

**Construction Specification for
Permanent Small Signs and Support Systems****Table of Contents**

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TS 703.01 SCOPE

This specification covers the requirements for the installation and removal of permanent small signs and support systems, and the relocation of small signs.

TS 703.02 REFERENCES

This specification refers to the following standards, specifications, or publications:

City of Toronto Standard Specifications

TS 501 Amendment to OPSS.MUNI 501 – Construction Specification for Compacting

Ontario Provincial Standard Specifications

OPSS.MUNI 2001 Material Specification for Signs

Ontario Ministry of Transportation Publications

Ontario Traffic Manual (OTM): Book 1B - Sign Design Principles

CSA Standards

O80 Series-15 Wood Preservation
O141-05 (R2014) Softwood Lumber

ASTM International

A 123/A123M-17	Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
A 153/A153M-16	Zinc Coating (Hot-Dip) on Iron and Steel Hardware
A 653/A653M-20	Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
A 780/A 780M-09 (2005)	Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings

Others

National Lumber Grade Authority (NLGA)
Canadian Wood Preservers Bureau (CWPB)

TS 703.03 DEFINITIONS

For the purpose of this specification, the following definitions apply:

Relocation means to move a existing permanent sign to a new chainage or offset or both.

Removal means to remove and dispose of an existing permanent sign or support system or both.

Sign and Sign Board means a traffic control device mounted on a fixed support that conveys a specific message by means of symbols and or words, and is officially erected for the purpose of regulating, warning, informing, and guiding traffic.

Sign Support System means a wooden or steel post of specified dimensions, hardware, and material embedded vertically into the ground for mounting signs at a specified height above the roadway and ground. The system may consist of a single, double, or triple post configuration.

Sign Hardware means hardware including, but not limited to, nuts, bolts, washers, spacers, and lock washers for attaching signs to sign support systems.

Small Sign Assembly means one or more signs mounted on a sign support system with specified sign hardware having a total sign or sign board area not greater than 3.6 m².

TS 703.04 DESIGN AND SUBMISSION REQUIREMENTS – Not Used

TS 703.05 MATERIALS

TS 703.05.01 General

The Contractor shall select a sign support system for each small sign assembly installation as specified in the Contract Documents.

All supplied components shall be according to the manufacturer's specifications and as specified in the Contract Documents. All sign hardware shall be hot dip galvanized according to ASTM A 153. New sign boards shall be supplied as specified in the Contract Documents.

TS 703.05.02 Wooden Posts

TS 703.05.02.01 General

All wooden posts shall be in dressed sizes and pressure treated with wood preservative.

The tolerance on the cross-sectional dimensions of all wooden posts shall be ± 2 mm.

TS 703.05.02.02 Wood Preservative

Wood preservative shall be according to CAN/CSA O80 Series, Use Category UC 4.1.

TS 703.05.02.03 Marking of Wood for Identification of Grade and Species

All wooden posts shall be stamped for species and grading according to CSA O141 by an approved agency authorized by the National Lumber Grade Authority (NLGA). The stamp shall be visible after installation and located at least 1.8 m from the bottom of the post.

TS 703.05.02.04 Marking of Wood for Identification of Preservative Treatment

All wooden posts shall be stamped for wood preservative treatment using a certification mark authorized by the Canadian Wood Preservers Bureau (CWPB). The wood preservative stamp shall be visible after installation and located at least 1.8 m from the bottom of the post.

TS 703.05.03 Metal Posts

Tubing material for metal post shall have a galvanized finish, roll formed from 12 gauge (.105 U.S.S. Gauge) hot rolled steel, galvanized material according to ASTM A 653 Grade 50. Average minimum yield strength after cold forming shall be 60,000 PSI.

Table 1: Tolerances

Tolerance	Description
wall thickness	12 guage with a 2.74 mm nominal base metal thickness and 2.63 mm minimum base metal thickness
convexity and concavity	Measured in the centre of the flat side, tolerance is $\pm .010$ inch applied to the specific size determined at the corner.
straightness tolerance	Permissible variation in straightness is 1/16" in 3 feet.
corner radii	Standard corner radius is $5/32" \pm 1/64"$.
weld flash	Weld flash on corner welded square tubing shall permit 9/64" radius gauge to be placed in the corner.
telescoping	Using 12 gauge (.105) square tube, consecutive size tubes shall telescope freely for ten feet.
length tolerance	The length of each post shall have a permissible length tolerance of $\pm 1/4"$.
hole tolerance	Tolerance on hole size is $\pm 1/64"$ on a 7/16" hole size. Tolerance on hole spacing $\pm 1/8"$ in 10 feet

Post corner weld shall be zinc coated after scarfing. Tubing to receive a chromate conversion coating and clear organic polymer topcoat.

TS 703.05.03.01 Weight per unit length

All square tube shall have a minimum weight per unit length according to Table 2.

Table 2: Item weight per unit length

Size (inch)	USS Gauge	Minimum Weight (lbs /foot)
1-3/4 x 1-3/4	12	2.06
2 x 2	12	2.42
2-1/4 x 2-1/4	12	2.77
2-1/2 x 2-1/2	12	3.14

TS 703.05.03.02 *Outside Dimensions Tolerances*

All square items shall have the following tolerances on outside dimensions according to Table 3.

Table 3: Outside dimension tolerances

Nominal outside dimensions (inch)	Outside tolerances at all sides at corners (inch)
1-3/4 x 1-3/4	± .008
2 x 2	± .008
2-1/4 x 2-1/4	± .010
2-1/2 x 2-1/2	± .010

TS 703.05.03.03 *Squareness of Sides and Twist*

All square tubes shall have squareness of sides and twist according to Table 4.

Table 4: Squareness of sides and twist

Nominal outside dimensions (inch)	Squareness tolerances (inch)	Maximum twist permissible in 3 foot length (inch)
1-3/4 x 1-3/4	± .010	.062
2 x 2	± .012	.062
2-1/4 x 2-1/4	± .014	.062
2-1/2 x 2-1/2	± .015	.075

TS 703.05.04 *Signs*

Signs shall be according to OPSS.MUNI 2001.

All sign hardware shall be hot dip galvanized according to ASTM A 153.

TS 703.05.04.01 *Sign Board Bolts*

Sign board bolts shall be according to Table 5.

Table 5: Sign board bolt items

Quantity	Description
1	3/8" dia - 16 threads per inch SAE UNC x 3- 1/2" long, Grade 5 steel, hot dip galvanized to ASTM A 153,
1	1/2" ID, hot dip galvanized to ASTM A 153, steel, flat washer with 1" OD
1	1/2" ID flat nylon washer with 1" O.D., weighing a minimum of 0.06 lbs per 100 washers
1	1/2" ID hot dip galvanized to ASTM A 153, lock washers with 13/16" OD,
1	3/8" dia -16 threads per inch SAE UNC, Grade 5 steel, hot dip galvanized to ASTM A 153, large hex head nut

TS 703.05.04.02 *Corner Bolts*

Corner bolts shall be according to Table 6.

Table 6: Corner bolt items

Quantity	Description
1	5/16"dia – 18 threads per inch SAE UNC, Grade 5 steel, hot dip galvanized to ASTM A 153, for use in 2-1/2" x 2-1/2" - 12 gauge square steel perforated tubing
1	1/2" ID, hot dip galvanized to ASTM A 153, steel, flat washer with 1" OD
1	5/16"dia – 18 threads per inch SAE UNC, Grade 5 steel, hot dip galvanized to ASTM A 153, heavy hex head jam nut, weighing a minimum of 1.08 lbs per 100 jam nuts.

TS 703.05.04.03 *Drive Rivet*

Drive rivet shall be according to Table 7.

Table 7: Drive rivet items

Quantity	Description
1	3/8" diam x 5/8" length, 1" tapered head diameter, of aluminum material, with plain finish with pin construction, and with tamper resistant design,
1	one nylon washer, 3/8" diameter, weighing a minimum of 0.06 lbs per 100 washers per rivet

TS 703.06 EQUIPMENT – Not Used

TS 703.07 CONSTRUCTION

TS 703.07.01 General

All breakaway and non-breakaway sign support systems shall be installed according to the manufacturer's specifications and as specified in the Contract Documents at locations specified in the Contract Documents.

All sign boards shall be installed according to OTM Book 1B and as specified in the Contract Documents.

All signs shall be installed, relocated, or removed at locations specified in the Contract Documents. Signs shall be installed so that they do not obstruct and are not obstructed by existing permanent signs or other objects. The Contract Administrator shall be notified prior to installation of sign supports if it is not possible to install a new or relocated sign as specified in the Contract Documents due to this requirement.

Signs shall be covered temporarily for traffic operational reasons when directed by the Contract Administrator. Signs shall be covered so they are not visible to approaching motorists. The cover shall remain securely in place until the signs are appropriate for display as directed by the Contract Administrator. The covering material shall not damage or make any marks on the signs.

Acceptable material from post hole excavation shall be used as backfill around posts and compacted according to TS 501.

Posts shall be plumb within a tolerance of ± 20 mm. The sign shall be levelled on a multiple post system within a tolerance of ± 10 mm.

Back-to-back signs may be installed on single or multiple posts. The sign support system shall be selected based on the largest sign area on one side of the post.

Cut ends and field drilled holes shall receive two applications of 2% copper naphthenate wood preservative. Field applied wood preservative that comes in contact with any metal components shall be removed immediately.

Damaged and cut areas of hot dip galvanized coatings on any galvanized components shall be repaired according to ASTM A 780.

TS 703.07.02 Sign Supply

Signs shall be supplied by the City.

TS 703.07.02.01 Sign Ordering

The Contractor shall submit a list of signs required for this Contract to the Contract Administrator. The list of signs shall contain the quantity and details of the signs and the date for pick up by the Contractor. The list of signs shall be submitted a minimum of 12 weeks prior to the pickup date.

TS 703.07.03 Sign Pickup

The Contractor shall pickup all the ordered signs on the list of required signs at a location provided in the Contract Documents to be supplied by the City within 10 Working Days of receiving notice from the Contract Administrator that the signs are ready for pickup. The Contractor shall ensure that all signs are safely secured and packaged prior to transporting the signs.

TS 703.07.03.01 *Sign Confirmation and Inspection*

The Contractor shall within 5 Calendar Days confirm in writing with the Contract Administrator that all the ordered signs were received in accordance with the list of required signs. The City shall be notified of any incorrect signs identified by the Contractor. The Contractor shall be responsible for the cost of replacing all damaged, missing, and incorrect signs subsequent to the Contractor's order confirmation.

TS 703.07.04 New Signs

New sign boards shall be attached to new sign support systems with sign hardware

TS 703.07.05 Relocation of Signs

Relocated sign boards shall be attached to new support systems with sign hardware. No portion of the existing sign, support system, and sign hardware shall be left at the original sign location and any excess material including support system and sign hardware shall be disposed of at no extra cost to the City.

TS 703.07.06 Removal of Signs

No portion of the removed sign, support system, and sign hardware shall be left at the original sign location and any excess materials shall be disposed of at no extra cost to the City.

TS 703.08 QUALITY ASSURANCE – Not Used**TS 703.09 MEASUREMENT FOR PAYMENT****TS 703.09.01 Small Signs, Ground Mounted, New**

For measurement purposes, a count shall be made of the number of new small sign assemblies installed.

TS 703.09.02 Small Signs, Relocation

For measurement purposes, a count shall be made of the number of small sign assemblies relocated.

TS 703.09.03 Small Signs, Removal

For measurement purposes, a count shall be made of the number of small sign assemblies removed.

TS 703.09.04 Small Signs, Existing Pole Mounted, New

For measurement purposes, a count shall be made of the number new small signs, existing pole mounted assemblies installed.

TS 703.10 BASIS OF PAYMENT

TS 703.10.01 Small Signs, Ground Mount, New – Item
Small Signs, Relocation – Item
Small Signs, Removal – Item
Small Signs, Existing Pole Mounted, New – Item

Payment at the Contract Price for the above tender item shall be full compensation for all labour, Equipment and Material to do the Work.

Costs associated with any required repairs or removals and replacements of defective materials shall be the Contractor's responsibility at no extra cost to the City.