NOTES:

GENERAL
- GUARDRAILS HAVE BEEN DESIGNED TO MEET THE CRITERIA FOR CONTAINMENT LEVEL CL-1 AS DEFINED BY THE MINISTRY. GUARDRAILS HAVE NOT BEEN DESIGNED TO CONTAIN ERRANT VEHICLES.
- MAXIMUM POST SPACING AS SHOWN ON DRAWING.
- FOR GUARDRAIL ANCHOR DETAILS, SEE MINISTRY STANDARD DRAWINGS:
  - STD-EC-030-09 - COMPOSITE PRECAST DECK PANEL
  - STD-EC-040-08 - NON-COMPOSITE PRECAST DECK PANEL DETAILS
  - STD-EC-070-03 - PRECAST CONCRETE SLAB DETAILS (SHEET 1)

MATERIALS

- TIMBER: ALLOWABLE WOOD SPECIES, LUMBER GRADES, GRADING CRITERIA AS PER MINISTRY:
  - BRIDGE TIMBER AND LUMBER MATERIAL STANDARD

- STEEL:
  - POSTS: PLATE TO CSA G40.21M - GRADE 350W (COATED)
  - OR TO ASTM A500 GRADE C (COATED)
  - GRADE 350A (UNCORED)
  - GRADE 300W (COATED)
  - STEEL FABRICATION:
  - WELDING:
    - SHOP WELDING IN ACCORDANCE WITH CSA W59 FABRICATOR TO BE CERTIFIED FOR DIVISION 1, 2 OR 3 IN ACCORDANCE WITH CSA W47.1.
    - FIELD WELDING BY COMPANY CERTIFIED TO CSA W47.1, DIVISIONS 1, 2 OR 3.
    - MIN. 6mm FILLET WELD UNLESS OTHERWISE NOTED.
  - GUARDRAIL BRACKETS AND POST COATING TO BE EITHER:
    - PAINTED IN ACCORDANCE WITH MINISTRY STEEL GUARDRAIL COMPONENT PAINT STANDARD.
    - HARDWARE:
      - BOLTS: ASTM A307 GRADE B GALVANIZED - TIMBER BOLTS C/W ECONO HEAD AND MALLEABLE IRON WASHERS TOP AND BOTTOM.

W-BEAM GUARDRAIL DETAIL FOR CONCRETE SLAB ORDERED/DECK PANEL

ASSUME NOT TO SCALE
**JOINT NOTES:**

**GENERAL**
- Guardrails have been designed to meet the criteria for containment level CL-2 as defined by the Ministry. Guardrails have not been designed to contain errant vehicles.
- Maximum post spacing = 3048 C/C.
- For guardrail anchor details, see Ministry Standard Drawings:
  - STD-EC-030-09 - Composite Precast Deck Panel
  - STD-EC-040-08 - Non-Composite Precast Deck Panel - DETAILS
  - STD-EC-070-03 - Precast Concrete Slab Details (Sheet 1)

**MATERIALS**
- **Steel:**
  - Rails and posts: to CSA G40.21M, Grade 350W (Coated), Grade 350A (Uncoated), or to ASTM A500 Grade C (Coated), A847 (Uncoated).
  - Plate to CSA G40.21M: Grade 350W (Coated), Grade 350A (Uncoated), Grade 300W (Coated).
- **Steel Fabrication:**
  - Welding:
    - Shop welding in accordance with CSA W59. Fabricator to be certified for Division 1, 2 or 3 in accordance with CSA W47.1.
    - Field welding by company certified to CSA W17.1, Divisions 1, 2 or 3.
    - Min. 6mm fillet weld unless otherwise noted.
- Guardrail brackets and post coating to be specified.
- Galvanized to CSA G164 as noted on drawings. Minimum 610 g/m².
- Painted in accordance with Ministry Steel Guardrail Component Paint Standard:
  - HSS Rail to be painted Safety Yellow in accordance with Ministry Steel Guardrail Component Paint Standard: Galvanized where specified to CSA G164, Minimum 610 g/m².
- Hardware:
  - All hardware bolts, nuts, washers to be galvanized to CSA G164, Minimum 610 g/m².
  - Bolts to ASTM A307 Grade B (uncoated).

**MINISTRY OF FORESTS, LANDS & NATURAL RESOURCE OPERATIONS**

**STANDARD BRIDGE DRAWING**

**STANDARD BRIDGE GUARDRAIL - HSS RAIL**

**SOME AS SHOWN**

**NOTES:**
- Guardrails have been designed to meet the criteria for containment level CL-2 as defined by the Ministry. Guardrails have not been designed to contain errant vehicles.
- Maximum post spacing = 3048 C/C.
- For guardrail anchor details, see Ministry Standard Drawings:
  - STD-EC-030-09 - Composite Precast Deck Panel
  - STD-EC-040-08 - Non-Composite Precast Deck Panel - DETAILS
  - STD-EC-070-03 - Precast Concrete Slab Details (Sheet 1)

**MATERIALS**
- **Steel:**
  - Rails and posts: to CSA G40.21M, Grade 350W (Coated), Grade 350A (Uncoated), or to ASTM A500 Grade C (Coated), A847 (Uncoated).
  - Plate to CSA G40.21M: Grade 350W (Coated), Grade 350A (Uncoated), Grade 300W (Coated).
- **Steel Fabrication:**
  - Welding:
    - Shop welding in accordance with CSA W59. Fabricator to be certified for Division 1, 2 or 3 in accordance with CSA W47.1.
    - Field welding by company certified to CSA W17.1, Divisions 1, 2 or 3.
    - Min. 6mm fillet weld unless otherwise noted.
- Guardrail brackets and post coating to be specified.
- Galvanized to CSA G164 as noted on drawings. Minimum 610 g/m².
- Painted in accordance with Ministry Steel Guardrail Component Paint Standard:
  - HSS Rail to be painted Safety Yellow in accordance with Ministry Steel Guardrail Component Paint Standard: Galvanized where specified to CSA G164, Minimum 610 g/m².
- Hardware:
  - All hardware bolts, nuts, washers to be galvanized to CSA G164, Minimum 610 g/m².
  - Bolts to ASTM A307 Grade B (uncoated).
Joist Joint for Side Mounted Delineator Tab Option

FOR FRONT MOUNTED DELINEATOR TAB OPTION

NOTES:

GENERAL
- Guardrails have been designed to meet the criteria for containment level CL-3 as defined by the Ministry. Guardrails have not been designed to contain errant vehicles.
- Maximum post spacing = 3048 C/C.
- For guardrail anchor details, see Ministry Standard Drawings: STD-EC-010-04 - CL3 Insert Details

MATERIALS
- Steel: Rails
  - To CSA G40.21M
  - Grade 350W (Coated)
  - Grade 350A (Uncoated)
- Posts to CSA G40.21M
  - Grade 350W (Coated)
- Plate to CSA G40.21M
  - Grade 350W (Coated)
  - Grade 350A (Uncoated)

- Steel Fabrication:
  - Welding:
    - Shop welding in accordance with CSA W59. Fabricator to be certified for Division 1, 2, or 3 in accordance with CSA W47.1.
    - Field welding by company certified to CSA W47.1, Divisions 1, 2, or 3.
  - Min. 6mm fillet weld unless otherwise noted.

- Guardrail brackets and post coating to be either:
  - Painted in accordance with Ministry Steel Guardrail Component Paint Standard.
  - HSS rail to be painted safety yellow in accordance with Ministry Steel Guardrail Component Paint Standard.

ASSUME NOT TO SCALE
JOINT FOR SIDE MOUNTED DELINEATOR TAB OPTION
FOR FRONT MOUNTED DELINEATOR TAB OPTION

NOTES:

GENERAL
- GUARDRAILS HAVE BEEN DESIGNED TO MEET THE CRITERIA FOR CONTAINMENT LEVEL CL-3 AS DEFINED BY THE MINISTRY. GUARDRAILS HAVE NOT BEEN DESIGNED TO CONTAIN ERRANT VEHICLES.
- MAXIMUM POST SPACING = 3048 C/C.

MATERIALS
- STEEL: RAILS
- TO CSA G40.21M
- GRADE 350W (COATED)
- GRADE 350A (UNCOATED)
- OR TO ASTM
- A500 GRADE C (COATED)
- A847 (UNCOATED)

POSTS TO CSA G40.21M
- GRADE 350W (COATED)

PLATE TO CSA G40.21M
- GRADE 350W (COATED)
- GRADE 350A (UNCOATED)

- STEEL FABRICATION:
- WELDING:
- SHOP WELDING IN ACCORDANCE WITH CSA W59 FABRICATOR TO BE CERTIFIED FOR DIVISION 1, 2 OR 3 IN ACCORDANCE WITH CSA W47.1.
- FIELD WELDING BY COMPANY CERTIFIED TO CSA W47.1, DIVISIONS 1, 2 OR 3.
- MIN. 6mm FILLET WELD UNLESS OTHERWISE NOTED.

GUARDRAIL BRACKETS AND POST COATING TO BE EITHER:
- PAINTED IN ACCORDANCE WITH MINISTRY STEEL GUARDRAIL COMPONENT PAINT STANDARD:
- HSS RAIL TO BE PAINTED SAFETY YELLOW IN ACCORDANCE WITH MINISTRY STEEL GUARDRAIL COMPONENT PAINT STANDARD:

MATERIALS
- STEEL
- RAILS
- TO CSA G40.21M
- GRADE 350W (COATED)
- GRADE 350A (UNCOATED)

GUARDRAIL BRACKETS AND POST COATING TO BE EITHER:
- PAINTED IN ACCORDANCE WITH MINISTRY STEEL GUARDRAIL COMPONENT PAINT STANDARD:
- HSS RAIL TO BE PAINTED SAFETY YELLOW IN ACCORDANCE WITH MINISTRY STEEL GUARDRAIL COMPONENT PAINT STANDARD:

NOTE:
- GUARDRAILS HAVE BEEN DESIGNED TO MEET THE CRITERIA FOR CONTAINMENT LEVEL CL-3 AS DEFINED BY THE MINISTRY. GUARDRAILS HAVE NOT BEEN DESIGNED TO CONTAIN ERRANT VEHICLES.
- MAXIMUM POST SPACING = 3048 C/C.

MINISTRY OF FORESTS, LANDS & NATURAL RESOURCE OPERATIONS

STANDARD BRIDGE DRAWING

STANDARD HSS GUARDRAIL FOR PRECAST CONCRETE SLAB BRIDGES
CL-3

ASSUME NOT TO SCALE