



# Ministry of Forests & Range

**ENGINEERING BRANCH, FIELD OPERATIONS DIVISION**

## STANDARD STEEL GIRDER BRIDGE WITH NON-COMPOSITE DECK

ASSUME NOT TO SCALE  
ORIGINAL SIGNED AND SEALED

DRAWING SCHEDULE			
DRAWING No. / MODEL TYPE	DESCRIPTION	REV.	DATE
STD-EC-040-01	GENERAL NOTES - SHEET 1	0	MARCH 2010
STD-EC-040-02	GENERAL NOTES - SHEET 2	0	MARCH 2010
STD-EC-040-03	GENERAL ARRANGEMENT	0	MARCH 2010
STD-EC-040-04	PRECAST DECK PANEL - TYPES	0	MARCH 2010
STD-EC-040-05	PRECAST DECK PANEL TYPE 1 & TYPE 2 - REINFORCING	0	MARCH 2010
STD-EC-040-06	PRECAST DECK PANEL TYPE 3 - REINFORCING	0	MARCH 2010
STD-EC-040-07	PRECAST DECK PANEL - SECTIONS	0	MARCH 2010
STD-EC-040-08	PRECAST DECK PANEL - DETAILS	0	MARCH 2010

**1 GENERAL**

- 1.1 THESE STANDARD DRAWINGS APPLY TO THE DESIGN AND SUPPLY OF SIMPLE SPAN SINGLE LANE STEEL GIRDER BRIDGES WITH NON-COMPOSITE PRECAST CONCRETE DECK PANELS. THE STANDARD DRAWINGS PROVIDE DESIGN GUIDELINES AND STANDARD DETAILS.
- 1.2 VARIATIONS FROM THE STANDARD DESIGN REQUIREMENTS MAY BE ACCEPTABLE IN CERTAIN SPECIAL SITUATIONS. ALL SUCH VARIATIONS SHALL BE DOCUMENTED AND REQUIRE APPROVAL FROM MFR PRIOR TO USE.
- 1.3 A PROFESSIONAL ENGINEER REGISTERED TO PRACTICE IN THE PROVINCE OF BRITISH COLUMBIA SHALL DESIGN ALL BRIDGE COMPONENTS.
- 1.4 DEFINITIONS
  - ENGINEER:
    - A PROFESSIONAL ENGINEER REGISTERED IN THE PROVINCE OF BRITISH COLUMBIA EXPERIENCED IN THE DESIGN OF STEEL GIRDER AND NON-COMPOSITE PANELIZED PRECAST CONCRETE DECK BRIDGES, WHO IS RESPONSIBLE FOR THE DETAILED STRUCTURAL DESIGN OF A BRIDGE IN CONFORMANCE WITH THESE DRAWINGS
  - MFR:
    - A PROFESSIONAL ENGINEER DESIGNATED BY THE MINISTRY OF FORESTS AND RANGE.
- 1.5 APPLICABLE OVERALL BRIDGE GIRDER LENGTH (OUT-TO-OUT):
  - TYPICAL APPLICABLE OVERALL NON-COMPOSITE BRIDGE GIRDER LENGTH IS 15.240 m (50') TO 48.632 m (160').
  - OVERALL BRIDGE GIRDER LENGTHS GREATER THAN 48.623 m (160') OR CONTINUOUS MULTI-SPAN BRIDGES WILL REQUIRE SPECIAL INVESTIGATION. DETAILS TO BE APPROVED BY MFR PRIOR TO USE.
- 1.6 STANDARD DECK WIDTHS
  - THE FOLLOWING TABLE SPECIFIES STANDARD DECK WIDTHS FOR THE DESIGNATED DESIGN VEHICLES.

DESIGN VEHICLE	STANDARD DECK WIDTH (mm)
BCL625, L100	4268
L150, L165	4876

- 1.7 STANDARD GIRDER SPACINGS
  - THE FOLLOWING TABLE SPECIFIES STANDARD GIRDER SPACINGS FOR SEVERAL DECK WIDTHS.

DECK WIDTH mm (ft)	STANDARD GIRDER SPACING mm
4268 (14')	3000
4876 (16')	3600
5486 (18')	4200

- 1.8 STANDARD DECK PANEL EDGE THICKNESS AND DECK PANEL CROSSFALL
  - PRECAST CONCRETE DECK PANELS SHALL INCORPORATE A MINIMUM 2% CROSSFALL.
  - THE FOLLOWING TABLE SPECIFIES STANDARD DECK EDGE THICKNESS FOR SQUARE PRECAST CONCRETE DECK PANELS. VARIATIONS MAY BE REQUIRED FOR SKEWED OR FLARED DECK PANELS.

DESIGN VEHICLE	DECK PANEL WIDTH mm (ft)	STANDARD DECK EDGE THICKNESS mm
BCL625	4268 (14')	175
	4876 (16')	175
	5486 (18')	200
L100	4268 (14')	200
	4876 (16')	200
	5486 (18')	225
L150 & L165	4876 (16')	225
	5486 (18')	250

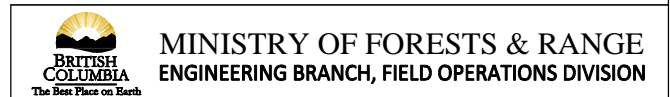
- 1.9 DECK PANEL LENGTH
  - THE PREFERRED DECK PANEL LENGTH IS 3048 (10').
  - NOTWITHSTANDING, DECK PANEL LENGTHS SHOULD CONFORM TO THE FOLLOWING:
    - MINIMUM DECK PANEL LENGTH: 1524 mm
    - MAXIMUM INTERNAL DECK PANEL LENGTH: 3048 mm
    - MAXIMUM END DECK PANEL LENGTH
      - (DECK BESIDE BALLAST WALL): 3048 mm
      - MAXIMUM END PANEL LENGTH
        - (DECK OVER BALLAST WALL): 3300 mm
- 1.10 SUPERSTRUCTURE IDENTIFICATION MARKING:
  - EACH BRIDGE SUPERSTRUCTURE SHALL HAVE CLEARLY STAMPED OR PERMANENTLY MARKED ON AT LEAST ONE SIDE OF THE SUPERSTRUCTURE:
    - STRUCTURE NUMBER
    - LOAD RATING
    - DATE OF MANUFACTURE
    - MANUFACTURER'S NAME, AND
    - "MINISTRY OF FORESTS & RANGE"
  - THE HEIGHT OF LETTERING MUST BE 50 mm MINIMUM.
  - ALTERNATIVE IDENTIFICATION MARKING SHALL REQUIRE PRIOR APPROVAL FROM MFR
- 1.11 BOLTED GIRDER FIELD SPLICES:
  - PROVIDE BOLTED FIELD SPLICES ON ALL BRIDGE SPANS PROCURED THROUGH A DESIGN/SUPPLY CONTRACT FOR GIRDERS WITH AN OVERALL LENGTH (OUT-TO-OUT) LENGTH > 24.384 m (80') UNLESS APPROVED BY MFR.
  - WHERE THE CONTRACT IS DESIGN/SUPPLY AND INSTALL, BOLTED FIELD SPLICES SHALL BE PROVIDED AT THE DISCRETION OF THE ENGINEER
- 1.12 DIAPHRAGMS:
  - PROVIDE DIAPHRAGMS AT BEARING LOCATIONS
  - PROVIDE INTERNAL DIAPHRAGMS AS REQUIRED. MAXIMUM SPACING OF INTERNAL DIAPHRAGMS NOT TO EXCEED 8.0 m
- 1.13 PLAN BRACING:
  - PROVIDE CONTINUOUS PLAN BRACING ON ALL BRIDGES.
- 1.14 SKEW:
  - BRIDGE SKEW IN PLAN IS PERMITTED UP TO AN ANGLE OF 30°, AS SHOWN ON DWG. -04. ADJUST BRIDGE DETAILS ACCORDINGLY.
- 1.15 COMPONENT WEIGHTS
  - THE FOLLOWING COMPONENT WEIGHTS SHALL BE SPECIFIED ON THE DESIGN DRAWING:
    - GIRDER WEIGHT - SINGLE GIRDER
    - ASSEMBLED STEEL GIRDERS PLUS BRACING AND DIAPHRAGMS - TOTAL WEIGHT
    - PRECAST CONCRETE COMPONENT WEIGHTS (DECK PANELS, BALLAST WALL, CAPS AND FOOTINGS)

**2 DESIGN**

- 2.1 DESIGN LIFE:
  - BRIDGE DESIGN LIFE: 45 YEARS
- 2.2 DESIGN CODE AND MFR REFERENCE STANDARDS:
  - CAN/CSA-S6-06
  - MINISTRY OF FORESTS AND RANGE BRIDGE DESIGN AND CONSTRUCTION MANUAL
  - MFR INTERIM BRIDGE DESIGN GUIDELINES
- 2.3 - DESIGN VEHICLES
  - REFER TO MFR STANDARD DRAWING STD-EC-000-01 TO STD-EC-000-02.
  - THE DESIGN DRAWINGS SHOULD CLEARLY SPECIFY THE DESIGN VEHICLE THAT WAS USED FOR THE BRIDGE DESIGN.
- 2.4 MULTI-LANE LOADING
  - WHERE A BRIDGE IS ABLE TO SIMULTANEOUSLY SUPPORT MORE THAN ONE LANE OF TRAFFIC, THE DESIGNER SHOULD SEEK CLARIFICATION FROM MFR ON HOW TO ACCOUNT FOR MULTI-LANE LOADING.
- 2.5 DYNAMIC LOAD ALLOWANCE:
  - DYNAMIC LOAD ALLOWANCE SHALL BE APPLIED IN ACCORDANCE WITH CAN/CSA-S6-06.

- 2.6 FATIGUE DESIGN FOR STEEL GIRDERS
  - FATIGUE DESIGN TO BE COMPLETED IN ACCORDANCE WITH CAN/CSA-S6-06 WITH THE FOLLOWING MODIFICATIONS:
    - DESIGN VEHICLE:
      - AS PER PROJECT SPECIFICATIONS
      - FOR L165 USE L150 FOR FATIGUE DESIGN LOAD
    - FATIGUE DESIGN VEHICLE TO BE CENTRED ON BRIDGE
    - LATERAL WHEEL DISTRIBUTION: 50% - 50%
  - FATIGUE STRESS RANGE
    - $f_{sr} < F_{sr}$
    - WHERE:
      - $f_{sr}$  = THE CALCULATED STRESS RANGE AT THE DETAIL DUE TO THE PASSAGE OF THE DESIGN VEHICLE
      - $F_{sr}$  = FATIGUE STRESS RANGE RESISTANCE
  - NUMBER OF DESIGN CYCLES:
    - 500 000 FOR SPANS >12 m
    - 1 000 000 FOR SPANS ≤ 12 m
- 2.7 FRACTURE CRITICAL AND PRIMARY TENSION COMPONENTS
  - ENGINEER TO SPECIFY FRACTURE CRITICAL AND PRIMARY TENSION COMPONENTS ON THE DESIGN DRAWINGS.
- 2.8 MAXIMUM LIVE LOAD DEFLECTION OF STEEL GIRDERS:
  - BRIDGES MUST BE DESIGNED SO THAT LIVE LOAD DEFLECTION (CALCULATED AS THAT CAUSED BY ONE TRUCK ONLY, PLACED AT THE CENTRE LINE OF THE TRAVELLED ROADWAY, DYNAMIC LOAD ALLOWANCE INCLUDED) DOES NOT EXCEED L/450. WHERE USING THE L165 DESIGN VEHICLE, THE DEFLECTION SHALL BE CALCULATED USING THE L150 DESIGN VEHICLE.
- 2.9 SEISMIC DESIGN:
  - SEISMIC DESIGN NOT REQUIRED UNLESS OTHERWISE SPECIFIED.
- 2.10 WEARING SURFACE:
  - AS A MINIMUM, ALL DESIGNS SHALL INCORPORATE AN ALLOWANCE FOR A FUTURE 50 mm CONCRETE OVERLAY.
- 2.11 CONSTRUCTION LOAD:
  - ENGINEER MUST CONSIDER THE WEIGHT OF MATERIALS, WORK CREWS AND EQUIPMENT SUPPORTED DURING CONSTRUCTION WHEN DESIGNING THE BRIDGE.
  - ENGINEER MUST SPECIFY MAXIMUM PERMISSIBLE CONSTRUCTION EQUIPMENT LOADS ON THE DRAWINGS.
  - WHERE A BRIDGE WILL BE INSTALLED UNDER A SEPARATE CONTRACT FROM THE DESIGN/SUPPLY CONTRACT FOR THE MAIN BRIDGE COMPONENTS, AS A MINIMUM, UNLESS OTHERWISE SPECIFIED BY THE MINISTRY, THE DESIGNER SHALL CONSIDER THE FOLLOWING MINIMUM CONSTRUCTION LOADS:
    - SELF WEIGHT OF THE STRUCTURE, SUPPORTED AT THE BEARINGS, INCLUDING ALL DECK PANELS IN POSITION BUT UN-GROUTED.
    - A VERTICAL LIVE LOAD OF 445 kN (40 TON EQUIPMENT + 10 TON PANEL) DISTRIBUTED OVER A LENGTH OF 4m, POSITIONED ON THE BRIDGE TO PRODUCE THE MAXIMUM EFFECT; ECCENTRICITY = 100 mm
    - LOAD FACTORS IN ACCORDANCE WITH CAN/CSA-S6-06
    - MIN DLA = 10% (ASSUMED DESIGN SPEED = 10 km/hr)
- 2.12 STANDARD CONCRETE COVER:
  - THE FOLLOWING ARE THE STANDARD REQUIRED CONCRETE COVERS
    - TOP OF DECK PANEL 50 mm
    - UNDERSIDE OF DECK PANEL 25 mm
    - VERTICAL FACE OF EXPOSED DECK EDGE 50 mm
    - FACE OF STUD POCKET 25 mm
    - VERTICAL FACE OF TRANSVERSE GROUTED JOINT 25 mm

**ASSUME NOT TO SCALE**  
**ORIGINAL SIGNED AND SEALED**



**MINISTRY OF FORESTS & RANGE**  
**ENGINEERING BRANCH, FIELD OPERATIONS DIVISION**

SCALE AS SHOWN		Designed <u>J.H.</u> Date <u>MAR 2010</u>	
		Checked <u>D.J.H.</u> Date <u>MAR 2010</u>	
		Drawn <u>W.R.</u> Date <u>MAR 2010</u>	
Rev	Date	DESCRIPTION	Init
REVISIONS			

<b>STANDARD BRIDGE DRAWING</b>	
<b>STANDARD STEEL GIRDER BRIDGE WITH NON-COMPOSITE DECK</b>	
<b>GENERAL NOTES – SHEET 1</b>	
ORIGINAL SIGNED and SEALED BY: JULIEN HENLEY	APPROVED BY:
DESIGN ENGINEER	MOF ENGINEER
DATE JULIEN HENLEY	DATE
FILE No.	DRAWING No.
	<b>STD-EC-040-01</b>

### 3 MATERIALS AND FABRICATION

- 3.1 STRUCTURAL STEEL:
- TO CAN/CSA-G40.21M
    - STEEL GIRDER FLANGES AND WEB PLATES: GRADE 350AT CATEGORY 3
    - OTHER STEEL PLATE: 350A
    - BRACING (DIAPHRAGMS AND PLAN BRACING): GRADE 350A.
    - ANY REQUIRED VARIATIONS REQUIRE MFR APPROVAL. IF NON WEATHERING STEEL IS APPROVED BY MFR, A CORROSION PROTECTION SYSTEM WILL BE REQUIRED.
  - COMPLETE ALL WELDS IN ACCORDANCE WITH CSA W59. WELD METAL OF PRIMARY TENSION MEMBERS AND FRACTURE CRITICAL MEMBERS SHALL MEET THE CVN TOUGHNESS REQUIREMENTS OF TABLE 10.14 OF CAN/CSA S6-06.
  - INSPECT ALL BUTT WELDS BY ULTRASONIC OR X-RAY EXAMINATION IN ACCORDANCE WITH CSA W59.
  - FABRICATOR TO BE CERTIFIED FOR DIVISION 1 OR 2 IN ACCORDANCE WITH CSA W47.1
  - FIELD WELDING BY COMPANY CERTIFIED TO CSA W47.1 DIVISION 1,2 OR 3
  - FABRICATE GIRDERS AS FRACTURE CRITICAL MEMBERS IN ACCORDANCE WITH CAN/CSA-S6-06, AS NOTED ON DESIGN DRAWINGS. STEEL PLATES FOR BOTTOM FLANGES AND WEBS SHALL CONFORM TO THE REQUIREMENTS FOR FRACTURE CRITICAL IN ACCORDANCE WITH CAN/CSA-S6-06 EXCEPT THAT CHARPY V-NOTCH TESTING RESULTS ARE ONLY REQUIRED ON A PER HEAT FREQUENCY.
  - MAKE ALL I-GIRDER FLANGE TO WEB WELDS USING SUBMERGED ARC WELDING.
  - WHERE SPECIFIED BY MFR, PAINT STEEL GIRDERS IN ACCORDANCE WITH THE FOLLOWING SPECIFICATIONS:
    - SURFACE PREPARATION: BLAST CLEAN TO SSPC SP-6
    - PAINT: HIGH SOLIDS, SELF-PRIMING EPOXY OR MOISTURE CURE URETHANE. SPECIFIC PAINT PRODUCT TO BE AMERLOCK 400 OR ALTERNATE EQUIVALENT PRODUCT. EQUIVALENT PRODUCTS MUST BE APPROVED BY MFR PRIOR TO USAGE.
    - PAINT SHALL BE UTILIZED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS
    - MINIMUM 2 COATS
    - MINIMUM 8 MILS DRY FILM THICKNESS
    - COLOUR BY MFR
  - SHOP TRIAL FIT ALL FIELD SPLICES UNLESS CNC EQUIPMENT IS USED.
- 3.2 STRUCTURAL BOLTS:
- ALL BOLTS INCORPORATED INTO STEEL GIRDER CONNECTIONS (BOLTED FIELD SPLICES, DIAPHRAGMS AND BRACING) TO BE ASTM A325 TYPE 3 M22 U.N.O. INSTALLED IN ACCORDANCE WITH CAN/CSA-S6-06
- 3.3 STUDS:
- SHEAR STUDS SHALL MEET THE REQUIREMENTS OF CSA W59 APPENDIX H FOR TYPE A AND B STUDS
  - ASTM A108 GRADE 1015, 1018, 1020
- 3.4 GALVANIZING:
- ALL ITEMS SPECIFIED AS GALVANIZED ARE TO BE GALVANIZED TO CSA G164.
- 3.5 REINFORCING:
- TO CAN/CSA G30.18M GRADE 400R
  - REINFORCING STEEL MUST NOT BE WELDED OR TACK WELDED
- 3.6 PRECAST CONCRETE:
- CSA A23.1 EXPOSURE CLASS C1,  $f_c = 35 \text{ MPa}$  AT 28 DAYS
  - PRECAST CONCRETE TO BE FABRICATED IN ACCORDANCE WITH CSA A23.4 BY A PLANT CERTIFIED IN ACCORDANCE WITH CSA A23.4
  - FABRICATION TOLERANCES TO CSA-A23.4
  - FINISH TO BE TRANSVERSE BROOM TO TOP OF DECK PANELS, OTHERWISE TO CSA-A23.1 AND A23.4.
  - ALL CORNERS TO COME WITH 20X20 CHAMFER U.N.O. ON THE APPLICABLE STANDARD DRAWING.
- 3.7 GROUT:
- GROUT MIN  $f_c = 35 \text{ MPa}$  AT 28 DAYS, INSTALLED ACCORDING TO MANUFACTURER'S INSTRUCTIONS
  - GROUT FOR BLOCK-OUTS SHALL BE TARGET TRAFFIC PATCH WITH FINE AGGREGATE, OR ALTERNATE EQUIVALENT PRODUCT. EQUIVALENT PRODUCTS MUST BE APPROVED BY MFR PRIOR TO USE.
  - COLD WEATHER GROUTING:
    - WHERE IT IS ANTICIPATED THAT THE TEMPERATURE SHALL DROP BELOW 5°C DURING GROUTING, THE CONTRACTOR SHALL IMPLEMENT COLD WEATHER CONCRETING PROCEDURES IN ACCORDANCE WITH CAN/CSA A23.1. PRIOR TO COMMENCING THE GROUTING OPERATION, THE CONTRACTOR SHALL PROVIDE MFR WITH WRITTEN COLD WEATHER CONCRETING PROCEDURES.
- 3.8 BEARINGS:
- TO CAN/CSA-S6-06: OZONE RESISTING NATURAL RUBBER, (NATURAL POLYISOPRENE).
  - WHERE EXPANSION JOINTS ARE USED, ENGINEER TO INCLUDE SUFFICIENT INFORMATION TO FACILITATE INSTALLATION AT VARIOUS TEMPERATURES.
- 3.9 COUPLERS
- COUPLERS SHALL CONFORM TO ASTM A563 GRADE A MIN TENSILE STRENGTH OF 120% OF THE YIELD STRENGTH OF THE ELEMENTS BEING CONNECTED OR AS SPECIFIED ON THE STANDARD DRAWINGS.

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### 4 TRANSPORTATION AND ERECTION OF BRIDGES

- 4.1 SUPPORT STEEL GIRDERS IN SUCH A WAY THAT THEY SUSTAIN NO DAMAGE DURING TRANSPORTATION. WHEN TRANSPORTING STEEL GIRDERS ON THE FLAT, PROVIDE A TRANSPORTATION PLAN PREPARED BY A PROFESSIONAL ENGINEER REGISTERED IN THE PROVINCE OF BRITISH COLUMBIA.
- 4.2 LIFTING DEVICES:
- ALL PRECAST COMPONENTS (EXCEPT CONCRETE ROADSIDE BARRIERS AND UNREINFORCED INTERLOCKING CONCRETE BLOCKS) MUST UTILIZE BURKE LIFTING INSERTS (OR PREAPPROVED EQUIVALENT) AS LIFTING DEVICES. GROUT RECESS AFTER INSTALLATION.
  - ENGINEER TO DESIGN LIFTING INSERTS TO FACILITATE LIFTING USING FOUR EQUAL LENGTH SLINGS/CHAINS.
  - ONLY LOW IMPACT LIFTS ARE PERMITTED. ANGLE OF LIFT MUST NOT EXCEED 30 DEGREES FROM VERTICAL.
- 4.3 STEEL GIRDERS SHALL BE CLEAN AND FREE OF SHOP MARKS.

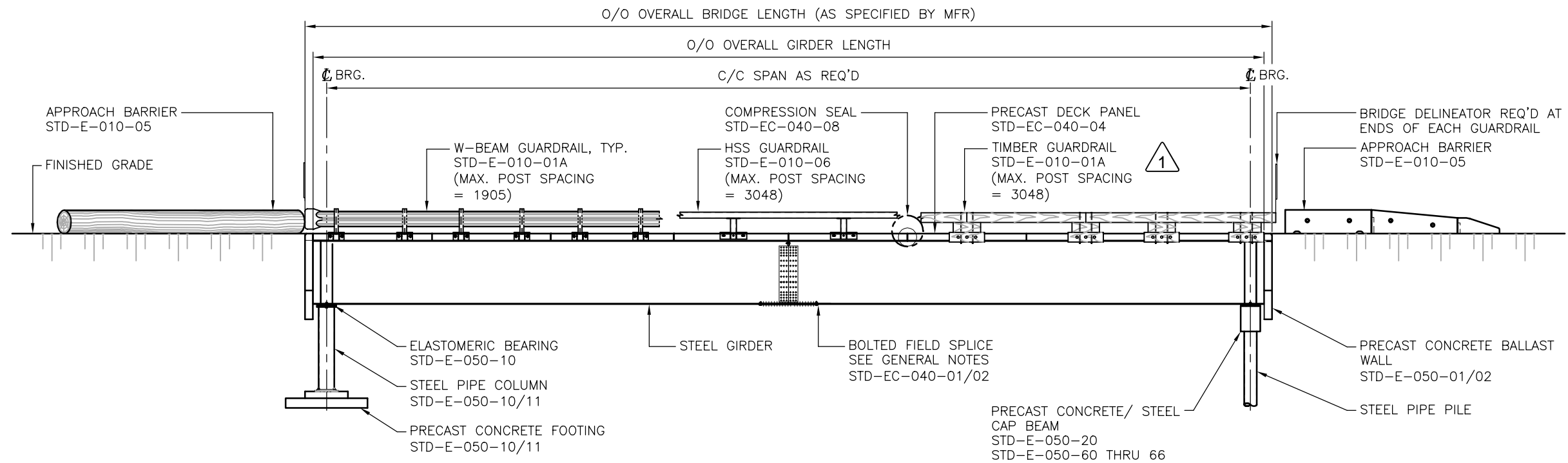
### 5 CERTIFICATION AND QUALITY CONTROL

- 5.1 PROVIDE CONCRETE TEST RESULTS BY AN APPROVED TESTING LABORATORY FOR ALL PRECAST CONCRETE COMPONENTS AND FOR FIELD GROUTING.
- 5.2 FIELD GROUT SAMPLES FOR THE BLOCKOUTS CAN COMPRISE 50 mm CUBE SAMPLES OR 50 mm DIAMETER X 100 mm CYLINDERS.
- 5.3 PROVIDE MILL CERTIFICATES FOR ALL STEEL INCORPORATED INTO THE STRUCTURE.
- 5.4 CERTIFICATION TO CSA STANDARDS FOR THE STEEL AND PRECAST CONCRETE MANUFACTURERS MUST BE IN EFFECT AT THE TIME OF TENDER OPENING AND THROUGHOUT THE MANUFACTURING PERIOD.

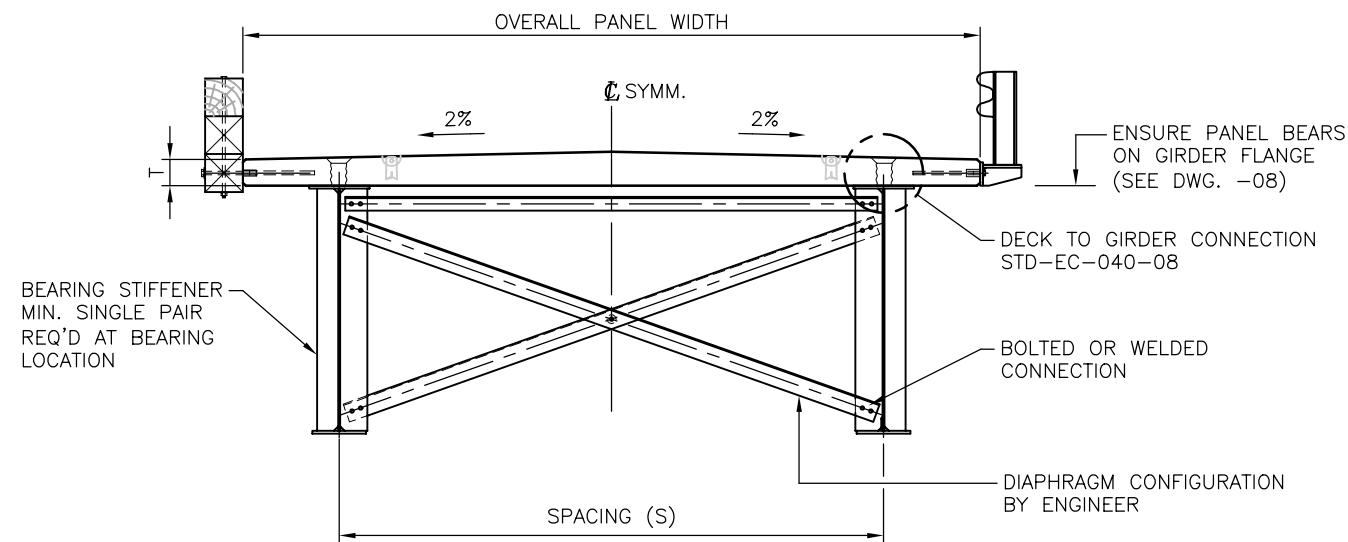


SCALE AS SHOWN		Designed <u>J.H.</u> Date <u>MAR 2010</u> Checked <u>D.J.H.</u> Date <u>MAR 2010</u> Drawn <u>W.R.</u> Date <u>MAR 2010</u>	<b>STANDARD BRIDGE DRAWING</b>
Rev	Date	DESCRIPTION	<b>STANDARD STEEL GIRDER BRIDGE WITH NON-COMPOSITE DECK GENERAL NOTES - SHEET 2</b>
REVISIONS			

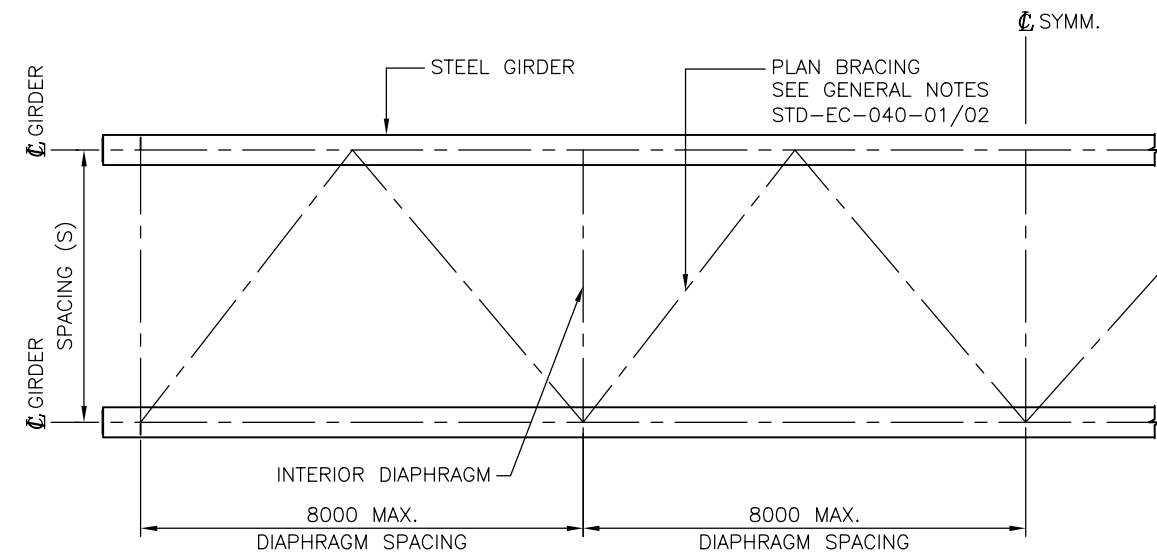
ORIGINAL SIGNED and SEALED BY: <b>JULIEN HENLEY</b>	APPROVED BY:
DESIGN ENGINEER	MOF ENGINEER
DATE <b>JULIEN HENLEY</b>	DATE
FILE No.	DRAWING No. <b>STD-EC-040-02</b>



**BRIDGE ELEVATION**  
1:125



**BRIDGE SECTION**  
1:50



**PARTIAL PLAN - STEEL GIRDERS**  
1:100

**ASSUME NOT TO SCALE**  
**ORIGINAL SIGNED AND SEALED**

SCALE AS SHOWN

Designed: J.H. Date: MAR 2010  
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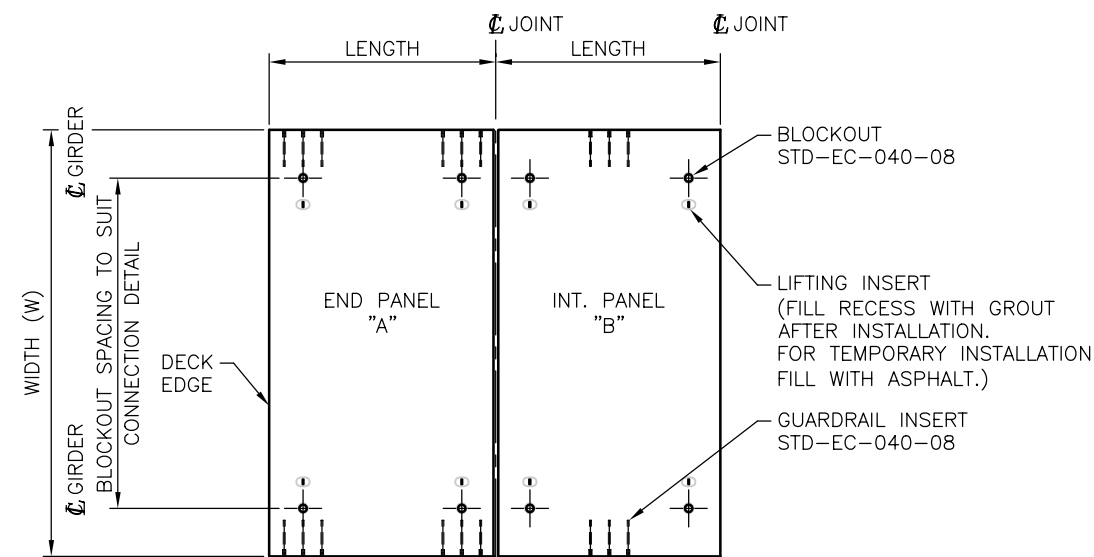
**STANDARD BRIDGE DRAWING**

Rev	Date	DESCRIPTION	Init
1	APR. 2011	REVISED STANDARD DRAWING NUMBERS	

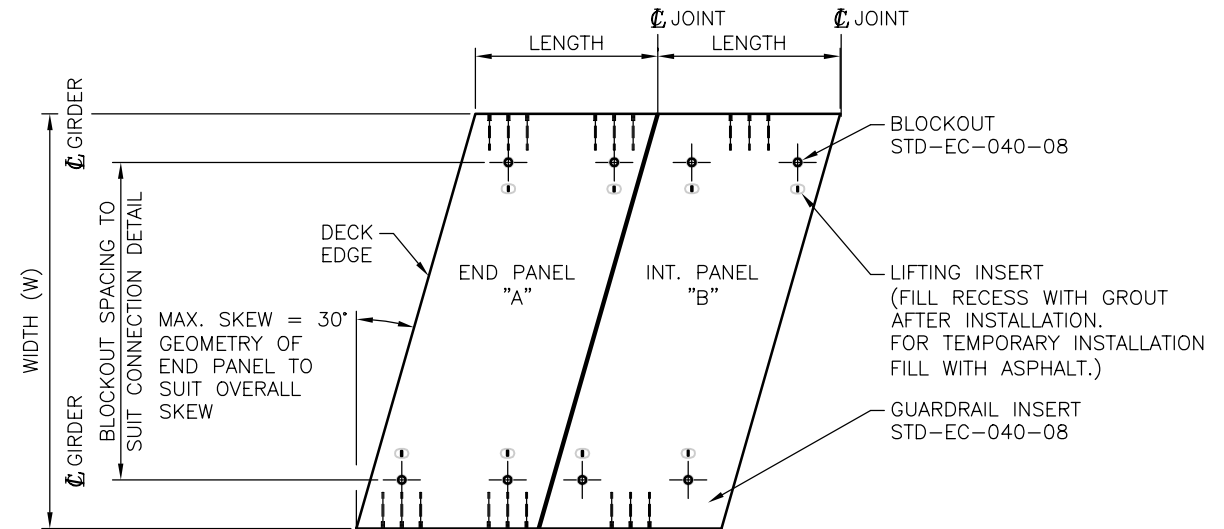
**STANDARD STEEL GIRDER BRIDGE WITH NON-COMPOSITE DECK GENERAL ARRANGEMENT**

ORIGINAL SIGNED and SEALED BY: JULIEN HENLEY	APPROVED BY:
DESIGN ENGINEER	MOF ENGINEER
DATE JULIEN HENLEY	DATE
FILE No.	DRAWING No.

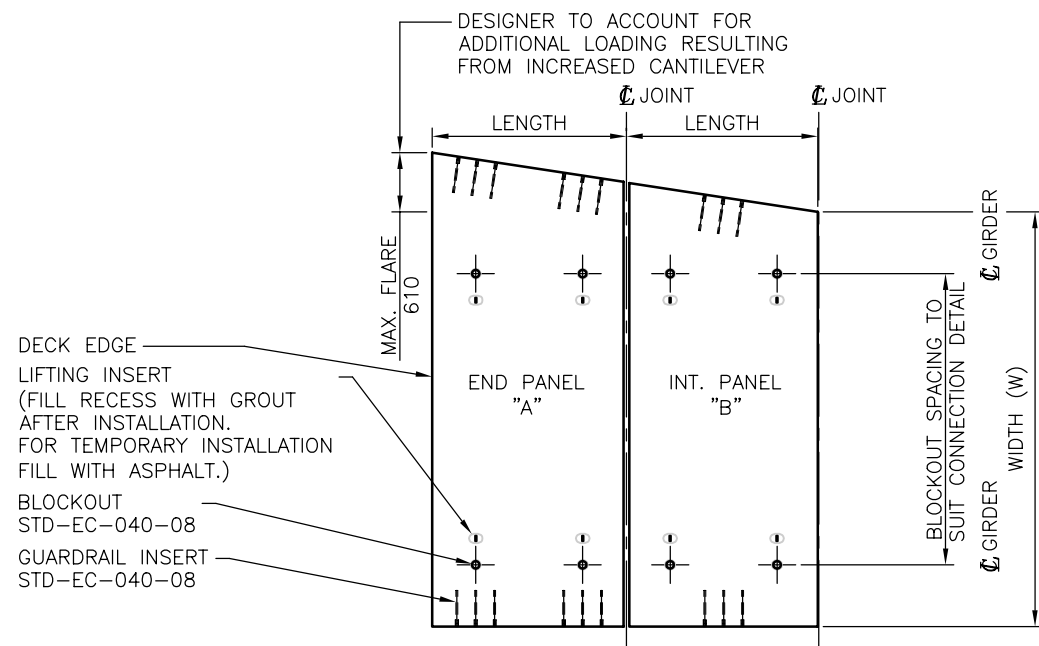
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**TYPE 1 – SQUARE PANEL GEOMETRY – PLAN**  
1:100



**TYPE 3 – SKEWED PANEL GEOMETRY (SKEW MAX. 30°) – PLAN**  
1:100



**TYPE 2 – FLARED PANEL GEOMETRY – PLAN**  
1:100

**NOTES:**

- DECK PANEL LENGTH:**
- THE PREFERRED DECK PANEL LENGTH IS 3048 (10').
  - NOTWITHSTANDING, DECK PANEL LENGTHS SHOULD CONFORM TO THE FOLLOWING:
    - MINIMUM DECK PANEL LENGTH: 1524 mm
    - MAXIMUM INTERNAL DECK PANEL LENGTH: 3048 mm
    - MAXIMUM END DECK PANEL LENGTH (DECK BESIDE BALLAST WALL): 3048 mm
    - MAXIMUM END PANEL LENGTH (DECK OVER BALLAST WALL): 3300 mm

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SCALE AS SHOWN  
Designed J.H. Date MAR 2010  
Checked D.J.H. Date MAR 2010  
Drawn W.R. Date MAR 2010

**STANDARD BRIDGE DRAWING**

**STANDARD STEEL GIRDER BRIDGE WITH NON-COMPOSITE DECK PRECAST DECK PANEL TYPES**

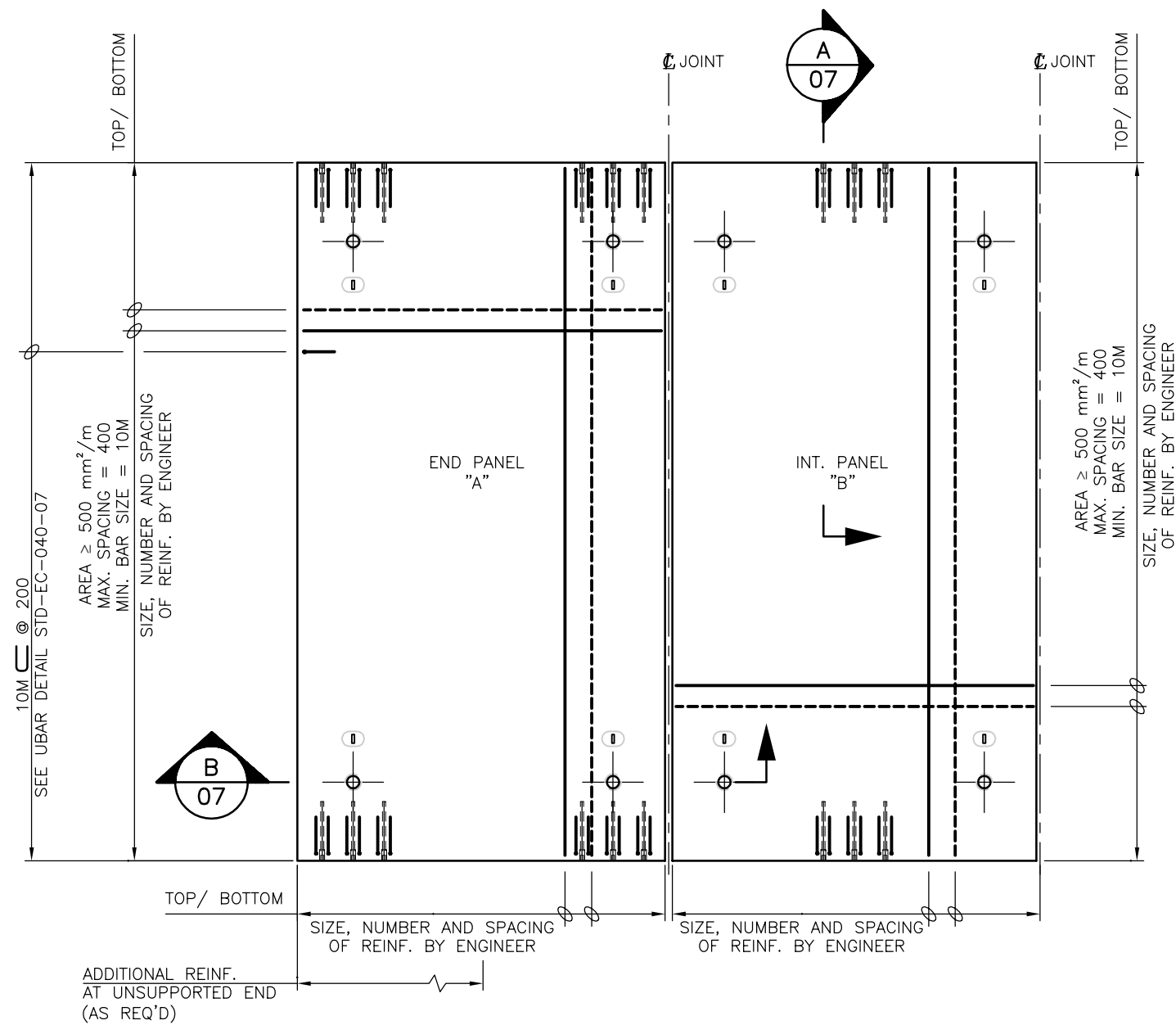
ORIGINAL SIGNED and SEALED BY: JULIEN HENLEY  
APPROVED BY:

DESIGN ENGINEER: JULIEN HENLEY  
MOF ENGINEER  
DATE: JULIEN HENLEY  
DATE:

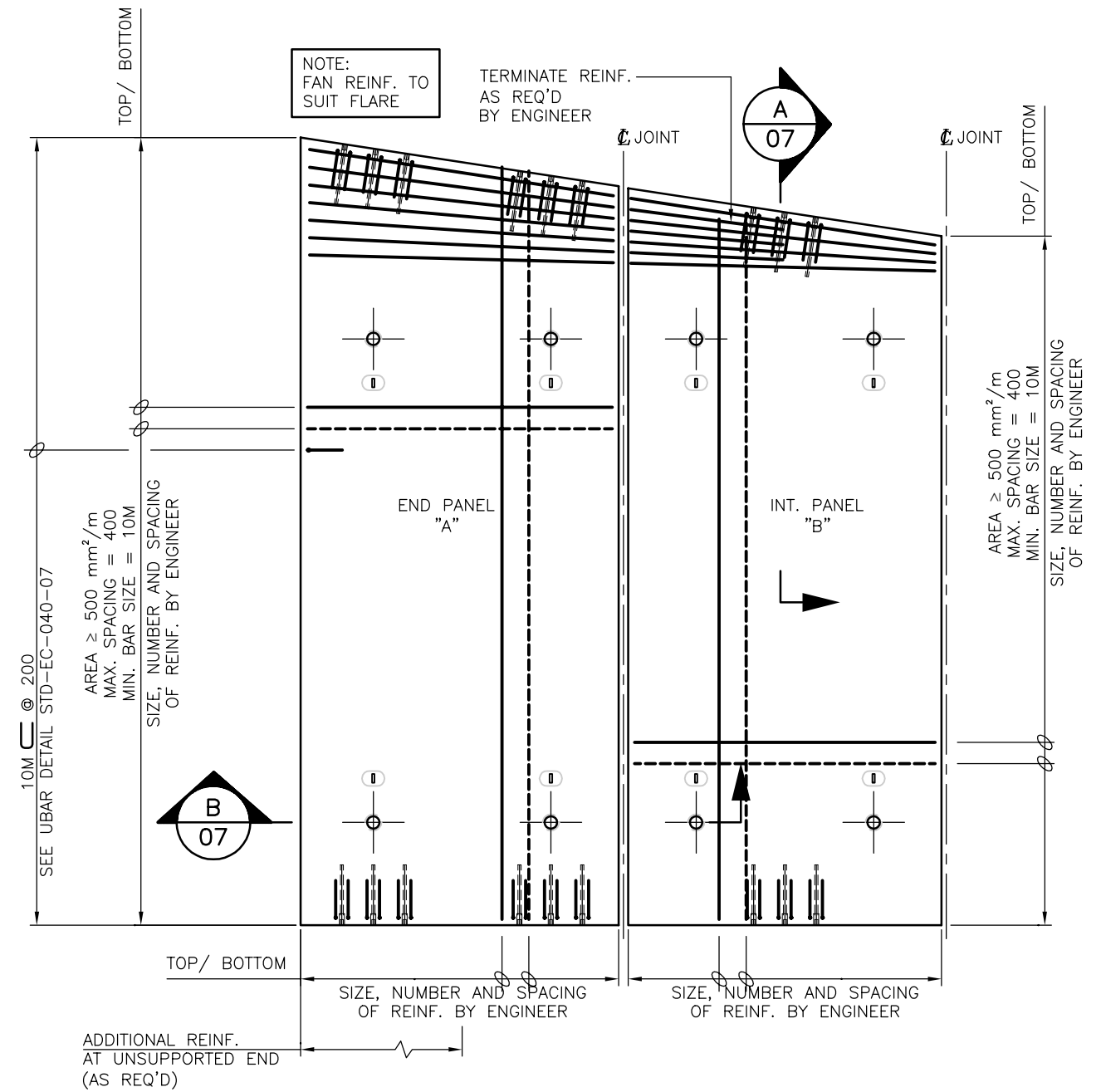
FILE No. DRAWING No. STD-EC-040-04

Rev	Date	DESCRIPTION	Init

REVISIONS



TYPE 1 - REINFORCEMENT PLAN  
1:50



TYPE 2 - REINFORCEMENT PLAN  
1:50

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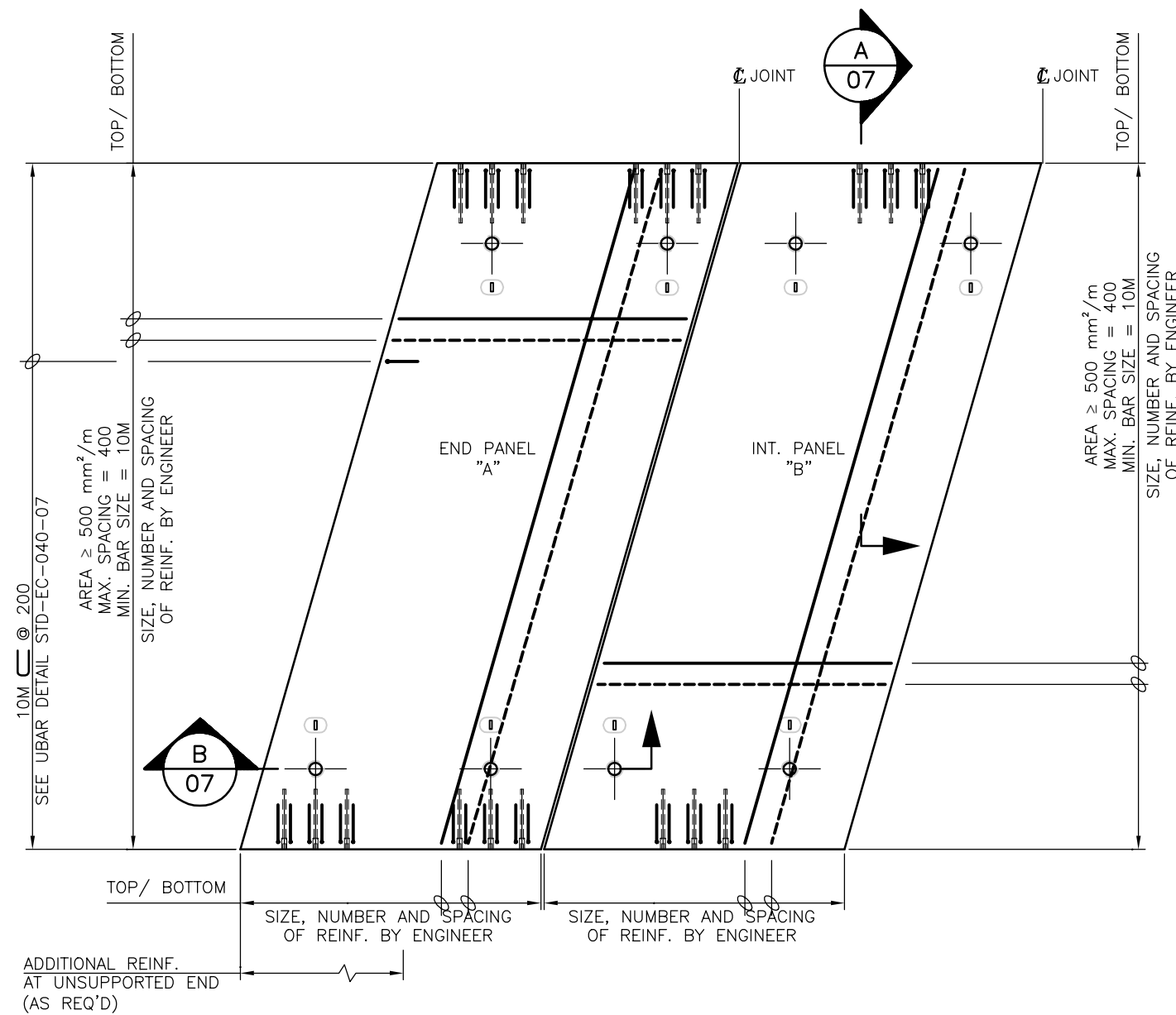
SCALE AS SHOWN  
 Designed: J.H. Date: MAR 2010  
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 Drawn: W.R. Date: MAR 2010

STANDARD BRIDGE DRAWING

Rev	Date	DESCRIPTION	Init

STANDARD STEEL GIRDER BRIDGE WITH NON-COMPOSITE DECK  
PRECAST DECK PANEL TYPE 1 & TYPE 2 - REINFORCING

ORIGINAL SIGNED and SEALED BY: JULIEN HENLEY	APPROVED BY:
DESIGN ENGINEER	MOF ENGINEER
DATE: JULIEN HENLEY	DATE:
FILE No.	DRAWING No.
	STD-EC-040-05



**TYPE 3 – REINFORCEMENT PLAN**  
1:50

**ASSUME NOT TO SCALE**  
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SCALE AS SHOWN  
Designed J.H. Date MAR 2010  
Checked D.J.H. Date MAR 2010  
Drawn W.R. Date MAR 2010

**STANDARD BRIDGE DRAWING**

Rev	Date	DESCRIPTION	Init

**STANDARD STEEL GIRDER BRIDGE WITH NON-COMPOSITE DECK PRECAST DECK PANEL TYPE 3 – REINFORCING**

ORIGINAL SIGNED and SEALED BY: JULIEN HENLEY  
APPROVED BY:

DESIGN ENGINEER: JULIEN HENLEY  
MOF ENGINEER

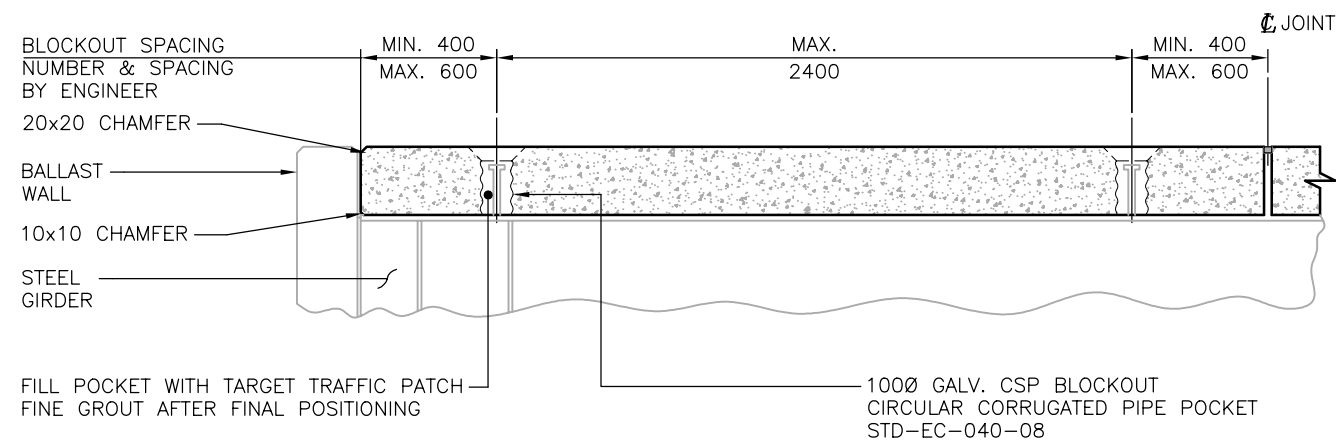
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DATE

REVISIONS

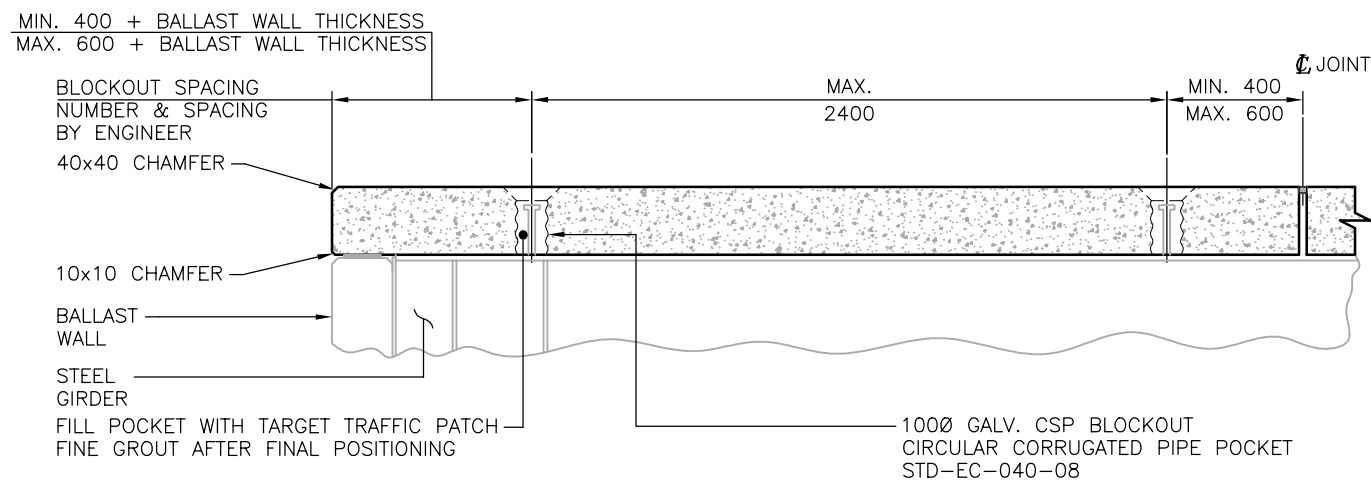
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**STD-EC-040-06**

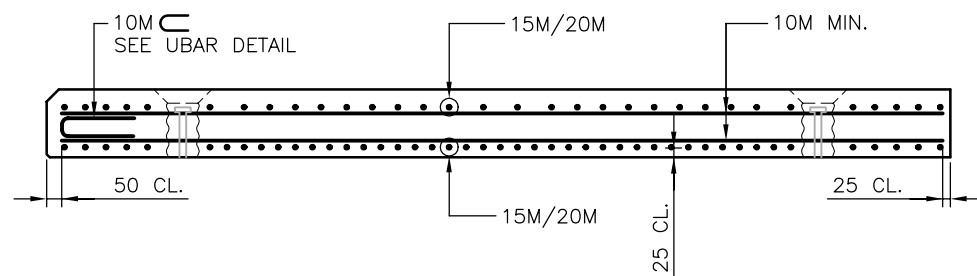




**BLOCKOUT SPACING – DECK PANEL BESIDE BALLAST WALL**  
1:25

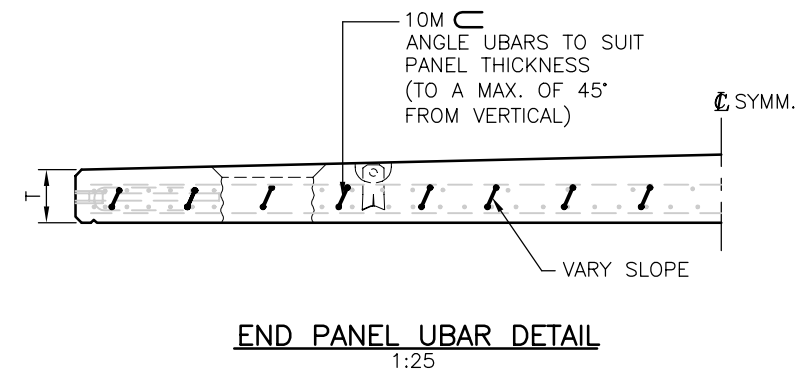
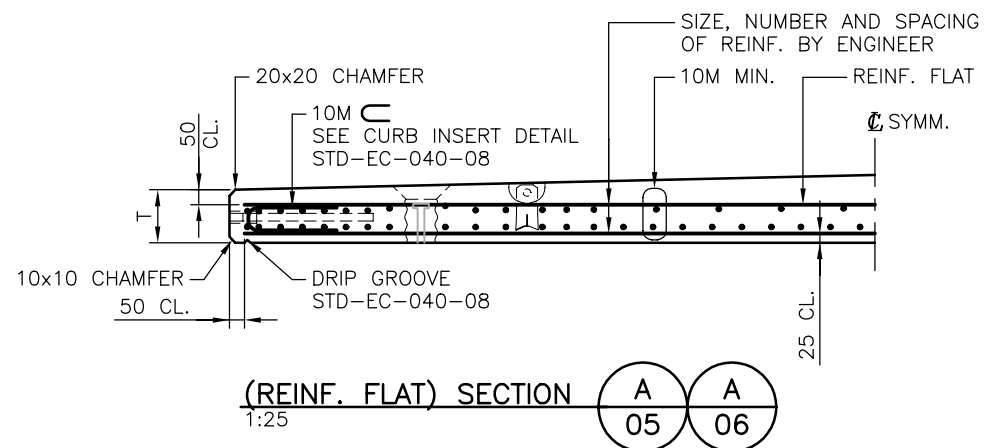
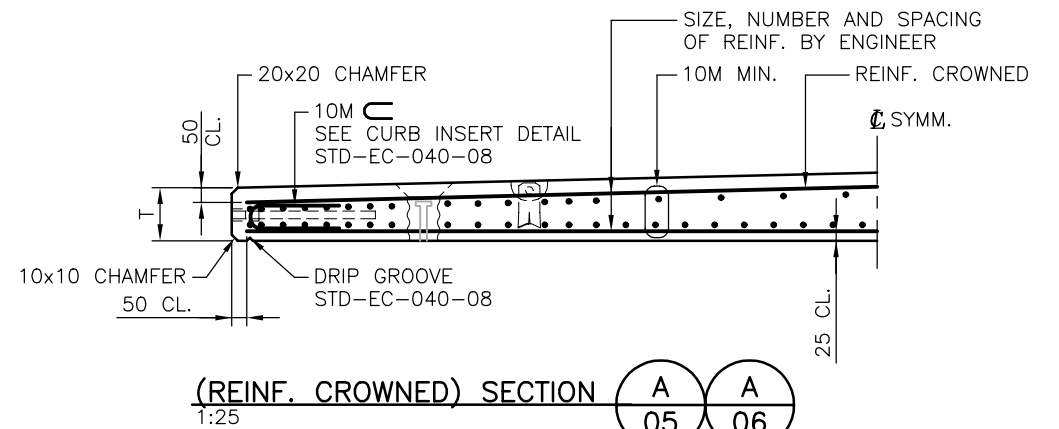


**BLOCKOUT SPACING – DECK PANEL OVER BALLAST WALL**  
1:25



**SECTION B B**  
1:25  
05 06

**ASSUME NOT TO SCALE**  
**ORIGINAL SIGNED AND SEALED**



**BRITISH COLUMBIA**  
The Best Place on Earth

**MINISTRY OF FORESTS & RANGE**  
**ENGINEERING BRANCH, FIELD OPERATIONS DIVISION**

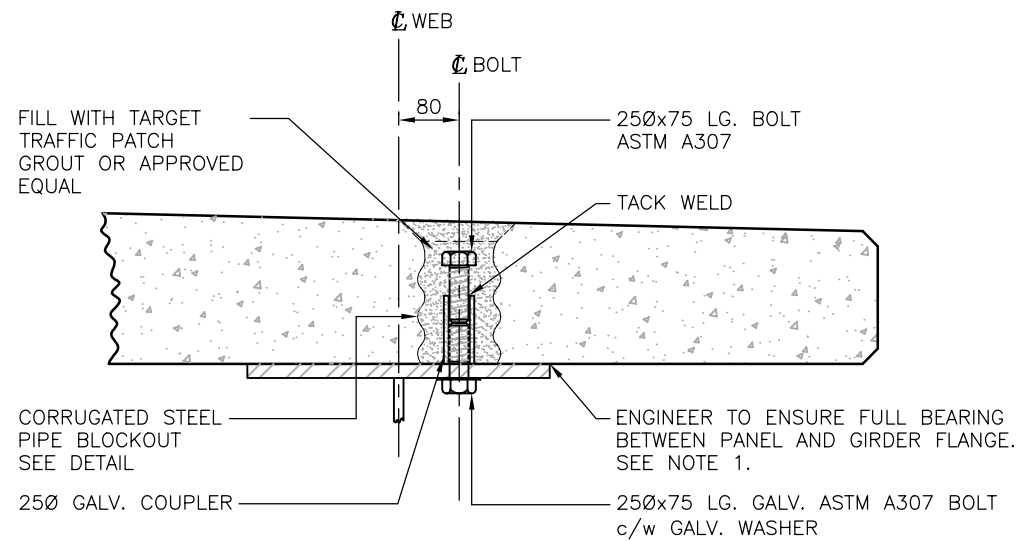
SCALE AS SHOWN

Designed J.H. Date MAR 2010  
Checked D.J.H. Date MAR 2010  
Drawn W.R. Date MAR 2010

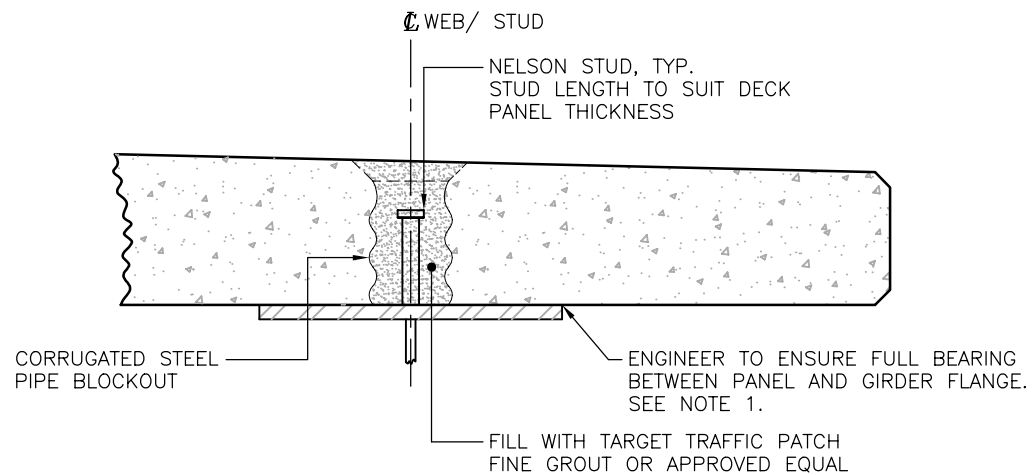
Rev	Date	DESCRIPTION	Init

<b>STANDARD BRIDGE DRAWING</b>	
<b>STANDARD STEEL GIRDER BRIDGE WITH NON-COMPOSITE DECK PRECAST DECK PANEL – SECTIONS</b>	
ORIGINAL SIGNED and SEALED BY: JULIEN HENLEY	APPROVED BY:
DESIGN ENGINEER JULIEN HENLEY	MOF ENGINEER
DATE	DATE
FILE No.	DRAWING No. STD-EC-040-07

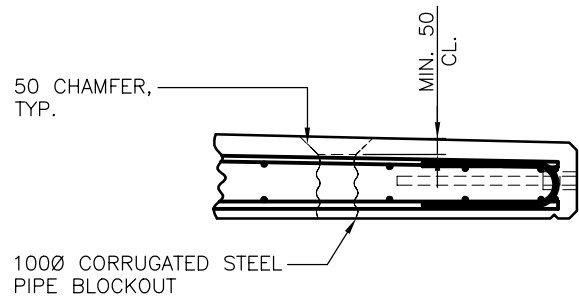




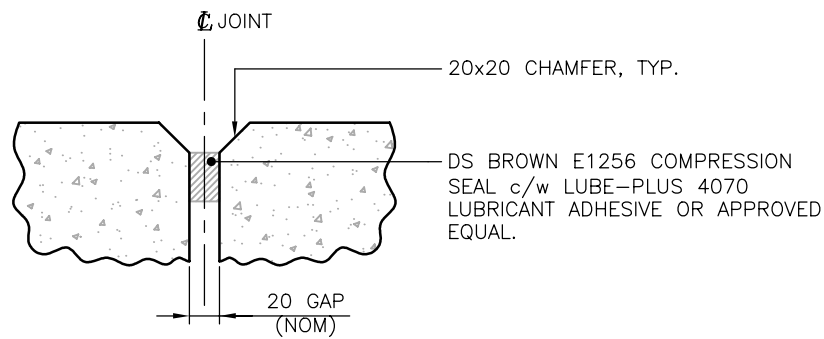
**REMOVABLE DECK/ GIRDER CONNECTION DETAIL**  
1:10 (4 REQ'D PER PANEL)



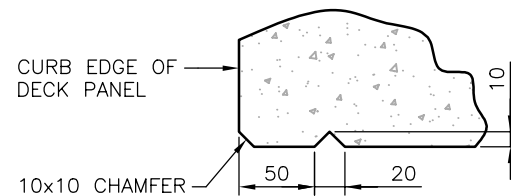
**NON-REMOVABLE DECK/ GIRDER CONNECTION DETAIL**  
1:10 (4 REQ'D PER PANEL)



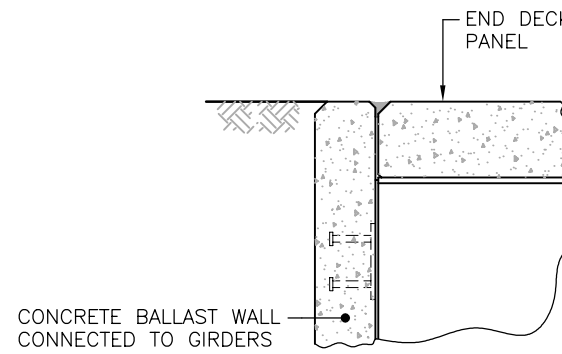
**CORRUGATED PIPE BLOCKOUT**  
1:20



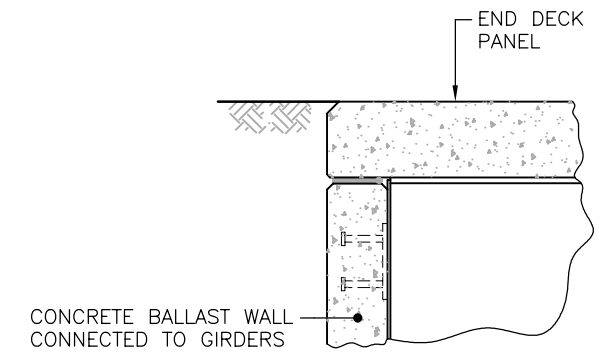
**PANEL JOINT DETAIL**  
1:10



**DRIP GROOVE DETAIL**  
1:5



**DECK BESIDE BALLAST WALL DETAIL**  
1:25

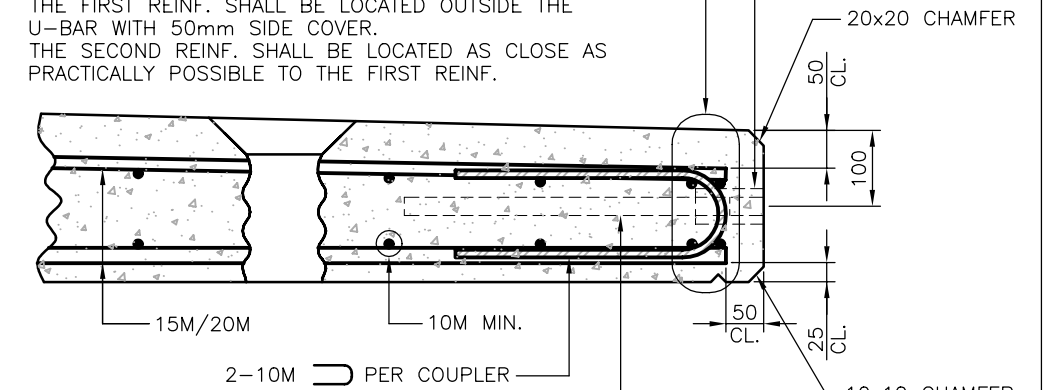


**DECK OVER BALLAST WALL DETAIL**  
1:25

NOTE:  
FOR DETAILS REFER TO M.F.R. STD. DWG. STD-E-050-01

250 GALV. COUPLER, TYP.  
MIN. TENSILE STRENGTH = 69 kN

THE FIRST AND SECOND LONGITUDINAL REINF. FROM THE DECK EDGE (TOP AND BOTTOM) SHALL BE LOCATED, AS SHOWN.  
THE FIRST REINF. SHALL BE LOCATED OUTSIDE THE U-BAR WITH 50mm SIDE COVER.  
THE SECOND REINF. SHALL BE LOCATED AS CLOSE AS PRACTICALLY POSSIBLE TO THE FIRST REINF.



25M x 430 LG. REINF. THREADED ONE END.  
FOR NUMBER AND LOCATION, REFER TO APPLICABLE GUARDRAIL STANDARD DRAWING.

**GUARDRAIL INSERT EDGE REBAR DETAIL**  
1:10

NOTE:  
1. THIS TYPE OF DECK SYSTEM USES PANEL ATTACHMENT DETAILS THAT DO NOT PROVIDE VERTICAL SUPPORT OF THE DECK PANELS. THE ENGINEER SHALL TAKE MEASURES TO ENSURE ADEQUATE VERTICAL SUPPORT OF THE DECK PANELS IS ACHIEVED.

**ASSUME NOT TO SCALE**

**ORIGINAL SIGNED AND SEALED**

SCALE AS SHOWN  
Designed: J.H. Date: MAR 2010  
Checked: D.J.H. Date: MAR 2010  
Drawn: W.R. Date: MAR 2010

**STANDARD BRIDGE DRAWING**

Rev	Date	DESCRIPTION	Init

STANDARD STEEL GIRDER BRIDGE WITH NON-COMPOSITE DECK PRECAST DECK PANEL - DETAILS	
ORIGINAL SIGNED and SEALED BY: JULIEN HENLEY	APPROVED BY:
DESIGN ENGINEER	MOF ENGINEER
DATE: JULIEN HENLEY	DATE:
FILE No.	DRAWING No.

REVISIONS

**STD-EC-040-08**