STRUCTURAL – GENERAL NOTES

GENERAL REQUIREMENTS

DESIGN AND SPECIFICATIONS: Bridge design and construction to conform with AASHTO LRFD Bridge Design Specification, 8th Edition and approved state amendments.

MEANS, METHODS and SAFETY REQUIREMENTS: The contractor is responsible for the means and methods of construction and all job related safety standards such as OSHA and DOSH (Department of Occupational Safety and Health). The contractor is responsible for means and methods of construction related to the intermediate structural conditions (i.e. movement of the structure due to moisture and thermal effects; construction sequence; temporary bracing, etc).

TEMPORARY SHORING, BRACING: The contractor is responsible for the strength and stability of the structure during construction and shall provide temporary shoring, bracing and other elements required to maintain stability until the structure is complete. It is the contractor's responsibility to be familiar with the work required in the construction documents and the requirements for executing it properly.

DESCREPANCIES: In case of discrepancies between the General Notes, Specifications, Plans/Details or Reference Standards, the Engineer shall determine which shall govern. Discrepancies shall be brought to the attention of the Engineer before proceeding with the work.

SITE VERIFICATION: The contractor shall verify all dimensions and conditions at the site. Conflicts between the drawings and actual site conditions shall be brought to the attention of the Engineer before proceeding with the work.

ADJACENT UTILITIES: The contractor shall determine the location of all adjacent underground utilities prior to earthwork, foundations, shoring, and excavation. Any utility information shown on the drawings and details is approximate and not necessarily complete.

GUARDRAILS: Design of any guardrails, crash barriers and pedestrian railings is by others. Owner/contractor is responsible to retain Civil Engineer to coordinate the design and layout of any guardrail and pedestrian railing systems. All connections to the structure to be reviewed and approved by Premier Steel Services.

SOILS AND FOUNDATIONS

FOUNDATIONS: Foundations shall bear either on competent native soil or compacted structural fill. Tops of footings shall be as shown on plans with vertical changes as indicated with steps in footings; locations of steps shown as approximate and shall be coordinated with the civil grading plans.

CONTRACTOR'S RESPONSIBILITIES: Contractor shall be responsible for all subgrade preparation, temporary excavation, retention, groundwater management and all other aspects associated to the geotechnical preparation.

GEOTECHNICAL SUBGRADE INSPECTION: Design of the foundations have been based upon assumed conditions without use of a site–specific Geotechnical Report. DCI recommends the Owner/Contractor retain a Geotechnical Consultant to inspect all sub–grades and prepared soil bearing surfaces, prior to placement of foundation reinforcing steel and concrete. Owner/Contractor Geotechnical Consultant shall provide a letter to the owner stating that soils are adequate to support the "Allowable Foundation Bearing Pressure(s)" shown below. Assumed values shall be field verified by the Authority Having Jurisdiction or the Geotechnical Engineer prior to placing concrete.

ASSUMED DESIGN SOIL VALUES:

Allowable Foundation Bearing Pressure	3000 PSF – Native or Structural Fill
Active Lateral Pressure (unrestrained)	45 PSF/FT
At–Rest Lateral Pressure (restrained)	65 PSF/FT
Surcharge Lateral Pressure	8H PSF
Coefficient of Sliding Friction	0.35
Modulus of Subgrade	150 PCI

SLABS–ON GRADE: All slabs–on–grade shall bear on compacted structural fill or competent native soil.

CAST–IN–PLACE CONCRETE

REFERENCE STANDARDS: Conform to:
(1) AASHTO LRFD Bridge Specification, Section 6 – "Concrete Structures"
(2) AASHTO Standard Specification for Materials and Methods of Sampling and Testing
(3) ACI 301 – "Specifications for Structural Concrete"
(4) ACI 117 – "Specifications for Tolerances for Concrete Construction and Materials"

MATERIALS: Conform to AASHTO Standard Specification M43, M157 & M194 or ACI 301 for requirements for cementitious materials, aggregates, mixing water and admixtures.

Concrete Bridge Deck & Beams	fc = 4000 psi at 28 days, Class B
Retaining Walls and Footings	fc = 4000 psi at 28 days, Class B
Miscellaneous Concrete	fc = 3000 psi at 28 days, Class B

MEASURING, MIXING, AND DELIVERY: Conform to ACI 301.

HANDLING, PLACING, CONSTRUCTING AND CURING: Conform to ACI 301 Section 5. In addition, hot weather concreting shall conform to ACI 305R–10 and cold weather concreting shall conform to ACI 206R–10.

STRENGTH TESTING AND ACCEPTANCE: Obtain samples and conduct tests in accordance with AASHTO T–23 or ACI 301 Section 1.6.3.2. Additional samples may be required to obtain concrete strengths at alternate intervals than shown below.

- Cure 4 cylinders for 28–day test age test 1 cylinder at 7 days, test 2 cylinders at 28 days, and hold 1 cylinder in reserve for use as the Engineer directs. After 56 days, unless notified by the Engineer to the contrary, the reserve cylinder may be discarded without being tested for specimens meeting 28–day strength requirements.
- The number of cylinders indicated above reference 6 by 12 in. cylinders. If 4 by 8 in. cylinders are to be used, additional cylinders must be cured for testing of 3 cylinders at test age per the table of mix design requirements.

Acceptance: Strength is satisfactory when:
(1) The averages of all sets of 3 consecutive tests equal or exceed the specified strength.
(2) No individual test falls below the specified strength by more than 500 psi.

A "test" for acceptance is the average strength of two 6 by 12 in. cylinders or three 4 by 8 in. cylinders tested at the specified test age.

SURFACE FINISH: Unless otherwise specified, provide ordinary surface finish on formed surfaces.

CONCRETE PLACEMENT TOLERANCE: Conform to ACI 117–10 for concrete placement tolerance.

EMBEDDED ITEMS: Position and secure in place expansion joint material, anchors and other structural and non–structural embedded items before placing concrete. Contractor shall refer to mechanical, electrical, plumbing and architectural drawings and coordinate other embedded items.

CONCRETE REINFORCEMENT

REFERENCE STANDARDS: Conform to:

(1) ACI 301–16 "Standard Specifications for Structural Concrete", Section 3 "Reinforcement and Reinforcement Supports."
(2) CRSI MSP–09, 28th Edition, "Manual of Standard Practice"
(3) ANSI/AWS D1.4:2005, "Structural Welding Code – Reinforcing Steel"
(4) AASHTO LRFD Bridge Specification, Section 5 – "Concrete Structures"
(5) ACI 117–10 "Specifications for Tolerances for Concrete Construction and Materials"

MATERIALS:

Reinforcing Bars	ASTM A615, Grade 60, deformed bars ASTM A615, Grade 75, deformed bars for #11 ASTM A706, Grade 60, deformed bars
Epoxy Coated Reinforcing Bars	ASTM A775 or A934
Smooth Welded Wire Fabric	ASTM A1064
Deformed Welded Wire Fabric	ASTM A1064
Bar Supports	CRSI MSP–09, Chapter 3 "Bar Supports"
Tie Wire	16 gage or heavier, black annealed
Headed Deformed Bars	ASTM A970

FABRICATION: Conform to ACI 301, Section 3.2.2. "Fabrication" and ACI SP–66 "ACI Detailing Manual"

WELDING: Bars shall not be welded unless authorized. When authorized, conform to ACI 301, Section 3.2.2.2. "Welding", AWS D1.4, and provide ASTM A706, grade 60 reinforcement.

PLACING: Conform to ACI 301, Section 3.2.2. "Placing." Placing tolerances shall conform to ACI 117.

CONCRETE COVER: Conform to AASHTO LRFD, Table 5.10.1–1 Cover for Unprotected Main Reinforcing Steel.

SPLICES, LAPS, HOOKS AND DEVELOPMENT: Conform to AASHTO LRFD, Bridge Specification, Section 5.10.8.

STRUCTURAL STEEL

REFERENCE STANDARDS: Conform to:

(1) AASHTO LRFD Bridge Specification, Section 6 – "Steel Structures"
(2) ANSI/AISC 303–16 – "Code of Standard Practice for Steel Buildings & Bridges"
(3) AISC – "Manual of Steel Construction", Fifteenth Edition (2016)
(4) AWS D1.5 – 2015 – "Bridge Welding Code"
(5) 2014 RCSC – "Specification for Structural Joints using High–Strength Bolts"

MATERIALS:
Structural steel materials shall conform to AASHTO MT270 Standard Specification for Structural Steel.

Wide Flange (W), Tee (WT) Shapes	ASTM A992, Fy = 50 ksi
Channel (C), Angle (L) & Misc Shapes	ASTM A36, Fy = 36 ksi
Structural Plate (PL)	ASTM A36, Fy = 36 ksi
High Strength Plate (Gr 50 PL)	ASTM A572, Fy = 50 ksi
Hollow Structural Section – Square/Rect (HSS)	ASTM A500, Grade B = 46 ksi
Structural Pipe, (PIPE) 12" dia and less	ASTM A53, Grade B = 35 ksi
Heavy Stength, Heavy Hex Structural Bolts	ASTM A325/F1852, Type 1 or 3, Plain
Heavy Hex Nuts	ASTM A563, Grade and Finish per RCSC Table 2.1
Washers (Hardened Flat or Beveled)	ASTM F436, Grade and Finish per RCSC Table 2.1
Anchor Rods (High Strength)	ASTM F1554, Gr 55 (weldable) per Supplement S1
Mild Threaded Rods	ASTM A36, Fy = 36 ksi
High Strength Threaded Rods	ASTM A193, Grade B7, Fy = 100 ksi
Welded Headed (shear) Stud Anchors	ASTM A108 – Nelson/TRW S3L
Welded Headed Stud (WHS) Anchors	ASTM A108 – Nelson/TRW H4L
Dowel Bar Anchors (DBA)	ASTM A496 – Nelson/TRW D2L, Fy = 70 ksi

FABRICATION & QUALITY CONTROL:
Fabrication shall conform to AISC 303 Section 6 and Quality Control shall conform to AISC 303 Section 8.

WELDING:
All welding shall conform to AWS D1.5 – Bridge Welding Code. Use 70 ksi strength, low–hydrogen type electrodes (E70018) or E71T as appropriate for the welding process selected.

PROTECTIVE COATING REQUIREMENTS:

(1) SHOP PAINTING: Conform to AISC 303 Section 6.5 unless otherwise specified by the project specifications.
(2) EXPOSED STEEL: shall be protected by either multi–coat paint or galvanizing.

METAL DECK

MATERIAL: ASTM A653 – SS Designation, Grade 33. Minimum yield strength shall be 33 ksi. Steel deck and accessories shall be galvanized to G60 minimum in accordance with ASTM A653.

TYPE: Deck shall be as shown on the structural drawings.

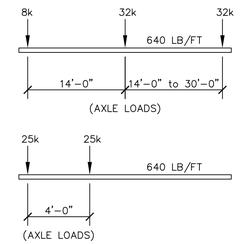
INSTALLATION: Install deck in accordance with supplier's instructions. Attachments shall resist the uplift forces and the diaphragm shear forces shown on the drawings. Welding shall conform to AWS D1.3. Welders shall have current Light Gage Certification. Minimum end lap shall be 2" centered over supports. Minimum bearing shall be 2".

ACCESSORIES: Deck manufacturer shall furnish shoring plans, closure plates, ridge and valley plates, cant strips, sump pans, flashing and all other light gage steel material required to complete the work.

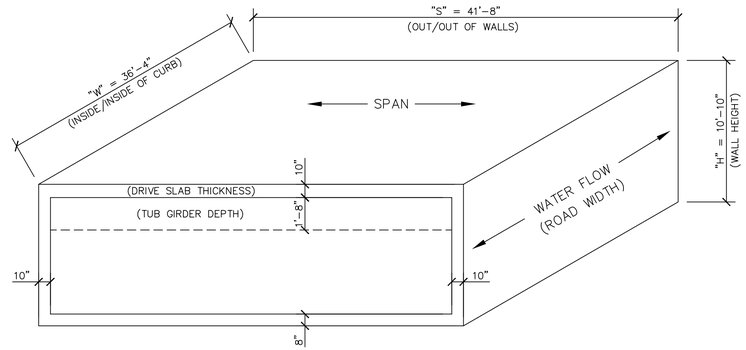
DECK FASTENING: Minimum deck fastening shall be as follows, unless noted otherwise on drawings:

- $\frac{5}{8}$" diameter puddle welds at each rib at transverse and perimeter supports.
- $\frac{5}{8}$" diameter puddle welds at 12" OC at longitudinal supports.
- Side lap connections necessary to develop the shear loading indicated on the diaphragm schedule, but not less than 300 PLF.

DESIGN LOADING



1. DESIGN LIVE LOAD: HL93 (GVW 36 TONS).
2. SUPERIMPOSED DEAD LOAD: 75 PSF.
3. DESIGN IS BASED ON AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS 8TH EDITION AND ALL INTERIM REVISIONS.
4. LIVE LOAD DEFLECTION AT MIDSPAN IS L/800.



WALL HEIGHT "H" –3'–2" = BOTTOM OF TUB GIRDER TO FLOOR (7'–8)
SPAN "S" –1'–8" = INSIDE OF WALL TO WALL (40'–0)
WIDTH "W" +1'–0" = OUT TO OUT OF CURB (37'–4)

APPROXIMATE CONCRETE OF 165 CUBIC YARDS REQUIRED, BY OTHERS. CONCRETE IS BASE ON THEORETICAL AMOUNTS MORE OR LESS MAY BE REQUIRED BASED ON SOIL PREPARATIONS.

CHRISTOPHER ROY SIMPSON – STATE OF WASHINGTON – 43316 – REGISTERED PROFESSIONAL ENGINEER

ENGINEER'S STAMP

APPROVAL/REVIEW AUTHORITY:

APPROVAL BY THE OWNER OF SHOP DRAWINGS PREPARED BY THE FABRICATOR INDICATES THAT THE FABRICATOR HAS CORRECTLY INTERPRETED THE CONTRACT DRAWINGS. APPROVAL DOES NOT RELIEVE THE FABRICATOR OF THE RESPONSIBILITY FOR ACCURACY OF DETAIL DIMENSIONS, NOR THE GENERAL FIT–UP OF PARTS TO BE ASSEMBLED IN THE FIELD. UNLESS SPECIFICALLY STATED TO THE CONTRARY, ANY ADDITIONS, DELETIONS OR CHANGES INDICATED ON THE APPROVAL OF THE SHOP AND ERECTION DRAWINGS ARE AUTHORIZATIONS BY THE OWNER TO RELEASE THE ADDITIONS, DELETIONS OR CHANGES FOR CONSTRUCTION.

No.	DATE	DESCRIPTION
2	11/13/20	ISSUED FOR APPROVAL
1	10/30/20	ISSUED FOR APPROVAL

REVISIONS

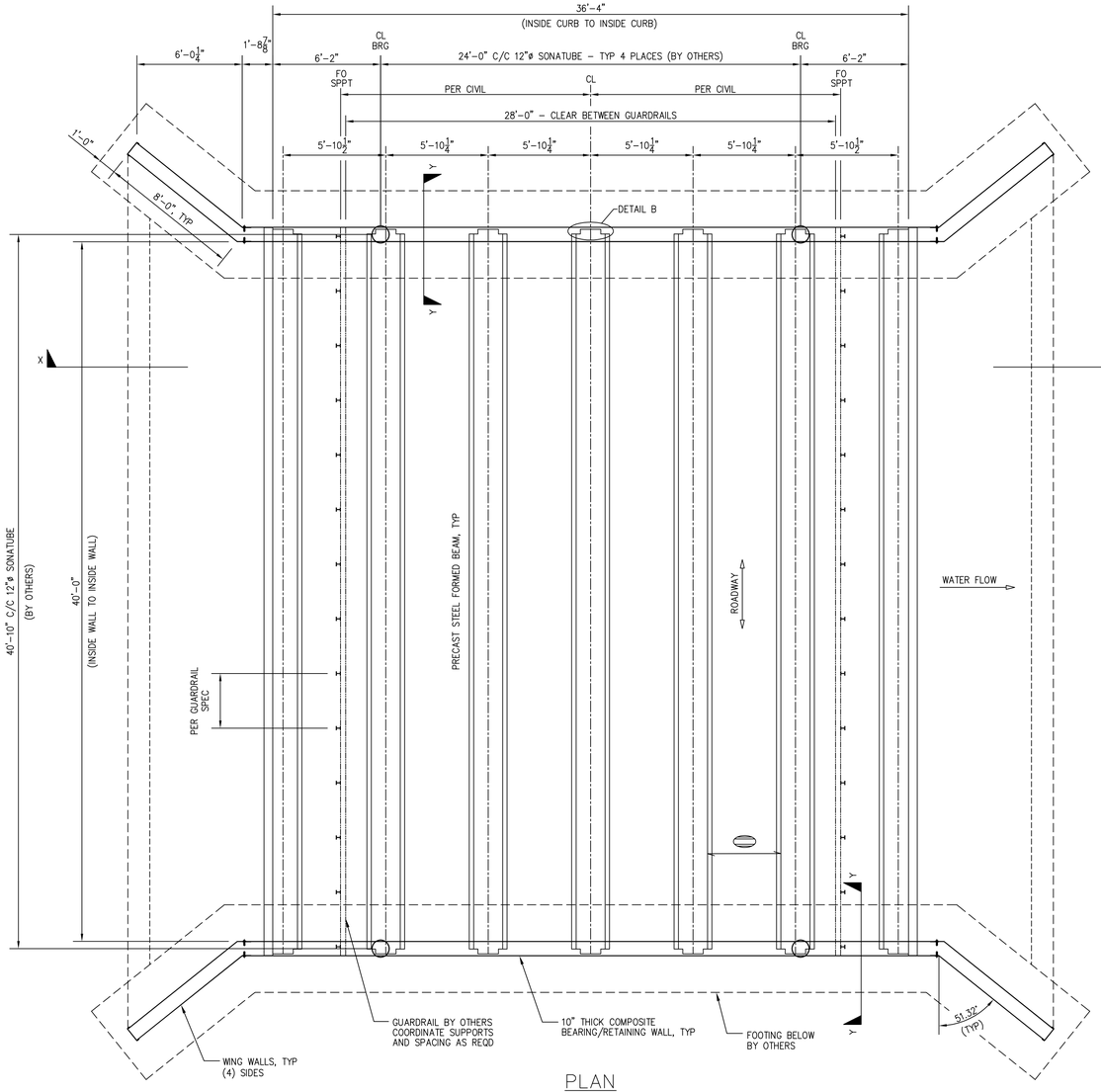
DATE	No.	TYPE	FOR

PRINT RECORD

PREMIER Steel
Premier Steel Services, LLC.
16420 S. Highway 75
Glenpool, OK 74033
Telephone 918 227–0110
Telefax 918 296–7102
www.premiersteelservices.com

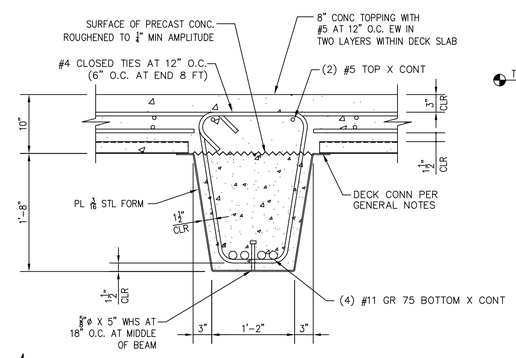
CUSTOMER:	CHEHALIS TRIBE
PROJECT:	420 HOWANUT ROAD
LOCATION:	OAKVILLE, WASHINGTON
DESCRIPTION:	11H-36W-40L FAST CAST BRIDGE

DRAWN BY: CJC DATE: 10/30/20	CHECKED BY: AV DATE: 10/30/20	JOB NO.	0531	SHEET NO.	CS-1



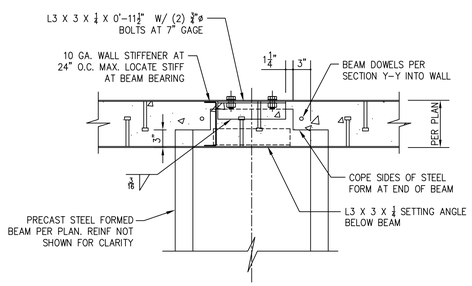
PLAN

SCALE: $\frac{1}{8}$" = 1'-0



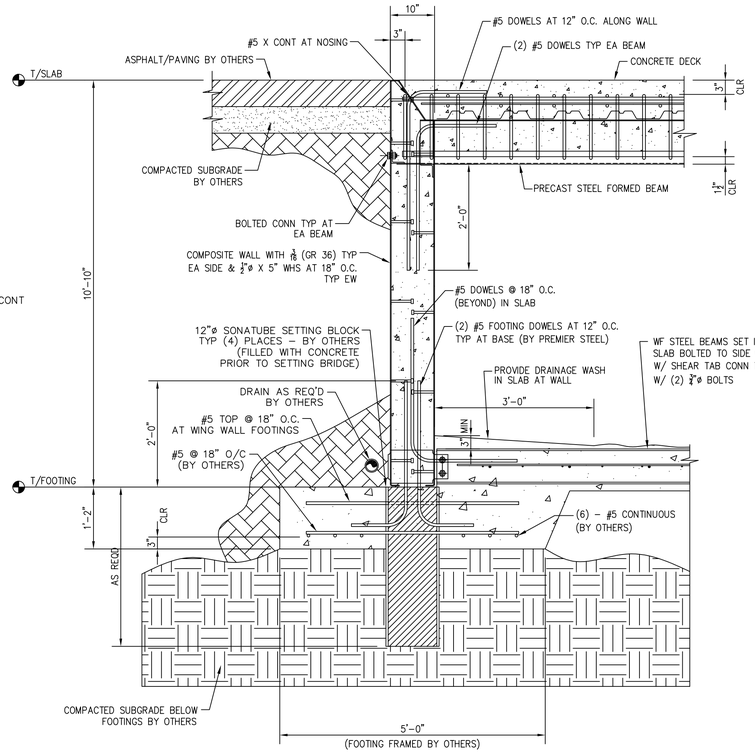
DETAIL A

SCALE: 1" = 1'-0



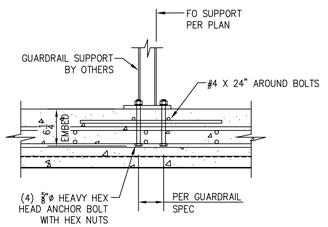
DETAIL B

SCALE: 1" = 1'-0



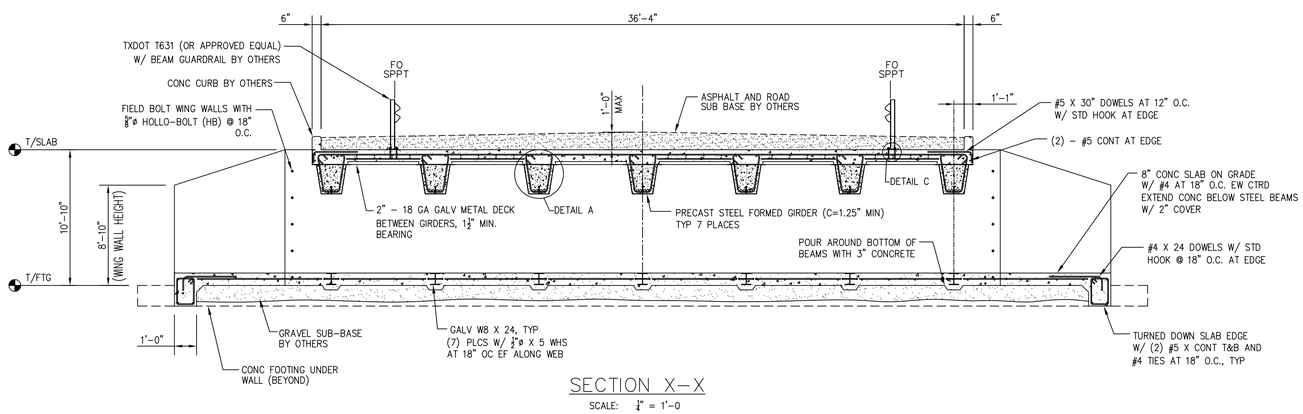
SECTION Y–Y

SCALE: $\frac{3}{4}$" = 1'-0



DETAIL C

SCALE: 1" = 1'-0



SECTION X–X

SCALE: $\frac{3}{4}$" = 1'-0

NOTES:

1. GENERAL NOTES AND SPECIFICATIONS PER CS–1.
2. CONTRACTOR IS RESPONSIBLE TO VERIFY ALL DIMENSIONS, SITE ELEVATIONS AND EXISTING CONDITIONS ARE IN COMPLIANCE WITH DESIGN SPECIFICATIONS.
3. EXCAVATION AND SUBGRADE PREPARATION IS BY OTHERS.
4. FOOTINGS SHALL BEAR ON COMPENTENT NATIVE SOIL AND/OR STRUCTURAL FILL PROVIDINGA MINIMUM ALLOWABLE BEARING PRESSURE AND SUBGRADE MODULUS AS SPECIFIED IN GENERAL NOTES.
5. BRIDGE SLABS, WALL AND FOUNDATIONS TO BE A MONOLITHIC POUR.
6. CONTRACTOR TO VERIFY GUARDRAIL DIMENSIONS AND LOCATIONS COMPLY WITH STRUCTURAL & CIVIL DRAWINGS. DESIGN OF ALL GUARDRAILS, APPROACHES AND TRANSITIONS ARE BY OTHERS.

APPROVAL/SIGNATURE OF THE OWNER CONSTITUTES ACCEPTANCE OF THE DIMENSIONAL SIZES SHOWN ON THE ATTACHED DRAWINGS. OWNER ACCEPTS THE FAST CAST™ BRIDGE IS DESIGNED STRUCTURALLY TO AASHTO HL93 LOADS FOR VEHICULAR TRAFFIC AND REDUCED LOADS FOR PEDESTRIAN BRIDGES: STAMPED/SEALED DRAWINGS AND CALCULATIONS WILL BE PROVIDED BY PREMIER STEEL SERVICES UPON RECEIPT OF FINAL PAYMENT. OWNER IS RESPONSIBLE TO EMPLOY IT'S OWN CIVIL ENGINEERING FOR DESIGN OF SITE AND SUITABILITY OF THE MODEL OF FAST CAST™ BRIDGE MODEL SELECTED AND SHOWN ON THIS DRAWING.

SIGNATURE OF APPROVER _____ DATE _____

APPROVAL BY THE OWNER OF SHOP DRAWINGS PREPARED BY THE FABRICATOR INDICATES THAT THE FABRICATOR HAS CORRECTLY INTERPRETED THE CONTRACT DRAWINGS. APPROVAL DOES NOT RELIEVE THE FABRICATOR OF THE RESPONSIBILITY FOR ACCURACY OF DETAIL DIMENSIONS, NOR THE GENERAL FIT–UP OF PARTS TO BE ASSEMBLED IN THE FIELD. UNLESS SPECIFICALLY STATED TO THE CONTRARY, ANY ADDITIONS, DELETIONS OR CHANGES INDICATED ON THE APPROVAL OF THE SHOP AND ERECTION DRAWINGS ARE AUTHORIZATIONS BY THE OWNER TO RELEASE THE ADDITIONS, DELETIONS OR CHANGES FOR CONSTRUCTION.

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Premier Steel Services, LLC.
16420 S. Highway 75
Glenpool, Oklahoma 74033

Telephone 918 227-0110
Telefax 918 296-7102
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