

 Office of Structures Guidelines and Procedures Memorandum	DESIGN
	Number: D-99-48(4)
	Date: 03-16-2018
Establishing Scope of Work for Structure Rehabilitation Projects	Approval: 

Whenever design studies are begun that involve an existing structure (deck replacement, superstructure replacement, major rehabilitation, etc.), a full evaluation of the condition of the existing structure and the constraints associated with structure rehabilitation must be made as early as possible so that the project can be properly scoped. All deteriorated elements and problem details (expansion joints over piers, longitudinal joints in the travel lanes, converting simple spans to continuous, etc.) that may cause premature deterioration must be addressed. The following steps should be investigated at the beginning of all rehabilitation projects to minimize the need for increasing the scope of the project as we near the advertising stage.

- Review the latest inspection reports.
- Make a field visit to the site to perform a structure inspection as described in GPM D-84-28(4).
- Review the bridge with SIRE personnel and include any recommended remedial repair or painting in the rehabilitation contract.
- Review the bridge with the Structure Hydrology and Hydraulics personnel and include any recommended scour countermeasures.
- Contact Project Planning to determine if additional lanes etc. are required for present or future traffic needs.
- Contact District to get their input into the scope of work required.
- Contact the District Traffic Engineer to discuss what options for maintaining traffic shall be investigated as part of the Maintenance of Traffic Alternate Analysis. The ideal maintenance of traffic scheme for ease of construction is a detour away from the construction area. This could include routing traffic (vehicles and/or pedestrians) over a temporary bridge during construction. In lieu of a detour, the minimum number of lanes and lane width that must be maintained across the structure during the construction phase should be agreed upon at this stage. Determine any requirements that may restrict the Contractor (work at night, temporary lane shut downs, summer construction, incentive/disincentive, etc.) so that the budget and Ad date can be adjusted/set to reflect.
- Determine if the bridge has functional concerns. If it does, determine how the bridge must be rehabilitated to eliminate any functional concern.

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- When traffic must be maintained across the bridge, set lane widths and construction gaps to meet the minimum requirements set by the district. Allow for lap splicing of reinforcing steel between stages of construction (in lieu of mechanical reinforcing steel couplers or bent rebars). Avoid single lane splits whenever possible.
- Evaluate the affect of staged construction on emergency vehicles, school buses, businesses etc. and coordinate any impacts through the District. If traffic must be maintained on approach shoulders, request shoulder corings to determine if the shoulders are sufficient to handle traffic. If the shoulders are not sufficient, the shoulders may need to be rebuilt as a first order of work.
- Find out if the lab has recently completed a structure condition survey. If not, request one to determine the extent of chloride intrusion and concrete deterioration. In areas where the lab reports sound concrete with high chloride content, consider chloride extraction as an alternative to complete removal and replacement of that element.
- For bridges with multiple simple spans, look at making the structure continuous for live load and eliminate the joints and seals over the pier(s). This may also include bearing modifications to allow the bridge to move properly (refer to GPM D-87-38(4)). A chart shall be prepared which clearly shows the effects the continuity will have on the existing stringers and substructure units. Cost data should be included in the chart and must include cost for bearings, continuity connections, etc. If the structure has kinked girders at the support, no effort shall be made to make the structure continuous. If the structure has many spans then as many spans as possible shall be made continuous. Drainage troughs shall be added under all deck joints as part of the deck replacement.
- Designers should also evaluate an alternative for a superstructure replacement. In some cases it may be cost effective to do a superstructure replacement in lieu of a deck replacement with cleaning and painting of structural steel with an existing lead based paint system on it. This is almost always the case if the stringers are going to be taken down to do any work on the substructure units.
- Evaluate the loading conditions as described in GPM D-89-40 (4).
- Evaluate the existing substructure's ability to carry the proposed loading condition in both the final condition and the conditions developed through staged construction. These loading conditions must be compared to the loading condition for which the bridge was designed.

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- Evaluate the approach traffic barrier and attachments to the structure and make the necessary modifications or replacement to bring the end treatments up to the latest safety standards. For bridge deck replacements our standards for new construction should be used.
- Request field surveys to verify key dimensions in the as built geometry of the existing structure. Refer to GPM D 84-28(4).
- Evaluate the constructability of the proposed scheme prior to submitting for TS&L to ensure that what is being proposed can be built; amount of sheeting, wetlands, construction access, temporary support of pier caps, etc.
- As an alternative to any scheme developed following the above criteria, evaluate the extent to which the existing bridge must be widened, have its alignment shifted or use mechanical couplers (sub and super) in lieu of reinforcing steel laps, to eliminate a stage of construction. It may be more cost effective to do a small bridge widening in conjunction with the rehabilitation if it eliminates a stage of construction, and results in additional bridge width that may be utilized to improve acceleration lanes, shoulder widths, etc.
- Evaluate the utility situation with respect to what is on the bridge, what needs to be maintained on the bridge, what will be affected near the bridge- especially relative to any pile driving required.