalk	Surv	survey	WW	water well		
S	siemens	Sym	symmetrical	W	watt		
SD	sight distance	SI	systems international	Wrng	wearing		

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NDDOT UTILITY COMPANY AND ORGANIZATION ABBREVIATIONS

D-101-10

702COM 702 Communications  
ACCENT Accent Communications  
AGASSIZ WU Agassiz Water Users Incorporated  
AGC Associated General Contractors of America  
All PI Alliance Pipeline  
ALL SEAS WU All Seasons Water Users Association  
AMOCO PI Amoco Pipeline Company  
AMRDA HESS Amerada Hess Corporation  
AT&T AT&T Corporation  
B PAW Bear Paw Energy Incorporated  
BAKER ELEC Baker Electric  
BASIN ELEC Basin Electric Cooperative Incorporated  
BEK TEL Bek Communications Cooperative  
BELLE PL Belle Fourche Pipeline Company  
BLM Bureau of Land Management  
BNSF Burlington Northern Santa Fe Railway  
BOEING Boeing  
BRNS RWD Barnes Rural Water District  
BURK-DIV ELEC Burke-Divide Electric Cooperative  
BURL WU Burleigh Water Users  
Cable One Cable One  
CABLE SERV Cable Services  
CAP ELEC Capital Electric Cooperative Incorporat  
CASS CO ELEC Cass County Electric Cooperative  
CASS RWU Cass Rural Water Users Incorporated  
CAV ELEC Cavalier Rural Electric Cooperative  
CBLCOM Cablecom Of Fargo  
CENEX PL Cenex Pipeline  
CENT PL WATER DIST Central Pipe Line Water District  
CENT PWR ELEC Central Power Electric Cooperative  
COE Corps of Engineers  
CONS TEL Consolidated Telephone  
CONT RES Continental Resource Inc  
CPR Canadian Pacific Railway  
D O E Department Of Energy  
DAK CARR Dakota Carrier Network  
DAK CENT TEL Dakota Central Telephone  
DAK RWD Dakota Rural Water District  
DGC Dakota Gasification Company  
DICKY R NET Dickey Rural Networks  
DICKY RWU Dickey Rural Water Users Association  
DICKY TEL Dickey Telephone  
DNRR Dakota Northern Railroad  
DOME PL Dome Pipeline Company  
DVELEC Dakota Valley Electric Cooperative  
DVMW Dakota, Missouri Valley & Western  
ENBRDG Enbridge Pipelines Incorporated  
ENVENTIS Enventis Telephone  
FALK MNG Falkirk Mining Company  
FHWA Federal Highway Administration  
G FKS-TRL WD Grand Forks-trail Water District  
GETTY TRD & TRAN Getty Trading & Transportation  
GLDN W ELEC Golden West Electric Cooperative  
GRGS CO TEL Griggs County Telephone

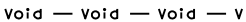

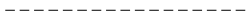
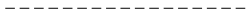
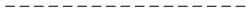

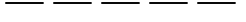
















GT PLNS NAT GAS Great Plains Natural Gas Company  
HALS TEL Halstad Telephone Company  
IDEA1 Idea1  
INT-COMM TEL Inter-Community Telephone Company  
KANEB PL Kaneb Pipeline Company  
KEM ELEC Kem Electric Cooperative Incorporated  
KOCH GATH SYS Koch Gathering Systems Incorporated  
LKHD PL Lakehead Pipeline Company  
LNGDN RWU Langdon Rural Water Users Incorporated  
LWR YELL R ELEC Lower Yellowstone Rural Electric  
MCKNZ CON McKenzie Consolidated Telcom  
MCKNZ ELEC McKenzie Electric Cooperative  
MCKNZ WRD McKenzie County Water Resource District  
MCLEOD McLeod USA  
MCLN ELEC McLean Electric Cooperative  
MCLN-SHRDN R WAT McLean-Sheridan Rural Water  
MDU Montana-dakota Utilities  
MID-CONT CABLE Mid-Continent Cable  
MIDSTATE TEL Midstate Telephone Company  
MINOT CABLE Minot Cable Television  
MINOT TEL Minot Telephone Company  
MISS W W S Missouri West Water System  
MNKOTA PWR Minnkota Power  
MOR-GRAN-SOU ELEC Mor-gran-sou Electric Cooperative  
MOUNT-WILLI ELEC Mountrail-williams Electric Cooperative  
MRE LBTY TEL Moore & Liberty Telephone  
MUNICIPAL City Water And Sewer  
MUNICIPAL City Of '.....'  
N CENT ELEC North Central Electric Cooperative  
N VALL W DIST North Valley Water District  
ND PKS & REC North Dakota Parks And Recreation  
ND TEL North Dakota Telephone Company  
NDDOT North Dakota Department of Transportation  
NDSU SOIL SCI DEPT NDSU Soil Science Department  
NEMONT TEL Nemont Telephone  
NODAK R ELEC Nodak Rural Electric Cooperative  
NOON FRMS TEL Noonan Farmers Telephone Company  
NPR Northern Plains Railroad  
NSP Northern States Power  
NTH PRAIR RW Northern Prairie Rural Water Association  
NTHN BRDR PL Northern Border Pipeline  
NTHN PLNS ELEC Northern Plains Electric Cooperative Incorporated  
NTHWSTRN REF Northwestern Refinery Company  
NW COMM Northwest Communication Cooperation  
ONEOK Oneok gas  
OSHA Occupational Safety and Health Administration  
OTTR TL PWR Otter Tail Power Company  
P L E M Prairielands Energy Marketing  
POLAR COM Polar Communications  
PVT ELEC Private Electric  
QWEST Qwest Communications  
R&T W SUPPLY R & T Water Supply Association  
RAMSEY R SEW Ramsey Rural Sewer Association  
RAMSEY RW Ramsey Rural Water Association  
RAMSEY UTIL Ramsey County Rural Utilities

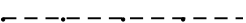



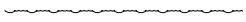
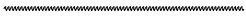
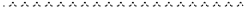





RED RIV TEL Red River Rural Telephone  
RESVTN TEL Reservation Telephone  
ROBRTS TEL Roberts Company Telephone  
R-RIDER ELEC Roughrider Electric Coop  
RRVW Red River Valley & Western Railroad  
RSR ELEC R.S.R. Electric Cooperative  
S E W U South East Water Users Incorporated  
SCOTT CABLE Scott Cable Television Dickinson  
SHERDN ELEC Sheridan Electric Cooperative  
SHEYN VLY ELEC Sheyenne Valley Electric Cooperative  
SKYTECH Skyland Technologies Incorporated  
SLOPE ELEC Slope Electric Cooperative Incorporated  
SOURIS RIV TELCOM Souris River Telecommunications  
ST WAT COMM State Water Commission  
STATE LN WATER State Line Water Cooperative  
STER ENG Sterling Energy  
STUT RWU Stutsman Rural Water Users  
SW PL PRJ Southwest Pipeline Project  
T M C Turtle Mountain Communications  
TCI TCI of North Dakota  
TESORO HGH PLNS PL Tesoro High Plains Pipeline  
TRI-CNTY WU Tri-County Water Users Incorporated  
TRL CO RWU Traill County Rural Water Users  
UNTD TEL United Telephone  
UPPR SOUR WUA Upper Souris Water Users Association  
US SPRINT U.S. Sprint  
USAF MSL CABLE U.S.A.F. Missile Cable  
USFWS US Fish and Wildlife Service  
USW COMM U.S. West Communications  
VRNDRY ELEC Verendrye Electric Cooperative  
W RIV TEL West River Telephone Incorporated  
WEB W. E. B. Water Development Association  
WILLI RWA Williams Rural Water Association  
WILSTN BAS PL Williston Basin Interstate Pipeline Company  
WLSH RWD Walsh Water Rural Water District  
WOLVRTN TEL Wolverton Telephone  
XLENER Xcel Energy  
YSVR Yellowstone Valley Railroad

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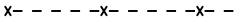

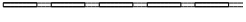
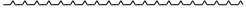

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Existing Topography









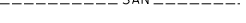
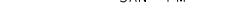












	Existing Ground Void
	Existing Cemetary Boundary
	Existing Box Culvert Bridge
	Existing Concrete Surface
	Existing Drainage Structure
	Existing Gravel Surface
	Existing Riprap
	Existing Dirt Surface
	Existing Asphalt Surface
	Existing Tie Point Line
	Existing Railroad Centerline
	Existing Guardrail Cable
	Existing Guardrail Metal
	Existing Edge of Water
	Existing Fence
	Existing Railroad
	Existing Field Line
	Exst Flow
	Existing Curb
	Existing Valley Gutter
	Existing Driveway Gutter
	Existing Curb and Gutter
	Existing Mountable Curb and Gutter

	Existing 3-Cable w Posts
	Site Boundary
	Existing Berm, Dike, Pit, or Earth Dam
	Existing Ditch Block
	Existing Tree Boundary
	Existing Brush or Shrub Boundary
	Existing Retaining Wall
	Existing Planter or Wall
	Existing W-Beam Guardrail with Posts
	Existing Railroad Switch
	Gravel Pit - Borrow Area
	Existing Wet Area-Vegetation Break

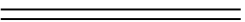


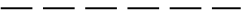
Proposed Topography

	3-Cable w Posts
	Flow
	Fence
	Remove Line
	Wall
	Retaining Wall (Plan View)
	W-Beam w Posts

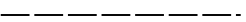
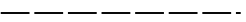







Existing Utilities

	Existing Electrical
	Existing Fiber Optic Line
	Existing TV Fiber Optic
	Existing Gas Pipe
	Existing Overhead Utility Line
	Existing Power
	Existing Fuel Pipeline
	Existing Undefined Above Ground Pipe Line
	Existing Sanitary Sewer
	Existing Sanitary Force Main
	Existing Storm Drain
	Existing Storm Drain Force Main
	Existing Culvert
	Existing Telephone Line
	Existing TV Line
	Existing Water or Steam Line
	Existing Under Drain
	Existing Slotted Drain
	Existing Conduit
	Existing Conductor
	Existing Down Guy Wire Down Guy
	Existing Underground Vault or Lift Station




Proposed Utilities

	24 Inch Pipe
	Reinforced Concrete Pipe
	Under Drain
	Edge Drain

Traffic Utilities

	Conductor
	Fiber Optic
	Existing Loop Detector
	Existing Double Micro Loop Detector
	Micro Loop Detector Double
	Existing Micro Loop Detector
	Micro Loop Detector
	Signal Head with Mast Arm
	Existing Signal Head with Mast Arm

Sign Structures

	Existing Overhead Sign Structure
	Existing Overhead Sign Structure Cantilever
	Overhead Sign Structure Cantilever

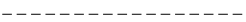
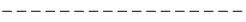




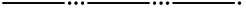






NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
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09-23-16	Added and Revised Items, Organized by Functional Groups

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Roger Weigel,  
Registration Number  
PE-2930,  
on 09/23/16 and the original document is stored at the  
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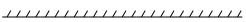










Line Styles

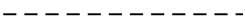
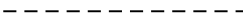
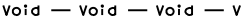
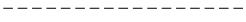




Right Of Way

	Easement
	Existing Easement
	Right of Way
	Existing Right of Way
	Existing Right of Way Railroad
	Existing Right of Way Not State Owned
	Existing Government Lot Line
	Existing Adjacent Block Lines
	Existing Adjacent Lot Lines
	Existing Adjacent Property Line
	Existing Adjacent Subdivision Lines
	Sight Distance Triangle Line
	Dimension Leader







Boundary Control



	Existing City Corporate Limits or Reservation Boundary
	Existing State or International Line
	Existing Township
	Existing County
	Existing Section Line
	Existing Quarter Section Line
	Existing Sixteenth Section Line
	Existing Centerline
	Tangent Line

Cross Sections and Typicals



	Existing Ground
	Existing Topsoil (Cross Section View)
	Existing Ground Void (Not Surveyed)
	Existing Concrete
	Existing Aggregate (Cross Section View)
	Existing Curb and Gutter (Cross Section View)
	Existing Asphalt (Cross Section View)
	Existing Reinforcement Rebar

Geotechnical


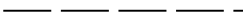
	Geotextile Fabric Type D
	Geogrid
	Geotextile Fabric Type R
	Geotextile Fabric Type R1
	Geotextile Fabric Type RR
	Geotextile Fabric Type S

	Subgrade Reinforcement
	Failure Line


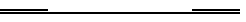

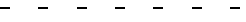


Countours

	Depression Contours
	Supplemental Contour



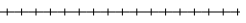
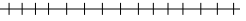
Profile

	Subgrade, Subcut or Ditch Grade
	Topsoil Profile










Striping

	Centerline Pavement Marking
	Barrier with Centerline Pavement Marking
	Barrier Pavement Marking
	Stripe 4 IN Dotted Extension White
	Stripe 8 IN Dotted Extension White
	Stripe 8 IN Lane Drop

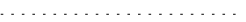



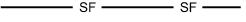

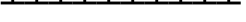
Pavement Joints

	Doweled Joint
	Tie Bar 30 Inch 4 Foot Center to Center
	Tie Bar 18 Inch 3 Foot Center to Center
	Tie Bar at Random Spacing



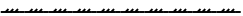
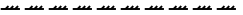
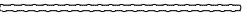
Bridge Details

	Hidden Object
	Small Hidden Object
	Large Hidden Object
	Phantom Object
	Centerline Main
	Centerline
	Existing Ground (Details)
	Existing Conditions
	Sheet Piling

Erosion Control

	Limits of Const Transition Line
	Bale Check
	Rock Check
	Floating Silt Curtain
	Silt Fence
	Excavation Limits
	Fiber Rolls

Environmental

	Wetland Mitigation
	Existing Wetland Easement USFWS
	Existing Wetland Jurisdictional
	Existing Wetland
	Tree Row

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
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





















































































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Symbols

	North Arrow (Half Scale)		Attenuation Device		Existing Railroad Battery Box		Existing Delineator Type E										
	Truck Mounted Attenuator		Diamond Grade Delineator Type A		Existing Bush or Shrub		Existing EFB Misc										
	Type I Barricade		Diamond Grade Delineator Type B		Existing Gas Cap or Stub		Existing Flashing Beacon										
	Type II Barricade		Diamond Grade Delineator Type C		Existing Sanitary Cap or Stub		Existing Pipe Mounted Flasher										
	Type III Barricade		Diamond Grade Delineator Type D		Existing Storm Drain Cap or Stub		Existing Pad Mounted Feed Point										
	Catch Basin		Diamond Grade Delineator Type E		Existing Water Cap or Stub		Existing Pipe Mounted Feed Point with Pad										
	Cairn or Stone Circle		Flexible Delineator		Existing Sanitary Cleanout		Existing Pole Mounted Feed Point										
	Video Detection Camera		Flexible Delineator Type A		Existing Concrete Foundation		Existing Railroad Frog										
	Storm Drain Cap or Stub		Flexible Delineator Type B		Existing Traffic Signal Controller		Existing Snow Gate 18										
	Corrugated Metal End Section 18 Inch		Flexible Delineator Type C		Existing Pad Mounted Signal Controller		Existing Snow Gate 28										
	Corrugated Metal End Section 24 Inch		Flexible Delineator Type D		Existing Sixteenth Section Corner		Existing Snow Gate 40										
	Corrugated Metal End Section 30 Inch		Flexible Delineator Type E		Existing Quarter Section Corner		Existing Headwall										
	Corrugated Metal End Section 36 Inch		Delineator Type A		Existing Section Corner		Existing Pedestrian Head with Number										
	Corrugated Metal End Section 42 Inch		Delineator Type A Reset		Existing Railroad Crossbuck		Existing Signal Head										
	Corrugated Metal End Section 48 Inch		Delineator Type B		Existing Satellite Dish		Existing Sprinkler Head										
	Concrete Foundation		Delineator Type B Reset		Existing Fuel Dispensers		Existing Fire Hydrant										
	Ground Connection Conductor		Delineator Type C		Existing Flexible Delineator Type A		Existing Catch Basin Drop Inlet										
	Neutral Connection Conductor		Delineator Type D		Existing Flexible Delineator Type B		Existing Curb Inlet										
	Phase 1 Connection Conductor		Delineator Type E		Existing Flexible Delineator Type C		Existing Manhole Inlet										
	Phase 2 Connection Conductor		Delineator Drums		Existing Flexible Delineator Type D		Existing Junction Box										
	Traffic Cone		Spot Elevation		Existing Flexible Delineator Type E	<table><tr><th colspan="2">NORTH DAKOTA DEPARTMENT OF TRANSPORTATION</th></tr><tr><th colspan="2">07-01-14</th></tr><tr><th colspan="2">REVISIONS</th></tr><tr><th>DATE</th><th>CHANGE</th></tr><tr><td></td><td></td></tr></table>		NORTH DAKOTA DEPARTMENT OF TRANSPORTATION		07-01-14		REVISIONS		DATE	CHANGE		
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION																	
07-01-14																	
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	Signal Controller		Existing Access Control Arrow		Existing Delineator Type A												
	Pad Mounted Signal Controller		Existing Artifact		Existing Delineator Type B												
	Alignment Data Point		Existing Flashing Beacon		Existing Delineator Type C												
	Emergency Vehicle Detector		Existing Benchmark		Existing Delineator Type D												

Symbols
































































































D-101-31

	Existing Light Standard		Existing Manhole with Valve Water		Existing Telephone Pole		Existing Undefined Manhole
	Existing High Mast Light Standard 10 Luminaire		Existing Water Manhole		Existing Wood Pole		Existing Undefined Pull Box
	Existing High Mast Light Standard 3 Luminaire		Existing Mile Post Type A		Existing Post		Existing Undefined Pedestal
	Existing High Mast Light Standard 4 Luminaire		Existing Mile Post Type B		Existing Pedestrian Push Button Post		Existing Undefined Valve
	Existing High Mast Light Standard 5 Luminaire		Existing Mile Post Type C		Existing Control Point CP		Existing Undefined Pipe Vent
	Existing High Mast Light Standard 6 Luminaire		Existing Reference Marker		Existing Control Point GPS-RTK		Existing Gas Valve
	Existing High Mast Light Standard 7 Luminaire		Existing RW Marker		Existing Control Point TRI		Existing Water Valve
	Existing High Mast Light Standard 8 Luminaire		Existing Utility Marker		Existing Reference Marker Point NGS		Existing Fuel Pipe Vent
	Existing High Mast Light Standard 9 Luminaire		Iron Monument Found		Existing Pull Box		Existing Gas Pipe Vent
	Existing Overhead Sign Structure Load Center		Iron Pin R/W Monument		Existing Intelligent Transportation Pull Box		Existing Sanitary Pipe Vent
	Existing Luminaire		Existing Object Marker Type I		Existing Water Pump		Existing Storm Drain Pipe Vent
	Existing Light Standard Luminaire		Existing Object Marker Type II		Existing Slotted Reinforced Concrete Pipe		Existing Water Pipe Vent
	Existing Federal Mailbox		Existing Object Marker Type III		Existing RR Profile Spot		Existing Weather Station
	Existing Private Mailbox		Existing Electrical Pedestal		Existing Fuel Leak Sensors		Existing Ground Water Well Bore Hole
	Existing Meander Section Corner		Existing Telephone Pedestal		Existing Highway Sign		Existing Windmill or Tower
	Existing Meter		Existing Fiber Optic Telephone Pedestal		Existing Miscellaneous Spot		Existing Witness Corner
	Existing Electrical Manhole		Existing TV Pedestal		Existing Lighting Standard Pole		Flashing Beacon
	Existing Gas Manhole		Existing Fiber Optic TV Pedestal		Existing Traffic Signal Standard		Flagger
	Existing Sanitary Manhole		Existing Fuel Filler Pipes		Existing Transformer		Pipe Mounted Flasher
	Existing Sanitary Force Main Manhole		Existing Traverse PI Aerial Panel		Existing Large Evergreen Tree		Sanitary Force Main with Valve
	Existing Sanitary Manhole with Valve		Existing Pole		Existing Small Evergreen Tree		
	Existing Storm Drain Manhole		Existing Power Pole		Existing Large Tree		
	Existing Force Main Storm Drain Manhole		Existing Power Pole with Transformer		Existing Small Tree		
	Existing Force Main Storm Drain Manhole with Valve				Existing Tree Trunk		
	Existing Telephone Manhole				Existing Pad Mounted Traffic Signal Control Box		

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Symbols

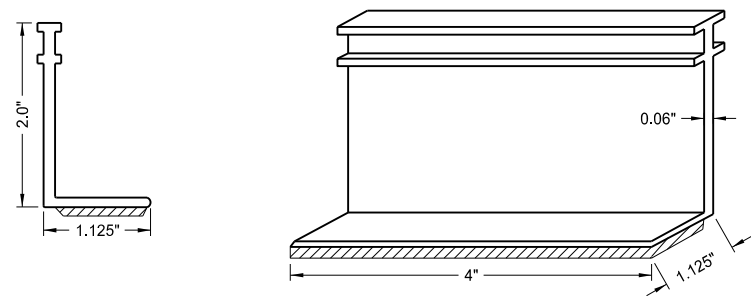
	Pad Mounted Feed Point		Light Standard 1000 Watt High Pressure Sodium Vapor Luminaire		Object Marker Type I		Reinforced Concrete End Section 48 Inch										
	Pipe Mounted Feed Point with Pad		Light Standard 150 Watt High Pressure Sodium Vapor Luminaire		Object Marker Type II		Reinforced Concrete End Section 54 Inch										
	Pole Mounted Feed Point		Light Standard 175 Watt High Pressure Sodium Vapor Luminaire		Object Marker Type III		Reset Right of Way Marker										
	Headwall		Light Standard 200 Watt High Pressure Sodium Vapor Luminaire		Caution Mode Arrow Panel		Reset USGS Marker										
	Double Headwall with Vegetation Barrier		Light Standard 250 Watt High Pressure Sodium Vapor Luminaire		Back to Back Vertical Panel Sign		Right of Way Markers										
	Single Headwall with Vegetation Barrier		Light Standard 310 Watt High Pressure Sodium Vapor Luminaire		Double Direction Arrow Panel		Riser 30 Inch										
	Pole Mounted Head		Light Standard 35 Watt High Pressure Sodium Vapor Luminaire		Left Directional Arrow Panel		Continuous Split Barrel Sample										
	Sprinkler Head		Light Standard 400 Watt High Pressure Sodium Vapor Luminaire		Right Directional Arrow Panel		Flight Auger Sample										
	Fire Hydrant		Light Standard 50 Watt High Pressure Sodium Vapor Luminaire		Sequencing Arrow Panel		Split Barrel Sample										
	Inlet Type 1		Light Standard 70 Watt High Pressure Sodium Vapor Luminaire		Truck Mounted Arrow Panel		Thinwall Tube Sample										
	Inlet Type 2		Light Standard 700 Watt High Pressure Sodium Vapor Luminaire		Power Pole		Highway Sign										
	Double Inlet Type 2		Manhole		Wood Pole		SNOW GATE 18 FT										
	Inlet Grate Type 2		Manhole 48 Inch		Pedestrian Push Button Post		SNOW GATE 28 FT										
	Junction Box		Sanitary Force Main Manhole		Property Corner		SNOW GATE 40 FT										
	High Mast Light Standard 10 Luminaire		Sanitary Sewer Manhole		Pull Box		Standard Penetration Test										
	High Mast Light Standard 3 Luminaire		Storm Drain Manhole		Intelligent Transportation Pull Box		Transformer										
	High Mast Light Standard 4 Luminaire		Storm Drain Manhole with Inlet		Sanitary Pump		Inclinometer Tube										
	High Mast Light Standard 5 Luminaire		Reset Mile Post		Storm Drain Pump		Underdrain Cleanout										
	High Mast Light Standard 6 Luminaire		Mile Post Type A		Reinforced Pavement		Excavation Unit										
	High Mast Light Standard 7 Luminaire		Mile Post Type B		Reinforced Concrete End Section 15 Inch		Water Valve										
	High Mast Light Standard 8 Luminaire		Mile Post Type C		Reinforced Concrete End Section 18 Inch	<table><tr><th colspan="2">NORTH DAKOTA DEPARTMENT OF TRANSPORTATION</th></tr><tr><th colspan="2">07-01-14</th></tr><tr><th colspan="2">REVISIONS</th></tr><tr><th>DATE</th><th>CHANGE</th></tr><tr><td></td><td></td></tr></table>	NORTH DAKOTA DEPARTMENT OF TRANSPORTATION		07-01-14		REVISIONS		DATE	CHANGE			
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	High Mast Light Standard 9 Luminaire		Right of Way Marker		Reinforced Concrete End Section 24 Inch												
	Relocate Light Standard		Tubular Marker		Reinforced Concrete End Section 30 Inch												
	Overhead Sign Structure Load Center		Alignment Monument		Reinforced Concrete End Section 36 Inch												
	Light Standard 100 Watt High Pressure Sodium Vapor Luminaire		Iron Pin Reference Monument		Reinforced Concrete End Section 42 Inch												

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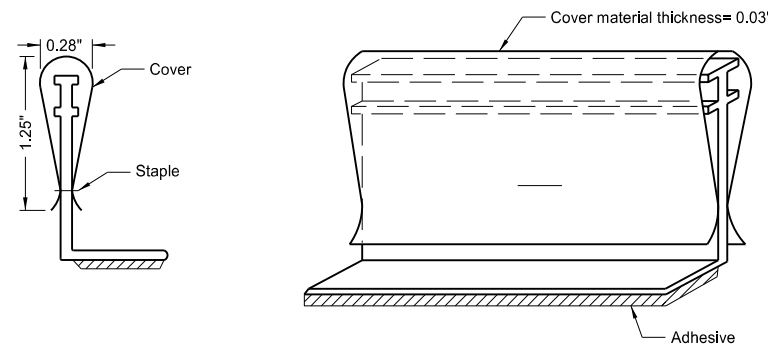
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LANE MARKERS  
(Spotting Tab for Seal Projects only)

D-704-3



Marker Body

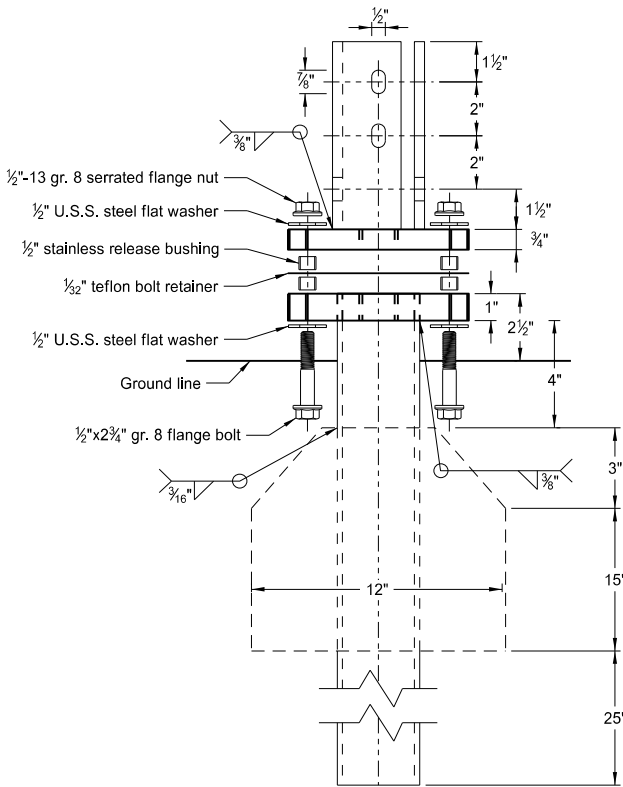


Marker Body with Protective Cover

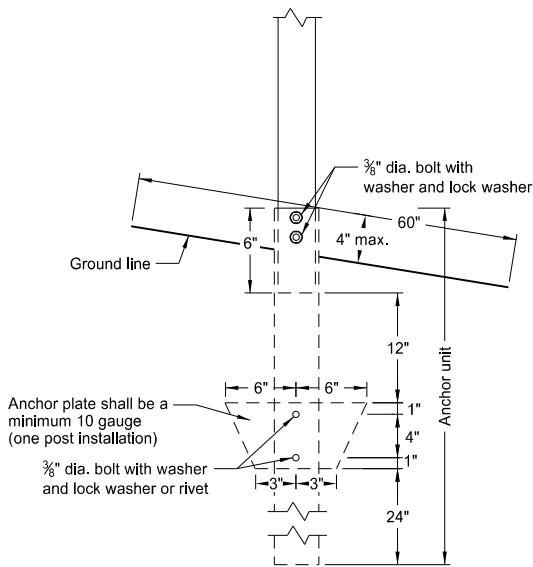
- Notes:
1. The lane line markers shall be installed as shown, prior to the beginning of the seal coat.
  2. The cover shall be attached to the vertical part of the marker in such a way that traffic will not cause it to detach and so that it may be easily removed manually.
  3. The protective covers shall be removed, immediately after the seal coat is applied.
  4. The markers shall be removed after permanent pavement marking has been installed.
  5. The marker body and cover shall be manufactured from polyurethane material.
  6. Marker types:  
Type Y - Yellow body and cover with yellow reflective tape on both sides.  
Type W - White body and cover with white reflective tape on one side.
  7. The reflective tape shall be a retroreflective material. The tape shall have a minimum reflectance of 1200 candle power per foot-candle per square foot, using a .1 degree observation angle and 0 degree entrance angle.
  8. The adhesive shall conform to AASHTO M 237.

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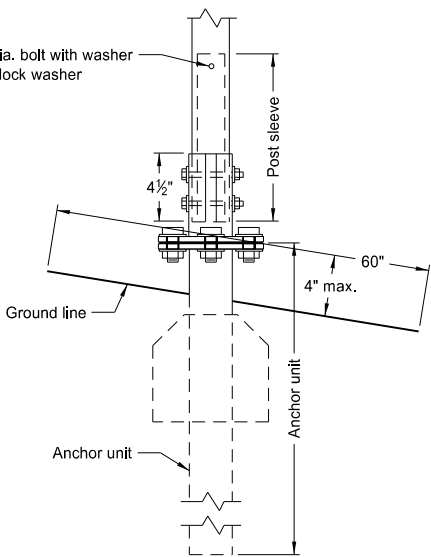
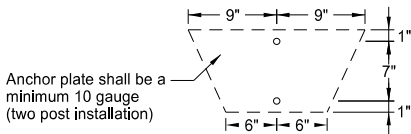
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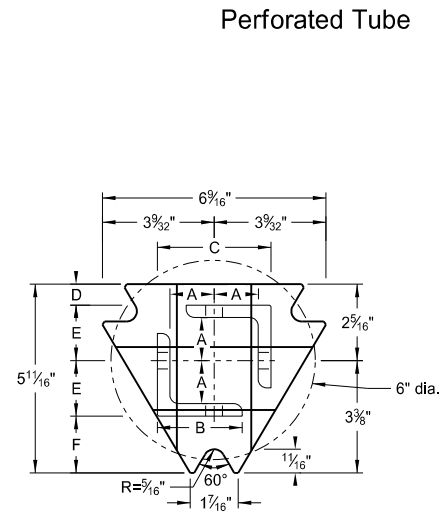
Multi-Directional Slip Base Assembly



Anchor Unit and Post Assembly

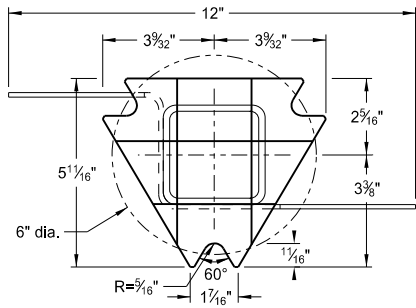


Multi-Directional Slip Base Anchor Unit and Post Sleeve Assembly



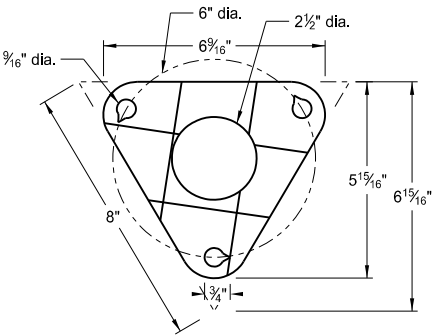
Top Post Receiver

Plate - ASTM A572 grade 50  
Angle Receiver - 2 1/2"x2 1/2"x3/8" 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



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

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	

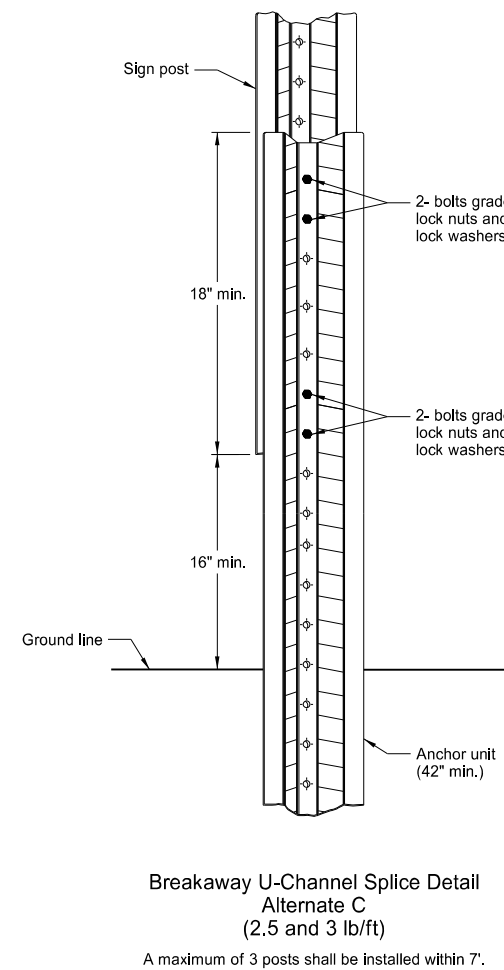
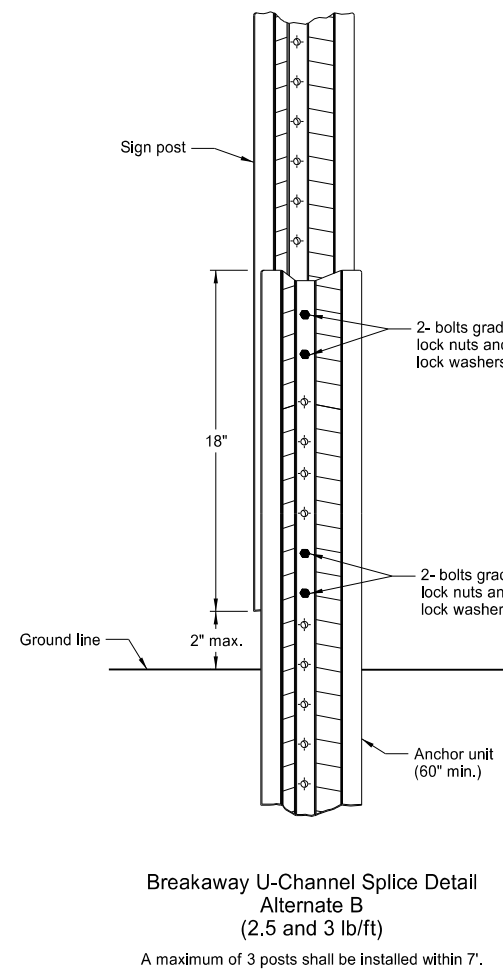
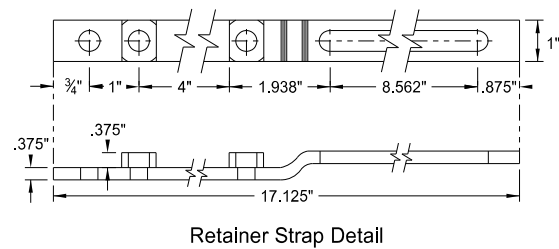
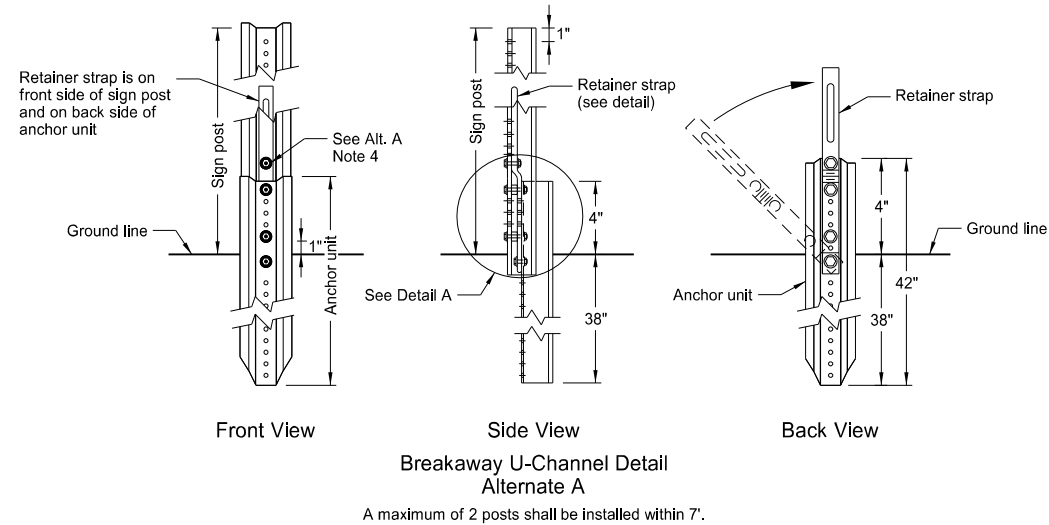
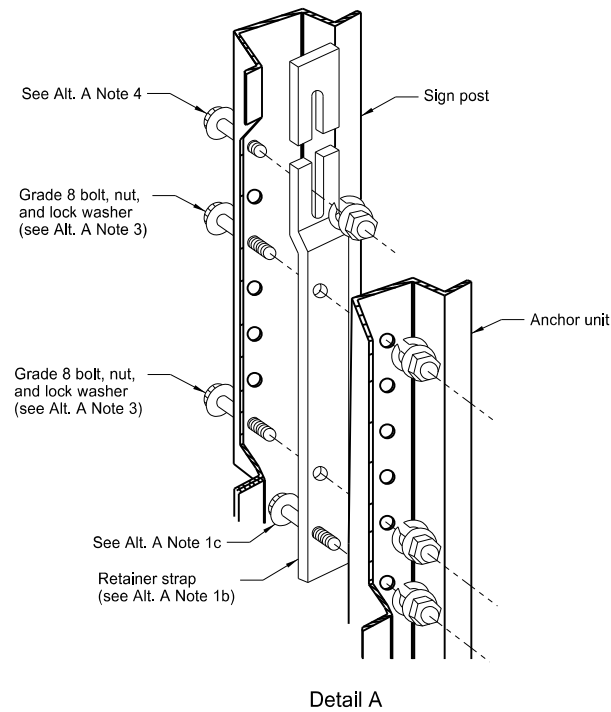
Properties of Telescoping Perforated Tube						
Tube Size in.	Wall Thickness in.	U.S. Standard Gauge	Weight per Foot lbs.	Moment of Inertia in. <sup>4</sup>	Cross Sec. Area in. <sup>2</sup>	Section Modulus in. <sup>3</sup>
1 1/2 x 1 1/2	0.105	12	1.702	0.129	0.380	0.172
2 x 2	0.105	12	2.416	0.372	0.590	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 7/8"
2 1/2"x10 ga.	1 9/32"	2 1/2"	3 5/16"	5/8"	1 21/32"	1 3/4"

- (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.

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U-Channel Post



Alternate A Steps of Installation:

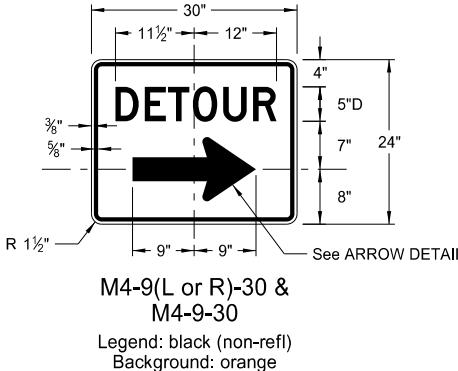
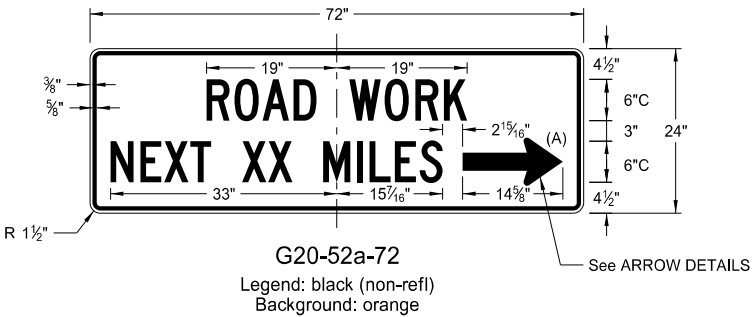
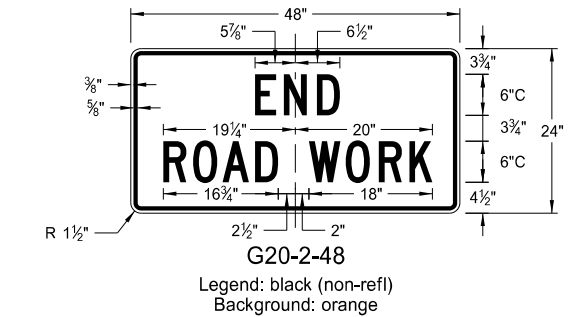
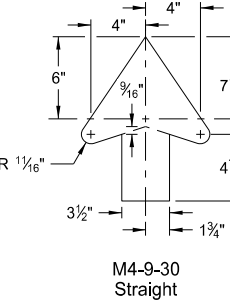
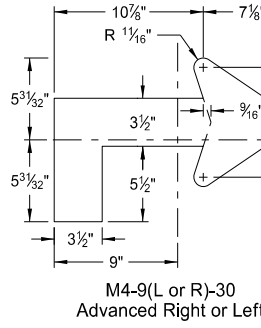
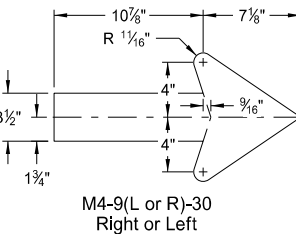
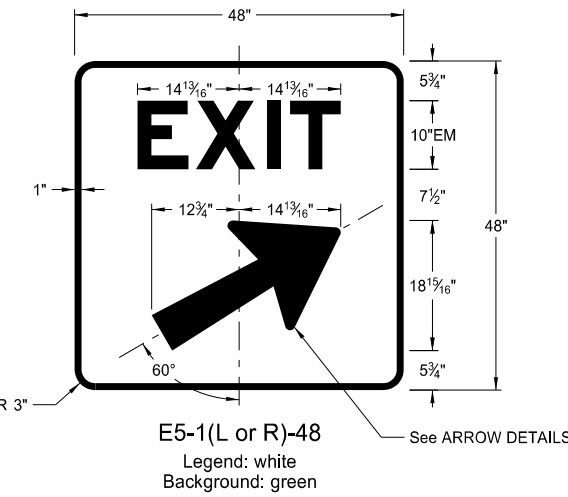
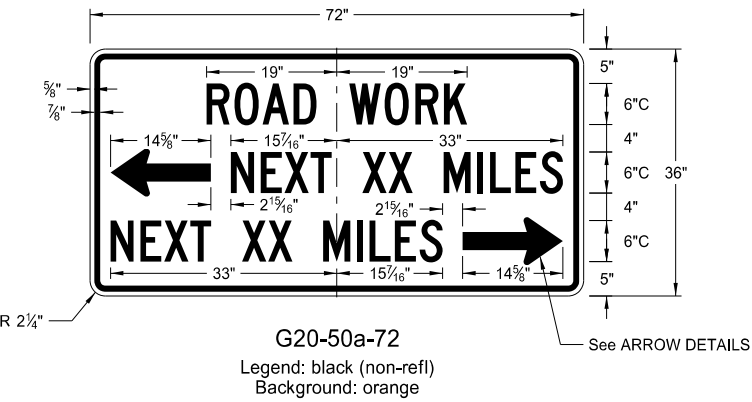
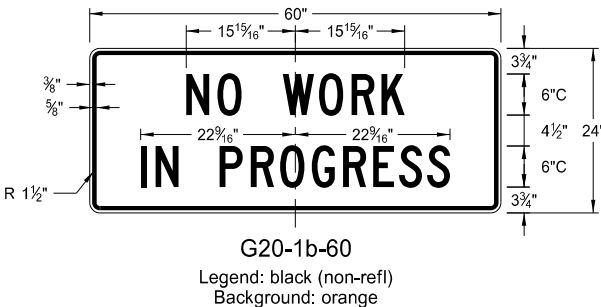
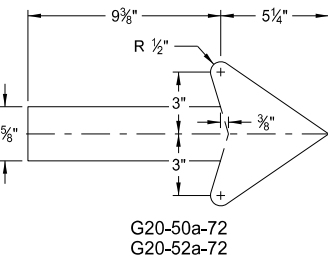
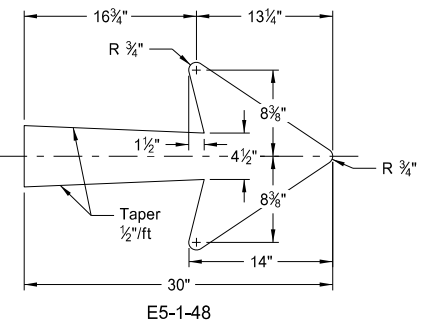
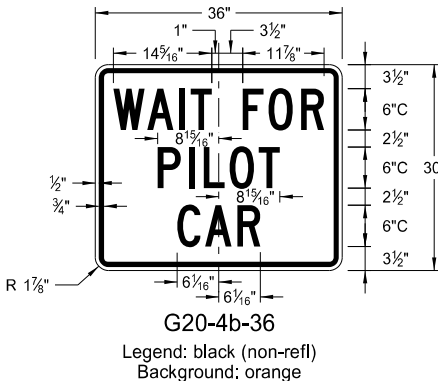
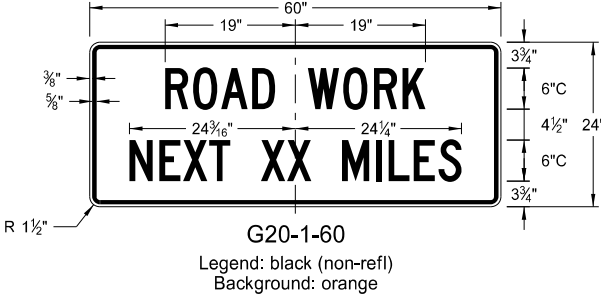
- Drive anchor unit to within 12" of ground level.
  - Proper assembly established by lining up the bottom hole of retainer strap with the 6th hole from the top of the anchor unit.
  - Assemble strap to back of anchor unit using 5/16"x2" bolt, lock washer and nut.
  - Rotate strap 90° to left.
- Drive anchor unit to 4" above ground.
  - Rotate strap to vertical position.
- 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.
  - Alternately tighten two connector bolts.
- Complete assembly by tightening 5/16"x2" bolt (this fastens sign post to retainer strap).
- 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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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.

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D-704-10

Legend: black (non-refl)  
Background: white

Legend: black (non-refl)  
Background: white

Legend: black (non-refl)  
Background: white

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Background: white

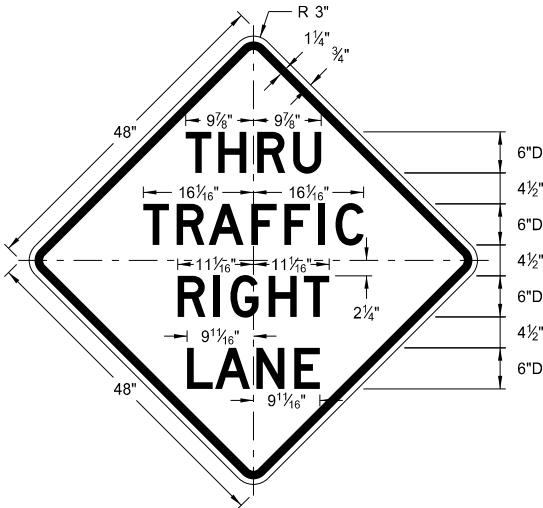
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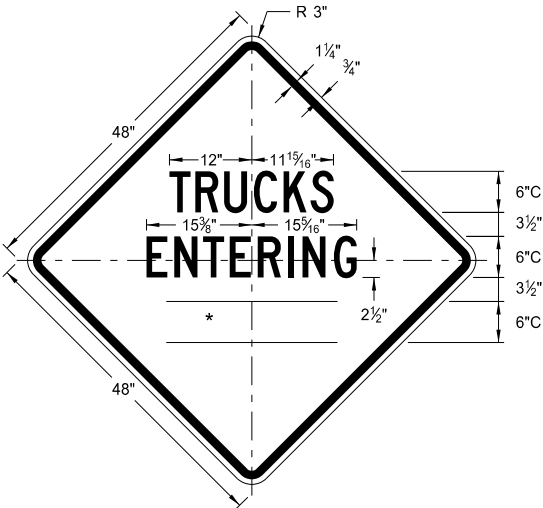
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CONSTRUCTION SIGN DETAILS  
WARNING SIGNS

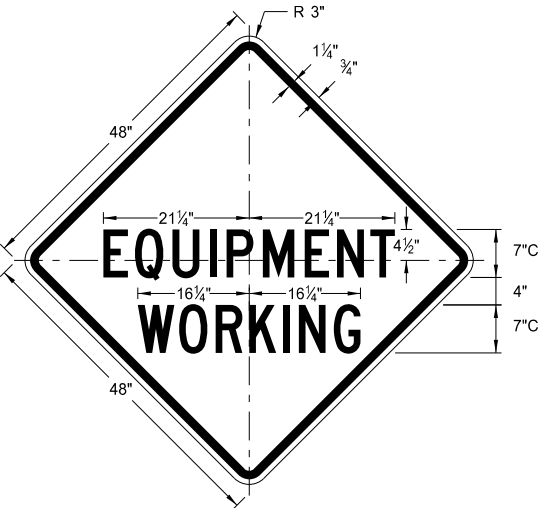
D-704-11



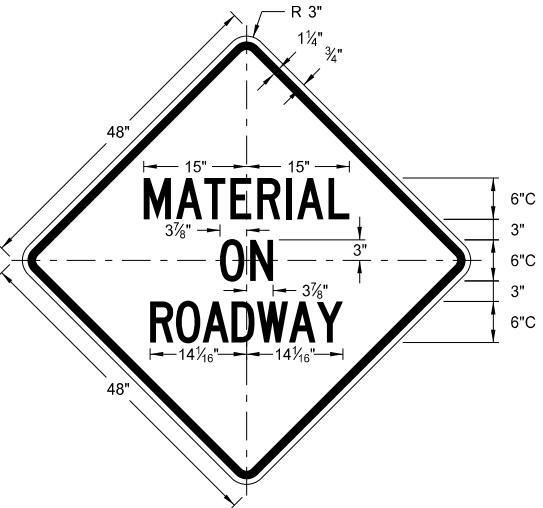
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Background: orange



W8-54-48  
Legend: black (non-refl)  
Background: orange



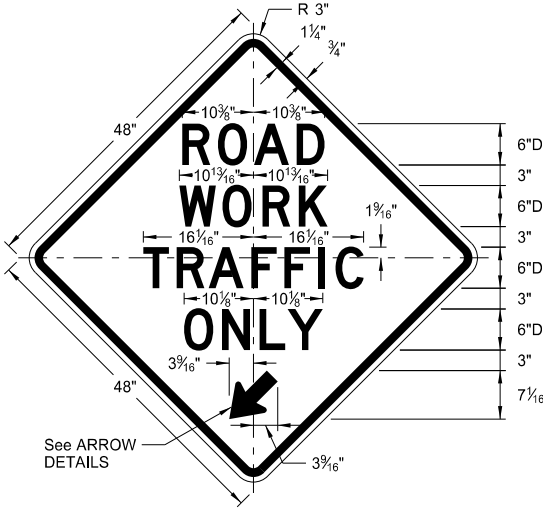
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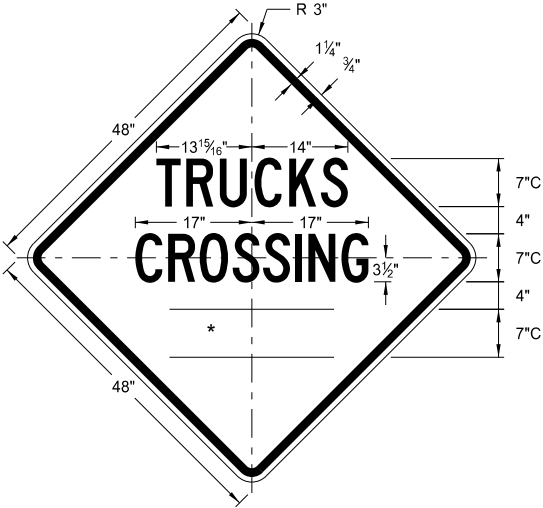
W21-51-48  
Legend: black (non-refl)  
Background: orange

WORD	LETTER SPACING
AHEAD	Standard
200 FT	Standard
350 FT	Standard
500 FT	Standard
1000 FT	Reduce 40%
1500 FT	Reduce 40%
½ MILE	Reduce 50%
1 MILE	Standard

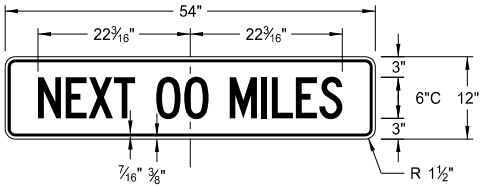
\* DISTANCE MESSAGES



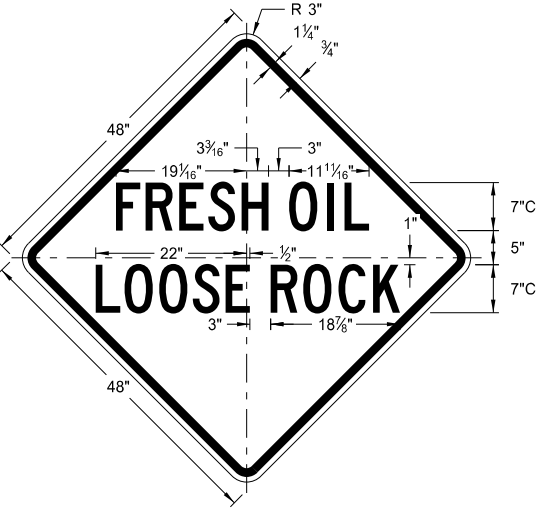
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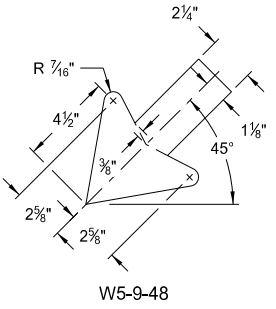
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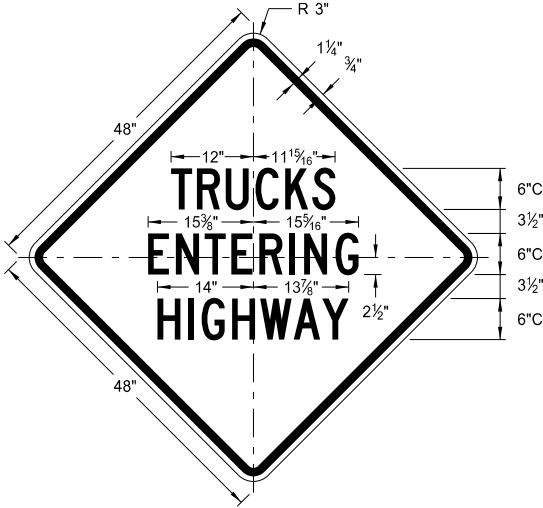
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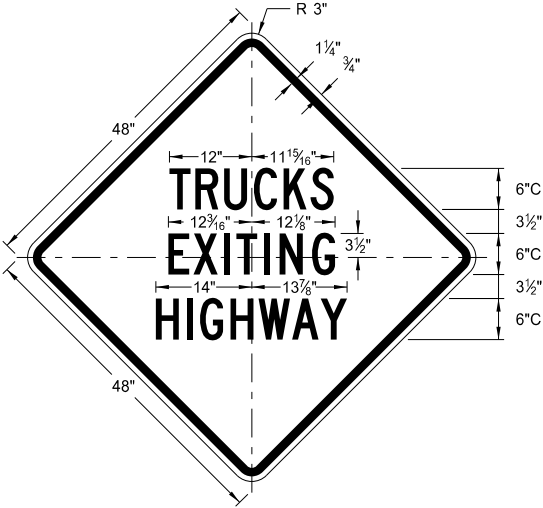
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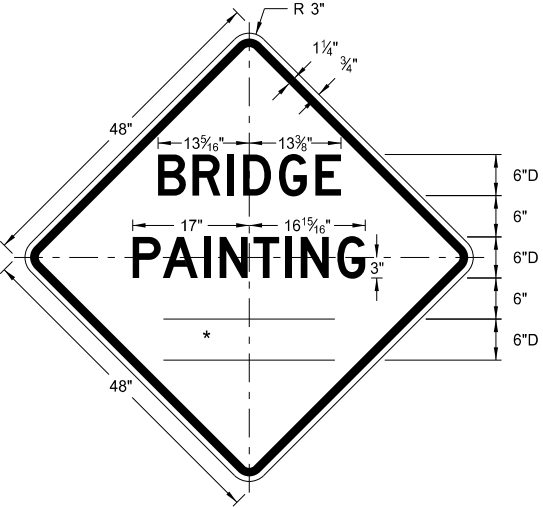
ARROW DETAILS



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W8-56-48  
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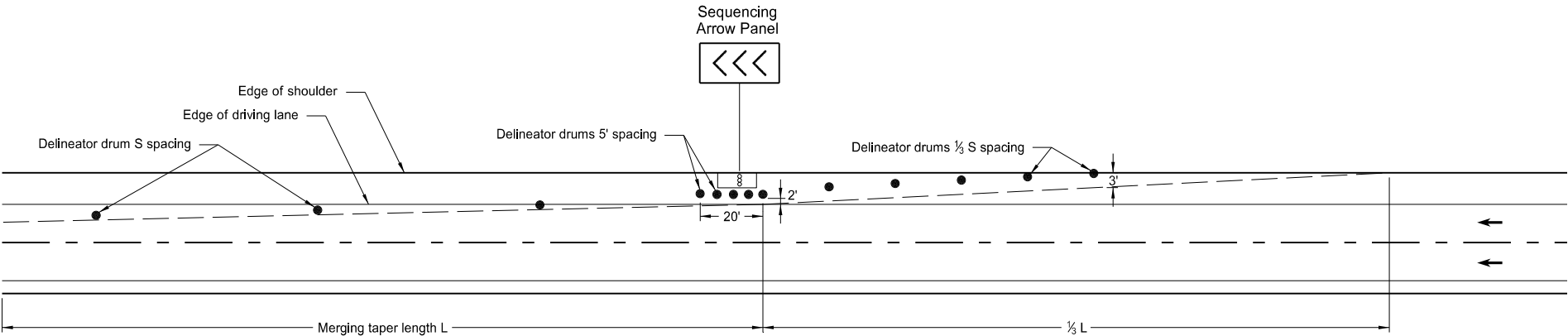
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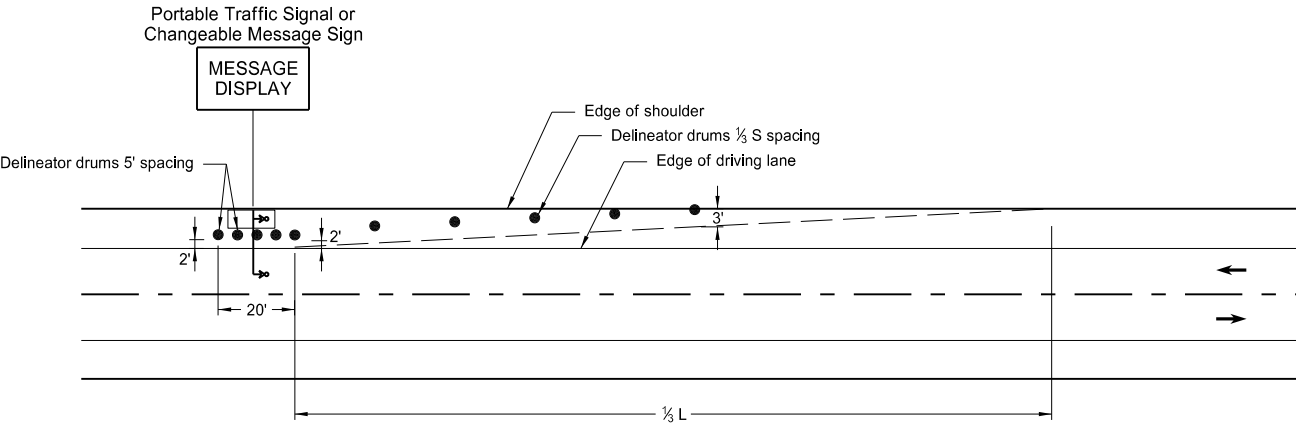
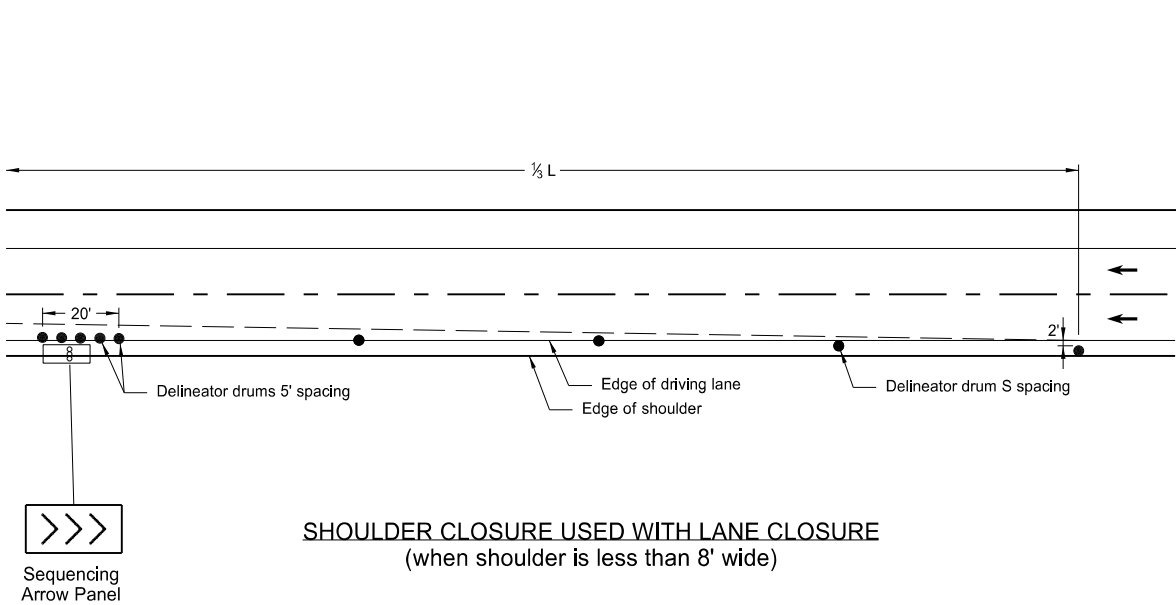
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SHOULDER CLOSURE TAPERS

D-704-12



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



PORTABLE TRAFFIC SIGNAL OR CHANGEABLE MESSAGE SIGN ON SHOULDER

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

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 =  $WS^2/60$  (40mph or less)  
L = WS (45mph or more)
  - If a shoulder taper is used, it should have a length of approximately  $\frac{1}{3}L$ . 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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CONSTRUCTION SIGN PUNCHING AND MOUNTING DETAILS

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 2½" x 2½" 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, ½" plywood, or other approved material, except where noted. All holes to be punched round for ⅜" 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, W1-6 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)

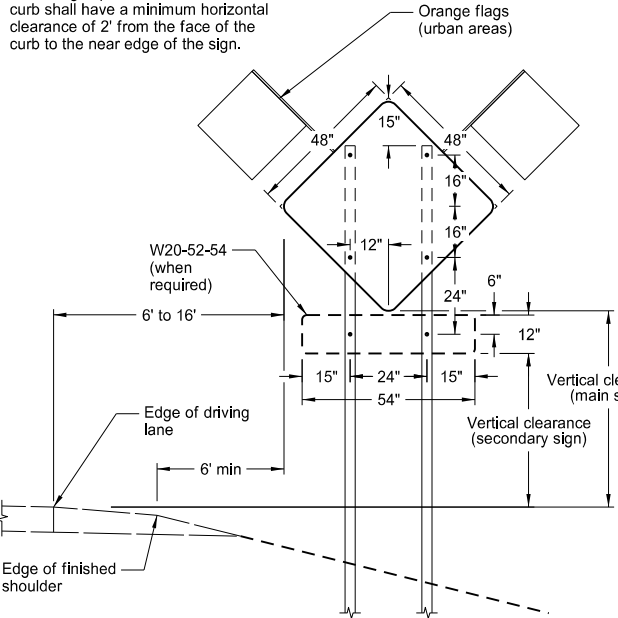
Sign Panel Mounting Height (ft)	Number of 25 lb sandbags for 4' x 4' sign panel
1'	6
5'	8
7'	10

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.

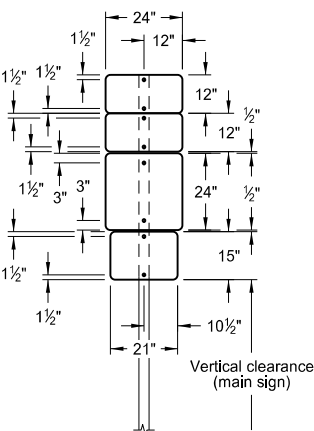
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10-4-13	
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11-14-13	Revised Note 6.

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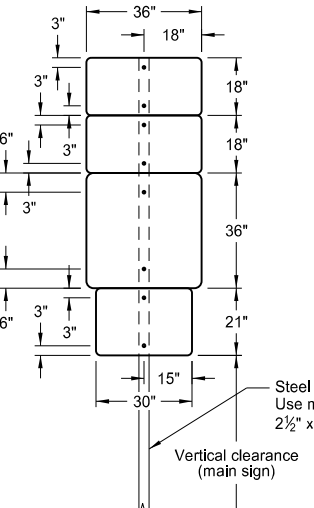
Note: Signs placed in sections with curb shall have a minimum horizontal clearance of 2' from the face of the curb to the near edge of the sign.



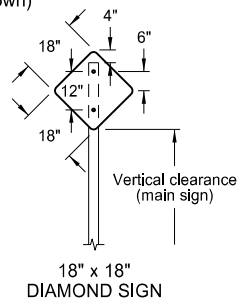
TYPICAL SECTION  
(48" x 48" diamond warning sign shown)



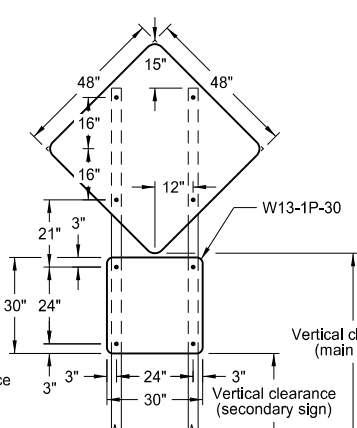
24" x 24" ROUTE MARKER ASSEMBLY



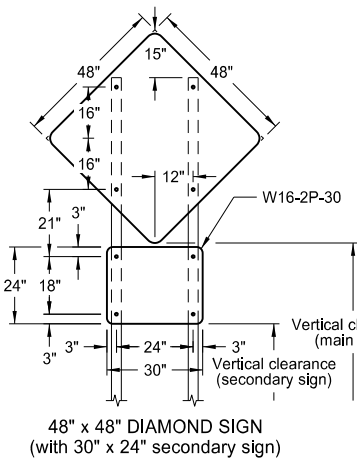
36" x 36" ROUTE MARKER ASSEMBLY



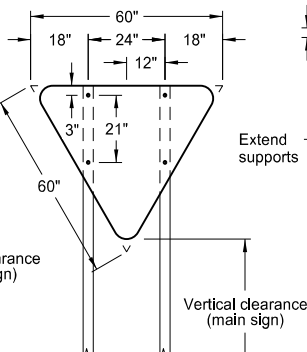
18" x 18" DIAMOND SIGN



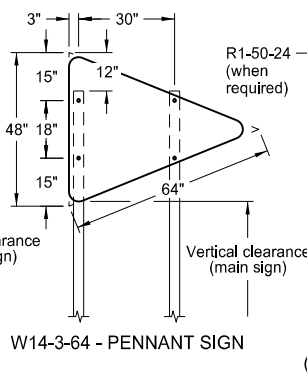
48" x 48" DIAMOND SIGN  
(with 30" x 30" secondary sign)



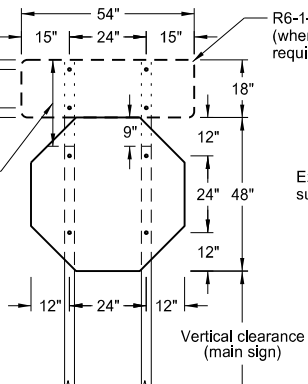
48" x 48" DIAMOND SIGN  
(with 30" x 24" secondary sign)



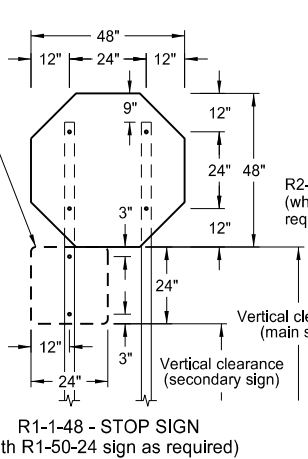
R1-2-60 - YIELD SIGN



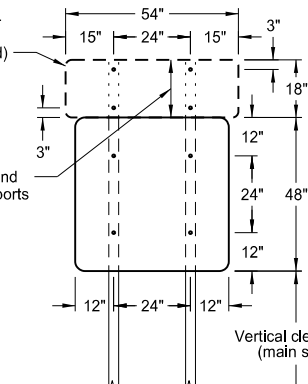
W14-3-64 - PENNANT SIGN



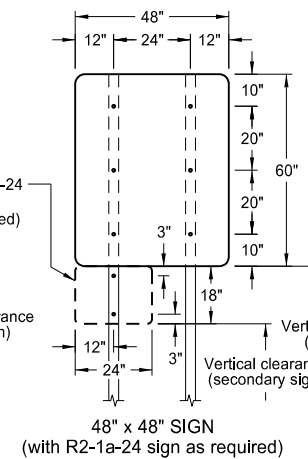
R1-1-48 - STOP SIGN  
(with R6-1-54 sign as required)



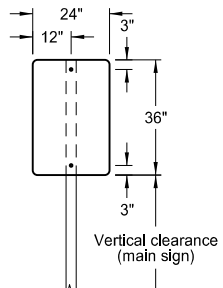
R1-1-48 - STOP SIGN  
(with R1-50-24 sign as required)



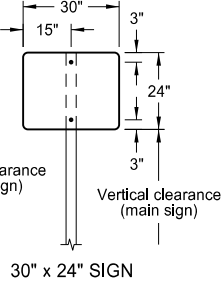
48" x 48" SIGN  
(with R6-1-54 sign as required)



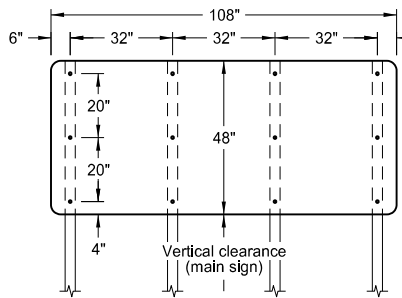
48" x 48" SIGN  
(with R2-1a-24 sign as required)



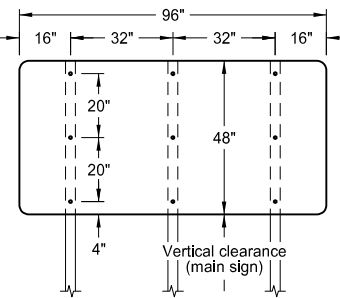
24" x 36" SIGN



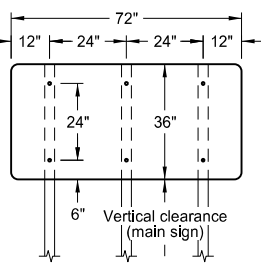
30" x 24" SIGN



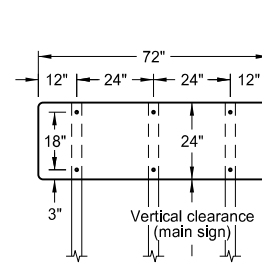
108" x 48" SIGN



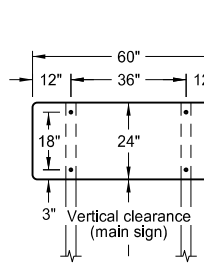
96" x 48" SIGN



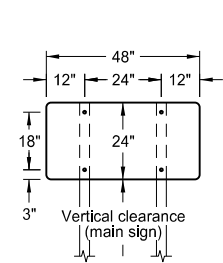
72" x 36" SIGN



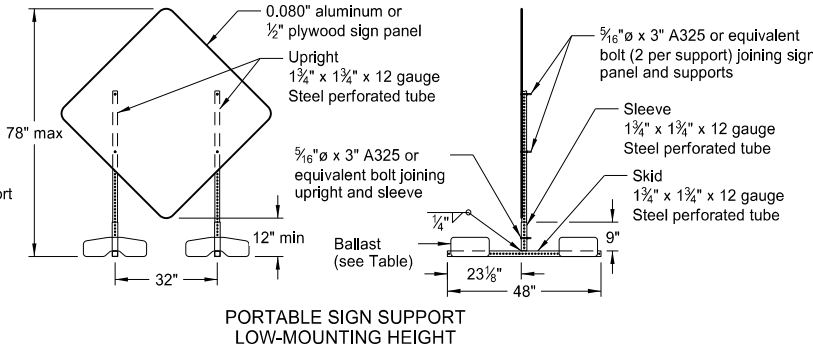
72" x 24" SIGN



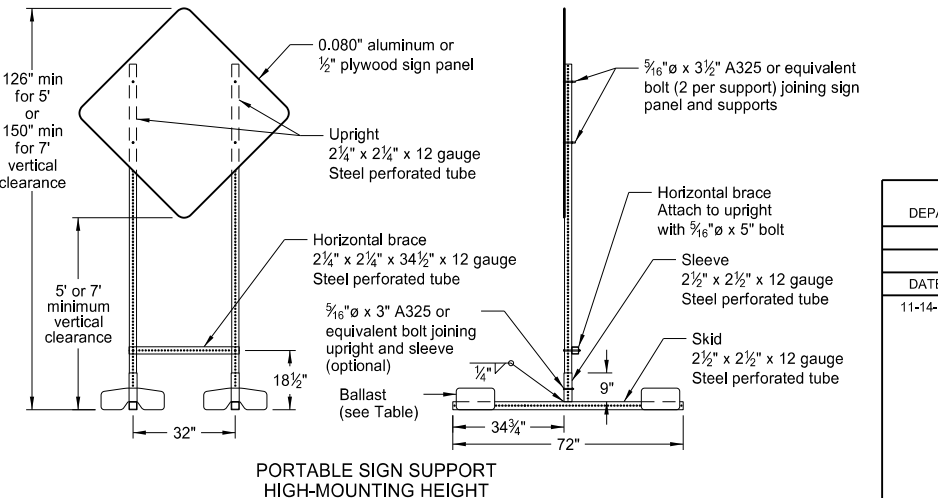
60" x 24" SIGN



48" x 24" SIGN



PORTABLE SIGN SUPPORT  
LOW-MOUNTING HEIGHT



PORTABLE SIGN SUPPORT  
HIGH-MOUNTING HEIGHT

## ROAD CLOSURE LAYOUTS

## 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 roadway shall be placed on skid mounted assemblies.
- Delineator drums, barricades or cones used for tapering traffic shall be spaced at the dimension "S". Delineator drums or cones used for tangents shall be spaced at 2 times dimension "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. See Shoulder Closure Standard Drawing.  
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  $\frac{1}{2}$  B.
- Use when work area is 1 mile or longer.
- 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.
- Where necessary, safe speed to be determined by the Engineer.
- The contractor has the option of using portable sign supports in lieu of post mounted signs in accordance with the NDDOT Standard Specifications.
- G20-55-96 sign is not required if this standard is part of other traffic control layouts, or the work is less than 15 days.

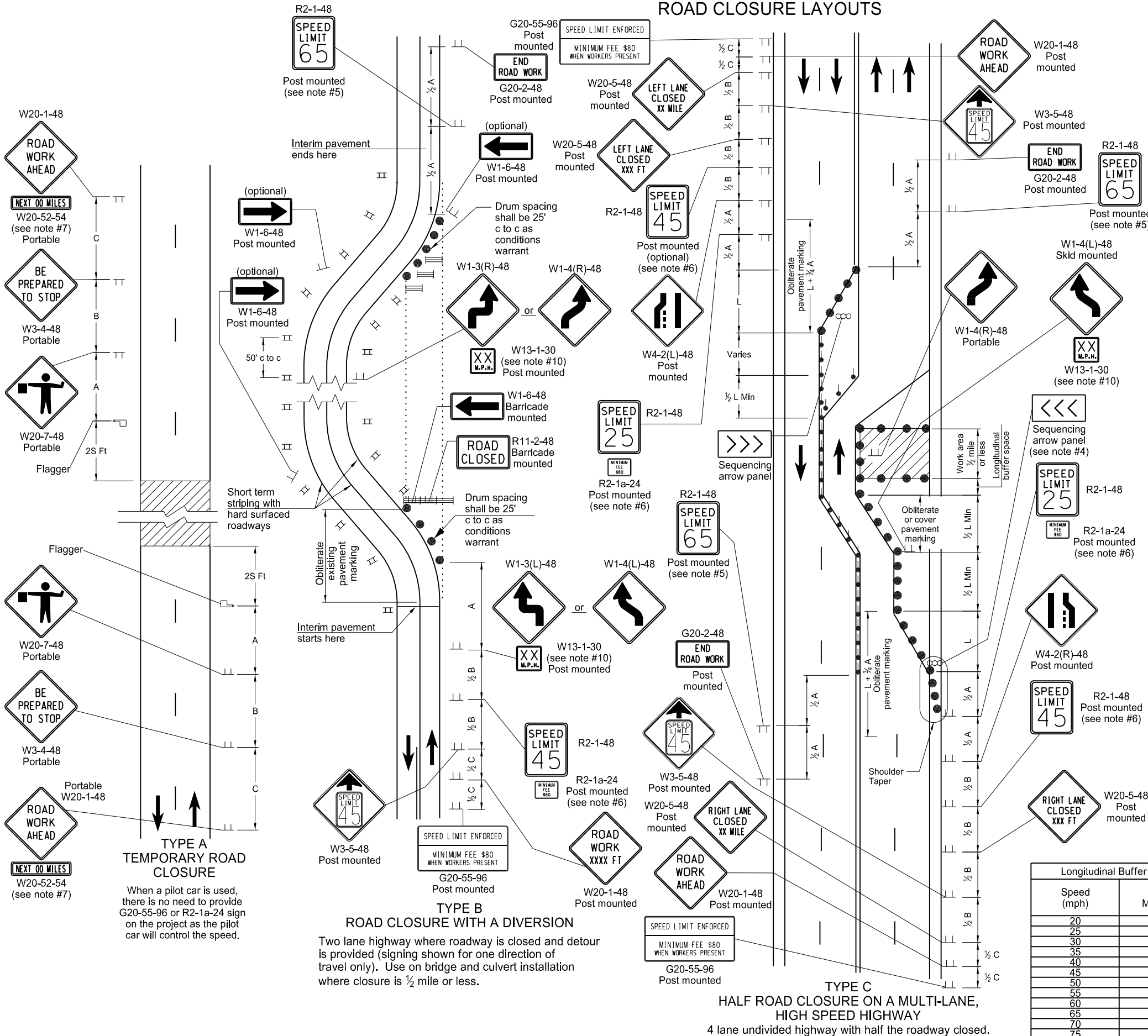
ADVANCE WARNING SIGN SPACING			
Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway 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

KEY	
	Type III barricade
	Sign
	Delineator drum
	Tubular markers
	Work area
	Flagger
	Sequencing arrow panel
	Vertical panels back to back

Longitudinal Buffer Space	
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

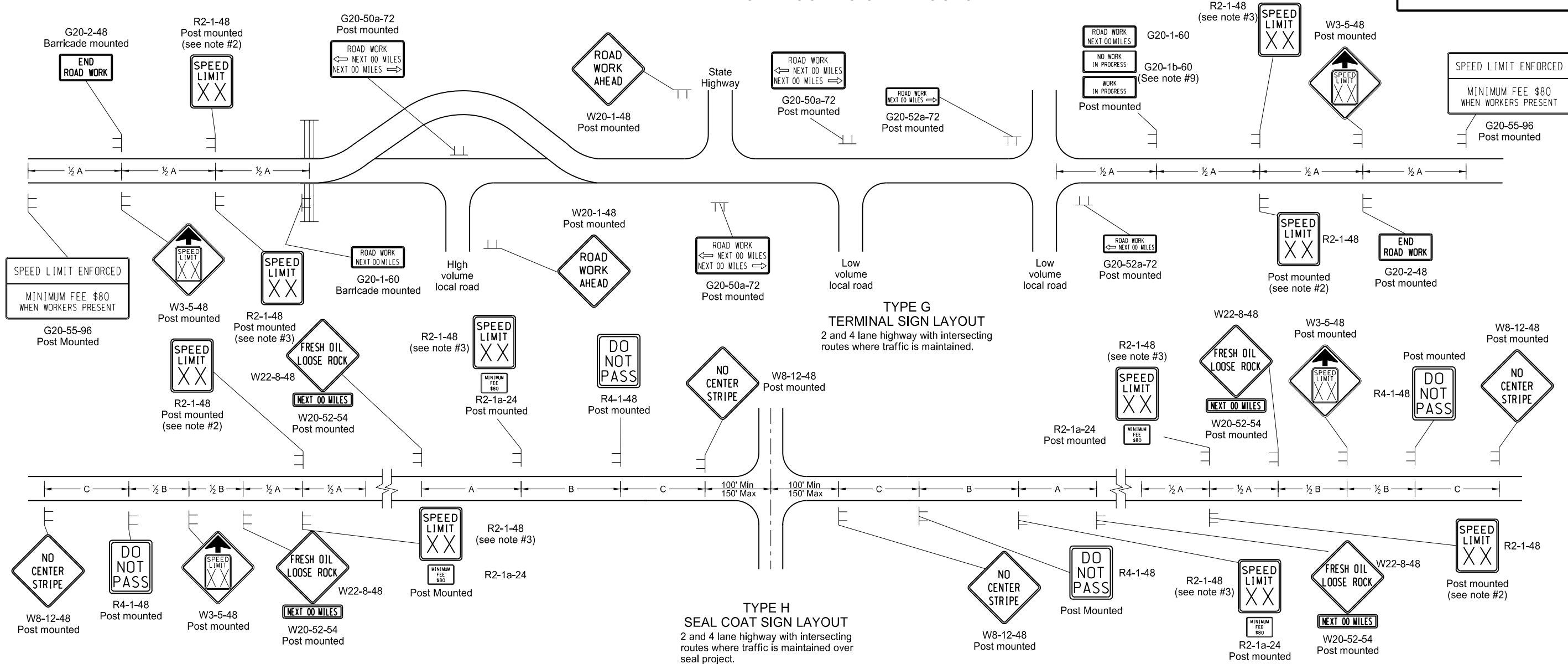
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-27-13	
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DATE	CHANGE

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TERMINAL AND SEAL COAT SIGN LAYOUTS

D-704-20



1. Barricades placed on roadway shall be on a moveable assembly. Signs placed on the roadway shall be placed on skid mounted assemblies.
2. The speed limit shall be re-established. The exact speed limit shall be determined in the field, dependent on location and conditions.
3. 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  $\frac{1}{2}$  B.
4. 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.
5. Existing speed limit signs within a reduced speed zone shall be covered.
6. On seal projects, signs R2-1-48, R2-1a-24, R4-1-48, W22-8-48 and W20-52-54 shall be placed just after all important intersections and at five mile intervals thereafter. Sign W8-12-48 shall be placed just after all important intersections and at 2 mile intervals thereafter until the short term center line pavement marking is in place. No short term pavement markings are placed when traffic volumes are 750 ADT or less.
7. The contractor has the option of using portable sign supports in lieu of post mounted signs in accordance with the NDDOT Standard Specifications.
8. Type H construction sign traffic control shall have the speed limit signs covered or removed once the loose aggregate has been removed.
9. The contractor shall install the G20-1b-60 sign when work is suspended for winter.
10. Other traffic control layouts will be required in the immediate work areas. If the speed limit is reduced in the work area, speed limit signs shall have the R2-1a-24 sign placed below.
11. G20-55-96 sign is not required if work is less than 15 days.

KEY

Type III barricade

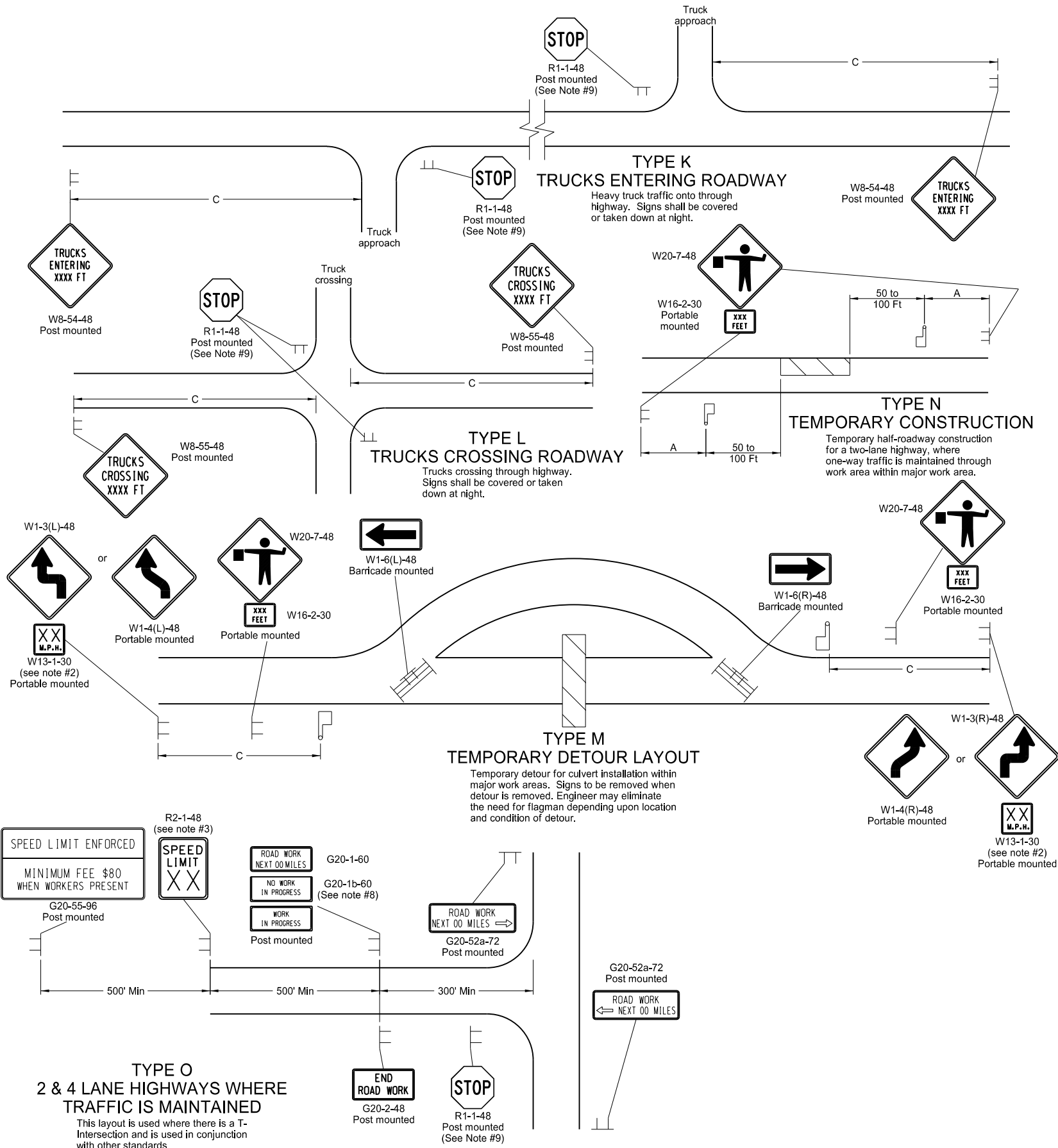
Sign

ADVANCE WARNING SIGN SPACING			
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

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CONSTRUCTION TRUCK AND TEMPORARY DETOUR LAYOUTS



- Notes
1. Barricades placed on roadway shall be on a moveable assembly. Signs placed on the roadway shall be placed on skid mounted assemblies. Where necessary, safe speed to be determined by the Engineer.
  2. 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 ½ B.
  3. 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.
  4. 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.
  5. The contractor has the option of using portable sign supports in lieu of post mounted signs in accordance with the NDDOT Standard Specifications.
  6. The contractor shall install the G20-1b-60 sign when work is suspended for winter.
  7. If existing stop sign is in place, a 48" stop sign is not required.
  8. G20-55-96 sign is not required if this standard is part of other traffic control layouts with this sign or the work is less than 15 days.

KEY

- Type III barricade
- Work area
- Sign
- Flagger

ADVANCE WARNING SIGN SPACING			
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 40mph)	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

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SHOULDER CLOSURES AND BRIDGE PAINTING LAYOUTS

D-704-24

- Notes
- Variables  
S = Numerical value of speed limit or 85th percentile.  
W = The width of the 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.
  - Delineator drums used for tapering traffic shall be spaced at dimension "S".  
Delineator drums or tubular markers used for tangents shall be spaced at 2 times "S".
  - Sequencing Arrow Panels  
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  $\frac{1}{2}B$ .
  - 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.
  - The contractor has the option of using portable sign supports in lieu of post mounted signs in accordance with the NDDOT Standard Specifications.

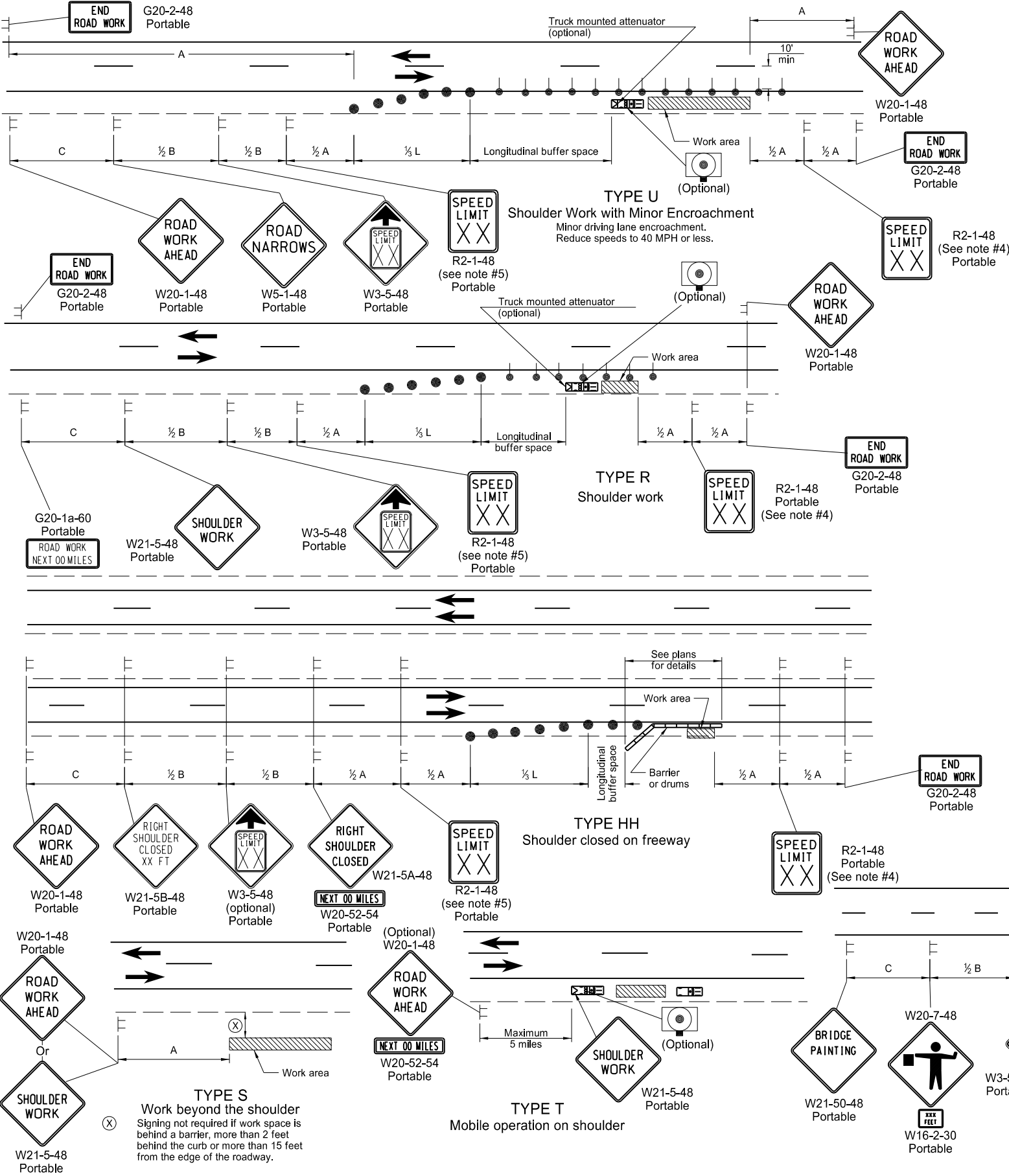
Longitudinal Buffer Space	
Speed (mph)	Length Min (feet)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820

ADVANCE WARNING SIGN SPACING			
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

KEY	
	Sign
	Delineator Drum
	Sequencing Arrow Panel (Caution Mode)
	Work area
	Tubular Marker

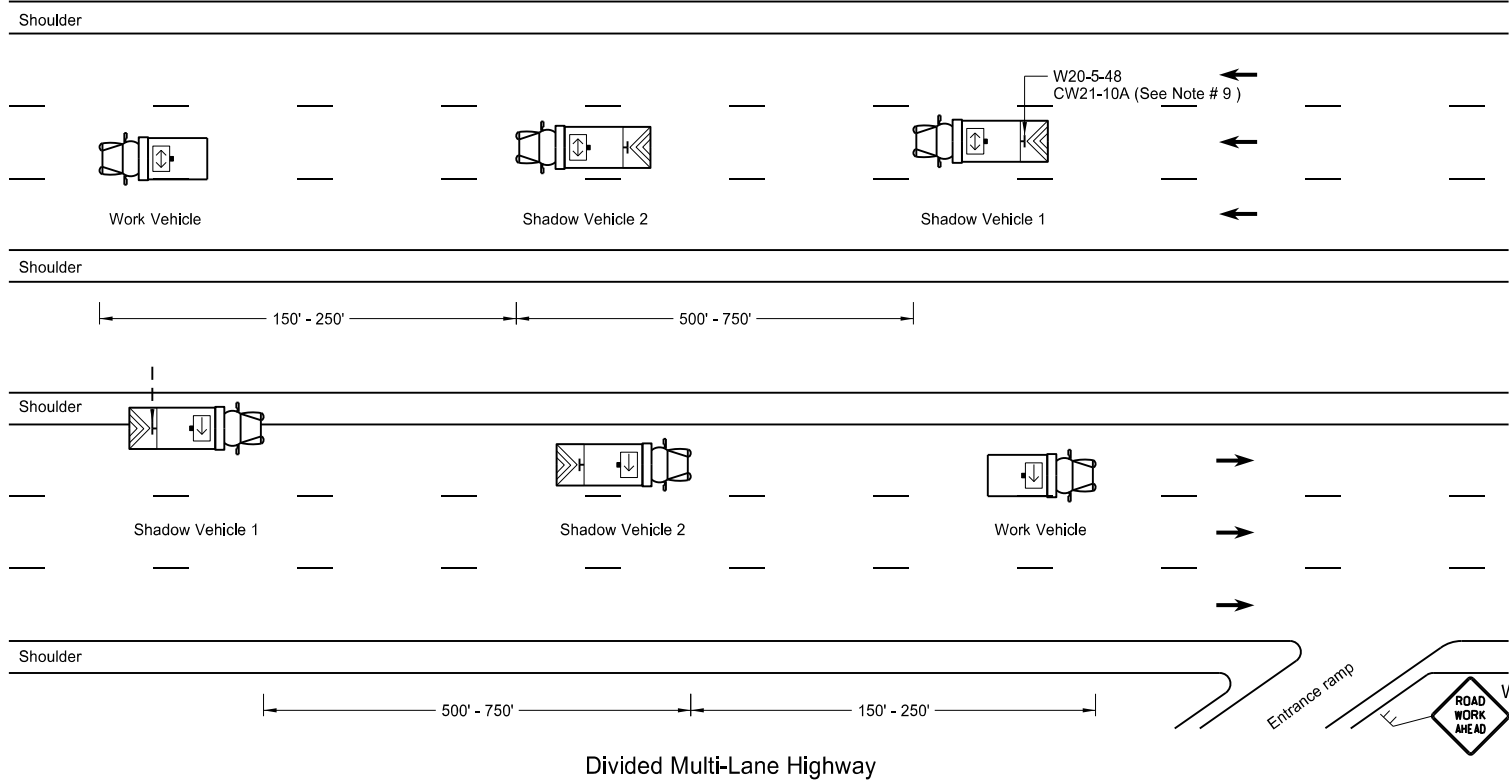
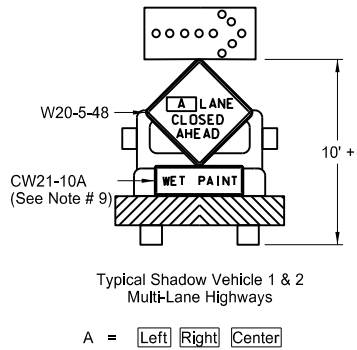
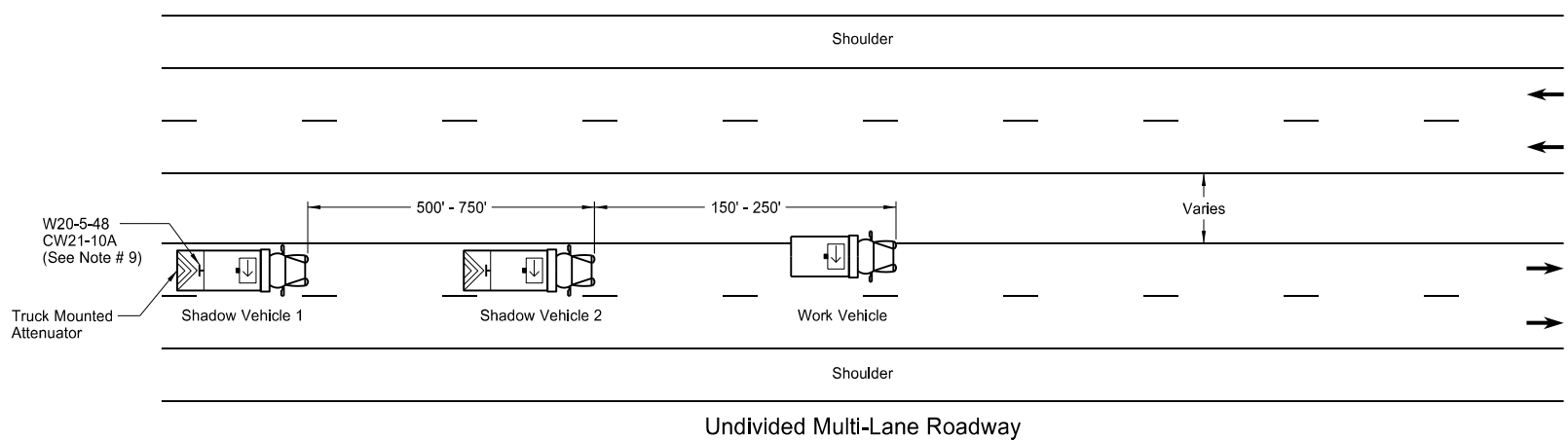
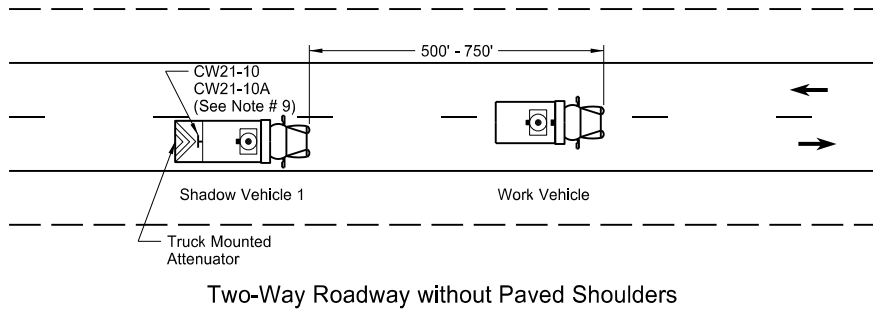
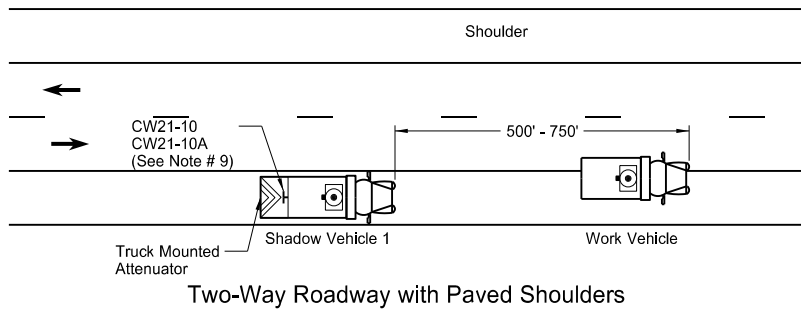
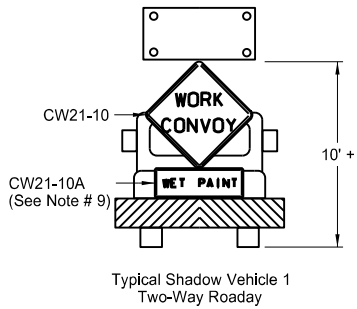
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9-27-13	
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DATE	CHANGE

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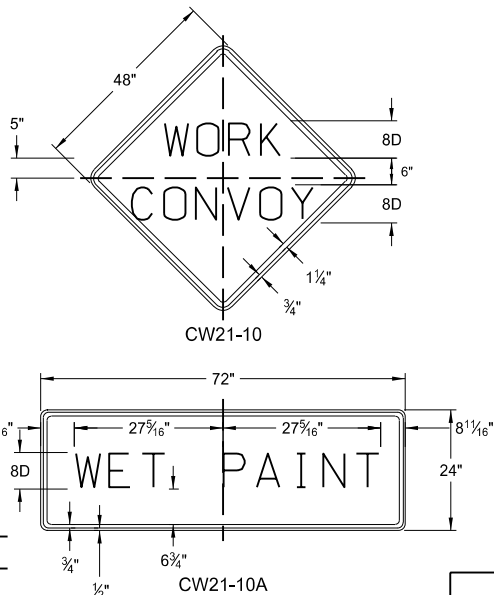


TRAFFIC CONTROL PLAN FOR MOVING OPERATIONS

D-704-27



Sign Details



Notes

1. If the contractor chooses to place more vehicles in the convoy than are shown, these vehicles shall have the truck mounted attenuator and shall be at the contractor's expense.
2. Shadow and work vehicles shall display yellow rotating beacons or strobe lights unless otherwise stated elsewhere in the plans.
3. Flashing arrow panels shall be Type B or Type C. The panel operation shall be controlled from inside the vehicle.
4. Each vehicle shall have two-way electronic communication capability.
5. When work convoys must change lanes, shadow vehicle 1 should change lanes first to shadow other convoy vehicles.
6. Vehicle spacing between the shadow vehicle 1 and shadow vehicle 2 will vary depending on sight distance restrictions. Motorists approaching the work convoy should be able to see the trail vehicle in time to slow down and/or change lanes as they approach the shadow vehicle.
7. Sign Colors  
Letters = Black  
Border = Black  
Background = Orange
8. Shadow vehicle 2 may be used as the paint tender vehicle.
9. Sign CW21-10A shall only be used during a painting operation.
10. On two lane - two way roadways, the work and shadow vehicles should pull over periodically to allow motor vehicle traffic to pass.

KEY

- Sign
- Truck mounted attenuator
- Flashing arrow panels:
  - Right directional
  - Left directional
  - Double arrow directional
  - Caution Mode

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-27-13	
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DATE	CHANGE
6-18-14	Removed shadow vehicle 2 on two lane roadways

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D-704-30

The diagram illustrates the placement of vertical panels and W21-51-48 skid-mounted signs for a material on roadway situation. It shows a two-lane road with a center line and a shoulder. A shaded area represents the material on the roadway. The placement of vertical panels is indicated by a series of 500' and 600' intervals along the shoulder. A W21-51-48 skid-mounted sign is placed at the beginning of the material area, with a distance 'A' marked between the sign and the start of the material. A note states: "When windrow is broken for drive, bridge, etc.... marker placement shall be the same as the beginning or end of windrow." The diagram also shows a "Continue" arrow indicating the direction of travel.

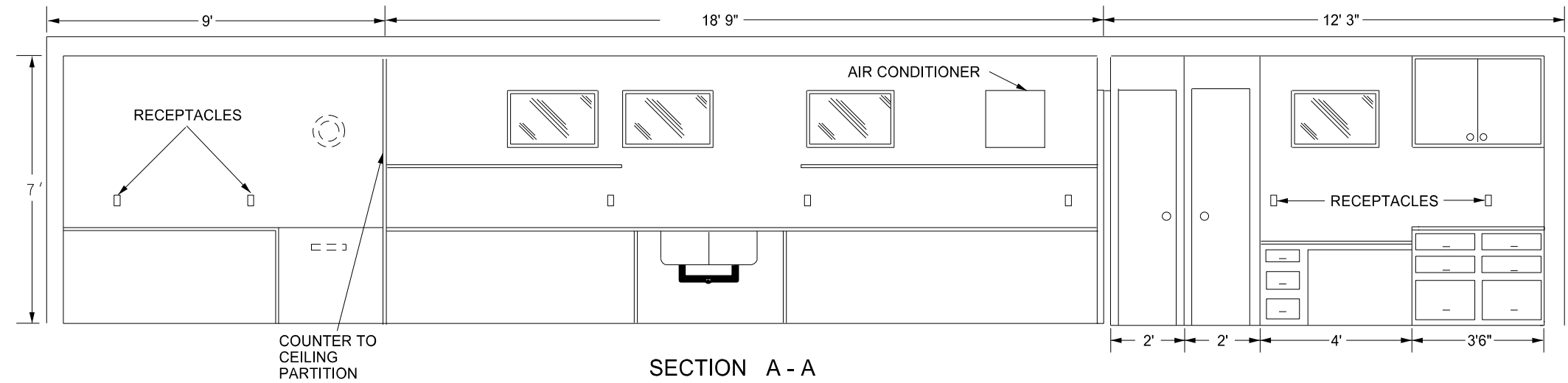
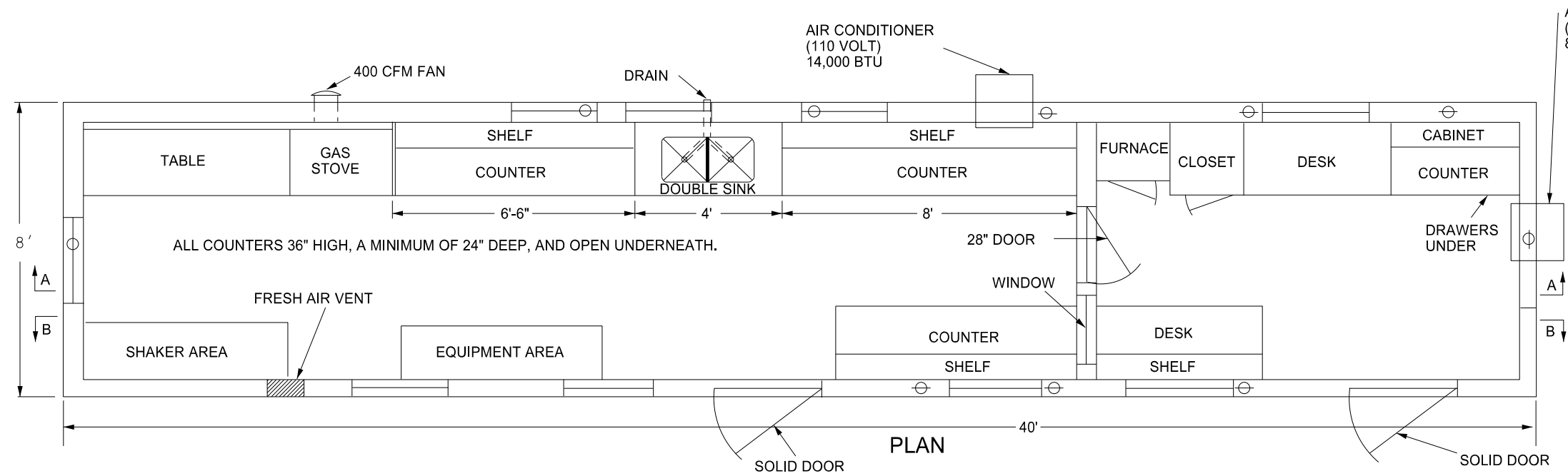
ADVANCE WARNING SIGN SPACING			
Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway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

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6-24-14	Revised Note

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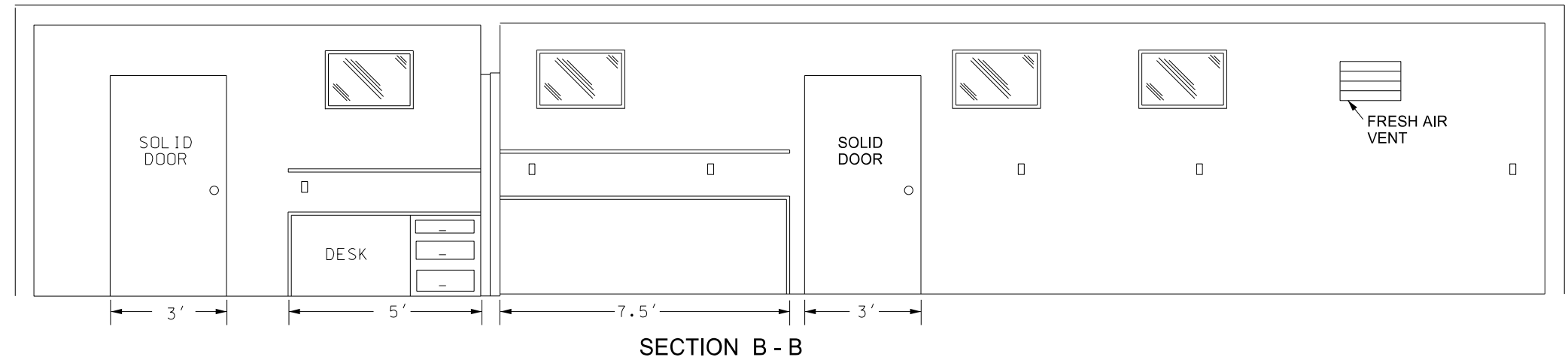
BITUMINOUS LABORATORY

D-706-1



Provide a laboratory with the following:

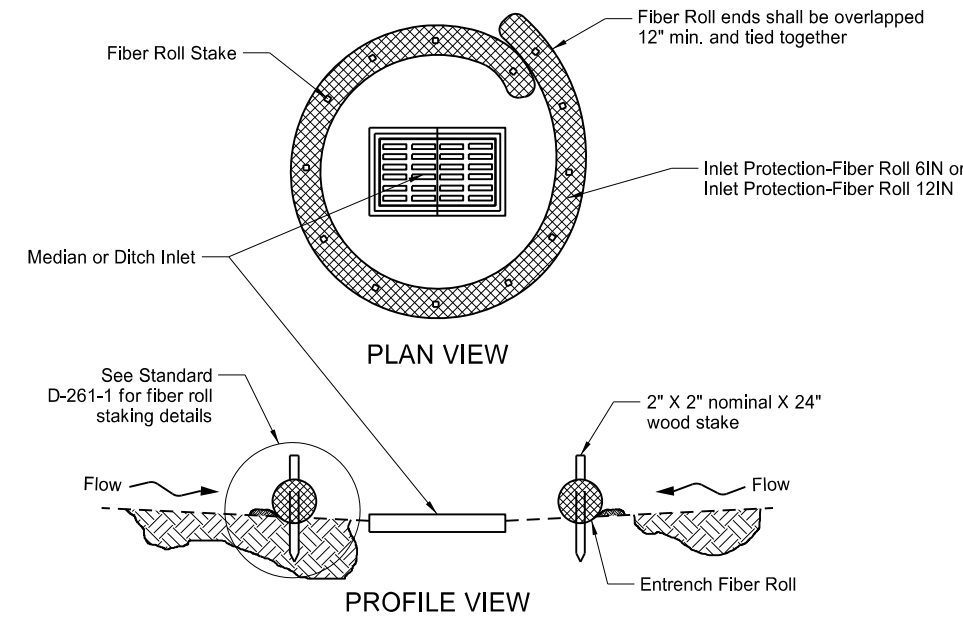
1. A 1'x1' shelf at 36" above the regular countertop.
2. Double compartment stainless steel sink, with each compartment a minimum of 16"x14"x10" deep. Provide water service lines made of copper or plastic and a diameter of ½ inch.
3. An exhaust fan capable of removing inside air at a rate of 400 CFM.
4. Fresh air vent hinged to open or close manually.
5. 24" x 48" table capable of holding a 200 lb masonry saw with a minimum clearance of 36" above the table.
6. A water supply tank with a capacity of 500 gallons and a 20 gallon capacity pressure tank on the pump.
7. Heavy duty type locks, latches, and hinges for doors made to withstand the intense use in service.
8. A wall between the office and the work area properly insulated to prevent the transmission of heat and noise.
9. The steel cable tie downs and ground anchors at each corner of the lab.
10. Electrical service entrance wired for 100 amps and separate circuits for air conditioners. Space convenience outlets in counter areas a minimum of four feet apart.



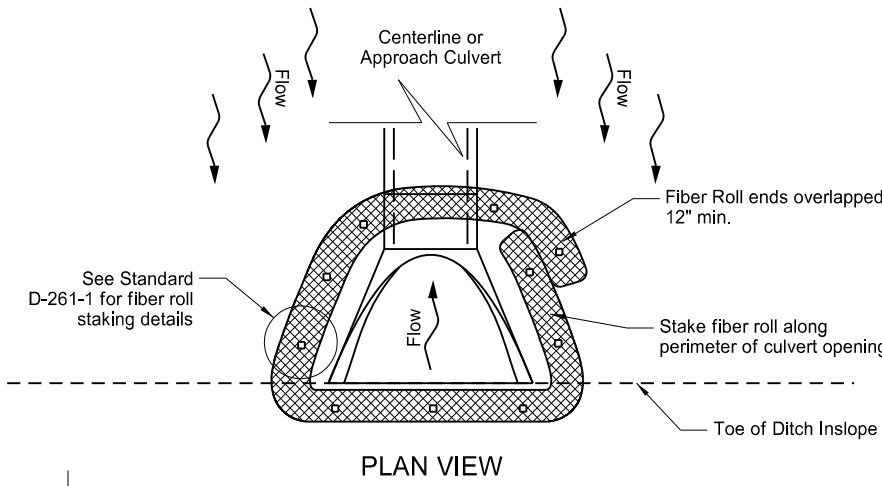
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-03-13	
REVISIONS	
DATE	CHANGE
07-30-14	Changed standard's title and revised notes.
01-11-16	Revised notes.

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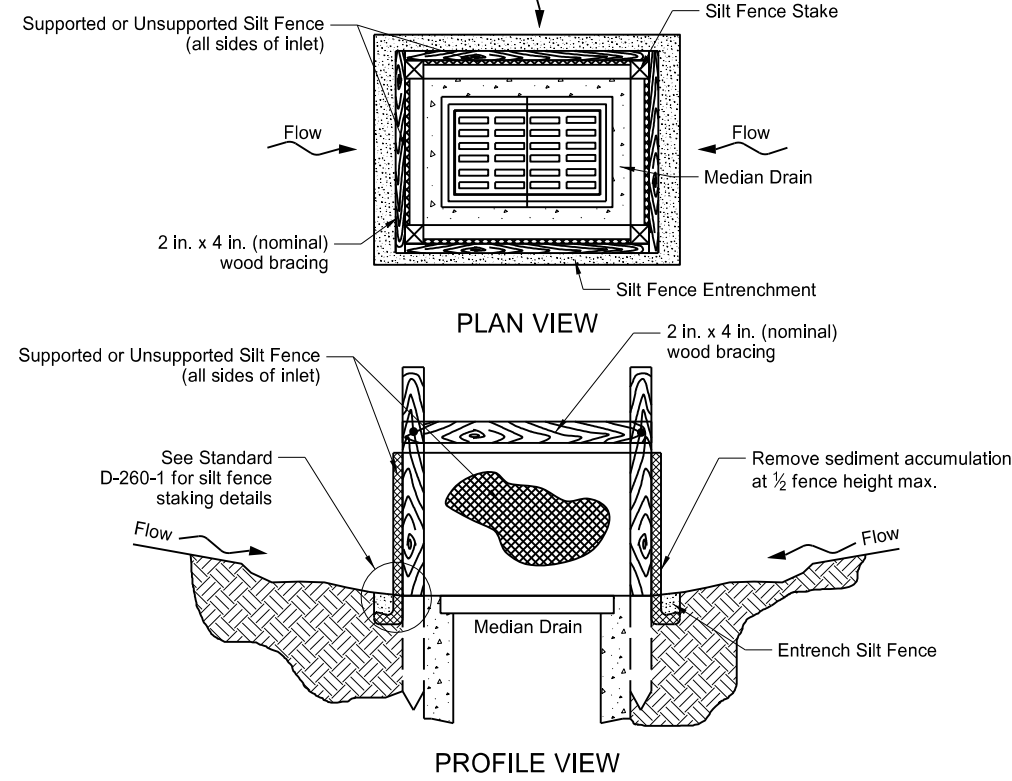
EROSION AND SILTATION CONTROLS  
MEDIAN OR DITCH INLET PROTECTION



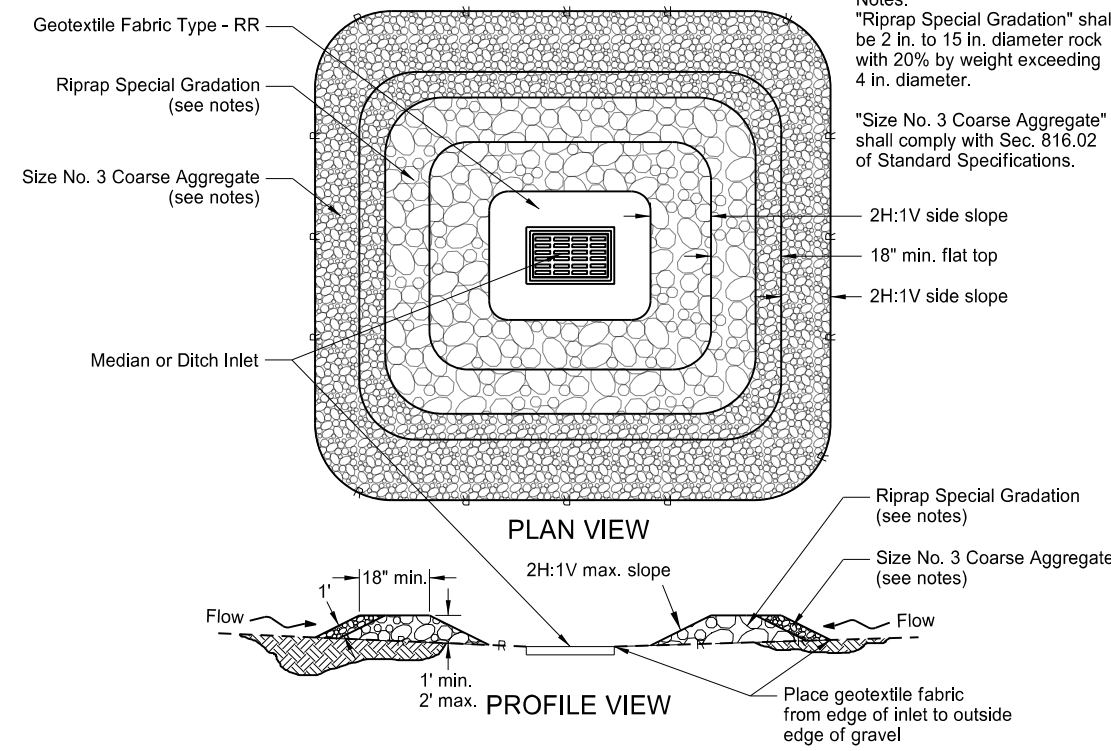
FIBER ROLL PROTECTION  
(MEDIAN OR DITCH INLET)



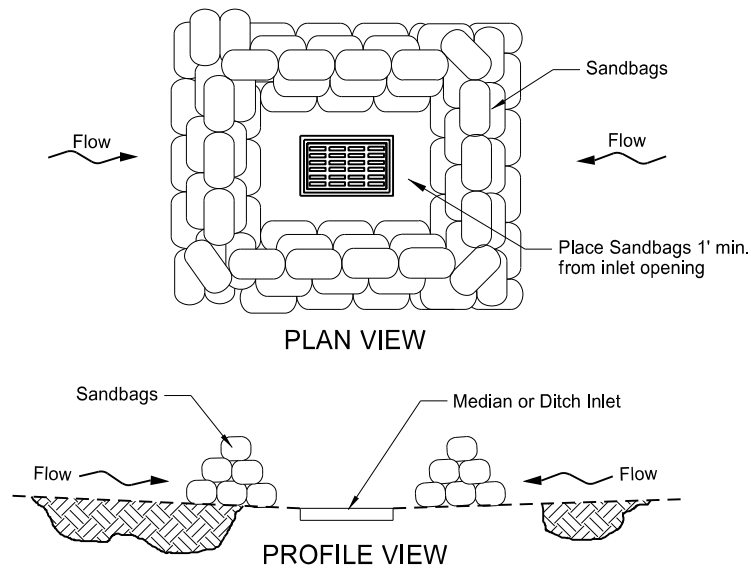
FIBER ROLL PROTECTION  
(INLET OF CULVERT)



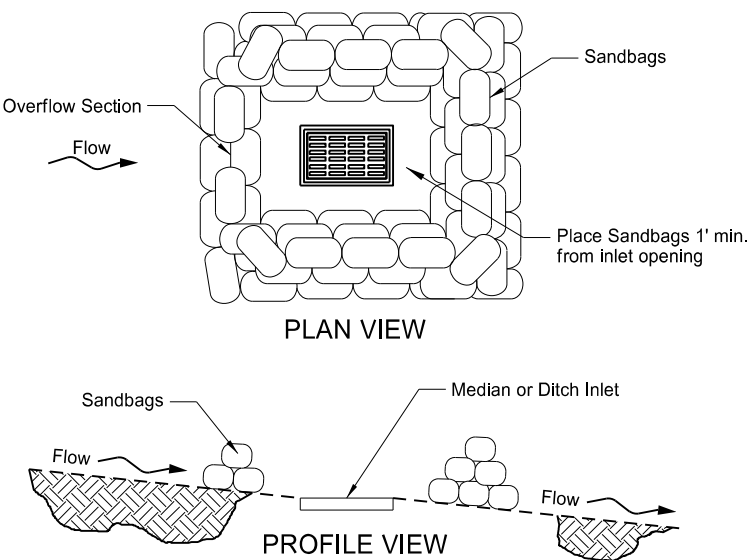
SILT FENCE PROTECTION  
(MEDIAN OR DITCH INLET)



GRAVEL INLET PROTECTION  
(MEDIAN OR DITCH INLET)



SANDBAG PROTECTION  
(LOW POINT)

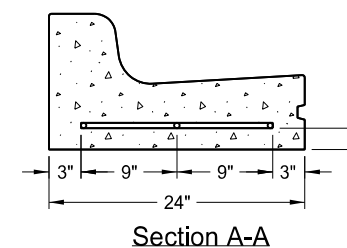
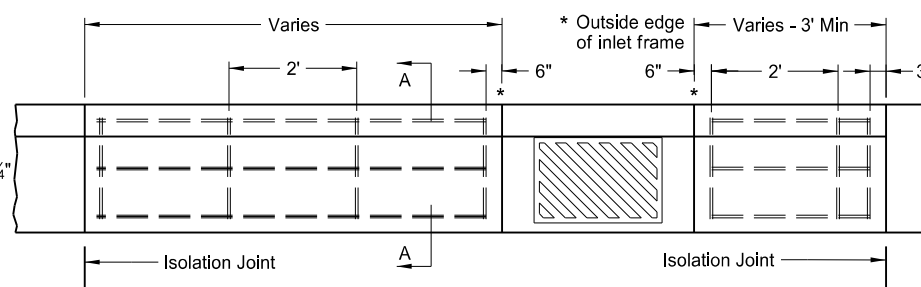
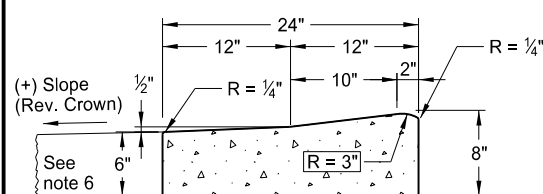
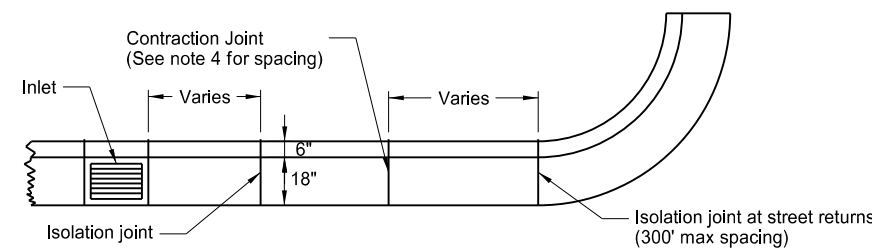
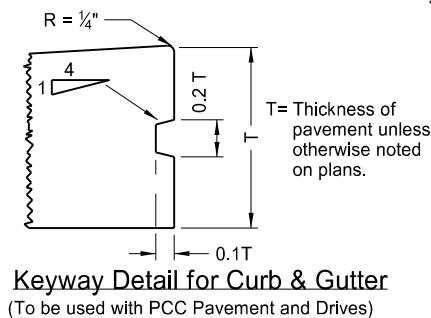
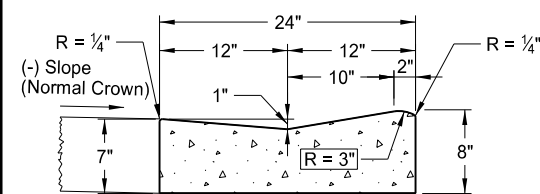
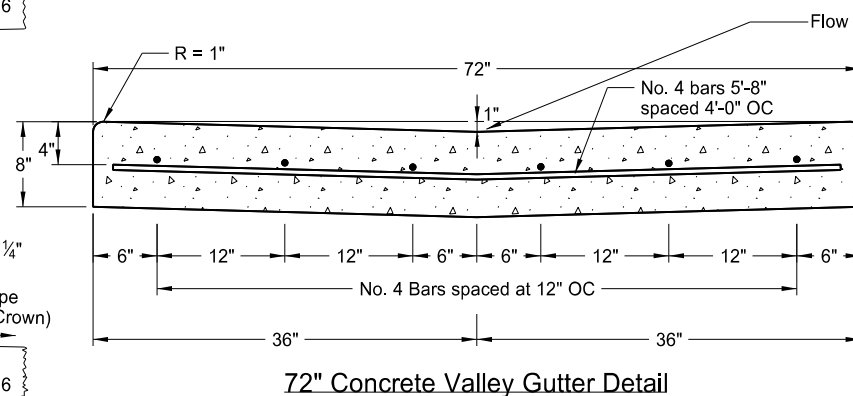
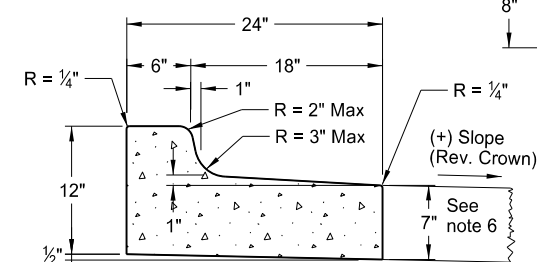
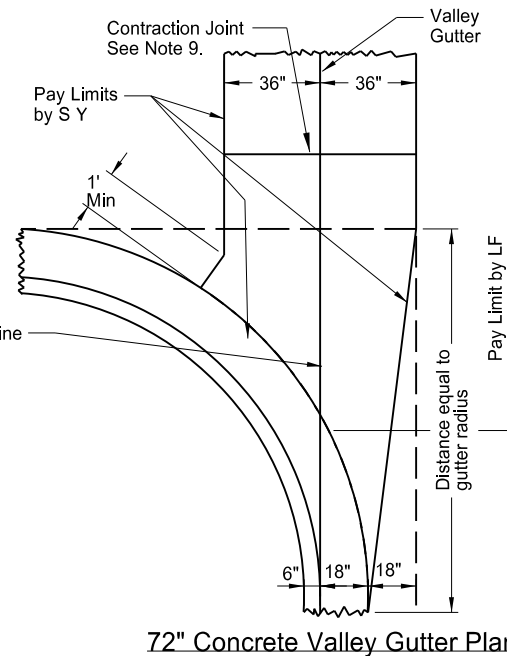
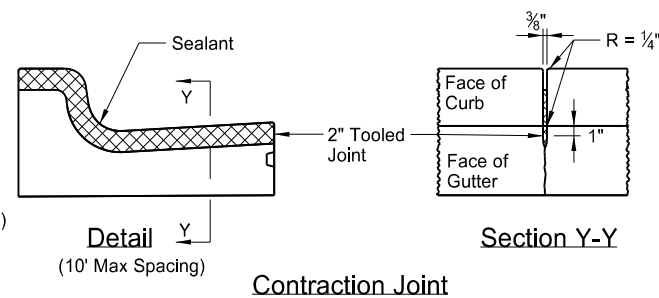
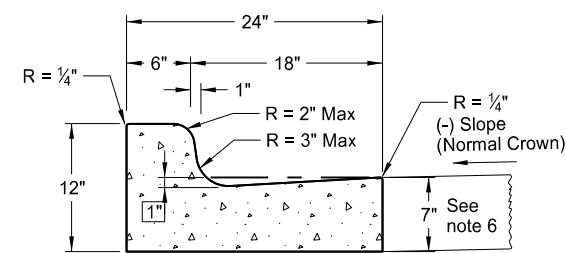
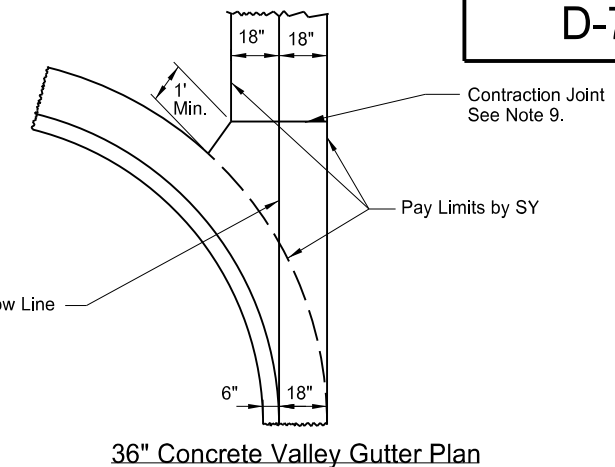
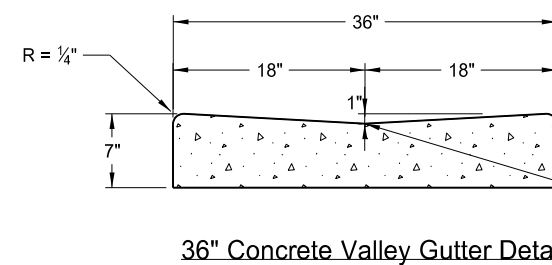
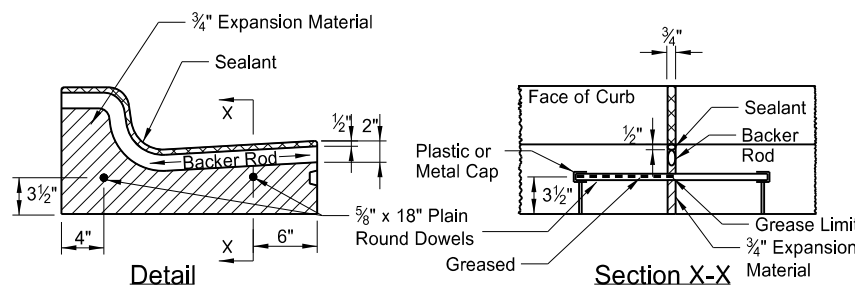
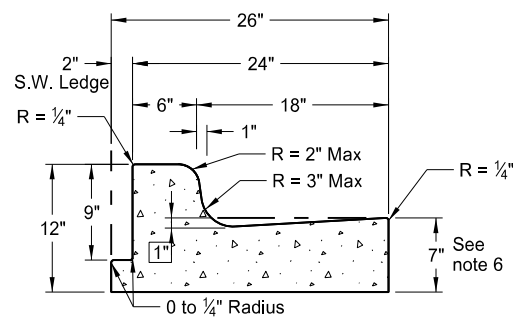


SANDBAG PROTECTION  
(ON SLOPE)

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-03-13	
REVISIONS	
DATE	CHANGE
06-26-14	Updated reference to standard drawing number for fiber roll staking details.
10-01-14	Updated reference to standard drawing number for silt fence.

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### Curb & Gutter and Valley Gutter



- NOTES:

1. Curb and Gutter Type 1 (Sec. A & B) to be used. Section "A" to be used with (-) pavement slopes and section "B" to be used with (+) pavement slopes.
2. Contraction Joints: Tool the Curb & Gutter 2" as shown on the contraction joint details.
3. Isolation Joints: Isolation joint material shall be 3/4" preformed expansion joint filler conforming to the standard specifications. The opening for the backer rod and joint sealant shall be formed by a pre-cut piece of wood or other material approved by the engineer. Dowel supports are not required on the second pour at a cold joint, plastic or metal caps and greased dowels shall be installed in the cold joint for the second pour.
4. Joint Spacing: For hot bituminous pavements the joint spacing for the curb and gutter shall be 10' max. with the panels on each side of the inlets. For concrete pavements the joint spacing for the curb and gutter shall match the pavement joint on PCC Pavements of approximately 15' spacing.
5. Joint sealing: All contraction and isolation joints shall be sealed as shown in the details. The joint sealant for contraction joints shall conform to section 826.02B. The sealant for expansion joints shall be as specified in note 3 above. The sealant shall be tooled and installed in accordance with the manufacturer's recommendations.
6. Depth of Face of Gutter: For hot bituminous pavement the depth of gutter shall be 7" as shown. For PCC pavements, the Contractor has the option to match the depth of gutter to the depth of the adjacent PCC pavement or to construct a 7" depth as shown.
7. When the curb and gutter abuts PCC pavement, it shall be tied to the PCC pavement. The tie bar shall consist of a No. 3 bar, 1'-6" in length spaced 4' center to center.
8. On street returns and other locations where the new curb and gutter ends and does not abut existing curb and gutter, the end two (2) feet of the curb shall be tapered from 6" in height to 0". A 1/2" premolded isolation joint which is full depth and the same shape as the curb and gutter shall be installed just ahead of the taper. An 18" tie bar shall be installed across the joint.
9. Valley Gutter Joints: Contraction joints are required at approx. 10' intervals. The contraction joints shall be 1/8" min. to 3/8" max. in width. The joints shall be formed by sawing or scoring to a minimum depth of 2". The joint sealant shall be a hot poured elastic type joint sealer in accordance with Section 826.02A.2 of the Standard Specifications. The joint and sealant shall be included in the price bid for Valley Gutter.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-7-2013	
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DATE	CHANGE

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CONCRETE DRIVEWAY - URBAN

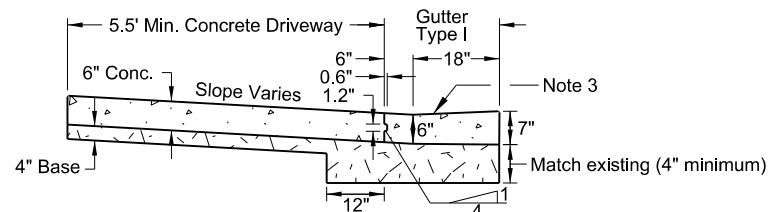
D-750-1

NOTES:

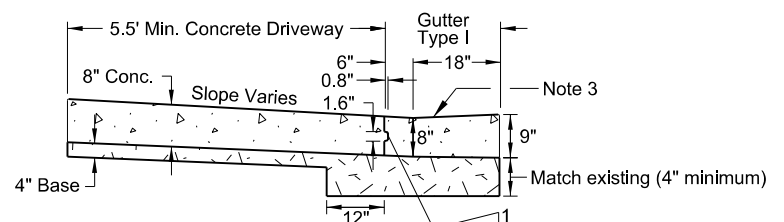
- 1. See Standard D-748-1 for curb and gutter isolation joint detail. On PCC roadways, the curb and gutter joints should match those of the pavement as much as practical.
- 2. Joint Spacing: 1 Center contraction joint to be used on all driveways 20' width or less, 2 center contraction joints for driveways > 20' to 30' width, and 3 center contraction joints for driveways greater than 30' width.  
  
The contraction joints may be sawed or a grooved joint, and shall be a minimum of 1/3 the depth of the concrete.
- Isolatin joints should also be used between seperately poured concretes, or between old and new concrete.
- All joints shall be sealed with hot pour bituminous filler or low modulus silicone. The sealant shall be installed and tooled in accordance with the manufacturer's recommendations.
- All costs for labor, equipment, and material necessary to construct and seal joints shall be included in the price bid for the driveway.
- 3. Gutter-Type 1 shall be paid for at the unit price bid for "Curb and Gutter-Type 1".
- 4. 6" Driveway to be used unless otherwise specified.
- 5. 4" base material shall be placed under the concrete driveway. All labor and materials necessary to place the base material shall be included in the price bid for Salvage Base Course or Aggregate Base Course CL 5.
- 6. Sidewalk that falls behind a driveway shall be constructed to the same thickness as the driveway and shall be paid for as driveway concrete.



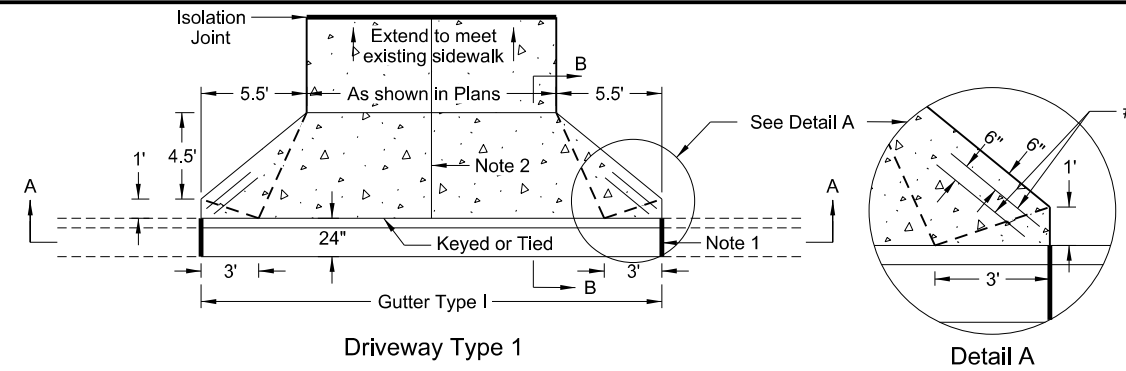
Section A-A



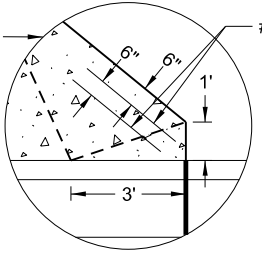
6" Section B-B



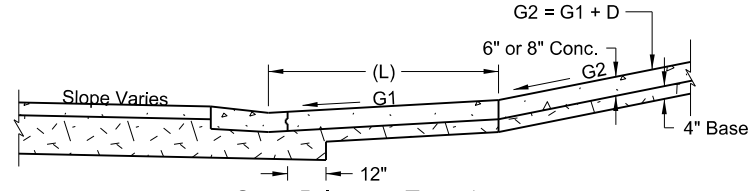
8" Section B-B



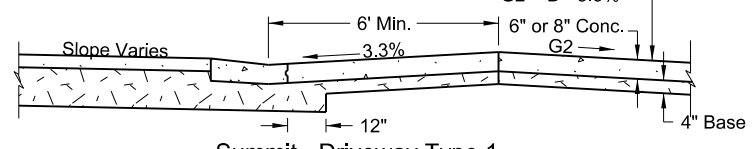
Driveway Type 1



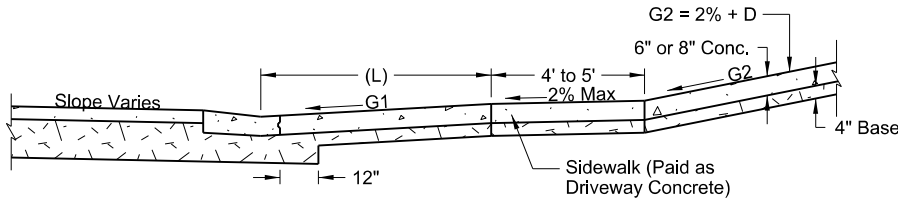
Detail A



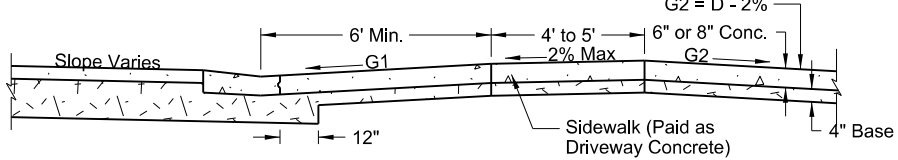
Sag - Driveway Type 1



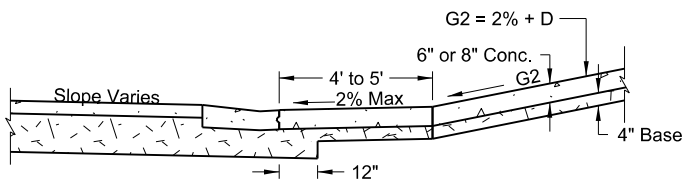
Summit - Driveway Type 1



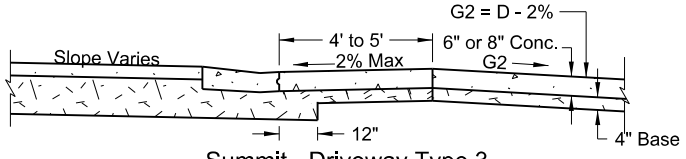
Sag - Driveway Types 2A & 2B



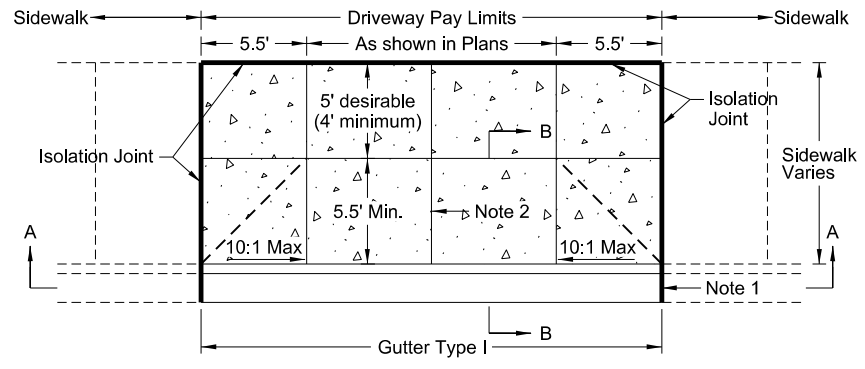
Summit - Driveway Types 2A & 2B



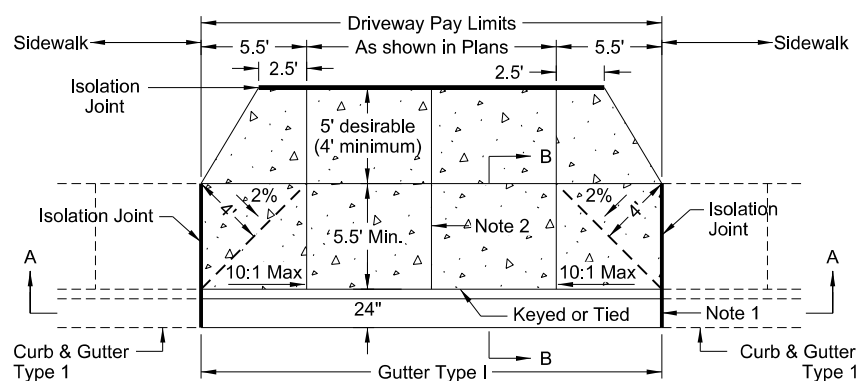
Sag - Driveway Type 3



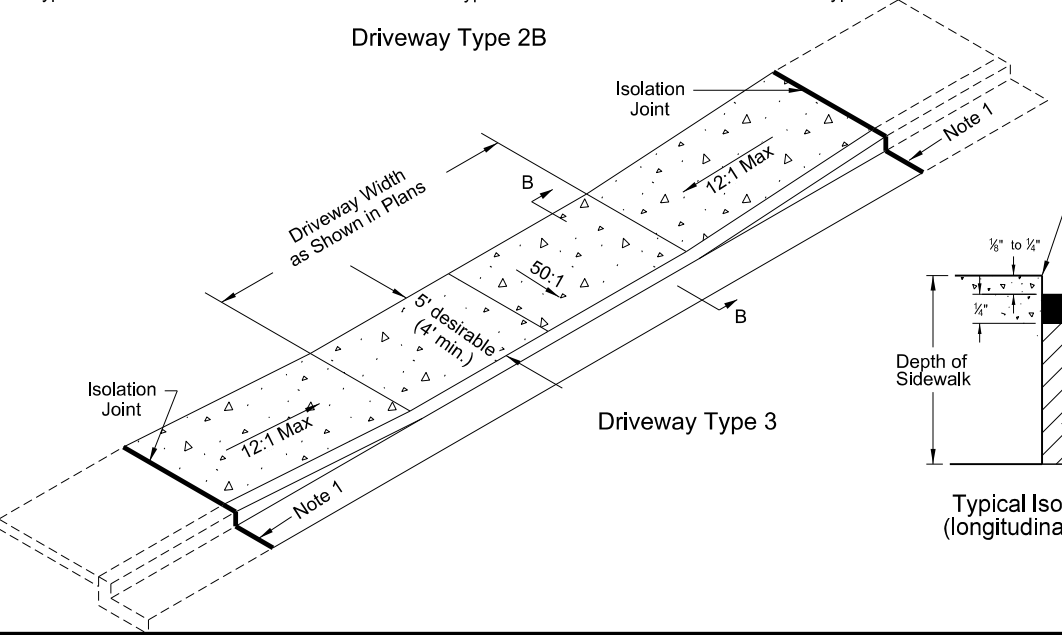
Summit - Driveway Type 3



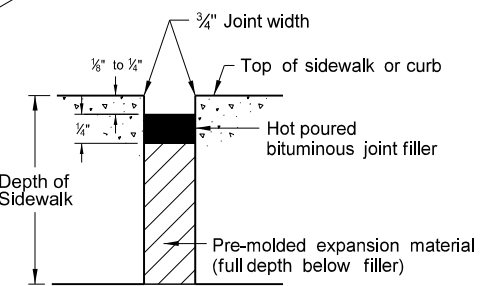
Driveway Type 2A



Driveway Type 2B



Driveway Type 3



Typical Isolation Joint Seal (longitudinal and transverse)

Driveway ADT	Grade G1		Dimension (L) ft.		Grade Changes (D)	
	Desirable	Maximum	Desirable	Maximum	Desirable	Maximum
(0-500)	5%	12% or controlled by vehicle clearance	12	6	6%	15% or controlled by vehicle clearance
(500-1500)	3%	8%	20	20	3%	6%
(> 1500)	2%	5%	40	40	0%	3%

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
2-13-2014	
REVISIONS	
DATE	CHANGE

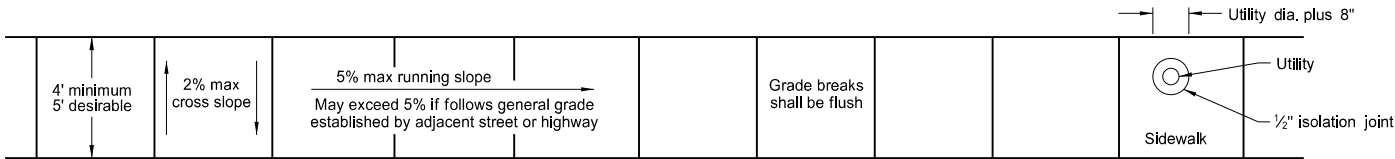
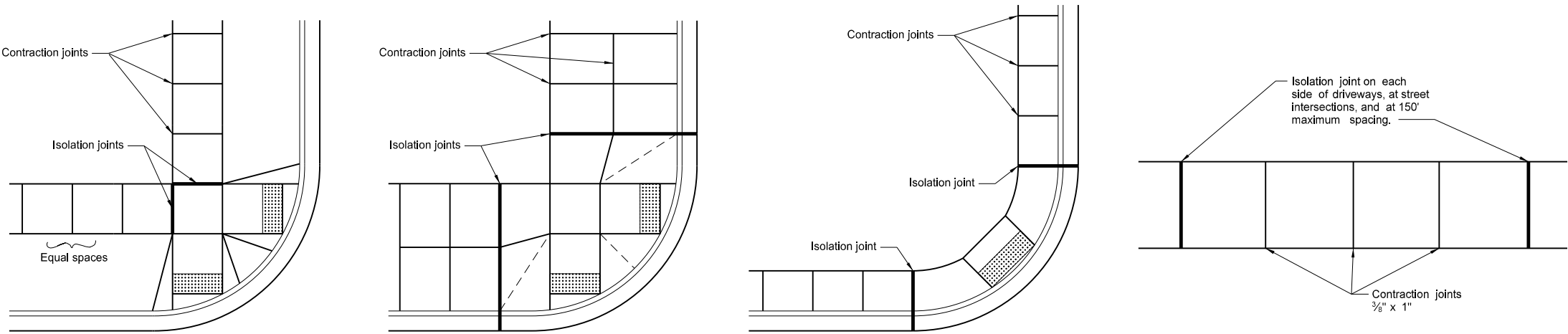
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SIDEWALK

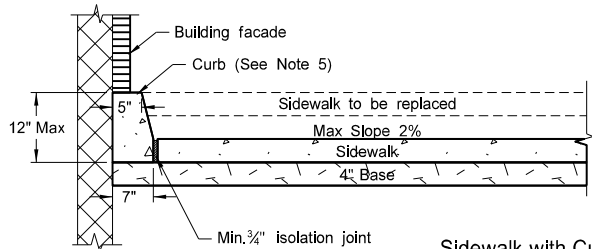
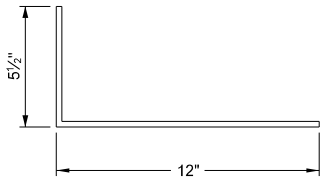
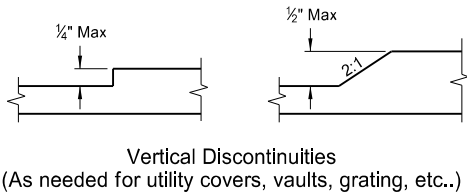
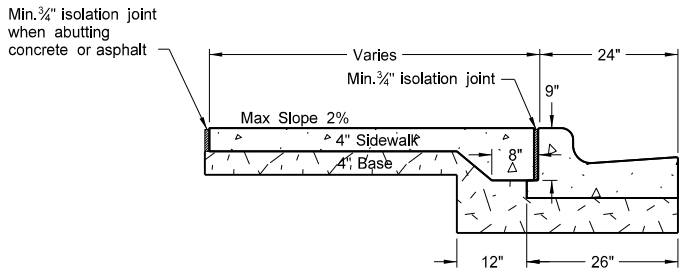
D-750-2

NOTES:

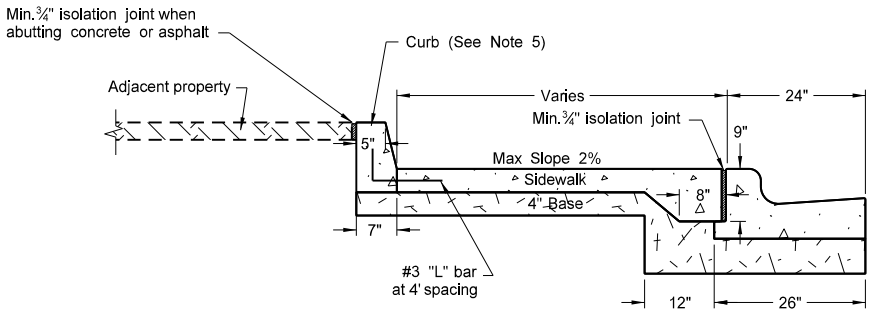
1. Curb ramp and detectable warning panel layouts are for informational purposes only. See Standard Drawing D-750-3 for curb ramp and detectable warning panel details.
2. Joint Spacing: Transverse contraction joint spacing shall vary from 4' to 6' to create approximate square panels.  
  
Longitudinal contraction joints shall be used where the sidewalk width is 8' or greater, and shall be spaced at half the sidewalk width.  
  
The contraction joints may be sawed or a grooved joint, and shall be a minimum of 1/3 the depth of the concrete.  
  
When the sidewalk is adjacent to the curb & gutter, the sidewalk joint spacing shall be varied to match up with the curb & gutter joints.  
  
Isolation joints should also be used between separately poured concretes, or between old and new concrete.  
  
The cost for all labor, equipment, and material necessary to construct contraction and isolation joints shall be included in the price bid for sidewalk concrete.
3. 4" sidewalk concrete thickness to be used unless otherwise specified in the plans.
4. 4" base material thickness to be used unless otherwise specified in the plans. All labor and materials necessary to place the base material shall be included in the price bid for "Salvage Base Course" or "Aggregate Base Course CL 5."
5. Landscaping is preferred to modify existing ground slope changes as needed. If not possible, such as adjacent buildings, a vertical curb may be used as shown in the detail below. The curb will be paid for at the unit price bid for the item "Curb - Type I" per lineal foot.



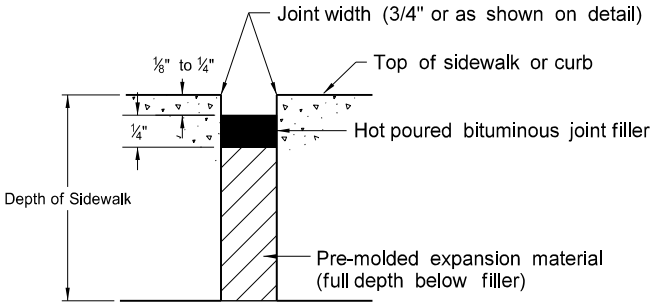
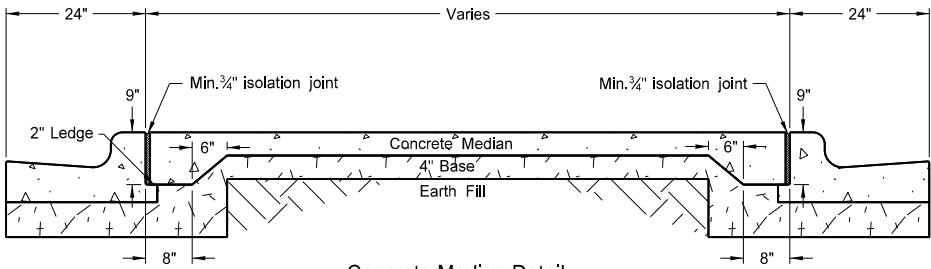
Utility Blockout



Sidewalk with Curb Detail  
(Building face application)



Sidewalk with Curb Detail  
(Adjacent property application)



NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-26-13	
REVISIONS	
DATE	CHANGE

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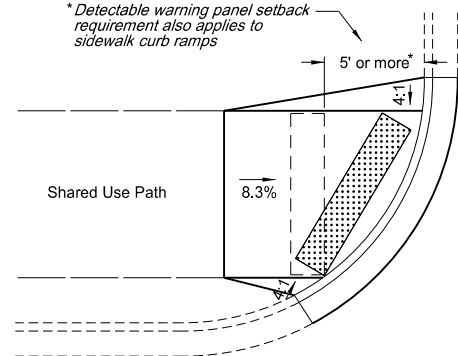
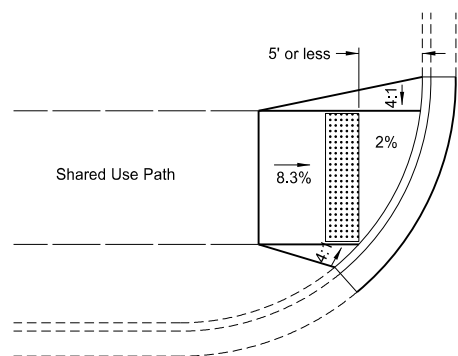
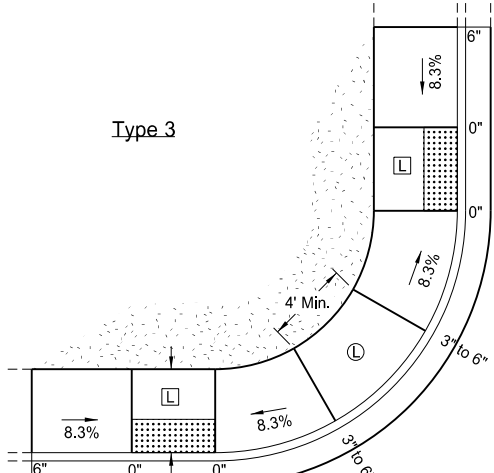
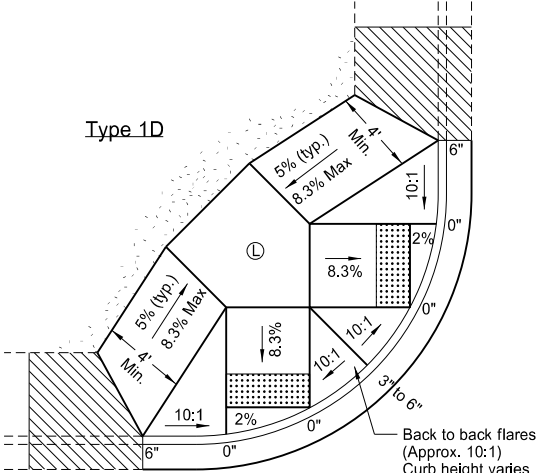
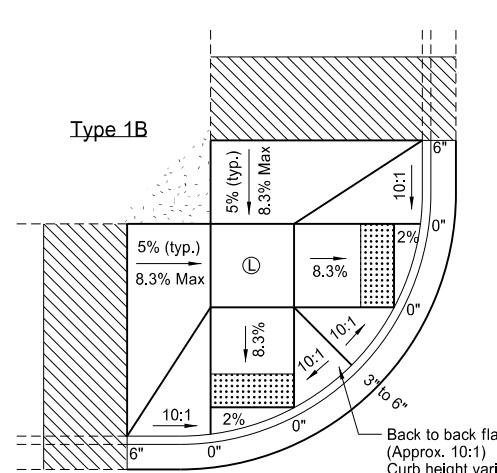
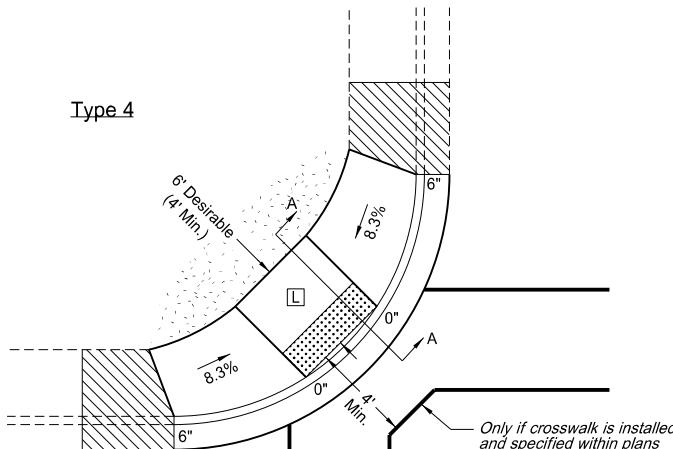
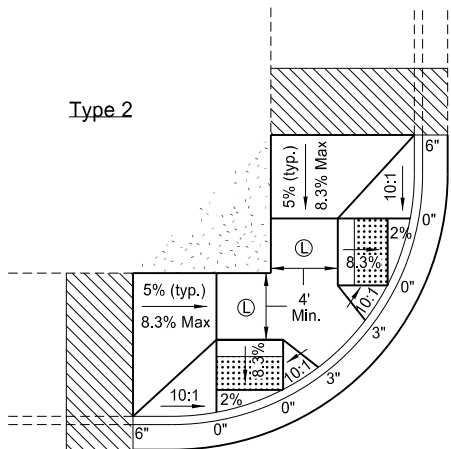
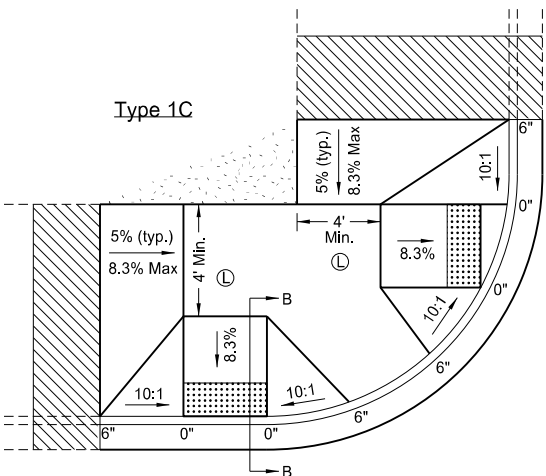
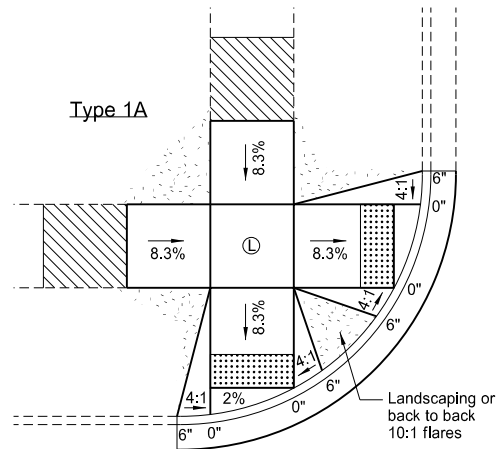


CURB RAMP DETAILS

D-750-3

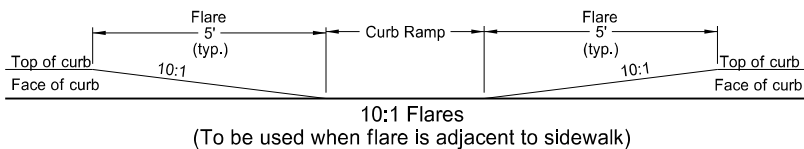
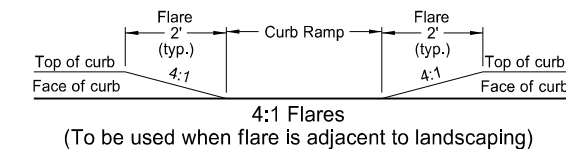
+More Right of Way

Less Right of Way

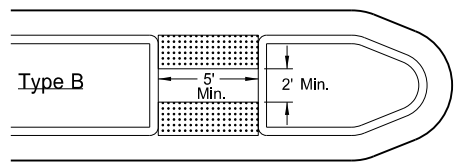
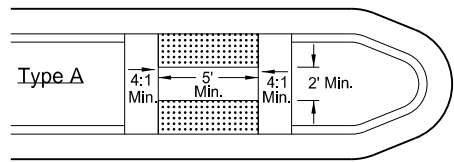


Concrete Apron for Shared Use Paths with Curb and Gutter

Concrete Apron for Shared Use Paths without Curb and Gutter



Median Refuge Islands (Cut-Through)

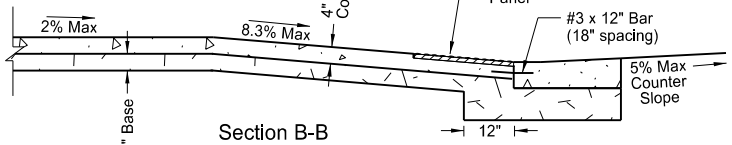
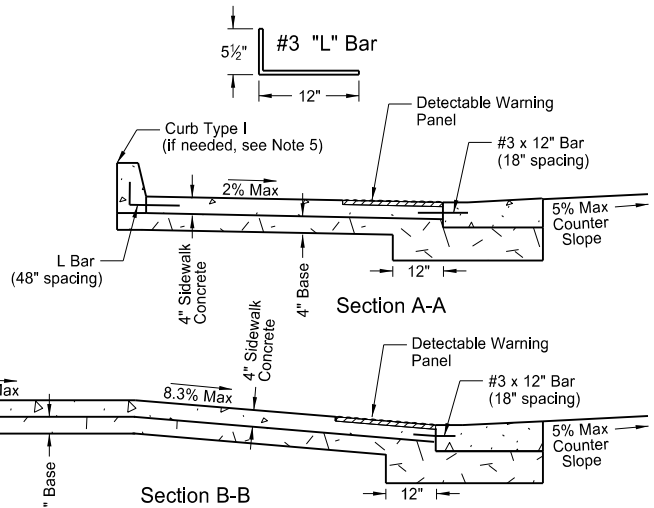


NOTES:

- Ramp width is defined as the useable portion of the ramp, excluding flares if used.  
Curb ramp width should match the existing sidewalk width. 4' width minimum.  
Ramp width for shared-use paths should match the existing shared use path width.  
Ramp length shall be maximum of 15'.
- Landings shall be a minimum of 4' x 4' and shall have a max 2% slope in any direction. Landings are desirably 5' x 5' or larger.
- Detectable warning panels shall match the ramp width. Radial panels may also be used. The detectable warning panel may be located within the lower landing.
- The pedestrian access route shall be continuous 4' min. width. Max 2% cross slope applies to all concrete, excluding flares.
- Landscaping is preferred to modify existing ground slope changes as needed. If not possible, such as adjacent buildings, a vertical curb may be used as shown in the detail below. The curb will be paid for at the unit price bid for the item "Curb - Type I" per lineal foot.

LEGEND:

- Detectable Warning Panel
- Landscaping
- Transitional tie-in segment if needed for retrofits. Max grade slope 8.3%.
- Upper Landing
- Lower Landing
- 0", 3", or 6" : Curb Height
- 8.3% : All slopes shown are max grades. Flatter slopes may be used.



NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-26-13	
REVISIONS	
DATE	CHANGE

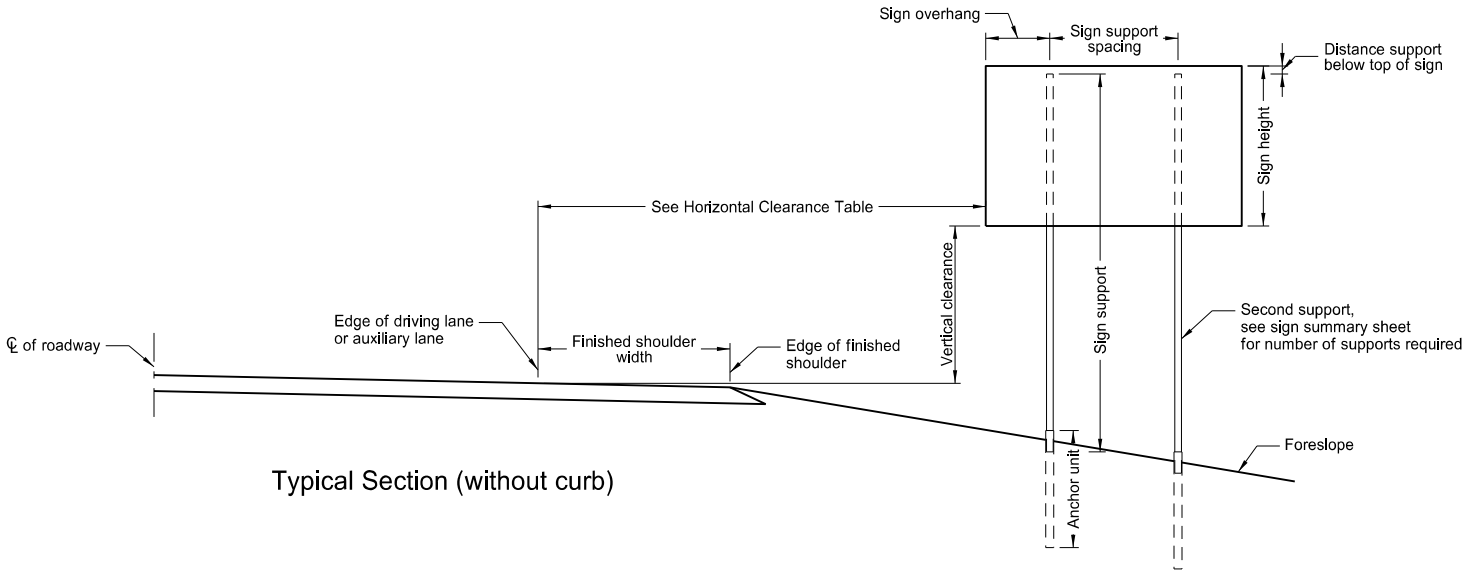
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PERFORATED TUBE ASSEMBLY DETAILS

D-754-23

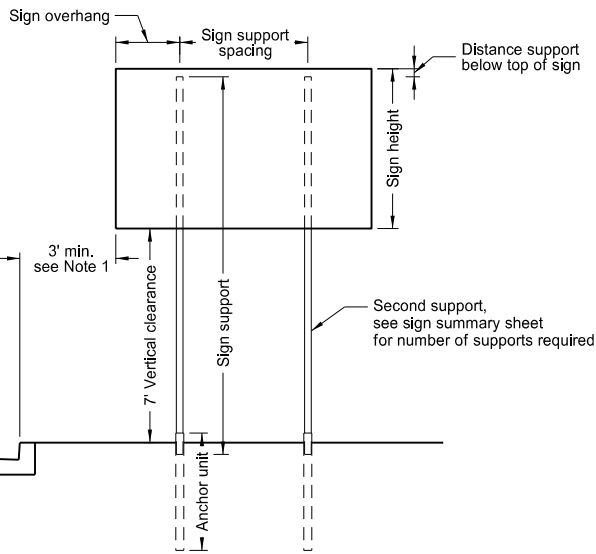
Notes:

- 1. Curbed Roadways: The clearance from the face of the curb should be 3' except where right of way or sidewalk width is limited, a minimum clearance of 2' shall be provided. The horizontal clearance may need to be increased to maintain a minimum sidewalk clear width of 4' from the sign support, not including any attached curb.
- 2. Minimum vertical clearance: Signs installed at the side of the road in rural districts shall be at least 5' measured from the bottom of the sign to the edge of the driving lane or auxiliary lane. Where parking or pedestrian movements occur, the clearance to the bottom of the sign shall be at least 7'.
- Signs on expressways shall be installed with a minimum height of 7'.
- Adopt-a-highway signs installed on Freeways shall be at least 7' above the edge of the driving lane.
- The vertical clearance shall have a maximum height of 6" above the vertical clearance specified above.
- 3. Offset signs: Where signs are placed at least 30 feet or more from the edge of the traveled way, the height to the bottom of such sign shall be 5' above the edge of the driving lane.
- 4. The clearance from edge of shared use path to edge of sign should be 3' except where width is limited, a minimum clearance of 2' shall be provided.

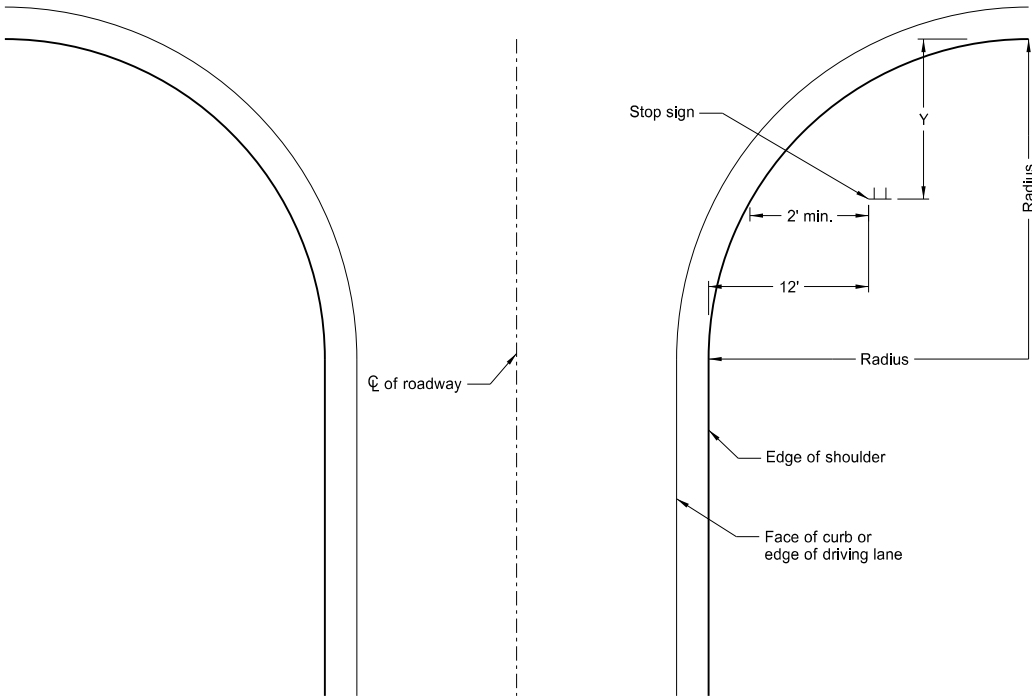


Typical Section (without curb)

Horizontal Clearance Table	
Shoulder Width ft	Offset ft
0 to 2	16
>2 to 4	18
>4 to 6	20
>6 to 8	22
>8 to 10	24

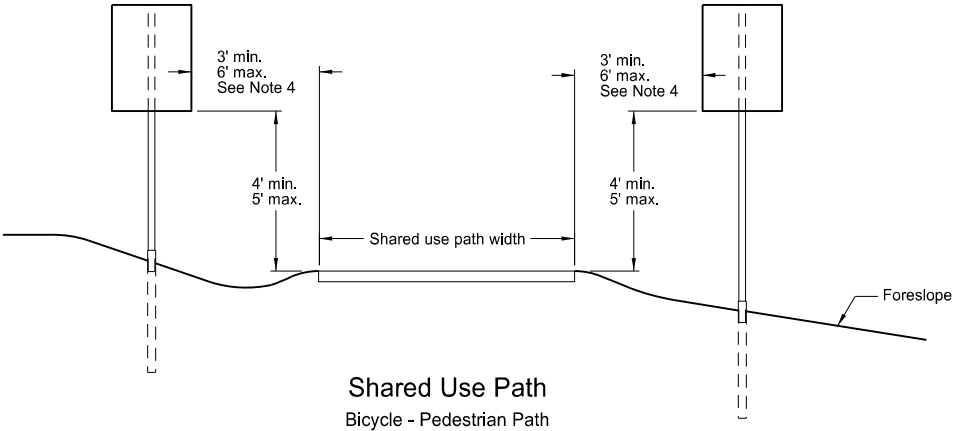


Typical Section (with curb)  
Residential or Business District



Stop Sign Location  
Wide Throat Intersection  
This layout is to be used for the placement of "Stop" signs.

Radius ft.	Y-max. ft.	Y-min. ft.
40	50	15
45	50	18
50	50	21
55	50	25
60	50	28
65	50	32
70	50	35
75	50	39
80	50	43



Shared Use Path  
Bicycle - Pedestrian Path

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-3-13	
REVISIONS	
DATE	CHANGE
7-8-14	Revised note 2, added note 4.

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Breakaway Coupler System  
for Perforated Tubes

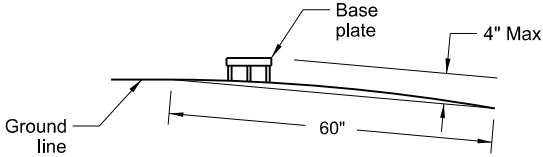
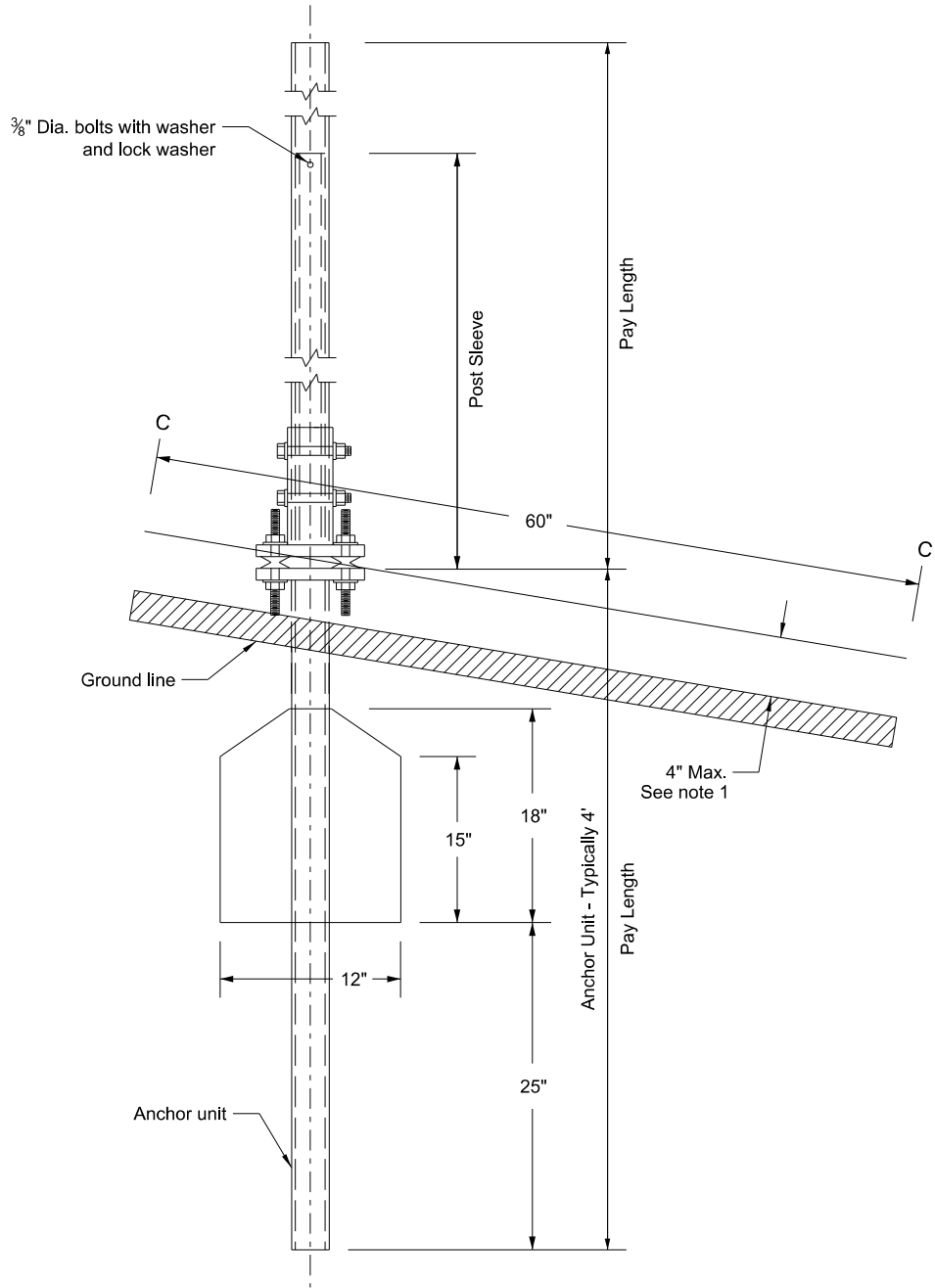
Notes:

- 4" Vertical clearance of anchor or breakaway base. The 4" x 60" measurement shall be made above and below post location and also back and ahead of post.
- Anchor unit shall be the same size as the post and shall have the same specification as the post.
- Four post signs shall have over 8' between the first and fourth post.
- In lieu of the breakaway base system on standard D-754-24 the breakaway coupling system may be used. The breakaway coupler system shall be manufactured from material meeting the requirements of ASTM A325 fasteners with the special requirements as specified by DENT BREAKAWAY IND., INC. which meets the test requirements of NCHRP Report 350.

Number of Posts	Telescoping Perforated Tube						
	Post Size In.	Wall Thick-ness Gauge	Sleeve Size In.	Wall Thick-ness Gauge	Slip Base	Anchor Size Without Slip Base In.	Anchor Wall Thickness Guage
1	2	12			No	2¼	12
1	2¼	12			No	2½	12
1	2½	12			(B)	3(C)	7
1	2½	10			Yes		7
1	2¼	12	2	12	Yes		7
1	2½	12	2¼	12	Yes		7
2	2½	10			Yes		7
2	2¼	12	2	12	Yes		7
2	2½	12	2¼	12	Yes		7
3 & 4	2½	12			Yes		7
3 & 4	2½	10			Yes		7
3 & 4	2½	12	2¼	12	Yes		7
3 & 4	2¼	12	2	12	Yes		7
3 & 4	2½	10	2¾	10	Yes		7

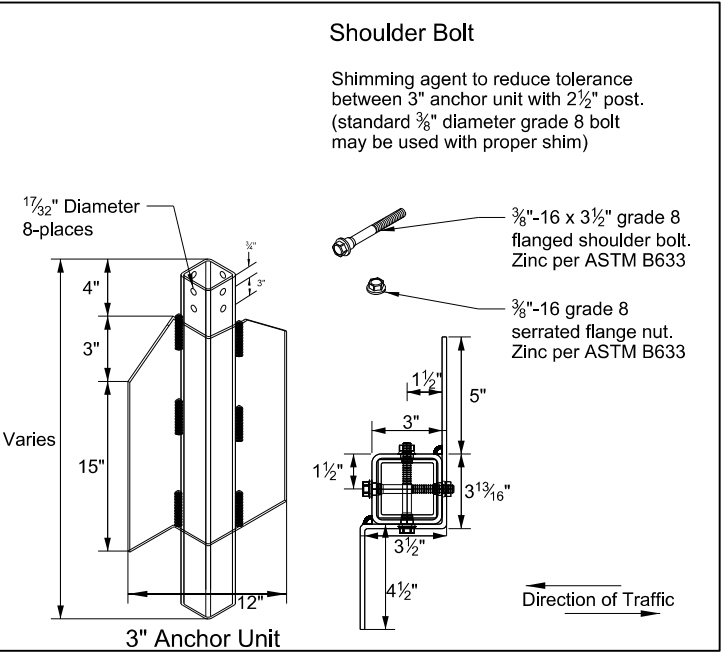
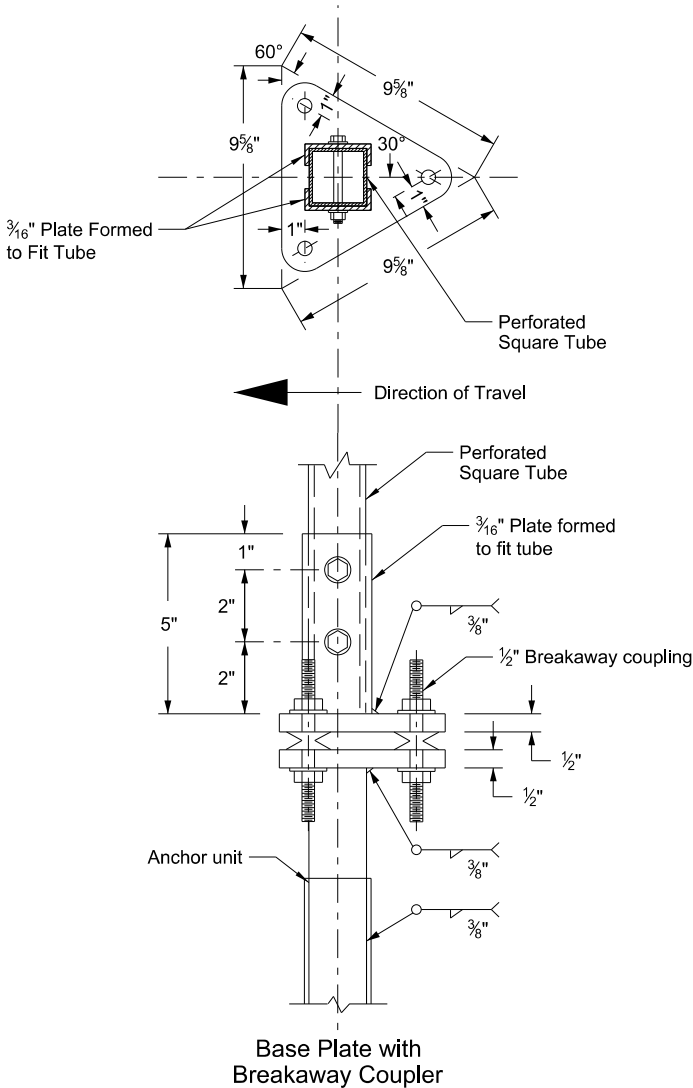
(B) - The 2½" 12 gauge posts do not need breakaway bases when placed in standard soils. The breakaway base is required when the support is placed in weak soils. The Engineer shall determine if the soils are weak. Weak soils are classified as boggy, wet, or loose soil areas.

(C) - 3" anchor unit



Section C-C

Max. protection of the stub post is 4" above a 60" chord aligned radially to the center line of the highway and connecting any point, within the length of the chord, on the ground surface on one side of the support to a point in the ground surface on the other side.



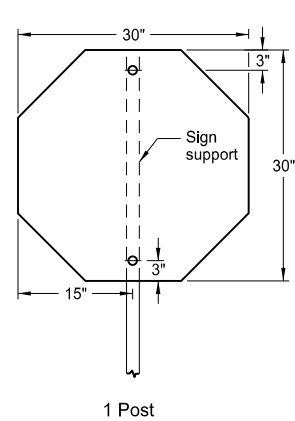
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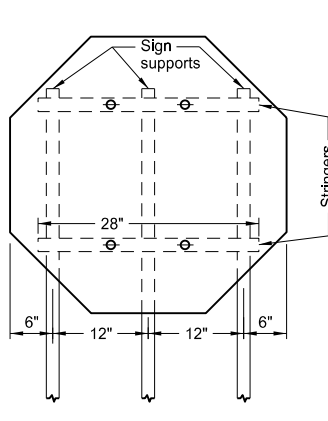
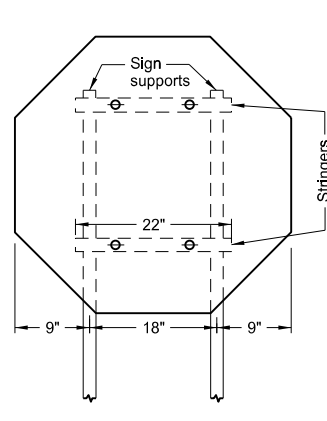
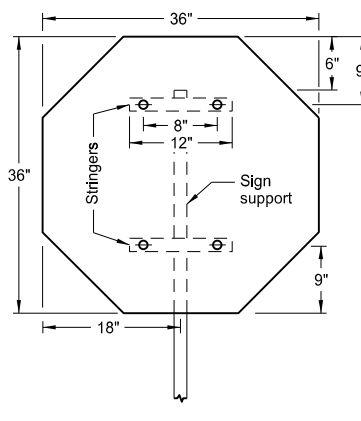
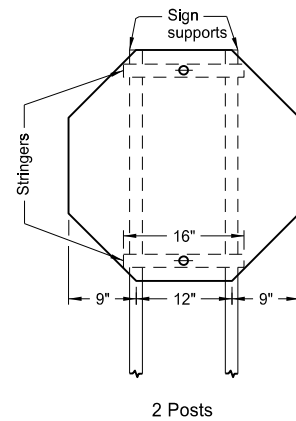


SIGN PUNCHING, STRINGER AND SUPPORT LOCATION  
DETAILS REGULATORY, WARNING AND GUIDE SIGNS

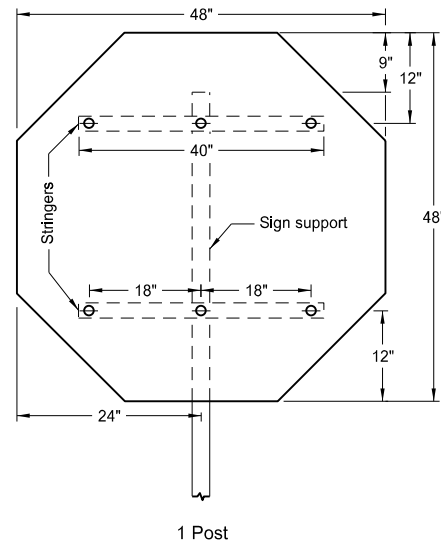
D-754-26



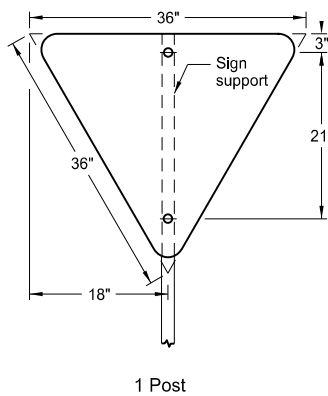
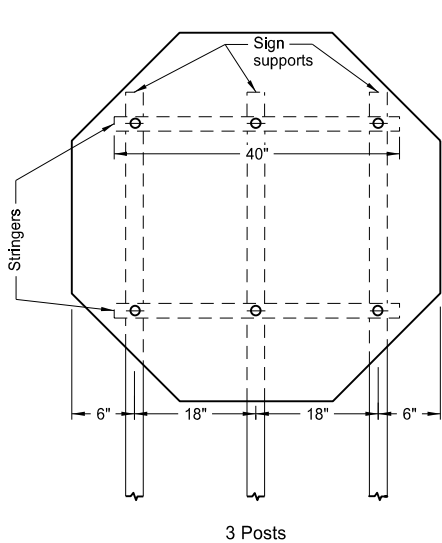
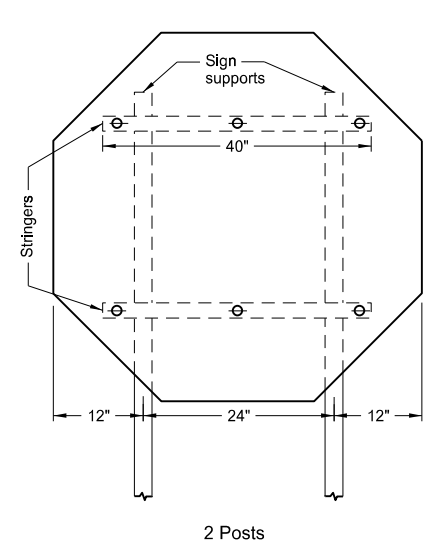
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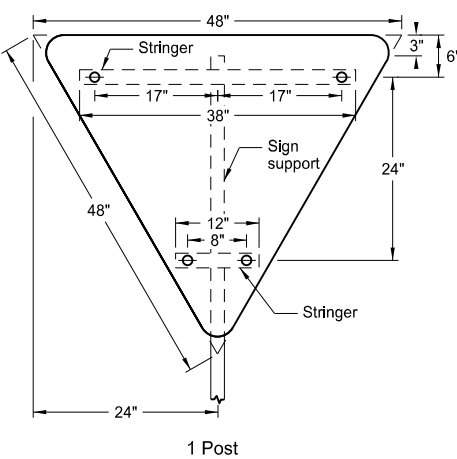
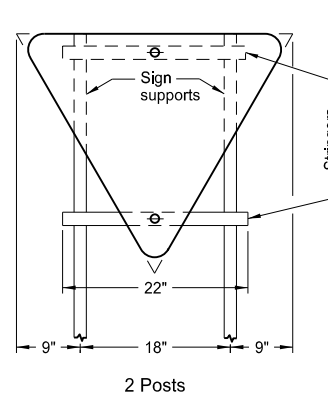
- Notes:
1. See Standard D-754-25 for mounting details.
  2. The minimum sign backing material thickness shall be 0.100 inch.
  3. Perforated square tube stringer shall be 1½" x 1½".
  4. All holes shall be punched round for ⅜" bolt.



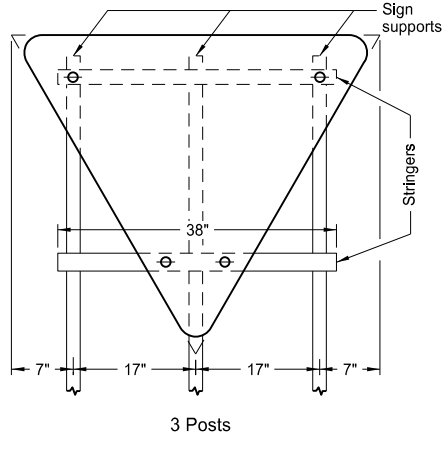
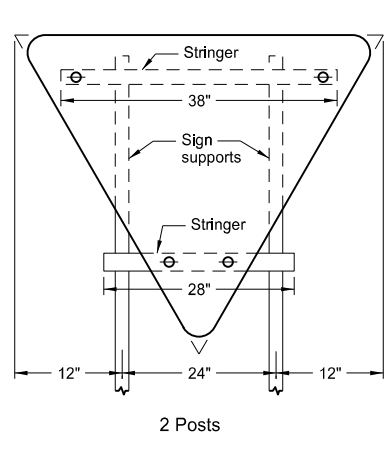
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Assembly No. 4



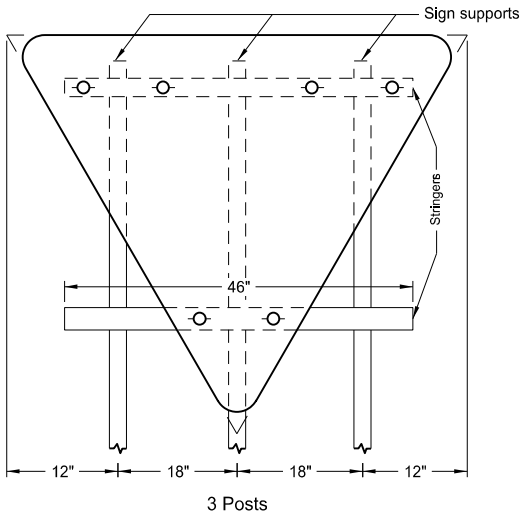
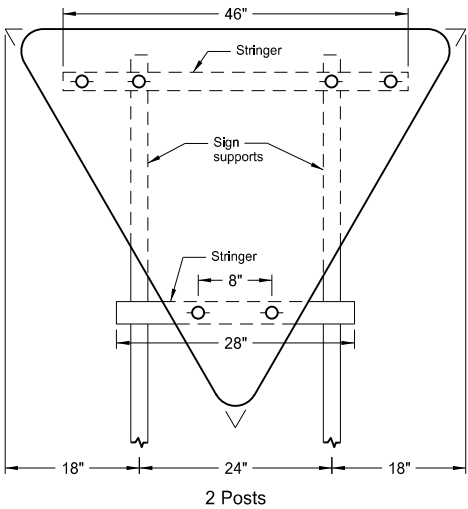
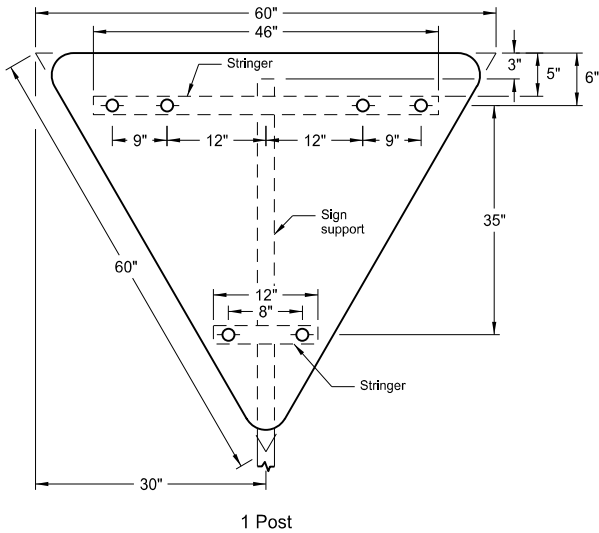
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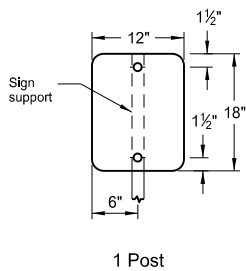
SIGN PUNCHING, STRINGER AND SUPPORT LOCATION  
DETAILS REGULATORY, WARNING AND GUIDE SIGNS



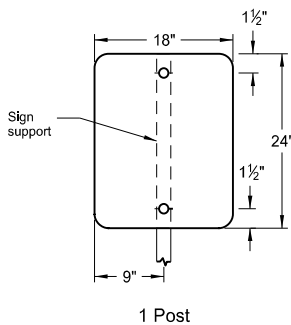
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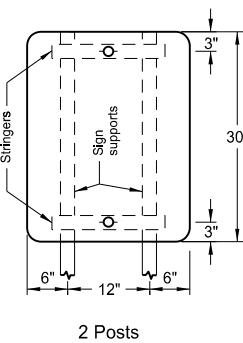
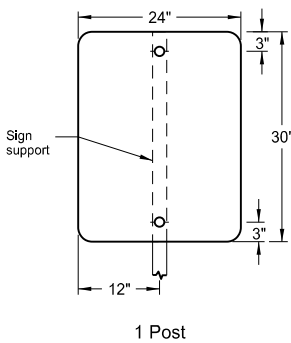
1. See Standard D-754-25 for mounting details.
2. The minimum sign backing material thickness shall be 0.100 inch.
3. Perforated square tube stringer shall be 1½" x 1½".
4. All holes shall be punched round for ⅜" bolt.



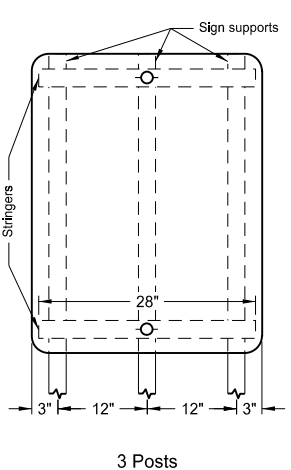
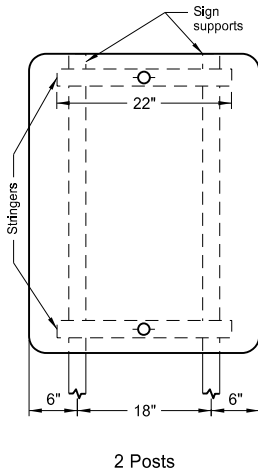
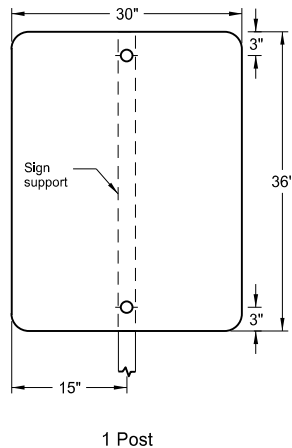
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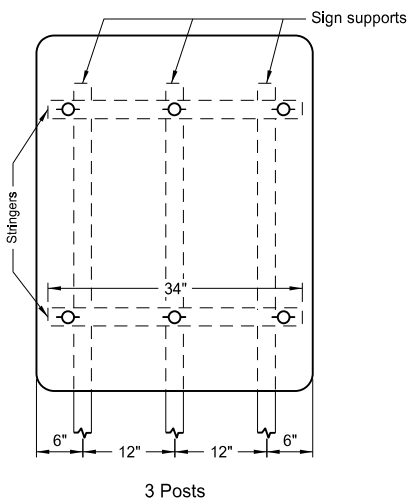
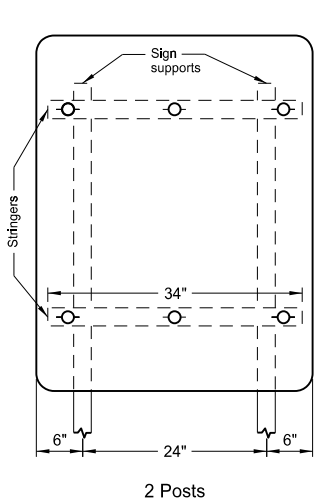
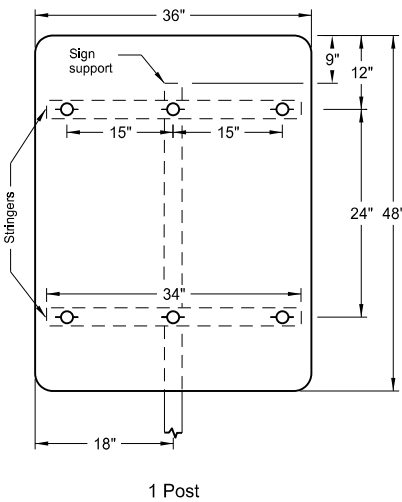
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Assembly No. 9



Assembly No. 10



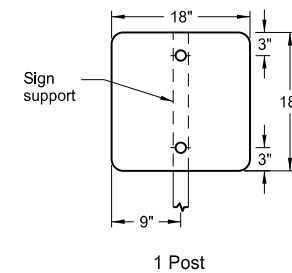
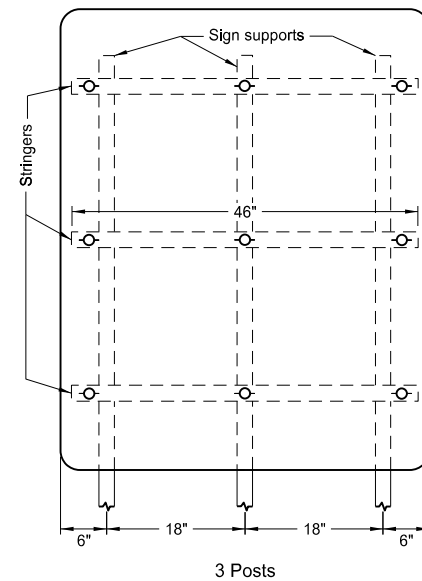
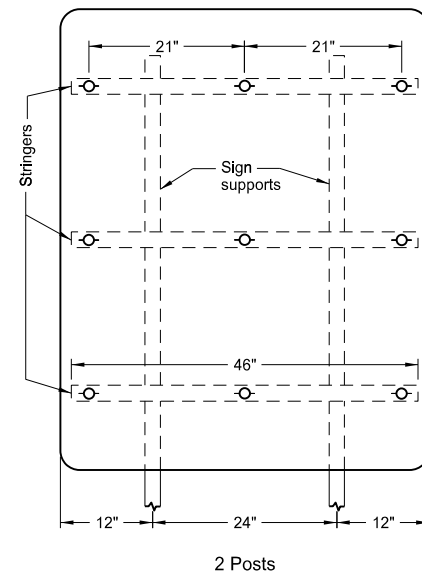
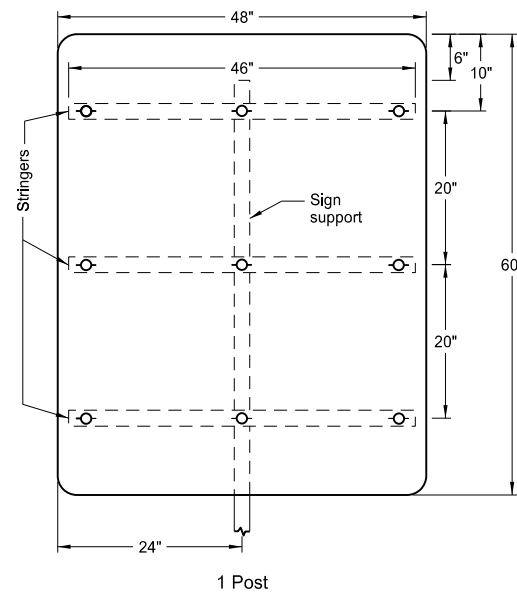
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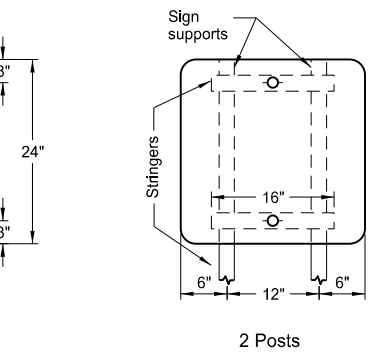
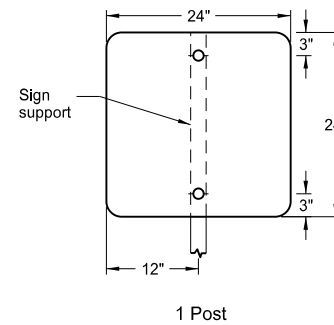
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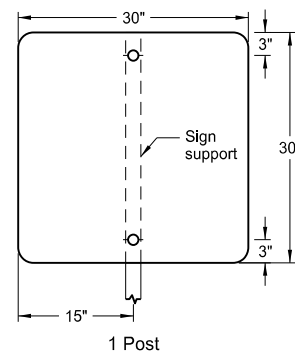
D-754-28



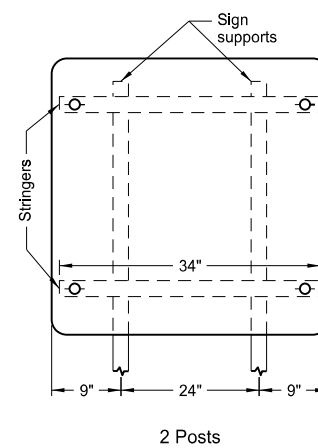
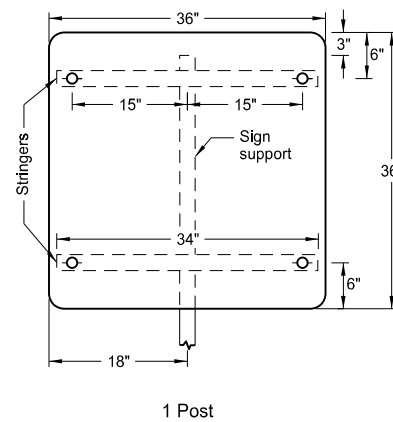
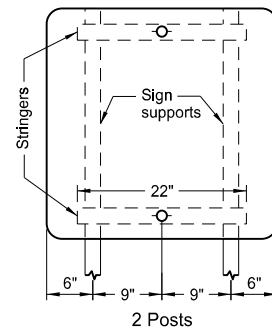
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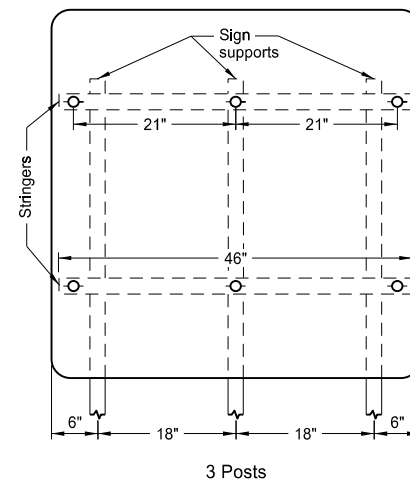
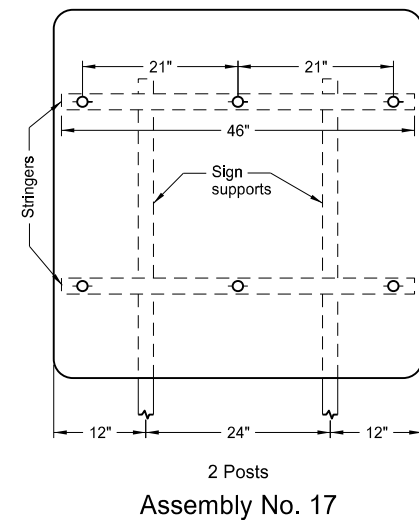
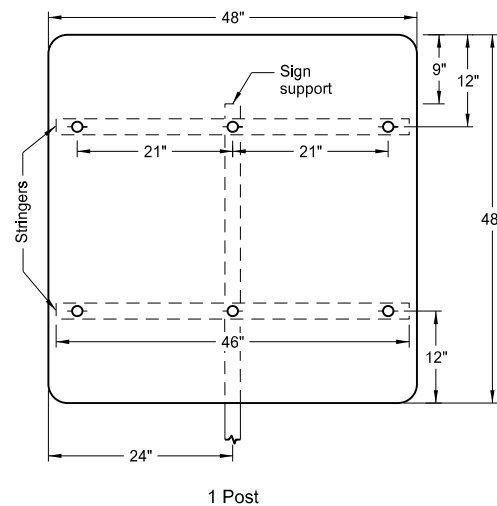
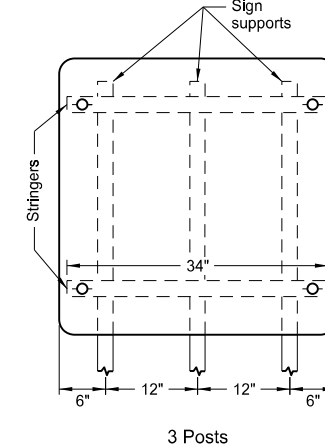
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Assembly No. 15



Assembly No. 16



Notes:

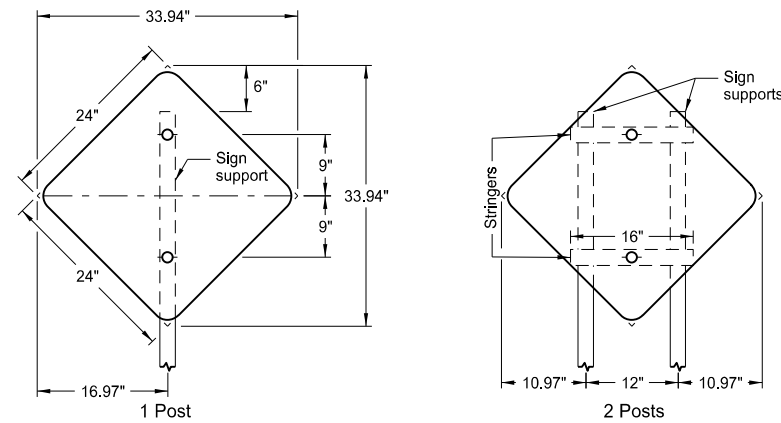
1. See Standard D-754-25 for mounting details.
2. The minimum sign backing material thickness shall be 0.100 inch.
3. Perforated square tube stringer shall be 1½" x 1½".
4. All holes shall be punched round for ⅜" bolt.

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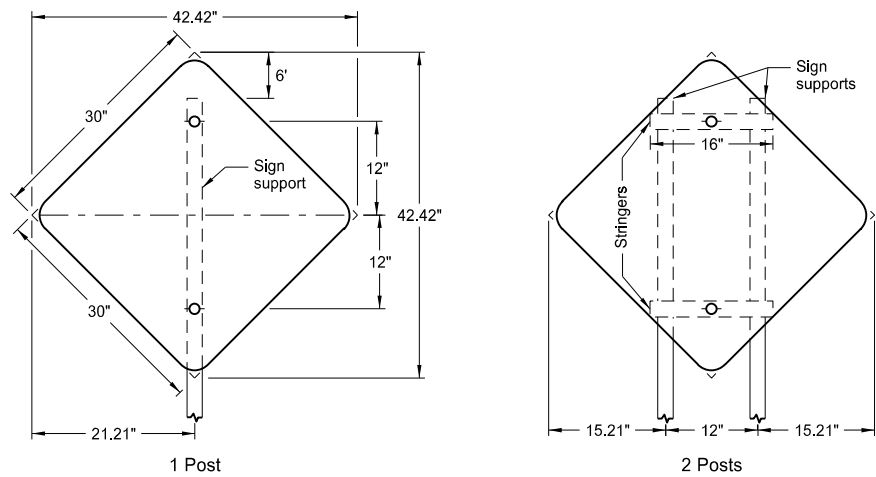
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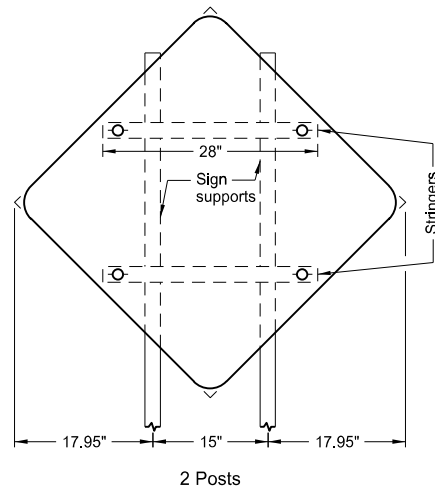
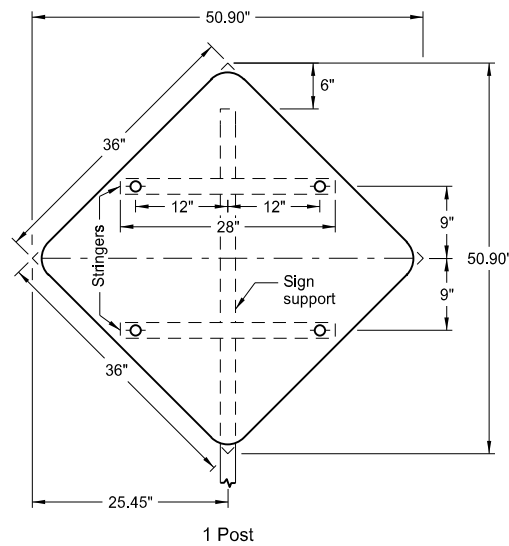
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DETAILS REGULATORY, WARNING AND GUIDE SIGNS



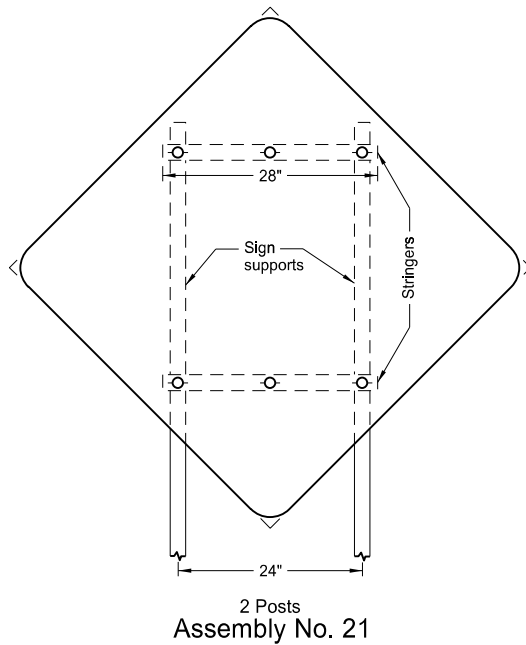
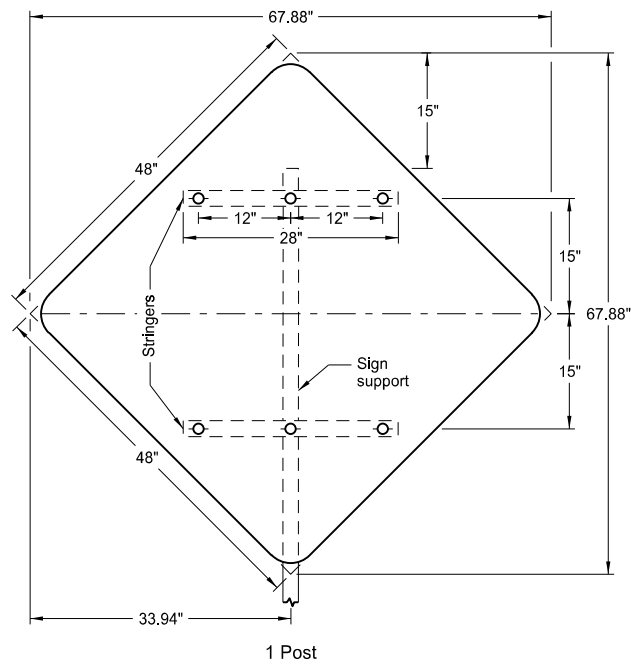
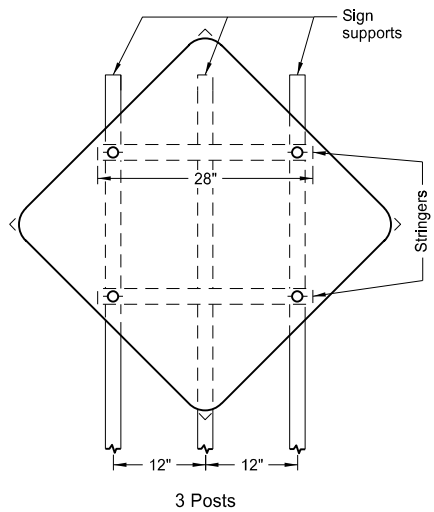
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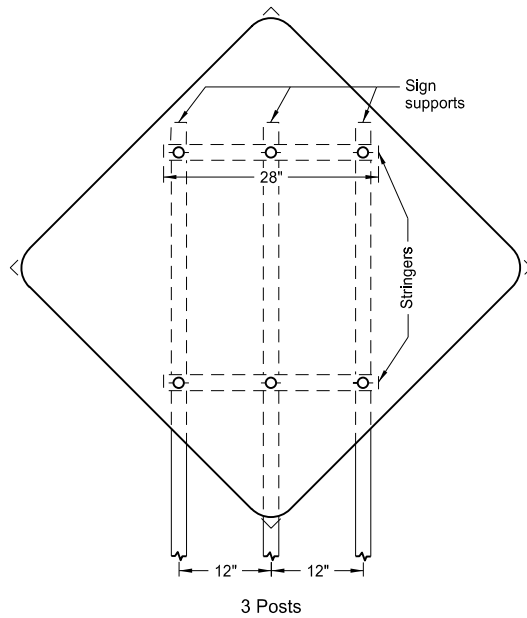
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Assembly No. 20



Assembly No. 21



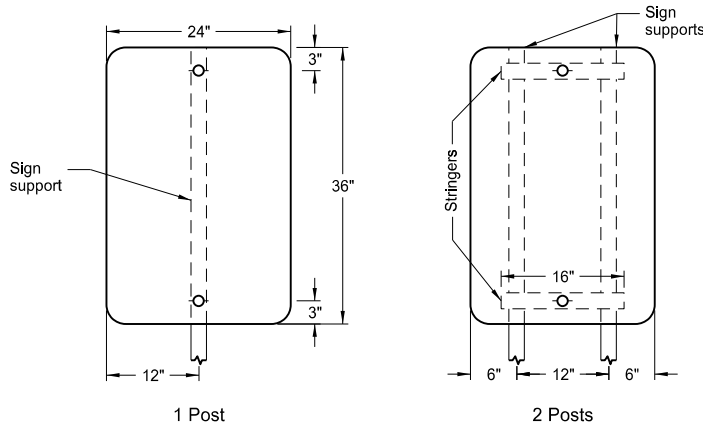
- Notes:
1. See Standard D-754-25 for mounting details.
  2. The minimum sign backing material thickness shall be 0.100 inch.
  3. Perforated square tube stringer shall be 1½" x 1½".
  4. All holes shall be punched round for ⅜" bolt.

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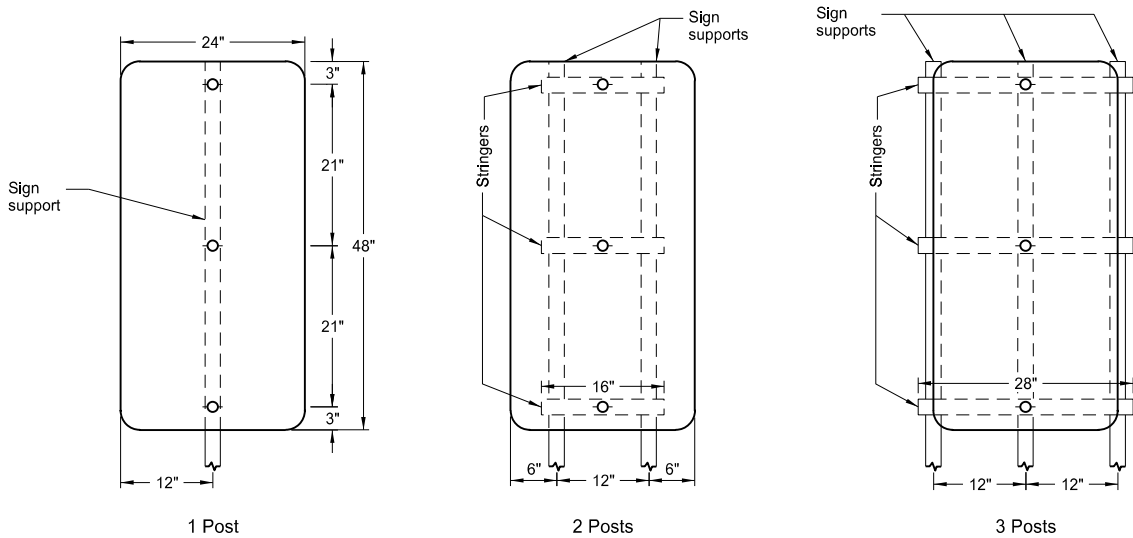
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D-754-30



Assembly No. 22



Assembly No. 23

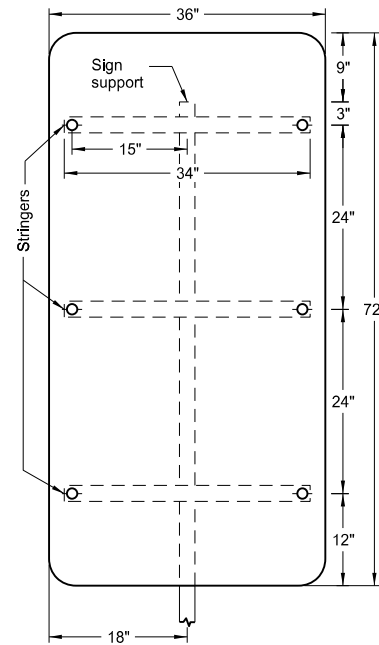
- Notes:
1. See Standard D-754-25 for mounting details.
  2. The minimum sign backing material thickness shall be 0.100 inch.
  3. Perforated square tube stringer shall be 1½" x 1½".
  4. All holes shall be punched round for ⅜" bolt.

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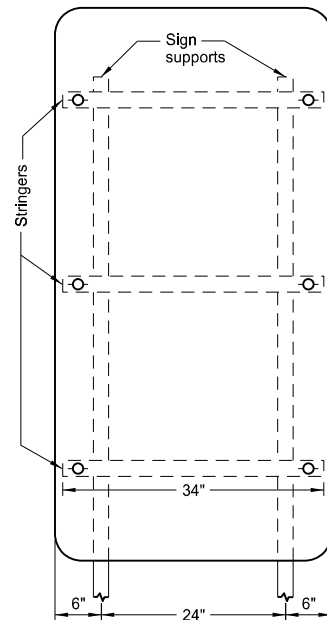
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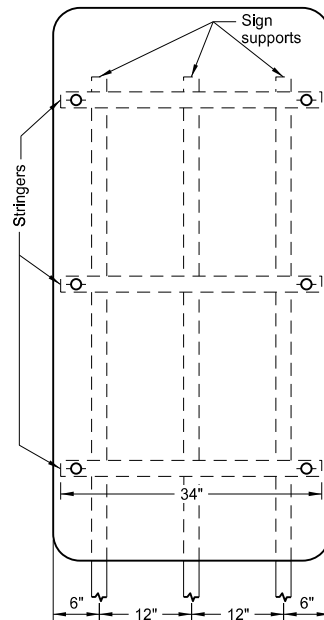
D-754-31



1 Post

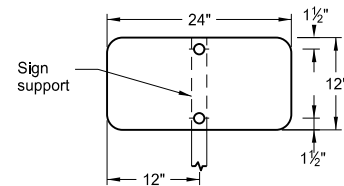


2 Posts



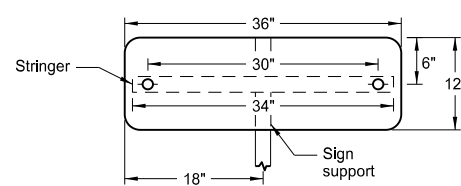
3 Posts

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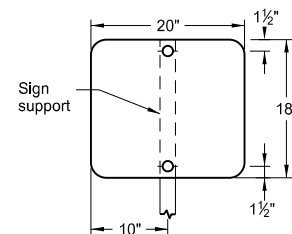
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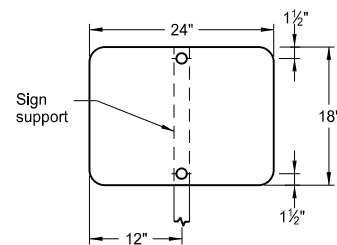
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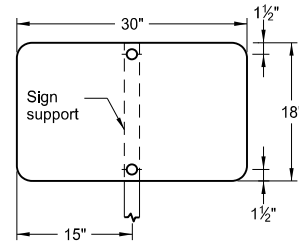
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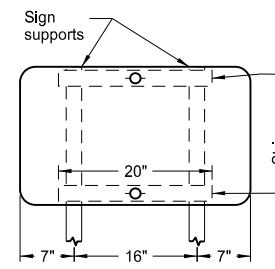
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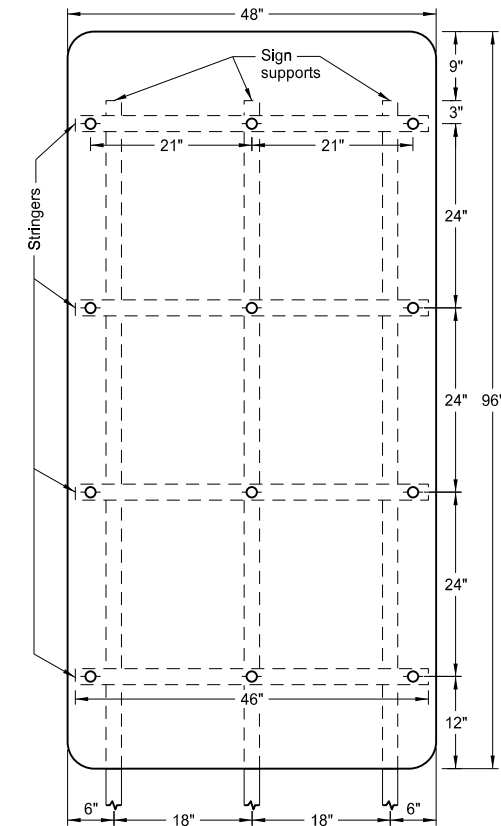


1 Post

Assembly No. 30



2 Posts



3 Posts

Assembly No. 25

Notes:

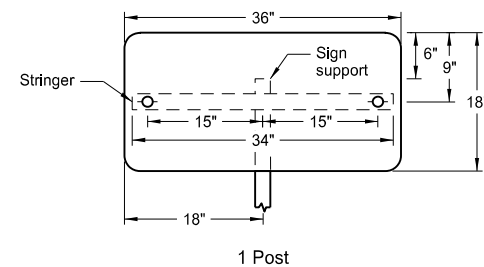
1. See Standard D-754-25 for mounting details.
2. The minimum sign backing material thickness shall be 0.100 inch.
3. Perforated square tube stringer shall be 1 1/2" x 1 1/2".
4. All holes shall be punched round for 3/8" bolt.

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DATE	CHANGE

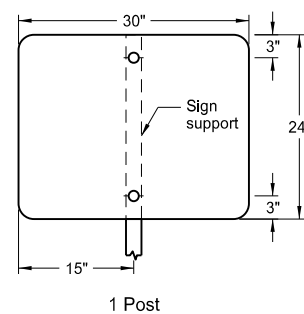
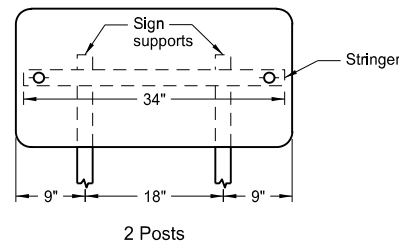
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DETAILS REGULATORY, WARNING AND GUIDE SIGNS

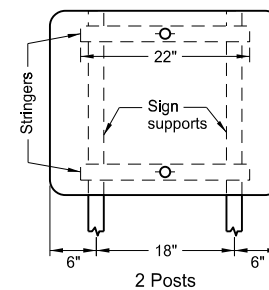
D-754-32



Assembly No. 31

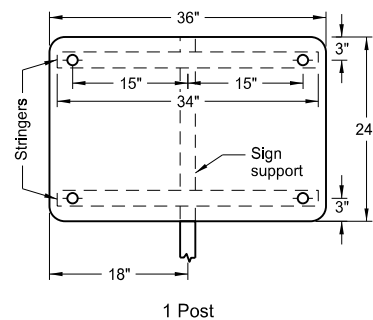


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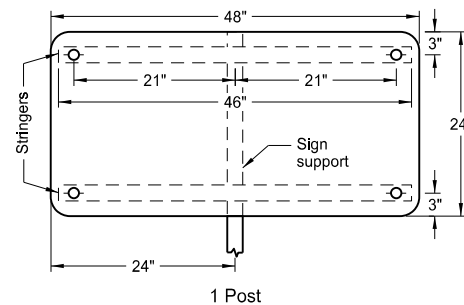
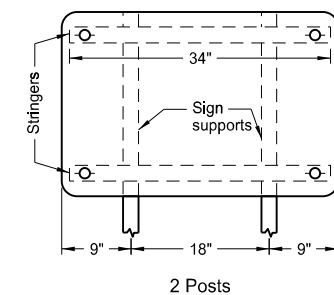


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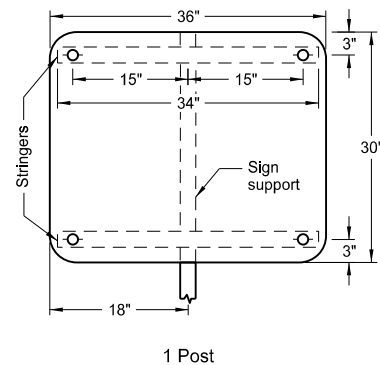
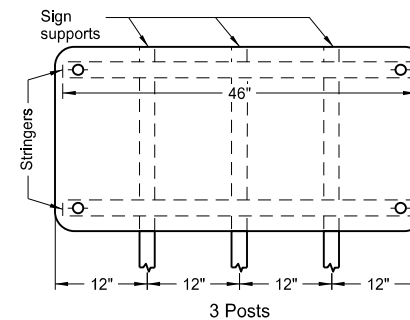
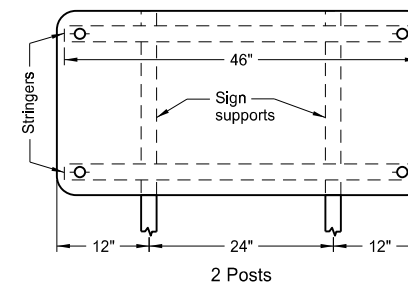
1. See Standard D-754-25 for mounting details.
2. The minimum sign backing material thickness shall be 0.100 inch.
3. Perforated square tube stringer shall be  $1\frac{1}{2}$ " x  $1\frac{1}{2}$ ".
4. All holes shall be punched round for  $\frac{3}{8}$ " bolt.



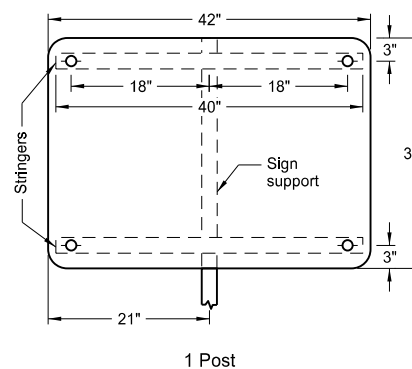
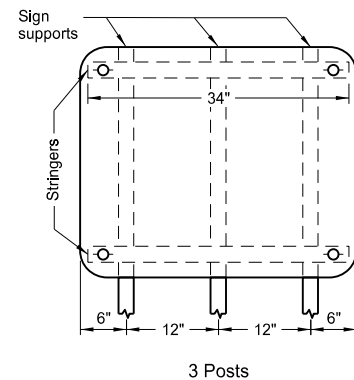
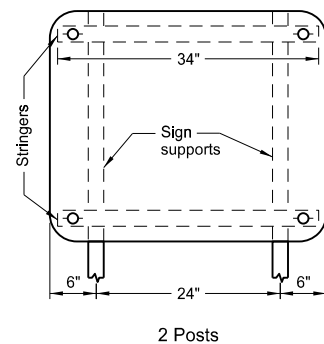
Assembly No. 33



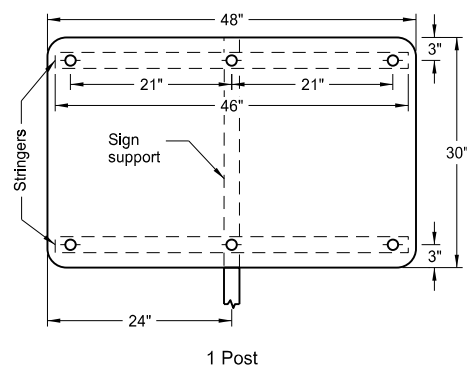
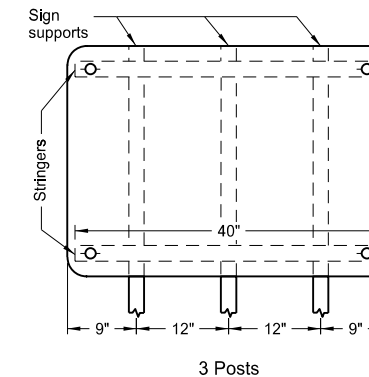
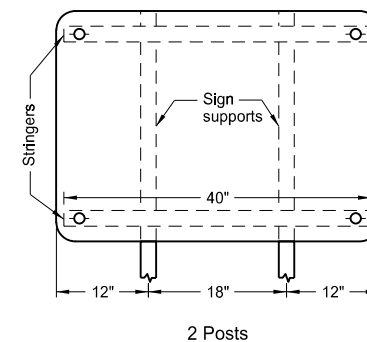
Assembly No. 34



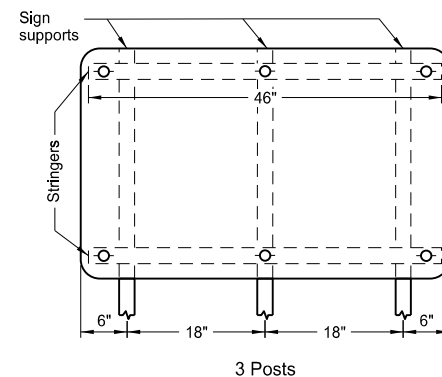
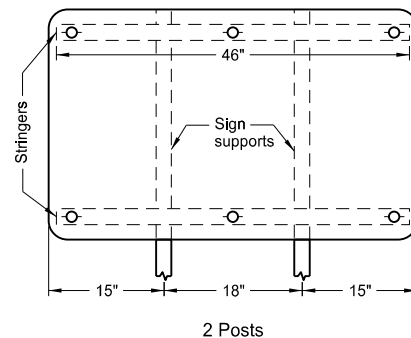
Assembly No. 35



Assembly No. 36



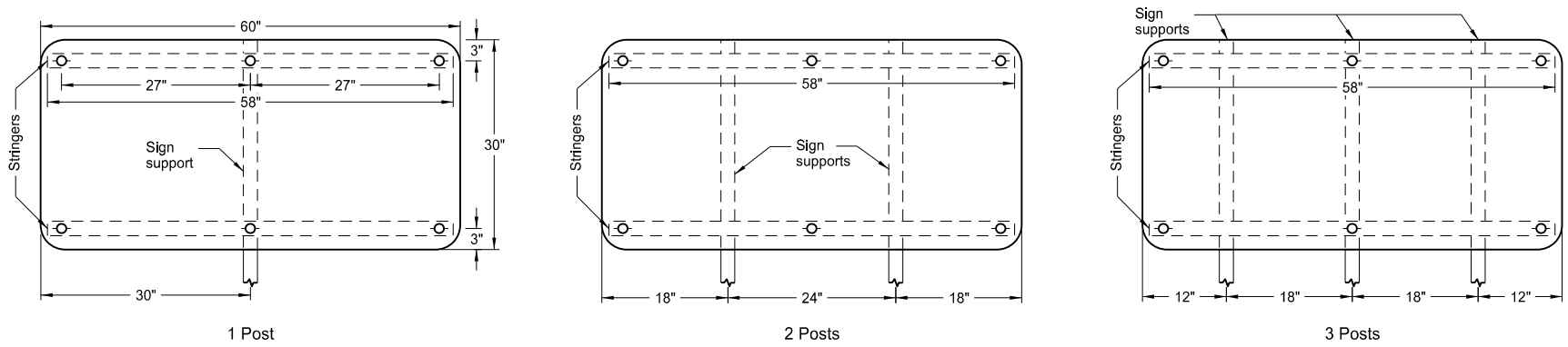
Assembly No. 37



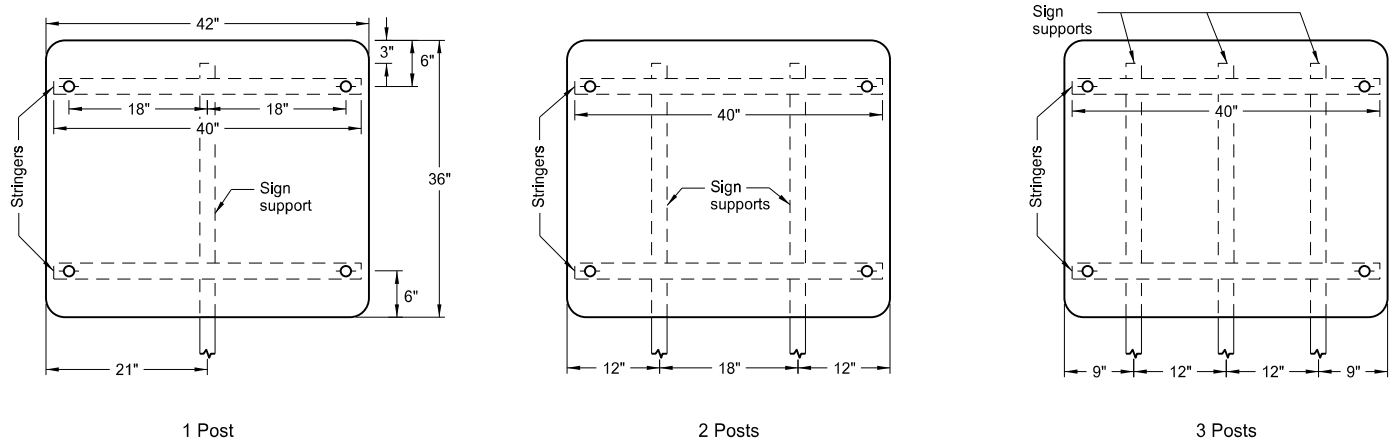
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE

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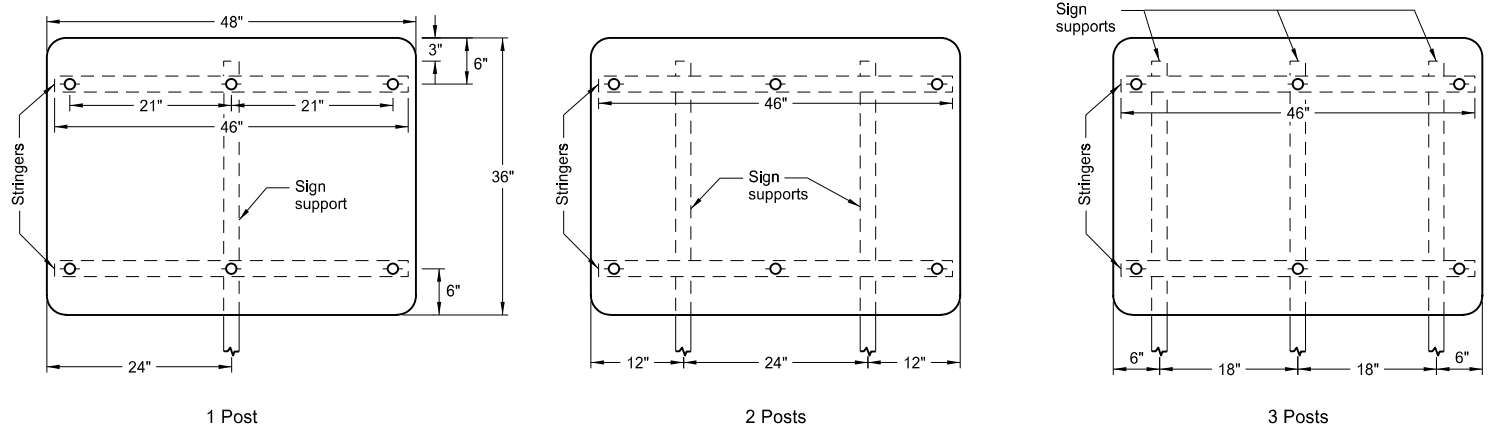
SIGN PUNCHING, STRINGER AND SUPPORT LOCATION  
DETAILS REGULATORY, WARNING AND GUIDE SIGNS



Assembly No. 38



Assembly No. 39



Assembly No. 40

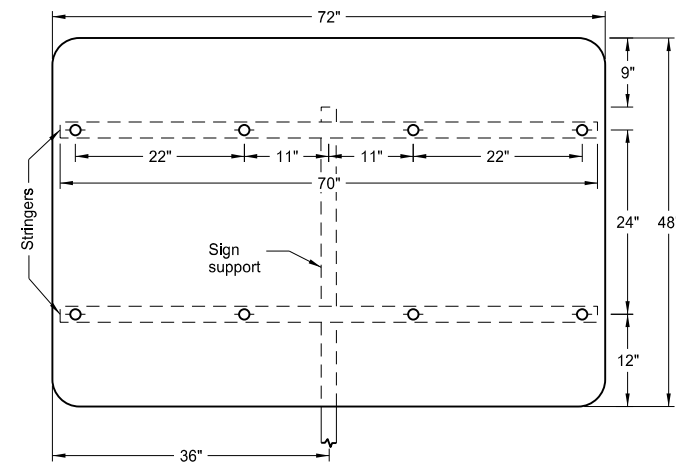
- Notes:
1. See Standard D-754-25 for mounting details.
  2. The minimum sign backing material thickness shall be 0.100 inch.
  3. Perforated square tube stringer shall be 1½" x 1½".
  4. All holes shall be punched round for ⅜" bolt.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE

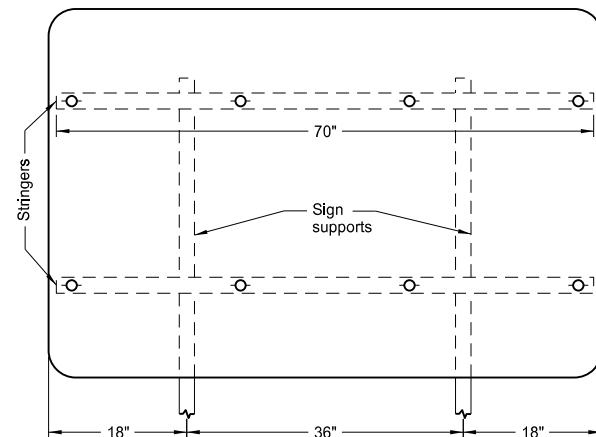
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SIGN PUNCHING, STRINGER AND SUPPORT LOCATION  
DETAILS REGULATORY, WARNING AND GUIDE SIGNS

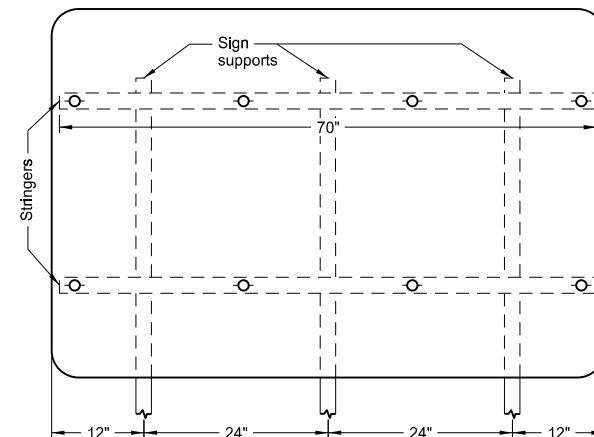
D-754-34



1 Post



2 Posts

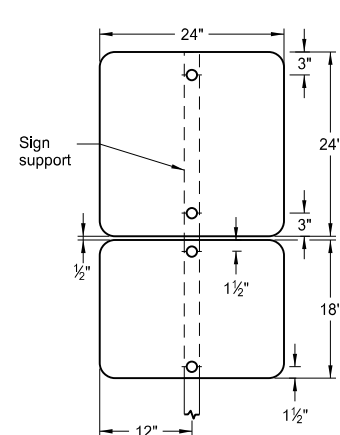


3 Posts

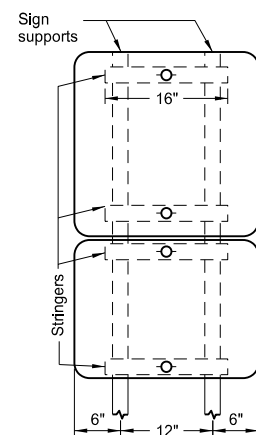
Notes:

1. See Standard D-754-25 for mounting details.
2. The minimum sign backing material thickness shall be 0.100 inch.
3. Perforated square tube stringer shall be  $1\frac{1}{2}$ " x  $1\frac{1}{2}$ ".
4. All holes shall be punched round for  $\frac{3}{8}$ " bolt.

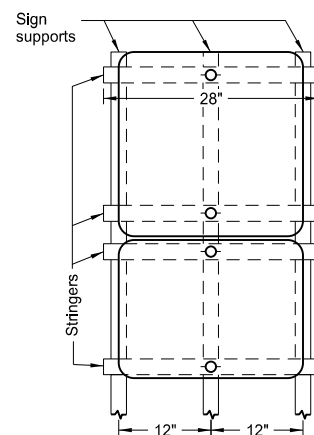
Assembly No. 41



1 Post

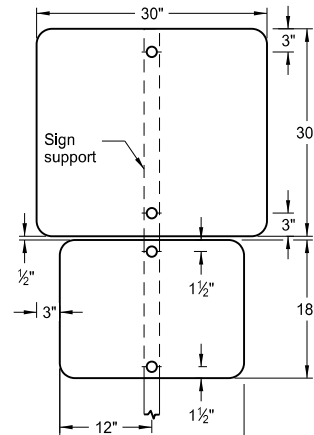


2 Posts

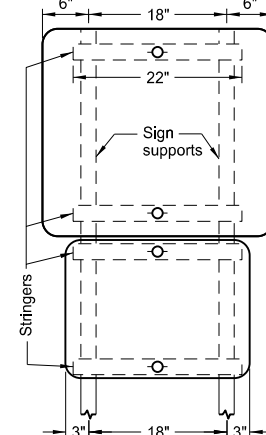


3 Posts

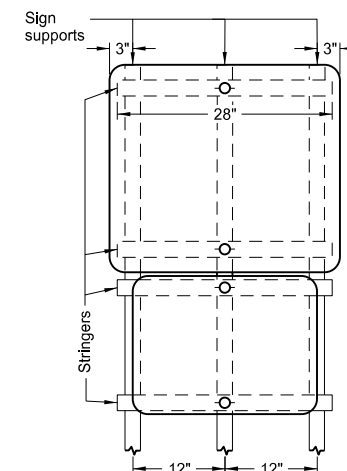
Assembly No. 42



1 Post



2 Posts



3 Posts

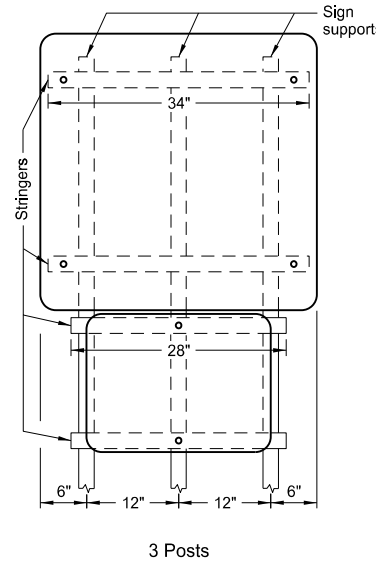
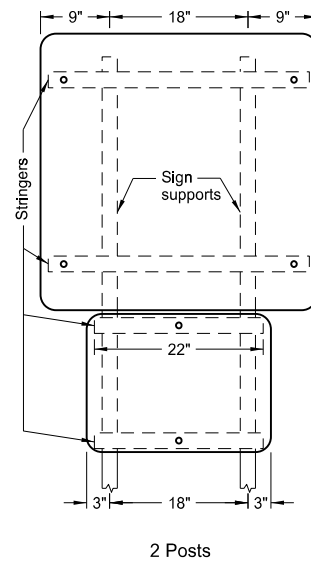
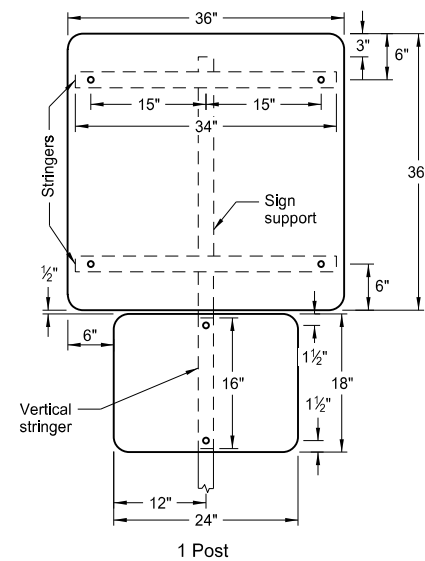
Assembly No. 43

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE

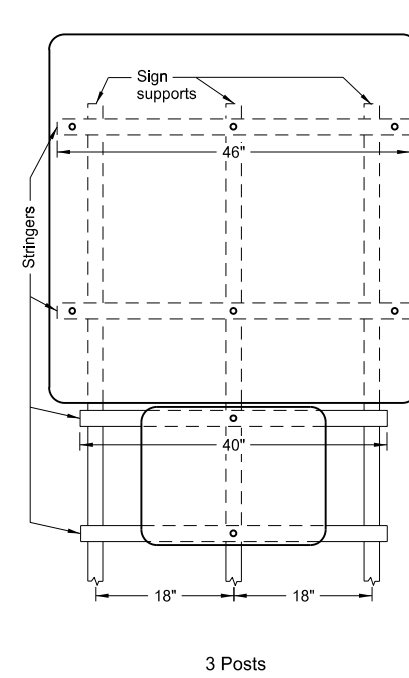
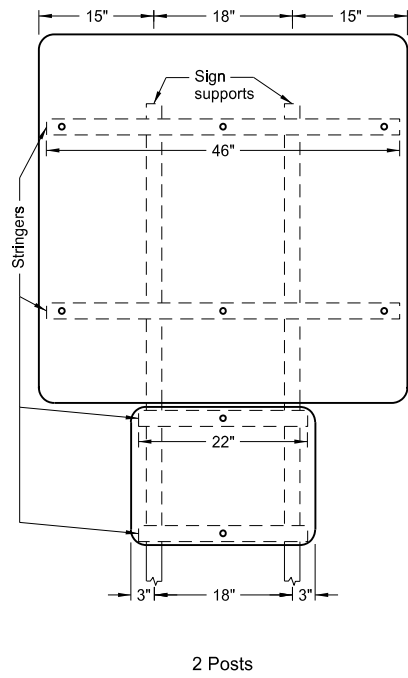
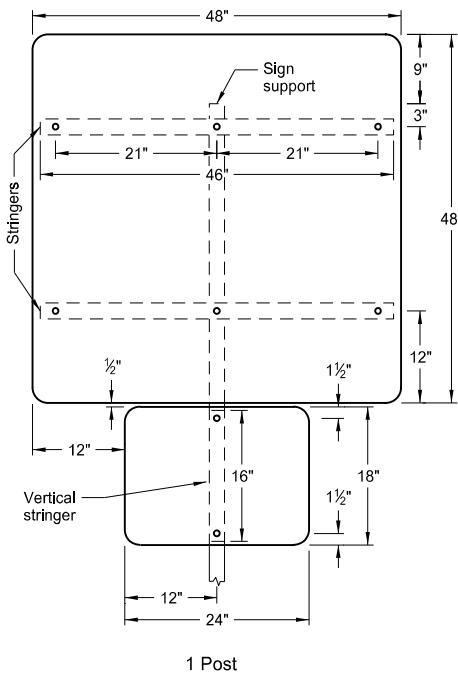
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SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS  
REGULATORY, WARNING AND GUIDE SIGNS

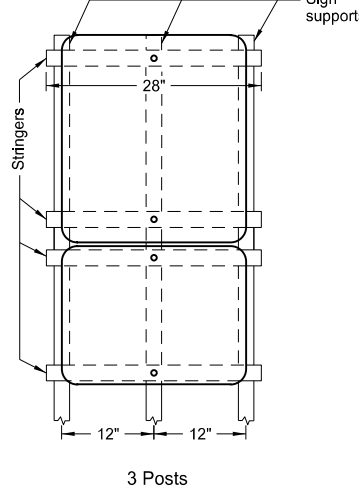
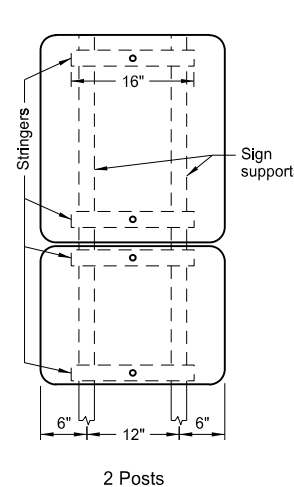
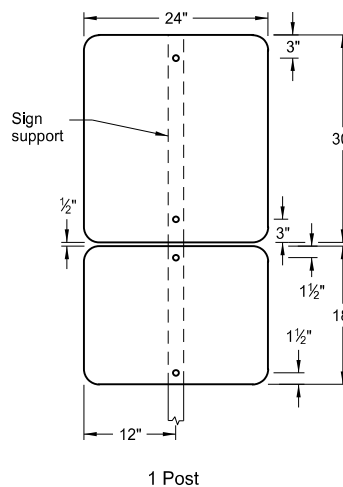
D-754-35



Assembly No. 44



Assembly No. 45



Assembly No. 46

- Notes:
1. The minimum sign backing material thickness shall be 0.100 inch.
  2. Perforated square tube stringer shall be 1 1/2"x1 1/2".
  3. All holes shall be punched round for 3/8" bolt.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-22-12	
REVISIONS	
DATE	CHANGE

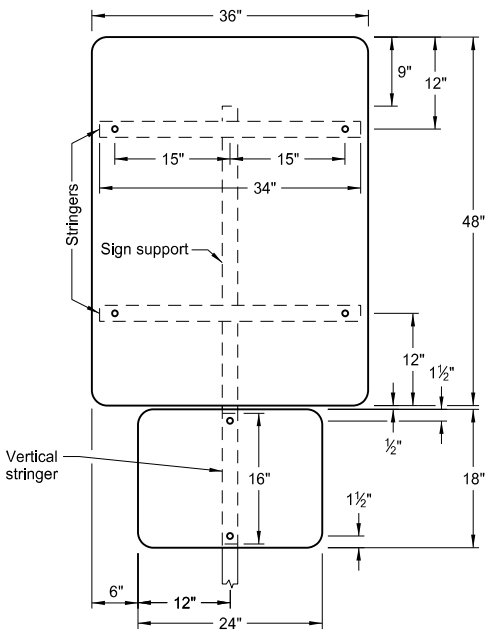
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SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS  
REGULATORY, WARNING AND GUIDE SIGNS

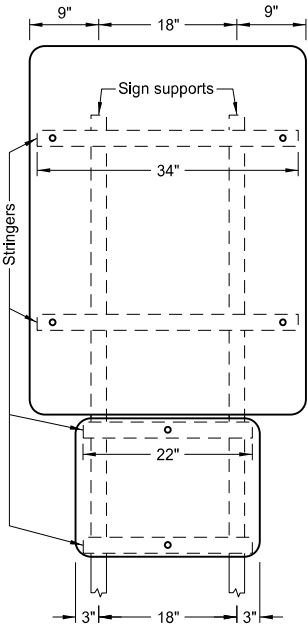
D-754-36

Notes:

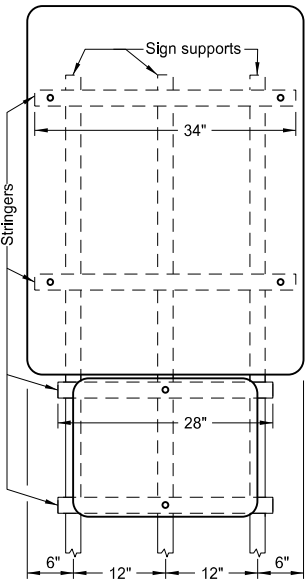
1. The minimum sign backing material thickness shall be 0.100 inch.
2. Perforated square tube stringer shall be 1½"x1½".
3. All holes shall be punched round for ⅜" bolt.



1 Post

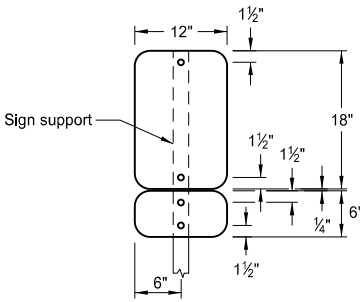


2 Posts



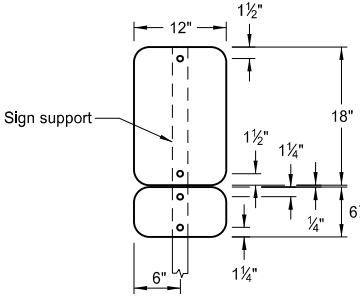
3 Posts

Assembly No. 47



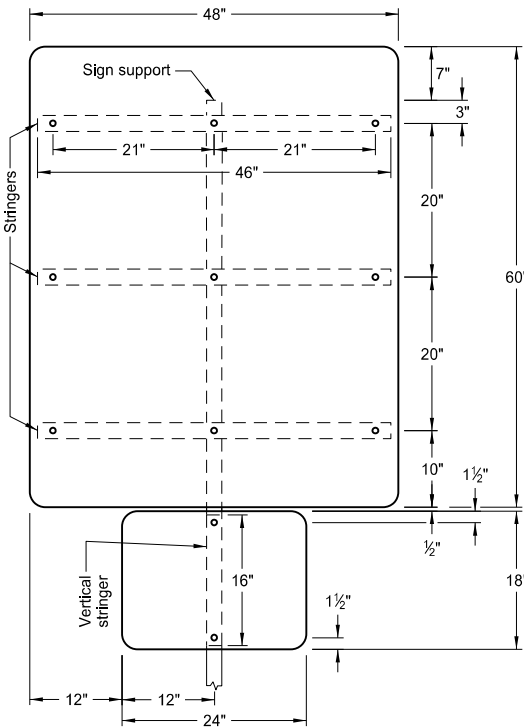
1 Post

Assembly No. 49

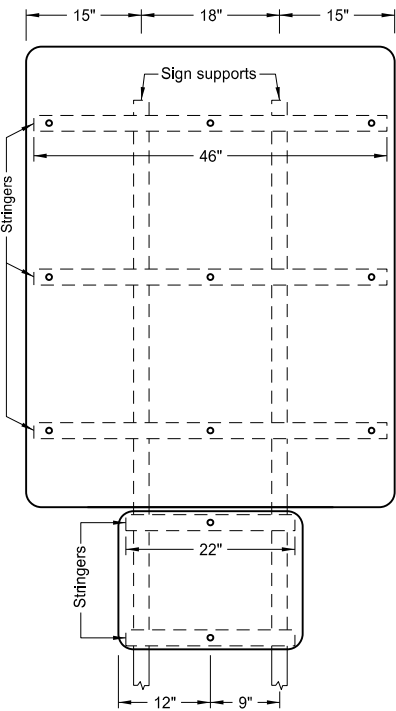


1 Post

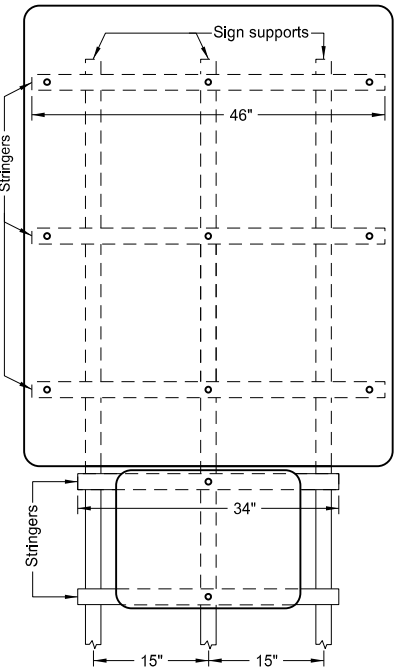
Assembly No. 50



1 Post

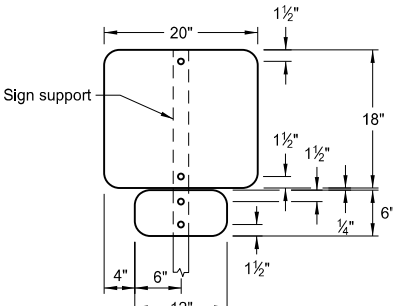


2 Posts



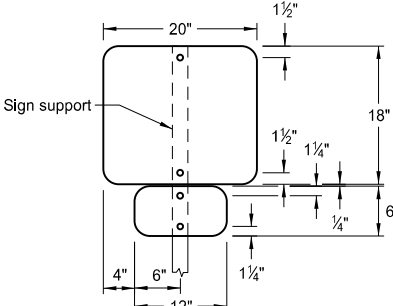
3 Posts

Assembly No. 48



1 Post

Assembly No. 51



1 Post

Assembly No. 52

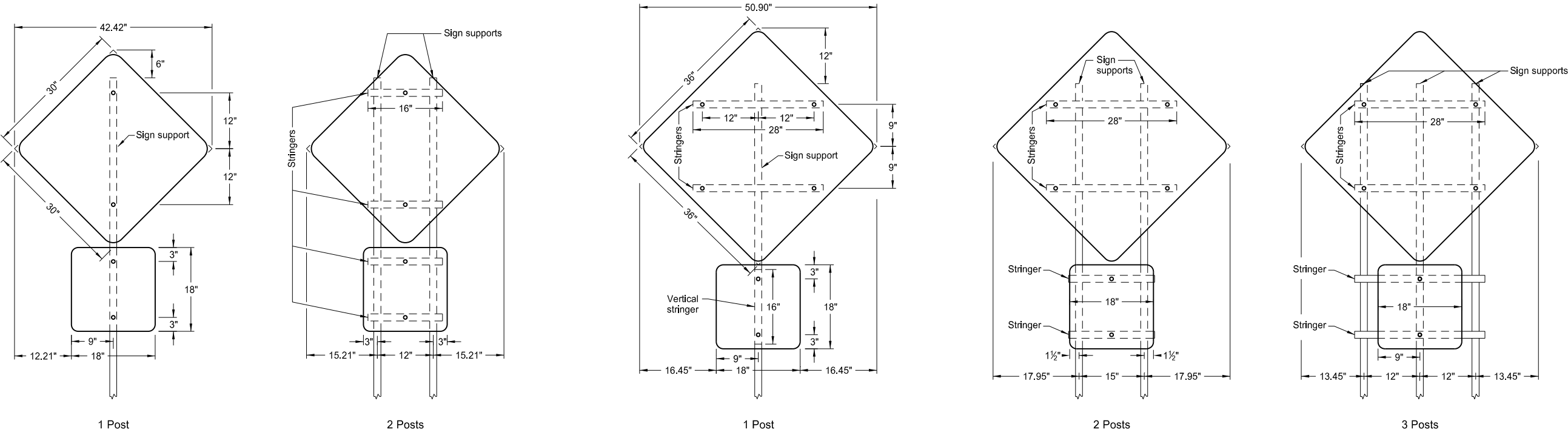
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8-22-12	
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SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS  
REGULATORY, WARNING AND GUIDE SIGNS

D-754-37



ASSEMBLY NO. 53

ASSEMBLY NO. 54

ASSEMBLY NO. 55

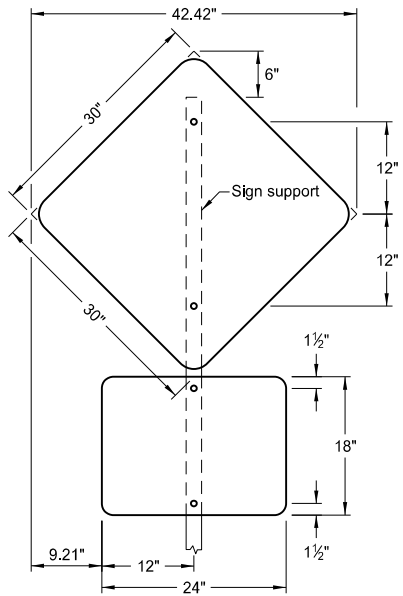
- Notes:
1. The minimum sign backing material thickness shall be 0.100 inch.
  2. Perforated square tube stringer shall be 1½"x1½".
  3. All holes shall be punched round for ⅜" bolt.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-25-12	
REVISIONS	
DATE	CHANGE

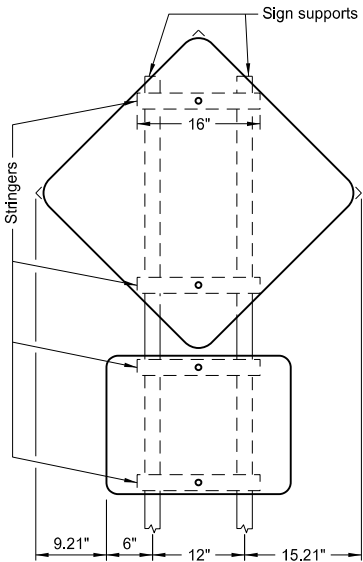
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SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS  
REGULATORY, WARNING AND GUIDE SIGNS

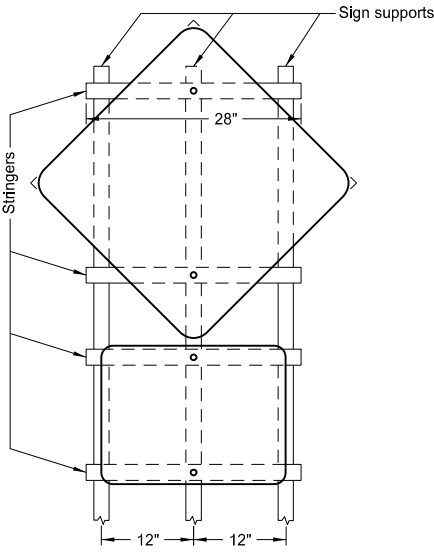
D-754-38



1 Post

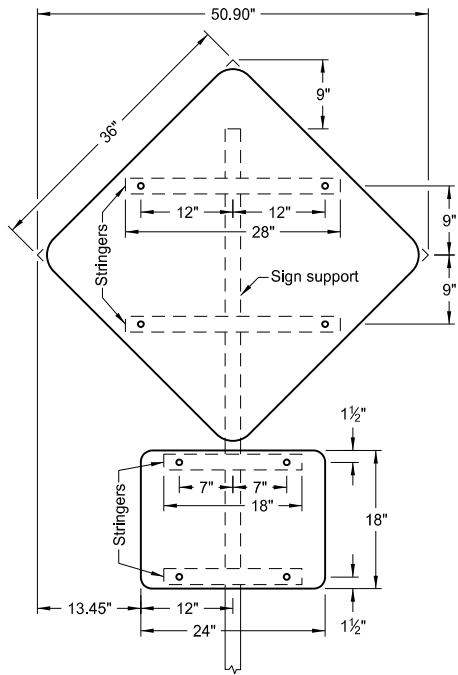


2 Posts

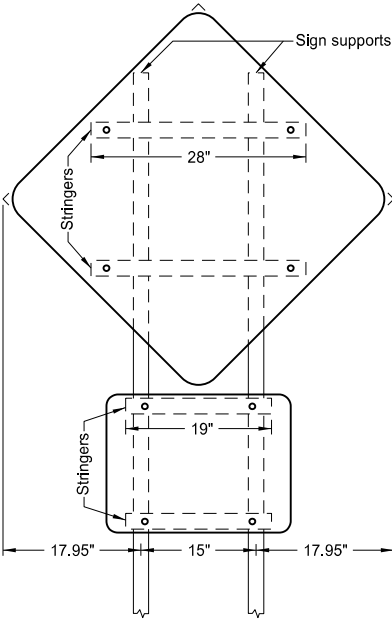


3 Posts

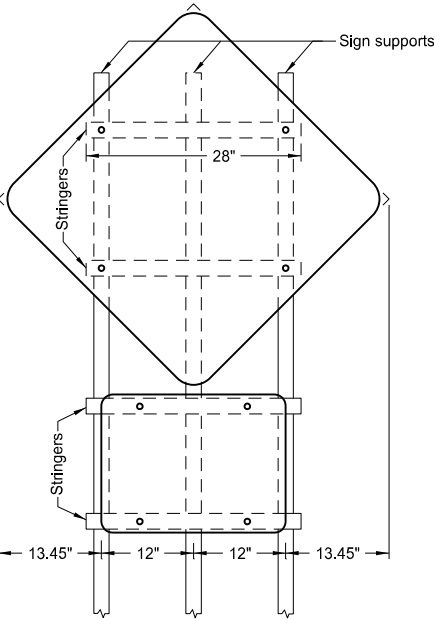
ASSEMBLY NO. 56



1 Post



2 Posts



3 Posts

ASSEMBLY NO. 57

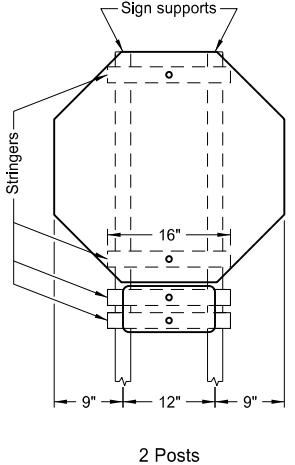
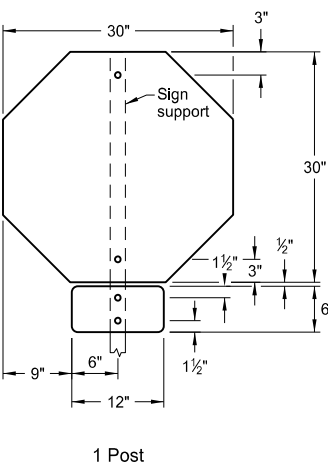
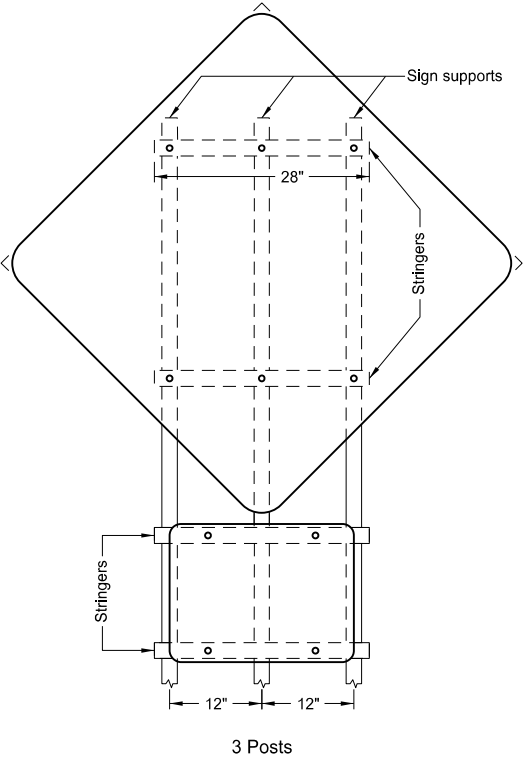
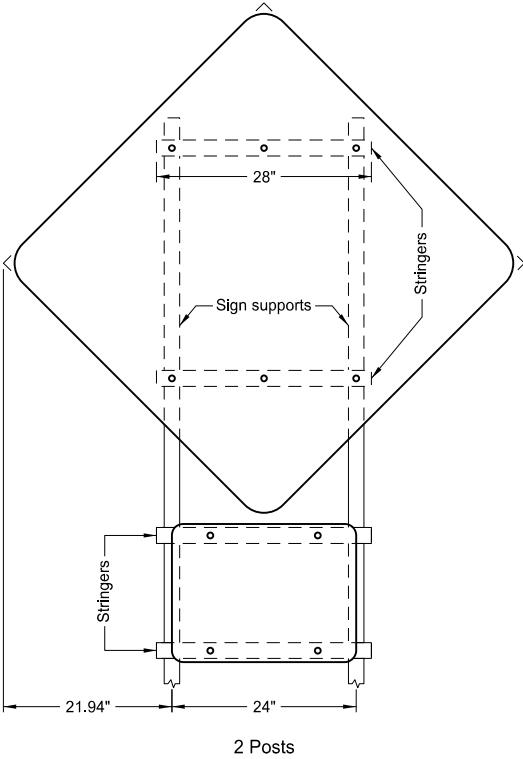
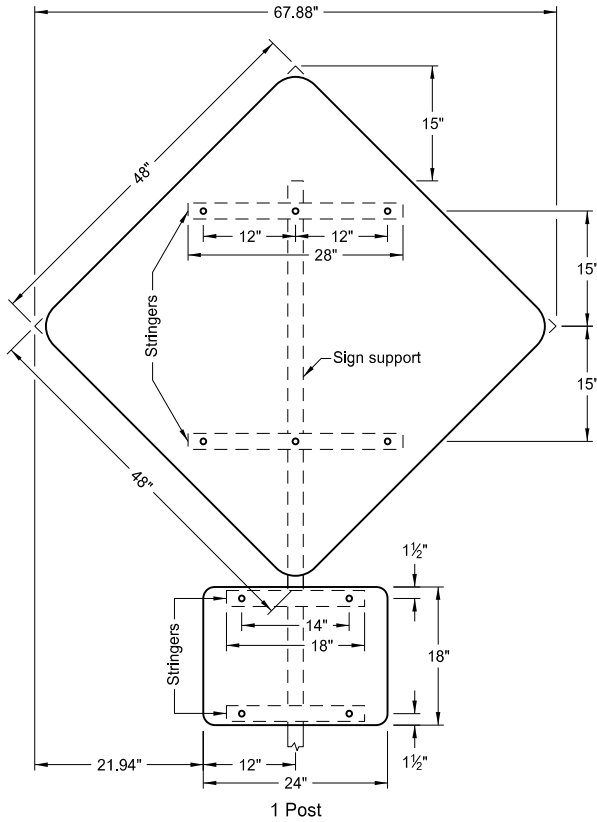
- Notes:
1. The minimum sign backing material thickness shall be 0.100 inch.
  2. Perforated square tube stringer shall be 1 1/2"x1 1/2".
  3. All holes shall be punched round for 3/8" bolt.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-22-12	
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DATE	CHANGE

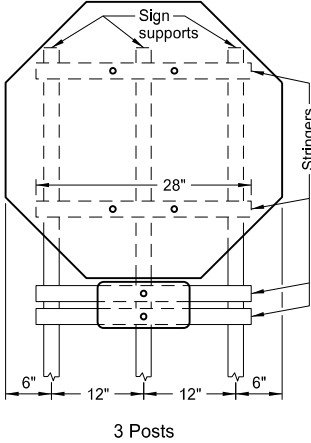
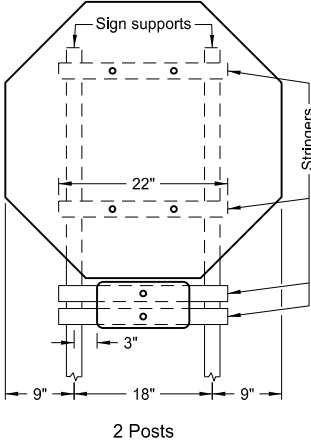
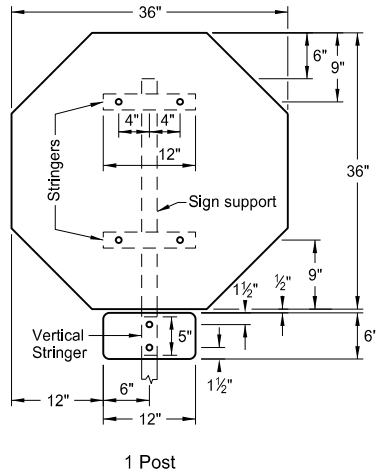
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SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS  
REGULATORY, WARNING AND GUIDE SIGNS

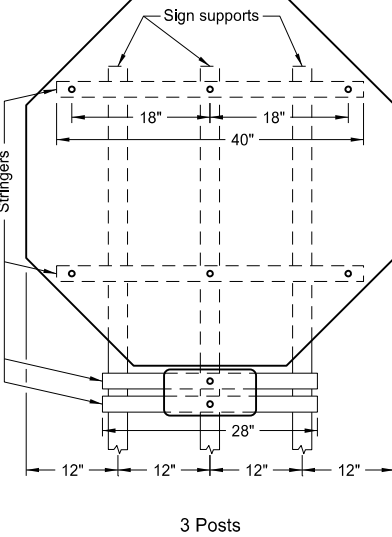
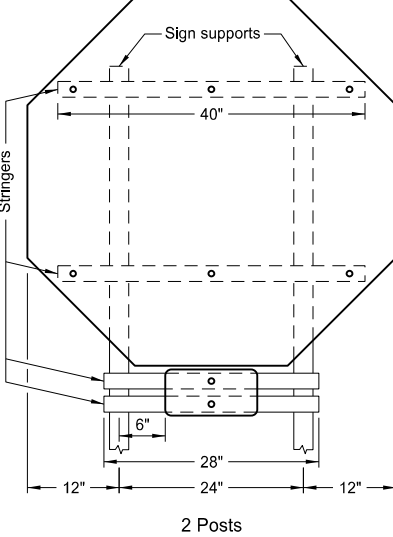
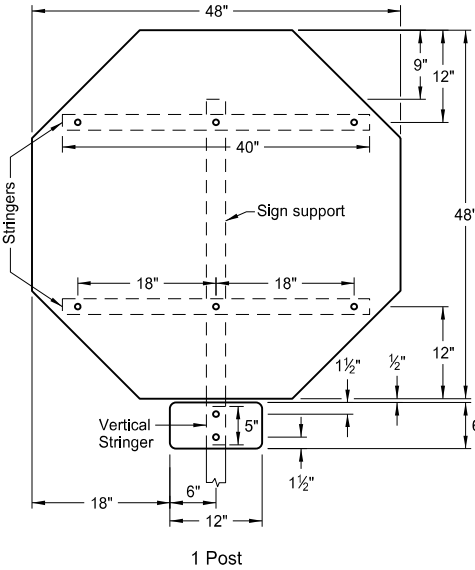
D-754-39



ASSEMBLY NO. 59



ASSEMBLY NO. 60



ASSEMBLY NO. 61

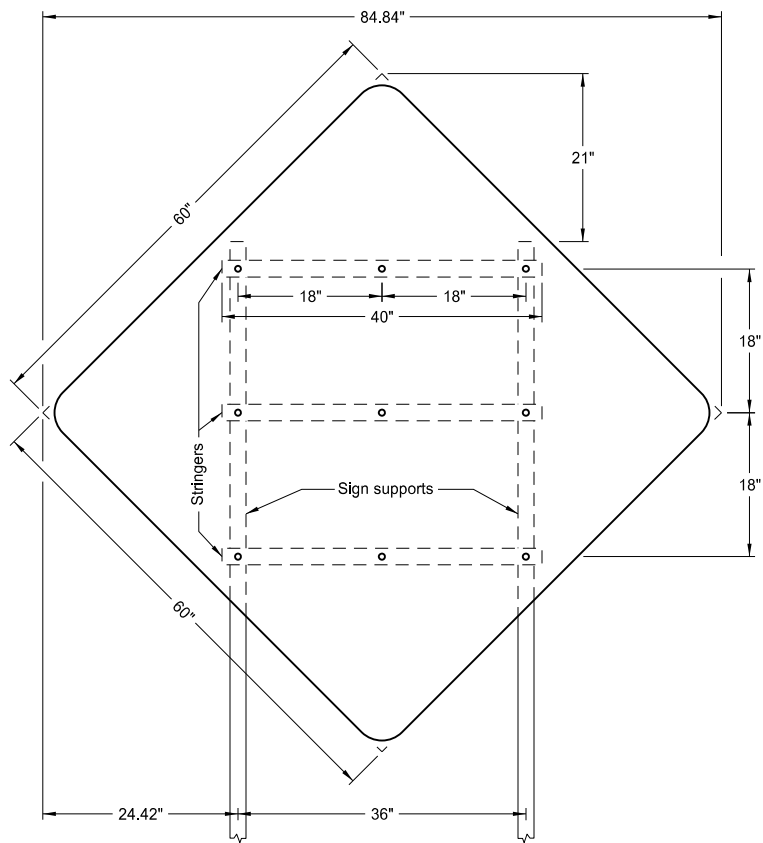
- Notes:
1. The minimum sign backing material thickness shall be 0.100 inch.
  2. Perforated square tube stringer shall be 1 1/2"x1 1/2".
  3. All holes shall be punched round for 3/8" bolt.

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8-22-12	
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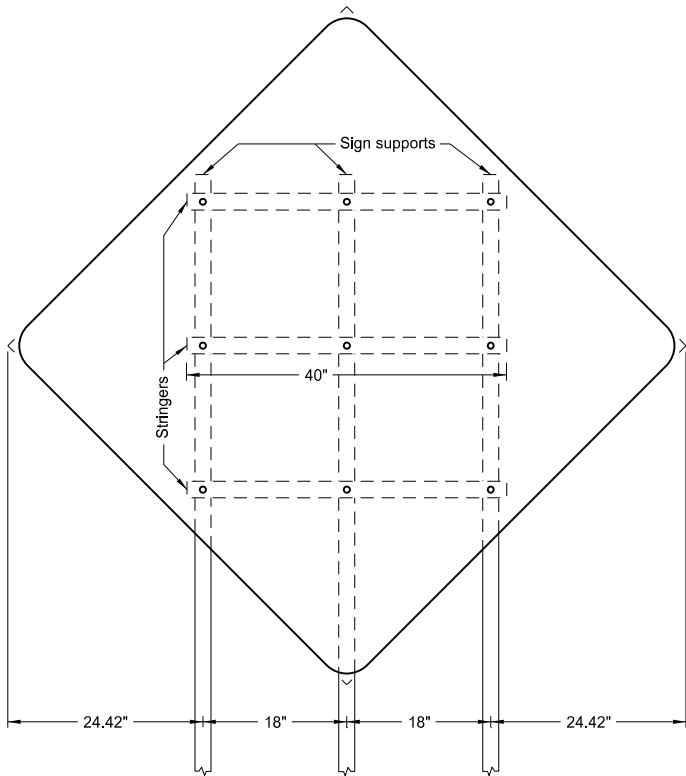
SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS  
REGULATORY, WARNING AND GUIDE SIGNS

D-754-40

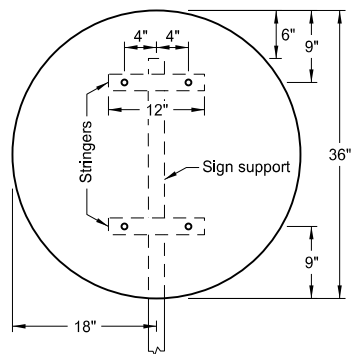


2 Posts

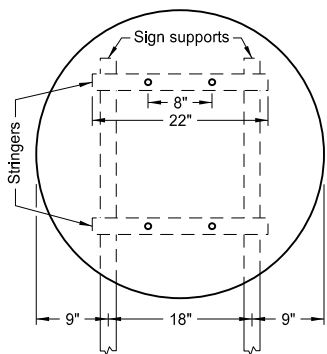
ASSEMBLY NO. 62



3 Posts



1 Post



2 Posts

ASSEMBLY NO. 63

Notes:

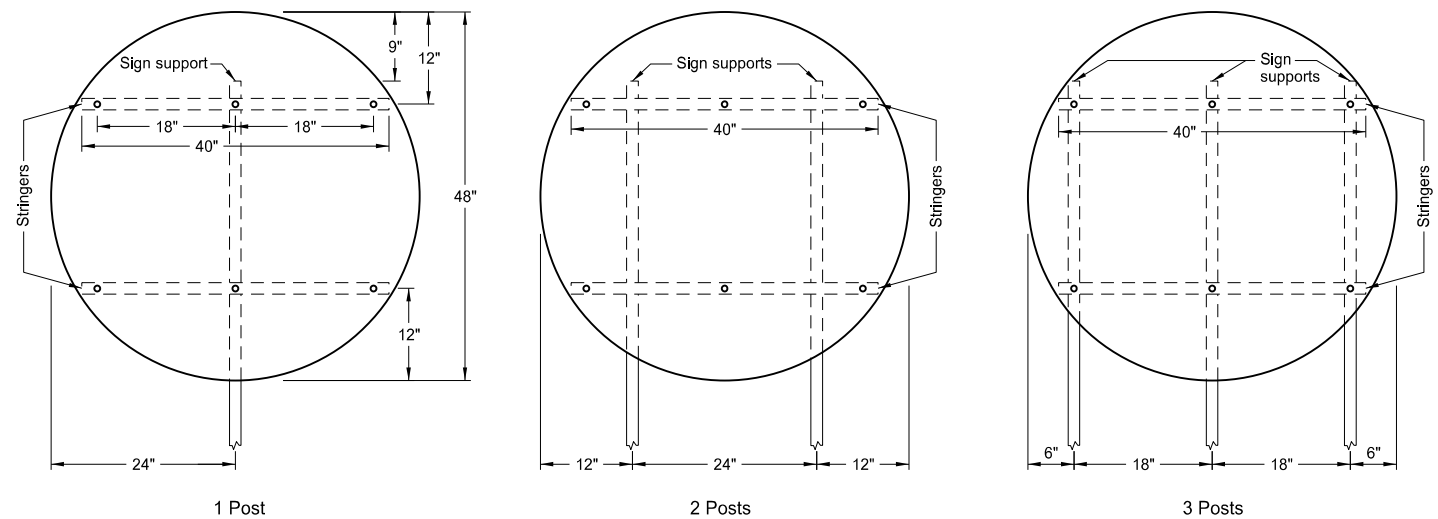
1. The minimum sign backing material thickness shall be 0.100 inch.
2. Perforated square tube stringer shall be 1½"x1½".
3. All holes shall be punched round for ⅜" bolt.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-22-12	
REVISIONS	
DATE	CHANGE

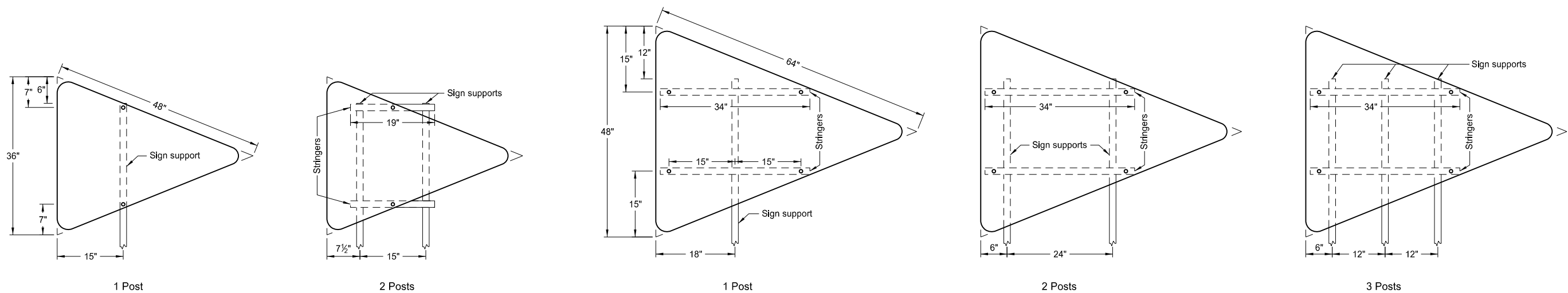
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SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS  
REGULATORY, WARNING AND GUIDE SIGNS

D-754-41

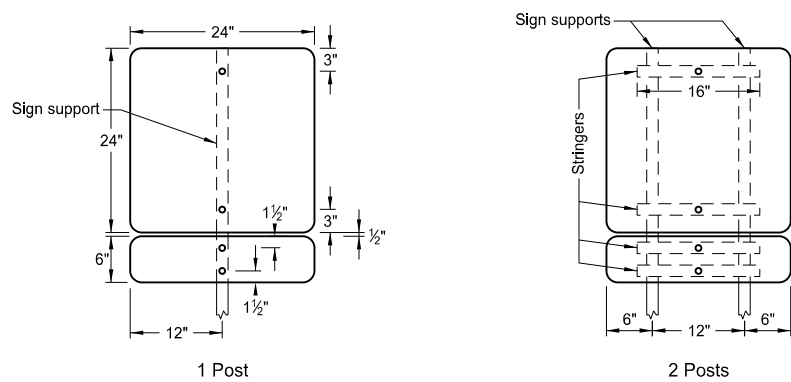


ASSEMBLY NO. 64



ASSEMBLY NO. 65

ASSEMBLY NO. 66



ASSEMBLY NO. 67

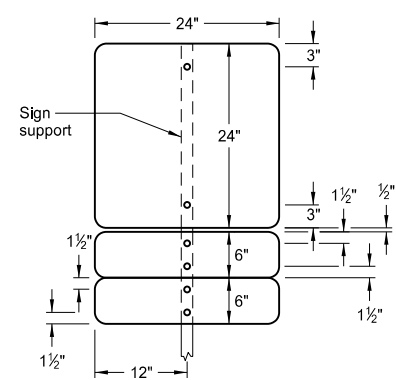
- Notes:
1. The minimum sign backing material thickness shall be 0.100 inch.
  2. Perforated square tube stringer shall be 1 1/2"x1 1/2".
  3. All holes shall be punched round for 3/8" bolt.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-22-12	
REVISIONS	
DATE	CHANGE

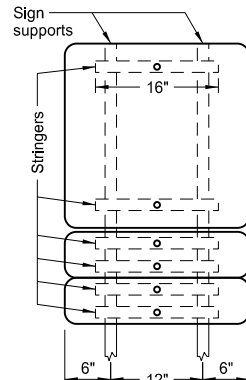
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on 8/22/12 and the original document is stored at the  
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SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS  
REGULATORY, WARNING, AND GUIDE SIGNS

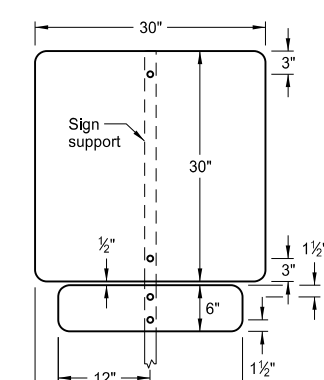
D-754-42



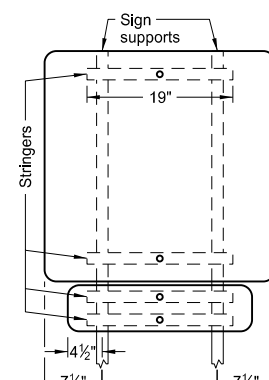
1 Post



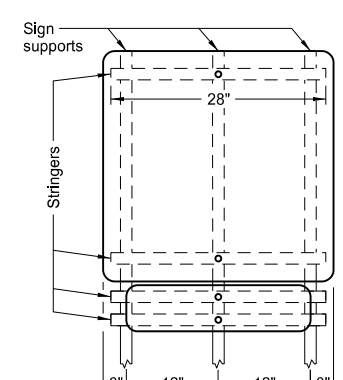
2 Posts



1 Post



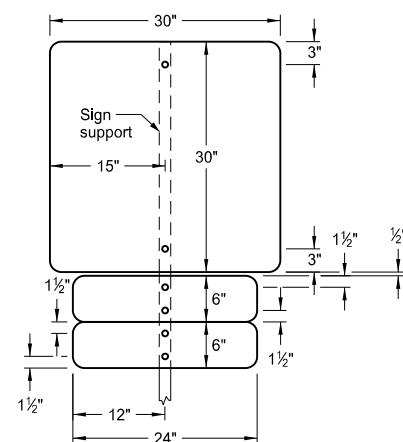
2 Posts



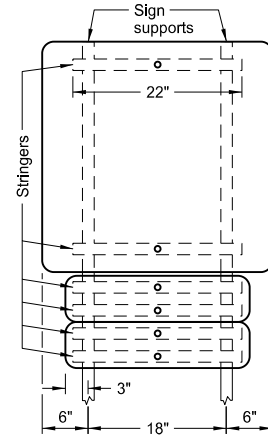
3 Posts

ASSEMBLY NO. 68

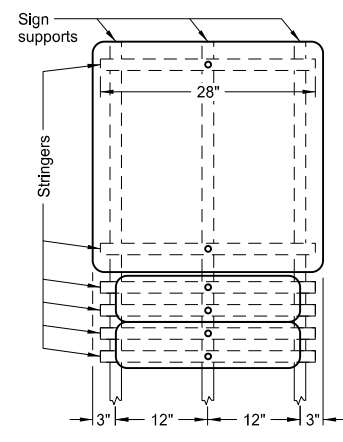
ASSEMBLY NO. 69



1 Post

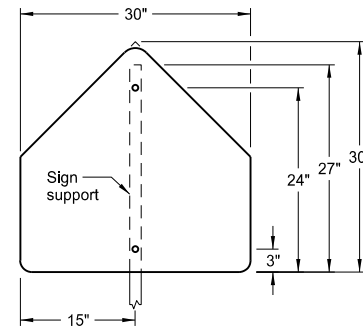


2 Posts

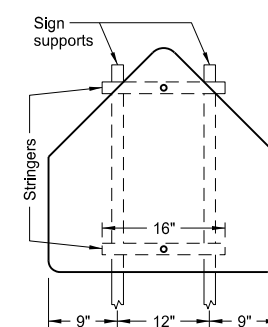


3 Posts

ASSEMBLY NO. 70

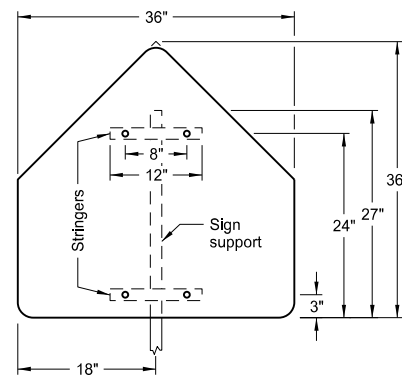


1 Post

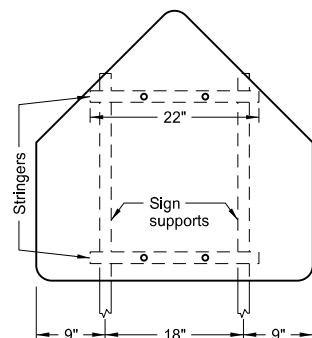


2 Posts

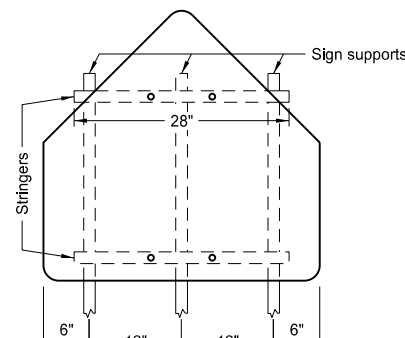
ASSEMBLY NO. 71



1 Post



2 Posts



3 Posts

ASSEMBLY NO. 72

Notes:

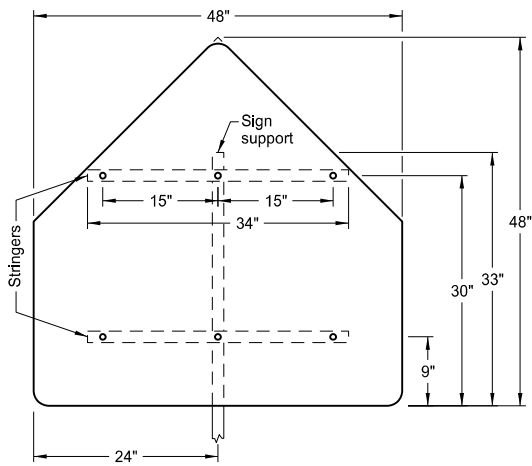
1. The minimum sign backing material thickness shall be 0.100 inch.
2. Perforated square tube stringer shall be 1 1/2"x1 1/2".
3. All holes shall be punched round for 3/8" bolt.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-22-12	
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DATE	CHANGE

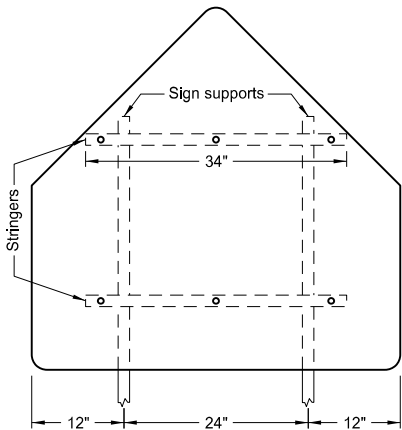
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SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS  
REGULATORY, WARNING AND GUIDE SIGNS

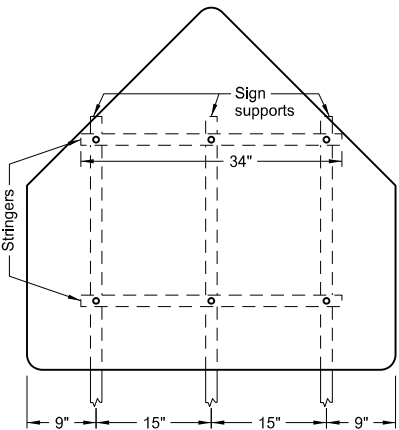
D-754-43



1 Post

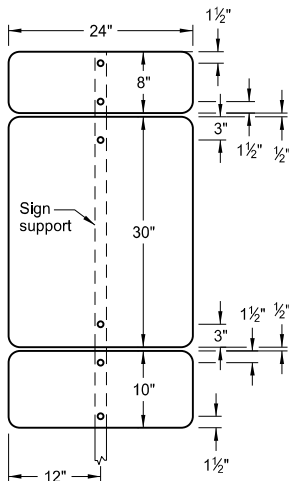


2 Posts

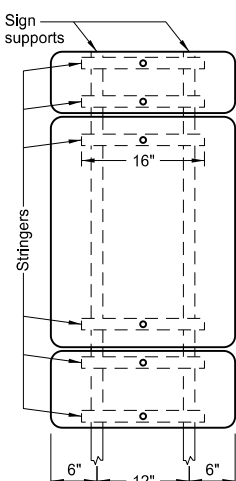


3 Posts

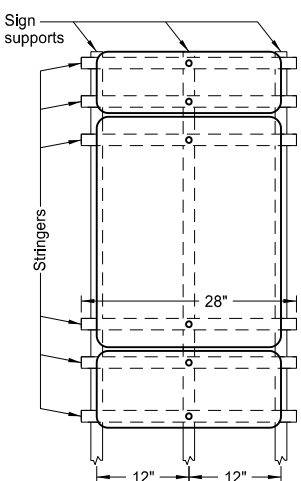
ASSEMBLY NO. 73



1 Post

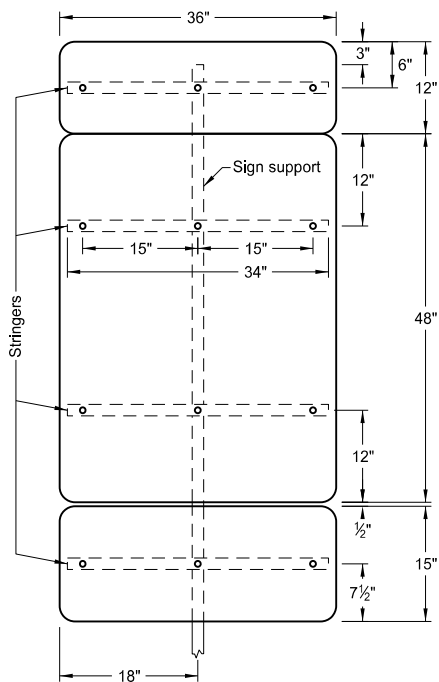


2 Posts

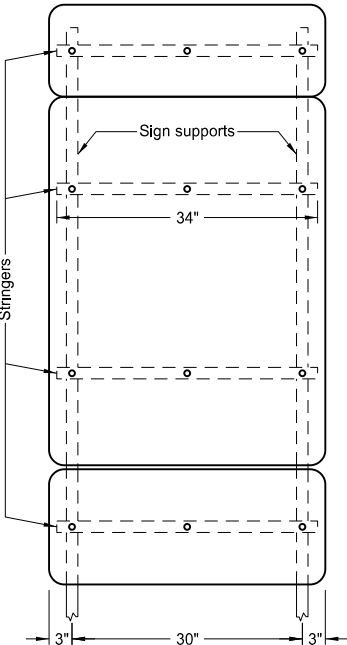


3 Posts

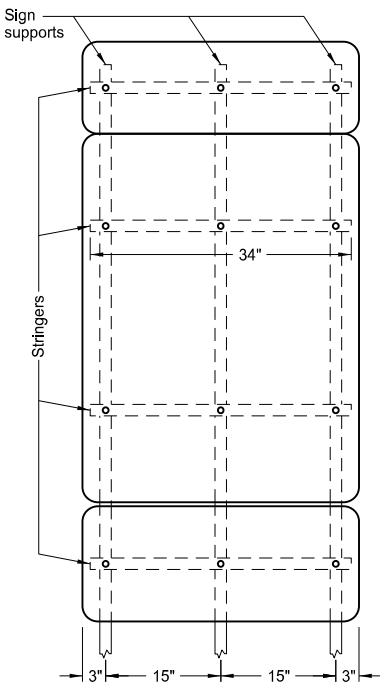
ASSEMBLY NO. 74



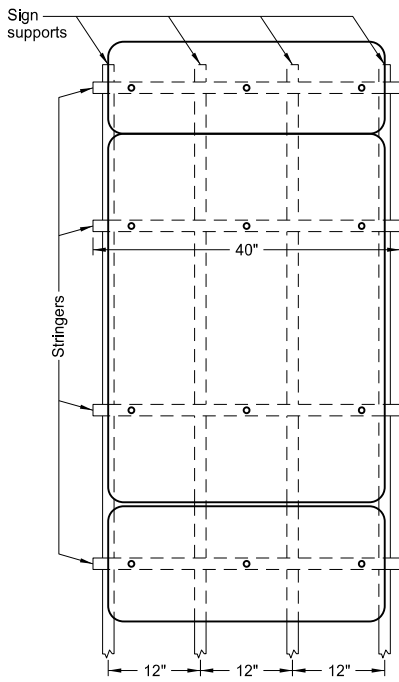
1 Post



2 Posts



3 Posts



4 Posts

ASSEMBLY NO. 75

- Notes:
1. The minimum sign backing material thickness shall be 0.100 inch.
  2. Perforated square tube stringer shall be 1 1/2"x1 1/2".
  3. All holes shall be punched round for 3/8" bolt.

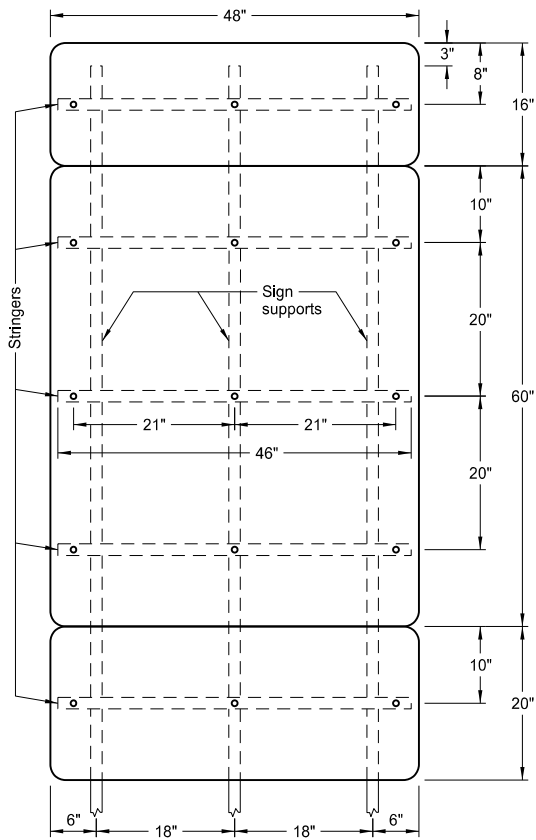
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8-22-12	
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SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS  
REGULATORY, WARNING AND GUIDE SIGNS

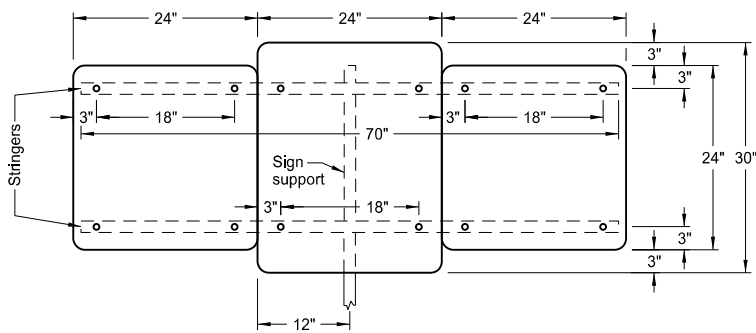
D-754-44

- Notes:
1. The minimum sign backing material thickness shall be 0.100 inch.
  2. Perforated square tube stringer shall be 1½"x1½".
  3. All holes shall be punched round for ⅜" bolt.

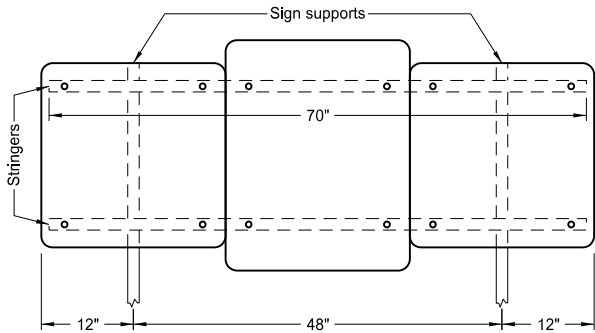


3 Posts

ASSEMBLY NO. 76

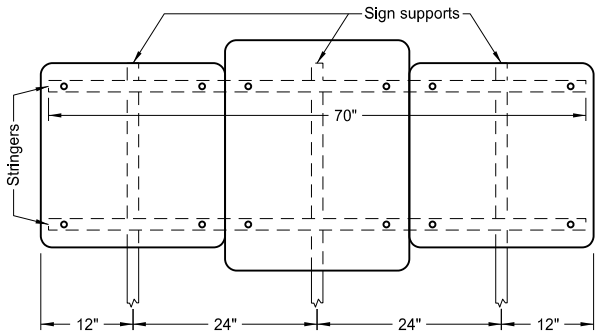


1 Post



2 Posts

ASSEMBLY NO. 77

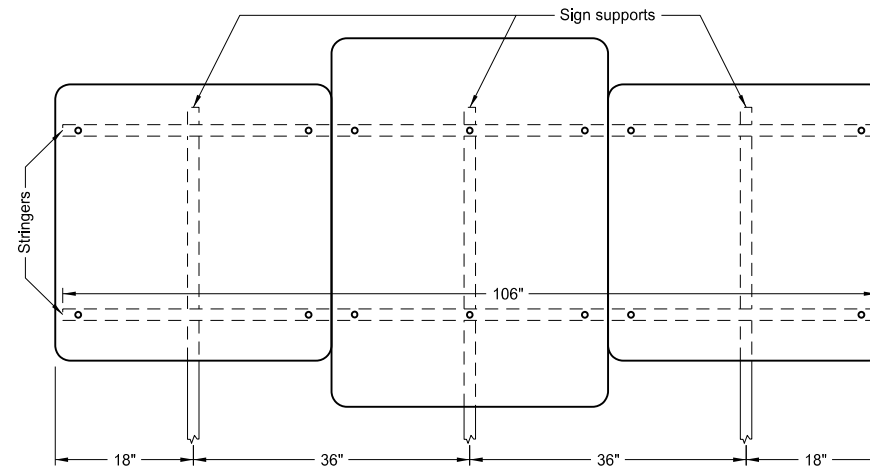


3 Posts

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3 Posts

The diagrams illustrate the structural layout of a diamond-shaped sign and its rectangular support. The left diagram shows a single vertical stringer supporting the sign. The right diagram shows two vertical stringers supporting the sign. Both diagrams include labels for 'Sign supports' and 'Stringers'.

3 Posts

Technical drawing of a diamond-shaped sign. The overall width is 50.90". The diamond's side length is 36". The top corner is rounded with a 12" radius. The sign features a central "Sign support" structure and "Stringers" (indicated by dashed lines). Below the diamond, a rectangular component is shown with a "Vertical stringer" (indicated by a dashed line). The rectangular component has a total height of 24" (divided into two 3" sections) and a width of 24" (divided into two 12" sections). The vertical stringer is 22" long. The overall width of the assembly is 50.90".

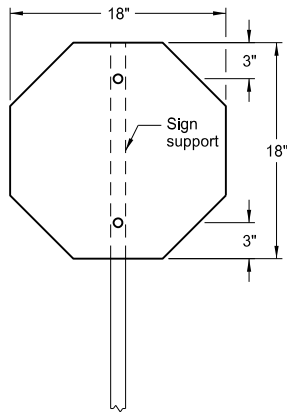
1 Post

1. The minimum sign backing material thickness shall be 0.100 inch.
2. Perforated square tube stringer shall be 1½"x1½".
3. All holes shall be punched round for ⅜" bolt.

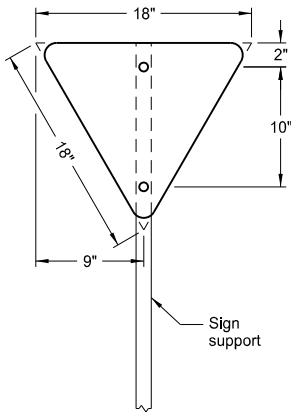
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
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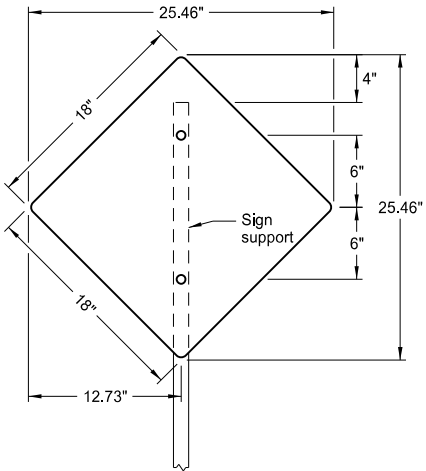
PUNCHING, STRINGER, AND SUPPORT LOCATION DETAILS  
FOR REGULATORY, WARNING AND GUIDE BIKE ROUTE SIGNS



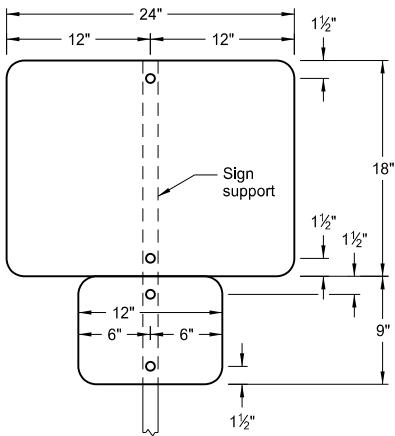
1 Post  
Assembly No. 100



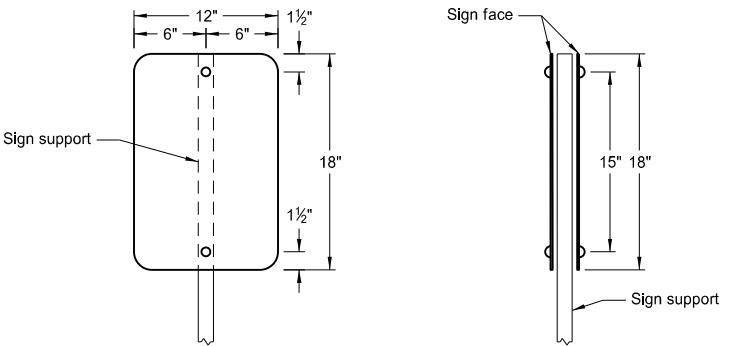
1 Post  
Assembly No. 101



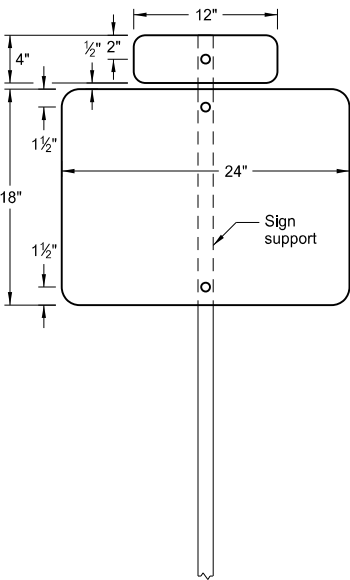
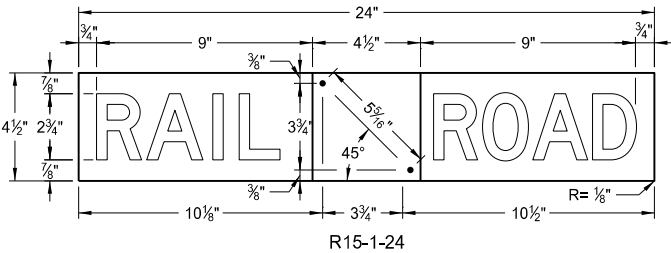
1 Post  
Assembly No. 102



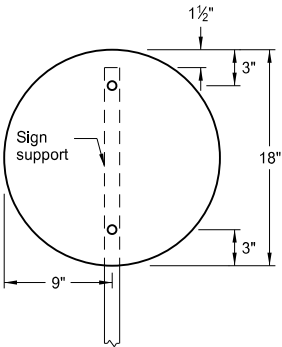
1 Post  
Assembly No. 103



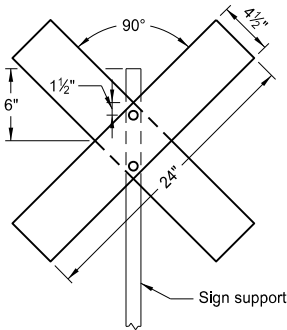
1 Post  
back to back  
Assembly No. 104



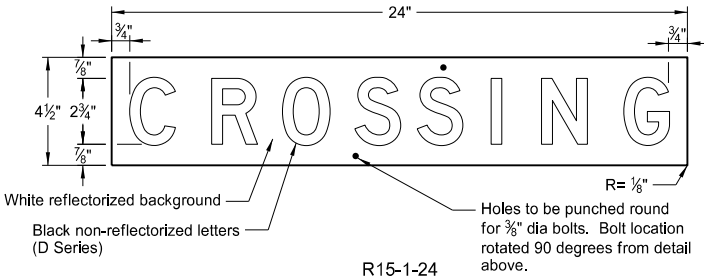
1 Post  
back to back  
Assembly No. 105



1 Post  
Assembly No. 106



1 Post  
Assembly No. 107



Railroad Crossing Sign Details

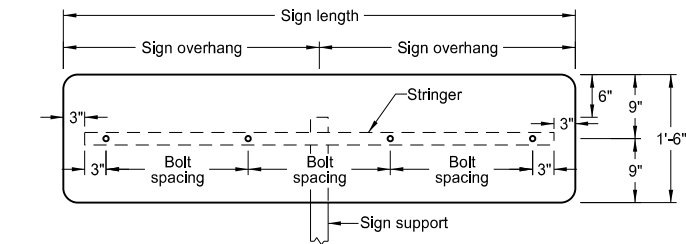
- Notes:
1. The minimum sign backing material thickness shall be 0.100 inch.
  2. All holes shall be punched round for 3/8" bolt.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-22-12	
REVISIONS	
DATE	CHANGE
9-18-15	Revised Title Name

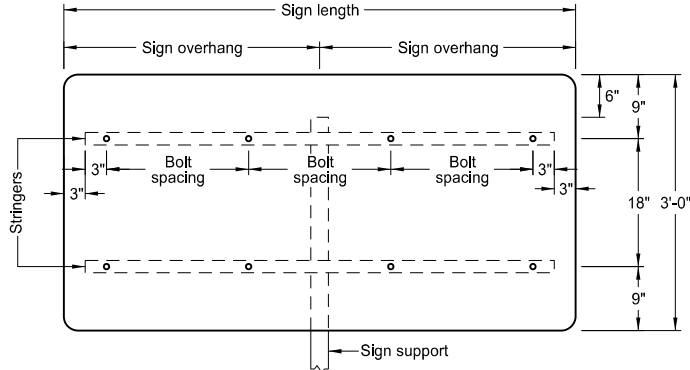
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SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS  
FOR VARIABLE LENGTH SIGNS

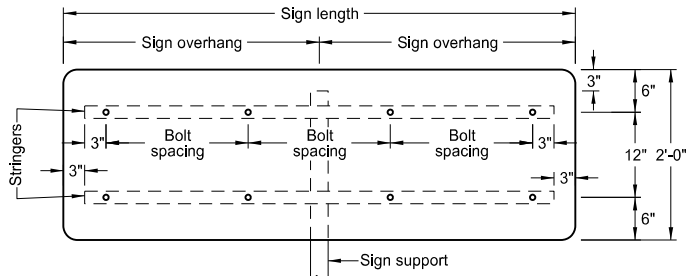
D-754-47



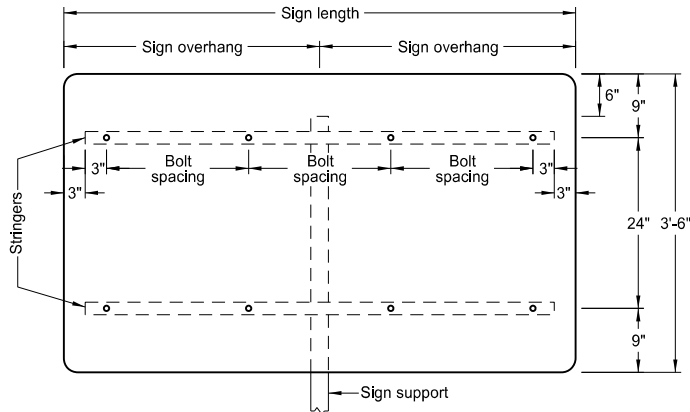
VARIES X 1'-6"



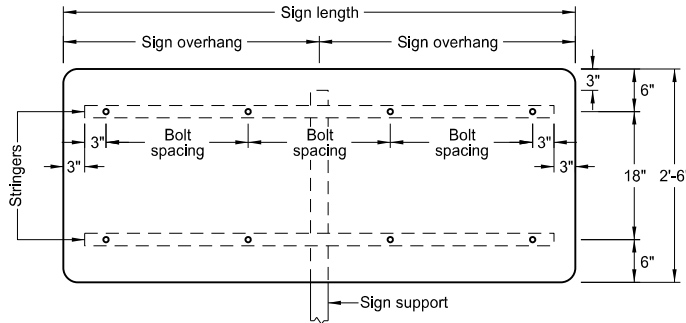
VARIES X 3'-0"



VARIES X 2'-0"



VARIES X 3'-6"



VARIES X 2'-6"

1 POST		
Sign Length	Sign Overhang	Bolt Spacing
4'-0"	2'-0"	18"
4'-6"	2'-3"	21"
5'-0"	2'-6"	24"
5'-6"	2'-9"	18"
6'-0"	3'-0"	20"
6'-6"	3'-3"	22"
7'-0"	3'-6"	24"
7'-6"	3'-9"	2-20" & 2-19"
8'-0"	4'-0"	21"
8'-6"	4'-3"	2-22" & 2-23"
9'-0"	4'-6"	24"
9'-6"	4'-9"	4-20" & 1-22"
10'-0"	5'-0"	2-21" & 3-22"
10'-6"	5'-3"	4-23" & 1-22"
11'-0"	5'-6"	24"
11'-6"	5'-9"	21"
12'-0"	6'-0"	22"

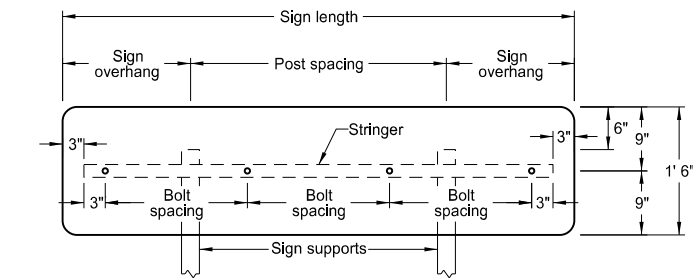
- Notes:
1. The minimum sign backing material thickness shall be 0.100 inch.
  2. Perforated square tube stringer shall be 1½" x 1½".
  3. All holes shall be punched round for ⅜" bolt.
  4. Single stringer and single post signs shall have stringers attached to the post using the special stringer angle, shown on the "Mounting Details Perforated Tube" standard drawing.

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9-25-12	
REVISIONS	
DATE	CHANGE

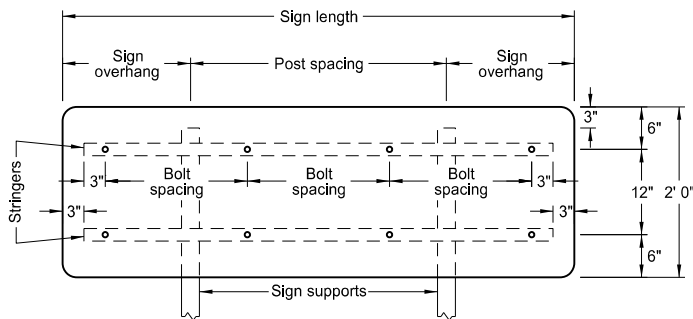
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SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS  
FOR VARIABLE LENGTH SIGNS

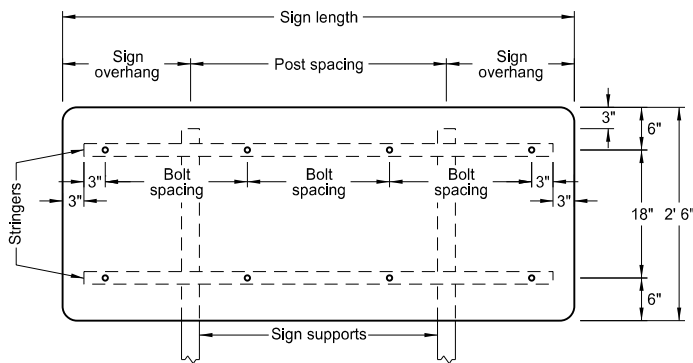
D-754-48



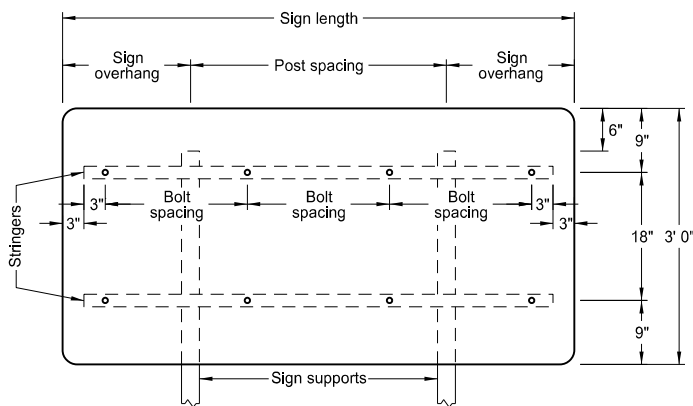
VARIES X 1'-6"



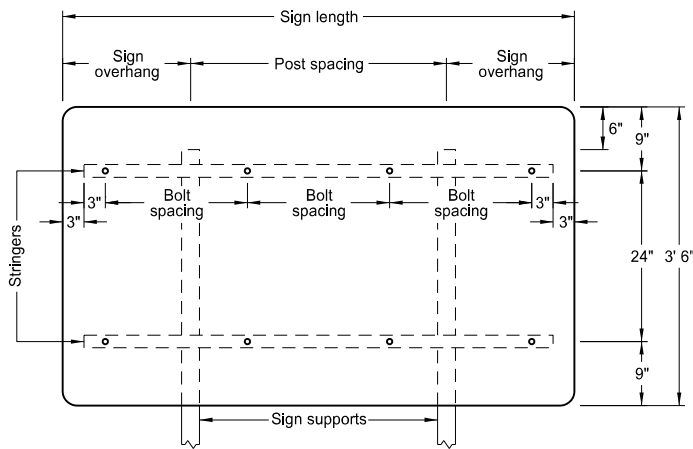
VARIES X 2'-0"



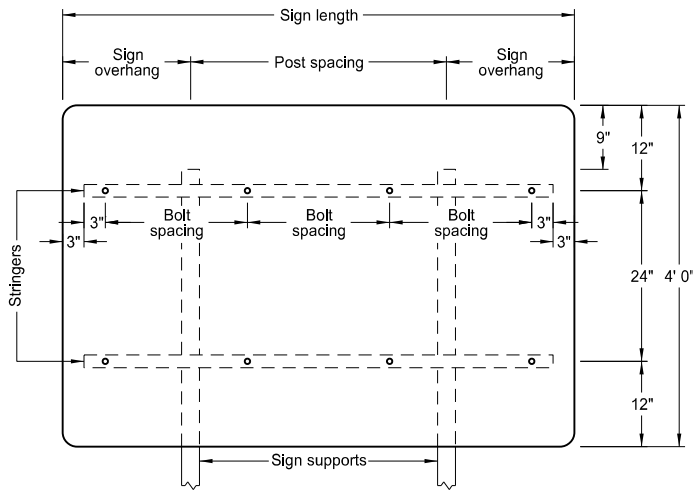
VARIES X 2'-6"



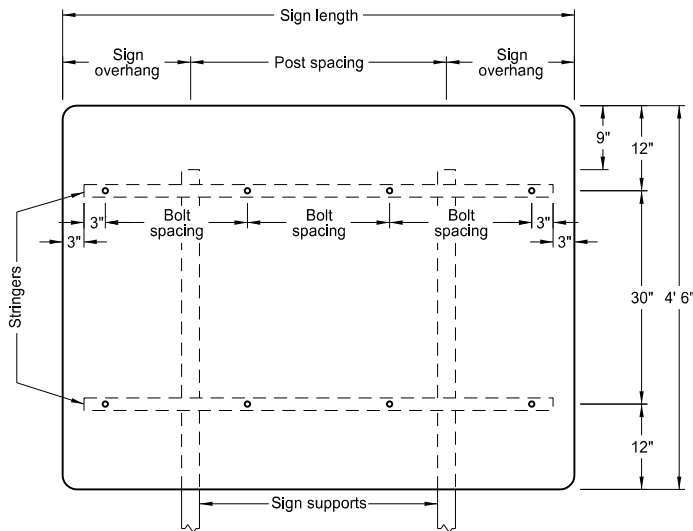
VARIES X 3'-0"



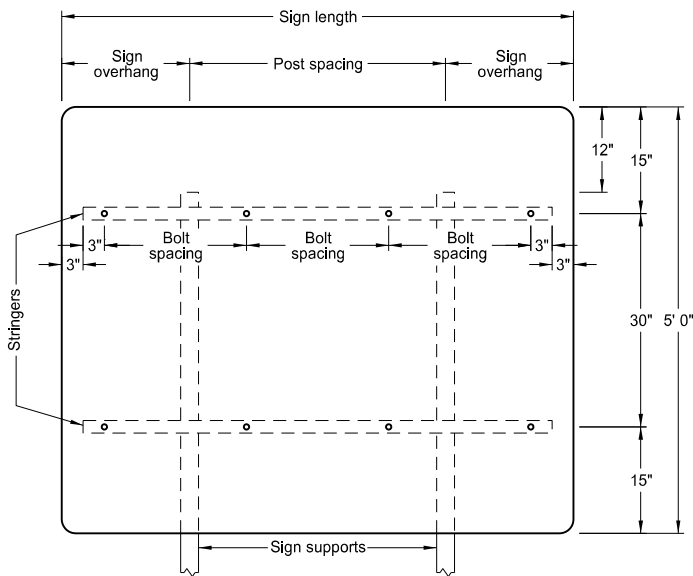
VARIES X 3'-6"



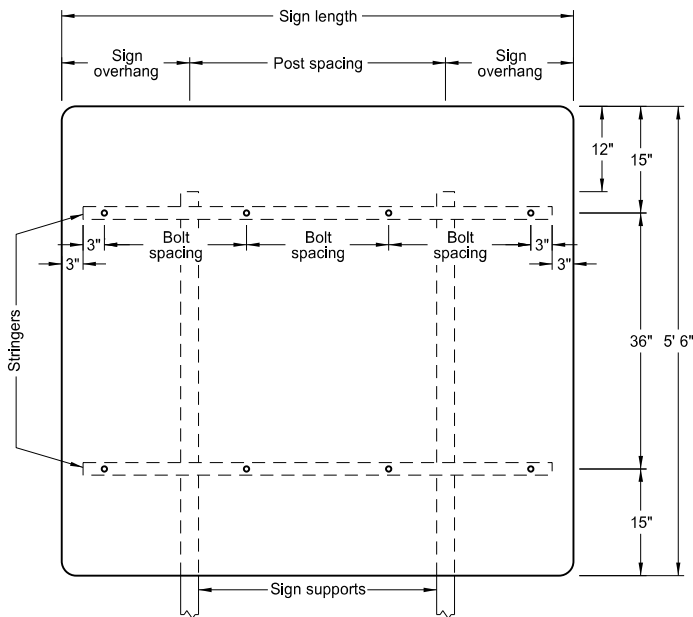
VARIES X 4'-0"



VARIES X 4'-6"



VARIES X 5'-0"



VARIES X 5'-6"

- Notes:
1. The minimum sign backing material thickness shall be 0.100 inch.
  2. Perforated square tube stringer shall be 1½" x 1½".
  3. All holes shall be punched round for ⅜" bolt.

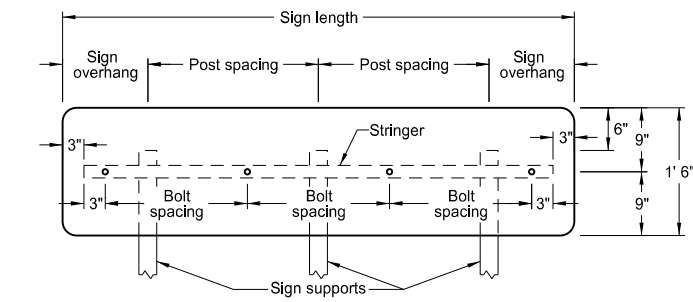
2 POSTS			
Sign Length	Sign Overhang	Post Spacing	Bolt Spacing
4'-0"	1'-0"	2'-0"	18"
4'-6"	1'-3"	2'-0"	21"
5'-0"	1'-0"	3'-0"	24"
5'-6"	1'-3"	3'-0"	18"
6'-0"	1'-6"	3'-0"	20"
6'-6"	1'-3"	4'-0"	22"
7'-0"	1'-6"	4'-0"	24"
7'-6"	1'-9"	4'-0"	2-20" & 2-19"
8'-0"	2'-0"	4'-0"	21"
8'-6"	1'-9"	5'-0"	2-22" & 2-23"
9'-0"	2'-0"	5'-0"	24"
9'-6"	1'-9"	6'-0"	4-20" & 1-22"
10'-0"	2'-0"	6'-0"	2-21" & 3-22"
10'-6"	2'-3"	6'-0"	4-23" & 1-22"
11'-0"	2'-6"	6'-0"	24"
11'-6"	2'-9"	6'-0"	21"
12'-0"	2'-0"	8'-0"	22"
12'-6"	2'-3"	8'-0"	23"
13'-0"	2'-6"	8'-0"	24"
13'-6"	2'-9"	8'-0"	3-22" & 4-21"
14'-0"	3'-0"	8'-0"	2-23" & 5-22"
14'-6"	3'-3"	8'-0"	6-23" & 1-24"
15'-0"	3'-6"	8'-0"	24"
15'-6"	2'-9"	10'-0"	6-22" & 2-21"
16'-0"	3'-0"	10'-0"	4-23" & 4-22"
16'-6"	3'-3"	10'-0"	6-23" & 2-24"
17'-0"	3'-6"	10'-0"	24"
17'-6"	3'-9"	10'-0"	22"
18'-0"	3'-0"	12'-0"	6-23" & 3-22"
18'-6"	3'-3"	12'-0"	6-23" & 3-24"
19'-0"	3'-6"	12'-0"	24"
19'-6"	3'-9"	12'-0"	8-22" & 2-23"
20'-0"	4'-0"	12'-0"	8-23" & 2-22"

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-25-12	
REVISIONS	
DATE	CHANGE

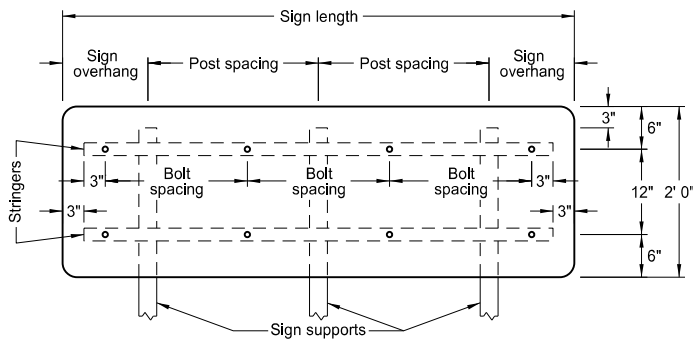
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SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS  
FOR VARIABLE LENGTH SIGNS

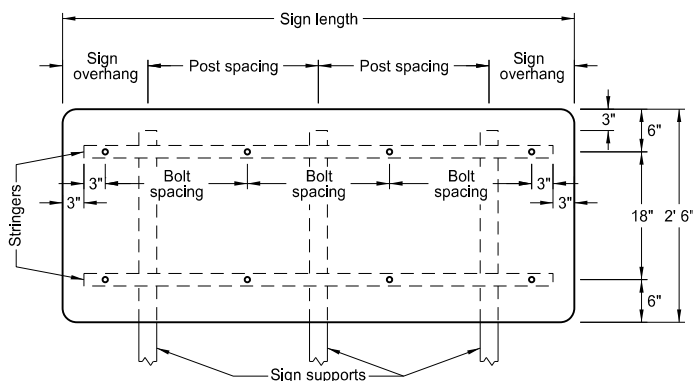
D-754-49



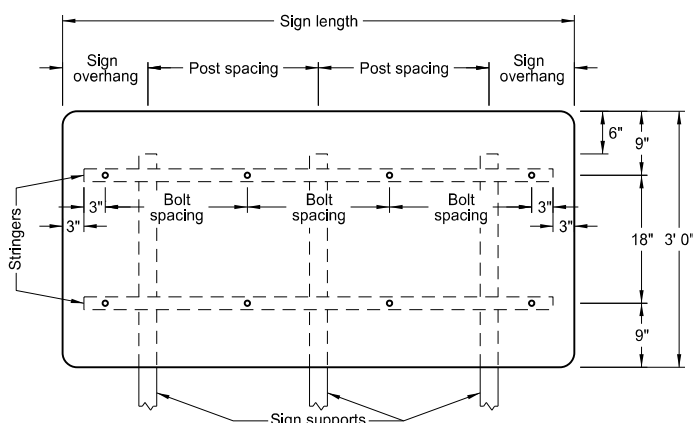
VARIES X 1'-6"



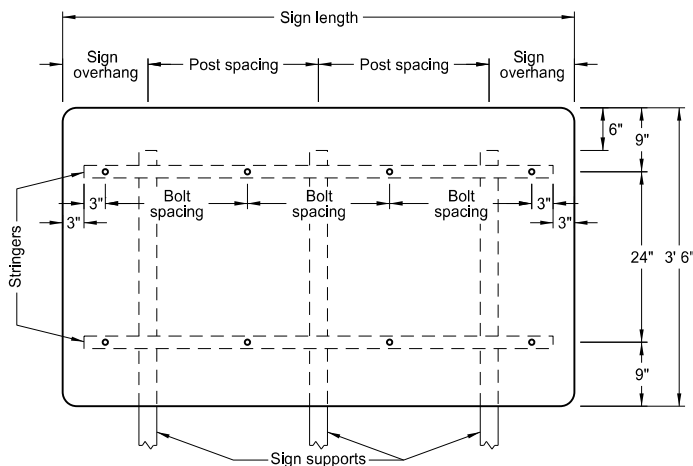
VARIES X 2'-0"



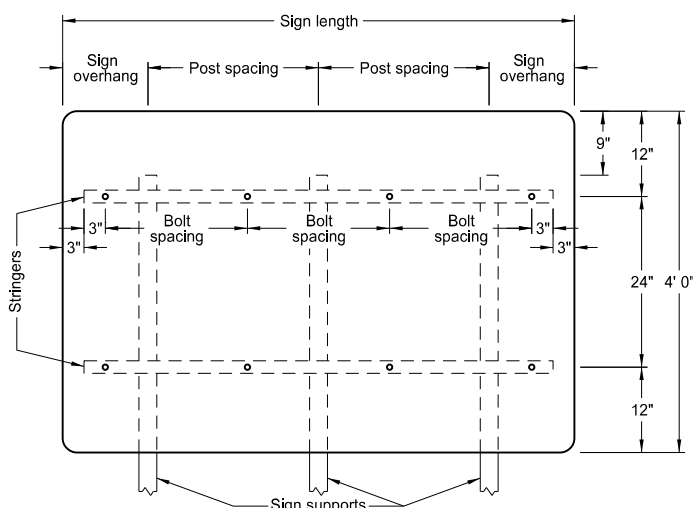
VARIES X 2'-6"



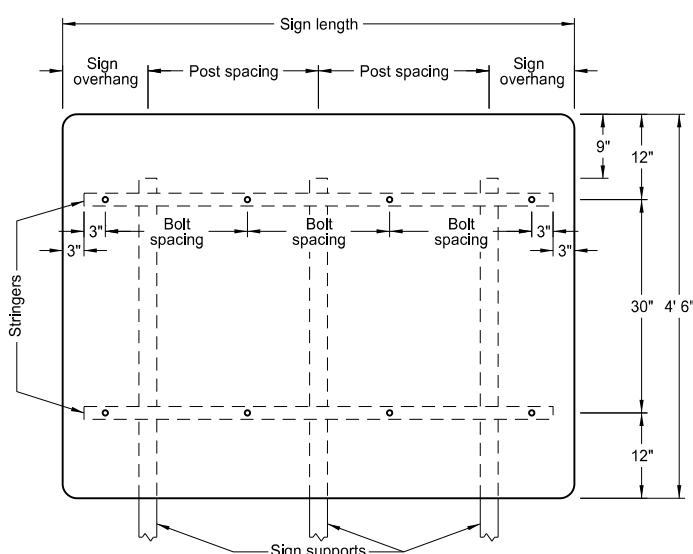
VARIES X 3'-0"



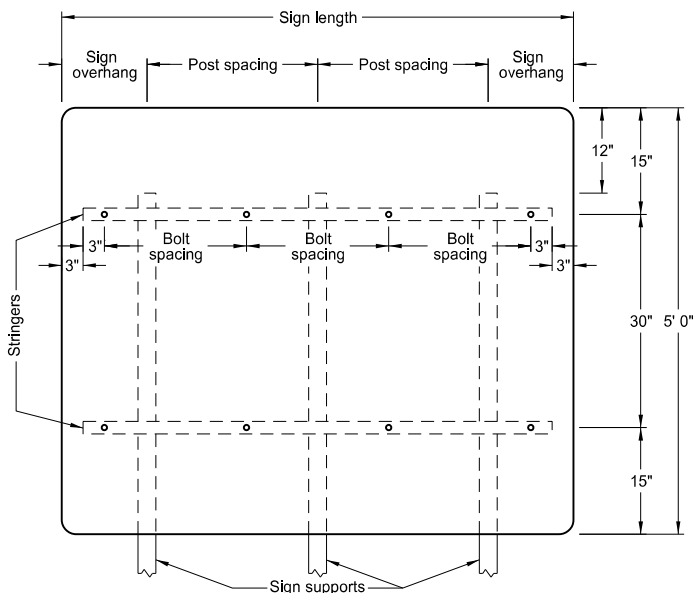
VARIES X 3'-6"



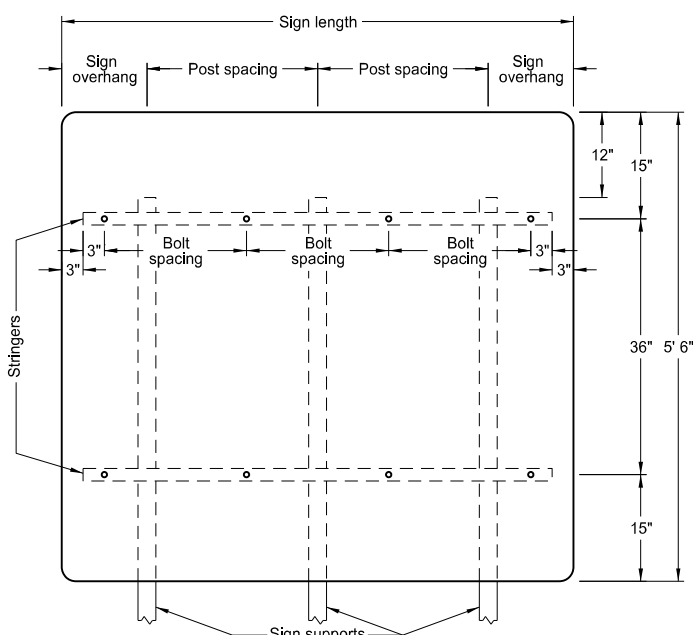
VARIES X 4'-0"



VARIES X 4'-6"



VARIES X 5'-0"



VARIES X 5'-6"

- Notes:
- The minimum sign backing material thickness shall be 0.100 inch.
  - Perforated square tube stringer shall be 1½" x 1½".
  - All holes shall be punched round for ⅜" bolt.

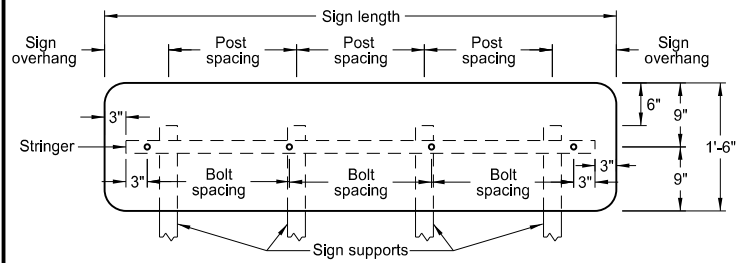
3 POSTS			
Sign Length	Sign Overhang	Post Spacing	Bolt Spacing
4'-0"	0'-6"	1'-6"	18"
4'-6"	0'-6"	1'-9"	21"
5'-0"	0'-6"	2'-0"	24"
5'-6"	1'-3"	1'-6"	18"
6'-0"	1'-0"	2'-0"	20"
6'-6"	1'-3"	2'-0"	22"
7'-0"	1'-6"	2'-0"	24"
7'-6"	1'-6"	2'-3"	2-20" & 2-19"
8'-0"	1'-9"	2'-3"	21"
8'-6"	2'-0"	2'-3"	2-22" & 2-23"
9'-0"	1'-6"	3'-0"	24"
9'-6"	1'-9"	3'-0"	4-20" & 1-22"
10'-0"	1'-9"	3'-3"	2-21" & 3-22"
10'-6"	1'-9"	3'-6"	4-23" & 1-22"
11'-0"	2'-0"	3'-6"	24"
11'-6"	2'-3"	3'-6"	21"
12'-0"	2'-4"	3'-8"	22"
12'-6"	2'-5"	3'-10"	23"
13'-0"	2'-6"	4'-0"	24"
13'-6"	2'-9"	4'-0"	3-22" & 4-21"
14'-0"	3'-0"	4'-0"	2-23" & 5-22"
14'-6"	3'-3"	4'-0"	6-23" & 1-24"
15'-0"	3'-6"	4'-0"	24"
15'-6"	2'-4"	5'-5"	6-22" & 2-21"
16'-0"	2'-5"	5'-7"	4-23" & 4-22"
16'-6"	2'-5"	5'-10"	6-23" & 2-24"
17'-0"	2'-6"	6'-0"	24"
17'-6"	3'-3"	5'-6"	22"
18'-0"	3'-6"	5'-6"	6-23" & 3-22"
18'-6"	3'-9"	5'-6"	6-23" & 3-24"
19'-0"	3'-6"	6'-0"	24"
19'-6"	4'-3"	5'-6"	8-22" & 2-23"
20'-0"	4'-4"	5'-8"	8-23" & 2-22"

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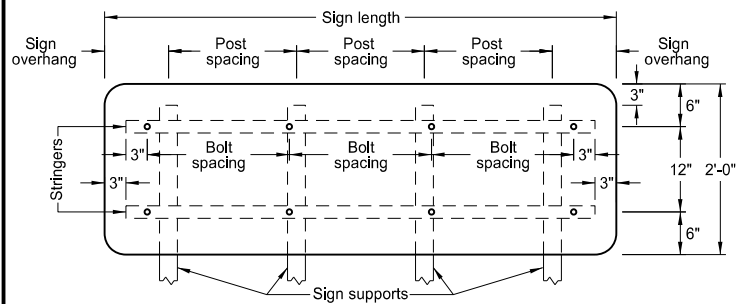
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SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS  
FOR VARIABLE LENGTH SIGNS

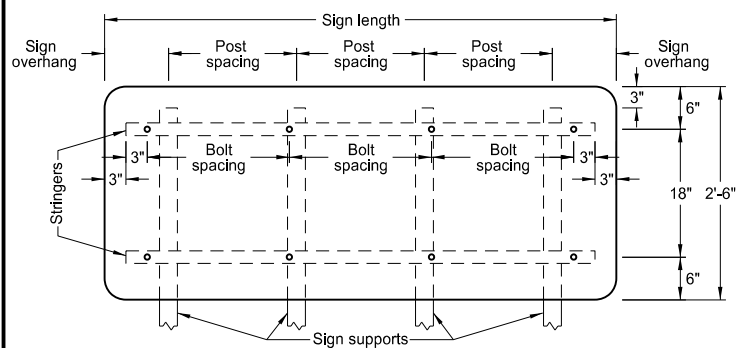
D-754-50



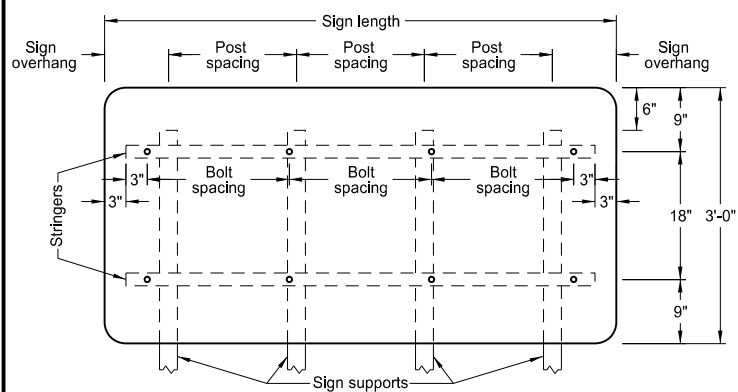
VARIES X 1'-6"



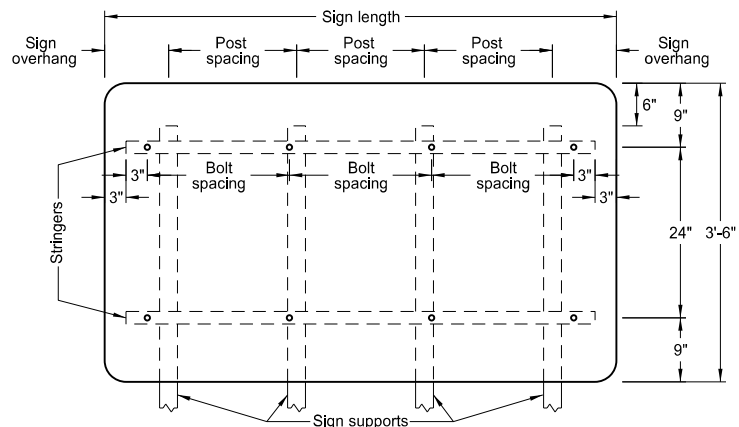
VARIES X 2'-0"



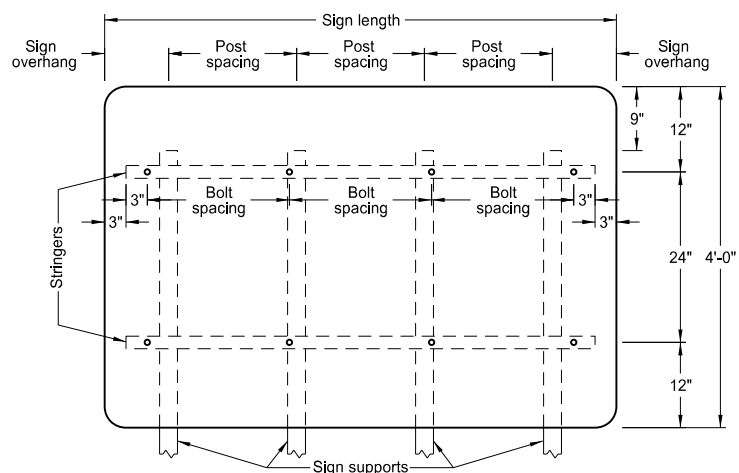
VARIES X 2'-6"



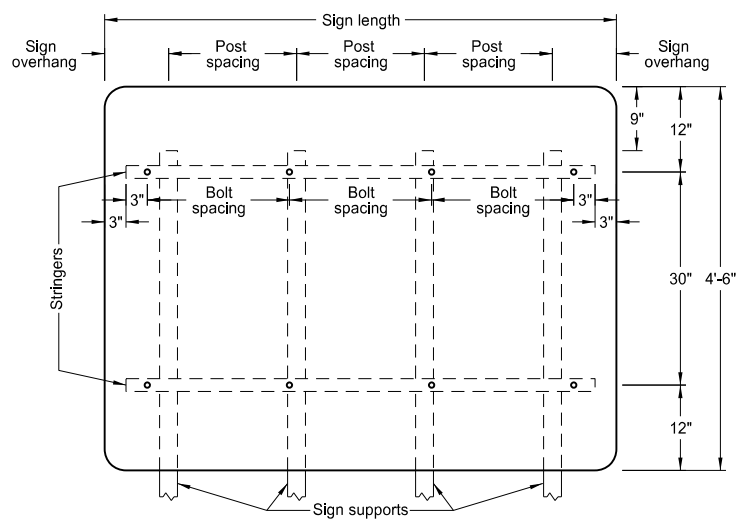
VARIES X 3'-0"



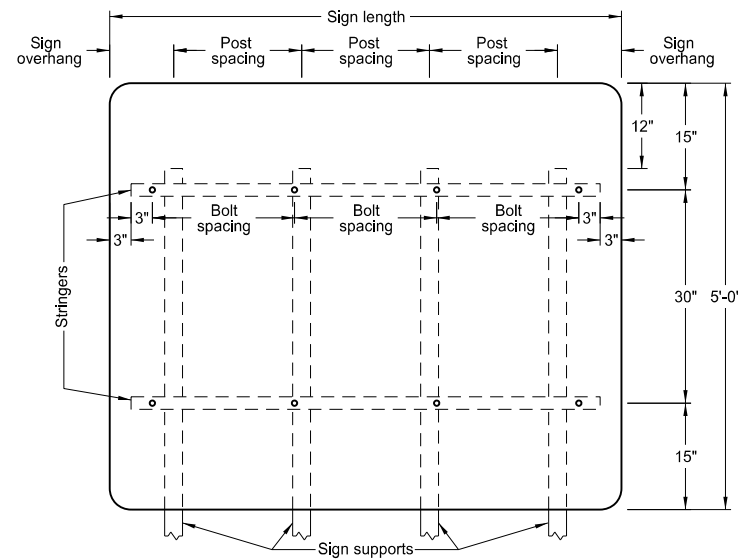
VARIES X 3'-6"



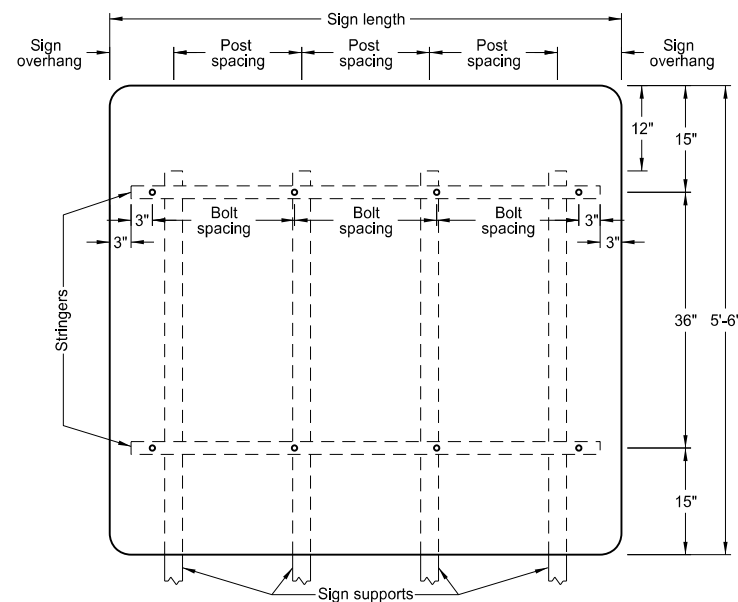
VARIES X 4'-0"



VARIES X 4'-6"



VARIES X 5'-0"



VARIES X 5'-6"

4 POSTS			
Sign Length	Sign Overhang	Post Spacing	Bolt Spacing
8'-6"	0'-3"	2'-8"	2-22" & 2-23"
9'-0"	0'-6"	2'-8"	24"
9'-6"	0'-9"	2'-8"	4-20" & 1-22"
10'-0"	1'-0"	2'-8"	2-21" & 3-22"
10'-6"	1'-3"	2'-8"	4-23" & 1-22"
11'-0"	1'-0"	3'-0"	24"
11'-6"	0'-6"	3'-6"	21"
12'-0"	0'-6"	3'-8"	22"
12'-6"	0'-6"	3'-10"	23"
13'-0"	0'-6"	4'-0"	24"
13'-6"	1'-3"	3'-8"	3-22" & 4-21"
14'-0"	1'-6"	3'-8"	2-23" & 5-22"
14'-6"	1'-3"	4'-0"	6-23" & 1-24"
15'-0"	1'-6"	4'-0"	24"
15'-6"	1'-0"	4'-6"	6-22" & 2-21"
16'-0"	1'-0"	4'-8"	4-23" & 4-22"
16'-6"	1'-0"	4'-10"	6-23" & 2-24"
17'-0"	1'-0"	5'-0"	24"
17'-6"	0'-6"	5'-6"	22"
18'-0"	2'-0"	4'-8"	6-23" & 3-22"
18'-6"	1'-9"	5'-0"	6-23" & 3-24"
19'-0"	0'-6"	6'-0"	24"
19'-6"	3'-0"	4'-6"	8-22" & 2-23"
20'-0"	3'-0"	4'-8"	8-23" & 2-22"

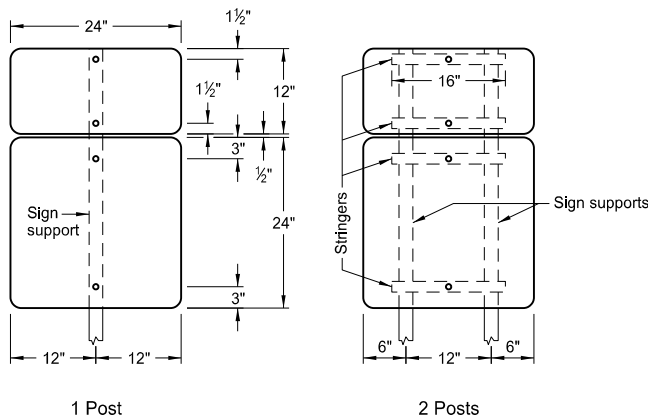
- Notes:
1. The minimum sign backing material thickness shall be 0.100 inch.
  2. Perforated square tube stringer shall be 1½" x 1½".
  3. All holes shall be punched round for ⅜" bolt.

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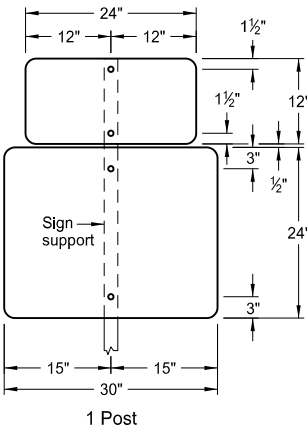
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SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS - ROUTE MARKER SIGNS

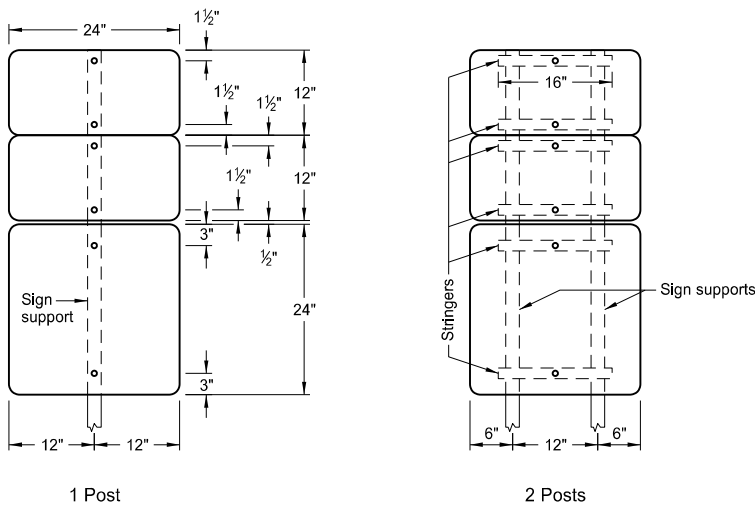
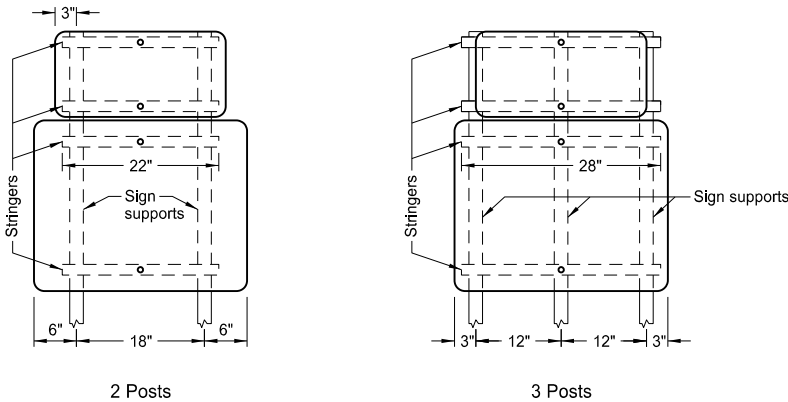
D-754-51



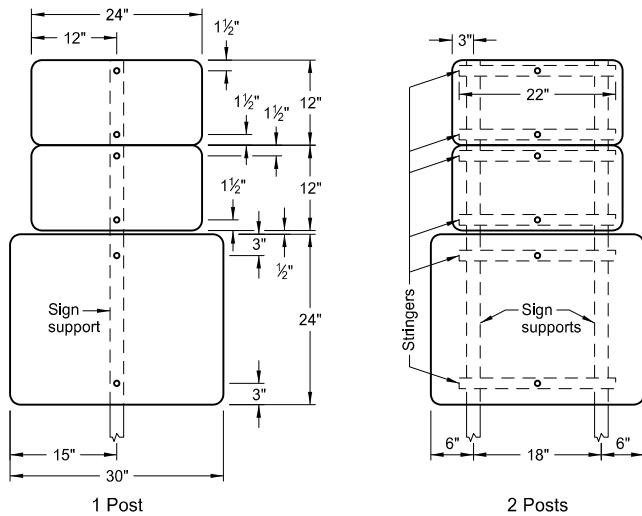
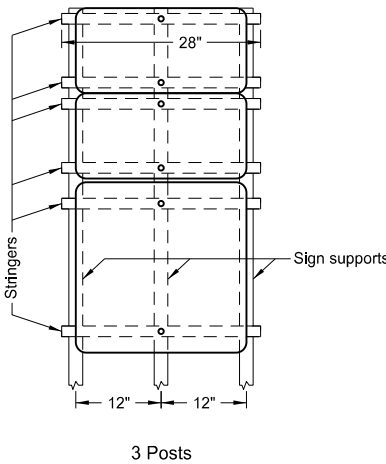
ASSEMBLY NO. 371



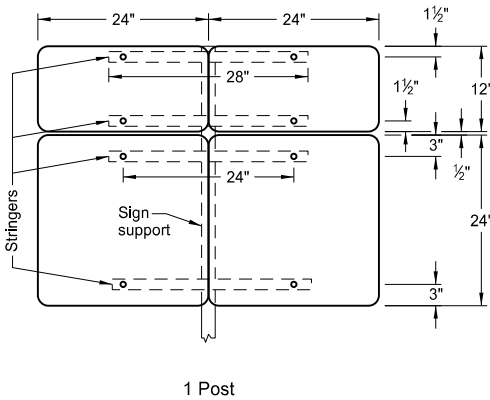
ASSEMBLY NO. 372



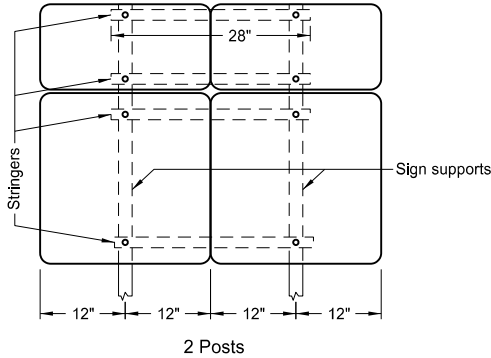
ASSEMBLY NO. 373



ASSEMBLY NO. 374

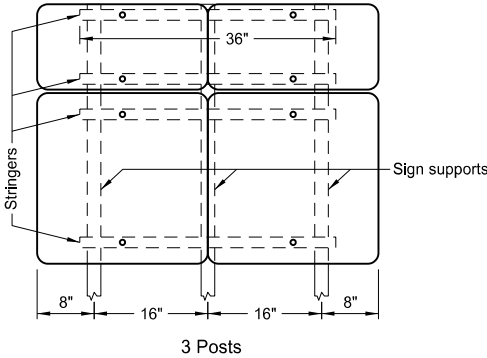


1 Post



2 Posts

ASSEMBLY NO. 375



3 Posts

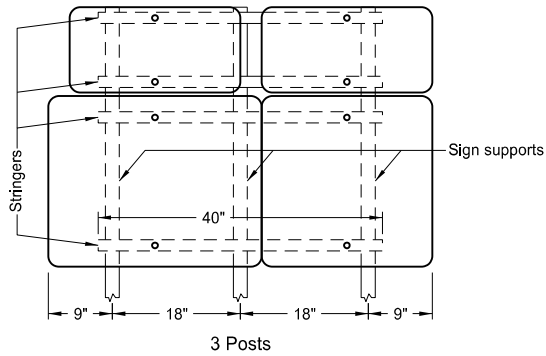
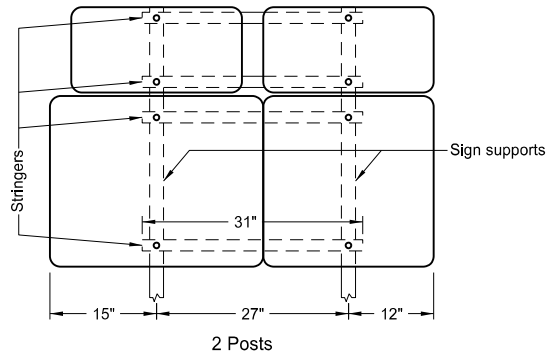
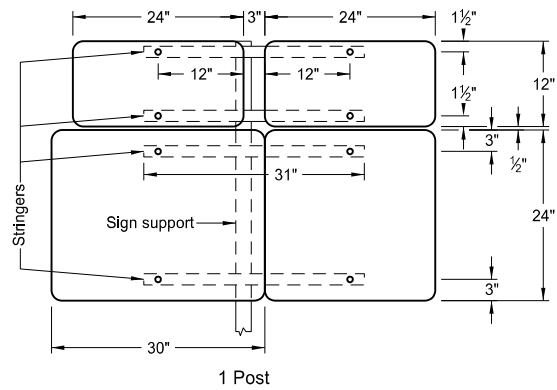
- Notes:
1. The minimum sign backing material thickness shall be 0.100 inch.
  2. Perforated square tube stringer shall be 1½"x1½".
  3. All holes shall be punched round for ⅜" bolt.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
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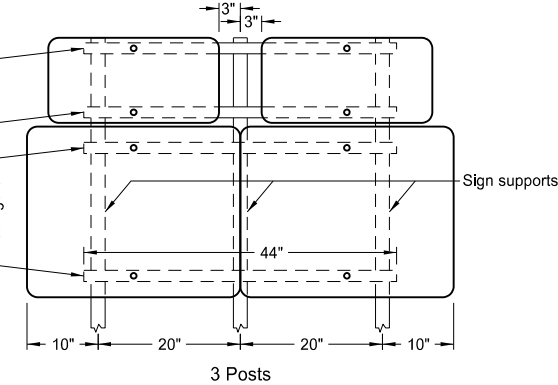
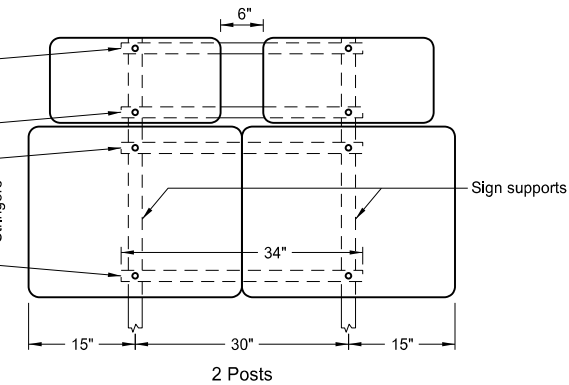
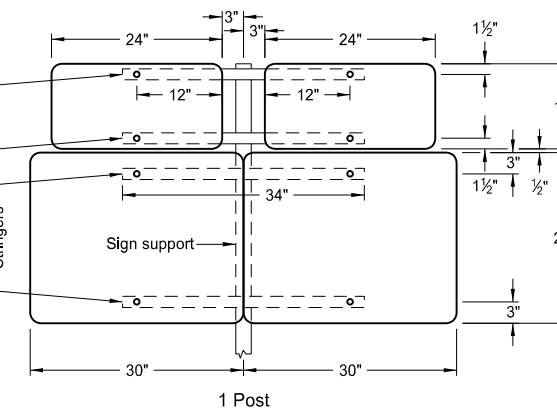
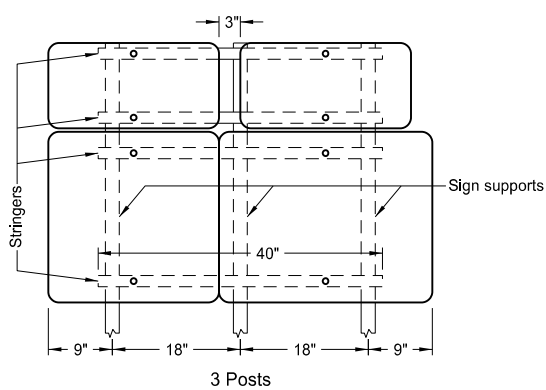
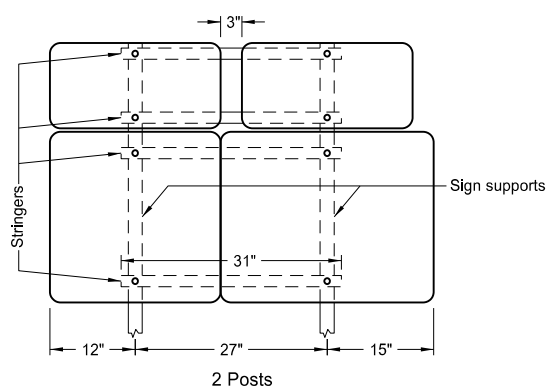
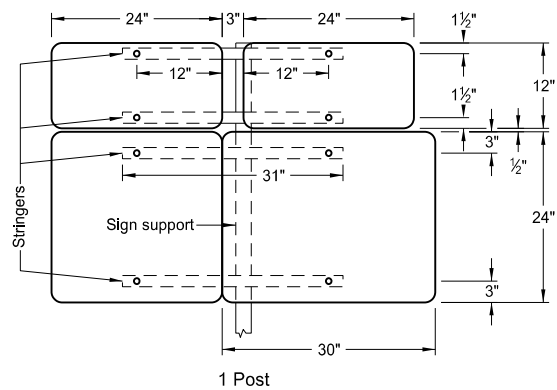
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SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS - ROUTE MARKER SIGNS

D-754-52



- Notes:
1. The minimum sign backing material thickness shall be 0.100 inch.
  2. Perforated square tube stringer shall be 1 1/2"x1 1/2".
  3. All holes shall be punched round for 3/8" bolt.



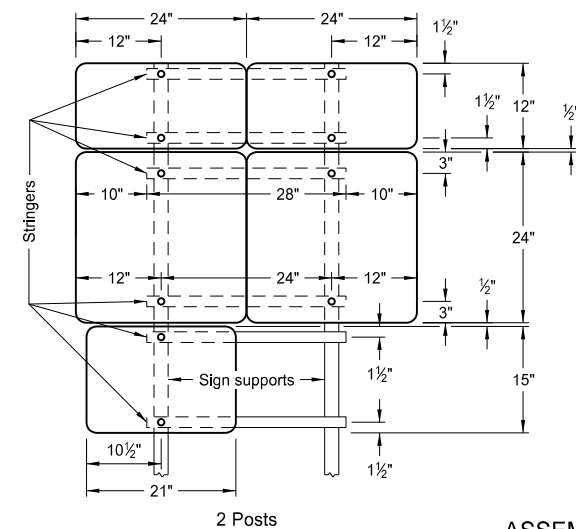
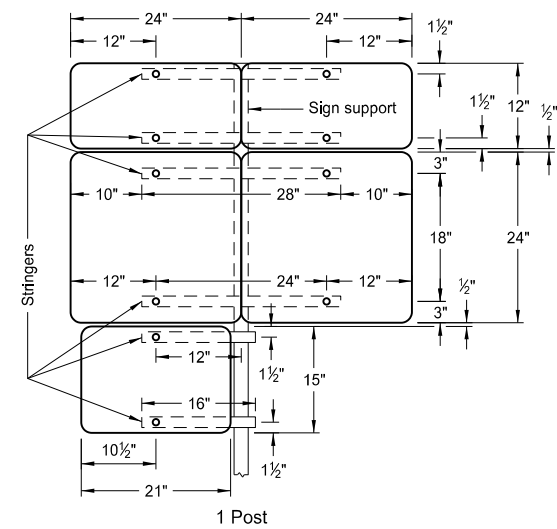
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
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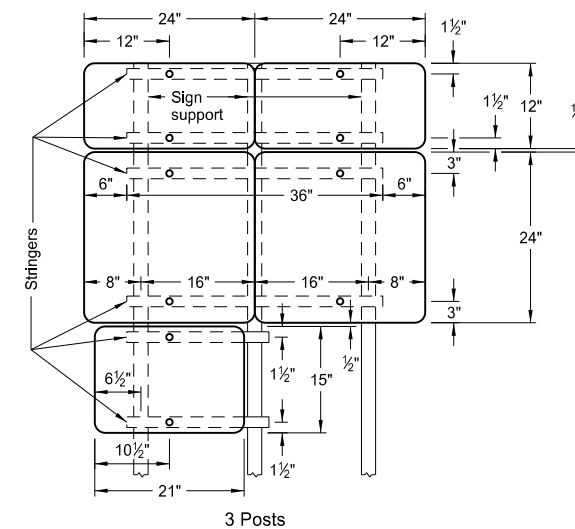




D-754-54

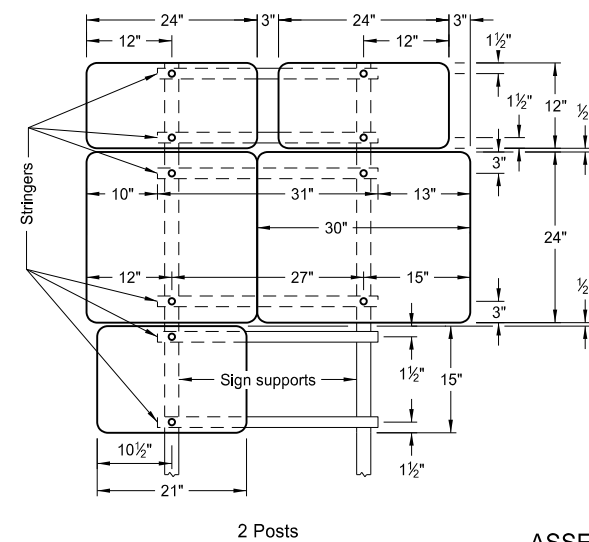
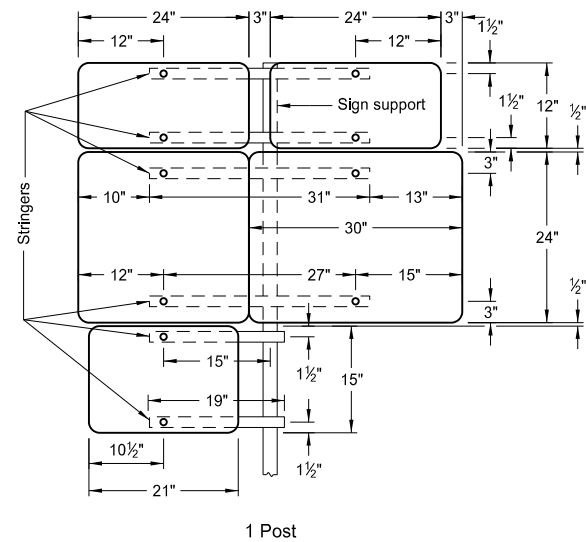


ASSEMBLY 383

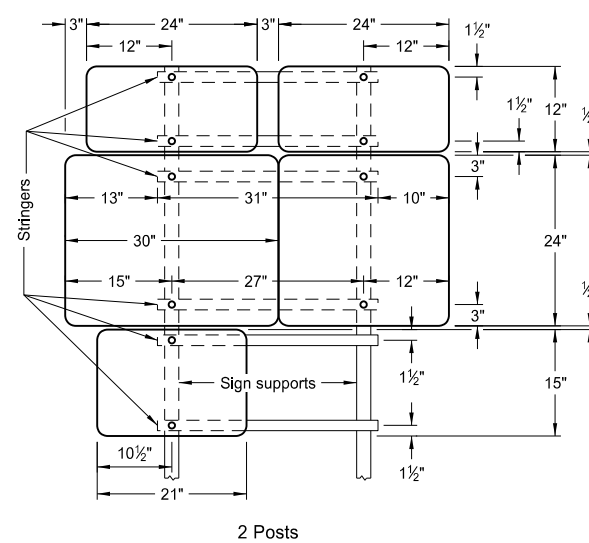
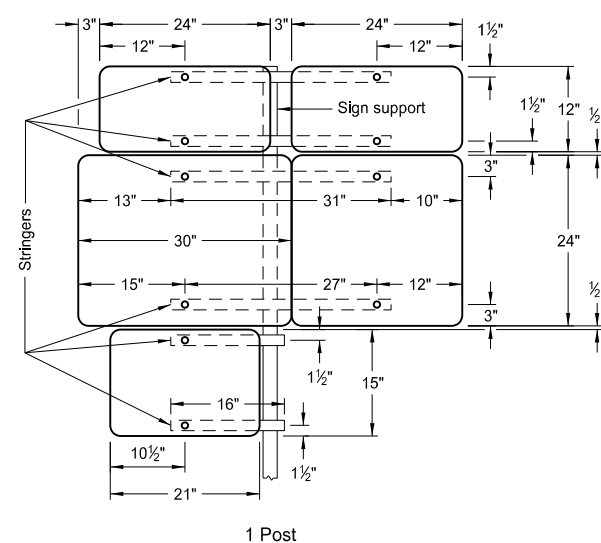
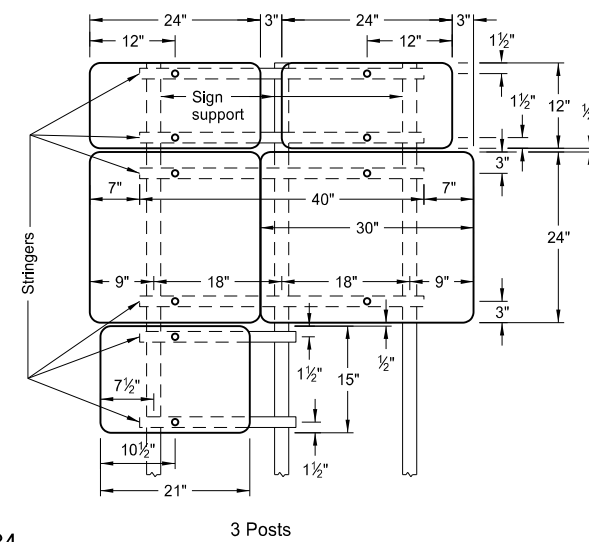


Notes:

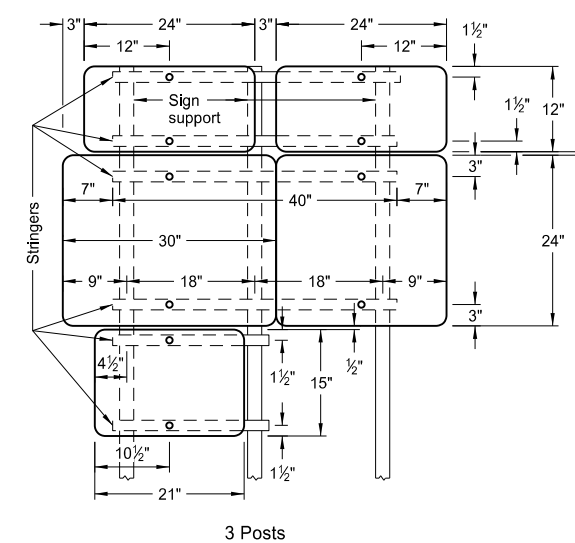
1. The minimum sign backing material thickness shall be 0.100 inch.
2. Perforated square tube stringer shall be  $1\frac{1}{2}" \times 1\frac{1}{2}"$ .
3. All holes shall be punched round for  $\frac{3}{8}"$  bolt.



ASSEMBLY 384



ASSEMBLY 385



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D-754-55



Notes:

1. The minimum sign backing material thickness shall be 0.100 inch.
2. Perforated square tube stringer shall be 1½"x1½".
3. All holes shall be punched round for ¾" bolt.



1 Post



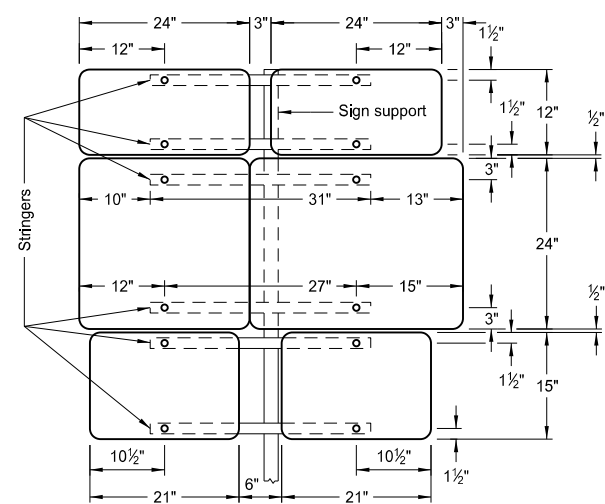
ASSEMBLY 388

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-22-12	
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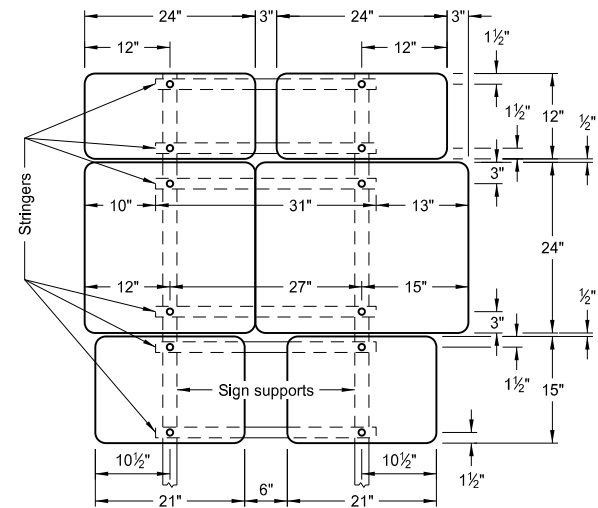
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SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS - ROUTE MARKER SIGNS

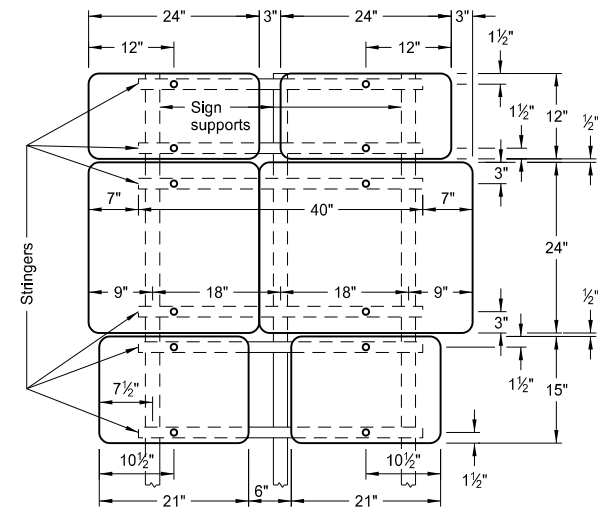
D-754-56



1 Post

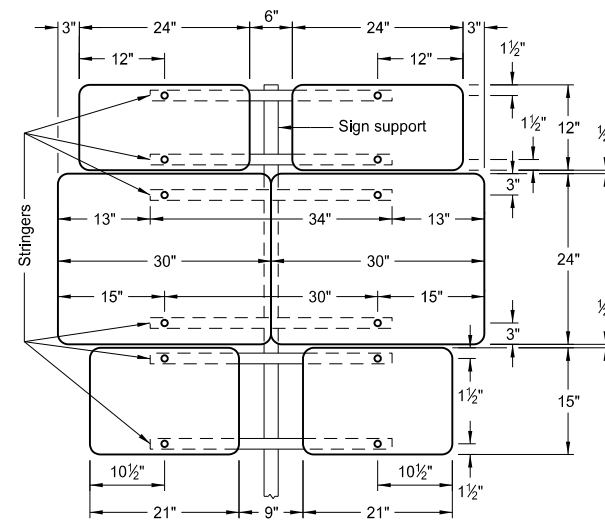


2 Posts

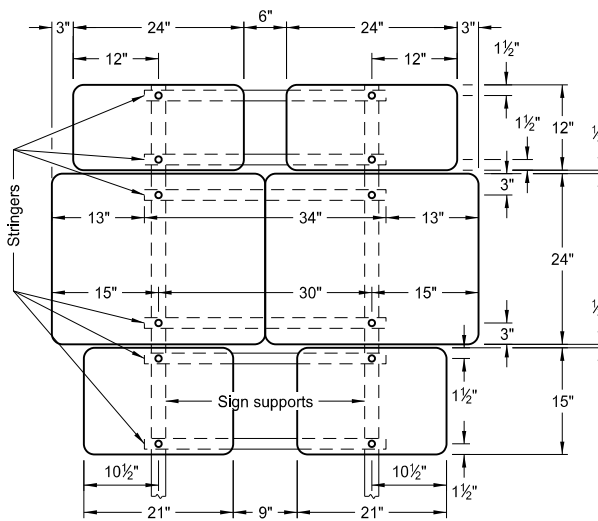


3 Posts

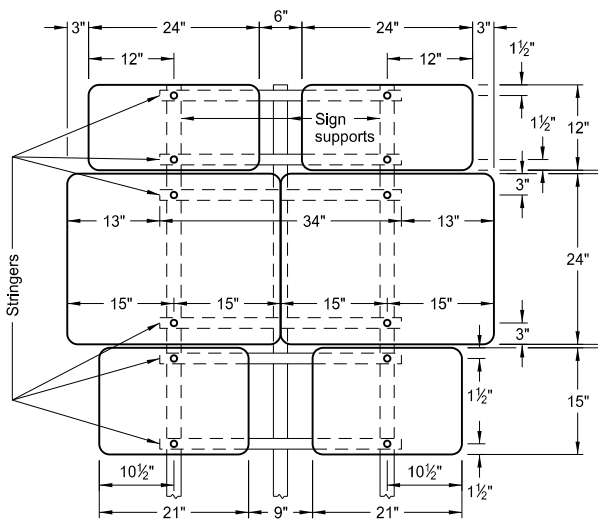
ASSEMBLY 389



1 Post



2 Posts



3 Posts

ASSEMBLY 390

Notes:

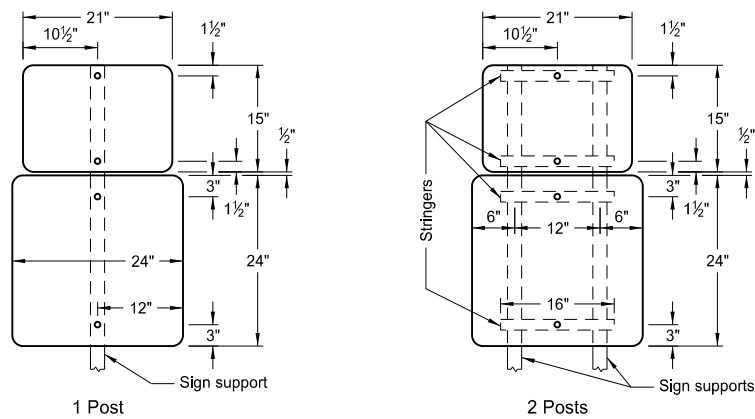
1. The minimum sign backing material thickness shall be 0.100 inch.
2. Perforated square tube stringer shall be 1½"x1½".
3. All holes shall be punched round for ⅜" bolt.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-22-12	
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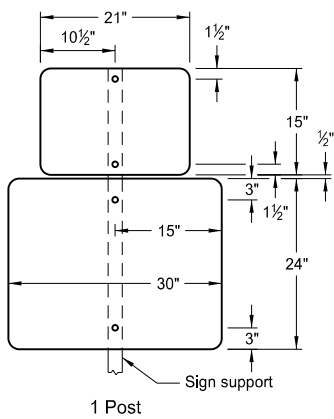
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SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS - ROUTE MARKER SIGNS

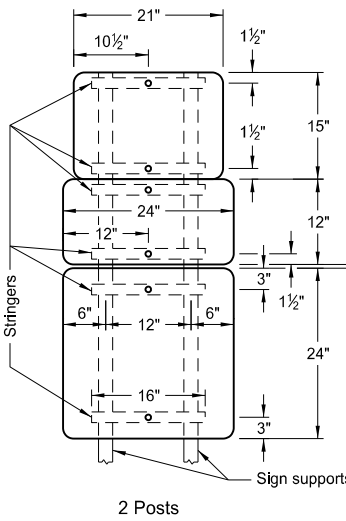
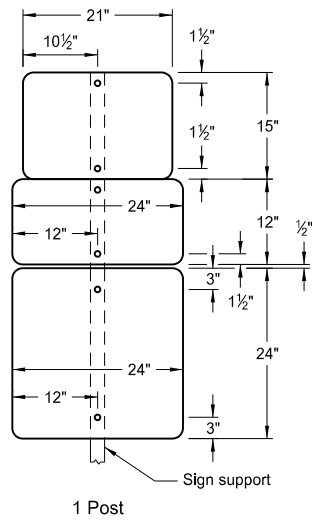
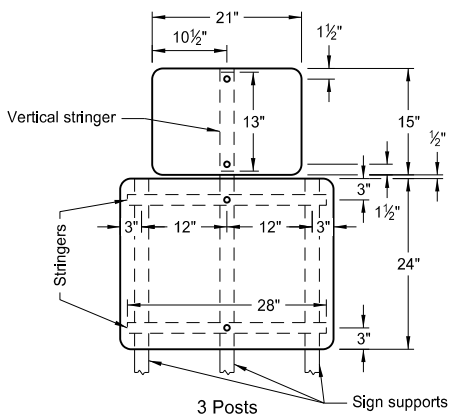
D-754-57



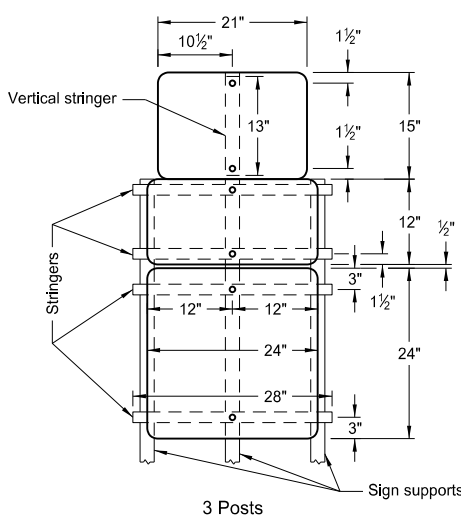
ASSEMBLY 391



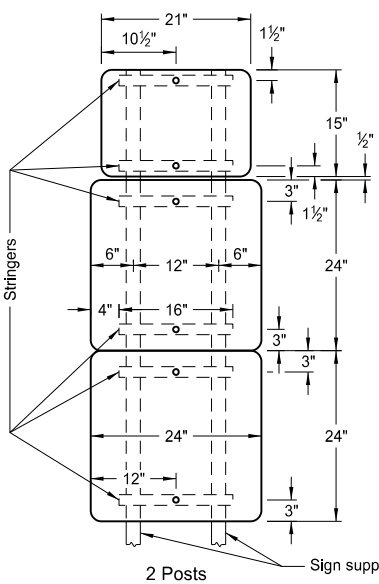
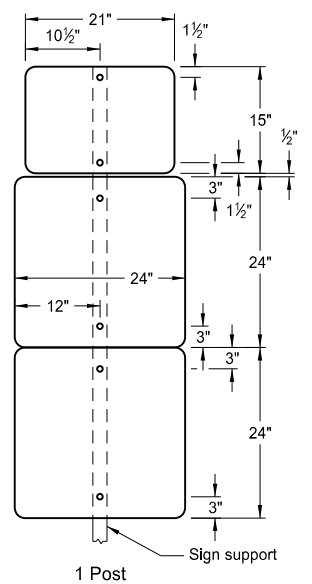
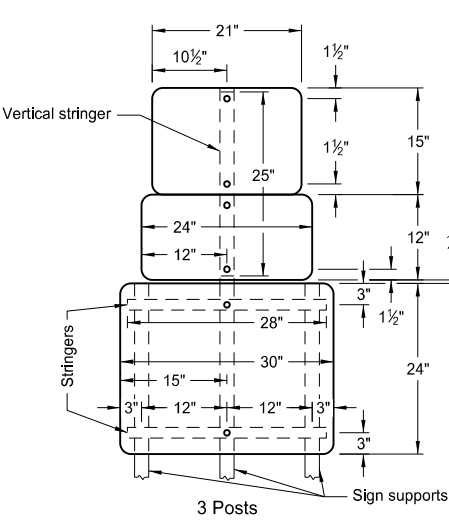
ASSEMBLY 392



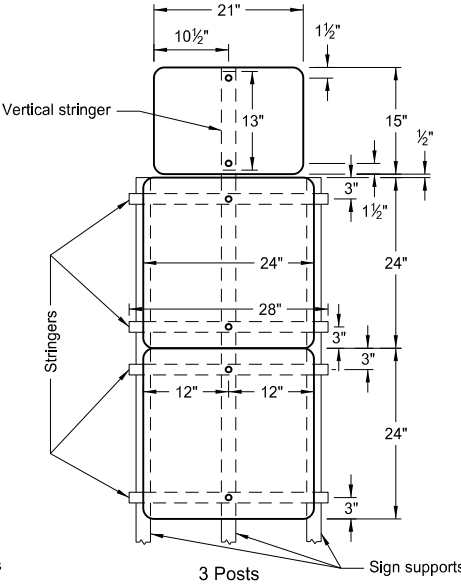
ASSEMBLY 393



ASSEMBLY 394



ASSEMBLY 395

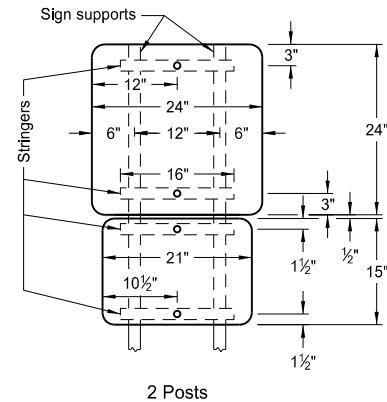
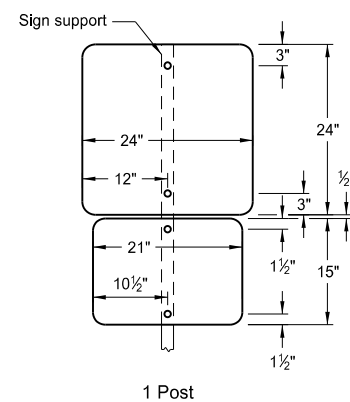
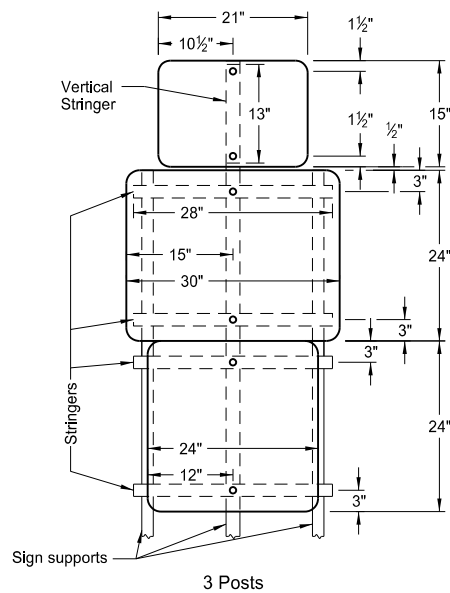
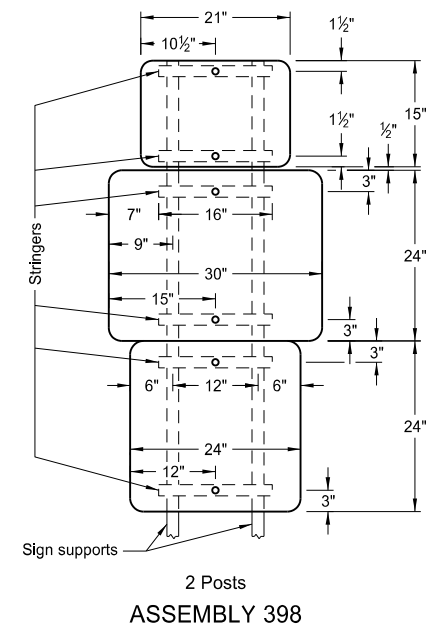
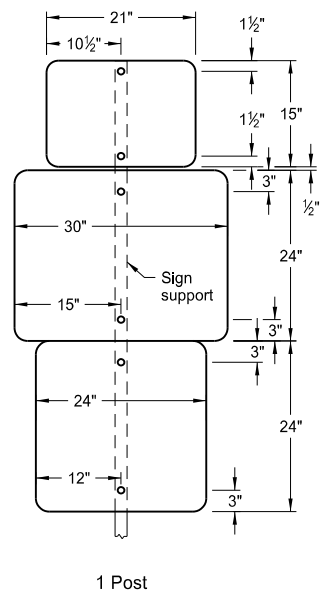
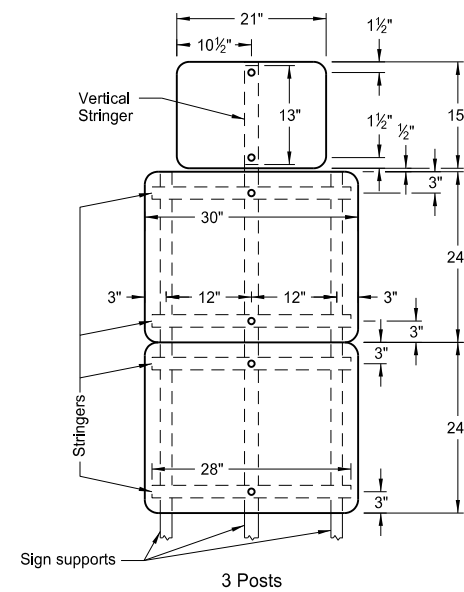
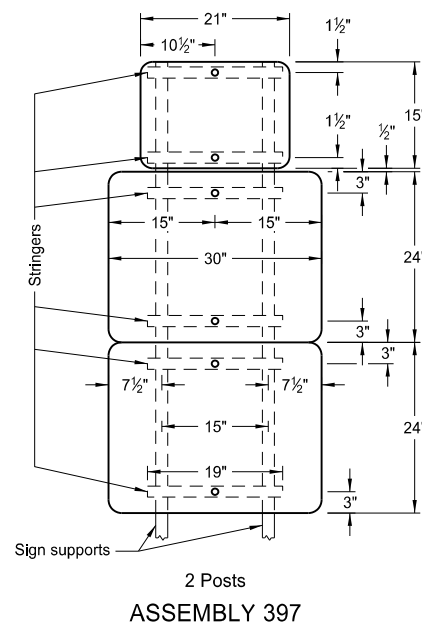
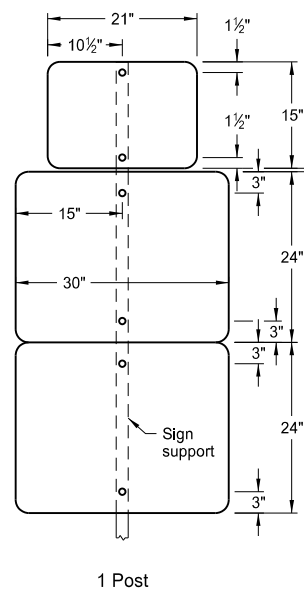
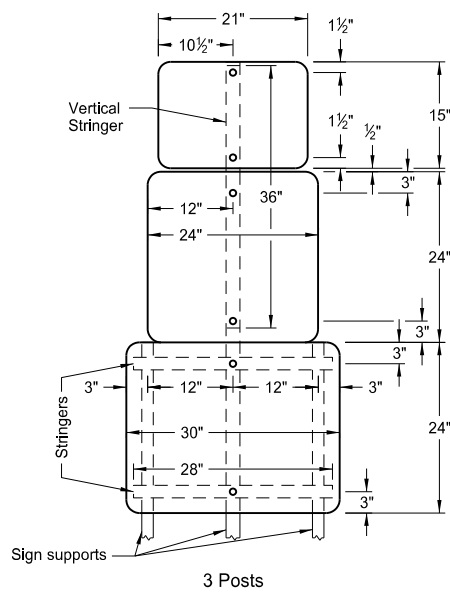
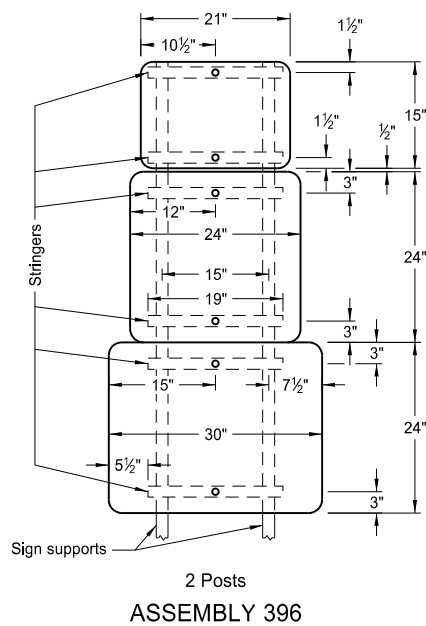
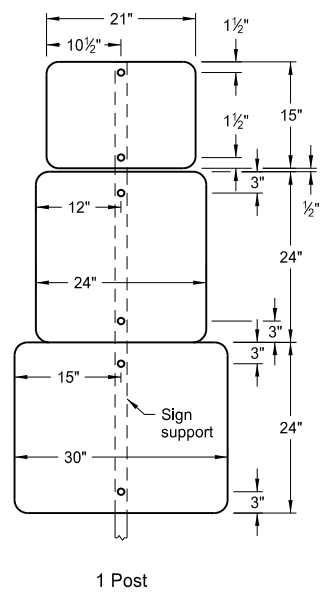


- Notes:
1. The minimum sign backing material thickness shall be 0.100 inch.
  2. Perforated square tube stringer shall be 1 1/2"x1 1/2".
  3. All holes shall be punched round for 3/8" bolt.

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SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS - ROUTE MARKER SIGNS



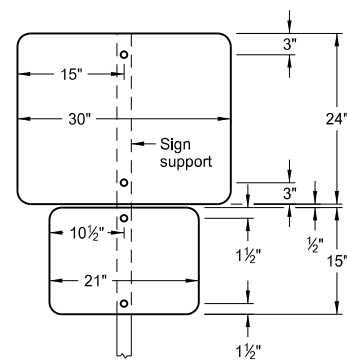
- Notes:
- 1. The minimum sign backing material thickness shall be 0.100 inch.
  - 2. Perforated square tube stringer shall be 1 1/2"x1 1/2".
  - 3. All holes shall be punched round for 3/8" bolt.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-22-12	
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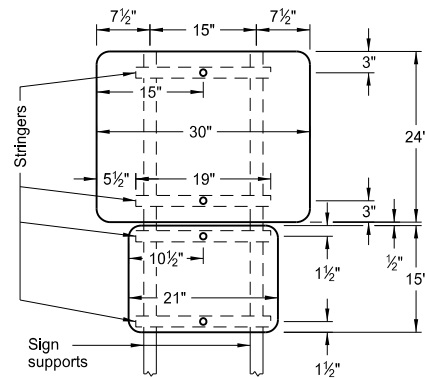
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SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS - ROUTE MARKER SIGNS

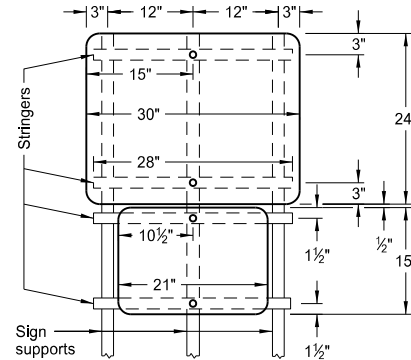
D-754-59



1 Post

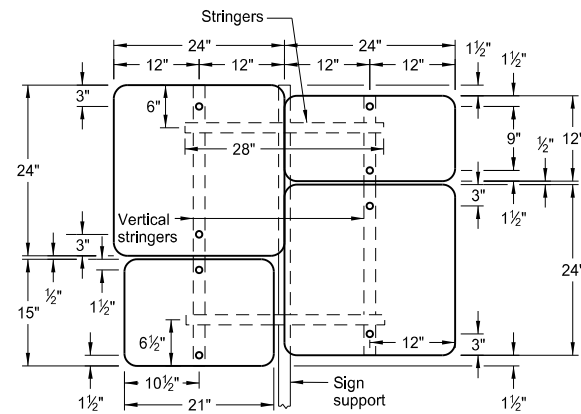


2 Posts

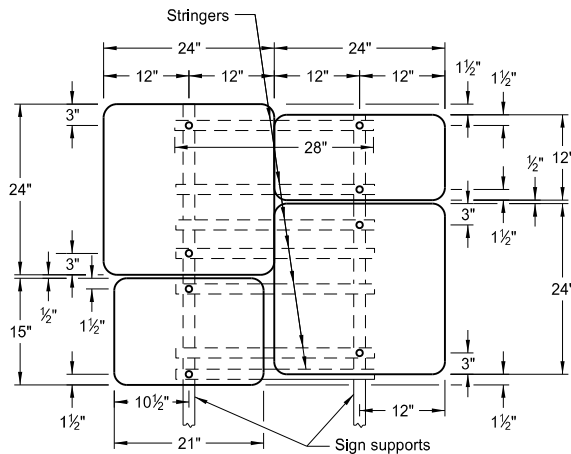


3 Posts

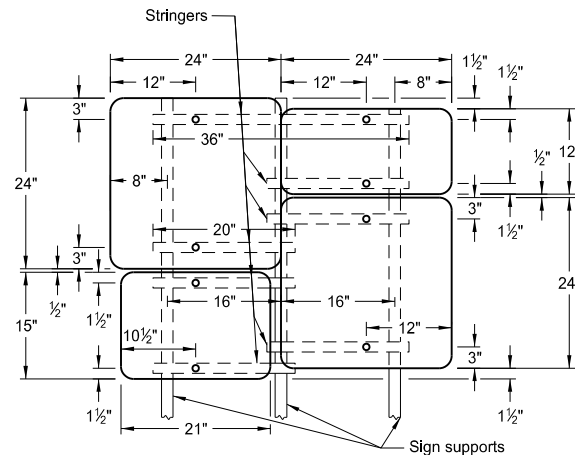
ASSEMBLY NO. 400



1 Post

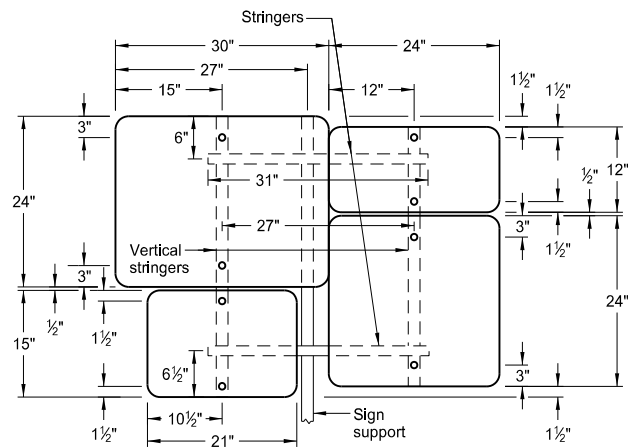


2 Posts

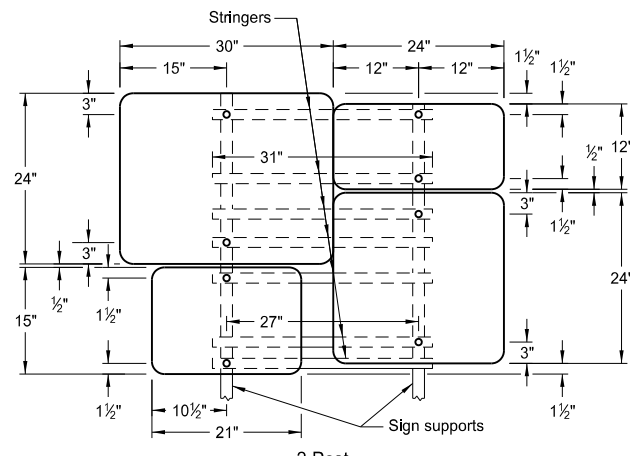


3 Posts

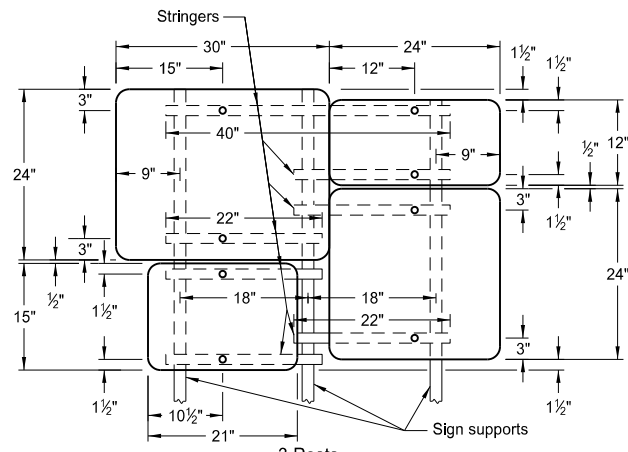
ASSEMBLY NO. 401



1 Post



2 Post



3 Posts

ASSEMBLY NO. 402

Notes:

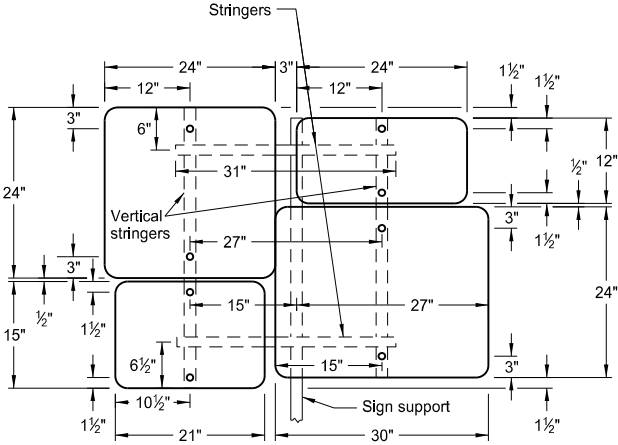
1. The minimum sign backing material thickness shall be 0.100 inch.
2. Perforated square tube stringer shall be 1 1/2"x1 1/2".
3. All holes shall be punched round for 3/8" bolt.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
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DATE	CHANGE

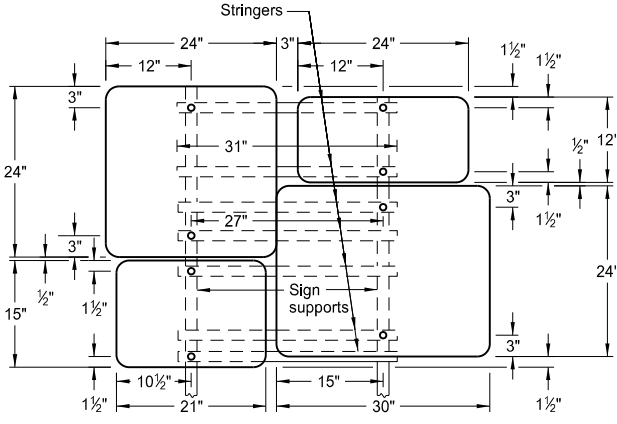
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SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS - ROUTE MARKER SIGNS

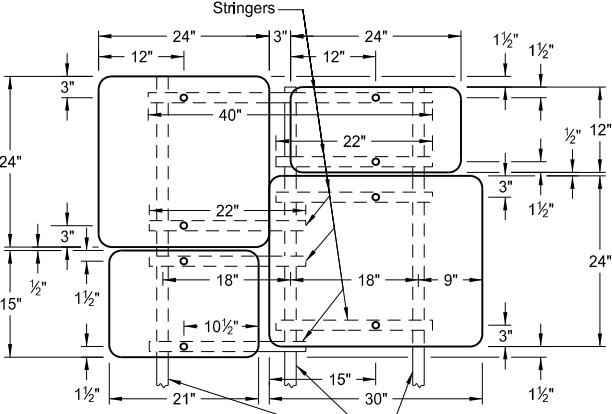
D-754-60



1 Post

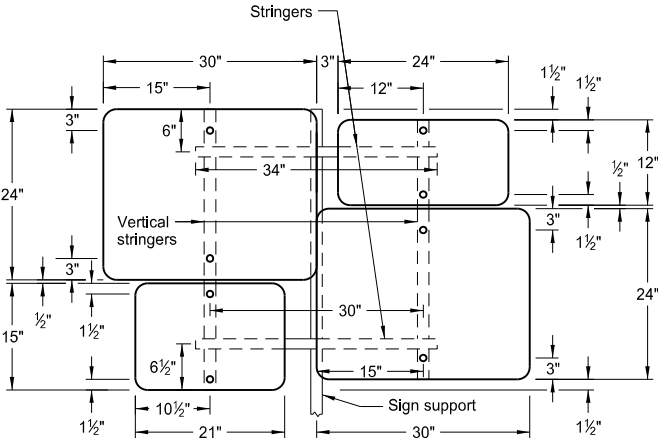


2 Posts

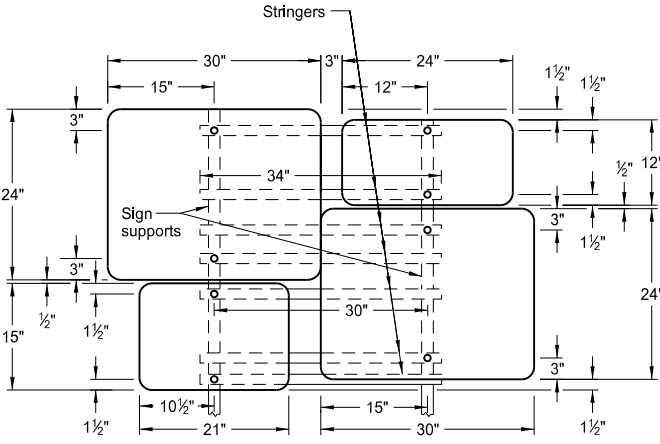


3 Posts

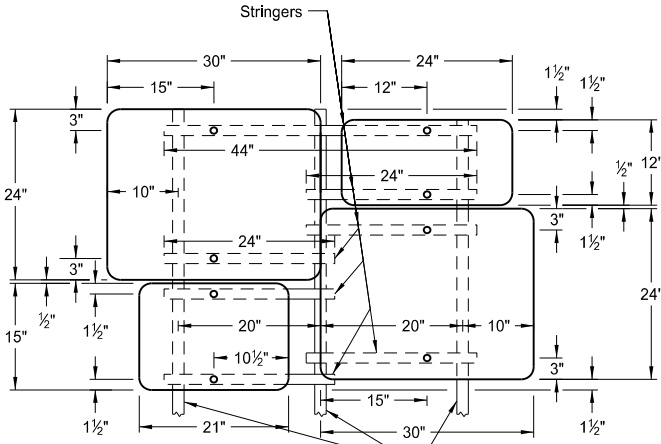
- Notes:
1. The minimum sign backing material thickness shall be 0.100 inch.
  2. Perforated square tube stringer shall be 1 1/2"x1 1/2".
  3. All holes shall be punched round for 3/8" bolt.



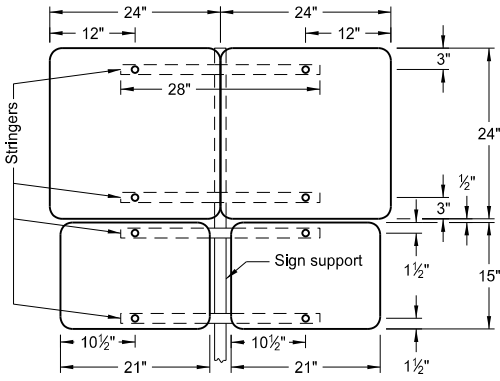
1 Post



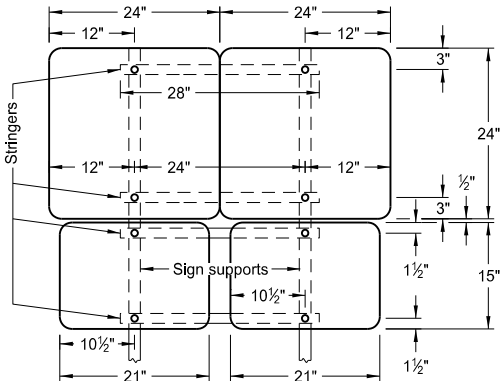
2 Posts



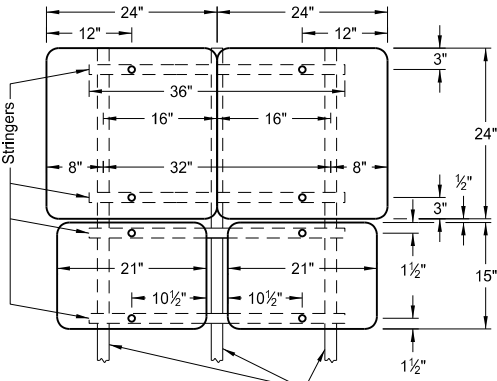
3 Posts



1 Post



2 Posts



3 Posts

ASSEMBLY NO. 405

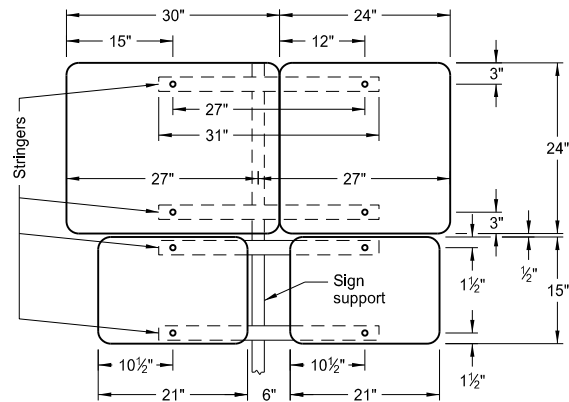
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-22-12	
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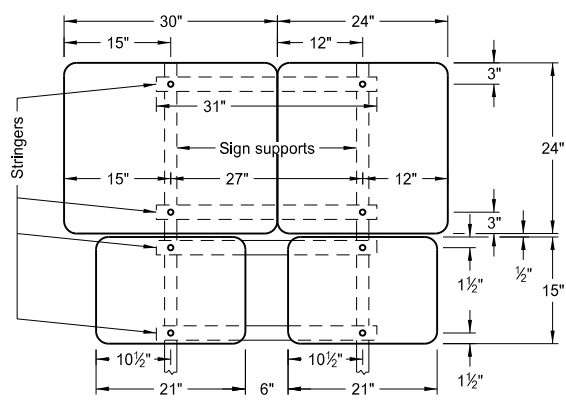


SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS - ROUTE MARKER SIGNS

D-754-61

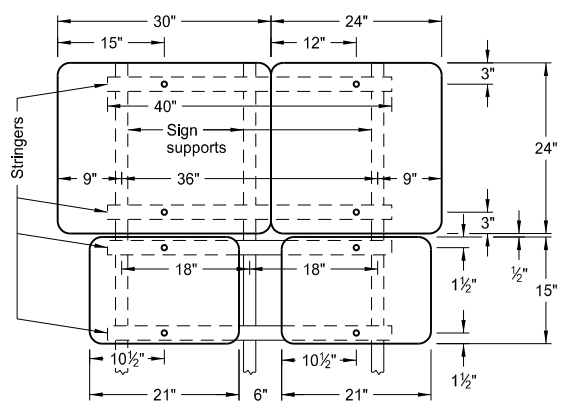


1 Post

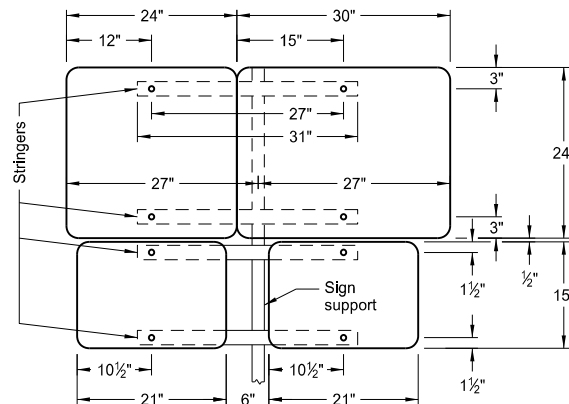


2 Posts

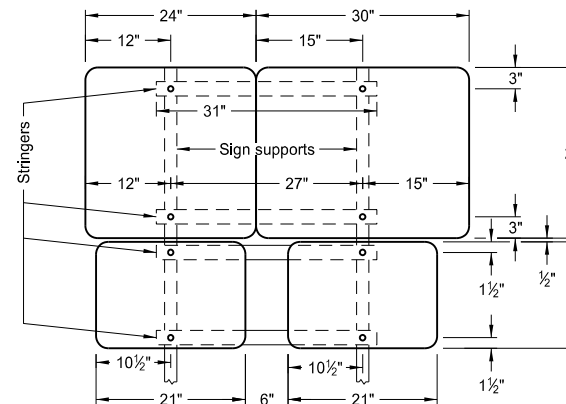
ASSEMBLY 406



3 Posts

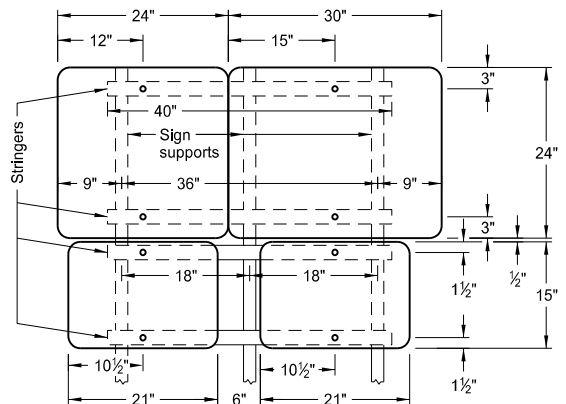


1 Post

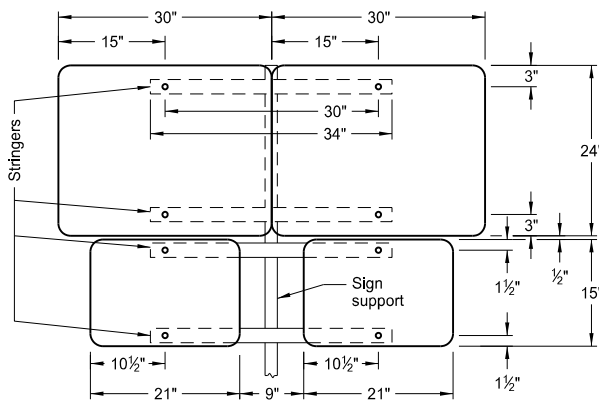


2 Posts

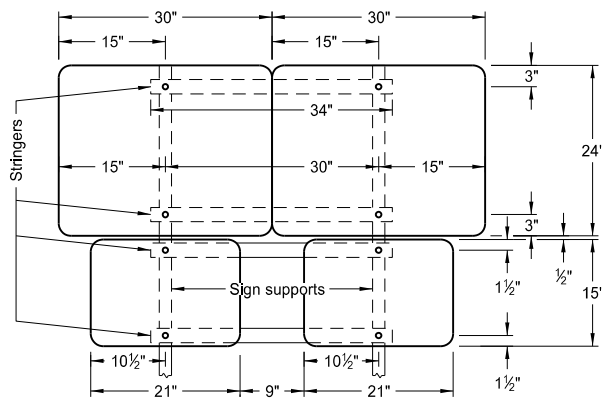
ASSEMBLY 407



3 Posts

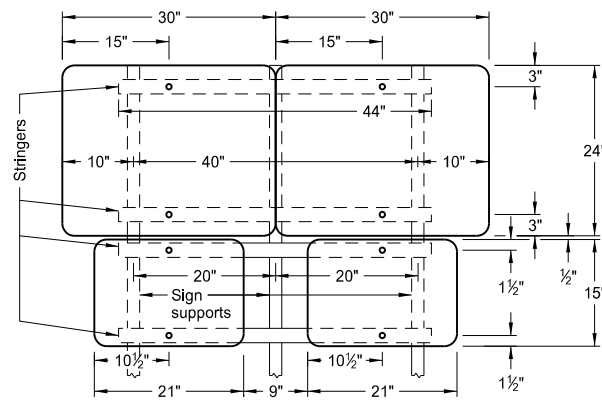


1 Post



2 Posts

ASSEMBLY 408



3 Posts

Notes:

1. The minimum sign backing material thickness shall be 0.100 inch.
2. Perforated square tube stringer shall be 1½"x1½".
3. All holes shall be punched round for ⅜" bolt.

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D-754-62



3 Posts

- 1 Post



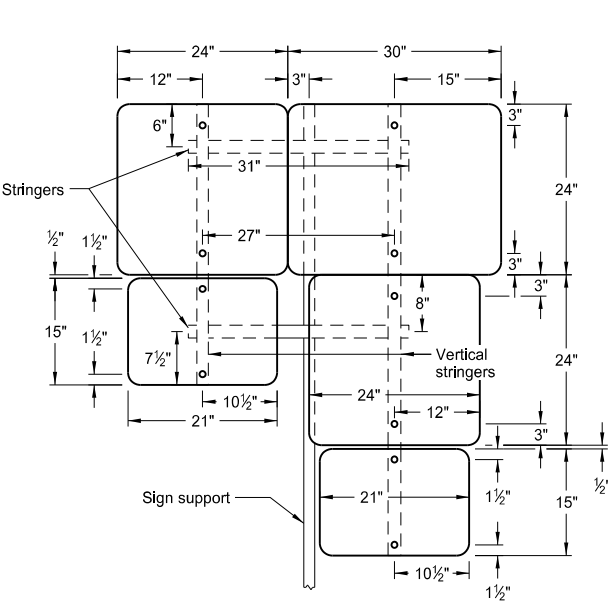
3 Posts

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Registration Number  
PE- 2930,  
on 8/22/12 and the original  
document is stored at the  
North Dakota Department  
of Transportation

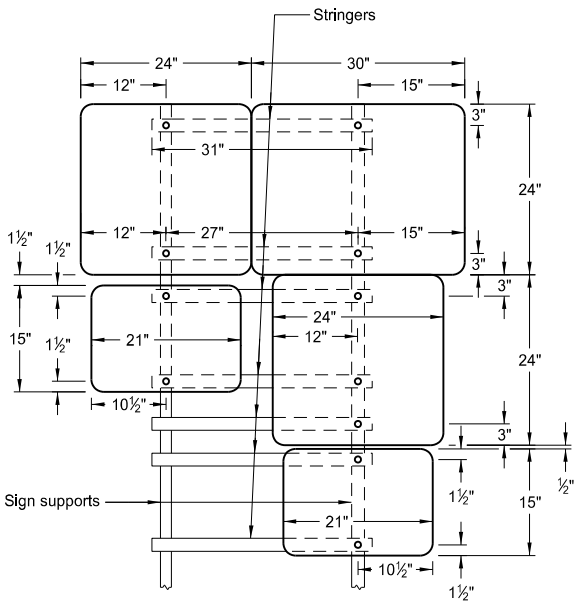
SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS - ROUTE MARKER SIGNS

D-754-63

- Notes:
1. The minimum sign backing material thickness shall be 0.100 inch.
  2. Perforated square tube stringer shall be 1½"x1½".
  3. All holes shall be punched round for ⅜" bolt.

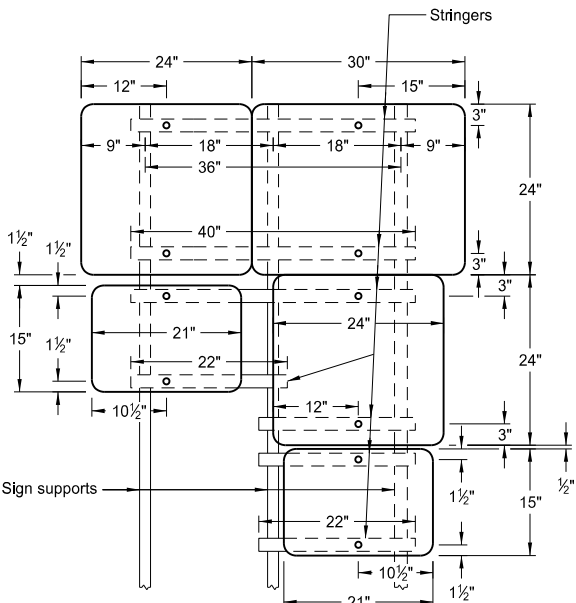


1 Post

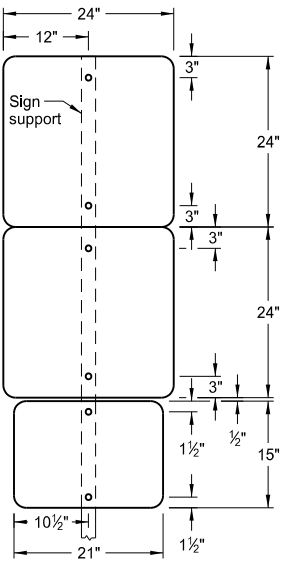


2 Posts

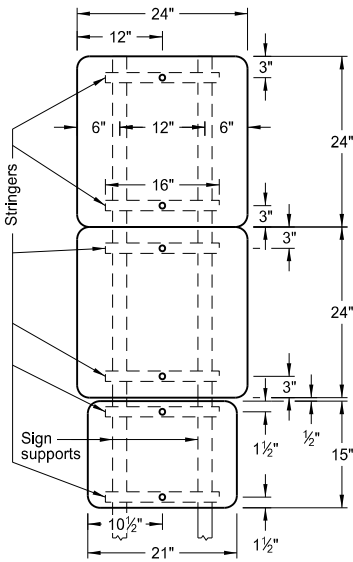
ASSEMBLY NO. 411



3 Posts

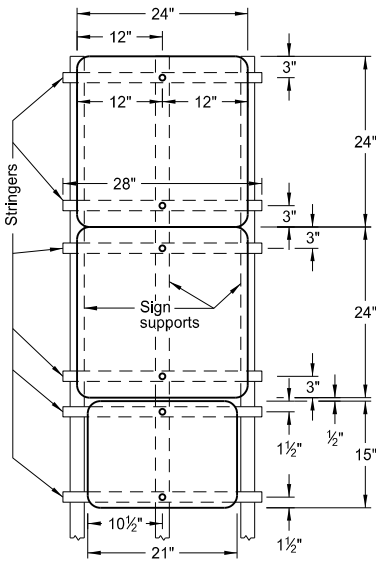


1 Post

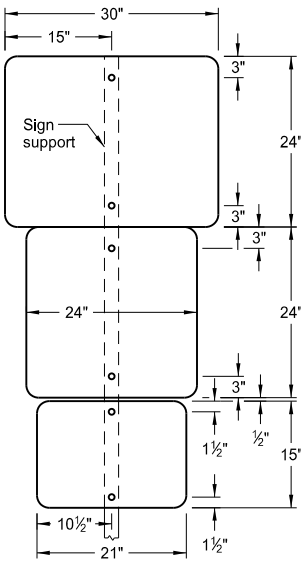


2 Posts

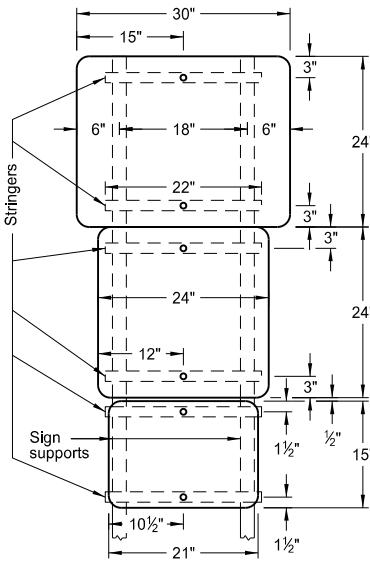
ASSEMBLY NO. 412



3 Posts

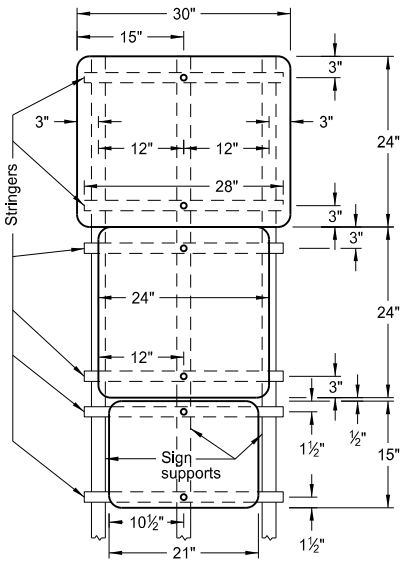


1 Post



2 Posts

ASSEMBLY NO. 413



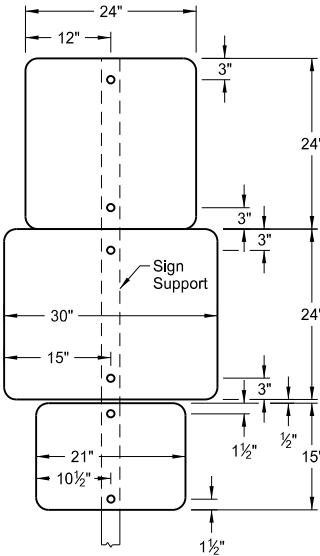
3 Posts

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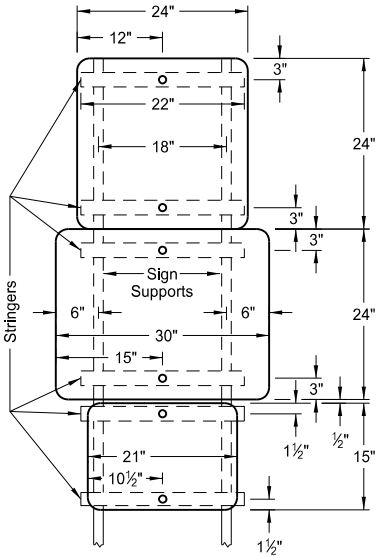
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Registration Number  
PE-2930,  
on 8/22/12 and the original document is stored at the  
North Dakota Department  
of Transportation

SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS - ROUTE MARKER SIGNS

D-754-64

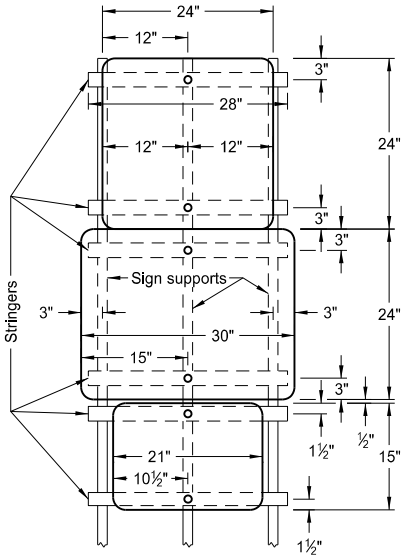


1 Post

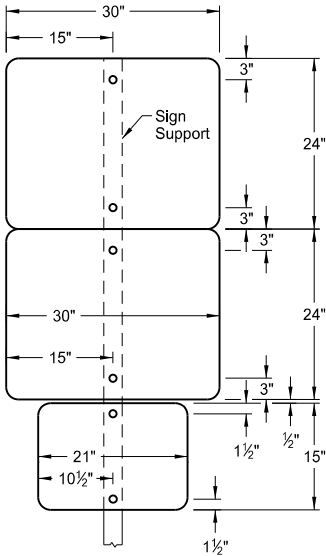


2 Posts

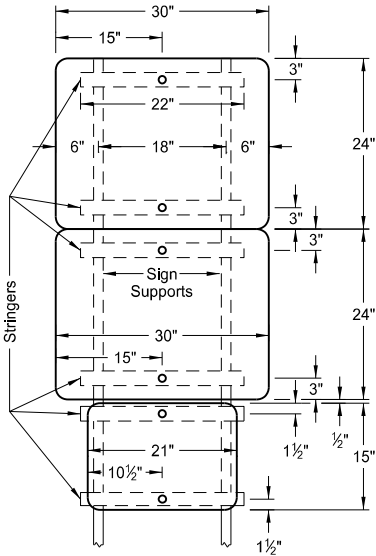
ASSEMBLY NO. 414



3 Posts

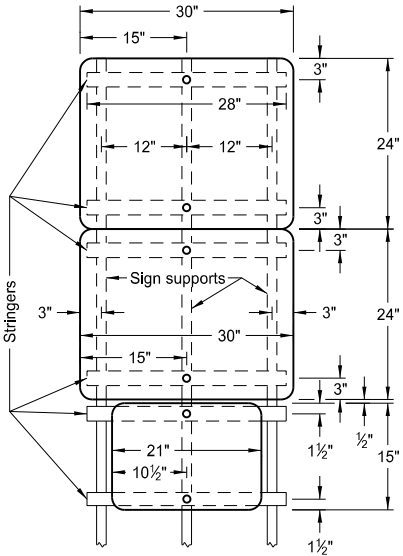


1 Post

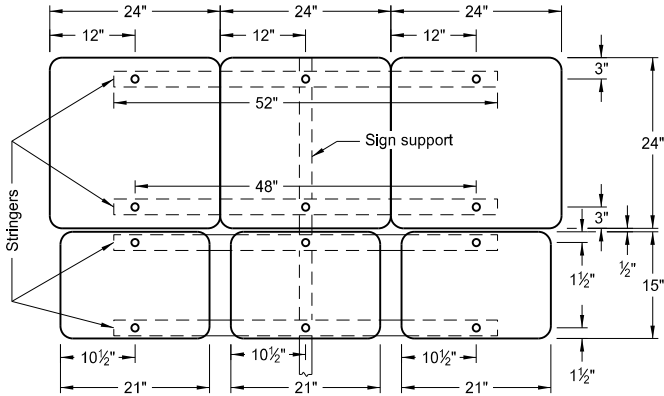


2 Posts

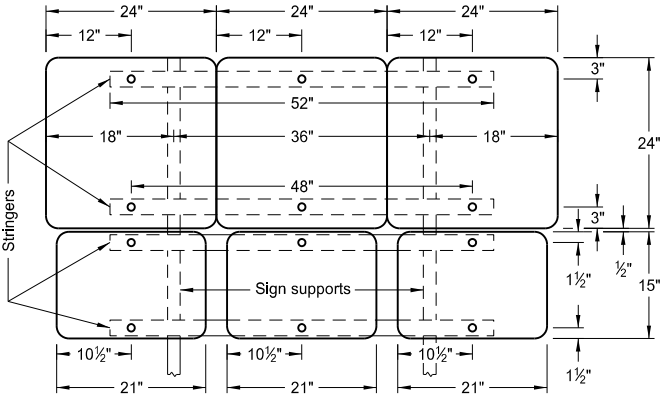
ASSEMBLY NO. 415



3 Posts

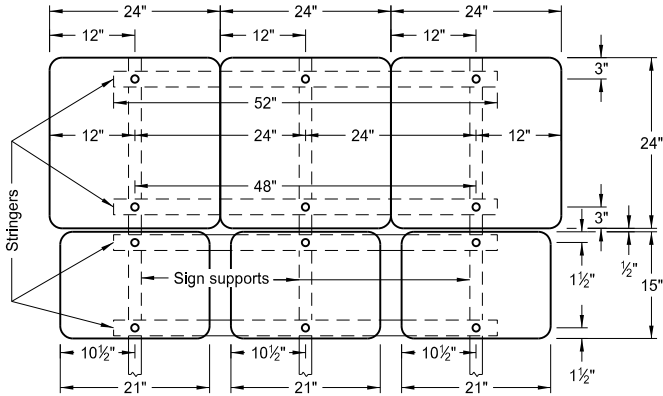


1 Post



2 Posts

ASSEMBLY NO. 416



3 Posts

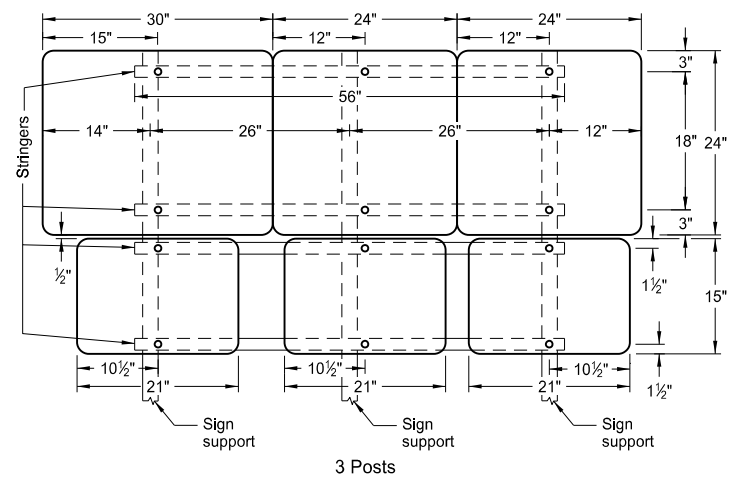
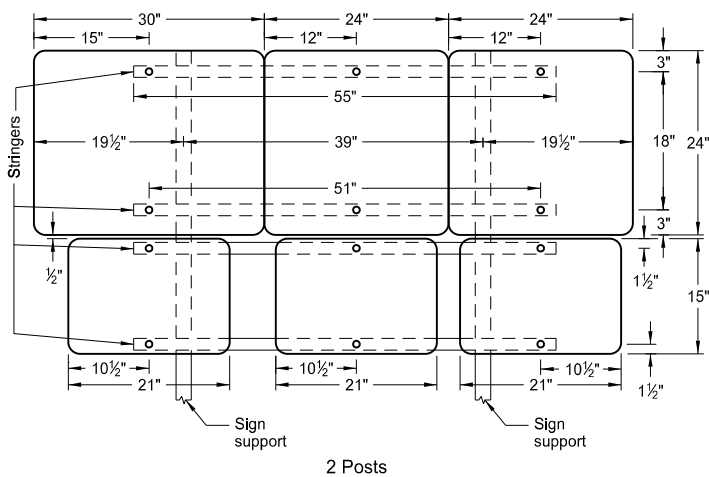
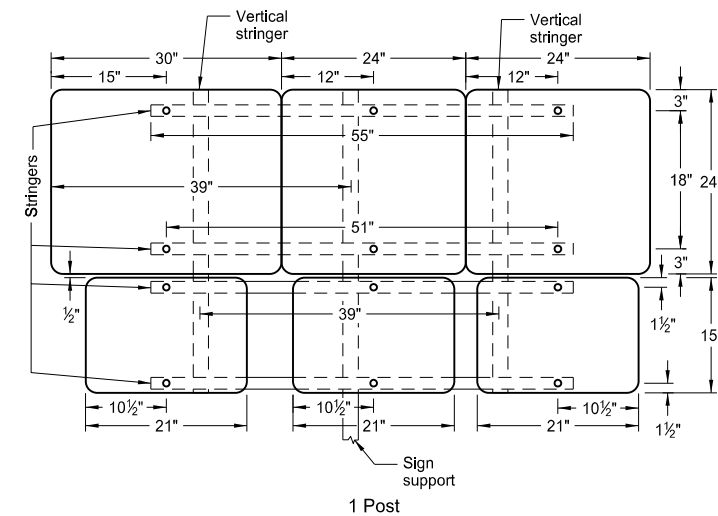
- Notes:
- 1. The minimum sign backing material thickness shall be 0.100 inch.
  - 2. Perforated square tube stringer shall be 1½"x1½".
  - 3. All holes shall be punched round for ⅝" bolt.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-22-12	
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DATE	CHANGE

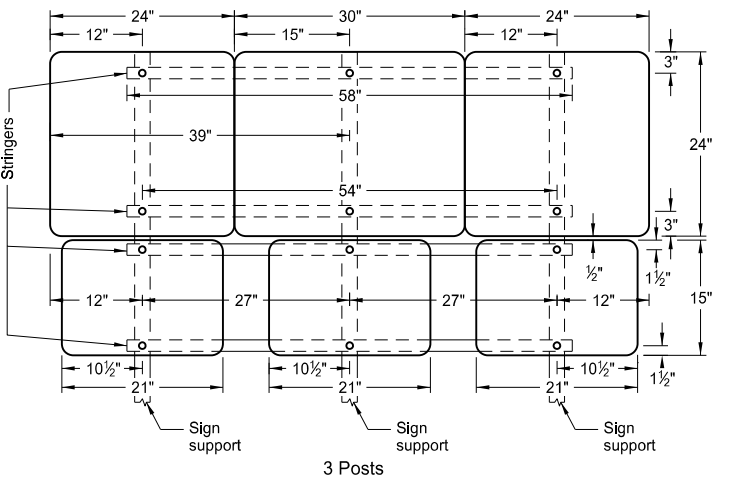
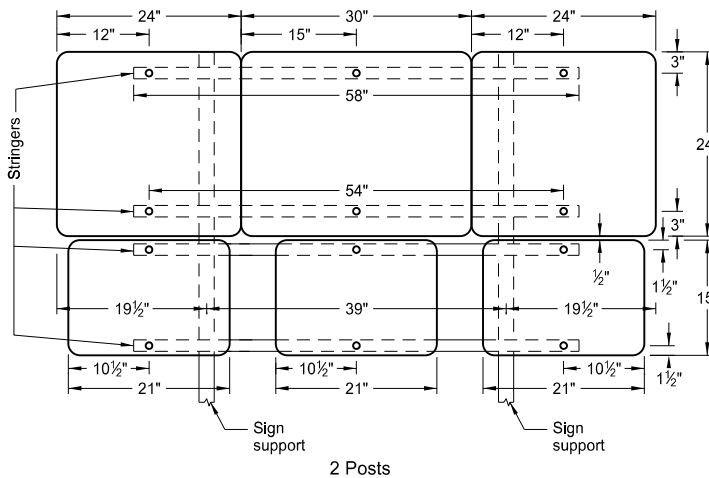
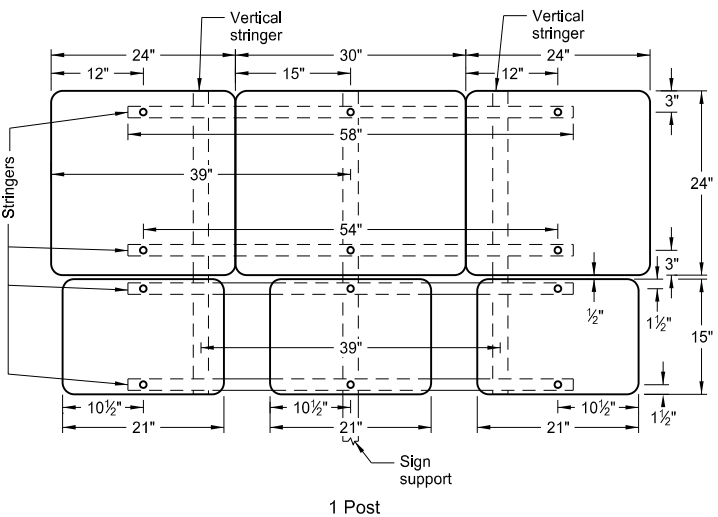
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SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS - ROUTE MARKER SIGNS

D-754-65



ASSEMBLY NO. 417



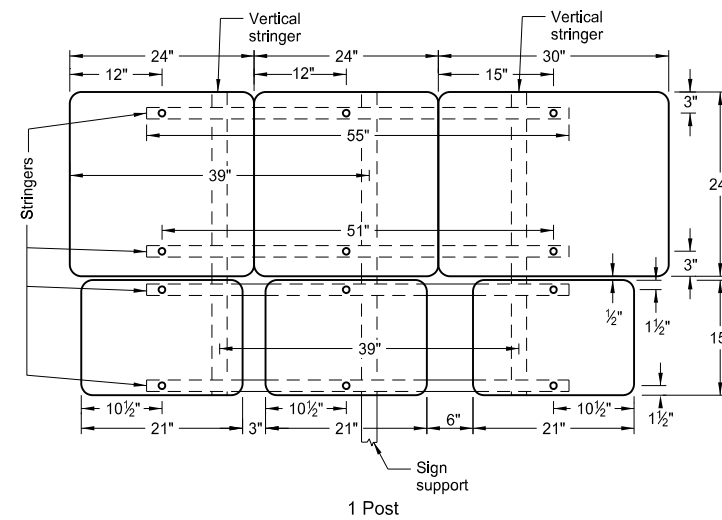
ASSEMBLY NO. 418

- Notes:
1. The minimum sign backing material thickness shall be 0.100 inch.
  2. Perforated square tube stringer shall be 1 1/2"x1 1/2".
  3. All holes shall be punched round for 3/8" bolt.

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D-754-66



Technical drawing of a 2x3 grid of signposts. The drawing shows two rows of three signposts each. Dimensions are provided in inches.

**Top Row Dimensions:**

- Overall width: 55"
- Overall height: 3"
- Horizontal spacing between columns: 12" (between first and second), 24" (between second and third), 15" (between third and fourth).
- Vertical spacing between rows: 19 1/2" (between first and second), 39" (between second and third), 19 1/2" (between third and fourth).

**Bottom Row Dimensions:**

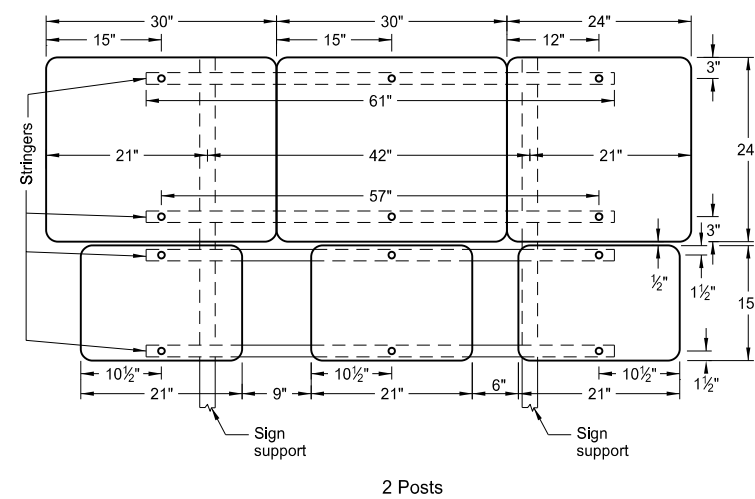
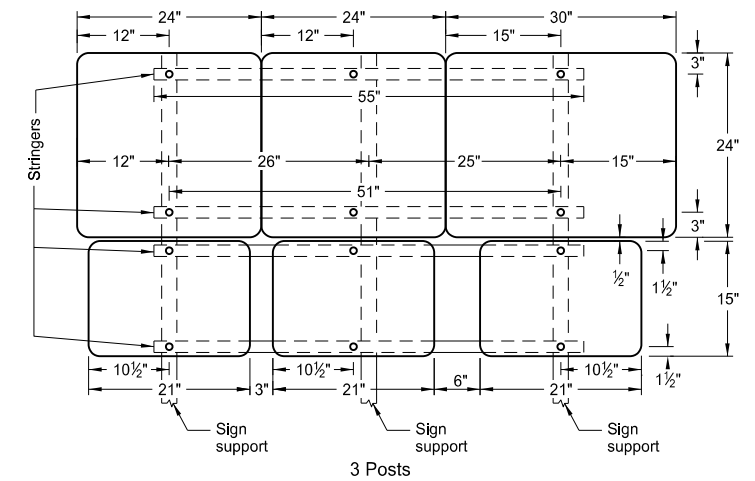
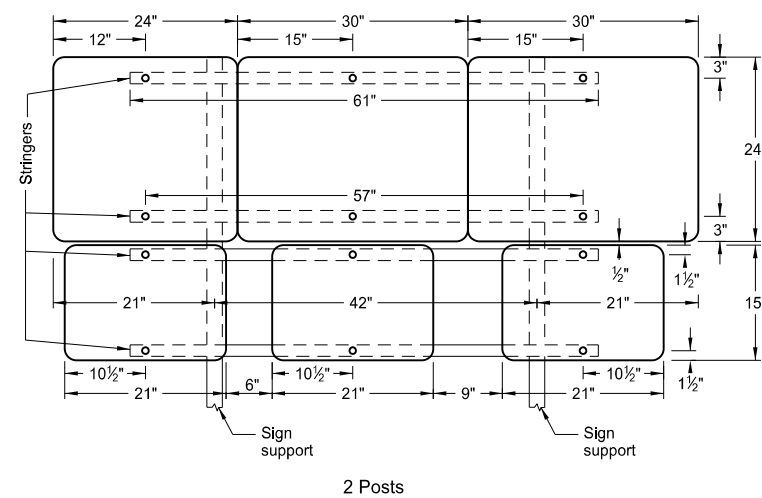
- Overall width: 51"
- Overall height: 3"
- Horizontal spacing between columns: 10 1/2" (between first and second), 21" (between second and third), 6" (between third and fourth).
- Vertical spacing between rows: 10 1/2" (between first and second), 21" (between second and third), 10 1/2" (between third and fourth).

**Other Dimensions:**

- Spacing between the two rows: 1 1/2"
- Spacing between the two columns: 1 1/2"

**Labels:**

- Stringers (pointing to the vertical lines on the left)
- Sign support (pointing to the bottom row)
- 2 Posts (pointing to the bottom row)

[illegible]

The drawing shows a three-post sign structure. The top view (labeled '1') shows a rectangular frame with three vertical posts. The overall width is 24" + 30" + 30" = 84". The distance between the first and second post is 12" + 15" = 27", and between the second and third post is 15" + 15" = 30". The height of the frame is 61" and 57". The side view (labeled '2') shows the profile of the structure. The total height is 3" + 3" = 6". The distance between the first and second post is 29", and between the second and third post is 28". The width of the frame is 12" and 15". The distance between the first and second post is 10 1/2" + 21" = 31 1/2", and between the second and third post is 10 1/2" + 21" = 31 1/2". The total width is 31 1/2" + 6" + 31 1/2" = 69". The distance between the first and second post is 10 1/2" + 21" = 31 1/2", and between the second and third post is 10 1/2" + 21" = 31 1/2". The total width is 31 1/2" + 6" + 31 1/2" = 69". The distance between the first and second post is 10 1/2" + 21" = 31 1/2", and between the second and third post is 10 1/2" + 21" = 31 1/2". The total width is 31 1/2" + 6" + 31 1/2" = 69".

1. The minimum sign backing material thickness shall be 0.100 inch.
2. Perforated square tube stringer shall be  $1\frac{1}{2} \times 1\frac{1}{2}$ .
3. All holes shall be punched round for  $\frac{3}{8}$ " bolt.

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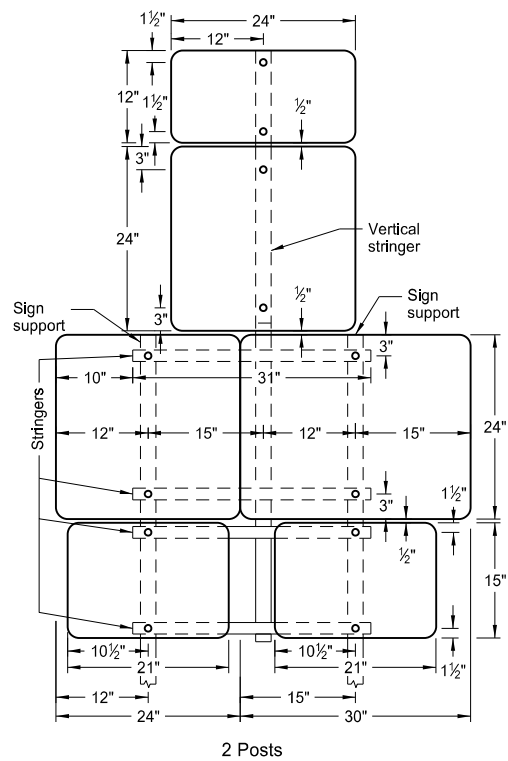
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D-754-67

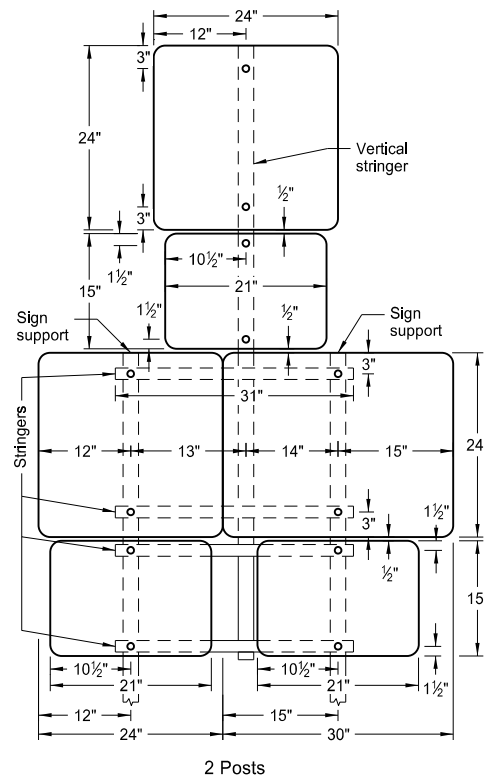
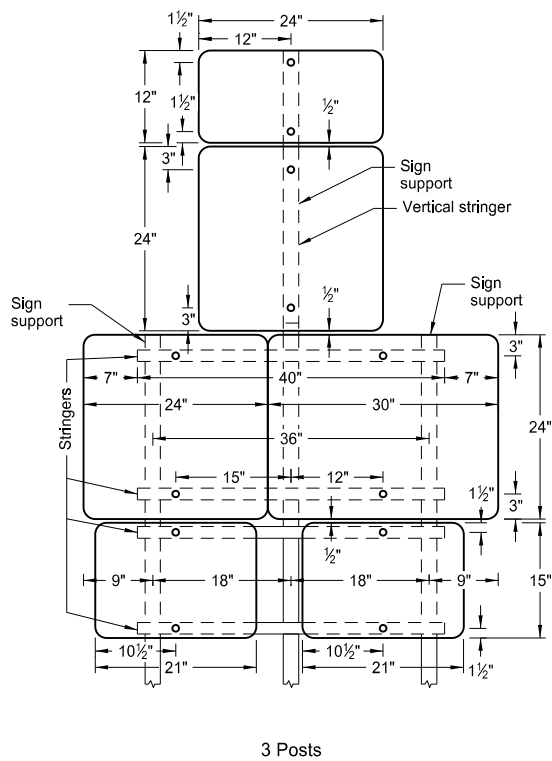
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on 9/25/2012 and the original  
document is stored at the  
North Dakota Department  
of Transportation

SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS - ROUTE MARKER SIGNS

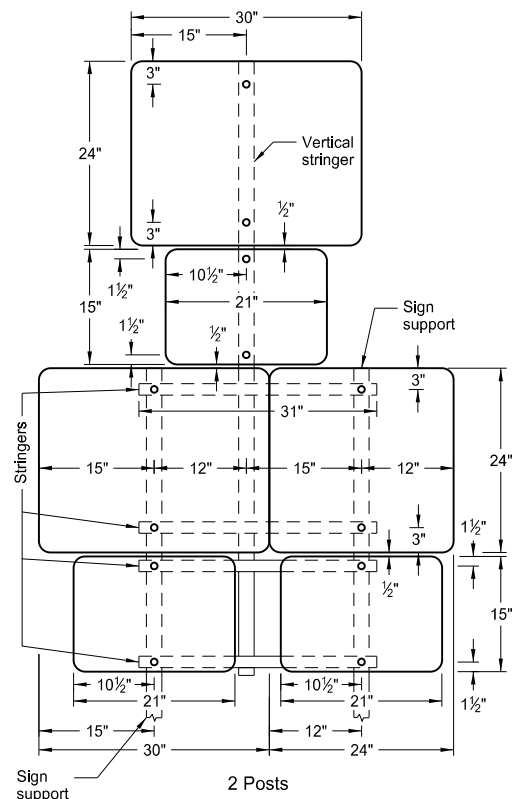
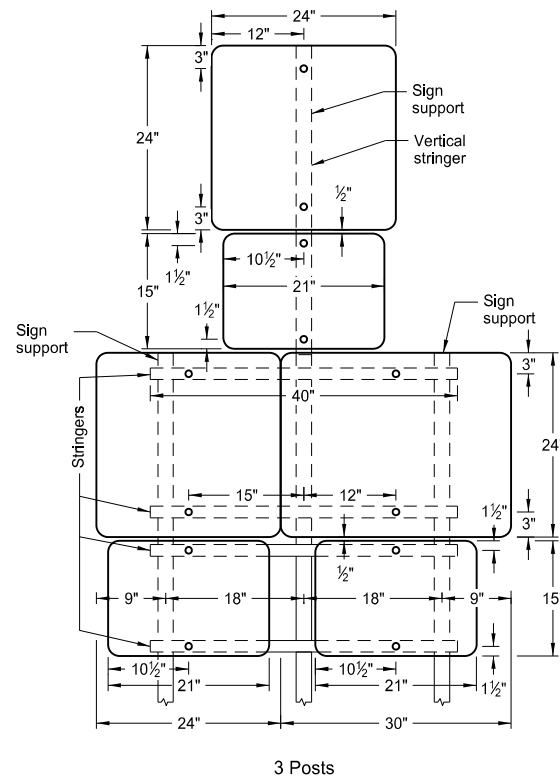
D-754-69



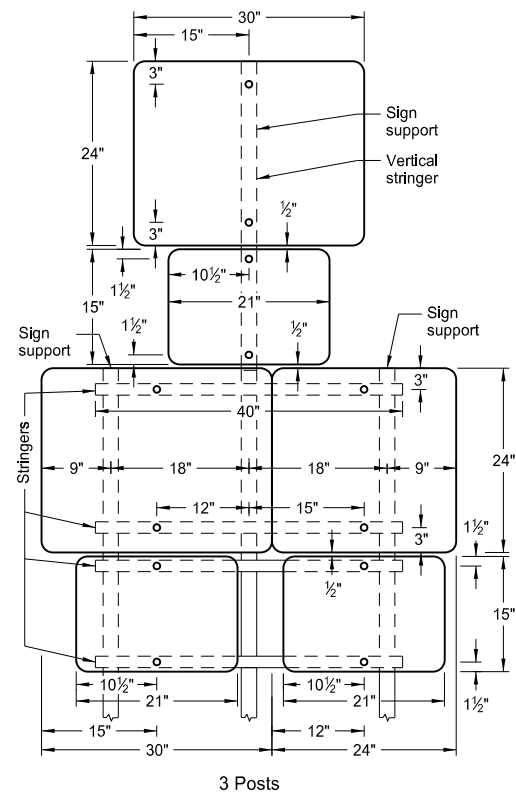
ASSEMBLY NO. 425



ASSEMBLY NO. 426



ASSEMBLY NO. 427



- Notes:
1. The minimum sign backing material thickness shall be 0.100 inch.
  2. Perforated square tube stringer shall be 1½"x1½".
  3. All holes shall be punched round for ⅜" bolt.

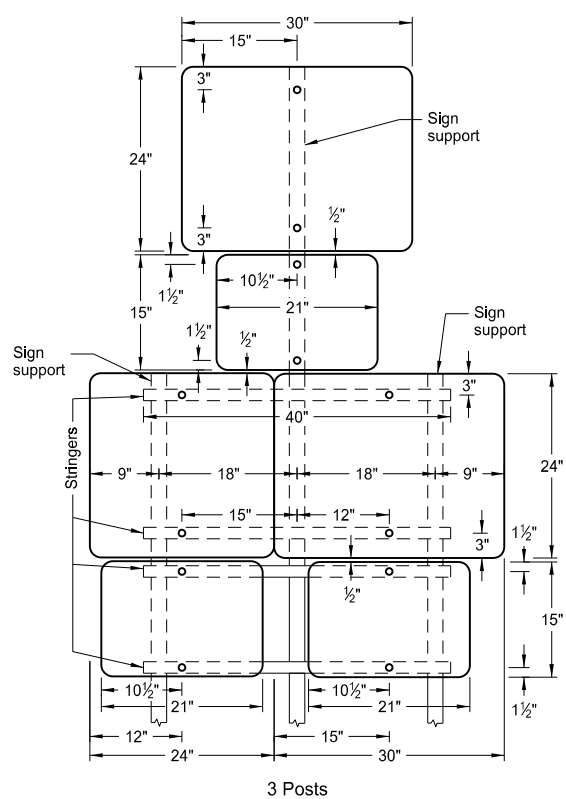
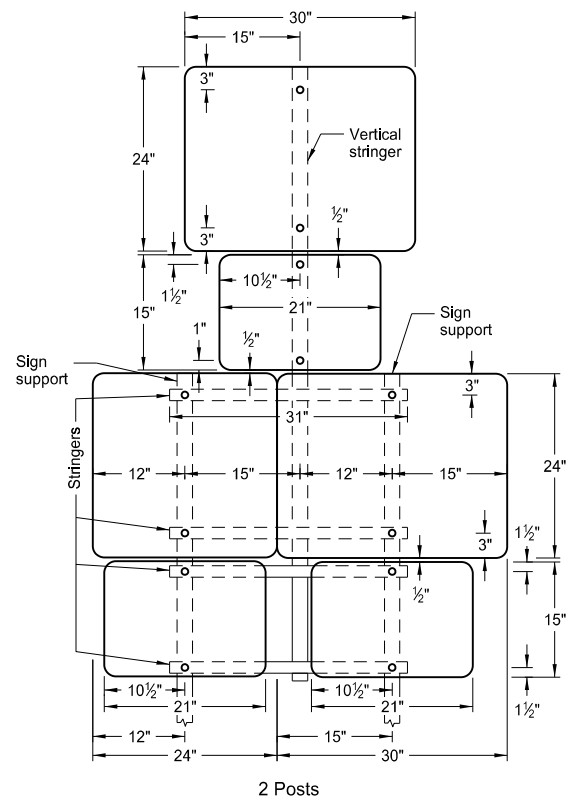
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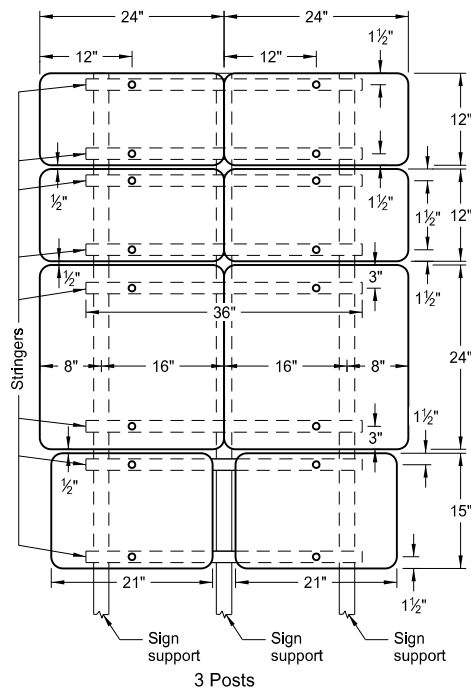
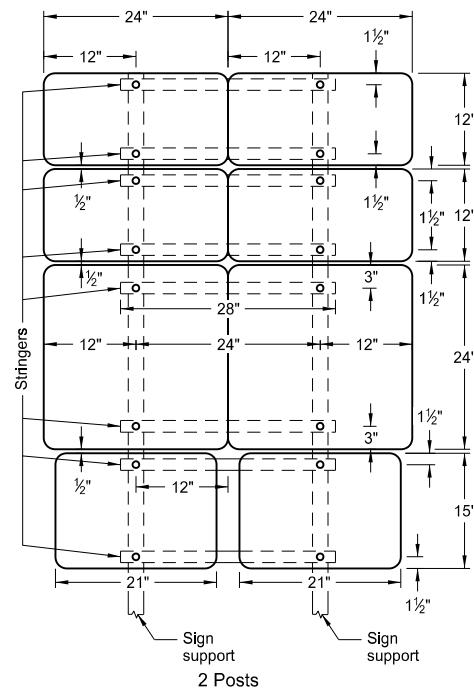
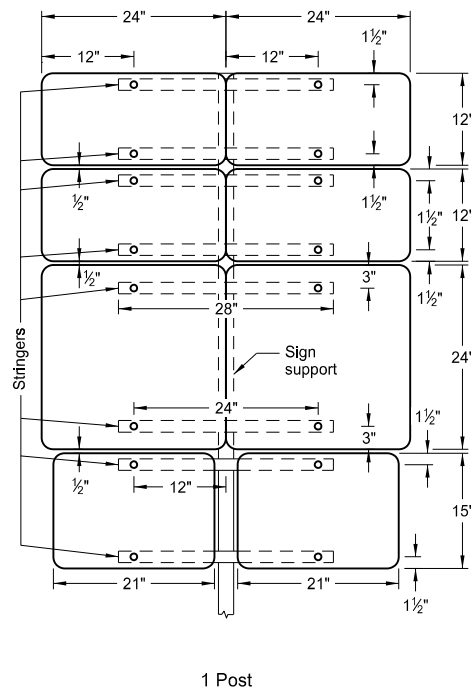


SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS - ROUTE MARKER SIGNS

D-754-70



ASSEMBLY NO. 428



- Notes:
1. The minimum sign backing material thickness shall be 0.100 inch.
  2. Perforated square tube stringer shall be 1 1/2"x1 1/2".
  3. All holes shall be punched round for 3/8" bolt.

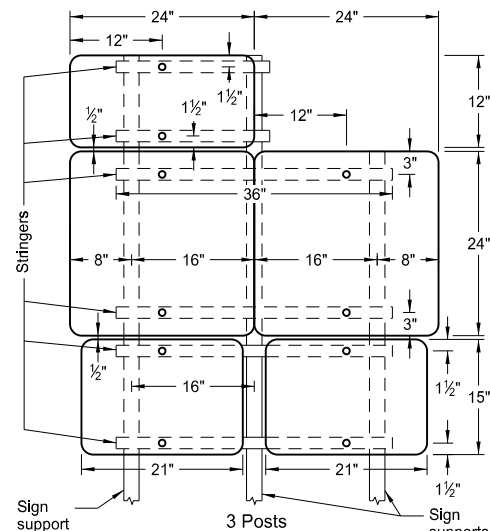
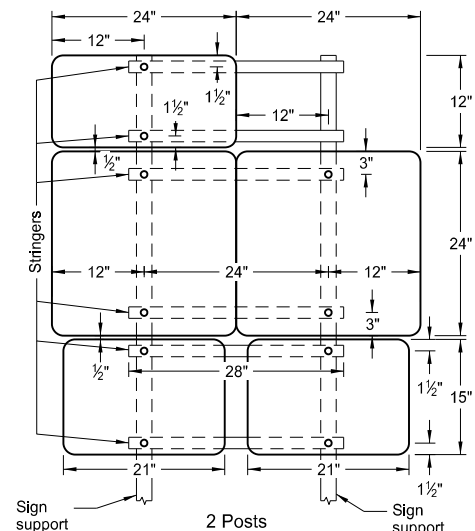
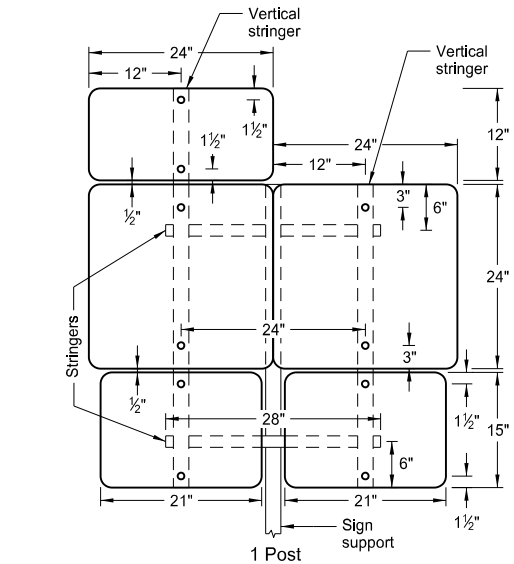
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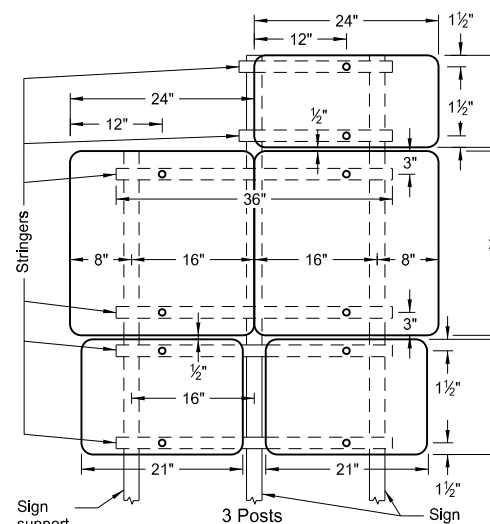
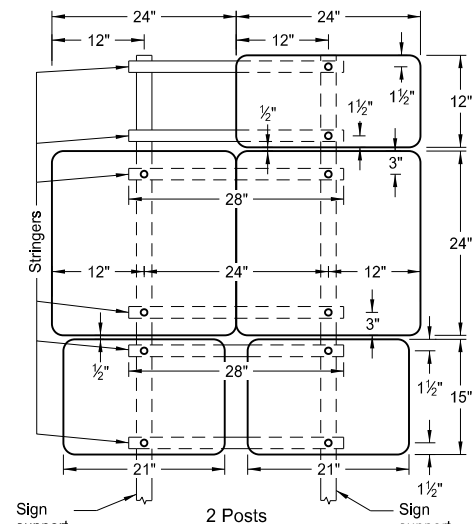
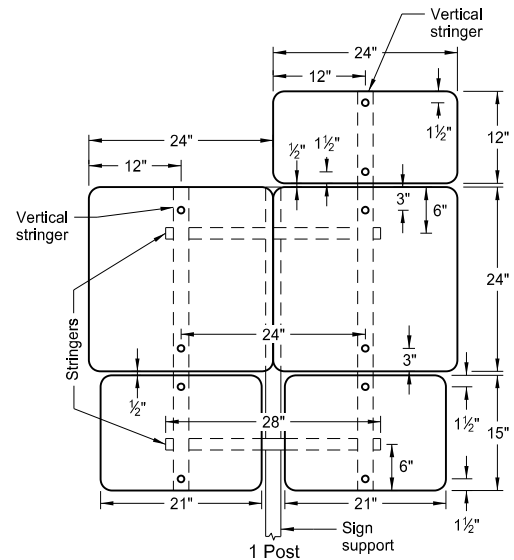
SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS - ROUTE MARKER SIGNS

D-754-72

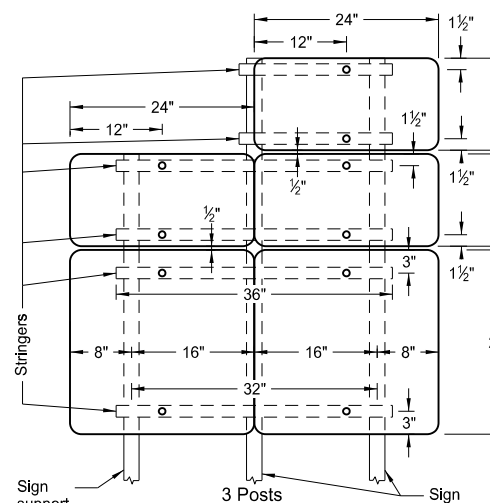
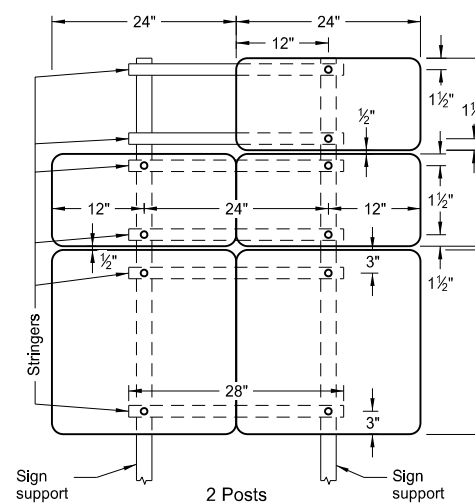
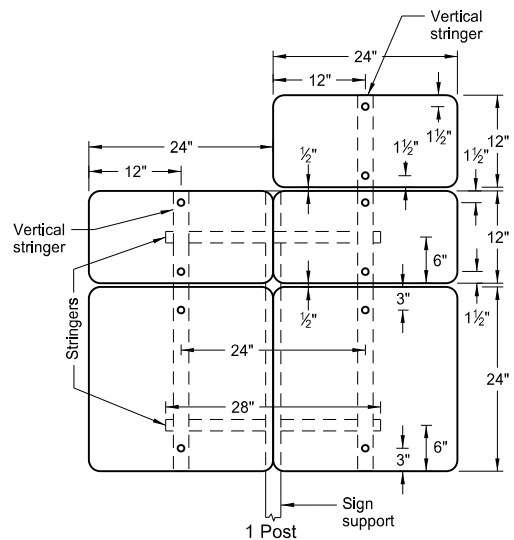
- Notes:
1. The minimum sign backing material thickness shall be 0.100 inch.
  2. Perforated square tube stringer shall be 1½"x1½".
  3. All holes shall be punched round for ¾" bolt.



ASSEMBLY NO. 430



ASSEMBLY NO. 431



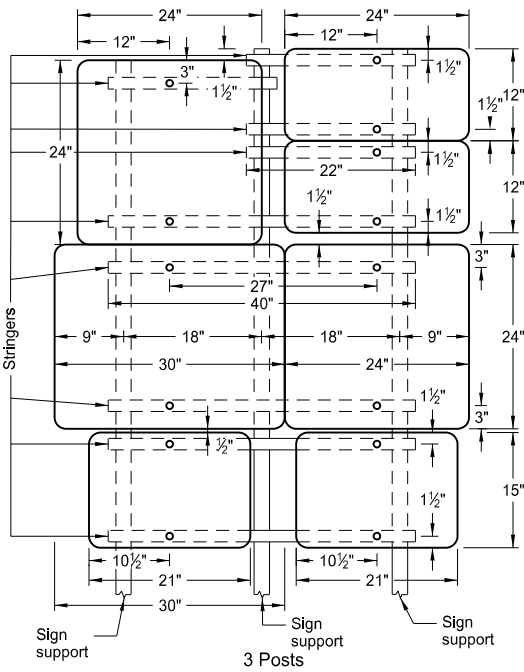
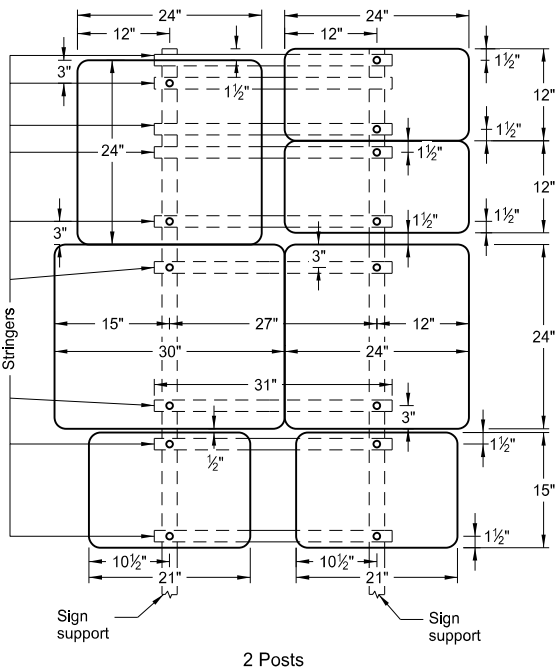
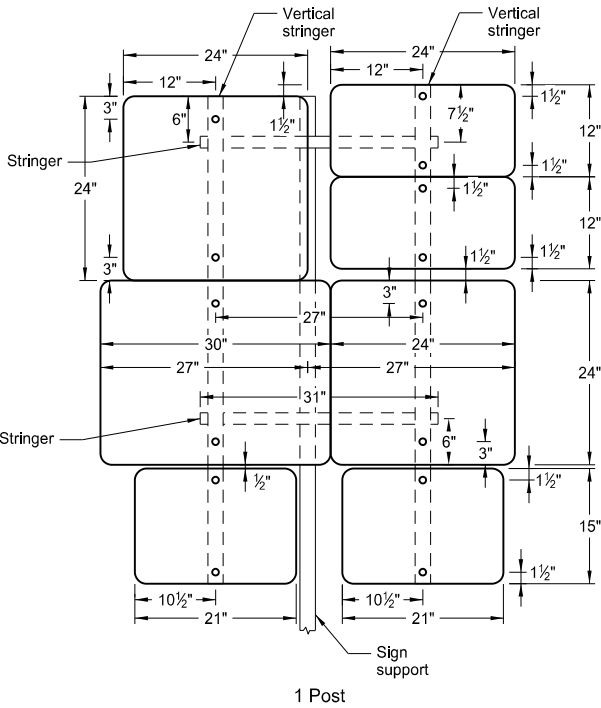
ASSEMBLY NO. 432

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-22-12	
REVISIONS	
DATE	CHANGE

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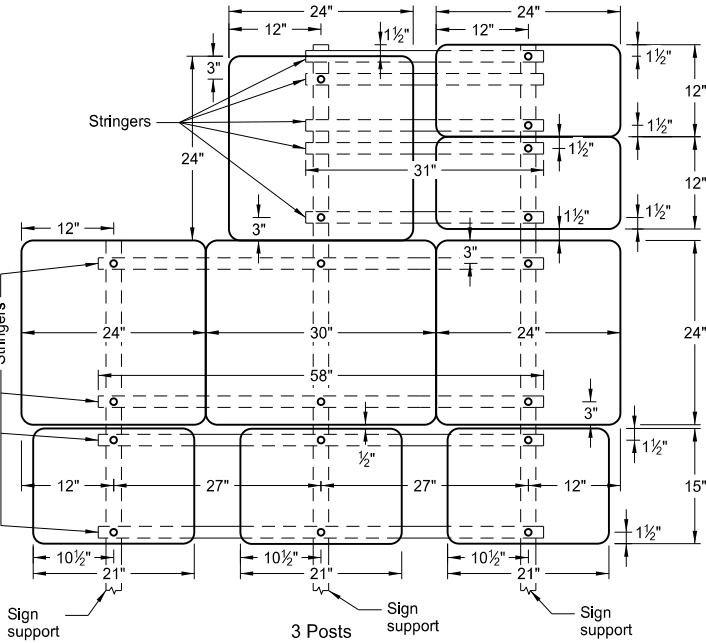
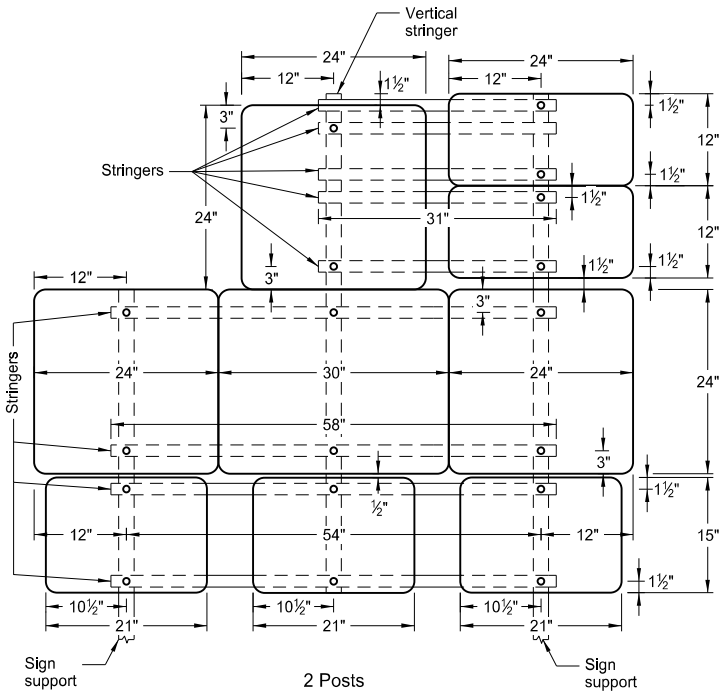
SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETIALS - ROUTE MARKER SIGNS

D-754-73



- Notes:
1. The minimum sign backing material thickness shall be 0.100 inch.
  2. Perforated square tube stringer shall be 1 1/2"x1 1/2".
  3. All holes shall be punched round for 3/8" bolt.

ASSEMBLY NO. 433



ASSEMBLY NO. 434

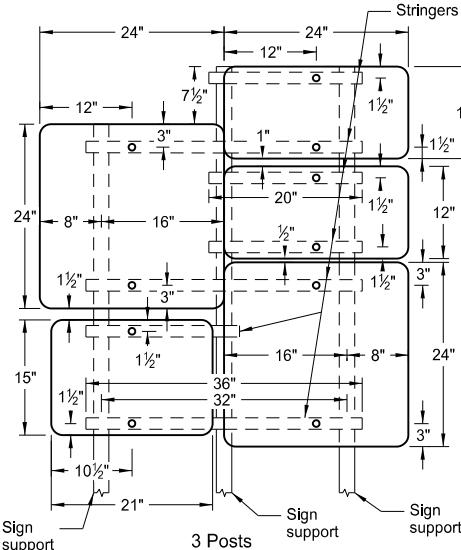
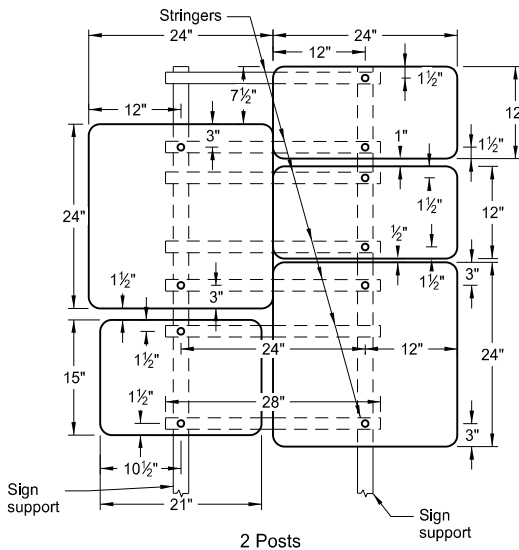
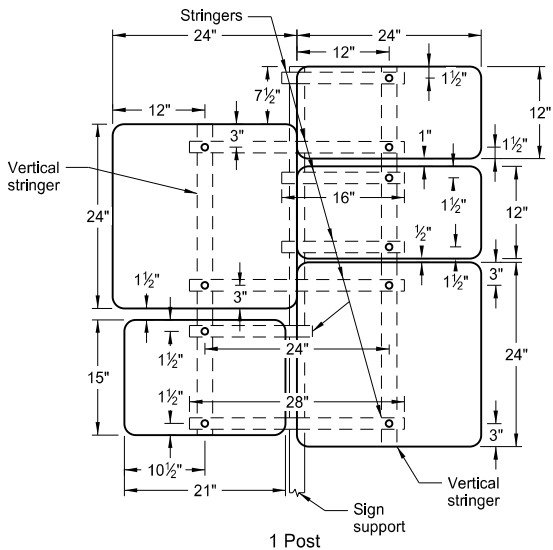
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-22-12	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by  
Roger Weigel  
Registration Number  
PE-2930,  
on 8/22/12 and the original document is stored at the  
North Dakota Department  
of Transportation

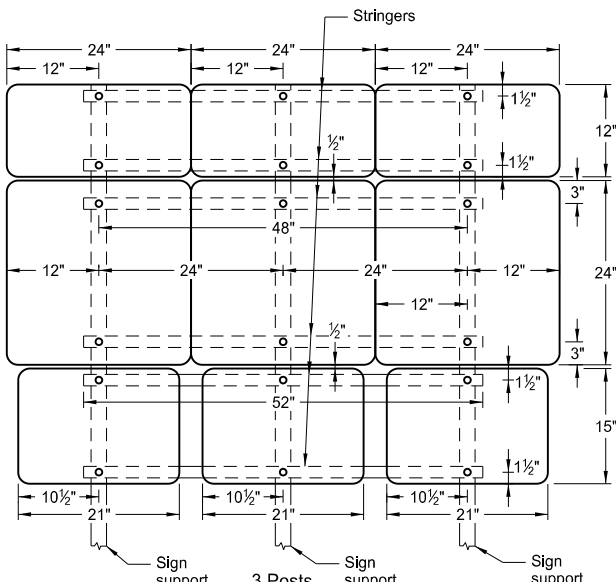
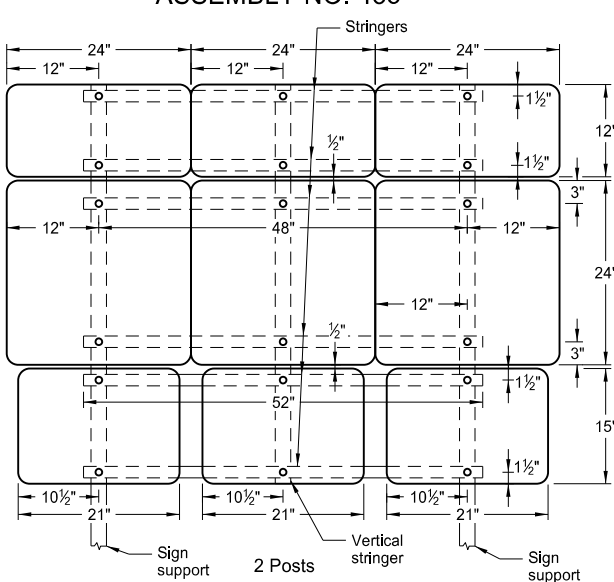
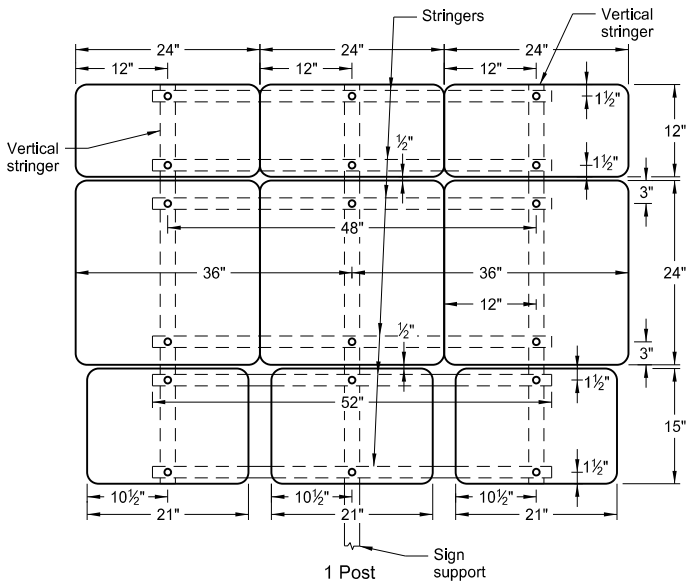
SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS - ROUTE MARKER SIGNS

D-754-74

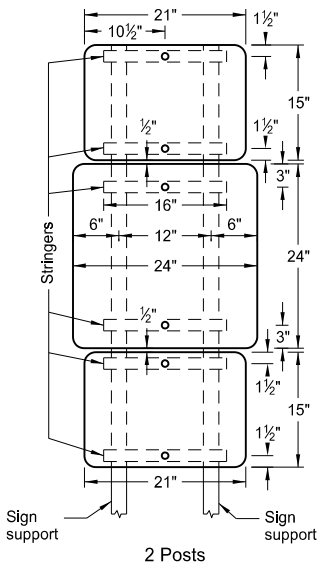
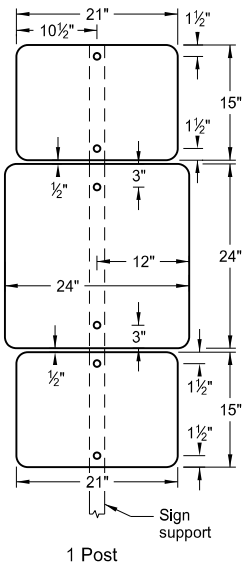
- Notes:
1. The minimum sign backing material thickness shall be 0.100 inch.
  2. Perforated square tube stringer shall be 1½"x1½".
  3. All holes shall be punched round for ⅜" bolt.



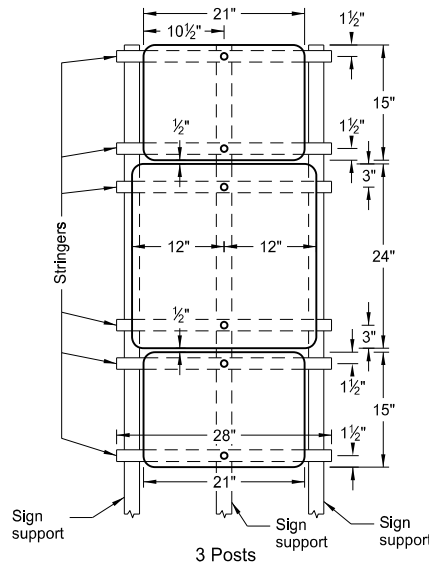
ASSEMBLY NO. 435



ASSEMBLY NO. 436



ASSEMBLY NO. 437



NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-25-12	
REVISIONS	
DATE	CHANGE

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911 SIGN SUPPORT INFORMATION AND SIGN DETAILS

D-754-86

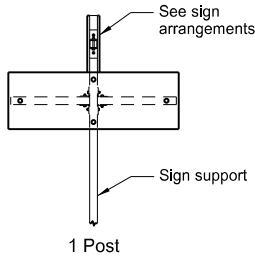
THE POST INFORMATION FOR VARIOUS SIGN CONFIGURATIONS (60 INCH VERTICAL CLEARANCE)													
ASSEMBLY NUMBER	STREET NAME SIGN SIZE	TOTAL SIGN AREA	MAXIMUM POST LENGTH	NUMBER OF POSTS	SUPPORT SIZE	SLEEVE LENGTH (A)			SLEEVE SIZE	ANCHOR			BREAK - AWAY
						1st LF	2nd LF	3rd LF		NUMBER	LENGTH LF	SIZE	
SA 1	24"x12"	8.00	20.2	1	2x2 12 ga					1	4.0	2.25x2.25 12ga	
	30"x12"	10.00	16.4	1	2x2 12 ga					1	4.0	2.25x2.25 12ga	
	36"x12"	12.00	13.8	1	2x2 12 ga					1	4.0	2.25x2.25 12ga	
	42"x12"	14.00	14.7	1	2x2 12 ga					1	4.0	2.25x2.25 12ga	
	48"x12"	16.00	12.9	1	2x2 12 ga					1	4.0	2.25x2.25 12ga	
	54"x12"	18.00	15.2	1	2.25x2.25 12 ga					1	4.0	2.5x2.5 12ga	
	60"x12"	20.00	13.7	1	2.25x2.25 12 ga					1	4.0	2.5x2.5 12ga	
	24"x9"	6.00	24.1	1	2x2 12 ga					1	4.0	2.25x2.25 12ga	
	30"x9"	7.50	21.2	1	2x2 12 ga					1	4.0	2.25x2.25 12ga	
	36"x9"	9.00	17.7	1	2x2 12 ga					1	4.0	2.25x2.25 12ga	
	42"x9"	10.50	15.3	1	2x2 12 ga					1	4.0	2.25x2.25 12ga	
	48"x9"	12.00	13.5	1	2x2 12 ga					1	4.0	2.25x2.25 12ga	
	54"x9"	13.50	14.8	1	2x2 12 ga					1	4.0	2.25x2.25 12ga	
	60"x9"	15.00	13.4	1	2x2 12 ga					1	4.0	2.25x2.25 12ga	
	24"x6"	4.00	35.2	1	2x2 12 ga					1	4.0	2.25x2.25 12ga	
	30"x6"	5.00	28.3	1	2x2 12 ga					1	4.0	2.25x2.25 12ga	
	36"x6"	6.00	23.6	1	2x2 12 ga					1	4.0	2.25x2.25 12ga	
	42"x6"	7.00	22.3	1	2x2 12 ga					1	4.0	2.25x2.25 12ga	
	48"x6"	8.00	19.6	1	2x2 12 ga					1	4.0	2.25x2.25 12ga	
	54"x6"	9.00	17.5	1	2x2 12 ga					1	4.0	2.25x2.25 12ga	
	60"x6"	10.00	15.4	1	2x2 12 ga					1	4.0	2.25x2.25 12ga	
SA 2	24"x12"	13.2	14.6	1	2.5x2.5 12 ga					1	4.0	3x3 7 ga	
	30"x12"	15.2	16.3	1	2.5,2.5 10 ga					1	4.0	3x3 7 ga	1
	36"x12"	17.2	15.4	1	2.5x2.5 10 ga					1	4.0	3x3 7 ga	1
	42"x12"	19.2	14.7	1	2.5x2.5 10 ga					1	4.0	3x3 7 ga	1
	48"x12"	21.2	15.3	1	2.25x2.25 12 ga	4.5			2x2 12 ga	1	4.0	3x3 7 ga	1
	54"x12"	23.2	20.6	1	2.5x2.5 10 ga	1.5			2.19x2.19 10ga	1	4.0	3x3 7 ga	1
	60"x12"	25.2	16.7	1	2.5x2.5 12 ga	3.9			2.25x2.25 12ga	1	4.0	3x3 7 ga	1
	24"x9"	11.2	15.2	1	2.5x2.5 12 ga					1	4.0	3x3 7 ga	
	30"x9"	12.7	14.5	1	2.5x2.5 12 ga					1	4.0	3x3 7 ga	
	36"x9"	14.2	16.5	1	2.5x2.5 10 ga					1	4.0	3x3 7 ga	1
	42"x9"	15.7	15.8	1	2.5x2.5 10 ga					1	4.0	3x3 7 ga	1
	48"x9"	17.2	14.4	1	2.5x2.5 10 ga					1	4.0	3x3 7 ga	1
	54"x9"	18.7	15.1	1	2.25x2.25 12 ga	4.2			2x2 12ga	1	4.0	3x3 7 ga	1
	60"x9"	20.2	14.6	1	2.25x2.25 12 ga	4.6			2x2 12 ga	1	4.0	3x3 7 ga	1
	24"x6"	9.2	16.0	1	2.5x2.5 12 ga					1	4.0	3x3 7 ga	
	30"x6"	10.2	15.5	1	2.5x2.5 12 ga					1	4.0	3x3 7 ga	
	36"x6"	11.2	15.0	1	2.5x2.5 12 ga					1	4.0	3x3 7 ga	
	42"x6"	12.2	13.7	1	2.5x2.5 12 ga					1	4.0	3x3 7 ga	
	48"x6"	13.2	15.9	1	2.5x2.5 10 ga					1	4.0	3x3 7 ga	1
	54"x6"	14.2	15.4	1	2.5x2.5 10 ga					1	4.0	3x3 7 ga	1
	60"x6"	15.2	14.9	1	2.5x2.5 10 ga					1	4.0	3x3 7 ga	1
SA 3	24"x12"	13.9	16.1	1	2.5x2.5 10 ga					1	4.0	3x3 7 ga	1
	30"x12"	15.9	15.3	1	2.5,2.5 10 ga					1	4.0	3x3 7 ga	1
	36"x12"	17.9	15.9	1	2.25x2.25 12 ga	4.4			2x2 12 ga	1	4.0	3x3 7 ga	1
	42"x12"	19.9	15.2	1	2.25x2.25 12 ga	4.8			2x2 12 ga	1	4.0	3x3 7 ga	1
	48"x12"	21.9	15.1	1	2.5x2.5 12 ga	5.1			2.25x2.25 12ga	1	4.0	3x3 7 ga	1
	54"x12"	23.9	20.6	1	2.5x2.5 10 ga	1.9			2.19x2.19 10ga	1	4.0	3x3 7 ga	1
	60"x12"	25.9	16.0	1	2.5x2.5 12 ga	4.7			2.25x2.25 12ga	1	4.0	3x3 7 ga	1
	24"x9"	11.9	16.8	1	2.5x2.5 10 ga					1	4.0	3x3 7 ga	1
	30"x9"	13.4	16.1	1	2.5x2.5 10 ga					1	4.0	3x3 7 ga	1
	36"x9"	14.9	15.4	1	2.5x2.5 10 ga					1	4.0	3x3 7 ga	1
	42"x9"	16.4	14.8	1	2.5x2.5 10 ga					1	4.0	3x3 7 ga	1
	48"x9"	17.9	15.6	1	2.25x2.25 12 ga	4.3			2x2 12 ga	1	4.0	3x3 7 ga	1
	54"x9"	19.4	14.9	1	2.5x2.5 12 ga	4.8			2.25x2.25 12ga	1	4.0	3x3 7 ga	1
	60"x9"	20.9	20.6	1	2.5x2.5 10 ga	1.6			2.19x2.19 10ga	1	4.0	3x3 7 ga	1
	24"x6"	9.9	14.7	1	2.5x2.5 12 ga					1	4.0	3x3 7 ga	
	30"x6"	10.9	14.3	1	2.5x2.5 12 ga					1	4.0	3x3 7 ga	
	36"x6"	11.9	16.5	1	2.5x2.5 10 ga					1	4.0	3x3 7 ga	1
	42"x6"	12.9	16.0	1	2.5x2.5 10 ga					1	4.0	3x3 7 ga	1
	48"x6"	13.9	14.8	1	2.5x2.5 10 ga					1	4.0	3x3 7 ga	1
	54"x6"	14.9	14.4	1	2.5x2.5 10 ga					1	4.0	3x3 7 ga	1
	60"x6"	15.9	15.3	1	2.25x2.25 12 ga	4.2			2x2 12 ga	1	4.0	3x3 7 ga	1

THE POST INFORMATION FOR VARIOUS SIGN CONFIGURATIONS (60 INCH VERTICAL CLEARANCE)													
ASSEMBLY NUMBER	STREET NAME SIGN SIZE	TOTAL SIGN AREA	MAXIMUM POST LENGTH	NUMBER OF POSTS	SUPPORT SIZE	SLEEVE LENGTH (A)			SLEEVE SIZE	ANCHOR			BREAK - AWAY
						1st	2nd	3rd		NUMBER	LENGTH	SIZE	
SA 4	24"x12"	15.5	15.1	1	2.25x2.25 12 ga	4.7			2x2 12 ga	1	4.0	3x3 7 ga	1
	30"x12"	17.5	15.1	1	2.5x2.5 12 ga	4.9			2.25x2.25 12 ga	1	4.0	3x3 7 ga	1
	36"x12"	19.5	17.5	1	2.5x2.5 12 ga	3.6			2.25x2.25 12ga	1	4.0	3x3 7 ga	1
	42"x12"	21.5	16.8	1	2.5x2.5 12 ga	4.1			2.25x2.25 12ga	1	4.0	3x3 7 ga	1
	48"x12"	23.5	16.2	1	2.5x2.5 12 ga	4.5			2.25x2.25 12ga	1	4.0	3x3 7 ga	1
	54"x12"	25.5	15.6	1	2.5x2.5 12 ga	4.9			2.25x2.25 12ga	1	4.0	3x3 7 ga	1
	60"x12"	27.5	16.7	1	2.5x2.5 10 ga	4.2			2.19x2.19 10ga	1	4.0	3x3 7 ga	1
	24"x9"	13.5	14.3	1	2.5x2.5 10 ga					1	4.0	3x3 7 ga	1
	30"x9"	15.0	15.1	1	2.25x2.25 12 ga	4.4			2x2 12 ga	1	4.0	3x3 7 ga	1
	36"x9"	16.5	14.6	1	2.25x2.25 12 ga	4.7			2x2 12 ga	1	4.0	3x3 7 ga	1
	42"x9"	18.0	14.7	1	2.5x2.5 12 ga	4.9			2.25x2.25 12 ga	1	4.0	3x3 7 ga	1
	48"x9"	19.5	17.2	1	2.5x2.5 12 ga	3.5			2.25x2.25 12ga	1	4.0	3x3 7 ga	1
	54"x9"	21.0	15.8	1	2.5x2.5 12 ga	4.3			2.25x2.25 12ga	1	4.0	3x3 7 ga	1
	60"x9"	22.5	15.4	1	2.5x2.5 12 ga	4.6			2.25x2.25 12ga	1	4.0	3x3 7 ga	1
	24"x6"	11.5	14.7	1	2.5x2.5 10 ga					1	4.0	3x3 7 ga	1
	30"x6"	12.5	14.4	1	2.5x2.5 10 ga					1	4.0	3x3 7 ga	1
	36"x6"	13.5	14.0	1	2.5x2.5 10 ga					1	4.0	3x3 7 ga	1
	42"x6"	14.5	15.0	1	2.25x2.25 12 ga	4.2			2x2 12 ga	1	4.0	3x3 7 ga	1
	48"x6"	15.5	14.5	1	2.5x2.5 12 ga	4.6			2.25x2.25 12 ga	1	4.0	3x3 7 ga	1
	54"x6"	16.5	14.1	1	2.5x2.5 12 ga	4.9			2.25x2.25 12ga	1	4.0	3x3 7 ga	1
	60"x6"	17.5	16.8	1	2.5x2.5 12 ga	3.5			2.25x2.25 12ga	1	4.0	3x3 7 ga	1
SA 5	24"x12"	21.3	17.2	2	2.5x2.5 10 ga					2	4.0	3x3 7 ga	2
	30"x12"	23.3	16.7	2	2.5x2.5 10 ga					2	4.0	3x3 7 ga	2
	36"x12"	25.3	16.3	2	2.5x2.5 10 ga					2	4.0	3x3 7 ga	2
	42"x12"	27.3	17.3	2	2.25x2.25 12 ga	4.2	4.6		2x2 12ga	2	4.0	3x3 7 ga	2
	48"x12"	29.3	16.9	2	2.25x2.25 12 ga	4.5	5.0		2x2 12 ga	2	4.0	3x3 7 ga	2
	54"x12"	31.3	16.5	2	2.25x2.25 12 ga	4.7	5.3		2x2 12 ga	2	4.0	3x3 7 ga	2
	60"x12"	33.3	17.5	3	2.5x2.5 12 ga					3	4.0	3x3 7 ga	3
	24"x9"	19.3	15.6	1	2.5x2.5 10 ga	4.9			2.19x2.19 10ga	1	4.0	3x3 7 ga	1
	30"x9"	20.8	17.0	2	2.5x2.5 10 ga					2	4.0	3x3 7 ga	2
	36"x9"	22.3	16.7	2	2.5x2.5 10 ga					2	4.0	3x3 7 ga	2
	42"x9"	23.8	16.3	2	2.5x2.5 10 ga					2	4.0	3x3 7 ga	2
	48"x9"	25.3	16.0	2	2.5x2.5 10 ga					2	4.0	3x3 7 ga	2
	54"x9"	26.8	17.2	2	2.25x2.25 12 ga	3.9	4.5		2x2 12 ga	2	4.0	3x3 7 ga	2
	60"x9"	28.3	16.8	2	2.25x2.25 12 ga	4.2	4.8		2x2 12 ga	2	4.0	3x3 7 ga	2
	24"x6"	17.3	15.8	1	2.5x2.5 10 ga	4.4			2.19x2.19 10ga	1	4.0	3x3 7 ga	1
	30"x6"	18.3	15.5	1	2.5x2.5 10 ga	4.5			2.19x2.19 10ga	1	4.0	3x3 7 ga	1
	36"x6"	19.3	15.3	1	2.5x2.5 10 ga	4.7			2.19x2.19 10ga	1	4.0	3x3 7 ga	1
	42"x6"	20.3	15.1	1	2.5x2.5 10 ga	4.9			2.19x2.19 10ga	1	4.0	3x3 7 ga	1
48"x6"	21.3	16.7	2	2.5x2.5 10 ga					2	4.0	3x3 7 ga	2	
54"x6"	22.3	16.4	2	2.5x2.5 10 ga					2	4.0	3x3 7 ga	2	
60"x6"	23.3	16.8	2	2.25x2.25 12 ga	3.8	4.4		2x2 12 ga	2	4.0	3x3 7 ga	2	

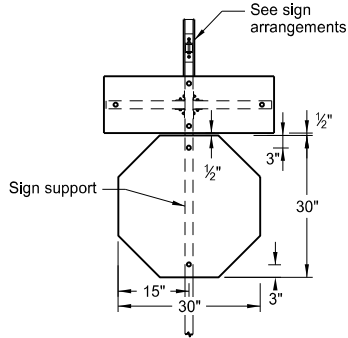
SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS  
FOR STREET NAME SIGNS AND 911 SIGNS

D-754-87

- A - Single sign  
B - Single sign back to back  
C - Single sign each direction  
D - Single sign one direction,  
back to back other direction  
E - Back to back both directions

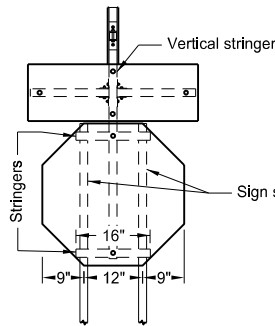


Special Assembly 1 (A, B, C, D or E)

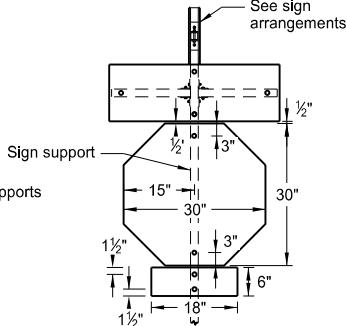


1 Post

Special Assembly 2 (A, B, C, D or E)

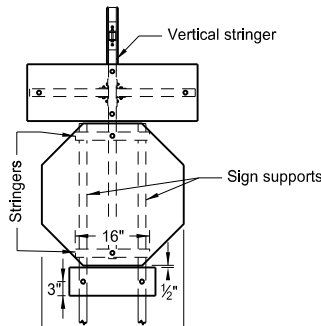


2 Posts

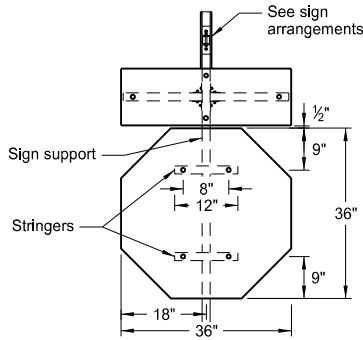


1 Post

Special Assembly 3 (A, B, C, D or E)

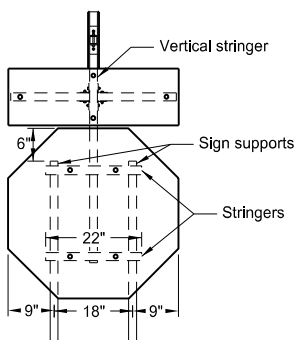


2 Posts

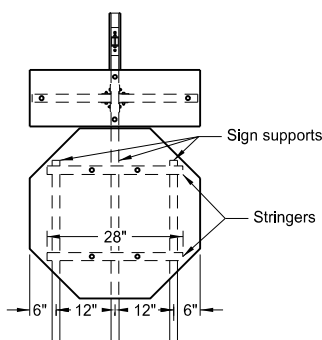


1 Post

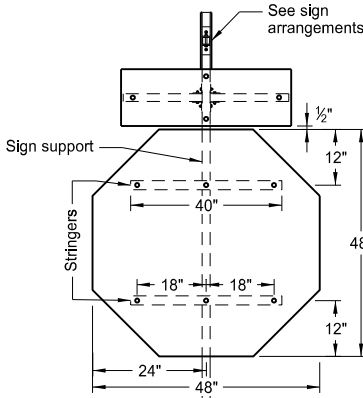
Special Assembly 4 (A, B, C, D or E)



2 Posts

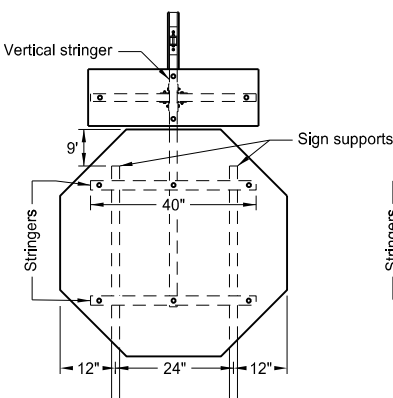


3 Posts

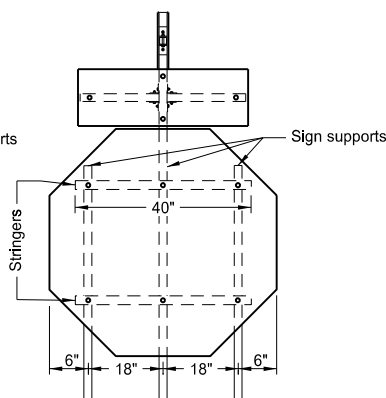


1 Post

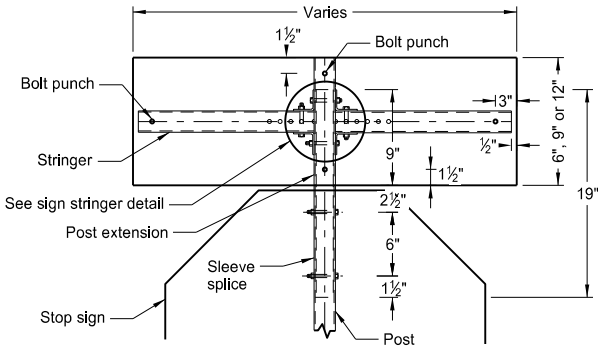
Special Assembly 5 (A, B, C, D or E)



2 Posts

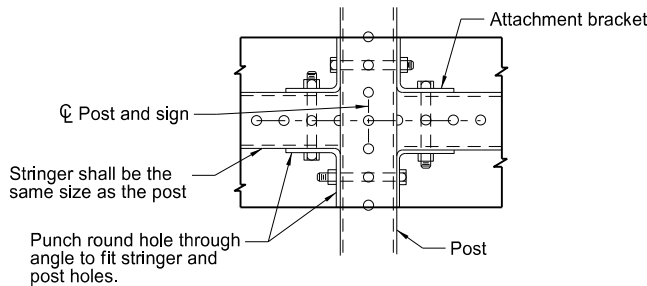


3 Posts

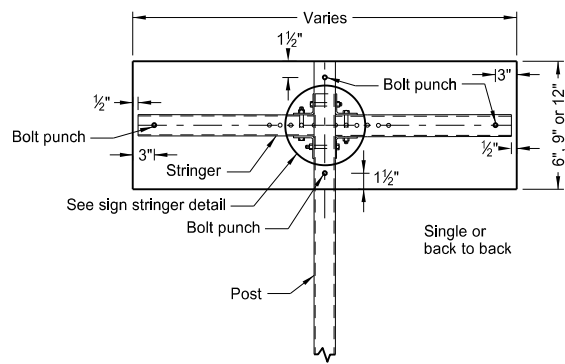


Front View  
Sleeve Splice Detail

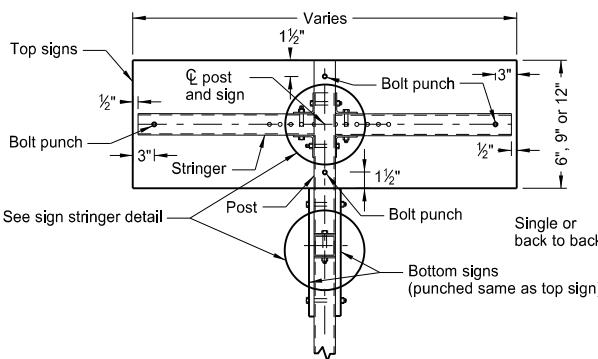
Note: The splice method may be used upon approval of the engineer.



Sign Stringer Detail

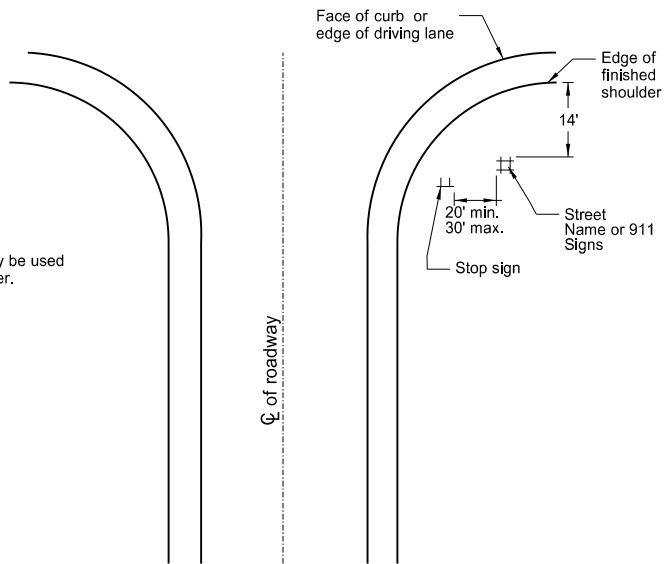


Detail A or B



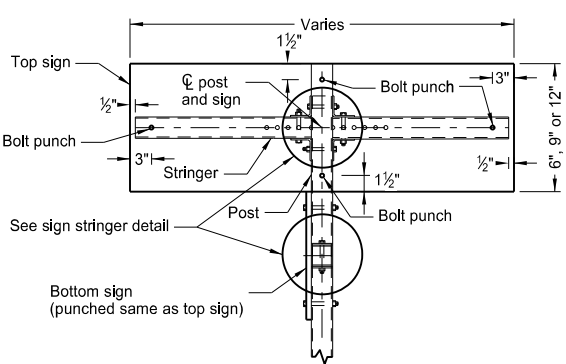
Detail D or E

Note: See Standard Drawing D-754-86 for 911 support information and sign layout details.



Intersection Layout

Note: This layout is to be used for street name signs or 911 signs that are used with Special Assembly 1.



Detail C

Sign Arrangements

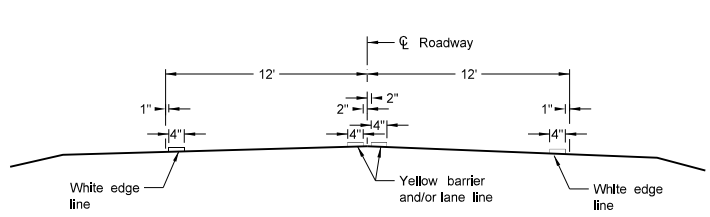
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-3-13	
REVISIONS	
DATE	CHANGE

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PE-2930,  
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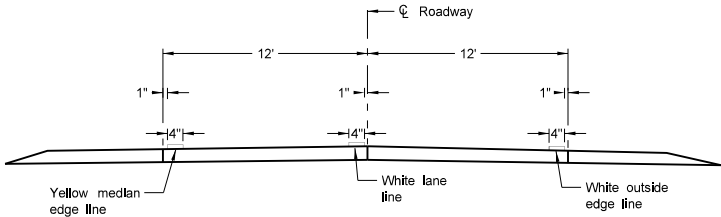
PAVEMENT MARKING

D-762-4

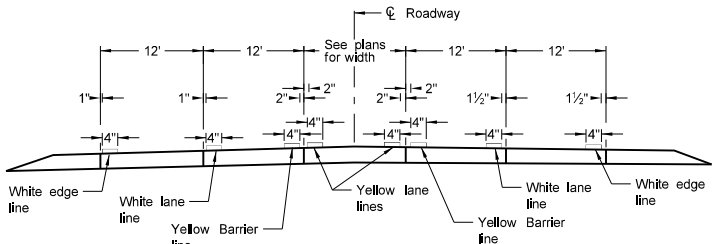
- NOTES:
- Edge lines shall be continued through private drives and field drives and broken for intersections.



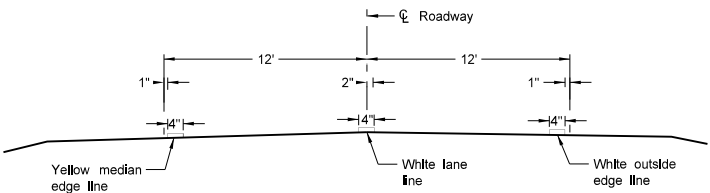
Two Lane Two Way  
RURAL ROADWAY



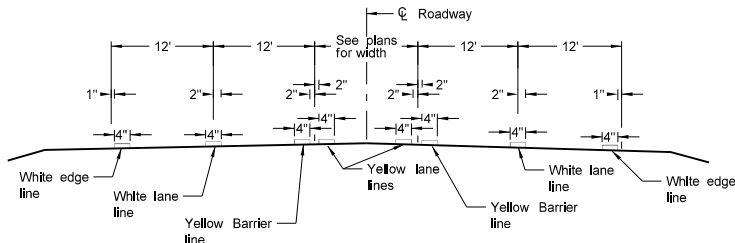
Two Lane Roadway  
INTERSTATE HIGHWAY  
Concrete Section



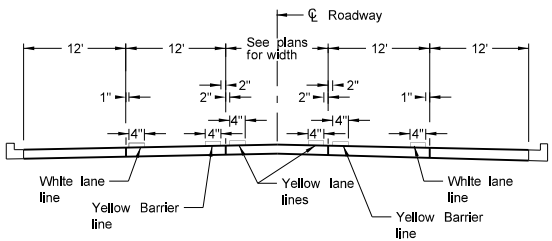
RURAL FIVE LANE ROADWAY  
Concrete Section



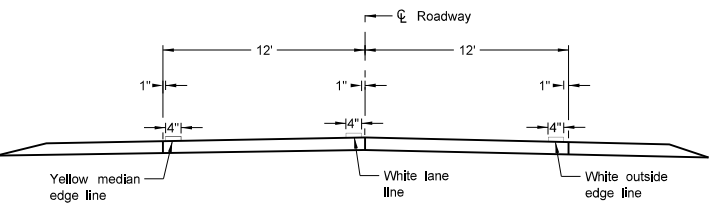
Two Lane Divided  
Rural Roadway  
PRIMARY HIGHWAY  
Asphalt Section



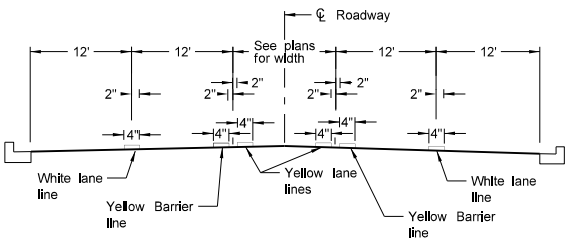
RURAL FIVE LANE ROADWAY  
Asphalt Section



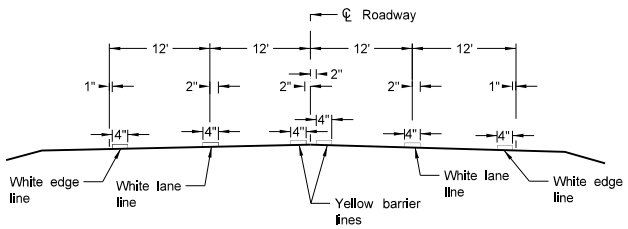
URBAN FIVE LANE SECTION  
Concrete Section



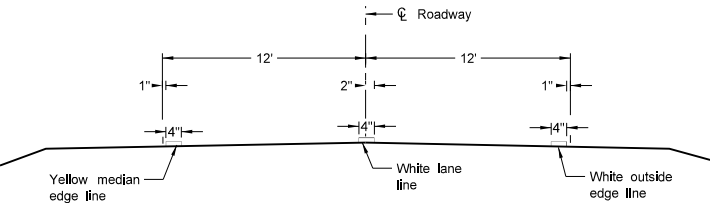
Two Lane Roadway  
PRIMARY HIGHWAY  
Concrete Section



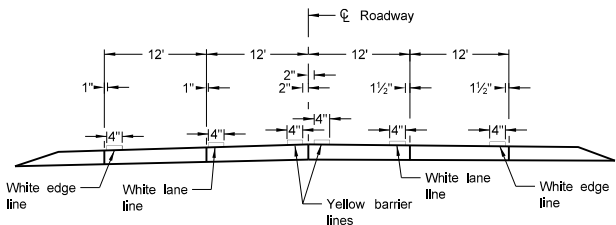
URBAN FIVE LANE SECTION  
Asphalt Section



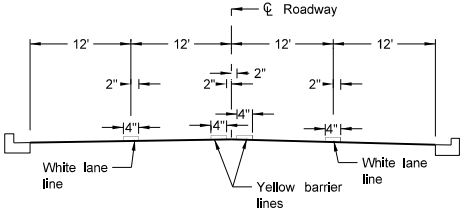
RURAL FOUR LANE ROADWAY  
Asphalt Section



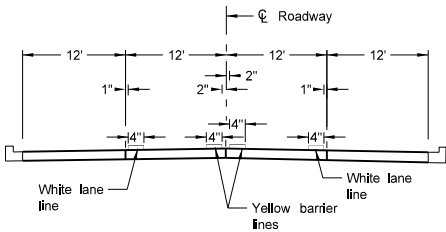
Two Lane Roadway  
INTERSTATE HIGHWAY  
Asphalt Section



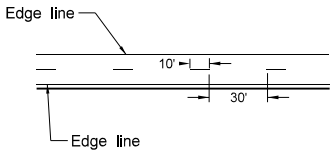
RURAL FOUR LANE ROADWAY  
Concrete Section



URBAN FOUR LANE SECTION  
Asphalt Section



URBAN FOUR LANE SECTION  
Concrete Section



CENTERLINE PAVEMENT MARKING SKIP SPACING DETAIL

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE

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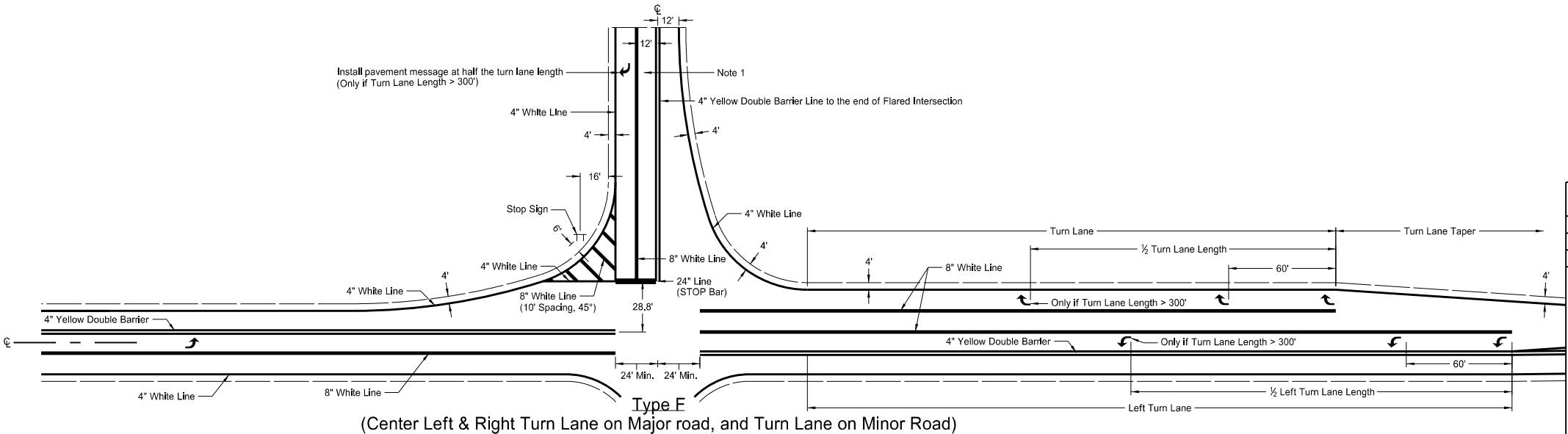
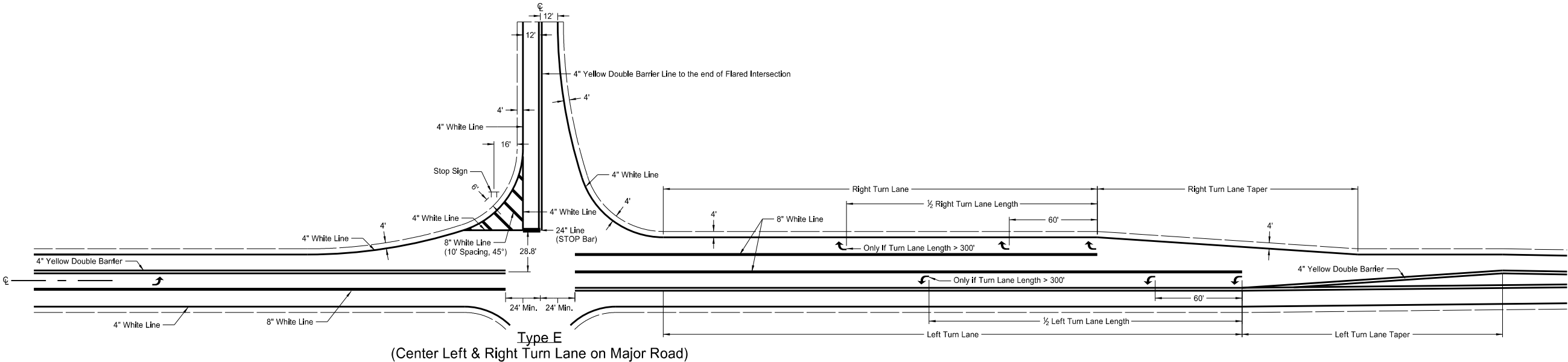
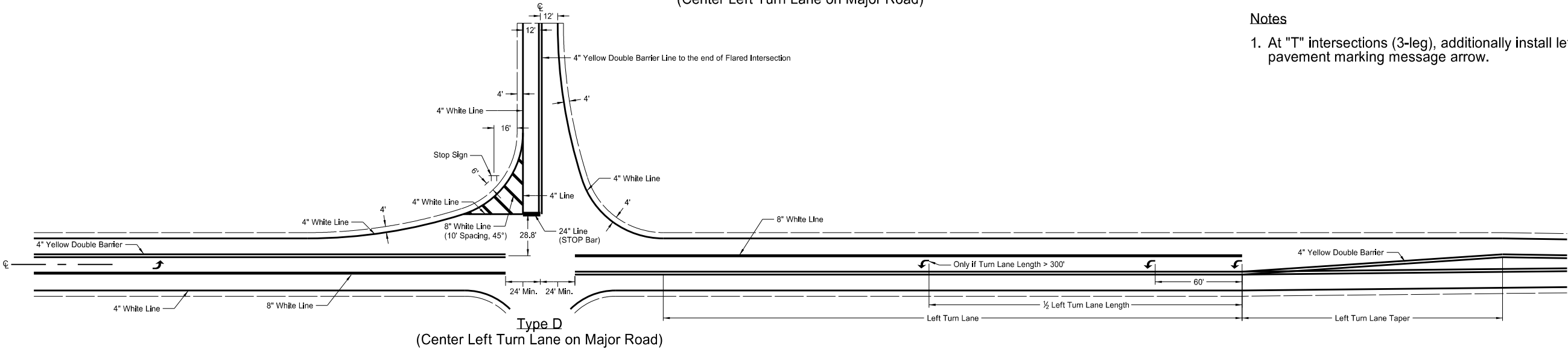
PAVEMENT MARKING FOR STANDARD 90 DEGREE FLARED INTERSECTION

(Center Left Turn Lane on Major Road)

D-762-6

Notes

1. At "T" intersections (3-leg), additionally install left turn pavement marking message arrow.



4" Marking  
8" Marking  
24" Marking

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
3-29-16	
REVISIONS	
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