

**ALL STEEL PORTABLE STRUCTURE**

**1. DESIGN USAGE**

1.1 ALL STEEL PORTABLE BRIDGES, AS SHOWN IN THESE CONCEPTUAL STANDARD DRAWINGS, ARE INTENDED TO BE USED ONLY FOR TEMPORARY BRIDGING APPLICATIONS, WITH MINIMAL BRIDGE DECK GRADES, WHERE BRAKING AND TURNING VEHICLE ACTIONS ARE NOT ANTICIPATED, AND WHERE TRAFIC SPEEDS ARE LOW. OTHER STRUCTURE CONFIGURATIONS ARE RECOMMENDED FOR CROSSINGS THAT ARE REQUIRED FOR LONGER TIME FRAMES, HAVE STEEP GRADES, OR INVOLVE VEHICLE BRAKING OR TURNING ACTION ON THE STRUCTURE, AND HIGHER TRAFFIC SPEEDS.

**2. DEFINITIONS**

2.1 DESIGN ENGINEER: PROFESSIONAL ENGINEER REGISTERED IN THE PROVINCE OF BRITISH COLUMBIA EXPERIENCED IN THE DESIGN OF STEEL PORTABLE BRIDGES FOR INDUSTRIAL APPLICATIONS AND RETAINED BY THE CONTRACTOR OR FABRICATOR TO COMPLETE THE DETAILED DESIGN OF THE ALL-STEEL PORTABLE BRIDGE.

2.2 MINISTRY REGIONAL ENGINEER: PROFESSIONAL ENGINEER DESIGNATED BY THE MINISTRY OF FORESTS AND RANGE.

**3. GENERAL**

3.1 DETAILED STRUCTURAL ENGINEERING TO BE COMPLETED BY DESIGN ENGINEER. DOCUMENTED CONCEPT REVIEW IN ACCORDANCE WITH APEGBC BYLAW 14(b) SHALL UPON REQUEST BY MINISTRY OF FORESTS AND RANGE BE PROVIDED TO THE MINISTRY REGIONAL ENGINEER.

3.2 NO TRUSS OR OPEN WEB TYPE STRUCTURES WILL BE ACCEPTED UNLESS APPROVED BY MINSITRY REGIONAL ENGINEER.

3.3 SKID PLATES TO BE PROVIDED AT BEARING LOCATIONS IF REQUIRED BY CONTRACT SPECIFICATIONS.

3.4 DELINEATORS TO BE PROVIDED AS REQUIRED BY CONTRACT SPECIFICATIONS.

3.5 ALL BRIDGES TO BE SUPPLIED WITH PERMANENT LIFTING BRACKETS (INCL. SHACKLES) TO ALLOW BRIDGE TO BE LIFTED BY EXCAVATOR.

3.6 NAME PLATE: ALL BRIDGES SHALL HAVE THEIR STRUCTURE NUMBER, MODULE WEIGHT, DATE OF FABRICATION, LOAD RATING, MANUFACTURERS NAME AND "MINISTRY OF FOREST AND RANGE" PERMANENTLY MARKED ON EACH MODULE. (MIN. HEIGHT OF LETTERING 50 MM).

3.7 WHERE WEB INCLINATION EXCEEDS 20° FROM THE VERTICAL PRIOR APPROVAL IS REQUIRED FROM THE MINISTRY REGIONAL ENGINEER.

3.8 LOADING AS DEFINED IN CONTRACT SPECIFICATIONS AND IN ACCORDANCE WITH CAN/CSA-S6 AND/OR FOREST SERVICE BRIDGE DESIGN AND CONSTRUCTION MANUAL, 1999.

3.9 LIVE LOAD:

- CL625: AS SPECIFIED BY CAN/CSA-S6-00
- BCFS L100, L150 AND L165: AS SPECIFIED BY FOREST SERVICE BRIDGE DESIGN AND CONSTRUCTION MANUAL, 1999.

3.10 FATIGUE:

- BASED ON 500,000 LOADED TRUCKS CROSSING STRUCTURE. ACTUAL NUMBER OF STRESS CYCLES DEPENDANT ON ELEMENT BEING EVALUATED. DESIGN ENGINEER TO DETERMINE ACTUAL NUMBER OF STRESS CYCLES.
- FATIGUE EVALUATION COMPLETED ASSUMING 50-50 LOAD DISTRIBUTION AND TRUCK CENTRED ON ROADWAY.
- FOR BRIDGES DESIGNED TO CL625 FATIGUE EVALUATION TO BE BASED ON 100% OF CL625 DESIGN VEHICLE AND S6-00 STRESS RANGES.
- FOR BRIDGES DESIGNED TO BCFS L100 AND L150 FATIGUE EVALUATION TO BE BASED ON 100% OF DESIGN VEHICLE AND S6-88 STRESS RANGES.
- FOR BRIDGES DESIGNED TO BCFS L165 FATIGUE EVALUATION TO BE COMPLETED USING BCFS L150 AS NOTED ABOVE.

3.11 MAXIMUM LIVE LOAD DEFLECTION: SPAN/350 (TRUCK CENTERED IN ROADWAY; 50-50 LOAD DISTRIBUTION; INCLUDES DLA DEFLECTION) TO BE CALCULATED USING SPECIFIED DESIGN VEHICLE EXCEPT FOR BCFS L165 WHERE DEFLECTION TO BE CALCULATED USING BCFS L150.

**4. MATERIALS & FABRICATION**

4.1 STEEL FABRICATION: FABRICATOR TO BE CERTIFIED FOR DIVISION 1 OR 2 IN ACCORDANCE WITH CSA W47.1

4.2 STEEL: CSA G40.21M GRADE 350AT CAT 3 (STEEL PLATE)  
GRADE 350A (ROLLED SECTIONS)  
GRADE 350W (TUBE) HSS.

4.3 BOLTS: ASTM A325 TYPE 3

4.4 WELDING: - ALL WELDING TO CONFORM TO CSA W59

- WELD SYMBOLS SHOWN INDICATE APPROVED WELD TYPES, WELD SIZE TO BE DETERMINED BY DESIGN ENGINEER.
- INSPECTION OF WELDING SHALL MEET THE REQUIREMENTS OF CSA W59.
- ALL BUTT WELDS ON THE FLANGE, WEB, & DECK SHALL BE RADIOGRAPHIC OR ULTRASONIC TESTED IN ACCORDANCE WITH CSA W59
- THE WELDING PROCEDURE DATA SHEETS, AS PER CSA W47.1, SHALL BE AVAILABLE FOR REVIEW PRIOR TO FABRICATION.
- THE DESIRED OBJECTIVE FOR FLANGE TO WEB WELDS, IS THAT THEY BE MADE AS CONTINUOUS, UNINTERRUPTED AND UNIFORM WELDS FREE OF ABNORMALITIES THAT COULD RESULT IN STRESS CONCENTRATIONS.
- GENERALLY WEB TO FLANGE WELDS SHALL BE MADE CONTINUOUSLY BY MACHINE OR AUTOMATIC WELDING USING SUBMERGED ARC WELDING, FLUX CORED ARC WELDING OR METAL CORED ARC WELDING.
- THERE MAY BE INSTANCES WHERE THE MINISTRY MAY ACCEPT GIRDER WEB TO FLANGE WELDS WITH STOPS AND STARTS IN THE DEPOSITION OF WELD MATERIAL (e.g. AT PLATE DIAPHRAGM LOCATIONS ON BOX GIRDERS, AT CERTAIN END OF GIRDER LOCATIONS WITH LIMITED ACCESS, OR UPON OCCASIONS OF UNEXPECTED POWER OUTAGES). HOWEVER, CONTINUOUS WELDS MADE BY AUTOMATIC OR MACHINE METHODS ARE REQUIRED WHEREVER IT IS REASONABLY PHYSICALLY POSSIBLE (e.g. WELDS MADE ON THE OUTSIDE OF ALL STEEL PORTABLE BOX GIRDERS, AND INTERIOR WELDS ON ALL STEEL PORTABLE BOX GIRDERS EXCEPT AS PREVIOUSLY NOTED IN THIS PARAGRAPH).
- WHERE WELDS REQUIRE REPAIR, THEY MAY BE REPAIRED USING A SEMI-AUTOMATIC OR MANUAL PROCESS, BUT THE REPAIRED WELD SHALL BLEND SMOOTHLY WITH THE ADJACENT WELDS. WELD REPAIRS SHALL BE UNDERTAKEN IN ACCORDANCE WITH CSA W59.

4.5 WEARING SURFACE: SURFACE PREPARATION SANDBLAST TO SSPC-SP6, COATING AMERLOCK 400 (OR EQUIVALENT EPOXY COATING APPROVED BY MINISTRY REGIONAL ENGINEER) C/W 16 GRIT SAND TO PROVIDE ANTI-SKID WEARING SURFACE.

4.6 GUARD RAILS & POSTS: SURFACE PREPARATION AND PAINTING AS PER MINISTRY SPECIFICATIONS.

4.7 BEARING PLATE TO BE DESIGNED TO ALLOW BRIDGE TO BE SUPPORTED ON FULL WIDTH DFIR NO.2 TIMBER SILL (MIN. WIDTH 400 MM)

ASSUME NOT TO SCALE  
NOT FOR CONSTRUCTION

SCALE AS SHOWN				Designed: J.H. Date: FEB 2007 Checked: J.H. Date: FEB 2007 Drawn: J.H. Date: FEB 2007
Rev	Date	DESCRIPTION	INIT	
REVISIONS				

**Province of British Columbia**  
MINISTRY OF FORESTS AND RANGE  
RESOURCE TENURES and ENGINEERING BRANCH

STANDARD BRIDGE DRAWING

TYPICAL ALL STEEL PORTABLE SUPERSTRUCTURE  
CONCEPTUAL GENERAL ARRANGEMENT SHEET 2 OF 2

ORIGINAL DRAWN AND SEALED BY: <b>DAVID I. HARVEY, P.ENG.</b>		APPROVED BY: 
DESIGN ENGINEER <b>JULIEN HENLEY, P.ENG.</b>	DATE: _____	

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CANCEL PRINTS BEARING PREVIOUS LETTER