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<p style="text-align: center;">30 Main Office 32 Regions 34 Special</p>	<p>SUBJECT: Bridge Technical Design Quality Actions</p> <p>Subject Code: 7.35-8</p> <p>Code: <u>EI 92- 018</u></p> <p>Date: <u>4 / 21/ 92</u></p> <p>Supersedes:</p>
<p>APPROVED: </p> <p><u>M. J. Cuddy, Assistant Commissioner & Chief Engineer</u></p>	

BRIDGE TECHNICAL DESIGN QUALITY ACTIONS

PURPOSE

This Engineering Instruction documents three levels of technical quality actions that apply to NYSDOT bridge designs. This document applies to designs performed by regions, the Structures Division and consultants working for the NYSDOT. Obviously all quality actions appropriate to bridge designs are not included in the requirements of this EI, and issuance of this EI in no way lessens the importance of other prudent and sound engineering quality measures that are and should be appropriately applied throughout the bridge design process. The purpose of this EI is to clarify bridge design quality actions and responsibilities.

This E.I. does not deal with financial and administrative reviews or approvals, nor does it address obtaining Federal reviews or approvals. Other Department documents deal with these issues. Following the requirements of this EI will help assure the overall technical quality of bridge designs and the resulting plans, specifications and estimates.

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TECHNICAL QUALITY ACTIONS

1. DESIGN COMPUTATION, DRAWING & ESTIMATE CHECKS DURING DESIGN

The following quality control actions should be done in the same office (Region, Structures Division or Consultant) where the design is produced.

Design Computation Checks: All design computations shall be checked in detail in the bridge designer's office. The checker must be competent in the level of structural design required, and be aware that he/she is as responsible for the design as much as the designer.

Both the designer and checker must sign and date all computation sheets. Full agreement must be reached and documented on all computations before any design is used in the development of bridge plans.

Bridge Contract Drawings Checks: All contract drawings shall be checked in detail. In cases where the designer is not the drawing checker, the designer must review the drawings to insure that the drawings are in conformance with the design. After any required changes are made, drawings shall be signed and dated by the individual who prepared the drawings, the drawing checker, the designer and the design checker.

Estimate Checks: All estimate unit pricing, quantity calculations and estimated cost computations shall be checked. All estimates shall be signed and dated by the estimator and the checker.

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2. TECHNICAL PROGRESS REVIEWS

As projects develop, technical progress reviews are required at project milestone events. Once a project is initiated (IPP), the project milestone events requiring technical reviews include draft-EPP development, preliminary plan development, ADP and PSE. Technical progress reviews are considered an integral part of the design process and are performed by parties other than the actual bridge designers or checkers.

It is both prudent and sound engineering practice to perform these designer-independent technical progress reviews. These technical progress reviews are broad based and conceptual in nature; they are not detailed checks. The purpose of these reviews is to offer general advice and, on occasion, expert opinion and approvals. Technical reviews help ensure that all bridge projects are developed in conformance with appropriate policies, guidelines and good engineering practice, and will result in a constructable, maintainable, durable structure.

The party responsible for performing the designer-independent technical progress review is dependent on both the type of project and the stage of project development.

Some bridge plan technical progress reviews are performed at the regional level and others involve a review by the Structures Division. The table and notes on the following two pages identify technical progress review responsibilities.

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BRIDGE PLAN TECHNICAL PROGRESS REVIEWS (8)

TYPE OF WORK	*IPP	DRAFT EPP	PRELIM. REVIEW (7)	ADP REVIEW	PS&E REVIEW
Bridge Removals (1)	R	R	R	R	R
Bridge Painting Contracts	R	R	R	R	R
Non Structural Maint. Repair by Contract	R	R	R	R	R
Non Structural Preventative Maint. Contract	R	R	R	R	R
Asphalt Overlays For Interim Repair To Improve Ridability (2)	R	R	R	R	R
Non Demand Structural Maint. Repair by Contract (3)	R	S	S	S	S
Deck Overlay Projects (4)	R	S	R	R	R
Deck Replacement Projects (4)	R	S	S	R	R
Structural Widening Projects (5)	R	S	S	S	S
General Bridge Rehabilitation Contracts (6)	R	S	R (Minor) S (Major)	R (Minor) S (Major)	R (Minor) S (Major)
Bridge Superstructure Replacement	R	S	S	S	S
Replacement and New Bridges	R	S	S	S	S

LEGEND

*IPP'S ARE REGIONAL DOCUMENTS SHOWN HERE ONLY TO SIGNIFY THE START OF THE PROJECT PROCESS.

"R" MEANS REGION RESPONSIBLE FOR THE REVIEW. REGIONS MAY REQUEST THE STRUCTURES DIVISION TO PERFORM AN OPTIONAL REVIEW OF ANY "R" DESIGNATED ACTIONS.

"S" MEANS REVIEW BY THE STRUCTURES DIV. IS REQUIRED AND MUST BE ACCOUNTED FOR IN THE PROJECT SCHEDULE. REGIONS SHOULD ALSO REVIEW THESE SUBMISSIONS TO A LEVEL THAT THEY DEEM IS APPROPRIATE.

SPECIAL NOTES:

ON OCCASION A REGION AND THE STRUCTURES DIVISION MAY NEGOTIATE AN AGREEMENT UNDER WHICH A REGION WOULD PERFORM AN "S" DESIGNATED REVIEW. ALSO ON OCCASION, FOR UNUSUAL OR UNIQUE SITUATIONS IT MAY BE DETERMINED THAT THE STRUCTURES DIVISION WILL PERFORM A REVIEW OF SOME "R" DESIGNATED REVIEWS. ALL EXCEPTIONS TO THE ABOVE CHART SHALL HAVE BEEN MUTUALLY AGREED TO BY THE AFFECTED REGION AND THE STRUCTURES DIVISION. ALL SUCH AGREEMENTS SHALL BE DOCUMENTED IN WRITING BETWEEN THE AFFECTED PARTIES.

IN SOME INSTANCES THE FIRST SEVEN CATEGORIES OF PROJECTS LISTED IN THE ABOVE TABLE MAY NOT INCLUDE EACH OF THE LISTED MILESTONE EVENTS IN A FORMALIZED WAY. IN THESE CASES, REGIONS ARE RESPONSIBLE FOR COORDINATING REVIEWS IN AN INFORMAL WAY SUFFICIENT TO MEET THE SPIRIT AND INTENT OF THE LISTED REVIEW ACTIVITY.

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FOOTNOTES:

- (1) Region should request a review by the Structures Division when a bridge removal has significant safety implications.
- (2) Refer to NYSDOT's "Bridge Deck Evaluation Manual" for criteria limiting the use of this treatment.
- (3) Structurally sensitive DEMAND maintenance projects shall be coordinated with the Regional Bridge Management Engineer and, when appropriate, with the Safety Assurance Unit.
- (4) Deck replacement projects and deck overlay projects do not include projects incorporating superstructure primary member or substructure repairs.
- (5) This category (structural widenings) only includes those widenings that require superstructure primary member additions or significant substructure modifications or additions.
- (6) During the review of the scoping documents the Region and Structures Division will categorize individual bridges in a rehabilitation project into either a "minor" or "major" rehabilitation category. (Minor bridge rehabilitations are projects which generally upgrade the overall condition of a structure but do not include the replacement or substantial repair to any principal bridge component). Regions will perform ADP and PS&E reviews for "minor" bridge rehabilitations and the Structures Division will perform these reviews for "major" bridge rehabilitations.
- (7) Structures Division reviews of Preliminaries are "approval" reviews in accordance with the Department's Environmental Action Plan. Other reviews are not approval reviews.
- (8) Certain other Technical Progress Reviews will be required for certain types of projects. For example, reviews shall be solicited from Railroads, Waterways Division, etc. as may be appropriate. The job manager coordinating overall review activities for the project will be responsible for soliciting these reviews.

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3. QUALITY ASSURANCE MONITORING REVIEWS

A small sample of bridge design projects will be selected for Quality Assurance monitoring review. When performed, these reviews will be done by Structures Division personnel who have not been involved in the design process. These Q.A. monitoring reviews will normally be extensive in nature and will generally be targeted at completed projects. The purpose of these reviews is to determine how well established criteria are being followed and to determine the need for new or better standards, policies or procedures. Formal reports will be issued for all third party Quality Assurance monitoring reviews. Reports will include findings and recommendations as may be appropriate.