

NDDOT ABBREVIATIONS

D-101-1

|        |                                                                                                                                                                                                                 |         |                                          |            |                                   |        |                           |
|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|------------------------------------------|------------|-----------------------------------|--------|---------------------------|
| ?      | 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. | C Gdrl  | cable guardrail                          | Culv       | culvert                           | FOS    | factor of safety          |
| Abn    | abandoned                                                                                                                                                                                                       | Calc    | calculate                                | C&G        | curb & gutter                     | Fed    | Federal                   |
| Abut   | abutment                                                                                                                                                                                                        | CIP     | cast iron pipe                           | CI         | curb inlet                        | FP     | feed point                |
| Adj    | adjusted                                                                                                                                                                                                        | CB      | catch basin                              | CR         | curb ramp                         | Fn     | fence                     |
| Aggr   | aggregate                                                                                                                                                                                                       | CRS     | cationic rapid setting                   | C          | cut                               | Fn P   | fence post                |
| Ahd    | ahead                                                                                                                                                                                                           | C Gd    | cattle guard                             | Dd Ld      | dead load                         | FO     | fiber optic               |
| ARV    | air release valve                                                                                                                                                                                               | C To C  | center to center                         | Defl       | deflection                        | FD     | field drive               |
| Align  | alignment                                                                                                                                                                                                       | CL or ☞ | centerline                               | Defm       | deformed                          | F      | fill                      |
| Al     | alley                                                                                                                                                                                                           | Ch      | chain                                    | DInt       | delineate                         | FAA    | fine aggregate angularity |
| Alt    | alternate                                                                                                                                                                                                       | Chnlk   | chain-link                               | DIntr      | delineator                        | FH     | fire hydrant              |
| Alum   | aluminum                                                                                                                                                                                                        | Ch Blk  | channel block                            | Depr       | depression                        | FI     | flange                    |
| ADA    | Americans with Disabilities Act                                                                                                                                                                                 | Ch Ch   | channel change                           | Desc       | description                       | Flrd   | flared                    |
| &      | and                                                                                                                                                                                                             | Chk     | check                                    | Det        | detail                            | FES    | flared end section        |
| Appr   | approach                                                                                                                                                                                                        | Chsld   | chiseled                                 | DWP        | detectable warning panel          | F Bcn  | flashing beacon           |
| Approx | approximate                                                                                                                                                                                                     | Cir     | circle                                   | Dtr        | detour                            | FA     | flight auger sample       |
| ACP    | asbestos cement pipe                                                                                                                                                                                            | Cl      | class                                    | Dia or ø   | diameter                          | FL     | flow line                 |
| Asph   | asphalt                                                                                                                                                                                                         | Clnt    | clean-out                                | Dir        | direction                         | Ftg    | footing                   |
| AC     | asphalt cement                                                                                                                                                                                                  | Clr     | clear                                    | Dist       | distance                          | FM     | force main                |
| Assmd  | assumed                                                                                                                                                                                                         | Cl&gr   | clearing & grubbing                      | DM         | disturbed material                | Fnd    | found                     |
| @      | at                                                                                                                                                                                                              | Comb.   | combination                              | DB         | ditch block                       | Fdn    | foundation                |
| Atten  | attenuation                                                                                                                                                                                                     | Coml    | commercial                               | DG         | ditch grade                       | Frac   | fractional                |
| ATR    | automatic traffic recorder                                                                                                                                                                                      | Compr   | compression                              | Dbl        | double                            | Frwy   | freeway                   |
| Ave    | Avenue                                                                                                                                                                                                          | CADD    | computer aided drafting & design         | Dn         | down                              | Frt    | front                     |
| Avg    | average                                                                                                                                                                                                         | Conc    | concrete                                 | Dwg        | drawing                           | FF     | front face                |
| ADT    | average daily traffic                                                                                                                                                                                           | CECB    | concrete erosion control blanket         | Dr         | drive                             | F Disp | fuel dispenser            |
|        |                                                                                                                                                                                                                 | Cond    | conductor                                | Drw        | driveway                          | FFP    | fuel filler pipes         |
|        |                                                                                                                                                                                                                 | Const   | construction                             | DI         | drop inlet                        | FLS    | fuel leak sensor          |
|        |                                                                                                                                                                                                                 | Cont    | continuous                               | D          | dry density                       | Furn   | furnish/ed                |
|        |                                                                                                                                                                                                                 | CSB     | continuous split barrel sample           |            |                                   |        |                           |
|        |                                                                                                                                                                                                                 | Contr   | contraction                              |            |                                   |        |                           |
|        |                                                                                                                                                                                                                 | Contr   | contractor                               |            |                                   |        |                           |
| Bk     | back                                                                                                                                                                                                            | CP      | control point                            | Ea         | each                              |        |                           |
| BF     | back face                                                                                                                                                                                                       | Coord   | coordinate                               | Esmt       | easement                          |        |                           |
| Balc   | balcony                                                                                                                                                                                                         | Cor     | corner                                   | E          | East                              |        |                           |
| B Wire | barbed wire                                                                                                                                                                                                     | Corr    | corrected                                | EB         | Eastbound                         |        |                           |
| Barr   | barricade                                                                                                                                                                                                       | CAES    | corrugated aluminum end section          | Elast      | elastomeric                       |        |                           |
| Btry   | battery                                                                                                                                                                                                         | CAP     | corrugated aluminum pipe                 | EL         | electric locker                   |        |                           |
| BI     | beehive inlet                                                                                                                                                                                                   | CMES    | corrugated metal end section             | E Mtr      | electric meter                    |        |                           |
| Beg    | begin                                                                                                                                                                                                           | CMP     | corrugated metal pipe                    | EVSE       | electric vehicle supply equipment |        |                           |
| BG     | below grade                                                                                                                                                                                                     | CPVCP   | corrugated poly-vinyl chloride pipe      | Elec       | electric/al                       |        |                           |
| BM     | bench mark                                                                                                                                                                                                      | CSES    | corrugated steel end section             | EDM        | electronic distance meter         |        |                           |
| Bkwy   | bikeway                                                                                                                                                                                                         | CSFES   | corrugated steel flared end section      | Elev or El | elevation                         |        |                           |
| Bit    | bituminous                                                                                                                                                                                                      | CSP     | corrugated steel pipe                    | Ellipt     | elliptical                        |        |                           |
| Blk    | block                                                                                                                                                                                                           | CSTES   | corrugated steel traversable end section | Emb        | embankment                        |        |                           |
| BH     | bore hole                                                                                                                                                                                                       | Co      | County                                   | Emuls      | emulsion/emulsified               |        |                           |
| Bot    | bottom                                                                                                                                                                                                          | Crse    | course                                   | ES         | end section                       |        |                           |
| Blvd   | Boulevard                                                                                                                                                                                                       | Ct      | Court                                    | Engr       | engineer                          |        |                           |
| Bndry  | boundary                                                                                                                                                                                                        | Xarm    | cross arm                                | ESS        | environmental sensor station      |        |                           |
| Brkwy  | breakaway                                                                                                                                                                                                       | Xbuck   | cross buck                               | Eq         | equal                             |        |                           |
| Br     | bridge                                                                                                                                                                                                          | Xsec    | cross sections                           | Evgr       | evergreen                         |        |                           |
| Bldg   | building                                                                                                                                                                                                        | Xing    | crossing                                 | Exc        | excavation                        |        |                           |
| Bus.   | business                                                                                                                                                                                                        | Xrd     | crossroad                                | Exst       | existing                          |        |                           |
| BV     | butterfly valve                                                                                                                                                                                                 | Crn     | crown                                    | Exp        | expansion                         |        |                           |
| Byp    | bypass                                                                                                                                                                                                          |         |                                          | Expy       | Expressway                        |        |                           |
|        |                                                                                                                                                                                                                 |         |                                          | E          | external of curve                 |        |                           |
|        |                                                                                                                                                                                                                 |         |                                          | Extru      | extruded                          |        |                           |

| NORTH DAKOTA<br>DEPARTMENT OF TRANSPORTATION |                   |
|----------------------------------------------|-------------------|
| 07-01-14                                     |                   |
| REVISIONS                                    |                   |
| DATE                                         | CHANGE            |
| 04-23-18                                     | General Revisions |
| 09-20-18                                     | General Revisions |
| 12-18-20                                     | General Revisions |
| 08-16-22                                     | General Revisions |
| 04-14-25                                     | General Revisions |



NDDOT ABBREVIATIONS

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|        |                              |          |                          |                      |                               |          |                                             |
|--------|------------------------------|----------|--------------------------|----------------------|-------------------------------|----------|---------------------------------------------|
| Galv   | galvanized                   | Ln       | lane                     | Obsc                 | obscure(d)                    | Qty      | quantity                                    |
| Gar    | garage                       | Lg       | large                    | Ocpd                 | occupied                      | Qtr      | quarter                                     |
| Gs L   | gas line                     | Lat      | latitude                 | Ocpy                 | occupy                        |          |                                             |
| G Reg  | gas line regulator           | Lt       | left                     | O/s                  | offset                        |          |                                             |
| GMV    | gas main valve               | Lens     | lenses                   | OC                   | on center                     | Rad or R | radius                                      |
| G Mtr  | gas meter                    | Lvl      | level                    | C                    | one dimensional consolidation | RR       | railroad                                    |
| GSV    | gas service valve            | Lvng     | leveling                 | OC                   | organic content               | Rlwy     | railway                                     |
| GVP    | gas vent pipe                | Lht      | light                    | Orig                 | original                      | Rsd      | raised                                      |
| GV     | gate valve                   | LP       | light pole               | O To O               | out to out                    | RC       | rapid curing                                |
| Ga     | gauge                        | Ltg      | lighting                 | OD                   | outside diameter              | Rec      | record                                      |
| Gov    | government                   | Liq      | liquid                   | OH                   | overhead                      | Rcy      | recycle                                     |
| Grd    | graded/grade                 | LL       | liquid limit             |                      |                               | RAP      | recycled asphalt pavement                   |
| Grnd   | ground                       | Loc      | location                 |                      |                               | RPCC     | recycled portland cement concrete           |
| GWM    | ground water monitor         | Long.    | longitude                | PMT                  | pad mounted transformer       | Ref      | reference                                   |
| Gdrl   | guardrail                    | Lp       | loop                     | Pg                   | pages                         | R Mkr    | reference marker                            |
| Gtr    | gutter                       | LD       | loop detector            | Pntd                 | painted                       | RM       | reference monument                          |
|        |                              | Lum      | luminaire                | Pr                   | pair                          | RP       | reference point                             |
|        |                              |          |                          | Pnl                  | panel                         | Refl     | reflectorized                               |
| H Plg  | H piling                     |          |                          | Pk                   | park                          | RCB      | reinforced concrete box                     |
| Hdwl   | headwall                     | Mb       | mailbox                  | PSD                  | passing sight distance        | RCES     | reinforced concrete end section             |
| Ht     | height                       | ML       | main line                | Pvmt                 | pavement                      | RCFES    | reinforced concrete flared end section      |
| Hel    | helical                      | MH       | manhole                  | Ped                  | pedestal                      | RCP      | reinforced concrete pipe                    |
| HDPE   | high density polyethylene    | Mkd      | marked                   | Ped                  | pedestrian                    | RCPS     | reinforced concrete pipe sewer              |
| HM     | high mast                    | Mkr      | marker                   | PPP                  | pedestrian pushbutton post    | RCTES    | reinforced concrete traversable end section |
| HP     | high pressure                | Mkg      | marking                  | Pen.                 | penetration                   | Reinf    | reinforcement                               |
| HPS    | high pressure sodium         | MA       | mast arm                 | Perf                 | perforated                    | Res      | reservation                                 |
| HTCG   | high tension cable guardrail | Matl     | material                 | Per.                 | perimeter                     | Res      | residence                                   |
| Hwy    | highway                      | Max      | maximum                  | Perm                 | permanent                     | Ret      | retaining                                   |
| Hor    | horizontal                   |          |                          | PL                   | pipeline                      | Rev      | reverse                                     |
| HBP    | hot bituminous pavement      | Meas     | measure                  | PI                   | place                         | Rt       | right                                       |
| HMA    | hot mix asphalt              | Mdn      | median                   | P&P                  | plan & profile                | R/W      | right of way                                |
| Hyd    | hydrant                      | MD       | median drain             | PL                   | plastic limit                 | Riv      | river                                       |
| Ph     | hydrogen ion content         | MC       | medium curing            | PI or $\overline{P}$ | plate                         | Rd       | road                                        |
|        |                              | MGS      | Midwest Guardrail System | Pt                   | point                         | Rdbd     | road bed                                    |
|        |                              | MM       | mile marker              | PE                   | polyethylene                  | Rdwy     | roadway                                     |
| Id     | identification               | MP       | mile post                | PVC                  | polyvinyl chloride            | RWIS     | roadway weather information system          |
| Incl   | inclinometer tube            | Min      | minimum                  | PCC                  | Portland Cement concrete      | Rk       | rock                                        |
| IMH    | inlet manhole                | Misc     | miscellaneous            | PP                   | power pole                    | Rt       | route                                       |
| ID     | inside diameter              | Mon      | monument                 | Preempt              | preemption                    |          |                                             |
| Inst   | instrument                   | Mnd      | mound                    | Prefab               | prefabricated                 |          |                                             |
| Intchg | interchange                  | Mtbl     | mountable                | Prfmd or Pref        | preformed                     |          |                                             |
| Intmdt | intermediate                 | Mtd      | mounted                  | Prep                 | preperation                   |          |                                             |
| Intscn | intersection                 | Mtg      | mounting                 | Press.               | pressure                      |          |                                             |
| Inv    | invert                       | Mk       | muck                     | PRV                  | pressure relief valve         |          |                                             |
| IP     | iron pipe                    |          |                          | Prestr               | prestressed                   |          |                                             |
|        |                              |          |                          | Pvt                  | private                       |          |                                             |
|        |                              |          |                          | PD                   | private drive                 |          |                                             |
| Jt     | joint                        | Neop     | neoprene                 | Prod.                | production/produce            |          |                                             |
| Jct    | junction                     | Ntwk     | network                  | Prog                 | programmed                    |          |                                             |
|        |                              | N        | North                    | Prop.                | property                      |          |                                             |
|        |                              | NE       | Northeast                | Ppsd                 | proposed                      |          |                                             |
|        |                              | NW       | Northwest                | PB                   | pull box                      |          |                                             |
|        |                              | NB       | Northbound               |                      |                               |          |                                             |
|        |                              | No. or # | number                   |                      |                               |          |                                             |

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|            |                                  |        |                                    |
|------------|----------------------------------|--------|------------------------------------|
| Salv       | salvage(d)                       | Tel    | telephone                          |
| San        | sanitary sewer line              | Tel B  | Telephone Booth                    |
| Sec        | section                          | Tel P  | telephone pole                     |
| SL         | section line                     | Tv     | television                         |
| Sep        | separation                       | Temp   | temperature                        |
| Seq        | sequence                         | Temp   | temporary                          |
| Serv       | service                          | TBM    | temporary bench mark               |
| Sht        | sheet                            | T      | thinwall tube sample               |
| Shtng      | sheeting                         | Ts     | topsoil                            |
| Shldr      | shoulder                         | Traf   | traffic                            |
| Sw or Sdwk | sidewalk                         | TSCB   | traffic signal control box         |
| SD         | sight distance                   | Tr     | trail                              |
| SN         | sign number                      | Transf | transformer                        |
| Sig        | signal                           | Trans  | transition                         |
| Sgl        | single                           | TT     | transmission tower                 |
| SRCP       | slotted reinforced concrete pipe | TES    | traversable end section            |
| SC         | slow curing                      | Trans  | transverse                         |
| SS         | slow setting                     | Trtd   | treated                            |
| Sm         | small                            | Trmt   | treatment                          |
| S          | South                            | Qc     | triaxial compression               |
| SE         | Southeast                        | TERO   | tribal employment rights ordinance |
| SW         | Southwest                        | Tpl    | triple                             |
| SB         | Southbound                       | Typ    | typical                            |
| Sp         | spaces                           |        |                                    |
| Spcl       | special                          | Qu     | unconfined compressive strength    |
| SA         | special assembly                 | Ugrnd  | underground                        |
| SP         | special provisions               | Util   | utility                            |
| G          | specific gravity                 |        |                                    |
| Spk        | spike                            |        |                                    |
| SB         | split barrel sample              | VG     | valley gutter                      |
| SH         | sprinkler head                   | Vap    | vapor                              |
| SV         | sprinkler valve                  | Vert   | vertical                           |
| Sq         | square                           | VCP    | vitrified clay pipe                |
| Stk        | stake                            | Vol    | volume                             |
| Std        | standard                         | VSFS   | vehicle speed feedback sign        |
| N          | standard penetration test        |        |                                    |
| Std Specs  | standard specifications          | Wkwy   | walkway                            |
| Stm L      | steam line                       | W      | water content                      |
| SEC        | steel encased concrete           | WGV    | water gate valve                   |
| SMA        | stone matrix asphalt             | WL     | water line                         |
| SSD        | stopping sight distance          | WM     | water main                         |
| SD         | storm drain                      | WMV    | water main valve                   |
| St         | street                           | W Mtr  | water meter                        |
| SPP        | structural plate pipe            | WSV    | water service valve                |
| SPPA       | structural plate pipe arch       | WW     | water well                         |
| Str        | structure                        | Wrng   | wearing                            |
| Subd       | subdivision                      | WIM    | weigh in motion                    |
| Sub        | subgrade                         | W      | west                               |
| Sub Prep   | subgrade preperation             | WB     | westbound                          |
| Ss         | subsoil                          | Wrng   | wiring                             |
| SS         | supplement specification         | W/     | with                               |
| Supp       | supplemental                     | W/o    | without                            |
| Surf       | surfacing                        |        |                                    |
| Surv       | survey                           |        |                                    |
| Sym        | symmetrical                      |        |                                    |

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NDDOT ABBREVIATIONS

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MEASUREMENTS

|          |                          |
|----------|--------------------------|
| ac       | acres                    |
| A        | ampere                   |
| Bd Ft    | board feet               |
| Cd       | candela                  |
| cm       | centimeter               |
| C        | coulomb                  |
| CF       | cubic feet               |
| m3       | cubic meter              |
| m3/s     | cubic meters per second  |
| CY       | cubic yard               |
| CY/mi    | cubic yards per mile     |
| D or Deg | degree                   |
| F        | Fahrenheit               |
| F        | farad                    |
| ft       | feet/foot                |
| Gal      | gallon                   |
| G        | giga                     |
| Ha       | hectare                  |
| H        | henry                    |
| Hz       | hertz                    |
| hr       | hour(s)                  |
| in.      | inch                     |
| J        | joule                    |
| K        | kelvin                   |
| kN       | kilo newton              |
| kPa      | kilo pascal              |
| kg       | kilogram                 |
| kg/m3    | kilogram per cubic meter |
| km       | kilometer                |
| K        | Kip(s)                   |
| LF       | linear foot              |
| L        | litre                    |
| Lm       | lumen                    |
| L sum    | lump sum                 |
| Lx       | lux                      |
| M Hr     | man hour                 |
| M        | mega                     |
| m        | meter                    |
| m/s      | meters per second        |
| mi       | mile                     |
| mL       | milliliter               |
| mm       | millimeter               |
| mm/hr    | millimeters per hour     |
| n        | nano                     |
| N        | newton                   |
| Pa       | pascal                   |
| lb       | pounds                   |
| sec      | seconds                  |
| S        | siemens                  |
| SF       | square feet              |
| km2      | square kilometer         |
| m2       | square meter             |
| SY       | square yard              |
| Sta Yd   | station yards            |
| SI       | Systems International    |

|      |               |
|------|---------------|
| T    | tesla         |
| T/mi | tons per mile |
| V    | volt          |
| W    | watt          |
| Wb   | weber         |

SURVEY DESCRIPTIONS

|         |                                 |
|---------|---------------------------------|
| Az      | azimuth                         |
| Bs      | backsight                       |
| Brg     | bearing                         |
| BP Cap  | blue plastic cap                |
| BS      | both sides                      |
| BC      | brass cap                       |
| CC      | closing corner                  |
| CS      | curve to spiral                 |
| Eq      | equation                        |
| E       | external of curve               |
| FS      | far side                        |
| FB      | field book                      |
| Fs      | foresight                       |
| Geod    | geodetic                        |
| GIS     | Geographical Information System |
| GPS     | Global Positioning System       |
| HI      | height of instrument            |
| IM      | iron monument                   |
| I Pn    | iron pin                        |
| LS      | Land Surveyor (licensed)        |
| LSIT    | Land Surveyor In Training       |
| L       | length of curve                 |
| LC      | long chord                      |
| LB      | level book                      |
| MC      | meander corner                  |
| Mer     | meridian                        |
| M       | mid ordinate of curve           |
| NGS     | National Geodetic Survey        |
| NS      | near side                       |
| Obsn    | observation                     |
| Off Loc | office location                 |
| OP Cap  | orange plastic cap              |
| PK      | Parker-Kalon nail               |
| P Cap   | plastic cap                     |
| PP Cap  | pink plastic cap                |
| PCC     | point of compound curve         |
| PC      | point of curve                  |
| PI      | point of intersection           |
| PRC     | point of reverse curvature      |
| PT      | point of tangent                |
| POC     | point on curve                  |
| POT     | point on tangent                |
| RTP     | random traverse point           |
| Rge     | range                           |
| RP Cap  | red plastic cap                 |
| SC      | spiral to curve                 |
| SC      | standard corner                 |
| ST      | spiral to tangent               |
| Sta     | station                         |
| SE      | superelevation                  |
| Tan     | tangent                         |
| T       | tangent (semi)                  |
| TS      | tangent to spiral               |
| Twp     | township                        |
| TB      | transit book                    |
| TP      | traverse point                  |
| TP      | turning point                   |
| USC&G   | US Coast & Geodetic Survey      |
| USGS    | US Geologic Survey              |
| VC      | vertical curve                  |
| WC      | witness corner                  |
| WGS     | World Geodetic System           |
| YP Cap  | yellow plastic cap              |
| Z       | zenith                          |

SOIL TYPES

|           |                 |
|-----------|-----------------|
| Cl        | clay            |
| Cl F      | clay fill       |
| Cl Hvy    | clay heavy      |
| Cl Lm     | clay loam       |
| Co S      | coal slack      |
| C Gr      | coarse gravel   |
| CS        | coarse sand     |
| FS        | fine sand       |
| Gr        | gravel          |
| Lig Co    | lignite coal    |
| Lig Sl    | lignite slack   |
| Lm        | loam            |
| Rk        | rock            |
| Sd        | sand            |
| Sdy Cl    | sandy clay      |
| Sdy Cl Lm | sandy clay loam |
| Sdy Fl    | sandy fill      |
| Sdy Lm    | sandy loam      |
| Sc        | scoria          |
| Sh        | shale           |
| Si Cl     | silt clay       |
| Si Cl Lm  | silty clay loam |
| Si Lm     | silty loam      |

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|----------------------------------------------|--------------------------------------------------------------|
| 07-01-14                                     |                                                              |
| REVISIONS                                    |                                                              |
| DATE                                         | CHANGE                                                       |
| 12-18-20                                     | Sheet Added<br>- Continued from D-101-3<br>General Revisions |
| 4-14-25                                      |                                                              |



NDDOT UTILITY COMPANY AND ORGANIZATION ABBREVIATIONS

D-101-10

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

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

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

| NORTH DAKOTA<br>DEPARTMENT OF TRANSPORTATION |                   |
|----------------------------------------------|-------------------|
| 07-01-14                                     |                   |
| REVISIONS                                    |                   |
| DATE                                         | CHANGE            |
| 04-23-18                                     | General Revisions |
| 09-20-18                                     | General Revisions |
| 12-18-20                                     | General Revisions |
| 08-16-22                                     | General Revisions |
| 04-14-25                                     | General Revisions |



LINE STYLES

D-101-20

Existing Topography

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

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

Proposed Topography

|  |                                         |
|--|-----------------------------------------|
|  | 3-Cable w Posts                         |
|  | Flow                                    |
|  | Fence                                   |
|  | Remove Line                             |
|  | Wall                                    |
|  | Retaining Wall (Plan View)              |
|  | W-Beam w Posts                          |
|  | High Tension Cable Guardrail with Posts |

Existing Utilities

|  |        |                                            |
|--|--------|--------------------------------------------|
|  | E      | Existing Electrical                        |
|  | FO     | Existing Fiber Optic Line                  |
|  | FO     | Existing TV Fiber Optic                    |
|  | G      | Existing Gas Pipe                          |
|  | OH     | Existing Overhead Utility Line             |
|  | P      | Existing Power                             |
|  | PL     | Existing Fuel Pipeline                     |
|  | PL     | Existing Undefined Above Ground Pipe Line  |
|  | SAN    | Existing Sanitary Sewer                    |
|  | SAN FM | Existing Sanitary Force Main               |
|  | SD     | Existing Storm Drain                       |
|  | SD FM  | Existing Storm Drain Force Main            |
|  |        | Existing Culvert                           |
|  | T      | Existing Telephone Line                    |
|  | TV     | Existing TV Line                           |
|  | W      | Existing Water or Steam Line               |
|  |        | Existing Under Drain                       |
|  |        | Existing Slotted Drain                     |
|  |        | Existing Conduit                           |
|  |        | Existing Conductor                         |
|  |        | Existing Down Guy Wire Down Guy            |
|  |        | Existing Underground Vault or Lift Station |

Proposed Utilities

|  |                          |
|--|--------------------------|
|  | 24 Inch Pipe             |
|  | Reinforced Concrete Pipe |
|  | Under Drain              |
|  | Edge Drain               |

Traffic Utilities

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

Sign Structures

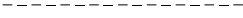
|  |                                             |
|--|---------------------------------------------|
|  | Existing Overhead Sign Structure            |
|  | Existing Overhead Sign Structure Cantilever |
|  | Overhead Sign Structure Cantilever          |

|                                              |                                                            |
|----------------------------------------------|------------------------------------------------------------|
| NORTH DAKOTA<br>DEPARTMENT OF TRANSPORTATION |                                                            |
| 07-01-14                                     |                                                            |
| REVISIONS                                    |                                                            |
| DATE                                         | CHANGE                                                     |
| 09-23-16                                     | Added and Revised Items,<br>Organized by Functional Groups |
| 12-18-20                                     | General Revisions                                          |

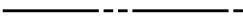
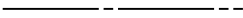
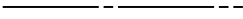
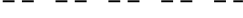
LINE STYLES

D-101-21

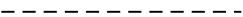
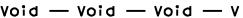
Right Of Way

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

Boundary Control

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

Cross Sections and Typicals

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

Geotechnical

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

|                                                                                      |                        |
|--------------------------------------------------------------------------------------|------------------------|
|  | Subgrade Reinforcement |
|  | Failure Line           |

Countours

|                                                                                      |                      |
|--------------------------------------------------------------------------------------|----------------------|
|  | Depression Contours  |
|  | Supplemental Contour |

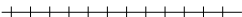
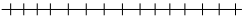
Profile

|                                                                                      |                                 |
|--------------------------------------------------------------------------------------|---------------------------------|
|  | Subgrade, Subcut or Ditch Grade |
|  | Topsoil Profile                 |

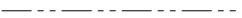
Striping

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

Pavement Joints

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

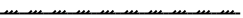
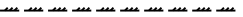
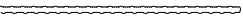
Bridge Details

|                                                                                       |                            |
|---------------------------------------------------------------------------------------|----------------------------|
|  | Small Hidden Object        |
|  | Large Hidden Object        |
|  | Phantom Object             |
|  | Existing Conditions Object |
|  | Centerline Main            |
|  | Centerline Secondary       |
|  | Excavation Limits          |
|  | Proposed Ground            |
|  | Sheet Piling               |

Erosion Control

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

Environmental

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

NORTH DAKOTA  
DEPARTMENT OF TRANSPORTATION

07-01-14

REVISIONS

| DATE     | CHANGE                                                                          |
|----------|---------------------------------------------------------------------------------|
| 09-23-16 | Added and Revised Items,<br>Organized by Functional Groups<br>General Revisions |
| 12-18-20 |                                                                                 |

KIRK J. HOFF

REGISTERED



PROFESSIONAL  
PE-4683

ENGINEER

NORTH DAKOTA

12 18 2020

SYMBOLS

D-101-30



North Arrow (Half Scale)

Alignment Data Point

Alignment Monument

Spot Elevation

Existing Miscellaneous Spot

Existing Access Control Arrow

Existing Benchmark

Reset USGS Marker

Iron Monument Found

Iron Pin R/W Monument

Property Corner

Iron Pin Reference Monument

Right of Way Marker (Exst, Ppsd, Reset)

Existing Federal Reference Corner

Existing Section Corner (Full, Quarter, Sixteenth, Meander)

Existing Witness Corner

Existing Control Point (CP, GPS-RTK, TRI)

Existing Traverse PI Aerial Panel

Existing Reference Marker Point NGS

Existing EFB Misc

Existing Bush or Shrub

Existing Large Evergreen Tree

Existing Small Evergreen Tree

Existing Large Tree

Existing Small Tree

Existing Tree Trunk

Cairn or Stone Circle

Existing Artifact

Existing Satellite Dish

Existing Weather Station

Existing Windmill or Tower

Reinforced Pavement

Continuous Split Barrel Sample

Flight Auger Sample

Split Barrel Sample

Thinwall Tube Sample

Standard Penetration Test

Inclinometer Tube

Excavation Unit

Existing Ground Water Well Bore Hole

|                                              |                   |
|----------------------------------------------|-------------------|
| NORTH DAKOTA<br>DEPARTMENT OF TRANSPORTATION |                   |
| 07-01-14                                     |                   |
| REVISIONS                                    |                   |
| DATE                                         | CHANGE            |
| 12-18-20                                     | General Revisions |

KIRK J. HOFF

REGISTERED

PROFESSIONAL

PE-4683

ENGINEER

NORTH DAKOTA

12 18 2020

SYMBOLS

D-101-31

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                                              |  |                                                                                     |                                                                                       |                                                                                       |                                      |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|--------------------------------------|
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |    | Flexible Delineator                                                                                          |  |                                                                                     |    |    | Highway Sign (Exst, Ppsd)            |
|                                                                                     |                                                                                     |    |    | Flexible Delineator Type A (Exst, Ppsd)                                             |                                                                                                              |  |  |    |    | Mile Post Type A (Exst-Ppsd-Reset)   |
|                                                                                     |                                                                                     |    |    | Flexible Delineator Type B (Exst, Ppsd)                                             |                                                                                                              |  |  |    |                                                                                       | Mile Post Type B (Exst, Ppsd)        |
|                                                                                     |                                                                                     |    |    | Flexible Delineator Type C (Exst, Ppsd)                                             |                                                                                                              |  |  |    |                                                                                       | Mile Post Type C (Exst, Ppsd)        |
|                                                                                     |                                                                                     |    |    | Flexible Delineator Type D (Exst, Ppsd)                                             |                                                                                                              |  |                                                                                     |    |    | Object Marker Type I (Exst, Ppsd)    |
|                                                                                     |                                                                                     |    |    | Flexible Delineator Type E (Exst, Ppsd)                                             |                                                                                                              |  |                                                                                     |    |    | Object Marker Type II (Exst, Ppsd)   |
|                                                                                     |    |    |    |    | Delineator Type A (Exst, Ppsd, Diamond Grade-Reset)                                                          |  |                                                                                     |    |    | Object Marker Type III (Exst, Ppsd)  |
|                                                                                     |    |    |    |    | Delineator Type B (Exst, Ppsd, Diamond Grade-Reset)                                                          |  |                                                                                     |                                                                                       |    | Existing Reference Marker            |
|                                                                                     |    |    |    |                                                                                     | Delineator Type C (Exst, Ppsd, Diamond Grade)                                                                |  |  |    |                                                                                       | Road Closure Gate 18 Ft (Exst, Ppsd) |
|                                                                                     |    |    |    |                                                                                     | Delineator Type D (Exst, Ppsd, Diamond Grade)                                                                |  |  |    |                                                                                       | Road Closure Gate 28 Ft (Exst, Ppsd) |
|                                                                                     |    |    |    |                                                                                     | Delineator Type E (Exst, Ppsd, Diamond Grade)                                                                |  |  |    |                                                                                       | Road Closure Gate 40 Ft (Exst, Ppsd) |
|                                                                                     |                                                                                     |  |  |  | Barricade (Type I, Type II, Type III)                                                                        |  |                                                                                     |                                                                                       |  | Existing Railroad Battery Box        |
|  |  |  |  |  | Arrow Panel (Caution Mode, Double Direction, Left Directional, Right Directional, Sequencing, Truck Mounted) |  |                                                                                     |                                                                                       |  | Existing RR Profile Spot             |
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |  | Attenuation Device                                                                                           |  |                                                                                     |                                                                                       |  | Existing Railroad Crossbuck          |
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |  | Truck Mounted Attenuator                                                                                     |  |                                                                                     |                                                                                       |  | Existing Railroad Frog               |
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |  | Delineator Drums                                                                                             |  |                                                                                     |  |  | Existing Mailbox (Private, Federal)  |
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |  | Flagger                                                                                                      |  |                                                                                     |                                                                                       |                                                                                       |                                      |
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |  | Tubular Marker                                                                                               |  |                                                                                     |                                                                                       |                                                                                       |                                      |
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |  | Traffic Cone                                                                                                 |  |                                                                                     |                                                                                       |                                                                                       |                                      |
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |  | Back to Back Vertical Panel Sign                                                                             |  |                                                                                     |                                                                                       |                                                                                       |                                      |

|                                              |                   |
|----------------------------------------------|-------------------|
| NORTH DAKOTA<br>DEPARTMENT OF TRANSPORTATION |                   |
| 07-01-14                                     |                   |
| REVISIONS                                    |                   |
| DATE                                         | CHANGE            |
| 12-18-20                                     | General Revisions |



12 18 2020

SYMBOLS

D-101-32

|                                                                                     |                                                               |                                                                                       |                                                                                       |                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                          |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|----------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------|
|    | Existing Luminaire                                            |    |    | High Mast Light Standard 3 Luminaire (Exst, Ppsd)  |  | Existing Traffic Signal Standard                                                    |                                                                                     |                                                                                     |                                                          |
|    | Luminaire LED                                                 |    |    | High Mast Light Standard 4 Luminaire (Exst, Ppsd)  |  |  |  | Pull Box (Exst-Ppsd-Undefined)                                                      |                                                          |
|    | Existing Light Standard Luminaire                             |    |    | High Mast Light Standard 5 Luminaire (Exst, Ppsd)  |  |  |                                                                                     | Intelligent Transportation Pull Box (Exst, Ppsd)                                    |                                                          |
|    | Relocate Light Standard                                       |    |    | High Mast Light Standard 6 Luminaire (Exst, Ppsd)  |                                                                                     |  |  | Transformer (Exst, Ppsd)                                                            |                                                          |
|    | Light Standard Light LED Luminaire                            |    |    | High Mast Light Standard 7 Luminaire (Exst, Ppsd)  |  |  |  | Power Pole (Exst-Ppsd-with Transformer)                                             |                                                          |
|    | Light Standard 35 Watt High Pressure Sodium Vapor Luminaire   |    |    | High Mast Light Standard 8 Luminaire (Exst, Ppsd)  |                                                                                     |  |  | Wood Pole (Exst, Ppsd)                                                              |                                                          |
|    | Light Standard 50 Watt High Pressure Sodium Vapor Luminaire   |    |    | High Mast Light Standard 9 Luminaire (Exst, Ppsd)  |                                                                                     |  |  | Pedestrian Push Button Post (Exst, Ppsd)                                            |                                                          |
|    | Light Standard 70 Watt High Pressure Sodium Vapor Luminaire   |    |    | High Mast Light Standard 10 Luminaire (Exst, Ppsd) |                                                                                     |                                                                                     |  | Existing Pole                                                                       |                                                          |
|    | Light Standard 100 Watt High Pressure Sodium Vapor Luminaire  |    |    | Overhead Sign Structure Load Center (Exst, Ppsd)   |                                                                                     |                                                                                     |  | Existing Telephone Pole                                                             |                                                          |
|    | Light Standard 150 Watt High Pressure Sodium Vapor Luminaire  |    |    | Traffic Signal Controller (Exst, Ppsd)             |                                                                                     |                                                                                     |  | Existing Post                                                                       |                                                          |
|    | Light Standard 200 Watt High Pressure Sodium Vapor Luminaire  |    |    | Pad Mounted Traffic Signal Controller (Exst, Ppsd) |  |  |  |  | Connection Conductor (Ground, Neutral, Phase 1, Phase 2) |
|  | Light Standard 250 Watt High Pressure Sodium Vapor Luminaire  |  |  | Flashing Beacon (Exst, Ppsd)                       |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                          |
|  | Light Standard 310 Watt High Pressure Sodium Vapor Luminaire  |  |  | Concrete Foundation (Exst, Ppsd)                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                          |
|  | Light Standard 400 Watt High Pressure Sodium Vapor Luminaire  |  |  | Pipe Mounted Flasher (Exst, Ppsd)                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                          |
|  | Light Standard 700 Watt High Pressure Sodium Vapor Luminaire  |  |  | Pad Mounted Feed Point (Exst, Ppsd)                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                          |
|  | Light Standard 1000 Watt High Pressure Sodium Vapor Luminaire |  |  | Pipe Mounted Feed Point with Pad (Exst, Ppsd)      |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                          |
|  | Emergency Vehicle Detector                                    |  |  | Pole Mounted Feed Point (Exst, Ppsd)               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                          |
|  | Video Detection Camera                                        |  |  | Junction Box (Exst, Ppsd)                          |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                          |
|                                                                                     |                                                               |  |                                                                                       | Existing Pedestrian Head with Number               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                          |
|                                                                                     |                                                               |  |                                                                                       | Existing Signal Head                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                          |
|                                                                                     |                                                               |                                                                                       |  | Pole Mounted Head                                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                          |
|                                                                                     |                                                               |  |                                                                                       | Existing Lighting Standard Pole                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                          |

|                                              |                   |
|----------------------------------------------|-------------------|
| NORTH DAKOTA<br>DEPARTMENT OF TRANSPORTATION |                   |
| 07-01-14                                     |                   |
| REVISIONS                                    |                   |
| DATE                                         | CHANGE            |
| 12-18-20                                     | General Revisions |



|                                              |                   |
|----------------------------------------------|-------------------|
| NORTH DAKOTA<br>DEPARTMENT OF TRANSPORTATION |                   |
| 07-01-14                                     |                   |
| REVISIONS                                    |                   |
| DATE                                         | CHANGE            |
| 12-18-20                                     | General Revisions |



12 18 2020

SYMBOLS

D-101-33

|  |  |  |                                                                                                    |  |                                                                                                  |
|--|--|--|----------------------------------------------------------------------------------------------------|--|--------------------------------------------------------------------------------------------------|
|  |  |  | Existing Manhole (Electrical, Gas, Telephone)                                                      |  | Cap or Stub<br>Exst Gas, Exst Sanitary, Exst Storm Drain, Ppsd Storm Drain, Exst Water           |
|  |  |  | Water Manhole (Exst, Exst with Valve)                                                              |  | Existing Pedestal<br>Electrical, Telephone, Fiber Optic Telephone, TV, Fiber Optic TV, Undefined |
|  |  |  | Sanitary Sewer Manhole (Exst, Ppsd, Exst with Valve)                                               |  | Existing Pipe Vent<br>Gas, Fuel, Sanitary, Storm Drain, Water, Undefined                         |
|  |  |  | Sanitary Force Main Manhole (Exst, Ppsd, Exst with Valve)                                          |  | Valve<br>Exst Gas, Exst Water, Ppsd Water, Exst Undefined                                        |
|  |  |  | Storm Drain Manhole (Exst, Ppsd, Exst with Inlet, Ppsd with Inlet)                                 |  | Pump<br>Sanitary, Storm Drain, Exst Water                                                        |
|  |  |  | Force Main Storm Drain Manhole (Exst, Exst with Valve)                                             |  | Corrugated Metal End Section (18, 24, 30, 36, 42, 48, 54, 60 Inch)                               |
|  |  |  | Manhole (Ppsd, Ppsd 48 Inch, Exst Undefined)                                                       |  | Reinforced Concrete End Section (18, 24, 30, 36, 42, 48, 54, 60 Inch)                            |
|  |  |  | Existing Water Appurtenance                                                                        |  | Existing Utility Marker                                                                          |
|  |  |  | Sprinkler Head (Exst, Ppsd)                                                                        |  | Existing Meter                                                                                   |
|  |  |  | Fire Hydrant (Exst, Ppsd)                                                                          |  | Existing Fuel Dispensers                                                                         |
|  |  |  | Cleanout (Exst Sanitary, Underdrain)                                                               |  | Existing Fuel Filler Pipes                                                                       |
|  |  |  | Existing Catch Basin Inlet (Round, Square)                                                         |  | Existing Fuel Leak Sensors                                                                       |
|  |  |  | Existing Curb Inlet (Round, Square)                                                                |  |                                                                                                  |
|  |  |  | Existing Slotted Reinforced Concrete Pipe                                                          |  |                                                                                                  |
|  |  |  | Catch Basin (Riser 30 Inch, Beehive, Type A)                                                       |  |                                                                                                  |
|  |  |  | Inlet Mountable Curb (Type A, Type B)                                                              |  |                                                                                                  |
|  |  |  | Inlet Saddle Base (Type 1, Type 2)                                                                 |  |                                                                                                  |
|  |  |  | Inlet Special (Catch Basin, Type 1, Type A)                                                        |  |                                                                                                  |
|  |  |  | Inlet (Tee, Type 1, Type 2, Type 2 Double)                                                         |  |                                                                                                  |
|  |  |  | Median Drain                                                                                       |  |                                                                                                  |
|  |  |  | Headwall (Exst, Ppsd, Ppsd Single with Vegetation Barrier,<br>Ppsd Double with Vegetation Barrier) |  |                                                                                                  |

|                                              |                                                               |
|----------------------------------------------|---------------------------------------------------------------|
| NORTH DAKOTA<br>DEPARTMENT OF TRANSPORTATION |                                                               |
| 07-01-14                                     |                                                               |
| REVISIONS                                    |                                                               |
| DATE                                         | CHANGE                                                        |
| 12-18-20                                     | General Revisions<br>Sheet added<br>- Continued from D-101-32 |

KIRK J. HOFF  
REGISTERED  
PROFESSIONAL  
PE-4683  
ENGINEER  
NORTH DAKOTA  
12 18 2020

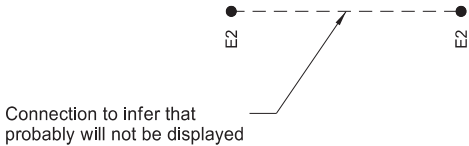
Cross Section Legend

D-101-40

| Description                    | Longitudinal<br>Parallel to Roadway | Transverse<br>Perpendicular to Roadway* |
|--------------------------------|-------------------------------------|-----------------------------------------|
| Cable Line                     | ●<br>CBL1                           | ●<br>CBL2                               |
| Conduit Line                   | ●<br>CDU1                           | ●<br>CDU2                               |
| Electric Line                  | ●<br>E1                             | ●<br>E2                                 |
| Fiber Optic Line               | ●<br>F1                             | ●<br>F2                                 |
| Gas Main Line                  | ●<br>GM1                            | ●<br>GM2                                |
| Gas Service Line               | ●<br>GS1                            | ●<br>GS2                                |
| Gas Transmission Line          | ●<br>GT1                            | ●<br>GT2                                |
| Fuel Pipeline                  | ●<br>PL1                            | ●<br>PL2                                |
| Sanitary Sewer Force Main      | ●<br>SSF1                           | ●<br>SSF2                               |
| Sanitary Sewer                 | ●<br>SS1                            | ●<br>SS2                                |
| Steam Line                     | ●<br>STE1                           | ●<br>STE2                               |
| Storm Drain<br>(Assumed Depth) | ●<br>SD1                            | ●<br>SD2                                |
| Telephone Line                 | ●<br>T1                             | ●<br>T2                                 |
| TV Line                        | ●<br>TV1                            | ●<br>TV2                                |
| Water Main Line                | ●<br>WM1                            | ●<br>WM2                                |
| Water Service Line             | ●<br>WS1                            | ●<br>WS2                                |

| Description                      | Longitudinal<br>Parallel to Roadway | Transverse<br>Perpendicular to Roadway* |
|----------------------------------|-------------------------------------|-----------------------------------------|
| Overhead Power Transmission Line | ↑<br>OHT1                           | ↑<br>OHT2                               |
| Overhead Line                    | ↑<br>OH1                            | ↑<br>OH2                                |

\* Usually the transverse utilities are shown on a cross section with 2 or more symbols. The utility runs from one symbol to the other, but the connection may not be shown.



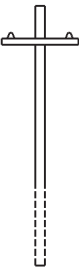
When storm drain invert elevations are NOT used to draw pipe, they will appear as shown to the left. When invert elevations are used to draw pipe, they will be a cross section similar to the graphics shown below.



Light Standard - Multiple Variations  
Concrete  
Steel  
Wood  
with Traffic Signal



Pole - Multiple Variations  
Utility  
Brace  
Feed Point  
Guy  
Power  
Power Structure  
Power with Light  
Power with Transformer



Manhole - Multiple Variations  
Electric  
Fiber Optic  
Gas  
Inlet  
Sanitary Force Main  
Sanitary  
Sanitary with Valve  
Steam  
Storm  
Storm Force Main  
Storm with Valve  
Telephone  
Water  
Water with Meter  
Water with Valve  
Water with Air Release Valve



Anchor



High Tension Cable Guardrail



|                                              |                       |
|----------------------------------------------|-----------------------|
| NORTH DAKOTA<br>DEPARTMENT OF TRANSPORTATION |                       |
| 9-20-18                                      |                       |
| REVISIONS                                    |                       |
| DATE                                         | CHANGE                |
| 6/14/2023                                    | CADD Standards Update |



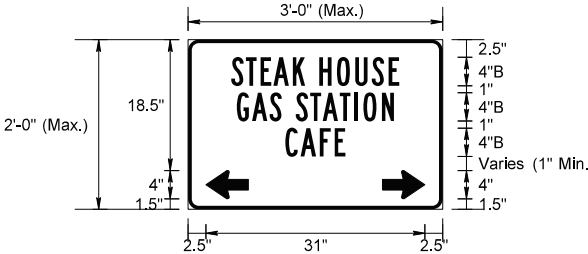
06/14/23

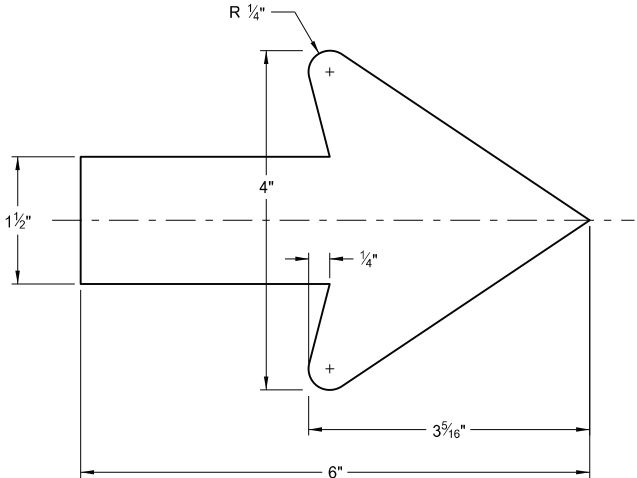
WORK ZONE BUSINESS SIGN DETAILS

D-704-4

Note:

Ground mounted business name sign area is based on a 36"x 24" sign panel. Determine size needed and exact length required to accommodate message. Use maximum 36"x24" sign size. Use 4" Series B 2000 letters. Use blue background color with white legend and border. Post mount sign and position arrow on right or left side of sign as needed.

|                                                       |                                     |      |      |      |      |                                                                                           |      |      |      |      |  |  |  |  |  |                  |  |  |  |  |  |  |  |  |  |  |      |   |        |
|-------------------------------------------------------|-------------------------------------|------|------|------|------|-------------------------------------------------------------------------------------------|------|------|------|------|--|--|--|--|--|------------------|--|--|--|--|--|--|--|--|--|--|------|---|--------|
| SIGN NUMBER                                           | Business_#                          |      |      |      |      | STATION(S):                                                                               |      |      |      |      |  |  |  |  |  | AREA: 6.0 Sq.Ft. |  |  |  |  |  |  |  |  |  |  |      |   |        |
| WIDTH X HEIGHT                                        | 3'-0" x 2'-0"                       |      |      |      |      |        |      |      |      |      |  |  |  |  |  |                  |  |  |  |  |  |  |  |  |  |  |      |   |        |
| BORDER WIDTH                                          | 0.5" (inset 0")                     |      |      |      |      |                                                                                           |      |      |      |      |  |  |  |  |  |                  |  |  |  |  |  |  |  |  |  |  |      |   |        |
| CORNER RADIUS                                         | 1.5"                                |      |      |      |      |                                                                                           |      |      |      |      |  |  |  |  |  |                  |  |  |  |  |  |  |  |  |  |  |      |   |        |
| MOUNTING                                              | Ground                              |      |      |      |      |                                                                                           |      |      |      |      |  |  |  |  |  |                  |  |  |  |  |  |  |  |  |  |  |      |   |        |
| BACKGROUND                                            | TYPE: IV Reflective<br>COLOR: Blue  |      |      |      |      |                                                                                           |      |      |      |      |  |  |  |  |  |                  |  |  |  |  |  |  |  |  |  |  |      |   |        |
| LEGEND/BORDER                                         | TYPE: IV Reflective<br>COLOR: White |      |      |      |      | Dimensions are in inches.tenths      Letter locations are panel edge to lower left corner |      |      |      |      |  |  |  |  |  |                  |  |  |  |  |  |  |  |  |  |  |      |   |        |
| PANEL STYLE: ND_TTC_Business.sst                      |                                     |      |      |      |      |                                                                                           |      |      |      |      |  |  |  |  |  |                  |  |  |  |  |  |  |  |  |  |  |      |   |        |
| LETTER POSITION (X)      LENGTH      SIZE      SERIES |                                     |      |      |      |      |                                                                                           |      |      |      |      |  |  |  |  |  |                  |  |  |  |  |  |  |  |  |  |  |      |   |        |
| S                                                     | T                                   | E    | A    | K    |      | H                                                                                         | O    | U    | S    | E    |  |  |  |  |  |                  |  |  |  |  |  |  |  |  |  |  | 23.8 | 4 | B 2000 |
| 6.1                                                   | 8.2                                 | 10.2 | 12.1 | 14.8 | 16.6 | 18.6                                                                                      | 21   | 23.6 | 26   | 28.4 |  |  |  |  |  |                  |  |  |  |  |  |  |  |  |  |  |      |   |        |
| G                                                     | A                                   | S    |      | S    | T    | A                                                                                         | T    | I    | O    | N    |  |  |  |  |  |                  |  |  |  |  |  |  |  |  |  |  | 22.2 | 4 | B 2000 |
| 6.9                                                   | 9                                   | 11.5 | 13.2 | 15.2 | 17.3 | 19                                                                                        | 21.4 | 23.5 | 24.8 | 27.4 |  |  |  |  |  |                  |  |  |  |  |  |  |  |  |  |  |      |   |        |
| C                                                     | A                                   | F    | E    |      |      |                                                                                           |      |      |      |      |  |  |  |  |  |                  |  |  |  |  |  |  |  |  |  |  | 8.5  | 4 | B 2000 |
| 13.8                                                  | 15.9                                | 18.6 | 20.7 |      |      |                                                                                           |      |      |      |      |  |  |  |  |  |                  |  |  |  |  |  |  |  |  |  |  |      |   |        |
|                                                       |                                     |      |      |      |      |                                                                                           |      |      |      |      |  |  |  |  |  |                  |  |  |  |  |  |  |  |  |  |  |      |   |        |
|                                                       |                                     |      |      |      |      |                                                                                           |      |      |      |      |  |  |  |  |  |                  |  |  |  |  |  |  |  |  |  |  |      |   |        |
|                                                       |                                     |      |      |      |      |                                                                                           |      |      |      |      |  |  |  |  |  |                  |  |  |  |  |  |  |  |  |  |  |      |   |        |
|                                                       |                                     |      |      |      |      |                                                                                           |      |      |      |      |  |  |  |  |  |                  |  |  |  |  |  |  |  |  |  |  |      |   |        |



|                                              |                              |
|----------------------------------------------|------------------------------|
| NORTH DAKOTA<br>DEPARTMENT OF TRANSPORTATION |                              |
| 9-25-12                                      |                              |
| REVISIONS                                    |                              |
| DATE                                         | CHANGE                       |
| 7-18-14                                      | Revised sheeting to type IV  |
| 8-17-17                                      | Revised font & arrow detail  |
| 10-03-19                                     | New Design Engineer PE Stamp |
| 8-01-24                                      | Electronic Stamp/Signature   |

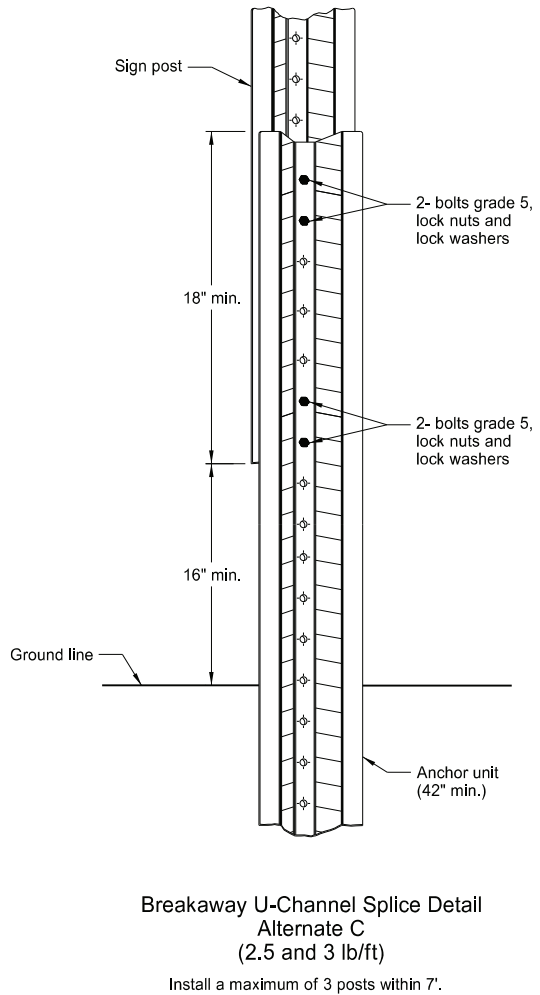
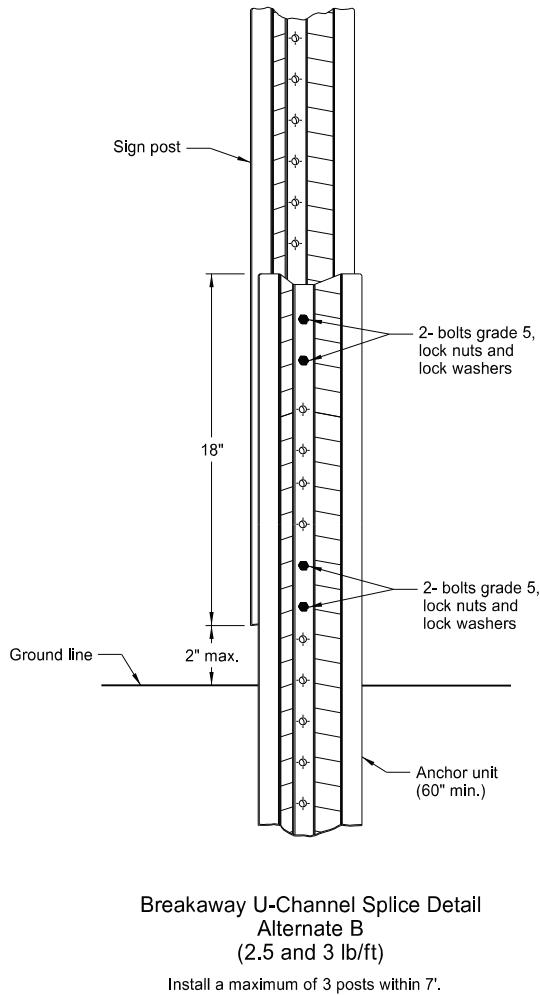
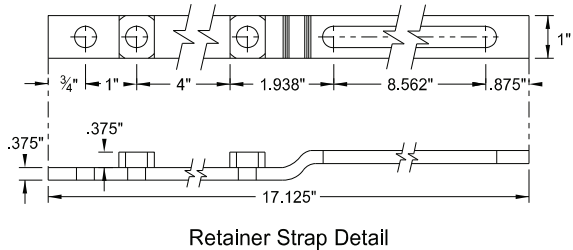
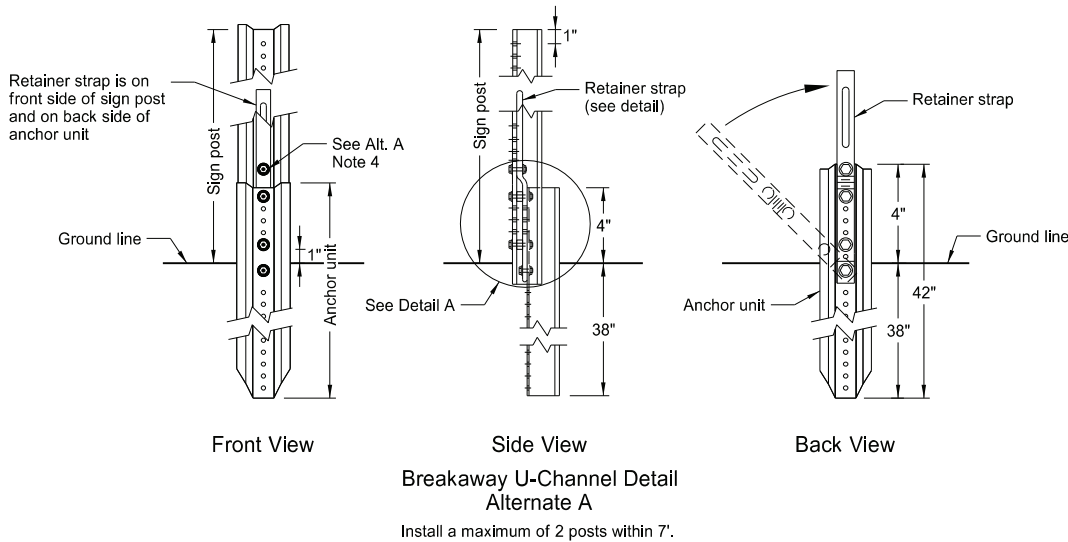
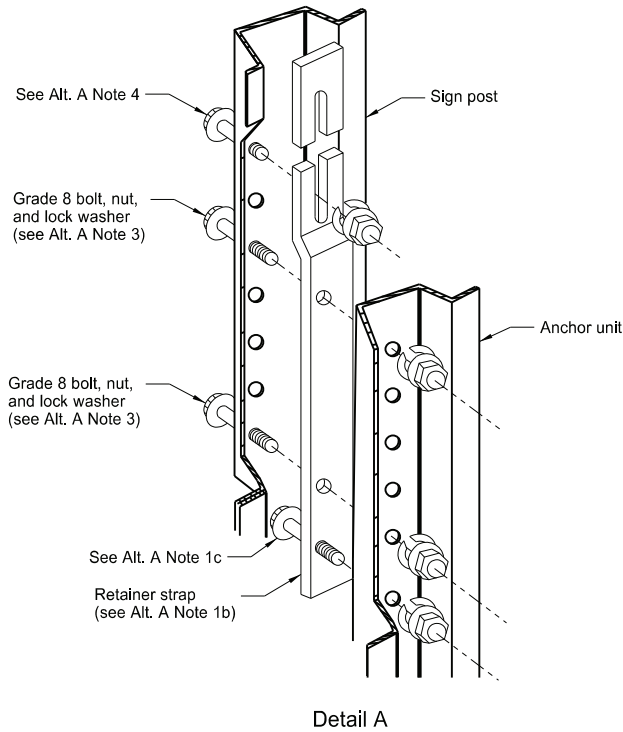


08/01/24

BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS

D-704-8

U-Channel Post



Alternate A Steps of Installation:

- a) Drive anchor unit to within 12" of ground level.  
b) Establish proper assembly by lining up bottom hole of retainer strap with 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).
- Properly nest base post, strap, and sign post. 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.

| NORTH DAKOTA<br>DEPARTMENT OF TRANSPORTATION |                            |
|----------------------------------------------|----------------------------|
| 2-28-14                                      |                            |
| REVISIONS                                    |                            |
| DATE                                         | CHANGE                     |
| 9-27-17                                      | Updated to active voice    |
| 10-03-19                                     | New Design Engr PE Stamp   |
| 8-01-24                                      | Electronic Stamp/Signature |

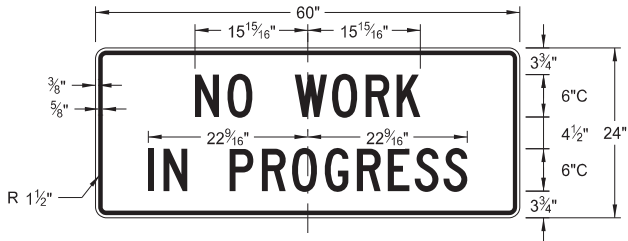


08/01/24

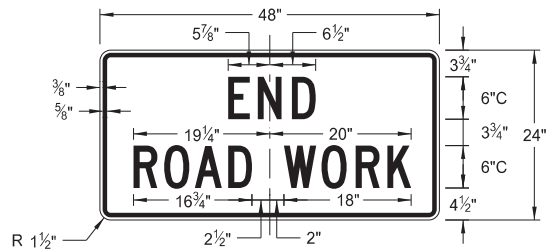
CONSTRUCTION SIGN DETAILS  
TERMINAL AND GUIDE SIGNS



G20-1-60  
Legend: black (non-refl)  
Background: orange



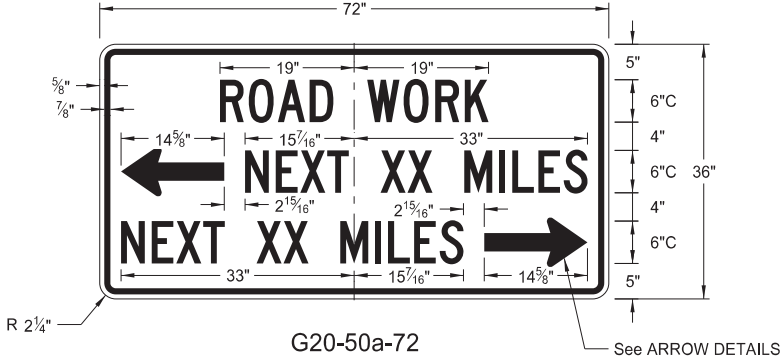
G20-1b-60  
Legend: black (non-refl)  
Background: orange



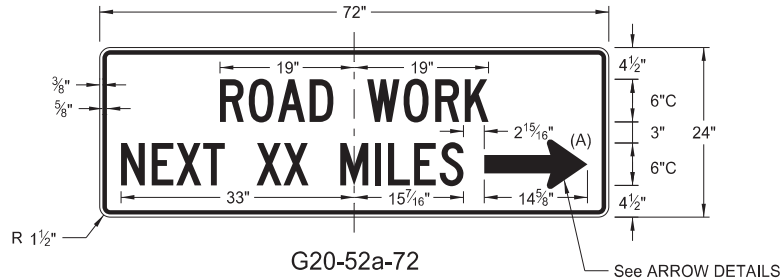
G20-2-48  
Legend: black (non-refl)  
Background: orange



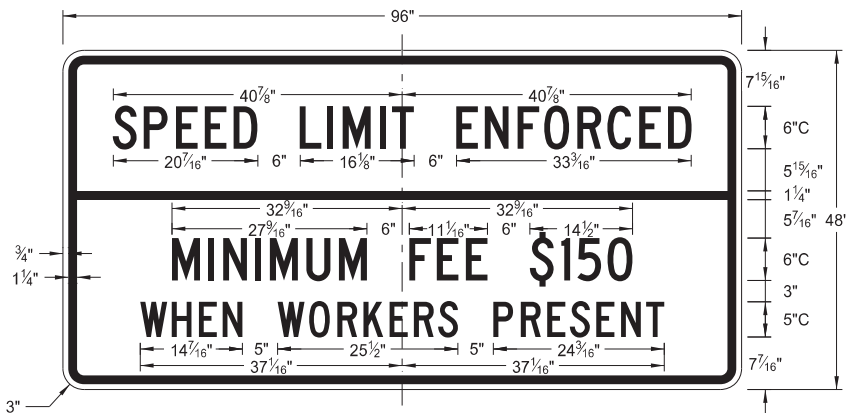
G20-4b-36  
Legend: black (non-refl)  
Background: orange



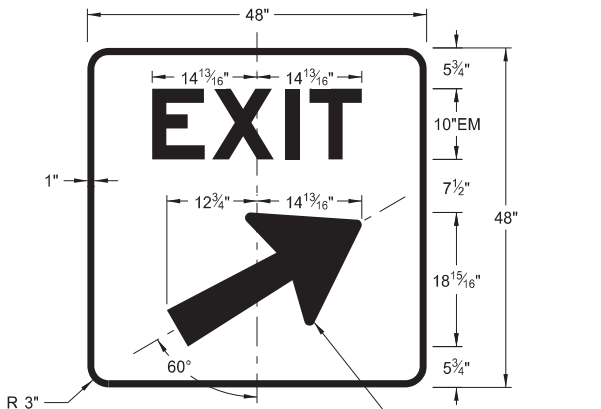
G20-50a-72  
Legend: black (non-refl)  
Background: orange



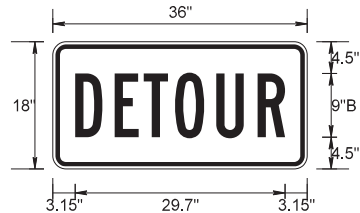
G20-52a-72  
Legend: black (non-refl)  
Background: orange



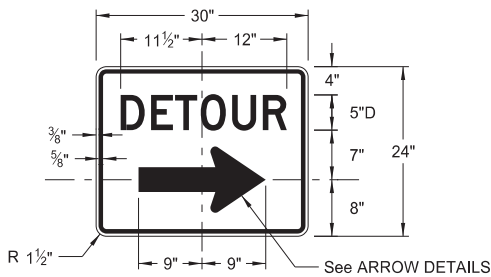
G20-55-96  
Legend: black (non-refl)  
Background: orange



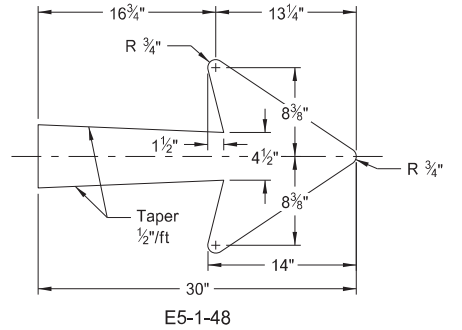
E5-1(L or R)-48  
Legend: white  
Background: green (orange optional)



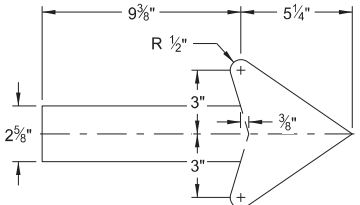
M4-8-36  
Legend: black (non-refl)  
Background: orange



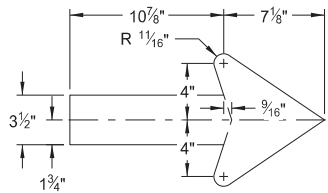
M4-9(L or R)-30 &  
M4-9-30  
Legend: black (non-refl)  
Background: orange



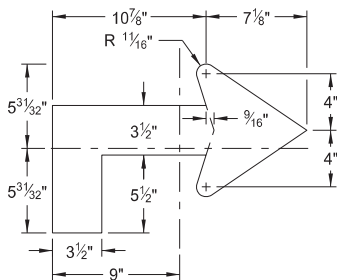
E5-1-48



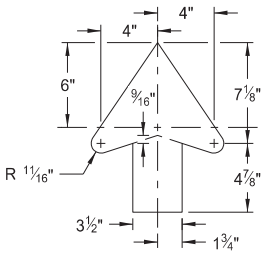
G20-50a-72  
G20-52a-72



M4-9(L or R)-30  
Right or Left



M4-9(L or R)-30  
Advanced Right or Left



M4-9-30  
Straight

ARROW DETAILS

NOTES:

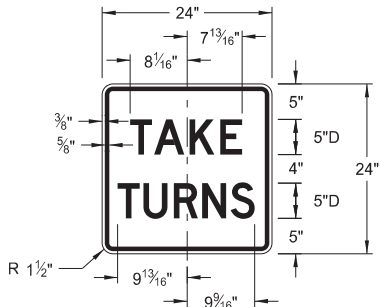
(A) Arrow may be right or left of the legend to indicate construction to the right or left.

| NORTH DAKOTA<br>DEPARTMENT OF TRANSPORTATION |                               |
|----------------------------------------------|-------------------------------|
| 8-13-13                                      |                               |
| REVISIONS                                    |                               |
| DATE                                         | CHANGE                        |
| 08-17-17                                     | Added sign & background color |
| 10-03-19                                     | New Design Engineer PE Stamp  |
| 08-01-24                                     | Electronic Stamp/Signature    |
| 06-30-25                                     | Legislative Changes           |



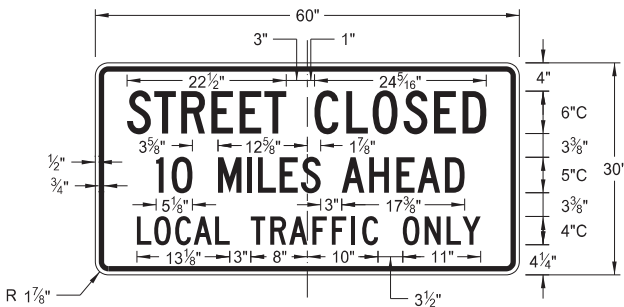
CONSTRUCTION SIGN DETAILS  
REGULATORY SIGNS

D-704-10



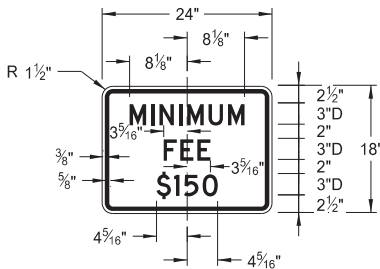
R1-50P-24

Legend: black (non-refl)  
Background: white



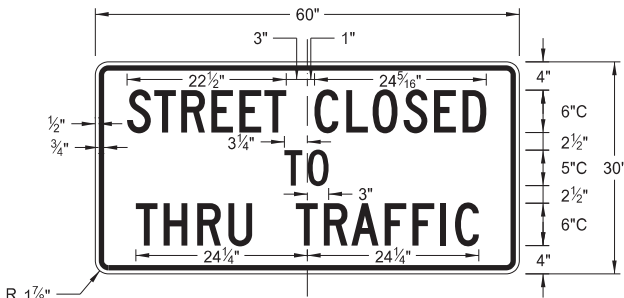
R11-3c-60

Legend: black (non-refl)  
Background: white



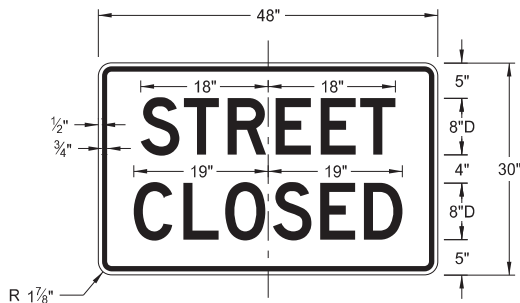
R2-1aP-24

Legend: black (non-refl)  
Background: white



R11-4a-60

Legend: black (non-refl)  
Background: white



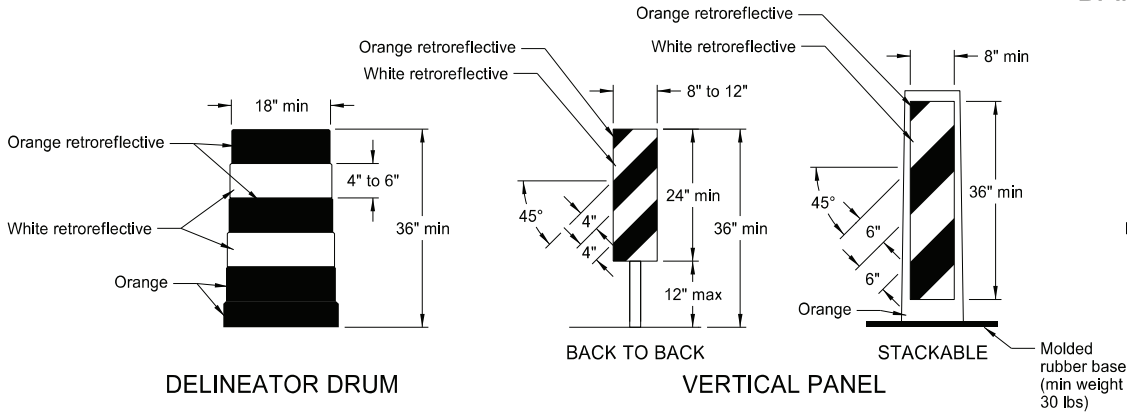
R11-2a-48

Legend: black (non-refl)  
Background: white

| NORTH DAKOTA<br>DEPARTMENT OF TRANSPORTATION |                              |
|----------------------------------------------|------------------------------|
| 8-13-13                                      |                              |
| REVISIONS                                    |                              |
| DATE                                         | CHANGE                       |
| 08-17-17                                     | Revised sign number          |
| 10-03-19                                     | New Design Engineer PE Stamp |
| 08-01-24                                     | Electronic Stamp/Signature   |
| 06-30-25                                     | Legislative Changes          |

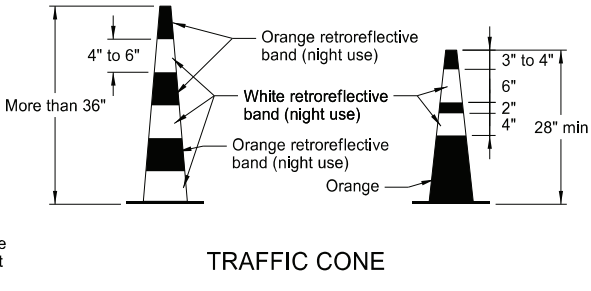


BARRICADE AND CHANNELIZING DEVICE DETAILS

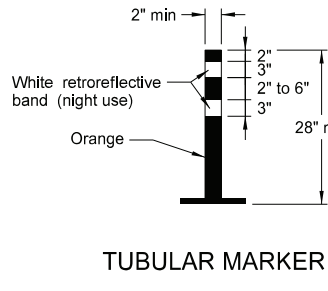


Provide horizontal, circumferential, alternating orange and white retroreflective stripes 4" to 6" wide for drum markings. Use a minimum of two orange and two white stripes with the top stripe being orange for each drum. Do not exceed 3" nonretroreflectORIZED spaces between the horizontal orange and white stripes. Avoid placement of stripes on drum ribs or indentations. Use closed top drums that will not allow collection of debris. Do not place ballast on the top of drum.

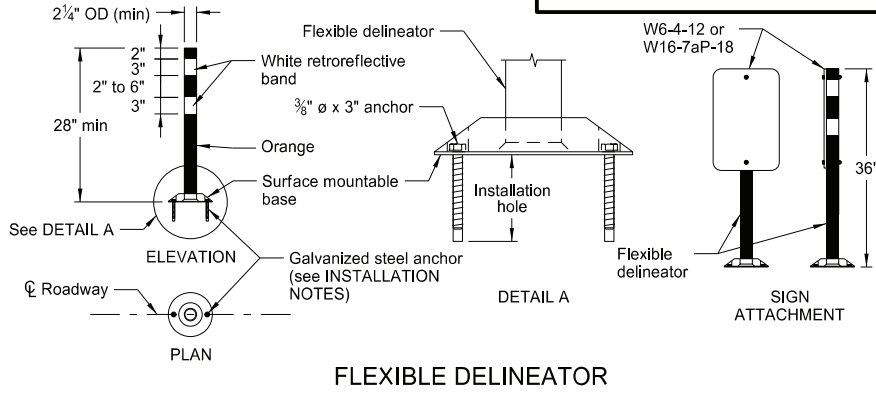
Provide alternating orange and white retroreflective stripes, sloping downward in direction vehicular traffic is to pass. Place retroreflective sheeting on both sides of panel with a minimum of 270 square inches of retroreflective area facing vehicular traffic. Where the height of the retroreflective material on the vertical panel is 36 inches or more, use a stripe width of 6 inches.



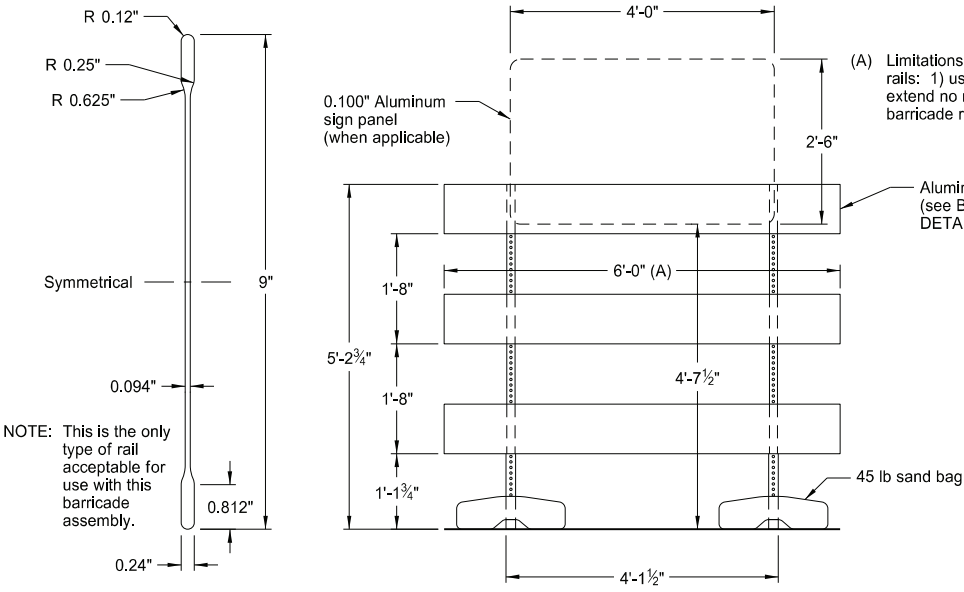
Provide retroreflectORIZATION of cones more than 36" in height by alternating orange and white retroreflective stripes. Use a minimum of two orange and two white stripes for each cone with the top stripe being orange. Use maximum 3" nonretroreflectORIZED space between the orange and white stripes.



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



- INSTALLATION NOTES:
1. Drill installation holes to diameter and depth 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, use an 8" x 8" butyl pad or hot melt butyl. Remove butyl as close as possible to pavement surface.

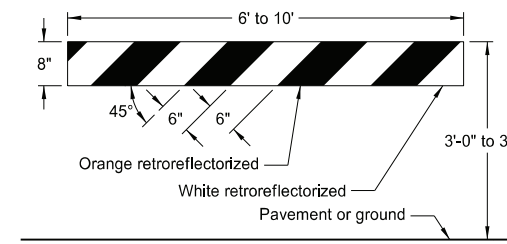


BARRICADE BLADE DETAIL

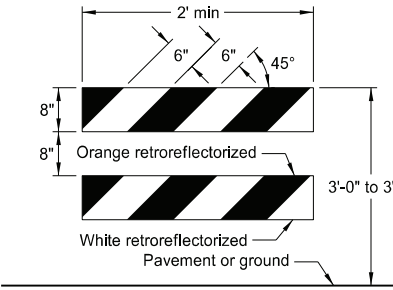
ELEVATION VIEW

BARRICADE ASSEMBLY DETAIL (Aluminum Barricade Rails)

NOTE: For barricade markings use alternating orange and white retroreflective stripes, sloping downward in the direction traffic is to pass. Place retroreflective sheeting on both sides of the rails with a minimum of 270 square inches of visible retroreflective area facing vehicular traffic. When the barricade length is less than 36", use a rail stripe width of 4".

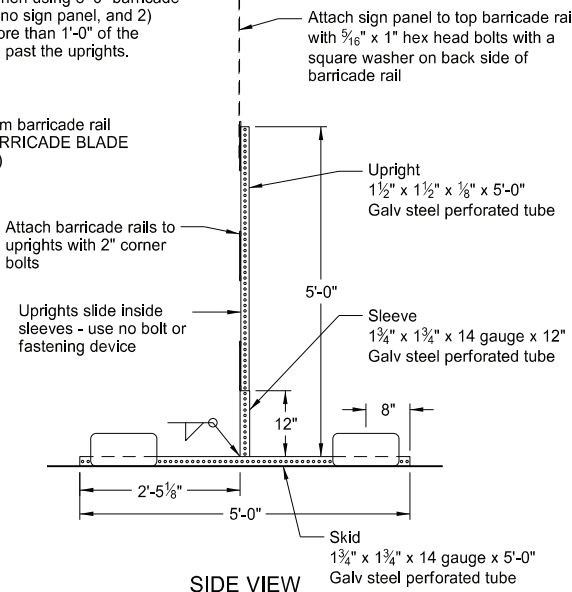


TYPE I BARRICADE

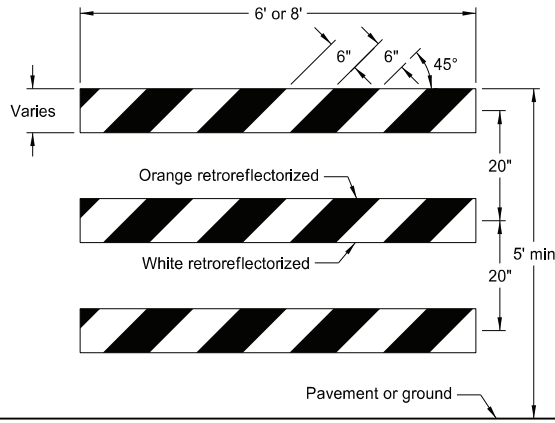


TYPE II BARRICADE

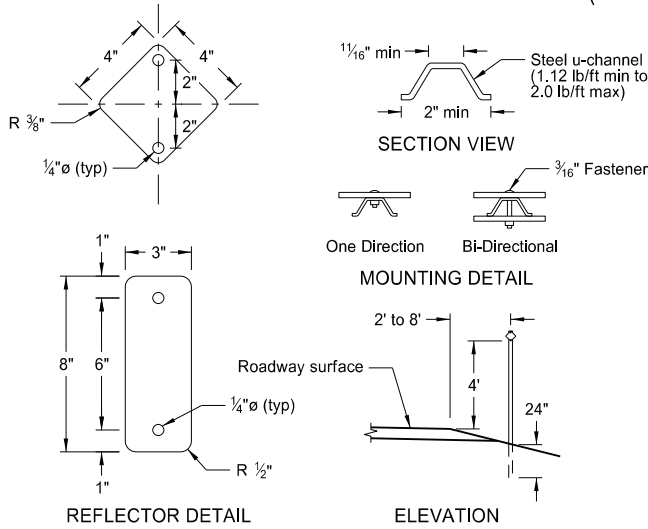
BARRICADE RAIL DETAILS



SIDE VIEW



TYPE III BARRICADE



REFLECTOR DETAIL

ELEVATION

DELINEATORS

BARRICADE ASSEMBLY DETAIL (Wood or Plastic Rails)

MINIMUM BALLAST (For each side of barricade support)

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

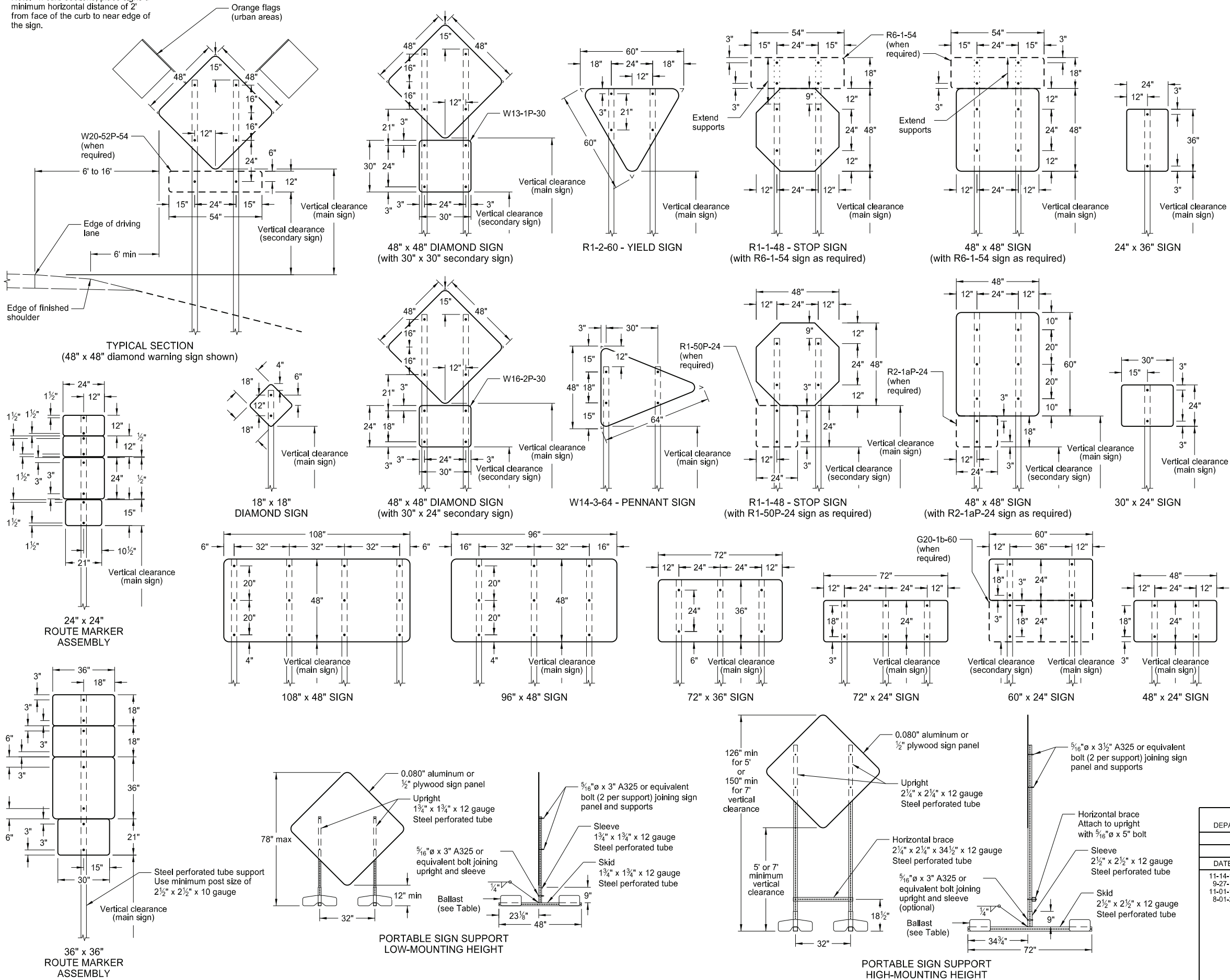
Note: Number of sandbags based on a wind speed of 55 MPH. Sandbags assumed to be placed at or near the ends of the skids.

|                                              |                                         |
|----------------------------------------------|-----------------------------------------|
| NORTH DAKOTA<br>DEPARTMENT OF TRANSPORTATION |                                         |
| 10-3-13                                      |                                         |
| REVISIONS                                    |                                         |
| DATE                                         | CHANGE                                  |
| 9-27-17                                      | Updated to active voice                 |
| 11-01-19                                     | Revised details for Flexible Delineator |
| 8-01-24                                      | Electronic Stamp/Signature              |



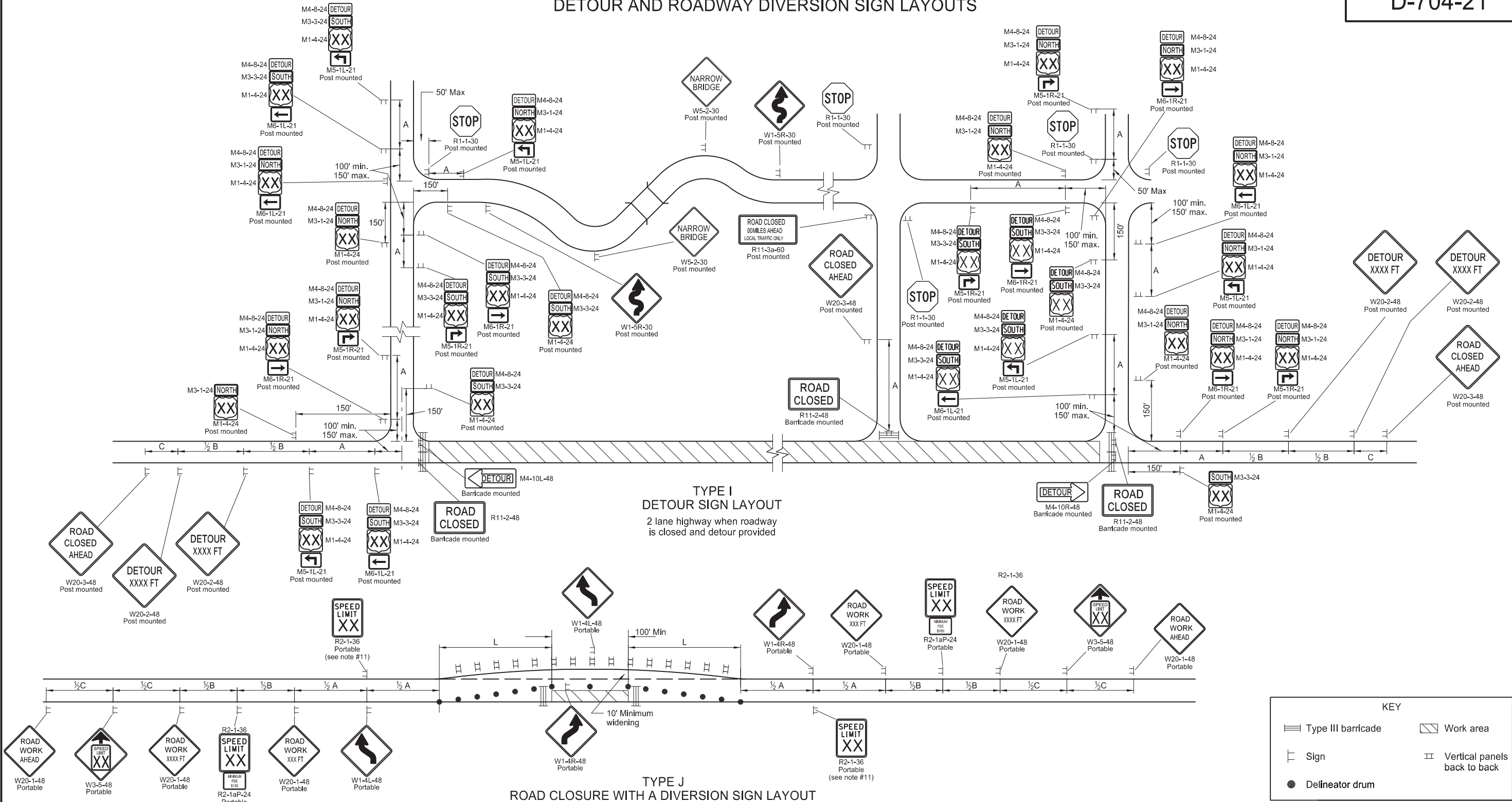
CONSTRUCTION SIGN PUNCHING AND MOUNTING DETAILS

Note: In curb sections, place signs a minimum horizontal distance of 2' from face of the curb to near edge of the sign.



DETOUR AND ROADWAY DIVERSION SIGN LAYOUTS

D-704-21



- Notes:
- Variables  
S=Numerical value of speed limit or 85th percentile. W=The width of taper.  
L=Minimum length of taper, or S x 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.
  - Place barricades on moveable assemblies and signs on portable assemblies when on roadway.
  - Space delineator drums and vertical panels at dimension "S" for tapering traffic. Space delineator drums, tubular markers and vertical panels at 2 times "S" for tangents.
  - Determine the reduced speed limit based on the in place speed limit before construction. Where speed limits exceed 30 MPH, install a second speed limit sign with the desired speed reduction (not to exceed 30 mph.) Place the second speed limit sign at  $\frac{1}{2}$  B.
  - Install flags on warning signs in urban areas when signs are not portable. Mount 24 inches square flags perpendicular to the edges of the sign, and at such a distance above the edge that the flag does not touch the sign when limp.
  - Cover existing speed limit signs within a reduced speed limit zone.
  - Covered (when approved by engineer) or obliterated pavement marking measured as Obliteration of Pavement Marking.
  - As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
  - If the tangent between tapers is less than 600', as an option, use sign W24-1-48 in place of double reverse curve signs.
  - Recommend using 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.
  - Re-establish speed limit. Determine exact speed limit in the field, dependent on location and conditions.

2 lane highway with widened section, traffic maintained in both directions.  
Use layout when work is less than 5 days or is within a project.

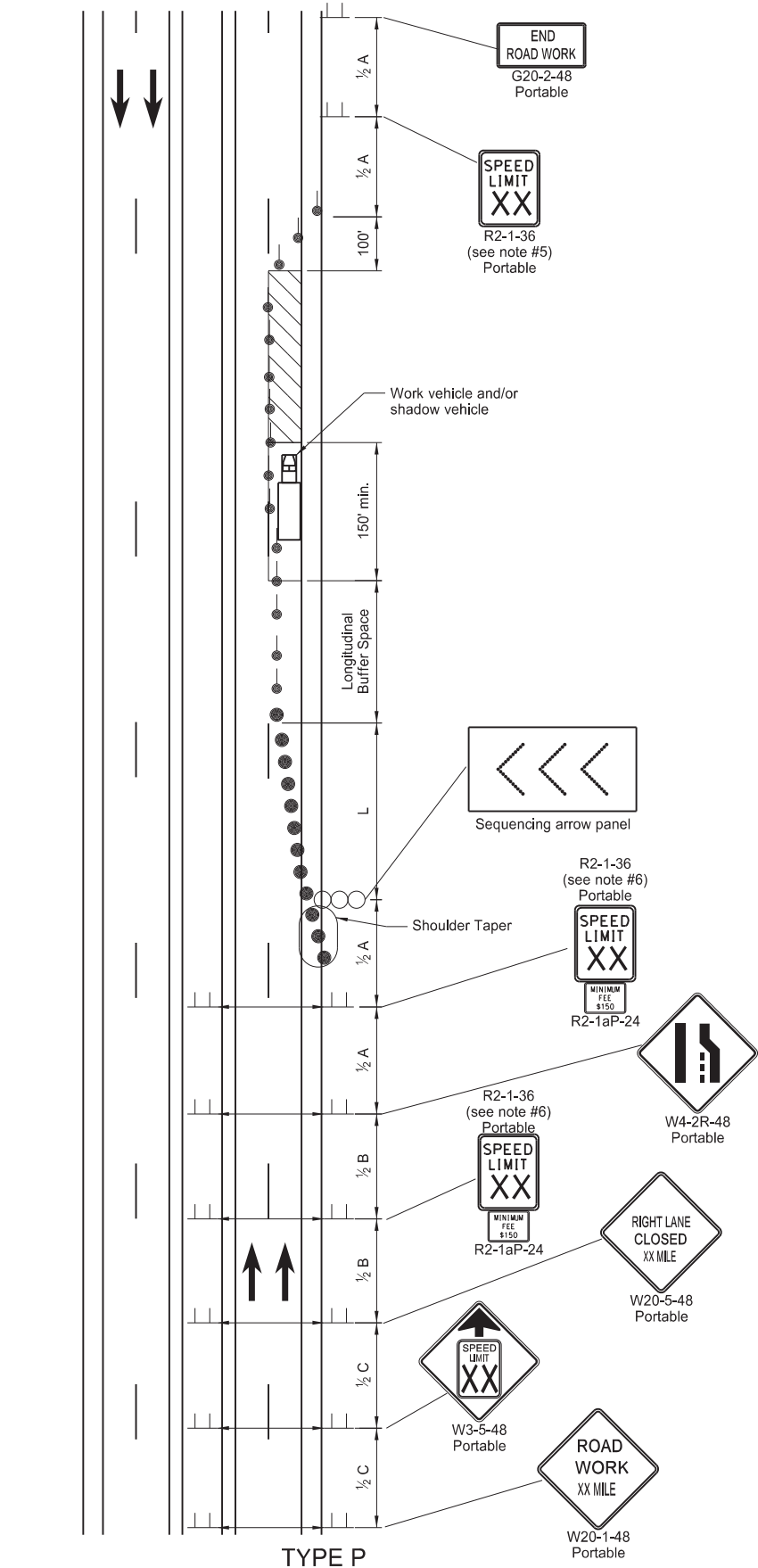
| ADVANCE WARNING SIGN SPACING                          |                                  |      |      |
|-------------------------------------------------------|----------------------------------|------|------|
| Road Type                                             | Distance Between Signs Min. (ft) |      |      |
|                                                       | 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 80 mph)       | 1000                             | 1500 | 2640 |
| Interstate/4-Lane Divided (Maintenance and Surveying) | 750                              | 1000 | 1500 |

| NORTH DAKOTA DEPARTMENT OF TRANSPORTATION |                                 |
|-------------------------------------------|---------------------------------|
| 9-27-13                                   |                                 |
| REVISIONS                                 |                                 |
| DATE                                      | CHANGE                          |
| 08-17-17                                  | Updated notes & added spd limit |
| 11-01-19                                  | Revised sign #s and note 8      |
| 12-08-21                                  | Added Dollars At Work sign      |
| 11-29-22                                  | Removed Dollars At Work         |
| 06-30-25                                  | Legislative Changes             |

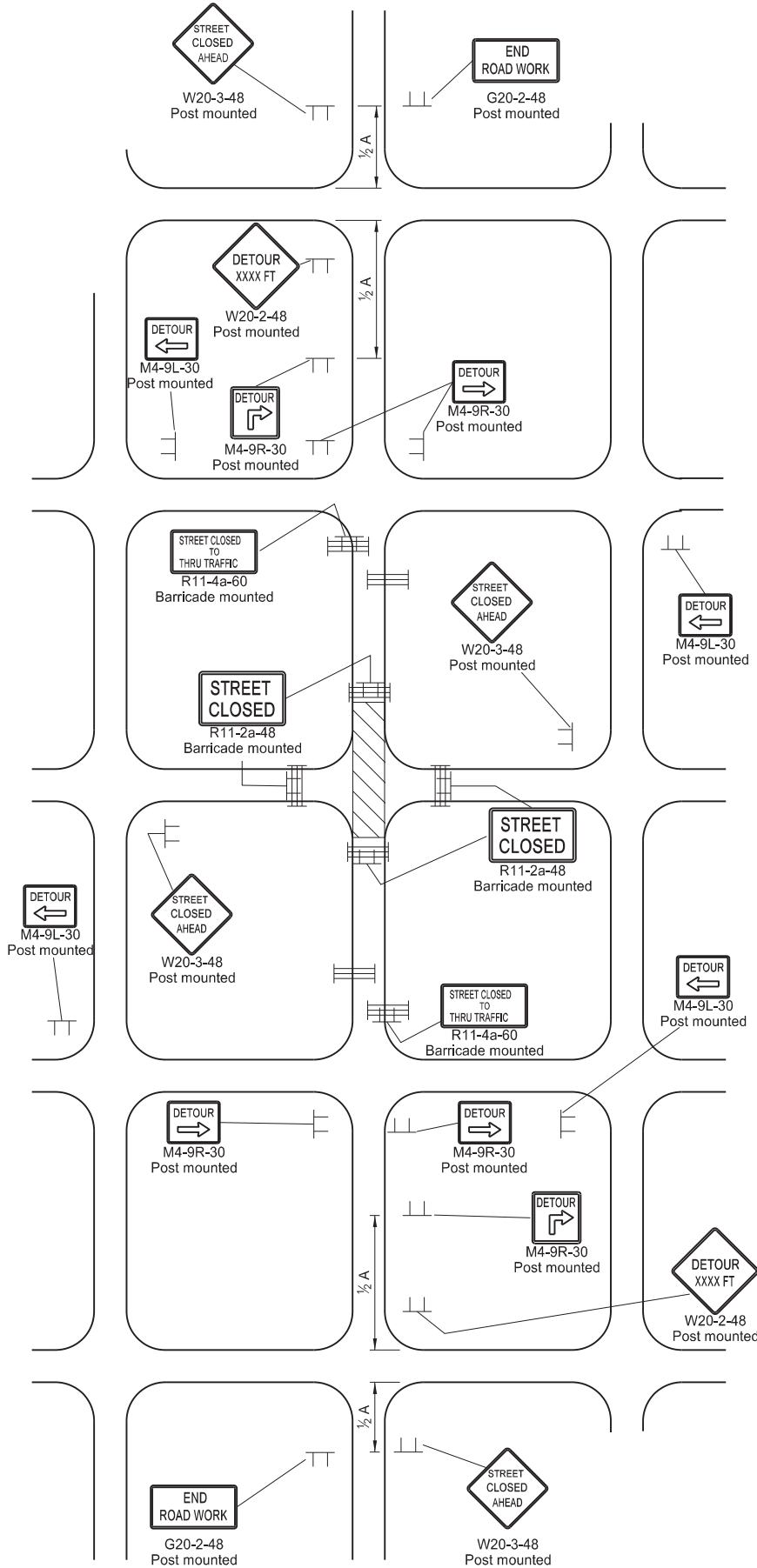


SHORT TERM URBAN DETOUR AND LANE CLOSURE ON A DIVIDED HIGHWAY LAYOUTS

D-704-23



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



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

- Notes:
- Variables
    - S = Numerical value of speed limit or 85th percentile.
    - W = The width of taper in feet
    - L = Minimum length of taper,  $S \times W$  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.
  - Place barricades on moveable assemblies and signs on portable assemblies when located on roadway.
  - Space delineator drums for tapering traffic at dimension "S". Space delineator drums or tubular markers for tangents at 2 times "S".
  - Place Sequencing Arrow Panels at the beginning of taper. Where shoulder width does not provide sufficient room, move panel closer to the work area and place on roadway surface.
    - Use Type A on roadways with slow moving traffic speeds and low volume (25 mph or less and 750 ADT or less).
    - Use Type B on roadways with moderate traffic speeds and volumes (40 mph or less and 5000 ADT or less).
    - Use Type C on roadways with high traffic speeds and volumes (over 40 mph or over 5000 ADT).
  - Re-established speed limit. Determine exact speed limit in the field, dependent on location and conditions.
  - Determine the reduced speed limit based on the in-place speed limit before construction. Where speed reductions exceed 30 MPH, install a second speed limit sign with the desired speed reduction (not to exceed 30 mph.) Place the second speed limit sign at 1/2 B.
  - Install flags on warning signs in urban areas when signs are not portable. Mount 24 inch square flags perpendicular to the edges of the sign, and at such a distance above the edge that the flag does not touch the sign when limp.
  - Cover existing speed limit signs within a reduced speed zone.
  - Covered (when approved by engineer) or obliterated payment marking measured as as Obliteration of Pavement Marking.
  - Change intersection control on detour for Type Q when determined necessary by the engineer.
  - Engineer to determine safe speed where necessary. When parking is present, place signs so they are entirely visible above parked vehicles or at the edge of the parking area so they are visible to oncoming traffic.
  - As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
  - Recommend using 40 mph speed limit in vicinity of workers for Layout Type P, unless location and conditions dictate otherwise.

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

| 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 80 mph)       | 1000                             | 1500 | 2640 |
| Interstate/4-Lane Divided (Maintenance and Surveying) | 750                              | 1000 | 1500 |

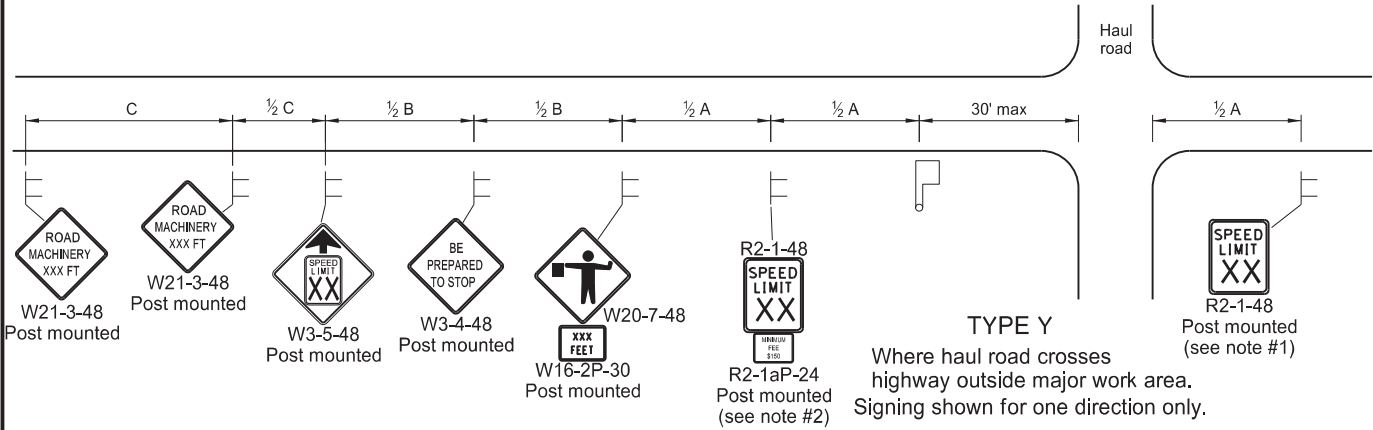
| Longitudinal Buffer Space |                   |
|---------------------------|-------------------|
| Speed (mph)               | Length Min (feet) |
| 20                        | 115               |
| 25                        | 155               |
| 30                        | 200               |
| 35                        | 250               |
| 40                        | 305               |
| 45                        | 360               |
| 50                        | 425               |
| 55                        | 495               |
| 60                        | 570               |
| 65                        | 645               |
| 70                        | 730               |
| 75                        | 820               |
| 80                        | 910               |

| NORTH DAKOTA<br>DEPARTMENT OF TRANSPORTATION |                                                           |
|----------------------------------------------|-----------------------------------------------------------|
| 9-27-13                                      |                                                           |
| REVISIONS                                    |                                                           |
| DATE                                         | CHANGE                                                    |
| 08-17-17                                     | Removed speed limit signs, & updated notes & sign numbers |
| 11-01-19                                     | Revised sign numbers & note                               |
| 12-08-21                                     | Added Dollars At Work sign                                |
| 11-29-22                                     | Removed Dollars At Work                                   |
| 06-30-25                                     | Legislative Changes                                       |

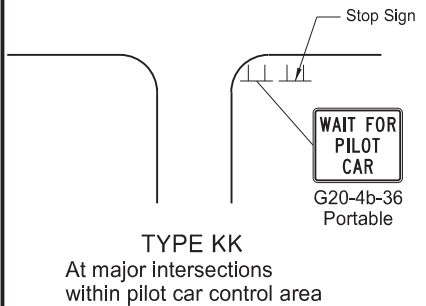
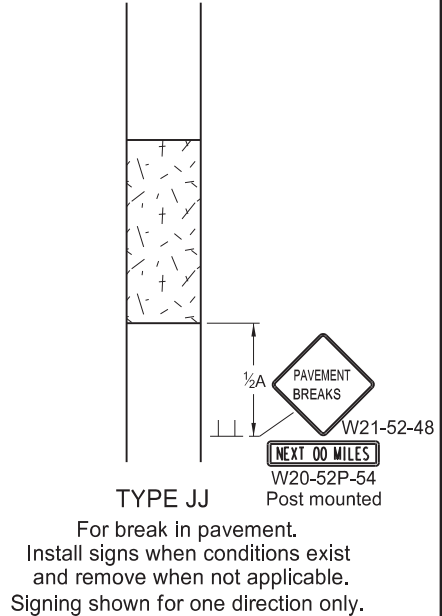
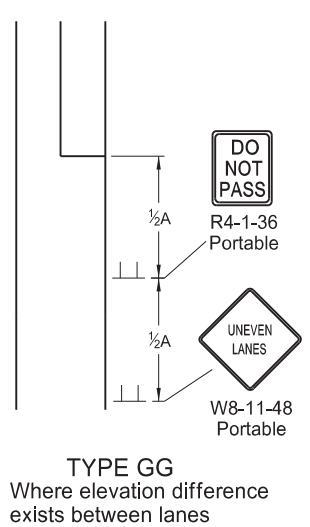
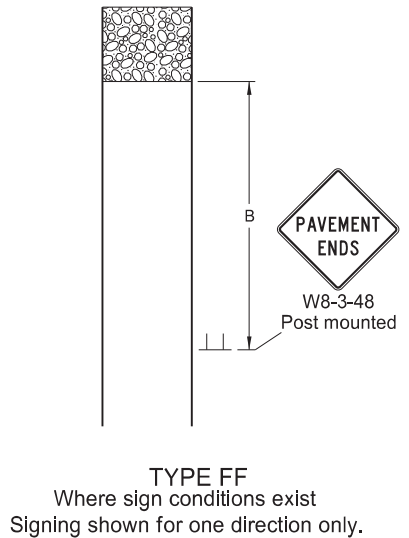
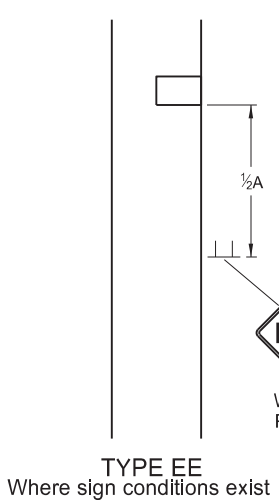
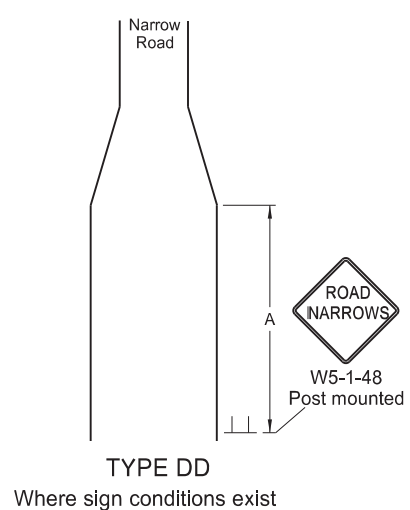
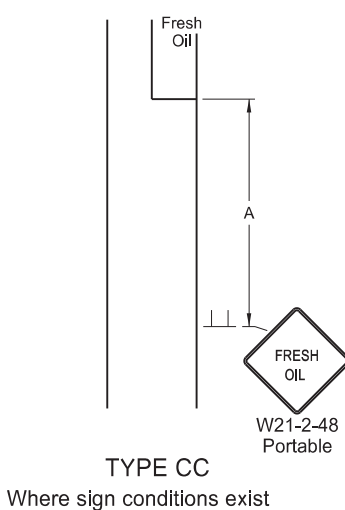
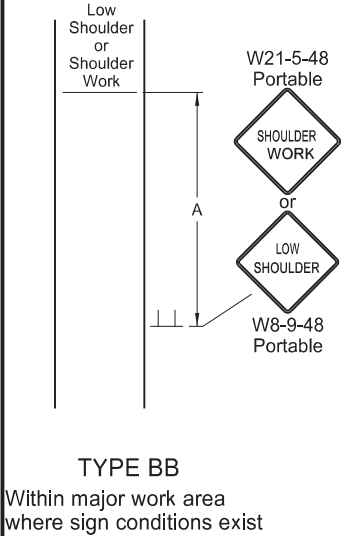
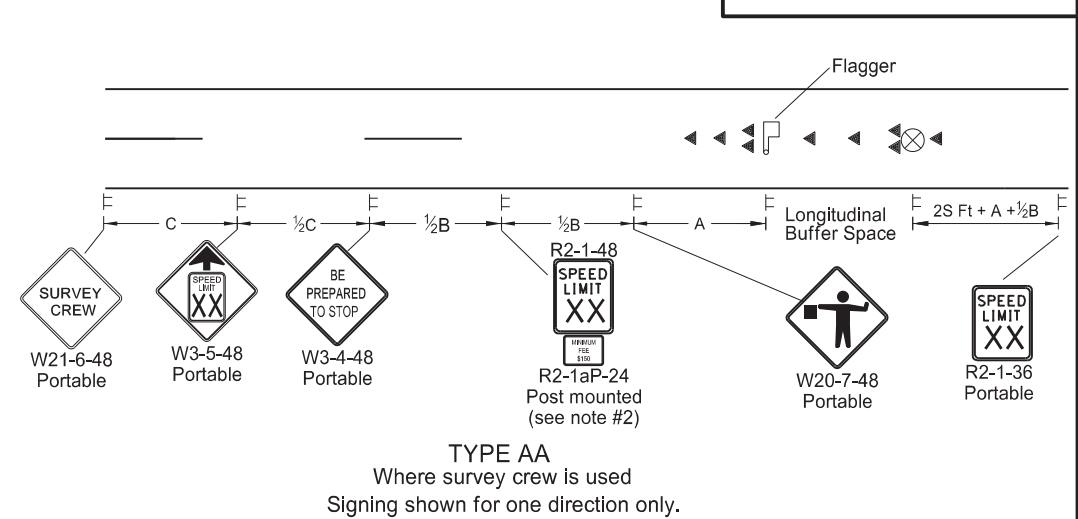


MISCELLANEOUS SIGN LAYOUTS

D-704-26



TYPE Z  
Where speed zone is needed  
Signing shown for one direction only.



- Notes
1. Re-establish speed limit. Determine exact speed limit in the field, dependent on location and conditions.
  2. Determine reduced speed limit based on in-place speed limit before construction. Where speed reductions exceed 30 mph, install a second speed limit sign with the desired speed reduction (not to exceed 30 mph.) Place the second speed limit sign at 1/2 B.
  3. Install flags on warning signs in urban areas when signs are not portable. Mount 24 inch square flags perpendicular to the edges of the sign, and at such a distance above the edge that the flag does not touch the sign when limp.
  4. Cover existing speed limit signs within reduced speed zones.
  5. As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
  6. Sign G20-55-96 is not required if this standard is part of other traffic control layouts, or work is less than 15 days.
  7. When pilot car operation is used, place sign G20-4b-36 "Wait For Pilot Car" at major intersections within pilot car control area.
  8. Recommend 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.
  9. Layouts shown for one direction only.

| 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 80 mph)       | 1000                             | 1500 | 2640 |
| Interstate/4-Lane Divided (Maintenance and Surveying) | 750                              | 1000 | 1500 |

| 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               |
| 80                        | 910               |

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

KEY

Flagger

Sign

Cones

Survey Equipment

S = Numerical value of speed limit or 85th percentile.

|                                              |                                                       |
|----------------------------------------------|-------------------------------------------------------|
| NORTH DAKOTA<br>DEPARTMENT OF TRANSPORTATION |                                                       |
| 9-27-13                                      |                                                       |
| REVISIONS                                    |                                                       |
| DATE                                         | CHANGE                                                |
| 08-17-17                                     | Added speed limit signs. Updated notes & sign numbers |
| 11-01-19                                     | Revised note 5 & sign numbers                         |
| 02-23-23                                     | Revised distance & removed signs                      |
| 06-30-25                                     | Legislative Changes                                   |

KIRK J. HOFF

REGISTERED

PROFESSIONAL

PE-4683

06/30/25

ENGINEER

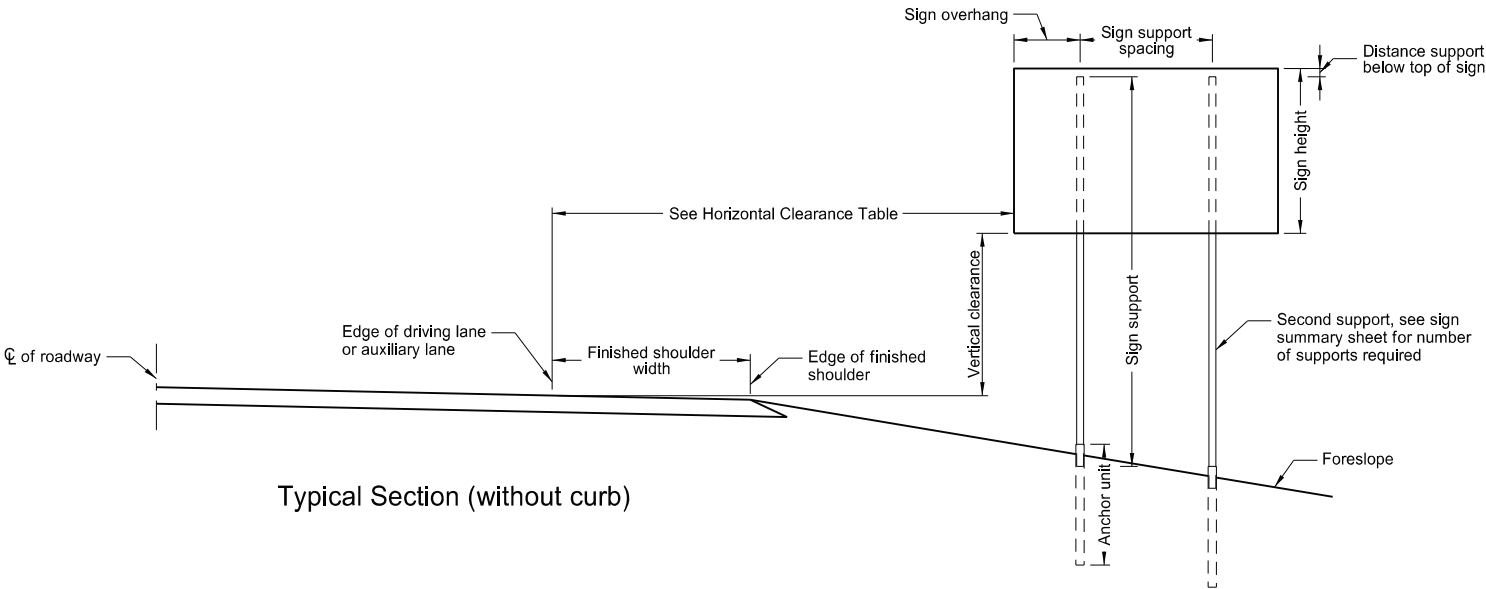
NORTH DAKOTA

PERFORATED TUBE ASSEMBLY DETAILS

D-754-23

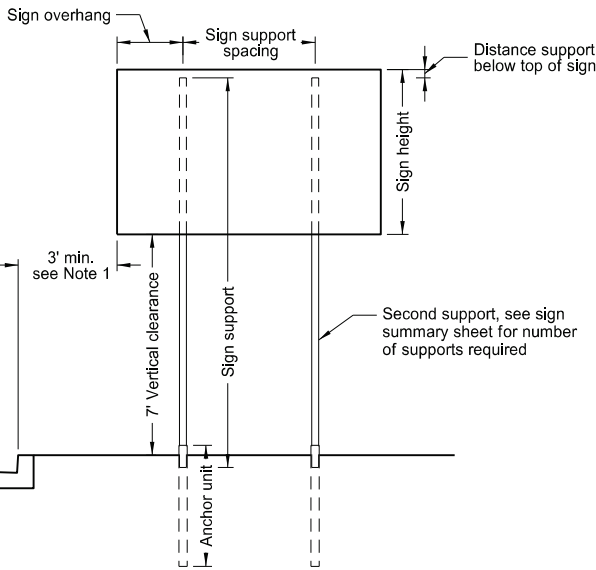
Notes:

1. Curbed Roadways: Use a 3' clearance from face of the curb except where right of way or sidewalk width is limited; Use a minimum 2' clearance. Increase the horizontal clearance if required to maintain a minimum sidewalk clear width of 4' from the sign support, not including any attached curb.
2. Minimum vertical clearance: Provide at least 5' measured from the bottom of the sign to the edge of the driving lane or auxiliary lane at the side of the road in rural districts. Provide at least 7' clearance to the bottom of the sign, where parking or pedestrian movements occur.
- Install signs on expressways a minimum height of 7'.
- Install adopt-a-highway signs on Freeways at least 7' above the edge of the driving lane.
- Maximum vertical clearance is 6" greater than the minimum vertical clearance.
3. Offset signs: Use a vertical clearance of 5' above the edge of the driving lane for signs placed 30 feet or more from the edge of the traveled way.
4. Provide a horizontal clearance from edge of shared use path to edge of sign of 3', except where width is limited. Provide a minimum clearance of 2'.

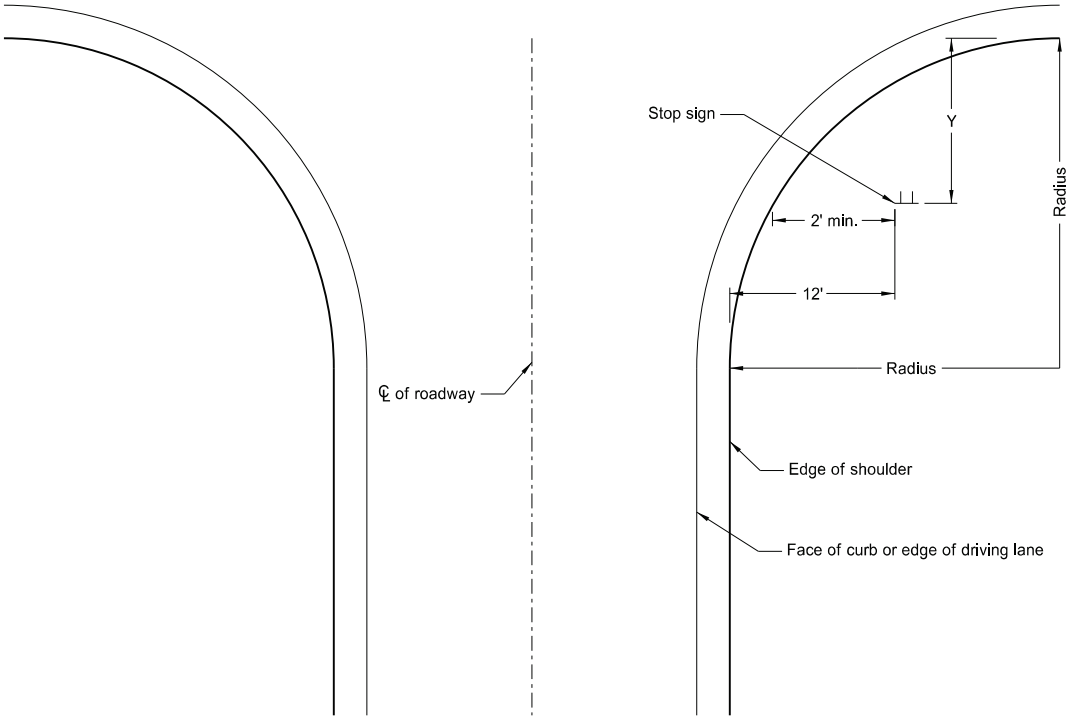


Typical Section (without curb)

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



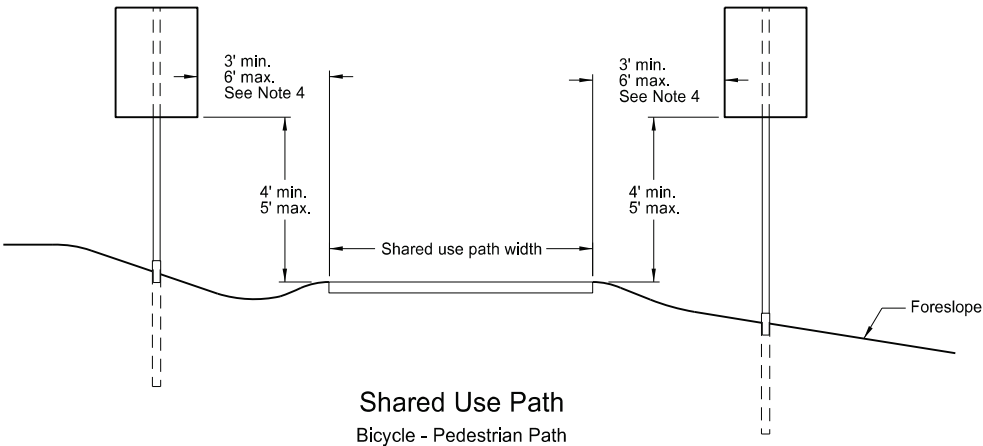
Typical Section (with curb)  
Residential or Business District



Stop Sign Location  
Wide Throat Intersection

Use layout for the placement of "Stop" signs.

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



Shared Use Path  
Bicycle - Pedestrian Path

| NORTH DAKOTA<br>DEPARTMENT OF TRANSPORTATION |                                |
|----------------------------------------------|--------------------------------|
| 10-3-13                                      |                                |
| REVISIONS                                    |                                |
| DATE                                         | CHANGE                         |
| 7-8-14                                       | Revised note 2, added note 4.  |
| 8-30-18                                      | Updated notes to active voice. |
| 8-29-19                                      | New Design Engineer PE Stamp.  |
| 8-05-24                                      | Electronic Stamp/Signature.    |



08/05/24



Notes:

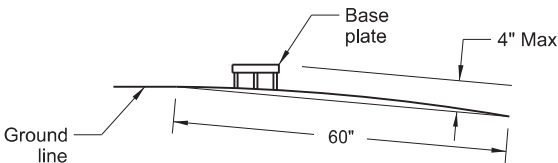
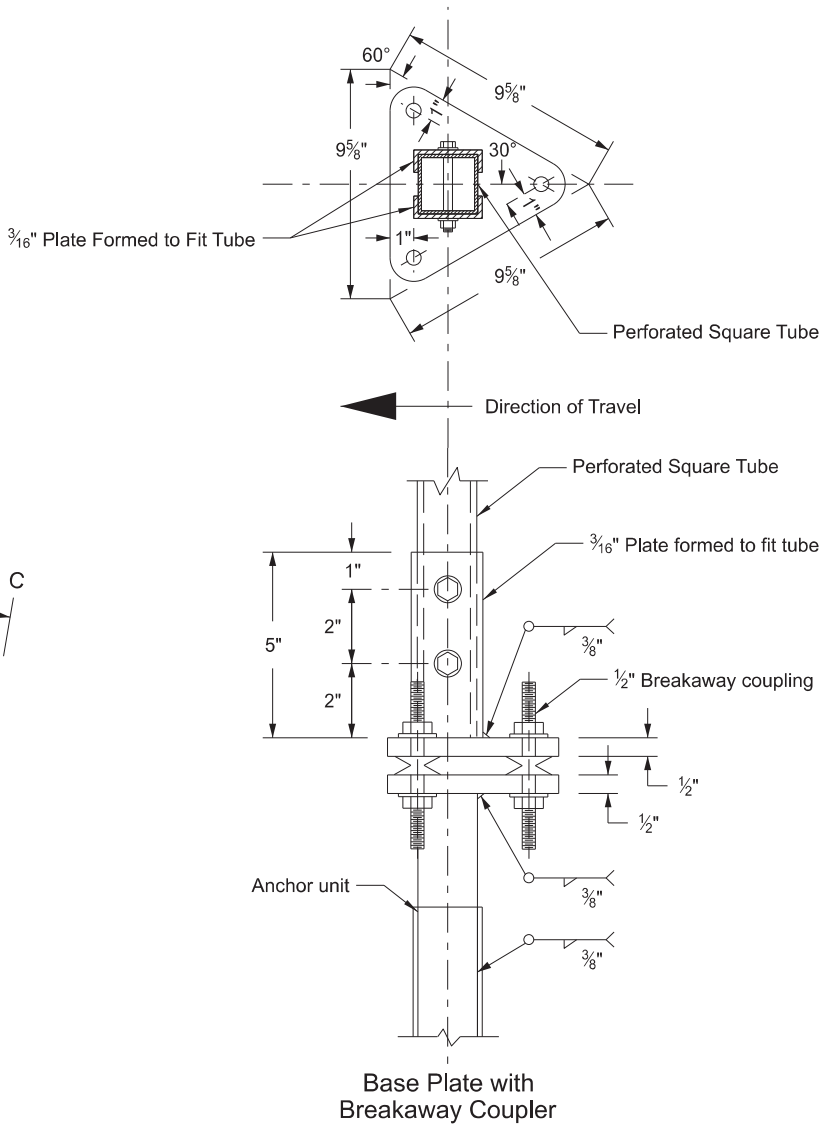
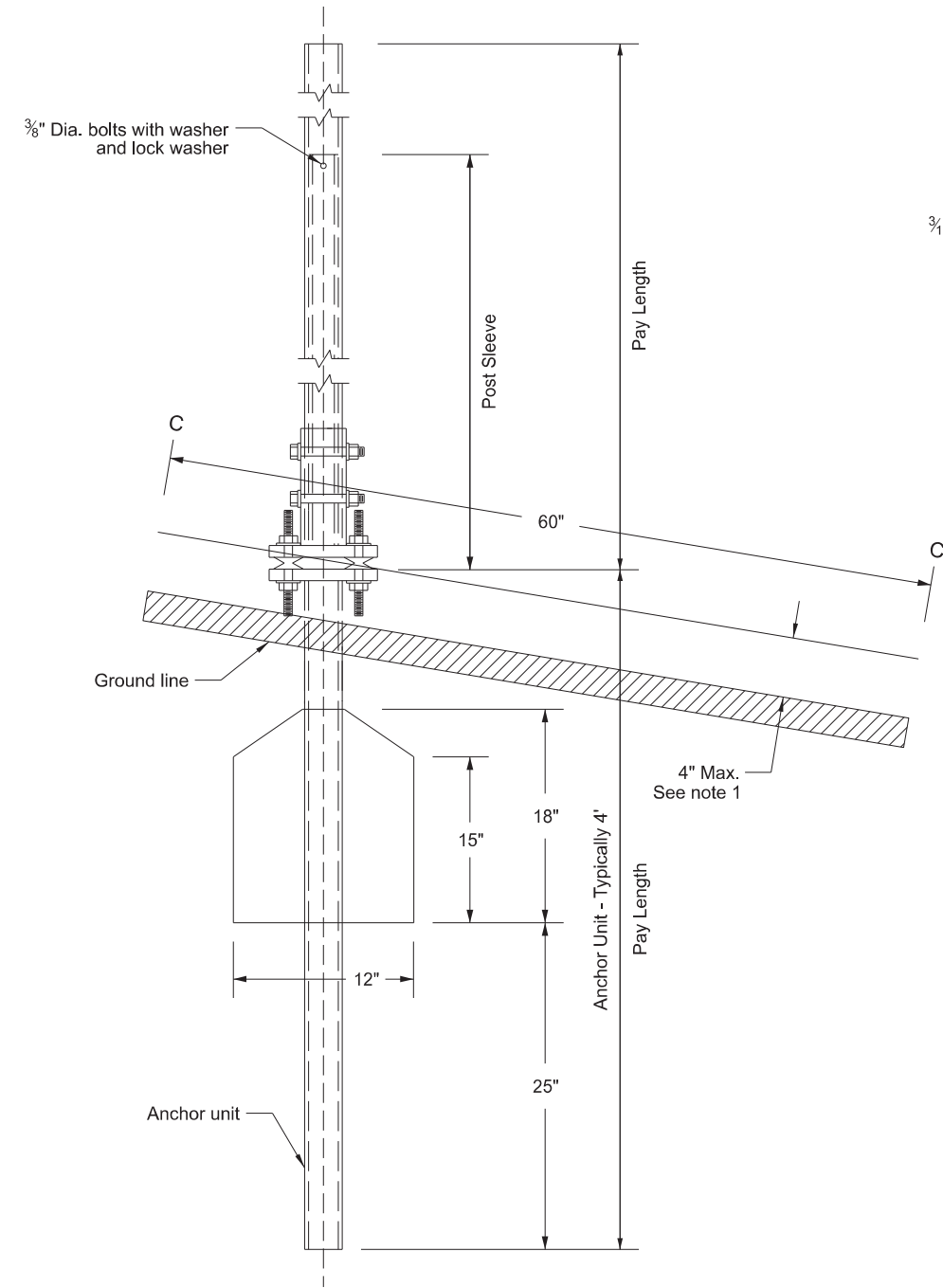
1. 4" Vertical clearance of anchor or breakaway base. The 4" x 60" measurement is above and below post location and also back and ahead of post.
2. Use anchor unit of the same size and specification as the post.
3. Provide a minimum 8' distance between the first and fourth post on four post signs.
4. Use the breakaway base system on standard D-754-24 or the breakaway coupling system manufactured from material meeting the requirements of ASTM A325 fasteners with the special requirements specified by DENT BREAKAWAY IND., INC. which meets the test requirements of NCHRP Report 350.

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

(B) - 2½" 12 gauge posts do not need breakaway bases unless support is placed in boggy, wet, or loose soil areas.

(C) - 3" anchor unit

Breakaway Coupler System for Perforated Tubes

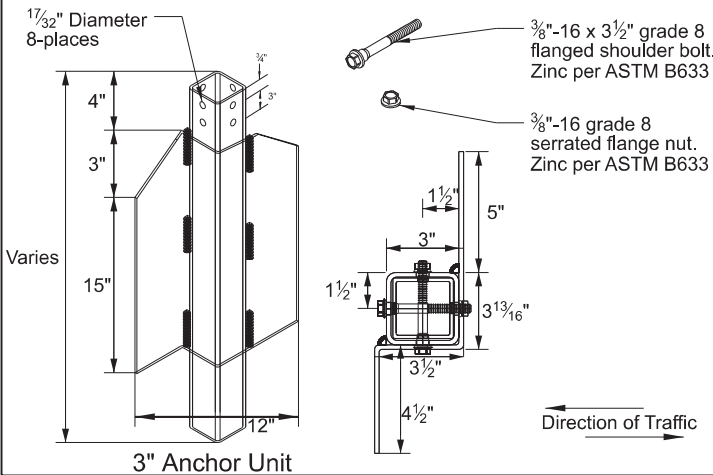


Section C-C

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

Shoulder Bolt

Shimming agent to reduce tolerance between 3" anchor unit with 2½" post. (use of standard ¾" diameter grade 8 bolt allowed with proper shim)



NORTH DAKOTA  
DEPARTMENT OF TRANSPORTATION

10-3-2013

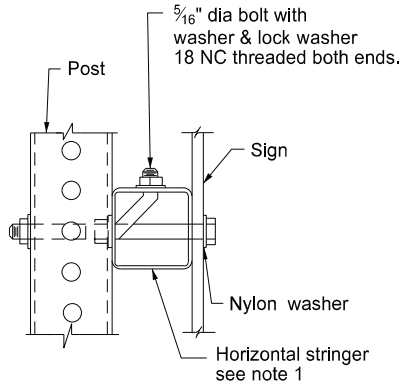
REVISIONS

| DATE     | CHANGE                         |
|----------|--------------------------------|
| 08-30-18 | Updated notes to active voice. |
| 08-30-19 | New Design Engr PE Stamp.      |
| 08-05-24 | Electronic Stamp/Signature.    |
| 07-22-25 | Corrected "typo" in C-C note.  |

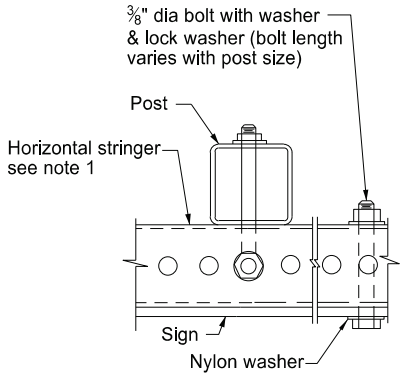
KIRK J. HOFF  
REGISTERED  
PROFESSIONAL  
PE-4683  
ENGINEER  
NORTH DAKOTA

07/22/25

Mounting Details Perforated Tube

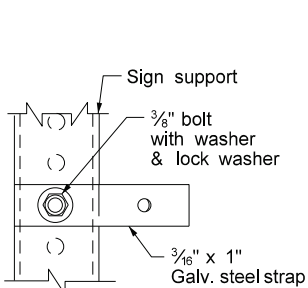


Side View

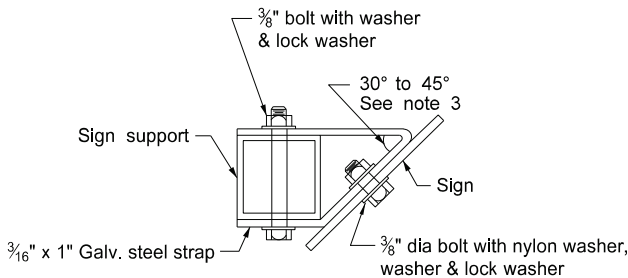


Top View

STRINGER MOUNTING  
(WITH STRINGER IN FRONT OF POST)

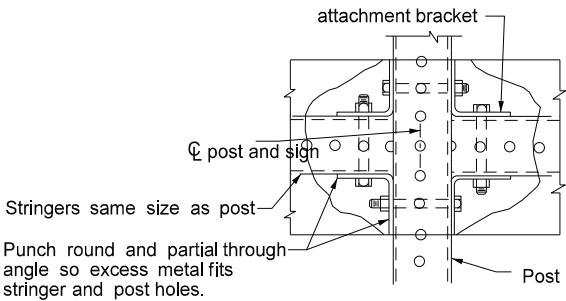


Side View

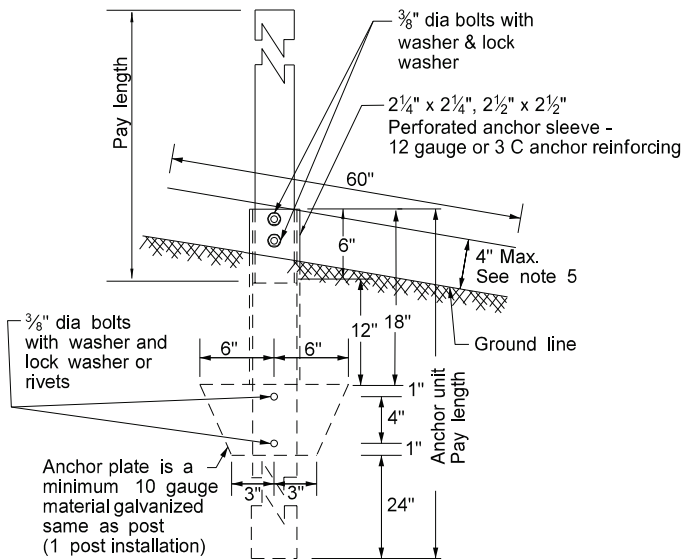


Top View

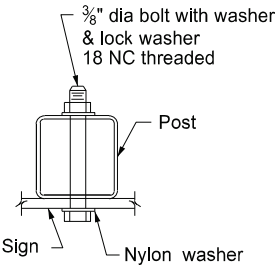
STRAP DETAIL



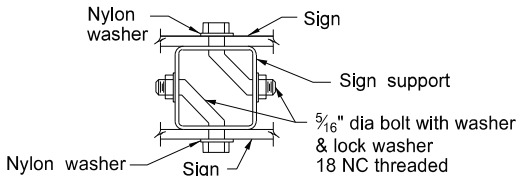
STREET NAME SIGNS AND ONE WAY SIGNS  
SINGLE POST ASSEMBLY  
ONE STRINGER OR BACK TO BACK MOUNTING



ANCHOR UNIT AND POST ASSEMBLY

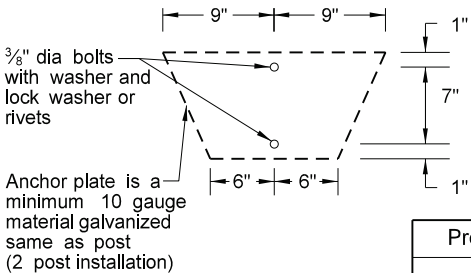


BOLT MOUNTING



Top View

BACK TO BACK MOUNTING



| Properties of Telescoping Perforated Tubes |                    |                     |                      |                                    |                                   |                                  |  |
|--------------------------------------------|--------------------|---------------------|----------------------|------------------------------------|-----------------------------------|----------------------------------|--|
| Tube Size In.                              | Wall Thickness In. | U.S. Standard Gauge | Weight Per Foot Lbs. | Moment of Inertia In. <sup>4</sup> | Cross Sect. area In. <sup>2</sup> | Section Modulus In. <sup>3</sup> |  |
| 1½ x 1½                                    | 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                            |  |
| 2¼ x 2¼                                    | 0.105              | 12                  | 2.773                | 0.561                              | 0.695                             | 0.499                            |  |
| 2½ x 2½                                    | 0.135              | 10                  | 3.432                | 0.605                              | 0.841                             | 0.590                            |  |
| 2½ x 2½                                    | 0.105              | 12                  | 3.141                | 0.804                              | 0.803                             | 0.643                            |  |
| 2½ x 2½                                    | 0.135              | 10                  | 4.006                | 0.979                              | 1.010                             | 0.783                            |  |

The 2½ size 10 gauge is shown as 2.19" size on the plans.  
The 2½ size is shown as 2.51" size on the plans.

Note:

- Horizontal stringers - Use perforated tubes or 1¼" x ¾" thick, 1.08 lbs./ft aluminum or 3.16 lbs./ft steel z bar stringers.
- Use minimum outside diameter 15/16" ± 1/16" and 10 gauge thick metal washers on sign face.
- Place No Parking signs with directional arrows at a 30 to 45 degree angle with the line of traffic flow. Turning the support to the correct angle for No Parking signs requiring the above angles is allowed. If the No Parking sign is placed with another sign that requires placement at a 90 degree angle with the line of traffic flow, use the detailed angle strap to mount the No Parking sign. Use flat washers and lock washers with all nylon washers.
- Punching the sign backing and placing the bolt through the sign, the stringer and the post is allowed in lieu of using the bent bolt to attach the post to the stringer.
- 4" vertical clearance of anchor or breakaway base. The 4" x 60" measurement is above and below post location and also back and ahead of post.

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

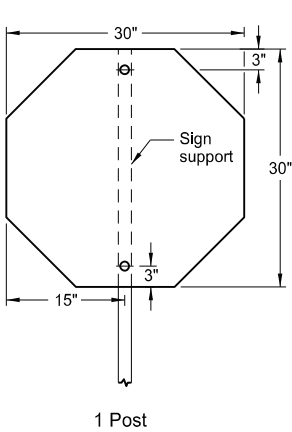
(B) - When placing 2½", 12 gauge posts in standard soils without breakaway bases, provide a shim as specified by the manufacturer. Provide breakaway base when placing the support in weak soils. Engineer will determine if soils are weak. Weak soils are classified as boggy, wet, or loose soil areas.  
(C) - 3" anchor unit  
(D) - 2½" x 12 ga. x 18" minimum length external sleeve required.

| NORTH DAKOTA<br>DEPARTMENT OF TRANSPORTATION |                                |
|----------------------------------------------|--------------------------------|
| 8-6-09                                       |                                |
| REVISIONS                                    |                                |
| DATE                                         | CHANGE                         |
| 7-8-14                                       | Revised Note 3.                |
| 8-30-18                                      | Updated notes to active voice. |
| 8-30-19                                      | New Design Engr PE Stamp.      |
| 8-05-24                                      | Electronic Stamp/Signature.    |

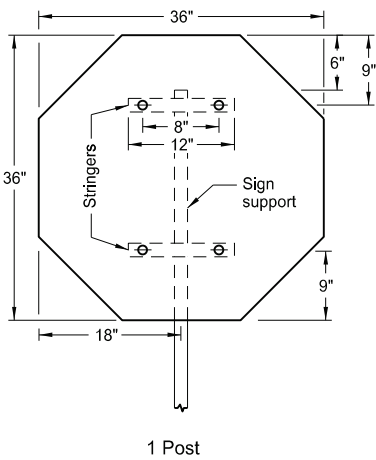
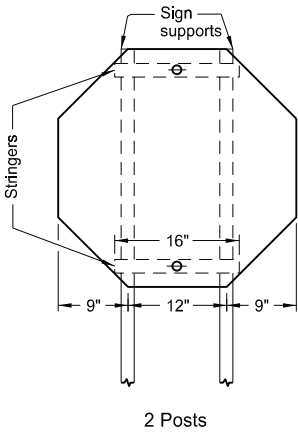


SIGN PUNCHING, STRINGER AND SUPPORT LOCATION  
DETAILS REGULATORY, WARNING AND GUIDE SIGNS

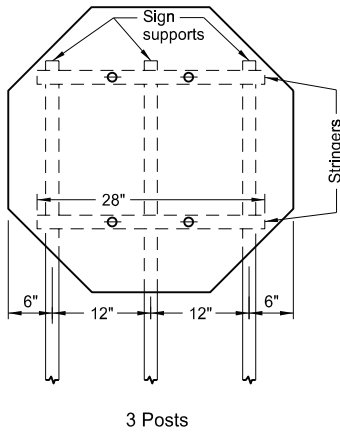
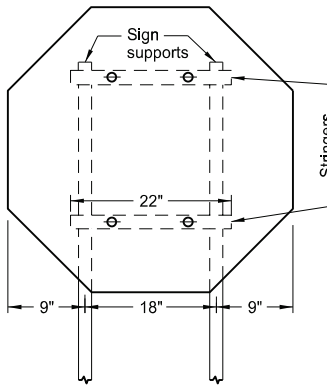
D-754-26



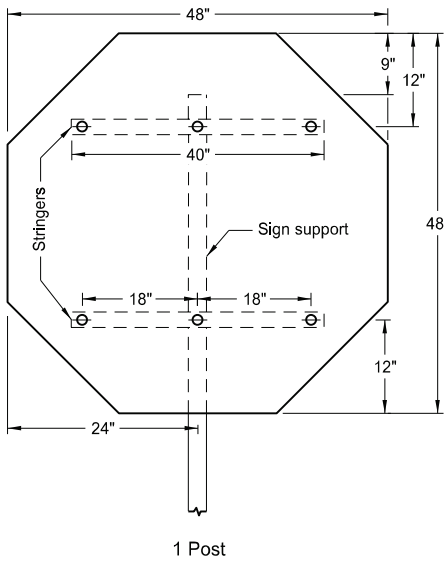
Assembly No. 1



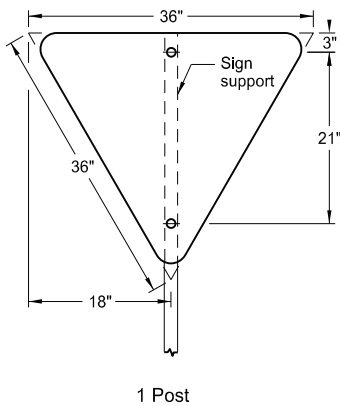
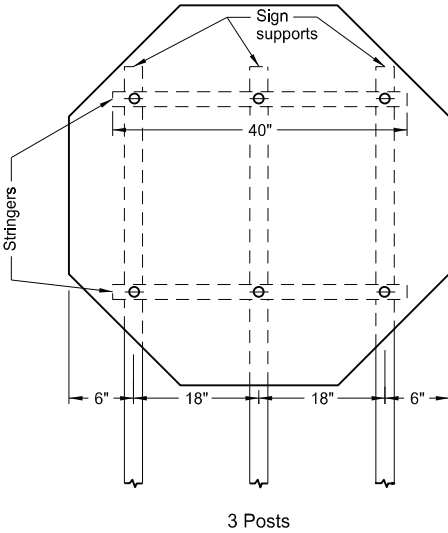
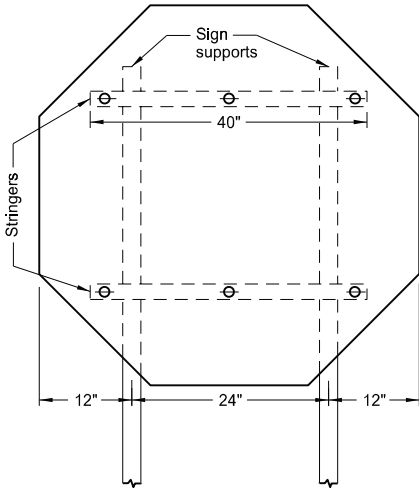
Assembly No. 2



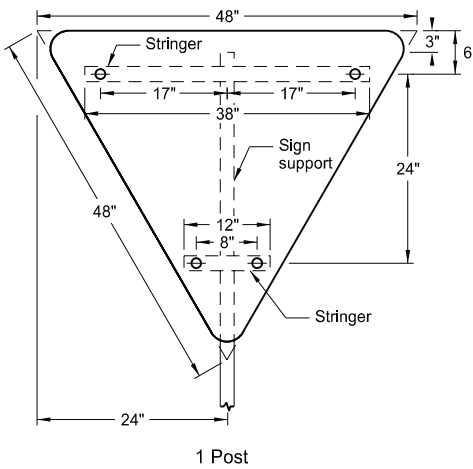
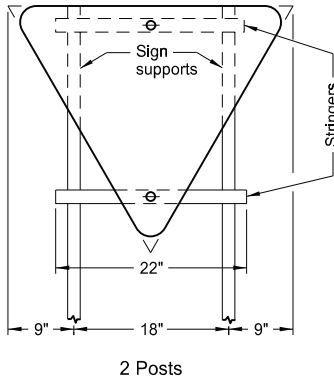
- Notes:
1. Use 0.100 inch minimum thickness sign backing material.
  2. Use 1½" x 1½" perforated square tube stringers.
  3. Punch holes round for ¾" bolt.



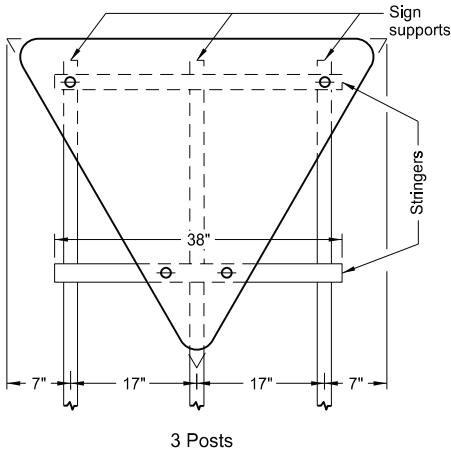
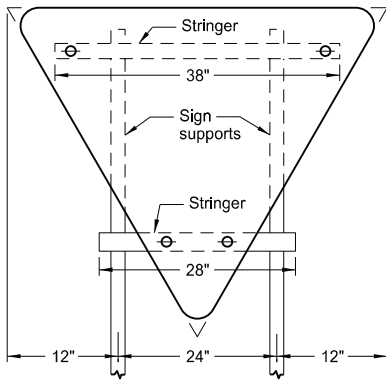
Assembly No. 3



Assembly No. 4



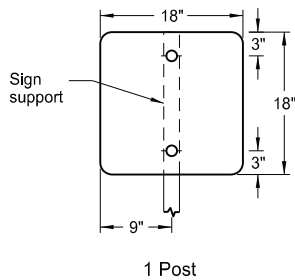
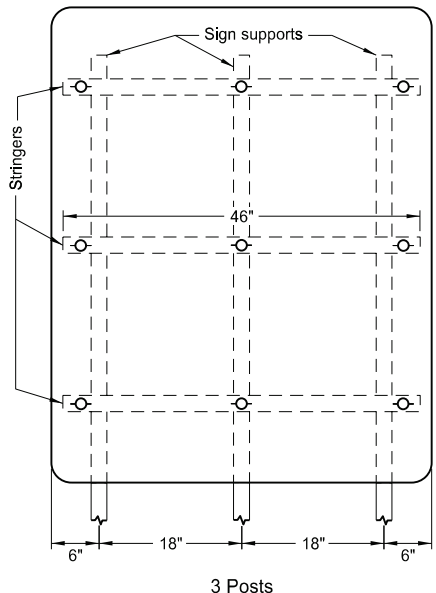
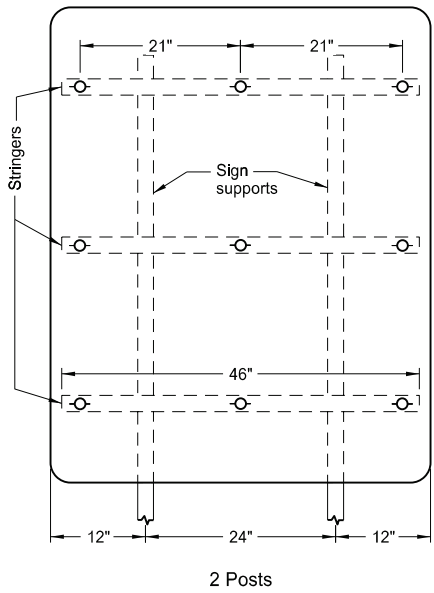
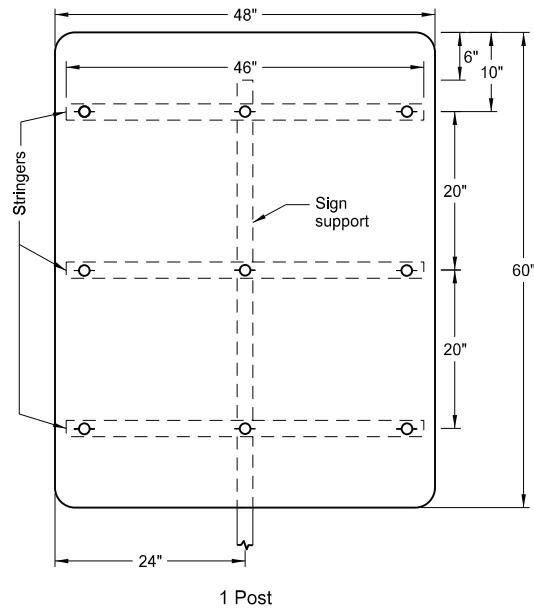
Assembly No. 5



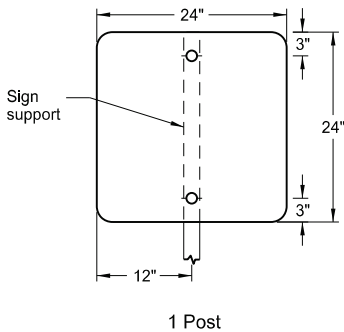
| NORTH DAKOTA<br>DEPARTMENT OF TRANSPORTATION |                                |
|----------------------------------------------|--------------------------------|
| 12-1-10                                      |                                |
| REVISIONS                                    |                                |
| DATE                                         | CHANGE                         |
| 8-30-18                                      | Updated notes to active voice. |
| 8-30-19                                      | New Design Engineer PE Stamp.  |
| 8-05-24                                      | Electronic Stamp/Signature.    |



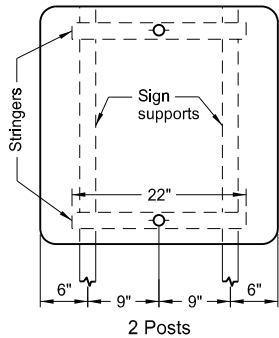
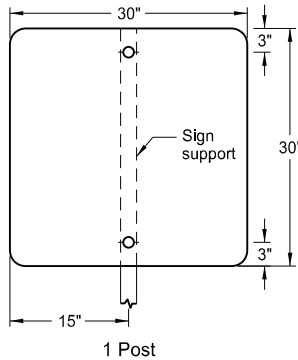
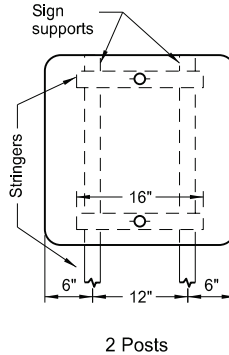
SIGN PUNCHING, STRINGER AND SUPPORT LOCATION  
DETAILS REGULATORY, WARNING AND GUIDE SIGNS



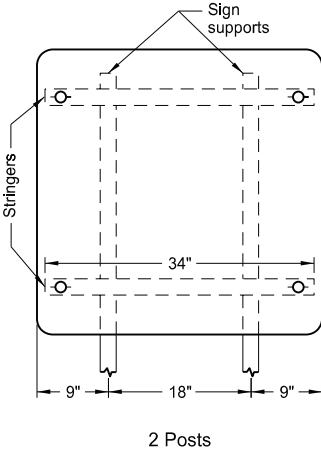
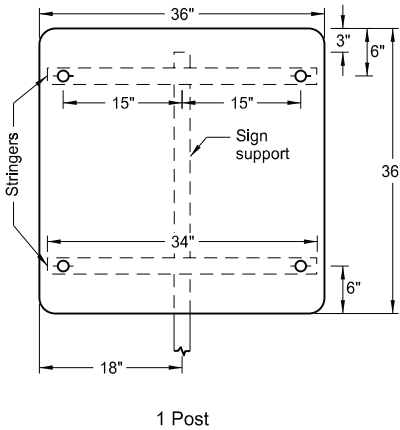
Assembly No. 13



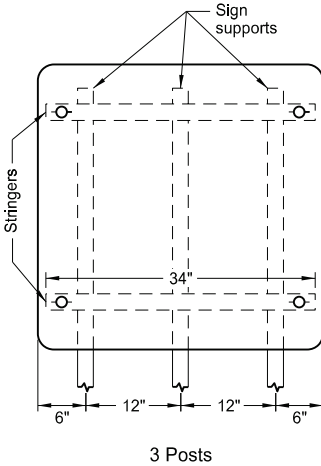
Assembly No. 14



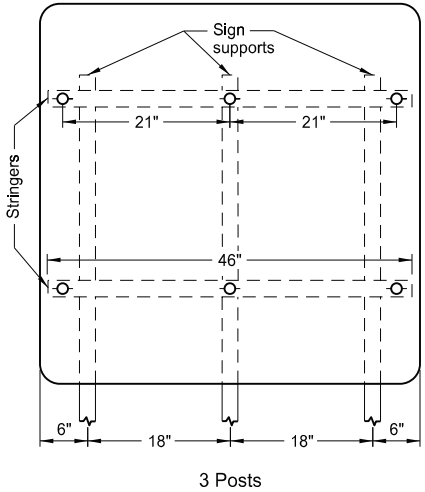
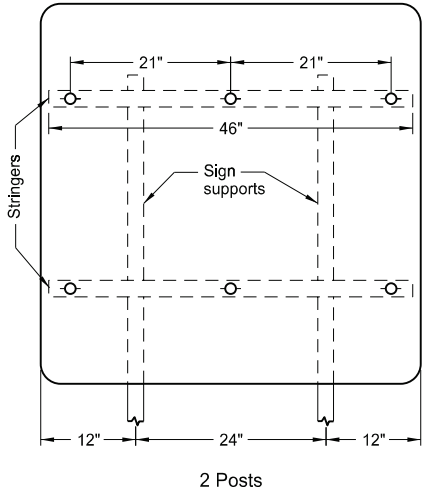
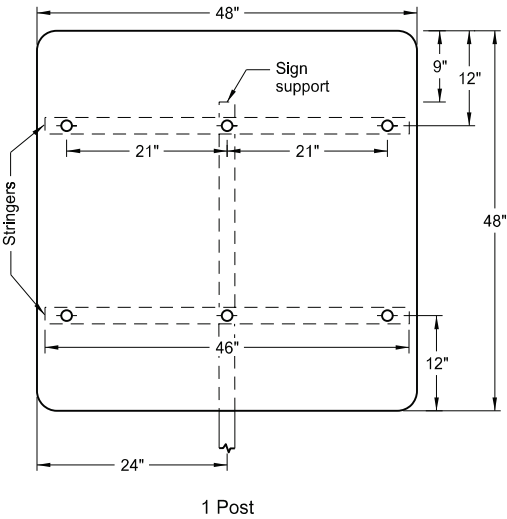
Assembly No. 15



Assembly No. 16



- Notes:
1. Use 0.100 inch minimum thickness sign backing material.
  2. Use 1½" x 1½" perforated square tube stringers.
  3. Punch holes round for ⅜" bolt.



Assembly No. 17

| NORTH DAKOTA<br>DEPARTMENT OF TRANSPORTATION |                                                             |
|----------------------------------------------|-------------------------------------------------------------|
| 12-1-10                                      |                                                             |
| REVISIONS                                    |                                                             |
| DATE                                         | CHANGE                                                      |
| 8-30-18                                      | Updated to active voice & changed Assembly 16 post spacing. |
| 8-30-19                                      | New Design Engineer PE Stamp.                               |
| 8-06-24                                      | Electronic Stamp/Signature.                                 |

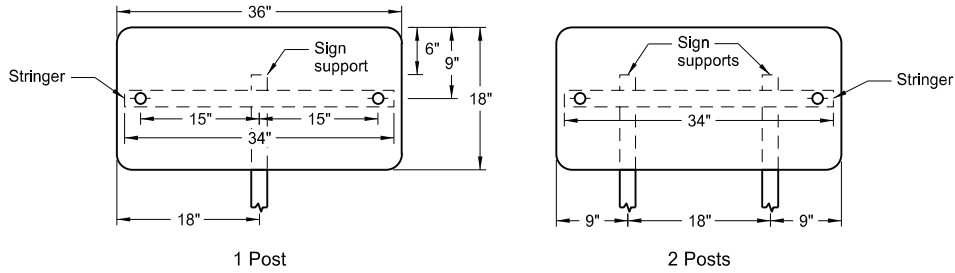


08/06/24

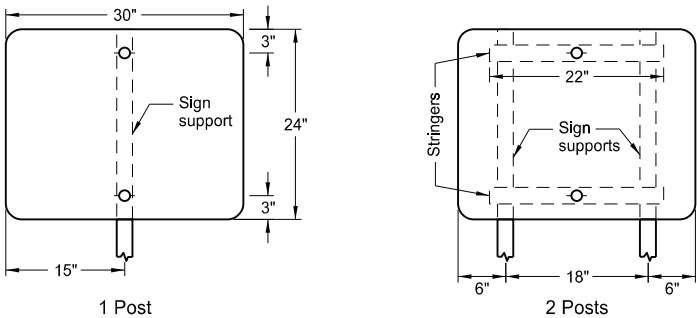
SIGN PUNCHING, STRINGER AND SUPPORT LOCATION  
DETAILS REGULATORY, WARNING AND GUIDE SIGNS

D-754-32

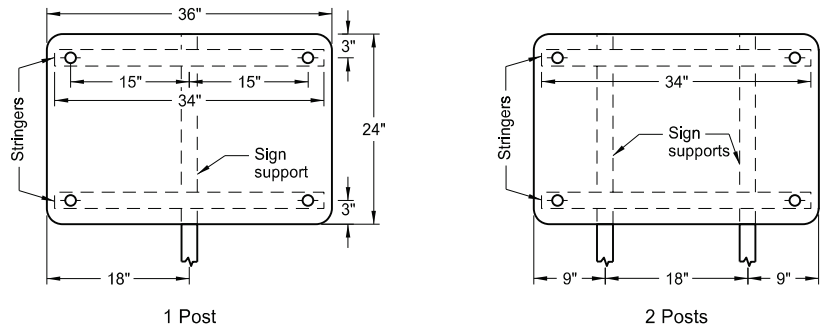
- Notes:
- 1. Use 0.100 inch minimum thickness sign backing material.
  - 2. Use 1½" x 1½" perforated square tube stringers.
  - 3. Punch holes round for ⅜" bolt.



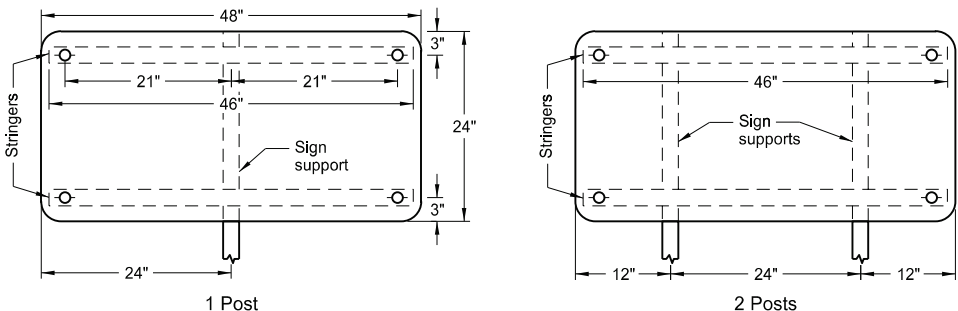
Assembly No. 31



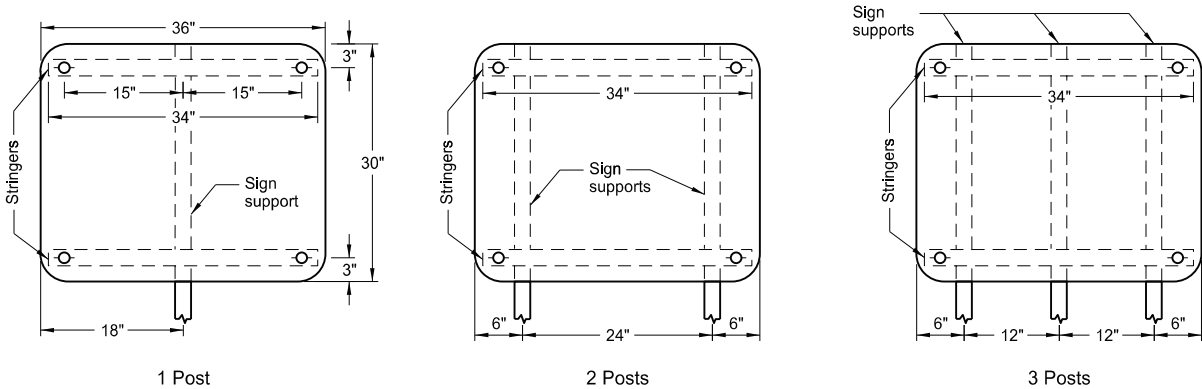
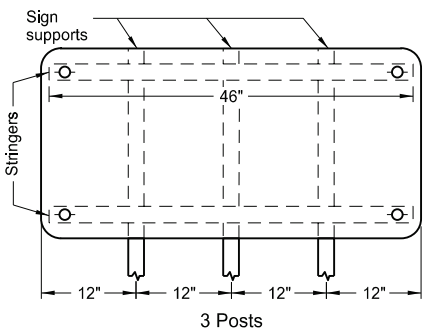
Assembly No. 32



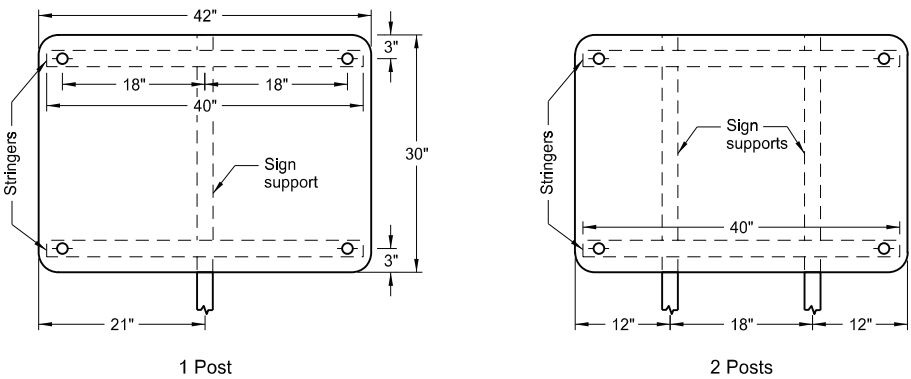
Assembly No. 33



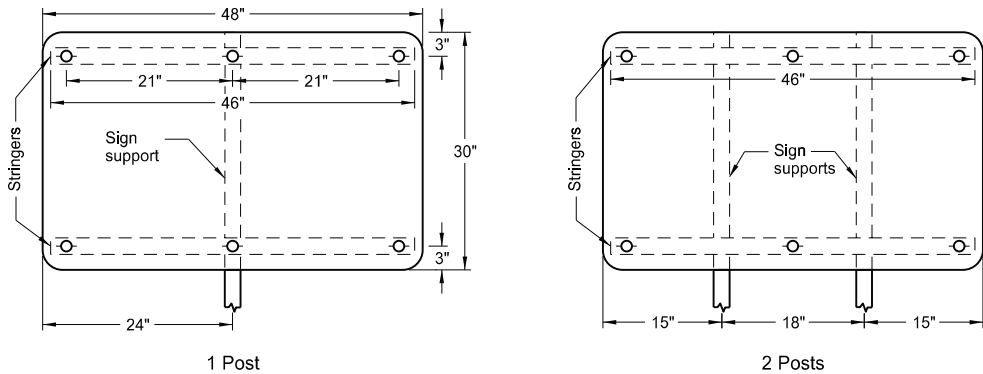
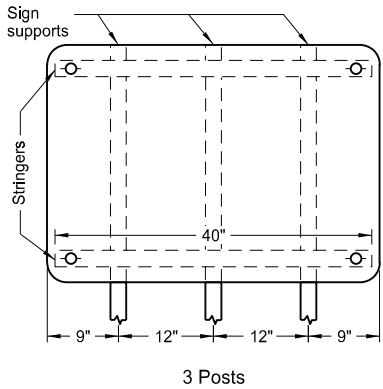
Assembly No. 34



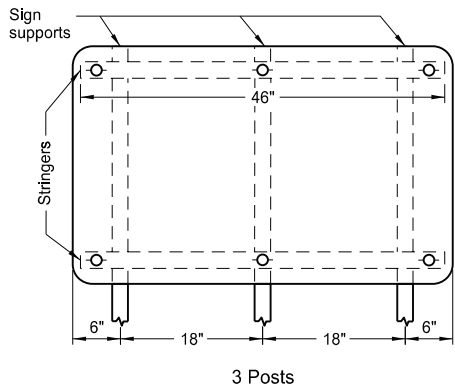
Assembly No. 35



Assembly No. 36



Assembly No. 37

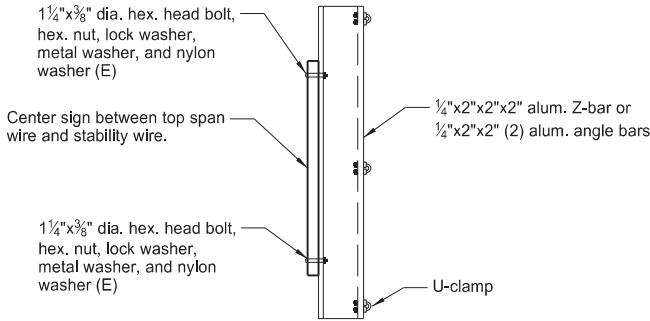
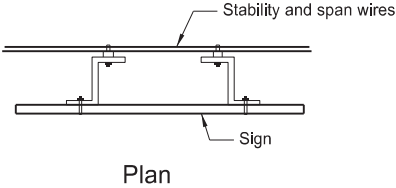
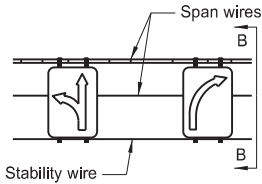


| NORTH DAKOTA<br>DEPARTMENT OF TRANSPORTATION |                                |
|----------------------------------------------|--------------------------------|
| 12-1-10                                      |                                |
| REVISIONS                                    |                                |
| DATE                                         | CHANGE                         |
| 8-30-18                                      | Updated notes to active voice. |
| 8-30-19                                      | New Design Engineer PE Stamp.  |
| 8-06-24                                      | Electronic Stamp/Signature.    |

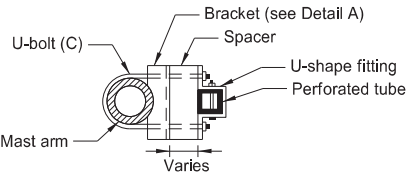


08/06/24

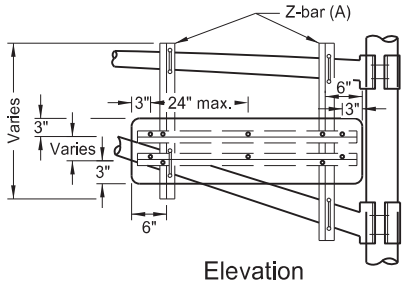
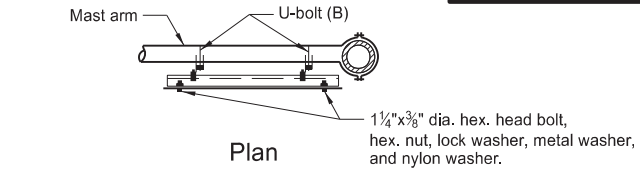
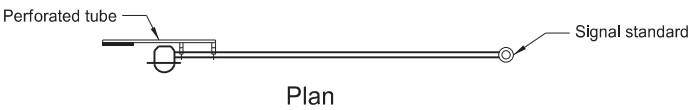
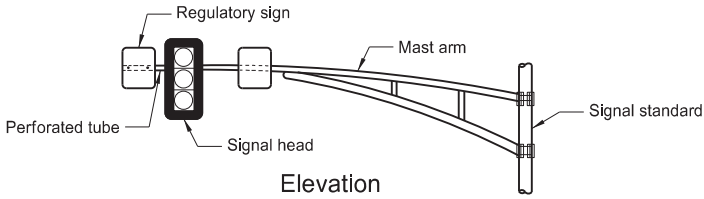
LIGHT STANDARD, SIGNAL STANDARD,  
AND SPAN WIRE MOUNTED SIGN  
ASSEMBLY DETAIL



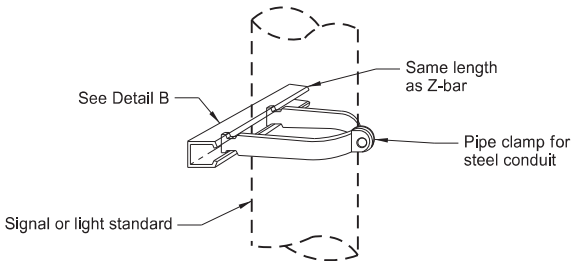
Section B-B  
Span Wire Mounted Sign Detail



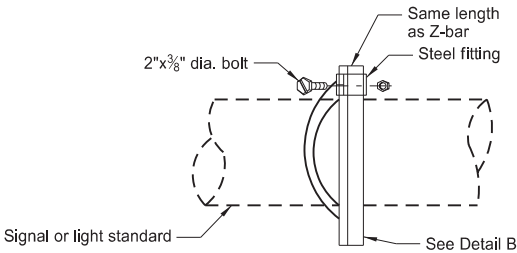
Section A-A



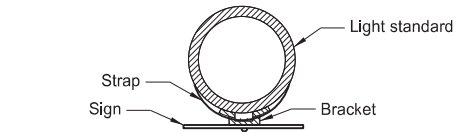
Mast Arm Mounted Street Name Sign Detail



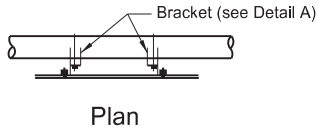
Vertical Mounting  
(Use 2 clamps per sign)



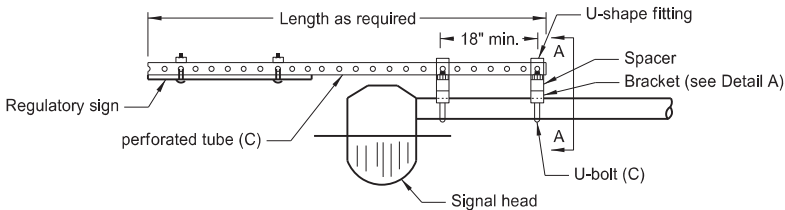
Horizontal Mounting  
alternate clamp mounting  
(Use 2 clamps per sign)



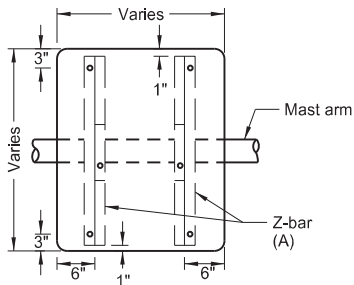
Light Standard Mounted Sign Bracket Detail  
Max. 24"x30" signs (D)



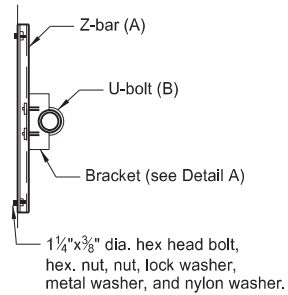
Plan



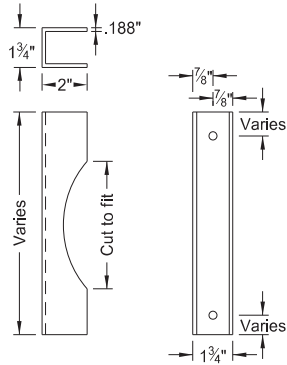
Sign Mounted Beyond End of Mast Arm Detail



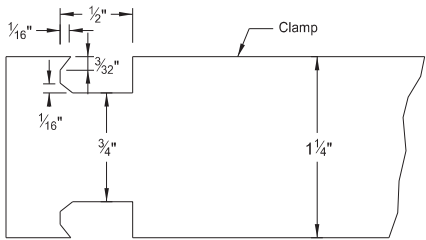
Elevation



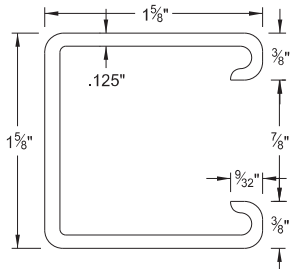
Side View



Detail A



Clamp Detail



Detail B  
Steel Channel

| Post Size<br>dia. | Clamp<br>Gauge<br>min. |
|-------------------|------------------------|
| 3 1/2" to 5"      | 11                     |
| 6" to 12"         | 10                     |

| Clamp                 |          |
|-----------------------|----------|
| Post Size<br>dia. in. | D<br>in. |
| 3 1/2                 | 3        |
| 4                     | 3 3/16   |
| 5                     | 5 1/8    |
| 6                     | 7 1/16   |
| 8                     | 13 1/16  |
| 10                    | 20 3/4   |
| 12                    | 29 5/8   |

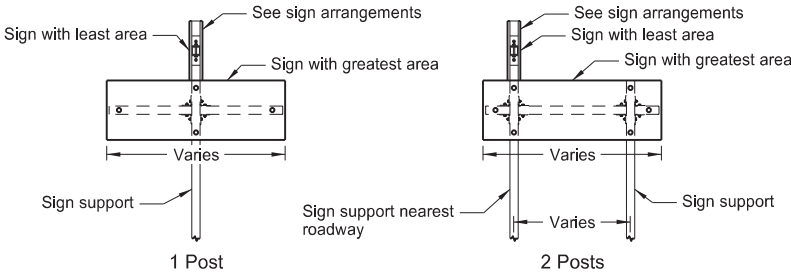
| NORTH DAKOTA<br>DEPARTMENT OF TRANSPORTATION |                                 |
|----------------------------------------------|---------------------------------|
| 10-3-13                                      |                                 |
| REVISIONS                                    |                                 |
| DATE                                         | CHANGE                          |
| 8-30-18                                      | Updated notes to active voices. |
| 9-05-19                                      | New Design Engineer PE Stamp.   |
| 8-08-24                                      | Electronic Stamp/Signature.     |



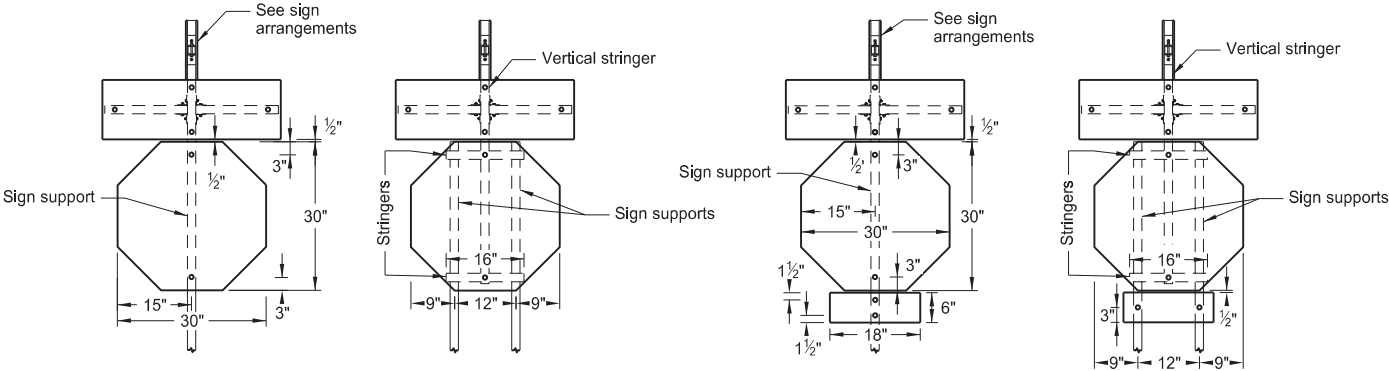
- Notes:
- (A) Use 1 3/4"x3/16" thick 1.08 lb/ft aluminum alloy Z-bar. In place of Z-bar, use two 1 3/4"x1 3/4"x3/16" angles bolted together or a 1 3/4"x2"x.188" channel.
  - (B) 3/8" U-bolt, hex. nut, lock washer, and bracket (U-bolt length depends on dia. of mast arm.)
  - (C) 3/8" U-bolt, hex. nut, lock washer, and bracket (U-bolt length depends on dia. of mast arm.)
- Maximum perforated tube lengths for mounting signs beyond end of mast arm:
- 2"x2" maximum support length 9.9'
  - 2 1/4"x2 1/4" maximum support length 12.6'
  - 2 1/2"x2 1/2" maximum support length 15.7'
- (D) Use galv. steel strap and sign attachment bracket similar to the one shown in the detail. Include all costs of bracket assembly in the price bid for flat sheet signs. Punch as shown on Standard Drawings. Provide a 7' minimum vertical clearance to the bottom of signs mounted on light standards.
  - (E) Use metal washers and nylon washers with a minimum outside dia. of 1 5/16" ± 1/16" and 10 gauge thickness on sign face.

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

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

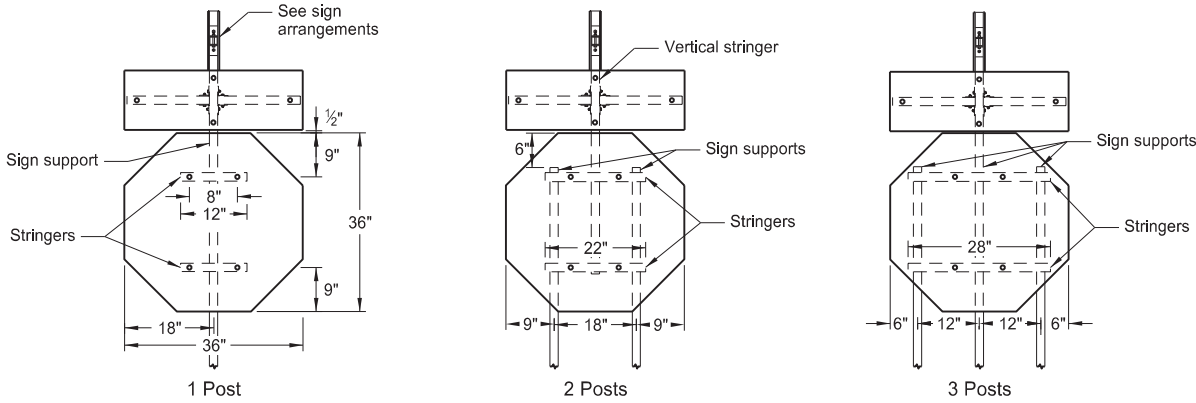


Special Assembly 1 (A, B, C, D or E)

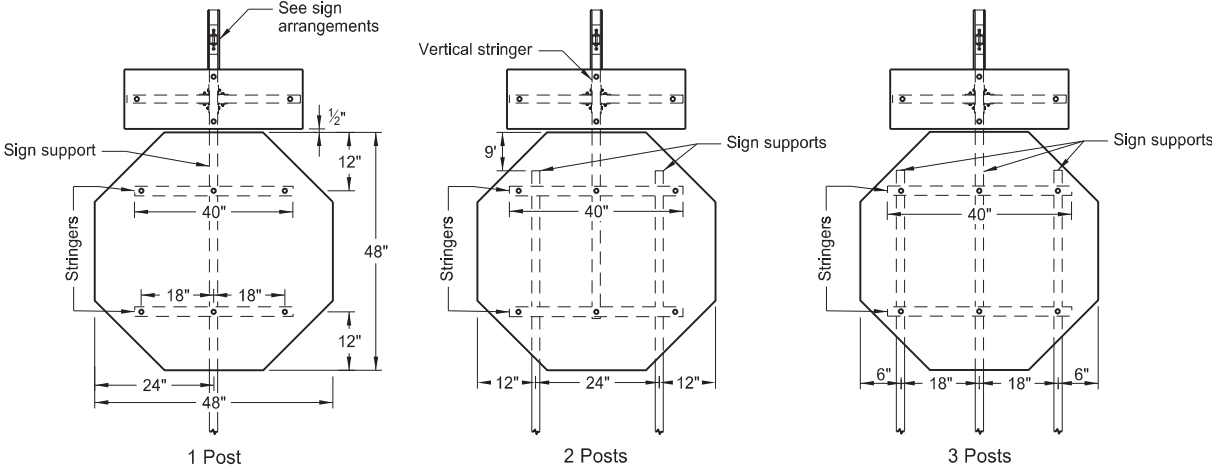


Special Assembly 2 (A, B, C, D or E)

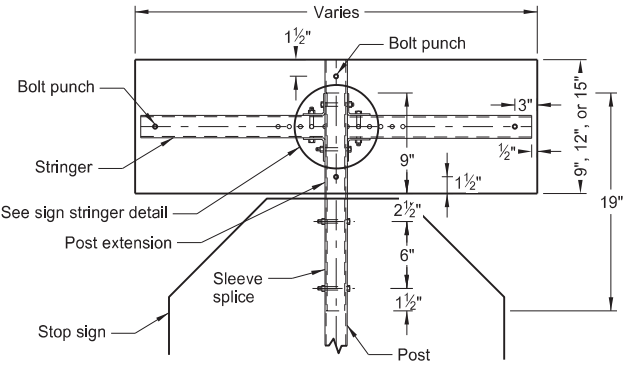
Special Assembly 3 (A, B, C, D or E)



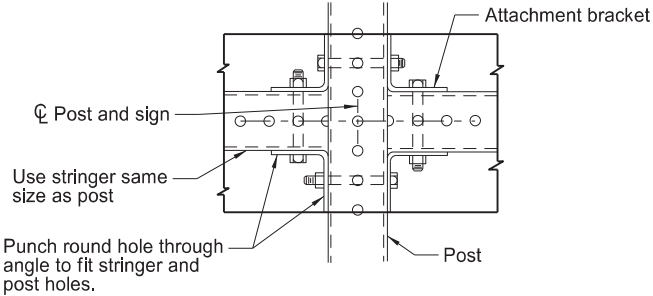
Special Assembly 4 (A, B, C, D or E)



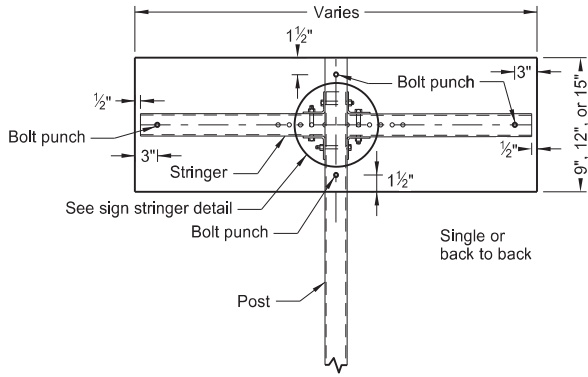
Special Assembly 5 (A, B, C, D or E)



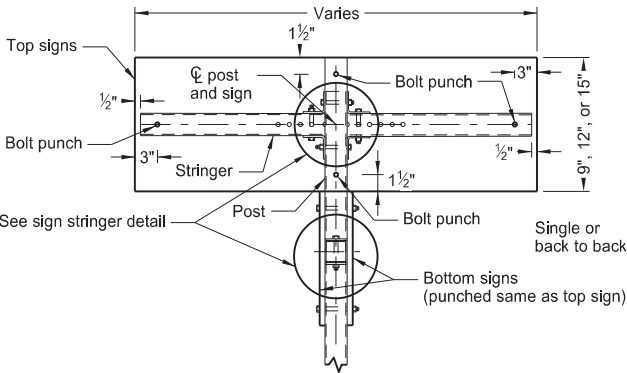
Front View  
Sleeve Splice Detail



Sign Stringer Detail

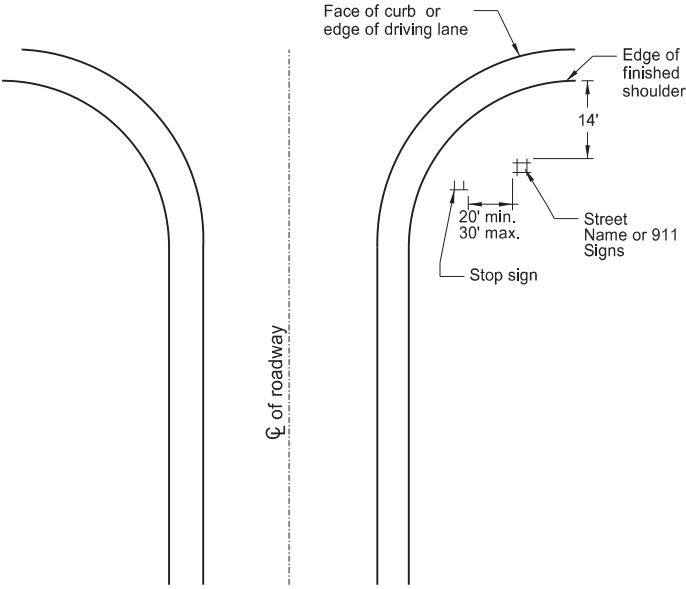


Detail A or B



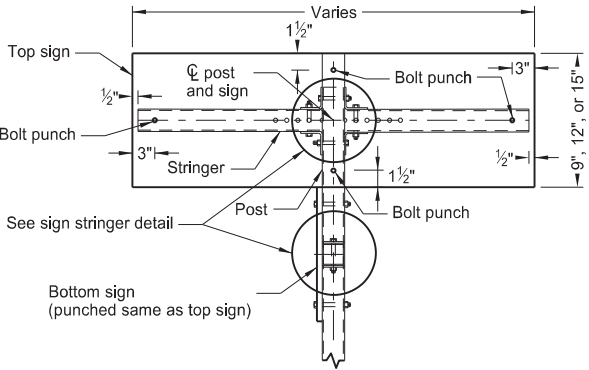
Detail D or E

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



Intersection Layout

Note: Use layout for street name signs or 911 signs with Special Assembly 1.



Detail C

Sign Arrangements

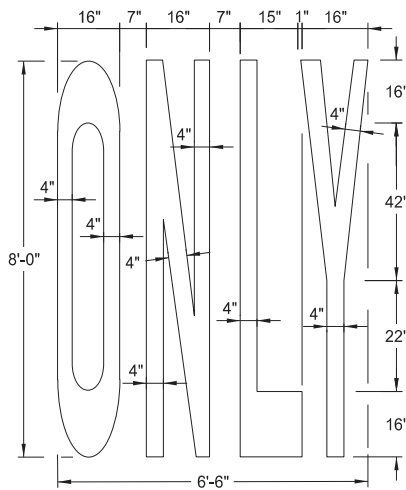
|                                              |                                                                |
|----------------------------------------------|----------------------------------------------------------------|
| NORTH DAKOTA<br>DEPARTMENT OF TRANSPORTATION |                                                                |
| 10-3-13                                      |                                                                |
| REVISIONS                                    |                                                                |
| DATE                                         | CHANGE                                                         |
| 8-30-18                                      | Added 2 post layout for SA1 and Updated notes to active voice. |
| 9-05-19                                      | New Design Engineer PE Stamp.                                  |
| 8-08-24                                      | Electronic Stamp/Signature.                                    |



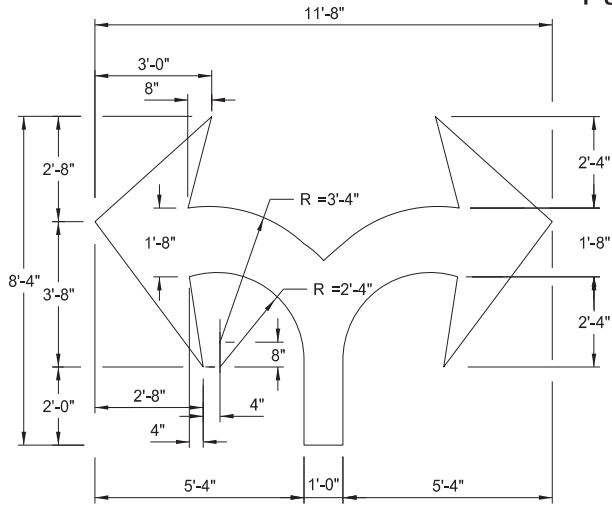
08/08/24

## Pavement Marking Message Details

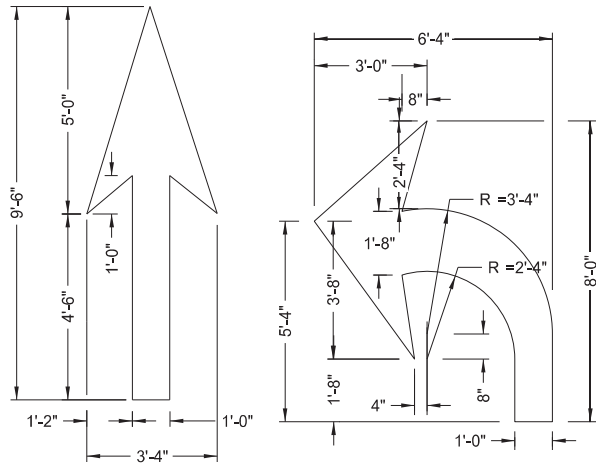
D-762-1



22 S. F.

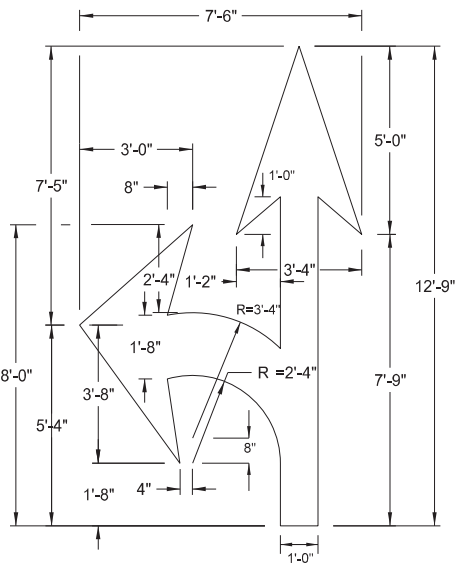


29 S. F.

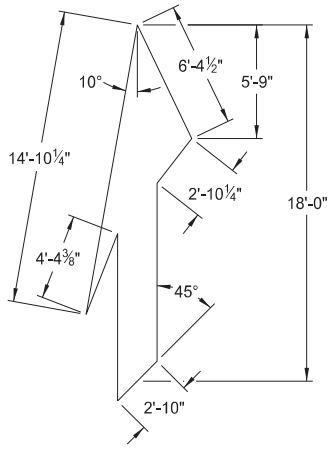


12 S. F.

16 S. F.



27 S. F.

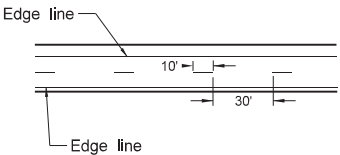


41 S. F.

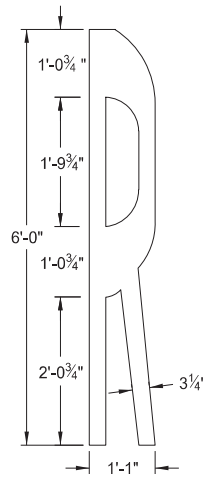
Note: Rotate merge arrow  
20° from edge of roadway.

| Speed Limit         | Chevron Width | Chevron Spacing<br>45° to Traffic |
|---------------------|---------------|-----------------------------------|
| 0-25 mph            | 8"            | 5'                                |
| 30-40 mph           | 8"            | 15'                               |
| 45 mph<br>and above | 12"           | 25'                               |

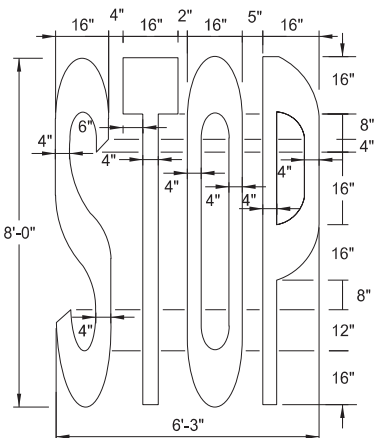
## Chevron Crosshatching Table



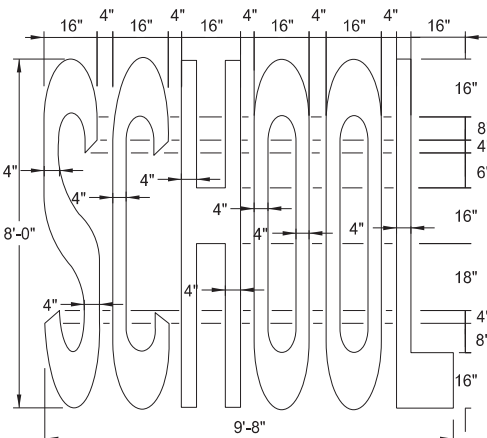
### Centerline Pavement Marking Skip Spacing Detail



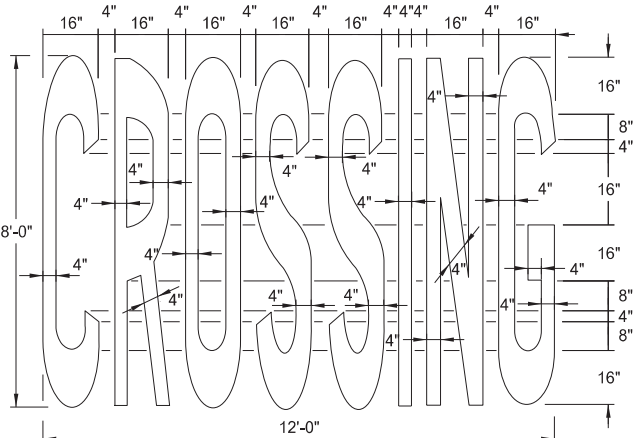
4 S. F.



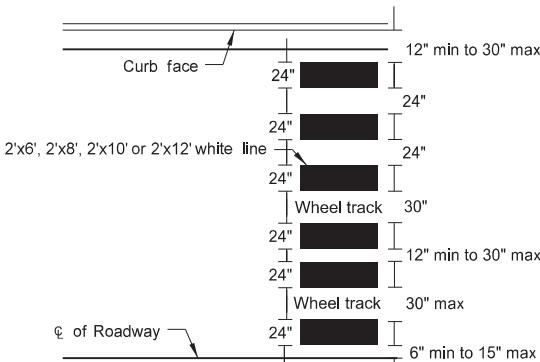
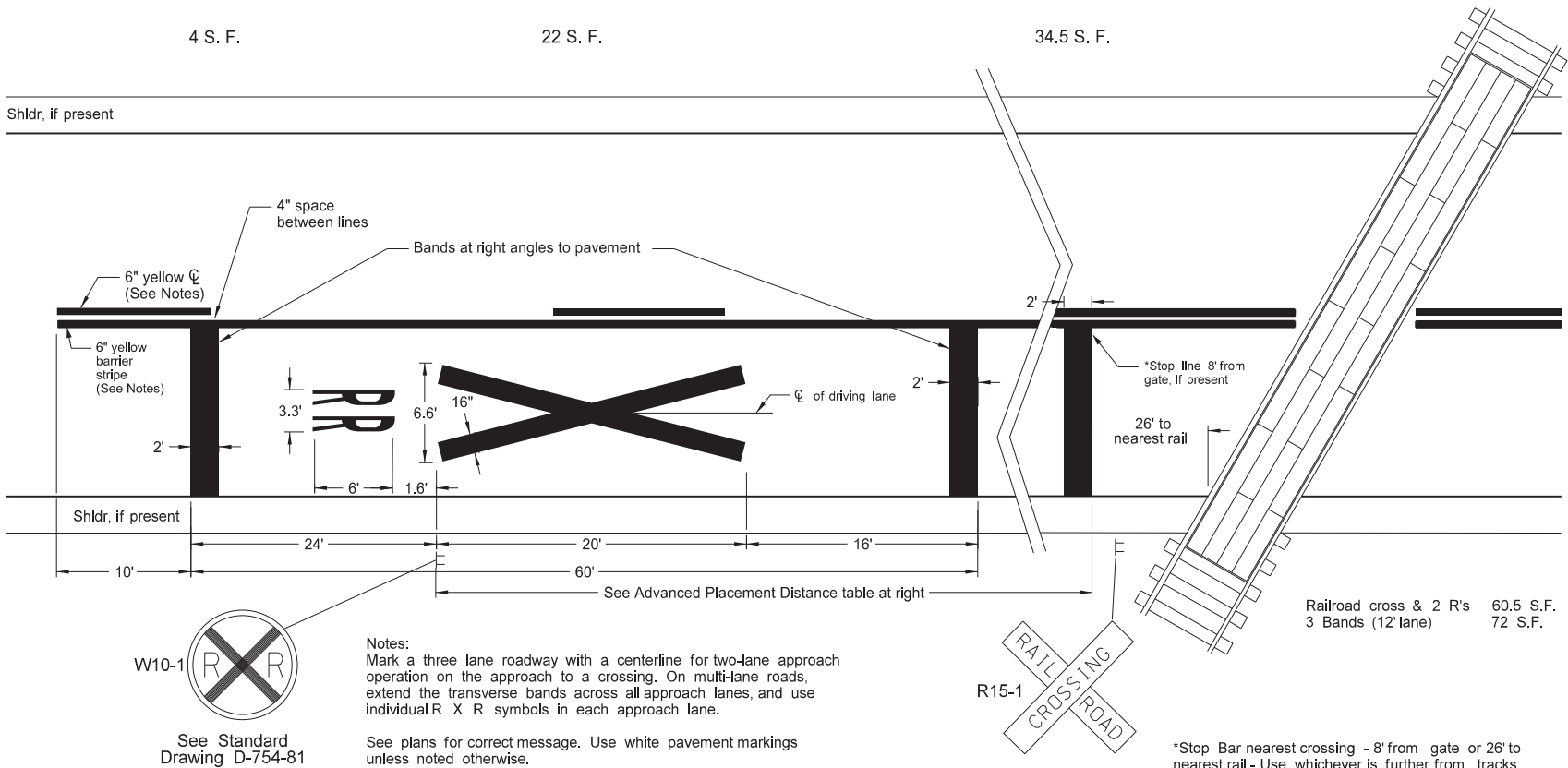
22 S. F.



34.5 S. F.



46 S. F.



## Continental Crosswalk Detail

| Advance Placement Distance<br>for Railroad Warning Signs |                     |
|----------------------------------------------------------|---------------------|
| Posted or 85th<br>Percentile Speed                       | Advance<br>Distance |
| 20 mph                                                   | min. 100 ft         |
| 25 mph                                                   | min. 100 ft         |
| 30 mph                                                   | min. 100 ft         |
| 35 mph                                                   | min. 100 ft         |
| 40 mph                                                   | 125 ft              |
| 45 mph                                                   | 175 ft              |
| 50 mph                                                   | 250 ft              |
| 55 mph                                                   | 325 ft              |
| 60 mph                                                   | 400 ft              |
| 65 mph                                                   | 475 ft              |
| 70 mph                                                   | 550 ft              |

| NORTH DAKOTA<br>DEPARTMENT OF TRANSPORTATION |                                        |
|----------------------------------------------|----------------------------------------|
| 12-6-11                                      |                                        |
| REVISIONS                                    |                                        |
| DATE                                         | CHANGE                                 |
| 10-17-17                                     | Updated to active voice.               |
| 08-27-19                                     | New Design Engineer PE Stamp.          |
| 01-28-2020                                   | Revised min Stop Bar distance to rail. |
| 11-22-2023                                   | Revised pavement marking widths.       |



NOTES:

1. Normal width line - 6 inches wide for freeways, expressways, and ramps; 6 inches for all other roadways with speed limits  $> 40$  mph,
2. Use 4 or 6 inch wide pavement marking for all other roadways with speed limits  $\leq 40$  mph.