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| SUPERSEDED BY EB 21-057 EFFECTIVE 11/24/21 |  | ENGINEERING INSTRUCTION New York State Department of Transportation | 94-033 Supersedes EI 94-25 |
| Title: Snow & Pedestrian Fencing Specifications (Metric & U.S. Standard) | | | |
| Subject Code: 7.35-6. | | | |
| Distribution: <input checked="" type="checkbox"/> Central Office(30) <input type="checkbox"/> Local Gov.(31) <input checked="" type="checkbox"/> Regions(32) <input type="checkbox"/> Contractors/AGC(39) <input checked="" type="checkbox"/> Consultants(34) <input type="checkbox"/> _____ () | Approved  <hr/> A. M. Shiroli, Deputy Chief Engineer Structures Division | | <hr/> 9/9/94 Date |

The attached specifications are effective September 9, 1994. They can be used immediately, but must be used in projects having a letting date of January 11, 1995 and beyond. The specifications are the same, except that one is the metric version of the other. Each specification has two pay items. They are:

U.S. Standard Specification -

1. 16607.0640 - Pedestrian Fencing On Bridges
2. 16607.0641 - Snow Fencing On Bridges

Metric Specification -

1. 16007.0640 M - Pedestrian Fencing On Bridges
2. 16607.0641 M - Snow Fencing On Bridges

The two pay items are used because of the difference in cost, and to track the use of each type of fencing.

The specification distributed with E.I. 94-25, with pay items 16607.0630 - Pedestrian Fencing On Bridges and 16607.0631 Snow Fencing On Bridges, is deleted effective September 9, 1994. This was made necessary by a change in Department policy.

The specifications distributed with this E.I. are required to meet the current Department policy regarding English and metric specifications.

If you have any questions, contact Larry Johanson at (518) 457-2459.

ITEM NO. 16607.0640 - PEDESTRIAN FENCING FOR BRIDGESITEM NO. 16607.0641 - SNOW FENCING FOR BRIDGESDESCRIPTION:

The work shall consist of furnishing and installing fencing including all hardware and construction systems necessary to complete the work. Fencing shall be installed according to the details and at the locations indicated on the Contract Plans.

MATERIALS:

Materials used for this work shall conform to the following requirements:

| <u>PART</u> | <u>REQUIREMENTS</u> |
|---|-------------------------|
| Vinyl Coated Steel Fence Fabric | 710-03 |
| Steel Fence Fabric (Aluminum Coated) | 710-04 |
| Posts, Rails, Braces, and Fittings | 710-10.3 |
| Plastic Coated Posts, Rails, Braces, and Fittings | 710-12 |
| Angles and Plates | ASTM A 36 |
| Steel "T" and Wide Flange Sections | ASTM A 36 |
| U-Bolts | ASTM A307 |
| Nuts and Bolts | ASTM A307 and ASTM A325 |
| Pipe Supports | ASTM A 53 |
| Anchor Bolts | ASTM A449 |

All uncoated steel shall be galvanized unless otherwise indicated on the Contract Plans or in the Proposal. Unless otherwise specified, galvanizing shall be in accordance with the requirements of Subsection 719-01, type as applicable. The type and size of fence fabric, posts, rails, braces, and fittings will be designated on the Contract Plans or in the Proposal.

Top and bottom edges of the fence fabric shall be "knuckled" (wire ends bent back upon themselves to eliminate sharp wire ends).

Unless otherwise noted on the Plans:

1. Posts shall be a nominal 2 1/2" dia. (2 7/8" O.D.). Minimum weight per foot shall be 5.75 lb. for Schedule 40 Pipe and 4.63 lb. for Class B Steel Tubing.
2. Top and Bottom rails shall be a nominal 1 1/4" dia. (1 5/8" O.D.). Minimum weight per foot shall be 2.25 lb for Schedule 40 Pipe and 1.3 lb. for Class B Steel Tubing.
3. Pipe supports shall be nominal 1 1/2" dia. Schedule 80 Pipe.

CONSTRUCTION DETAILS:

Fence fabric shall be firmly attached to the posts, rails, and braces. All fencing shall be stretched taut.

The posts shall be fastened to the structure in accordance with the details indicated on the Contract Plans. Posts shall be set so that straight sections are truly vertical.

ITEM NO. 16607.0640 - PEDESTRIAN FENCING FOR BRIDGESITEM NO. 16607.0641 - SNOW FENCING FOR BRIDGES

All the top rails shall pass through the base of the post caps. Both the top and bottom rails shall provide continuous support for the fencing from end-to-end of the fence fabric. Sections of both rails shall be joined with sleeve couplings. At expansion joints in the structure, expansion sleeves shall be used. Top rails shall be securely fastened to terminal posts by means of rail end connectors approved by the Engineer.

Horizontal braces shall be provided at all terminal posts, midway between the top and bottom rails, and shall extend from the terminal post to the first adjacent intermediate post. Braces shall be securely fastened to the intermediate posts by brace ends and brace bands. Braces shall be securely fastened to the terminal posts by rail end connectors, approved by the Engineer. Braces shall be made from the same material as the top and bottom rails.

All welding shall meet the requirements of the New York State Steel Construction Manual.

Field welding shall be allowed only where indicated on the Contract Plans, or where ordered by the Engineer. Remove galvanizing in the area of the weld, prior to welding.

All finished surfaces of welds, and surfaces from which the galvanizing has been removed, shall be repaired in accordance with the requirements of Sub-section 719-01. All galvanizing repair shall be done at no additional cost.

Unless otherwise noted on the plans:

1. The fabric shall be securely fastened to all terminal posts by 1" X 3/4" tension bars with 11 gauge pressed steel bands spaced approximately 1.0 foot apart.
2. Fabric shall be attached to top and bottom rails with 6 gauge tie wires at 2.0 foot centers.
3. The fabric shall be securely fastened to all vertical posts by 6 gauge aluminum ties at 1.0 foot centers.
4. Whenever fencing is cut to fit, the exposed ends, shall be coated as dictated by galvanizing repair procedures in subsection 719-01 of the standard specifications.

METHOD OF MEASUREMENT:

Measurement will be taken as the number of linear feet of fencing installed.

Measurement will be taken along the bottom of the bottom rail, center-to-center of terminal posts.

BASIS OF PAYMENT:

The unit price bid per linear foot shall include the cost of furnishing all labor, materials, and equipment necessary to complete the work.

ITEM NO. 16607.0640 M - PEDESTRIAN FENCING FOR BRIDGESITEM NO. 16607.0641 M - SNOW FENCING FOR BRIDGESDESCRIPTION:

The work shall consist of furnishing and installing fencing including all hardware and construction systems necessary to complete the work. Fencing shall be installed according to the details and at the locations indicated on the Contract Plans.

MATERIALS:

Materials used for this work shall conform to the following requirements:

| <u>PART</u> | <u>REQUIREMENTS</u> |
|---|--------------------------|
| Vinyl Coated Steel Fence Fabric | 710-03 |
| Steel Fence Fabric (Aluminum Coated) | 710-04 |
| Posts, Rails, Braces, and Fittings | 710-10.3 |
| Plastic Coated Posts, Rails, Braces, and Fittings | 710-12 |
| Angles and Plates | ASTM A 36M |
| Steel "T" and Wide Flange Sections | ASTM A 36M |
| U-Bolts | ASTM A307 |
| Nuts and Bolts | ASTM A307 and ASTM A325M |
| Pipe Supports | ASTM A 53 |
| Anchor Bolts | ASTM A449 |

All uncoated steel shall be galvanized unless otherwise indicated on the Contract Plans or in the Proposal. Unless otherwise specified, galvanizing shall be in accordance with the requirements of Subsection 719-01, type as applicable. The type and size of fence fabric, posts, rails, braces, and fittings will be designated on the Contract Plans or in the Proposal.

Top and bottom edges of the fence fabric shall be "knuckled" (wire ends bent back upon themselves to eliminate sharp wire ends).

Unless otherwise noted on the Plans:

1. Posts shall be a nominal 64 mm dia. (73 mm O.D.). Minimum weight per 305 mm shall be 2.61 kg for Schedule 40 Pipe and 2.10 kg for Class B Steel Tubing.
2. Top and Bottom rails shall be a nominal 32 mm dia. (42 mm O.D.). Minimum weight per 305 mm shall be 1.03 kg for Schedule 40 Pipe and .59 kg for Class B Steel Tubing.
3. Pipe supports shall be 38 mm nominal dia. Schedule 80 Pipe.

CONSTRUCTION DETAILS:

Fence fabric shall be firmly attached to the posts, rails, and braces. All fencing shall be stretched taut.

The posts shall be fastened to the structure in accordance with the details indicated on the Contract Plans. Posts shall be set so that straight sections are truly vertical.

ITEM NO. 16607.0640 M - PEDESTRIAN FENCING FOR BRIDGESITEM NO. 16607.0641 M - SNOW FENCING FOR BRIDGES

All the top rails shall pass through the base of the post caps. Both the top and bottom rails shall provide continuous support for the fencing from end-to-end of the fence fabric. Sections of both rails shall be joined with sleeve couplings. At expansion joints in the structure, expansion sleeves shall be used. Top rails shall be securely fastened to terminal posts by means of rail end connectors approved by the Engineer.

Horizontal braces shall be provided at all terminal posts, midway between the top and bottom rails, and shall extend from the terminal post to the first adjacent intermediate post. Braces shall be securely fastened to the intermediate posts by brace ends and brace bands. Braces shall be securely fastened to the terminal posts by rail end connectors, approved by the Engineer. Braces shall be made from the same material as the top and bottom rails.

All welding shall meet the requirements of the New York State Steel Construction Manual.

Field welding shall be allowed only where indicated on the Contract Plans, or where ordered by the Engineer. Remove galvanizing in the area of the weld, prior to welding.

All finished surfaces of welds, and surfaces from which the galvanizing has been removed, shall be repaired in accordance with the requirements of Sub-section 719-01. All galvanizing repair shall be done at no additional cost.

Unless otherwise noted on the plans:

1. The fabric shall be securely fastened to all terminal posts by 25 mm x 19 mm tension bars with 11 gauge pressed steel bands spaced approximately 300 mm apart.
2. Fabric shall be attached to top and bottom rails with 6 gauge tie wires at 600 mm centers.
3. The fabric shall be securely fastened to all vertical posts by 6 gauge aluminum ties at 300 mm centers.
4. Whenever fencing is cut to fit, the exposed ends, shall be coated as dictated by galvanizing repair procedures in subsection 719-01 of the standard specifications.

METHOD OF MEASUREMENT:

Measurement will be taken as the number of linear meters of fencing installed.

Measurement will be taken along the bottom of the bottom rail, center-to-center of terminal posts.

BASIS OF PAYMENT:

The unit price bid per linear meter shall include the cost of furnishing all labor, materials, and equipment necessary to complete the work.