# APPENDIX 12
## QUALITY CONTROL AND QUALITY ASSURANCE

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1.0 INTRODUCTION

1.1 PURPOSE

The purpose of this Appendix is to:

- Describe the Region’s quality control and quality assurance roles and responsibilities.
- Provide guidelines on the format and content of the Region’s Design Quality Control/Assurance Plan.
- Describe the roles of the Main Office Functional Units (MOFUs).

1.2 DEFINITIONS

**Quality** - The degree to which a product or service satisfies defined expectations representing a balance of identified customer requirements.

**Quality Control (QC)** - Actions to catch defects. Quality Control is the independent checking of work and use of control points (approvals) to ensure a high level of confidence that each product will meet expectations.

The responsibility for Quality Control rests with the office producing the product. For the purpose of this document, Quality Control includes, but not limited to:

- Detailed independent check of compliance with Department policies and procedures.
- Detailed independent check of compliance with NEPA and SEQR requirements.
- Detailed independent check of compliance with Department Design Standards.
- Detailed independent check of all computations.
- Detailed independent check of project design drawings for compliance with Department Standard Details and design calculations.

**Quality Assurance (QA)** - Actions to prevent defects or make improvements. Quality Assurance is a function that identifies, documents, and reviews for improvement the processes that deliver products. Quality Assurance is the policies, procedures, and systematic actions established in the Design Division and the Regions for the purpose of ensuring quality.

Although the majority of design quality assurance responsibilities reside in the Main Office, Regions also have a quality assurance responsibility to assure the execution of the required quality control activities, and development of the Regional process and procedures that fit the region’s operation or organization.
2.0 QUALITY CONTROL/QUALITY ASSURANCE (QC/QA)

2.1 REGION’S RESPONSIBILITIES

- Designate a Professional Engineer (P.E.) to be the Region’s Design Quality Control Engineer (RDQCE) to oversee QC/QA activities and related issues in the Region.
- Prepare a Regional Design Quality Control/Assurance plan and use it as the basis for their QC/QA activities.
- Perform Quality Control on all in-house project development and design products.
- Establish a process to ensure that consultants, outside agencies, and Main Office MOFUs perform their own quality control activities on all project products produced for the Region.
- Submit a certification of compliance with required Quality Control measures with project approval requests.

2.2 REGIONAL DESIGN QUALITY CONTROL ENGINEER’S ROLES AND RESPONSIBILITIES

The Regional Design Engineer shall designate a P.E. as the Regional Design Quality Control Engineer (RDQCE) to oversee the design quality control/assurance efforts in each Region. The RDQCE responsibilities may include but are not limited to:

- Regional Design Group quality control and quality assurance program (QC/QA). The purpose of this program is to:
  - Develop, maintain, and verify implementation of the Regional Design QA/QC program and ensure management goals, needs and objectives are met.
  - Ensure that Regional Design Group support units develop, maintain and execute their own QC/QA processes, and that these QC/QA processes are in compliance with the overall Regional Design Group quality assurance program.
  - Ensure that Main Office Functional Unit/Regional Design Group support unit communication and feedback is incorporated into the QA program.
  - Coordinate Regional Design Group design quality assurance program activities with other Regional Groups.
- Monitor project development/design product quality.
  - Use various indicators to evaluate the Region’s QC/QA program (sampling plans, reviewing visitation reports, EIC feedback, etc.)
  - Develop and implement quality measures and indicators throughout the project development process.
  - Identify design quality problems and analyze customer feedback.
  - Ensure compliance with the project quality program/plan.
- Implement and monitor quality improvement initiatives.
  - Advise Regional Design Group management of design quality issues.
  - Identify and implement quality improvement initiatives or corrective actions for procedural, product, and/or process deficiencies. (Based on
quality indicators, customer feedback, etc.)

- Recommend training in various standard operating procedures.
- Assist Regional Design Group support units in developing quality assurance policies and procedures.
- Provide feedback to Main Office MOFUs regarding design and process quality issues of Department wide interest.

2.3 GUIDANCE ON DEVELOPING QUALITY CONTROL PLAN (QCP)

2.3.1 Quality Control Process

1. Document the process that is currently used or will be used to insure that the Region is prepared to accomplish the quality control function and that the necessary procedures and personnel are or will be in place.

2. The Regional Director, or his/her designee, submits the QCP to the Design Quality Assurance Bureau for review and comment.

3. The Design Quality Assurance Bureau Director and the Regional Director, or his/her designee, jointly resolve any issues resulting from review of the QCP. Issues that cannot be resolved will be referred to the Chief Engineer for resolution.

4. The Regional Director submits the Regional QCP to the Deputy Chief Engineer for final approval.

5. Upon approval by the Deputy Chief Engineer, the Regional Director, or his/her designee implements all elements of the Regional QCP, and when accomplished certifies to the Deputy Chief Engineer that the approved Regional QCP is in place and functioning effectively.

6. Compliance with the adopted QCP will be an element of Main Office quality assurance reviews of Regional activities. From time to time the QCP may need to be revised and resubmitted as outlined above.

2.3.2 Required Content for the Regional Quality Control Plan

Design quality control can be accomplished in a variety of ways and should be tailored to a particular Region’s circumstances. It is strongly suggested that the Regional Director establish and adequately staff a Quality Control Unit within the Regional Design Group as the means for accomplishing the above activities.

Working on behalf of the Regional Director, the Regional Design Engineer (RDE) or his designee assesses, in consultation with the appropriate Main Office Functional Unit, current Regional design quality control practices in order to determine whether the current mechanisms in place are satisfactory and consistent with the requirements of this section. Monitoring reports, review comments (such as the number of level I comments generated), number of amendments, number of field changes, etc., should be
used to help make this determination. The Regional Quality Control Plan (QCP) is the responsibility of the Regional Director and should, regardless of the approach taken, ensure that:

- Reviews of the various design products are accomplished independently.
- Reviews of a particular design related product are accomplished utilizing an approach that will promote Regional consistency (Develop/adopt review checklist that provide a consistent and acceptable level of quality).
- Reviews are accomplished by or under the direction of a professional engineer.

The proposal should be specific relative to:

- How the design quality control function will be integrated into the organizational structure of the Region.
- List of Master Control Documents including regional policies and specifications.
- How the design quality control features in the plan will be implemented (i.e., what reviews will be performed, to what extent, who is responsible for the review and what form of documentation will be maintained).
- Assistance needed from the Main Office during implementation.
- The training needs of the persons assigned to the quality control function.
- A schedule for implementation.

2.4 CONTROL DOCUMENTS

The Department is committed to Quality Management through continuous process improvements. These improvements are reflected in regular updates of its manuals, procedures, policy statements, bulletins, standards, rules, regulations and other publications used for project developments. To assure design quality, it is important that designers be aware of and uses the up-to-date design standards and specifications in developing capital projects. Regions shall assure an up to date, complete set of control documents are being used by utilizing those posted on the Intradot when available and/or maintaining a master copy of them. The master control documents shall include the up-to-date versions of the following design policies, standards, specifications, and guidelines:

- NYSDOT Project Development Manual (PDM)
- NYSDOT Highway Design Manual
- NYSDOT Standard Sheets
- NYSDOT Standard Specifications for Highway Bridges
- NYSDOT Bridge Manual
- NYSDOT Bridge Detail Sheets
- NYSDOT Standard Specifications for Construction and Materials
- NYSDOT Manual of Uniform Traffic Control Devices
- NYSDOT Surveying Standards and Procedures Manual
- NYSDOT Right of Way Mapping Procedure Manual
- NYSDOT Materials Bureau Materials Methods
- NYSDOT Environmental Procedures Manual
The Regional organizational approach to accomplish the quality control/quality assurance function is an important aspect of the Regional QCP. It is strongly suggested that the Regional Director overlay a “Quality” organizational structure over the existing organization. Quality responsibility and reporting should be intertwined throughout the Regional organization. It is suggested that quality initiatives be formalized but that quality reporting not necessarily follow existing chains of command. The Regional Design Quality Control Engineer (RDQCE) should act as surrogate in a staff capacity for the RDE with respect to design quality and facilitate organizational quality, efficiency, and effectiveness initiatives. The RDQCE may report “directly” to the Regional Director and/or the Director, Main Office Design Quality Assurance. It is the responsibility of the Region Director to decide on the best approach to developing a quality organizational structure.

The Regional Director may propose alternative methods for accomplishing quality control. For example, establishing small committees, to review certain design products or elements, is one approach. However, as a minimum each Region must have a Quality Control Engineer to coordinate such activities and to be a liaison for QC/QA with
the Main Office. The Regional Design Quality Control Engineer needs to be a Professional Engineer (P.E.) and desirably have extensive design experience.

### 2.6 REQUIRED QUALITY CONTROL REVIEWS

Considering the fact that the organizational structure varies from Region to Region, and that designs are produced by different groups, the following guideline places the QC/QA focus on the design products rather than the players. The Region’s Quality Control/Quality Assurance Plan is expected to include processes, procedures and responsible participants to review, **at a minimum**, the following design elements through the project development phases.

**Scoping:**

Provide independent review of the project Scoping Report/ Design Approval Document with emphasis on the following elements:

<table>
<thead>
<tr>
<th>Elements</th>
<th>Review Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>General scope</td>
<td>Project scope is adequately defined, and project objectives reflect the purpose and need. All feasible and prudent alternatives are developed and evaluated. Processes are provided to insure that designs are cost effective.</td>
</tr>
<tr>
<td>Design criteria</td>
<td>Design criteria are fully described. Non-standard features and/or non-conforming features are properly documented and addressed.</td>
</tr>
<tr>
<td>Capacity and safety</td>
<td>Readily available traffic and accident data are gathered and evaluated.</td>
</tr>
<tr>
<td>Cost and schedule</td>
<td>The project preliminary cost estimate and schedule are reasonable.</td>
</tr>
<tr>
<td>Community input</td>
<td>A Public Involvement Plan is developed (refer to Appendix 2 of this manual). Coordination with the communities and localities is initiated.</td>
</tr>
</tbody>
</table>
Preliminary Design (Phase I - IV):

Provide independent review on the Draft and Final Design Reports/Environmental Documents with emphasis on the following elements:

<table>
<thead>
<tr>
<th>Elements</th>
<th>Review Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design criteria</td>
<td>Design criteria are fully described and correct. Non-standard features and/or non-conforming features are properly documented and retention justified. Correlation of retained non-standard features to safety concerns is addressed.</td>
</tr>
<tr>
<td>Public Involvement Plan</td>
<td>Community input are sought and addressed per Public Involvement Plan. Public hearing and agency requirements are met.</td>
</tr>
<tr>
<td>Geometric selections</td>
<td>Clear zone and related safety appurtenances are evaluated.</td>
</tr>
<tr>
<td>Capacity and safety analysis</td>
<td>Traffic and accident data are gathered, and capacity and safety issues addressed.</td>
</tr>
<tr>
<td>Maintenance &amp; protection of traffic scheme</td>
<td>Preliminary MPT alternatives are evaluated and selected.</td>
</tr>
<tr>
<td>Environmental documents &amp; permits</td>
<td>Environmental documents and permit preparations are underway.</td>
</tr>
<tr>
<td>ROW and ARM</td>
<td>ROW acquisitions are adequate and necessary. Abstract Request Maps are prepared on time.</td>
</tr>
<tr>
<td>Utility agreement</td>
<td>Utility involvements are clearly defined. Utility agreements are initiated and preparation is underway.</td>
</tr>
<tr>
<td>Constructability review</td>
<td>Regional Construction Group is on board, preliminary constructability review is sought.</td>
</tr>
<tr>
<td>Preliminary cost estimate</td>
<td>Preliminary cost estimate is prepared. Costs for related work are appropriate.</td>
</tr>
</tbody>
</table>
Final Design (Phase V-VI):

Provide independent review on the Advanced Detail Plans and Final PS&E with emphasis on the following elements:

<table>
<thead>
<tr>
<th>Elements</th>
<th>Review Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bridge site data package</td>
<td>Bridge site data are prepared, submitted.</td>
</tr>
<tr>
<td>Community commitments</td>
<td>Community commitments are reflected in plans</td>
</tr>
<tr>
<td>Maintenance &amp; protection of traffic plans</td>
<td>MPT scheme is appropriate and MPT plans are complete and workable.</td>
</tr>
<tr>
<td>Structures Plans</td>
<td>Structure layout agrees with site data.</td>
</tr>
<tr>
<td>Utility agreement</td>
<td>Utility agreements are complete or in process</td>
</tr>
<tr>
<td>ECOPAC</td>
<td>ECOPAC are prepared and items listed are complete or in process.</td>
</tr>
<tr>
<td>Special notes and specifications</td>
<td>Special notes are complete and appropriate. Special specifications are submitted for review and approval on time.</td>
</tr>
<tr>
<td>Engineer's estimate</td>
<td>Estimate computation sheets are prepared, item prices are verified.</td>
</tr>
<tr>
<td>CADD files and drawings</td>
<td>CADD drawings are prepared to the CADD specs.</td>
</tr>
</tbody>
</table>
### Post-PS&E:

<table>
<thead>
<tr>
<th>Elements</th>
<th>Review Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Visitation Report (PVR)</td>
<td>Mid-construction meeting is arranged and PVR is prepared.</td>
</tr>
<tr>
<td>Analysis of Orders on Contract</td>
<td>Designers received feedback on Field Change Orders or Orders on Contracts.</td>
</tr>
<tr>
<td>Post-construction meeting</td>
<td>Designers attend the post-construction meeting.</td>
</tr>
</tbody>
</table>
Table A12-1 summarizes the minimum independent review elements to be included in a Regional Design QA/QC plan.

### Exhibit 12-1 Guidelines for Regional Design QC/QA Plan

<table>
<thead>
<tr>
<th>Elements (at minimum, requiring independent review)</th>
<th>Phases</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Scoping (PSR)</td>
</tr>
<tr>
<td>General scope</td>
<td>×</td>
</tr>
<tr>
<td>Design criteria</td>
<td>× × ×</td>
</tr>
<tr>
<td>Public Involvement activities</td>
<td>× × × ×</td>
</tr>
<tr>
<td>Cost/Estimate</td>
<td>× × ×</td>
</tr>
<tr>
<td>Geometric selections</td>
<td>× ×</td>
</tr>
<tr>
<td>Capacity and Safety analysis</td>
<td>× × ×</td>
</tr>
<tr>
<td>MPT</td>
<td>× × ×</td>
</tr>
<tr>
<td>Environmental document/permit</td>
<td>× × × ×</td>
</tr>
<tr>
<td>ROW and ARM</td>
<td>× × ×</td>
</tr>
<tr>
<td>Utility agreement</td>
<td>× ×</td>
</tr>
<tr>
<td>Constructability review</td>
<td>× ×</td>
</tr>
<tr>
<td>Bridge site data package</td>
<td></td>
</tr>
<tr>
<td>Structures Plan</td>
<td></td>
</tr>
<tr>
<td>Special Notes</td>
<td></td>
</tr>
<tr>
<td>Special Specification</td>
<td></td>
</tr>
<tr>
<td>CADD files and drawings</td>
<td></td>
</tr>
<tr>
<td>Project Visitation Report</td>
<td></td>
</tr>
<tr>
<td>Analysis of OOC</td>
<td></td>
</tr>
<tr>
<td>Post-construction meeting</td>
<td></td>
</tr>
</tbody>
</table>
2.6.1 **Review Responsibility**

Due to variation of the organizational structure from Region to Region, the above guideline for the Regional Design QC/QA Plan does not specify the responsible groups or individuals to conduct the review. The Regions should designate reviewers for each of the review elements in their Regional Design QC/QA Plan. It is recommended that design check lists of review responsibilities for the various Regional Functional Units be included in the Plan.

Main Office Program Areas also play a vital role of assuring design quality. The review responsibilities for Main Office Program Areas are listed in the succeeding sections of this Chapter. However, it is the Region’s responsibility to request appropriate reviews. At a minimum, M.O. Design Quality Assurance Bureau, Environmental Analysis Bureau and the Legal Department must review all EISs prior to title sheet signature. Other MOFUs should review projects as the Region deems necessary to provide adequate technical and procedural oversight. It is recommended that appropriate MOFUs be brought into the design process early for all complex projects.

2.6.2 **Correspondence**

- For all correspondence within DOT: Send a memorandum directly to the leader in charge of the section doing the review. If the submittal requires approval by Chief Engineer or FHWA, the request should be addressed to the Bureau Director. Correspondence should indicate the person(s) performing the work and the leader in charge of the section doing the work. The correspondence should state clearly the desired work (e.g., review a design report), the requested completion date, any unusual circumstances, and the person who is to be contacted in the event of questions. In cases where documents are sent to multiple groups, note all recipients of the correspondence and appropriately indicate who received attachments. For concurrent (i.e., DOT/FHWA) reviews address correspondence directly to FHWA as indicated below.

- For general correspondence to FHWA: Send memorandums to the Division Administrator, attn: Area Engineer, with copy to the M.O. Liaison (see Chapter 4, exhibit 4-1 of this manual for a listing of Liaison offices.)

- For correspondence to outside agencies: Regional protocols should be followed.

2.6.3 **Electronic Reviews**

The use of ProjectWise as the file management system for the Department facilitates progressing technical and procedural project reviews electronically. Utilizing electronic reviews using ProjectWise will expedite the review and create a paperless review process. Before initiating an electronic review please contact the appropriate MOFU to make sure they are ready and familiar with the process.
Following are the recommended steps for electronic reviews:

- Each Main Office Project Liaison (MOPL) office responsible for the reviews should create a generic e-mailbox; for example DQAB-Regional Liaison Section has the account dqab-rls@dot.state.ny.us. The creation of a generic e-mailbox makes it easy to track projects coming into a unit, prevents the clogging of managers e-mail boxes and having e-mails go to the wrong person.
- Requests for electronic reviews to FHWA must be sent to newyork.fhwa@fhwa.dot.gov.
- The Region stores project documents in the appropriate ProjectWise directory.
- The Region sends an e-mail to the generic e-mailbox informing the MOPL (per Table 4-1)/FHWA that the project (PIN) is ready for review. The e-mail should list the names and locations of the documents in ProjectWise, a brief description of the content of the files, and a statement specifying the details of the request.
- The MOPL/FHWA reviews the document(s) and provides comments in MOPL's ProjectWise directory.
- The MOPL/FHWA e-mails the person who sent the request from the region notifying him/her that comments are available in the ProjectWise MOPL/FHWA directory.
- Requests for Environmental determination, Non-standard Feature approval and/or Design Approval should be made with the appropriate request memos and hardcopies as outlined in Chapter 4 and Appendix 3.

2.6.4 Regional and Main Office Functional Units Improvement/Feedback Responsibility

Throughout the course of project development, general project reviews and post project reviews, engineers develop elements of design, design processes, and engineering practice which result in general improvements for the Department. Occasionally, a Region may develop their own standard to gain the efficiencies of an improved quality design. It is the responsibility of all Regions and the MOFUs to provide feedback to the appropriate design policy group regarding significant design improvements, both planned and implemented. The Region QCP must designate the depository of planned, implemented or proposed design engineering or design process improvements. Usually, this would fall in the purview of the Region Design Quality Control Engineer. Furthermore, it is the responsibility of the Region to periodically submit to the appropriate Main Office Functional Unit Director, a summary of these improvements with appropriate documentation (i.e., samples of the improvements, if available, or detailed suggestions). Occasionally, the designated regional representative of proposed, planned and implemented design policy improvements is expected to attend quality improvement meetings. He/she is responsible for providing input to design process improvements. The intent is to share with other Regions and MOFUs the design improvements and provide a mechanism for Department improvement.
2.7 TRAINING FOR DESIGN QUALITY

Training for design quality means training for both technical skills and quality attitude. Staff expertise in specialized fields such as traffic analysis, geometric design, CADD, etc., affects the quality of the design. Providing opportunities for continuing education can be costly, but will pay dividends in terms of design quality. The Regional Design QC/QA Plan should include regional guidelines for designers to receive sufficient technical training.

The Plan must also place as much emphasis on the development of a “quality attitude” (so-called intangible training) as it does on technical capabilities. Examples of intangible training could be:

- Attending public information meetings.
- Dialogues with localities during the project development process.
- Visiting a project’s site during construction and preparing a Project Visitation Report.
- Involvement in the evaluation of change orders or post-construction reviews.
- Participating in post PS&E MPT activities.
- Leadership and Quality System training.

These actions or activities provide good feedback to the designers and allows them to learn from past experiences. Such actions or activities also send a message to the others that the Department is concerned about accountability and continuous improvement.

The Region is encouraged to contact the Design Quality Assurance Bureau and other MOFUs for advice and assistance while developing and implementing their Quality Control Plan. The continuation of this cooperative relationship after implementation is essential to success.

In addition to this formalized and independent quality control function in the Region, it is essential that all design staff, particularly project designers (job managers), understand and accept the premise that they are the most important factor in quality control. Their responsibility is to do it right the first time, every time, by adhering to Department policies, procedures, rules, regulations and good engineering practice.

2.8 MAIN OFFICE ROLE

As explained in Sections 1.2 and 2.1, the office producing the product is responsible for all aspects of quality control. The Main Office role is to support the Regions by providing the following:

- Quality Assurance - The Main Office develops and improves standards, policies and procedures.
- Provides training.
- DQAB provides periodic QC/QA engineers’ meetings to promote the sharing of best practices.
Provides periodic meetings of Design Staff from various Regions to allow for sharing of best practices, learn of upcoming developments, and to provide feedback to Main Office staff.

• Provides technical and procedural assistance to regional staff and consulting engineers to ensure the successful completion of capital projects.

• Liaison Activities –
  o M.O. project liaison coordinates FHWA reviews and approvals as appropriate.
  o M.O. project liaison coordinates MOFUs reviews as requested by the Region.

• Quality Assurance Review -The Main Office project liaison engineer (refer to Chapter 4, Exhibit 4-1 for a listing of liaison offices) will perform a quality assurance review whenever design approval or title sheet signature is required from the Deputy Chief Engineer; or whenever environmental determination or design approval is required from FHWA and the process requires MOFU liaison involvement, see TEA-21 Matrix and process steps in Chapter 4. This review focuses on, but not limited to, compliance with the control documents identified in Section 2.4, NEPA, SEQR, Executive Orders and other provisions of State and Federal Law.

• Peer Reviews - The Regional Office may request a peer review for a project, an element of a project, and/or process steps for a project. The MOFUs will work closely with the Region to determine the purpose, scope, and schedule of the peer review. As appropriate, the Main Office may reach out to FHWA, other state agencies, national associations to obtain and provide the necessary support to the region.

Formal comments will be provided and resolved in accordance with Section 4.3 of this appendix. Review guidelines for the most commonly contacted MOFUs are as follows: (see Chapter 4, exhibit 4-1 of this Manual for a listing of Liaison Offices).

2.8.1 Design Quality Assurance Bureau- Regional Liaison Section (DQAB-RLS)

DQAB-RLS should be involved early, beginning with a review of the scoping document, especially on complex projects where they will be the design liaison with FHWA. DQAB-RLS is to be requested to perform a Quality Assurance review on all EIS projects. In addition to the required projects reviews, it would be appropriate to request DQAB-RLS involvement for:

• Projects with many possible procedural snags due to federal or state requirements (e.g., there are many agencies involved and/or complex environmental impacts are anticipated)
• Projects with many complex engineering issues (e.g., proposed High Occupancy Vehicle lanes, major maintenance and protection of traffic or construction sequencing problems, modification of freeway access, roundabouts, etc.)
• Projects where an overall peer review outside the Region is desired.

If unsure of whether Main Office involvement is appropriate, contact the Regional Design Engineer, the Regional Quality Control Engineer, or the Design Quality Assurance Bureau liaison for your region.
2.8.2 **Landscape Architecture Bureau (LAB)**

LAB should be involved early, beginning with a review of the scoping document, on the more complex projects that involve landscape architecture expertise, especially those where they will be the design liaison with FHWA. Examples of projects where LAB reviews may be appropriate are:

- Rest area and comfort station construction/reconstruction
- Construction of complex or controversial bicycle and pedestrian projects
- Information centers
- Complex facilities for persons with disabilities
- Complex landscape development projects
- Projects with complex or controversial issues related to aesthetics

If unsure of whether a LAB review is appropriate, contact the Regional Landscape Architect.

2.8.3 **Structures Design and Construction Division Technical Reviews**

The Structures Division maintains a continuing role in the review of scoping documents, draft design approval documents, structure study package, preliminary plans, advance detail plans, and PS&E's for certain types of bridge projects, regardless of fund source. Refer to Section 20 of the Bridge Design Manual for specific guidance relative to structural design review considerations. If unsure of whether a Structures review is appropriate, contact the Structures Design and Construction Division, Design Quality Assurance Bureau.

2.8.4 **Environmental Analysis Bureau**

Environmental reviews by the Environmental Analysis Bureau (EAB) include:

- EIS projects
- Design Approval Documents that involve complex environmental issues.
- Any report that the Regional Environmental Contact (REC) decides it will add value to the project and/or benefit staff.

In addition, coordination with EAB should occur early in the project development process for the following types of projects:

- Projects that involve complex environmental requirements and coordination with many agencies.
- Projects which have to meet Congestion Management System requirements

The environmental resource sections in EAB are 1) Air Quality, 2) Water/Ecology, 3) Socio-Economic/Cultural Resources/Process, 4) Hazardous Waste, and 5) Noise. If a copy is provided for each section in EAB that needs to review the environmental document, EAB's environmental resource sections can review the document concurrently and provide a reduced turn-around.
If unsure of terms such as Congestion Management System or whether an EAB review is appropriate contact the REC.

2.8.5 **Technical Services Division Technical Reviews**

On projects with substantial technical content (new or reconstructed pavements, bridge replacements, substantial earthwork, retaining walls, etc.) the Advance Detail Plans should be submitted to the Technical Services Division for review. This review is most useful at ADP design stage where the technical items have been detailed, but not finalized.

2.8.5.1 Geotechnical Engineering Bureau

Because of the specialized nature of soils analysis and design required during the design stage, the Regional Geotechnical Engineer should be involved in the development and review of the scoping document, the design approval document, and Advance Detail Plans for projects with soils related work. Scoping documents, design approval documents, and information on the availability of plans should be made available to the Geotechnical Engineering Bureau through the Regional Geotechnical Engineer. Reviews by the Geotechnical Engineering Bureau are typically done for the stability of permanent and temporary walls and sheeting systems; foundation/piling analysis; sign, signal, and light foundations in soft soils; etc. If unsure of whether a review is appropriate, contact the Regional Geotechnical Engineer.

2.8.5.2 Materials Bureau

In most cases, the regular Regional Functional Group review is all that is needed. Main Office Materials Bureau reviews should be considered for projects that have unusual types of work, such as cold/hot in-place recycling, rubblizing, or unusual special specifications. For these projects, a request for review of the scoping documents or draft design approval documents or Advance Detail Plans is appropriate. Documents for review and an explanation of what is to be reviewed should be developed in conjunction with the Regional Materials Engineer and submitted to the Main Office through the Regional Materials Engineer. If unsure of whether a review is appropriate, contact the Regional Materials Engineer.

2.8.6 **Traffic Engineering & Highway Safety Division (TE&HS)**

Reviews by the TE&HS are recommended for projects having unusual or controversial issues related to traffic safety, operations, or access to private development. Reviews should also be considered for new or innovative safety and/or operational improvements.

Examples of projects where a review by TE&HS would be appropriate are ITS, major traffic signal system, new traffic control devices. Since these issues can impact the scope of a project, the TE&HS should be involved early at the scoping stage and throughout the design stage. If unsure of whether a review is appropriate, contact the Regional Traffic Engineer. Also, Appendix 6, Intelligent Transportation Systems (ITS),
Scoping Methodologies of this manual contains further guidance on the development of ITS type projects.

2.8.7 **Office of transportation Policy and Strategy - Mobility Management Bureau**

Reviews by the Mobility Management Bureau are recommended for the following types of projects:

- Projects having corridor studies.
- Projects which involve mobility/capacity issues, especially those having to meet Congestion Management System requirements involving significant statewide and regional corridors and facilities within those corridors (e.g. preferential lane treatments, ITS elements, major Travel Demand Management/Transportation System Management (TDM/TSM) projects, linear capacity expansion, intermodal access, major metropolitan transportation investment projects, etc.).
- Projects which involve changes in control of access to an Interstate.
- Projects which involve changes in control of access to a freeway where the original right-of-way was purchased with Federal funds.
- Access management projects; projects involving statewide trade corridors, intercity passenger corridors, tourism corridors and facilities within those corridors, commuter corridors and facilities within those corridors.
- Projects for which an Environmental Impact Statement or Environmental Assessment is required that may have major metropolitan transportation investment or congestion management issues.

It is also recommended for these projects that the Mobility Management Section be involved early, at the scoping stage and throughout the design stage, when deemed appropriate. Contact the Regional Planning & Program Manager for further assistance on Regional efforts such as congestion management system, ITS, TDM/TSM, etc. or whether a review is appropriate. Also see section 2.8.6 above for additional guidance.

2.8.8 **Real Estate Division**

Reviews by the Real Estate Division are recommended for projects that will require the following types of takings:

- Environmentally sensitive property (i.e., parklands or wetlands involving replacement property)
- Hazardous waste sites
- Property owned by the federal government or other state agencies
- Property dedicated to cemetery use

These reviews should begin during the Scoping Stage and continue through the Design Stage. If you are unsure of whether a review is appropriate, contact the Regional Real Estate Officer.
2.8.9 **Passenger Transportation Division**

Reviews by the Office of Passenger and Freight Transportation, Passenger Transportation Division are recommended for projects with a significant share of the improvements intended to enhance exclusive bike and/or pedestrian access, or other intermodal access.

2.8.10 **Office of Legal Affairs**

A review by the Office of Legal Affairs is required for all Draft and Final EIS’s during Design Phase I and IV.

2.9 **OTHER STATE OR FEDERAL AGENCY REVIEWS**

Submissions for information and comment to state and federal agencies (other than FHWA), whether required or optional, will be made directly to the agencies by the Region. The listings of state and federal agencies from which comments are usually solicited are referenced in Appendix 3 of this manual. However, for projects that require or may require a Coast Guard Permit, submissions to the Coast Guard should be sent via the Structures Design and Construction Division. This is discussed further under the Federal Advisory Agency listing for "Coast Guard" in Appendix 3.

3.0 **PROJECT REVIEWS AND COMMENT RESOLUTION**

3.1 **PURPOSE AND APPLICATION**

The purpose of this section is to establish a uniform method for providing review comments and documenting their resolution. This procedure applies to all project reviews conducted by Main Office staff regardless of whether they are required reviews or optional peer reviews.

3.2 **SUBMISSIONS**

- Submissions should be addressed as follows:
  - For Chief Engineer or FHWA approval send request to Bureau Director.
  - For all other project review send request to the appropriate Section Leader.
- Requests for reviews should include a statement specifying the details of the request and indicating the areas of concern.
- Document should include a detailed table of contents as shown in Appendix 7 of this manual. This works very well as a time saver for reviews where NYSDOT and FHWA reviewers are only looking for selected information, and for outside agency reviews that are only
interested in a few sections (e.g. utility companies, railroads, Coast Guard, Army Corps of Engineers, SHPO, etc.)

### 3.3 REVIEW TIMES FOR MAIN OFFICE REVIEWS

Many of the Program and Project Management (PPM) documents and other issuances stress the importance of including adequate review times in project schedules for Regional Functional Unit reviewers, Regional Quality Control Unit reviews, Main Office reviews, and outside agency reviews.

PPM procedures require that review times be mutually agreed to by the job manager and the reviewers. A job manager should not establish the review times for a project unilaterally nor reduce agreed to review times without agreement by the reviewer(s). It is recommended that early reviewer involvement in the project development process be maintained. Concurrent reviews with the Main Office and outside agencies (especially FHWA) may be desirable for some projects and can reduce review times.

Under normal workload and for normal projects, the job manager should allow two to four weeks from date of receipt for Main Office review based on the project type and complexity. Activities that require reviews include the transmittal of reports, plans, etc. for approval by the Federal Highway Administration (FHWA), and design approval request memos to the Chief Engineer.

Review times for complex projects will be longer, the designer should contact the Main Office Liaison to establish appropriate review time.

### 3.4 CATEGORIES OF REVIEW COMMENTS

Review comments will be categorized under one of the following two categories:

#### 3.4.1 Major Comments

Major comments concern issues of non-conformance with Department or Federal policies, procedures, standards, rules and regulations including whether supporting explanations are adequate.

Each major comment will be presented in a manner that ensures the following:

- The non-conformance issue is clearly described and the likely consequences are identified, if not obvious.
- The applicable policy, regulation, procedure, or standard is identified, if necessary for clarification.
- A recommended approach to resolving the non-conformance issue is presented. If this recommendation to the Regional Director includes putting further processing of the project on hold until the comment is resolved, the reviewer must provide a substantive reason for believing that a change to the report or
plans must be made before proceeding to the next step in the design process, or before sending a request for action and/or approval to the approving authority for a particular project.

3.4.2 Comments and Recommendations for Project Improvement

Comments and recommendations for project improvement are intended to improve the quality of the project and its documentation.

3.5 COMMENT RESOLUTION AND REQUIRED DOCUMENTATION

3.5.1 Major Comments

The Region is expected to address the major comment by modifying the work or otherwise explaining the issue in the project record, and providing a disposition of comments memo to the reviewers for information. The Main Office Liaison for the project should receive a copy of the comments resolutions.

Every attempt should be made to resolve issues at the lowest possible level. However, it is the responsibility of the Regional Director to ensure quality of their projects. Projects must be progressed using good project management techniques. As such, the cost, schedule and quality of every project must be continually monitored and assessed.

3.5.2 Comments and Recommendations for Project Improvement

Since comments and recommendations for project improvement are usually items of engineering and professional judgments more than policy matters, the Region decides how to revise the design or report to reflect the review comments.

The dispositions of the comments should be included in the project file and a copy sent to reviewers for their information at the Region’s discretion. Comments resolutions should involve discussions with the reviewer to clarify and resolve the issues and concerns.
3.6 REVISED SUBMISSIONS

All major comments need to be formally disposed of for the record, even when the Design Approval Document has been revised. Either one of the following guidelines should be used to streamline and simplify the revised submission process:

- Provide a memo listing the comments and explaining corresponding resolution.
- Submit a revised document with the changes highlighted. Highlight revised text, use a different font, or use vertical bars in the margins. The transmittal memo should explain how to interpret the changes.

Job managers should submit one revised copy to each involved Main Office Unit. When FHWA is involved, an additional revised copy should be sent to the Main Office liaison for submittal to FHWA.