



addendum 02

number name	date	sent by
2023-38 DFCM Farmington Regional Center	06/17/2025	Dijana Rambo

This addendum issued with written comments, drawings and/or specifications is for all persons preparing Bids for the DFCM Farmington Regional Center and as enumerated herein, shall be included in the Contractor's Bid; this addendum becomes a part of the Contract Documents and modifies the original bidding documents. Bidders should acknowledge receipt of this Addendum on the Contractors Bid Form. Failure to do so may subject the Bidder to disqualification. In case of any conflict between the drawings, specifications and this addendum, the latest addendum shall govern. All changes, corrections, deletions and/or additions to the initial bidding documents shall govern. All changes, corrections, deletions and/or additions to the initial bidding documents shall be included in the Bidder's proposal. This review does not relieve the contractor or supplier of the responsibility of conforming to the drawings and specifications, nor does it relieve the contractor of the requirements of the specifications for coordination with other trades. All dimensions shall be confirmed and correlated at the job site. The Contractor shall be responsible for verifying existing conditions and the suitability of "equivalent" products for the specified application.

Revisions to the project drawings

Responses to questions from Bidders.

Project Manual

Essential specification sections have been added per Addendum request, existing sections were modified. **Review full project manual attached in its entirety. See attached.**

Structural Narrative

See attached.

Electrical Narrative

See attached.

Mechanical Narrative.

See attached.

Architectural

1. AS101 – ARCHITECTURAL SITE PLAN
 - o Updated landscape background.
2. AS102-ENLARGED PLAN – PLAZA & EAST EMPLOYEE PATIO
 - o Clarified control joint dimensions.
3. AS200-SITE DETAILS – PLAY AREA & NORTH EMPLOYEE PATIO
 - o Clarified fastener type.
 - o Clarified concrete footings.
4. AS201- SITE DETAILS – PLAY AREA & NORTH EMPLOYEE PATIO
 - o Clarified concrete footings.
5. AS202 SITE DETAILS – TRASH ENCLOSURE
 - o Clarified slope at trash enclosure.



- Clarified control joint locations.
- 6. AS203
 - Clarified monument sign dimensions, font, and letter dimensions.
- 7. AS204 – SITE DETAILS
 - Clarified accessible van parking stalls.
 - Clarified painted crosswalk.
 - Clarified miscellaneous dimensions.
- 8. AS301 – BID ALTERNATES
 - Clarified bollards are to be under the base bid.
- 9. A100.B SLAB PLAN-CONTROL JOINTS
 - Clarified annotations.
- 10. A101 – REFERENCE FLOOR PLAN
 - Revised public and staff restroom layout.
- 11. A101.A, A101.B, A101.C, A101.D, A101.E, A101.F
 - Removed corner guard annotations from annotated plans.
 - Revised baby changing station location in men's and women's restroom.
 -
- 12. A101.E ENLARGED ANNOTATED FLOOR PLANS – AREA "E" COMMON & BOH
 - Clarified W3 locations.
- 13. A102.A, A102.B, A102.C, A102.D, A102.E, A102.F
 - Revised dimension strings.
 - Added furring wall at entrance into DLD and DMV spaces to capture wood wall.
 - Revised interior storefront dimensions at entrances into DLD and DMV.
- 14. A103-REFERENCE FINISH FLOOR PLAN
 - Revised public and staff restroom layout.
- 15. A103.A, A103.B, A103.C, A103.D, A103.E, A103.F
 - Revised corner guard locations.
 - Columns in Area 'A' and Area 'B' to be painted PT3.
- 16. A104.A, A104.B, A104.C, A104.D,
 - Clarified gyp control joint locations at curved ceiling.
 - Clarified access panel locations.
- 17. A105 ROOF PLAN
 - Clarified roofing elevation markers.
- 18. A106, A107
 - Clarified wall section locations.
- 19. A109 CLERESTORY ELEVATIONS
 - Clarified clerestory elevation materials.
- 20. A110 – MOCK UP PLAN & ELEVATIONS.
 - Clarified brick texture pattern.
- 21. A200- ELEVATIONS
 - Clarified metal coping at 3/A200
 - Clarified metal panel styles and locations (MP1,MP2,MP3)
- 22. A201-ELEVATIONS
 - Clarified metal coping at 1/A201
 - Clarified Finish grade at 1/A201
- 23. A300-BUILDING SECTIONS
 - Clarified top of footing at 3/A300
 - Clarified RTU Gas Carrier on roof at 1/A300
- 24. A310-WALL SECTIONS
 - Clarified 3/8" Plate Steel (5.42) at 3/A310
- 25. A311-WALL SECTIONS



- Clarified exterior lighting(26.02) at 1/A311
- Clarified top of footing elevation at 1/A311
- Clarified concrete footing at 1/A311
- Clarified concrete paving at 1/A311
- 26. 312-WALL SECTIONS
 - Clarified bracing and gypsum board anchor at 2/A312
- 27. A313-WALL SECTIONS
 - Clarified metal stud bracing at 2/A313
- 28. A314-WALL SECTIONS
 - Clarified insulating material at 1/A314
 - Clarified metal sill flashing at 1/A314 and 2/A314
 - Clarified Lighting at 2/A314
- 29. A315-WALL SECTIONS
 - Clarified storefront type at 3/A315
 - Clarified metal stud bracing at 2/A315
- 30. A316-WALL SECTIONS
 - Clarified Spot elevations at 5/A316
 - Clarified Lighting at 3/A316
 - Clarified composite metal desk at 2/A316
- 31. A440 – INTERIOR ELEVATIONS
 - Revised public and staff restroom elevations.
- 32. A505-DETAILS-SECTION
 - Clarified ¾" Chamfer at 9/A505
 - Clarified Clerestory detail at 3/A507
 - Clarified foundation wall types, typical for all details on sheet
- 33. A507-DETAILS SECTION
 - Revised detail 3/A507.
- 34. A510-DETAIL-SECTION
 - Clarified angular dimension at 11/A510
- 35. A524 DETAILS – FINISHES
- 36. A601 DOOR TYPES & SCHEDULE
 - Revised door and hardware schedule.
- 37. A610 STOREFRONT TYPES-EXTERIOR
 - Revised spelling.
- 38. A620 FINISH & ACCESSORY SCHEDULE
 - Revised finishes in schedule, conforming to plan updates.

attachments

This Addendum consists of this cover sheet and the documents listed below:

- **PROJECT MANUAL**
- **ARCHITECTURAL DRAWINGS.**
 - AS101-ARCHITECTURAL SITE PLAN
 - AS102-ENLARGED PLAN – PLAZA & EAST EMPLOYEE PATIO
 - AS200-SITE DETAILS – PLAY AREA & NORTH EMPLOYEE PATIO
 - AS201- SITE DETAILS – PLAY AREA & NORTH EMPLOYEE PATIO
 - AS202 SITE DETAILS – TRASH ENCLOSURE
 - AS203



- AS204 – SITE DETAILS
- AS301 – BID ALTERNATES
- A101 – REFERENCE FLOOR PLAN
- A101.A, A101.B, A101.C, A101.D, A101.E, A101.F
- A101.E ENLARGED ANNOTATED FLOOR PLANS – AREA “E” COMMON & BOH
- A102.A, A102.B, A102.C, A102.D, A102.E, A102.F
- A103-REFERENCE FINISH FLOOR PLAN
- A103.A, A103.B, A103.C, A103.D, A103.E, A103.F
- A104.A, A104.B, A104.C, A104.D,
- A105 ROOF PLAN
- A106, A107
- A109 CLERETORY ELEVATIONS
- A110 – MOCK UP PLAN & ELEVATIONS.
- A200- ELEVATIONS
- A201-ELEVATIONS
- A300-BUILDING SECTIONS
- A310-WALL SECTIONS
- A311-WALL SECTIONS
- 312-WALL SECTIONS
- A313-WALL SECTIONS
- A314-WALL SECTIONS
- A315-WALL SECTIONS
- A316-WALL SECTIONS
- A440 – INTERIOR ELEVATIONS
- A505-DETAILS-SECTION
- A507-DETAILS SECTION
- A510-DETAIL-SECTION
- A524 DETAILS – FINISHES
- A601 DOOR TYPES & SCHEDULE
- A610 STOREFRONT TYPES-EXTERIOR
- A620 FINISH & ACCESSORY SCHEDULE
- **STRUCTURAL DRAWINGS**
 - SB101 FOOTING AND FOUNDATION PLAN
 - SF101 ROOF FRAMING PLAN
 - SF102 PENTHOUSE ROOF FRAMING PLAN
 - SF512 ROOF FRAMING DETAILS
 - SF601 TYPICAL STEEL FRAMING SCHEDULES
- **STRUCUTRAL NARRATIVE**
- **CIVIL DRAWINGS**
 - C101 GENERAL DETAILS
 - CS230 OVERALL SITE LAYOUT
 - CU UTILITY PLAN
 - CG400 OVERAL GRADING PLAN
 - CG ENLARGED GRADING PLAN
 - CG450 HYDROLOGY PLAN
 - C500 EROSION CONTROL PLAN
- **ELECTRICAL DRAWINGS**
 - ES402 ENLARGED SITE PLANS
 - EP101 LEVEL 1 POWERP PLAN
 - EP401 ENLARGED POWER PLANS
 - EP603 ELECTRICAL SCHEDULES



- AL101 LEVEL 1 LIGHTING PLAN
 - EL603 LIGHTING RELAY DIAGRAMS & SCHEDULES
- **ELECTRICAL NARRATIVE**
- **MECHANICAL DRAWINGS**
 - ME101 LEVEL 1 MECHANICAL FLOOR PLAN
 - ME101.2 MECHANICAL RCP FLOOR PLAN
 - ME404 ENLARGED MECHANICAL FLOOR PLAN – AREA D
 - MP404 ENLARGED MECHANICAL PIPING FLOOR PLAN – AREA D
 - PE101 LEVEL 1 PLUMBING FLOOR PLANS
 - PE404 ENLARGED PLUMBING FLOOR PLAN – AREA D
- **MECHANICAL NARRATIVE**
- **RESPONSES TO GC COMMENTS**



REAVELEY
Engineers

STRUCTURAL REVISIONS

FARMINGTON REGIONAL CENTER—ADD 02

JUNE 16, 2025

SB101: FOOTING & FOUNDATION PLAN

1. Revise column marks along grid B.

SF101: ROOF FRAMING PLAN

1. Add beam size.

SF102: PENTHOUSE ROOF FRAMING PLAN

1. Add shear transfer mark.

SF512: ROOF FRAMING DETAILS

1. Remove lower kicker from detail D3.

SF601: TYPICAL STEEL FRAMING SCHEDULES

1. Revise column schedule.

ADDENDUM #2

Project Name: Multi Agency Farmington

WHW Project # 24061

From: WHW Engineering LLC
733 West 9000 S
Sandy, Utah 84070
Phone (801) 466-4021 Fax (801) 466-8536

To: All Bidding Contractors
Addendum No: 2

Date: 06.17.25

This Addendum forms and becomes a part of the Contract Documents and modifies the original Bidding Documents dated May 2025 as noted below. Acknowledge receipt of this Addendum in the space provided on the Bid Form. Failure to do so may subject the Bidder to disqualification.

This Addendum consists of 1 page of prior approvals.

I. CHANGES TO PRIOR ADDENDA:

a. See prior approvals below.

II. CHANGES/CLARIFICATIONS TO DRAWINGS:

a. See sheets below. Sheets reissued due to architectural changes.

PRIOR APPROVALS

THE FOLLOWING ITEMS, AS SUBMITTED, ARE CONSIDERED, IN GENERAL AND IN NAME ONLY, AS EQUAL TO THOSE ITEMS SPECIFIED. THIS REVIEW DOES NOT RELIEVE THE CONTRACTOR OR SUPPLIER OF THE RESPONSIBILITY OF CONFORMING TO THE DRAWINGS AND SPECIFICATIONS, NOR DOES IT RELIEVE THE CONTRACTOR OF THE REQUIREMENTS OF THE SPECIFICATIONS FOR COORDINATION WITH OTHER TRADES. ALL DIMENSIONS SHALL BE CONFIRMED AND CORRELATED AT THE JOBSITE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING EXISTING CONDITIONS AND THE SUITABILITY OF "EQUAL" PRODUCTS FOR THE SPECIFIED APPLICATION.

<u>Description</u>	<u>Manufacturer</u>
Diffuser and Grille	Tuttle & Bailey
Exhaust Fans	Twin City / Aerovent
Boiler Flue	Schebler Co
Roof Top Unit	Trane
VAV Units	Tuttle & Bailey
Boilers	Fulton, RBI
Hydronic Pumps	Patterson, Wilo
Expansion Tank	Patterson, Wilo
Air Separator	Patterson
Check Valves	Griswold
Y Strainers	Griswold
Meters and Gauges	Weiss
Auto Air Vent	Watson McDaniel
Flex Connectors	Flex Weld
VFD	Franklin Electric
3 Way Control Valves	Griswold



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Electrical Addendum 2

Date:	June 16, 2025	From:	Matt Haverkamp
To:	Dijana Rambo	Email:	Matt.haverkamp@speceng.com
Company:	ajc architects	Phone:	801-401-8474
Job:	Farmington Regional Center	Re:	Addendum 2
Job No:	2023-38 / SE:240314		
Cc:			

This Addendum shall be considered part of the Contract Documents and Project Manual for the above mentioned project as though it had been issued at the same time and shall be incorporated integrally therewith. Where provisions of the following supplementary data differ from those of the original Contract Documents and Project Manual, the Addendum shall govern and take precedence.

Electrical Addendum

Specifications

1. 260800 – Electrical Commissioning Requirements

Drawings

2. ES402 - See attached sheet for the following:
 - a. Relocated 'ORGM' j-boxes for art benches.
 - b. Added (OT2) lights to art bench sculptures.
 - c. Added Art Bench Lighting Elevations.
3. EP101 – See attached sheet for the following:
 - a. Relocated duplex and hand dryer devices in 103, 104, 108 and 109.
 - b. Relocated power and ADA operators for 103, 104, 108 and 109.
4. EP401 – Revised power requirements for RP-1 in 122. See attached sheet.
5. EP603 – See attached sheet for the following:



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- a. Removed motor controller for MX-1 from Equipment Schedule.
 - b. Revised requirements for RP-1 in Equipment Schedule.
 - c. Added motor controller for RTU-1 to Equipment Schedule.
6. EL101 – See attached sheet for the following:
- a. Revised Sheet Keynote #3.
 - b. Relocated lighting devices in 108, 109, 112, 130, 307, 400, 404, 405, 406, 407, 412, 505, 506, 511, 512, 513, 515, 516, 517, 518, 519, 520, and 521.
 - c. Relocated downlight in 109.
 - d. Removed lighting devices, added lighting devices, and revised circuiting in 214.
 - e. Added tag for lighting device doors in 301.
7. EL603 – Revised 'CS-3' overrides in Low Voltage Override Switch Schedule. See attached sheet.

END OF ADDENDUM

Attachments < 260800, ES402, EP101, EP401, EP603, EL101, EL603 >

SECTION 26 0800

ELECTRICAL SYSTEMS COMMISSIONING

PART 1 – GENERAL REQUIREMENTS

1.1 RELATED WORK

- A Specification Section 019113 – “General Commissioning Requirements”
- B Specification Section 230800 – “HVAC Systems Commissioning
- C Specification Section 220800 – “Plumbing Systems Commissioning”

1.2 Description

- A. The purpose of the commissioning process is to provide the Owner/operator of the facility with a high level of assurance that the electrical and associated electrical Systems have been installed in the prescribed manner, and operate within the performance guidelines set in the design intent. The Commissioning Authority shall provide the Owner with an unbiased, objective view of the systems installation, operation, and performance. This process is not to take away or reduce the responsibility of the design professionals or installing contractors to provide a finished product. Commissioning is intended to enhance the quality of system start-up and aid in the orderly transfer of systems to beneficial use by the owner. The Commissioning Authority will be a member of the construction team, cooperating and coordinating all commissioning activities with the design professionals, construction manager, contractors, subcontractors, manufacturers and equipment suppliers.

1.3 Scope

- A The electrical systems commissioning shall include a demonstration by the Contractor with the assistance of the Commissioning Authority (CxA) of each piece of equipment to comply with the Owners Project Requirements (OPR) and the Construction Documents (CD). The commissioning process shall demonstrate that each piece of equipment is performing and operating to the OPR and CDs.
- B Participants in Electrical Systems Commissioning: Electrical systems shall be conducted with representatives from the following entities (the required participants shall be confirmed with the commissioning agent prior to scheduling the commissioning).
 - 1. General Contractor
 - 2. Owners Representative
 - 3. Electrical Contractor
 - 4. Fire Alarm Contractor
- C Major Pieces of Equipment shall be defined as: (While this list is meant to show a representative sample any equipment that uses electrical energy)
 - 1. Network Lighting Controls
 - 2. UPS Systems
 - 3. Coordination Study
 - 4. Generators
 - 5. Automatic Transfer Systems
 - 6. Metering Devices
- D Kickoff, Coordination and MEP Meetings

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1. Bi-weekly meetings shall be held by the CxA with full participation and attendance of all participants as indicated in the "Participants in Electrical Systems Commissioning" section.
2. These meetings will be held at the CxA convenience and shall be scheduled on a regular basis.
3. Other meetings such as the Commissioning Kick-Off Meeting, Update Meetings, Controls Meeting, Submittal Meetings and other Coordination Meetings shall be attended by those participants as indicated in the "Participants in Electrical Systems Commissioning"

E Submittal Reviews and Meetings

4. The CxA shall review each submittal in Division 26. The contractor shall look and ask for the CxA comments if the comments are not in the return submittal. It is the sole responsibility of the contractor to search out and ask for the CxA comments.
5. For major pieces of equipment, the contractor, sub-contractors, and suppliers shall be in attendance for a submittal review meeting with the Owner and CxA to review the submittal with the Owner and CxA and address any deficiencies.
6. Submittal reviews are NOT an approval but a courtesy review to help validate products submitted is in general compliance with the construction documents. It is the suppliers and contractor's responsibility to verify the supplied product meets or exceeds the construction documents requirements or the supplier is to provide a separate letter noting each of the requirements that has not been achieved and MUST identify they are not in compliance with the construction documents and request a PR. Failure to do so may require modification or replacement of the product when onsite or installed

F Issues Log

1. An issues log shall be kept by the CxA. These issues will intensify issues, defects, improper installations, and deficiencies of the installation and design. The issues log will have the issue, a potential resolution, the sub-contractor responsible, the date of the issue found and the CxA who found the issue.
2. The issues log shall be immediately addressed every week by the contractor. If an issue lags beyond four (4) weeks, the CxA shall request from the Owner and reduction in payment for services by the contractor.
3. When an item is completed and addressed by the contractor or sub-contractor responsible, the party responsible shall sign off and deliver to the CxA for review. The sign off shall include how the contractor addressed the issue and the date in which the contractor addressed the issue. If the issue has not been addressed after re-inspection the contractor shall be liable for the CxA time and efforts as outlined later in this specification.

G Construction Checklist, Pre and Final Functional Testing Checklist, and Startup Checklist

1. The CxA shall develop construction checklist that will be executed by the CxA. The contractors and sub-contractors shall review the checklist for compliance with the ability of their individual systems. If the contractor or sub-contractors do not provide comments to the CxA then the CxA shall assume their procedures shall not harm nor deteriorate the individual systems. If a problem occurs during testing that causes a piece of equipment of system to malfunction, damage, or any other failure and the contractor or sub-contractor has not in writing opposed such test then the contractor or sub-contractor shall be liable for any damages and delays.
2. The contractor shall fill out checklist called Contractor Readiness checklist. These shall be delivered in the commissioning plan and shall be used to show the CxA that the contractor is ready for Final Function Testing.
3. Startup Sheets shall be delivered to the CxA. The contractor responsible for the piece of equipment is also responsible for delivering those startup sheets to the CxA.
4. Functional Testing shall be attended by the members as defined in "Participants in Electrical Systems Commissioning."

5. Should any of the aforementioned requirements not be met on the date that the commissioning process commences and or if deficiencies are observed during the commissioning process the commissioning will be considered a failure and the deficiencies will be required to be remedied and then addressed in writing prior to requesting a date for re-commissioning. There will be no additional costs allowed to the Contractor for re-commissioning sessions as may be required to address issues that are found to be in non-compliance with the requirements of this specification. The contractor shall be responsible for the CxA additional time due to absence of the member as outlined later in this specification.

H Current Facility Requirements and Operations and Maintenance Document

1. The contractors and sub-contractors shall prepare a documents that contains the following pieces of information. This document shall include the following:
 - a. Set points for network lighting controls and building schedules
 - b. Set points for Daylighting and Occupancy Sensors
 - c. Set lighting levels throughout the building
 - d. Any changes in schedules or set points for different seasons, days of the week, and times of day
 - e. A systems narrative describing the electrical systems and equipment
 - f. a preventive maintenance plan for electrical equipment described in the systems narrative
 - g. final installed settings of all adjustable overload protective devices
2. The document shall be delivered to the CxA by the contractor in a Microsoft Word (.doc or .docx) format

I Systems Manual

1. The contractors and sub-contractors shall prepare a documents that contains the following pieces of information. This document shall include the following:
 - a. Construction record documents and specifications
 - b. Approved submittals
 - c. As-built drawings
 - d. As-built sequence of operation for network lighting controls
 - e. Recommended schedule for sensor recalibration
 - f. Equipment operations and maintenance manuals
 - g. Equipment preventive maintenance schedules
 - h. Confirmation of completed training for the owner and occupants

J Sky Spark Implementation

1. SkySpark, by Sky Foundry, shall be implemented on this project. The Lighting Controls (booth local, i.e. occupancy sensors daylighting sensors, and network) contractor shall furnish their expertise and time to help with point assignments, communication, and network setup.
2. The Lighting Controls contractor shall spend 40 hours to help implement this process. The Lighting Controls contractor shall furnish an integration specialist to assist with this setup for the 40 hours, a salesperson or representative without knowledge of the project shall not be considered as a specialist.
3. The CxA or a representative appointed by the CxA shall work with the controls contractor, any issues with the Lighting Controls failure to communicate shall not go against the 40 hours.

K Access to Network Lighting Controls System Software

1. The Lighting Controls contractor shall give the CxA their own password and user name for their system.
2. The contractor shall also give Admin Access to the CxA to change settings, review programming, and review settings.

1.4 SYSTEMS TO BE COMMISSIONED

A. This list is not intended to be exhaustive. All division 22 and 23 and any equipment, piping, balancing, controls, etc. that are defined in the entire cumulative sections of division 22 and 23 will go through commissioning. The below list is a representative sample of items that are typically commissioned.

1. Network Lighting Controls
2. Occupancy/Vacancy Sensors
3. Daylighting/Photocell Systems
4. UPS Systems
5. Cable Trays
6. Fire Alarm Systems
7. Overload Protected Devices
8. Coordination Study
9. Generators
10. Automatic Transfer Systems
11. Panelboards
12. Lighting
13. Local Lighting Controls
14. Receptacles
15. Motor Control Centers
16. Transformers
17. Medium Voltage Cabling
18. Raceways
19. Switchgear
20. Main Distribution Boards
21. Switchboards
22. Variable Frequency Drives
23. Medium Voltage Switchgear
24. Metering Devices
25. Surge Protection Systems
26. Power Factor Correction
27. Electrical Distribution
28. Motor Starters
29. Disconnects
30. Hand-Off-Autos

1.5 COORDINATION

- A The Commissioning authority shall receive a copy of all construction documents, addenda, change orders, and appropriate approved submittals and shop drawings directly from the Contractor.
- B The Commissioning Authority shall disseminate written information and documents to all responsible parties relative to the nature and extent of the communication.
- C The Commissioning Authority is primarily responsible to the Owner, and as such, shall regularly appraise the Architect, the Contractor, and the Owner of progress, pending problems and/or disputes, and shall provide regular status reports on progress with each system. Any potential

change in the contractual and/or financial obligations of the owner (credits, change orders, schedule changes, etc.) shall be identified and quantified as soon as possible.

- D The Commissioning Authority shall coordinate the schedule of commissioning activities with the construction schedule. It is possible that some procedures will be completed before the entire Electrical system is completed.

1.6 SCHEDULE

- A Final Commissioning shall not commence on the individual pieces of equipment, Network Lighting Controls, Occupancy and Daylighting Sensors and d other electrical systems until the Contractor Readiness Forms are delivered to the CxA.
- B Pre-Functional Commissioning shall commence during the progress of the project. Contractor Readiness checklist do not typically have to be filled out for the CxA to check out these systems. However, the contractor is responsible to inform and schedule the CxA to do Pre-Functional Checks.
- C Contractor schedules and scheduling is the responsibility of the Contractor. The Commissioning Authority shall provide commissioning scheduling information to the contractor for review and planning activities.
- D The following list is a general set of tasks and criteria along with an approximate duration for each task in regards to the CxA activities. This list is intended to be utilized as a guideline for creating an appropriate schedule for all of the work related to electrical systems commissioning. Three of these activities can be commissioned concurrently at one time. These activities do not include the PFAT Systems. The activities do not include issues that will take additional days to fix.
 - 1. PFAT Systems – PFATs will be completed within 10 business days of the contractor native to CxA to start. We expect these systems to be split up and not told to inspect ALL systems at one time. These will be completed during the typical construction schedule and before Startup.
 - 2. Variable Frequency Drives – 3 business days
 - 3. Network Lighting Controls – 10 business days
 - 4. Occupancy Sensors/Daylighting Sensors – 10 business days
 - 5. Panelboards – 3 business days
 - 6. Receptacles – 7 business days
 - 7. Lighting and Local Lighting Controls – 7 business days
 - 8. Metering – 2 business days
 - 9. Fire Alarm Review – 2 business days
- E Most other electrical systems are covered during PFAT phase or HVAC Systems Commissioning and the electrical systems associated with those systems shall be commissioned with the HVAC Systems Commissioning.
- F Completion and acceptance of the electrical systems commissioning shall be a condition of Substantial Completion. The building shall be considered 'not ready to utilize for its intended use' until such time that the electrical systems commissioning is successfully completed.
 - 1. In the event that Substantial Completion is given by the owner to the Contractor and Commissioning is not complete then the Warranty period for all pieces of electrical systems shall not begin until the CxA gives their final Commissioning Report.

1.7 Miscellaneous Contractor Responsibilities

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- A Means and Methods: The contractor is solely responsible for the means and methods of construction. While the CxA shall assist in construction the final responsibility rest solely on the General and Installation Contractor.
- B Special Tools and Equipment: While the CxA retains tools in accordance with NEBB BSC Procedural Standards any specialized tools to test the equipment shall be provided to the CxA and used by the Contractor to prove compliance with the OPR and Construction Documents.

PART 2

– PRODUCTS

(NOT USED)

PART 3

– EXECUTION

3.1 commissioning Kickoff meeting

- A The CxA shall facilitate a Commissioning Kickoff Meeting after all Electrical, Electrical, and Plumbing subcontractors are under contract with the General Contractor. The CxA shall invite the Architect, Engineers, and Owners Representatives to the meeting.
- B The General Contractor shall ensure that the following individuals are in attendance:
 - 2. The Electrical Foreman and Project Manager
 - 3. The Plumbing Foreman and Project Manager
 - 4. The Controls Foreman and Project Manager
 - 5. The Test and Balance Project Manager
 - 6. The Electrical Foreman and Project Manager
 - 7. The Fire Protection Foreman and Project Manager
 - 8. The General Contractor Project Engineer, Superintendent, and Project Manager
- C The CxA shall keep meeting minutes and distribute to the individuals present.

3.2 Distribution List

- A. The distribution list shall be developed during the Commissioning Kickoff Meeting. This distribution list shall be used for all distribution of commissioning activities. While every effort shall be made to distribute all pertinent information to the sub-contractors by the CxA, the sole responsibility for sub-contractors to receive information rest on the General Contractor.
- B If the sub-contractors do not receive information in regards to commissioning activities and the CxA has to reschedule a meeting or appointment or testing activity the contractor shall reimburse the CxA for any expenses as a result.

3.3 Commissioning Plan

- A. The Commissioning Plan shall be developed by the CxA and delivered at the conclusion of the submittal process.
- B The Commissioning Plan will have the CxA Procedural Standards for testing, the PFAT checklist, the FAT checklist and the Contractor Readiness checklist.
- C The sub-contractors and contractors are responsible for reviewing the above checklist and provide comments to the CxA within 30 calendar days of receiving the commissioning plan. During this comment period the comments must be received in writing and the CxA will work with the individual contractors and sub-contractors to ensure the safety of systems. After the 30-day period for

comment any additional comments received shall be reviewed by the CxA, however, the subcontractor shall be liable for any cost associated with this review and any delays.

3.4 Submittal Reviews and Submittal Meetings

- A The CxA shall review all electrical submittals. It is the responsibility of the contractor to ensure they receive the CxA reviews. The Architect is responsible for delivering the submittals to the CxA, however, in the return submittal if the contractor does not see our review or see an acknowledgement that we did not want to review the submittal it is the responsibility of the contractor to ask for the submittal from the CxA directly.
- B The subcontractor, supplier and manufacturer are responsible to submit with initial submittals a line by line submittal compliance document. The compliance document will follow the specification that the submittal is in reference too. The compliance document will have one of the following for each paragraph of the specification: Comply, Exception, or Unable to Comply. With each Exception and Unable to Comply the compliance document will have a detailed explanation.
- C The subcontractor, supplier and manufacturer shall attend a submittal review meeting before any piece of equipment shall be ordered. This meeting will be held and conducted by the Commissioning Authority at a place designated by Commissioning Authority (which typically is the General Contractors Trailer). During this meeting the CxA, Engineer, and Owner will review the submittal compliance document.
- D The submittals will be marked with Reviewed, reviewed as Noted, defer to Engineer, Note, or Revise and Resubmit. Only Revise and Resubmit items will have the expectation of a re-submittal. In the event that any item is marked as Revise and Resubmit contractor shall pay all expenses incurred by the CX Authority for the re-review process.

3.5 Building Information Modeling (BIM) Reviews

- A. The CxA shall review the BIM models at 90% completion for access issues. The file shall be delivered to the CxA in a NavisWorks format (.nwd).
- B The contractor may split the review up by floors. Partial floors shall not be reviewed by the CxA until the entire floor is completed to 90%.
- C The CxA shall deliver a floor plan with markups on areas of access concern.
- D The BIM model shall include all items as outlined in specification 019113 – “General Commissioning Requirements”

3.6 Coordination Meetings (MEP Meetings)

- A. The CxA shall conduct a weekly coordination meeting. The electrical, plumbing, test and balance, electrical, and controls contractor shall attend these meetings on a weekly basis.
- B The purpose of these meetings is to coordinate installation, commissioning, and testing activities. These meetings will be conducted by the CxA and minutes from these meetings shall be delivered to those individuals described in the Distribution List section.

3.7 Construction Observation and First Installs

- A. The CxA shall observe construction activities throughout the construction of the project. The contractors shall be available during these observations for information. An issues log as outlined in Part 1 shall be kept by the CxA.

- B First installs are not mockups; they are first installations of individual pieces of equipment that need to be installed in their location. First installs shall be required by the contractor and sub-contractor for the following items:
 - 1. Underground Raceway Installation
 - 2. Aboveground Raceway Installation
 - 3. Floor Boxes
 - 4. Panelboards
- C Contractor shall coordinate and not prohibit observations and first installs. Sub-contractors, owner's representatives and engineers shall review the first installs for compliance.

3.8 Contractor Readiness Checklist

- A Contractor Readiness Checklist (CRC) shall be delivered by the CxA to the contracting team for the contracting team to fill out. The purpose of the CRCs to inform the CxA of the readiness of the contractor to begin Functional Testing on the electrical system.
- B The CxA shall not begin Functional Testing of the system or any equipment until the CRC are received. While some systems can be tested without a complete system the CxA shall have the final say on which can and cannot begin functional testing based on the completeness of the project.
- C If the contractor delivers the CRC and the CxA finds the system is not functional then the contractor shall be liable for cost incurred by the CxA.

3.9 Pre Functional Checklist

- A The Pre Functional Checklist shall be developed by the CxA and delivered in the commissioning plan.
- B The Pre Functional Checklist shall be reviewed by the contractors and sub-contractors and shall be executed by the CxA.
- C The CxA shall review 100% of all electrical systems installations.

3.10 Functional Performance Checklist

- A The CxA shall execute Functional Performance Checks with the attendance of suppliers, Electrical Contractors, Lighting Controls Contractor and the Fire Alarm Contractor at the request of the CxA.
- B Commissioning Authority shall develop and document the commissioning procedures to be used this will be delivered to the contractor in the commissioning plan and is called the Procedural Standards. Include a performance checklist and performance test data sheets for each system based on actual system configuration. These procedures shall be reviewed by the appropriate contractors and sub-contractors for technical depth, clarity of documentation and completeness. Emphasis shall be placed on testing procedures that shall determine actual system performance and compliance with the design intent.
- C The Commissioning Authority shall determine the acceptance procedures for each system within electrical divisions as required. The acceptance procedures shall incorporate the commissioning standards and successful testing results as referred to throughout electrical and electrical specifications.

1. In particular, lighting controls systems including the network lighting controls, occupancy sensors, and daylighting controls.
 2. Where NETA is required for test procedures in the other sections, whether the section requires a written test report or not, the electrical contractor shall provide a written report in accordance and outlined to the most current NETA specifications.
- D The appropriate contractor and vendor(s) shall be informed of what tests are to be performed and the expected results. Whereas some test results and interpretations may not become evident until the actual tests are performed, all parties shall have a reasonable understanding of the requirements. The Commissioning Plan shall address those requirements and be distributed to all parties involved with that particular system.
- E Acceptance procedures shall confirm the performance of systems to the extent of the design intent. When a system is accepted, the Owner shall be assured that the system is complete, works as intended, is correctly documented, and operator training has been performed.
- F During the functional performance testing the BMS or ATC contractor shall be in attendance to setup the CxA on the controls system and be in attendance throughout the Sequence of Operation checks.
- G The CxA shall review 100% and test 100% of electrical systems as outlined in the systems to be commissioned section.

3.11 Trending

- A Trending points shall be outlined in the Procedural Standards as delivered by the CxA in the commissioning plan.
- B The network lighting controls contractor shall trend the system in their software for a minimum of four (4) weeks. If the contractor is unable to do four weeks of trending in the system, then the contractor shall reimburse the Owner for CxA expenses to install temporary trending loggers.

3.12 Operation and Maintenance Manuals

- A The contractor responsible for Electrical O&Ms shall deliver electronic copies of those O&M to the CxA at 50% billable completion of installed electrical systems. The O&M manuals shall include installation requirements and maintenance requirements.
1. The 50% electrical billable draw shall be held up by the owner at the request of the CxA if the O&M Manuals are not delivered.
- B The final O&M Manual shall be reviewed by the CxA before delivery to the Owner. Any deficiencies shall be noted and the contractor shall remedy before final delivery.
- C The final O&M must be delivered to the Owner before training shall commence and it shall be one of the requirements for Substantial Completion.

3.13 Current Facility Requirements and Operation and Maintenance Plan

- A All contractors as defined in Participants in ELECTRICAL Commissioning shall compile a Current Facility Requirements (CFR) and Operations and Maintenance (O&M) Plan as outlined in LEED v4 EA – “Fundamental Commissioning and Verification”.

- B The contractors shall provide the following in an editable Microsoft Word Format. (.doc or .docx) in a narrative format for use by the CxA to provide the final CFR and O&M Plan.

1. Building occupancy schedule
2. Set points for all lighting controls equipment
3. Lighting levels throughout the building
4. Changes in schedules or set points for different seasons, days of the week, and times of day
5. Systems narrative describing the electrical systems and equipment
6. Preventive maintenance plan for building equipment described in the systems narrative

3.14 Systems Manual

- A All contractors as defined in Participants in ELECTRICAL Commissioning shall compile a Systems Manual.
- B The contractors shall provide the following in an editable Microsoft Word Format. (.doc or .docx) in a narrative format for use by the CxA to provide the final Systems Manual. The submittals shall be compiled by section in a .pdf format.

1. Construction record documents and specifications
2. Approved submittals
3. As-built drawings
4. As-built sequence of operation
5. Original set points for all systems commissioned
6. Recommended schedule for sensor recalibration
7. Equipment operations and maintenance manuals
8. Equipment preventive maintenance schedules
9. Confirmation of completed training for the owner and occupants

3.15 TRAINING

- A The CxA shall be invited to all electrical training sessions by the General Contractor.
- B The training shall not commence until the system has been commissioned and proven ready for training.
- C The contractor shall schedule and coordinate training sessions for the Owner's staff for each system. Training shall be in a classroom setting with the appropriate schematics, handouts, and visual/audio training aids on-site with equipment.
- D The Commissioning Authority shall review agendas, which shall be submitted at least four weeks before training, and shall audit the training sessions. The agenda shall include but not limited to operational set points, runtime schedules, general operation and maintenance requirements, time and location for the training. Agendas shall conform to the Syllabus section in ASHRAE 0-2013-Appendix P and LEED v4 – EA – “Enhanced Commissioning”.
- E The training program shall include the following:
1. Emergency instructions and procedures
 2. Operation instructions and procedures
 3. Troubleshooting procedures
 4. Maintenance and inspection procedures
 5. Repair procedures
 6. Upkeep of the systems manual and associated maintenance documentation logs

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- F Evaluations shall be done of the training system by the attendees. The evaluations shall reflect ASHRAE 0-2013-Appendix P Evaluation Form.
 - 1. If the Evaluations from the training average rises above 2 (based on 1 being very well trained and 5 not at all trained) then the training shall recommence. All cost for the re-training shall be solely born by the contractor training including any reimbursement to the Owner for the CxA, the Owners Operational Staff, and any other cost born by the owner for failure to comply with requirements.
- G The contractor shall provide a schedule for training times and dates. The schedule shall include location, who is training, trainers contact information,
- H The appropriate installing contractors shall provide training on all the major systems per specifications, including peculiarities specific to this project.
- I The equipment vendors shall provide training on the specifics of each major equipment item including philosophy, troubleshooting, and repair techniques.
- J The automatic control vendor shall provide training on the control system per their specification section.
- K The contractor shall furnish a final video DVD set, above the owner's requirements as defined elsewhere, to the CxA for their use and ownership and review. Included in those DVDs shall be the sign-in sheet for each training.

3.16 Record Drawings or Redlines

- A The CxA shall review the "Redlines" or "Record Drawings" on a bi-weekly basis. Updating redlines shall be a term of a monthly draw and can hold up a monthly draw if the Record Drawings are not updated.
- B Record Drawings or Redlines shall be kept in a printed format above and beyond any BIM modeling. If record drawings are being kept on BIM a printed out version on a typical 2D flat sheet of paper large enough to read shall be kept as well in the General Contractors trailer.
- C The following requirements shall be meet for Redlines or Record Drawings:
 - 1. Underground: All underground raceways 1.5" and larger or raceways accumulating in 1.5" or larger shall be shown with dimensions from walls (not gridlines) and elevations of the pipe at every ninety or y fitting and marked at every 20 feet on the drawings.
 - 2. Above Ground Concealed: All above ground piping 1.5" and larger or raceways accumulating in 1.5" or larger concealed in hard lid or behind walls shall be dimensioned from walls.
 - 3. Above Ground Accessible or Unconcealed: All above ground piping 1.5" and larger or raceways accumulating in 1.5" or larger shall be documented in the redlines. General location shall be sufficient as long as the general location is in the same area not separated by walls.
- D The final redlines shall be reviewed by the CxA before delivery to the Architect.

3.17 Warranty Period and Continuous Commissioning

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- A The CxA shall provide Continuous Commissioning during the One Year Warranty Period after substantial completion. During this time the CxA shall adjust settings on the BMS for optimization of the system, shall find issues with the system, and shall report issues to the contractors.
- B The contractor and sub-contractors shall resolve issues immediately.

3.18 Repeated Work, Testing, and Reviews

- A Contractor shall, at no additional cost to the Owner, repeat the complete verification test procedure for each test for which acceptable results are not achieved. Repeat tests until acceptable results are achieved.
- B Contractor shall compensate the Owner for costs incurred as the result of tests review or inspection repeated. This includes the costs for the Commissioning Authority, Design Architect, Design Engineers, and Owner--s personnel for billed costs (including travel expenses) for the extraordinary participation of the Owners Representative, Architect, Commissioning Authority or owners staff.
- C All retesting, inspection or review of equipment or re reviewing of startup sheets or re reviewing of electrical systems or re-reviewing of submittals shall be billed at an hour of \$250 per hour with a minimum of 4 hours billed per session.