



**CONSTRUCTION SPECIFICATION FOR  
STANDARD HIGHWAY FENCE**

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**771.01 SCOPE**

This specification covers the requirements for the installation of highway fence, brace panels, and gates.

**771.02 REFERENCES**

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

**Ontario Provincial Standard Specifications, Construction**

OPSS 510 Removal

**Ontario Provincial Standard Specifications, Material**

OPSS 1540 Standard Highway Fence Components

**ASTM International**

A 780 / A 780M-09 Standard Practice for Repair of Damaged and Uncoated Areas of Hot Dip Galvanized Coatings

**771.03 DEFINITIONS**

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

**Brace Post** means the wooden post installed to anchor the diagonal wooden brace within the brace panel.

**Corner Post** means the terminal post installed at horizontal deflections in the fenceline greater than 22 degrees.

**Cross Fences** means intersecting wire fences.

**Line Post** means the fence post spaced at regular intervals between terminal posts throughout each section of fence.

**Line Wire** means the horizontal wire of the fence fabric.

**Stay Wire** means the vertical wire that is woven or wrapped around the line wire to form the rectangular opening of the fence fabric.

**Steel Brace Panel** means the steel brace, steel line post, angle iron, and grout.

**Straining Post** means the terminal post installed at changes in vertical deflections in the fence line greater than 22 degrees or at approximately 200 m intervals.

**Terminal Post** means end, gate, corner, and straining posts.

**Twitch-Stick Method** means the tensioning of wires by inserting and rotating a twitch stick between the space of the diagonal wires as they cross.

**Wooden Brace Panel** means the diagonal wooden brace, wooden brace post, brace wire, fasteners, and when installed in rock, steel T-rail posts with 3.5 mm wire and grout.

**771.05 MATERIALS****771.05.01 Highway Fence**

Highway fence components shall be according to OPSS 1540.

**771.05.02 Fence Fabric**

Only one type of fence fabric shall be used within the limits of the Contract.

**771.07 CONSTRUCTION****771.07.01 Removal**

Removal of existing fence shall be according to OPSS 510.

## **771.07.02 Site Preparation**

Prior to the commencement of fencing operations, all debris shall be removed and ground undulations shall be corrected along the fenceline to obtain a smooth and uniform gradient.

All trees, stumps, and brush along the fenceline shall be cut off at ground level and all logs and overhanging branches that interfere with the installation of the fence shall be removed.

### **771.07.02.01 Selective Clearing**

When fencing is required through wooded areas that are not designated for clearing and grubbing, only selective clearing shall be permitted in order to gain access to the fenceline and to permit fence installation with lightweight equipment. Clearing shall be kept to a minimum and shall be subject to the approval of the Contract Administrator prior to the commencement of any clearing operation. Travel around obstructions may be required.

The location of access points shall be based on the least amount of clearing required and the frequency of access points shall be subject to reasonable material delivery requirements. The access points shall be approved by the Contract Administrator.

## **771.07.03 Highway Fence**

### **771.07.03.01 General**

Highway fence shall be installed at locations as specified in the Contract Documents.

Survey reference points or permanent property boundary markers shall not be disturbed or moved without the authorization of the Contract Administrator. When it is necessary to set posts adjacent to such points, the posts shall be placed on the roadway side of the property line as close as feasible to the monuments or markers.

### **771.07.03.02 Post Installation**

#### **771.07.03.02.01 General**

All posts shall be installed plumb and to the depth as specified in the Contract Documents.

Terminal posts shall be installed at all highway fence ends, both sides of all openings and gates, locations with changes in horizontal or vertical deflections greater than 22 degrees in the fenceline, and at locations identified for straining purposes. Terminal posts shall be installed on each side of watercourse crossings. Line posts shall be installed as specified in the Contract Documents.

#### **771.07.03.02.02 Post Installation in Earth, Shale, or Loose or Friable Rock**

Postholes for wooden posts shall be excavated to 150 mm greater than the diameter of the larger end of the post. The large end of the post shall be placed in the bottom of the posthole. Material resulting from posthole excavation shall be used as backfill around the posts and compacted to 90% modified proctor density.

Steel posts shall be driven with care to ensure they will not be bent or burred.

#### **771.07.03.02.03 Post Installation in Rock**

Posts installed in solid rock shall be steel posts as specified in the Contract Documents.

Postholes for steel posts shall be drilled in rock to a maximum diameter of 150 mm. Overburden shall be

excavated to a maximum diameter of 300 mm. Posts shall be placed in the postholes and filled as specified in the Contract Documents.

#### **771.07.03.03 Brace Panels**

Brace panels shall include the installation of the diagonal wooden braces or diagonal angle iron braces; diagonal brace wires; and fasteners, as appropriate.

Diagonal brace wires may be tensioned using the twitch-stick method.

When cross fence separates property owners, three brace panels shall be installed at the end post of cross fences. When the cross fence does not separate property owners, one brace panel shall be installed on the cross fence at the end post.

Brace panels at straining posts shall be installed at equal intervals of approximately 200 m without any intervals greater than 230 m. Brace panels shall be installed on each side of a corner, straining, opening, or gate locations.

Brace panels shall be installed at terminal posts on each side of watercourse crossings.

When fences are to be partially removed, brace panels shall be installed at the terminal ends of the remaining fence.

#### **771.07.03.04 Fence Fabric**

Fence fabric shall be placed on the side of the post nearest the roadway, except on curves with a radius of less than or equal to 1,750 m. In this situation, the fabric shall be placed on the side of the post away from the centre of the curve.

Fence fabric shall be uniformly tensioned so that its line wires are tight and parallel and the stay wires are straight, uniformly spaced, and at right angles to the line wires.

Staples for fence fabric with design numbers 948-12-9.75 and 949-12-9 shall be set diagonally to the grain of the wooden post and driven securely. Top wire shall be double stapled and all other wires single stapled.

Staples for fence fabric with design number 949-12-12.5 shall be set diagonally to the grain of the wooden post and driven securely, but shall allow for movement of the horizontal line wires as a result of thermal expansion and contraction.

Fence fabric shall be fastened to the steel post using wire ties at all nine line wires.

Fencing fabric shall be tensioned and properly terminated with the wire wrapped around the terminal posts at least once and around itself at least four complete turns and stapled to the terminal posts.

Rolls of fence fabric with design numbers 948-12-9.75 and 949-12-9 shall be spliced together by wrapping adjacent line wires, using mechanical splicing units or using crimp sleeves. The same method shall be used throughout the limits of the Contract.

Rolls of fence fabric with design number 949-12-12.5 shall be spliced together using mechanical splicing units or crimp sleeves.

When splicing is achieved by wrapping adjacent line wires, wrap the overhanging line wires around the corresponding line wires on the adjacent roll, at least four complete turns as specified in the Contract Documents.

Mechanical splicing units and crimp sleeves shall be installed according to the manufacturer's instructions and as specified in the Contract Documents.

After splicing, all projecting ends of the line wires shall be removed. Terminal posts shall not be installed for splice purposes only.

#### **771.07.04 Cross Fences**

Cross fences shall be secured to the adjacent post prior to cutting the fence at the brace panel.

#### **771.07.05 Gates**

Gates shall be installed at locations and be of the type and size as specified in the Contract Documents.

When gates are required without adjacent fencing, terminal posts with brace panels shall be installed on each side of the gate.

Gates shall be installed to open away from the roadway and to close by gravity.

#### **771.07.06 Marking**

Identification plates, provided by the material supplier, shall be securely attached to the completed fence installation at the following intervals:

- a) At the start and end of each fence installation.
- b) At a maximum interval of 300 m.

The fence identification plate shall be located within 300 mm of a terminal post with the top of the plate located approximately 300 mm from the top of the fence fabric. The maximum dimensions of the plate shall be 200 by 200 mm. The plate shall be made from 0.81 mm thick anodized aluminum sheet according to ASTM B 209 series 1100 or 5005-H34.

Each fence identification plate shall be engraved with the following information:

- a) Contract number.
- b) Name or trademark of fence Subcontractor.
- c) Name or trademark of fence supplier (i.e., suppliers of fence fabric and posts).
- d) Date of completed installation (i.e., yyyy-mm).

The height of the letters and numerals shall be within the range of 6 to 32 mm.

#### **771.07.07 Zinc Coating Repairs**

Cut ends, field drilled holes, and damaged areas of hot dip galvanized coatings on galvanized components, except fence fabric, shall be repaired according to ASTM A 780.

#### **771.07.08 Site Restoration**

After fence installation, the site shall be cleaned and trimmed and the ground restored to a neat condition.

**771.07.09 Management of Excess Material**

Management of excess material shall be according to the Contract Documents.

**771.08 QUALITY ASSURANCE**

**771.08.01 Construction**

The Contract Administrator may perform a spot visual inspection to determine conformance with the workmanship, design, and dimensional requirements of this specification.

Failure to conform to this specification may result in a partial or complete inspection of the installation by the Owner and removal and replacement of all defective workmanship or materials by the Contractor.

**771.08.02 Material Certification**

Certificates of compliance for each fence component used in the installation shall be provided to the Contract Administrator. The certificate of compliance shall indicate that the material was manufactured, sampled, tested, and inspected according to the reference specification and has been found to meet the requirements.

Each certificate of compliance shall include the following information typed on company letterhead:

- a) Manufacturer's name or trademark.
- b) General description of the component.
- c) Reference specification for material (e.g., CGSB 138.1, Fence Fabric for Chain-Link Fence).
- d) Signed and dated by the manufacturer's authorized representative.

All certificates of compliance shall be assembled and submitted to the Contract Administrator prior to completion of the Work.

**771.08.03 Material Sampling**

The Contract Administrator may obtain and test samples to ensure compliance with the specifications. Products represented by the test samples that are not in compliance shall be removed from the Work Area and replaced.

**771.09 MEASUREMENT FOR PAYMENT**

**771.09.01 Actual Measurement**

**771.09.01.01 Highway Fence**

Measurement of highway fence shall be by length in metres along the contour of the ground for the actual length of highway fence installed and shall include gate openings and brace panels.

**771.09.01.02 Brace Panels**

For measurement purposes, a count shall be made of the number of brace panels installed, regardless of material type.

**771.09.01.03                    Gates**

For measurement purposes, a count shall be made of the gates installed, regardless of the size and type. Double gates shall be counted as one gate.

**771.09.02                    Plan Quantity Measurement**

When measurement is by Plan Quantity, such measurement shall be based on the units shown in the clauses under Actual Measurement.

**771.10                    BASIS OF PAYMENT**

- 771.10.01                    Highway Fence - Item**
- Brace Panels - Item**
- Gates - Item**

Payment at the Contract price for the above tender items shall be full compensation for all labour, Equipment, and Material to do the work.