# Appendix C - Sample Commissioning Agent Request for Proposals

[Editor’s Note: The following is a sample Request for Proposals (RFP) for an Indefinite Delivery, Indefinite Quantity commissioning services contract. This sample document assumes the NCA will solicit qualifications and award one or more commissioning agent (CxA) contracts by the various VA Regional CFM Offices, or NCA MSNs via IDIQ contracts with ordering officer authority given to the various Contracting Officers. The RFP should be modified and adapted as necessary to meet the specific needs of the Region or MSN. It can also be adapted by NCACO to request proposals for specific very large projects where Central Office oversight is desired.

The sample document requests qualifications from qualified commissioning firms. Award of an IDIQ contract will be qualifications-based without pricing for specific projects. Subsequent task orders will request firm fixed pricing via competition between the IDIQ firms. -

When the proposals have been evaluated, a short list of prospective firms can be established. These firms can be interviewed so the NCA and the MSN can evaluate the firm and the key personnel face-to-face.

When evaluations have been completed, the NCA or the MSN will award IDIQ contracts to three or more best qualified commissioning firms. As required for specific projects, the NCA or MSN will compete commissioning services between the firms to provide commissioning services for the project.

The sample RFP that follows is too big for a synopsis; a synopsis should be prepared in accordance with contracting requirements that can be used in the announcement of the RFP. Using the template that follows would be a good basis for a solicitation. The sample will need to be tailored to the specific solicitation. The acquisition of a CxA may require development of an acquisition plan, source selection plan, etc. on the contracting side, and the sample RFP should be used for informational purposes only.]

Request for Proposals

Commissioning Agent Services

[Project Title]

# GENERAL INFORMATION:

## Overview:

Editor’s Note: In the paragraph below, identify the issuing office. If this is an IDIQ RFP, retain the language shown, edit as necessary. It this is an RFP for a specific project, delete the language in braces and insert language for the specific project. Add information in brackets as necessary for the specific RFP.

The U.S. Department of Veterans Affairs, [insert issuing office] hereby solicits for Qualifications to provide Whole Building Commissioning Services {on an Indefinite Delivery/Indefinite Quantity (IDIQ) Contract basis to be procured in accordance with the Federal Acquisition Regulation Part 36. It is anticipated that these ID/IQ contracts will be negotiated and awarded in [insert timeframe]. The initial contract periods will consist of one base year with four (4) option years per contract. The amount of work will not exceed $ [insert amount] per year. Work will be issued by negotiated firm-fixed-price task orders not to exceed the maximum limit per task order.}

## Pre-Proposal Conference:

A [voluntary / mandatory] Pre-Proposal Conference will be held on [insert date and time] at [insert location]. The purpose of this conference will be to review the RFP and to provide an opportunity to ask any questions or receive further information.

## Proposal Schedule and Submission Deadline:

The schedule for this solicitation is as follows:

Request for Proposals release: [insert date]

Pre-Proposal Conference: [insert date & time]

Questions / Requests for Clarification due: [insert date & time]

Responses to Questions & Clarifications release: [insert date]

Proposals Due: [insert date & time]

## Questions of Requests for Clarification

All questions, requests for clarification or other correspondence relative to this Request for Proposals shall be addressed to:

[Insert name of point of contact]

[Address]

[City, State Zip]

Phone: [xxx-xxx-xxxx]

Fax: [xxx-xxx-xxxx]

Email: [insert email address]

Copies shall be sent to:

[Insert name of Contracting Officer]

[Address]

[City, State Zip]

Phone: [xxx-xxx-xxxx]

Fax: [xxx-xxx-xxxx]

Email: [insert email address]

Questions or requests for clarification shall be submitted in writing only. Any verbal responses to questions or clarifications are not official and are not binding on this RFP unless confirmed in writing. Questions or requests for clarifications, along with the responses will be distributed in writing to all parties registered to receive this RFP

# Project Overview

## Project Description:

[For an IDIQ RFP – insert a general description of the types of projects that may be included in task orders.]

[For a specific project RFP – insert a general description of the project]

## Project Location:

[For an IDIQ RFP – insert a description of the locations where projects may be located for individual task orders]

[For a specific project RFP – insert the project location]

## Project Team

[For an IDIQ RFP – insert a general list of typical project team members, including NCA Project Manager, NCA Resident Engineer, A/E, Peer Reviewer, and Prime Contractor.]

[For a specific project – insert a list of project team members with name/firm, if available, for the NCA Project Manager, NCA Resident Engineer, A/E, Peer Reviewer, and Prime Contractor.]

## Project Schedule

[For an IDIQ RFP – insert a typical schedule for a project and indicate that the schedule is generic and is subject to change. The intent of providing the schedule is to give the proposing firm an idea of how long a typical project will require for design, construction, and warranty phases.

[For a specific project – insert the proposed project schedule and indicate the schedule is subject to change. The intent is to provide the proposing firm an idea of how long the project will require for design, construction and warranty phases. All proposals should be based on the initial project schedule provided in the RFP.]

## Estimated Project Construction Cost

[For an IDIQ RFP – provide a range of probable project construction costs for the types of projects that may be assigned to a specific task order.]

[For a specific project RFP – provide a budget construction cost to give the proposing firm an idea of the anticipated construction costs.]

# Commissioning Agent Qualifications

## Firm and Individual Experience

The firm and the designated Commissioning Authority shall have a minimum of five (5) years’ experience in providing Total Building Commissioning Services and shall be regularly employed as a Commissioning Provider.

The Commissioning Authority is an objective, independent advocate for the Contracting Officer. The Commissioning Authority shall have current engineering knowledge and extensive hands-on field experience regarding building systems; the physical principles of building systems performance; building systems start-ups, balancing, functional testing, and troubleshooting; operation and maintenance procedures; and the building design and construction process.

The Commissioning firm and the designated Commissioning Authority shall have successful commissioning experience for projects that are similar to the project. The Firm and designated Commissioning Authority shall have been the principal commissioning authority on at least [three (3)] [\_\_\_\_\_\_\_] comparable projects that have been completed within the previous five (5) years.

The Commissioning Authority shall have experience in the quality process.

The Commissioning Authority shall be knowledgeable in building operation and maintenance, including training of operations and maintenance personnel.

The Commissioning Authority shall have excellent verbal and written communications skills, be highly organized, and able to work with all levels of management, technical, and trades personnel.

The Commissioning Authority shall demonstrate the depth of experienced personnel and the capability to sustain loss of assigned personnel without compromising quality and timeliness of performance.

The Commissioning Authority shall be an independent contractor and not an employee of the Architect/Engineer, Design-Build Contractor or Prime / General Contractor on this project.

## Firm and Individual Certifications

The proposed commissioning firm should be certified by at least one of the following agencies:

* National Environmental Balancing Bureau
* Associated General Contractors
* Building Commissioning Association

The proposed CxA should be certified by one of the following organizations to supervise execution of the commissioning process:

* National Environmental Balancing Bureau
* Associated General Contractors
* Building Commissioning Association
* Association of Energy Engineers

The Fire Protection Commissioning Specialist should be a registered Fire Protection Engineer in at least one state. He/she should have a minimum of 5 years’ experience with design, installation, inspection, or testing of fire protection systems, and/or smoke control systems.

The Building Envelope Commissioning Specialist should be a Registered Architect in at least one state. He/she should also have a minimum of five (5) years’ experience with design, installation, or inspection of building envelope components.

The Controls Commissioning Specialist should have a minimum of 5 years’ experience in design, installation, programming, inspection, or testing of direct digital control systems for HVAC systems.

Key members of the Commissioning Authority’s commissioning team should have a bachelor’s degree in [Mechanical], [Electrical], [Architectural] engineering. A Professional Engineer license in at least one jurisdiction is desired. Over 5 years field experience in [building systems operations, maintenance, and troubleshooting], [HVAC system installation, maintenance, and troubleshooting], [HVAC Direct Digital Control system installation, programming, maintenance, and troubleshooting], [electrical system installation, maintenance, and troubleshooting], [other applicable trade contracting] experience may be deemed equivalent experience for the bachelor’s degree.

## SBA Program

[Insert any requirements or goals for small business, veteran-owned, minority-owned, woman-owned business enterprise requirements.]

The NCA is committed to the utilization of Veteran-owned, Disabled Veteran-Owned, Woman Owned, Small Disadvantaged Businesses, or other small business firms. Identify whether your firm, or any sub-consultant, is qualified/certified as one of these enterprises.

# Commissioning Services

## Scope of Commissioning Services

Building Commissioning is a systematic approach to improving system performance, operation & maintenance, indoor air quality & thermal comfort, and energy efficiency, as well as benefits like improving occupant comfort, health & welfare, and productivity, in both new and existing buildings. These activities are not, as many owners and managers believe, part of the typical design and construction process or part of standard operation & maintenance service contracts. Commissioning goes beyond testing, adjusting and balancing (TAB) and traditional inspections. Commissioning involves functional testing to determine how well the building systems, such as Heating, Ventilating and Air Conditioning (HVAC) and Lighting, work together. Commissioning also seeks to determine whether the installed building equipment (e.g. chillers, boilers, motors, airflow system) meets a facility's goals or whether it needs to be adjusted to improve the efficiency and overall performance, consistent with the original design intent. The long-term life-cycle benefits of commissioning far outweigh the short-term up-front investments, as borne out by many documented case studies, both in the public and private sector building/facility infrastructure. Green building rating systems and certification programs have given a significant boost to the role of Building Commissioning, as part of the Efficient and High Performance Building stock.

Commissioning services for third-party commissioning are required for various NCA facilities and infrastructure projects within the area of responsibility which [includes insert area description]. The successful CxA will provide support to the Commissioning Process through the design, construction, acceptance, and post-acceptance phases of renovation, additions, or other projects with an estimated construction cost of [$5,000,000 to $50,000,000] per project. NCANCANCANCANCANCAProjects for which commissioning services would be required may include new facility construction, additions to existing facilities, and/or renovation, alteration, maintenance, repair, or upgrades to existing facilities.

Commissioning Services will be provided in accordance with the Department of Veterans Affairs Commissioning Process Manual. Prospective proposers shall review the Whole Building Commissioning Process Manual available on the VA Technical Information Library at http://www.cfm.va.gov/til/.

The following tables describe the commissioning services and deliverables to be provided by the CxA:

[Editor’s Note: Edit the following tables as necessary to adjust the scope of services to the specific project. The tables provided in Appendix B to the Whole Building Commissioning Process Manual can be used to edit the table, or edits can be made directly in the table below.

Commissioning Agent Task/Deliverables Description

Pre-Design Phase

| Project Phase/ Cx Task | Commissioning Task Description | Commissioning Deliverables |
| --- | --- | --- |
| Pre-Design Commissioning Kickoff Meeting | Conduct Pre-Design Commissioning Kickoff Meeting with the NCA and the Design Team.  Establish or review Owner’s Project Requirements (OPR), goals, objectives, and preliminary schedule.  Establish commissioning goals and objectives.  Establish the purpose and proposed process for commissioning the project.  Establish the individual roles of each participating commissioning team member.  Establish systems to be commissioned and preliminary acceptance criteria. | Draft Commissioning Plan  Meeting Minutes  Preliminary Owner’s Project Requirements |

Commissioning Agent Task/Deliverables Description

Design Phase

| Project Phase/ Cx Task | Commissioning Task Description | Commissioning Deliverables |
| --- | --- | --- |
| **SD1 PHASE** | | |
| Design Submission Review | Complete a thorough commissioning review of the SD1 submittal documents and submitted criteria to establish the systems to be designed and installed in compliance with the Owner’s Project Requirements (OPR). Review is conducted in conjunction with the IDIQ-AE Peer Review.  Documents provided to the CxA should include, SD1 Design Narrative and other submittal documents required by PG 18-15, Volume D as well as other pertinent documents. | Design Phase Commissioning Issues Log  (Incorporate CxA review comments into Dr Checks for Project Tracking – Retain for Design Phase Cx Report) |
| Basis of Design Report | Review and Reconcile the Project Design Narrative. Narrative should incorporate OPR requirements from VA Standards and other Project Documents. Design Narrative should describe designer’s approach to the project requirements.  Basis of Design (BOD) should include the Owner’s Project Requirements (OPR), Design Narrative and sustainability goals. Likewise separate documents can be developed and retained in the project record. | Basis of Design Report  Design Phase Commissioning Issues Log  (Incorporate commissioning review comments into Dr. Checks for Project Tracking – Retain for Design Phase Cx Report) |
| Commissioning Plan | Develop the Project Design Phase Commissioning Plan that outlines preliminary scope, process requirements, deliverables, roles, design concerns, responsibilities, schedule and milestones.  Provide a copy of the Commissioning Plan to the A/E. The A/E will incorporate the Commissioning Plan into the Design Narrative as described in PG 18-15, Volume D. | Project Design Phase Commissioning Plan |
| Duration Schedule for Commissioning Activities | Based on the Project Design Phase Commissioning Plan, prepare a duration schedule for the design phase commissioning activities required by the commissioning plan. This duration schedule should include Design Phase Activities. The Duration Schedule should provide sufficient detail to comply with the AE Team CPM scheduling requirements as outlined in PG 18-15, Volume D. | Design Phase Commissioning Duration Schedule – Incorporate into Commissioning Plan |
| Design Review Meeting | Attend and participate in SD1 Design Review Meeting. Provide clarifications for identified Commissioning Issues as appropriate. Incorporate other comments or issues identified at Review Meeting that impact project commissioning into Commissioning Issues Log. | Revised Design Phase Commissioning Issue Log.  (Note that resolution of some issues may be deferred to later design stages.) |
| **SD2 PHASE** | | |
| Design Submission Review | Complete a thorough commissioning review of the SD2 submittal documents and submitted criteria to establish the systems to be designed and installed in compliance with the OPR.  Documents provided to the CxA should include, SD2 Design Narrative, calculations, room locations and preliminary layouts and other submittal documents required by PGA 18-15, Volume D, as well as other pertinent documents. | Design Phase Commissioning Issues Log  (Incorporate commissioning review comments into Dr. Checks for Project Tracking – Retain for Design Phase Cx Report) |
| Design Narrative | Review the updated Project Design Narrative. The Design Narrative should incorporate OPR requirements from VA Standards and other Project Documents. Design Narrative should describe designer’s approach to the project requirements. | Design Phase Commissioning Issues Log  (Incorporate review comments into Dr Checks for Project Tracking – Retain for Design Phase Cx Report) |
| Commissioning Plan | Update the Project Design Phase Commissioning Plan.  Provide a copy of the Commissioning Plan to the A/E. The A/E will incorporate the Commissioning Plan into the Design Narrative as described in PG 18-15, Volume D. | Updated Project Design Phase Commissioning Plan |
| Duration Schedule for Commissioning Activities | Based on the Project Design Phase Commissioning Plan, prepare a duration schedule for the Design Phase commissioning activities required by the commissioning plan. This duration schedule should include Design Phase Activities. The Duration Schedule should provide sufficient detail to comply with the AE Team CPM scheduling requirements as outlined in PG 18-15, Volume D. | Design Phase Commissioning Duration Schedule – Incorporate into Commissioning Plan |
| Commissioning Specifications | Provide List of Commissioning Specifications Sections utilizing the VA Master Construction Specification. Specifications shall be submitted in accordance with the requirements of PG 18-15, Volume D. | List of Required Commissioning Specifications  Specification Coordination Matrix for CxA/A/E coordination. |
| Design Review Meeting | Attend and participate in SD2 Design Review Meeting. Provide clarifications for identified Commissioning Issues as appropriate. Incorporate other comments or issues identified at Review Meeting that impact project commissioning into Commissioning Issues Log. | Revised Design Phase Commissioning Issue Log  Note that resolution of some issues may be deferred to later design stages. |
| Design Phase Issue Log Resolution | Update the Commissioning Issues Log by recording resolutions to identified Commissioning Issues. | Revised Design Phase Commissioning Issue Log |
| **DD1 PHASE** | | |
| Design Submission Review | Complete a thorough commissioning review of the DD1 submittal documents and submitted criteria to establish the systems to be designed and installed in compliance with the OPR.  Documents provided to the CxA should include: DD1 Updated Design Narrative, calculations, equipment schedules, system and control schematic diagrams and appropriate schematics and other submittal documents required by PG 18-15, Volume D, as well as other pertinent documents. | Design Phase Commissioning Issues Log  (Incorporate review comments into Dr. Checks for Project Tracking – Retain for Design Phase Cx Report) |
| Design Narrative | Update Project Design Narrative. The Design Narrative should be updated to reflect the evolution of the project design and note all significant deviations from prior version for ease of review and reconciliation. Design Narrative should describe designer’s approach to the project requirements. | Design Phase Commissioning Issues Log  (Incorporate review comments into Dr Checks for Project Tracking – Retain for Design Phase Cx Report) |
| Design Phase Controls Meeting | Meet with the Design Team and NCA to develop HVAC and other system control strategies, sequences of operation, trending, and alarms.  The CxA acts as a advocate for the NCA and the facilities operations staff to assist the Design Team in developing realistic operating strategies and sequences of operations that will enable the facilities operations staff to operate the building systems to sustain the operational, energy and other systems parameters throughout the project life cycle. | Meeting Notes |
| Commissioning Plan | Update the Project Design Phase Commissioning Plan, including any revisions to Commissioning Team Members, Schedules and other modifications required by the progress of the project.  Prepare a Draft Construction Phase Commissioning Plan, including systems to be commissioned, an outline of construction phase roles and responsibilities, and an outline of required system documentation requirements.  Provide a copy of the updated Design Phase Commissioning Plan to the A/E. The A/E will incorporate the Commissioning Plan into the Design Narrative as described in PG 18-15, Volume D. | Updated Project Design Phase Commissioning Plan  Draft Construction Phase Commissioning Plan |
| Duration Schedule for Commissioning Activities | Based on the Project Design Phase Commissioning Plan, prepare a duration schedule for the commissioning activities required by the commissioning plan. This duration schedule should include Design Phase Activities. The Duration Schedule should provide sufficient detail to comply with the AE Team CPM scheduling requirements as outlined in PG 18-15, Volume D.  Based on the Draft Construction Phase Commissioning Plan, prepare a preliminary duration schedule for Construction Phase Commissioning Activities. Incorporate the draft duration schedule into the Draft Construction Phase Commissioning Plan. | Commissioning Duration Schedule – Incorporate into Commissioning Plan  Draft Construction Phase Commissioning Duration Schedule – Incorporate into the Draft Construction Phase Commissioning Plan. |
| Commissioning Specifications | Provide Draft Commissioning Specifications Sections utilizing the VA Master Construction Specification. Specifications shall be submitted in accordance with the requirements of PG 18-15, Volume D.  Provide a Specification Coordination Matrix that outlines the commissioning-related language that needs to be included in the individual equipment and technical specifications. | Draft Commissioning Specifications  Specification Coordination Matrix for CxA/A/E coordination. |
| Design Review Meeting | Attend and participate in DD1 Design Review Meeting. Provide clarifications for identified Commissioning Issues as appropriate. Incorporate other comments or issues identified at Review Meeting that impact project commissioning into Commissioning Issues Log. | Revised Design Phase Commissioning Issue Log.  (Incorporate review comments into Dr. Checks for Project Tracking – Retain for Design Phase Cx Report)  (Note that resolution of some issues may be deferred to later design stages.) |
| Design Phase Issue Log Resolution | Update the Commissioning Issues Log by recording resolutions to identified Commissioning Issues. | Revised Design Phase Commissioning Issue Log  (Incorporate review comments into Dr Checks for Project Tracking – Retain for Design Phase Cx Report) |
| **DD2 PHASE** | | |
| Design Submission Review | Complete a thorough review of the DD2 submittal documents and submitted criteria to establish the systems to be designed and installed in compliance with the OPR.  Documents provided to the CxA should include: DD2 Updated Design Narrative, calculations, equipment schedules, system and control schematic diagrams, floor plans and appropriate schematics and other submittal documents required by PG 18-15, Volume D as well as other pertinent documents. | Design Phase Commissioning Issues Log  (Incorporate review comments into Dr. Checks for Project Tracking – Retain for Design Phase Cx Report) |
| Design Narrative | CxA to update, review and reconcile the Project Design Narrative. The Design Narrative should reflect the evolution of the project design and note all significant deviations from prior version for ease of review and reconciliation. Design Narrative should describe designer’s response to the project requirements.  Submit the updated Design Narrative to the AE team for review and comment. Incorporate review comments into the updated Design Narrative as necessary. | Design Phase Commissioning Issues Log |
| Commissioning Plan | Update the Project Design Phase Commissioning Plan, including any revisions to Commissioning Team Members, Schedules and other modifications required by the progress of the project.  Update the Construction Phase Commissioning Plan, including systems to be commissioned, an outline of construction phase roles and responsibilities, and an outline of required system documentation requirements.  Include the updated Commissioning Plan in the revised Design Narrative | Updated Project Commissioning Plan |
| Commissioning Specifications | Provide Preliminary Commissioning Specifications Sections utilizing the VA Master Construction Specification. Specifications shall be submitted in accordance with the requirements of PG 18-15, Volume D.  Review individual equipment and technical sections to ensure commissioning-related language has been included as provided in the Commissioning Specification Coordination Matrix. | Preliminary Commissioning Specifications  Marked up equipment and technical specification sections showing any revisions to commissioning-related language.  Specification Coordination Matrix for CxA/A/E coordination. |
| Duration Schedule for Commissioning Activities | Based on the Project Design Phase Commissioning Plan, prepare an updated duration schedule for the design phase commissioning activities required by the commissioning plan. This duration schedule should include Design Phase Activities. The Duration Schedule should provide sufficient detail to comply with the AE Team CPM scheduling requirements as outlined in PG 18-15, Volume D.  Based on the Project Construction Phase Commissioning Plan and the DD2 Phase design submission, update the draft Construction Phase Commissioning Duration Schedule. Incorporate the revised Construction Phase Duration Schedule into the Draft Commissioning Phase Commissioning Plan. | Design Phase Commissioning Duration Schedule – Incorporate into Design Phase Commissioning Plan  Construction Phase Commissioning Duration Schedule – Incorporate into Construction Phase Commissioning Plan |
| Develop Preliminary Pre-Functional Checklists (PFC’s) | The CxA will prepare Preliminary Pre Functional Checklists (PFC) for type of system to be commissioned and distribute to all Cx Team members for review and comment. A completed PFC indicates the system and its related equipment is ready for Systems Functional Performance Testing.  Preliminary Pre-Functional Checklists shall be included in the Construction Phase Commissioning Plan and the Commissioning Specifications. | Preliminary Pre Functional Checklists (PFC’s) |
| Develop Preliminary Systems Functional Performance Test (FPT’s) Procedures | Based on the systems to be commissioned and the systems shown in the DD2 submittal, the CxA will prepare Preliminary Systems Functional Performance Test Procedures (FPT’s).  Preliminary FPTs shall be included in the Construction Phase Commissioning Plan and the Commissioning Specifications. | Preliminary Systems Functional Performance Test Procedures (FPT’s) |
| Design Phase Controls Meeting | Meet with the Design Team and NCA to update HVAC and other system control strategies, sequences of operation, trending, and alarms.  The CxA acts as an advocate for the NCA and the facilities operations staff to assist the Design Team in developing realistic operating strategies and sequences of operations that will enable the facilities operations staff to operate the building systems to sustain the operational, energy and other systems parameters throughout the project life cycle. | Meeting Notes |
| Design Review Meeting | Attend and participate in DD2 Design Review Meeting. Provide clarifications for identified Commissioning Issues as appropriate. Incorporate other comments or issues identified at Review Meeting that impact project commissioning into Commissioning Issues Log. | Revised Design Phase Commissioning Issue Log.  (Incorporate review comments into Dr. Checks for Project Tracking – Retain for Design Phase Cx Report)  (Note that resolution of some issues may be deferred to later design stages.) |
| Design Phase Issue Log Resolution | Update the Commissioning Issues Log by recording resolutions to identified Commissioning Issues. | Revised Design Phase Commissioning Issue Log  (Incorporate review comments into Dr. Checks for Project Tracking – Retain for Design Phase Cx Report) |
| **CD1 PHASE** | | |
| Design Submission Review | Complete a thorough commissioning review of the CD1 submittal documents and submitted criteria to establish the systems to be designed and installed in compliance with the OPR.  Documents provided to the CxA should include: calculations, equipment schedules, system and control schematic diagrams, floor plans and appropriate schematics and other submittal documents required by PG 18-15, Volume D, as well as other pertinent documents. | Design Phase Commissioning Issues Log  (Incorporate review comments into Dr. Checks for Project Tracking – Retain for Design Phase Cx Report) |
| Design Narrative | CxA to update, review and reconcile the Project Design Narrative. The Design Narrative should be updated to reflect the evolution of the project design and note all significant deviations from prior version for ease of review and reconciliation. Design Narrative should describe designer’s response to the project requirements.  Submit the updated Design Narrative to the AE team for review and comment. Incorporate review comments into the updated Design Narrative as necessary. Inlcude O&M Manual, training and demonstration requirements. | Revised Design Narrative |
| Commissioning Plan | Update the Project Design Phase Commissioning Plan, including any revisions to Commissioning Team Members, Schedules and other modifications required by the progress of the project.  Update the Construction Phase Commissioning Plan, including systems to be commissioned, an outline of construction phase roles and responsibilities, and an outline of required system documentation requirements.  Include the updated Commissioning Plan in the revised Design Narrative | Updated Design Phase Project Commissioning Plan  Updated Construction Phase Project Commissioning Plan |
| Duration Schedule for Commissioning Activities | Based on the Project Design Phase Commissioning Plan, prepare a duration schedule for the commissioning activities required by the commissioning plan. This duration schedule should include Design Phase Activities. The Duration Schedule should provide sufficient detail to comply with the AE Team CPM scheduling requirements as outlined in PG 18-15, Volume D.  Based on the Project Construction Phase Commissioning Plan and the DD2 Phase design submission, update the draft Construction Phase Commissioning Duration Schedule. Incorporate the revised Construction Phase Duration Schedule into the Draft Commissioning Phase Commissioning Plan. | Design Phase Commissioning Duration Schedule – Incorporate into Design Phase Commissioning Plan  Update Construction Phase Duration Schedule – Incorporate into Construction Phase Commissioning Plan |
| Commissioning Specifications | Provide Final Commissioning Specifications Sections utilizing the VA Master Construction Specification. Specifications shall be submitted in accordance with the requirements of PG 18-15, Volume D.  Review individual equipment and technical sections to ensure commissioning-related language has been included as provided in the Commissioning Specification Coordination Matrix. | Final Project Commissioning Specifications  Marked up equipment and technical specification sections to identify any changes to commissioning-related language. |
| Develop Draft Pre-Functional Checklists (PFC’s) | The CxA will update the Preliminary Pre Functional Checklists (PFC) to Draft Pre-Functional Checklists for each type of system to be commissioned and distribute to all Cx Team members for review and comment.  Draft Pre-Functional Checklists shall be included in the Construction Phase Commissioning Plan and the Commissioning Specifications. | Draft Pre Functional Checklists (PFC’s) |
| Develop Draft Systems Functional Performance Test (FPT’s) Procedures | Based on the systems to be commissioned and the systems shown in the CD1 submittal, the CxA will update the Preliminary Systems Functional Performance Test Procedures (FPT’s) to become Draft Systems Functional Performance Test Procedures. .  Draft FPTs shall be included in the Construction Phase Commissioning Plan and the Commissioning Specifications. | Draft Systems Functional Performance Test Procedures (FPT’s) |
| Design Phase Controls Meeting | Meet with the Design Team and NCA to update HVAC and other system control strategies, sequences of operation, trending, and alarms.  The CxA acts as an advocate for the NCA and the facilities operations staff to assist the Design Team in developing realistic operating strategies and sequences of operations that will enable the facilities operations staff to operate the building systems to sustain the operational, energy and other systems parameters throughout the project life cycle. | Meeting Notes |
| Design Review Meeting | Attend and participate in CD1 Design Review Meeting. Provide clarifications for identified Commissioning Issues as appropriate. Incorporate other comments or issues identified at Review Meeting that impact project commissioning into Commissioning Issues Log. | Revised Design Phase Commissioning Issue Log.  (Incorporate review comments into Dr. Checks for Project Tracking – Retain for Design Phase Cx Report)  (Note that resolution of some issues may be deferred to later design stages.) |
| Design Phase Issue Log Resolution | Update the Commissioning Issues Log by recording resolutions to identified Commissioning Issues. | Revised Design Phase Commissioning Issue Log |
| **BID PHASE** | | |
| Design Final Design Submission Review | Review Final Design Submission for resolution of Outstanding Commissioning Issues | Design Phase Commissioning Issues Log  (Incorporate review comments into Dr. Checks for Project Tracking – Retain for Design Phase Cx Report) |
| Design Narrative | CxA to provide a Final Design Narrative to Include all modifications and/or deviations from CD1 Design Narrative. The Design Narrative should be updated to reflect the evolution of the project design and note all significant deviations from prior version for ease of review and reconciliation. Design Narrative should describe designer’s response to the project requirements. Where appropriate, provide documentation of approved deviations from design standards and reasoning for same. | Revised Design Narrative |
| Commissioning Plan | Update & Submit Project Construction Phase Commissioning Plan  Include the updated Commissioning Plan in the revised Design Narrative | Project Construction Phase Commissioning Plan |
| Duration Schedule for Commissioning Activities | Based on the Project Construction Phase Commissioning Plan, prepare a duration schedule for the commissioning activities required by the commissioning plan. This duration schedule should include Construction Phase Activities. The Duration Schedule should provide sufficient detail to allow the Prime Contractor to incorporate commissioning activities into the Master Project Schedule. | Construction Phase Commissioning Duration Schedule – Incorporate into Commissioning Plan |
| Commissioning Specification | Provide updated Final Cx Specifications. Specifications shall be submitted in accordance with the requirements of PG 18-15, Volume D. | Updated Project Commissioning Specifications |
| Design Phase Issue Log Resolution | Record resolutions to Cx Issues on the Design Phase Commissioning Issues Log. | Revised Design Phase Commissioning Issue Log  (Incorporate review comments into Dr Checks for Project Tracking – Retain for Design Phase Cx Report) |
| Design Phase Commissioning Report | Prepare Design Phase Commissioning Report to document the Design Phase commissioning process and results | Design Phase Commissioning Report |

Commissioning Team Task/Deliverables Description

Bid and Pre Construction Phase

| Project Phase/ Cx Task | Commissioning Task Description | Commissioning Deliverables |
| --- | --- | --- |
| Pre Bid Meeting | Attend Pre Bid Meeting; provide overall description of Commissioning Process, provide clarifications for Commissioning Issues. | Meeting Notes for PM/RE  Clarifications for Addendum if required |
| Pre-Construction Meeting | Attend Pre Construction Meeting and be prepared to clarify the Commissioning Process for this project (e.g., discuss commissioning representative selection). | None |

Commissioning Team Task/Deliverables Description

Construction Phase

| Project Phase/ Cx Task | Commissioning Task Description | Commissioning Deliverables |
| --- | --- | --- |
| Commissioning Kick Off Meeting  (Construction Phase)  [The kickoff meeting should occur within 60 days of Notice to Proceed.] | Conduct a “Commissioning Kickoff Meeting” with the Construction Team  Establish the purpose and process for commissioning the project.  Establish the individual roles of each participating commissioning team member.  Review the Construction Phase Commissioning Plan and Commissioning Specifications.  Review the Commissioning Documents  Review the Project Schedule and discuss how commissioning activities will be incorporated into the master schedule.  Review Draft PFC and FPT; identify pre-requisites for functional testing.  ATTENDEES:  CxA, A/E Design Team Representatives, Contractor’s Commissioning Representative, Subcontractor’s Commissioning Representatives, RE. | Meeting Minutes  Revised Project Commissioning Plan (Include Names/Contact Information for selected Commissioning Team Members) |
| Duration Schedule for Commissioning Activities | Based on the Construction Phase Commissioning Plan, prepare a duration schedule for the commissioning activities required by the commissioning plan. This duration schedule should be incorporated into the contractor’s project schedule to track all commissioning activities of the commissioning team. | Commissioning Duration Schedule  (Schedule shall be periodically updated to reflect changes in the project schedule and/or scope.) |
| Submittal & Shop Drawing Review | Review all pertinent project shop drawings necessary to support the Commissioning Process. Review of the shop drawings is for the purpose of developing appropriate Pre Functional Checklists and Systems Functional Performance Test Procedures. Submittals & Shop drawings shall be reviewed for commissionability, maintainability and for compliance to the Construction Documents.  Note any issues identified in the Shop Drawing Review that might compromise the final commissioned system on the ‘Commissioning Review Log’ and submit comment to the Design Team and the RE contemporaneously with the A/E review for resolution.  Comments shall be submitted in accordance with the contractual submittal review time. Comments shall be provided to the Design Team no less than 7 days prior to the Submittal Review Due Date provided that the Cx Agent has no less than 7 days to review the submittals.  **ANY ISSUES IDENTIFIED IN THE SUBMITTAL REVIEW THAT MIGHT REQUIRE A CONTRACT CHANGE BUT IS NECESSARY TO MEET DESIGN INTENT SHOULD BE SPECIFICALLY REFERRED TO THE RE.** | Shop Drawing Cx Review List    Shop Drawing Review Comments |
| Construction Phase Commissioning Plan | Based on the work completed in the items above, the Construction Phase Commissioning Plan for the project shall be periodically reviewed with the Commissioning Team and updated to reflect changes in project equipment, sequences of operations, scope or schedule and with project personnel. | Revised Project Commissioning Plan |
| Commissioning Construction Observations | During the course of construction, the CxA will visit the site to observe the progress of construction with respect to the systems being commissioned. The focus of the observations will be to verify that systems being installed comply with the Construction Documents and can be successfully configured, operated and maintained.  In addition, site observation visits will be scheduled to include  • Witnessing factory testing and/or contractor equipment/system start up activities;  • Verification of Completed Pre Functional Checklists  • Verification that the Contractor and his subcontractors are completing and documenting Pre-Test procedures required by the specifications.  • Clarification and technical support for understanding and resolving Commissioning Issues. | Site Observation Reports  Updated Commissioning Issues Log |
| Commissioning Team Meetings | The CxA will hold regular commissioning team meetings to review progress of the commissioning effort and reinforce individual responsibilities. The team will review schedule, construction sequence, and completed work (PFC, PFT and FPT’s) and outstanding issues on the Commissioning Issues Log.  Commissioning Team Meetings may be held at the jobsite or by teleconference depending upon the status of construction. While it is imperative that many of the Commissioning Team Meetings be held in person, during early construction phases, some meetings may be more cost effectively conducted remotely. Scheduling and location of meetings shall occur by consultation between the CxA and the -RE.  The Prime Contractor’s scheduler should attend approximately every other Commissioning Team Meeting to review the master schedule and any changes that will affect commissioning activities. | Commissioning Meeting Agenda and Minutes  Updated Commissioning Issues Log |
| Develop Final Pre-Functional Checklists (PFC’s) | The CxA will prepare Pre-Final Pre Functional Checklists (PFC) for the project and distribute to all Cx Team members for review and comment. The CxA will incorporate review comments and prepare Final PFCs.  An executed PFC submitted by the Prime Contractor indicates the system and its related equipment is ready for Systems Functional Performance Testing.  The requirements for Pre Functional Checklists shall be coordinated with the startup requirements specified for each commissioned system. The PFC’s shall be constructed to leverage the specified contractor and vendor start activities to avoid unnecessary duplication. | Pre Functional Checklists (PFC’s) |
| Final Systems Functional Performance Test (FPT’s) Procedures | Based on construction documents and approved submittals, the CxA will prepare Pre-Final Systems Functional Performance Test Procedures (FPT’s) for systems to be commissioned.  Completed Final FPT’s will be distributed to all appropriate members of the Commissioning Team for review and comment.  Final FPT’s will be issued once comments are reviewed and incorporated into final documents as appropriate. | Pre-Final and Final Systems Functional Performance Test Procedures (FPT’s) |
| Review Operations & Maintenance Manuals | The CxA shall review Operations and Maintenance Manuals submitted by contractors for general conformance with specifications and NCA’s requirements, including:  If provided with the manuals, Review Preventive Maintenance Schedules provided as part of the O&M Manuals for completeness. Verify that data is provided in a manner consistent with NCA process for managing Preventive Maintenance tasks.  Review of O&M Manuals will include a review of system and component warranties to confirm conformance with contract requirements and adequate documentation of warranty contact information and NCA obligations.  Review of O&M Manuals shall be completed in accordance with the Submittal Review schedule requirements. | Updated Commissioning Issues Log |
| Review Contractor Equipment Startup Checklists, TAB Reports and PFC’s | The CxA will review all contractor prepared Equipment Startup Checklists, TAB Reports (including “pencil” daily test results) and PFC’s to confirm that the systems have been subject to appropriate Quality Control and Start Up procedures prior to initiation of Functional Performance Testing. Incomplete work, inadequate preparation and deficiencies will be noted and tracked on the Commissioning Issues Log. | Commissioning Issues Log |
| TAB Verification | The CxA shall work with the TAB Contractor to verify that all Testing and Balancing work is conducted in strict accordance with the specified Procedural Standards for Testing, Adjusting and Balancing by either NEBB or AABC. The CxA shall execute the following tasks:  • Review the TAB Agenda provided by the TAB Contractor to verify that it is complete, thorough and in compliance with the specification and Procedural Standards requirements.  • On the project site, the CxA shall review the calibration certificates for the instrumentation being used by the TAB Contractor during the execution of TAB activities to confirm that the instrumentation meets the requirements of the spec and the appropriate Procedural Standard.  • The CxA shall periodically visit the project site and review the TAB documentation for method, reasonable values, and compliance with the specification, Procedural Standard and TAB Agenda.  • Upon completion of the TAB activities, the CxA shall visit the project site with the TAB Contractor and the RE. The TAB Contractor shall demonstrate readings selected by the CxA that demonstrate that the system performance is consistent with the submitted values on the TAB report. Readings shall include Air Handling Unit total flows, static pressure control values, select outlet flows, building, and space pressures selected by the CxA as critical system operating values. | TAB Agenda Review Comments  TAB Agenda Review Meeting Minutes  Field Observation Reports of TAB Inspections  Summary Report of TAB Verification Readings |

Commissioning Team Task/Deliverables Description

Acceptance and Testing Phase

| Project Phase/ Cx Task | Commissioning Task Description | Commissioning Deliverables |
| --- | --- | --- |
| Systems Functional Performance Testing | The CxA will oversee, facilitate, and document all FPT testing. Execution of FPT’s shall be executed in accordance with the Functional Testing Procedures published by the CxA. All systems tested in accordance with the FPT’s shall be operated by the contractors in accordance with the approved FPT. Contractors shall retain responsibility for the installed systems during and after functional testing until substantial completion or final acceptance as determined by the NCA.  The CxA, in collaboration with the control contractor shall include long term trends (greater than 7 days) of integrated system performance once all systems have been commissioned. The CxA shall provide analysis of these trends to confirm that the installed systems are stable and reliable | Executed Functional Performance Tests and support documentation.  Long Term Trend Data and Analysis |
| Prepare Systems Manuals | The CxA shall work with the design team, contractor and NCA to develop Systems Manuals. Manuals will contain system design, operations and sequence information that describes the design intent, operational features and appropriate operational practices necessary to sustain the system operation in accordance with the Design Narrative and the NCA’s overall objectives for the facility.  Systems Manual will include sections for each major system included in the commissioning process. | Project Systems Manual |
| Training Plan Review | The CxA shall collaborate with the Prime Contractor and installing subcontractors to develop effective contractor and manufacturer training plans and agendas for general conformance with specifications and NCA’s requirements. Observe training for quality of training and for general conformance with the training plan and agenda.  The CxA shall observe contractor and vendor training for critical systems. The Contractor shall provide and the CxA shall maintain all attendance records and associated agendas and presentations for all training sessions. Attendance records shall be written original sign in sheets for each training session. | Compiled Training Plan  Individual Training Agendas  Training Attendance Sign In Sheets |
| Systems Training | The CxA will conduct training sessions to provide systems-level training for O&M personnel. Training will include:  • Review of system design, capacity, and equipment selection  • Review of system operating sequences  • Review of interconnection with other systems  • Review of Emergency operating procedures  • Review of the Project Systems Manual and its Use  • Student Evaluation forms  The number, duration and scope of the Systems Training sessions shall be determined by the specific requirements of the project.  The training provided by the CxA does not in any way relieve the Contractor from any specified training obligations. | Systems Training Presentations (electronic) |
| Final Commissioning Report | The CxA shall compile a comprehensive commissioning report documenting all commissioning activities, including but not limited to the following:  • Executive Summary  • Commissioning Scope of Work  • Test methods and results  • Outstanding commissioning issues  • Comprehensive Commissioning Issues Log, including resolved items and a description of their resolution,  • Commissioning plan,  • Field Observation Reports, Status reports and other field activity documentation,  • Submittal and O&M manual reviews  • Training record  • Completed Pre Functional Checklists  • Completed Functional Performance Test protocols and support documentation  • Other support documentation developed as part of the execution of the project • Construction Phase Commissioning Process | Final Commissioning Report |

Commissioning Team Task/Deliverables Description

Warranty Phase

| Project Phase/ Cx Task | Commissioning Task Description | Commissioning Deliverables |
| --- | --- | --- |
| Deferred and/or Seasonal Testing | The CxA shall witness and document Systems Functional Performance Testing that was deferred to allow systems to be tested in appropriate seasonal conditions. Testing will be conducted in accordance with Systems Functional Performance Test Procedures. Testing support will be required from the installing contractors, EMCS Vendor and NCA. Requirement for seasonal testing will be incorporated into the project specifications.  As part of the Seasonal Testing Effort, the CxA shall review system operations with the onsite operations team and reinforce training and best operating practices of the operations team. | Executed Functional Performance Test and Support Documents  Commissioning Issues Log |
| Warranty Period Site Visits | The CxA shall make quarterly visits to the project site to reinforce training, evaluate performance of the installed systems and provide technical support to the operating team to sustain commissioned performance of the systems. | Warranty Site Visit Reports |
| Post-Occupancy Inspection | Return to the project approximately 10 months after substantial completion to review the building operation with the facility occupants and O&M staff, and to discuss outstanding issues related to commissioning. Provide suggestions for improvements to systems operation including,  • Measurement & Verification Issues,  • Re-Commissioning Tasks, and  • Improvements in Preventive Maintenance or Operational Strategies  Assist facility staff in developing warranty issues, documents and requests for service to remedy outstanding problems.  As part of the Post Occupancy Inspection, the CxA shall analyze the energy consumption records from the project site (both utility and system generated reports) and provide the team with an analysis of actual system energy performance versus predicted performance. To the extent possible, deficiencies in performance shall be analyzed to provide an understanding of the systems, components or operating strategies that may be operating outside predicted parameters. | Post Occupancy Field Visit Report  Commissioning Issues Log  Warranty Issues Report  Systems Energy Review Report |
| Final Commissioning Report Amendment | Amend Final Commissioning Report to document the Warranty Phase commissioning activities. | Final Report Amendment |

## Commissioned Systems

[Insert discussion of the required / desired systems to be commissioned. Discuss any sampling strategies that may be allowed.]

[Editor’s Note: Edit the following table to include the systems to be commissioned for the specific project.

While buildings are comprised of static systems (e.g., building envelope, building structure) and dynamic systems (e.g., HVAC, emergency power), the commissioning process is intended to address the ‘integrated dynamic performance of the ‘building system.’ Therefore, when considering which building systems to commission, the primary considerations are driven by the impacts of any given system on the overall performance of the building as a whole. So, for example, the building envelope, while a static system, will have a substantial impact on the performance of the building environmental controls, particularly if the air or vapor barriers installed are deficient. The list of commissioned systems included below is intended to identify those major systems that can have a significant impact on the ability of the integrated building system to achieve the patient safety, comfort, reliability and energy performance goals established by the OPR in the commissioning process.

The intent of the NCA Standard for Building Commissioning is to subject all building systems to the commissioning process. On a case by case basis, the NCA recognizes that the nature of the project and its attendant budget may require that systems be selectively commissioned to maximize the value delivered by the process. With this in mind, the following criteria should be applied to evaluating each installed system (listed below) for inclusion in the commissioning process.

Systems with the most significant impacts on environmental performance or reliability of the installed ‘building system’ should have highest priority in the commissioning process.

Systems that have traditionally caused performance or maintenance problems on a site (or similar sites) should have a high priority in the process.

Systems that have a significant dynamic performance component but may have a moderate impact on the net environmental building system performance should have a priority in the process.

The specific list of ‘Systems to be Commissioned’ included on any given project must be driven by the nature of the project, the installed systems and the opportunity to impact the quality of the installed system during the construction of the project.

It is recommended that the editor consider updating the table in Appendix B and then copying the information into this section.]

Systems To Be Commissioned

| System | Description |
| --- | --- |
| **Precast Burial Crypts** | |
| Crypts | Precast burial crypts |
| **Building Exterior Closure** | |
| Foundations (excluding structural) | Standard, special, slab-on-grade, vapor barriers, air barriers |
| Exterior Closure | Exterior walls, exterior windows, exterior doors, louvers, grilles and sunscreens, |
| Roofing | Roof system (including parapet), roof openings (skylights, pipe chases, ducts, equipment curbs, etc.) |
| Note: | The emphasis on commissioning the above building envelope systems is on control of air flow, heat flow, noise, infrared, ultraviolet, rain penetration, moisture, durability, security, reliability, constructability, maintainability, and sustainability. |
| **Equipment** | |
| Global Positioning System (GPS) | Base station, remote GPS receivers, antenna, reference monuments |
| Geographic Information System (GIS) | Software user interface |
| **Fire Suppression** | |
| Fire Pump | Fire Pump, jockey pump, fire pump controller/ATS |
| Fire Sprinkler Systems | Wet pipe system, dry pipe system, pre-action system, special agent systems |
| **Plumbing** | |
| Domestic Water Distribution | Booster pumps, backflow preventers, water softeners, potable water storage tanks |
| Domestic Hot Water Systems | Water heaters\*\*, heat exchangers, circulation pumps, point-of-use water heaters\* |
| Sewerage Pump Systems | Sewage ejectors |
| Wastewater Pump Systems | Sump pumps |
| Sanitary Waste Interceptors | Grease interceptors, acid neutralizers |
| General Service Air Systems | Packaged compressor systems, air dryers, filtration |
| Water Treatment Systems | Water treatment systems |
| **HVAC** | |
| Noise and Vibration Control | [Noise and vibration levels for critical equipment such as Air Handlers, Chillers, Boilers, Generators, etc. will be commissioned as part of the system commissioning] |
| Direct Digital Control System\*\* | Operator Interface Computer, Operator Work Station (including graphics, point mapping, trends, alarms), Network Communications Modules and Wiring, Integration Panels. [DDC Control panels will be commissioned with the systems controlled by the panel] |
| Chilled Water System\*\* | Chillers (air-cooled), pumps (primary, secondary, variable primary), VFDs associated with chilled water system components, DDC Control Panels (including integration with Building Control System) |
| HVAC Air Handling Systems\*\* | Air handling Units, packaged rooftop AHU, Outdoor Air conditioning units, humidifiers, DDC control panels |
| HVAC Ventilation/Exhaust Systems | General exhaust, toilet exhaust, laboratory exhaust, isolation exhaust, room pressurization control systems |
| HVAC Energy Recovery Systems\*\* | Heat Wheels, Heat Recovery Loops, AHU Integrated Heat Recovery |
| HVAC Terminal Unit Systems\*\* | VAV Terminal Units, CAV terminal units, fan coil units, fin-tube radiation, unit heaters |
| Decentralized Unitary HVAC Systems\* | Split-system HVAC systems, controls, interface with facility DDC |
| Unitary Heat Pump Systems\*\* | Water-source heat pumps, controls, interface with facility DDC |
| Hydronic Distribution Systems | Pumps, DDC control panels, heat exchangers, |
| Facility Fuel Systems | Boiler fuel system, generator fuel system |
| Geothermal Energy Heating (water and direct exchange) \*\* | Geothermal well, ground heat exchanger, geothermal pumps, heat exchanger, valves, instrumentation |
| Solar Energy Heating Systems \*\* | Solar collectors, heat exchangers, storage tanks, solar-boosted domestic hot water heater, pumps, valves, instrumentation |
| Facility Fuel Gas Systems | Witness Natural gas piping pressure testing, natural gas compressors and storage, propane storage |
| **Electrical** | |
| Grounding & Bonding Systems | Witness 3rd party testing, review reports |
| Electric Power Monitoring Systems | Metering, sub-metering, power monitoring systems, PLC control systems |
| Electrical System Protective Device Study | Review reports, verify field settings consistent with Study |
| Low-Voltage Distribution System | Power distribution system, Life-safety power distribution system, critical power distribution system, equipment power distribution system, switchboards, distribution panels, panelboards, verify breaker testing results (injection current, etc) |
| Emergency Power Generation Systems | Generators, Generator paralleling switchgear, automatic transfer switches, PLC, Uninterruptible Power Supplies and other control systems |
| Lighting & Lighting Control\*\* Systems | Emergency lighting, occupancy sensors, lighting control systems, architectural dimming systems, theatrical dimming systems, exterior lighting and controls |
| Lightning Protection System | Witness 3rd party testing, review reports |
| **Communications** | |
| Grounding & Bonding System | Witness 3rd party testing, review reports |
| Structured Cabling System | Witness 3rd party testing, review reports |
| Security Emergency Call Systems | Witness 3rd party testing, review reports |
| **Electronic Safety and Security** | |
| Grounding & Bonding | Witness 3rd party testing, review reports |
| Physical Access Control Systems | Witness 3rd party testing, review reports |
| Access Control Systems | Witness 3rd party testing, review reports |
| Security Access Detection Systems | Witness 3rd party testing, review reports |
| Video Surveillance System | Witness 3rd party testing, review reports |
| Electronic Personal Protection System | Witness 3rd party testing, review reports |
| Fire Detection and Alarm System | 100% device acceptance testing, battery draw-down test, verify system monitoring, verify interface with other systems. |
| **Site Utilities** | |
| Water Utilities | City Water Service Entrance, Backflow Prevention, Pressure Control, Booster Pumps,Lawn Irrigation Systems, Drinking Well Water Systems |
| Sanitary Sewerage Utilities | City Sanitary Connection, Waste Water Treatment Systems |
| Storm Water Drainage Utilities | City Storm Water Connection, Site Storm Water Distribution and Storage |
| **Renewable Energy Sources** | |
| Solar Energy Electrical Power Generation Systems \*\* | Solar collector modules, DC-AC inverter, storage batteries, combiners, Switchgear, instrumentation, monitoring and control systems |
| Wind Energy Electrical Power Generation Systems \*\* | Wind Turbines, DC-AC inverter, storage batteries, combiners, switchgear, instrumentation, monitoring and control systems |
| **Integrated Systems Tests** | |
| Fire Alarm Response | Integrated System Response to Fire Alarm Condition and Return to Normal |
| **Table Notes** | |
| \*\* Denotes systems that LEED requires to be commissioned to comply with the Fundamental Commissioning pre-requisite. | |

## Commissioning Roles and Responsibilities

The following tables outline the roles and responsibilities for the members of the commissioning team during the various phases of the project. These roles and responsibilities are provided for information and clarification only. The roles of commissioning team members, other than the CxA, are described in other documents (i.e. the Architect/Engineer contract, the Construction contract, the Peer Reviewer contract, etc.)

Commissioning Team Roles and Responsibilities

Design Phase

| Phase | Project Phase/Cx Task  (ref Table above for description**)** | Commissioning Team Member Responsibilities | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| PM | CFM | NCA | A/E Team | CxA | |
| Pre-Design | Commissioning Kick Off Meeting | Facilitate the Kick Off Meeting  Participate in Kick Off Meeting  Provide NCA Schedule Requirements and Milestones  Review Meeting Minutes & Comment | Identify Cx Team Members  Participate in Kick Off Meeting  Review Meeting Minutes & Comment | Identify Cx Team Members  Participate in Kick Off Meeting  Review Meeting Minutes & Comment | Identify Cx Team Members  Discuss Design Schedule and Critical Milestones  Participate in Kick Off Meeting  Review Meeting Minutes & Comment | Prepare and disseminate Agenda  Lead Kick Off Meeting  Produce Meeting Minutes and Incorporate Comments  Prepare Draft Commissioning Plan | |
|  | | | | | | |
| SD-1 | Design Submission Review | Facilitate delivery of Design Submission Documents to CxA  Review CxA Issues Log & provide feedback as appropriate  Facilitate resolution of comments by A/E Team | Review CxA Issues Log & Provide Feedback as appropriate | Review CxA Issues Log & Provide Feedback as appropriate | Deliver Documents to CxA for review.  Review Dr. Checks comments.  Review CxA Issues Log  Provide Written Responses to Issues | Perform commissioning review and comment on SD1 Design Review submission.  Record review comments on Commissioning Issues Log.  Incorporate review comments into Dr. Checks.  .  Record resolution for each issues based on A/E Response; record in Commissioning Issues Log and on Dr. Check. | |
| SD-1 | Design Narrative | Review Design Narrative & Comment | Review Design Narrative & Comment | Review Design Narrative & Comment | Develop Design Narrative to Include OPR and Basis of Design response to OPR. | Review Design Narrative for compliance with NCA Standards and other stated NCA Objectives for project.  Provide support for developing measurable performance criteria for installed systems. | |
| SD-1 | Commissioning Plan | Distribute Design Phase Cx Plan  Review Cx Plan & Comment | Review Cx Plan & Comment | Review Cx Plan & Comment | Review Cx Plan & Comment | Develop & Submit Project Design Phase Commissioning Plan | |
| SD-1 | Duration Schedule for Commissioning Activities | Distribute schedule  Review and comment | Review and comment | Review and comment | Review schedule and incorporate into project design schedule | Prepare Duration Schedule for Design Phase Commissioning Activities | |
| SD-1 | Design Review Meeting | Facilitate Design Review Meeting.  Facilitate Resolution of Cx Issues | Attend Design Review Meeting as req’d by other NCA requirements. | Attend Design Review Meeting | Attend Design Review Meeting.  Provide responses to and clarifications of identified Commissioning Issues. | Attend Design Review Meeting. Provide clarification and facilitate resolution to Commissioning Issues Identified | |
|  | | | | | | |
| SD-2 | Design Submission Review | Facilitate delivery of Design Submission Documents to CxA  Review CxA Issues Log & Provide Feedback as appropriate  Facilitate Resolution of Comments by A/E Team | Review CxA Issues Log & Provide Feedback as appropriate | Review CxA Issues Log & Provide Feedback as appropriate | Deliver Documents to CxA for review.  Review CxA Issues Log  Provide Written Responses to Issues | Review and comment on SD2 Design Review Log.  Provide clarifications as required.  Record resolution for each issues based on A/E Response | |
| SD-2 | Design Narrative | Review Design Narrative & Comment | Review Design Narrative & Provide Feedback as appropriate | Review Design Narrative & Provide Feedback as appropriate | Update Design Narrative to Include OPR and Basis of Design response to OPR. | Review Design Narrative for compliance with NCA Standards and other stated NCA Objectives for project.  Provide support for developing measurable performance criteria for installed systems. | |
| SD-2 | Commissioning Plan | Distribute Updated Design Phase Cx Plan  Review Cx Plan & Comment | Review Cx Plan & Comment | Review Cx Plan & Comment | Review Cx Plan & Comment | Update & Submit Project Commissioning Plan | |
| SD-2 | Duration Schedule for Commissioning Activities | Distribute schedule  Review and comment | Review and comment | Review and comment | Review schedule and incorporate into project design schedule | Update Duration Schedule for Design Phase Commissioning Activities | |
| SD-2 | Commissioning Specifications | Review specification list and comment | Review specification list and comment | Review specification list and comment | Include list of commissioning specifications in submission to NCA. | Provide list of required commissioning specifications to A/E Team. | |
| SD-2 | Design Review Meeting | Facilitate Design Review Meeting.  Facilitate Resolution of Cx Issues. | Attend Design Review Meeting as required by other NCA requirements.  Participate in Issue Resolution as appropriate. | Attend Design Review Meeting as required by other NCA requirements.  Participate in Issue Resolution as appropriate. | Attend Design Review Meeting.  Provide responses to and clarifications of identified Commissioning Issues. | Attend Design Review Meeting. Provide clarification and facilitate resolution to Commissioning Issues Identified | |
| SD-2 | Design Phase Issue Log Resolution | Review & Comment on Revised Design Phase Commissioning Issues Log | Review & Comment on Revised Design Phase Commissioning Issues Log | Review & Comment on Revised Design Phase Commissioning Issues Log | Review & Comment on Revised Design Phase Commissioning Issues Log | Record resolutions to Cx Issues on the Design Phase Commissioning Issues Log. | |
|  | | | | | | | |
| DD-1 | Design Submission Review | Facilitate delivery of Design Submission Documents to CxA  Review CxA Issues Log & Provide Feedback as appropriate  Facilitate Resolution of Comments by A/E Team | Review CxA Issues Log & Provide Feedback as appropriate | Review CxA Issues Log & Provide Feedback as appropriate | Deliver Documents to CxA for review.  Review CxA Issues Log  Provide Written Responses to Issues | Review and comment on DD1 Design Review Log.  Provide clarifications as required.  Record resolution for each issues based on A/E Response | |
| DD-1 | Design Narrative | Review Design Narrative & Comment | Review Design Narrative & Provide Feedback as appropriate | Review Design Narrative & Provide Feedback as appropriate | Update Design Narrative to Include OPR and Basis of Design response to OPR. | Review Design Narrative for compliance with NCA Standards and other stated NCA Objectives for project.  Provide support for developing measurable performance criteria for installed systems. | |
| DD-1 | Design Phase Controls Meeting | Facilitate and schedule meeting.  Participate in meeting | Attend and participate in meeting | Attend and participate in meeting | Chair meeting  Attend and participate in meeting | Attend and participate in meeting | |
| DD-1 | Commissioning Plan | Distribute Updated Design Phase Cx Plan  Review Cx Plan & Comment | Review Cx Plan & Comment | Review Cx Plan & Comment | Review Cx Plan & Comment | Update & Project Commissioning Plan | |
| DD-1 | Duration Schedule for Commissioning Activities | Distribute schedule  Review and comment | Review and comment | Review and comment | Review schedule and incorporate into project design schedule | Update Duration Schedule for Design Phase Commissioning Activities  Prepare draft duration schedule for Construction Phase Commissioning Activities | |
| DD-1 | Commissioning Specification | Review Cx Draft Specs & Comment | Review Cx Draft Specs & Comment | Review Cx Draft Specs & Comment | Incorporate Draft Cx Specifications into Project Specification Submittal.  Review Cx Draft Specs & Comment | Develop Draft Cx Specifications & Cx Coordination Matrix. Deliver to A/E Team for incorporation into Specification Submittal. | |
| DD-1 | Design Review Meeting | Facilitate Design Review Meeting.  Facilitate Resolution of Cx Issues. | Attend Design Review Meeting as required by other NCA requirements.  Participate in Issue Resolution as appropriate. | Attend Design Review Meeting as required by other NCA requirements.  Participate in Issue Resolution as appropriate. | Attend Design Review Meeting.  Provide responses to and clarifications of identified Commissioning Issues. | Attend Design Review Meeting. Provide clarification and facilitate resolution to Commissioning Issues Identified | |
| DD-1 | Design Phase Issue Log Resolution | Review & Comment on Revised Design Phase Commissioning Issues Log | Review & Comment on Revised Design Phase Commissioning Issues Log | Review & Comment on Revised Design Phase Commissioning Issues Log | Review & Comment on Revised Design Phase Commissioning Issues Log | Record resolutions to Cx Issues on the Design Phase Commissioning Issues Log. | |
|  | | | | | | | |
| DD-2 | Design Submission Review | Facilitate delivery of Design Submission Documents to CxA  Review CxA Issues Log & Provide Feedback as appropriate  Facilitate Resolution of Comments by A/E Team | Review CxA Issues Log & Provide Feedback as appropriate | Review CxA Issues Log & Provide Feedback as appropriate | Deliver Documents to CxA for review.  Review CxA Issues Log  Provide Written Responses to Issues | Review and comment on DD2 Design Review Log.  Provide clarifications as required.  Record resolution for each issues based on A/E Response | |
| DD-2 | Design Narrative | Review Design Narrative & Comment | Review Design Narrative & Provide Feedback as appropriate | Review Design Narrative & Provide Feedback as appropriate | Review Updated Design Narrative to Include OPR and Basis of Design response to OPR. | CxA to update, review and reconcile the Project Design Narrative. The Design Narrative should reflect the evolution of the project design and note all significant deviations from prior version for ease of review and reconciliation.  Design Narrative should describe designer’s response to the project requirements.  Where appropriate, provide documentation of approval of deviations from NCA Design Criteria and reasoning for same.  Provide support for developing measurable performance criteria for installed systems. | |
| DD-2 | Preliminary Pre-Functional Checklists and Preliminary System Functional Performance Test Procedures | Distribute to Cx Team.  Review and comment | None | Review and Comment | Review and Comment | Prepare Preliminary PFC and FPT.  Incorporate review comments into the Draft PFCs and FPTs as appropriate. | |
| DD-2 | Design Phase Controls Meeting | Facilitate and schedule meeting.  Participate in meeting | Attend and participate in meeting | Attend and participate in meeting | Chair meeting  Attend and participated in meeting | Attend and participate in meeting | |
| DD-2 | Commissioning Plan | Distribute Updated Design Phase Cx Plan  Review Cx Plan & Comment | Review Cx Plan & Comment | Review Cx Plan & Comment | Review Cx Plan & Comment | Update & Submit Project Commissioning Plan | |
| DD-2 | Commissioning Specification | Review Cx Preliminary Specs & Comment | Review Cx Draft Preliminary & Comment | Review Cx Draft Preliminary & Comment | Incorporate Preliminary Cx Specifications into Project Specification Submittal.  Review Cx Draft Specs & Comment | Develop Preliminary Cx Specifications & Cx Coordination Matrix. Deliver to A/E Team for incorporation into Specification Submittal. | |
| DD-2 | Duration Schedule for Commissioning Activities | Distribute schedule  Review and comment | Review and comment | Review and comment | Review schedule and incorporate into project design schedule | Update Duration Schedule for Design Phase Commissioning Activities  Update draft duration schedule for Construction Phase Commissioning Activities | |
| DD-2 | Design Review Meeting | Facilitate Design Review Meeting.  Facilitate Resolution of Cx Issues. | Attend Design Review Meeting as required by other NCA requirements.  Participate in Issue Resolution as appropriate. | Attend Design Review Meeting as required by other NCA requirements.  Participate in Issue Resolution as appropriate. | Attend Design Review Meeting.  Provide responses to and clarifications of identified Commissioning Issues. | Attend Design Review Meeting. Provide clarification and facilitate resolution to Commissioning Issues Identified | |
| DD-2 | Design Phase Issue Log Resolution | Review & Comment on Revised Design Phase Commissioning Issues Log | Review & Comment on Revised Design Phase Commissioning Issues Log | Review & Comment on Revised Design Phase Commissioning Issues Log | Review & Comment on Revised Design Phase Commissioning Issues Log | Record resolutions to Cx Issues on the Design Phase Commissioning Issues Log. | |
|  | | | | | | | |
| CD-1 | Design Submission Review | Facilitate delivery of Design Submission Documents to CxA  Review CxA Issues Log & Provide Feedback as appropriate  Facilitate Resolution of Comments by A/E Team | Review CxA Issues Log & Provide Feedback as appropriate | Review CxA Issues Log & Provide Feedback as appropriate | Deliver Documents to CxA for review.  Review CxA Issues Log  Provide Written Responses to Issues | Review and comment on CD1 Design Review Log.  Provide clarifications as required.  Record resolution for each issues based on A/E Response | |
| CD-1 | Design Narrative | Review Design Narrative & Comment | Review Design Narrative & Provide Feedback as appropriate | Review Design Narrative & Provide Feedback as appropriate | Review Design Narrative for conformance with current project status. Verify recorded decisions are consistent with Design Team intent and contracts with the NCA. | CxA to update, review and reconcile the Project Design Narrative. The Design Narrative should reflect the evolution of the project design and note all significant deviations from prior version for ease of review and reconciliation.  Design Narrative should describe designer’s response to the project requirements.  Where appropriate, provide documentation of approval of deviations from NCA Design Criteria and reasoning for same. | |
| CD-1 | Draft Pre-Functional Checklists and Functional Performance Test procedures | Distribute to team  Review and comment | None | Review and Comment | Review and comment | Starting from the Preliminary PFCs and FPTs and review comments, develop Draft PFCx and FPTs.  Incorporate into the Construction Phase Commissioning Plan and Commissioning Specifications. | |
| CD-1 | Design Phase Controls Meeting | Facilitate and schedule meeting.  Participate in meeting | Attend and participate in meeting | Attend and participate in meeting | Chair meeting  Attend and participated in meeting | Attend and participate in meeting | |
| CD-1 | Commissioning Plan | Distribute Updated Design Phase Cx Plan  Review Cx Plan & Comment | Review Cx Plan & Comment | Review Cx Plan & Comment | Review Cx Plan & Comment | Update & Submit Project Commissioning Plan | |
| CD-1 | Duration Schedule for Commissioning Activities | Distribute schedule  Review and comment | Review and comment | Review and comment | Review schedule and incorporate into project design schedule | Update Duration Schedule for Design Phase Commissioning Activities  Update draft duration schedule for Construction Phase Commissioning Activities | |
| CD-1 | Commissioning Specification | Review Cx Final Specs & Comment | Review Cx Final Specs & Comment | Review Cx Final Specs & Comment | Incorporate Final Cx Specifications into Project Specification Submittal.  Review Cx Final Specs & Comment | Develop Final Cx Specifications & Cx Coordination Matrix. Deliver to A/E Team for incorporation into Specification Submittal. | |
| CD-1 | Design Review Meeting | Facilitate Design Review Meeting.  Facilitate Resolution of Cx Issues. | Attend Design Review Meeting as required by other NCA requirements.  Participate in Issue Resolution as appropriate. | Attend Design Review Meeting as required by other NCA requirements.  Participate in Issue Resolution as appropriate. | Attend Design Review Meeting.  Provide responses to and clarifications of identified Commissioning Issues. | Attend Design Review Meeting. Provide clarification and facilitate resolution to Commissioning Issues Identified | |
| CD-1 | Design Phase Issue Log Resolution | Review & Comment on Revised Design Phase Commissioning Issues Log | Review & Comment on Revised Design Phase Commissioning Issues Log | Review & Comment on Revised Design Phase Commissioning Issues Log | Review & Comment on Revised Design Phase Commissioning Issues Log | Record resolutions to Cx Issues on the Design Phase Commissioning Issues Log. | |
|  | | | | | | | |
| Final | Design Final Design Submission Review | Facilitate delivery of Design Submission Documents to CxA  Facilitate Resolution of Comments by A/E Team | None | None | Deliver Documents to CxA for review.  Review CxA Issues Log  Provide Written Responses to all Outstanding Issues | Review Final Design Submission for resolution of Outstanding Commissioning Issues | |
| Final | Design Narrative | Review & Approve Final Design Narrative | None | None | Review Design Narrative for conformance with current project status. Verify recorded decisions are consistent with Design Team intent and contracts with the NCA. | CxA to provide Final Project Design Narrative. The Design Narrative should reflect the evolution of the project design and note all significant deviations from prior version for ease of review and reconciliation.  Design Narrative should describe designer’s response to the project requirements.  Where appropriate, provide documentation of approval of deviations from NCA Design Criteria and reasoning for same. | |
| Final | Commissioning Plan | Distribute Updated Design Phase Cx Plan  Review Cx Plan & Comment | Review Cx Plan & Comment | Review Cx Plan & Comment | Review Cx Plan & Comment | Update & Submit Project Commissioning Plan | |
| Final | Draft Pre-Functional Checklists and Functional Performance Test procedures | Distribute  Review and back-check | None | Review and back-check | Review and back-check | Incorporate back-check comments into the Draft PFCs and FPTs; incorporate into the Commissioning Plan and Final Commissioning Specifications. | |
| Final | Duration Schedule for Commissioning Activities | Distribute schedule  Review and comment | Review and comment | Review and comment | Review schedule and incorporate into project design schedule | Update Duration Schedule for Design Phase Commissioning Activities  Update draft duration schedule for Construction Phase Commissioning Activities | |
| Final | Commissioning Specification | Review Cx Updated Specs & Approve | Review Cx Updated Specs & Comment | Review Cx Updated Specs & Comment | Incorporate Updated Cx Specifications into Project Specification Submittal. | Provide updated Final Cx Specifications & Cx Coordination Matrix. Deliver to A/E Team for incorporation into Specification Submittal. | |
| Final | Design Phase Issue Log Resolution | Review & Comment on Revised Design Phase Commissioning Issues Log | None | N one | None | Record resolutions to Cx Issues on the Design Phase Commissioning Issues Log. | |
| Final | Design Phase Commissioning Report | Review, comment and approve | Review and Comment | Review and Comment | Review and Comment | Prepare and submit Design Phase Commissioning Report. | |

Commissioning Team Roles and Responsibilities

Bid and Pre-Construction Phase

| Phase | Project Phase/Cx Task  (ref Table above for description**)** | Commissioning Team Member Responsibilities | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| PM/RE | CFM | NCA | A/E Team | CxA |
| Pre-Bid | Pre Bid Meeting | Organize, schedule and conduct meeting | None | Attend meeting, respond to questions | Attend meeting, respond to questions | Attend meeting, respond to questions |
| Pre-Const. | Pre-Construction Meeting | Organize, schedule and conduct meeting | None | Attend meeting, respond to questions | Attend meeting, respond to questions | Attend meeting, respond to questions |

Commissioning Team Roles and Responsibilities

Construction Phase

| Project Phase/  Cx Task | Commissioning Team Member Responsibilities | | | | |
| --- | --- | --- | --- | --- | --- |
| RE | CxA | NCA | A/E Team | Contractor |
| Commissioning Kick Off Meeting | Facilitate the Kick Off Meeting  Provide NCA Schedule Requirements and Milestones  Review Meeting Minutes & Comment | Prepare and disseminate Agenda  Lead Kick Off Meeting  Produce Meeting Minutes and Incorporate Comments | Identify Cx Team Members  Review Meeting Minutes & Comment | Identify Cx Team Members  Review Meeting Minutes & Comment | Identify Cx Team Members (including SC, TAB, DDCC, SpC)  Review Meeting Minutes & Comment |
| Duration Schedule for Commissioning Activities | Review CxA Duration Schedule and Comment as Appropriate | Refine Commissioning Duration Schedule provided with the specification to include Commissioning Activities, Estimated Duration for each Activity and Conditions Required for Activity Execution | Review CxA Duration Schedule and Comment as Appropriate  Schedule NCA Personnel to support Commissioning Process as appropriate | Review CxA Duration Schedule and Comment as Appropriate | Review CxA Duration Schedule and Comment as Appropriate  Incorporate Commissioning Activities into Project CPM Schedule.  Confirm with CxA |
| Submittal & Shop Drawing Review | Facilitate Delivery of Shop Drawings to CxA  Review and approve submittals and shop drawings after review by A/E and CxA | Provide a list of Required Shop Drawings to CM/GC  Review required Shop Drawings in parallel with A/E Team.  Deliver Comments to A/E Team as part of Submittal Review Process | None | Review CxA Comments  Incorporate into A/E Comments as Appropriate  Communicate with CxA where Cx comments are deemed inappropriate. | Deliver appropriate Shop Drawings to CxA when provided to A/E Team.  Submittal deliverable must be in contract  -Agent address /Section 01340  -in specs? |
| Review RFI’S ASI’S and other Contract Documents | Distribute to CxA | Review documents to identify impacts on Commissioning Process. Review to identify any conflicts with the project OPR. | None | In addition to other contract responsibilities, review and respond to CxA comments. | In addition to other contract responsibilities, review and respond to CxA comments. |
| Project Commissioning Plan | Distribute Design Phase Cx Plan  Review Cx Plan & Comment/Approve | Update Project Commissioning Plan to include specific individuals and team members.  Update as required for changes in project schedule or work scope as appropriate. | Review Cx Plan & Comment | Review Cx Plan & Comment | Review Cx Plan & Comment  Support Construction Team adherence to Cx Plan |
| Site Observations | Review Site Visit Reports and Commissioning Issues Logs and Comment as appropriate.  Forward Site Visits Report to Contractor and A/E  Facilitate resolution of Commissioning Issues Log Items as expeditiously as possible. | Visit the Project Site on a regular scheduled basis as agreed upon with the RE.  Submit Site Visit Report to RE.  Update and deliver Commissioning Issues Log | Review Site Visit Report & Comment as Appropriate | Review Site Visit Report & Comment as Appropriate  Assist the CxA in resolving all Design related Commissioning Issues. | Forward Site Visit Report to all Subcontractors, Commissioning Representatives and other appropriate construction team personnel.  Review Site Visit Report & Comment as Appropriate  Assist the CxA in resolving all commissioning Issues. |
| Commissioning Team Meetings | Review Meeting Minutes & Comment | Prepare and disseminate Agenda for regular periodic Cx Team Meetings  Lead Cx Team Meetings  Produce Meeting Minutes and Incorporate Comments | NCA Cx Team Members Attend  Review Meeting Minutes & Comment | A/E Cx Team Members Attend  Review Meeting Minutes & Comment | Cx Team Members (including SC, TAB, DDC, SpC) Attend  Review Meeting Minutes & Comment |
| Develop Pre Functional Checklists (PFC’s) | Review & Comment as appropriate | Develop Pre Functional Checklists. (PFC’s)  Provide to Contractor for comment.  Disseminate final PFC’s for use by Construction Team. | Review & Comment as appropriate | Review & Comment as appropriate | Review & Comment – All Cx Team Members.  Incorporate PFC requirements into start up schedules and processes. |
| Develop Functional Performance Test (FPT’s) Procedures | Review & Comment as appropriate | Develop Functional Performance Tests (FPT’s).  Provide to Contractor team for comment.  Disseminate final FPT’s for use by Construction Team. | Review & Comment as appropriate | Review & Comment as appropriate | Review & Comment – All Cx Team Members.  Incorporate FPT requirements into project and personnel schedules. |
| Review Contractor Equipment Startup Checklists, TAB Reports and PFC’s | Review & Comment as appropriate | Review & Comment on result s of Start Up testing, TAB results and PFC documentation.  Field Verify a sampling of PFC’s to confirm compliance with PFC requirements. Evaluate readiness for Functional Performance Testing | Review & Comment as appropriate | Review & Comment as appropriate | Provide Factory and Contractor Start Up documentation in accordance with Specifications and PFC’s to PM/RE, CxA and A/E Team for review & comment.  Correct any deficiencies or deviations noted on the Commissioning Issues Log and report corrective action. |
| Review Operations & Maintenance Manuals | Review & Comment on Operations and Maintenance Manuals. | Review & Comment on Operations and Maintenance Manuals.  Incorporate into Systems Training as appropriate. | Review & Comment on Operations and Maintenance Manuals. | Review & Comment on Operations and Maintenance Manuals. | Complete & Submit Operations and Maintenance Manuals prior to equipment start up and execution of Pre Functional Checklists.  Correct issues identified with O&M Manuals identified on the Commissioning Issues Log. |

Commissioning Team Roles and Responsibilities

Acceptance and Testing Phase

| Project Phase/  Cx Task | Commissioning Team Member Responsibilities | | | | |
| --- | --- | --- | --- | --- | --- |
| RE | CxA | NCA | A/E Team | Contractor |
| Systems Functional Performance Testing | Facilitate execution of the Functional Performance Testing as required.  Review CxA Issues Log & Provide Feedback as appropriate  Facilitate Resolution of Commissioning Issues Log and reporting requirements between the CxA and the Construction team. | In collaboration with the Contractor Commissioning Team, direct the execution of the Functional Performance Testing.  Identify issues and deficiencies in system operation and performance on the Commissioning Issues Log.  Retest systems as appropriate to demonstrate compliance with the Contract Documents and the Commissioning Plan. | Participate with the CxA as agreed upon to support the commissioning process and facilitate training of the Operations Team.  Review & Comment on Commissioning Issues Log as appropriate. | Review & Comment on the Commissioning Issues Log as appropriate. | Provide Qualified Technicians and Professionals to operate the installed systems and components as required by the Functional Performance Testing and any retesting required by the CxA.  Provide documentation of test results from installed systems as required by the FPT’s.  Correct issues and deficiencies identified on the Commissioning Issues Log and report methods and results of corrective actions to the CxA. |
| Prepare Systems Manuals | Review Systems Manual & Approve | Utilizing the accumulated information and data, prepare a Systems Manual for the Operations Team.  Review submitted data and note any issues or deficiencies on the Commissioning Issues Log.  Deliver Systems Manual to the Cx Team for Review and Comment. | Review Systems Manual & Comment | Provide systems diagrams and other appropriate data to the CxA in electronic format for development of Systems Manual.  Review Systems Manual & Comment | Provide data, including record drawings and submittal data for all commissioned systems.  Correct any deficiencies and issues identified with the submitted data.  Review Systems Manual & Comment |
| Training Plan Review | Facilitate Development of Training Agendas and Training Schedules.  Review Training Plan & Comment | Facilitate development of Training Agendas.  Collaborate with CM/GC/SC and NCA teams to schedule training activities.  Review and Approve all CM/GC/SC training agendas. Note any issues or deficiencies in Agendas on the Commissioning Issues Log. | Review Training Plan & Comment  Schedule Appropriate Operations Personnel in accordance with the training schedule. | Review Training Plan & Comment | Develop training agendas in accordance with Project Specifications and submit to CxA for review.  Coordinate training schedule with CxA and other Cx Team members.  Schedule and execute training in accordance with training schedule and agendas. |
| Systems Training | Review & Approve Systems Training Agenda  Facilitate Systems Training in accordance with the Agenda and Schedule | Develop Systems Training Sessions in accordance with the Commissioning Plan. Sessions shall include the use of the Operations and Maintenance Manual and a ‘Systems Manual’ developed for the NCA operations Team.  Deliver Systems Training in accordance with the approved Systems Training Agenda. | Schedule key O&M Personnel to attend Systems Training Sessions. | Review & Comment on Systems Training Agenda. | Review & Comment on Systems Training Agenda. |
| Final Commissioning Report | Review & Approve Final Commissioning Plan. | Create and submit Final Commissioning Report in accordance with the Commissioning Plan and other contract requirements. | Review & Comment on Final Commissioning Plan | Review & Comment on Final Commissioning Report | None |
| Lessons Learned Review Meeting | Facilitate Lessons Learned Meeting  Review & Comment on Meeting Minutes | Distribute the Agenda for the Lessons Learned Meeting.  Lead the Lessons Learned Meeting.  Complete and distribute Meeting Minutes. Incorporate comments as appropriate. | Attend & Contribute to Meeting.  Review & Comment on Meeting Minutes | Attend & Contribute to Meeting.  Review & Comment on Meeting Minutes | Attend & Contribute to Meeting.  Review & Comment on Meeting Minutes |

Commissioning Team Roles and Responsibilities

Warranty Phase

| Project Phase/  Cx Task | Commissioning Team Member Responsibilities | | | | |
| --- | --- | --- | --- | --- | --- |
| RE | CxA | NCA | A/E Team | Contractor |
| Deferred and/or Seasonal Testing | Facilitate Seasonal Testing with all appropriate parties.  Review CxA Issues Log & facilitate issues resolution.  Facilitate Resolution of identified Commissioning Issues. | Schedule & Execute Seasonal Testing in Accordance with Functional Performance Testing Protocols.  Maintain & Distribute Warranty Phase Commissioning Issues Logs.  Facilitate and record resolution to identified Issues and Deficiencies recorded on Commissioning Issues Log. | Provide O&M Personnel to support seasonal testing in accordance with the Commissioning Plan.  Review CxA Issues Log & Comment  Operations Team will operate systems under the deferred season testing protocols. | Review & Comment on Seasonal Testing.  Provide and report resolution of any issue identified as a Design Issue. | Contractor will be invited to participate in the execution of seasonal testing and assist in resolution of issues and deficiencies identified.  Record resolution for each issues based on A/E Response |
| Post-Occupancy Warranty Checkup | Facilitate Post Occupancy Warranty Check Up Meetings.  Review and approve Final Commissioning Report Amendment. | Meet with the NCA Operations Team. Interview team members to evaluate system performance and identify any issues with operation of the commissioned systems.  Evaluate system performance through a review of operating performance data and warranty phase (re-commissioning) tests as identified in the Commissioning Plan and Systems Manual.  Develop a Warranty Report identifying any outstanding warranty issues for NCA use in resolving warranty issues on the project. | Provide O&M personnel to participate with the CxA in the Post Occupancy Warranty Checkup.  Identify any outstanding or persistent warranty issues to the CxA. | A/E Team will be invited to participate at their discretion.  Review & Comment on Seasonal Testing.  Provide and report resolution of any issue identified as a Design Issue. | Contractor will be invited to participate at his discretion. Assist in resolution of issues and deficiencies identified. Assist in facilitating execution of all warranty obligations identified. |
| Final Commissioning Report Amendment | Review & Approve Final Commissioning Report Amendment. | Create and submit Final Commissioning Report Amendment in accordance with the Commissioning Plan and other contract requirements. | Review & Comment on Final Commissioning Report Amendment | Review & Comment on Final Commissioning Report | None |

# Evaluation Criteria

The proposal evaluation criteria are listed below:

COMMISSIONING APPROACH:

1. Firms shall include a narrative discussion of their approach to completing the commissioning tasks included in the Scope of Services. See Section 4 – Commissioning Services for further information on the required scope of services.

SPECIALIZED EXPERIENCE & TECHNICAL COMPETENCE:

1. Firms shall demonstrate specific relevant experience in Whole Building Commissioning Services. See Section 3 for qualification requirements. Projects shall be similar in nature, application and project size. Firms must address and demonstrate the specialized experience and technical competence of the CxA and proposed support team members in each discipline required to address the systems to be commissioned described in Section 4 – Commissioning Services above. For joint venture submittals and prime professionals with sub-consultant team members, each joint venture partner and/or each sub-consultant shall provide letters of commitment to the project team. The offeror agrees to assign to the contract those persons whose resumes, personnel data forms or personnel qualification statements were submitted. If personnel for whatever reason become unavailable for work under the contract for a continuous period exceeding 30 working days, or are expected to devote substantially less effort to the work than indicated in the proposal, the contractor shall propose a substitution of such personnel. All proposed substitutions shall be submitted, in writing, to the Contracting Officer at least 15 days prior to the proposed substitution. All proposed substitutes shall have qualifications equal to or higher than the qualifications of the person being replaced. Project descriptions should show explicit experience pertinent to this announcement.

PROFESSIONAL QUALIFICATIONS:

1. Firms shall demonstrate the professional qualifications of the firm or joint venture. See Section 3 for qualification requirements.
2. Firms shall demonstrate the professional qualifications of the Senior CxA. See Section 3 for qualification requirements.
3. Firms shall demonstrate the commissioning firm, or proposed team, is familiar with construction practices, materials, standards, and design requirements.
4. Firms shall identify the key personnel in the following disciplines: Senior CxA or Project Manager, Building Envelope Specialist, Electrical Engineering Commissioning Specialist, Mechanical Engineering Commissioning Specialist, and Communications/Security Engineering Commissioning Specialist. Firms shall demonstrate the qualifications for each of these key personnel. See Section 3 for qualification requirements.
5. The qualifications evaluation will consider the breadth and depth of education, training, certification, overall and relevant experience and longevity with the proposed Commissioning firm team for all proposed key personnel.
6. Firms shall demonstrate that the Senior CxA or Project Manager and Lead Field Personnel have either bachelor’s degrees in their discipline, certifications from recognized national Commissioning Certification Organizations, or similar qualifications.

PAST PERFORMANCE:

1. Firms shall demonstrate that the CxA firm has relevant past performance on NCA, DOD, GSA, or other projects that are similar with respect to cost control, quality of work and compliance with performance schedules.
2. Firms shall demonstrate the CxA firm has acted as the principal CxA for similar construction projects. See Section 3 for experience requirements Provide contact information for an individual who can provide a reference for at least seven of the ten projects.
3. For the projects submitted in response to the above requirement, identify the role of the proposed key project personnel including Senior CxA or Project Manager, electrical, mechanical communications and envelope Commissioning Specialist. Indicate if the key individual was an employee or a sub-consultant.

CAPACITY:

Editor’s Note: Insert the dollar amount in paragraph a. below:

1. Demonstrate the Firm’s or Joint Venture’s ability (in terms of labor capacity, operational control and quality assurance) to perform projects with labor fee in the range of approximately $ [*insert amount (consistent with maximum contract/task order amount*] for the required type in a one-year period. The evaluation will consider the availability of an adequate number of personnel in key disciplines, equipment availability, and demonstrated management procedures.
2. Firms shall demonstrate the capacity to execute multiple Task Orders simultaneously while dealing with existing work backlog.

ADDITIONAL QUALIFICATIONS OF THE COMMISSIONING TEAM MEMBERS:

1. Demonstrate the Commissioning Team members have extensive knowledge and experience in the operations and troubleshooting of HVAC or complex electrical systems.
2. Demonstrate the Commissioning Team members have extensive knowledge and experience in open-protocol direct digital control (DDC) systems.
3. Demonstrate the Commissioning Team members have extensive knowledge of testing, adjusting, and balancing (TAB) of HVAC systems. Experience in performing or managing the TAB process is desired.
4. Demonstrate the Commissioning Team members have extensive experience in testing and commissioning building system envelopes and envelope assemblies.
5. Demonstrate the Commissioning Team members have knowledge and experience in building operations and maintenance. Experience in developing and providing systems-level training for O&M personnel is desired.
6. Demonstrate the Commissioning Team members have experience in developing, implementing, and/or optimizing system control strategy and sequences.
7. Demonstrate the Commissioning Team members have extensive experience in writing commissioning specifications, commissioning plans, functional test procedures, and coordinating commissioning tasks with the contractor’s schedule.

OVERALL QUALITY AND COMPLETENESS OF THE PROPOSAL:

1. Proposals will also be evaluated on the following:
2. Completeness
3. Attention to detail
4. Clarity
5. Organization
6. Appearance

# RFP Response Requirements

## Proposal Deadline

[Insert the date and time proposals are due. This should be the same date and time identified in paragraph 1.3]

## Proposal Submission Instructions

[Insert identification of the name, address, phone, fax, and email information for the person to receive the proposal.]

[Insert instructions on how may hardcopies and/or electronic copies are required.]

[Insert any information on the page limits, binding instructions, and other administrative instructions for submitting the proposals.]

## Proposal Organization

Provide a cover letter and statement of intent. Acknowledge receipt of amendments to the /RFP. Indicate acceptance of the contract terms, or identify any exceptions taken to the terms and conditions.

Provide a Technical/Management Proposal organized as follows:

Tab A – Commissioning Firm Information:

1. Provide the name and location of the proposing firm. Show locations of all offices and identify the office(s) that will be responsible for the project(s) in this RFP.
2. Indicate the type of firm (i.e. corporation, sole proprietor, LLC, etc.)
3. Indicate if the firm is a small business, minority-owned, woman-owned, veteran-owed or other similarly qualified enterprise.
4. Provide documentation of the firm’s ability to obtain performance bonds.

Tab B – Commissioning Team

1. Provide an organization chart showing the names and roles of the proposed CxA team. Include the Principal/Project Executive, Project Manager/Senior CxA, key technical leaders (mechanical, electrical, plumbing, fire protection, etc.)
2. Identify any key sub-consultants and identify their role on the team.

Tab C - Management Skills and Technical Expertise:

1. Provide relevant project experience as discussed in Section 3 and 5 above.
2. For additional projects that demonstrate the firm’s breadth of similar work, provide a list of commissioning projects, a brief scope, project cost and owner’s contact information
3. Provide information for projects where the commissioning firm and the key sub-consultant have previously worked together. Identify the type of project, services provided by the sub-consultant, and the key project team members.
4. Describe your firm’s Quality Control Program and provide an example of how your quality control program improved the quality of the end product.
5. Describe your firm’s approach to resource management and allocation and provide a description of how this process will ensure appropriate resources will be available to support this project.
6. Provide documentation of any awards or letters of commendation received.

Tab D - Credentials of the Project Team:

1. Identify the Project Manager or Senior CxA who will be the technical manager and the primary point of contact for day-to-day technical aspects of the project. Provide resumes and list of related projects.
2. Identify other key project team members and indicate their role on the Commissioning Team. Provide resumes and list of related projects.
3. Provide a Staffing Plan to demonstrate staffing requirements throughout the project. This Staffing Plan should demonstrate the staffing requirements on a monthly basis throughout the project based on the project schedule information provided in this RFP.
4. Identify key sub-consultants and previous working experience with the sub-consultants identified in the proposal. If the offeror is a large business, provide a Sub-Contracting Plan that describes the role and scope of services for proposed sub-consultants. Identify qualified Veteran-owned, Disabled Veteran-Owned, Woman Owned, Small Disadvantaged, or other small business firms included in the proposal.

Tab E - Commissioning Approach:

1. Submit a brief but informative narrative overview of your approach to facilitating and implementing the commissioning services under this contract. This Commissioning Approach shall be developed in response to this RFP and shall address your project performance ability. Describe how you will support the scope of services described in Section 4 – Commissioning Services above. Identify any unique skills, special expertise, and highly-efficient systems, and home office support that will enhance the successful and timely delivery of the services and the project.
2. The narrative shall include a description of the firm’s ability to manage the commissioning process in coordination with the NCA, the A/E, and the Prime Contractor.
3. The narrative shall include a preliminary schedule for completing commissioning tasks relative to the project schedule data provided in this RFP.
4. The narrative shall include a discussion of the means and methods to complete the scope of servicers.
5. The narrative shall also indicate potential challenges or risks that are foreseen along with a plan to mitigate the possible risks or challenges.

Tab F - Capability for Timely Response:

1. Proximity of the CxA’s office relative to the project location.
2. Describe your ability to respond to issues, inquiries, and other requirements in a timely manner.

Tab G - Compliance with Contractual Terms:

1. Provide a definitive statement of intent to comply with contract Terms and Conditions as delineated in this RFP. If proposed Terms and Conditions are not acceptable as described, note and explain any exceptions; however failure to agree to terms required by law or NCA purchasing regulations may be grounds for disqualification of the proposal.
2. Acknowledge and describe any deviations from the Scope of Services.

Tab H – Sample Work Product

1. Submit examples of the following work products for a recently completed project that were prepared by proposed Commissioning Team members. Examples should be submitted in electronic PDF format on CD-ROM or DVD:

* Commissioning Plan
* Commissioning Specifications
* Design Review Comments
* Field Report for Commissioning Construction Observation Visit
* Commissioning Issues Log
* Pre-Functional Checklist completed by the contractor
* Systems Functional Performance Test Procedure annotated with testing results
* Final Commissioning Report (Executive Summary and narrative sections only.)

Tab I - Cost of Services:

1. Tab I – Cost Of Services shall be submitted in a separate sealed envelope. Mark the envelope with the Firm Name, RFP Number and Title, and identify as “Tab I – Costs of Service” on the outside of the envelope.