

Request for Proposals – Commissioning Services Greene County Jail

March 6, 2020 (Addendum No.1)

REQUEST FOR PROPOSALS **COMMISSIONING SERVICES FOR THE** **NEW GREENE COUNTY JAIL FACILITY**

Project Summary:

The Greene County Jail is a new facility that is scheduled to be completed by the end of February of 2021. The Greene County Jail is a 73,000 square feet two level building, with a detached 6,000 square foot single level maintenance building. The main building will be a mix of commercial level construction for the administrative space and detention level construction for the institutional space. The housing pods will have smoke evacuation systems to allow inmates to remain in place during a smoke event. The maintenance structure is a pre-engineered metal building used for maintenance and storage. **Please be advised that construction has started and the project is approximately 50% complete and all submittals and coordination drawings have been completed and approved by the AE. Additionally, the project schedule is progressing by area and the equipment start-up and pre-functional testing will be completed as each area is completed. Final Commissioning will be completed at the end of the project. The areas of work include:**

- 1. Core #1 – Area ME, AD & SV**
- 2. Core#2 – Area VS, IN & HL**
- 3. Housing Unit A**
- 4. Housing Unit C**
- 5. Housing Unit D**
- 6. Housing Unit C & D Center Core**
- 7. Maintenance Building S**

Commissioning Scope of Work:

The intent of this Commissioning Project is to verify the successful completion, documentation and performance of the facility's mechanical systems. Additionally, HVAC systems will be evaluated under emergency power conditions. Life safety smoke control system will be evaluated under the smoke conditions.

The proposal is to include, but not be limited to, all labor, material, tools, equipment, plant supplies, transportation, supervision, contributions, insurance, coordination with entities, and other services necessary for the performance of work for the project.

The systems to be commissioned will be focused on the following systems, and their integration with emergency power and life safety systems (Fire Alarm):

- HVAC systems, including building automation controls and graphics;
- Domestic water heater and distribution system;
- Lighting controls;
- Smoke Control system;
- Emergency Power Generator system.

The Commissioning Agent (CA) will verify completion of start-up and close-out activities for the equipment systems listed above., Testing, adjusting and balancing of these systems as well as operation of systems under building management control will be verified. The CA will not necessarily witness and be present for milestones related to every system listed; however, the CA will review documentation for each system and notify the Construction Manager immediately of any discrepancies. The Owner will be provided with systems that operate in accordance with the design intent and owner requirements.

Section 019113, Commissioning Requirements, as issued for the construction of the Greene County Jail are attached to and are herein made part of this Request for Proposals.

Qualifications:

The commissioning organization must be certified and in good standing with one of the following commissioning organizations: Building Commissioning Association (BCA), AABC Commissioning Group (ACG), Association of Energy Engineers, or a professional engineer. Current certifications must be submitted with this RFP response.

RFP Response Requirements:

1. Provide a fixed fee for these services on the Bid Form provided; provide any assumptions as an attachment to the Bid Form. This is a Lum Sum Price contract. Agreed upon contract value shall be inclusive of the cost for all work inclusive of travel and reimbursable expenses.
2. Provide firm experience, firm's approach to commissioning a full list of similar commissioning projects completed demonstrating proficiency along with contact information.
3. Provide commissioning certificates and resume(s) of staff planned to be the commissioning site authority.
4. Provide a staffing plan with anticipated staff and hours for the following:
 - Preparation and Approval of the Commissioning Plan
 - Pre-Construction Phase
 - Construction Phase
 - Acceptance Phase
 - Post Occupancy Phase.

RFP General Requirements:

1. By submission of this proposal, each bidder and each person signing on behalf of any bidder certifies and in the case of a joint bid, each party thereto certifies as to its own organization, under penalty of perjury, that to the best of his knowledge and belief: 1) the prices in this proposal have been arrived at independently without collusion, consultation, communication or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor; 2) unless otherwise required by law, the prices which have been quoted in this proposal have not been knowingly disclosed by the bidder prior to opening to any other bidder or to any competitor; and 3) no attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose for restricting competition.

2. All forms required to be submitted with each Bid are as follows:
 - a. **Bid Form:** completely filled out. Attach any assumptions to the Bid Form.
 - b. **Non-Collusive Bidding Certificate:** Affidavit is signed and dated in blue or other non-black ink;
 - c. **Insurance Certificate;** Certificates of Insurance are to be submitted to Owner seven (7) calendar days after Contract Notice of Award;
 - d. **Sexual Harassment Form;** All vendors and bidders acknowledge and agree to be bound by the Greene County Sexual Harassment Prevention Policy (adopted 11/20/18) and the Greene County Discriminatory Harassment Prevention Policy (adopted 11/20/18). Vendors and Bidders shall execute the Acknowledgement Form and attach to any and all Bids or Proposals submissions. <https://www.greengovernment.com/wp-content/uploads/2019/01/BIDDERS-AND-VENDORS-ACKNOWLEDGEMENT.pdf>

Project Schedule:

Receipt of Proposals:

1. Any and all questions of a scope and/or technical nature should be directed via e-mail to SMRT, the Project Architect, attention Greg Burgess at gburgess@smrt.com and Mark Bollin at bollin@pikeco.com. Questions must be provided in writing on the Request for Information Form attached.
2. Proposals are to be submitted on the Bid Form provided.
3. Proposals must be received no later than **Tuesday, March 24, 2020, 2:00 PM** and will be opened privately. Late bids will not be accepted.
4. Bids are to be emailed to: Mark Bollin (bollin@pikeco.com).
5. Greene County reserves the right to reject any or all proposals in whole or in part.

**Request for Proposals – Commissioning Services
Greene County Jail**

BID FORM

Date: March 24, 2020

A. Bidder Information:

Name of Contact Person

Name of Business or Firm

Address

City, State and Zip Code

Telephone

Cell Phone

E-mail

Total Base Bid Amount:

\$ _____

Total Base Bid Written Amount:

B. Informational Bid Amount Breakdown:

- | | |
|--|----------|
| 1. HVAC Systems, including BAC and Graphics | \$ _____ |
| 2. Domestic Water Heater and Distribution System | \$ _____ |
| 3. Lighting Controls | \$ _____ |
| 4. Smoke Control System | \$ _____ |
| 5. Emergency Power Generator System | \$ _____ |

*Total should equal base bid amount

C. Addendum No. 1 Acknowledged

Yes _____ No _____

**Request for Proposals – Commissioning Services
Greene County Jail**

D. Unit Prices for Additional Services:

- 1. Personal (list): _____ \$ _____ per hour
- 2. Personal (list): _____ \$ _____ per hour
- 3. Personal (list): _____ \$ _____ per hour
- 4. Personal (list): _____ \$ _____ per hour
- 5. Travel (list): _____ \$ _____ per trip
- 6. Other (list): _____ \$ _____
- 7. Other (list): _____ \$ _____

The undersigned hereby binds themselves to enter into a written agreement with **OWNER** within ten (10) calendar days from receipt of a Notice of Award and further agrees to comply with all the terms and conditions stated in contract documents

Legal Name of Person, Firm or Corporation

BY: _____

The Address of the bidder is:

Phone No.

Fax No.

IF A CORPERATION

Name

Address

_____, President _____

_____, Secretary _____

_____, Treasurer _____

IF A FIRM

Name

Address

**Request for Proposals – Commissioning Services
Greene County Jail**

NON-COLLUSIVE BIDDING CERTIFICATION

By submission of this Bid for the Greene County Jail Commissioning Services each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid, each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:

1. The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
2. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and
3. No attempt has been made or will be made by the bidder to induce any other person, partnership, or corporation to submit or not to submit a bid for the purpose of restricting competition.

NAME OF FIRM:

Individual or Legal Name of Firm or Corporation

MAILING ADDRESS: _____

CITY/STATE/ZIP CODE: _____

BY: _____

Signature of Representative of Firm or Corporation (blue or other non-black ink)

DATED: _____

Request for Proposals – Commissioning Services
Greene County Jail

INSURANCE REQUIREMENTS

1. GENERAL

- 1.1 As a condition of the Contract, Contractors are required to submit ACORD Corporation No. 25-S (1/96).
- 1.2 Certificates of Insurance provided by the Contractor must be in this form.
- 1.3 Certificates of Insurance are to be submitted to Owner seven (7) calendar days after Contract Notice of Award.

2. INSURANCE REQUIREMENTS

- 2.1 Project Insurance Requirements are as follows:

<u>Insurance Type</u>	<u>Limits</u>
A. Workers' Compensation	
(1) Employer's Liability:	<u>\$1,000,000.00</u> each accident <u>\$1,000,000.00</u> Disease, Policy limit <u>\$1,000,000.00</u> Disease, Each employee
B. General Liability (including Premises-Operations; Independent Contractors' Protective; Products and Completed Operations; Broad Form Damage)	
(1) Bodily Injury:	<u>\$1,000,000.00</u> each Occurrence <u>\$3,000,000.00</u> Aggregate
(2) Property Damage:	<u>\$1,000,000.00</u> each Occurrence <u>\$3,000,000.00</u> Aggregate
(3) Products and Completed Operations:	<u>\$1,000,000</u> Aggregate

Products and Completed Operations Insurance shall be maintained for a minimum period of one (1) year after date the Certificate of Final Completion is issued and the Contractor shall continue to provide evidence of such coverage to the Owner on an annual basis during aforementioned period.

- (4) Contractual Liability (Hold Harmless Coverage)
 - a. Bodily Injury: \$1,000,000.00 each Occurrence
 - b. Property Damage: \$1,000,000.00 each Occurrence
\$2,000,000.00 Aggregate

- (5) Personal Injury (with Employment Exclusion deleted, if applicable)
\$2,000,000.00 Aggregate

(6) If the General Liability policy includes a General Aggregate, such General Aggregate shall be not less than \$2,000,000.00 Policy shall be endorsed to have General Aggregate apply to this Project only.

- C. Umbrella Excess Liability \$5,000,000.00 Over primary Insurance
\$ 10,000.00 Retention

- D. Automobile Liability \$1,000,000.00 Each Person

2.2 Each Prime Contractor's Insurance shall be considered primary and non-contributing insurance. The types and coverage's shall be written for not less than the limits of liability required.

3. ACORD CORPORATION NO. 25-S (1/96) CERTIFICATE OF INSURANCE

- 3.1 Samples Attached.

Greene County Jail, Coxsackie New York
Issued For Construction, January 22, 2020

SECTION 019113
COMMISSIONING REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section specifies project commissioning requirements. Commissioning efforts are intended to verify the successful completion, documentation and performance of the facility's mechanical systems. Additionally, HVAC systems will be evaluated under emergency power conditions. Life safety smoke control system will be evaluated under smoke control conditions.
- B. Systems Commissioned: Commissioning efforts will be focused on the following systems, and their integration with emergency power and life safety systems (Fire Alarm):
 - 1. HVAC systems, including building automation controls and graphics.
 - 2. Domestic water heater and distribution system
 - 3. Lighting controls
 - 4. Smoke Control system
 - 5. Emergency Power Generating system
- C. Scope of Commissioning Efforts: The commissioning authority, (CA) will verify completion of start-up and close activities for the equipment and systems listed above. Testing, adjusting and balancing of these systems as well as operation of systems under building management control will be verified.
 - 1. The CA will not necessarily witness and be present for milestones related to every system listed. However, the CA will review documentation for each system and notify Construction Manager immediately of any discrepancies.
- D. Commissioning Expectations: The Owner will be provided with systems that operate in accordance with the design intent and owner requirements.

1.2 RELATED REQUIREMENTS

- A. Examine Contract Documents for requirements that affect work of this Section. Other Specification Sections that directly relate to work of this Section include, but are not limited to;
 - 1. Division 21: Sections for the plumbing systems and equipment being commissioned.
 - 2. Division 23: Sections for Mechanical systems and equipment being commissioned.
 - 3. Division 26: Sections for Electrical system requirements for lighting control equipment being commissioned.
 - 4. Division 21: Sections for Fire Alarm system, smoke management system and equipment being commissioned.

1.3 COMMISSIONING TEAM

- A. General: The Commissioning Team shall consist of the following parties.
 - 1. Owner: Green County, NY
 - 2. Architect: SMRT, Inc. (AE)
 - 3. MEP Engineer: SMRT, Inc. (AE)
 - 4. Commissioning Authority: (CA)
 - 5. Construction Manager: The Pike Company (CM)
 - 6. Mechanical Contractor John W. Danforth Co. (MC)
 - a. Controls Contractor: (CC)
 - b. Testing, Adjusting and Balancing Contractor: (TAB)
 - 7. Electrical Contractor: nrastructure Technologies, LLC (EC)
 - a. Fire Alarm Contractor (FA)

1.4 QUALITY ASSURANCE

- A. BCA: Commissioning procedures shall comply with the Building Commissioning Association's Essential Attributes.
- B. ASHRAE: Commissioning procedures shall comply with the intent of the American Society of Heating, Refrigerating and Air Conditioning's Guideline 0, "The Commissioning Process."
- C. ACG: Commissioning procedures shall comply with the intent of the AABC Commissioning Group (ACG) Commissioning Guideline 2005.
- D. IECC 2015: Commissioning procedures shall comply with the intent of the International Energy Conservation Code 2015 version to meet New York State commissioning requirements.
- E. NFPA 3, 4, and 92: Commissioning procedures shall comply with the intent of the National Fire Protection Association Code for commissioning, integrating fire protection and life safety and smoke control systems.
- F. NEC 2020/NFPA 110: Commissioning procedures shall comply with the intent of the National Electrical Code and the National Fire Protection Association Code for commissioning and testing emergency power generating systems.

1.5 ROLES, RESPONSIBILITIES AND LINES OF COMMUNICATION

- A. General: The following roles and responsibilities are assigned to each member of the Commissioning Team.
- B. Owner:
 - 1. It will be the responsibility of the Owner to provide direction to the AE and CM based on issues raised by the CA, (the CA will courtesy copy the AE and CM on correspondence to expedite communications).
 - 2. Owner holds the responsibility of authorizing / not authorizing the AE and CM to make document and construction modifications, not the CA.

- C. Architect / Engineer, (AE):
1. The AE will capture the Owner's Project Requirements, (OPR) in the construction documents. The AE shall include a Basis of Design narrative for systems being commissioned.
 2. The AE will conduct a review of the TAB report against design requirements.
 3. The AE will direct all TAB related correspondence to the MC.
 4. The AE shall courtesy copy the CA on TAB related correspondence.
- D. Commissioning Authority, (CA):
1. General: The CA does not have the authority to direct design or construction modifications. The CA may identify design and/or construction related issues for consideration. Direction to act on these suggestions lies with the Owner, not the CA.
 2. The CA will direct all correspondence to the CM.
 3. The CA will courtesy copy correspondence to the AE.
 4. The CA will review all contract documents, approved submittals, request for information (RFI's), supplemental instructions and other documents to familiarized themselves and fully understand the project.
 5. The CA will provide a commissioning plan per (IECC 2015 Section 408.2.1Z) requirements. The Cx plan should include functional performance verification forms that will be utilized during systems commissioning. The plan will provide direction for the commissioning team completion of the project commissioning
 6. The CA will generate a log of all equipment and systems that require pre-functional testing, start-up and commissioning and track the scheduled dates and actual dates for each task.
 7. The CA will lead commissioning related meetings and will keep minutes of these meetings.
 8. The CA will review the approved submittals for commissioned equipment.
 9. The CA will attend major equipment startups and document startup procedures with manufacturer generated startupsheets.
 10. The CA will generate functional performance documentation for the systems being commissioned. These documents will be based on approved controls sequences, approved submittals, and project design criteria.
 11. The CA will collect, and review OEM equipment pre-functional documentation provided by the MC, EC, PC, FA, & FP; notify CM immediately with any deficiencies.
 12. The CA will perform functional performance verifications on commissioned systems. These efforts will be supported by the MC, CC, EC, FA, and CM as applicable.
 13. The CA will review TAB plan, TAB process, & final Tab Report. The CA may provide review comments to the AE for consideration.
 14. CA will track commissioning related issues on the Commissioning Issues Log or other reporting means. The Issues log will be the method for tracking all issues raised to completion. If the CM has a suitable issue tracking process, the CM may track commissioning related issues.
- E. Construction Manager, (CM):
1. The CM shall include the cost of commissioning efforts in their contract price.
 2. The CM will provide timely responses to CA generated Construction Oversight comments.
 3. The CM will provide the CA with construction schedules as requested.

4. The CM will provide the CA with the project contact list.
 5. The CM will track the status of issued raised by the CA. (if the CA is not tracking issues with the Commissioning Issues Log). The CM will review open commissioning items as part of regular construction meetings.
 6. The CM will participate in, and expedite actions required by Construction Phase activities.
 7. The CM will participate in, and expedite actions required by Acceptance Phase activities.
 8. The CM will make project shop drawings, RFI's, addenda, bulletins, drawing revisions and similar documentation available to the CA at the field construction office, via e-mail, or preferably through a FTP site. The CM will provide copies of select documents as necessary, (if extended off-site review becomes necessary).
 9. The CM will provide requested information to the CA for inclusion in the Systems & energy manual & the commissioning record.
 10. The CM will direct all commissioning related correspondence to owner, with courtesy copies to the CA and AE.
- F. Mechanical Contractor, (MC): *(May contain responsibilities outlined under PC)*
1. The MC shall include the cost of commissioning efforts in their contract price.
 2. The MC will direct all commissioning related correspondence to the CM.
 3. The MC will ensure that start-up, training, warranty, Extra Materials and O&M requirements of this project are included in each equipment purchase order or service sub-contract. The MC is responsible for compiling and presenting this data in a form consistent with the requirements of this project.
 4. The MC will create or coordinate with equipment suppliers to provide pre-functional / basic start-up checklists (System Component Verifications, SCV's) for equipment being commissioned.
 5. The MC will generate reports pertaining to piping pressure tests and duct air leak testing.
 6. The MC will expedite actions required by Construction Oversight activities.
 7. The MC will hold the TAB and CC contracts.
 8. The MC will provide all required documentation prior to the Acceptance Phase commissioning activities.
 9. The MC will participate in, and expedite actions required by Acceptance Phase activities.
 10. The MC will support CA efforts with functional performance verifications.
 11. The MC will participate in integrated testing efforts.
- G. Controls Contractor, (CC):
1. The CC shall include the cost of commissioning efforts in their contract price.
 2. The CC will be a sub-contract to the MC. As such, the CC will direct all commissioning related correspondence to the MC.
 3. The CC will coordinate efforts with the MC, EC, CA and TAB.
 4. The CC will provide necessary software and cabling to the TAB for use in balancing efforts.
 5. The CC will ensure that start-up, training and O&M requirements of this project are included in each equipment purchase order or service sub-contract. The CC is responsible for compiling and presenting this data in a form consistent with the requirements of this project.

6. The CC will demonstrate performance and adherence to sequences of operation for equipment and systems being commissioned in the presence of, and participating with the CA and TAB.
 7. The CC will provide all required documentation prior to the Acceptance Phase commissioning activities.
 8. The CC will participate in, and expedite actions required by Acceptance Phase activities.
 9. The CC will support CA efforts with functional performance verifications.
 - a. The CC will establish appropriate trending data for a minimum of a 30-day period for performance evaluation.
 10. The CC will participate in integrated testing efforts.
- H. Testing, Adjusting and Balancing Contractor, (TAB):
1. The TAB shall include the cost of commissioning efforts in their contract price.
 2. The TAB will be a sub-contract to the MC. As such, the TAB will direct all correspondence to the MC.
 3. The TAB will coordinate efforts with the MC, EC, CC and CA.
 4. Upon completion of the TAB work, the TAB will coordinate with the CC to demonstrate performance of equipment and systems to the CA.
 5. The TAB will repeat any measurement contained in the TAB report, where required by the AE or the CA for verification purposes.
 6. The TAB will provide all required documentation prior to the Acceptance Phase commissioning activities.
 7. The TAB will participate in and provide timely responses to Acceptance Phase activities.
 8. The TAB will participate in integrated testing efforts as directed.
- I. Electrical Contractor, (EC):
1. The EC shall include the cost of commissioning efforts in their contract price.
 2. The EC will direct all commissioning related correspondence to the CM.
 3. The EC will provide expedite actions required by Construction Phase activities.
 4. The EC will provide all required documentation prior to the Acceptance Phase commissioning activities.
 5. The EC will participate in, and expedite actions required by Acceptance Phase activities.
 - a. The EC will notify the CA times of acceptance testing for standby power.
 6. The EC will assist in emergency power drop tests during acceptance phase commissioning and integrated testing.
- J. Fire Alarm Contractor, (FA):
1. The FA shall include the cost of commissioning efforts in their contract price.
 2. The FA will direct all commissioning related correspondence to the EC.
 3. The FA will provide expedite actions required by Construction Phase activities.
 4. The FA will provide all required documentation prior to the Acceptance Phase commissioning activities.
 5. The FA will participate in, and expedite actions required by Acceptance Phase activities.
 6. The FA will participate in integrated testing efforts as directed.

- A. General: The following actions shall be made part of project submittal and close out activities, in support of the commissioning process.
- B. Pre-Construction Submittals: At the time of initial equipment submittal, each submittal shall include pre-functional / basic start-up checklists or system component verifications (SCV's). These checklists shall be developed by the contractors or provided by the original equipment manufacturers, (OEM). The CA will review all approved submittals for commissioned systems.
- C. Submittals During Construction: As project close out milestones are reached, each activity shall be documented and signed off by the appropriate parties. Copies of documents shall be made available to the CA.
 - 1. Pre-Start Up: The contractor shall prepare and complete pre-start up reports based on project manual requirements, (pressure tests, AHJ inspections, etc.).
 - 2. Pre-Functional / Basic Start-Up / System Component Verifications (SCV's): The contractor shall complete or work in conjunction with the equipment suppliers and representatives to complete manufacturer's standard pre-operational checks and checks of equipment operation under manual control. This included factory required start-up of equipment. These reports shall be submitted to the CA.
 - 3. Functional Performance: The CM shall provide an approved copy of the controls submittal to the CA for use in preparing functional performance verifications documents.
 - 4. The FA contractor shall provide the record of completion.
 - 5. The CC shall provide the final point-to-point check out to the CA.
 - 6. The TAB contractor shall provide the final TAB report (at least a preliminary TAB report) prior to acceptance phase commissioning efforts.
- D. Project Close Out Submittals:
 - 1. All team members must respond to the CA in writing regarding commissioning related deficiencies.

1.7 FUNCTIONAL VERIFICATION DOCUMENTATION

- A. Installing contractors will provide the CA with start-up documentation for every piece of installed equipment. CA recommends factory pre-start forms found within IOM manuals be utilized. All factory start-up forms are to be submitted to the CA. Reports required under NFPA for fire alarm and smoke management systems will serve as start-up forms for these systems.
- B. The CA will generate project specific functional performance Documents. These forms will be based on approved controls sequences, submittals, and design intent.
- C. The CC, MC, and TAB will work with the CA to demonstrate the performance of commissioned HVAC systems under building management control. Successful demonstration as well as deficiencies (action items) will be recorded by the CA. The CA and CC will sign the completed forms. Completed Functional verifications will become part of the commissioning record.

- D. The EC will work with the CA to demonstrate the performance of commissioned electrical systems. Successful demonstration as well as deficiencies (action items) will be recorded by the CA. The CA and PC will sign the completed forms.
- E. The FA will work with the CA to demonstrate the performance of commissioned Fire Alarm systems. Successful demonstration as well as deficiencies (action items) will be recorded by the CA. The CA and PC will sign the completed forms.

PART 2 – PRODUCTS (not used)

PART 3 – EXECUTION

3.1 COMMISSIONING APPROACH

- A. Pre-construction
 - 1. The CA will review all contract documents, approved submittals, request for information (RFI's), supplemental instructions and other documents to familiarized themselves and fully understand the project.
 - 2. Commissioning Kickoff Meeting: CA will meet with the Owner and Construction Team to introduce the Commissioning Process and review the goals expectations.
 - 2. Commissioning Plan: The CA commissioning team shall provide a plan to quantify and clarify the scope and focus of commissioning activities. Generation and adherence to a commissioning plan is good practice as well as mandated by membership in the Building Commissioning Association (BCA).
- B. General: The commissioning process is structured around four general phases.
 - 1. Pre-Construction.
 - 2. Construction.
 - 3. Acceptance.
 - 4. Post Occupancy.
- C. Construction Phase:
 - 1. This specification sections defines contractor requirements in support of the commissioning process.
 - 2. The CA may periodically visit the construction site to confirm compliance with the construction documents, good industry practices and manufacturer's requirements.
 - a. This oversight will not be in-place of AE construction administration responsibilities. Rather, CA oversight will augment AE responsibilities with a focus on system operation and performance.
 - b. The CA will document each visit and distribute reports within 3 working days and immediately notify CM of any deficiencies.
 - 3. CA will generate a log of all equipment and systems that require pre-functional testing, start-up and commissioning and track the scheduled dates and actual dates for each task.
 - 4. CA will develop and maintain a Commissioning Issues Log containing issues associated with systems being commissioned. This log will be updated and distributed as warranted. The issues log will describe all associated Cx issues and observations from site visits. Action items will have notations for responsible parties.

5. CA will develop project specific System Component Verification (SCVs) to verify completed and correct installation. As a minimum requirement Contractors will utilize pre-start-up check sheets. The installing contractor may use self-generated start-up forms if preferable.
 - a. In some cases, where factory start-up on equipment is being performed by an OEM representative, these reports will serve as SCV's for the equipment.
 - b. Contractors will utilize one SCV for *EACH* piece of equipment as provided. Each SCV should identify equipment ID, equipment serial number, equipment model number, location of equipment (location / room # per project drawings), responsible party, and the date of SCV completion.
 6. Start Up Review: CA will witness select system factory or manufacturer authorized representative start-up of major equipment for commissioned systems. CA will report on the success of start-up and any issues which may have arisen, whether reconciled or not.
 7. CA will generate functional performance verification forms (FPV's) for HVAC systems based on approved sequences of operation. They will be distributed to the Cx team for review prior to the start of actual functional performance verifications.
 8. The Testing, adjusting, and balancing contractor should provide the CA a TAB execution plan for review. The CA will review the plan to verify it meets the requirements of the project.
- D. Acceptance Phase:
1. The CA will verify the completion and documentation of pre-start up and basic operational activities.
 2. The CA will verify the functional performance of systems under building management control. The CA will document these activities.
 - a. Complete testing of some systems may be deferred until more appropriate seasonable conditions.
 3. CA will review contractor-generated reports pertaining to piping pressure tests, duct air leak testing (DALT), and hydronic system flush out. Testing reports are to be provided to CA in .PDF format for inclusion into the final Cx record. The commissioning agent will not witness all piping pressure tests.
 4. CA will review Controls contractor point-to-point wiring checks and sensor calibration efforts prior to equipment start-ups while performing site inspections. Additionally, these reports are to be provided to CA in PDF format for inclusion into the final Cx record.
 5. System Component Verifications (SCV's): Once installation of terminal systems is complete, Checklists provided by the manufacturer, standard contractor checklists (reviewed and approved by CA) or CA provided checklists, will be completed to indicate proper installation and start-up of the system. CA will review the completed documentation to confirm System Component installation and checkout are complete.
 6. Testing, Adjusting and Balancing (TAB) Report: CA will provide a review of the final report, concurrent with the design team review. This review will aim to verify that all systems requiring testing and balancing are accounted for and compare final readings with design requirements. A report on the TAB review will be forwarded to the Owner and Commissioning Team.

7. Acceptance Documentation Requirements: The following Documents should be submitted to the Commissioning Authority in PDF format for the final Commissioning record and prior to scheduling the start of Functional Performance Verifications:

#	Document	Reference	Responsible	Received
1	Piping pressure tests for Cx Systems	Cx Plan	MC, PC	
2	DALT Test reports	CX Plan	MC	
3	Equipment Factory Start-up Reports	Cx Plan	All	
4	Completed SCV's	CX Plan	All	
5	Building Control's Point to Point / Sequence Checks	CX Plan	CC	
6	Preliminary TAB report (if applicable)	CX Plan	TAB	
7	Final TAB report	Cx Plan	TAB	
8	Written confirmation of Cx Issue resolution.	CX Plan	All	
9	Building Controls Sequence of Operation Completed Test Plan.	CX Plan	CC	

E. Functional Performance Verifications (FPV's): Once the SVC's, Pre-Functional Performance Tests, and TAB are complete, CA will work with the construction team to verify systems performance, under building management control. This will be completed by reviewing the Functional Performance Verifications (FPV's) for the approved sequence of operations under BAS control. Below is listed the order of events for Functional Performance Verifications (FPV's) for the approved sequence of operations under BAS control;

1. The contractor shall provide CA with the acceptance documentation in .PDF format prior to the Start of Functional Performance Verifications as stated above.
2. CA will witness verification of each mode of operation, alarm, and life safety interface with appropriate contractors per the approved sequence of operation with appropriate contractors. Certain environmental, emergency and failure conditions will need to be simulated due safety and time-of-year.
4. CA will record any issues identified during the verification process on the verification forms themselves, including any on-the-spot resolutions or corrective actions taken. Issues noted will be placed on the Commissioning Issues Log for tracking to a resolution.
5. If extensive corrective measures become necessary and verifications cannot be completed as scheduled the contractor shall be responsible for re-verification and reporting efforts. Any additional participation by Cx will require an additional 3-Day notice and be subject to additional fees.

F. Integrated Testing:

1. Once acceptance phase commissioning is complete and deficiencies have been addressed by installing contractors, integrated testing will be conducted on systems.
 - a. Normal power loss – HVAC operation will be verified as operational under emergency power conditions. All essential HVAC equipment will be confirmed

as operational. Pressure relationships will be confirmed as being maintained under emergency power conditions.

- b. HVAC operation / shutdown will be verified under various fire alarm and smoke management conditions to assure life safety requirements have been met.
- G. O&M Review: CA will conduct a review of the Operations and Maintenance Documentation provided for commissioned systems. O&M documentation will be reviewed for completeness and accuracy of content. Documentation is expected to be provided electronically.
- H. Owner Training: Contractors are expected to develop owner-training plans for commissioned systems and provide these to the CA. CA will review the training plans with the government for adequacy prior to training. Following training, CA will be provided with PDF copies of the sign-in sheets. Following training completion, CA will review with select Owner Maintenance personnel to confirm acceptable level of training.
- I. CA will perform deferred testing on HVAC equipment through all seasons of operation. Both heating and cooling sequences will be verified in the proper seasons.
- J. Final Commissioning Record: CA will write a final report which reflects the entirety of the documentation provided by CA throughout the project. The Final Commissioning Record will be provided in a binder including all commissioning documentation as well as digital format on CD.

END OF SECTION 019113