



GO Transit Signals & Communications - Overhead Signal Structures Specification

Section 34 42 04

Revision 02
August 2026

Overhead Signal Structures Specification

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Publication: April 2020

Revised: February 2021, August 2026

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Preface

This is the third edition of the Overhead Signal Structures Specification. This edition features a comprehensive update to design criteria and code requirements, meticulously aligned with the stringent standards of the AREMA C&S and AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals.

It specifies the design and manufacturing criteria for Overhead Signal Structures for use by design contractors carrying out the design activities for the GO Transit Signal and Train Control system, and is intended for suitably qualified professionals familiar with the subject matter.

This document was developed by the Signals & Communications Office, Asset Management and Maintenance Division, Metrolinx.

Suggestions for revision or improvements can be sent to the Metrolinx Signals and Communications office, Attention: Director of Signals and Communications - Engineering, who shall introduce the proposed changes to the Metrolinx Signals and Communications Engineering office. The Director of the Signals and Communications - Engineering office ultimately authorizes the changes. Be sure to include a description of the proposed change, background of the application, and any other useful rationale or justification. Be sure to include your name, company affiliation (if applicable), email address, and phone number.

August 2026

Revision	Date	Comments
00	April 2020	Initial release.
01	February 2021	Revised Sections 3 and 4, updated loading criteria and general structural components requirements.
02	August 2026	General revision to align with AREMA design requirements. Revised signal numbers, clarified junction box and wire harness requirements.

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1. Scope

1.1. General

- 1.1.1. This Specification defines the design criteria for Overhead Signal Structures for use on Metrolinx heavy rail property. Overhead Signal Structures include span-type bridges and cantilever structures, associated mounting hardware for the attachment of Signal Units, associated anchorages required to be installed into the foundations, and the foundation design. The Overhead Signal Structure scope of supply excludes the Signal Units.
- 1.1.2. The following terms are used in this Specification:
 - a) Signal Aspect—Individual colour lamp (Red/Yellow/Green);
 - b) Signal Head—An assembly of up to three Signal Aspects in a housing; or a tri-colour LED Signal Head (Metrolinx preferred type), that a single Signal Head can display multiple Signal Aspects; and
 - c) Signal Unit—An assembly that can comprise of one, two, or three Signal Heads.

2. Abbreviations

Abbreviation	Definition
AASHTO	American Association of State Highway and Transportation Officials, Allowable Stress Design (ASD)
ANSI	American National Standards Institute
AREMA	American Railway Engineering and Maintenance-of-Way Association
ASTM	American Society for Testing and Materials
AWS	American Welding Society
CROR	Canadian Railway Operating Rules
CSA	Canadian Standards Association
OHSA	Occupational Health and Safety Act
SCP	Standard Codes of Practice
SSPC	Society for Protective Coatings

3. Overhead Signal Structures Design Requirements

3.1. Standards

- 3.1.1. The design, fabrication, and assembly of Overhead Signal Structures shall be in accordance with AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals (6th Edition 2013), with 2022 Interim Revisions, hereinafter referred to as AASHTO Standard Specifications¹.
- 3.1.2. The Overhead Signal Structure shall be made of aluminum.
- 3.1.3. Aluminum welding shall follow CSA W59.2-18 Welded Aluminum Construction, or ANSI / AWS D1.2. Welding consumables shall conform to CSA W59.2-18 or conform to the last edition of ANSI / AWS D1.2.
- 3.1.4. All aluminum extruded tubes and structural profiles (I-Beam, channels and angles) shall be alloy 6061-T6 conforming to ASTM B221 and ASTM B308/B308M, with a yielding stress of 240 MPa and tensile strength of 260 MPa.
- 3.1.5. Solid aluminum bars and rods shall be made of alloy 6061-T6 and shall conform to ASTM B211M standards.
- 3.1.6. Aluminum plates and all other miscellaneous aluminum components shall be made of an aluminum alloy 6061-T6 and shall conform to ASTM B209 standard.
- 3.1.7. All steel components shall comply with AASHTO Standard Specifications.
- 3.1.8. The design of the Overhead Signal Structures shall take into account the location and clearance requirements as per GO Transit Signals & Communications Standards SCP-302.
- 3.1.9. The design and installation of foundations for Overhead Signal Structures shall be in accordance with AASHTO Standard Specifications and AREMA Communications & Signals Manual.
- 3.1.10. If the date or version of a standard is not specified in a specification, the latest version of this standard should be used.

¹Note: AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals are referenced in Part 3.2.5 of AREMA C&S Manual for the design of overhead bridge and cantilever structures.

3.2. Loading Criteria

3.2.1. Dead Loads

- a) The dead load shall consist of the weight of the entire Overhead Signal Structure, including all appurtenances, and the equipment that will be attached to the structure by others, including the Signal Units, associated cables and signs. The point of application of the weights of the individual items shall be their respective centres of gravity. Maintenance temporary loads shall be considered as part of the dead loads.

3.2.2. Live Load

- a) The walkways and service platforms of the Overhead Signal Structure shall support a single load of 500 lb (227 kg) distributed over a distance of 2' (0.6 m) transversely;
- b) All other elements of the Overhead Signal Structure shall support a single point load of 250 lb (113 kg); and
- c) Each fixed ladder of the Overhead Signal Structure shall support at least two-point loads of 300 lb (137 kg). Each step shall be capable of supporting a single concentrated load of at least 300 lb (137 kg) applied in the middle of the step.

3.2.3. Fall Protection Loads

- a) Fall protection shall be compliant with OHSA;
- b) Where a fall hazard exists and guardrails are not present, fall protection anchorage points shall be provided and designed to withstand a 5,000 lb (22.2 kN) load in any direction; and
- c) Fall protection anchorage points shall be provided at locations where the work involves extending beyond the guardrails, especially at locations where working above the walkway or around signals.

3.2.4. Ice Load

- a) The Overhead Signal Structure shall withstand the following ice loads applied to all overhead support elements and on all surfaces of the supported components:
 - i. Working surface areas such as horizontal platforms shall have an ice load of 20 psf (1 kPa) applied uniformly over the entire surface; and
 - ii. All other surfaces shall have an ice load equivalent to 31 mm of surface icing with an ice density of 9.8 kN/m³.

3.2.5. Thermal Forces

- a) The Overhead Signal Structure shall withstand the thermal forces associated with the temperature range between -35 °C and 50 °C. The design shall assume an erection temperature of 20 °C.

3.2.6. Wind Load

- a) Wind load shall be applied to all elements of the Overhead Signal Structure and the supported components. Shielding shall not be assumed for any element unless it is completely encapsulated by another structural element.
- b) The basic wind load shall be based on a sustained wind speed of 100 mph with a 3-second gust in accordance with the AASHTO Standard Specifications.
- c) The wind importance factor I_r shall be 1.00.
- d) For Overhead Signal Structures that have a maximum height of 32.8 ft (10 m) or less, the height and exposure factor K_z shall not be less than 1.0. If the structure exceeds this height limit, then the relevant provisions outlined by AASHTO must be followed instead.
- e) Wind exposure area shall take into account the increase in exposure area due to ice accumulation for Group III load combination (Dead load + Ice + $\frac{1}{2}$ Wind).
- f) The direction of the applied wind load in AASHTO clause 3.9.3 shall be followed.

3.2.7. Load combinations

- a) The design load combinations in AASHTO Table 3.4-1 shall be substituted with Table 1.

Table 1 Design Load Combination

Group Load	Load Combination	Percentage of Allowable Stress
I	Dead Load	100%
II	Dead Load + Wind	133%
III	Dead Load + Ice + $\frac{1}{2}$ Wind	133%
IV	Fatigue	See AASHTO, Section 11, for fatigue loads and stress range limits
V	Dead Load + Ice	100%
VI	Dead Load + Live + Ice	133%
VII	Dead Load + Thermal	125%
VIII	Dead Load + Wind + Thermal	140%
IX	Dead Load + Fall Protection	140%

3.3. Structural Analysis

- 3.3.1. Structural analysis and design shall consider the fixity at element connections and supports. Structural design shall include both member design and connection design (including anchor bolts and base plates of vertical posts).

3.4. Welding Criteria

- 3.4.1. Welding of all aluminum Overhead Signal Structures shall be done by licensed personnel in accordance with CSA W47.2-11 standard.
- 3.4.2. The Contractor shall supplement the visual inspection of welds with non-destructive testing (NDT) of 50% of the welds as described in an inspection plan produced by the Contractor and approved by Metrolinx. NDT shall consist of Liquid Penetrant Inspection (LPI). LPI procedures shall be in accordance with ASTM E165, and LPI acceptance requirements shall be in accordance with CSA W59.2.
- 3.4.3. The Contractor shall document the "W" (size of weld) dimensions for skewed T-joints and tubular connections that are measured with weld gauges during visual inspection.
- 3.4.4. Verification testing shall be performed by an agency retained by Metrolinx. The Contractor shall make provisions in the schedule to provide verification testing and shall give proper advance notification for the time that such testing may be performed.

3.5. Bolted Connections

- 3.5.1. Design of bolted connections shall conform to Section 3.1 Standards.
- 3.5.2. Stainless steel bolts, nuts, and washers shall conform to ASTM F593 / F594, alloy 304 with a minimum yield of 480 MPa and a minimum tensile strength of 715 MPa. Bolted connections that depend on aluminum-to-aluminum friction to transfer shear forces (slip-critical connections) shall be designed with friction coefficients of 0.50 for roughened surfaces. Surface roughening shall consist of abrasive blasting with coal slag to SSPC-5 to an average substrate profile of 2.0 mils.
- 3.5.3. The minimum bolt tension used for aluminum slip critical connections shall account for temperature changes and the difference in the coefficients of thermal expansion in the bolt material and the connected parts.
- 3.5.4. U-bolt connections to truss chords shall ensure that the connected parts are not overstressed in local bending. If necessary, curved saddles shall be used under tubular truss chords at U-bolt locations.
- 3.5.5. If the U-bolt tension is necessary to develop frictional resistance in the connection, the design shall specify how the minimum U-bolt tension is provided. U-bolts are to be tension only.

- 3.5.6. Stainless steel bolts, nuts, and washers shall be applied with an approved dielectric coating to protect against oxidation/corrosion due to contact between electrically dissimilar metals.

3.6. Anchor Bolts

- 3.6.1. Design of anchor bolts shall be in accordance with Section 3.1 Standards and the following additional requirements:
- a) Steel anchor bolts, nuts, and washers shall be hot-dip galvanized as per ASTM A123-09 coating grade 100;
 - b) Anchor bolts shall conform to ASTM F1554, steel yield strength is 55 ksi (380 MPa);
 - c) Nuts shall conform to ASTM A563, Grade A;
 - d) Washers shall conform to ASTM F436;
 - e) Anchor bolts shall be a minimum of 38 mm in nominal diameter and a minimum of 1000 mm in length;
 - f) Anchor bolts shall have a minimum 165 mm of projection above the top of the foundation, and shall be fully threaded over their exposed length; and
 - g) Double nuts shall be used at each anchor bolt to prevent loosening from cyclic loads; alternatively, a heavy hex nut with brass cotter pin can be used in accordance with General Guidelines for Design of Railway Bridges and Structures (RC-0506-04STR), Drawing S3m.

3.7. Serviceability Requirements

3.7.1. Gantry Supports:

- a) Maximum vertical deflection resulting from Group V load combination (Dead load + Ice) shall be limited to $L/150$, or 150 mm (whichever is less), where L is the span length.

3.7.2. Cantilever Support:

- a) Maximum vertical deflection resulting from Group V load combination (Dead load + Ice) shall not exceed $L/150$, or 150 mm (whichever is less), where L is the cantilever length;
- b) Horizontal Deflection at the top of vertical supports resulting from Group II load combination (Dead load + Wind) shall not exceed $H/40$, where H is the height of the Overhead Signal Structure; and
- c) Horizontal rotation (due to horizontal deflection) of cantilever arms resulting from Group II load combination (Dead load + Wind) shall not exceed 3 degrees 15 minutes, where the rotation is measured in plan from the base of the cantilever to the tip of the arm.

- 3.7.3. Camber: Permanent camber equal to $L/1000$, where L is the unsupported length of the horizontal support, shall be provided in addition to the dead load camber for Overhead Signal Structures.

3.8. Fatigue Design

- 3.8.1. The structure shall be designed for infinite fatigue life.
- 3.8.2. The fatigue importance factor I_F shall be 1.0.
- 3.8.3. The Overhead Signal Structure shall withstand train-induced gusts in accordance with AASHTO Standard Specifications, with the train speed replaced with the maximum track design speed as confirmed by Metrolinx.
- 3.8.4. The Overhead Signal Structure shall withstand natural wind gust loads and galloping in accordance with AASHTO Standard Specifications.
- 3.8.5. The Overhead Signal Structure shall withstand vortex shedding loads in accordance with the following:
- a) Vortex shedding shall be evaluated in accordance with the AASHTO Standard Specifications;
 - b) Vortex shedding loads shall not be considered for the design of trusses. Individual aluminum members for trusses shall meet the following member slenderness restrictions to prevent vortex shedding fatigue on individual members:
 - i. $L/r \leq 105$ for branch members in T-type tubular connections;
 - ii. $L/r \leq 115$ for branch members in K-type tubular connections; and
 - iii. $L/r \leq 95$ for branch members with gusset plate connections.
 - c) The length, L , is the face-to-face length of a member as measured along the member centerline. These member slenderness restrictions shall also apply to tubular guardrails;
 - d) Vortex shedding loads shall not be considered for the design of posts for bridge-type Overhead Signal Structures; and
 - e) Vortex shedding loads shall be considered for all other support structures and elements.

3.9. Vertical Clearance

- 3.9.1. The vertical clearance from the lowest point of the horizontal elements of the Overhead Signal Structure to above top of rail to the lowest point of the signal structure shall conform to GO Transit Signals & Communications Standards Codes of Practice (RC-0506-03SIG-02), Number 302 and Electric Traction Enabling Works

Specification (MX-ELEC TRAC EW-SPEC-2016-REV1) (unless approved otherwise by Metrolinx).

3.10. Horizontal Clearance

- 3.10.1. The horizontal clearance between the nearest rail and any elements of the Overhead Signal Structure shall conform to GO Transit Signals & Communications Standards Codes of Practice (RC-0506-03SIG-02), Number 302 and Electric Traction Enabling Works Specification (MX-ELEC TRAC EW-SPEC-2016-REV1) (unless approved otherwise by Metrolinx).

3.11. Foundations

- 3.11.1. The Contractor shall provide the foundation design, including drawings, design criteria and loads (reaction load) in accordance with AASHTO Standard Specifications and AREMA C&S Manual.
- 3.11.2. The Contractor shall provide the anchor bolts to be embedded in the foundation and the associated nuts and washers to allow levelling and fastening of the Overhead Signal Structure.

4. Assembly and Components

4.1. General

- 4.1.1. The Overhead Signal Structure shall be supplied with a ladder, service platforms, guardrails, signal support masts, and fall protection anchorage points.
- 4.1.2. All holes, openings, and cavities shall be sealed to prevent entry of moisture, dust or wildlife.
- 4.1.3. All platform mounting/assembly hardware, such as bolts, nuts and washers, shall be either stainless steel or hot-dip galvanized steel.

4.2. Signal Support Mast

- 4.2.1. Overhead Signal Structures shall be provided with 5" (127 mm) (nominal) inside diameter vertical masts or struts for mounting Signal Units and signs, as required. Proper clearance of other structure components shall be provided to permit proper adjustment/maintenance of the Signal Units.
- 4.2.2. A mileage signboard assembly shall be provided with each signal support mast. The size of the signboard assembly shall be 7" x 24" (178 mm x 610 mm).
- 4.2.3. The front-facing signal number sticker shall be provided by the Contractor and displayed on the mileage signboard assembly described in Section 4.2.2 on the front of the signal structure (or each side of the signal structure, for two-way configurations) using a non-reflective matte black background with white retroreflective lettering. The lettering shall be 5½ in (140 mm) tall and in accordance with AREMA C&S Section 14.6.2.
- 4.2.4. The rear-facing signal number shall also be provided by the Contractor and displayed on the rear of the signal structure for one-way configurations using a non-reflective yellow background with black lettering. The lettering shall be oriented vertically in a column on the mast structure directly behind the front mileage signboard so that on-rail equipment can read the lettering.
- 4.2.5. The top of the mast(s) shall be closed or booted with a removable aluminum cap. The cap shall be secured to the pipe or mast with set screws.
- 4.2.6. The Contractor shall provide a tube-type signal support arm for each type of Signal Head to be installed on the main mast. A 2" by 4" slot (51 mm x 102 mm) shall be provided in the mast such that cabling for the Signal Head can be routed through the mast and signal support arm. The edges of the slot and signal support arm tube shall be smooth and free of any burrs. A removable metal cap or plug shall be provided for each slot.

- 4.2.7. The orientation and spacing of the Signal Units shall be easily accessed, free of any obstruction which may affect the maintenance or visibility of the Signal Units when mounted, and shall comply with the following:
- a) The lowest or first Signal Head shall be located at a nominal height of 3.0 ft (914 mm), when measured from the top side of the lower platform level to the centre of Signal Head;
 - b) The spacing of additional Signal Heads shall be 72" (1029 mm) between centres of two consecutive signal heads, or 60" (1524 mm) as directed by Metrolinx; and
 - c) Provision shall be made to allow staggering of Signal Heads as required by the latest CROR (Canadian Rail Operating Rules).
- 4.2.8. The Contractor shall supply all hardware related to the mounting of the Signal Units. This shall include mounting brackets, clamps, bolts, nuts, and washers lubricated with NO-OX-ID grease, as required.
- 4.2.9. The Contractor shall provide for cable access from the aluminum junction box through the vertical columns and signal support arms to the signal heads. Cables shall remain unexposed throughout their lengths. All openings for cable passage shall be flanged and covered with a cover plate when not used.
- 4.2.10. As an alternative to Section 4.2.9, External conduits may be used where approved on a case-by-case basis. Conduits with 4" (102 mm) diameter or larger shall be Schedule 10 Aluminum 6061-T6. Conduits with a diameter less than 4" (102 mm) shall be Schedule 40 Aluminum 6061-T6. Conduits shall be secured to the signal mast with formed clamp brackets with U-bolts.
- 4.2.11. The Contractor shall ensure that all the cables are routed through the Overhead Signal Structure or through external conduits and remain unexposed.

4.3. Ladder Assembly

- 4.3.1. The ladder shall be constructed of aluminum and be designed to comply with current OSHA standards affecting rail size and design, rung length 16" (406 mm) and toe spacing. Rungs shall have heavy-duty skid-resistant serrated surfaces.
- 4.3.2. The ladder assembly shall be provided complete with all mounting hardware to secure it to the mast and/or service platform framework.
- 4.3.3. The base of the ladder shall provide a safe, secure footing. A removable aluminum security panel system shall be provided to fit on the ladder to prevent unauthorized access to the ladder structure. It shall be lockable using a standard railway signal lock provided by Metrolinx.
- 4.3.4. The aluminum ladder shall be designed to be:
- a) Secured (bolted) to an approved heavy-duty galvanized steel footing; or
 - b) Buried to a minimum depth of 18" (457 mm); or

c) Secured to the mast assembly by means of a ladder brace.

4.3.5. Fixed ladders shall have a ladder safety device in compliance with fall arrest requirements of OHSA (O. Reg. 213/91) and include a ladder cage in compliance with fixed access ladder requirements of OHSA (O. Reg. 851/90).

4.3.6. Fixed ladders shall be designed to live load specifications as per Section 3.2.2.c).

4.4. Service Platforms

4.4.1. The service platform(s) shall be constructed of aluminum with a working surface area of not less than 36" (914 mm) in length by 32" (813 mm) wide.

4.4.2. The platform surface shall be constructed using one of the following components:

a) Cross-linked style, anti-slip tread, aluminum grating welded to an aluminum frame; or

b) One-piece aluminum channel perforated plank grating. Grating walking surface shall be slip-resistant in all directions.

4.4.3. A service platform shall be provided for each Signal Head, ergonomically located to provide access to the Signal Head for a maintainer.

4.5. Walkway

4.5.1. Maintenance walkways on Overhead Signal Structures shall extend from the access ladder to a point which will provide safe access to Signal Units.

4.5.2. Walkways shall have skid-proof surfaces, a minimum width of 18" (457 mm) and shall be of open design to allow drainage.

4.6. Guardrails

4.6.1. Guardrails shall be provided around each service platform and walkways.

4.6.2. Guardrail assemblies shall be able to resist a single concentrated load of 1 kN in all directions on top of the guardrail, applied in any direction at any point along the top.

4.6.3. The guardrails shall comply with the requirements of OHSA Regulation 851 Industrial Establishments.

4.6.4. The guardrails shall have a minimum height of 42" (1067 mm), measured from the top of the platform surface.

- 4.6.5. The guardrails shall extend the complete perimeter of the platform area, except at the egress area, which shall be no less than 24" (610 mm) wide, for which a horizontal footing shall be provided at the mid-point of the egress floor. A hinged security rail designed with a spring return extending across the entry point shall be provided.

4.7. Aluminum Junction Boxes

- 4.7.1. A junction box shall be provided on the main mast (U-bolt mounted) to mate with a 2-5/8" x 6-5/8" (67 mm x 170 mm) slot located in the main mast 40" (100 mm) from the signal base. This slot is not required if wiring is provided in an external conduit.
- 4.7.2. The junction box shall be equipped with a lockable, weather-sealed hinged door (complete with grease fittings) having a robust security locking latch system designed to accommodate a standard Railway-type lock.
- 4.7.3. The junction box shall be equipped with a 3/4" (20 mm) plywood backboard finished on all sides with a matte white enamel paint.
- 4.7.4. The size and number of terminals in the junction box shall accommodate the cabling for the number of signals on the Overhead Signal Structure. A minimum of twenty-four (24) double AAR terminals (one row of 24 double post strips), complete with insulated test straps, shall be provided per signal mast support.
- 4.7.5. The junction box AAR terminals shall be clearly numbered from top to bottom, starting with "1" at the top. The numbering shall be located on the case wire side of the AAR terminals. Each column shall be clearly lettered from left to right, starting with "A" at the left.
- 4.7.6. The junction box shall be attached to the bottom of the bridge masts for easy access from the ground. External conduits, where required, shall not impede access to the junction box.
- 4.7.7. The junction box shall have a wire mesh screened drain hole to allow rain or condensation water to drain out of the box.
- 4.7.8. Wire harnesses of six wires per harness shall be provided to each signal head, regardless of whether it is used. The case wire and components shall be in accordance with GO Transit Signals & Communications SCP-1003 and SCP-1007.
- 4.7.9. The field cables shall enter through the base of the junction box through either 4" flexible conduit or 4" rigid PVC conduit. One conduit shall be provided per signal support mast and shall align vertically with the AAR terminal column where the field cables will be terminated.

4.8. Electrification Requirements

- 4.8.1. The Overhead Signal Structure shall be grounded and bonded as per the Metrolinx Performance Specification for Structures Passing Over Electrified Corridors (MX-ELEC STR-SPEC-2017-Rev 03). All conductive components of the structure shall comply with MX-ELEC STR-SPEC-2017-Rev 03.
- 4.8.2. Grounding lugs at the base of a structure shall be provided to accept cable as per the grounding design.

4.9. Life Span

- 4.9.1. The Overhead Signal Structures shall have a minimum service life of 100 years. Fatigue calculations shall satisfy unlimited loading cycles.

5. Submittals

5.1. General

- 5.1.1. Structural calculations and engineering drawings of the complete assembly shall be submitted to Metrolinx for approval prior to manufacturing. Shop drawings, records, and as-built drawings shall also be submitted to Metrolinx for approval/information. Engineering drawings shall be provided in electronic format (AutoCAD and PDF). The engineering drawing shall contain the seal and signature of the professional engineer, registered in the Province of Ontario, responsible for the design, attesting that the Overhead Signal Structures and foundations meet or exceed all applicable design criteria herein. Design calculations shall be presented in a legible and logical format and shall be sufficiently detailed to allow a technical review of the concepts and assumptions used in the design.
- 5.1.2. The structural calculations and engineering drawings shall include design loadings and moment, shear, axial forces, and fatigue analysis for all the components of Overhead Signal Structures, including:
 - a) Foundations;
 - b) Columns;
 - c) Horizontal cantilever arms or trusses;
 - d) Column, arm or truss flange bolted connections;
 - e) All welded and bolted connections, stiffeners;
 - f) Anchor bolts; and
 - g) Location of fall protection anchorage points where required.
- 5.1.3. The Contractor shall include, with each Overhead Signal Structure shipped, a schematic drawing showing the correct assembly of the structure and detailed installation procedures for both structure and foundation, which shall also identify the various components of the assembly, including part numbers. Torque specifications shall be noted for all bolted connections, including foundation anchor bolts.
- 5.1.4. The Contractor shall include in the schematic drawing details related to the placement of the Signal Support Masts with respect to the proposed track design. Track centreline measurements shall be indicated on the drawing with the proposed Signal Support Mast offset distances from these centre lines.
- 5.1.5. The Contractor shall provide a drawing(s) showing conduit and cable cross-section and calculation of conduit fill capacity.

5.2. Identification

- 5.2.1. The main masts and service platform portions of the Overhead Signal Structure shall have a permanent type of label affixed to them, indicating the manufacturer, assembly type, part number, serial number, weight and date of manufacture.

6. Compliance Matrix

Manufacturer:		Revision:	
Contract Number:		Project Name:	

Section	Criteria	Comply	Do Not Comply	N/A	Notes / Comments
3.1.1	AASHTO Standard Specifications Requirements				
3.1.1.a	Aluminum Requirement				
3.1.1.b	Aluminum Welding Requirements				
3.1.1.c	Aluminum Material Requirements				
3.1.1.d	ASTM B211M Requirement				
3.1.1.e	ASTM B209 Requirement				
3.1.1.f	AASHTO Standard Specifications				
3.1.1.g	SCP-302 Requirement				
3.1.1.h	Foundation Requirements				
3.2.1	Dead Loads				
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3.4.1	CSA W47.2-11 / W59.2-18 Standards				
3.4.2	Non-Destructive Testing of Welds				
3.4.3	Documentation of Welds				
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3.5.1	Bolt Design Requirements				
3.5.2	Surface Roughening				
3.5.3	Minimum Bolt Tension				
3.5.4	U-bolt Connections				
3.5.5	U-bolt Tension				
3.5.6	Dissimilar Hardware Requirements				

Section	Criteria	Comply	Do Not Comply	N/A	Notes / Comments
3.6.1	Anchor Bolts and Hardware				
3.7.1	Gantry Vertical Deflection				
3.7.2	Cantilever Horizontal & Vertical Deflection				
3.7.3	Camber				
3.8.1	Infinite Fatigue Life				
3.8.2	Fatigue Importance Factor				
3.8.3	Train-Induced Gusts Requirements				
3.8.4	Natural Wind Gust Load Requirements				
3.8.5	Vortex-Shedding Load Requirements				
3.9.1	Vertical Clearance Requirements				
3.10.1	Horizontal Clearance Requirements				
3.11.1	Foundation Requirement				
4.1.1	General Assembly Requirements				
4.1.2	Opening Requirement				
4.1.3	Hardware and Assembly Requirements				
4.2.1	Signal Mast Assembly General Requirements				
4.2.2	Mileage Signboard Requirements				
4.2.3	Front-facing Number Sticker Requirements				
4.2.4	Rear-facing Number Requirements				
4.2.5	Aluminum Cap Requirements				
4.2.6	Aluminum Signal Head Mast Requirements				
4.2.7	Orientation and Spacing Requirements				
4.2.8	Hardware Requirements				
4.2.9	Cable Routing Requirements				
4.2.10	External Conduit Assembly				
4.3.1	Ladder Assembly General Requirements				
4.3.2	Ladder Assembly Requirements				
4.3.3	Ladder Security Panel System Requirements				
4.3.4	Ladder Securement Requirements				
4.3.5	Fall Arrest Requirements				
4.3.6	Ladder Load Requirements				
4.4.1	Service Platform Area Requirements				
4.4.2	Service Platform Surface Requirements				

Section	Criteria	Comply	Do Not Comply	N/A	Notes / Comments
4.4.3	Service Platform General Requirements				
4.5.1	Maintenance Walkway Requirements				
4.5.2	Maintenance Walkway Surface Requirements				
4.6.1	Guardrail Location Requirements				
4.6.2	Guardrail Assembly Requirements				
4.6.3	OHSA Regulation 851 Requirements				
4.6.4	Guardrail Height Requirements				
4.6.5	Guardrail General Requirements				
4.7.1	Junction Box Mounting Requirements				
4.7.2	Junction Box Locking System Requirements				
4.7.3	Junction Box Plywood Requirements				
4.7.4	Junction Box AAR Terminal Requirements				
4.7.5	Junction Box Identification Requirements				
4.7.6	Junction Location				
4.7.7	Junction Box Drain Hole				
4.7.8	Wire Harness Requirements				
4.7.9	Field Cable Entry Requirements				
4.8.1	Grounding and Bonding Requirements				
4.8.2	Grounding Lug Requirements				
4.9.1	Life Span Requirements				
5.1.1	General Submittal Requirements				
5.1.2	Structural Calculations Requirements				
5.1.3	Assembly Schematic Drawing				
5.1.4	Signal Head Placement Drawing				
5.1.5	Conduit and Cable Cross-section Drawing				
5.2.1	Identification Plate				