

**ATTACHMENT 55 – ANSWERS TO STANDARD SET OF QUESTIONS BY THE
NEW YORK STATE DOT**

(33 pages)

New York State DOT

June 25, 2008

Italics represent the responses by the New York State DOT.

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?

It is the mission of the Office of Structures to provide the professional engineering services necessary to implement the structural portion of the Department's capital construction and maintenance programs, to evaluate the existing structures infrastructure and direct the appropriate actions necessary to assure safety and improvement.

To implement the mission, the NYSDOT performs quality control during the design phases. This includes designer based independent checking of design computations, bridge contract drawings and estimates to ensure that all projects are designed in conformance with current standards, policies, guidelines and sound engineering practices, and will result in a constructible, maintainable and durable structure.

The NYSDOT also performs quality assurance at key project milestones. This includes broad based and conceptual designer-independent reviews performed at key project milestones to ensure that all projects are developed in conformance with current standards, policies, guidelines and sound engineering practices, and will result in a constructible, maintainable and durable structure.

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?

The NYSDOT ensures the QA/QC process of a consultant engineering firm is adequate through technical progress reviews. The following briefly describes the requirements and purpose of technical progress reviews:

- *Required at project milestones for all structures.*
- *Considered integral to the design process.*
- *Performed by parties other than the designers.*
- *Broad based and conceptual in nature; experience driven.*
- *Purpose; offer general advice, expert opinion and approvals.*
- *Ensure standards, policies, guidelines and good engineering practice are met.*

3. What does the New York State DOT 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 New York State DOT uses in reviewing consultant engineering bridge plans?

The level of detail at each project milestone of a technical progress review is described below:

Project Milestone #1 – Project Scoping Document

- *Identify the project area’s safety, mobility, infrastructure, community, and environmental conditions, needs and objectives.*
- *Establish project objectives.*
- *Establish design criteria.*
- *Identify feasible alternative(s).*
- *Prepare preliminary cost estimate.*
- *Confirm likely SEQR Type.*
- *Confirm likely NEPA Class.*

Project Milestone #2 – (Draft) Design Report (DDR)

- *Public Document*
- *Documents Environmental Procedures and Engineering Analysis*
- *Information to Evaluate Feasible Alternatives*
- *Identify Recommended Alternative*
- *Sufficiently detailed information to allow the approval to commence Detailed Design*

Project Milestone #3 – Preliminary Plan Development

- *Site data*
- *Structure Study Plan*
- *Advance Preliminary Structure Plan*
- *Final Preliminary Structure Plan*

Project Milestone #4 – Advance Detail Plans (ADP)

- *75% complete plans*
- *Special Specifications*
- *Estimate of Quantities*

Project Milestone #5 – Final Plans, Specifications and Estimates (PS&E)

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

The NYSDOT performs a thorough and complete design plan review irrespective of the type of review performed by FHWA.

5. What are the qualifications of the New York State DOT personnel who conduct the review of consultant engineering bridge plans?

NYSDOT bridge personnel who perform the reviews of bridge plans have a four year degree in engineering and many are Professional Engineers. The number of years experience of the PE's performing these reviews in the Office of Structures is over 20 years experience.

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

The following represents the percentage of bridge design work that is done in-house versus the percentage that is done by consultant engineering firms:

- 35% - In-house (Central Office)
- 15% - In-house (Regional Offices)
- 50% - Consultant designed

7. Describe the structure of the New York State DOT? 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 Office of Structures is headed by a Deputy Chief Engineer and is broken into 4 bureaus: Structure Design Bureau, Structural Engineering Services Bureau, Bridge Evaluation Services Bureau, and the Structures Design Quality Assurance Bureau. The 4 bureaus are centrally organized in Albany. The state is divided into 11 regional offices. The regional offices manage the bridge design projects within each region and perform coordination functions with the highway design group.

Quality Assurance in New York State

- In Everything we do
 - Inventory and data collection
 - Inspection
 - Program and Project Development
 - Project Design
 - Fabrication Process
 - Construction Process
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How?

- Owner's Perspective; State owned bridges
 - Clear Standards and Procedures
 - Mechanisms/processes to assure conformance
 - Maintain the experience and expertise to “know what’s right”
 - Qualification Based Selection Process for Consultants
 - Consultant Performance Evaluations
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Structures Expertise in New York State

- Regional Offices
 - 11 Regions – 40'ish staff
 - Regional Structures Engineer with Group
 - Bridge Management Engineer with small group
 - Office of Structures
 - Main Office Group
 - 4 Bureaus
 - 165 people
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Office of Structures' Mission

- It is the Mission of the Office of Structures to provide the professional engineering services necessary to implement the structural portion of the Department's capital construction and maintenance programs, to evaluate the existing structures infrastructure and direct the appropriate actions necessary to assure safety and improvement.
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How We Do It

- **Through Quality Control During the Design Phases**

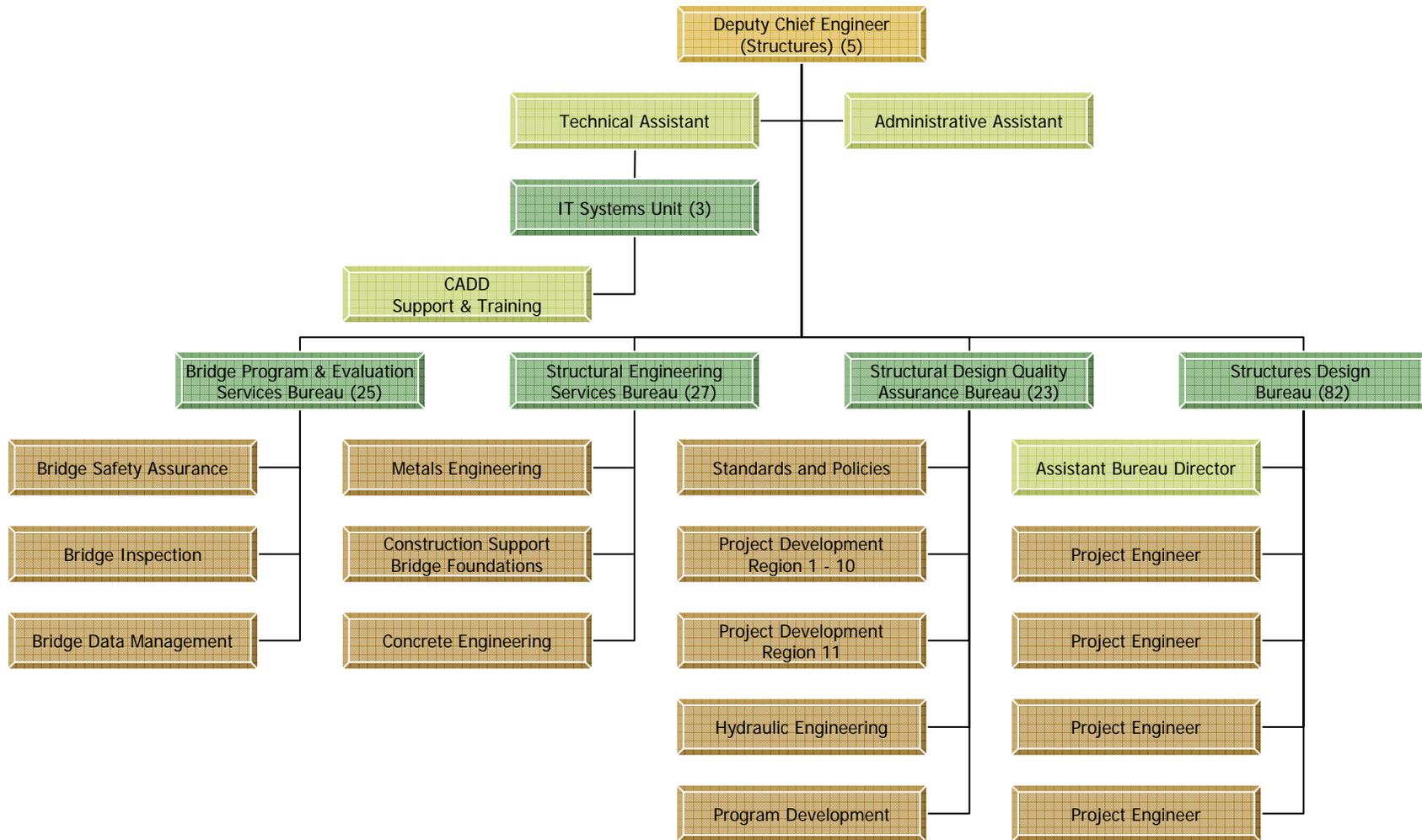
Designer based independent checking of Design Computations, Bridge Contract Drawings and Estimates to ensure that all projects are designed in conformance with current standards, policies, guidelines and sound engineering practices, and will result in a constructible, maintainable and durable structure.

How We Do it

- **Through Quality Assurance at Key Project Milestones.**

Broad Based and Conceptual designer-independent reviews performed at key project milestones to ensure that all projects are developed in conformance with current standards, policies, guidelines and sound engineering practices, and will result in a constructible, maintainable and durable structure.

Our Organization



Structure Design Bureau

- Produce a portion of the Department's overall Capital Bridge Program
 - 82 designers and detailers
 - 40 to 50 bridges per year for \$100m to \$120m
 - Develop the experience base necessary to sustain expertise in specialized areas
 - Commissions the Bridge Design Committee that adopts and interprets AASHTO Bridge Design Specifications for use in New York State
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Structural Engineering Services Bureau

- Provide specialized engineering services in support of the Department's design and construction programs.
 - Specialization areas:
 - metals engineering
 - concrete engineering
 - foundations and construction
 - Implement Quality Assurance programs, for steel and concrete fabrication plants, that ensure that bridges are constructed with quality materials and in the manner designed.
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Bridge Evaluation Services Bureau

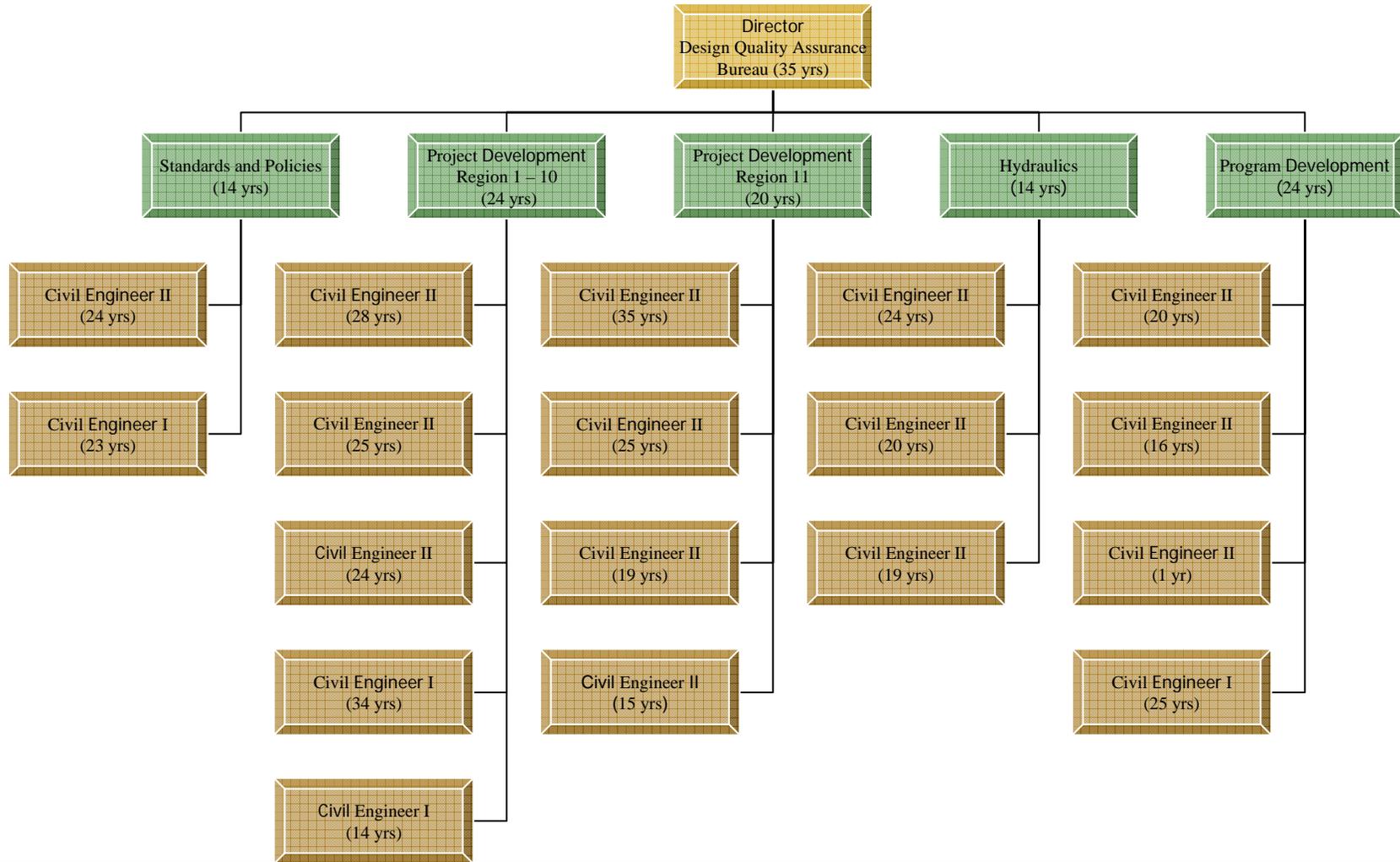
- Manage the Bridge Inspection Program
 - Manage Bridge Load Rating and Safety Assurance Programs
 - Evaluate Overload Permit Applications
 - Administer a Bridge Information Database that underpins the Department's effort to develop a sound strategy to manage and improve the overall bridge network
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Structures Design Quality Assurance Bureau

Overall Purpose:

Assure that the Department's bridge program and associated projects are developed in conformance with the appropriate policies, standards and guidelines.

Structure Design Quality Assurance Bureau



Standards and Policies Unit

- Prepare standard details for bridges (BD Sheets). Evaluate performance of details and recommend new standard practices.
 - Provide technical support to designers in the use of standard details and offer design advice.
 - Prepare and update the NYSDOT Bridge Manual.
 - Prepare and update specifications and details for overhead sign structures.
 - Provide coordination in the preparation of all bridge related construction specifications, EI's and EB's.
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Project Development Units

- Through our reviews, we Communicate the Department's technical Standards, Guidelines, and Best Practices to Designers.
 - Provide early project technical guidance to designers.
 - Assure that Bridge Project Development and Detail Design documents properly incorporate Standards, Guidelines, and Best Practices and that resulting products are Constructible.
 - Facilitate Consultant and Regional Bridge Plan Preparation.
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Project Development (Regions 1 - 10)

- Engineer and Prepare Preliminary Bridge Plans for some In-House designs
 - Perform Technical Progress Reviews for Federally Funded Locally Administered bridge projects that are Innovative and Unusual
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Project Development (Region 11)

- Liaison for the Structures Division with FWHA for the East River Bridge rehabilitation projects and other major NYCDOT bridge projects that are federally funded.
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Hydraulic Engineering

- Perform hydraulic and scour analyses for in-house and consultant designed structure replacements.
 - Provide Quality Assurance for Regional and Consultant prepared hydraulic analyses.
 - Perform hydraulic analyses to size temporary detour structures to conform to existing Department and FEMA regulations.
 - Coordinate with regulatory agencies, State and Federal
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Hydraulic Engineering (cont'd)

- Provide hydraulic designs for a variety of hydraulic problems unrelated to bridges upon request.
 - Review planning documents for selection of alternate designs considering hydraulic safety, conformance with existing regulations, and overall efficiency.
 - Provide hydraulics training to Department personnel statewide.
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Program Development Unit

- Provide tools to program developers to identify appropriate program candidates.
 - Coordinate with Policy and Strategy for Goals and Selection Guidance.
 - Provide quality assurance to the Regions' proposed bridge programs
 - Maintain Bridge Project Cost Estimating and Reporting System.
 - Maintain Division's bridge project database; report progress & production of Design Bureau.
 - Maintain Bridge Design Resource Estimating System (Consultant and In-house).
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Program Development Unit (cont'd.)

- Serve as the Structures Division liaison to Consultant Managers; Recommend technical activities and estimate the associated effort necessary to generate bridge project development / design products.
 - Serve as the Structures Division liaison to the FWHA for bridge program development and production activities.
 - Serve as the Office of Structures Coast Guard Permit agent.
 - Produce Federal Unit Cost Report
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Our Process

- Quality Assurance Through Technical Progress Reviews
 - Required at project milestones for all structures.
 - Considered integral to the design process
 - Performed by parties other than the designers.
 - Broad based and conceptual in nature; experience driven.
 - Purpose; offer general advice, expert opinion and approvals.
 - Ensure standards, policies, guidelines and good engineering practice are met.
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Technical Progress Review

Milestones

- Project Scoping Document
 - Identify the project area's safety, mobility, infrastructure, community, and environmental conditions, needs and objectives.
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 - Prepare preliminary cost estimate.
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Technical Progress Review Milestones

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Technical Progress Review Milestones

- Preliminary Plan Development
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Technical Progress Review Milestones

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Technical Progress Review Milestones

- Final Plans, Specifications and Estimates (PS&E)



Our Review Matrix

TYPE OF WORK	*IPP	DRAFT EPP	DRAFT DAD	PRELIM. REVIEW	ADP REVIEW	PS&E REVIEW
Bridge Removals	R	R	R	R	R	R
Bridge Painting Contracts	R	R	R	R	R	R
Non-Structural Maintenance Repair by Contract	R	R	R	R	R	R
Non-Structural Preventative Maintenance Contract	R	R	R	R	R	R
Asphalt Overlays For Interim Repair To Improve Ridability	R	R	R	R	R	R
Non-Demand Structural Maintenance Repair by Contract/Element Specific	R	R	R	R	R	R
Deck Overlay Projects – other than asphalt	R	S	S	R	R	R
Deck Replacement Projects	R	S	S	S	R	R
Structural Widening Projects	R	S	S	S	S	S
Major Bridge Rehabilitation Contracts	R	S	S	S	S	S
Minor Bridge Rehabilitation Contracts	R	S	S	R	R	R
Bridge Superstructure Replacement	R	S	S	S	S	S
Replacement and New Bridges	R	S	S	S	S	S

Post Letting

- Shop Drawing Reviews
 - Temporary Structure Approval
 - Lifting Operations Approval
 - Erection procedure approval
 - Pile driving equipment and Pile Load test approval
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Post Letting (cont'd)

- NYS Pre-stressed Concrete Construction Manual
 - NYSDOT Steel Construction Manual
 - Full time inspectors in Concrete and Steel Fabrication Plants
 - Welder Certification
 - Post Construction Meetings
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