

PURPOSE

To establish a quality assurance/quality control (QA/QC) plan during the design phase of capital projects in order to produce well-managed, well-designed, and properly-constructed projects that meet or exceeds the client's expectations, and is completed within the established budget and schedule.

POLICY

In order to ensure quality of design for Capital Improvement Projects planned, managed, and/or designed by Public Works, a systematic process of assessing project development must be implemented, monitored, and maintained.

Producing a quality project requires adherence to all applicable QA/QC procedures:

- Quality assurance (QA) is the systematic process of checking to see whether a project being designed and constructed is meeting specified requirements. QA is performed during the process of developing the contract documents and during construction.
- Quality control (QC) is the process of checking that the finished design or construction project meets the specified requirements. QC is performed after completion of a design phase or during the construction phase.


DISCUSSION

1. As the QA and QC procedures are interrelated, the entire process is referred to as QA/QC. Responsibility for performing QA/QC is shared by the following:
 - *Owner/Client* – The owner/client is responsible for clearly communicating the project needs, expectations and constraints to the project manager and the design team; for coordinating client progress reviews of design documents and transmitting comments to the design team in a timely manner; for properly communicating decisions that affect the project scope, quality, budget, and schedule; and for adequately funding the project. The client is also responsible for operability review.
 - *Bureau Manager* – The bureau managers of BOA, BOE, PMC, and BCM are responsible for ensuring that adequate procedures are in place and appropriate organizational structure exists for supporting QA/QC activities.
 - *Project Manager* – The project manager (PM) has overall responsibility for establishing a project's budget and schedule; for committing to and funding the appropriate level of QA/QC review; for organizing the project team; for being the direct link to the client; and for communicating effectively with the team.
 - *Section Manager* – The section manager is responsible for ensuring that the discipline-specific design team members follow established procedures and for providing resources for all design activities including design reviews.
 - *Project Lead* – The project lead (PL) is responsible for coordinating all design activities; for establishing the design criteria; and for ensuring that QA/QC reviews and project reviews take place. Depending on the project, PL means the

project engineer, project architect, or project landscape architect. The PL for most projects may also be the lead designer from the lead discipline.

- *Regulatory Affairs Manager* – The Regulatory Affairs (RA) section is responsible for coordinating environmental clearance, for ensuring that the scope of each fully designed project is consistent with the scope of the project when it received environmental clearance, ensuring that environmental commitments from environmental documents, consultations, and permits for which the contractor will be paid are incorporated into project specifications, and checking that those commitments for which Public Works is otherwise responsible are fulfilled by the project manager.
- *Site Assessment and Remediation Manager* – The site assessment and remediation (SAR) manager is responsible for ensuring that the project complies with the department’s responsibilities associated with regulation of hazardous materials and pollution source control, and for ensuring that the project incorporates any standard construction measures adopted by the department.
- *QAQC Program Manager* – The QAQC program manager (QPM) of the Project Controls and Services Division is responsible for maintaining the QA/QC procedures, and for monitoring compliance with the QAQC Forms and review procedures. The QPM is the section manager of the Contract Preparation and Project Controls Section or his/her designee.
- *Construction Manager* – The construction management bureaus in both PMC and BCM are responsible for performing constructability review on projects before they go to bid and for ensuring that the contractor performs the work according to plans and specifications. At the end of construction phase, Construction Management conducts a post-construction review of the project.

2. Overview of QA/QC plan

- a. Procedure 10-05-01 provides the general overview of QA/QC Plan and procedures for Capital Improvement Projects. Refer to the QAQC Plan Flow Chart for a flowchart showing the different design phases, reviews, and QA/QC procedures.  [QA-QC Flow Chart.pdf](#)
- b. *Design team QA checklists* For multi-discipline projects, the project design team may consist of staff from the various architectural and engineering design sections, each of whom carries different roles and responsibilities for preparing the contract documents. The design team from each discipline may include the lead designer, drafter, checker, and group leader. The lead designer is responsible for following and completing the QA checklist for his/her discipline. Refer to Procedure No. 10-05-02 (Design Quality Assurance Checklists).
- c. *Project reviews* At certain stages of design, projects must undergo a project review by a team of reviewers from each discipline who are not associated with the project. The section manager shall designate staff to perform project reviews for their discipline. Procedure No. 10-05-03 (Project Review) establishes guidelines and procedures for this review process.
- d. *Consultant-designed projects* Project design for which a consultant is the responsible lead must go through the consultant's own design QA/QC process. The PL must ensure that the following the following internal reviews for such projects are conducted by the department: Project peer review: CAD/BIM

manager, CM constructability, Contract Prep, disability access coordinator, public affairs, Regulatory Affairs, SAR manager, value engineering and deputy division manager. The agreement between the City and consultant should spell out the QA/QC requirements. The PM shall require proof that QA/QC has been performed. Procedure No. 10-05-04 (Quality Assurance of Projects Using Consultants) outlines the QA/QC procedure for consultant-designed projects.

- e. *Regulatory Affairs review* RA reviews all projects at the initial project plan stage and advises the PL as to requirements for environmental clearance. Projects that have environmental commitments, and/or for which the scope of work has expanded since environmental review, must be reviewed by RA at the 50% PS&E/100% DD milestone. RA will provide guidance on the incorporation into specifications of commitments in the construction contract, and provide the PM with a summary of Public Works' other outstanding commitments (i. e. post-construction mitigation monitoring, annual monitoring reports, compensatory mitigation, etc...). RA will as necessary initiate revalidation/re-evaluation of projects with substantial scope changes as appropriate. At the 95% PS&E/95% CE milestone, all projects, unless otherwise indicated by RA on the QA/QC plan, must be reviewed by RA, at which time RA will determine whether all commitments have been addressed. For projects for which environmental review is managed by another department, RA will provide confirmation that the environmental review process has been concluded and that all commitments have been addressed.
- f. *Site Assessment and Remediation review* SAR reviews projects at the 75% PSE/50% CD milestone, and provides the PL with contract specifications for project compliance with the department's responsibilities associated with regulation of hazardous materials and pollution source control, and with any standard construction measures adopted by the department.
- g. *Contract Preparation review* At the 95% design stage, the PL sends review drawings, specifications and cost estimate to Contract Preparation for QA/QC review. Contract Preparation is responsible for making sure that this QA/QC procedure has been followed, that the contract documents are complete for bidding, and that appropriate contracting requirements are included. Procedure No. 10-05-05 (Contract Preparation Review) details the procedures for this review.
- h. *Public Affairs Review.* The PL/PM will provide documentation of this coordination to the Public Affairs Manager with the 95% review form. It is the responsibility of the PL and/or PM:
 - a. to consult with the Department's Policy and Communications office to ascertain whether the project requires community notification as per Public Works Code,
 - b. to consult with the Department's Policy and Communications office to ascertain whether project delivery could be improved through community outreach
 - c. to determine whether the project sponsor will provide public-affairs coordination and outreach in lieu of the Department's involvement.

3. The following QA/QC forms are to be used to track QA/QC and document that QA/QC has been fully executed. The completion of the QA/QC form set demonstrates that the project is ready for bidding.
 - . [Project QA-QC Plan Form.pdf](#)
 - a. [Project QA-QC Reviews Form.pdf](#)
 - b. [95 Percent Review Transmittal Form.docx](#)
4. Related Procedures. Some of the required reviews for QA/QC have their own separate procedures:
 0. *Project Peer Review*. Project peer review is a process whereby outside experts or other City professionals review a project or a portion of a project being designed by City staff to critique the design. For consultant-designed projects, selected City staff or other consultants will perform the project peer review. Procedure No. 10-05-06 (Project Peer Review) provides the guidelines for such reviews.
 1. *Constructability Review*. Construction staff shall be brought into the design process early enough to provide input and guidance on the design. Therefore at the 50% or 75% design stages (or 50% design development and 50% construction document phases for BDC projects) the project design lead shall request a constructability review from the construction management bureau. The construction management bureau will also provide a review at the 95% stage. Procedure No. 10-05-07 (Constructability Review) outlines the procedure for such a review.
 2. *Quality Assurance Audit*. The bureaus may conduct a quality assurance audit at any stage of a project to ensure that all design work is performed in accordance with Public Works policies and procedures. Procedure No. 10-05-08 (Quality Assurance Audit) outlines the procedures for such an audit. Incorporating lessons learned To ensure continuous improvement, it is important to learn from past experiences. The PL and the project team should review past data on errors and omissions and incorporate lessons learned. The PL and the team should also incorporate client feedback where appropriate. Procedure No. 09-03-08 (Project Assessment) provides the procedures for incorporating lessons learned.
 3. *Disability Access Coordinator Review*. Public Works procedure No. 10-02-12 is used to identify the scope of work required to attain accessibility compliance on all Department of Public Works projects and to ensure that construction documents and completed facilities meet all applicable requirements and policies.

PROCEDURE

1. For each completed plan, and each completed 95% and 100% review form circulated, the PM or PL shall provide a completed copy to the QPM, save a completed digital copy in the project folder, and notify the PCS manager by email that such form has been completed.
2. Project QA/QC plan form
At the planning and programming phase, the PM or PL shall, concurrent with the project plan, complete the project QA/QC plan form, obtain all reviewer signatures indicated by

the form, address all comments made by reviewers, and save a digital copy in the project folder. The QA/QC Plan Form shall be completed as follows:

- a. Section 1:
 - Title: This is the project title in FSP
 - Project description: This is a short, clear statement of the scope and scale of the project.
 - FSP ID: This is the FSP numeric ID code.
 - Estimated construction cost: This is a rough estimate of hard construction costs only.
 - Other items are self explanatory.
 - b. Section 2. The PM or PL shall:
 - Provide estimated approximate review dates for all milestones, each in the appropriate column.
 - The remainder of section is prescriptive, to be altered by reviewers only.
 - c. Section 3. The PM or PL shall:
 - Check off all current and projected project team members. When providing them with the final, fully signed Plan form, include the project information that was circulated with it.
 - d. Section 4. The PM or PL shall:
 - Check off known applicable regulatory agencies. Reviewers may add additional agencies.
 - Signatures: Obtain all signatures – wet ink only. Circulate copies of final signed plan to all signatories, all Project Team members, and the Contract Prep manager.
 - e. Comment fields are for reviewers' comments only. These may not be altered once the reviewer has signed.
 - f. The PM or PL shall address all comments made by reviewers before circulating a Project QA/QC reviews form.
 - g. If the scope of the project has changed substantially since the planning and programming phase before the 50% PS&E/100%DD milestone, the PM or PL will recirculate the plan form with the updated project information.
3. Project QA/QC reviews form
- a. For every review milestone indicated in Section 2 of the QA/QC Plan, the PM or PL shall circulate the QA/QC Reviews form to the reviewers indicated in the Plan as required for that milestone.
 - b. The review form shall be accompanied by project information sufficient for the reviewer to conduct their review.
 - c. The 2. *Final Reviews* section is reserved for the 95% review circulation. The final reviewers shall not sign unless all of 1. *QA/QC Reviews Completed* has been completed, including the SAR certification, and all comments from the reviews have been addressed.
4. 95% Review transmittal form
- At 95% design phase, the PL shall use the 95% review transmittal form as the cover for distributing the 95% review package, which shall include a QA/QC reviews form with 1. *QA/QC Reviews Completed* fully completed.

5. The QA/QC reviews form with all final review signatures (which is equivalent to 100% review) shall serve as documentation that the project is ready for bidding.



PROJECT QA/QC PLAN

(This form must be completed by the PM or PL during the Planning Phase and saved in the Project Folder)



Section 1: Project Information

Project Title:	
Project Description:	
FSP Project ID:	Estimated Construction Cost: \$
Client Department:	Funding Type: <input type="checkbox"/> General Fund <input type="checkbox"/> Bond <input type="checkbox"/> State Grant <input type="checkbox"/> Federal Grant
Project Manager:	
Submitted By:	
Project Location:	<input type="checkbox"/> Within Right-of-Way <input type="checkbox"/> Within City Park or Open Space <input type="checkbox"/> Within the Shoreline Band/Coastal Zone

Section 2: QA/QC Review Plan

Reviews & Milestones*: <small>Strike out this line when a consultant is the responsible lead</small>	IDC BDC	PD / PP	10% PS&E 100% SD	50% PS&E 100% DD	75% PS&E 50%CD	95% PS&E 95%CD
<i>Estimated Review Dates>></i>						
Section Project Review		A	B	B	B	A
Constructability Review		O	O	B	B	A
Contract Preparation Review		O	O	B	B	A
Bureau Manager Review		A	O	O	O	A
Disability Access Coordinator		B	B	B	B	A
Regulatory Affairs Review		A	O	O	O	A
Site Assessment and Remediation		O	O	O	A	A
Other:		O	O	O	O	A

A – Required for All Projects *PD = Project Definition O – Reviews are Optional DD = Design Development
 B – Required for Building and Complex Projects PP = Planning and Programming SD = Schematic Design CD = Construction Documents

Section 3: Project Team

<input type="checkbox"/> Architectural	<input type="checkbox"/> Structural	<input type="checkbox"/> Regulatory Affairs	<input type="checkbox"/> Materials Testing Lab
<input type="checkbox"/> Streets & Highways / Paving	<input type="checkbox"/> Mechanical	<input type="checkbox"/> SAR	<input type="checkbox"/> ADA Coordinator
<input type="checkbox"/> Hydraulics / Drainage	<input type="checkbox"/> Electrical	<input type="checkbox"/> Public Affairs	<input type="checkbox"/> Consultant Designer
<input type="checkbox"/> Landscape Architecture	<input type="checkbox"/> Consultant Services	<input type="checkbox"/> Construction Management	<input type="checkbox"/> 3rd Party Project Lead

Section 4: Applicable Regulatory Agency Review

<input type="checkbox"/> DBI	<input type="checkbox"/> PUC Commission	<input type="checkbox"/> DPH	<input type="checkbox"/> OSA
<input type="checkbox"/> BAAQMD	<input type="checkbox"/> Rec & Park Commission	<input type="checkbox"/> HRC	<input type="checkbox"/> OSHPD
<input type="checkbox"/> Caltrans	<input type="checkbox"/> Planning Commission	<input type="checkbox"/> MTA-DPT	<input type="checkbox"/> State Fire Marshal
<input type="checkbox"/> Port Commission	<input type="checkbox"/> 5-Year Excavation	<input type="checkbox"/> BSM	<input type="checkbox"/>

Reviewed by:

Comments:

Disability Access Coordinator	Date	
Regulatory Affairs Manager	Date	
SAR Manager	Date	
Public Affairs Manager	Date	
Construction Manager	Date	
Deputy Bureau Mgr. (BOE) or Technical Mgr. (BOA)	Date	

Section Manager

Date

Approved:

Project Manager	Date	
Bureau Manager	Date	

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PROJECT QA/QC REVIEWS FORM

(This Form must be completed by the PM or PL after each milestone for review by the QA/QC Program Manager.)



Check Milestone for this Submittal:	Mandatory Milestones for Building and Complex Projects	For All Projects
	* <input type="checkbox"/> PD/PP <input type="checkbox"/> 10% PS&E <input type="checkbox"/> 50% PS&E <input type="checkbox"/> 75% PS&E <input type="checkbox"/> 100% SD <input type="checkbox"/> 100% DD <input type="checkbox"/> 50% CD	<input type="checkbox"/> 95% PS&E <input type="checkbox"/> 100% Final <input type="checkbox"/> 95% CD

Job Order No.: _____ Date Submitted: _____
 Project Title: _____
 Project Manager: _____ Phone Number: _____
 Submitted By: _____ Phone Number: _____

1. QA/QC Reviews Completed

Team	Team Review Completed?	Reviewer	Date Review Completed	No. of Drawings	If applicable, Design Checklists Done?
Streets & Highways	<input type="checkbox"/> Yes <input type="checkbox"/> NA				<input type="checkbox"/> Yes <input type="checkbox"/> No
Hydraulics	<input type="checkbox"/> Yes <input type="checkbox"/> NA				<input type="checkbox"/> Yes <input type="checkbox"/> No
Landscape	<input type="checkbox"/> Yes <input type="checkbox"/> NA				<input type="checkbox"/> Yes <input type="checkbox"/> No
Electrical	<input type="checkbox"/> Yes <input type="checkbox"/> NA				<input type="checkbox"/> Yes <input type="checkbox"/> No
Mechanical	<input type="checkbox"/> Yes <input type="checkbox"/> NA				<input type="checkbox"/> Yes <input type="checkbox"/> No
Structural	<input type="checkbox"/> Yes <input type="checkbox"/> NA				<input type="checkbox"/> Yes <input type="checkbox"/> No
Architecture	<input type="checkbox"/> Yes <input type="checkbox"/> NA				<input type="checkbox"/> Yes <input type="checkbox"/> No
Other Reviews					Standard Construction Measures
Project Peer Review	<input type="checkbox"/> Yes <input type="checkbox"/> NA				I certify that the Public Works Standard Construction Measures have fully been incorporated into project specifications. SAR Manager _____ Date _____
Value Engineering	<input type="checkbox"/> Yes <input type="checkbox"/> NA				
Disability Access Coordinator	<input type="checkbox"/> Yes <input type="checkbox"/> NA				
CM Constructability	<input type="checkbox"/> Yes <input type="checkbox"/> NA				
Contract Prep	<input type="checkbox"/> Yes <input type="checkbox"/> NA				
CAD/BIM Manager	<input type="checkbox"/> Yes <input type="checkbox"/> NA				
Regulatory Affairs	<input type="checkbox"/> Yes <input type="checkbox"/> NA				
Public Affairs	<input type="checkbox"/> Yes <input type="checkbox"/> NA				
Deputy Division Manager	<input type="checkbox"/> Yes <input type="checkbox"/> NA				

Is a tabulation of the review comments and responses saved in the Project file folder? Yes No NA

2. Final Reviews

Final Reviews	Completed?	By	Date Completed
General Design Checklist	Completed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		
Final Interference Check	Completed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA		

Note: Final Interference Check is required when substantial revisions to the Drawings are made due to 95% review comments.

Reviewed by: _____ Reviewed by: _____ Reviewed by: _____
 Disability Access Coordinator Date Regulatory Affairs Manager Date Public Affairs Manager Date
 Reviewed by: _____

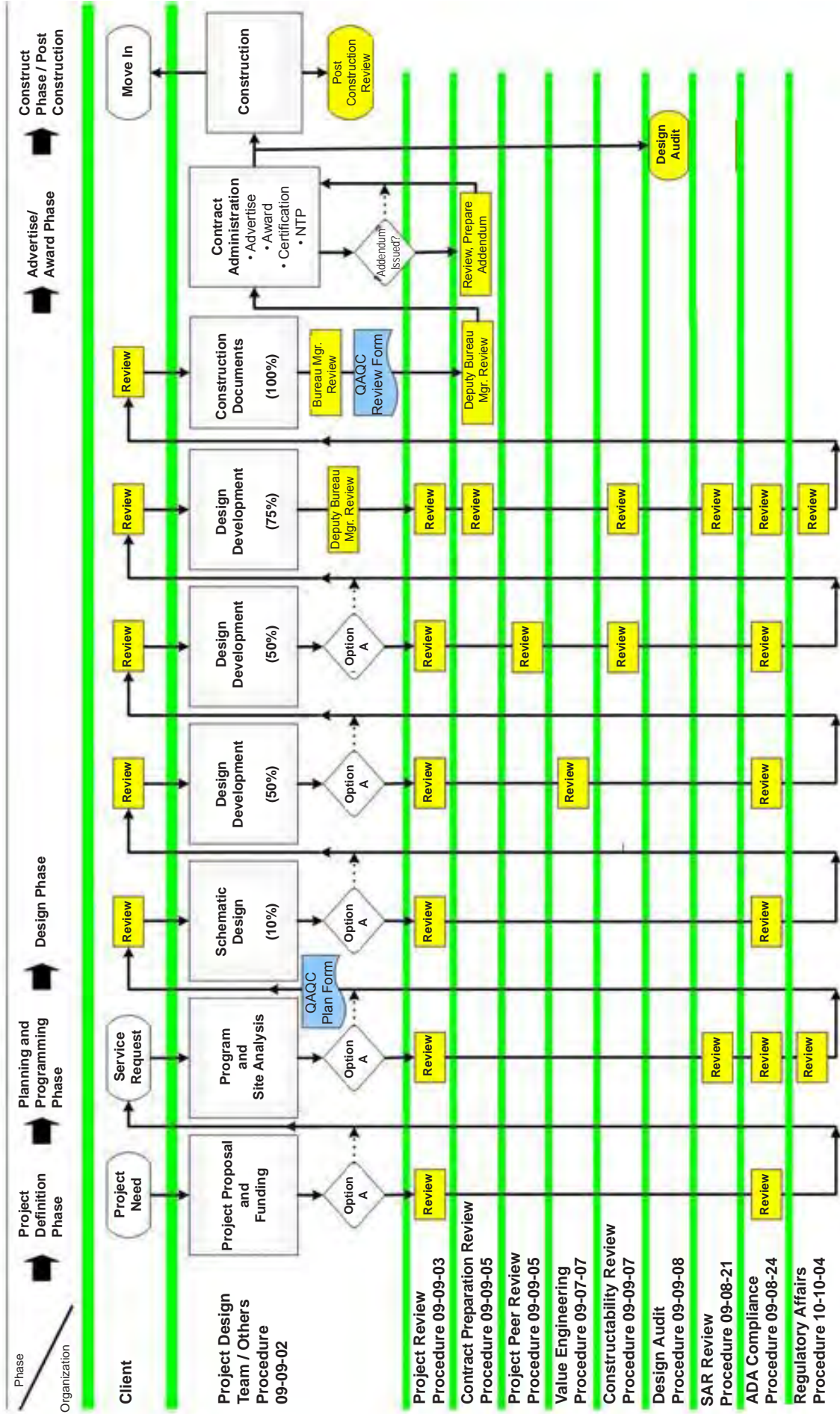
Deputy Division Manager (BOE) or Bureau Manager (BOA) _____ Date _____

* PD = Project Definition; PP = Planning and Programming; SD = Schematic Design; DD = Design Development; CD = Construction Documents. Refer to Procedure 10.05.03.

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Quality Assurance / Quality Control Plan Flow Chart

Procedure 09-09-01



LEGEND: → "YES" PROCEED TO NEXT STEP
 → "NO" PROCEED AS SHOWN