Final Plans

This chapter will assist you in the final plan review process. The owner, or their consultant, shall submit two hard copies of the Final Plans and an electronic PDF copy of the Division SB Special Provisions to State Aid Bridge. Plans shall typically contain (at a minimum):

- Title sheet
- General plan and elevation showing span lengths, pier and abutment locations, and profile grade information
- Bridge cross section showing deck material and railing requirements
- Design and material specifications, painting requirements, loading requirements and construction notes
- Bridge layout sheet
- Substructure design
- Survey sheets including hydraulic information and boring logs.

An Engineer's estimate of project should also be submitted.

State Aid Bridge will review the plans and do mark up comments in red. A hard copy of the marked up plans with a transmittal letter will be returned to the owner's consultant. An electronic PDF copy of the transmittal letter will be forwarded to the owner, DSAE and the State Aid Bridge file.

Discussions in this chapter include the final plan review process and a final review checklist. The section on final review will tell you which areas of the plan we check in depth. Special care should be taken to insure that these areas are done correctly to save time on both the review process and the reworking of the plan. Go to http://www.dot.state.mn.us/bridge/ to download Special Provisions.

Final Bridge Plan Review Priority

Thorough Check

Layout Geometry/Alignment	
Stations and elevations on survey line	Horizontal and vertical clearances
Deck cross-section dimensions	Deck and seat elevations at working points
Coordinates at working points and key stations	Working line location
Pay items	Substructure locations (stations)
Design data block on GP&E sheet. Bridge rating must be included.	Project numbers
Certificate Block	Framing plan shown on partial plan
	Slab span design

These items found must be correct so a thorough check is necessary to assure that the geometry given on the plans fits the roadway layout. A check of other items that are geometric-related may require the performance of calculations to assure that the bridge components will fit together on the structure and will be constructed at the correct locations. Most of this information can be checked using data from the approved preliminary plan. These checks are important because errors that carry through to construction can be very costly to correct.

Other items can be checked by observation, but the check should be thorough enough to eliminate possible errors that may occur in such areas as the pay items in the Schedule of Quantities. Use of the correct pay items can be difficult for a consultant to anticipate because of frequent changes. Numbers, descriptions and units must be correct because these are carried through the entire accounting system for the project.

Framing plans, including the proposed beams, are the backbone of the bridge design and must be assured as correct on the partial plan before the consultant gets deep into the design of the remainder of the bridge.

Cursory Review

Superstructure	**Substructure**
PCB strand patterns (in partial plan) vs. consultant's calculations	Abutment and pier design checked against consultant's calculations
PCB conformance to industry standards (f'ci) and use of tested design programs	Conformance to foundation recommendations
Max. moments and stresses in steel beams by examining consultant's calculations, steel beam sections	Pile loads and earth pressures. Check against consultant's calculations.
Steel beam splice locations and diaphragm spacing, flange plate thickness increments (enough to save 800# + of steel)	Concrete Mix No's
Misc. details, quantities and other items	Rebar series increments – (min. length interval: 3")
Railing lengths and metal post spacing to assure fit on bridge	Interior beam seat elevations
Use of B-Details and Standard Plan Sheets	Bottom-of-footing elevations to assure adequate cover.
Conformance to aesthetic requirements. Constructability.	
General notes, construction notes, reference notes.	
Quantity items on tabulations	

All plans should have a cursory review to note the completeness of the work. This would consist of reading and observing the contents of the plans. Such review can usually be performed quickly and would normally not require numerical calculations. The reviewer should be experienced enough to know what looks right and what doesn't look right.

This type of review would require reading of standard plan notes and other notes that give direction to the contractor for construction. Listed items should be reviewed for conformance to office and industry practice. Obvious errors or inconsistencies on any parts of the plans should be marked for correction.

The consultants are usually well versed in design procedures and do not need much assistance from our office. To assure that the plans reflect the consultant's design, a comparison of their calculations with the plan details is recommended. An independent design by our office is time consuming and is not recommended unless there is a reasonable doubt as to their design.

No Review

Diagonals on layout sheet	Rebar placement dimensions
Figures in Bills of Reinforcement	Bar marks on details against listed bars.
Quality values (include totals of tabs)	Aesthetic detail dimensions
Bar shapes and dimensions	Timeliness of Delivering Plans, Calcs., Quantities, CADD

A thorough check of these items would be time-consuming and may not produce corrections that are vital to construction; therefore, it is recommended that little or no time be spent on the listed items. For example, numerous errors can occur in the Bills of Reinforcement, however, checking this information is too time-consuming so the burden of providing correct data should be placed on the consultant.