ATTACHMENT 52 – ANSWERS TO STANDARD SET OF QUESTIONS BY THE MARYLAND STATE HIGHWAY ADMINISTRATION

(4 pages)

Maryland State Highway Administration

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Italics represent the responses by the Maryland State Highway Administration.

1. What was your procedure in reviewing consultant engineering bridge plans in the early 1960's? What is your procedure in reviewing consultant engineering bridge plans today?

Procedures in reviewing consultant engineering plans in the 1960's are a bit sketchy, since there are so few people currently around who worked during that era. It is fairly certain that a separate consultant review section existed, comprised of experienced engineers of all disciplines, including bridge, who exclusively reviewed plans developed by consultants. This group was not, however, under the direction of the bridge department, which was ultimately found not to be conducive for consistency in producing bridge design plans. At some point, date uncertain but probably prior to 1975, this system was abandoned in favor of the current organizational set-up, where all bridge designs, consultant and in-house, are produced and reviewed under the direction and control of the bridge department.

Today, there are extensive procedures in place for the review of consultant-designed bridge plans (and for all plans, regardless of designer). Many of these are documented in various Policy and Procedure Memorandum.

All projects, both in-house design and consultant design, are assigned to a team leader for review, development and processing through the permitting and advertising phase. These team leaders are typically experienced, degreed engineers, usually with a Professional Engineer's license. All projects follow a formal review process, with plans being reviewed at various stages of development. In addition to being reviewed at the team leader level, all structure plans are reviewed at two or three additional, higher levels by generally more experienced senior engineering staff.

2. How do you ensure the QA/QC process of a consultant engineering firm is adequate? In the early 1960's and today? What procedures are in-place to ensure that the consultant does not submit an inadequate design?

Again, in the early 1960's the processes for QA/QC for consultants are impossible to describe.

Today, during the procurement process for consultant engineering services, firms seeking to obtain design engineering contracts are expected to have in place their own internal QA/QC processes. Generally, such programs are documented in written form and can be made available to us if requested. Most of the firms that seek to provide design engineering services to SHA are either large, national firms, or firms that have worked for SHA in the past and are well known to us. All consultant firms working for SHA are evaluated on their performance annually and these annual ratings are used in the evaluation process for new contracts.

The Maryland SHA makes extensive use of standard details, both for consultant and in-house projects. These details take a lot of the need to provide custom designed elements of bridges out of the hands of consultants (or in-house staff) and ensure a certain consistency in the design and detailing of frequently used bridge elements. If a bridge, or elements of a bridge, are unusual or complex, we frequently make use of peer review by an independent consultant to check the design. On some of our recent mega-projects, we have utilized the services of a General Engineering Consultant to manage the project. Their scope of services includes review of the design consultants plans.

3. What does the Maryland State Highway Administration consider a red-flag item when reviewing consultant engineering bridge plans? What follow-up action is taken to address the red-flag item? Describe the level of detail the Maryland State Highway Administration uses in reviewing consultant engineering bridge plans?

Anything can be a "red-flag" item during the course of review. Generally, we look at major structural items, such as beams and girders, piers, abutments, walls, reinforcing, etc. to be sure that these items are consistent with our experience with similar structures with regard to sizes, configurations and details. However, the level of review can be quite detailed, extending to all elements of the design, depending on the particular structure. Certainly, we would consider major complex structures, such as trusses, arches, movable bridges, non-redundant or fracture-critical elements, etc, to be "red-flag" items, requiring intense review.

When "red-flag" items are found, at a minimum these are raised with the in-house engineer or consultant, who is expected to make formal response to all review comments. We also have the ability to perform an independent design check or analysis, using either in-house resources or separate consultants, to check portions of a design that may be in question.

4. Does the Maryland State Highway Administration review consultant engineering bridge plans concurrently with the FHWA Division Office? Does the Maryland State Highway Administration review the consultant plans with the expectation that FHWA will be performing a similar type of review?

On non-exempt projects where the FHWA requests to review bridge plans, the plans are generally provided to FHWA following the review by SHA and the resolution of SHA's review comments. We would not typically make a formal review submission to FHWA prior to it being reviewed in-house.

Maryland has no expectations about the level or quality of FHWA review. We review all projects the same, regardless of FHWA involvement.

5. What are the qualifications of the Maryland State Highway Administration personnel who conduct the review of consultant engineering bridge plans?

Generally, the SHA personnel reviewing consultant plans are degreed civil/structural engineers, most with professional engineering licenses who generally have five years or more of experience in bridge design and detailing. The level of experience of the team leader assigned to a project is generally commensurate with the size and complexity of the project. At least one or more of the reviewers at all stages of all projects is a professional engineer.

6. What is the percentage of bridge design work that is done in-house versus the percentage that is done by consultant engineering firms?

This can vary from year to year depending on the size of the SHA program and the available resources within the department, but we can generally say that the split between in-house and consultant project runs around 50-50.

7. Describe the structure of the Maryland State Highway Administration? Is the bridge office centrally organized? How many district bridge offices are located in the state? Are consultant engineering bridge plans reviewed at the central office or district bridge office?

The bridge office of the Maryland SHA is centrally organized. All structural design originates at the central headquarters in Baltimore. No structural design is performed in any of the SHA's district offices, nor is there any bridge staff located in any of the district offices. Non-bridge personnel from the district offices may provide review comments on bridge projects during the various development and review stages of projects, but these are not usually of a design or technical nature, although they are sometimes related to constructability and project management issues. When questions or problems arise during construction, the bridge office staff are involved in assessing and resolving the question or problem, including the consultant, if applicable.