

FORM 580



GOVERNMENT OF NEWFOUNDLAND AND LABRADOR
Department of Transportation and Works
Highway Design Division

SECTION 580 SIGN AND SIGNPOST INSTALLATIONS

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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 which require only one wooden vertical member for support. for Type A and Type B signpost installations,

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the number following the letter denotes the required height of the sign to be placed on the post, measured in millimetres. See section 1290, "Sign Post Installation Details Type A", and Section 1291, "Sign Post Installation Details Type B", for an illustration.

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

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 Section 1292 "Sign Board Installation Details Type C", and Section 1293, "Sign Post Installation Details Type D", for an illustration.

Type E signpost installations will be of various dimensions and are intended to support signs less than or equal to 2440 mm in height and between 4880 mm and 6096 mm 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 section 1294 "Sign Post Installation Details Type E", for an illustration.

Type F signpost installations are intended to support signs between 2440 mm and 3050 mm in height and less than or equal to 4880 mm 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 section 1295 "Sign Post Installation Details Type F", for an illustration.

Type G signpost installations are intended to support signs greater than 2440 mm in height and less than or equal to 6100 mm 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 section 1296 "Sign Post Installation Details Type G", for an illustration.

Type H signpost installations will be of various dimensions and are intended to support signs less than or equal to 2440 mm in height and between 6706 mm and 7925 mm 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 section 1294a "Sign Post Installation Details Type H", for an illustration.

Type I signpost installations are intended to support signs greater than 2440 mm in height and between 6700 mm and 7925 mm in length which 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 "Sign Post Installation Details Type "I", for an illustration.

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 BC fir and be of the size specified for each post type.

Nails shall be galvanized with a length of 100 mm.

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

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

Posts for Type F, Type G and Type I shall be W250x49 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 "Structural Steel". No splicing of the vertical member will be permitted. The sign post shall be painted in accordance with Section 921 "Blast Cleaning and Painting of Structural Steel". 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, shall be submitted for approval.

Brackets for attaching the aluminum panels to the steel post shall be manufactured from 8mm steel plate to the dimensions shown on Forms 1295, 1296 and 1296a. The brackets are to be painted in accordance with Section 921 "Blast Cleaning and Painting of Structural Steel".

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

580.03.01 Additional Material Requirements For Type A Installations

Vertical members shall be 114 mm x 114 mm pressure treated lumber of length not less than that as calculated for the appropriate sign drawings as explained by Section 580.02 "Classification of Signpost Installations", and as illustrated on Section 1290 "Sign Post Installation Details Type A".

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

Cross bracing shall consist of one or two pieces of 38 mm x 89 mm 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 mm x 140 mm 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 "Classification of Signpost Installation" and as illustrated on Section 1291 "Sign post Installation Details Type B".

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

Cross bracing shall consist of one or two pieces of 38 mm x 89 mm 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 mm x 140 mm pressure treated lumber. Footings for each installation shall consist of two pieces of 38 mm x 89 mm 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 "Classification of Signpost Installations" and as illustrated on Section 1292 "Sign Post Installation Details Type C", and Section 1299 "Sub-Grade Widening for Types C, D, and E Signpost Installations".

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

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580.03.04 Additional Material Requirements For Type D Installations

Vertical members shall be 184 mm x 184 mm pressure treated lumber. Footings for each installation shall consist of two pieces of 38 mm x 89 mm pressure treated lumber. Cross members for each installation shall consist of two pieces of 89 mm x 89 mm 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 "Classification of Signpost Installations" and as illustrated on Section 1293 "Sign Post Installation Details

Type D", and Section 1299 "Sub-Grade Widening For Types C, D and E Signpost Installations".

Cross bracing shall consist of two pieces of 38 mm x 89 mm 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 mm and be of diameter not less than 15 mm or greater than 25 mm.

580.03.05 Additional Material Requirements For Type E Installations

Vertical members shall be 184 mm x 184 mm pressure treated lumber. Footings for each installation shall consist of two pieces of 38 mm x 89 mm pressure treated lumber. Cross members for each installation shall consist of three pieces of 89 mm x 89 mm 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 "Classification of Signpost Installations" and as illustrated in Section 1294 "Sign Post Installation Details Type E", and Section 1299 "Sub-Grade Widening for Types C, D and E Signpost Installations".

Cross bracing shall consist of four pieces of 38 mm x 89 mm 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 mm and be of diameter not less than 12 mm or greater than 25 mm.

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 drawings 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 "Classification of Signpost Installations" and as illustrated in Section 1295 "Sign Post Installation Details Type F", Section 1296 "Signpost Installation Details Type G", Section 1296a "Signpost Installation Details Type I" and Section 1299a "Sub-Grade Widening For Types F, G, H and I Signpost Installations".

580.03.07 Additional Material Requirements For Type H Installations

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

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"Classification of Signpost Installations" and as illustrated in Section 1294-2 "Sign Post Installation Details Type "H", and Section 1299a "Sub-Grade Widening for Types F, G, H and I Signpost Installations".

Cross bracing shall consist of six pieces of 38 mm x 89 mm 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 mm and be of diameter not less than 15 mm or greater than 25 mm.

580.03.08 Materials Used For The Installation Of Signs

Signs will be made by the Department of Works, Services and Transportation 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, Clarendville Depot, Grand Falls Depot, Deer Lake Depot, or Goose Bay Depot).

Signs will be placed on wooden signposts with 80 mm x 10 mm lag bolts and washers in accordance with Section 1290 "Sign Post Installation Details Type A", Section 1291 "Sign Post Installation Details Type B", Section 1292 "Sign Post Installation Details Type "C", Section 1293 "Sign Post Installation Details Type "D", and Section 1294 "Sign Post Installation Details Type "E".

Signs will be placed on steel posts with 6mm x 100mm brackets. Bolts are to be stainless steel. See Section 1295 "Sign Post Installation Details Type "F", Section 1296 "Sign Post Installation Details Type "G", and Section 1296a "Sign Post Installation Details Type "I".

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 his own expense. For aluminum installations, posts or panels which become damaged in any manner shall be replaced by the Contractor at his 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 Section 1290 "Sign Post Installation Details Type A", and Section 1291 "Sign Post Installation Details Type B".

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 Section 1290 "Sign Post Installation Details Type A", and Section 1291 "Sign Post Installation Details Type B".

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 drawing, Section 1292 "Sign Post Installation Details Type C and Section 1299 "Sub-grade Widening for Types C, D, and E Signpost Installations".

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 the drawings, Section 1293 "Sign Post Installation Details Type D" and Section 1299 "Sub-grade Widening for Types C, D, and E Signpost Installations".

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.

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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 the drawings, Section 1294 "Sign Post Installation Details Type E", and Section 1299 "Sub-grade Widening for Types C, D, & E Sign Post Installations".

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 Form 1295, 1296 or 1296a as the case may be and Section 1299a "Sub-grade Widening for Types F, G, H & I Sign Post Installations".

All concrete is to be 35MPa and shall conform to the requirements of Section 904 "Concrete Structures" for substructures. However, the slump must be 60mm \pm 20mm. Reinforcing steel shall be hard grade, YP400MPa. 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 D698-78).

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 the drawings, Section 1294 "Sign Post Installation Details Type H", and Section 1299a "Sub-grade Widening for Types F, G, H and I Sign Post Installations".

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 Engineer 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 mm from the edge of the shoulder, as illustrated in drawings, Section 1298 "Sub-grade Widening for Type

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A and Type B Sign Post Installations" and Section 1299 "Sub-grade Widening for Types C, D, and E Sign Post Installations". The vertical post edge nearest the road shall be 3500 mm from the edge of the shoulder, as illustrated in drawings, Section 1299a "Sub-grade Widening for Types F, G, H and I Sign Post Installations".

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

Backfill material shall be placed in layers of thickness not greater than 150 mm. 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 Engineer.

The Contractor shall be responsible for placing each sign on the correct posts, and at the location as set by the Engineer, taking care to ensure that each sign is placed undamaged, horizontally levelled, and attached to the posts and cross members with 80 mm x 10 mm 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 mm 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 Engineer.

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 mm in the ground.

Type E installation shall be placed so that the three vertical members are at least 2500 mm 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 Engineer.

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 Engineer.

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 mm above the signpost.

On Type A and Type B signposts, the top and bottom lag bolts must be placed 100 mm from the top and bottom edges of the sign board, **EXCEPT** for those pre-drilled sign boards that are

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normally supplied to the Contractor. See also Section 1290 "Sign Post Installation Details Type A", and Section 1291 "Sign Post Installation Details Type B".

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

See also Section 1292 "Sign Post Installation Details Type C", Section 1293 "Sign Post Installation Details Type D", Section 1294 "Sign Post Installation Details Type E", and Section 1294-2 "Sign Post Installation Details Type H".

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

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 mm. The entire aluminum sign must be attached to the steel posts with brackets at a spacing not exceeding 900 mm with a bracket band at the extreme top and bottom panels of the sign. See Section 1295 "Sign Post Installation Details Type F", Section 1296 "Sign Post Installation Details Type G" and Section 1296a "Sign Post Installation Details Type I".

For signs with tabs in the upper corners, the Contractor is to supply and install 2 pieces of aluminum T-Bar, 75mm x 100mm x 6mm thick x 1600mm long with 10-9.5mm x 25mm stainless steel bolts with 15 x 25 x 5 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, Excavation for Foundations, Solid Rock.