ADDENDUM NO. 1

AT&T
Little Rock Franklin 8th Floor AON Buildout
120 W. 8th Street
Little Rock, Arkansas

ISSUED: February 6, 2026

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TO: Nabholz Construction

(This Addendum forms a part of the Bidding Documents and modifies them as described herein.)

I. REFER TO THE DRAWINGS, dated December 16, 2024.

Architectural

1. Add the attached Section 019113 Building Systems Commissioning Specifications to the Architectural Specifications.

Mechanical

A. None in this Addendum.

Electrical

A. None in this Addendum.

II. ATTACHMENTS.

A. Section 019113 Building Systems Commissioning Specifications

END OF ADDENDUM NO. 1

SECTION 019113 - BUILDING SYSTEMS COMMISSIONING

PART 1 GENERAL

1.01 SUMMARY

A. ATT has retained the services of a Third Party Commissioning Firm as the Commissioning Authority (CA) for the Construction Phase of the AON upgrade project. The CA shall direct and coordinate all commissioning activities and the commissioning activities of all contractors on the project.

B. Commissioning is intended to achieve the following objectives:

1. Verify that the work is installed in accordance with the Contract Documents and the manufacture's recommendations and instructions, and that it receives adequate operational checkout prior to start up.
2. Verify and document that functional performance is in accordance with the Contract Documents and the owner's intent.
3. Verify that operations and maintenance manuals submitted to the Owner are complete.
4. Verify contractor training activities are in accordance with the Contract Documents and meet the Owners operator's requirements.

1.02 RELATED SECTIONS

1. Section 15010 – Commissioning of HVAC Systems, Controls and TAB.
2. Section 16000 – Commissioning of Electrical Systems

1.03 DEFINITIONS AND ABBREVIATIONS

A. Definitions set forth in the AT&T General Conditions are applicable to this Section. In addition, the following definitions shall apply to the terms used in this section.

1. "Acceptance Phase" Phase of construction after startup and initial checkout when functional performance tests, O&M documentation review and training occurs.
2. "Approval" Acceptance that a piece of equipment or system has been properly installed and is functioning in the tested modes according to the Contract Documents.
3. "Commissioning authority (CA)" An independent agent, not otherwise associated with the A/E team members or the Contractor, though he/she may be hired as a subcontractor to them. The CA directs and coordinates the day-to-day commissioning activities. The CA does not take an oversight role like the CM. The CA is part of the Construction Manager (CM) team or shall report directly to the CM.

4. "Commissioning Plan” An overall plan, developed before or after bidding, that provides the structure, schedule and coordination planning for the commissioning process
5. "Deferred Functional Tests" FPT's that are performed later, after substantial completion, due to partial occupancy, equipment, seasonal requirements, design or other site conditions that disallow the test from being performed
6. “Deficiency” A condition in the installation or function of a component, piece of equipment or system that is not in compliance with the Contract Documents. Deficiencies shall be indicated on commissioning issue logs, observation reports or commissioning test results. Deficiencies are to be corrected by the installing contractor until correct function is achieved.
7. “Field Installation Verification (FIV)” Verification of all installed systems for compliance to plans and specification are listed under Prefunctional Tests. These inspections are to be described in detail in the commissioning plan. Primarily static inspections and procedures to prepare the equipment or system for initial operation
8. "Functional Performance Test (FPT)” Test of the dynamic function and operation of equipment and systems using manual (direct observation) or monitoring methods. Functional testing is the dynamic testing of systems (rather than just components) under full operation (e.g., the chiller pump is tested interactively with the chiller functions to see if the pump ramps up and down to maintain the differential pressure setpoint). Systems are tested under various modes, such as during low cooling or heating loads, high loads, component failures, unoccupied, varying outside air temperatures, fire alarm, power failure, etc. The systems are run through all the control system’s sequences of operation and components are verified to be responding as the sequences state. Traditional air or water test and balancing (TAB) is not functional testing, in the commissioning sense of the word. TAB’s primary work is setting up the system flows and pressures as specified, while functional testing is verifying that which has already been set up. The commissioning authority develops the functional test procedures in a sequential written form, coordinates, oversees and documents the actual testing, which is usually performed by the installing contractor or vendor. FPT's are performed after Field Installation Verification (FIV) and Operational Performance Tests (OPT) are complete
9. “Issue Log” A report of issues discovered by the CA. Issue log entrees must be answered or responded to by the appropriate party having authority for the issue resolution.
10. “Observation Report” A report of a field inspection by the Commissioning authority.
11. “Operational Performance Test (OPT)” Verification of proper start-up of all equipment and systems to be commissioned is listed under Prefunctional Tests. These tests are to be described in detail in the commissioning plan.
12. "Sampling” Operational or Functional testing only a fraction of the total

number of identical or near identical pieces of equipment. Generally not allowed on this project see individual division specifications.

B. Abbreviations. The following are common abbreviations used in the Specifications and in the Commissioning Plan.

1. A/E: Architect and design engineers.
2. CA: Commissioning authority.
3. CC: Controls Contractor
4. CM: Construction Manager (the Owner's representative)
5. Cx: Commissioning.
6. Cx Plan: Commissioning Plan document
7. EC: Electrical contractor
8. FIV: Field Installation Verification
9. FPT: Functional Performance Test
10. GC: General contractor (Prime)
11. MC: Mechanical contractor
12. OPT: Operational Performance Test
13. PFT: Prefunctional test (FIV & OPT)
14. PM: Project Manager (of the Owner)
15. Subs: Subcontractors to General
16. TAB: Test and Balance Contractor

1.04 REFERENCES:

A. AHSRAE Guideline “0” for the Commissioning Process
B. NEBB Building Systems Commissioning Procedural Manual latest addition

1.05 SYSTEMS TO BE COMMISSIONED:

A. Commissioning of HVAC Systems, Controls and TAB Section 23
B. Commissioning of Electrical Systems Section 26

1.06 COORDINATION

A. Commissioning Team. The members of the commissioning team consist of the Commissioning authority (CA), the Project Manager (PM), the designated representative of the Owner’s Construction Management firm (CM), the General Contractor (GC or Contractor), the architect and design engineers , the Mechanical Contractor (MC), the Electrical Contractor (EC), the TAB representative, the Controls Contractor (CC), any other installing subcontractors or suppliers of equipment. If known, the Owner’s building or plant operator/engineer is also a member of the commissioning team

B. Management. The CA is hired by the Owner. The CA directs and coordinates the commissioning activities and the reports to the Owner. All members work together to fulfill their contracted responsibilities and meet

the objectives of the Contract Documents.

C. Scheduling. The CA will work with the CM according to established protocols to schedule the commissioning activities. The CA will provide sufficient notice to the CM for scheduling commissioning activities. The GC will integrate all commissioning activities into the master schedule. All parties will address scheduling problems and make necessary notifications in a timely manner in order to expedite the commissioning process. The CA will provide the initial schedule of primary commissioning events at the commissioning scoping meeting. As construction progresses more detailed schedules are developed by the CA.

1.07 COMMISSIONING PROCESS

A. Commissioning Plan. A Commissioning Plan shall be developed by the CA and will be provided at the initial commissioning kickoff meeting. The commissioning plan provides guidance in the execution of the commissioning process. The Cx Plan is a living document and will continue to evolve and expand as the project progresses. The final commissioning plan is binding on the Contractor. The *Specifications* will take precedence over the *Commissioning Plan*.

B. Commissioning Process. The following narrative provides a brief overview of the typical commissioning tasks during design and construction and the general order in which they occur.

1. Construction phase commissioning begins with a commissioning kickoff meeting conducted by the CA where the commissioning process is reviewed with the commissioning team members
2. Additional meetings will be required throughout construction, scheduled by the CA with necessary parties attending, to plan, scope, coordinate, schedule future activities and resolve problems.
3. Equipment documentation is submitted to the CA during normal submittals, including detailed start-up procedures.
4. The CA works with the Subs in developing startup plans and startup documentation formats, including approving subcontractor and vendor forms, or by providing the Subs with FIV and OPT checklists as a reference of items to be verified by the commissioning team.
5. In general, the checkout and performance verification proceeds from simple to complex; from component level to equipment to systems and intersystem levels with FIV and OPT checklists being completed before functional performance testing. The contractors provide FIV checks and inspections and documents such on an approved check sheet. The CA shall provide field installation inspections for random systems and subsystems covered in the scope of work for this project and provide an installation observation report to the General Contractor/Construction Manager. The report shall cover any

installation deficiencies from plans and specifications.
6. The Subs perform startup and initial checkout. The CA documents that the startup was completed according to the approved plans.
7. The CA develops specific equipment and system functional performance test procedures to show system functionality. FPT tests are performed by the contractors.
8. Deficiencies in material, installation, setup, operation or system functionality are corrected at the Sub's expense and the system retested.
9. The CA reviews the O&M documentation for completeness.
10. Commissioning is completed before Substantial Completion.
11. The CA reviews, pre-approves and coordinates the training provided by the Subs and verifies that is was completed.
12. The CA issues a final Commissioning report.

1.08 RESPONSIBILITIES

A. The responsibilities of the commissioning team members for the commissioning process are provided in this section. The responsibilities of the subcontractors, vendors and third tier subcontractors are listed in the separate Division specifications. See related sections above. The commissioning team is comprised of the Owner, Architect, Engineers of Record, Construction Manger, General Contractor, and Subcontractors, vendors, and third tire subcontractors of each division included in the scope of work.

B. All Commissioning Team Parties

1. Assist in the development of the Final Commissioning Plan.
2. Follow and implement the Final Commissioning Plan.
3. Attend commissioning meetings as necessary.

C. Owner's Project Manager (PM)

1. Construction and Acceptance Phase
   a. Manage the contract of the A/E and of the GC.
   b. Act as final authority on all Issue log resolutions
   c. Arrange for facility operating and maintenance personnel to attend various field commissioning activities and field training sessions according to the Commissioning Plan.
   d. Provide final approval for the completion of the commissioning work.

2. Warranty Period: Ensure that any seasonal or deferred testing and any deficiency issues are addressed and all warranty period commissioning activities are facilitated.

D. Architect (of A/E)

1. Construction and Acceptance Phase

    a. Perform normal submittal review, construction observation, as-built drawing preparation, O&M manual preparation, etc., as contracted
    b. Provide any design narrative documentation requested by the CA.
    c. Coordinate resolution of system deficiencies identified during commissioning, according to the contract documents.
    d. Prepare and submit final as-built design intent documentation for inclusion in the O&M manuals. Review and approve the O&M manuals.

2. Warranty Period: Coordinate resolution of design non-conformance and design deficiencies identified during warranty-period commissioning.

E. Designers/Engineers (of the A/E)

1. Construction and Acceptance Phase
    a. Perform normal submittal review, construction observation, as-built drawing preparation, etc., as contracted.
    b. Provide any design narrative and sequences documentation requested by the CA. The designers shall assist (along with the contractors) in clarifying the operation and control of commissioned equipment in areas where the specifications, control drawings or equipment documentation is not sufficient for writing detailed testing procedures.
    c. Participate in the resolution of system deficiencies identified during commissioning, according to the contract documents.
    d. Prepare and submit the final as-built design intent and operating parameters documentation for inclusion in the O&M manuals. Review and approve the O&M manuals.
    e. Provide a Design intent presentation at the training sessions for the Owner’s personnel.

2. Warranty Period: Participate in the resolution of non-compliance, non-conformance and design deficiencies identified during commissioning during warranty-period commissioning.

F. Commissioning Authority (CA): The CA is not responsible for design concept, design, design criteria, compliance with codes, design or general construction scheduling, cost estimating, or construction management. The CA may assist with problem-solving non-conformance or deficiencies, but ultimately that responsibility resides with the general contractor and the A/E. The primary role of the CA is to develop and coordinate the execution of a testing plan, observe and document performance that

systems are functioning in accordance with the documented design intent and in accordance with the Contract Documents.

1. Construction and Acceptance Phase
    a. Coordinates and directs the commissioning activities
    b. Revise as necessary the Commissioning Plan, check sheets or performance tests
    c. Conduct commissioning meetings as necessary.
    d. Perform site inspections and create observation reports
    e. Create and manage the Cx Issue log. Manage al issue to their final resolution.
    f. Review and comment on contractor submittals
    g. Create, review and approve and distribute FIV, OPT, and FPT tests and checklists.
    h. Validate system start up tests performed by contractor by verifying start up procedures or by observing start up tests
    i. Review TAB execution plan.
    j. Perform complete point-to-point control system checkout.
    k. Approve all TAB readings by spot testing reading repeatability on a sampling basis as dictated by the CA.
    l. Create all Functional Tests and criteria.
    m. Analyze any functional performance trend logs and monitoring data to verify performance.
    n. Review and approve all O&M manuals of equipment and systems included in the commissioning scope.
    o. Assist and coordinate training materials and training agendas.
    p. Provide a final commissioning report

2. Warranty Period
    a. Perform a warranty site visit to determine any unresolved functional issues with all systems in commissioning scope of work.
    b. Participate in the resolution of non-compliance, non-conformance and design deficiencies identified during commissioning during warranty-period commissioning.
    c. Coordinate any deferred FPT tests
    d. Issue commissioning report addenda
    e. Create a re-commissioning manual to be used by the owner for future re-commissioning efforts and efficient future operations.

G. Construction Manager—Owner’s Representative (CM)

1. Construction and Acceptance Phase:
    a. Facilitate the coordination of the commissioning work by the CA, and, with the GC and CA, ensure that commissioning activities are being scheduled into the master schedule.
    b. Review and approve the final Commissioning Plan
    c. Perform the normal review of Contractor submittals.

d. Furnish a copy of all construction documents, addenda, change orders and approved submittals and shop drawings related to commissioned equipment to the CA.
e. When necessary, observe and witness FIV, OPT and FPT of selected equipment.
f. Review commissioning progress and deficiency reports.
g. Coordinate the resolution of non-compliance and design deficiencies identified in all phases of commissioning by managing the issue log.
h. Assist the CA in coordinating the training of owner personnel.

2. Warranty Period: Assist the CA as necessary in the seasonal or deferred testing and deficiency corrections required by the specifications.

H. General Contractor (GC)

1. Construction and Acceptance Phase
   a. Facilitate the coordination of the commissioning work and commissioning communications between the Owner, Design professionals, CA and all subcontractors and ensure that commissioning activities are being scheduled into the master schedule.
   b. Include the cost of commissioning in the total contract price.
   c. Furnish a copy of all construction documents, addenda, change orders and approved submittals and shop drawings related to commissioned equipment to the CA.
   d. In each purchase order or subcontract written, include requirements for submittal data, O&M data, commissioning tasks and training.
   e. Ensure that all Subs execute their commissioning responsibilities according to the Contract Documents and schedule.
   f. Coordinate the training of owner personnel.
   g. Prepare O&M manuals, according to the Contract Documents, including clarifying and updating the original sequences of operation to as-built conditions.

2. Warranty Period
   a. Ensure that Subs execute seasonal or deferred functional performance testing, witnessed by the CA, according to the specifications.
   b. Ensure that Subs correct deficiencies and make necessary adjustments to O&M manuals and as-built drawings for applicable issues identified in any seasonal testing.

I. Subcontractors and Vendors

3. Construction and Acceptance Phase

a. Provides commissioning work and commissioning communications between the commissioning team for there required commissioning responsibilities.
b. Include the cost of commissioning in their total contract price.
c. In each purchase order or subcontract written, include requirements for submittal data, O&M data, commissioning tasks and training.
d. Ensure that all Subs execute their commissioning responsibilities according to the Contract Documents and schedule.
e. Coordinate the training of owner personnel.
f. Prepare O&M manuals, according to the Contract Documents, including clarifying and updating the original sequences of operation to as-built conditions.

4. Warranty Period

a. Ensure that Subs execute seasonal or deferred functional performance testing, witnessed by the CA, according to the specifications.
b. Ensure that Subs correct deficiencies and make necessary adjustments to O&M manuals and as-built drawings for applicable issues identified in any seasonal testing.

PART 2 PRODUCTS

2.01 TEST EQUIPMENT

A. All standard testing equipment required to perform startup and initial checkout and required functional performance testing shall be provided by the Division contractor for the equipment being tested.

B. Special equipment, tools and instruments (only available from vendor, specific to a piece of equipment) required for testing equipment, according to these Contract Documents shall be included in the base bid price to the Contractor and left on site, except for stand-alone Datalogging equipment that may be used by the CA.

C. Datalogging equipment and software required to test equipment will be provided by the CA, but shall not become the property of the Owner.

D. All testing equipment shall be of sufficient quality and accuracy to test and/or measure system performance with the tolerances specified in the *Specifications.* If the specification does not specify test instrument accuracy the CA shall provide the required data. All equipment shall be calibrated annually and calibrated according to the manufacturer's recommended intervals and when dropped or damaged. Calibration tags shall be affixed or certificates readily available.

PART 3 EXECUTION

3.01 MEETINGS

A. Kickoff Commissioning Meeting. The CA will schedule, plan and conduct a commissioning kickoff meeting with the entire commissioning team in attendance. Meeting agenda will be distributed to all parties by the CA. Information gathered from this meeting will allow the CA to revise the Draft Commissioning Plan to its “final” version, which will also be distributed to all parties.

B. Miscellaneous Meetings. Other meetings will be planned and conducted by the CA as construction progresses. These meetings will cover coordination, deficiency resolution and planning issues with Cx team members.

3.02 REPORTING

A. The CA will provide regular reports to the CM or PM, depending on the management structure, with increasing frequency as construction and commissioning progresses. Standard forms are provided and referenced in the *Commissioning Plan.*

B. The CA will regularly communicate with all members of the commissioning team, keeping them apprised of commissioning progress and scheduling changes through memos, progress reports, etc.

C. Testing or review approvals and non-conformance and deficiency reports are made regularly with the review and testing as described in later sections.

3.03 SUBMITTALS

A. The CA will provide appropriate contractors with a specific request for the type of submittal documentation that the CA requires facilitating the commissioning work. These requests will be integrated into the normal submittal process and protocol of the construction team. At minimum, the request will include the manufacturer and model number, the manufacturer’s printed installation and detailed start-up procedures, full sequences of operation, O&M data, performance data, any performance test procedures, control drawings, user interface graphics for each system, and details of owner contracted tests. In addition, the installation and checkout materials that are actually shipped inside the equipment and the actual field checkout sheet forms to be used by the factory or field technicians shall be submitted to the Commissioning authority. All documentation requested by the CA will be included by

the Subs in their O&M manual contributions.

B. The Commissioning authority will review and approve submittals related to the commissioned equipment for conformance to the Contract Documents as it relates to the commissioning process, to the functional performance of the equipment and adequacy for developing test procedures. It is intended that the CA shall provide submittal review after the design professionals have reviewed or approved the submittals. This review is intended primarily to aid in the development of functional testing procedures and only secondarily to verify compliance with equipment specifications. The Commissioning authority will notify the CM, PM or A/E as requested, of items missing or areas that are not in conformance with Contract Documents and which require resubmission.

C. The CA may request additional design narrative from the A/E and Contractors, depending on the completeness of the design intent documentation and Drawings and Specifications.

D. These submittals to the CA do not constitute compliance for O&M manual documentation. The O&M manuals are the responsibility of the Contractor, though the CA will review and approve them.

3.04 FIELD INSTALLATION VERIFICATION AND OPERATIONAL PERFORMCE TESTS (Pre Functional Testing)

A. The following procedures apply to all equipment and systems to be commissioned.

B. Field Installation Verification (FIV) inspections are performed by various commissioning team members as outlined in the commissioning plan. FIV inspections are intended to verify that all equipment and systems are installed in accordance with the manufactures installation requirements and allow all required operation and maintenance access. No sampling strategies are allowed for FIV inspections. FIV inspections for a given system or piece of equipment shall be complete prior to OPT testing.

C. FIV forms and check sheets are created by the contractor from manufactures installation instructions. The CA may provide the check sheets and forms if the contractor’s submitted forms are inadequate. All FIV check sheets and forms shall be approved by the CA prior to there use on the project.

D. All FIV inspections are performed in accordance with the commissioning schedule as created by the commissioning team.

E Operational Performance Tests (OPT) are start up tests and

procedures performed by the start up contractors as required by the project specifications. The start up contractor shall perform the start up services and document all pertinent startup information on the OPT check sheet. No sampling strategies are allowed for OPT tests. OPT tests for a given system or piece of equipment shall be complete prior to FPT testing.

F. OPT forms and check sheets are created by the contractor or vendor from manufactures start up instructions. The CA may provide the check sheets and forms if the contractor's submitted forms are inadequate. All OPT check sheets and forms shall be approved by the CA prior to there use on the project.

G. All OPT tests are performed in accordance with the commissioning schedule as created by the commissioning team.

H. Deficiency Issue Log.

1. The CA shall provide a periodic commissioning issue log clearly listing any deficiencies or areas of concern from any FIV or OPT.
2. The issue log shall be provided to the CM/GC for distribution to the appropriate parties for review, response and action. All actions and results will be listed on the issue log for future reference.
3. Items left incomplete, which later cause deficiencies or delays during functional testing may result in back charges to the responsible party.

3.05 PHASED COMMISSIONING

A. The project may require startup and initial checkout to be executed in phases. This phasing will be planned and scheduled in a coordination meeting of the CA, CM, GC and appropriate subcontractors. Results will be added to the master and commissioning schedule.

3.06 FUNCTIONAL PERFORMANCE TESTING

A. This section applies to all systems and equipment that is to be functional tested in accordance with the commissioning plan.

B. Functional Performance Testing (FPT) Objectives and Scope.

1. The objective of functional performance testing is to demonstrate that each system is operating according to the documented design intent and Contract Documents. Functional tests will identify areas of deficient performance so they can be corrected, improving the operation and functionality of the systems.

2. In general, each system should be operated through all modes of operation (seasonal, occupied, unoccupied, warm-up, cool-down, part- and full-load) where there is a specified system response. Verifying each sequence in the sequences of operation is required. Proper responses to such modes and conditions such as failure mode, normal operating mode, and alarm mode shall also be tested.

C. Development of FPT Test Procedures.

1. Before test procedures are written, the CA shall obtain all requested documentation and a current list of change orders affecting equipment or systems, including an updated points list, program code, control sequences and parameters. The CA shall develop specific test procedures and forms to verify and document proper operation of each piece of equipment and system. The Subcontractor or Vendor then performs or executes the FPT and provides the specified verification back to the CA for approval. The CA shall provide a copy of the test procedures to the Subcontractors or Vendors who shall review the tests for feasibility, safety, equipment and warranty protection. The CA may submit the tests to the A/E for review, if requested.

D. FPT Test Methods.

1. Functional performance testing and verification may be achieved by manual testing (persons manipulate the equipment and observe performance) or by monitoring the performance and analyzing the results using an automatic control system's trend log capabilities or by stand-alone dataloggers. The CA may substitute specified methods or require an additional method to be executed, other than what was specified if satisfactory results are not obtained through the specified tests. The CA will determine which method is most appropriate for tests that do not have a method specified.
2. FPT Sampling methodology.
   a. Multiple identical pieces of non-life-safety or otherwise non-critical equipment with identical factory configured control sequences may be functionally tested using a sampling strategy. Significant application differences and significant sequence of operation differences in otherwise identical equipment invalidates their common identity. A small size or capacity difference, alone, does not constitute a difference.

E. FPT Coordination and Scheduling:

1. The Subcontractors shall provide sufficient notice to the CA

regarding their completion schedule for the startup of all equipment and systems. The CA will schedule functional tests through the CM, GC and affected Subcontractors. The CA shall direct, document the functional testing of all equipment and systems.

2. In general, functional testing is conducted after FIVs and OPTs has been satisfactorily completed. Control systems are sufficiently tested and calibrated before being used to test and verify the function of other equipment and systems. System balancing and testing is completed and system operation is debugged before functional testing is performed. Testing proceeds from components to subsystems to systems.

G. Test Equipment. Refer to Part 2 - Products for test equipment requirements.

H. Problem Solving. The CA will recommend solutions to problems found, however the burden of responsibility to solve, correct and retest problems is with the Designers, GC, and Subcontractors.

3.07 DOCUMENTATION, NON-CONFORMANCE AND APPROVAL OF TESTS

A. Documentation. The CA shall document the results of all functional performance tests using the specific procedural forms developed in the commissioning plan and on the FPT forms.

B. Non-Conformance.

1. The CA will record the results of the functional test on the procedure or test form. All deficiencies or non-conformance issues shall be noted and reported to the CM/GC on the standard commissioning issue log.
2. Corrections of minor deficiencies identified may be made during the tests at the discretion of the CA. In such cases the deficiency and resolution will be documented on the procedure form.
3. Every effort will be made to expedite the testing process and minimize unnecessary delays, while not compromising the integrity of the procedures. However, the CA will not be pressured into overlooking deficient work or loosening acceptance criteria to satisfy scheduling or cost issues.
4. As tests progress and a deficiency is identified, the CA discusses the issue with the executing contractor.

    a. When there is no dispute on the deficiency and the Sub accepts responsibility to correct it:
        1) If the deficiency can be easily corrected it shall be corrected and the commissioning shall proceed.
        2) The CA reschedules the test and the test is

repeated.

b. If there is a dispute about a deficiency, regarding whether it is a deficiency or who is responsible or the repair will take more than one hour:

   1) The deficiency shall be documented on the issue log or the test check sheet with the Sub's response and a copy given to the CM/GC and to the Subcontractor representative assumed to be responsible.
   2) Resolutions are made at the lowest management level possible. Other parties are brought into the discussions as needed. Final interpretive authority is with the A/E. Final acceptance authority is with the Owner's Project Manager.
   3) The CA documents the resolution process.
   4) Once the interpretation and resolution have been decided, the appropriate party corrects the deficiency, signs the statement of correction on the non-compliance form and provides it to the CA. The CA reschedules the test and the test is repeated until satisfactory performance is achieved.

5. Cost of Retesting.

   a. The cost for the subcontractor to retest a OPT or FPT, if they are responsible for the deficiency, shall be theirs. If they are not responsible, any cost recovery for retesting costs shall be per the GC.
   b. For a deficiency identified, not related to any prefunctional checklist or start-up fault, the CA will direct the retesting of the equipment once at no "charge" to the GC for the CA's time. However, if the test fails for the corrected work the CA's time for a second retest will be charged to the GC at the CA's standard rate. This process will be repeated until the system performance is verified.
   c. The time for the CA to direct any retesting required because a specific FIV or OPT item, reported to have been successfully completed, but determined during functional testing to be faulty, will be back charged to the GC, who may choose to recover costs from the party responsible

6. The Contractor shall respond in writing to the CA and CM/GC at least as often as commissioning meetings are being scheduled concerning the status of each apparent outstanding discrepancy identified during commissioning.

7. The CA retains the original non-conformance forms until the end of the project.
8. Any required retesting by any contractor shall not be considered a justified reason for a claim of delay or for a time extension by the prime contractor.

C. Failure Due to Manufacturer Defect. If 10%, or three, whichever is greater, of identical pieces (size alone does not constitute a difference) of equipment fail to perform to the Contract Documents (mechanically or substantively) due to manufacturing defect, not allowing it to meet its submitted performance specifications, all identical units may be considered unacceptable.

D. Approval. The CA notes each satisfactorily demonstrated function on the test form. Formal approval of the functional test is made later after review by the CA. The CA recommends acceptance of each test to the Owner's representative using a standard form.

3.08. OPERATION AND MAINTENANCE MANUALS

A. Standard O&M Manuals.

1. The specific content and format requirements for the standard O&M manuals are detailed in Section 017824. Special requirements for the division contractors shall be as specified in their specification Section.
2. CA Review and Approval. Prior to substantial completion, the CA shall review the O&M manuals, documentation and final as-builds *for systems that were commissioned* to verify compliance with the *Specifications.* The CA will communicate deficiencies in the manuals to the CM/GC or A/E, as requested. Upon a successful review of the corrections, the CA recommends approval and acceptance of these sections of the O&M manuals to the CM/GC. This work does not supersede the A/E's review of the O&M manuals according to the A/E's contract.

B. Commissioning Final Report.

1. Final Report Details. The final commissioning report shall include an executive summary, LEED commissioning statement sheet if required, list of participants and roles, brief building description, overview of commissioning and testing scope and a general description of testing and verification methods. For each piece of commissioned equipment, the report should contain the appropriate FIV, OPT and FPT completed check sheets as described in the commissioning plan. The report shall also include all issue logs and commissioning communication.
2. Other documentation will be retained by the CA.

3.09 TRAINING OF OWNER PERSONNEL

A. The GC shall be responsible for training coordination and scheduling and ultimately for ensuring that training is completed.

B. The CA shall be responsible for overseeing and approving the content and adequacy of the training of Owner personnel for commissioned equipment.

1. The CA shall interview the facility manager and lead engineer to determine the special needs and areas where training will be most valuable. The Owner and CA shall decide how rigorous the training should be for each piece of commissioned equipment. The CA shall communicate the results to the Subcontractors and vendors who have training responsibilities.
2. Each Sub and vendor responsible for training will submit a written training plan to the CA for review and approval prior to training. The plan will cover the following elements:

    a. Equipment (included in training)
    b. Intended audience
    c. Location of training
    d. Objectives
    e. Subjects covered (description, duration of discussion, special methods, etc.)
    f. Duration of training on each subject
    g. Instructor for each subject
    h. All training Methods shall include a classroom lecture and an actual operational demonstration of start up, operation, shut down and maintenance procedures.
    i. Instructor and qualifications

5. The GC develops an overall training plan and coordinates and schedules, with the subcontractors and Owners representative incorporating the training agendas approved by the CA. The CA develops criteria for determining that the training was satisfactorily completed. The CA recommends approval of the training to the CM using a standard form.
6. Video taping of the training sessions may be provided by the CA if specified and required by the Owner. Completed Video training sessions shall be provided in DVD format for the owner’s future use.
8. The design engineer shall provide a training session explaining the theory of operation of the system, methodology of the layout and its key features for operation of the system efficiently, including what equipment is to be normally operating and which equipment is intended to be standby.

3.10 DEFERRED TESTING

A. Unforeseen Deferred Tests. If any check or test cannot be completed due to the building structure, required occupancy condition or seasonal constraints or other deficiency, execution of checklists and functional testing may be delayed upon approval of the PM. These tests will be conducted in the same manner as the seasonal tests as soon as possible.

END OF SECTION