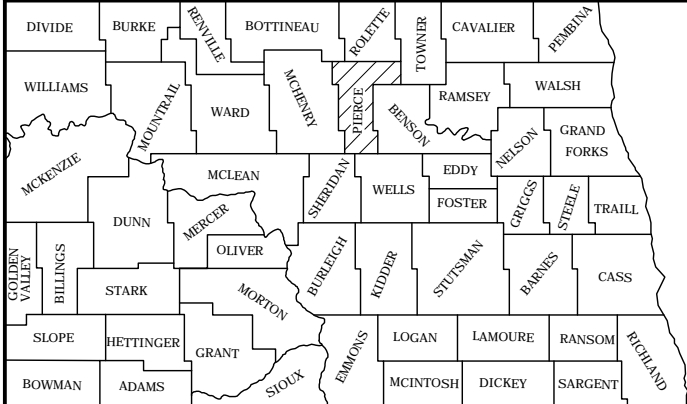
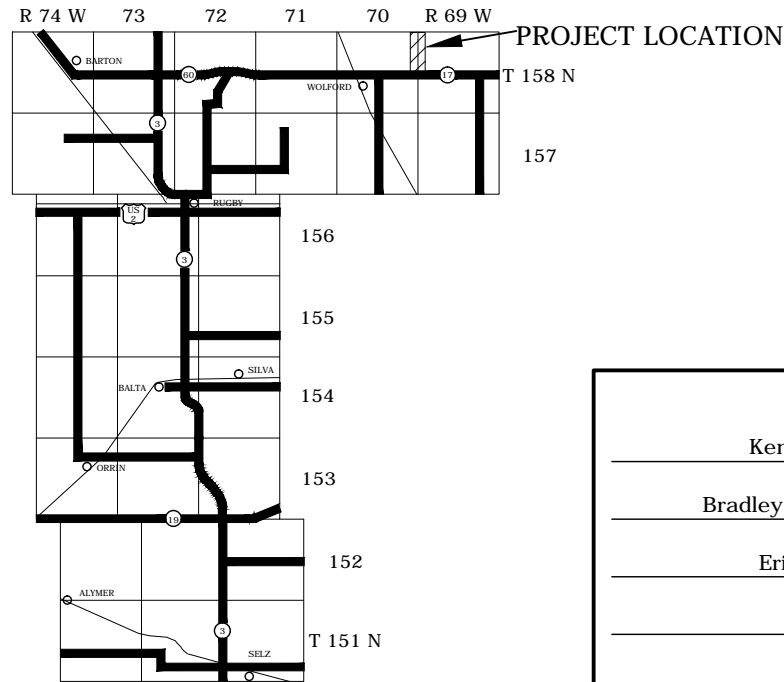


DESIGN DATA				
Traffic	Average Daily			Max.Hr.
Current (2016)	Pass:	-	Trucks: -	Total: < 750
Forecast -			Trucks: -	Total: < 750
Clear Zone Distance:		Design Speed: 55 MPH		
Minimum Sight Dist. for Stopping:		495 FT		
Minimum Sight Dist. for Safe Passing:		-		
Sight Dist. for No Passing Zone:		-		



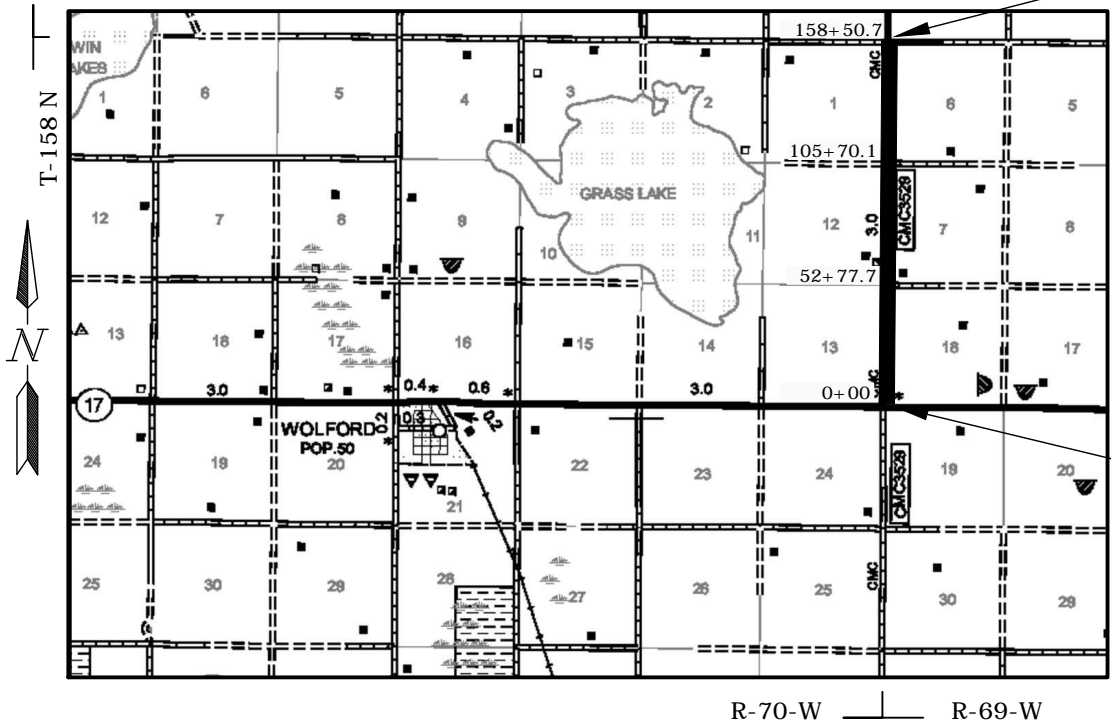
SKETCH MAP OF PIERCE COUNTY



PIERCE COUNTY  
NORTH DAKOTA

Federal Aid Project: SC-3529(054)

Bituminous Seal Coat  
CMC Route 3529 Paved County Road from NDSH 17,  
3 1/2 Miles East of Wolford, Thence North 3 Miles to  
the Pierce/Rolette County Line.



JOB #7

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	SC-3529(054)	21433	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-3529(054) - Bituminous Seal Coat	3.002	3.002

End Project SC-3529(054)  
Sta. 158+50.7 = NW Corner  
Sec. 6, Twp. 158 N., Rge. 69 W.  
= Sta. 363+45.2 - SC-3529(52) and  
Sta. 363+45.2 ~ CRS-4025(51) & CRS-3529(51)

Begin Project SC-3529(054)  
Sta. 0+00 = SW Corner  
Sec. 18, Twp. 158 N., Rge. 69 W.  
= Sta. 521+95.9 ~ SC-3529(52) & CRS-3529(51)  
= Sta. 215+45.6 - S-3-11(12) & S-3-17(15)

DESIGNERS
Kent D. Indvik, P.E.
Bradley N. Robertson, P.L.S.
Eric Larson, E.I.T.

**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 02-08-16  
/S/ KENT D. INDVIK  
Wold Engineering, P.C.

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Bottineau, ND

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8	1	Estimate of Quantities
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30	1-2	Typical Sections
100	1	Traffic Control Devices List
100	2	Sign Placement Layout

**LIST OF STANDARD DRAWINGS**

<b><u>Standard No.</u></b>	<b><u>Description</u></b>
D101-1,2,3	NDDOT Abbreviations
D101-10	NDDOT Utility Company Abbreviations
D101-20,21	Linestyles
D101-30,31,32	Symbols
D-704-3	Lane Markers (Spotting Tab, Seal Jobs Only)
D-704-7, 8	Breakaway Systems for Construction Zone Signs
D-704-9,10, 11	Construction Sign Details
D-704-12	Shoulder Closure Tapers
D-704-13	Barricade and Channelizing Device Details
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-704-26	Miscellaneous Sign Layouts
D-704-27	Traffic Control Plan for Moving Operations
D-762-4	Pavement Marking
D-762-6	Short-Term Pavement Marking

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-3529(054)	6	1

NOTES

- 100-P01 TIED PROJECT:** This project is tied to Rolette County Project SC-4025(054). Contract Bond, Mobilization, and Traffic Control items will be combined pay items and will not be paid for separately.
- 105-P01 PAVEMENT PROTECTION:** The Contractor shall protect the existing pavement outside the construction limits. The Contractor, at the Contractor’s expense, shall 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 placing additional hot bituminous pavement to damaged areas.
- 105-P02 HAUL ROADS:** All roads off the state system will not be designated as haul roads. The Contractor will obtain approval from the local government agency in charge of local roads before using them as haul roads.
- 408-P01 HOT BITUMINOUS PAVEMENT CRACK CLEAN AND SEAL:** The sealant material shall conform to Standard Specifications Section 826.02 A.2. Crack cleaning and sealing shall be completed a minimum of 3 weeks prior to the start of the chip seal. Cracks less than ¾ inch wide shall be routed to a depth not to exceed ¾ of the router bit diameter. Cracks larger than ¾ inch do not need to be routed but will require use of backer rod before placement of sealant material. Cost of backer rod shall be incidental to the bid item “Hot Bituminous pavement Crack Cleaning and Sealing”. The Contractor shall be required to thoroughly clean the cracks with compressed air to remove all dirt, debris and loose material immediately prior to crack sealing. Cracks shall be free of moisture prior to crack sealing. Cracks to be cleaned and sealed will be marked by the Engineer in the field.
- 420-P01 SEAL COAT APPLICATION:** The cover coat material shall be placed on the CRS-2P emulsified asphalt within one minute of being applied on the roadway. Class 41 cover coat material shall 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 shall be removed by the Contractor. Initial light brooming shall be done the following morning after the seal application.

- 704-P01 TRAFFIC CONTROL FOR SEAL COATS:** Traffic control for the seal coat shall consist of a temporary road closure, flagging and a pilot car. Traffic control devices shall 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 shall be the Contractor’s responsibility.
- 704-P02 CONSTRUCTION SIGNING:** The Contractor shall furnish the necessary signing as shown on the Standard Drawings, “Construction Sign and Barricade Location Details: under Type A, G, H, K, L, BB, CC, and EE as per Standard Drawings D-704-15, 20, 22 & 26 as required by the Contractor’s operations.
- 762-P01 PAVEMENT MARKING:** The short term application shall be applied immediately following final brooming for the entire project. The permanent application shall be no sooner than two weeks following the short term application. Lane markers (spotting tabs) shall be installed as per Std. Dwg. D-704-3.



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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-3529(054)	8	1

ESTIMATE OF QUANTITIES						
				SC-3529(054)		
<i>SPEC</i>	<i>CODE</i>	<i>DESCRIPTION</i>	<i>UNIT</i>	MAINLINE	APPROACHES	TOTAL
103	0100	CONTRACT BOND	L SUM			0.30
401	0150	SS1H OR CSS1H OR MS1 EMULSIFIED ASPHALT	GAL	2,555		2,555
408	1230	HOT BITUMINOUS CRACK CLEANING AND SEALING	LF	12,608		12,608
420	0111	CRS2P EMULSIFIED ASPHALT	GAL	17,754	378	18,132
420	0125	COVER COAT MATERIAL CL 41	TON	528	21	549
702	0100	MOBILIZATION	L SUM			0.30
704	1052	TYPE III BARRICADES	EA	2		2
704	1100	TRAFFIC CONTROL	L SUM			0.30
762	0460	SHORT TERM PAINTED LINE - SEAL JOBS	LF	4,710		4,710
762	1104	PVMT MK PAINTED 4IN LINE	LF	36,411		36,411

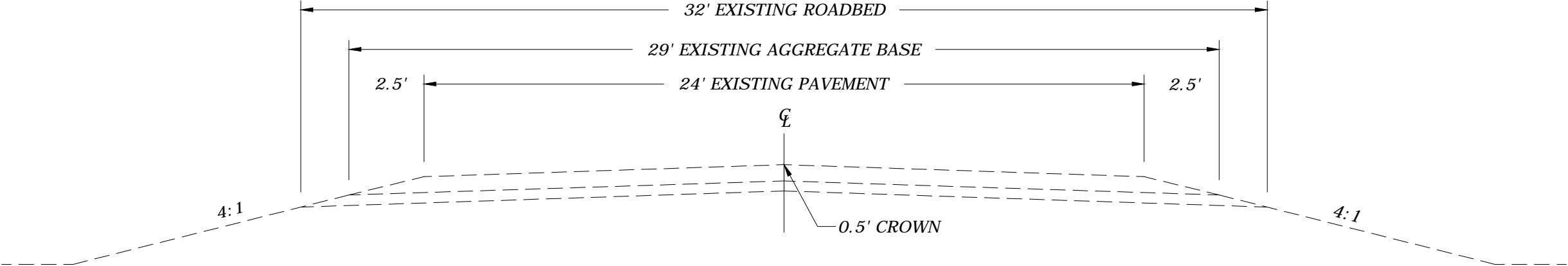


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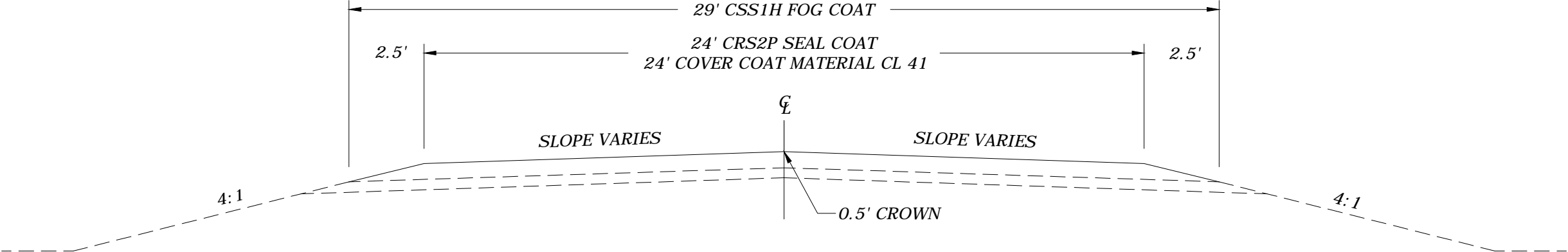




STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-3529(054)	30	1



**EXISTING TYPICAL SECTION**  
**STA. 0+00 TO 158+50.7**



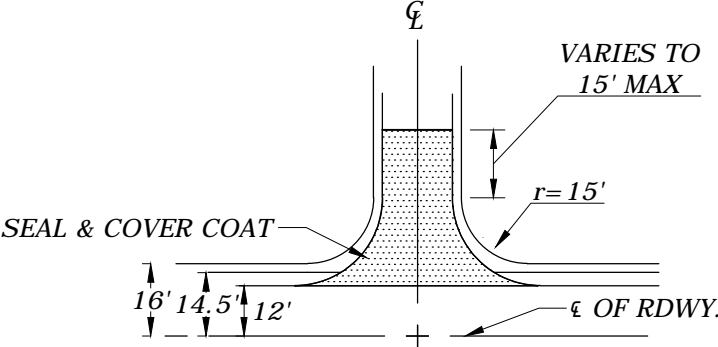
**PROPOSED TYPICAL SECTION**  
**STA. 0+00 TO 158+50.7**



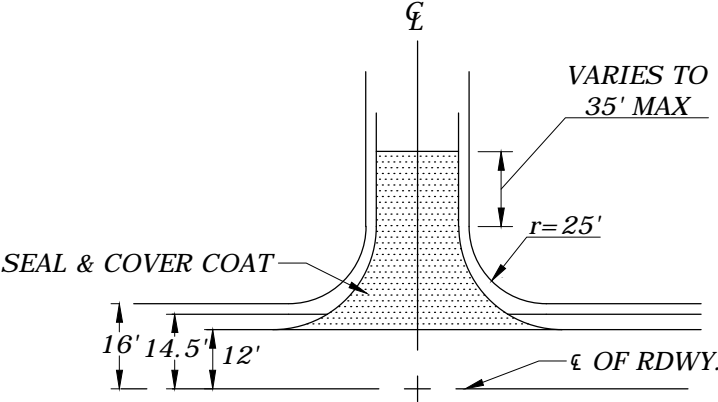
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**TYPICAL SECTIONS**  
**EXISTING &**  
**PROPOSED**

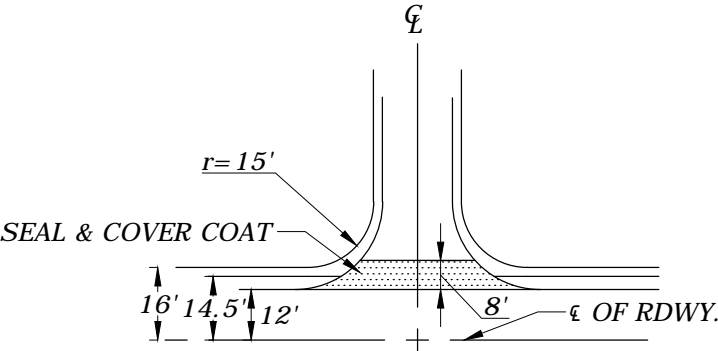
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-4025(054) & SC-3529(054)	30	2



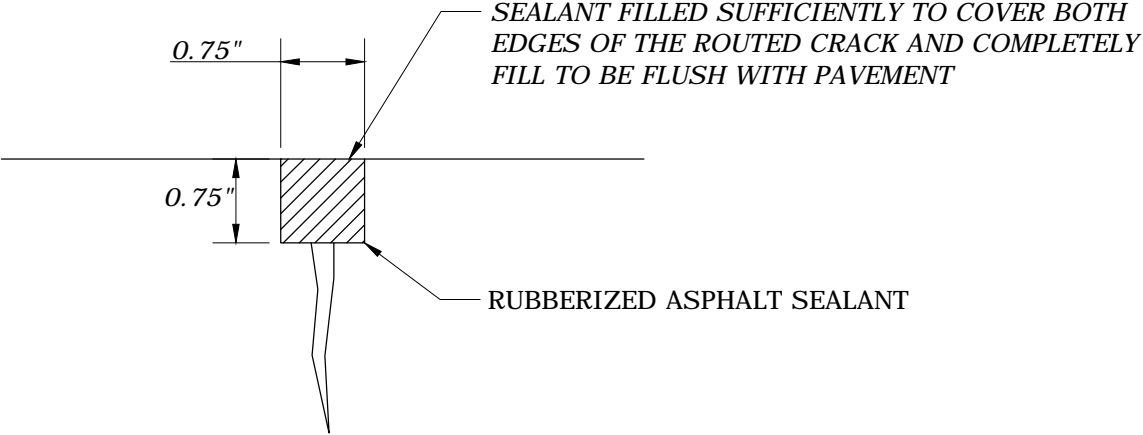
PRIVATE DRIVE APPROACH



SECTION LINE APPROACH



FIELD APPROACH



CRACK SEALING



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TYPICAL SECTIONS  
APPROACHES

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-3529(054)	100	1

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL
G3-36	36"x6"	STREET NAME SIGN (Sign and installation only)		6	
G20-1a-60	60"x24"	ROAD WORK NEXT ___ MILES	1	34	34
G20-1b-60	60"x24"	WORK IN PROGRESS/ NO WORK IN PROGRESS (Sign and installation only)		26	
G20-2a-48	48"x24"	END ROAD WORK	1	19	19
G20-4-36	36"x18"	PILOT CAR FOLLOW ME	1	18	18
G20-10-108	108"x48"	CONTRACTOR SIGN		64	
G20-50a-72	72"x36"	ROAD WORK NEXT ___ MILES RT & LT ARROWS		37	
G20-52a-72	72"x24"	ROAD WORK NEXT ___ MILES RT or LT ARROW		30	
G20-55-96	96"x48"	SPEED LIMIT ENFORCED - MINIMUM FEE \$80 WHEN WORKERS PRESENT		59	
M1-1-36	36"x36"	ROUTE MARKER (Post and installation only)		10	
M1-4-24	24"x24"	ROUTE MARKER (Post and installation only)		10	
M1-5-24	24"x24"	ROUTE MARKER (Post and installation only)		10	
M3-1-24	24"x12"	NORTH (Mounted on route marker post)		7	
M3-2-24	24"x12"	EAST (Mounted on route marker post)		7	
M3-3-24	24"x12"	SOUTH (Mounted on route marker post)		7	
M3-4-24	24"x12"	WEST (Mounted on route marker post)		7	
M4-8-24	24"x12"	DETOUR (Mounted on route marker post)		7	
M4-9-30	30"x24"	DETOUR ARROW RIGHT or LEFT/AHD AND RT or LT		15	
M4-10-48	48"x18"	DETOUR ARROW RIGHT or LEFT		23	
M5-1-21	21"x15"	ARROW AHD AND RT or LT(Mounted on route marker post)		7	
M5-2-21	21"x15"	ARROW AHD UP & RT or LT (Mounted on route marker post)		7	
M6-1-21	21"x15"	ARROW RT or LT (Mounted on route marker post)		7	
M6-2-21	21"x15"	ARROW UP & RT or LT (Mounted on route marker post)		7	
M6-3-21	21"x15"	ARROW AHD (Mounted on route marker post)		7	
R1-1-48	48"x48"	STOP		32	
R1-1a-18	18"x18"	STOP and SLOW PADDLE Back to Back		5	
R1-2-60	60"x60"	YIELD		29	
R2-1-48	48"x60"	SPEED LIMIT _____	1	39	39
R2-1a-24	24"x18"	MINIMUM FEE \$80 (Mounted on Speed Limit post)	1	10	10
R3-7-48	48"x48"	LEFT or RIGHT LANE MUST TURN LEFT or RIGHT		35	
R4-1-48	48"x60"	DO NOT PASS	1	39	39
R4-7-48	48"x60"	KEEP RIGHT SYMBOL		39	
R5-1-48	48"x48"	DO NOT ENTER		35	
R6-1-36	36"x12"	ONE WAY RIGHT or LEFT		13	
R7-1-12	12"x18"	NO PARKING		11	
R10-6-24	24"x36"	STOP HERE ON RED		16	
R11-2-48	48"x30"	ROAD CLOSED		28	
R11-2a-48	48"x30"	STREET CLOSED		28	
R11-3a-60	60"x30"	ROAD CLOSED _____ MILES AHEAD LOCAL TRAFFIC ONLY		31	
R11-3c-60	60"x30"	STREET CLOSED _____ MILES AHEAD LOCAL TRAFFIC ONLY		31	
R11-4a-60	60"x30"	STREET CLOSED TO THRU TRAFFIC		31	
W1-3-48	48"x48"	RIGHT or LEFT SHARP REVERSE CURVE ARROW		35	
W1-4-48	48"x48"	RIGHT or LEFT REVERSE CURVE ARROW		35	
W1-4b-48	48"x48"	DOUBLE RIGHT or LEFT REVERSE CURVE ARROW		35	
W1-6-48	48"x24"	LARGE ARROW		26	
W3-1a-48	48"x48"	STOP AHEAD SYMBOL		35	
W3-3-48	48"x48"	SIGNAL AHEAD SYMBOL		35	
W3-4-48	48"x48"	BE PREPARED TO STOP		35	
W3-5-48	48"x48"	SPEED REDUCTION AHEAD	1	35	35
W4-2-48	48"x48"	RIGHT or LEFT LANE TRANSITION SYMBOL		35	
W5-1-48	48"x48"	ROAD NARROWS		35	
W5-8-48	48"x48"	THRU TRAFFIC RIGHT LANE		35	
W5-9-48	48"x48"	ROAD WORK TRAFFIC ONLY DOWN & LT or RT ARROW		35	
W6-3-48	48"x48"	TWO WAY TRAFFIC SYMBOL		35	
W8-1-48	48"x48"	BUMP		35	
W8-3-48	48"x48"	PAVEMENT ENDS		35	
W8-7-48	48"x48"	LOOSE GRAVEL		35	
W8-9a-48	48"x48"	SHOULDER DROP-OFF		35	
W8-11-48	48"x48"	UNEVEN LANES		35	
W8-12-48	48"x48"	NO CENTER STRIPE	3	35	105
W8-53-48	48"x48"	TRUCKS ENTERING HIGHWAY	2	35	70
W8-54-48	48"x48"	TRUCKS ENTERING AHEAD or _____ FT.		35	
W8-55-48	48"x48"	TRUCKS CROSSING AHEAD or _____ FT.		35	
W8-56-48	48"x48"	TRUCKS EXITING HIGHWAY		35	
W9-3a-48	48"x48"	CENTER LANE CLOSED SYMBOL		35	
W12-2-48	48"x48"	LOW CLEARANCE SYMBOL		35	
W13-1-24	24"x24"	_____ MPH ADVISORY SPEED PLATE (Mounted on warning sign post)		11	
W13-4-48	48"x60"	RAMP ARROW		39	
W14-3-48	48"x36"	NO PASSING ZONE		23	
W20-1-48	48"x48"	ROAD WORK AHEAD or _____FT or _____ MILE		35	
W20-2-48	48"x48"	DETOUR AHEAD or _____ FT		35	
W20-3-48	48"x48"	ROAD or STREET CLOSED AHEAD or _____ FT.		35	
W20-4-48	48"x48"	ONE LANE ROAD AHEAD or _____ FT.		35	
W20-5-48	48"x48"	RIGHT or LEFT LANE CLOSED AHEAD or _____ FT.		35	
W20-7a-48	48"x48"	FLAGGING SYMBOL		35	
W20-7k-24	24"x18"	_____ FEET (Mounted of warning sign post)		10	
W20-8-48	48"x48"	STREET CLOSED		35	
W20-51-48	48"x48"	EQUIPMENT WORKING		35	
W20-52-54	54"x12"	NEXT _____ MILES (Mounted on warning sign post)	1	12	12
W21-1a-48	48"x48"	MEN WORKING SYMBOL		35	
W21-2-48	48"x48"	FRESH OIL		35	
W21-3-48	48"x48"	ROAD MACHINERY AHEAD or _____ FT		35	

[illegible]

## SPECIAL SIGNS

[illegible]

## SPEC &amp; CODE

704-1000	TRAFFIC CONTROL SIGNS	TOTAL UNITS	416
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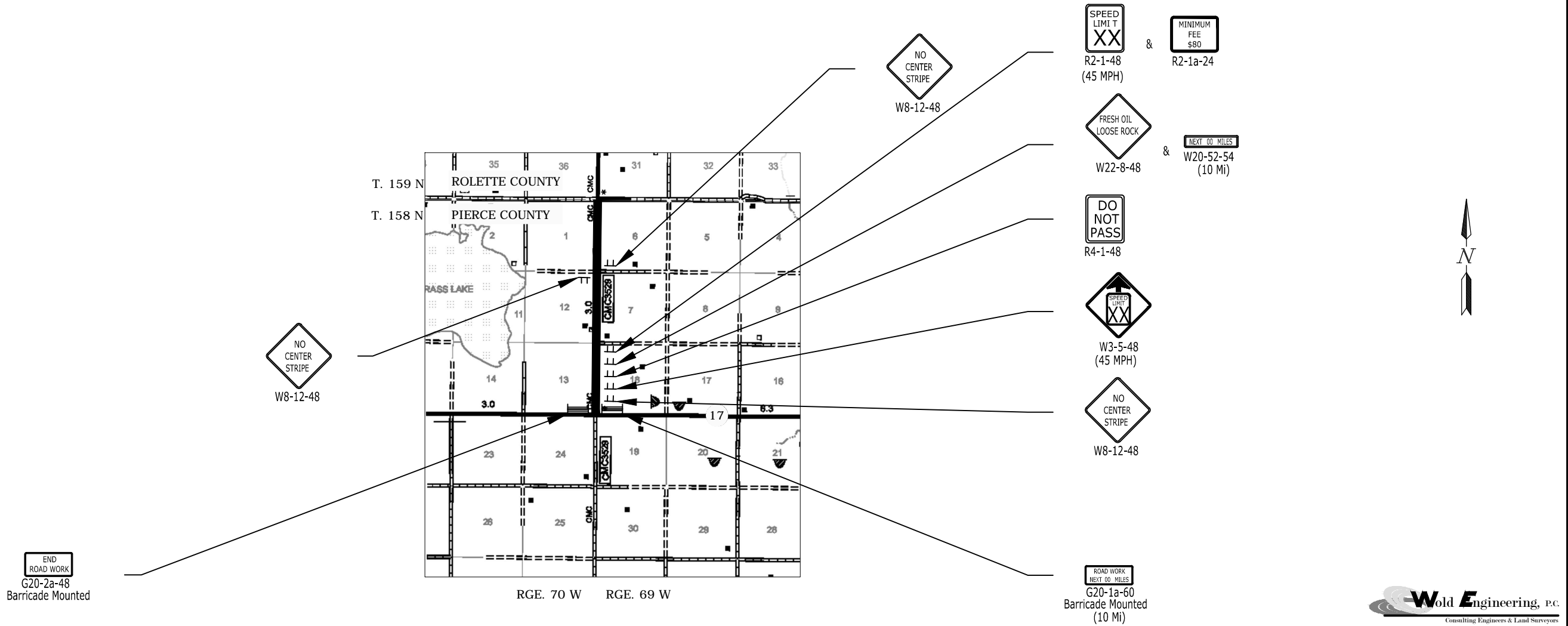
SPEC & CODE	DESCRIPTION	UNIT	QUANTITY
704-0100	FLAGGING	MHR	
704-1041	ATTENUATION DEVICE-TYPE B-55	EACH	
704-1043	ATTENUATION DEVICE-TYPE B-65	EACH	
704-1044	ATTENUATION DEVICE-TYPE B-70	EACH	
704-1050	TYPE I BARRICADES	EACH	
704-1051	TYPE II BARRICADES	EACH	
704-1052	TYPE III BARRICADES	EACH	2
704-1060	DELINEATOR DRUMS	EACH	
704-1065	TRAFFIC CONES	EACH	
704-1067	TUBULAR MARKERS	EACH	
704-1070	DELINEATOR	EACH	
704-1072	FLEXIBLE DELINEATORS	EACH	
704-1081	VERTICAL PANELS - BACK TO BACK	EACH	
704-1085	SEQUENCING ARROW PANEL - TYPE A	EACH	
704-1086	SEQUENCING ARROW PANEL - TYPE B	EACH	
704-1087	SEQUENCING ARROW PANEL - TYPE C	EACH	
704-1088	SEQUENCING ARROW PANEL - TYPE C - CROSSOVER	EACH	
704-1095	TYPE B FLASHERS	EACH	
704-3501	PORTABLE PRECAST CONCRETE MED BARRIER	LF	
704-3510	PRECAST CONCRETE MED BARRIER - STATE FURNISHED	EACH	
762-0200	RAISED PAVEMENT MARKERS	EACH	
762-0420	SHORT TERM 4IN LINE - TYPE R	LF	
762-0430	SHORT TERM 4IN LINE - TYPE NR	LF	
762-1500	OBLITERATION OF PVMT MK	SF	
772-2110	FLASHING BEACON - POST MOUNTED	EACH	

**NOTE:**  
If additional signs are required, units will be calculated using the formula from Section III-19.06 of the Design Manual.  
<http://www.dot.nd.gov/>

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## Traffic Control Devices List

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-3529(054)	100	2



?	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	IP	iron Pipe	M	mega	Ped	pedestrian
FLS	fuel leak sensor	Jt	joint	Mer	meridian	PPP	pedestrian pushbutton post
Furn	furnish/ed	J	joule	M	meter	Pen.	penetration
Gal	gallon	Jct	junction	M/s	meters per second	Perf	perforated
Galv	galvanized	K	kelvin	M	mid ordinate of curve	Per.	perimeter
Gar	garage	Kn	kilo newton	Mi	mile	PL	pipeline
Gs L	gas line	Kpa	kilo pascal	MM	mile marker	PI	place
G Reg	gas line regulator	Kg	kilogram	MP	mile post	P&P	plan & profile
GMV	gas main valve	Kg/m3	kilogram per cubic meter	MI	milliliter	PL	plastic limit
G Mtr	gas meter	Km	kilometer	Mm	millimeter	PI	plate
GSV	gas service valve	K	Kip(s)	Mm/hr	millimeters per hour	Pt	point
GVP	gas vent pipe	LS	Land Surveyor (licensed)	Min	minimum	PCC	point of compound curve
GV	gate valve	LSIT	Land Surveyor In Training	Misc	miscellaneous	PC	point of curve
Ga	gauge	Ln	lane	Mon	monument	PI	point of intersection
Geod	geodetic	Lg	large	Mnd	mound	PRC	point of reverse curvature
GIS	Geographical Information System	Lat	latitude	Mtbl	mountable	PT	point of tangent
G	giga	Lt	left	Mtd	mounted	POC	point on curve
GPS	Global Positioning System	L	length of curve	Mtg	mounting	POT	point on tangent
Gov	government	Lens	lenses	Mk	muck	PE	polyethylene
Grd	graded/grade	Lvl	level	Mun	municipal	PVC	polyvinyl chloride
Gr	gravel	LB	level book	N	nano	PCC	Portland Cement concrete
Grnd	ground	Lvlng	leveling	NGS	National Geodetic Survey	Lb or #	pounds
GWM	ground water monitor	Lht	light	NS	near side	PP	power pole
Gdrl	guardrail	LP	light pole	Neop	neoprene	Preempt	preemption
Gtr	gutter	Ltg	lighting	Ntwk	network	Prefab	prefabricated
H Plg	H piling	Lig Co	lignite coal	N	newton	Prfmd	preformed
Hdwl	headwall	Lig Sl	lignite slack	N	North	Prep	preperation
Ha	hectare	LF	linear foot	NE	North East	Press.	pressure
Ht	height	Liq	liquid	NW	North West	PRV	pressure relief valve
HI	height of instrument	LL	liquid limit	NB	Northbound	Prestr	prestressed
Hel	helical	L	litre	No. or #	number	Pvt	private
H	henry	Lm	loam	Obsc	obscure(d)	PD	private drive
Hz	hertz	Loc	location	Obsn	observation	Prod.	production/produce
HDPE	high density polyethylene	LC	long chord	Ocpd	occupied	Prog	programmed
HM	high mast	Long.	longitude	Ocpy	occupy	Prop.	property
HP	high pressure	Lp	loop	Off Loc	office location	Prop Ln	property line
HPS	high pressure sodium	LD	loop detector	O/s	offset	Ppsd	proposed
Hwy	highway	Lm	lumen	OC	on center	PB	pull box
Hor	horizontal	Lum	luminaire	C	one dimensional consolidation		
HBP	hot bituminous pavement	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		
IPn	Iron Pin	MC	medium curing	Ped	pedestal		

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NDDOT ABBREVIATIONS

D-101-3

Qty quantity  
Qtr quarter  
Rad or R radius  
RR railroad  
Rlwy railway  
Rsd raised  
RTP random traverse point  
Rge or R range  
RC rapid curing  
Rec record  
Rcy recycle  
RPCC recycled Portland cement concrete  
Ref reference  
R Mkr reference marker  
RM reference monument  
Refl reflectorized  
RCB reinforced concrete box  
RCES reinforced concrete end section  
RCP reinforced concrete pipe  
RCPS reinforced concrete pipe sewer  
Reinf reinforcement  
Res reservation  
Ret retaining  
Rev reverse  
Rt right  
R/W right of way  
Riv river  
Rd road  
Rdbd road bed  
Rdwy roadway  
RWIS Roadway Weather Information System  
Rk rock  
Rt route  
Salv salvage(d)  
Sd sand  
Sdy Cl sandy clay  
Sdy Cl Lm sandy clay loam  
Sdy Fl sandy fill  
Sdy Lm sandy loam  
San sanitary sewer line  
Sc scoria  
Sec seconds  
Sec section  
SL section line  
Sep separation  
Seq sequence  
Serv service  
Sh shale  
Sht sheet  
Shtng sheeting  
Shldr shoulder  
Sw sidewalk  
S siemens  
SD sight distance  
SN sign number

Sig signal  
Si Cl silt clay  
Si Cl Lm silty clay loam  
Si Lm silty loam  
Sgl single  
SC slow curing  
SS slow setting  
Sm small  
S South  
SE South East  
SW South West  
SB Southbound  
Sp spaces  
Spcl special  
SA special assembly  
SP special provisions  
G specific gravity  
Spk spike  
SC spiral to curve  
ST spiral to tangent  
SB split barrel sample  
SH sprinkler head  
SV sprinkler valve  
Sq square  
SF square feet  
Km2 square kilometer  
M2 square meter  
SY square yard  
Stk stake  
Std standard  
N standard penetration test  
Std Specs Standard Specifications  
Sta station  
Sta Yd station yards  
Stm L steam line  
SEC steel encased concrete  
SSD stopping sight distance  
SD storm drain  
St street  
SPP structural plate pipe  
SPPA structural plate pipe arch  
Str structure  
Subd subdivision  
Sub subgrade  
Sub Prep subgrade preperation  
Ss subsoil  
SE superelevation  
SS supplement specification  
Supp supplemental  
Surf surfacing  
Surv survey  
Sym symmetrical  
SI Systems International  
Tan tangent  
T tangent (semi)

TS tangent to spiral  
Tel telephone  
Tel B Telephone Booth  
Tel P telephone pole  
Tv television  
Temp temperature  
Temp temporary  
TBM temporary bench mark  
T tesla  
T thinwall tube sample  
T/mi tons per mile  
Ts topsoil  
Twp or T township  
Traf traffic  
TSCB traffic signal control box  
Tr trail  
Transf transformer  
TB transit book  
Trans transition  
TT transmission tower  
Trans transverse  
Trav traverse  
TP traverse point  
Trtd treated  
Trmt treatment  
Qc triaxial compression  
TERO tribal employment rights ordinance  
Tpl triple  
TP turning point  
Typ typical  
Qu unconfined compressive strength  
Ugrnd underground  
USC&G US Coast & Geodetic Survey  
USGS US Geologic Survey  
Util utility  
VG valley gutter  
Vap vapor  
Vert vertical  
VC vertical curve  
VCP vitrified clay pipe  
V volt  
Vol volume  
Wkwy walkway  
W water content  
WGV water gate valve  
WL water line  
WM water main  
WMV water main valve  
W Mtr water meter  
WSV water service valve  
WW water well  
W watt  
Wrng wearing  
Wb weber  
WIM Weigh In Motion  
W West

WB Westbound  
Wrng wiring  
W/ with  
W/o without  
WC witness corner  
WGS World Geodetic System  
Z zenith

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NDDOT UTILITY COMPANY AND ORGANIZATION ABBREVIATIONS

702COM	702 Communications	GT PLNS NAT GAS	Great Plains Natural Gas Company	RED RIV TEL	Red River Rural Telephone
ACCENT	Accent Communications	HALS TEL	Halstad Telephone Company	RESVTN TEL	Reservation Telephone
AGASSIZ WU	Agassiz Water Users Incorporated	IDEA1	Idea1	ROBRTS TEL	Roberts Company Telephone
AGC	Associated General Contractors of America	INT-COMM TEL	Inter-Community Telephone Company	R-RIDER ELEC	Roughrider Electric Coop
All PI	Alliance Pipeline	KANEB PL	Kaneb Pipeline Company	RRVW	Red River Valley & Western Railroad
ALL SEAS WU	All Seasons Water Users Association	KEM ELEC	Kem Electric Cooperative Incorporated	RSR ELEC	R.S.R. Electric Cooperative
AMOCO PI	Amoco Pipeline Company	KOCH GATH SYS	Koch Gathering Systems Incorporated	S E W U	South East Water Users Incorporated
AMRDA HESS	Amerada Hess Corporation	LKHD PL	Lakehead Pipeline Company	SCOTT CABLE	Scott Cable Television Dickinson
AT&T	AT&T Corporation	LNGDN RWU	Langdon Rural Water Users Incorporated	SHERDN ELEC	Sheridan Electric Cooperative
B PAW	Bear Paw Energy Incorporated	LWR YELL R ELEC	Lower Yellowstone Rural Electric	SHEYN VLY ELEC	Sheyenne Valley Electric Cooperative
BAKER ELEC	Baker Electric	MCKNZ CON	McKenzie Consolidated Telcom	SKYTECH	Skyland Technologies Incorporated
BASIN ELEC	Basin Electric Cooperative Incorporated	MCKNZ ELEC	McKenzie Electric Cooperative	SLOPE ELEC	Slope Electric Cooperative Incorporated
BEK TEL	Bek Communications Cooperative	MCKNZ WRD	McKenzie County Water Resource District	SOURIS RIV TELCOM	Souris River Telecommunications
BELLE PL	Belle Fourche Pipeline Company	MCLEOD	McLeod USA	ST WAT COMM	State Water Commission
BLM	Bureau of Land Management	MCLN ELEC	McLean Electric Cooperative	STATE LN WATER	State Line Water Cooperative
BNSF	Burlington Northern Santa Fe Railway	MCLN-SHRDN R WAT	McLean-Sheridan Rural Water	STER ENG	Sterling Energy
BOEING	Boeing	MDU	Montana-dakota Utilities	STUT RWU	Stutsman Rural Water Users
BRNS RWD	Barnes Rural Water District	MID-CONT CABLE	Mid-Continent Cable	SW PL PRJ	Southwest Pipeline Project
BURK-DIV ELEC	Burke-Divide Electric Cooperative	MIDSTATE TEL	Midstate Telephone Company	T M C	Turtle Mountain Communications
BURL WU	Burleigh Water Users	MINOT CABLE	Minot Cable Television	TCI	TCI of North Dakota
Cable One	Cable One	MINOT TEL	Minot Telephone Company	TESORO HGH PLNS PL	Tesoro High Plains Pipeline
CABLE SERV	Cable Services	MISS W W S	Missouri West Water System	TRI-CNTY WU	Tri-County Water Users Incorporated
CAP ELEC	Capital Electric Cooperative Incorporat	MNKOTA PWR	Minnkota Power	TRL CO RWU	Traill County Rural Water Users
CASS CO ELEC	Cass County Electric Cooperative	MOR-GRAN-SOU ELEC	Mor-gran-sou Electric Cooperative	UNTD TEL	United Telephone
CASS RWU	Cass Rural Water Users Incorporated	MOUNT-WILLI ELEC	Mountrail-williams Electric Cooperative	UPPR SOUR WUA	Upper Souris Water Users Association
CAV ELEC	Cavalier Rural Electric Cooperative	MRE LBTY TEL	Moore & Liberty Telephone	US SPRINT	U.S. Sprint
CBLCOM	Cablecom Of Fargo	MUNICIPAL	City Water And Sewer	USAF MSL CABLE	U.S.A.F. Missile Cable
CENEX PL	Cenex Pipeline	MUNICIPAL	City Of '.....'	USFWS	US Fish and Wildlife Service
CENT PL WATER DIST	Central Pipe Line Water District	N CENT ELEC	North Central Electric Cooperative	USW COMM	U.S. West Communications
CENT PWR ELEC	Central Power Electric Cooperative	N VALL W DIST	North Valley Water District	VRNDRY ELEC	Verendrye Electric Cooperative
COE	Corps of Engineers	ND PKS & REC	North Dakota Parks And Recreation	W RIV TEL	West River Telephone Incorporated
CONS TEL	Consolidated Telephone	ND TEL	North Dakota Telephone Company	WEB	W. E. B. Water Development Association
CONT RES	Continental Resource Inc	NDDOT	North Dakota Department of Transportation	WILLI RWA	Williams Rural Water Association
CPR	Canadian Pacific Railway	NDSU SOIL SCI DEPT	NDSU Soil Science Department	WILSTN BAS PL	Williston Basin Interstate Pipeline Company
D O E	Department Of Energy	NEMONT TEL	Nemont Telephone	WLSH RWD	Walsh Water Rural Water District
DAK CARR	Dakota Carrier Network	NODAK R ELEC	Nodak Rural Electric Cooperative	WOLVRTN TEL	Wolverton Telephone
DAK CENT TEL	Dakota Central Telephone	NOON FRMS TEL	Noonan Farmers Telephone Company	XLENER	Xcel Energy
DAK RWD	Dakota Rural Water District	NPR	Northern Plains Railroad	YSVR	Yellowstone Valley Railroad
DGC	Dakota Gasification Company	NSP	Northern States Power		
DICKEY R NET	Dickey Rural Networks	NTH PRAIR RW	Northern Prairie Rural Water Association		
DICKEY RWU	Dickey Rural Water Users Association	NTHN BRDR PL	Northern Border Pipeline		
DICKEY TEL	Dickey Telephone	NTHN PLNS ELEC	Northern Plains Electric Cooperative Incorporated		
DNRR	Dakota Northern Railroad	NTHWSTRN REF	Northwestern Refinery Company		
DOME PL	Dome Pipeline Company	NW COMM	Northwest Communication Cooperation		
DVELEC	Dakota Valley Electric Cooperative	ONEOK	Oneok gas		
DVMW	Dakota, Missouri Valley & Western	OSHA	Occupational Safety and Health Administration		
ENBRDG	Enbridge Pipelines Incorporated	OTTR TL PWR	Otter Tail Power Company		
ENVENTIS	Enventis Telephone	P L E M	Prairielands Energy Marketing		
FALK MNG	Falkirk Mining Company	POLAR COM	Polar Communications		
FHWA	Federal Highway Administration	PVT ELEC	Private Electric		
G FKS-TRL WD	Grand Forks-trail Water District	QWEST	Qwest Communications		
GETTY TRD & TRAN	Getty Trading & Transportation	R&T W SUPPLY	R & T Water Supply Association		
GLDN W ELEC	Golden West Electric Cooperative	RAMSEY R SEW	Ramsey Rural Sewer Association		
GRGS CO TEL	Griggs County Telephone	RAMSEY RW	Ramsey Rural Water Association		
		RAMSEY UTIL	Ramsey County Rural Utilities		

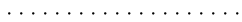




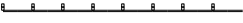
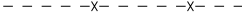
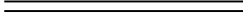
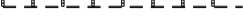


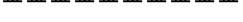
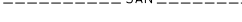



























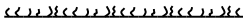

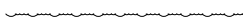

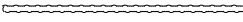

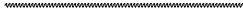

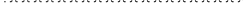






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Line Styles

	Limits of Const Transition Line		Floating Silt Curtain		Existing Aggregate (Cross Section View)		Existing Centerline
	Bale Check		Existing Telephone Line		Existing Curb and Gutter (Cross Section View)		Supplemental Contour
	Rock Check		Existing TV Line		Existing Riprap		Right of Way
	Sight Distance Triangle Line		Existing Assumed Ground (Not Surveyed)		Existing Underground Vault or Lift Station		Existing Right of Way
	Small Hidden Object		Tentative Ground Line		Tangent Line		Existing Right of Way Railroad
	Dimension Leader		Existing Water or Steam Line		Hidden Object		Failure Line
	Existing Ground		Existing Under Drain		Existing Dirt Surface		Existing Conditions
	Existing Topsoil (Cross Section View)		Under Drain		Existing Conduit		Existing Ground (Details)
	Large Hidden Object		Wall		Topsoil Profile		Existing Sixteenth Section Line
	Edge Drain		Existing Slotted Drain		Existing Conductor		Existing Right of Way Not State Owned
	Geotextile Fabric Type D		Existing Cemetary Boundary		Conductor		Phantom Object
	Existing Electrical		Centerline Pavement Marking		Fiber Optic		Centerline Main
	Existing Fiber Optic Line		Barrier with Centerline Pavement Marking		Existing Loop Detector		Existing Guardrail Cable
	Existing TV Fiber Optic		Barrier Pavement Marking		Subgrade, Subcut or Ditch Grade		Existing Guardrail Metal
	Existing Gas Pipe		Stripe 4 IN Dotted Extension White		Existing Asphalt Surface		Existing Edge of Water
	Geogrid		Stripe 8 IN Dotted Extension White		Existing Asphalt (Cross Section View)		Excavation Limits
	Existing Overhead Utility Line		Stripe 8 IN Lane Drop		Existing Reinforcement Rebar		Existing Government Lot Line
	Existing Power		Wetland Mitigation		Existing Tie Point Line		Existing Adjacent Block Lines
	Existing Fuel Pipeline		Existing Box Culvert Bridge		Existing State or International Line		Existing Adjacent Lot Lines
	Existing Undefined Above Ground Pipe Line		Existing Concrete Surface		Existing Quarter Section Line		Existing Adjacent Property Line
	Geotextile Fabric Type R		Existing Drainage Structure		Existing County		Existing Adjacent Subdivision Lines
	Geotextile Fabric Type R1		Easement		Existing Section Line		
	Remove Line		Existing Concrete		Existing Township		
	Geotextile Fabric Type RR		Existing Easement		Existing Railroad Centerline		
	Geotextile Fabric Type S		Existing Gravel Surface		Centerline		

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Line Styles

	Subgrade Reinforcement		Existing Railroad Switch		Sheet Piling
	Existing Down Guy Wire Down Guy		Overhead Sign Structure Cantilever		W-Beam w Posts
	Existing Fence		24 Inch Pipe		Existing W-Beam Guardrail with Posts
	Existing Railroad		Reinforced Concrete Pipe		Exst Wet Area-Vegetation Break
	Existing Sanitary Sewer		Signal Head with Mast Arm		Existing Wetland Delineated
	Existing Sanitary Force Main		Existing Signal Head with Mast Arm		
	Existing Storm Drain		Tie Bar at Random Spacing		
	Existing Storm Drain Force Main		3-Cable w Posts		
	Fence		Existing 3-Cable w Posts		
	Silt Fence		Site Boundary		
	Existing Field Line		Fiber Rolls		
	Exst Flow		Doweled Joint		
	Flow		Tie Bar 30 Inch 4 Foot Center to Center		
	Existing Culvert		Tie Bar 18 Inch 3 Foot Center to Center		
	Existing Curb		Existing Berm, Dike, Pit, or Earth Dam		
	Existing Valley Gutter		Existing Ditch Block		
	Existing Driveway Gutter		Depression Contours		
	Existing Curb and Gutter		Existing City Corporate Limits or Reservation Boundary		
	Existing Mountable Curb and Gutter		Gravel Pit - Borrow Area		
	Existing Double Micro Loop Detector		Existing Tree Boundary		
	Micro Loop Detector Double		Tree Row		
	Existing Overhead Sign Structure		Existing Brush or Shrub Boundary		
	Existing Micro Loop Detector		Existing Retaining Wall		
	Micro Loop Detector		Existing Planter or Wall		
	Existing Overhead Sign Structure Cantilever		Retaining Wall (Plan View)		



















































































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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																	
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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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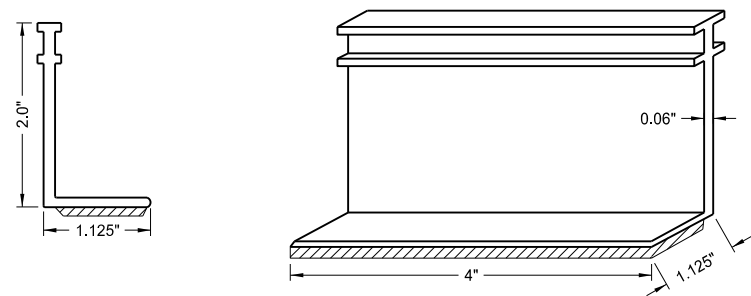
Symbols

	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><td colspan="2">07-01-14</td></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												

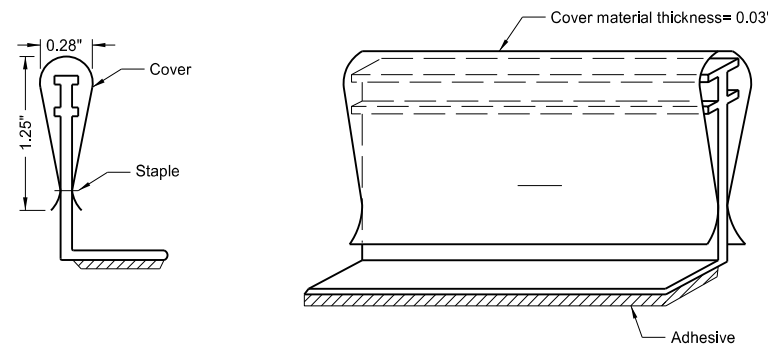
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LANE MARKERS  
(Spotting Tab for Seal Projects only)

D-704-3



Marker Body



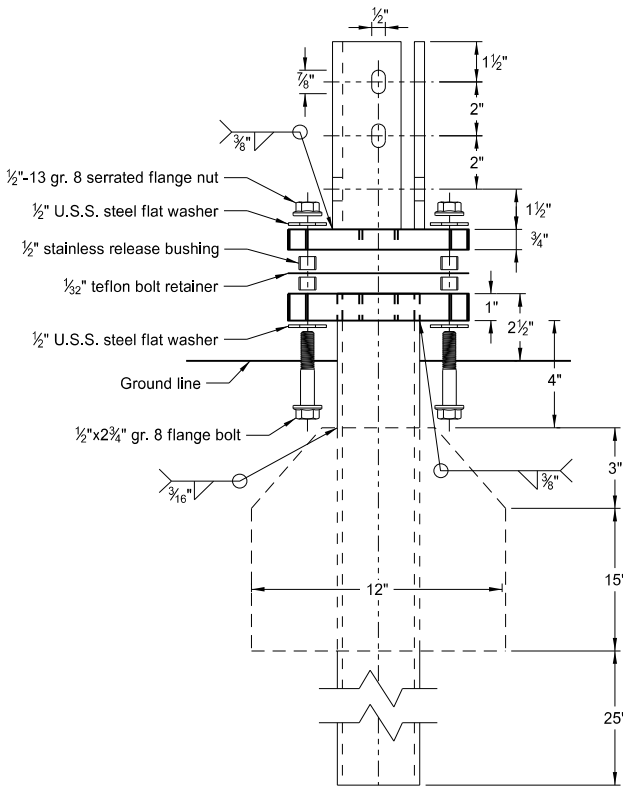
Marker Body with Protective Cover

Notes:

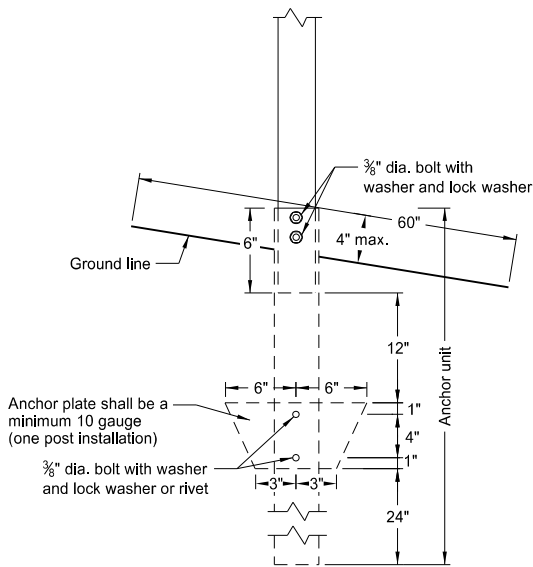
1. The lane line markers shall be installed as shown, prior to the beginning of the seal coat.
2. The cover shall be attached to the vertical part of the marker in such a way that traffic will not cause it to detach and so that it may be easily removed manually.
3. The protective covers shall be removed, 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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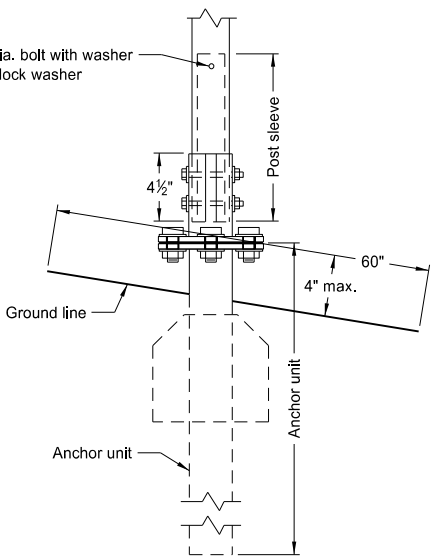
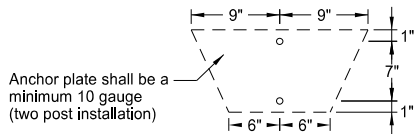
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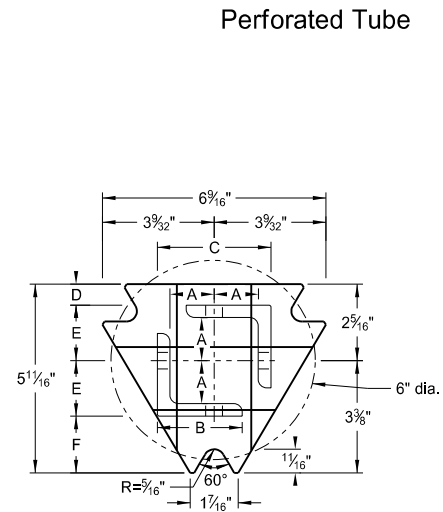
Multi-Directional Slip Base Assembly



Anchor Unit and Post Assembly

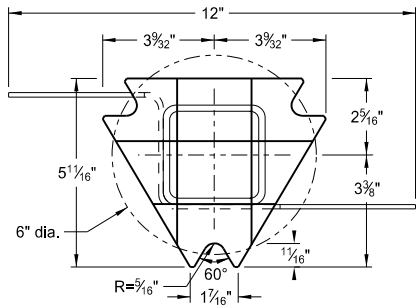


Multi-Directional Slip Base Anchor Unit and Post Sleeve Assembly



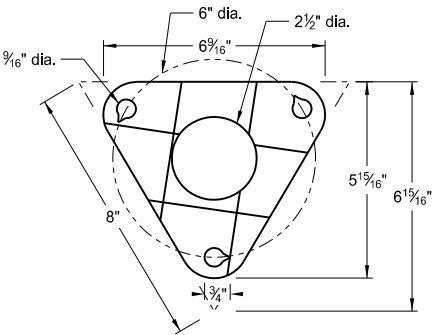
Top Post Receiver

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:

- Slip base bolts shall be torqued as specified by the manufacturer.
- Anchor shall have a yield strength of 43.9 KSI and tensile strength of 59.3 KSI.
- 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.
- When used in concrete sidewalk, anchor shall be same except without the wings.
- 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.

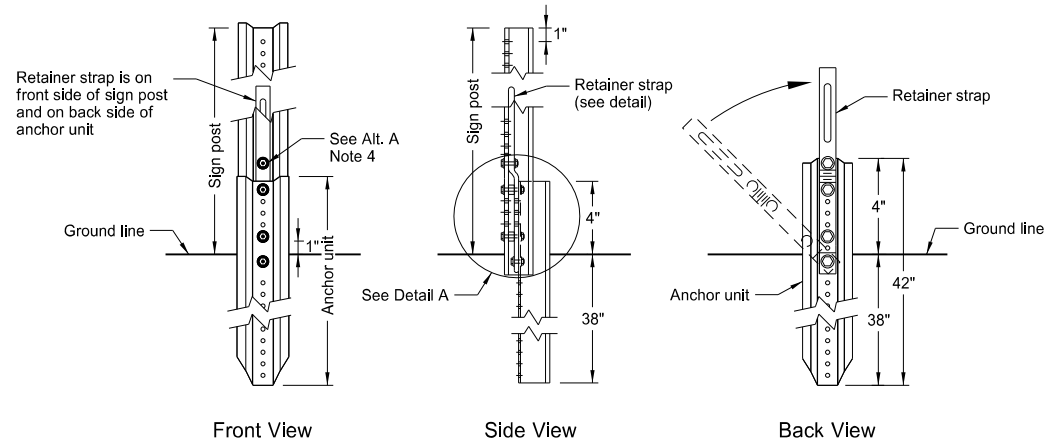
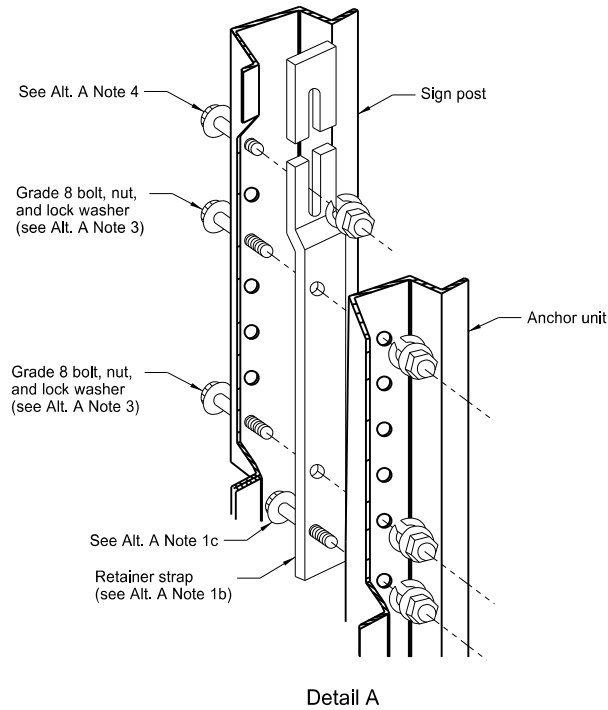
(B) The 2 3/16"x10 ga. may be inserted into 2 1/2"x10 ga. for additional wind load.

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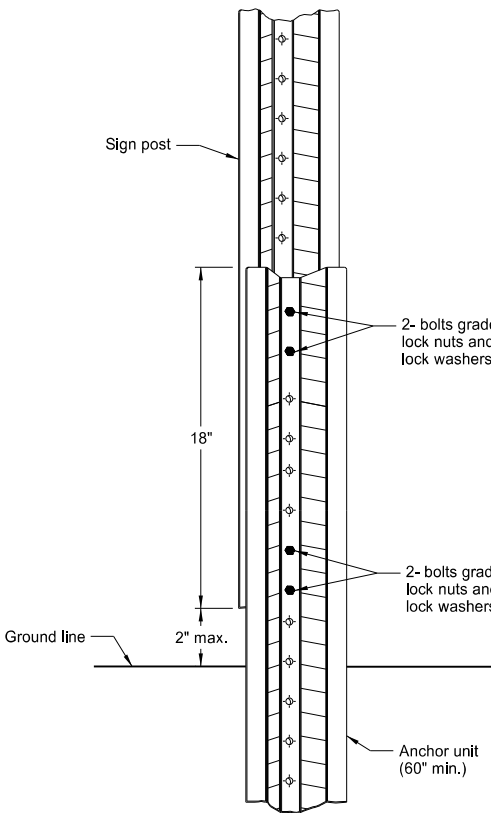
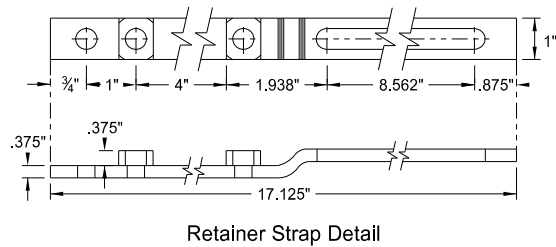
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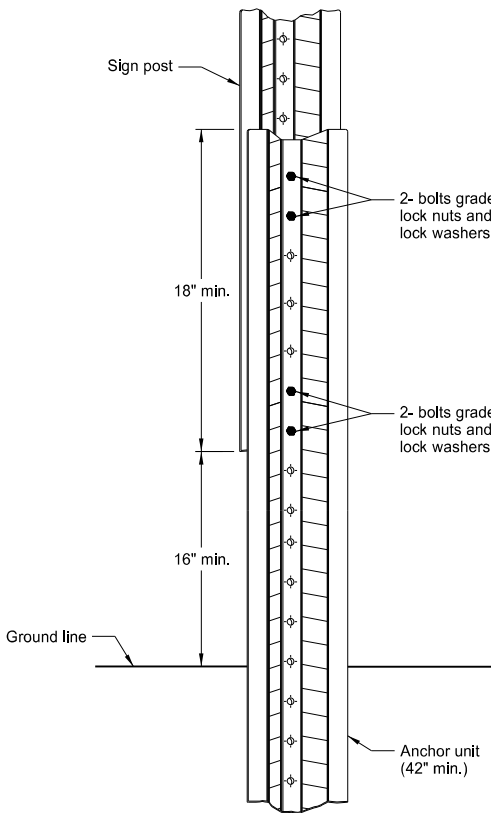
U-Channel Post



Breakaway U-Channel Detail  
Alternate A  
A maximum of 2 posts shall be installed within 7'.



Breakaway U-Channel Splice Detail  
Alternate B  
(2.5 and 3 lb/ft)  
A maximum of 3 posts shall be installed within 7'.



Breakaway U-Channel Splice Detail  
Alternate C  
(2.5 and 3 lb/ft)  
A maximum of 3 posts shall be installed within 7'.

Alternate A Steps of Installation:

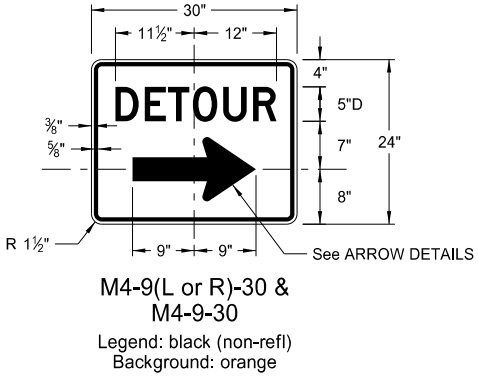
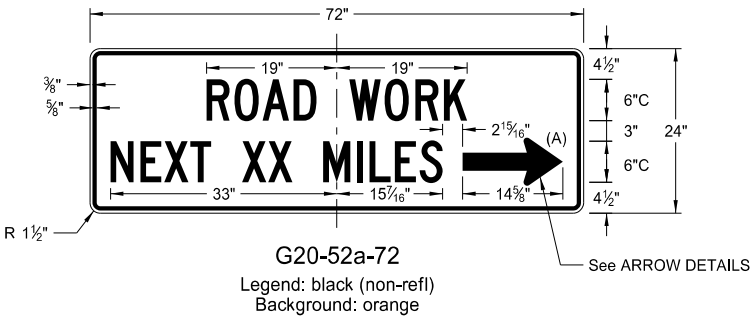
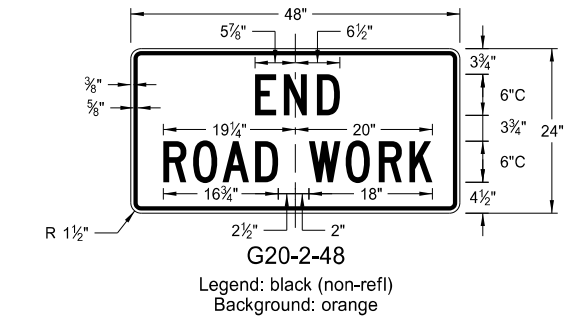
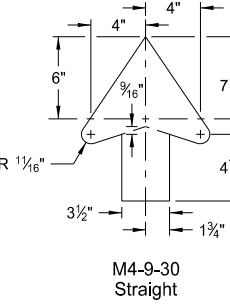
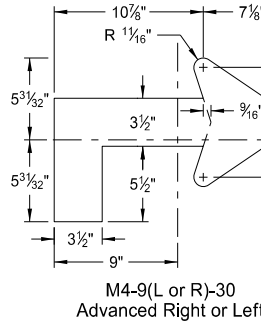
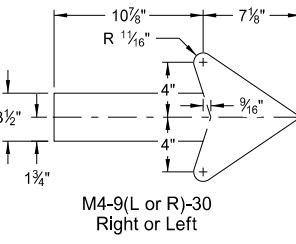
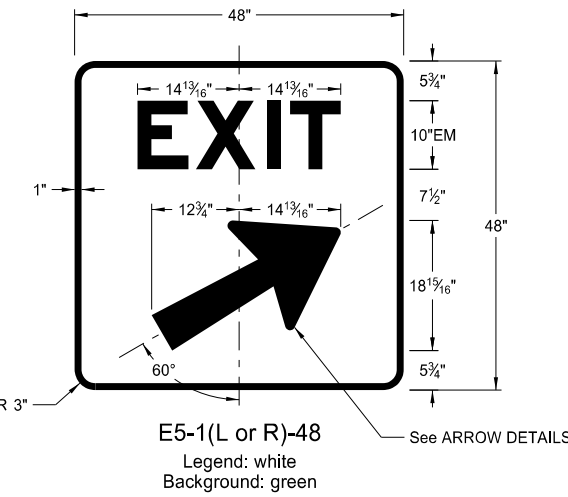
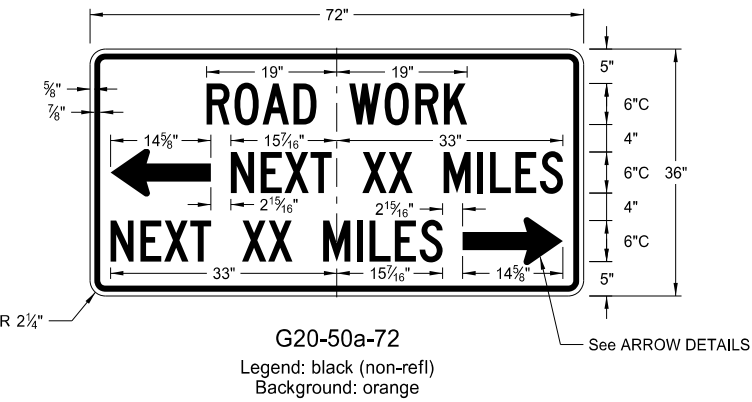
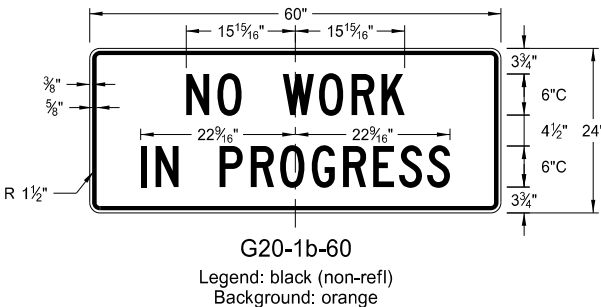
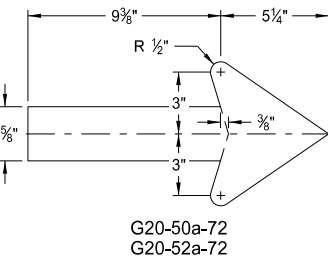
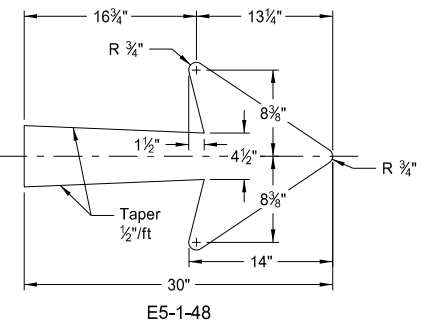
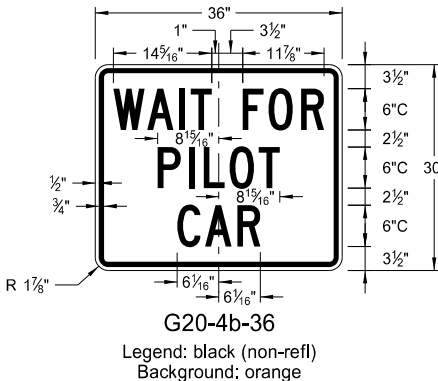
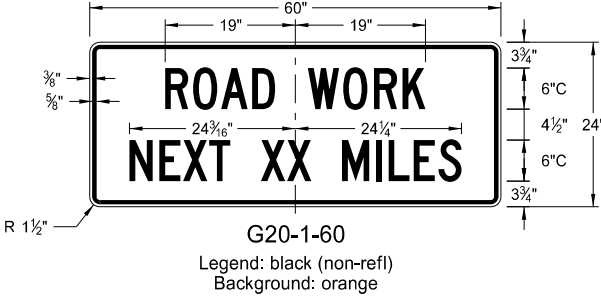
- a) Drive anchor unit to within 12" of ground level.  
b) Proper assembly established by lining up the bottom hole of retainer strap with the 6th hole from the top of the anchor unit.  
c) Assemble strap to back of anchor unit using 5/16"x2" bolt, lock washer and nut.  
d) Rotate strap 90° to left.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



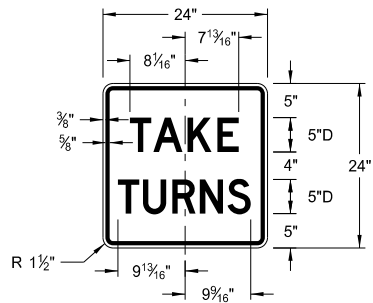
ARROW DETAILS

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

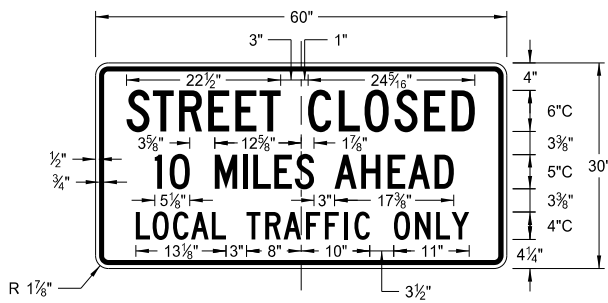
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION		This document was originally issued and sealed by  Roger Weigel, Registration Number PE- 2930 , on 8/13/13 and the original document is stored at the North Dakota Department of Transportation
8-13-13		
REVISIONS		
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CONSTRUCTION SIGN DETAILS  
REGULATORY SIGNS

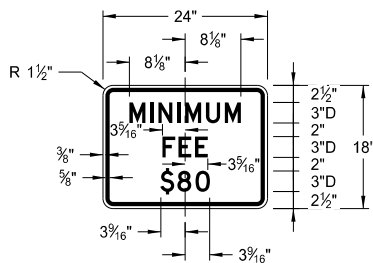
D-704-10



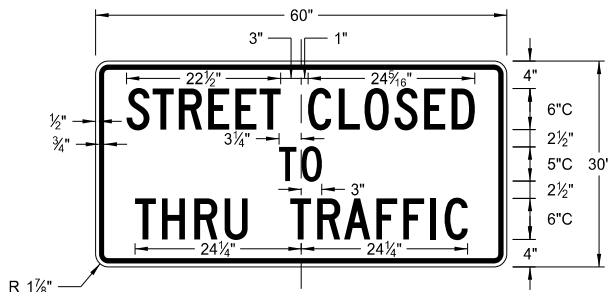
R1-50-24  
Legend: black (non-refl)  
Background: white



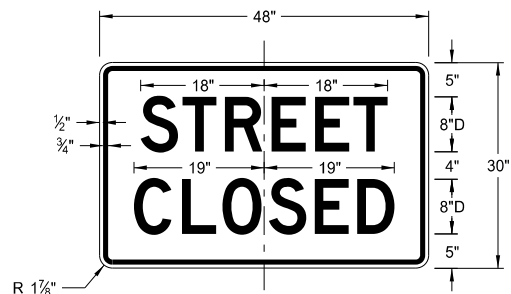
R11-3c-60  
Legend: black (non-refl)  
Background: white



R2-1a-24  
Legend: black (non-refl)  
Background: white



R11-4a-60  
Legend: black (non-refl)  
Background: white



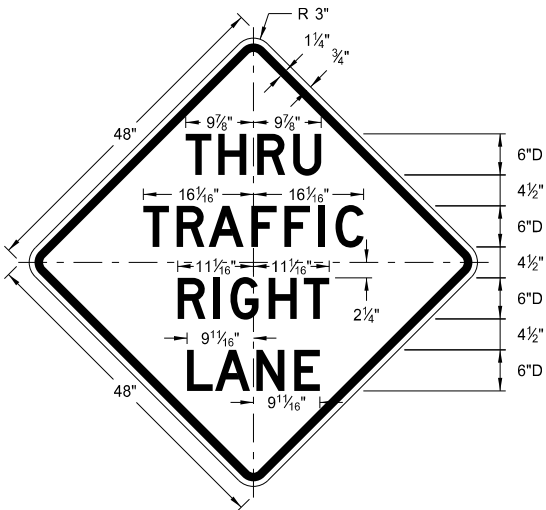
R11-2a-48  
Legend: black (non-refl)  
Background: white

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8-13-13	
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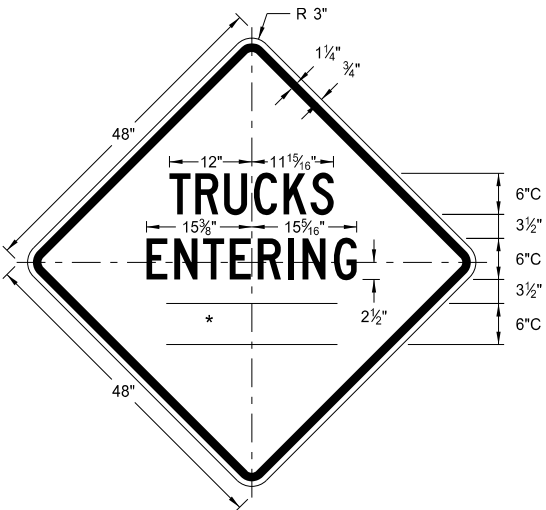
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CONSTRUCTION SIGN DETAILS  
WARNING SIGNS

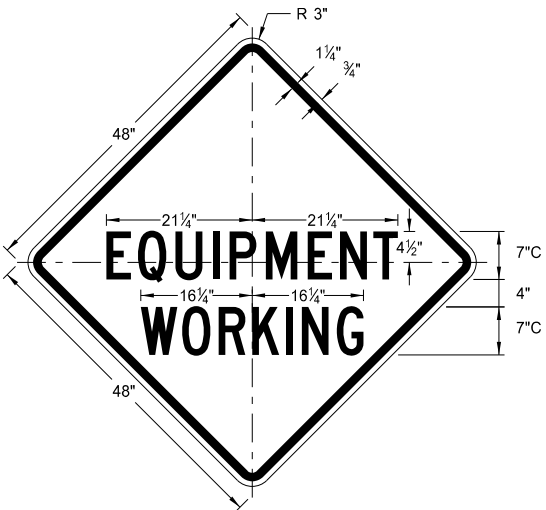
D-704-11



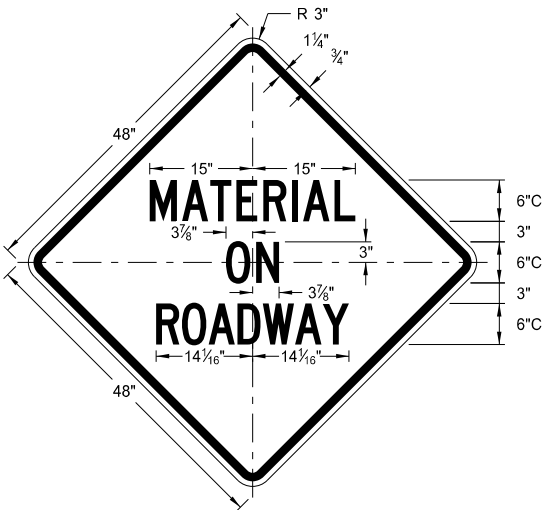
W5-8-48  
Legend: black (non-refl)  
Background: orange



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



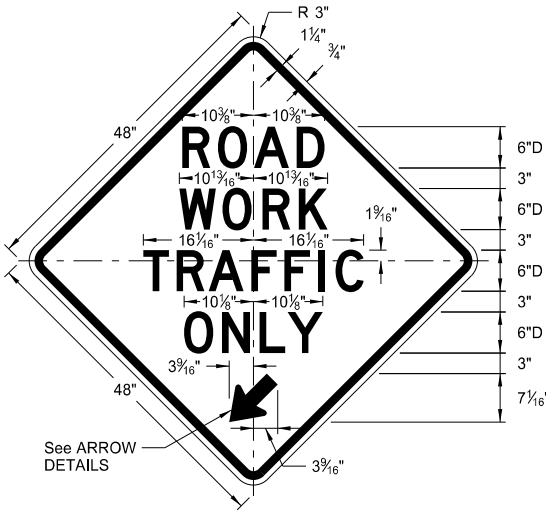
W20-51-48  
Legend: black (non-refl)  
Background: orange



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

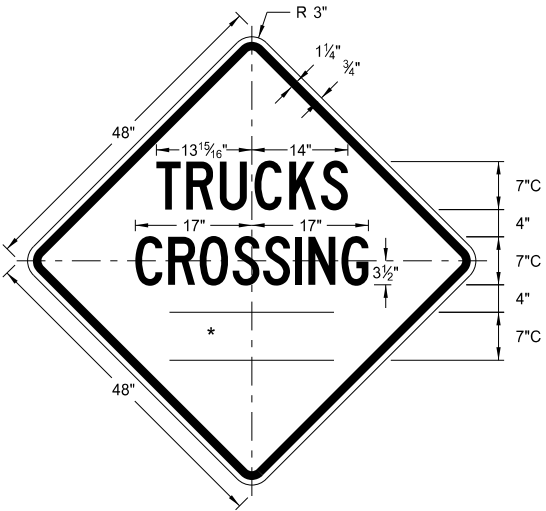
WORD	LETTER SPACING
AHEAD	Standard
200 FT	Standard
350 FT	Standard
500 FT	Standard
1000 FT	Reduce 40%
1500 FT	Reduce 40%
1/2 MILE	Reduce 50%
1 MILE	Standard

\* DISTANCE MESSAGES

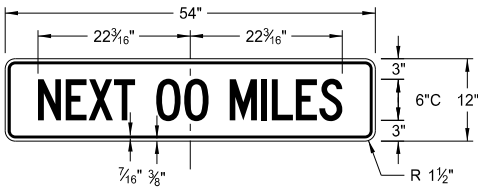


See ARROW  
DETAILS

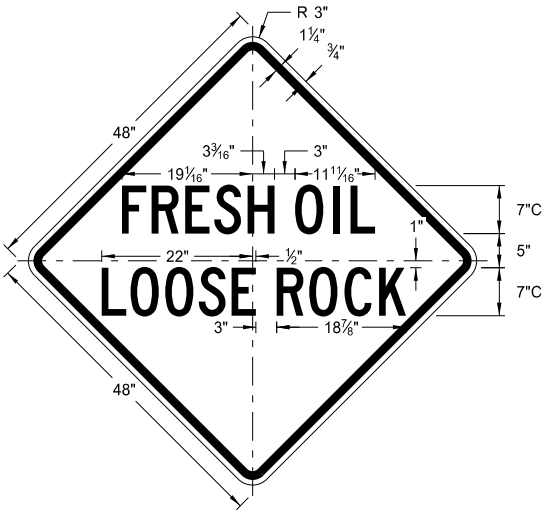
W5-9-48  
Legend: black (non-refl)  
Background: orange



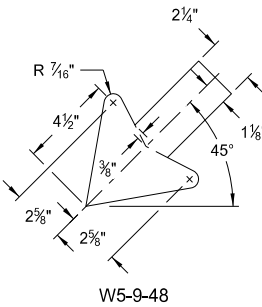
W8-55-48  
Legend: black (non-refl)  
Background: orange



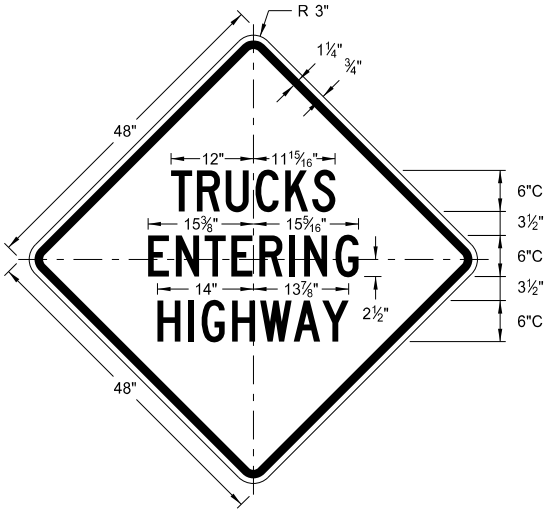
W20-52-54  
Legend: black (non-refl)  
Background: orange



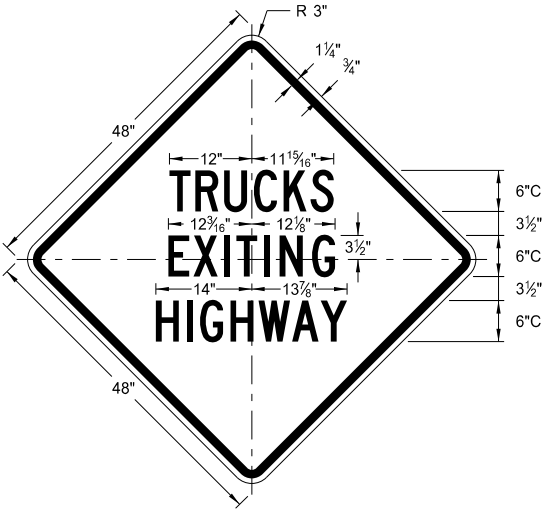
W22-8-48  
Legend: black (non-refl)  
Background: orange



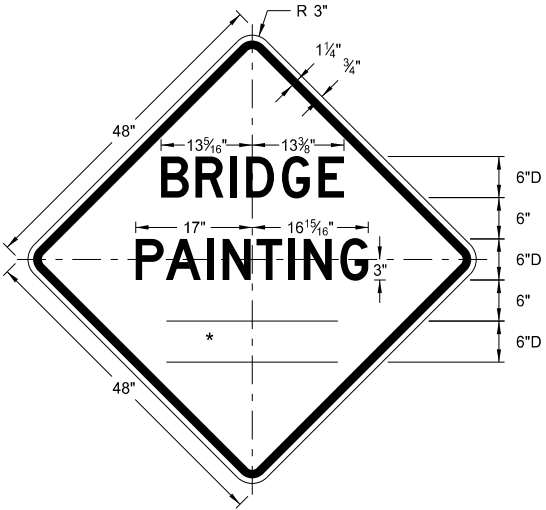
ARROW DETAILS



W8-53-48  
Legend: black (non-refl)  
Background: orange



W8-56-48  
Legend: black (non-refl)  
Background: orange



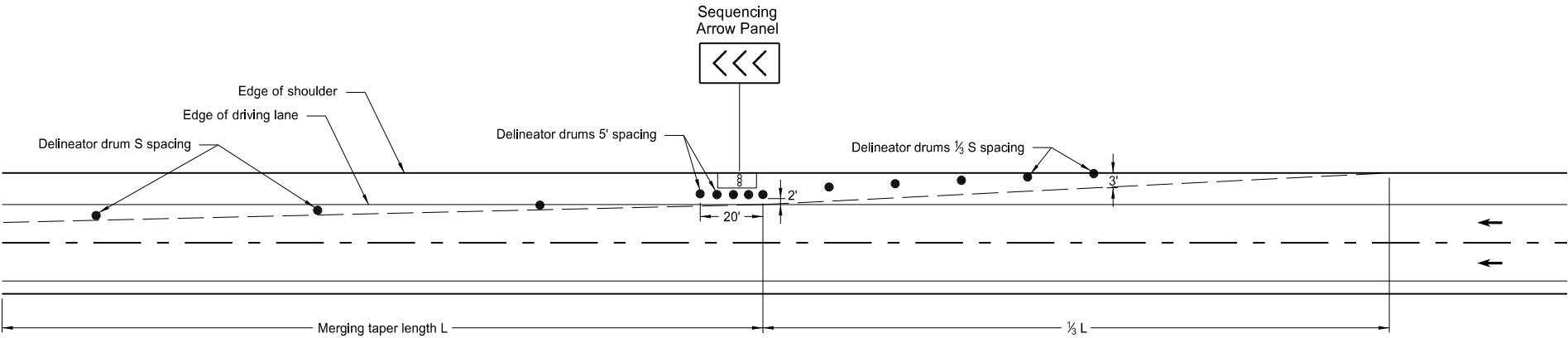
W21-50-48  
Legend: black (non-refl)  
Background: orange

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
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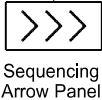
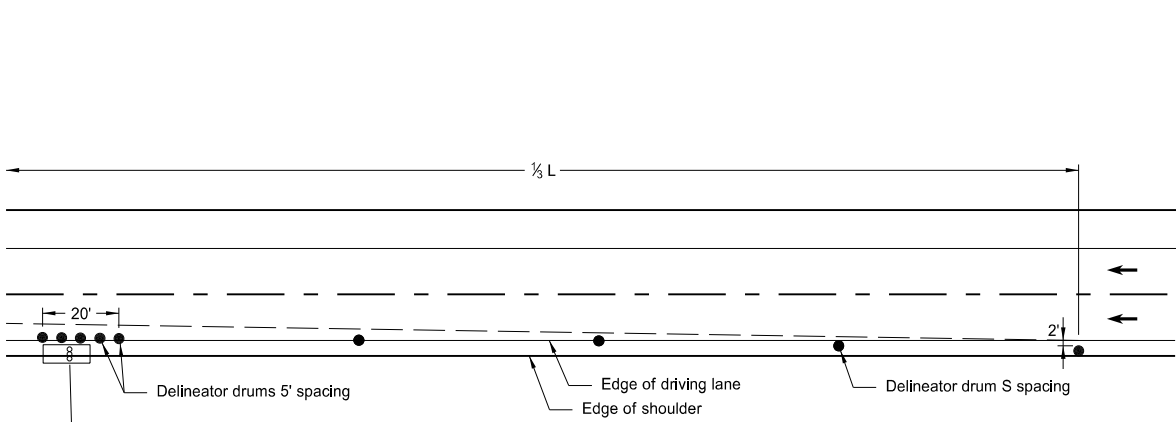
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SHOULDER CLOSURE TAPERS

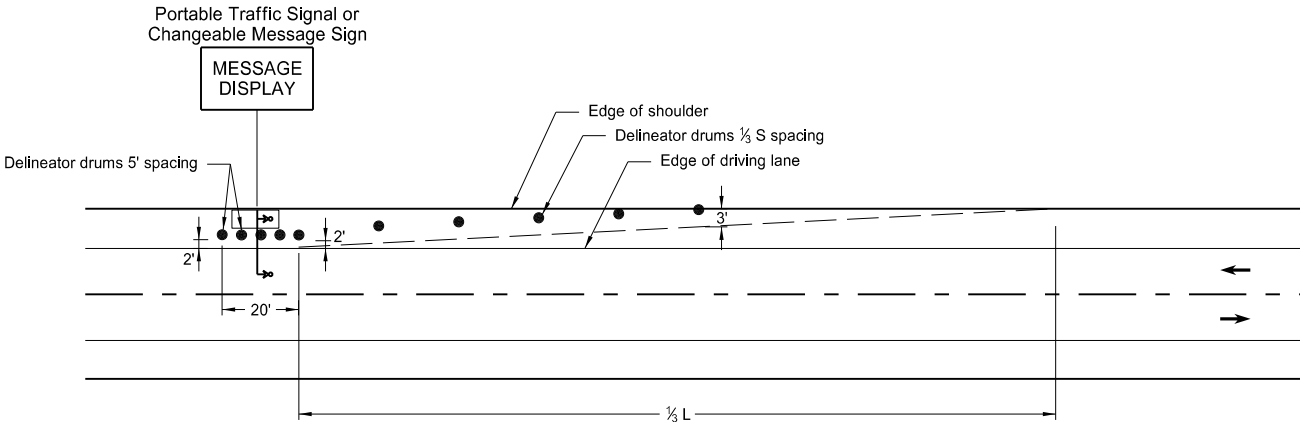
D-704-12



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



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



PORTABLE TRAFFIC SIGNAL OR CHANGEABLE MESSAGE SIGN ON SHOULDER

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

Notes:

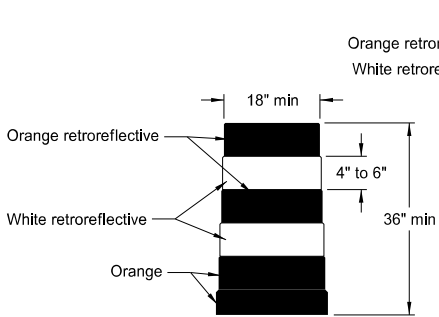
- S = Posted Speed Limit in mph  
W = Width of offset in feet  
L = Taper length in feet  
L =  $WS^2/60$  (40mph or less)  
L = WS (45mph or more)
- If a shoulder taper is used, it should have a length of approximately  $\frac{1}{3}L$ . If a shoulder is used as a travel lane, a normal merging or shifting 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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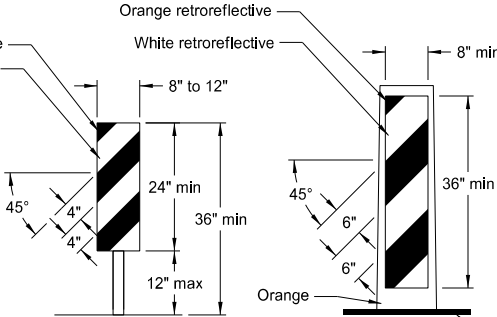
BARRICADE AND CHANNELIZING DEVICE DETAILS

D-704-13



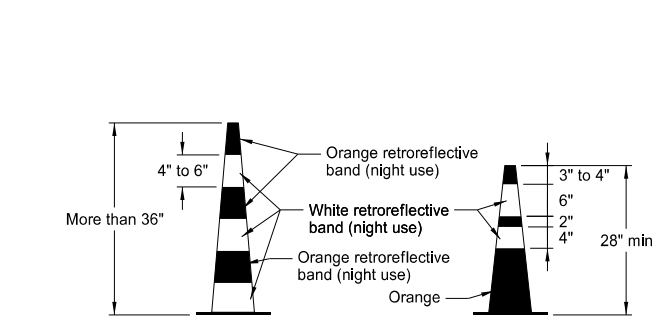
DELINEATOR DRUM

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



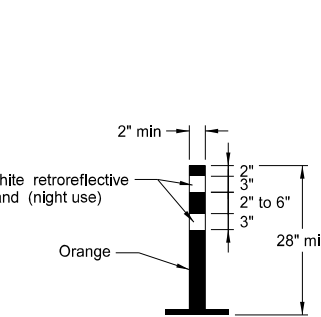
VERTICAL PANEL

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



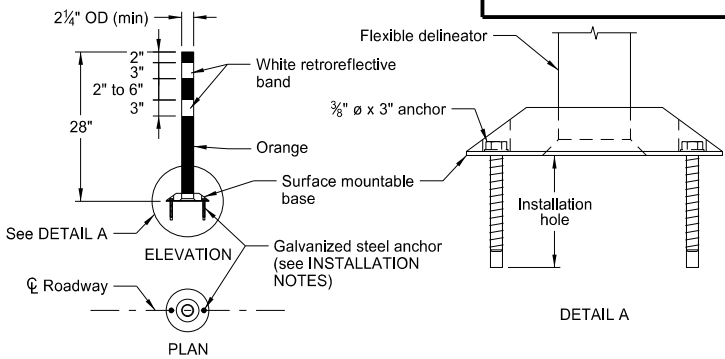
TRAFFIC CONE

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



TUBULAR MARKER

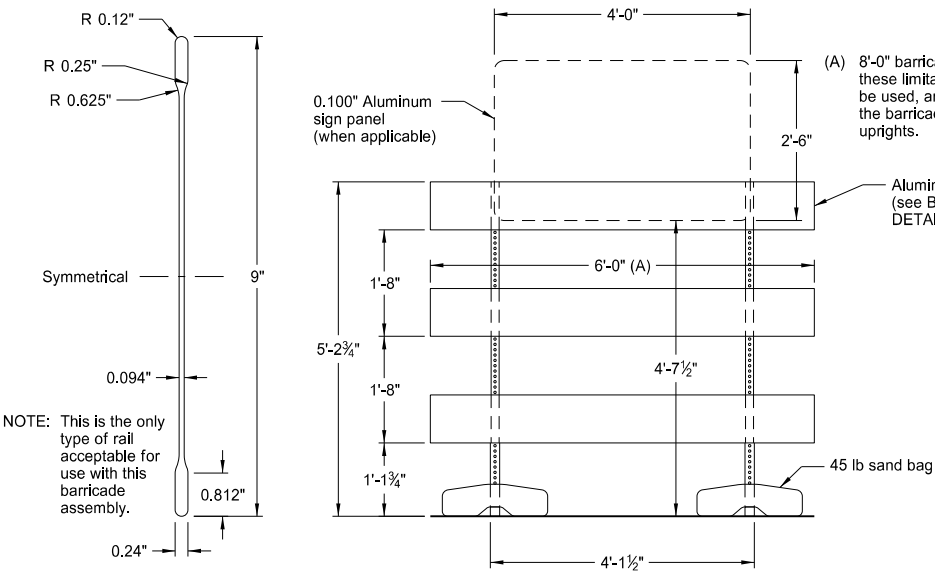
RetroreflectORIZATION of tubular markers more than 42" in height shall be provided by alternating four 4" to 6" wide orange and white stripes with the top stripe being orange.



FLEXIBLE DELINEATOR

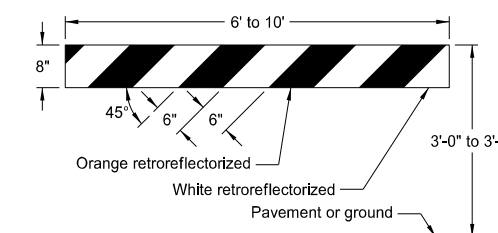
INSTALLATION NOTES:

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



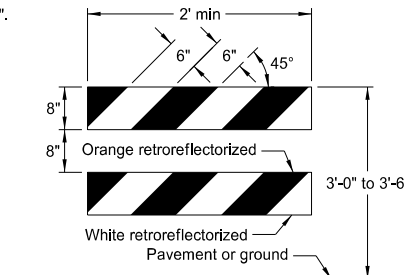
BARRICADE BLADE DETAIL

NOTE: This is the only type of rail acceptable for use with this barricade assembly.



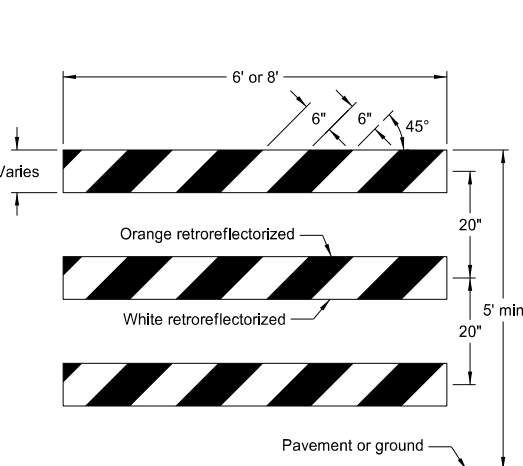
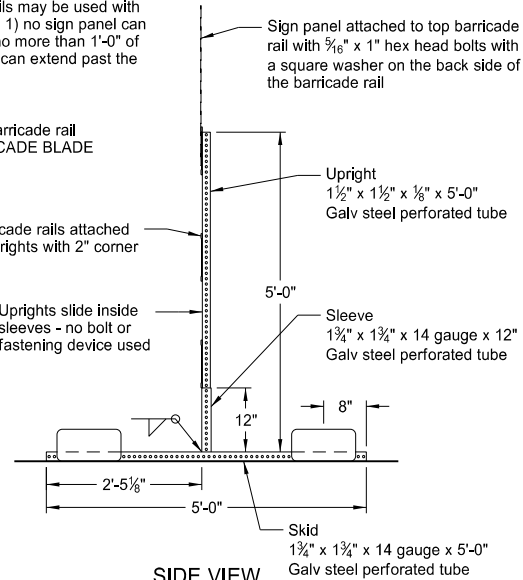
TYPE I BARRICADE

ELEVATION VIEW  
BARRICADE ASSEMBLY DETAIL  
(Aluminum Barricade Rails)

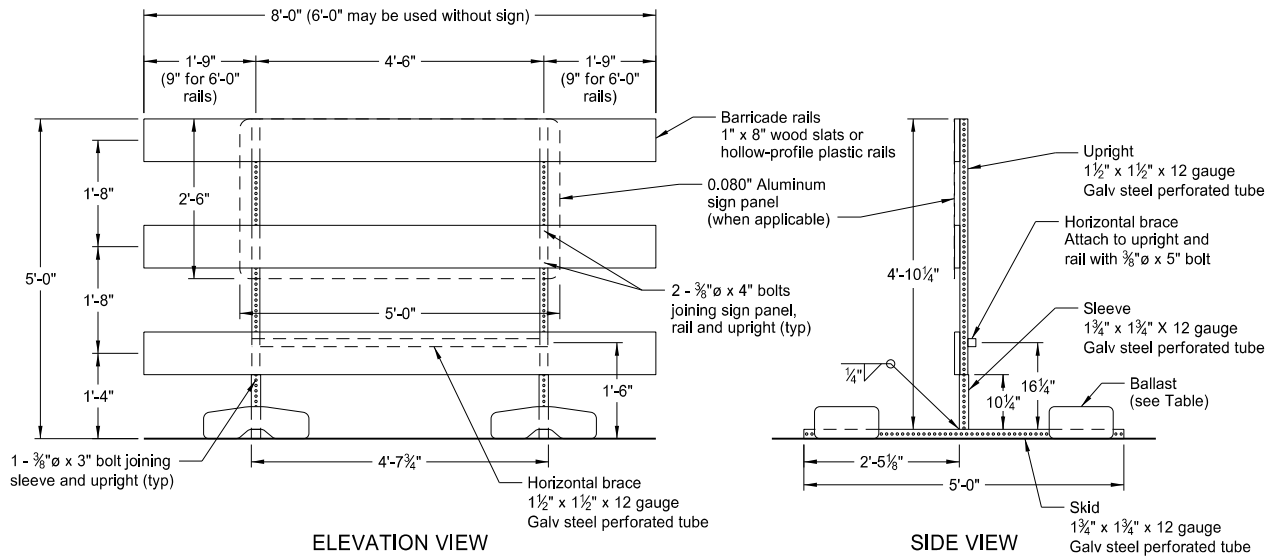


TYPE II BARRICADE

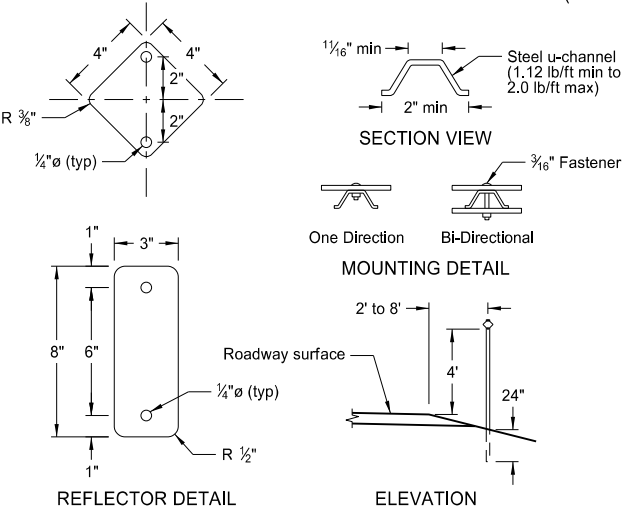
BARRICADE RAIL DETAILS



TYPE III BARRICADE

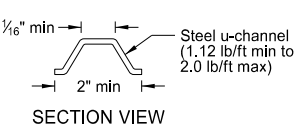


BARRICADE ASSEMBLY DETAIL  
(Wood or Plastic Rails)



REFLECTOR DETAIL

DELINEATORS



SECTION VIEW



MOUNTING DETAIL

MINIMUM BALLAST  
(For each side of barricade support)

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

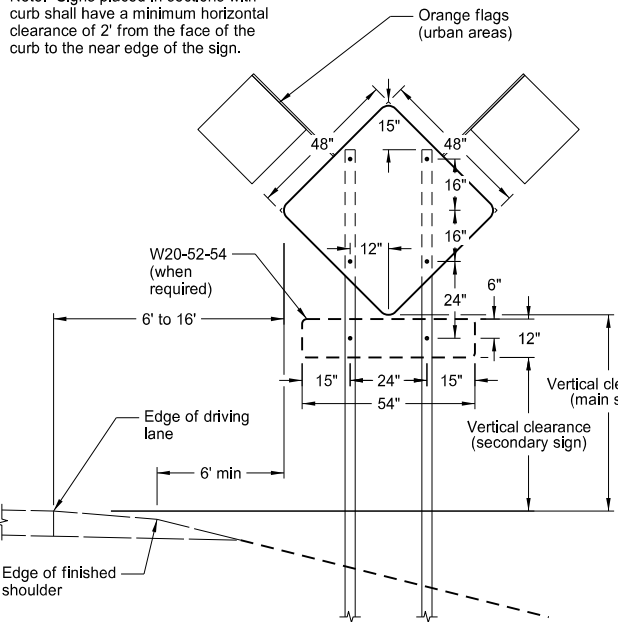
Note: The number of sandbags are based on a wind speed of 55 MPH. The sandbags are assumed to be placed at or near the ends of the skids.

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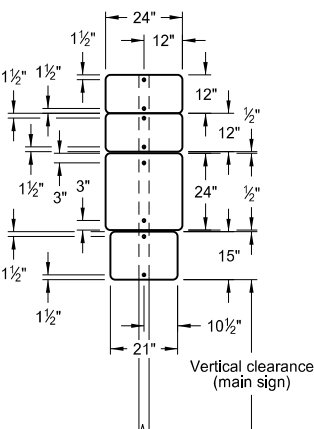
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# CONSTRUCTION SIGN PUNCHING AND MOUNTING DETAILS

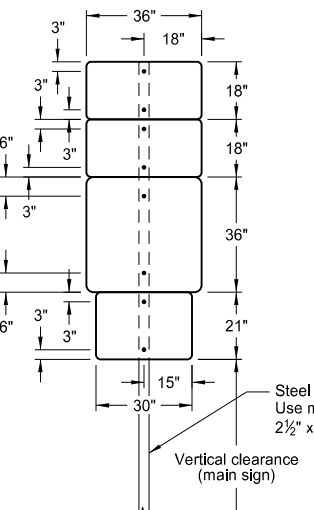
Note: Signs placed in sections with curb shall have a minimum horizontal clearance of 2' from the face of the curb to the near edge of the sign.



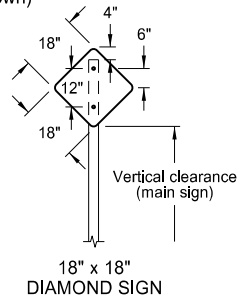
TYPICAL SECTION  
(48" x 48" diamond warning sign shown)



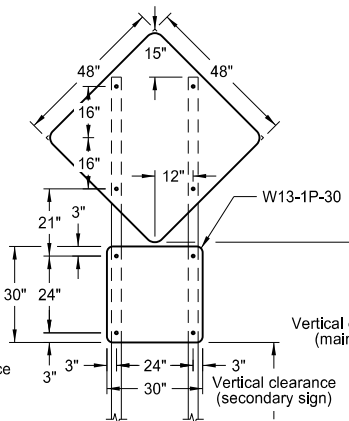
24" x 24" ROUTE MARKER ASSEMBLY



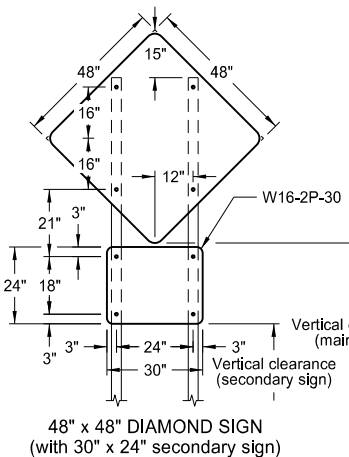
36" x 36" ROUTE MARKER ASSEMBLY



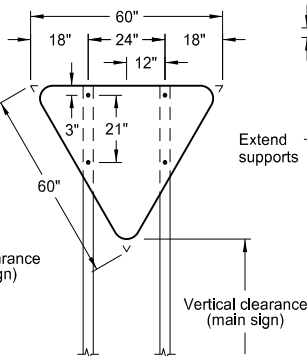
18" x 18" DIAMOND SIGN



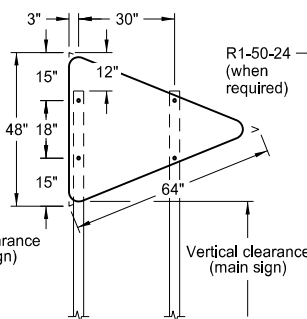
48" x 48" DIAMOND SIGN  
(with 30" x 30" secondary sign)



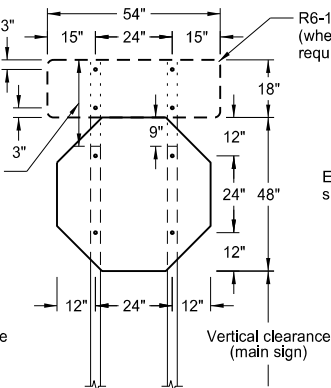
48" x 48" DIAMOND SIGN  
(with 30" x 24" secondary sign)



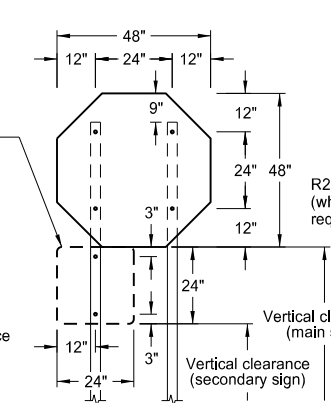
R1-2-60 - YIELD SIGN



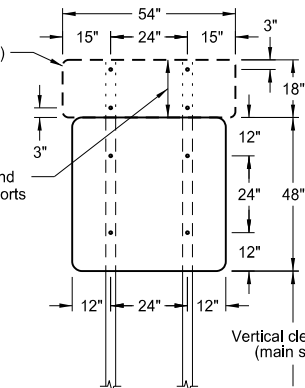
W14-3-64 - PENNANT SIGN



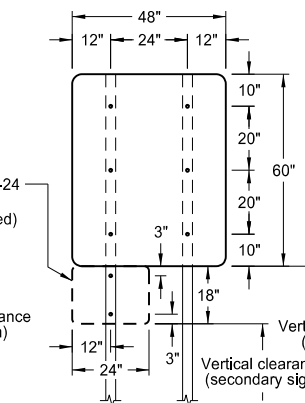
R1-1-48 - STOP SIGN  
(with R6-1-54 sign as required)



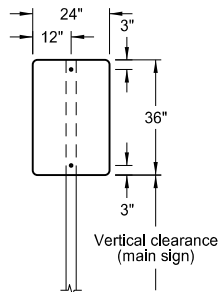
R1-1-48 - STOP SIGN  
(with R1-50-24 sign as required)



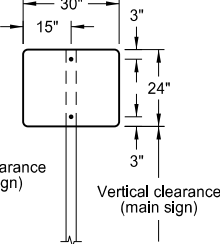
48" x 48" SIGN  
(with R6-1-54 sign as required)



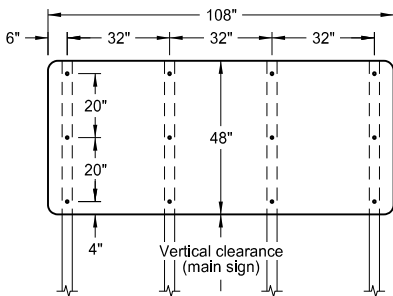
48" x 48" SIGN  
(with R2-1a-24 sign as required)



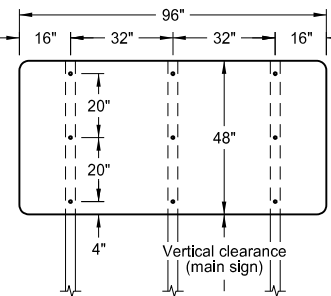
24" x 36" SIGN



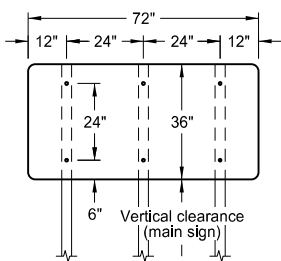
30" x 24" SIGN



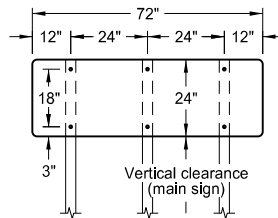
108" x 48" SIGN



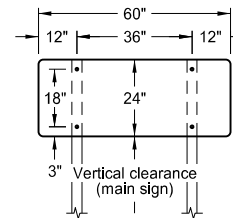
96" x 48" SIGN



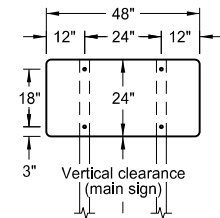
72" x 36" SIGN



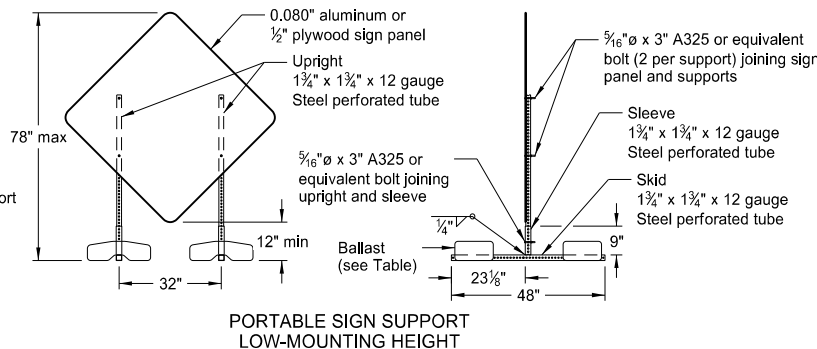
72" x 24" SIGN



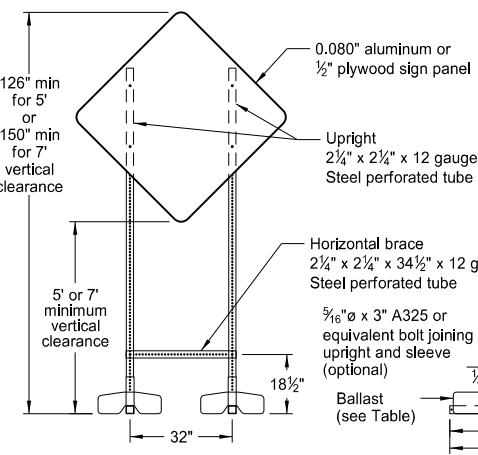
60" x 24" SIGN



48" x 24" SIGN



PORTABLE SIGN SUPPORT  
LOW-MOUNTING HEIGHT



PORTABLE SIGN SUPPORT  
HIGH-MOUNTING HEIGHT

## 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.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-4-13	
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11-14-13	Revised Note 6.

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Roger Weigel,  
Registration Number  
PE-2930,  
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# 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.

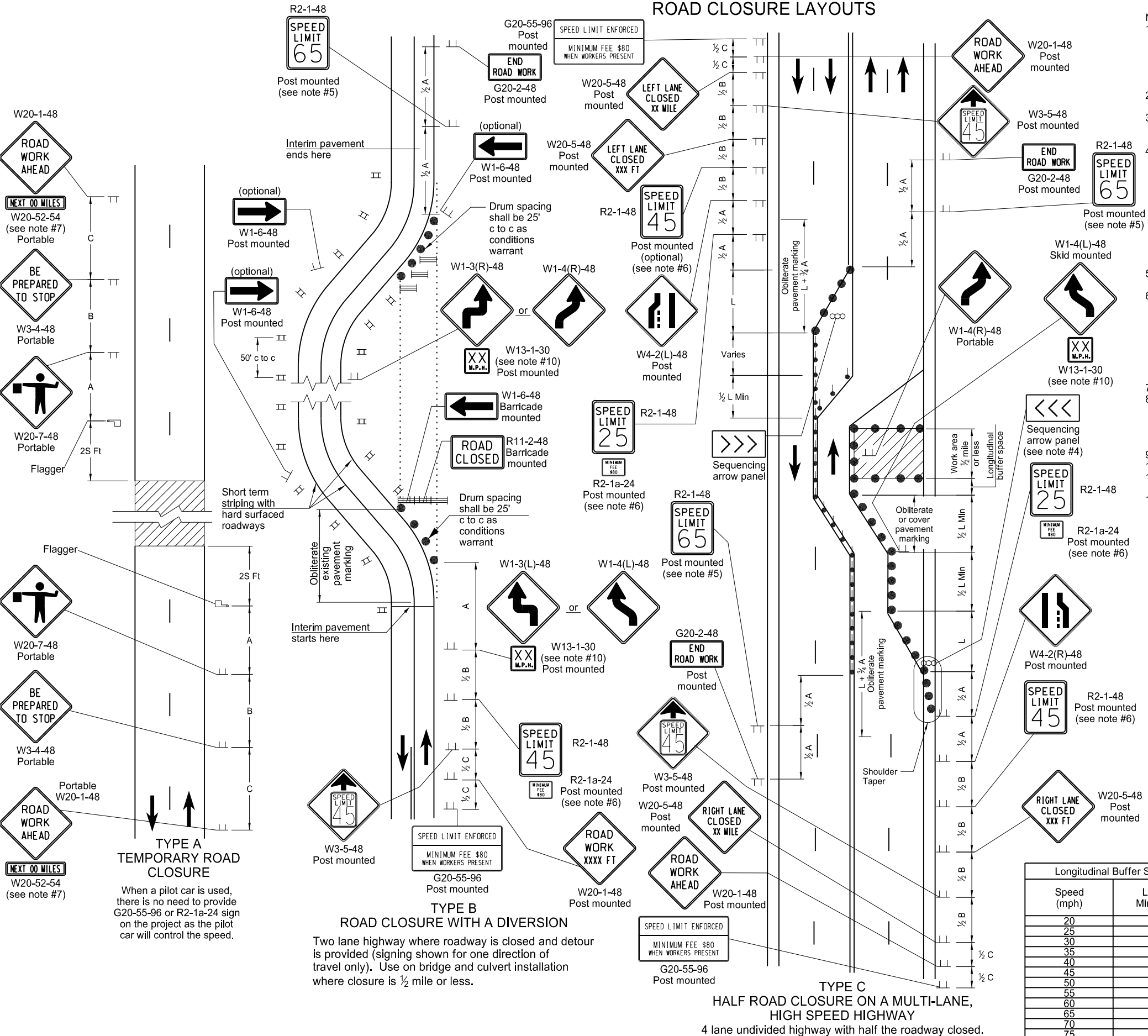
ADVANCE WARNING SIGN SPACING			
Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway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

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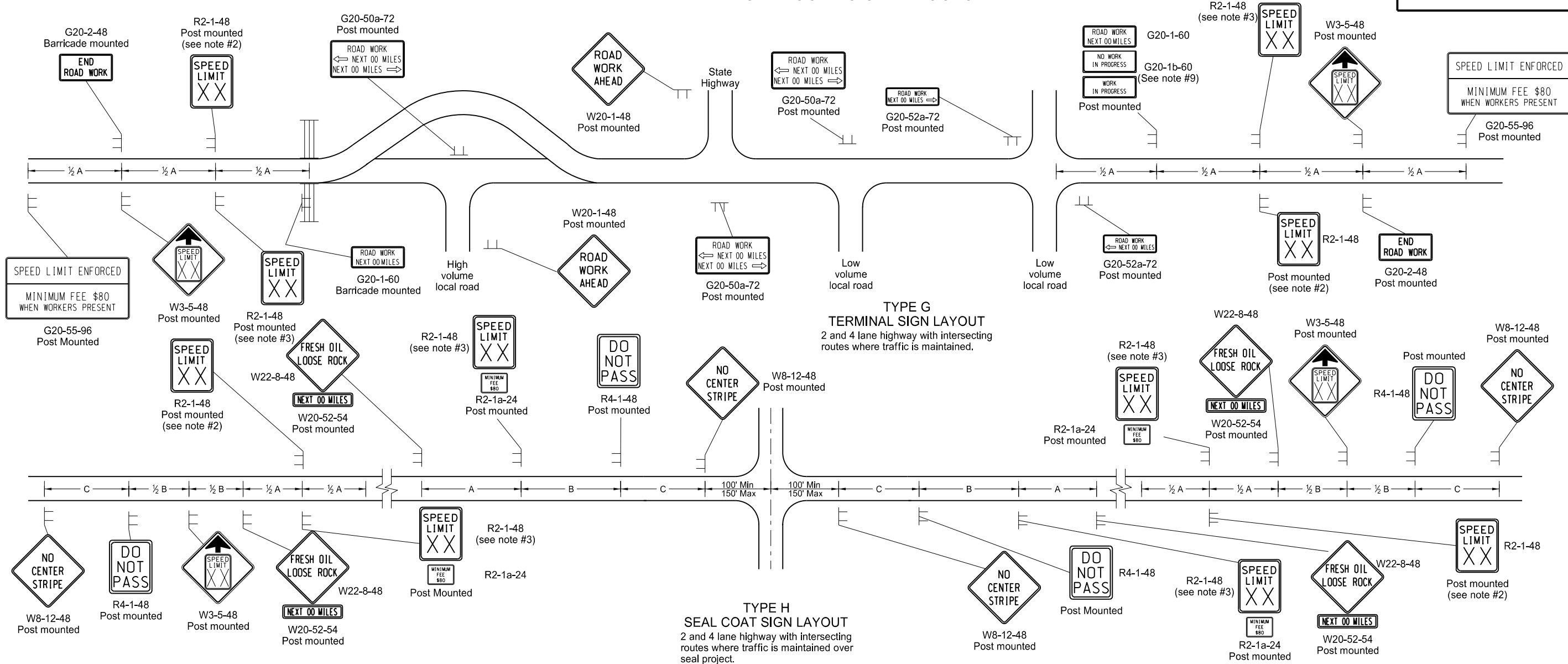
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TERMINAL AND SEAL COAT SIGN LAYOUTS

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.

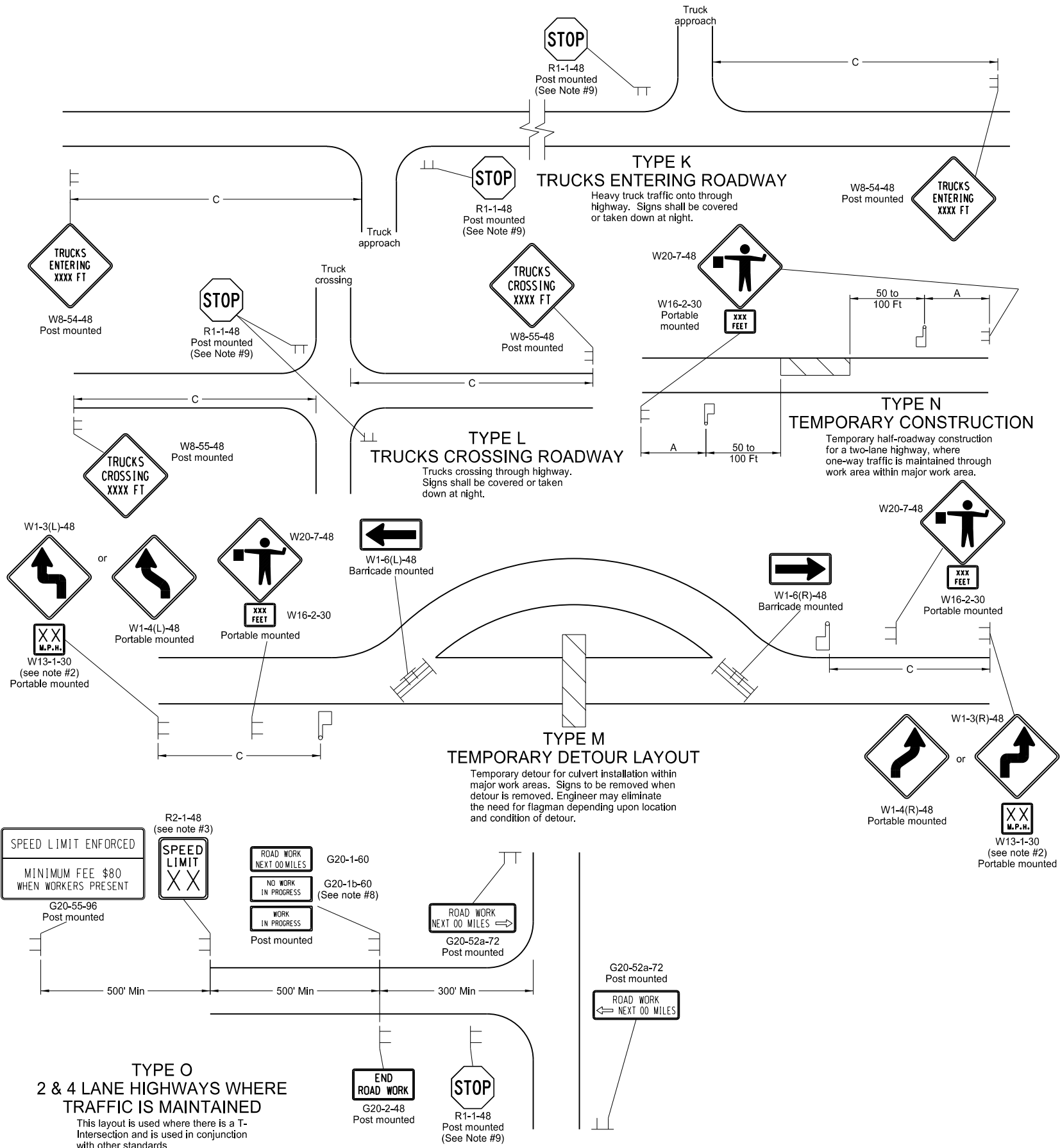
KEY	
	Type III barricade
	Sign

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 1/2 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.
  - 5. Obliterated or covered pavement marking shall be paid for as Obliteration of Pavement Marking. The covering shall be approved by the engineer.
  - 6. The contractor has the option of using portable sign supports in lieu of post mounted signs in accordance with the NDDOT Standard Specifications.
  - 7. The contractor shall install the G20-1b-60 sign when work is suspended for winter.
  - 8. If existing stop sign is in place, a 48" stop sign is not required.
  - 9. 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.
  - 10.

KEY

- Type III barricade
- Work area
- Sign
- Flagger

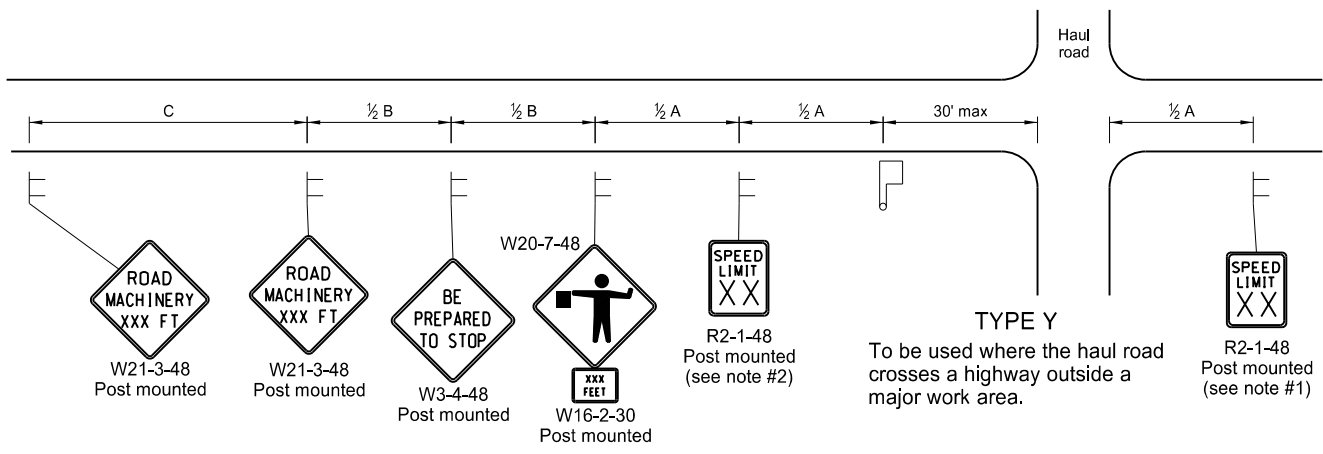
ADVANCE WARNING SIGN SPACING			
Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway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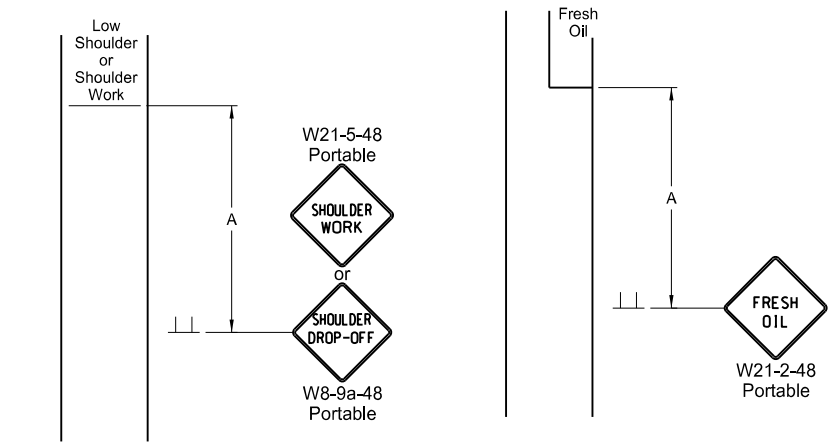
MISCELLANEOUS SIGN LAYOUTS

D-704-26



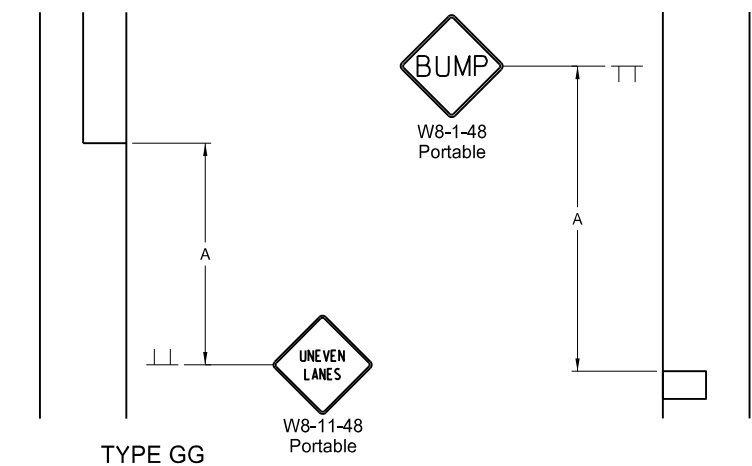
**TYPE Y**  
To be used where the haul road crosses a highway outside a major work area.

R2-1-48  
Post mounted  
(see note #1)



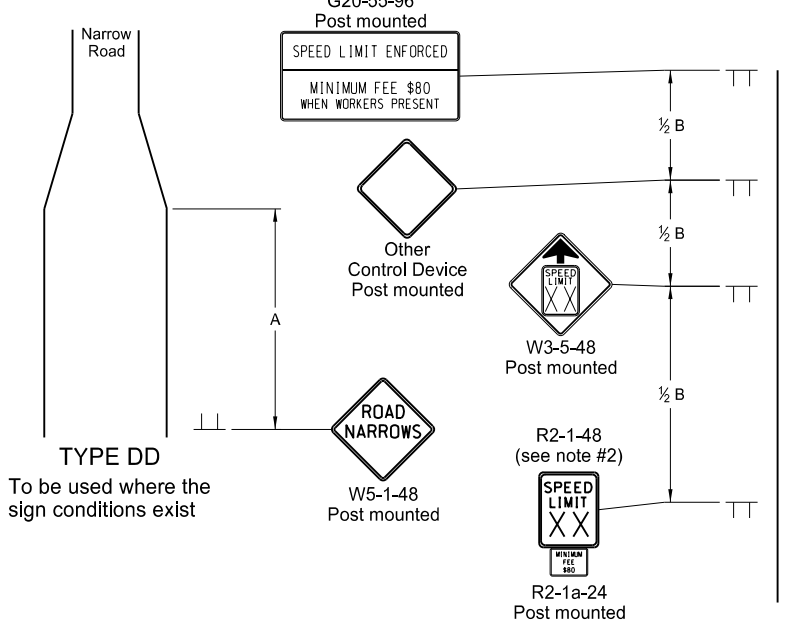
**TYPE BB**  
To be used within a major work area where the sign conditions exist

**TYPE CC**  
To be used where the sign conditions exist



**TYPE GG**  
To be used where a difference of elevation between lanes exist

**TYPE EE**  
To be used where the sign conditions exist



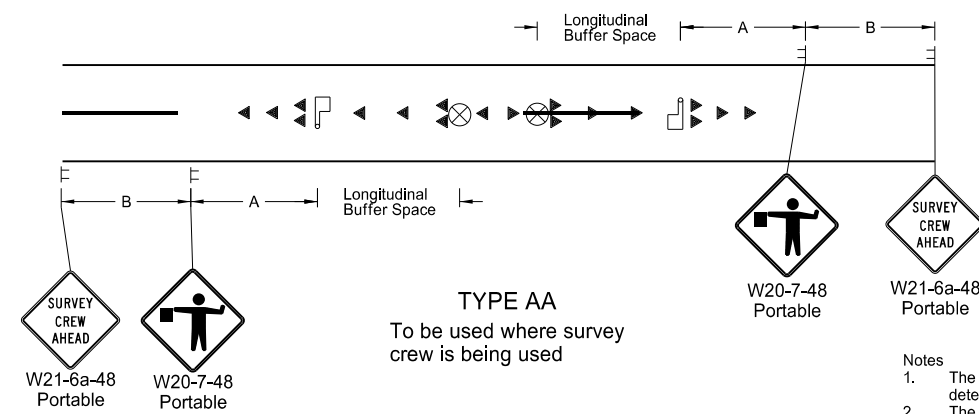
**TYPE DD**  
To be used where the sign conditions exist

**TYPE Z**  
To be used where speed zone is needed

W3-5-48  
Post mounted

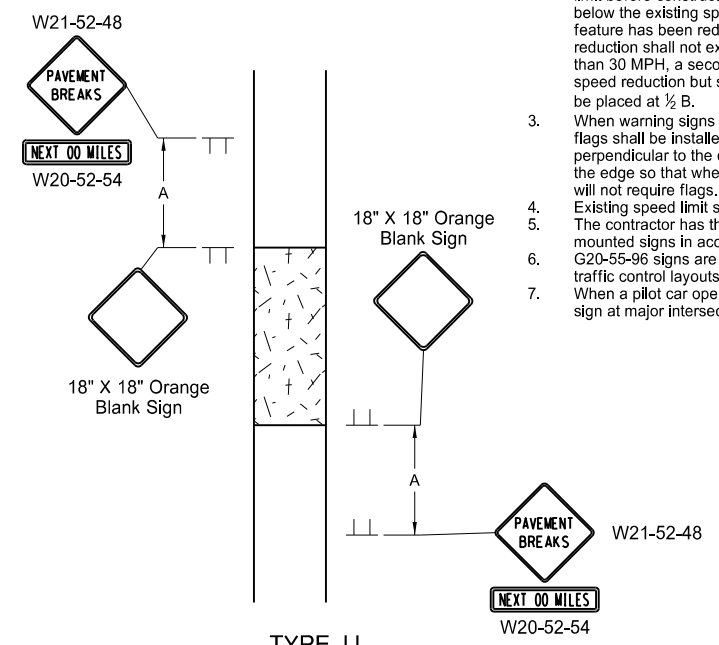
R2-1-48  
(see note #2)

R2-1a-24  
Post mounted



**TYPE AA**  
To be used where survey crew is being used

**TYPE KK**  
To be used at major intersections within pilot car control area



**TYPE JJ**  
To be used where there is a break in the pavement. These signs may be skid mounted or post mounted and shall be installed when conditions exist and removed when not applicable.

- Notes
1. The speed limit shall be re-established. The exact speed limit shall be determined in the field, dependent on location and conditions.
  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 1/2 B.
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  4. Existing speed limit signs within a reduced speed zone shall be covered.
  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. G20-55-96 signs are not required if this standard is part of other traffic control layouts, or the work is less than 15 days.
  7. When a pilot car operation is used, place a G20-4b-36 "Wait For Pilot Car" sign at major intersections within pilot car control area.

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

\* Posted speed, off-peak 85th percentile speed prior to work starting, or the anticipated operating speed in mph.

**KEY**

Sign (represented by a sign symbol)

Cones (represented by a cone symbol)

Flagger (represented by a flagger symbol)

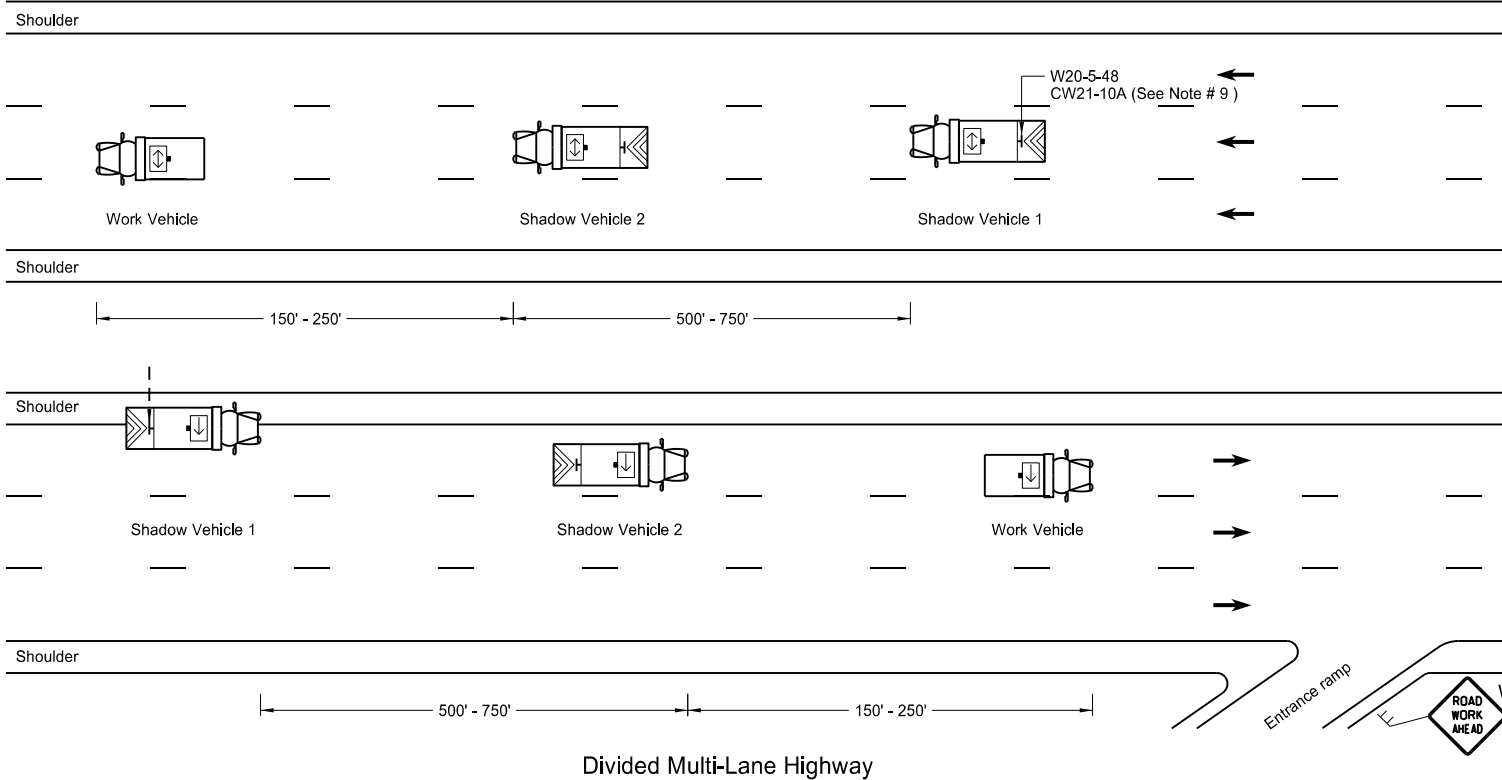
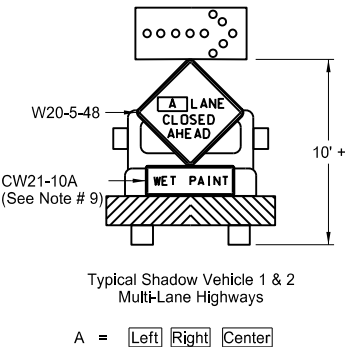
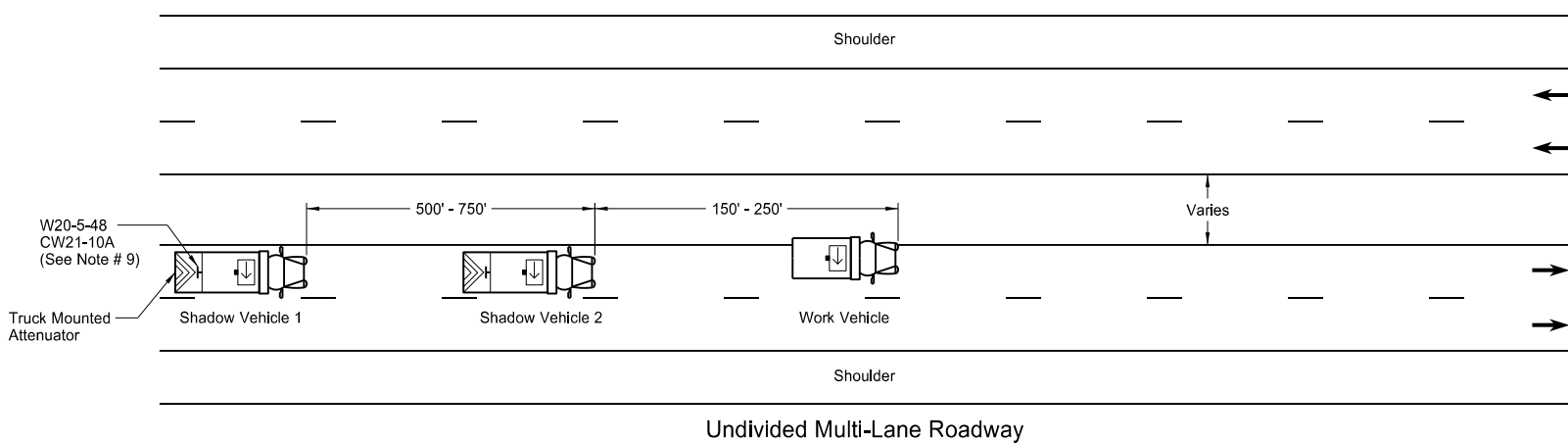
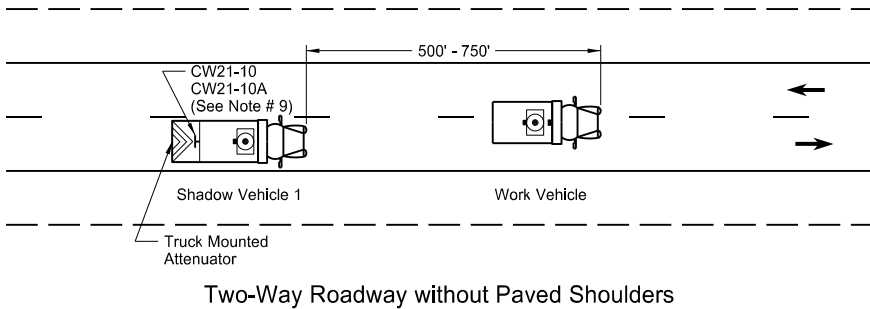
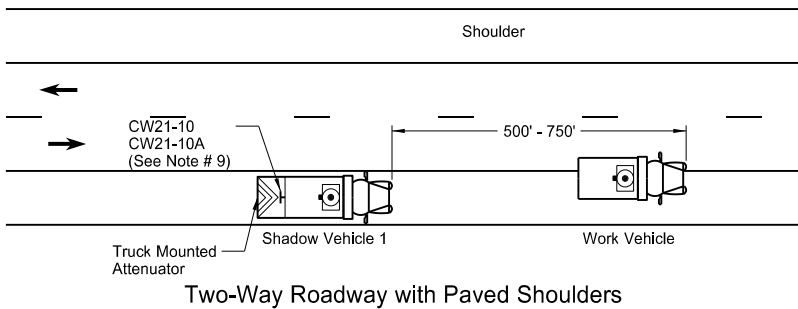
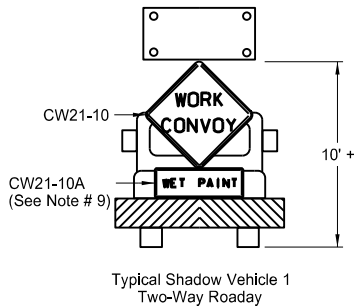
ADVANCE WARNING SIGN SPACING			
Road Type	Distance Between Signs Min. (ft)		
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Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

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9-27-13	
REVISIONS	
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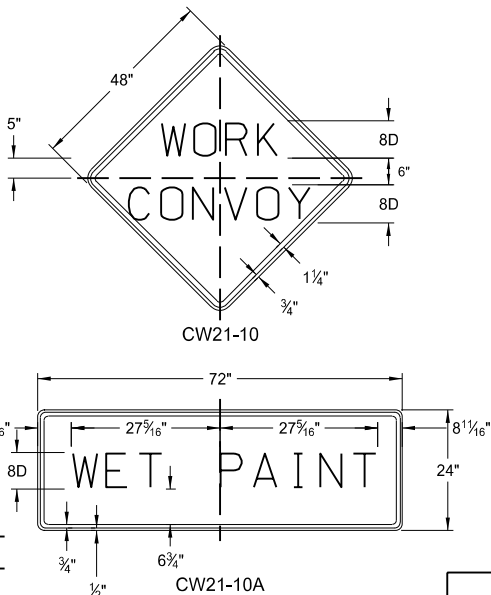
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TRAFFIC CONTROL PLAN FOR MOVING OPERATIONS

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

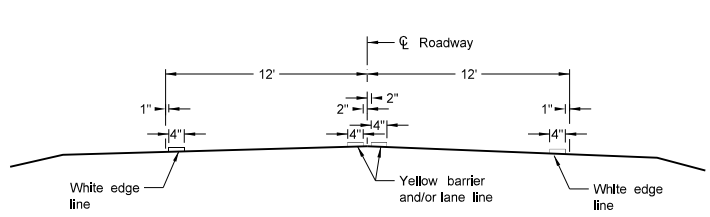
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-27-13	
REVISIONS	
DATE	CHANGE
6-18-14	Removed shadow vehicle 2 on two lane roadways

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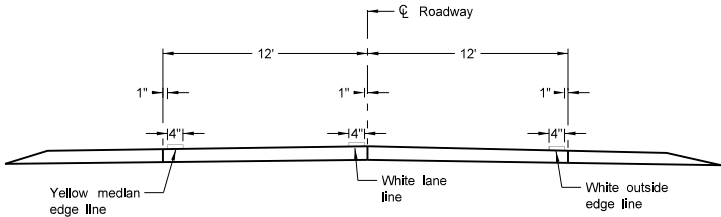
PAVEMENT MARKING

D-762-4

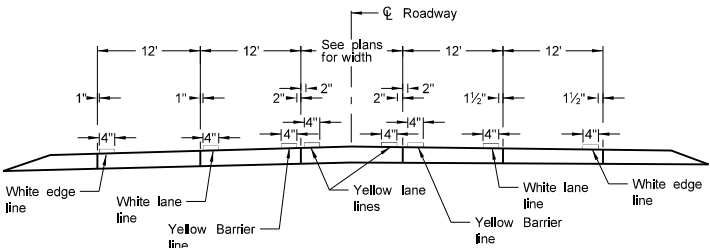
NOTES:  
1. Edge lines shall be continued through private drives and field drives and broken for intersections.



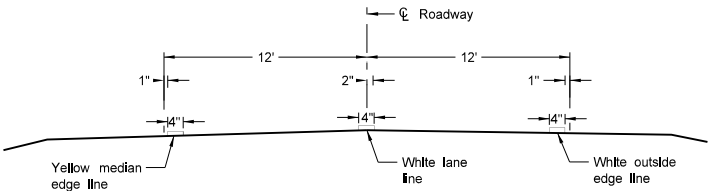
Two Lane Two Way  
RURAL ROADWAY



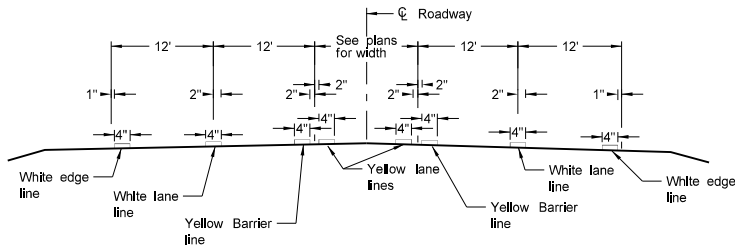
Two Lane Roadway  
INTERSTATE HIGHWAY  
Concrete Section



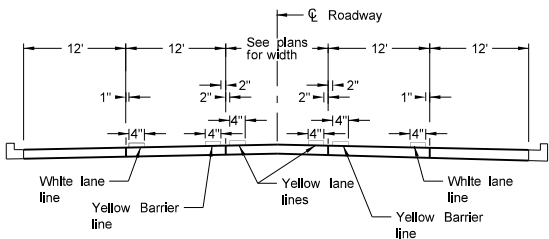
RURAL FIVE LANE ROADWAY  
Concrete Section



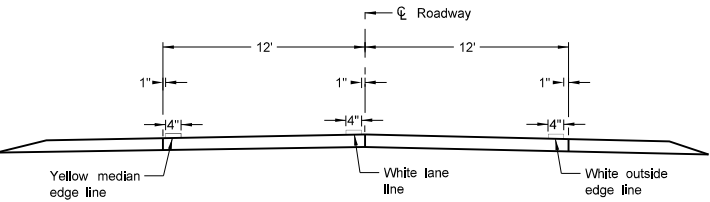
Two Lane Divided  
Rural Roadway  
PRIMARY HIGHWAY  
Asphalt Section



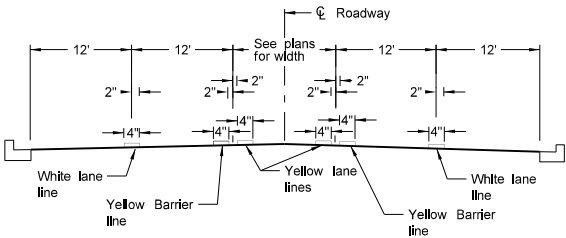
RURAL FIVE LANE ROADWAY  
Asphalt Section



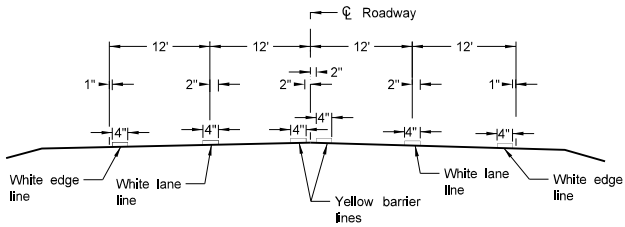
URBAN FIVE LANE SECTION  
Concrete Section



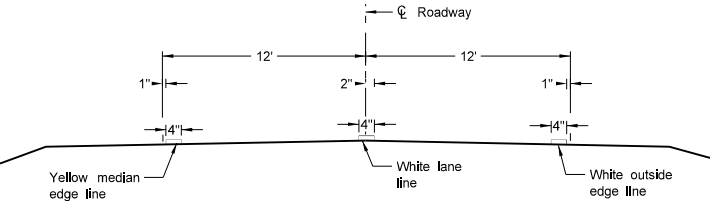
Two Lane Roadway  
PRIMARY HIGHWAY  
Concrete Section



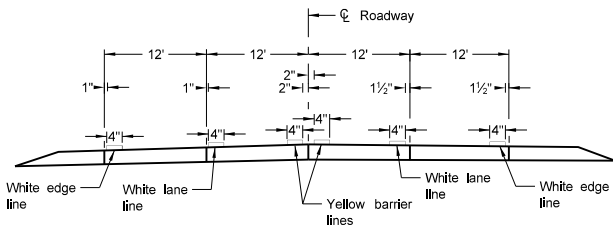
URBAN FIVE LANE SECTION  
Asphalt Section



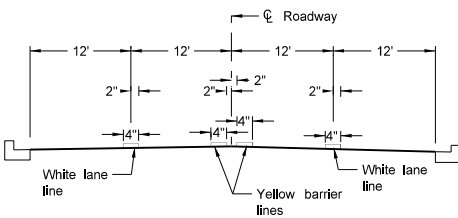
RURAL FOUR LANE ROADWAY  
Asphalt Section



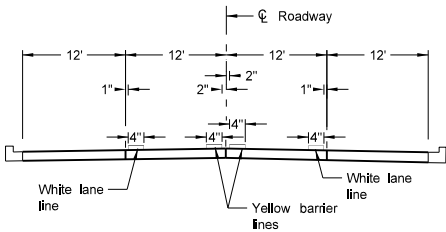
Two Lane Roadway  
INTERSTATE HIGHWAY  
Asphalt Section



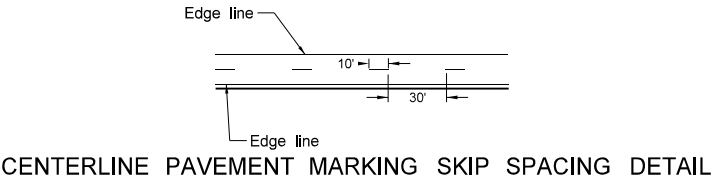
RURAL FOUR LANE ROADWAY  
Concrete Section



URBAN FOUR LANE SECTION  
Asphalt Section



URBAN FOUR LANE SECTION  
Concrete Section



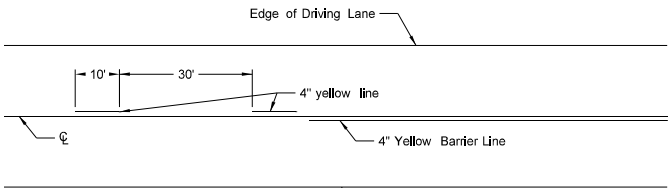
CENTERLINE PAVEMENT MARKING SKIP SPACING DETAIL

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

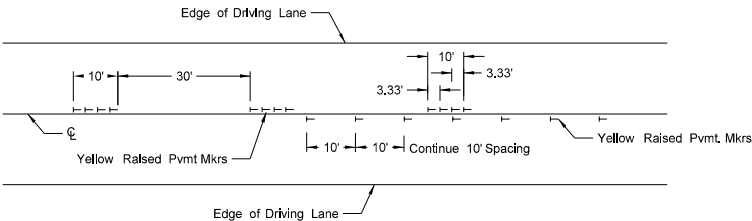
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SHORT-TERM PAVEMENT MARKING

D-762-6

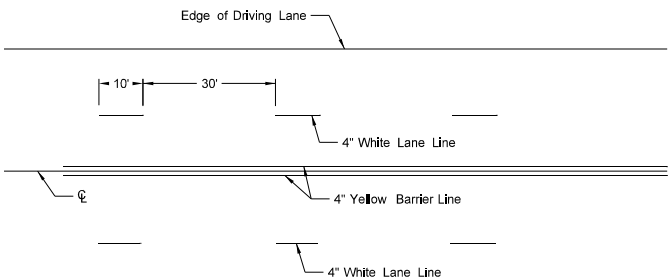


Painted or Tape Lines

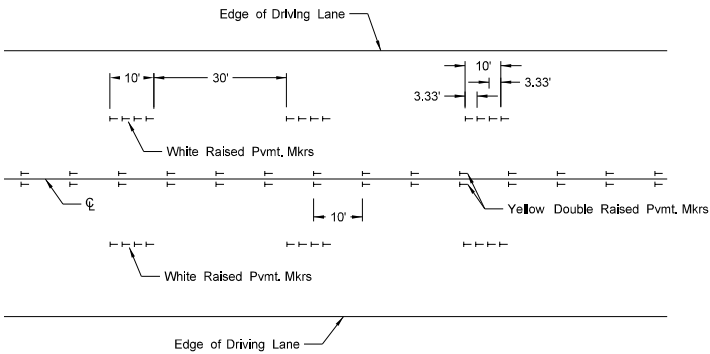


Raised Pavement Markers

TWO-LANE TWO-WAY ROADWAY

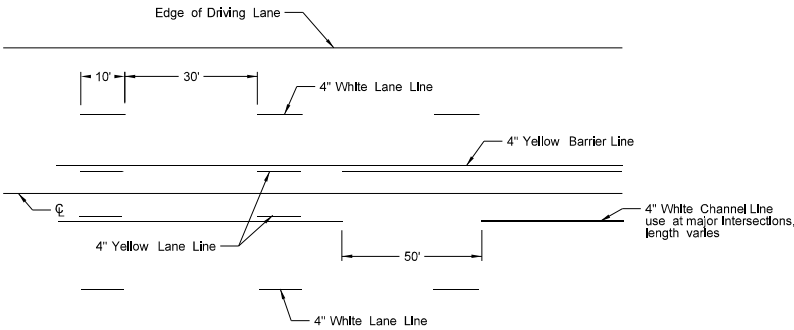


Painted or Tape Lines

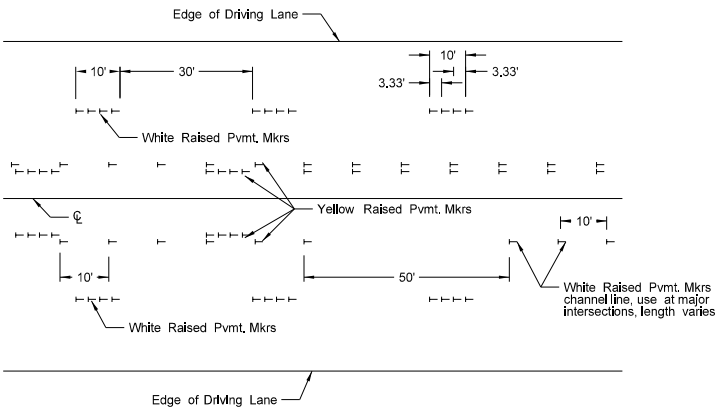


Raised Pavement Markers

FOUR LANE ROADWAY

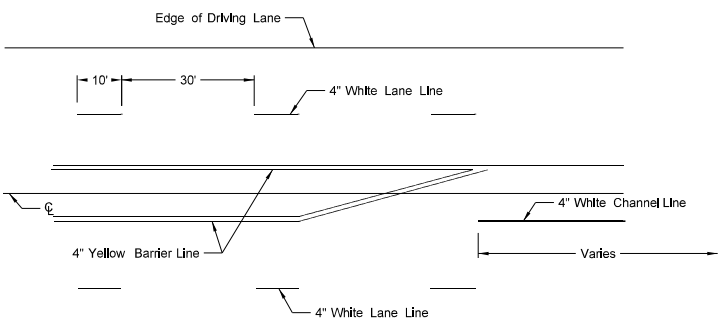


Painted or Tape Lines

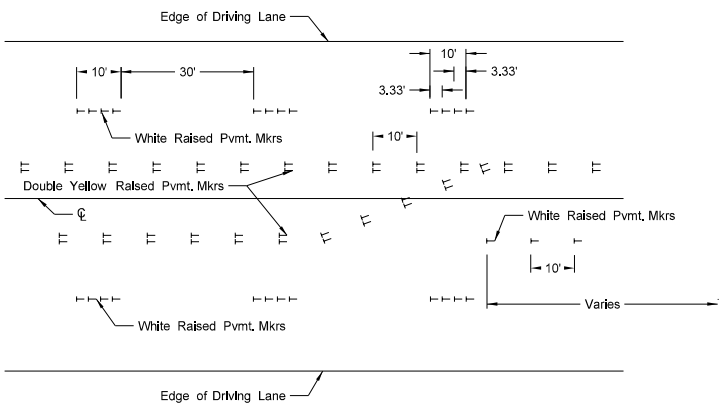


Raised Pavement Markers

FIVE LANE ROADWAY TWO WAY LEFT TURN



Painted or Tape Lines



Raised Pavement Markers

FIVE LANE ROADWAY WITH MARKED ISLANDS

- NOTES:
- Two-lane two-way roadways shall have no passing zones placed as shown. No passing zone signs may be placed in lieu of short term no passing zone pavement markings. These signs will be allowed to remain in place for three days, at which time the short term no passing zone pavement marking shall be placed.
  - Short term center line stripe (paint) on top lift shall be carefully placed with exact spacing so that the permanent stripe will match when applied.
  - Raised markers and tape markings shall be removed after permanent pavement marking has been installed. Removed markings shall become the property of the contractor.

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

This document was originally issued and sealed by Roger Weigel, Registration Number PE- 2930, on 12-1-10 and the original document is stored at the North Dakota Department of Transportation