
State of New Mexico Public School Facilities Authority

Performance Assurance Program Manual for TAB



For Facility Design, Construction and Renovation

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1.0 PROGRAM DESCRIPTION

1.1 Overview

The New Mexico Public School Facilities Authority (PSFA) Performance Assurance Program was first launched in 2007 and has been successfully used in numerous school construction and renovation projects. The Program is designed to be integrated into all phases of a school construction or renovation project. It is to be used in conjunction with the New Mexico Public School Facilities Authority Request for Authorization of School Construction (RASC) process through the Program Statement, Schematic Design, Design Development, and Construction Documents phases. The Performance Assurance Program then continues through the Construction Phase and the 11-Month Correction Period.

The Performance Assurance Program shall be included in all school construction or renovation projects per PSFA policy unless an exception is specifically requested with justification by the responsible PSFA Regional Manager and approved by PSFA management. The program requirements are expected to be included in bid and construction documents to provide a defined process for assurance and documented verification that the HVAC and control systems for a school facility meet PSFA standards for acceptability, are installed and operating properly, and fulfill the functional and performance requirements of the design intent.

The Performance Assurance Program utilizes the services of an independent third-party **Performance Assurance Contractor (PAC) and Test, Adjust, and Balance Contractor (TAB)** that holds a Price Agreement with the PSFA. The Program requires the professional services of an independent company or individual, who along with his subcontractors, is not contractually associated with business entities that sell, install or repair HVAC and control systems, which is experienced in the field of evaluation of HVAC and control systems design, installation, testing and balancing and is capable of maintaining an unbiased third-party position. The PAC and TAB are employed by the Owner to provide the Performance Assurance functions described for the program including the testing, adjusting, and balancing required for individual projects.

It also provides for collaboration on the part of the PSFA/District project team, the Design Team, and the independent PAC and TAB in the Design Stage to increase communication between all parties. Further, it defines roles and provides accountability for performance and is intended to ensure cooperation of all parties towards the solution of issues.

The services and costs of the TAB are divided into distinct Design and Construction Stages. The program also provides for involvement of the TAB, as required, during the Opposite Season and the PAC for the 11-Month Correction Period. Engagement of the TAB will generally begin early in the Design Development Phase. It is the intent of the PSFA Performance Assurance Program to use the same PAC for all stages of an individual project.

Because the nature of this Program is dynamic, it may be revised periodically based upon ongoing evaluations and lessons learned. The most recent revision should be used for the design of school building construction and renovation projects.

1.2 PSFA Objectives for the Program

The design, installation, and proper operation of HVAC and control systems in public school facilities is critical to providing a comfortable learning environment for students and teachers. These systems also represent a major investment during building construction or renovation and present continuing life cycle costs for maintenance, repair, and energy use over the service life of the building. It is therefore highly important that HVAC and control systems meet PSFA standards for functionality, maintenance/life cycle costs, community/district suitability, and energy costs; and that they are installed and operating properly in order to fulfill the requirements of the design intent.

The Performance Assurance Program shall be used to supplement the PSFA adequacy planning guide and other construction requirements and is available on the PSFA web site (www.nmpsfa.org) so the program can be incorporated into PSFA projects.

The Program is designed to provide clear direction and accountability for all participants in the design, construction, and maintenance for PSFA projects by:

- Defining roles and scopes of services.
- Formalizing process steps, equipment/systems checklists, performance verification reports, and other documentation.
- Including checklists and program requirements in bid and construction documents.
- Ensuring the approach of all parties is to be part of a solution to issues.

The Performance Assurance Program is intended for use by Public School Facilities Authority Regional Facilities Managers (RFM's), project design teams, and individual School Districts and is therefore meant to be clear, concise, and user-friendly. It is expandable to incorporate other building systems in the future, scalable to various-sized projects, and has the potential for incorporation in future efforts by the PSFA with regard to high performance school building programs.

The program provides for early collaboration on the part of the TAB Agencies to increase communication between all parties. Further, it defines roles and provides accountability for performance and is intended to ensure the approach of all parties is to be part of solutions to issues. School Districts and their design teams in concert with the successful Offeror(s) of the Request for Proposals for TAB Agency Services will be utilizing the Performance Assurance Program for renovations and new construction projects.

This Test and Balance Agency Program Manual has been developed for the PSFA and school districts in New Mexico to provide details of the Request for Proposals for TAB Agencies process and to set forth the guidelines and requirements for the Request for Proposals. It is

intended to supplement the Performance Assurance Program Manual that covers the details of the program itself. Examples of the Request for Proposals and attachments to the Request for Proposals document are contained in Appendix material.

1.3 Assurance Program vs. Commissioning

1.3.1 Performance Assurance Activities

While the Performance Assurance Program contains several elements normally found in the building systems commissioning process, the full services of a commissioning agent are not anticipated by the PSFA nor should they be proposed by the PAC or TAB for the performance assurance activities in the Program. The performance assurance services provided under this Program are specifically those described within this Program Manual for the following:

- Heating, Ventilating and Air Conditioning (HVAC) equipment and systems and auxiliary components.
- Control Systems including Direct Digital Controls (DDC) and Building Management Systems (BMS), connectivity, and communication of alarms and events from ancillary building subsystems to those systems when required for the Project.

To avoid confusion, Performance Assurance Program activities shall not be referred to as “commissioning”. The term “commissioning” relates to additional activities on projects beyond the scope of this Program that are discussed in section 1.3.2 below and shall not be acceptable in the Performance Assurance context.

The table below is an example of TAB Activities but do not represent an actual Scope of Work.

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1.3.2 Test, Adjust, and Balance Contractor Activities

DESIGN STAGE	
1	The TAB Agency shall provide qualified staff to assist PSFA staff, school district staff and their respective Design Professionals
2	Starting no later than the 60% Design Development Stage to review and comment on inclusion of TAB into the Design.
3	Review and comment on the Sequence Of Operations as it relates to TAB Activities.
4	Provide review and comments at 95% Design Development
5	Provide review and comments at 100% Bid/CD Development
6	Develop the Test, Adjust, and Balance Plan
CONSTRUCTION STAGE	
1	Attend the Pre-Construction Kick-Off Meeting
2	Attend the PAC Kick-Off Meeting
3	Present the Test, Adjust, and Balance Test Plan
4	Provide a TAB Milestone Schedule to be incorporated into the Project Schedule
5	Inform Project Team of communication protocols in notifying the TAB Contractor of equipment and system readiness
6	Perform periodic site visits to note conditions that might affect Test, Adjust, and Balance performance verification
7	Coordinate with the PAC and GC in scheduling the Test, Adjust, and Balance Testing.
8	Conduct and perform Test, Adjust, and Balance testing
9	Submit TAB Testing Results to DP, GC, PAC, and RFM for review.
OPPOSITE SEASON FUNCTIONAL TESTING	
1	Participate in Opposite Season Functional Testing
2	Submit TAB Testing Results to DP, GC, PAC, and RFM for review.
11 MONTH WARRANTY CORRECTION AND INSPECTION	
1	If requested, participate in the 11 Month Warranty Correction and Inspection.
PROJECT CLOSE-OUT	
1	Submit all Final TAB Reports to DP, GC, PAC, and RFM for review.

2.0 DEFINITIONS

Throughout this program manual and the Request for Proposals document a number of terms and acronyms are commonly used. For the purposes of the PSFA Performance Assurance Program, definitions of terms including appropriate abbreviations are as follows. These definitions shall be included in the Request for Proposals document.

Award of Contract:	shall mean a formal written notice by the GSD Purchasing Division and PSFA that a firm(s) has been selected to enter into a contract for services.
Building Subsystems:	Ancillary systems for which communication of alarms and events to the Building Management System is required
CIMS:	The PSFA's Construction Information Management System.
Commissioning & Close-Out Manager:	Edward (Edd) Schuller, QCxP Commissioning & Close-Out Manager Direct: 505-468-0276 X1023 Cell: 505-414-7518 Email: eschuller@nmpsfa.org
Common System Interface:	The ability of ancillary Building Subsystems to communicate messages to the Building Management System via the BACnet® protocol.
Contract:	Any agreement for the procurement of items of tangible personal property, services or construction.
Control Systems:	All devices and systems (pneumatic, electric, electronic, Direct Digital Control, etc.) associated with control of HVAC equipment and systems from simple unit controls to sophisticated Building Management Systems
Design Issues Log:	A log created and maintained by the PAC of issues noted in the design that may have an impact on performance assurance activities, including record of when identified issues are resolved and the action taken for resolution.
Design Professional (DP):	The Project's architect or engineer
Design Team :	The team selected by the owner responsible for providing Professional Services for project design and implementation, generally consisting of Architects, Engineers, and other professionals as required
District / Owner:	The individual School District involved in a particular project. This may also include a charter school residing in a particular District, or a charter school that is funded directly by the state of NM.
Determination:	means the written documentation of a decision of the Evaluation Committee, including findings of fact required to support a

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	decision. A determination becomes part of the procurement file to which it pertains.
eBuilder:	The Public School Facilities Authority CIMS System.
Entity:	means “PSFA” for the purposes of Section 13-1-120(B) (6), NMSA 1978; Evaluation Criteria; and is the entity requesting proposals.
Evaluation Committee:	means a body constituted in accordance with Section 13-1-121 NMSA 1978 to perform the evaluation of Offeror proposals.
General Contractor (GC):	The contractor responsible for constructing the individual Project and/or subcontractors working under the General Contractor.
HVAC:	Heating, Ventilating, and Air Conditioning equipment and systems including all major components and auxiliary equipment.
Installation Issues Log:	A log created and maintained by the PAC capturing construction deficiencies that have an impact on performance assurance activities including record of when deficiencies are resolved and the action taken for resolution.
Lighting Controls:	All devices and systems associated with electronic control of lighting systems that may be integrated with a Building Management System
MACC:	The maximum allowable construction cost as defined by the Public School Facilities Authority.
MCR:	Modification Change Request. Documentation that affects or alters Design or SOW that may, or may not, effect schedule, material(s), or budget.
MOU:	Memorandum Of Understanding. A document to define the Scope Of Work (SOW) and work to be performed.
OAC:	Owner, Architect, and Contractor.
Offeror:	is any person, corporation, or partnership who chooses to submit a proposal in response to this RFP.
Opposite Season:	When the facility is Functionally Tested during one Season (ie: Summer), a repeat of Functional Testing will be conducted at the Opposite Season (ie: Winter).
PAC:	Performance Assurance Contractor: The independent third-party agency that holds a Price Agreement with the PSFA to provide services under this program including the HVAC and control system testing, adjusting, and balancing required for individual projects.
Price Agreement:	A definite quantity contract or indefinite quantity contract which requires the contractor to furnish items of tangible personal property, services or construction to a state agency or a local public body which issues a purchase order, if the purchase order is within the limitations of the contract. See also “ Contract ”.
Procurement	Mr. Shatona M. Martin

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Officer:	Contracts Administrator/Chief Procurement Officer E-mail: smartin@nmppsfa.org Phone: 505-468-0286
Project Issues Log:	A log created and maintained by the General Contractor to document and resolve Construction Issues outside the scope of the PAC.
Project Requirements:	Guidance for the project Design Team, developed by the Project Team, for HVAC and control systems that form the basis for all decisions made with respect to design, construction, and operation.
Project Team:	The Owner’s team responsible for project development and implementation, generally consisting of PSFA and School District personnel
Public School Capital Outlay Council (PSCOC)	is the body with responsibility to approve allocations for public school capital outlay assistance.
Public School Facilities Authority (PSFA)	The State of New Mexico Public School Facilities Authority is the agency, under the Public School Capital Outlay Council (PSCOC) charged with responsibility for overseeing projects and shall serve as the owner’s representative for work performed under this.
PSFA RFM:	The Public School Facilities Authority Regional Facilities Manager is PSFA’s Project Manager who monitors PAC activities and ensures that they are included in the project and completed prior to final payment to PAC, General Contractor, and Design Professional
RASC:	The Request for Approval of School Construction form required by the PSFA for construction or renovation projects.
RFI:	A Request for Information submitted by the PAC to the Design Professional through the PSFA RFM for questions and comments related to the design of the HVAC and Control systems other than those that affect performance assurance activities.
Request For Proposals (RFP):	means all documents, attached or incorporated by reference, used for soliciting proposals.
Responsible Offeror:	means an Offeror who submits a responsive proposal and who has furnished, when required, information and data to prove that his financial resources, production or service facilities, personnel, service reputation and experience are adequate to make satisfactory delivery of the services described in the proposal.
Responsive Offer or Responsive Proposal	means an offer or proposal, which conforms in all material respects to the requirements set forth in the RFP. Material respects of a RFP include, but are not limited to quality, quantity or delivery requirements.
TAB Agency:	means the independent company or individual, not contractually

	associated with business entities that sell, install or repair HVAC and control systems, which is experienced in the field of evaluation of HVAC and control systems design, installation, testing and balancing and is capable of maintaining an unbiased third-party position.
TAB:	Test, Adjust, and Balance
User:	means the school district staff occupying the facility or facilities, for which a project(s) is being designed, repaired, renovated or corrected.
User Contact:	is the person designated by the PSFA to speak on behalf of the School District staff concerning the scope of work and programming requirements for the project(s).

The terms "**must**," "**shall**," "**will**," "**is required**," or "**are required**" identify *a necessary* item or factor. Failure to comply *with such* an item or factor *may* result in the rejection of the Offeror's proposal.

The terms "**can**," "**may**," "**should**," "**preferably**," or "**prefers**" identifies a desirable or discretionary item or factor. Failure to comply with such an item or factor *may* result in the rejection of the Offeror's proposal. *Rejection of the proposal will be subject to review by the Evaluation Committee and the final decision on rejection will be made by the Committee Chairman.*

3.0 RELATED DOCUMENTS

There are a number of standard contract documents used in the PSFA contracting and construction processes that address or mention the Performance Assurance Program. Examples of these documents are available on the PSFA web site (www.nmpsfa.org). The latest versions, as modified for the specific Project, shall be used.

4.0 DESIGN DEVELOPMENT PHASE

4.1 Description

Following the Schematic Phase, the Design Development Phase creates documents that begin to finalize and describe the size, scope, and character of the entire project. Included in this phase are development of the Project Manual and specifications/drawings for the HVAC and control systems. At the end of this phase it is anticipated that the project design should be approximately 60% complete, although requirements may vary by individual project as defined during the Program Statement Phase Kickoff Meeting described under that phase.

From the performance assurance perspective, this phase requires good communication and interaction between all parties to ensure designs are consistent with the Project Requirements and potential issues are addressed in Design Development documents. The TAB participates

in reviews of designs and narratives prior to 60% Design Development Phase, providing comments relative to HVAC and Controls Systems proposed based upon their experience and specialized knowledge.

In this phase, the project TAB Contractor participates in reviews of system options and provides comments on the complexity and maintainability of proposed systems when the Design Narrative is complete. **Therefore, the Purchase Order with the selected PAC for Design Stage Services must be executed early in this phase.**

4.2 Responsibilities, and Deliverables

For the purposes of integrating the Performance Assurance Program specific responsibilities and deliverables for individual team members include, but are not necessarily limited to, those described in the paragraphs that follow.

4.2.1 PSFA Regional Manager

- a. Assure signed and approved Purchase Order with TAB Agency for Design Stage Services is in place.
- b. Coordinate Owner and TAB review of designs prior to Design Development Phase submittal (60% or as otherwise defined in the Project Requirements).
- c. Ensure questions, comments and recommendations of the TAB Contractor during design reviews are addressed by the Design Team.
- d. Verify Performance Assurance Program for TAB requirements have been met in Design Development Phase RASC submittal to PSFA.

4.2.2 Design Team

- a. Develop and update designs and design narrative with Life Cycle Cost Analysis (LCCA).
- b. Provide updated designs and design narrative to PAC in advance as part of the Owner Design Development Phase review.
- c. Respond to questions and comments related to the design of the HVAC and Control systems submitted by the TAB.
- d. Address comments and recommendations of TAB from design reviews.
- e. Develop project budget.
- f. Verify Performance Assurance Program for TAB requirements have been met in Design Development Phase RASC submittal to PSFA.

4.2.3 Performance Assurance TAB Contractor

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- a. Review HVAC & Control Systems Design Narrative and provide comments on the complexity and maintainability of proposed HVAC systems and required controls as part of Owner review prior to Design Development RASC submittal.
- b. Submit questions and comments related to the design of the HVAC and Control systems through the PSFA RFM.
- c. Review Basis of Design, Design Narrative, and Schematic designs.

Table 1 lists the interactions, responsibilities and deliverables for this phase. Some of these responsibilities are part of the normal PSFA process and they are listed here due to their relevance to performance assurance. Responsibilities are designated “**Lead**” for the entity with primary responsibility for the activity; “**Approve**” to indicate the entity with final approval authority where appropriate; “**Support**” for other team members who are to provide technical and other assistance to the lead team member; and “**Participate**” for others who are part of the process and participate in the activity.

KEY: L = Lead; A = Approve; S = Support; P = Participate

Table 1

	Task/Deliverable	PSFA RFM	District	Design Team	TAB
1	Assure Purchase Order with PAC for Design Stage Services.	L	L		P
2	Develop and update designs and design narrative with LCCA.			L	P
3	Review designs prior to RASC DD submittal (60% or as otherwise prescribed for project). Set expectations for the next phase.	A	L	S	P
4	Address questions, comments and recommendations of TAB from design reviews.	S	S	L	P
5	Review Basis of Design, Design Narrative, and Schematic designs.	P	P	L	L
6	Develop project budget.	A	A	L	
7	Verify performance assurance requirements for TAB have been met in Design Development Phase and included in RASC submittal to PSFA.	A	S	L	L

Design Development Phase Responsibilities

5.0 CONSTRUCTION PHASE

5.1 Description

The overall goal of the Performance Assurance Program during the Construction Phase is that test, adjust, and balance activities of the TAB are integrated into the construction process and schedule to document that the HVAC and control systems are set and operating properly and that they fulfill the design intent prior to certifying Substantial Completion of the Project.

Performance Assurance activities during this phase provide verification that these systems perform as designed to assure that requirements of the contract are met, and document system functional operation. The Purchase Order with the TAB for Construction Phase services shall be arranged through NMPSFA's Procurement Manager through the PSFA RFM and executed with the TAB no later than the date of contract execution with the Construction General Contractor.

Of critical importance during this phase is ensuring that the work to be performed by the TAB is included in the project schedule. Completion of TAB is a prerequisite for certifying Substantial Completion of the project and Construction Phase payment to the contractors for that milestone. To avoid potential for delays in Substantial Completion and payment and the possibility of assessment of liquidated damages, the contractors must consult with the PSFA RFM to determine milestones and critical paths are incorporated and met prior to Owner's occupancy. The TAB activities shall then be inserted in the Project Schedule.

This scheduling activity should begin with the General Contractor providing a copy of the initial draft of the Project Schedule prior to submittal to the Design Professional for approval. The TAB will then insert the TAB Milestone activities with due dates. The PSFA RFM shall ensure that this step is completed and that the approved Project Schedule is uploaded to the PSFA CIMS by the responsible party. The PSFA RFM shall also be notified that subsequent revisions to the Project Schedule are uploaded to the PSFA CIMS with notification to the PA. The TAB shall review revisions on a continuing basis.

The TAB will perform periodic site visits to keep apprised of any changes that may affect TAB. This is particularly important of the Factory Start-Up of those components or systems that will be tested, adjusted, and balanced.

For questions and comments related to the design of the HVAC and Control systems, the TAB will submit Requests for Information (RFI) through the PSFA's established process.

The TAB's Issues and any RFIs submitted by the TAB to the PSFA RFM will be uploaded by the RFM to the CIMS. The TAB will continue to monitor these items related to testing, adjusting, and balancing that may affect performance assurance for the HVAC and controls systems.

A key element in avoiding delays in performance of the performance assurance requirements and completion of the project is prompt attention to, and resolution of deficiencies that impact performance assurance activities as identified by the TAB.

The PSFA RFM shall be made aware of and ensure particular issues are forwarded to the appropriate Design Team member(s) for resolution. It is the responsibility of the Design Professional to ensure deficiencies are corrected by the contractor and issues related to the design are resolved. Resolution of deficiencies and RFIs is a prerequisite for certifying Substantial Completion.

The General Contractor is responsible to verify systems are ready for TAB by verifying completed Project-specific, PSFA approved, Pre-Functional Checklist (PFC) forms and successful Manufacturer's Start-Up's have been submitted to the PAC and PSFA RFM for review and approval.

It is the responsibility of the PAC to witness, verify, and document the initial start of Test, Adjust, and Balance. It is the TAB's responsibility to record and report the overall outcome of the TAB. The General Contractor is responsible to coordinate test, adjust, and balance activities with the TAB and responsible sub-contractors to ensure completion according to contract documents and schedule.

5.2 Responsibilities, and Deliverables

The Construction Stage process will include all those elements and responsibilities normally associated with building or renovating school facilities. Further, construction will be consistent with requirements already established by the PSFA and published elsewhere. For the purposes of integrating the HVAC and Controls Performance Assurance Program specific responsibilities and deliverables for individual team members include, but are not necessarily limited to, those described in the paragraphs that follow.

5.2.1 PSFA Regional Facilities Manager

- a. Review updated Construction Phase test and verification plan.
- b. Ensure that the Performance Assurance requirements for TAB are communicated at pre-bid conference.
- c. Verify that the Performance Assurance requirements, schedule, time estimates, and milestones provided by the TAB are included in the master Project Schedule are uploaded to the PSFA CIMS.
- d. Verify that subsequent revisions to the Project Schedule are uploaded to the PSFA CIMS with notifications to the PSFA Project Team and TAB.
- e. Work with Design Team and General Contractor to alleviate potential impacts on TAB due to changes in the Project Schedule.
- f. Verify TAB receives all Submittals, RFIs, Change Orders, and other project documentation related to TAB activities.

- g. Follow-up on TAB's Issues items and Requests for Information submitted by the TAB to ensure resolution by the Design Team and General Contractor.
- h. Verify initial acceptance of system operation.
- i. Verify Performance Assurance Program requirements have been met for this phase.

5.2.2 Design Team

- a. Schedule, coordinate and conduct a pre-construction conference ensuring TAB is present.
- b. Ensure Performance Assurance requirements, schedule, time estimates and milestones provided by the TAB are included in the master Project Schedule.
- c. Work with PSFA RFM and General Contractor to alleviate potential impacts on TAB due to changes in the Project Schedule.
- d. Provide copies of Change Orders critical to performance assurance process to the TAB for review and comments as appropriate.
- e. Provide copies of those General Contractor submittals that are critical to test, adjust, and balance activities to the TAB for review and comment.
- f. Attend test and verification meetings as needed.
- g. Review Pre-Functional Checklists submitted by the General Contractor and verify equipment is ready for TAB.
- h. Verify performance assurance program requirements have been met.

5.2.3 Performance Assurance Contractor

- a. Witness, Verify, and document the initial start of TAB of systems in accordance with the Specifications.

5.2.4 Test, Adjust, and Balance Contractor

- a. Conduct and document the TAB of HVAC and Controls.
- b. Submit Final TAB test report to RFM, PAC, DP, and GC.

5.2.5 General Contractor

- a. Ensure performance assurance activities and the time required to perform them are included in the Project Schedule for completion prior to Substantial Completion of the Project.
- b. Correct items on the TAB's Issues Log.
- c. Submit completed PSFA approved Pre-Functional Checklists when equipment and systems are installed and operational ready. Update

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Issues Log items corrected, Notify PAC, PSFA RFM, and TAB Contractor of equipment / Systems ready for Factory Start-Up.

- d. Coordinate TAB activities with PAC, PSFA RFM, and installation subcontractors, and complete according to contract documents and schedule.
- e. Ensure subcontractors execute their test , adjust, and balance responsibilities.
- f. Attend test and verification meetings when scheduled.

Table 2 summarizes the interactions, responsibilities and deliverables for this phase. Many of these responsibilities are part of the normal PSFA construction process; Responsibilities are designated “**L**ead” for the entity with primary responsibility for the activity; “**A**pprove” to indicate the entity with final approval authority where appropriate; “**S**upport” for other team members who are to provide technical and other assistance to the lead team member; and “**P**articipate” for others who are part of the process and participate in the activity.

	Task/Deliverable	PSFA RFM	District	Design Team	PAC	TAB	General Contractor
1	Arrange Purchase Order with TAB for Construction Stage Services.	L	L			P	
2	Attend DP & GC Project Kick-Off Meeting	P	P	L	P	P	L
3	Include TAB activities and time to perform in Project Schedule.	A		A		A	L
5	Attend PAC Coordination Meeting with General Contractor, subs, etc.	P	P	P	L	P	P
6	Assure TAB Requirements are incorporated in the Project Plan.	S	S	S		A	L
7	Review Change Modification Requests that may impact TAB.	S				L	
8	Perform periodic site visits to note conditions that might affect TAB					L	
9	Review Design Issues Log for HVAC & Controls.				S	L	
10	Review Installation Issues Log for HVAC & Controls.				S	L	
11	Assure issues to TAB in Design and Installation Issues Logs are resolved.	S	S	L	S	A	L
12	Review any factory start-up procedures, equipment performance data, and control drawings.				S	L	S
15	Submit notification that equipment and systems are ready for TAB			A	P		L
17	Verify performance assurance requirements have been met.	A	S	L			
18	Confirm Owner acceptance of system operation.	S	A	L		S	

KEY: L = Lead; A = Approve; S = Support; P = Participate

Table 2 – Construction Phase Responsibilities

6. OPPOSITE SEASON TESTING

6.1 Description

The Major objectives of the Performance Assurance Program during the Opposite Season Testing Phase are to assure opposite seasonal demands are Functionally Tested to the specifications the season dictates from the previous Functional Tests.

This phase includes to resolve any remaining open Punch List items, which shall include the PAC's Design and Installation Issues Logs. In addition, the PAC will be requested by the PSFA RFM to assist with resolving any remaining performance problems, help address warranty issues that may arise, or provide other project-related services.

It is the responsibility of the General Contractor, and verified by the Design Professional, to ensure deficiencies in the Project Issues Log are corrected and documented. Open items in the PAC's Design Issues Log and Installation Issues Log, or performance problems, are the responsibility of the PAC to confirm and document are resolved.

TAB participation in Opposite Season Functional Testing will be identified as required in the Design Development Stage of the Project.

Pricing for performance assurance activities that may be carried over from the PAC's Construction Stage price. Other services will be requested by the PSFA RFM during this period on an "as-needed" basis with the PAC Purchase Order adjusted accordingly in advance of such work being performed. The hourly rate and allowable expense items included in the PAC's price proposal and for performing other work during this period may be used for pre-authorized additional services.

6.2 Responsibilities, and Deliverables

The Opposite Season Testing Phase will include all those elements and responsibilities normally associated with Functional Testing and TAB, will be consistent with requirements that may have already been established by the PSFA and published elsewhere. For the purposes of integrating the Performance Assurance Program specific responsibilities and deliverables for individual team members include, but are not necessarily limited to, those described in the paragraphs that follow.

6.2.1 PSFA Regional Facilities Manager

- a. Ensure deficiencies identified in the PAC's Design and Installation Issues Logs, warranty issues and performance problems are resolved by the General Contractor and design team and documented in the PSFA CIMS.
- b. Attend Opposite Season Functional Testing and Verification.

- c. Verify the Performance Assurance Program requirements have been met for this phase.
- d. Have assisted the TAB, DP, and GC in identifying if TAB is required for Opposite Season Functional Testing.

6.2.2 Design Team

- a. Ensure issues listed in the PAC’s Design and Installation Issues Logs, warranty issues, and performance problems are resolved and document resolutions in the PSFA CIMS.
- b. Request, through the PSFA RFM, the assistance of the PAC with resolving issues or performance problems related to the HVAC and control systems installed.
- c. Have assisted the TAB, RFM, and GC in identifying if TAB is required for Opposite Season Functional Testing.
- d. Attend Opposite Season Functional Testing

6.2.3 Performance Assurance Contractor

- a. Supervise, conduct, and document Opposite Season Functional Testing and/or any follow-up testing.
- b. Assist in resolving outstanding issues, warranty issues, or performance problems when requested by the PSFA RFM.

6.2.4 Test, Adjust, and Balance Contractor

- a. Attend Opposite Season Functional Testing if so identified as required.
- b. Conduct and supervise Test, Adjust, and Balance activities as related to Opposite Season Functional Testing.
- c. Submit Opposite Season Test, Adjust, and Balance Report, if so conducted.

6.2.5 General Contractor

- a. Support and assure subcontractor’s participation in Opposite Season Functional Testing and/or any follow-up testing.
- b. Ensure, with Design, that issues listed in the PAC’s Installation and Design Issues Logs are addressed and corrected.
- c. Have assisted the TAB, RFM, and DP in identifying if TAB is required for Opposite Season Functional Testing.
- d. Support TAB activities if so identified as required.
- e. Provide “As-operated” sequence from controls contractor.
- f. Make adjustments to O&M Manuals as-built drawings, etc. to document system modifications or component replacement,

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changes to operating procedures, updated equipment data, calibration, and other revisions.

Table 3 summarizes the interactions, responsibilities and deliverables for this phase. Many of these responsibilities are part of the normal PSFA post-construction and warranty period requirements; however, they are listed here due to their relevance to performance assurance.

Responsibilities are designated “**L**ead” for the entity with primary responsibility for the activity; “**A**pprove” to indicate the entity with final approval authority where appropriate; “**S**upport” for other team members who are to provide technical and other assistance to the lead team member; and “**P**articipate” for others who are part of the process and participate in the activity.

KEY: L = Lead; A = Approve; S = Support; P = Participate

	Task/Deliverable	PSFA RFM	District	Design Team	TAB	PAC	General Contractor
1	Correct operational deficiencies identified by Owner.	A	S	P	S	S	L
2	Complete any Opposite Season or follow-up testing and verification.	S	S		S	L	S
3	Resolve all open issues in PAC’s Design and Installation Issues Logs.	A	S	L		P	S
4	Resolve outstanding warranty issues or performance problems.	A	S	L	S	S	L
5	Record system modifications, component replacement, changes to operating procedures, updated equipment data, calibration, and other revisions.			A	S		L
6	Provide “As-operated” sequence from controls contractor.			A			L
7	Schedule 11 Month Correction Period Inspection	P	P	L		P	P

Table 3 Opposite Season Testing Phase Responsibilities

7.0 11-MONTH CORRECTION PERIOD PHASE

TAB participation in the 11 Month Correction Period is not a required activity. But, TAB's presence may be requested by the District.

8.0 PROJECT CLOSE-OUT

8.1 Description

The major objectives of the Performance Assurance Program for Close-Out is to finalize all deliverables and to assure all follow up testing and verification; adjust and optimize systems have met specifications; all contracted equipment and systems are free from all maintenance deficiencies; and all Punch List items are resolved, which shall include the PAC's Design and Installation Issues Logs.

It is the responsibility of the Design Professional to deliver the final As-Built Drawings.

PSFA Maintenance Personnel have received specific training to the systems and equipment installed for the project.

8.2 Responsibilities, and Deliverables

The Close-Out will include all those elements and responsibilities normally associated with the Project Close-Out following construction or renovation of school facilities and will be consistent with requirements that may have already been established by the PSFA and published elsewhere. For the purposes of integrating the Performance Assurance Program specific responsibilities and deliverables for individual team members include, but are not necessarily limited to, those described in the paragraphs that follow.

8.2.1 PSFA Regional Facilities Manager

- a. Ensure deficiencies identified in the 11-Month Correction Period Punch List, including the PAC's Design and Installation Issues Logs, warranty issues and performance problems are resolved by the General Contractor and design team and documented in the PSFA CIMS.
- b. Verify Performance Assurance Program requirements have been met for this phase.
- c. Review submittal of the O&M Manuals from GC.
- d. Review and approve Final PAC Report.
- e. Distribute Final PAC Report to appropriate parties.

8.2.2 Design Team

- a. Ensure issues listed in the PAC’s Design and Installation Issues Logs and the 11-Month Correction Punch List, warranty issues and performance problems are resolved and document resolutions in the PSFA CIMS.
- b. Request, through the PSFA RFM, the assistance of the PAC with resolving issues or performance problems related to the HVAC and control systems installed.
- c. Submit final As-Built Drawings to RFM and PAC for review and approval.

8.2.3 Performance Assurance Contractor

- a. Assist in resolving any outstanding 11-Month Correction Period Punch List items, warranty issues, or performance problems when requested by the PSFA RFM.
- b. Review, comment, and approve submitted O&M Manuals.
- c. Submit Final PAC Report conforming to the specific requirements for format, organization and content described in the Performance Assurance Program Manual and submit to the PSFA RFM
- d. Meet with the PSFA RFM to review the Final PAC Report.

8.2.4 Test, Adjust, and Balance Contractor

- a. Meet with the PSFA RFM, District, DP, and PAC to review the Final TAB Report.

8.2.5 General Contractor

- a. Provide all contractual deliverables requested by Design, PAC, and RFM.

Table 4 summarizes the interactions, responsibilities and deliverables for this phase. Many of these responsibilities are part of the normal PSFA post-construction and warranty period requirements; however, they are listed here due to their relevance to performance assurance.

Responsibilities are designated “Lead” for the entity with primary responsibility for the activity; “Approve” to indicate the entity with final approval authority where appropriate; “Support” for other team members who are to provide technical and other assistance to the

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lead team member; and “Participate” for others who are part of the process and participate in the activity.

KEY: L = Lead; A = Approve; S = Support; P = Participate

	Task/Deliverable	PSFA RFM	District	Design Team	TAB	PAC	General Contractor
1	Assure all operational deficiencies identified by Owner and PAC are resolved.	A	S	S		S	L
2	Assure all follow-up testing and verification is completed.	S	S			L	S
3	Assure all open issues in PAC’s Design and Installation Issues Logs are resolved.	A	S	L		P	S
4	Review and verify Equipment and Systems training of District’s Maintenance Personnel. Submit Training Completed forms and audio/video content to RFM	A	A	P		L	L
4	Submit all O&M Manuals	A	A			A	L
5	Document any system modifications, component replacement, changes to operating procedures, updated equipment data, calibration, and other revisions.	P	P	L		P	L
6	Submit Final AS-Built Drawings	A	A	L		P	
7	Submit all Warranty Documents to District and RFM.	A	A	S		S	L
8	Provide “As-operated” sequence from controls contractor.	A		A			L
9	Perform near end-of correction period review to identify performance problems or warranty issues as part of 11-month walkthrough.	S	S	L		P	P
10	Submit Final TAB Report including Opposite Season and 11 Month activities, if so requested.	A	A		L	A	
11	Prepare and deliver final PAC Report.					L	
12	Review/Approve final PAC Report.	A	A			L	

Table 4 Close-Out Responsibilities

END OF PERFORMANCE ASSURANCE PROGRAM MANUAL FOR TAB