

A2.6 TYPE, SIZE AND LOCATION PLAN & ELEVATION

The bridge TS&L and Final Design Checklists have been combined into a single Bridge Design Checklist, which includes checklists for Class I and II Design Checks. The file is available as an Excel spreadsheet: [br_design_checklist_rev01.xls](#)

Bridge Design Checklist

10/26/2009
2:55 PM

❖ PROJECT INFORMATION	
• Project Name: _____	• Designer: _____
• Bridge Name: _____	• Checker: _____
• Highway No.: _____	• Drafter: _____
• Milepoint: _____	• Reviewer: _____
<p>• NOTE: Each Task, when applicable & completed, is Checked (Y, N, N/A), Dated and Initialized by the Designer, Checker and Reviewer.</p>	

TS&L Tasks	Y	N	N/A	Designer	DATE	Checker	DATE	Reviewer	DATE
Preliminary Data Collection									
• <i>Project Prospectus</i>									
• <i>Vicinity Map or Data</i>									
• <i>Foundation Report</i>									
• <i>Hydraulic Report</i>									
• <i>Grades & Alignments</i>									
• <i>Location Narrative</i>									
Plan & Elevation Drawing(s)									
• <i>Alignment Data</i>									
• <i>Roadway Width</i>									
• <i>Intersection Stations & Angles</i>									
• <i>Span Lengths & Numbers</i>									
• <i>Angles between Bents & Centerline</i>									
• <i>Existing Structures</i>									
• <i>Right-of-Way lines</i>									
• <i>Detours / Traffic Staging</i>									
• <i>Demolitions</i>									
• <i>Utilities</i>									
• <i>North Arrow</i>									
• <i>Location map (w/North Arrow, Project</i>									
• <i>Location Arrow and Nearest Town)</i>									
• <i>Live Load Loading (Sketch and note)</i>									
• <i>Type of bridge Rail</i>									
• <i>Expansion & Fixed joints</i>									
• <i>Elevation Datum</i>									
• <i>Existing Ground Line</i>									
• <i>High Water & O.H.W. Elevation</i>									
• <i>Proposed Ground Line</i>									
• <i>End Slope & Protection</i>									
• <i>Hydraulic Data</i>									
• <i>Grade Lines</i>									
• <i>Typical Bent Section</i>									
• <i>Roadway Clearances</i>									
• <i>Railroad final and Construction Clearance</i>									
• <i>Guardrail Transitions</i>									
• <i>Footing Elevations & Pile Types</i>									
• <i>Datum Elevation</i>									

A2.6 TYPE, SIZE AND LOCATION PLAN & ELEVATION (Continued)

Bridge Design Checklist

10/26/2009
2:55 PM

TS&L Tasks - Continued	Y	N	N/A	Designer	DATE	Checker	DATE	Reviewer	DATE
TS&L Estimate									
• Title Block w/MP location, bridge number									
• Based on rough calcs per square foot									
• Account for tall abutments using projected quantities									
TS&L Narrative Report									
• General Background:									
o Project Development & justification									
o Right-of-way restrictions									
o Permits and restrictions									
o Utility conflicts or restrictions									
o Railroad Clearances & Restrictions									
• Geometry and Lay-out:									
o Roadway Width, ADT, Grades & Alignment (exception for AASHTO as necessary)									
o Sidewalks, bridge rails & protective screening									
• Hydraulics:									
o Waterway openings, High water elevation, and Clearances									
o Embankment or bent protection									
o Floodway information, when appropriate									
• Foundations:									
o Piling, drilled shafts, spread footings									
o Fills, surcharges									
o Settlement									
o Lateral Earth, Seismic loads									
o Liquefaction Potential									
• Structure Features (discussion items):									
o Span length & span arrangements									
o Type of superstructure									
o Type of bents & location									
o Alternate structure types considered and estimated costs									
o Stage construction & detour requirements.									
• Design Concepts (decision/assumptions):									
o Building a new bridge vs. widening existing one									
o Use a bridge vs. culvert									
o Foundation support assumptions									
o Assumed pile or drilled shaft bearing capacity loads									

A2.6 TYPE, SIZE AND LOCATION PLAN & ELEVATION (Continued)

Bridge Design Checklist

10/28/2009
2:55 PM

	Y	N	N/A	Designer	DATE	Checker	DATE	Reviewer	DATE
TS&L Narrative Report - Continued									
o Assumed lateral soil pressure against end bent									
o Seismic load assumptions									
• <i>Biological Assessment</i> Considerations (applies to many bridge replacements):									
o Project timing and chronology									
o In-Water Work Period									
o Bird Nesting									
o Bat Habitat									
o Alignment and size of the new bridge in relation to the existing (i.e., no. of spans, length)									
o Quantity of impervious bridge surface, existing vs. new									
o Type of new deck and construction methods									
o Type of new bridge railing and construction methods									
o Proposed treatment of the runoff									
o Number & sizes of bents/footings added for new bridge w/in OHWM and the wetted channel. Discuss construction of new footings, bents & piles.									
o Type of isolation methods used during construction (i.e., coffer dam)									
o If a detour bridge, working bridge or Falsework are required, discuss how many bents & types of temporary supports that may be within the OHWM and wetted channel. Discuss the construction & removal methods that might be used.									
o Extent and duration of in-water work (i.e., heavy machinery in wetted channel)									
o Amount or extend of fill or rip-rap									

A2.6 TYPE, SIZE AND LOCATION PLAN & ELEVATION (Continued)

Bridge Design Checklist

10/28/2009
2:55 PM

FINAL DESIGN Tasks	Y	N	N/A	Designer	DATE	Checker	DATE	Reviewer	DATE
Plans									
• <i>Plan & Elevation Drawings</i>									
○ Footing Plan shown									
○ Alignment & Bearing shown									
○ Skew angles shown									
○ Bent Fixity (free, exp., hinge, etc.) shown									
○ Slope Paving shown									
○ Footing Elevations									
○ Pile Bearing or min. Tip Elevation shown									
○ Drainage provided for									
○ Military Loading noted and shown									
○ Stationing shown									
○ Clearances shown									
• Railroad									
• Navigation									
• Highway									
○ Minimum Construction Clearances shown									
○ Bridge Rail Ends shown									
○ Location Map shown									
○ Detour shown									
○ Existing Structure shown									
○ Utilities shown & located									
○ Grade Line Diagram shown									
○ Elevation Datum shown									
○ General Notes complete									
○ Accompanying Drawings shown correctly									
○ North Arrow shown									
○ Hydraulic Data & High Water Mark shown									
• <i>Superstructure Details:</i>									
○ Deck Elevation – Shown									
○ Bearing Devices – Shown & Detailed									
○ No. of Bearing Devices – Given									
○ Expansion Allowances – Shown									
○ Camber Diagram – Shown									
○ Joints – Shown & Detailed									
○ Stage Construction – Detailed									
○ Pour Schedule – Shown									
○ Concrete Finish Sketch – Shown									
• <i>Beam Details:</i>									
○ Beams Located & Dimensioned									
○ Beam Cross Sections – Shown									
○ Prestressed Beam Details – Shown									
○ Interim Bars – Shown @ Top of Stem									

A2.6 TYPE, SIZE AND LOCATION PLAN & ELEVATION (Continued)

Bridge Design Checklist

10/28/2009
2:55 PM

	Y	N	N/A	Designer	DATE	Checker	DATE	Reviewer	DATE
Plans - Continued									
• Beam Details - Continued:									
o Bar Extensions – Adequate									
o End Anchorages of Longitudinal Bars – Sufficient									
o Post-tensioning Details/Data – Included									
• Bent Details:									
o Column Steel - properly dim. w/splices									
o Neg. moment at X-Beam - Reinforced									
o Footing Elevations – Shown									
o Skew Angles – Shown									
o Utility Holes – Shown & Noted									
o Hinges – Shown & Detailed									
o Seismic Restraints – Shown & Noted									
o Guardrail Connections at end bents									
o Concrete finish - Shown									
	Y	N	N/A	Designer	DATE	Checker	DATE	Reviewer	DATE
Specifications									
• Prepare & assembly:									
o Specifications									
o Supplemental Specifications									
o Special Provisions									
• Bid Let Item Names Check									
• Bid Let Item Quantities Check									
• Specials Verify & Review									
	Y	N	N/A	Designer	DATE	Checker	DATE	Reviewer	DATE
Estimates									
• Calculate quantities for all materials									
• Construction Time Estimate									
o Graph format									
o Critical stages shown									
• Cost for construction assistance									
	Y	N	N/A	Designer	DATE	Checker	DATE	Reviewer	DATE
Calculation Books - Design									
• Analysis & Design of bridge's structural components									
• Documentation of work with									
o Hand calculations									
o Computer output									
o Detailed notes									

A2.6 TYPE, SIZE AND LOCATION PLAN & ELEVATION (Continued)

Bridge Design Checklist

10/28/2009
2:55 PM

DESIGN CHECKS	Y	N	N/A	Designer	DATE	Checker	DATE	Reviewer	DATE
Class I Check									
<ul style="list-style-type: none"> • <i>Class I Check is a comprehensive design review covering all aspects of the project. It'll be done primarily for:</i> <ul style="list-style-type: none"> ○ Major Complex Structures ○ Steel and post-tensioned bridges ○ Structures designed by an inexperienced Designer ○ Structures checked by an inexperienced Checker • <i>Checker's responsibilities:</i> <ul style="list-style-type: none"> ○ Review of location data and correspondence files ○ Review of construction time and seasonal requirements, permit applications, work-in-stream restrictions, and utility installations and conflicts ○ Review foundation and hydraulic requirements ○ Check of consistency of alignment and details with roadway plans ○ Thorough check of geometry, alignment, grades, clearances, and construction details ○ Verification of structure length, roadway width, structure type selection, aesthetic treatment, span arrangement, bent type and configuration, and bridge rail type ○ Complete independent structural analysis according to design specifications and current design practices ○ Make a quick long hand check of the most important structural elements before beginning a computer analysis of the design ○ Independent check of Final Estimate quantities & reconciliation of figures with Designer ○ ○ 									

A2.6 TYPE, SIZE AND LOCATION PLAN & ELEVATION (Continued)

Bridge Design Checklist

10/28/2009
2:55 PM

DESIGN CHECKS	Y	N	N/A	Designer	DATE	Checker	DATE	Reviewer	DATE
Class II Check									
<ul style="list-style-type: none"> • <i>Class II Check is a review of design concepts and construction details & does not necessarily include structural analysis. It will be done primarily for:</i> <ul style="list-style-type: none"> ○ Minor Bridges designed by an experienced designer • <i>Checker's Responsibilities:</i> <ul style="list-style-type: none"> ○ Review of correspondence, job files and design calculations ○ Confirmation that foundation and hydraulic requirements are met ○ Verification of geometry, alignment and structure type selection ○ Confirmation with Designer that structural critical elements have been analyzed during final design ○ Completeness of plans ○ Check of construction details and Final Estimate quantities ○ ○ 									