SECTION 580

SIGN AND SIGNPOST INSTALLATIONS

INDEX

580.01 SCOPE

This specification covers the requirements for the supply and installation of various types of signposts and the actual placing of highway signs on those signposts.

580.02 CLASSIFICATION OF SIGNPOST INSTALLATIONS

There are nine basic types of signpost installations, namely; Type A, Type B, Type C, Type D, Type E, Type F, Type G, Type H and Type I.

Type A and Type B signpost installations are of various dimensions, but all are intended to support signs that require only one wooden vertical member for support. For Type A and Type B signpost installations, the number following the letter denotes the required height of the sign to be placed on the post, measured in millimetres. See Forms 1290 and 1291 for typical details.

Type C and Type D signpost installations are of various dimensions, but all are intended to support signs that require two wooden vertical members for support. Type C installations are intended for signs of width less than or equal to 2440 millimetres and a height of less than or equal to 1220 millimetres. Type D installations are intended for signs wider than 2440 millimetres but less than 4880 millimetres and/or higher than 1220 millimetres.

For Type C and Type D signpost installations the upper number following the letter denotes the required height of the sign board in millimetres, and the lower number denotes the length of the sign board in millimetres. See Forms 1292 and 1293 for typical details.

Type E signpost installations will be of various dimensions and are intended to support signs less than or equal to 2440 millimetres in height and between 4880 and 6096 millimetres in length which require three wooden vertical members for support. For Type E signpost installations, the upper number following the letter denotes the height of the signboard in millimetres and the lower number denotes the length of the signboard in millimetres. See Form 1294 for typical details.

Type F signpost installations are intended to support signs between 2440 and 3050 millimetres in height and less than or equal to 4880 millimetres in length which require two vertical structural steel members for support. For Type F signpost installations, the upper number following the letter denotes the height of the sign panel in millimetres and the lower number denotes the length of the sign panel in millimetres. See Form 1295 for typical details.

Type G signpost installations are intended to support signs greater than 2440 millimetres in height and less than or equal to 6100 millimetres in length which require three vertical structural steel members for support. For Type G signpost installations, the upper number following the letter denotes the sign panel height in millimetres and the lower number denotes the sign panel length in millimetres. See Form 1296 for typical details.

Type H signpost installations will be of various dimensions and are intended to support signs less than or equal to 2440 millimetres in height and between 6706 and 7925 millimetres in length which require four wooden vertical members for support. For Type H signpost installations, the upper number following the letter denotes the height of the signboard in millimetres and the lower number denotes the length of the signboard in millimetres. See Form 1294a for typical details.

Type I signpost installations are intended to support signs greater than 2440 millimetres in height and between 6700 and 7925 millimetres in length that require four vertical structural steel members for support. For Type I signpost installations, the upper number following the letter denotes the sign panel height in millimetres and the lower number denotes the sign panel length in millimetres. See Section 1296a for typical details.

580.03 MATERIALS

The Contractor shall supply all materials required to complete sign and signpost installations in accordance with these specifications.

All posts, footings, and braces for Types A to E and H shall be pressure treated eastern hemlock, western hemlock, or British Columbia fir and be of the size specified for each post type.

Nails shall be galvanized with a length of 100 millimetres.

Lag bolts shall be galvanized with a length of 80 millimetres and a diameter of 10 millimetres and with Hex or Square Head only (carriage type head is not to be used on signs).

Washers shall be galvanized flat washers to fit 10 millimetre diameter lag bolts.

Posts for Type F, Type G and Type I shall be W 250x49 structural steel members, grade 350W in accordance with CSA G40-21, latest edition. All welding is to conform to CSA W59 and companies are to be certified to W47.1, latest edition. All fabrication of structural steel shall be done in accordance with Section 910. No splicing of the vertical member

will be permitted. The sign post shall be painted in accordance with Section 921. The complete penetration groove weld between the vertical member and the base plate shall be designed by a qualified welding engineer to handle a factored moment of 135 kN-M (ultimate limit states), 103.85kN-M (fatigue limit states) a factored horizontal shear force of 32.5 kN (Ultimate limit states), 25.0 kN (fatigue limit states). The fatigue category shall be “B” for 2,000,000 cycles. Shop drawings bearing the seal of a registered professional engineer, licensed to practice in the Province of Newfoundland and Labrador, and shall be submitted for approval.

Brackets for attaching the aluminum panels to the steel post shall be manufactured from 8 millimetre steel plate to the dimensions shown on Forms 1295, 1296 and 1296a. The brackets are to be painted in accordance with Section 921.

A 6 millimetre thick x 245 millimetre wide neoprene gasket shall be placed between the steel post and aluminium sign panels. The gasket is to extend the full height of the aluminium panels.

580.03.01 Additional Material Requirements for Type A Installations

Vertical members shall be 114 millimetre x 114 millimetre pressure treated lumber of length not less than that as calculated for the appropriate sign drawings as explained by Section 580.02 and as illustrated on Form 1290.

Footings for each post shall consist of six pieces of 38 millimetre x 89 millimetre pressure treated lumber of length not less than 450 millimetres.

Cross bracing shall consist of one or two pieces of 38 millimetre x 89 millimetre pressure treated lumber of sufficient length to provide cross bracing for the installation of the required size and shape.

580.03.02 Additional Material Requirements for Type B Installations

Vertical members shall be 140 millimetre x 140 millimetre pressure treated lumber of length not less than that as calculated for the appropriate sign indicated by the contract drawings, as explained by Section 580.02 and as illustrated on Form 1291.

Footings for each post shall consist of six pieces of 38 millimetre x 89 millimetre pressure treated lumber of length not less than 450 millimetres.

Cross bracing shall consist of one or two pieces of 38 millimetre x 89 millimetre pressure treated lumber of sufficient length to provide cross bracing for the installation of the required size and shape.

580.03.03 Additional Material Requirements for Type C Installations

Vertical members shall be 140 millimetre x 140 millimetre pressure treated lumber. Footings for each installation shall consist of two pieces of 38 millimetre x 89 millimetre pressure treated lumber. The length of vertical members and footings shall not be less than that as calculated for the appropriate sign board indicated by the contract drawings, as explained by Section 580.02 and as illustrated on Form 1292 and Form 1299.

Cross bracing shall consist of two pieces of 38 millimetre x 89 millimetre pressure treated lumber of sufficient length to provide cross bracing for the installation of the required size.

580.03.04 Additional Material Requirements for Type D Installations

Vertical members shall be 184 millimetre x 184 millimetre pressure treated lumber. Footings for each installation shall consist of two pieces of 38 millimetre x 89 millimetre pressure treated lumber. Cross members for each installation shall consist of two pieces of 89 millimetre x 89 millimetre pressure treated lumber.

The length of vertical members, footings, and cross members shall not be less than that as calculated for the appropriate sign board indicated by the contract drawings, as explained by Section 580.02 and as illustrated on Form 1293 and Form 1299.

Cross bracing shall consist of two pieces of 38 millimetre x 89 millimetre pressure treated lumber of sufficient length to provide cross bracing of the installation of the required size.

Nuts, bolts, and washers for connecting cross members shall be galvanized. The bolt shall be of length 150 millimetres and be of diameter not less than 15 millimetres or greater than 25 millimetres.

580.03.05 Additional Material Requirements for Type E Installations

Vertical members shall be 184 millimetre x 184 millimetre pressure treated lumber. Footings for each installation shall consist of two pieces of 38 millimetre x 89 millimetre pressure treated lumber. Cross members for each installation shall consist of three pieces of 89 millimetre x 89 millimetre pressure treated lumber.

The length of vertical members, footings, and cross members shall not be less than that as calculated for the appropriate sign board indicated by the contract drawings, as explained by Section 580.02 and as illustrated in Forms 1294 and 1299.

Cross bracing shall consist of four pieces of 38 millimetre x 89 millimetre pressure treated lumber of sufficient length to provide cross bracing of the installation of the required size. Nuts, bolts, and washers for connecting cross members shall be galvanized. The bolt shall be of length 300 millimetres and be of diameter not less than 12 millimetres or greater than 25 millimetres.

580.03.06 Additional Material Requirements for Type F, Type G and Type I Installations

Vertical members shall be W250x49 Structural Steel sections as specified by Forms 1295, 1296 and 1296a. Footings for each installation shall consist of reinforced concrete complete with anchor bolts as shown on the contract drawings. Neoprene gaskets shall be used to isolate the aluminum panels from the vertical members.

The length of vertical members shall not be less than that as calculated for the appropriate sign board indicated by the contract drawings, as explained by Section 580.02 and as illustrated in Forms 1295, 1296, 1296a and 1299a.

580.03.07 Additional Material Requirements for Type H Installations

Vertical members shall be 184 millimetre x 184 millimetre pressure treated lumber. Footings for each installation shall consist of two pieces of 38 millimetre x 89 millimetre pressure treated lumber. Cross members for each installation shall consist of six pieces of 89 millimetre x 89 millimetre pressure treated lumber.

The length of vertical members, footings, and cross members shall not be less than that as calculated for the appropriate sign board indicated by the contract drawings, as explained by Section 580.02 and as illustrated in Forms 1294-2 and 1299a.

Cross bracing shall consist of six pieces of 38 millimetre x 89 millimetre pressure treated lumber of sufficient length to provide cross bracing of the installation of the required size.

Nuts, bolts, and washers for connecting cross members shall be galvanized. The bolt shall be of length 150 millimetres and be of diameter not less than 15 millimetres or greater than 25 millimetres.

580.03.08 Materials Used For the Installation of Signs

Signs will be made by the Department and must be picked up by the Contractor. Signs will be made available to the Contractor at the nearest main Depot, (i.e. White Hills Depot, Clarenville Depot, Grand Falls Depot, Deer Lake Depot, or Goose Bay Depot).

Signs will be placed on wooden signposts with 80 millimetre x 10 millimetre lag bolts and washers in accordance with Forms 1290, 1291, 1292, 1293 and 1294.

Signs will be placed on steel posts with 6 millimetre x 100 millimetre brackets. Bolts are to be stainless steel. See Forms 1295, 1296 and 1296a.

580.04 ASSEMBLY

Should any piece of lumber become split or cracked during nailing or installing the sign, then the Contractor shall replace the damaged piece with sound lumber at their own expense. For aluminum installations, posts or panels which become damaged in any manner shall be replaced by the Contractor at their own expense.

580.04.01 Assembly of Type A and Type B

The footings shall be secured to the vertical member at the spacing shown on Forms 1290 and 1291.

Each piece of footing and cross bracing shall be nailed near its centre to the vertical member, by means of two nails as shown on Forms 1290 and 1291.

580.04.02 Assembly of Type C

The footings, cross bracing, and vertical members shall be assembled and secured at the spacing shown on the Form 1292.

Each piece of footing and cross bracing shall be secured to the vertical members with four nails, that is, with two nails at each joint.

580.04.03 Assembly of Type D

The footings, cross bracing, cross members and vertical members shall be assembled and secured at the spacing shown on Forms 1293 and 1299.

Each joint shall be secured with a nut, bolt, and washer. The head of the bolt shall be placed at the front of the installation. The head shall be counter sunk so that the top of the bolt is flush with the front of the installation.

Each piece of footing and cross bracing shall be secured to the vertical members with four nails, that is, with two nails at each joint.

580.04.04 Assembly of Type E

The footings, cross bracing, cross members and vertical members shall be assembled and secured at the spacing shown on Forms 1294 and 1299.

Each joint shall be secured with a nut, bolt, and washer. The head of the bolt shall be placed at the front of the installation. The head shall be counter sunk so that the top of the bolt is flush with the front of the installation.

Each piece of footing and cross bracing shall be secured to the vertical members with four nails, that is, with two nails at each joint.

580.04.05 Assembly of Type F, Type G and Type I

The footings shall be constructed of reinforced concrete as shown on Forms 1295, 1296 1296a, or 1299a, as the case may be.

All concrete shall meet all requirements for “Substructure Concrete” as specified in Section 904. However, the slump must be 60 millimetres ± 20 millimetres. All reinforcing steel shall meet the requirements stipulated in Section 905. The top of the footing is to be steel float finished, dead level.

The foundation backfill material shall be compacted to 95% of the maximum standard dry density (ASTM D698).

Prior to placing the post, bottom nuts are to be placed and levelled. The post is then to be set and the top nuts tightened. Ensure that the post is true and plumb. Hand pack non-shrink grout under base plate and trowel exposed edges to a smooth bevel.

580.04.06 Assembly of Type H

The footings, cross bracing, cross members and vertical members shall be assembled and secured at the spacing shown on Forms 1294 and 1299a.

Each joint shall be secured with a nut, bolt, and washer. The head of the bolt shall be placed at the front of the installation. The head shall be counter sunk so that the top of the bolt is flush with the front of the installation.

Each piece of footing and cross bracing shall be secured to the vertical members with four nails, that is, with two nails at each joint.

580.05 INSTALLATION

The Owner's Representative will stake the locations where signpost installations are to be installed and designate the sign number of the signpost installation that is required for each location.

The Contractor shall place signpost installations at these locations only of the required type and size for the sign as noted on the drawings.

The Contractor shall excavate holes for the footings, such that when installed the installation is at least the required minimum depth in the ground.

Signpost installations shall be placed with the vertical axis plumb, and with at least the required minimum depth in the ground. The vertical post edge nearest the road shall be 2500 millimetres from the edge of the shoulder, as illustrated in Forms 1298 and 1299. The vertical post edge nearest the road shall be 3500 millimetres from the edge of the shoulder, as illustrated in Form 1299a.

Footings shall be backfilled with selected fill which meets with the Owner's Representative's approval. Backfill material shall not contain stones larger than 150 millimetres in any one dimension.

Backfill material shall be placed in layers of thickness not greater than 150 millimetres. Each layer shall be thoroughly compacted before the successive layer is placed. Dry granular backfill shall be moistened before tamping.

Backfill material around the signpost installations shall be brought up level with the surrounding ground and surplus excavated material together with surplus backfill material shall be disposed of on the sides of fills, or as directed by the Owner's Representative.

The Contractor shall be responsible for placing each sign on the correct posts, and at the location as set by the Owner's Representative, taking care to ensure that each sign is placed undamaged, horizontally levelled, and attached to the posts and cross members with 80 millimetre x 10 millimetre galvanized lag bolts and galvanized washers. Nails cannot be substituted for this job.

Sign board size, sign post type, and the location of each will be specified on drawings as set by the Engineer.

580.05.01 Additional Installation Requirements for Type A and Type B

Type A and Type B sign post installations shall be placed so that at least 1250 millimetres of the vertical member is in the ground. They shall be installed so that the face of the post that is to take the sign is perpendicular to the direction of traffic, or as directed by the Owner's Representative.

580.05.02 Additional Installation Requirements for Type C, Type D, Type E, Type F, Type G, Type H and Type I

Type C and Type D sign post installations shall be placed so that both vertical members are at least 1500 millimetres in the ground.

Type E installation shall be placed so that the three vertical members are at least 2500 millimetres in the ground.

Type F, Type G, Type H and Type I installations shall be placed as shown on the contract drawings.

Special care should be taken with the placing of the above sign post installations so as to minimize specular glare.

On straight stretches of roadway, Type C, Type D, Type E, Type F, Type G, Type H and Type I sign post installations shall be set with the horizontal axis at an angle of 93 degrees with the traffic lane which the proposed sign will serve, or as directed by the Owner's Representative.

On the horizontal curves, these installations shall be set with the horizontal axis at an angle of 93 degrees with a straight line brackets between the sign and the point at which the sign is to be read, or as directed by the Owner's Representative.

580.05.03 Additional Installation Instructions for the Sign Board

On Type A and Type B sign posts, the sign board will be mounted flush with the top of the sign post.

On Type C and Type D signposts, the sign board will be mounted with the top of the sign board, 100 millimetres above the signpost.

On Type A and Type B signposts, the top and bottom lag bolts must be placed 100 millimetres from the top and bottom edges of the sign board, EXCEPT for those pre-drilled sign boards that are normally supplied to the Contractor. See also Forms 1290 and 1291.

On Type C, Type D, Type E and Type H signposts, lag bolts must be placed 250 millimetres down from the top edge of the sign board and follow down the sign board at a maximum spacing of 600 millimetres apart with the lowest lag bolt placed approximately 100 millimetres above the bottom edge of the sign board (for each post). See also Forms 1292, 1293, 1294 and 1294-2.

On Type C, Type D, Type E, and Type H signposts, lag bolts must be placed 300 millimetres from each outside edge of the sign board and spaced a maximum of 600 millimetres apart (for each cross member). See also Forms 1292, 1293 and 1294.

The Contractor is advised that care must be taken when installing the sign board to see that all lag bolts are seated into the frame and without the washer indenting the signs reflective sheeting. Care must be taken to see that damage to the sign while installing it to the post is minimal.

For Type F, Type G and Type I signposts, all aluminum sign panels must be bolted together with 3/8" x 1" stainless steel stitch bolts and washers (supplied by Department) at a maximum spacing of 600 millimetres. The entire aluminum sign must be attached to the steel posts with brackets at a spacing not exceeding 900 millimetres with a bracket band at the extreme top and bottom panels of the sign. See Forms 1295, 1296 and 1296a.

For signs with tabs in the upper corners, the Contractor is to supply and install 2 pieces of aluminum T-Bar, 75 millimetre x 100millimetre x 6 millimetre thick x 1600 millimetres long with 10-9.5millimetre x 25 millimetre stainless steel bolts with 15 millimetre x 25 millimetre x 5 millimetre rectangular heads and nuts to brace the tabs to the back of the sign.

580.06 MEASUREMENT FOR PAYMENT

Measurement for payment will be by means of the number of each type of signpost installation placed at the required locations.

580.07 BASIS OF PAYMENT

Payment at the contract price for sign and signpost installation of a particular type shall be compensation in full for all labour, handling, materials, and equipment-use to: supply all materials, handling of signs from Department Depots, assemble the installation, excavate a hole for the footings, install the signposts, backfill the hole, compact the backfill, install the sign board and dispose of all surplus materials, all in accordance with this specification. Concrete footings, reinforcing, anchor bolts, neoprene gaskets, base

plates, posts, brackets, and hardware to install the signs for Type F, Type G and Type I installations are also included in the contract price for these items.

Should excavation of solid rock be required to complete the installation of a signpost, payment for the rock excavation will be made according to Section 403.