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## 1.0 GENERAL

### 1.1 DETAIL DRAWINGS

- .1 The following detail drawings are appended hereto and form part of this section.

<u>Number</u>	<u>Title</u>
[ ]	[ ]
[ ]	[ ]

### 1.2 REFERENCES

- .1 Provide cable barrier in accordance with the following standards (latest revision) except where specified otherwise.

.2 American Society for Testing and Materials (ASTM)

- |    |               |   |
|----|---------------|---|
| .1 | ASTM A47/A47M | Standard Specifications for Ferritic Malleable Iron Castings.   |
| .2 | ASTM A307     | Standard Specifications for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.                      |
| .3 | ASTM A325M    | Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength (Metric). |
| .4 | ASTM A536     | Standard Specifications for Ductile Iron Castings.  |
| .5 | ASTM B30      | Standard Specifications for Copper Alloys in Ingot Form.  |

.3 Canadian General Standards Board (CGSB)

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|----|----------------|--|
| .1 | CAN/CGSB-1.181 | Ready-Mixed Organic Zinc-Rich Coating. |
|----|----------------|--|

.4 Canadian Standards Association (CSA)

- |    |              |   |
|----|--------------|---|
| .1 | CAN/CSA-G12  | Zinc-Coated Steel Wire Strand.                                      |
| .2 | CSA-G40.20   | General Requirements for Rolled or Welded Structural Quality Steel. |
| .3 | CSA-G40.21   | Structural Quality Steel.   |
| .4 | CAN/CSA-G164 | Hot-Dip Galvanizing of Irregularly Shaped Articles.                 |
| .5 | CSA-W47.1    | Certification of Companies for Fusion Welding of Steel Structures.  |
| .6 | CSA-W59M     | Welded Steel Construction (Metal Arc Welding) (Metric Version).     |

.5 Society of Automotive Engineers

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- .1 SAE J403 Chemical Composition of SAE Carbon Steels.

### 1.3 SUBMITTALS

- .1 Provide the following submittals.
- .2 Shop drawings of the cable barrier, including material specifications, dimensions, finishes, and other details, at least 20 days prior to fabrication.
- .3 Manufacturer's affidavit certifying that the cable and fittings and post materials meet the specified requirements prior to delivery to the Site.

### 1.4 DELIVERY, STORAGE, AND HANDLING

- .1 Inspect each shipment of material and timely replace any damaged materials.
- .2 Unload, handle, and store cable and fittings according to the manufacturer's recommendations to prevent damage to the galvanized coating and the material.
- .3 Manufacturer's written instructions for unloading, handling, and storing guardrail and for repairing damaged galvanized coating prior to performing the work.

## 2.0 PRODUCTS

### 2.1 MATERIALS

- .1 Provide materials in accordance with the following.
- .2 Cable: In accordance with CAN/CSA-G12, Grade 110 galvanized or Class A electro-zinc coated steel wire strands, 13 mm diameter, 7-wire strand weighing approximately 228 kg per 300 m with a minimum breaking strength of 70 kN. Provide cable in a continuous length of 305 m on expendable reels.
- .3 Fittings
- .1 Ferrous castings for the end fitting and splicer: In accordance with ASTM A47/A47M for malleable iron, grade 32510 or ASTM A536 for ductile iron, Type 60-45-10.
- .2 Tension bolt for the end fitting: SAE 1035 hot-rolled fine grained steel and the ferrule of SAE 1020 rolled steel, in accordance with SAE J403, or the specified tension bolt containing a square or hex nut welded in accordance with low hydrocarbon classification CSA-W59 with the ferrule galvanized after it has been pressed onto the cable.
- .3 Bronze wedges: Alloy, in accordance with ASTM B30, suitable for sand casting.
- .4 Design and size fittings to develop the full strength of a single cable or cable assemblies, as the case may be. For a single-cable assembly the minimum tensile strength is 100 kN, and 300 kN for a three-cable assembly.
- .5 Press ferrule onto the end of the cable. Provide ferrule that does not slip from the cable when tested under a tensile static load to the limit of cable breakage.

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- .4 Hook bolts and nuts: In accordance with ASTM A307, galvanized finish.
- .5 Fasteners: Cadmium plated, self-drilling, self-tapping #12-24-1.50 fasteners with indented hex washer head.
- .6 Standard and anchor posts:
  - .1 Steel sections as specified in the Contract Documents.
  - .2 Posts, ground plates, brackets, and splice plates in accordance with CSA-G40.21, Grade 230G.
- .7 Shop welding: In accordance with CSA-W47.1 and CSA-W59.
- .8 Reflectors: Grade 1 sign material, Scotchlite 50 mm by 100 mm, high-intensity reflector metal strips.
- .9 Galvanizing: Hot-dip galvanized all steel components and hardware, except for cadmium plated fasteners and bronze wedges, in accordance with CAN/CSA-G164.
- .10 Fill concrete anchor blocks: Minimum compressive strength of 20 MPa at 28 days, with Type HS or HSB Sulphate Resistant Cement, with an air content between 4% and 7%, and a maximum slump of 100 mm.

### **3.0 EXECUTION**

#### **3.1 INSTALLATION - GENERAL**

- .1 Accurately set posts at the locations, and to the alignment, spacing, and heights specified in the Contract Documents.
- .2 Remove unsuitable soils, as determined by the Minister, at the bottom of the hole and replace with granular material. Compact the base of the hole.
- .3 Install the cable barrier as specified in the Contract Documents. Install cables and stretch using a tension apparatus capable of adjustment to provide uniform tension. Do not tension the cable until the concrete has attained its specified compressive strength.
- .4 Provide a completed installation that is smooth and uniform in alignment, and continuously rigid, free of sags, buckles or loose sections.

#### **3.2 STANDARD POSTS**

- .1 Maintain plumb and grade of posts within a tolerance of +/-6 mm.
- .2 For posts, auger holes of sufficient diameter to allow pneumatic tamping.
- .3 Place the posts directly and solidly on compacted material.
- .4 Place compact backfill material in layers not exceeding 150 mm for the full depth of the hole. Crown the compacted fill slightly to provide drainage away from the post.
- .5 Attach reflector strips 25 mm below the top of the posts

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**3.3 ANCHOR POSTS**

- .1 Auger holes to the diameter specified in the Contract Documents.
- .2 Place and rigidly support anchor posts, and embed in concrete. Cast concrete directly against the in situ soils.

**3.4 REPAIR OF DAMAGED GALVANIZED COATING**

- .1 Repair damaged galvanized surfaces with a zinc-rich paint that is in accordance with CAN/CGSB-1.181.
- .2 Power tool clean surfaces to be repaired to a bright metal surface. Apply multiple coats of zinc-rich paint in accordance with the manufacturer's written instructions to obtain a minimum dry film thickness of 50 microns or greater where required by the paint manufacturer.

**END OF SECTION**