STANDARD PLANS
for
ROAD CONSTRUCTION

New Hampshire DOT
Department of Transportation

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION
April 1, 2021
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HIGHWAY STANDARD PLANS

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GENERAL NOTES

1. At interchange ramps, delineators shall be located along the outside of the curves. The spacing and color of these signs on both sides shall be agreed upon in the alignment.

2. Continue normal delineator spacing on both sides of ramps at rates of curves are greater than 1000 ft or tangent sides (see No. 1).

3. Place the first 150 ft of exit moves on ramps the longer of 1000 ft or tangent sides.

4. Place the first 150 ft of exit moves on ramps the longer of 1000 ft or tangent sides.

5. Place the first 150 ft of exit moves on ramps the longer of 1000 ft or tangent sides.

6. Place the first 150 ft of exit moves on ramps the longer of 1000 ft or tangent sides.

7. Place the first 150 ft of exit moves on ramps the longer of 1000 ft or tangent sides.

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12. Place the first 150 ft of exit moves on ramps the longer of 1000 ft or tangent sides.

13. Place the first 150 ft of exit moves on ramps the longer of 1000 ft or tangent sides.

14. Place the first 150 ft of exit moves on ramps the longer of 1000 ft or tangent sides.

15. Place the first 150 ft of exit moves on ramps the longer of 1000 ft or tangent sides.
GENERAL NOTES
1. CENTERLINE RUMBLE STRIPES SHALL BE CONTINUOUS THROUGHOUT ALL PASSING ZONES.

2. WHERE 2-LANE BRIDGES ARE PRESENT, RUMBLE STRIPES SHALL BE CENTERED 2 FEET BEHIND THE EXISTING BRIDGE RAIL HOLES.

3. RUMBLE STRIPES SHALL HAVE A DIAMETER ELIPSE OF 2" WIDE IN THE DIRECTION OF TRAVEL AND HAVE A DIAMETER OF 1" LONG HORIZONTAL PERPENDICULAR TO THE DIRECTION OF TRAVEL.

4. THE DEPRESSIONS SHALL GENERALLY BE A UNIQUE DIAMETER SHAPE WITH A 3/8" MINIMUM TO 1/8" MAXIMUM DEPTH AT THE CENTER.

DETAILS OF DEPRESSION

TYPICAL CENTERLINE INSTALLATION DETAIL

TYPICAL "T" INTERSECTION

TYPICAL INTERSECTION

DELINEATION STANDARD
MILLED RUMBLE STRIPES
(CENTERLINE)
TYPICAL RURAL INTERSECTION WITH BYPASS LANES

TYPICAL RURAL INTERSECTION WITH OPPOSING LEFT TURN LANES

TYPICAL RURAL INTERSECTION WITH OFFSET LEFT TURN LANES
**General Notes**

1. Joint numbers: C.B. = 604.1XX, D.I. = 604.2XX, M.H. = 604.3XX
2. Fitting frame to grade may be done with prefabricated adjustment rings or clay bases (if supplied).
3. CB & DI structures in raised areas shall be set according to the foundation depression detail shown on Plate 4 of Standard No. DR-2.
4. Concrete sections may be either concentric or eccentric. For flat slab tops, pipe will be used where pipe may otherwise enter into the core section of the structure and where permitted.
5. For structures with diameters greater than 4", the diameter may be constant from top to bottom with a flat slab top or, for sections that transition from a standard 4" core section to the larger diameter riser or base section, a may be used.
6. Pipe elevations shown on plans shall be field verified prior to precasting.
7. Outside edges of pipes shall project no more than 3" beyond inside wall of structure.
8. Precautions shall have a tangular and groove joint 4" high at an 11° angle centered at the width of the wall and shall be assembled using an approved flexible sealant in joints.
9. All structures with multiple pipes shall have a minimum of 12" of clear concrete between pipes. More than 5% of a horizontal cross-section shall be made, and there shall be no pipes closer than 2" to joints.
TYPICAL HALF-SECTION SHOWING MUCK TO BE REMOVED PER SECTION 203.
GENERAL NOTES

1. All end posts shall have one brace. All corner and intermediate braces on full posts shall have two braces.

2. Intermediate or line posts shall be standard studded tee posts.

3. End posts, corner posts and full posts shall be an angle post detailed in Plate 3. Braces shall be an angle post detailed in Plate 4.

4. Where driving condition permits, driven posts for footing will not be required.

5. Concrete shall be Class A.

SECTION VIEW ON R.O.W. LINE

SLOTTER HOLE SELF-FASTENING

2" x 2½" x ½" ANGLE POST
½" LEAD HOLE (FT. TERMINAL)

ELEVATION

TYPICAL FENCE POST ASSEMBLY

CONCRETE ANCHOR

CONCRETE ANCHOR
ELEVATION

GENERAL NOTES
1. ALL END POSTS SHALL HAVE ONE BRACE (SEE DETAIL PLATE 2).
2. ALL CORNER AND INTERMEDIATE BRACES OR FULL POSTS SHALL HAVE TWO BRACES.
3. FENCE POSTING DETAILS ARE SHOWN IN PLATE 3. FOR FENCE ERECTION ON THE RIGHT-OF-WAY LINE, SEE PLATE 7 OR DIG. NO. 504.
4. FENCE DETAILS ARE FOR STEEL, ALUMINUM, OR VINYL FENCING. FOR ADDITIONAL DETAILS AND NOTES, SEE PLATE 2, 3, 4, 4.

GENERAL NOTES
1. FOR ADDITIONAL DETAILS AND NOTES, SEE PLATES 1, 3, & 4.

CHAIN LINK FENCE

FOOTING DETAIL (WITH FORM)

GENERAL NOTES
1. WHERE GROUND CONDITION PERMITS, FENCING FOR FOOTINGS WILL NOT BE REQUIRED.
2. ALUMINUM POSTS IN CONCRETE SHALL HAVE A PROTECTIVE COATING - 607.

CHAIN LINK FENCE

FOOTING DETAIL (WITHOUT FORM)

GENERAL NOTES
1. WHERE GROUND CONDITION PERMITS, FENCING FOR FOOTINGS WILL NOT BE REQUIRED.
2. ALUMINUM POSTS IN CONCRETE SHALL HAVE A PROTECTIVE COATING - 607.

CHAIN LINK FENCE

FOOTING DETAIL (WITH FORM)

GENERAL NOTES
1. WHERE GROUND CONDITION PERMITS, FENCING FOR FOOTINGS WILL NOT BE REQUIRED.
2. ALUMINUM POSTS IN CONCRETE SHALL HAVE A PROTECTIVE COATING - 607.

CHAIN LINK FENCE

FOOTING DETAIL (WITHOUT FORM)

GENERAL NOTES
1. WHERE GROUND CONDITION PERMITS, FENCING FOR FOOTINGS WILL NOT BE REQUIRED.
2. ALUMINUM POSTS IN CONCRETE SHALL HAVE A PROTECTIVE COATING - 607.

CHAIN LINK FENCE

FOOTING DETAIL (WITH FORM)

GENERAL NOTES
1. WHERE GROUND CONDITION PERMITS, FENCING FOR FOOTINGS WILL NOT BE REQUIRED.
2. ALUMINUM POSTS IN CONCRETE SHALL HAVE A PROTECTIVE COATING - 607.

CHAIN LINK FENCE

FOOTING DETAIL (WITHOUT FORM)

GENERAL NOTES
1. WHERE GROUND CONDITION PERMITS, FENCING FOR FOOTINGS WILL NOT BE REQUIRED.
2. ALUMINUM POSTS IN CONCRETE SHALL HAVE A PROTECTIVE COATING - 607.

CHAIN LINK FENCE
GENERAL NOTES
1. THE CONCRETE BARRIER DETAILS AS SHOWN ON THIS SHEET ARE IN COMPLIANCE WITH THE
REQUIREMENTS OF ACHCA REPORT 950-7 (1).
2. BEAMS AND STRUCTURAL TIES SHALL BE GALVANIZED AFTER FABRICATION.
3. STEEL REINFORCING SHOULDER IN ACCORDANCE WITH ITEM 44.
4. SURFACES OF STRUCTURAL TIES SHALL BE SMOOTH OR POLISHED.
5. TAPER IN STRUCTURAL TIE SHOWN IN FIGURE 15B IS MODIFIED BY GIRDER SURFACE MEETING A SMOOTH GROUND FINISHING WITHOUT EXCESSIVE VIBRATIONS OR BEAT (GUIDELINES 946-15).
6. PRECIP FLOOR ATTACHED TO THE GIRDERS AS SHOWN ON PLANS.

MATERIAL NOTES
1. THE CONCRETE BARRIERS SHALL BE LIGHT-COLORED CLASS “A” CONCRETE HAVING A MINIMUM 28-DAY
COMPRESSIVE STRENGTH OF 4,000 PSI. BARRIERS SHALL HAVE A SMOOTH INTERIOR SURFACE
FREE OF DEFECTS AND FINGERS. CASTING RATE SHALL BE SHOWN ON BARRIER. ALL
EXPOSED SIZES OF CONCRETE SHALL BE CLEARLY MARKED.
2. ALL REINFORCING STEEL SHALL BE ASTM A615 GRADE 60 ENCAPSULATED.
3. STEEL REINFORCING SHOULDER IN ACCORDANCE WITH ITEM 44.
4. EACH MASONRY UNIT SHALL INCLUDE ONE 3-1/2” AS SHOWN ON PLAN SHEET.
5. ALL MASONRY PIECES OR MATERIALS SHALL BE SUBMITTED TO THE CONTRACTOR.

PERSPECTIVE VIEW
UNTAPELED END      PERSPECTIVE VIEW
TAPELED END

SECTION B-B
(MASONRY &
REINFORCEMENT)
### Dimension Table

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**Notes:**
- Steel quantities are for concrete headwalls only.
- Dimensions shown are to payment lines. Mortar bubble masonry to be stepped outside payment lines on sloping faces.

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### Plan View

- **2x1 Slope:**
  - 4" Step in Outlet Headwall (approx.)
  - See detail on Plate 47

### Section on Centerline

- **Culvert Headwall:**
  - Right slope (see Plate 48)

### Elevation

- **2x1 Slope:**
  - Round slope (see Plate 47)

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**Additional Notes:**
- **Mortar Bubble Masonry Headwalls with 45° Wings for R.C. Pipe**
  - PC-6
- **Mortar Bubble Masonry Headwalls for Pipes Other Than R.C.**
  - PC-8
CONCRETE PULL BOX 14" x 14"
ITEM 614-511

CONCRETE PULL BOX 18" x 18"
ITEM 614-512

GENERAL NOTES
1. DIMENSIONS SHOWN ARE NOMINAL. MOLDED PULL BOX DIMENSIONS MAY VARY BY 1/2".
2. ADJUST FRAMES & COVERS SO THAT DRAINAGE WILL BE AWAY FROM PULL BOX.
3. LID & SIGNAL 17", BRASS OR BRONZE AS REQUIRED, ON CENTER OF COVER.

MOLDED PULL BOXES
FOR USE IN OTHER THAN PAVED AREAS

TRENCH DETAIL FOR CONDUIT INSTALLATION
DOUBLE LINES

TWO-LANE ROADWAY STRIPING LAYOUT

LEGEND

DIVERGING (OR CONVERGING) LINES FOR PAINTED ISLANDS

EXAMPLE: A 4" SINGLE SOLID LINE WHITE = 4" SILW
TANGENT SECTION

STRING LINE (150') PARALLEL TO PAYMENT MARKING LINE. DISTANCE FROM STRING TO PAYMENT MARKING LINE SHALL NOT VARY MORE THAN ± 1".

CURVED SECTION

MIDDLE LENGTH ACTUAL LENGTH = CALCULATED LENGTH ± 1"

STRING LINE (150') TO FORM CURVE

TYPICAL "CROSS-SWITCH" PASSING ZONE

TYPICAL BROKEN LINE

GENERAL NOTES

1. ALL PAYMENT MARKINGS SHALL BE IN CONFORMANCE WITH THESE STANDARDS AND THE CURRENT EDITION OF THE WORK.

2. WIDTH OF LINES SHALL VARY NO MORE THAN ± 1/4"

3. THE NET FILM THICKNESS OF A PAINTED LINE SHALL BE A MINIMUM OF 1/16 INCH THROUGHOUT THE ENTIRE WIDTH AND LENGTH OF LINE SPECIFIED.

4. BROKEN LINES SHALL BE A STARTING POINT AND END WITH THE NEAREST FULL CYCLE OR BROKEN LINE.

5. SOLID LONGITUDINAL LINES SHALL BE A MINIMUM OF 2" OF A LAYOUT SQUARE INDICATING THE END OF THE LINE OR WITH A FULL CYCLE OF BROKEN LINE (IF APPROPRIATE).

PAVEMENT MARKING STANDARD

TOLERANCES FOR PAYMENT MARKING LINES
GENERAL NOTES

1. All ramps, with a minimum friction width of 20', shall receive both white edge line and yellow median line whenever the edge line would be of use.

2. The edge and median line markings for entrance ramps will be a minimum of 2' from the centerline to the face of curb or edge of pavement. Median line markings for all other ramps will be a minimum of 2' from the face of curb or edge of pavement.

3. The minimum distance between the edge and median line for ramps shall be 1'.

4. The edge line on a curb shall continue with the edge marking. The edge line shall coincide with the shoulder edge to provide a continuous line.

5. All pavement markings plans or other project document plans the project specific design dimensions.

6. All dotted line markings for acceleration/deceleration lanes shall run the full length of each lane and continue through the transition taper.

LEGEND

- Thermoplastic
- Painted line offset
- Painted line thickness

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- Transition taper
- Painted edge line or design sheet input

PAVEMENT MARKING STANDARD
DIVIDED HIGHWAY
PARALLEL RAMP MARKINGS
GENERAL NOTES

1. All ramps with a horizontal radius of 20' shall receive both white edge line and yellow edge line where the ramp has either curb or slope.

2. The white edge line shall be 1 1/4" wide except in the case of ramps on a roadway or overpass, when the exception for all other ramps shall be a width of 1 1/2" wide where the edge line is seen.

3. The required distance between the edge and yellow lines for ramps shall be 3/4' for the edge line on a ramp shall be in conformity with the edge line marking where the edge line is seen in the edge line marking.

4. See pavement making plans or other project documents for project specific design

5. All edge line lines for acceleration/deceleration lane shall have the full length of each line as shown in the project documents.

6. Broken lines shall be installed where the edge line is shown to meter into the edge line.

LEGEND

(Notwithstanding)

Construction plans shall be为准 and any plan variations may be made.

Pavement marking plans shall be为准 and any plan variations may be made.

PAVEMENT MARKING STANDARD

DIVIDED HIGHWAY WEAVE/LANE
DROP RAMP MARKINGS

ENTRY AND EXIT RAMP WEAVING SECTION MARKINGS

NOT TO SCALE - REFERENCE WHITE PAPER ON ITSELF
CENTERLINE AND EDGELINE "CUTS" AT SIDE ROAD

NOTE: FOR SHALLOWS WIDTH > 5p
TAPER EDGELINE AS SHOWN OR
FOR SHALLOWS WIDTH < 5p
STRAIGHT LINE

CENTERLINE AND EDGELINE "CUTS" AT SIDE ROAD W/ TURN LANES

NOTE: FOR SHALLOWS WIDTH > 5p
TAPER EDGELINE AS SHOWN OR
FOR SHALLOWS WIDTH < 5p
STRAIGHT LINE

GENERAL NOTES

1. EDGELINE DETAILS SHOWN ARE FOR MAINLINE ROADS/ WAYS WITHOUT TURN LANES. THE PRESENCE OF TURN LANES MAY REQUIRE DIFFERENT EDGELINE TREATMENTS.

2. EDGELINES ON SIDE ROADS, ALSO CALLED CURBS, SHALL FOLLOW THE SAME MAINLINE TYPICALS: EDGELINES SHALL NOT BE CONTROVERSIAL AMONG THE MAINLINE/ SIDE ROAD BOUNDARY. EDGELINES SHALL END AT STOP BARS.

3. CENTERLINE AND EDGELINE SHALL BE PRICED FOR RESIDENTIAL ROADS/ WAYS, CENTERLINE AND EDGELINE SHALL BE MARKED FOR COMMERCIAL ROADS / WAYS IN DEPENDENT ON THE REQUIREMENT OF THE INTERSECTION.

4. LOCATION OF THE STOP LINE MAY VARY DUE TO INTERSECTION SIGN DISTANCE AND VEHICLE TURNING MARSHALS AND MAY NOT ALWAYS COINCIDE WITH THE LOCATION OF THE STOP SIGN.

5. IF THERE IS NO EDGELINE, END STOP BAR 12" FROM EDGE OF PAVEMENT.

6. STOP BARS, HOOKS, LANE LINES, SYMBOLS AND ARROWS SHALL BE THERMOPLASTIC (T).
PERPENDICULAR ACCESSIBLE PARKING

ACCESSIBLE SIGN (8'-0"
ACCESSIBLE SIGN & VAN ACCESSIBLE SIGN (8'-0" & 9'-0"
FACE OF CURB OR FOUNT. EDGE
6'-12"
5'-12"

ACCESSIBLE RAMP REQ'D IN Curb areas (Typ.)

4" SILL Ht (Typ.)
3'-0"

8'
5'
8'
8'
8'
5'

PARALLEL ACCESSIBLE PARKING

GENERAL NOTES
1. VAN ACCESSIBLE SHALL BE A MINIMUM 9' WIDE. 8'-0" VAN SIGN WILL BE REQUIRED TO VAN ACCESSIBLE PARKING SIGN 8'-0".
2. MARKER ON THIS SHEET INDICATE DIRECTION OF TRAFFIC ONLY.
3. P/T: THERMOPLASTIC MARKING.

PAVEMENT MARKING STANDARD
ACCESSIBLE PARKING DETAIL

STANDARD NO. P.M.-11
STANDARD PLANS 2021
GENERAL NOTES

1. All words and symbols shall be retro-reflective white and shall conform to the latest version of the Manual.

2. Multi-word messages shall read "up", that is, the first word shall be nearest the approaching driver.

3. The word "ONLY" shall not be used with turning or combination arrows, and shall not be used adjacent to a broken lane line. A word/symbol shall precede the word "ONLY".

4. Combination arrows may be comprised of 2 single arrows (e.g., turn and through arrows). HOWEVER, the shafts of the arrows shall coincide as shown.

5. Prefixed words and symbols shall be pre-cut by the manufacturer.

6. Wrong-way arrows shall not be substituted for through arrows.

7. All stop bars, signs, symbols and arrows shall be thermoplastic.
RAILROAD CROSSING SYMBOL

Pavement Markings at Railroad-Highway Grade Crossings

1. A portion of the pavement marking RRR symbol shall be directly opposite the advance warning sign (VIO-1, VIO-2).
2. In multi-line roads the transverse lines should extend across all approach lanes, and individual RRR symbols should be used in each approach lane.
3. RRR symbol will be paid for by the square foot. Transverse lines and strip bars (124' wide) will be paid for by the linear foot.

15'-10" wide from nearest rail (20' max.) or approx. 8' from gate (if present).

Strip line - perpendicular to approach & (see note 3)

Varies with approach speed and sight distance, but not less than 50' (see note 3)

Pavement Marking Standard

Words and Symbols

April 2004
GENERAL NOTES

1. ALL SPEED ZONE MARKINGS SHALL BE PAINTED WHITE.

2. ALTERNATE APPROACH END PATTERN SHALL BE USED FOR ZONE LENGTHS LESS THAN 50'. STANDARD PATTERN SHALL BE USED IN LIEU OF ALTERNATE PATTERN FOR ZONE LENGTHS LESS THAN 90'.

3. LONGITUDINAL DISTANCES SHALL BE MEASURED TO NEAREST SURVEY POINT. A COPY OF SURVEY NOTES SHALL BE FURNISHED TO BUREAU OF TRAFFIC.

4. FOR LEGAL REASONS, STATE POLICE SHALL BE PRESENT DURING THE INSTALLATION OF THESE MARKINGS. (TEL: 605-271-0701).

5. STATE POLICE SHOULD BE NOTIFIED WHEN ANY EXISTING MARKINGS ARE REMOVED DUE TO CONSTRUCTION.

MARKERS SHOWN ON THIS SHEET INDICATE DIRECTION OF TRAFFIC ONLY

PAVEMENT MARKING DETAILS

RIGHT SHOULDER SHOWN - LEFT SHOULDER OPPOSITE IN KIND (SEE NOTE NO. 2)
ATTACHMENT OF AUXILIARY PANELS
AND SERVICE SYMBOL PANELS (BACK VIEW)

1. Auxiliary panels shall be mounted to the right side of the main sign for right-hand exit ramps, or to the left for left-hand exit ramps. Supports shall extend to the top of the auxiliary panel and shall overlap the main sign by a minimum of 3 full planes as shown.

2. Service symbol panels, when not on a separate sign, shall be mounted immediately below the main sign and centered laterally within the width of the sign. Supports shall extend to the main sign by a minimum of 2 full planes as shown.

3. First clip assemblies shall be installed on both sides of each auxiliary panel support and service symbol support at each plane, as well as each end of both supports.

GENERAL NOTES

1. Gap between any two assembled plank sections shall not exceed 3/32".
2. Allowable lateral bow shall not exceed 0.1/16".
3. All plane sections shall be one piece for the entire width of sign specified, and shall not exceed 8 1/2" from the length & width specified.
4. All plane sections shall be 8" wide unless otherwise specified.
5. Signs 8' and greater in width shall be mounted on steel beam.

PLANK MOUNTED ON STEEL BEAM

1. First clip assemblies shall be installed on both sides of each post at each plane as well as at the top and bottom of the sign.
2. Steel beam shall be flush with top of sign and shall not extend onto auxiliary panels.
3. Steel beams shall not be used as auxiliary panel supports.

PLANK MOUNTED ON TUBING

1. First clip assemblies shall be installed at each plane, as well as at the top and bottom of the sign.
2. Tubing shall not be used as auxiliary panel supports.
EXTRUDED ALUMINUM SIGN PLANK

STIFFENER DETAILS

POST CLAMP ASSEMBLIES
1. SEE SPECIFICATION 615-2-1-2 FOR ADDITIONAL INFORMATION REGARDING THE CHANNEL BRACKET AND POST CLAMP.
2. USE #2 X 2-1/8" COUNTERSUNK CARDED WOOD SCREW WITH 2-1/8" PLASTIC WASHERS AND LOCKNUT FOR CLAMP CONNECTION.
3. ALL HARDWARE SHALL BE STAINLESS STEEL.
**ALUMINUM POST SPACING**

**CHANNEL BRACKET 14 GAUGE**

**SIGN BLANK ATTACHMENT DETAIL**

**POST CLAMP ASSEMBLIES**

**SIGN AND U-CHANNEL POST ASSEMBLY DETAIL**

1. For galvanized U-channel post, see Ninth Standard Specification for Road and Bridge Construction Manual, Section 915.
2. The stainless steel hex head bolt length shall be increased to accommodate a thicker sign material.
3. The post shall be set a minimum of 3 inches to a maximum of 6 inches below the top of sign.
4. U-channel posts shall not be specified and do not require channel brackets.
5. U-channel posts shall be installed 36" of greater below existing ground.

**GENERAL NOTES**

1. Brackets: All signs to be fastened to posts with post clamp assemblies as shown.
2. Sign width 36" or less may be mounted on one (1) U-channel post.
3. Rectangular signs 72" x 48" or less may be mounted on dual U-channel post. Diamond shape signs greater than 36" shall be mounted on aluminum tubing (interstate).
4. Sign weight 48" or less, center channel bracket may be omitted.
5. Diamond shape signs 48" or larger require two channel brackets.
6. Signs 72" x 72" or greater shall be aluminum plate.
DIRECT BURIED

SINGLE POST

STIFFENER DETAILS

DOUBLE POST

FOOTING DETAIL

BREAKAWAY

CONCRETE BASE

ANCHOR DETAIL

ANCHORS USE 1 PIECE OF 2" x 12" PLANK (PRESSURE TREATED) CLADGED TO FIT WITH A MINIMUM OF 1½" DECKING, TO BE PARALLEL WITH GROUND LINE, PLACED 2" x 12" PLANK BEHIND SIGN POST.

MAXIMUM BREAKAWAY STUD HEIGHT

BREAKAWAY SUPPORTS PLACED ON ROADSIDE SLIDES SHALL NOT ALLOW IMPACTING VEHICLES TO PASS ON EITHER THE FOUNDATION OR ANY SUBSTANTIAL REMNANCE OF THE SUPPORT. SURROUNDING TERRAIN SHALL BE ARRANGED TO PREVENT VEHICLES TO PASS OVER ANY NON-BREAKAWAY PORTION OF THE SIGN INSTALLATION WHICH REMAINS IN THE GROUND OR PROPPED ATTACHED TO THE FOUNDATION.

GENERAL NOTES

1. CONCRETE BASE NOTES:
   1. GALVANIZED STEEL TUBE 4-1/4" I.D. X 4'-0"
   2. CONCRETE CLASS B
   3. TOP SHALL HAVE TROWEL FINISH
   4. USE 5/16" X 5-1/2" LONG STAINLESS STEEL BOLT WITH STAINLESS STEEL NYLON INSERT NUT FOR SECURING POST.
   5. ALUMINUM CAP SHALL BE INSTALLED ON THE TOP OF THE SIGN POST WITH THIS INSTALLATION.

2. MULTIPLE POST SIGNS MUST BE PROTECTED BY GUARDRAIL OR OTHER POSITIVE BARRIER, UNLESS BREAKAWAY MOUNTED.

3. THE MINIMUM HORIZONTAL CLEARANCE TO THE NEAR EDGE OF THE SIGN OF ANY MULTIPLE POST NON-BREAKAWAY MOUNT SIGN SHALL BE 7'-0" MIN. FROM EDGE OF HIGHway. OTHER TYPES OF GUARDRAIL OR BARRIER MAY REQUIRE A DIFFERENT OFFSET.

4. ALL HARDWARE SHALL BE STAINLESS STEEL UNLESS OTHERWISE NOTED.
PROcedure for Selecting Beam Sections

- Determine values for H, W, L as indicated in drawing.
- H = maximum height of required sign.
- W = maximum width of required sign.
- L = maximum distance between top of footing and bottom of required sign.
- See General Note No. 4.
- Use next highest foot value.
- Enter table with maximum value of L and required values of H and W for selection of appropriate beam section.

<table>
<thead>
<tr>
<th>W</th>
<th>L</th>
<th>2</th>
<th>2</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>22</td>
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<td>36</td>
<td>36</td>
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<td>36</td>
<td>36</td>
</tr>
</tbody>
</table>

Post Spacing Detail

General Notes

1. Signs shall be provided for locations specified on the plans or as directed by the engineer. See sign test layout sheets and plans for sign sizes and approximate location.
2. Dimensions, elevations, slopes, and situations shown are for illustrative purposes only. Actual cases will depend on field conditions.
3. When two or more independent signs are installed as a single installation, the post supports shall be calculated with the total area of the signs being considered as one unit, including an allowance for a 0.5" vertical space between the signs.
4. Post length to be determined by sign size and location. Exact field location to be determined by the engineer.
5. The minimum horizontal clearance to the near edge of the sign of any multiple post non-breakaway mount sign shall be 18'-0" min. from face of beam diaphragm. Other types of structural or barrier may require a different offset.
6. See Standard No. 5-1 and 5-2 for additional information.

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<th>Size</th>
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<th>Diameter</th>
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<td>24&quot;</td>
</tr>
<tr>
<td>5x15</td>
<td>10'</td>
<td>24&quot;</td>
</tr>
<tr>
<td>5x15</td>
<td>12'-0&quot;</td>
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<tr>
<td>5x15</td>
<td>15'-0&quot;</td>
<td>24&quot;</td>
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<td>18'-0&quot;</td>
<td>24&quot;</td>
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<tr>
<td>5x15</td>
<td>21'-0&quot;</td>
<td>30&quot;</td>
</tr>
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<td>5x15</td>
<td>22'-0&quot;</td>
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</tr>
<tr>
<td>5x15</td>
<td>28'-0&quot;</td>
<td>36&quot;</td>
</tr>
</tbody>
</table>

Signing Standard

Steel Beam Details
Non-Breakaway
PROCEDURE FOR SELECTING BEAM SECTIONS

- Determine values for W, H, L, & L as indicated in drawing
- W = Maximum Width of Required Sign
- H = Maximum Height of Required Sign Including Auxiliary Signs and Service Symbols.
- L = Maximum Distance Between Top of Sign and Bottom of Required Sign.
  (See General Note No. 4)
- For sign sizes between those values in the table, use next highest foot value.
- Enter table with maximum value of "L" and required values of "H" and "W" for selection of appropriate beam section.

### 3 POST SIGN

<table>
<thead>
<tr>
<th>W</th>
<th>L</th>
<th>H</th>
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</thead>
<tbody>
<tr>
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<td>18</td>
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<tr>
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<tr>
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### POST SPACING DETAIL

GENERAL NOTES
1. Signs shall be provided for locations specified in the plans or as directed by the engineer. See sign test layout sheets and plans for sign sizes and approximate locations.
2. Dimensions, elevations, slopes, and situations shown are for illustrative purposes only, actual sizes will depend on field conditions.
3. When two or more independent signs are located as a single installation, the post supports shall be calculated with the total area of the signs being considered as the unit, including an allowance for a 6" vertical space between the signs.
4. Post length to be determined by sign size and location. Exact field location to be determined by the engineer.
5. The minimum horizontal clearance to the rear edge of the sign of any multiple post non-breakaway where sign shall be 7" - 9" Wide from face of beam shall vary. Other types of shearwall or barrier may require a different offset.

### FOOTING DETAIL

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<td>SIZE</td>
<td>DEPTH</td>
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<td>5 x 18</td>
<td>7&quot;</td>
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</tr>
<tr>
<td>5 x 25</td>
<td>8&quot;</td>
</tr>
<tr>
<td>5 x 26</td>
<td>8&quot;</td>
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</table>
PROCEDURE FOR SELECTING BEAM SECTIONS

- Determine values for W, L, and H as indicated in drawing.
- W = Maximum width of required sign.
- H = Maximum height of required sign including auxiliary signs and service symbols.
- L = Maximum distance between top of footing and bottom of required sign.
- See General Note No. 6.

For sign sizes between those values in the table, use next highest foot value.

Enter table with maximum value of "L" and required values of "W" and "H" for selection of appropriate beam selection.

<table>
<thead>
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<th>W</th>
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<tbody>
<tr>
<td>L</td>
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</tbody>
</table>

**Post Sign**

MAXIMUM BREAKAWAY STUB HEIGHT

Breakaway supports placed on reducing slopes shall not allow impacting vehicles to drive in either the formation or any substantial portion of the support. Surrounding terrain shall be graded to permit vehicles to pass over any non-breakaway portion of the sign installation which remains in the grade of usually attached to the foundation.

**GENERAL NOTES**

1. Signs shall be provided for locations specified in the plans or as directed by the Engineer. See sign test layout sheets and plans for sign sizes and approximate locations.

2. Dimensions, elevations, slopes, and situations shown are for illustrative purposes only. Actual cases will depend on field conditions.

3. Where two or more independent signs are mounted as a single installation, the post supports shall be calculated with the total area of the signs being considered as one unit, including an allowance for a 6" vertical space between the signs.

4. Post length to be determined by sign size and location. Exact field location to be determined by the Engineer.

5. The minimum horizontal clearance to the near edge of the sign of any multiple post non-breakaway sign shall be 7'-0" min. from face of beam chamfer. Other types of beams and barriers may require a different offset.


**FOOTING DETAIL**

**SIGNING STANDARD**

**STEEL BEAM DETAILS**

**BREAKAWAY**

**POST SPACING DETAIL**

**STEM DETAIL**

**CLASS B**

**DIAMETER HOLE**

**TOLERANCE**

**FOOTING**

**DEPTH**

**DIAMETER**

<table>
<thead>
<tr>
<th>POST</th>
<th>FOOTING</th>
<th>SITE</th>
<th>DEPTH</th>
<th>DIAMETER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wx3</td>
<td>6&quot;</td>
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<td>Wx12</td>
<td>6&quot;</td>
<td>24&quot;</td>
<td></td>
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</tr>
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<td>Wx15</td>
<td>7&quot;-6&quot;</td>
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</tr>
<tr>
<td>Wx16</td>
<td>7&quot;-6&quot;</td>
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<td>8&quot;-6&quot;</td>
<td>30&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wx22</td>
<td>8&quot;-6&quot;</td>
<td>36&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wx26</td>
<td>8&quot;-6&quot;</td>
<td>36&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wx28</td>
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<td>36&quot;</td>
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</tr>
<tr>
<td>Wx30</td>
<td>9&quot;</td>
<td>36&quot;</td>
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</tr>
</tbody>
</table>
PROCEDURE FOR SELECTING BEAM SECTIONS

- Determine values for W, H, S, L as indicated in drawing
  - W = Maximum width of required sign
  - H = Maximum height of required sign
  - L = Maximum distance between top of footing and bottom of required sign.
- For sign sizes between these values in the table, use next highest
- Enter table with maximum value of "L" and required values of "W" and "H" for selection of appropriate beam section.

GENERAL NOTES

1. Signs shall be provided for locations specified on the plans or as directed by the engineer. See sign layout sheets and plans for sign sizes and approximate locations.
2. Dimensions, elevations, slopes, and situations shown are for illustrative purposes only. Actual cases will depend on field conditions.
3. When two or more independent signs are mounted as a single installation, the post supports shall be calculated with the total area of the signs being considered as one unit. Including an allowance for a 6" vertical space between the signs.
4. Post length to be determined by sign size and location. Exact field location to be determined by the engineer.
5. The minimum horizontal clearance to the near edge of the sign of any multiple post non-breakaway mount sign shall be 2'-0" min. from face of beam. Other types of glass or barrier may require a different offset.
6. See standard no. PS-1 & PS-2 for additional information.

<table>
<thead>
<tr>
<th>Post</th>
<th>Planting</th>
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<td>W8x12</td>
<td>6'</td>
</tr>
<tr>
<td>W8x15</td>
<td>8'-0&quot;</td>
</tr>
<tr>
<td>W8x18</td>
<td>8'-0&quot;</td>
</tr>
<tr>
<td>W8x21</td>
<td>8'-0&quot;</td>
</tr>
<tr>
<td>W8x22</td>
<td>8'-0&quot;</td>
</tr>
<tr>
<td>W8x25</td>
<td>8'-0&quot;</td>
</tr>
<tr>
<td>W8x30</td>
<td>9'</td>
</tr>
</tbody>
</table>
GENERAL NOTES

1. ASSEMBLE ACCORDING TO MANUFACTURER'S INSTRUCTIONS.
2. SEE PS-7 OR PS-8 FOR STEEL BEAM SIZES.
3. SEE PS-10 FOR BRACKET SELECTION TABLES FOR TYPE B-60X-LP & B-650-LP.

TRANSPO TYPE AP-4-5 (4X4 OR EQUAL)
USE FOR 4" DIAMETER ALUMINUM PIPE

TRANSPO TYPE AR-4-LP (OR EQUAL)
USE FOR 4" DIAMETER STEEL PIPE

TRANSPO TYPE B-60X-LP (OR EQUAL)
USE FOR 6" DIAMETER STEEL PIPE

TRANSPO TYPE B-650-LP (OR EQUAL)
USE FOR 6" DIAMETER STEEL PIPE
ANCHOR INSTALLATION & BRACKET SELECTION

A = Lateral Spacing of Anchors
3" for B-525 used in 6" & 9" wide flange posts
4" for B-650 used in 10", 12" & 14" wide flange posts
4-1/4" for A46 used in 20" wide flange posts
1-1/4" for AP x 4-1/2" used on 4" diameter aluminum tube.

B = Linear Spacing of Anchors
- Bracket #4 = Depth of post section plus 1-15/16" depth
- Bracket #2 = Depth of post section plus 6-1/16" depth
- Bracket #3 = Depth of post section plus 6-1/8" depth
- Bracket #1 = Depth of post section plus 3-3/4" for A46
- For B-525 & B-650 mounts, see Bracket Tables

PLAN VIEW OF FOOTINGS
(SEE P5-3, P5-5A, OR P5-5B FOR FOOTING SIZES)

5" POST
POST LENGTH = L + H (FT)  SIGN WEIGHT = H (FT)

8" POST
POST LENGTH = L + H (FT)  SIGN WEIGHT = H (FT)

BRACKET TABLES FOR B-525-LP MOUNTS

10" POST
POST LENGTH = L + H (FT)  SIGN WEIGHT = H (FT)

12" POST
POST LENGTH = L + H (FT)  SIGN WEIGHT = H (FT)

14" POST
POST LENGTH = L + H (FT)  SIGN WEIGHT = H (FT)

BRACKET TABLES FOR B-650-LP MOUNTS
SELECT CORRECT BRACKET NUMBER BY LOCATING THE INTERSECTION OF SIGN WEIGHT AND POST LENGTH IN THE BRACKET SELECTION TABLES. THE INTERSECTION WILL BE EITHER ZONE 1, 2, OR 3 WHICH CORRESPONDS TO BRACKET NUMBERS 1, 2, OR 3.

MAXIMUM BREAKAWAY STUD HEIGHT
BREAKAWAY supports placed on embankment slopes shall not allow impacting vehicles to strike in either the foundation or any substantial portion of the support. Surrounding terrain shall be graded to permit vehicles to pass over any non-breakaway portion of the sign installation which remains in the ground or rigidly attached to the foundation.

INSTALLATION HG AND SLOPE DETAIL

SIGNING STANDARD
BREAKAWAY MOUNTS
**R7-2B1**

**COLOR CHART**

| BORDER | RED
|---|---
| BLACK | RED

**DIMENSIONS (inches/LETTER Fonts)**

| A | B | C | D | E | F | G | H | I | J | K | L | M | N | O
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | 24 | 78 | 10 | 5 | 14 | 4 | 2.5 | 1.5 | 2.5 | 8.5 | 2 | 2 | 2.5 | 0.5

1.50" RADIUS, 0.50" BORDER, 0.38" INDENT, BLACK ON WHITE

**R10-9**

**REGULATORY SIGN**

**DIMENSIONS (inches/LETTER Fonts)**

| A | B | C | D | E | F | G | H | I | J | K | L | M | N | O
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 | 30 | 30 | 60 | 44 | 10 | 12 | 4 | 2 | 2.5 | 8.5 | 2 | 2 | 2.5 | 0.5

1.50" RADIUS, 0.50" BORDER, 0.38" INDENT, BLACK ON WHITE

**R10-11AM**

**REGULATORY SIGN**

**DIMENSIONS (inches/LETTER Fonts)**

| A | B | C | D | E | F | G | H | I | J | K | L | M | N | O
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 | 30 | 30 | 60 | 44 | 10 | 12 | 4 | 2 | 2.5 | 8.5 | 2 | 2 | 2.5 | 0.5

1.50" RADIUS, 0.50" BORDER, 0.38" INDENT, BLACK ON WHITE

**R10-11BI**

**REGULATORY SIGN**

**DIMENSIONS (inches/LETTER Fonts)**

| A | B | C | D | E | F | G | H | I | J | K | L | M | N | O
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 | 30 | 30 | 60 | 44 | 10 | 12 | 4 | 2 | 2.5 | 8.5 | 2 | 2 | 2.5 | 0.5

1.50" RADIUS, 0.50" BORDER, 0.38" INDENT, BLACK ON WHITE

**SIGNING STANDARD**

**R7-2B1**

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**R10-9**

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**R10-11AM**

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**R10-11BI**

<table>
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<td>12</td>
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**WT-87**

1/4 MILE AHEAD

Dimensions (inches/letter fonts): 24 18 14 10 6 3 1 1/16 1/32
Black on yellow

**WT-82**

200 FT AHEAD

Dimensions (inches/letter fonts): 24 18 14 10 6 3 1 1/16 1/32
Black on yellow

**WT-89**

5 MILES AHEAD

Dimensions (inches/letter fonts): 24 18 14 10 6 3 1 1/16 1/32
Black on yellow

**WT-60**

60 FT AHEAD

Dimensions (inches/letter fonts): 48 24 12 6 3 1 1/32
Black on yellow

*Dimension varies with different numbers*

**WARNING SIGN**

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<th>Description</th>
<th>Date</th>
<th>Plate</th>
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<td>07-12-2001</td>
<td>1/4, 1/8, 3/4 MILE AHEAD</td>
<td>07-16-2001</td>
<td>56-7</td>
</tr>
<tr>
<td>07-12-2001</td>
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<td>56-7</td>
</tr>
<tr>
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<td>07-12-2001</td>
<td>60 FT AHEAD</td>
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<td>56-7</td>
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**SIGNING STANDARD**

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<td>07-16-2001</td>
<td>56-7</td>
</tr>
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### Town Line

**Entering Epsom**

- **Dimensions:** 10 inches/letter fonts
- **Character Spacing:**
  - Under 10 characters: 0.50" radius, 0.75" border, white on green
  - Over 10 characters: 0.75" radius, 0.50" border, white on green

**Interstate Sign**

- **Dimensions:** 10 inches/letter fonts
- **Character Spacing:** 4 varies depending on town name

### Vertical Town/City Line

**Dimensions:** 10 inches/letter fonts
- **Character Spacing:**
  - Under 10 characters: 0.50" radius, 0.75" border, white on green, green on white

### Horizontal Town/City Line

- **Dimensions:** 10 inches/letter fonts
- **Character Spacing:**
  - Under 10 characters: 0.50" radius, 0.75" border, white on green, green on white

### Signing Standard

- **Dimensions:**
  - 10 inches/letter fonts
  - Character Spacing: varies depending on town name

**Notes:**
- For the town or city name is small, enter the text in the sign.
- If under 8 characters use 1" for vertical spacing between characters.
### General Notes (Type 2 Foundation)

1. There shall be a section of the test diaphragm at the approximate foundation location. No control of the test diaphragm shall be required through the foundation. The section of the test diaphragm shall be considered to be a complete control of the foundation. The section of the test diaphragm shall be considered to be a complete control of the foundation. The section of the test diaphragm shall be considered to be a complete control of the foundation. The section of the test diaphragm shall be considered to be a complete control of the foundation. The section of the test diaphragm shall be considered to be a complete control of the foundation.

2. The test diaphragm shall be considered to be a complete control of the foundation. The section of the test diaphragm shall be considered to be a complete control of the foundation. The section of the test diaphragm shall be considered to be a complete control of the foundation.

3. The test diaphragm shall be considered to be a complete control of the foundation. The section of the test diaphragm shall be considered to be a complete control of the foundation. The section of the test diaphragm shall be considered to be a complete control of the foundation.

4. The test diaphragm shall be considered to be a complete control of the foundation. The section of the test diaphragm shall be considered to be a complete control of the foundation. The section of the test diaphragm shall be considered to be a complete control of the foundation.

5. The test diaphragm shall be considered to be a complete control of the foundation. The section of the test diaphragm shall be considered to be a complete control of the foundation. The section of the test diaphragm shall be considered to be a complete control of the foundation.

6. The test diaphragm shall be considered to be a complete control of the foundation. The section of the test diaphragm shall be considered to be a complete control of the foundation. The section of the test diaphragm shall be considered to be a complete control of the foundation.

### Table: Typical Dimensions for Type 2 Foundation

<table>
<thead>
<tr>
<th>Type</th>
<th>Diameter</th>
<th>Height</th>
<th>Depth</th>
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<tr>
<td>A</td>
<td>1.5</td>
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<tr>
<td>B</td>
<td>2.0</td>
<td>2.5</td>
<td>3.0</td>
</tr>
<tr>
<td>C</td>
<td>2.5</td>
<td>3.0</td>
<td>3.5</td>
</tr>
</tbody>
</table>

### Drilled Holes

1. The drilled hole shall be considered to be a complete control of the foundation. The section of the test diaphragm shall be considered to be a complete control of the foundation. The section of the test diaphragm shall be considered to be a complete control of the foundation.

2. The drilled hole shall be considered to be a complete control of the foundation. The section of the test diaphragm shall be considered to be a complete control of the foundation. The section of the test diaphragm shall be considered to be a complete control of the foundation.

### Excavated Holes

1. The excavated hole shall be considered to be a complete control of the foundation. The section of the test diaphragm shall be considered to be a complete control of the foundation. The section of the test diaphragm shall be considered to be a complete control of the foundation.

2. The excavated hole shall be considered to be a complete control of the foundation. The section of the test diaphragm shall be considered to be a complete control of the foundation. The section of the test diaphragm shall be considered to be a complete control of the foundation.

### Traffic Signal Standard

Traffic Signal Mast Arm Foundation - Type 2
Typical Wire Loop Diagram

Rectangular Loop Installation Saw Cut Detail

Detector Box Out Detail Stage 1 at Paving

Detector Box Out Detail Stage 2 at Loop Installation

General Notes:
1. Maximum of two lead-in pairs per 1/8" concrete.
2. Tape tubing 3' on each side of the saw cut and cut boundary with electrical tape.
3. After tubing is installed, fill cutout with crimped paper on both sides with flexible duct casing.
4. Use 1/2" duct - crimped duct (may use Steel) to cover and support the signal wiring.
AMENDMENTS TO PART VI OF THE MUTCD (2009 EDITION)

NOTE: Revised Standards TC-4 through TC-8 amend Part VI of the 2009 edition of the MUTCD by superseding or supplementing certain Sections. They shall be used in conjunction with the MUTCD and the Specifications for Work zone traffic control on all projects.

1. Section 6C.03, Sign Placement. Add the following paragraph as a "Standard" heading:
   
   u2a. Actuate placement of temporary traffic control signs shall be carefully considered to avoid obstructing existing signs or allowing existing signs, vegetation or other physical features to obstruct or limit visibility to temporary traffic control signs. Temporary traffic control signs shall also be placed at locations that avoid overwhelming motorists with information when combined with existing signs.

3. Section 6F.17 Positioning of Advanced Warning Signs. Add the following sentence as "Guidance" and "Option", respectively after sentence 01:
   
   Guidance: 08 When multiple operations are occurring in the same area, duplication of the advance warning signs, e.g., ROAD WORK AHEAD, ROAD WORK 2 MILE, etc., should be avoided. Option: 09 In cases where one of the primary operations is severely limited, some of the general advanced warning signs (e.g., ROAD WORK AHEAD) may be eliminated in order to provide adequate space for driver to see and comprehend the warning signs requiring driver action, e.g., LANE END Merging Left, FLASHER AHEAD, etc.

4. Section 6F.64, Cones. Add the following to the "Standard":
   
   01a Cones shall not be used at night as the primary channelling device, except during work hours.
   
   5. Section 6F.65, Tubular Markers. Replace paragraphs 01a and 02 of the "Standard" section with the following:
   
   01b Tubular markers shall be predominately orange and shall not be less than 42 inches high and 3 inches wide when facing road users. They shall be made of material that can be struck without causing damage to the impacting vehicle. Refers to MUTCD 6F.65 Paragraph 3 for delineation color and type.

6. Section 6F.67, Drums. Add the following sentences after Sentence number 01:
   
   Standard: 01b Drums shall be the primary delineation device on divided highways for all taper and tangents.

7. Section 6F.78, Temporary Markings. Add the following to the "Standard" following sentences:

   05a All temporary markings on undivided highways shall be 4-inch removable tape or paint conforming to MUTCD Chapter 3, Section 3A.
   
   05b All temporary markings shall be offset 1-foot from the final striping location.
   
   05c All temporary white broken-line pavement markings for traffic moving in the same direction shall be retroreflective on paint or tape. Temporary paint or tamp markings shall have a cycle length of 40 feet long with minimum 4-foot long skip and 36-foot long gap. Tape markings shall be removed prior to any overlap and after permanent pavement markings have been applied.
   
   05d Stop lines shall be installed during temporary conditions and shall be retroreflective on paint or tape. Replace "Guidance" paragraph 03 with:
   
   03 Edge lines, channelizing lines, lane reduction transitions, gore markings, and non-longitudinal lines (e.g., railroad crossings, crosswalks, wet, symbols, etc.) are usually not required for temporary situations. Their use should be evaluated on a project-by-project basis based on site conditions, extreme traffic speeds and volumes, and the use of other traffic control devices. When used, temporary markings for these types of longitudinal and non-longitudinal lines shall be retroreflective on paint or tape and conform to MUTCD Part 3 Chapters 3A and 3B.

8. Section 6F.85, Temporary Traffic Barriers. Add the following to the "Standard" paragraph 06:

   06a Temporary and treatments in the form of sand barrels and water 'like' barrels shall not be used from November 1st through April 15th unless they are greater than ten feet from the traveled (measured to the face) or specifically approved in writing by the Engineer. If approved by the Engineer for winter use, the sand or water shall be treated in accordance with the manufacturer's recommendations to prevent freezing.
   
   06b Impact attenuators shall be marked with a Type 3 Object Marker per Section 2C.63 Object Marker Design and Placement Height Paragraph 02.

9. Section 6F.86, Crash Cushions. Add the following to the "Standard" paragraph 05:

   05a Truck Mounted Attenuators (TMA's) shall be used as protective protection when short-term, short duration, or mobile work operations require a lane or shoulder closure.

10. Section 6C.05, Work Affecting Pedestrian and Bicycle Facilities. Add the following to the "Support" paragraph 02:

   02b Bicycle facilities shall be protected from vehicle encroachment.

11. Section 6H.03, Typical Applications. Add the following paragraph to the Option heading:

   08 Many diagrams show ROAD WORK (W22-1), ROAD WORK NEXT 2 MILES (G22-1), and END ROAD WORK (G20-2) signs being used for as traffic control devices. These signs may be omitted if the activity is being performed within the limit of a larger project and the Advance Warning and/or Termination Signs for the larger project provide reasonable warning to the motorists for the activity.

12. Section 6H.06, Figure 6H-4. The diagram for the uninsured crossing of a Haul Road shows an inter-tape and a NO PASSING ZONE (W-14-3) sign to deter passing maneuvers. In lieu of inter-tape, cones may be placed along the centerline, using a maximum spacing of 40-foot.

In both diagrams, add a "TRUCK CROSSING (W8-6) sign at a distance of 10 feet" and alarm the DO NOT PASS (R4-1) sign. Show the ROAD WORK AHEAD (W22-1a) sign at a distance of 10 feet before the TRUCK CROSSING sign. (See Table 6H-3 for distance between signs)

13. Section 6H.01, Figure 6H-5. Make the following revisions:

   a. Use REVERSE CURVE (W4-4) signs which show side-by-side arrows, one arrow for each open lane, at each location that the sign is shown.

WORK ZONE TRAFFIC CONTROL
AMENDMENTS TO PART VI MUTCD (2009)
**UNIFORMED OFFICER AND FLAGGER USE GUIDELINES**

Flaggers shall be used to the greatest extent possible for "dynamic" traffic control operations. Uniformed Officers may be utilized for their specific authority above and beyond that of a flagger, such as assistance in speed control and traffic law enforcement. The use of Uniformed Officers may be necessary in some instances. However, Officer use is not a requirement. Their use must be preapproved by NHDOT.

**Examples of traffic control operations where Uniformed Officers and flaggers are typically not needed:**
1. Shoulder work.
2. Work behind barrier.

**Examples of traffic control operations where flaggers should be used include:**
1. Alternating 1-way traffic (stop/stay/pedestrian-only, etc.
2. Directing traffic through low volume intersections.
3. Assisting traffic and equipment in and out of work areas.
4. Providing coverage at side roads and driveways during mobile operations (e.g., paving, striping, etc.).
5. Directing pedestrians and bicyclists through the work zone.

**Examples of traffic control operations where Uniformed Officers may be used include:**
1. Directing traffic through complex interactions, especially where signals are being overridden.
2. Assisting construction vehicles and equipment in and out of work areas on high-speed (45 mph), high volume facilities (≥ 15,000 vpd). Note: If an access area is anticipated to be in place for an extended period of time and it is determined that assistance is required for the safety and entry of construction vehicles, a flagger is recommended but not required. The cost of the flagger would be borne by the contractor.
4. If a uniformed officer is already on site for other needs (enforcement or presence), then the officer may be asked to supplement these duties by providing limited duration traffic control that would otherwise be covered by a flagger. However, the officer must be adequately trained for the flagger operation to be performed and must use appropriate equipment and techniques (which may include the use of stop/stay paddles).

- 5. If approved, officers may be hired as a speed deterrent and/or to increase driver awareness through a work zone under the following conditions:
  a. The work zone has a posted speed of 45 mph or higher and an average daily traffic (ADT) volume of 15,000 vpd or greater; and
  b. The work zone presents a unique safety issue, such as a high rate of crashes, vehicles traveling at excessive speeds, poor roadway geometry, excessive East-West sun glare; workers exposed to traffic; and/or construction equipment frequently entering and exiting the work zone.

- 6. In rare cases, a presence officer may be approved for use on low speed (≤ 45 mph) or low volume (≤ 15,000 vpd) roads if a unique safety issue exists and other speed deterrent or driver awareness measures are proven ineffective.

7. The use of law enforcement may be considered for nighttime operations. When used at night the use of the blue lights and positioning should be carefully considered. Excessive use of police vehicles with lights at night, or inappropriate positioning of these vehicles may actually detract from the use of the blue lights. Blue lights should be dimmed and headlights should be off.

See complete Flagger and Uniformed Officer guidelines at this link:

**UNIFORMED OFFICER PLACEMENT IN THE WORK ZONE**

If uniformed officer with vehicle use has been approved for presence, cruiser placement is recommended as follows:

1. Park in the shoulder or median, not in the travel lane.
2. Do not park behind the Truck Mounted Attenuator (TMA).
3. Do not park in the buffer zone. If buffer zone presence is needed, then consideration should be given to installing a truck TMA instead.
4. Do not park in the taper.
5. Locate the police cruiser between the 1st and 2nd signs from the taper.
   a. Urban (Low v<30 mph) 150' from the taper.
   b. Urban (High v<35 mph) 225' from the taper.
   c. Rural = 750' from the taper.
   d. Expressway/Freeway = 750' from the taper.
6. Consider having the cruiser face traffic for stationary operations.
   a. Recommended cruiser positioning for moving operations:
      i. Less than 5 mph face traffic (e.g. crack seal).
      ii. Greater than 5 mph face work (e.g., striping, rumble strips).
7. Stay 3/4 mile in front of queue.
8. If a second officer is used for enforcement, and there is no queue, the enforcement officer should be immediately after the work zone. If there is a traffic queue then the enforcement officer should be moved several miles before the backup queue and presence officer.
9. Hands free and cell phone use should be only for work zone activity.
10. Headlights off, dim blue lights at night if possible.
TYPICAL APPLICATION
PERMANENT CONSTRUCTION SIGNING

MULTI-LANE DIVIDED

TWO LANE UNDIVIDED

GENERAL NOTES
1. SIGNS SHOWN INDICATE TYPICAL INSTALLATIONS. ACTUAL NUMBER OF SIGNS MAY VARY TO FIT INDIVIDUAL PROJECT NEEDS.
2. CONSTRUCTION SIGNS SHOWN ON THIS SHEET SHALL BE FLUORESCENT ORANGE. WITH THE EXCEPTION OF R50-1 AND G20-2a.
3. REFER TO TYPICAL APPLICATIONS FOR SIGNING OF INTERMEDIATE WORK AREAS.

NOT TO SCALE
TYPICAL APPLICATION
LANE SHIFTS - DIVIDED HIGHWAYS

SINGLE LANE SHIFT (DIVIDED HIGHWAY)

LANE CLOSURE WITH LANE SHIFT
FOR SPEED REDUCTION (DIVIDED HIGHWAY)

GENERAL NOTES

1. FOR TAPER LENGTH (L) CRITERIA, SEE MUTCD TABLES 6C-3 AND 6C-4.
2. FOR BUFFER SPACE CRITERIA, SEE STOPPING SIGHT DISTANCE, MUTCD TABLE 6C-2.

WORK ZONE TRAFFIC CONTROL
LANE SHIFTS
DIVIDED HIGHWAYS

LEGEND

- CHANNELIZING DEVICES
- ARROW PANEL
- POLICE CRUISER (SEE TC-2)

NOT TO SCALE
NOT TO SCALE

LANE CLOSURE: SIGNALIZED CONTROL WITH BARRIER

GENERAL NOTES

1. TEMPORARY TRAFFIC SIGNALS ARE PREFERABLE TO FLAGGERS FOR LONG-TERM PROJECTS AND OTHER ACTIVITIES THAT WOULD REQUIRE FLAGGERS AT NIGHT.

2. THE MAXIMUM LENGTH OF THE ACTIVITY AREA FOR ONE-WAY TRAFFIC SIGNAL PROJECTS AND OTHER ACTIVITIES THAT WOULD REQUIRE FLAGGERS AT NIGHT.

3. SIGNALS SHALL BE INSTALLED AND OPERATED IN ACCORDANCE WITH THE REQUIREMENTS OF PART IV OF THE MUTCD. TEMPORARY TRAFFIC CONTROL IS DETERMINED BY THE CAPACITY REQUIRED TO HANDLE THE PEAK HOUR DEMAND. SIGNAL TIMING SHALL BE ESTABLISHED BY QUALIFIED PERSONNEL.

4. ADEQUATE AREA ILLUMINATION SHALL BE PROVIDED TO CLEARLY IDENTIFY THE CONVENTIONAL TRAFFIC SIGNALS.

5. ACTIVITY AREA AND THE STOP LINES SHALL BE REMOVED. PAINT MARKINGS AND RAISED PAVEMENT MARKER REFLECTORS BETWEEN THE LANE CLOSURE TO SIGNALIZED CONTROL WITH BARRIER WHEN NECESSARY. REMOVABLE PAINT MARKINGS MAY BE USED. CONFLICTING STOP LINES 18 INCHES WIDE SHALL BE INSTALLED. ADD "NO-PASSING" LINES.

6. HAZARD IDENTIFICATION BEACONS OR TYPE A FLASHING WARNING LIGHTS MAY BE MOUNTED WITH WARNING SIGNS, IF WARRANTED.

7. THE VERTICAL ALIGNMENT OF THE ROADWAY MAY REQUIRE ADJUSTMENTS IN THE HEIGHT OF THE SIGNAL HEADS.


9. THE USE OF BARRIER IS ANTICIPATED FOR MOST SITUATIONS REQUIRING APPLICATION OF BARRIER. THE DIRECTION OF TRAFFIC SHOULD BE IDENTIFIED WITH THE USE OF "SINGLE LANE CLOSURE" BARRIERS.<br/>

10. FOR TEMPORARY TRAFFIC BARRIER CRITERIA, SEE SECTION 6F.85 OF THE MUTCD.

11. CRASH CUSHIONS SHALL BE DELINEATED WITH TYPE 3 OBJECT MARKERS. SEE MUTCD FIGURE 2C-13.

12. INSTALL ON ALL APPROACHES IF THE CRITERIA IN AMENDMENT NO. 10 ON TC-1 APPLIES.

** POSTED BRIDGE WIDTH SHALL BE 1 FOOT LESS THAN ACTUAL WIDTH. SEE AMENDMENT NO. 11 ON TC-1.
**GENERAL NOTES**

1. The above diagram illustrates cold-planed surfaces for pavement matches. This same sign package shall be used for any cold-planed surface within the limits of the traveled way. See pavement match typical, included in the plans for length of pavement match, fillet detail, etc.

2. The grooved pavement ahead (notes) sign may be eliminated for relatively short pavement matches at the discretion of the Engineer. If W20-6a is not used W8-15 & 18-15P must be placed.

---

**LEGEND**

- Cold-planed surface

---

**CONSTRUCTION SIGNING FOR COLD-PLANED SURFACES**

---

**TYPICAL APPLICATION**

CONSTRUCTION SIGNING FOR COLD-PLANED OPERATIONS

---

**Recommended Advance Warning Sign Minimum Spacing**

<table>
<thead>
<tr>
<th>ROAD TYPE</th>
<th>DISTANCE BETWEEN SIGNS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban 15-30 MPH</td>
<td>A: 100', B: 200', C: 300'</td>
</tr>
<tr>
<td>Urban 30-55 MPH</td>
<td>A: 250', B: 350', C: 450'</td>
</tr>
<tr>
<td>Rural</td>
<td>A: 100', B: 200', C: 300'</td>
</tr>
</tbody>
</table>

---

**NOT TO SCALE**