SECTION 00 9112

ADDENDUM NUMBER 2

DATE: July 28, 2016

TO: PROSPECTIVE BIDDERS

This Addendum forms a part of the Contract Documents and modifies the Bidding Documents dated **July 1, 2016**, with amendments and additions noted below. Where addendum items below modify a portion of the Bid Documents, the remainder of the Bid Document remains unchanged.

********* THIS ADDENDUM CHANGES THE RECEIPT OF BIDS DATE TO AUGUST 16, 2016 ********

******* The last date that RFI's will be accepted is August 2, 2016 *******

ACKNOWLEDGE RECEIPT OF THIS ADDENDUM IN THE SPACE PROVIDED IN THE BID FORM. FAILURE TO DO SO MAY DISQUALIFY THE BIDDER.

This addendum consists of **9** page(s), in addition to the following document(s):

A. RFI Log, dated 7/27/2016 (2 pages).
B. Section 22 0800 Commissioning of Plumbing Systems
C. Section 26 0800 Commissioning of Electronic Systems
D. Sketches:
   ADD2-S-01 Basement Demolition Keyplan
   ADD2-S-02 Second Floor Keyplan
   ADD2-S-03 Third Floor Keyplan
   ADDSK-A-03 Room 235 and 237 Furred Wall
   ADDSK-A -04 Band Room
   ADD2-M01 Pool Plunge Exhaust System Removal
   ADD2-E01 Vacancy Sensor Diagram
   ADD2-E02 Vacancy Sensor Diagram
E. Drawings:
   LS103 Life Safety Third and Fourth Floor Plans (Revision #1, dated 7.27.16)

CHANGES TO ADDENDUM NO 1

A. See sketches ADD2-E01 and ADD2-E02 that are referenced in paragraph A of the following item:

   "ALL LIGHTING DRAWINGS, E110, E112, E114, E116, E130, E132, E134, E136, E150, E152, E156, E170, E172, E174, E176 AND E190"

CHANGES TO THE PROJECT MANUAL

00 0110 TABLE OF CONTENTS

A. Change Section "22 4700 WATER CLOSETS" to read "22 4700 WATER COOLERS".

B. Add Section 22 0800 Commissioning of Plumbing Systems

C. Add Section 26 0800 Commissioning of Electronic Systems

01 1200 - MULTIPLE CONTRACT SUMMARY

2. MULTIPLE CONTRACT SUMMARY 01 12 00. Notes to Electrical Contractor (Contract No. 300) page 22.

Replace Note q. page 22 with the following:

q. At all ceilings, the Electrical Contractor shall install temporary lighting at light levels safe for construction and as described in Section 01 50 00 Temporary Facilities. The temporary lights shall be provided for all areas of construction and is also intended to illuminate all rooms, work areas, pathways, corridors, stairwells, etc. The temporary lights shall be removed and discarded by the EC at project completion and for installation of the new lights. Where temporary lighting already exists, reference the following note hh. for scope of work requirements.

01 5000 – TEMPORARY FACILITIES AND CONTROLS

Temporary Facilities and Controls 01 50 00 3.2 B. Temporary Electric Service. Page 8.

Replace Note B. 1. Temporary Electric Service page 8 with the following:

B. Temporary Electric Service:

1. The EC Electrical Contract (Contract No. 300) shall provide and maintain temporary electric service at all building sites consisting of main power hook-up, power service to temporary field offices, staging areas, and work areas in new construction, additions and renovation areas, panel boards, switchboards, temporary lighting for site and renovations and new buildings, temporary heating & ventilation, temporary equipment, and branch circuit wiring. The staging areas and building construction and renovation may require separate services. Services for each area shall be minimum 400 amp, 3-phase, unless otherwise authorized by the Construction Manager. Temporary service shall be operational seven (7) days a week, 24 hours per day, maintained during all work periods, and shall comply with all codes and regulations. System shall be modified as required or as directed by the Construction Manager as work progresses.

01 5000 – TEMPORARY FACILITIES AND CONTROLS

Temporary Facilities and Controls 01 50 00 3.2 C. Temporary Water Service. Page 9.

Replace Note C. 1. Temporary Water Service page 9 with the following:

C. Temporary Water Service:

1. The PC Plumbing Contract (Contract No. 400) shall provide and maintain temporary water and sewer service, including water distribution piping and hose bibs on sites, as required throughout the construction period. The PC Plumbing Contract (Contract No. 400) shall provide temporary water and sewer services to all buildings as required during all shut downs necessary for utility changeovers and

construction activity. Levels of all sites such that the distance between any given hose bib shall not exceed 75 feet.

01 5000 – TEMPORARY FACILITIES AND CONTROLS
Temporary Facilities and Controls 01 50 00 1.4 USE CHARGE. Pages 2, 3.

Delete paragraph 1.4 B. Water Service in its entirety.
Delete paragraph 1.4 C. Electric Power Service in its entirety.
Delete paragraph 1.4 D. Gas Service in its entirety.

01 1200 MULTIPLE CONTRACT SUMMARY
MULTIPLE CONTRACT SUMMARY 01 1200 - 1.10 ADDITIONAL NOTES TO CONTRACT DOCUMENTS page 9, 10

Add Note 51. with the following:
All work and Demolition Keynotes on Pages D100, D101, D102, D103 and D104 are the responsibility of the General Contractor with the following exceptions:
Removal notes pertaining to mop sinks, sinks and drinking fountains (D.F.) on pages D100, D101, D102 and D103 shall be completed by the Plumbing Contractor (Contract No. 400).
D104 plan note “create opening in existing roof + roof slab coordinate w/ mechanical” shall be completed by the Mechanical Contractor (Contract No. 200).

Add Note 52. with the following:
All work and General Project Notes on A100 shall be the responsibility of the General Contractor with the following exceptions:
Note 3 shall be performed by each Prime Contractor for its scope of work.
Note 7 shall be performed by each Prime Contractor for its scope of work.
Note 8 shall be performed by all Prime Contractors.
Note 9 shall be performed by all Prime Contractors.
Note 10 shall be performed by all Prime Contractors.
Note 12 shall be performed by each Prime Contractor for its scope of work.
Note 13 shall be performed by each Prime Contractor for its scope of work.
Note 14 shall be performed by each Prime Contractor for its scope of work.
Note 16 shall be performed by each Prime Contractor for its scope of work.

Add Note 53. with the following:
All work and General Demolition Plan Notes on A100 shall be the responsibility of the General Contractor with the following exceptions:
Note 1 shall be performed by each Prime Contractor for its scope of work.
Note 2 shall be performed by all Prime Contractors.
Note 3 shall be performed by all Prime Contractors.
Note 4 shall be performed by each Prime Contractor for its scope of work.
Note 5 shall be performed by all Prime Contractors.
Note 9 shall be performed by all Prime Contractors.
Note 10 shall be performed by all Prime Contractors
Note 11 shall be performed by all Prime Contractors.
Note 12 shall be performed by all Prime Contractors.
The second Note 7 “The contractor…” shall be performed by all Prime Contractors.
The second Note 8 “Remove all signage…” shall be performed by the General Contractor (GC).
The second Note 9 “Remove existing blinds…” shall be performed by the General Contractor (GC).
The second Note 10 “All doors…” pertains to all Prime Contractors.
The second Note 11 “Remove existing ceiling…” shall be performed by the General Contractor (GC).

The second Note 12 “Repair wall due…” shall be performed by the General Contractor (GC).

Add Note 54. with the following:
All work and General Floor Plan Notes on A100 are the responsibility of the General Contractor with the following exceptions:
Note 1 shall be performed by each Prime Contractor for its scope of work.
Note 4 shall be performed by each Prime Contractor for its scope of work.
Note 6 pertains to each Prime Contractor for its scope of work.
Note 7 pertains to each Prime Contractor for its scope of work.
Note 8 pertains to each Prime Contractor for its scope of work.
Note 9 pertains to each Prime Contractor for its scope of work.
Note 10 pertains to each Prime Contractor for its scope of work.
Note 23 pertains to each Prime Contractor for its scope of work.

Add Note 55. with the following:
All work and Floor Plan Keynotes on A100 are the responsibility of the General Contractor.
All work and Hazardous Material Awareness Notes is the responsibility of each Prime Contractor for its scope of work.

Add Note 56. with the following:
All work and plan notes on A120 shall be the responsibility of the General Contractor with the following exceptions:
Notes and details referencing Roof Penetration Housing, Piping Roof Penetration Detail and Typical Curb Detail @ Exhaust Fan shall be performed by the HVAC Contractor (Contract No. 200). The HVAC contractor shall patch and maintain roof weather tight, provide and set curbs as shown and provide new roofing and flashing per this scope of work.

Add Note 62. with the following:
All work and Corridor Keynotes and General Corridor Elevation Notes on A300 shall be the responsibility of the General Contractor with the following exceptions:
Note 10 abandoned electrical box and all associated components shall be removed by the Electrical Contractor (Contract No. 300), the General Contractor shall repair wall to match existing after removals.
Note 12 conduit removal shall be performed by the Electrical Contractor, the General Contractor shall patch after conduit removal.

Add Note 63. with the following:
All work and Corridor Keynotes and General Corridor Elevation Notes on A305 shall be the responsibility of the General Contractor with the following exceptions:
Note E8 the Electrical Contractor shall remove all existing raceway and electrical boxes mounted to wood window trim, the General Contractor shall repair wood to match existing adjacent material and finish after removal.
Note E11 shall be performed by the Electrical Contractor (Contract No. 300).
Note E19 the Electrical Contractor shall remove all existing raceway and electrical boxes mounted to wall, the General Contractor shall repair wall to match existing adjacent material and finish after removal.

Add Note 64. with the following:
All work and Toilet Room General Notes on A354 shall be the responsibility of the General Contractor with the following exceptions:
Note 12 shall be performed by the Plumbing Contractor (Contract No. 400).
Note 13 shall be performed by the Plumbing Contractor (Contract No. 400).

Add Note 65. with the following:
All work and General Reflected Ceiling Plan Notes and Ceiling Work Keynotes on A401 shall be the responsibility of the General Contractor.

ROOM FINISH SCHEDULE

A. Change ceiling height of the rooms to the height indicated in brackets and extend bulkhead construction within room in-kind to 1" below revised ceiling height when ceiling height is lowered below existing bulkheads. Rooms and new ceiling heights are as follows:
    a. Room 136 (9'-6" AFF).
    b. Room 144 (9'-7 ½" AFF).
    c. Room 236 (9'-10" AFF).
    d. Room 244 (9'-10" AFF).
    e. Room 308 (Match existing 10'-2" AFF).
    f. Room 324 (Match existing 10'-2" AFF).
    g. Room 336 (Match existing 12'-6" AFF).
    h. Room 344 (Match existing 10'-1" AFF).
B. Refinish Band Room wood floor per Specification Section 09 6400. Include in Alternate GC-05.
C. Concrete floors of Corridors BC-1, BC-2, BC-2A, BC-3, BC-3C, BC-3D, BC-4, BC-4A, AND BC-4B shall be painted.
D. Concrete floor of Corridor BC-3A shall be Concrete–Sealed.

09 6400 STAGE FLOOR REFINISHING

A. Replace paragraph 1.02 1 with the following:
    "1. Refinishing of existing auditorium and band room wood floors.
        a. Refinish built-in tiers and risers of band room."

09 6613 TERRAZZO FLOORING AND REPAIR

A. Replace "(220 grit through 100 grit)" in paragraph 3.05 B 3 with the following:
    "(200 grit through 2000 grit)"

23 0923 - BUILDING MANAGEMENT SYSTEM - ELECTRONIC DDC LOGIC

A. Article 1.1.D - Clarification - Removal of the pneumatic controls systems shall include the complete removal of the wire mold and conduit systems.

B. Add Article 1.1.G - All control wiring is to be concealed where possible. Where not possible, vertical and horizontal raceways are to be installed in finished areas. In areas where concealment is impossible, wire mold to be located and installed in an inconspicuous fashion and approved by the architect and engineer prior to installation. At no time shall wire mold be installed on the wood trim surfaces. Coordinate all surface raceway installation and locations with architect and engineer prior to installation.

260500 - BASIC ELECTRICAL REQUIREMENTS

A. Delete Article 1.12 in its entirety.

260800 - COMMISSIONING OF ELECTRICAL SYSTEMS

A. Add the following specification section per attached document.

CHANGES TO THE DRAWINGS

HMA-Series Drawings

A. Asbestos Abatement Note 10: Change to read as follows:

"Alternate GC-01: Remove existing aluminum window frame, sash, and caulking complete. Remove all asbestos-containing caulk from existing wood window frame and surrounding masonry complete. Wood window frame to remain. Coordinate window removal with the Architectural Drawings. Refer to A200-Series Elevation Drawings.".

B. Add Asbestos Abatement Note 14 as follows:
"14. Remove existing interior window frames, sashes, and any associated caulking complete along Corridor BC-4 at Storage Room 44C and Custodian Room 44B. Window glazing compound on the window sashes are asbestos-containing. Removal is considered OSHA Class II work. Dispose of as EPA Category II Non-friable waste.".

HMA 102 – BASEMENT – AREA B HAZARDOUS MATERIALS ABATEMENT PLAN

A. Rooms 44B and 44C: Change Asbestos Abatement Note 8 to read "14".

HMA 108 – FIRST FLOOR – AREA D HAZARDOUS MATERIALS ABATEMENT PLAN

A. Girls Toilet Room 120A: Change Asbestos Abatement Note 2 to read "4".

HMA 109 – SECOND FLOOR – AREA A HAZARDOUS MATERIALS ABATEMENT PLAN

A. Office 200B: Omit Asbestos Abatement Note 4.

S410 – FRAMING SECTIONS

A. Detail 10: Add the following Note:
"6. For bidding purposes, contractor shall assume average thickness of 1 ½" of Homasote.".

LS103 – LIFE SAFETY THIRD AND FOURTH FLOOR PLANS

A. See attached drawing with third floor room names and numbers displayed.

D-SERIES DRAWINGS

A. Symbol Legend: Replace window symbol text "Remove existing aluminum window u.n.o.. Remove existing wood sash when exists" with the following.
"Follow HMA-Series drawings for removal of existing aluminum window units and wood sash when they exist at aluminum window removals.".

D100 – BASEMENT DEMOLITION PLAN

B. Demolition Keynote 2: omit the word “undisturbed”.
C. Room 74: Omit keynote 13 from this room.

D101 – FIRST FLOOR DEMOLITION PLAN

A. Rooms 162A and 165F: Omit keynote 13 from this room.

D102 – SECOND FLOOR DEMOLITION PLAN

B. Room 271: Change keynote 7 at double door to read “3”.
C. Rooms 264A and 269A: Omit keynote 13 from this room.

A101 – BASEMENT PLAN

A. Exterior Court #3: Add to courtyard concrete slab note that concrete is to match beige color of existing concrete.

A102 – BASEMENT PLAN

A. Exterior Court #4: Add to courtyard concrete slab note that concrete is to match beige color of existing concrete.

A112 –SECOND FLOOR PLAN

A. Provide furring and other work to rooms 235 and 237 per sketch ADDSK-A-03.

A119 –FOURTH FLOOR BAND ROOM FLOOR PLAN

B. See attached revised floor plan sketch ADDSK-A-04 of Band Room.

A325 – SCIENCE ROOMS PLANS & ELEVATIONS

A. Details 1 and 2: Change elevation key tag from A320 to read “A325”.
B. Change elevation letter designation of “F” at Elevation drawn above Elevation “E” to read “G”

A328 – SCIENCE ROOMS PLANS AND SECTIONS

C. Detail 1: Change elevation key tag from A323 to read “A328”
D. Detail 2: Change elevation key tag from A323 to read “A328”.
E. Detail 3: Change elevation key tag from A322 to read “A328”.

A401 – BASEMENT REFLECTED CEILING PLAN

A. At Rooms 043, 045, 047, and 049: Provide (2) layers 5/8” gypsum board ceiling applied to light gauge metal framing at underside of existing concrete joists similar to Typical Plaster Ceiling Infill Detail 1/A404.

A402 – BASEMENT REFLECTED CEILING PLAN

A. At Room 026A and 027: Provide (2) layers 5/8” gypsum board ceiling applied to light gauge metal framing at underside of existing concrete joists similar to Typical Plaster Ceiling Infill Detail 1/A404.

A416 – THIRD FLOOR REFLECTED CEILING PLAN

A. Omit two (2) light fixtures nearest the exterior window wall from room Biology 9th Room 339.

A500 through 504 inclusive VERTICAL CIRCULATION STAIRS 2, 3, 4, 5, 8, 9, 12A, 12B, AND HOUSE RIGHT AND HOUSE LEFT

A. Clarification of portions of work required at Stairs of Alternate GC-02
   1. All existing handrails of those stairs are to be replaced regardless of a note identifying such work.
   2. All existing stair treads of those stairs are to be replaced regardless of a note identifying such work, including the tread at the intermediate and terminal landings.
   3. Typical Section 5/A501 applies to those stairs.

A501 – VERTICAL CIRCULATION STAIR 3 PLANS, SECTION AND DETAILS

D. Detail 5: Replace each “Provide new fall protection grille” dimension text with the following dimension text:

   “Remove all existing interior window protection guards and provide new fall protection screens.

A503 – VERTICAL CIRCULATION STAIRS 8 AND 9 PLAN, PREP RM. LIFT PLANS, SECTIONS AND DETAILS

E. Detail 4: Change section mark from 9/A504 to read “9/A503”.
F. Detail 4: Change section mark from 10/A504 to read “10/A503”.

A504 – ENLARGED STAIR PLAN AND SECTIONS- STAGE

G. Detail 4: Change section mark from 7/A505 to read “5/A504”.

A800 – PARTITION SCHEDULE & NOTES

A. Floor/Roof Assemblies / New Floor Topping at Existing Walls: Add the following note: “Notes:
   1. Provide sawtooth stagger pattern of 18” removed/18” maintained, except at wall ends remove/maintain 8”.
   2. Notify Architect and Structural Engineer following removals from Side A of first wall for review of demolition approach and conditions.
   3. Prior to removal of wood sleeper floor system on opposite side, Side B, grout space between new concrete and wall with non-shrink grout. Provide same after placement of Side B concrete slab infill.”.

MD110 - QUADRANT C BASEMENT DEMOLITION PLAN - HVAC

A. Add the work associated with the removal of the pool plunge exhaust system as shown on the attached sketch ADD2-M01.

E503 - DETAILS - ELECTRICAL

A. Add the following sketches: ADD2-E01 AND ADD2-E02 to accommodate Bid addendum #1.

TD152- QUADRANT C SECOND FLOOR PLAN DWT DEMOLITION

A. Add demolition note 4 to read as follows: Relocation of existing dual compartment raceway shall be by EC.

ALL T-SERIES DRAWINGS

A. Remove all references to "Technology Integrator" from drawings.

END OF ADDENDUM NUMBER 2

RSMP Phase 2A
James Monroe High School
RFI LOG
7/28/16

Project Owner: **Rochester City School District**
Constr. Manager: **Campus CMG** **CJS Architects** **Project No 1522**

RFI #	Date Received	RFI SUBJECT	RFI REPSONSE
3	07/22/16	Can acoustical ceilings be hung from existing plaster ceilings, please advise.	No, install per Section 09 5120 Article 3.3, using materials specified in paragraph 2.2 D..
4	07/22/16	Can acoustical ceiling anchors be shot into existing joists bottoms, please advise.	No, install per Section 09 5120 Article 3.3, using materials specified in paragraph 2.2 D..
5	07/22/16	If ceilings cannot be hung from plaster, how are existing building members located that are buried by plaster ceilings.	Invasive or non-invasive methods are available. If any portion of the plaster ceiling plane, that is attached to the bottom of the joists is removed, it shall be replaced with two (2) layers of 5/8" fire code gypsum board similar to detail 1/A404.
6	07/22/16	Corridors mechanicals are congested, please advise acceptable means of ceiling hangers to be used where overhead structure fastening is not possible. Framing members that span corridor width may be necessary.	See Section 09 5120 3.3, with special attention to paragraph B 3.
7	07/22/16	A construction software allowance is prescribed for this phase of construction. The schedule is greatly condensed at best, should the GC really be tasked with owner/CM software issues and responsibilities, please advise.	At this time the Construction Software Allowance will remain in contract.
8	07/22/16	Windows are an Alternate, window demo is depicted on the plans as base bid work and on HMA drawings as an alternate. Please advise how this is intended to be estimated.	Windows removal is an alternate as indicated on HMA drawings and Section 00 4323 Alternates. Estimate accordingly.
9	07/22/16	Interior walls are built upon the floor sleeper system. To remove the sleeper system a portion of this system must remain beneath the wall. What is the size of this portion and has any concern been given to walls shifting and or moving from the extensive demo required to and the frequency of the demo. Please advise	Maximum dimension of the staggered removal/maintained material below walls, over the walls length, shall be 1'-6", except at wall ends remove/leave 8" of material below the wall. Brace top of wall as required during wood sleeper floor system demolition. After the floor system is removed at the first wall, and prior to placing components for the new concrete floor assembly infill, request Architect and Structural Engineer to review demolition methods of operation and resulting conditions. Simplified measures may be assessed.
10	07/22/16	Demo drawings are missing walls and look as though they are a printing mistake. Please advise.	As printed, 24x36 format drawings do show the walls, although lightly. Reduced size/scaled formats do not show the walls unless special attention is given by the Printing Company when printing those pages. Estimate from the format that shows the walls.
11	07/22/16	Are emergency egress ladders new or existing, please advise.	Egress ladders are new work.
12	07/22/16	Court yards 1 & 2 are not shown to be removed and replaced. During phase 1, it was discovered that the courtyard subgrades have settled out many inches below the concrete subgrade surface, to the point that the PC prime was directed to only place back 1-2 inches of concrete because replacement was necessary in phase 2. Please advise	Replacement of Courtyard 1 and 2 slabs on grade are not part of this project .
13	07/22/16	SD 100, note 5. Who removes the pipe rack and replaces the pipe rack?. All new phase 1 large bore piping has been run through the existing rack and does not appear to be temporary. Please advise.	General Trade Contract 100 shall replace the pipe rack. The piping is not intended to be removed, but shored and braced during removal and replacement of the rack.
14	07/22/16	Please advise if the only location for joist repair and CFR is basement rooms 25,26,26A&27.	FRP required in basement at 027B in addition to rooms listed in question. Refer to S012 and S013 for 2nd and 3rd floor framing FRP.

Project Owner: **Rochester City School District**

Constr. Manager: **Campus CMG** **CJS Architects** **Project No 1522**

RFI #	Date Received	RFI SUBJECT	RFI REPSONSE
15	07/22/16	There's a typical note to patch and CFR joists directly above interior walls in the lightweight infill locations. These walls are not coordinated with the demo plans and no plaster removal is scheduled. Please advise.	Refer to revised DWGs S012 and S013 (Sketches ADD2-S-02 and ADD2-SK-03) for walls to be reinforced. .
16	07/22/16	If two shifts of work are considered base bid at this time, what provisions from the City have been granted in relation to noise ordinance and light plants being used. Please advise.	There have been no special provisions given by the city to complete the work. All local noise ordinances will need to be followed. Work shall be coordinated around these restrictions.
17	07/22/16	If the window alternate is accepted, has the CM and owner given any consideration to schedule and duration of the work? The challenge of demo/abating each opening and the lead time for ordering even after color selections, guaranteed openings etc have been worked out, does not consider room finishes and major accessibility issues of windows located in courtyards. Do the owner and CM believe in the time frame of Phase 2 that windows can be abated/demoed and reinstalled by June 1 to turn over to facilities? Please advise.	We are going to now allow the window work to extend until June 30, 2017. We feel the work can be completed by June 30, 2017 having reviewed lead times, scope of work and second shift options.
18	07/22/16	Room numbers are not consistent between drawings. How will room numbers be kept straight in a schedule if any two rooms have to be discussed with different room numbers? This is asking for problems. Please advise if a single numbering scheme will be provided throughout all plans.	Demolition plans (including the HMA-series drawings) include the existing room numbers. New work plans include new room numbers from which signage will be based. Clear and precise communication, written and spoken, is necessary to be assured ideas are communicated effectively and understood. A single numbering system is not possible since existing large rooms are being subdivided and suites of rooms are being converted to open rooms.
19	07/25/16	Electrical spec sections 1.12 260500-6 & 1.12 262713-2 states: "Owner shall pay all utility company fees and charges for service as part of contract. Allow for an allowance of approximately $100,000.00 for Rochester City School District - Monroe". There is a $55,000.00 electrical allowance on the bid form. Please clarify if the $100,000.00 allowance is also required.	See Addendum No 2
20	07/25/16	Is GC Allowance No 4 intended to cover all costs associated with the CM Field Office as spelled out in Section 015000-11 Item 3.3D?	The allowances are for work above and beyond what is shown in the contract documents.
21	07/25/16	Are the allowance as listed in the Section 004321 intended to be for all work on the project or for work above and beyond what is shown in the bid documents? All say for "additional" work, but want to make sure that we don't carry twice.	Yes (Re: CM's field office allowance) Exceptions: items listed as base bid are not part of the allowance.
22	07/26/16	Are phase 1 and phase 2 taking place concurrently	Yes.
23	07/26/16	If phase 1 and phase 2 are to be completed at the same time who is responsible for final cleaning	a. Final Cleaning (hospital grade) at end of Phase 2a by Phase 2a Prime Contractor for General Construction.
24	07/26/16	Can the bid date be extended 2 weeks	Yhe bid is extended one (1) week.
25	07/26/16	Section 004331 – MWBE/DBE/SBE Utilization and Work Force Diversity a. III. Workforce Diversity and Business Development Goals, 1. "Each Contractor, supplier, professional service provider, or other business providing goods and services shall strive to maximize the use of Rochester based labor, contractors, suppliers and service providers in performing the Contract.i. If Rochester EBE's cannot be used to fulfill the EBE requirements should Good Faith Efforts include soliciting and hiring EBE's from outside the "Rochester" Area? What are the geographical limits of "Rochester" defined as for the purposes of soliciting and using Rochester EBE's?b. IV. Forms And Procedures. 1. "In addition to general Certification, all SBE's must complete and submit the Small Business Certification Form included in the Attachment to this Section. i. Please define the "general Certification" mentioned above? Is the general Certification meant to refer to New York State MBE, WBE, & DBE Certifications? In order to qualify for an SBE does the subcontractor first need to be either a MBE, WBE or DBE?	a. The contractor may go outside the Rochester Area to solicit and hire EBE firms. However, the COMIDA requirements for local labor will still apply. b. General Certification is a general term meant to define a firm's legal status as a business entity. General Certification is not meant to refer to the MBE, WBE, and DBE certifications. A subcontractor does not need to be MBE, WBE, and/or DBE certified to qualify as an SBE firm.

Project Owner: **Rochester City School District**

Constr. Manager: **Campus CMG** **CJS Architects** **Project No 1522**

RFI #	Date Received	RFI SUBJECT	RFI REPSONSE
26	07/26/16	Phase II Diversity Plan 2.02 Business Development and Diversification Principles and Goals, (d) EBE Status, (v) a. “MBE, WBE, DBE and SBE firms must maintain their applicable certifications throughout the duration of their work on the project. The RJSCB acknowledges that due to the timing of the recertification process, there may be a technical lapse in a firm’s certification. If upon completion of the recertification process, the certifying entity grants retroactive certification to the firm, the RJSCB will recognize the retroactive date set by the certifying entity.i. Please clarify that if the firm who was originally certified at the time the DP-1 was approved, does NOT receive its recertification then the Contractor will execute Good Faith Efforts as described in the contract documents in an attempt to backfill the participation that the decertified entity was providing. ii. Is there an expectation that the Contractor would terminate the de-certified firm to replace them with a certified EBE firm for the same scope of work?	a. The contractor is responsible for meeting the goals. The EBE will only count towards the goal while they are certified. The contractor is not required to terminate the de-certified firm, but will be responsible to fulfill the goal per the contract.
26	07/26/16	Phase II Diversity Plan, Article III Program Management and Independent Compliance Officer (ICO), 3.02 Independent Compliance Officer (ICO), (a) General Duties of the ICO, (iv)a. “Verify EBE’s are appropriately certified in accordance with the provisions set forth by recognized certification agencies. ICO shall determine whether a firm qualifies as an SBE upon review of pertinent financial and other supporting records.”i. Please clarify how long a SBE’s certification is good for? Is it on an annual basis or are they certified per project?	a. An SBE firm should complete a qualification form per project. Upon approval for that project, the firm’s SBE status will remain until the completion of their scope of work.
27	07/26/16	Phase II Diversity Plan, Article III Program Management and Independent Compliance Officer (ICO), 3.02 Independent Compliance Officer (ICO), (a) General Duties of the ICO, (v). a. Develop, maintain and make available database of certified EBE’s. i. Please issue a list of certified SBE’s via Addendum	a. The ICO can issue a list of MBE, WBE, DBE, and SBE firms that participated in Phase I. However, all firms must be verified. Per Phase II Diversity Plan 2.02 Business Development and Diversification Principles and Goals Section IV, “The judgment as to whether or not an EBE has the qualifications and experience for the type of work required by the Contract rests with the Contractor.”

SECTION 22 0800

COMMISSIONING OF PLUMBING SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections apply to this Section.

B. Section 011800 – Commissioning Requirements contains general information pertaining to the commissioning of plumbing systems.

1.2 DESCRIPTION

A. Commissioning is a systematic process of verifying that all building systems perform interactively according to the owner's operational needs, the design documents, manufacturer's recommendations, and good engineering and workmanship practices. This is achieved by beginning in the design phase and documenting the owner's requirements and continuing through construction, acceptance and the warranty period with actual verification of performance. The commissioning process shall encompass and coordinate the traditionally separate functions of system documentation, equipment startup, control system calibration, testing and balancing, performance testing and training.

B. Commissioning during the construction phase is intended to achieve the following specific objectives according to the Contract Documents:

1. Verify that applicable equipment and systems are installed according to the contract documents, manufacturer's recommendations and to industry accepted minimum standards and that they receive adequate operational checkout by installing contractors.
2. Verify and document proper performance of equipment and systems.
3. Verify that O&M documentation provided for the project is complete, accurate and represents the actual installed equipment.
4. Verify that the Owner's operating personnel are adequately trained.

C. The commissioning process does not take away from or reduce the responsibility of the system designers or installing contractors to provide a finished and fully functioning product.

D. Abbreviations: The following are common abbreviations used in the Specifications. Definitions are found in Article 1.03.

A/E -	Architects and Design Engineers	EC -	Electrical Representative
CxA -	Commissioning Authority	FT -	Functional Performance Test
CC -	Controls Representative	GC -	General Contractor
CTR -	Installers	MC -	Mechanical Representative
Cx -	Commissioning	PFI -	Pre-Functional Inspection
Cx Plan -	Commissioning Plan Document	PM -	Project Manager (of the owner)
PC -	Plumbing Representative	TAB -	Test and Balance Contractor

1.3 RESPONSIBILITIES

A. The responsibilities of various parties in the commissioning process are provided in this section. Further specific responsibilities, when required, of the mechanical representative, TAB, controls representative, plumbing representative and those of the electrical representative are described in their particular contract specifications and documents. It is noted that the services for the owner's Project Manager, Architect, HVAC mechanical and electrical designers/engineers and Commissioning Authority are not provided for in this contract. That is, the Contractor is not responsible for providing their services, and those responsibilities are listed here only for clarification of the commissioning process.

B. All Parties

1. Follow the Commissioning Plan.
2. Attend the commissioning scoping meeting and additional meetings as necessary.

C. Commissioning Authority (CxA)

1. The CxA is not responsible for design concept, design criteria, compliance with codes, design or construction scheduling, cost estimating, or construction management. The CxA may assist with problem solving non-conformance or deficiencies, but ultimately that responsibility resides with the GC and A/E. The primary role of the CxA is to develop and coordinate the execution of the Commissioning Plan, observe and document system performance. Specifically, those systems are functioning in accordance with the documented design intent and in accordance with the Contract Documents. The Contractor will provide all tools or the use of tools to start, check-out and functionally test equipment and systems, except for specified testing with portable data-loggers, which shall be supplied and installed by the CxA.
2. Construction and Acceptance Phase

    a. Coordinates and directs the commissioning activities in a logical, sequential and efficient manner using consistent protocols and forms, centralized documentation, clear and regular communications and consultations with all necessary parties, frequently updated timelines and schedules and technical expertise.
    b. Coordinate the commissioning work and, with the GC and CTRs, verify that commissioning activities are being scheduled into the master schedule.
    c. Revise the Commissioning Plan as necessary.
    d. Plan and conduct a commissioning scoping meeting.
    e. Request and review additional information required to perform commissioning tasks, including O&M materials, contractor start-up and checkout procedures.
    f. Before startup, gather and review the current control sequences and interlocks and work with installers and design engineers until sufficient clarity has been obtained, in writing, to be able to write detailed testing procedures.
    g. Review equipment submittals applicable to systems being commissioned for compliance with commissioning needs, concurrent with the A/E reviews.
    h. Write and distribute pre-functional inspections. The CxA will provide the GC and installers a list of the required submittals. The Contractor bears all costs associated with providing the requested submittals to the CxA without any additional cost to the Owner, CxA or others.
    i. Develop an enhanced start-up and initial systems checkout plan with CTRs.
    j. Perform site visits, as necessary, to observe component and system installations. Attends selected planning and job-site meetings to obtain information on construction progress. Review construction meeting minutes for

revisions/substitutions relating to the commissioning process. Assist in resolving any discrepancies.

k. Witness all or part of the plumbing piping test and flushing procedure, sufficient to be confident that proper procedures were followed. Document this testing and include the documentation in O&M manuals. Notify owner's project manager of any deficiencies in results or procedures.
l. With necessary assistance and review from the Contractor and installers, write the functional performance test procedures for equipment and systems. This may include energy management control system trending, stand-alone data logger monitoring or manual functional testing.
m. Perform pre-functional inspections by selected equipment inspections, site observation and spot-checking.
n. Evaluate systems startup procedures by reviewing start-up reports and by selected site observation.
o. Analyze any functional performance trend logs and monitoring data to verify performance.
p. Maintain a master deficiency and resolution log and a separate testing record. Provide the GC, PM and installers with written progress reports and test results with recommended actions.
q. Review equipment warranties to verify that the Owner's responsibilities are clearly defined.
r. Oversee and approve the training of the Owner's operating personnel.
s. Compile and maintain a commissioning record and Systems Energy Manual.
t. Review the preparation of O&M manuals.
u. Provide a final commissioning report.
v. Coordinate and supervise required seasonal or deferred testing and deficiency corrections.
w. Return to the site at 10 months into the 12 month warranty period and review with facility staff the current building operation and the condition of outstanding issues related to the original and seasonal commissioning. Also interview facility staff and identify problems or concerns they have operating the building as originally intended. Make suggestions for improvements and for recording these changes in the O&M manuals. Identify areas that may come under warranty or under the original construction contract. Assist facility staff in developing reports, documents and requests for services to remedy outstanding problems.
x. Identify any warranty phase deficiencies and provide detailed documentation to the Contractor.

D. General Contractor (GC)

1. Construction and Acceptance Phase

a. Include the cost of supporting commissioning in the contract price.
b. Attend a commissioning scoping meeting and other commissioning team meetings.
c. Furnish a copy of all construction documents, addenda, change orders and submittals and shop drawings related to commissioned equipment to the CxA. The CxA will forward a request to the GC for copies of the submittals that the CxA is required to review concurrently with the engineer as required by the LEED guidelines. The Contractor bears all costs associated with providing the requested submittals to the CxA without any additional cost to the Owner, CxA or others.
d. Provide the requisite readiness notification to the CxA for equipment pre-functional inspections and functional testing utilizing forms provided by the CxA.

e. Participate in pre-functional inspections, startup and functional testing of all equipment, as directed by the CxA.
f. Review the functional performance test procedures submitted by the CxA, prior to testing.
g. Review commissioning progress and deficiency reports.
h. Coordinate the resolution of deficiencies identified by the CxA.
i. Document the completion and/or action taken for the resolution of deficiencies as directed by the CxA and described in the Cx Plan utilizing forms provided by the CxA.
j. Coordinate and perform the training of owner personnel. Notify the CxA when training will be taking place.
k. Ensure that all installers execute their commissioning responsibilities according to the Contract Documents and schedule.
l. Prepare O&M manuals, according to the Contract documents, including clarifying and updating the original sequences of operation to as-built conditions.
m. Assist the CxA as necessary in the seasonal or deferred testing and deficiency corrections required by the specifications.
n. Ensure that installers execute seasonal or deferred functional performance testing, witnessed by the CxA, according to the specifications.
o. Ensure that installers correct deficiencies and make necessary adjustments to O&M manuals and as-built drawings for applicable issues identified in any seasonal testing.

E. Installers (CTRs)

1. Construction and Acceptance Phase
   a. Attend all commissioning scoping meetings and other commissioning team meetings.
   b. Provide the requisite readiness notification to the GC for equipment pre-functional inspections and functional testing.
   c. Participate in pre-functional inspections, startup and functional testing of all equipment, as directed by the CxA.
   d. Review the functional performance test procedures submitted by the CxA, prior to testing.
   e. Review commissioning progress and deficiency reports.
   f. Coordinate the resolution of deficiencies identified by the CxA.
   g. Document the completion and/or action taken for the resolution of deficiencies as directed by the CxA and described in the Cx Plan.
   h. Coordinate and perform the training of owner personnel.
   i. Prepare O&M manuals, according to the Contract documents, including clarifying and updating the original sequences of operation to as-built conditions.
   j. Assist the CxA as necessary in the seasonal or deferred testing and deficiency corrections required by the specifications.
   k. Ensure that seasonal or deferred functional performance testing is executed and witnessed by the CxA, according to the specifications.
   l. Ensure deficiencies are corrected and make necessary adjustments to O&M manuals and as-built drawings for applicable issues identified in any seasonal testing.

F. Equipment Suppliers

1. Provide all requested submittal data, including detailed start-up procedures and specific responsibilities of the Owner to keep warranties in force.

2. Assist in equipment commissioning with CTRs as per the contract documents.
3. Include all special tools and instruments (only available from vendor, specific to a piece of equipment) required for testing equipment according to these Contract Documents in the base bid price to the Contractor.
4. Provide the information requested by the CxA regarding equipment sequences of operation and testing procedures.
5. Review test procedures for equipment installed by factory representatives.

1.4 SYSTEMS TO BE COMMISSIONED

A. The following systems will be commissioned in this project. The Owner and the CxA reserves the right to amend this list at any time during the construction and acceptance process.

Plumbing

1. Building domestic water pressure booster pump system

PART 2 - PRODUCTS

2.1 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, 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 data logging equipment that may be used by the CxA.

C. Data logging equipment and software required to test equipment will be provided by the CxA, 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.

PART 3 - EXECUTION

3.1 MEETINGS

A. Scoping Meeting – The CxA will schedule, plan and conduct a commissioning scoping meeting with the entire commissioning team in attendance. Meeting minutes will be distributed to all parties by the CxA. Information gathered from this meeting will allow the CxA to revise the Commissioning Plan to its final version, which will also be distributed to all parties.

B. Pre-functional Inspection (PFI) Meeting – The CxA will schedule, plan and conduct a PFI meeting with the entire commissioning team in attendance to kickoff the PFI phase.

C. Functional Performance Testing Meeting – The CxA will schedule, plan and conduct a functional performance test meeting with the entire commissioning team in attendance to kickoff the FT phase. The Controls Representative (CC) will play a critical role in the Functional Performance Testing. The CC's Project Manager will be required to attend this meeting.

D. Miscellaneous Meetings – Progress meetings will be scheduled and conducted by the CxA, as necessary. Other meetings will be planned and conducted by the CxA as the construction progresses. These meetings will cover coordination, deficiency resolution and planning issues with particular CTRs. The CxA will plan these meetings and will minimize unnecessary time being spent by CTRs.

3.2 REPORTING

A. The CxA will provide regular reports to the Owner, PM, GC and A/E depending on the management structure, with increasing frequency as construction and commissioning progresses.

B. The CxA will regularly communicate with all members of the commissioning team, keeping them apprised for 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.

D. A final summary report by the CxA will be provided to the Owner. The report will include:

1. A brief summary report that includes a 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 disposition of the CxA regarding the adequacy of the equipment, documentation, and training meeting the contract documents in the following areas:

    a. Equipment meeting the equipment specifications
    b. Equipment installation
    c. Functional performance and efficiency
    d. Equipment documentation
    e. Operator Training
2. All outstanding non-compliance items shall be specifically listed. Recommendations for improvement to equipment and operations, future actions, recommended commissioning process changes, etc. shall also be listed.
3. Also included in the Commissioning Record shall be the issues log, commissioning plan, progress reports, submittal and O&M manual reviews, training record, test schedules, construction checklists, start-up reports, functional tests and trend log analysis.

E. The CxA will compile a Systems Manual that consists of the following:

1. Space and use descriptions
2. Single line drawings and schematics for major systems (to be provided by the design engineer)
3. Control drawings and sequences of control (to be provided by the controls contractor)
4. Table of all set points and implications when changing them
5. Schedules

6. Instructions for operation of each piece of equipment for emergencies, seasonal adjustment, startup and shutdown
7. Instructions for energy savings operations and descriptions of the energy savings strategies in the facility
8. Recommendation for recommissioning the facility
9. Energy tracking recommendations

3.3 SUBMITTALS

A. The CxA will provide the Contractor with a specific request for the type of submittal documentation the CxA requires to facilitate the commissioning work. These requests will be integrated into the normal submittal process and protocol of the construction team. At a minimum the request will include the manufacturer and model number, the manufacturer's printed installation and detailed startup procedures, full sequences of operation, O&M data, performance data, any performance test procedures, control drawings 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 CxA. All documentation requested by the CxA will be included by the CTRs in their O&M manual contributions.

B. The CxA will review 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. This review is intended primarily to aid in the development of functional testing procedures and only secondarily to verify compliance with equipment specifications. The CxA will notify the Owner, PM, GC or A/E as requested, of items missing or areas that are not in conformance with Contract Documents and which require resubmission. The CxA **does not** have approval responsibility, but is required to review the submittals concurrently with the engineer as required by LEED guidelines.

C. The CxA may request additional design narrative from the A/E and Controls Contractor, depending on the completeness of the design intent documentation and sequences provided with the Specifications.

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

3.4 SYSTEM START-UP AND TESTING

A. General Requirement

1. All systems and system components shall be tested by the CTRs and in the presence of the Owner and Design Consultants if desired by the Owner and Design Consultants to demonstrate compliance with specified requirements. To minimize the time of commissioning, contracting, and Design Consultant team members, testing shall be done in seasonal single blocks of time insofar as possible.
2. The Contractor shall notify the CxA fourteen (14) days prior to scheduled functional performance tests, of the scheduled completion date of the installation verification and pre-functional inspections.
3. All testing shall be conducted under specified design operating conditions as approved by the CxA and Design Consultants.
4. All elements of systems shall be tested to demonstrate that total systems satisfy all requirements of these Specifications. Testing shall be accomplished on a hierarchical

basis. Each piece of equipment shall be tested for proper operation, and functionality of safety devices, followed by each system's subsystem, followed by the entire system, followed by any interlocks to other major systems.

5. All special testing materials and equipment shall be provided by the CTR. This includes, but is not limited to, proprietary equipment, hand-held control parameter/set point adjustment tools, and water/air flow balancing readout and adjustment tools.
6. One copy of all factory test reports and records as well as all start-up documentation shall be provided to the CxA.

B. Test Procedure Development and Test Documentation

1. At least fourteen (14) days prior to startup of the plumbing system, the CTR shall inform the CxA, the Owner's representative and Design Consultants of the intention to start up the system.

C. Installation Verification Requirements

1. All systems and system components shall be checked and verified by the CTR that they have been installed according to the drawings, specifications, and manufacturer's written instructions, and that all connections have been made correctly. Discrepancies shall be corrected and resolved to the satisfaction of the engineer and CxA prior to proceeding any further with pre-functional inspections.
2. Each system of interlocked system components shall be observed and verified by the CTR that it is ready to function as specified.
3. Verification of complete and proper installation shall be completed prior to the CxA authorizing functional performance testing.
4. The installation verification shall be documented by the CTR in a written format for each system/piece of equipment as designated by the CxA. Each certificate of readiness shall be dated and initialed by the Contractor and clearly stating any items that are deficient or have not been completed. The protocols for this will be further clarified in the Commissioning Plan.

D. Pre-functional Inspection Requirements

1. The CxA will provide the inspection forms for each system and equipment.
2. Completion of the pre-functional inspections is the responsibility of the CxA.
3. Prior to the CxA performing the pre-functional inspection, the CTRs shall check the equipment for proper installation, adjustments, and shall calibrate the equipment to verify that it is ready to perform as specified.
4. Verification of complete and proper installation shall be completed prior to performing functional performance tests.

E. Functional Performance Testing Requirements

1. A functional performance test shall be performed on each complete system. Each function shall be demonstrated to the satisfaction of the CxA based on the written test procedure developed by the CxA to demonstrate conformance to the requirements of the Contract Documents.
2. Each functional performance test shall be performed, witnessed and signed off by the CxA. The CxA and the CTRs will perform the functional testing together. Any exceptions to this will be made clear to the Owner as to the reason and justification.
3. The functional performance testing shall be conducted in accordance with prior approved procedures and documented as required.

4. The Contractor shall notify the contracting team, the CxA, and Design Consultants, at least two weeks prior to the date of schedule functional performance tests. The seasonal functional performance test periods shall be scheduled over a single block of days. The schedule of functional performance tests shall be based on the construction completion schedule.

3.5 FUNCTIONAL TESTING SUPPORT REQUIREMENTS

A. General Requirements
1. This section provides brief descriptions of the testing and supports the Contractor and installers will be required to provide to perform the functional testing of the equipment for the project.

B. Pumping Systems
1. The installer(s) will be required to demonstrate in writing (TAB Report) that the pumps are balanced to achieve the specified design flows, including motor performance data as specified in the specifications. The controls contractor will be required to demonstrate that the pumps can start, stop, modulate speed (if required) and the lead/lag sequence performs as per the sequence of operations. In addition, a representative will be required to manually operate all hand valves.

3.6 DOCUMENTATION, NON-CONFORMANCE AND APPROVAL OF TESTS

A. Documentation – The CxA shall witness and document the results of all functional performance tests using the specific forms developed by the CxA for that purpose.

B. Non Conformance
1. The CxA will record the results of the PFIs and functional tests utilizing the appropriate documentation. All deficiencies or non-conformance issues shall be noted and reported to the Owner, PM, GC and CTRs.
2. Reports of the deficiencies identified will be provided to the project team by the CxA. Individual forms identifying the deficiencies for each trade will also be provided. These forms are utilized for the contractor to inform the CxA of the action taken to address the deficiency items and **these forms must be returned in a timely manner to the CxA.**
3. Corrections of minor deficiencies identified may be made during the tests at the discretion of the CxA. In such cases, the deficiency and resolution will be documented by the CxA.
4. Every effort will be made to expedite the testing process and minimize unnecessary delays, while not compromising the integrity of the procedures. However, the CxA will not be pressured into overlooking deficient work or compromising acceptance criteria to satisfy scheduling or cost issues, unless there is an overriding reason to do so at the request of the Owner.
5. Cost of Retesting
   a. The cost for the Installer to repeat a pre-functional inspection or functional test, if they are responsible for the deficiency, shall be theirs.
   b. The time for the CxA to direct any retesting required because a specific pre-functional inspection of start-up test item, reported to have been successfully completed, but determined during functional testing to be faulty, will be back charged to the appropriate CTR.
6. The Contractor shall respond in writing to the CxA at least as often as commissioning meetings are scheduled concerning the status of each apparent outstanding discrepancy identified during commissioning. Discussion shall cover explanations of any disagreements and proposals for their resolution.

C. Failure Due to Manufacturer Defect or Improper Installation - If 10%, or three, whichever is greater, of identical pieces of equipment (size alone does not constitute a difference) fail to perform to the Contract Documents (either mechanically or substantively) due to manufacturing defect or improper installation, not allowing it to meet its submitted performance spec, all identical units may be considered unacceptable by the CxA, PM, A/E or Owner. In such case, the Contractor shall provide the Owner with the following:

1. Within one week of notification from the A/E (via the CxA), the installer or manufacturer's representative shall examine all other identical units making a record of the findings. The findings shall be provided to the CxA or PM within two weeks of the original notice.
2. Within two weeks of the original notification, the installer or manufacturer shall provide a signed and dated written explanation of the problem, cause of failures, etc., and all proposed solutions, which shall include full equipment submittals. The proposed solutions shall not significantly exceed the specification requirements of the original installation.
3. The CxA, GC and PM will determine whether a replacement of all identical units or a repair is acceptable.
4. Two examples of the proposed solution will be installed by the Contractor and the CxA will be allowed to test the installations for up to one week, upon which the CxA or PM will decide whether to accept the solution.
5. Upon acceptance, the installer and/or manufacturer shall replace or repair all identical items, at their expense, and extend warranty accordingly, if the original equipment warranty had begun. The replacement/repair work shall proceed with reasonable speed beginning within one week from when parts can be obtained.

D. Approval – The CxA documents each satisfactorily demonstrated functional test.

3.7 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 the contract documents. Special requirements for the controls representative and TAB are detailed in the contract documents.
2. Prior to substantial completion, the CxA shall review the O&M manuals, documentation and redline as-built's for systems that were commissioned to verify compliance with the specifications. The CxA will communicate deficiencies in the manuals to the CTRs, PM, GC, A/E or Owner as requested. Upon successful review of the corrections, the CxA recommends approval and acceptance of these sections of the O&M manuals to the PM, GC, A/E and Owner. The CxA also reviews each commissioned equipment's warranty and verifies that all requirements to keep the warranty valid are clearly stated. This work does not supersede the A/E's review of the O&M manuals according to the A/E contract.

3.8 TRAINING OF OWNER PERSONNEL

A. The GC shall be responsible for training coordination and scheduling and for ultimately ensuring that training is completed. The GC shall inform the CxA when training will be scheduled.

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

C. The CxA shall interview the facility manager and lead engineer to determine the special needs and areas where training would be most valuable. The Owner and CxA shall decide how rigorous the training should be for each piece of commissioned equipment.

D. In addition to these general requirements, the specific training requirements of Owner's personnel by CTRs, as detailed in the specifications, shall be provided.

E. Each CTR and vendor responsible for training will submit a written training plan to the CxA, for review and approval prior to training. The plan will cover the following elements:

1. Equipment (included in training)
2. Intended audience
3. Location of training
4. Objectives
5. Subjects covered (description, duration of discussion, special methods, etc.)
6. Duration of training on each subject
7. Instructor for each subject and qualifications
8. Methods (classroom lecture, video, site walk thru, actual demonstrations, etc.)

F. The CxA develops criteria for determining that the training was satisfactorily completed, including attending some of the training.

3.9 DEFERRED TESTING

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

B. Seasonal Testing – During the warranty period, seasonal testing (tests delayed until weather conditions are closer to the system's design) shall be completed as part of this contract. The CxA shall coordinate this activity. Tests will be executed, documented and deficiencies corrected by the appropriate CTRs, with facilities staff and the CxA witnessing. Any final adjustments to the O&M manuals and as-built's due to the testing will be made.

3.10 WRITTEN WORK PRODUCTS

A. The commissioning process generates a number of written work products described in various parts of the specifications. The Commissioning Plan lists all the formal written work products, describes briefly their contents, who is responsible to create them, and, who receives and approves them and the location of the specification to create them. In summary the written products are:

Product	Developed By
1. Final Commissioning Plan	CxA
2. Commissioning Schedules	CxA, GC and CTRs
3. Equipment Documentation Submittals	CTRs
4. Sequence Clarifications	A/E and CTRs as needed
5. Pre-Functional Inspection Forms	CxA
6. Pre-Functional Inspections	CxA

7.	Startup and Initial Checkout Plans	CTRs
8.	Final TAB Report	TAB CTR
9.	Commissioning Progress Record	CxA
10.	Deficiency Reports	CxA
11.	Functional Test Procedures	CxA
12.	O&M Manuals	CTRs
13.	Commissioning Record	CxA
14.	Overall Training Plans	GC and CTRs
15.	Specific Training Syllabus	CxA
16.	Final Commissioning Report	CxA

END OF SECTION 220800

SECTION 26 0800

COMMISSIONING OF ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Commissioning is a systematic process of verifying that all building systems perform interactively according to the Owner's operational needs, the design documents, manufacturer's recommendations, good engineering and workmanship practices. This is achieved by beginning in the design phase and documenting the Owner's requirements and continuing through construction, acceptance and the warranty period with actual verification of performance. The commissioning process shall encompass and coordinate the traditionally separate functions of system documentation, equipment startup, control system calibration, testing and balancing, performance testing and training.

B. Commissioning during the construction phase is intended to achieve the following specific objectives according to the Contract Documents:

1. Verify that applicable equipment and systems are installed according to the contract documents, manufacturer's recommendations and to industry accepted minimum standards and that they receive adequate operational checkout by installing contractors.

2. Verify and document proper performance of equipment and systems.

3. Verify that O&M documentation provided for the project is complete, accurate and represents the actual installed equipment.

4. Verify that the Owner's operating personnel are adequately trained.

C. The commissioning process does not take away from or reduce the responsibility of the system designers or installing contractors to provide a finished and fully functioning product.

D. Abbreviations: The following are common abbreviations used in the Specifications. Definitions are found in Article 1.2.

A/E - Architects and Design Engineers
CA - Commissioning Agent
CC - Controls Representative
CTR - Contractor Technical Representative
Cx - Commissioning
Cx Plan - Commissioning Plan Document
PC - Plumbing Contractor
EC - Electrical Contractor
FT - Functional Performance Test
GC - General Contractor
HC - Mechanical Contractor
PFI - Pre-Functional Inspection
PM - Project Manager (of the Owner)
TAB - Test and Balance Contractor

1.2 RESPONSIBILITIES

A. The responsibilities of various parties in the commissioning process are provided in this section. Additional specific responsibilities, when required, of the mechanical representative, TAB, controls representative, plumbing representative and those of the electrical representative are described in their particular contract specifications and documents. It is noted that the commissioning responsibilities of the Owner's Project Manager, Architect, HVAC mechanical and electrical designers/engineers and Commissioning Agent are not provided for in this contract. That is, the Contractor is not responsible for providing their services, and those responsibilities are listed here only for clarification of the commissioning process.

B. All Parties:

1. Follow the Commissioning Plan.

2. Attend the commissioning scoping meeting and additional meetings as necessary.

C. Commissioning Agent (CA):

1. The CA is not responsible for design concept, design criteria, compliance with codes, design or 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 EC and A/E. The primary role of the CA is to develop and coordinate the execution of the Commissioning Plan, observe and document system performance. Specifically, that systems are functioning in accordance with the documented design intent and in accordance with the Contract Documents. The Contractor will provide all tools or the use of tools to start, check-out and functionally test equipment and systems, except for specified testing with portable data-loggers, which shall be supplied by the CA.

2. Construction and Acceptance Phase:

a. Coordinates and directs the commissioning activities in a logical, sequential and efficient manner using consistent protocols and forms, centralized documentation, clear and regular communications and consultations with all necessary parties, frequently updated timelines and schedules and technical expertise.

b. Coordinate the commissioning work and, with the EC and CTRs, verify that commissioning activities are being scheduled into the master schedule.

c. Revise the Commissioning Plan as necessary.

d. Plan and conduct a commissioning scoping meeting.

e. Request and review additional information required to perform commissioning tasks, including O&M materials, contractor start-up and checkout procedures.

f. Before startup, gather and review the current control sequences and interlocks and work with installers and design engineers until sufficient clarity has been obtained, in writing, to be able to write detailed testing procedures.

g. Review equipment submittals applicable to systems being commissioned for compliance with commissioning needs, concurrent with the A/E reviews.

h. Write and distribute prefunctional inspections. The CA will provide the EC and installers a list of the required submittals. The Contractor bears all costs associated with providing the requested submittals to the CA without any additional cost to the Owner, CA or others.

i. Develop prefunctional checklists for completion by Contractor.

j. Perform site visits, as necessary, to observe component and system installations. Attends selected planning and job-site meetings to obtain information on construction progress. Review construction meeting minutes for revisions/substitutions relating to the commissioning process. Assist in resolving any discrepancies.

k. With necessary assistance and review from the Contractor and installers, write the functional performance test procedures for equipment and systems. This may include energy management control system trending, stand-alone datalogger monitoring or manual functional testing.

l. Verify completion of prefunctional checklists by selected equipment inspections, site observation and spot-checking.

m. Evaluate systems startup procedures by reviewing start-up reports and by selected site observation.

n. Execute, with the assistance of the Contractor and installers, functional testing of the control system before, or in conjunction with, the HVAC system TAB. Coordinate retesting as necessary until satisfactory performance is achieved.

o. Analyze select functional performance trend logs and monitoring data to verify performance.

p. Maintain a master deficiency and resolution log and a separate testing record. Provide the EC, PM and installers with written progress reports and test results with recommended actions.

q. Review equipment warranties to verify that the Owner's responsibilities are clearly defined.

r. Oversee and approve the training of the Owner's operating personnel.

s. Compile and maintain a Commissioning Record and Systems Energy Manual.

t. Review the preparation of O&M manuals.

u. Provide a final commissioning report.

v. Coordinate and supervise required seasonal or deferred testing and deficiency corrections.

w. Return to the site at ten (10) months into the twelve (12) month warranty period and review with facility staff the current building operation and the condition of outstanding issues related to the original and seasonal commissioning. Also interview facility staff and identify problems or concerns they have operating the building as originally intended. Make suggestions for improvements and for recording these changes in the O&M manuals. Identify areas that may come under warranty or under the original construction contract. Assist facility staff in developing reports, documents and requests for services to remedy outstanding problems.

x. Identify any warranty phase deficiencies and provide detailed documentation to the Contractor.

D. Electrical Contractor (EC):

1. Construction and Acceptance Phase:

a. Include the cost of supporting commissioning in the contract price.

b. Attend a commissioning scoping meeting and other commissioning team meetings.

c. Furnish a copy of all construction documents, addenda, change orders and submittals and shop drawings related to commissioned equipment to the CA. The CA will forward a request to the EC for copies of the submittals that the CA is required to review concurrently with the engineer as required by the LEED guidelines. The Contractor bears all costs associated with providing the requested submittals to the CA without any additional cost to the Owner, CA or others.

d. Provide the requisite readiness notification to the CA for equipment prefunctional inspections and functional testing utilizing forms provided by the CA.

e. Participate in pre-functional inspections, startup and functional testing of all equipment, as directed by the CA.

f. Review the functional performance test procedures submitted by the CA, prior to testing.

g. Review commissioning progress and deficiency reports.

h. Coordinate the resolution of deficiencies identified by the CA.

i. Document the completion and/or action taken for the resolution of deficiencies as directed by the CA and described in the Cx Plan utilizing forms provided by the CA.

j. Coordinate and perform the training of Owner personnel. Notify the CA when training will be taking place.

k. Ensure that all installers execute their commissioning responsibilities according to the Contract Documents and schedule.

l. Prepare O&M manuals, according to the Contract documents, including clarifying and updating the original sequences of operation to as-built conditions.

m. Assist the CA as necessary in the seasonal or deferred testing and deficiency corrections required by the specifications.

n. Ensure that installers execute seasonal or deferred functional performance testing, witnessed by the CA, according to the specifications.

o. Ensure that installers correct deficiencies and make necessary adjustments to O&M manuals and as-built drawings for applicable issues identified in any seasonal testing.

E. Installers (CTRs):

1. Construction and Acceptance Phase:

a. Attend all commissioning scoping meetings and other commissioning team meetings.

b. Provide the requisite readiness notification to the EC for equipment prefunctional inspections and functional testing.

c. Complete prefunctional checklists developed by the CA.

d. Review the functional performance test procedures submitted by the CA, prior to testing.

e. Review commissioning progress and deficiency reports.

f. Coordinate the resolution of deficiencies identified by the CA.

g. Document the completion and/or action taken for the resolution of deficiencies as directed by the CA and described in the Cx Plan.

h. Coordinate and perform the training of Owner personnel.

i. Prepare O&M manuals, according to the Contract documents, including clarifying and updating the original sequences of operation to as-built conditions.

j. Assist the CA as necessary in the seasonal or deferred testing and deficiency corrections required by the specifications.

k. Ensure that seasonal or deferred functional performance testing, is executed and witnessed by the CA, according to the specifications.

l. Ensure deficiencies are corrected and make necessary adjustments to O&M manuals and as-built drawings for applicable issues identified in any seasonal testing.

F. Equipment Suppliers:

1. Provide all requested submittal data, including detailed start-up procedures and specific responsibilities of the Owner to keep warranties in force.

2. Assist in equipment commissioning with CTRs as per the contract documents.

3. Include all special tools and instruments (only available from vendor, specific to a piece of equipment) required for testing equipment according to these Contract Documents in the base bid price to the Contractor.

4. Provide the information requested by the CA regarding equipment sequences of operation and testing procedures.

5. Review test procedures for equipment installed by factory representatives.

1.3 COMMISSIONING DOCUMENTATION

A. Provide the following information to the CA for inclusion in the commissioning record:

1. Plan for delivery and review of submittals, systems manuals and other documents and reports.

2. Identification of installed systems, assemblies, equipment, and components including design changes that occurred during the construction phase.

3. Process and schedule for completing construction checklists and manufacturer's prestart and startup checklists for electrical systems, assemblies, equipment and components to be verified and tested.

4. Certificate of completion certifying that installation, prestart checks and startup procedures have been completed.

5. Certificate of readiness certifying that electrical systems, subsystems, equipment and associated controls are ready for testing.

6. Test and inspection reports and certificates.

7. Corrective action documents.

8. Verification of testing, adjusting and balancing reports.

1.4 SYSTEMS TO BE COMMISSIONED

A. The following systems will be commissioned in this project. The Owner and the CA reserves the right to amend this list at anytime during the construction and acceptance process.

1. Electrical:

a. Emergency Generator System; including ATS(s)

b. Fire Alarm System (Point Addressable)

c. Electrical Distribution System

d. Theatrical Lighting System

e. Scoreboard

f. Building Wide Paging and Intercom System

g. Access Control System

h. Intrusion Detection System

i. Audio Entry System

j. Master and Secondary Clock System

PART 2 - PRODUCTS

2.1 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, 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.

PART 3 - EXECUTION

3.1 MEETINGS

A. Scoping Meeting - The CA will schedule, plan and conduct a commissioning scoping meeting with the entire commissioning team in attendance. Meeting minutes will be distributed to all parties by the CA. Information gathered from this meeting will allow the CA to revise the Commissioning Plan to its final version, which will also be distributed to all parties.

B. Prefunctional Inspection (PFI) Meeting - The CA will schedule, plan and conduct a PFI meeting with the entire commissioning team in attendance to kickoff the PFI phase.

C. Functional Performance Testing Meeting - The CA will schedule, plan and conduct a functional performance test meeting with the entire commissioning team in attendance to kickoff the FT phase. The Controls Representative (CC) will play a critical role in the Functional Performance Testing. The CC's Project Manager will be required to attend this meeting.

D. Miscellaneous Meetings - Progress meetings will be scheduled and conducted by the CA, as necessary. Other meetings will be planned and conducted by the CA as the construction progresses. These meetings will cover coordination, deficiency resolution and planning issues with particular CTRs. The CA will plan these meetings and will minimize unnecessary time being spent by CTRs.

3.2 REPORTING

A. The CA will provide regular reports to the Owner, PM, EC, and A/E depending on the management structure, with increasing frequency as construction and commissioning progresses.

B. The CA will regularly communicate with all members of the commissioning team, keeping them apprised for 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.

D. A final summary report by the CA will be provided to the Owner. The report will include:

1. A brief summary report that includes a 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 disposition of the CA regarding the adequacy of the equipment, documentation, and training as it relates to the Contract Documents in the following areas:

   a. Equipment meeting the equipment specifications.

   b. Equipment installation.

   c. Functional performance and efficiency.

   d. Equipment documentation.

   e. Operator Training.

2. All outstanding non-compliance items shall be specifically listed. Recommendations for improvement to equipment and operations, future actions, recommended commissioning process changes, etc. shall also be listed.

3. Also included in the Commissioning Record shall be the issues log, commissioning plan, progress reports, submittal and O&M manual reviews, training record, test schedules, construction checklists, start-up reports, functional tests and trend log analysis.

E. The CA will compile a Systems Manual that consists of the following:

1. Space and use descriptions.

2. Single line drawings and schematics for major systems (to be provided by the design engineer).

3. Control drawings and sequences of control (to be provided by the controls contractor).

4. Table of all setpoints and implications when changing them.

5. Schedules.

6. Instructions for operation of each piece of equipment for emergencies, seasonal adjustment, startup and shutdown.

7. Instructions for energy savings operations and descriptions of the energy savings strategies in the facility.

8. Recommendation for recommissioning the facility.

9. Energy tracking recommendations.

3.3 SUBMITTALS

A. The CA will provide the Contractor with a specific request for the type of submittal documentation the CA requires to facilitate the commissioning work. These requests will be integrated into the normal submittal process and protocol of the construction team. At a minimum the request will include the manufacturer and model number, the manufacturer's printed installation and detailed startup procedures, full sequences of operation, O&M data, performance data, any performance test procedures, control drawings 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 CA. All documentation requested by the CA will be included by the CTRs in their O&M manual contributions.

B. The CA will review 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. This review is intended primarily to aid in the development of functional testing procedures and only secondarily to verify compliance with equipment specifications. The CA will notify the Owner, PM, EC or A/E as requested, of items missing or areas that are not in conformance with Contract Documents and which require resubmission. The CA does not have approval responsibility, but is required to review the submittals concurrently with the engineer as required by LEED guidelines.

C. The CA may request additional design narrative from the A/E and Controls Contractor, depending on the completeness of the design intent documentation and sequences provided with the 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 them.

3.4 SYSTEM START-UP AND TESTING

A. General Requirement:

1. All systems and system components shall be tested by the CTRs and in the presence of the Owner and Design Consultants if desired by the Owner and Design Consultants to demonstrate compliance with specified requirements. To minimize the time of commissioning, contracting, and Design Consultant team members, testing shall be done in seasonal single blocks of time insofar as possible.

2. The Contractor shall notify the CA fourteen (14) days prior to scheduled functional performance tests.

3. All testing shall be conducted under specified design operating conditions as approved by the CA and Design Consultants.

4. All elements of systems shall be tested to demonstrate that total systems satisfy all requirements of these Specifications. Testing shall be accomplished on a hierarchical basis. Each piece of equipment shall be tested for proper operation, and functionality of safety devices, followed by each system's subsystem, followed by the entire system, followed by any interlocks to other major systems.

5. All special testing materials and equipment shall be provided by the CTR. This includes, but is not limited to, proprietary equipment, hand-held control parameter/setpoint adjustment tools, water/air flow balancing readout and adjustment tools.

6. One copy of all factory test reports and records as well as all start-up documentation shall be provided to the CA.

B. Test Procedure Development and Test Documentation:

1. At least fourteen (14) days prior to startup of the electrical system, the CTR shall inform the CA, the Owner's Representative and Design Consultants of the intention to start up the system.

C. Installation Verification Requirements:

1. All systems and system components shall be checked and verified by the CTR that they have been installed according to the drawings, specifications, and manufacturer's written instructions, and that all connections have been made correctly. Discrepancies shall be corrected and resolved to the satisfaction of the engineer and CA prior to proceeding any further with prefunctional inspections.

2. Each system of interlocked system components shall be observed and verified by the CTR that it is ready to function as specified.

3. Verification of complete and proper installation shall be completed prior to the CA authorizing functional performance testing.

4. The installation verification shall be documented by the CTR in a written format for each system/piece of equipment as designated by the CA. Each certificate of readiness shall be dated and initialed by the Contractor and clearly stating any items that are deficient or have not been completed. The protocols for this will be further clarified in the Commissioning Plan.

5. Certify that electrical systems, subsystems and equipment have been installed, calibrated and started and are operating according to the Contract Documents.

6. Certify that electrical instrumentation and control systems have been completed and calibrated, that they are operating according to the Contract documents, and that pretest set points have been recorded.

7. Certify that testing, adjusting and balancing procedures have been completed and that testing, adjusting and balancing reports have been submitted, discrepancies corrected and corrective work approved.

8. Set systems, subsystems and equipment into operating mode to be tested (e.g., normal shutdown, normal auto position, normal manual position, unoccupied cycle, emergency power, and alarm conditions).

9. Inspect and verify the position of each device and interlock identified on checklists.

10. Check safety cutouts, alarms, and interlocks with smoke control and life-safety systems during each mode of operation.

11. Testing Instrumentation: Install measuring instruments and logging devices to record test data as directed by the CA.

D. Prefunctional Inspection Requirements:

1. The CA will provide the inspection forms for each system and equipment.

2. CA will verify the completion of the prefunctional checklists by the Contractor.

3. Prior to the CA performing the pre-functional inspection, the CTRs shall check the equipment for proper installation, adjustments, and shall calibrate the equipment to verify that it is ready to perform as specified.

4. Verification of complete and proper installation shall be completed prior to performing functional performance tests.

E. Functional Performance Testing Requirements:

1. A functional performance test shall be performed on each complete system. Each function shall be demonstrated to the satisfaction of the CA based on the written test procedure developed by the CA to demonstrate conformance to the requirements of the Contract Documents.

2. Each functional performance test shall be performed, witnessed and signed off by the CA. The CA and the CTRs will perform the functional testing together. Any exceptions to this will be made clear to the Owner as to the reason and justification.

3. The functional performance testing shall be conducted in accordance with prior approved procedures and documented as required.

4. The Contractor shall notify the contracting team, the CA, and Design Consultants, at least two weeks prior to the date of schedule functional performance tests. The seasonal functional performance test periods shall be scheduled over a single block of days. The schedule of functional performance tests shall be based on the construction completion schedule.

Added per Bid Addendum No. 2

3.5 FUNCTIONAL TESTING SUPPORT REQUIREMENTS

A. General Requirements:

1. This section provides brief descriptions of the testing and support the Contractor and installers will be required to provide to perform the functional testing of the equipment for the project.

B. Lighting Fixtures and Switches:

1. Light fixtures will be verified that they are the proper fixture and the proper installation requirements have been adhered to. Switches will be tested for operation, including the operation of multiple 3-way switches.

2. The contractor is expected to test and verify the operation of every light and switch. The CA will sample approximately 25% of this system.

C. Lighting Controls (Interior):

1. All occupancy sensors will be tested for sensitivity and duration of "on period" after area has been vacated.

2. The Contractor is expected to test and verify the operation of every occupancy sensor. The CA will sample approximately 25% of this system.

D. Lighting Controls (Exterior):

1. The BMS schedule will be verified by the CA and the photoelectric override will be tested during actual operation via observation and utilizing an external light source.

2. The Contractor is expected to test and verify the operation of all of the exterior lighting. The CA will sample 100% of this system.

E. HVAC Electrical Components:

1. The CA will test selected amp draws and voltages on various HVAC motors. These tests correspond to full load operation, where practical.

2. The CA will test these devices after the testing and balancing (TAB) has been performed to confirm the TAB's readings.

3. The CA will verify the settings for any equipment that has associated heaters or adjustable load relays.

F. Emergency Generator System:

1. The Contractor(s) will be required to demonstrate all safeties (personnel and electrical e.g. emergency shutdown switches, low oil pressure, high coolant temperature, etc.); local generator control panel operation; local controls (such as combustion air dampers), and integrated 3rd party Building Management System controls including all related devices and sequence of operations.

2. The Cx Authority will define the tests and procedures in the Cx Plan as well as the individuals required to support the testing.

3. A representative will be required to manually operate all hand valves, and the controls contractor will be required to demonstrate their systems' integrated performance. Any local controls will require the representative who was responsible for the programming and setting up of the equipment to document the set points and demonstrate the performance of their equipment.

3.6 DOCUMENTATION, NON-CONFORMANCE AND APPROVAL OF TESTS

A. Documentation - The CA shall witness and document the results of all functional performance tests using the specific forms developed by the CA for that purpose.

B. Non Conformance:

1. The CA will record the results of the PFIs and functional tests utilizing the appropriate documentation. All deficiencies or non-conformance issues shall be noted and reported to the Owner, PM, EC and CTRs.

2. Reports of the deficiencies identified will be provided to the project team by the CA. Individual forms identifying the deficiencies for each trade will also be provided. These forms are utilized for the contractor to inform the CA of the action taken to address the deficiency items and these forms must be returned in a timely manner to the CA.

3. 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 by the CA.

4. 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 compromising acceptance criteria to satisfy scheduling or cost issues, unless there is an overriding reason to do so at the request of the Owner.

5. Cost of Retesting:

a. The cost for the Installer to repeat a prefunctional inspection or functional test, if they are responsible for the deficiency, shall be theirs.

b. The time for the CA to direct any retesting required because a specific prefunctional inspection of start-up test item, reported to have been successfully completed, but determined during functional testing to be faulty, will be backcharged to the appropriate CTR.

6. The Contractor shall respond in writing to the CA at least as often as commissioning meetings are scheduled concerning the status of each apparent outstanding discrepancy identified during commissioning. Discussion shall cover explanations of any disagreements and proposals for their resolution.

C. Failure Due to Manufacturer Defect or Improper Installation - If 10%, or three, whichever is greater, of identical pieces of equipment (size alone does not constitute a difference) fail to perform to the Contract Documents (either mechanically or substantively) due to manufacturing defect or improper installation, not allowing it to meet its submitted performance spec, all identical units may be considered unacceptable by the CA, PM, A/E or Owner. In such case, the Contractor shall provide the Owner with the following:

1. Within one (1) week of notification from the A/E (via the CA), the installer or manufacturer's representative shall examine all other identical units making a record of the findings. The findings shall be provided to the CA or PM within two weeks of the original notice.

2. Within two weeks of the original notification, the installer or manufacturer shall provide a signed and dated written explanation of the problem, cause of failures, etc., and all proposed solutions, which shall include full equipment submittals. The proposed solutions shall not significantly exceed the specification requirements of the original installation.

3. The CA, EC and PM will determine whether a replacement of all identical units or a repair is acceptable.

4. Two examples of the proposed solution will be installed by the Contractor and the CA will be allowed to test the installations for up to one week, upon which the CA or PM will decide whether to accept the solution.

5. Upon acceptance, the installer and/or manufacturer shall replace or repair all identical items, at their expense, and extend warranty accordingly, if the original equipment warranty had begun. The replacement/repair work shall proceed with reasonable speed beginning within one week from when parts can be obtained.

D. Approval - The CA documents each satisfactorily demonstrated functional test.

3.7 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 the contract documents. Special requirements for the controls representative and TAB are detailed in the contract documents.

2. Prior to substantial completion, the CA shall review the O&M manuals, documentation and redline as-builts for systems that were commissioned to verify compliance with the specifications. The CA will communicate deficiencies in the manuals to the CTRs, PM, EC, A/E or Owner as requested. Upon successful review of the corrections, the CA recommends approval and acceptance of these sections of the O&M manuals to the PM, EC, A/E and Owner. The CA also reviews each commissioned equipment's warranty and verifies that all requirements to keep the warranty valid are clearly stated. This work does not supersede the A/E's review of the O&M manuals according to the A/E contract.

3.8 TRAINING OF OWNER PERSONNEL

A. The EC shall be responsible for training coordination and scheduling and for ultimately ensuring that training is completed. The EC shall inform the CA when training will be scheduled.

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

C. The CA shall interview the facility manager and lead engineer to determine the special needs and areas where training would be most valuable. The Owner and CA shall decide how rigorous the training should be for each piece of commissioned equipment.

D. In addition to these general requirements, the specific training requirements of Owner's personnel by CTRs, as detailed in the specifications, shall be provided.

E. Each CTR 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:

1. Equipment (included in training).

2. Intended audience.

3. Location of training.

4. Objectives.

5. Subjects covered (description, duration of discussion, special methods, etc.).

6. Duration of training on each subject.

7. Instructor for each subject and qualifications.

8. Methods (classroom lecture, video, site walk thru, actual demonstrations, etc.).

F. The CA develops criteria for determining that the training was satisfactorily completed, including attending some of the training.

3.9 DEFERRED TESTING

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

B. Seasonal Testing - During the warranty period, seasonal testing (tests delayed until weather conditions are closer to the system's design) shall be completed as part of this contract. The CA shall coordinate this activity. Tests will be executed, documented and deficiencies corrected by the appropriate CTRs, with facilities staff and the CA witnessing. Any final adjustments to the O&M manuals and as-builts due to the testing will be made.

3.10 WRITTEN WORK PRODUCTS

A. The commissioning process generates a number of written work products described in various parts of the specifications. The Commissioning Plan lists all the formal written work products, describes briefly their contents, who is responsible to create them, and, who receives and approves them and the location of the specification to create them. In summary the written products are:

Product	**Developed By**
1. Final Commissioning Plan	CA
2. Commissioning Schedules	CA, EC and CTRs
3. Equipment Documentation Submittals	CTRs
4. Sequence Clarifications	A/E and CTRs as needed
5. Pre-Functional Inspection Forms	CA
6. Pre-Functional Inspections	CA
7. Startup and Initial Checkout Plans	CTRs
8. Final TAB Report	TAB CTR
9. Commissioning Progress Record	CA
10. Issue and Resolution Log	CA
11. Functional Test Procedures	CA
12. O&M Manuals	CTRs
13. Commissioning Record	CA
14. Overall Training Plans	EC and CTRs
15. Specific Training Syllabus	CA
16. Final Commissioning Report	CA

END OF SECTION

1 / S–01 BASEMENT DEMOLITION KEY PLAN
SCALE: 1"=20'–0"

CHAINTREUIL | JENSEN | STARK ARCHITECTS, LLP
54 South Union Street
Rochester, N.Y. 14607
(585) 244.3780 tel.
(585) 244.1294 fax.
www.cjjarchitects.com

Rochester City School District
James Monroe High School
164 Alexander Street
Rochester, New York

SED #: 26-16-00-01-0-107-029
DWT #: 26-16-00-01-7-999-019

PROJECT: RSMP - JAMES MONROE HIGH SCHOOL PHASE 2A

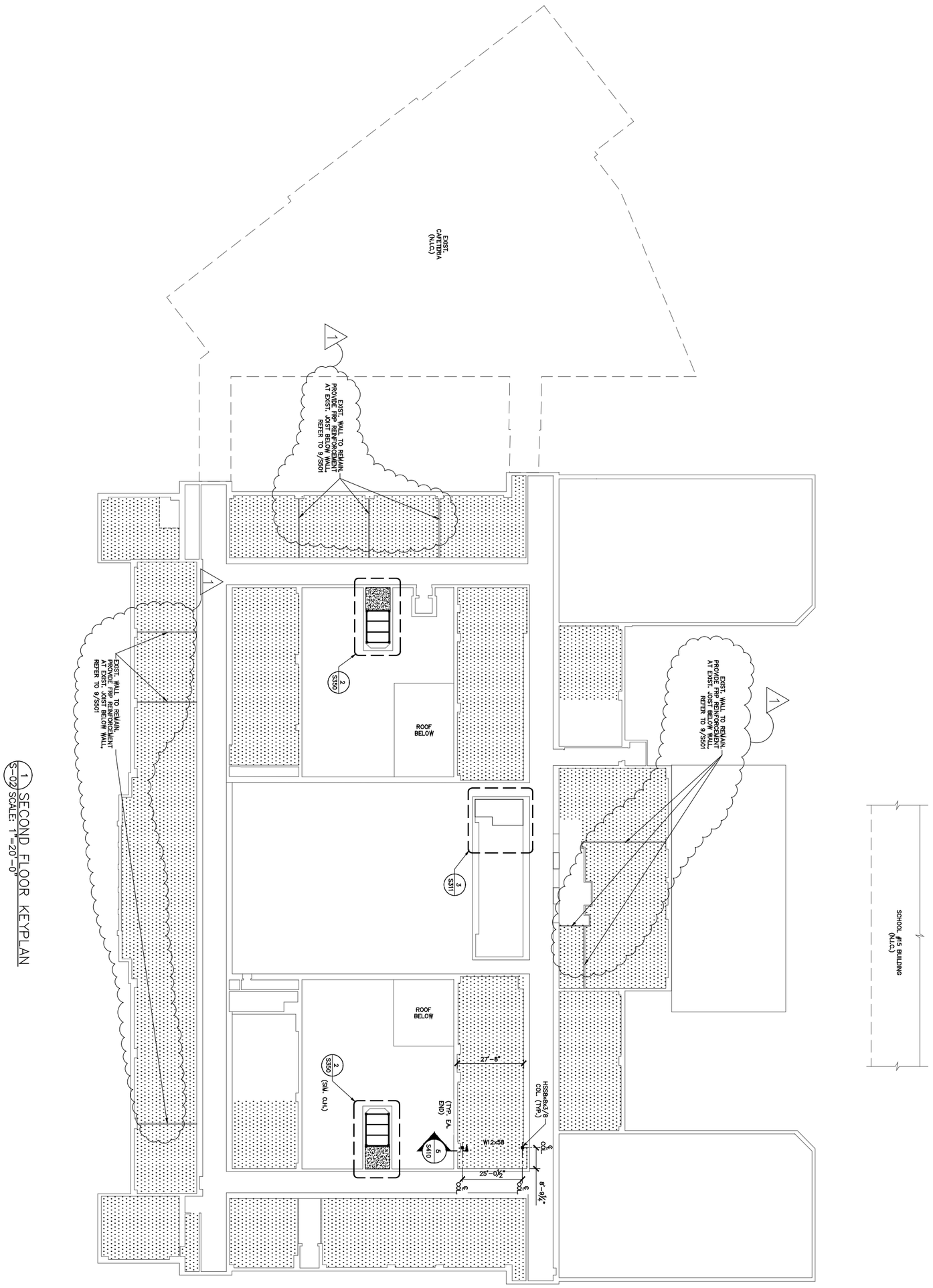
DRAWING TITLE: BASEMENT DEMOLITION KEY PLAN

PROJECT NO:	DRAWN BY:	SCALE:	ISSUE DATE:	REVISION DATE:
1522	MR	AS NOTED	6/28/16	7/27/16

DRAWING REFERENCE NUMBER(S): AS NOTED

DRAWING NUMBER: ADD2-S-01

NOTE:
1. [dotted] DENOTES LIGHTWEIGHT CONCRETE INFILL REFER TO 10/S410.

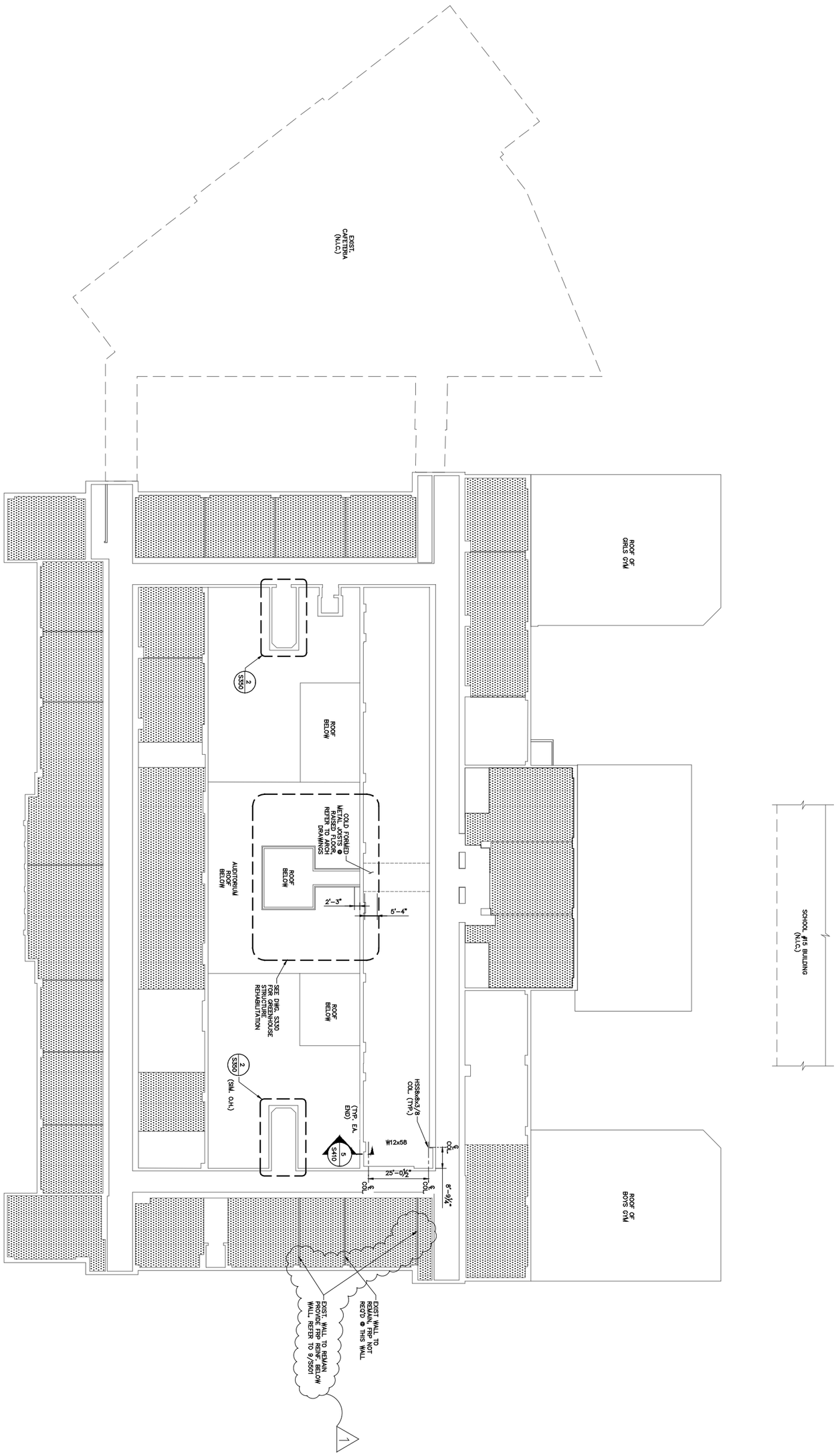


1 S-02 SECOND FLOOR KEYPLAN
SCALE: 1"=20'-0"

DRAWING REFERENCE NUMBER(S): AS NOTED	PROJECT: RSMP - JAMES MONROE HIGH SCHOOL PHASE 2A				Rochester City School District James Monroe High School 164 Alexander Street Rochrester, New York SED #: 26-16-00-01-0-107-029 DWT #: 26-16-00-01-7-999-019
DRAWING NUMBER: ADD2-S-02	DRAWING TITLE: SECOND FLOOR KEYPLAN				
	PROJECT NO: 1522	DRAWN BY: MR	SCALE: AS NOTED	ISSUE DATE: 6/28/16	REVISION DATE: 7/27/16

CHAINTREUIL | JENSEN | STARK ARCHITECTS, LLP
54 South Union Street
Rochester, N.Y. 14607
(585) 244.3780 tel.
(585) 244.1294 fax.
www.cjsarchitects.com

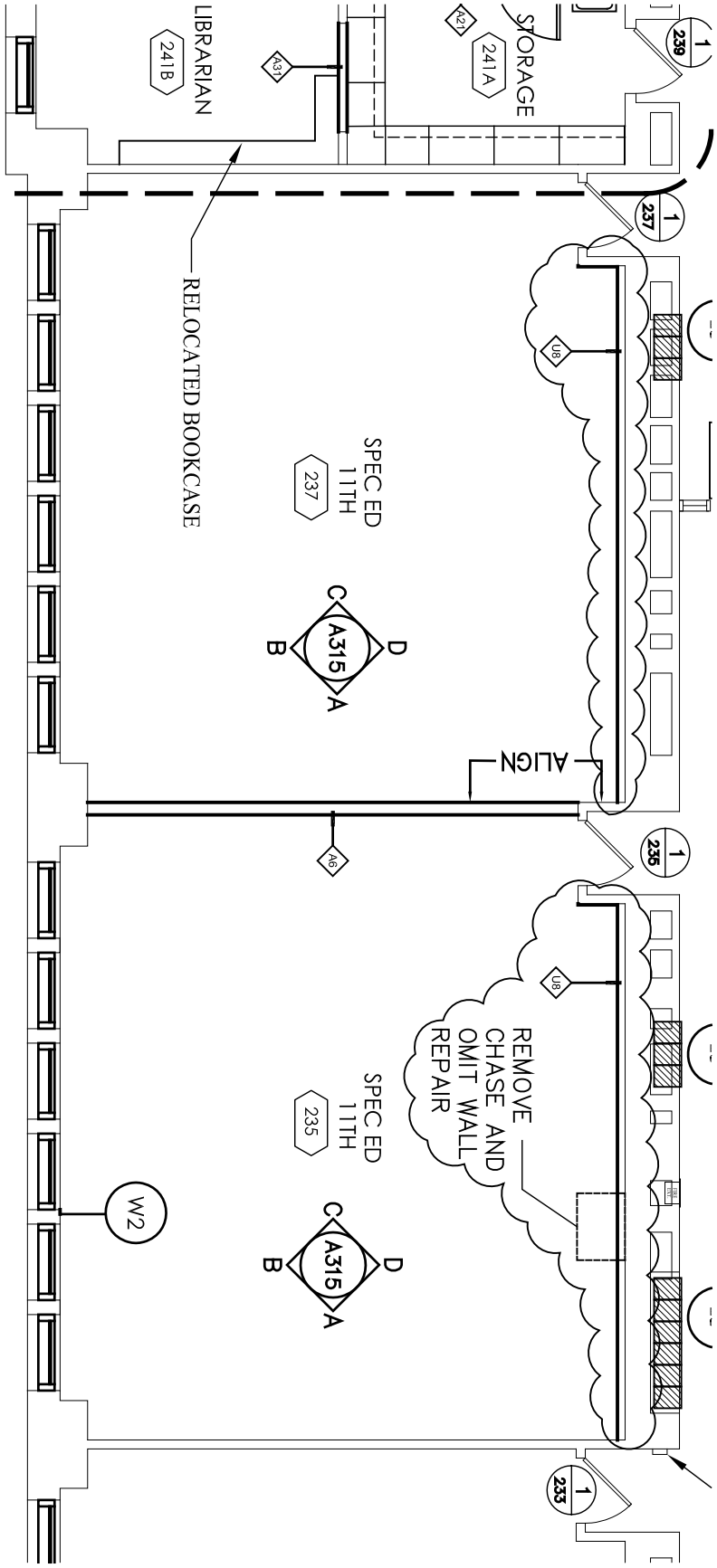
NOTE:
1. [▨] DENOTES LIGHTWEIGHT CONCRETE INFILL REFER TO SECTION 10/S410.



1/S-03 THIRD FLOOR KEYPLAN
SCALE: 1"=20'-0"

DRAWING REFERENCE NUMBER(S): AS NOTED	PROJECT: RSMP - JAMES MONROE HIGH SCHOOL PHASE 2A				Rochester City School District James Monroe High School 164 Alexander Street Rochrester, New York SED #: 26-16-00-01-0-107-029 DWT #: 26-16-00-01-7-999-019
DRAWING NUMBER: ADD2-S-03	DRAWING TITLE: THIRD FLOOR KEYPLAN				
	PROJECT NO: 1522	DRAWN BY: MR	SCALE: AS NOTED	ISSUE DATE: 6/28/16	REVISION DATE: 7/27/16

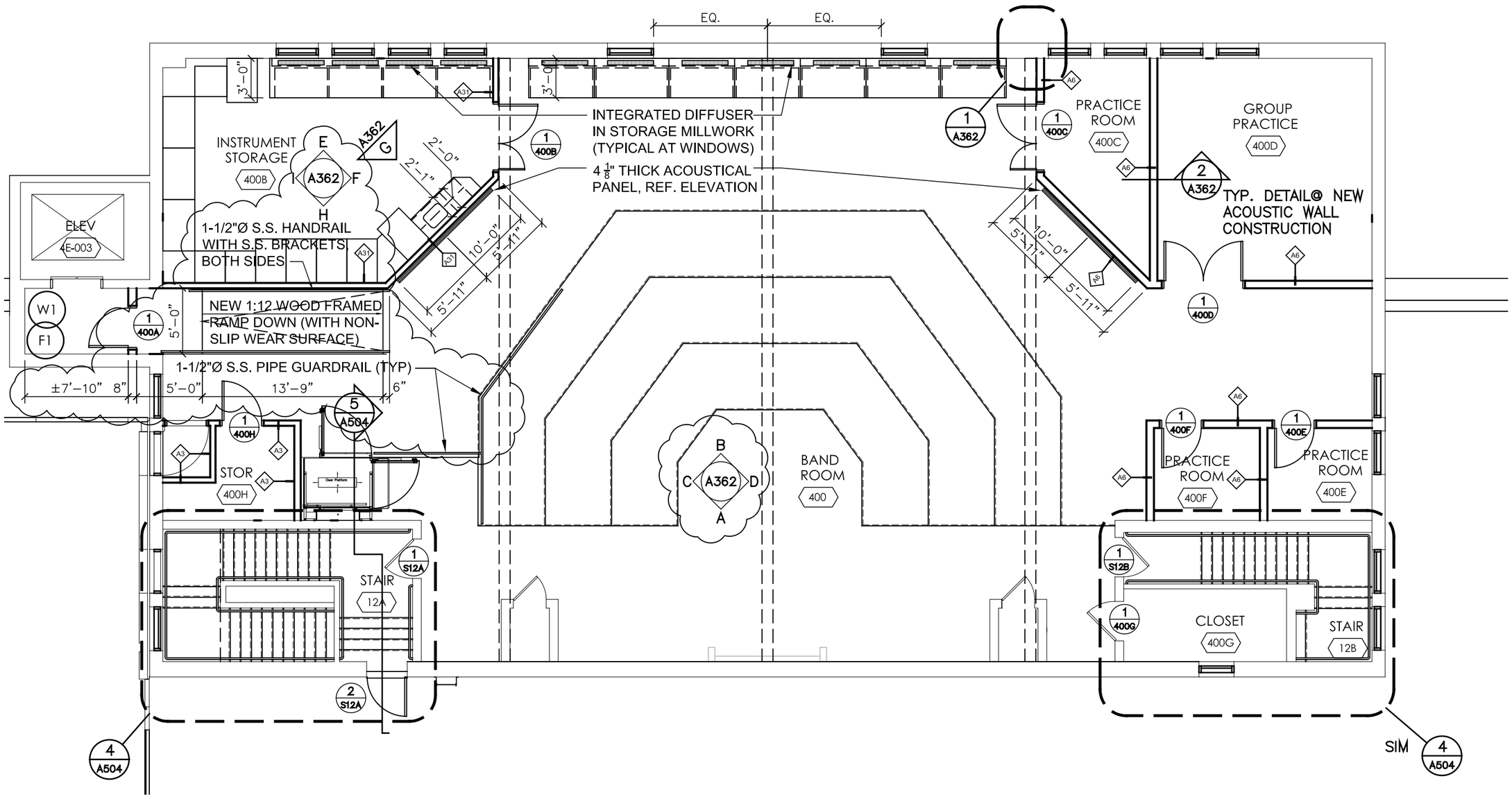
CHAINTREUIL | JENSEN | STARK ARCHITECTS, LLP
54 South Union Street
Rochester, N.Y. 14607
(585) 244.3780 tel.
(585) 244.1294 fax.
www.cjsarchitects.com



PARTIAL SECOND FLOOR PLAN

A112 SCALE: 1/8" = 1'-0"

DRAWING REFERENCE NUMBER(S): A112	PROJECT: RSMP - JAMES MONROE HIGH SCHOOL PHASE 2A				CHAINTREUIL | JENSEN | STARK ARCHITECTS, LLP 54 South Union Street Rochester, N.Y. 14607 (585) 244.3780 tel. (585) 244.1294 fax. www.cjsarchitects.com
DRAWING NUMBER: ADDSK-A-03	DRAWING TITLE: ROOM 235 AND 237 FURRED WALL				
SED CONTROL NUMBERS: SED. #: 26-16-00-01-0-107-029 DWT #: 26-16-00-01-7-999-019	PROJECT NO: 1522	DRAWN BY: ME	SCALE: AS NOTED	ISSUE DATE: 7/27/16	REVISION DATE: #/#/##



1 / A119 FOURTH FLOOR BAND ROOM FLOOR PLAN

SCALE: 1/8" = 1'-0"

CHAINTREUIL | JENSEN | STARK ARCHITECTS, LLP
54 South Union Street
Rochester, NY 14607
[585] 244.3760 tel.
[585] 244.1294 fax.
www.cjsarchitects.com

Rochester City School District
James Monroe High School
164 Alexander Street
Rochester, New York

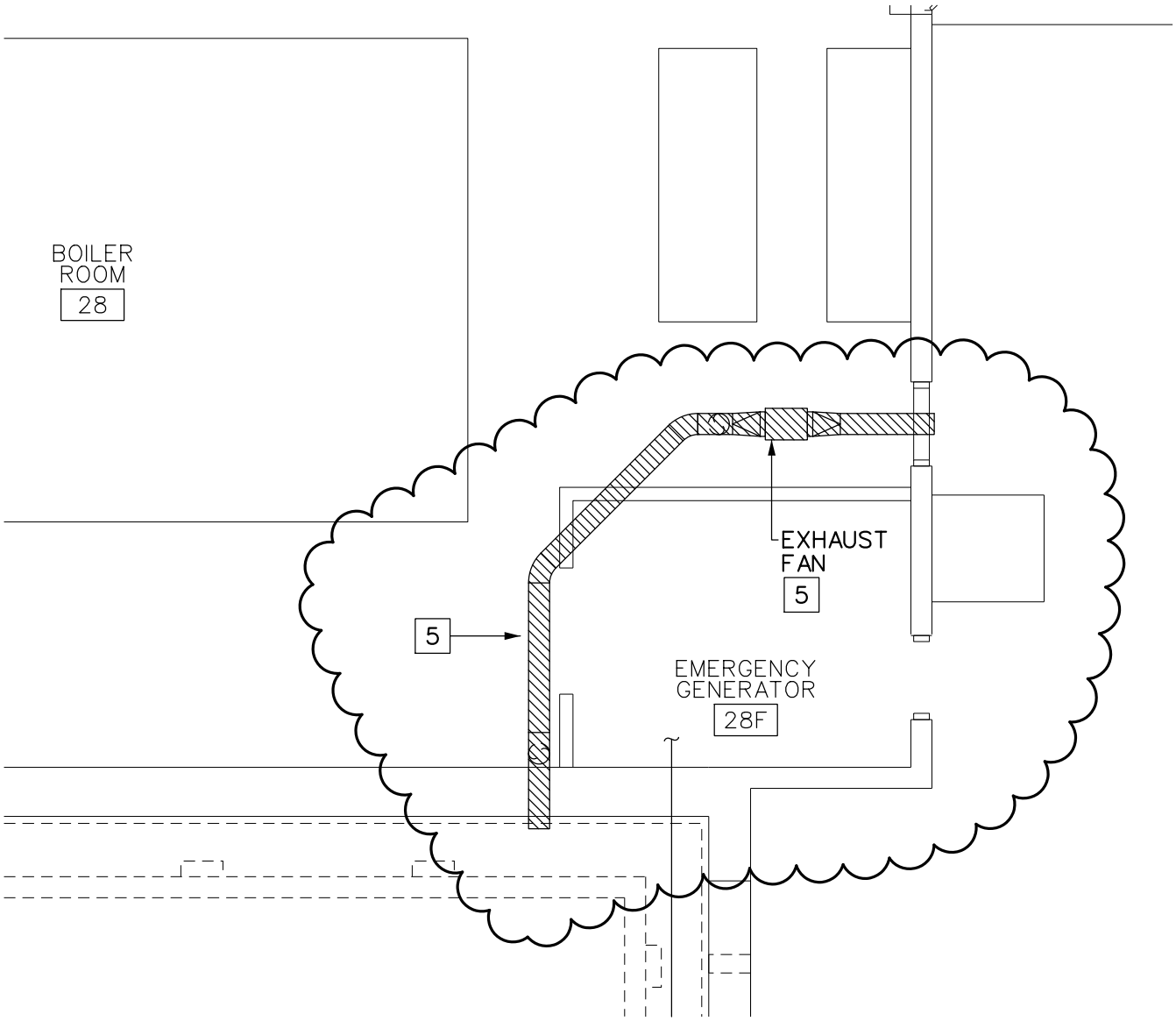
SED #: 26-16-00-01-0-107-029
DWT #: 26-16-00-01-7-999-019

PROJECT: RSMP - JAMES MONROE HIGH SCHOOL PHASE 2A

DRAWING TITLE: BAND ROOM

PROJECT NO: 1522
DRAWN BY: ME
SCALE: AS NOTED
ISSUE DATE: 7/27/16
REVISION DATE: ####

DRAWING REFERENCE NUMBER(S): A119
DRAWING NUMBER: ADDSK-A-04



1
MD110

BOILER 28 DEMOLITION PLAN

SCALE: 1/8" = 1'-0"

GENERAL NOTES:

A. THIS SKETCH IDENTIFIES THE REMOVAL OF THE POOL PLUNGE EXHAUST FAN SYSTEM LOCATED IN THE BOILER ROOM.

DEMOLITION NOTES:

5 REMOVE EXHAUST FAN AND ASSOCIATED CONTROLS. REMOVE THE DUCTWORK SYSTEM COMPLETE.

DRAWING REFERENCE NUMBER(S): MD-110

DRAWING NUMBER: ADD2-M01

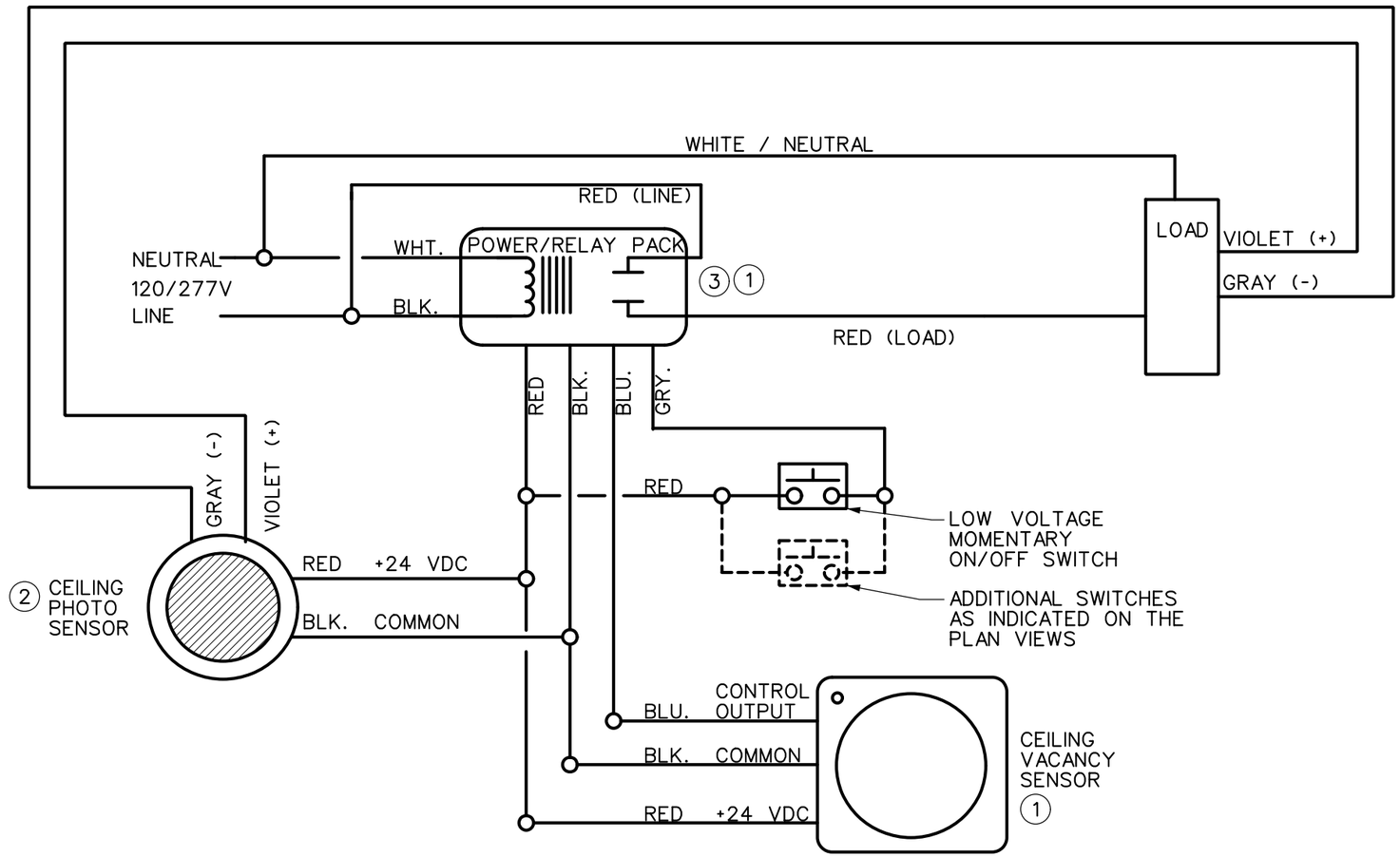
SED CONTROL NUMBERS:
SED. #: 26-16-00-01-0-107-029
DWT #: 26-16-00-01-7-999-019

PROJECT: RSMP - JAMES MONROE HIGH SCHOOL PHASE 2A

DRAWING TITLE: POOL PLUNGE EXHAUST SYSTEM REMOVAL

PROJECT NO:	DRAWN BY:	SCALE:	ISSUE DATE:	REVISION DATE:
1522	AJM	AS NOTED	6/28/16	07/25/16

CHAINTREUIL | JENSEN | STARK ARCHITECTS, LLP
54 South Union Street
Rochester, N.Y. 14607
(585) 244.3780 tel.
(585) 244.1294 fax.
www.cjsarchitects.com



DETAIL NOTES:

1. PROVIDE ADDITIONAL VACANCY SENSORS AS INDICATED ON THE PLANS VIEWS. PROVIDE ADDITIONAL POWER/RELAY PACKS TO ACCOMMODATE THE SENSOR QUANTITIES AS REQUIRED BY THE MANUFACTURER.
2. PROVIDE CEILING MOUNTED PHOTO SENSOR TO MEASURE TOTAL LIGHT LEVEL FROM DAYLIGHT AND ELECTRIC LIGHT IN THE CONTROLLED AREA AND ADJUST ELECTRIC LIGHTING LEVELS TO MAINTAIN A DESIRED LIGHTING LEVEL. AS DAYLIGHT CONTRIBUTION INCREASES THE SENSOR SHALL DIM DOWN THE LIGHTS.
3. PROVIDE ADDITIONAL POWER PACKS TO ACCOMMODATE MULTI-LEVEL SWITCHING.

1 CEILING MOUNTED VACANCY SENSOR & PHOTO SENSOR
N.T.S.

STATE OF NEW YORK
W. BRUCE KNAPP
072078
LICENSED PROFESSIONAL ENGINEER

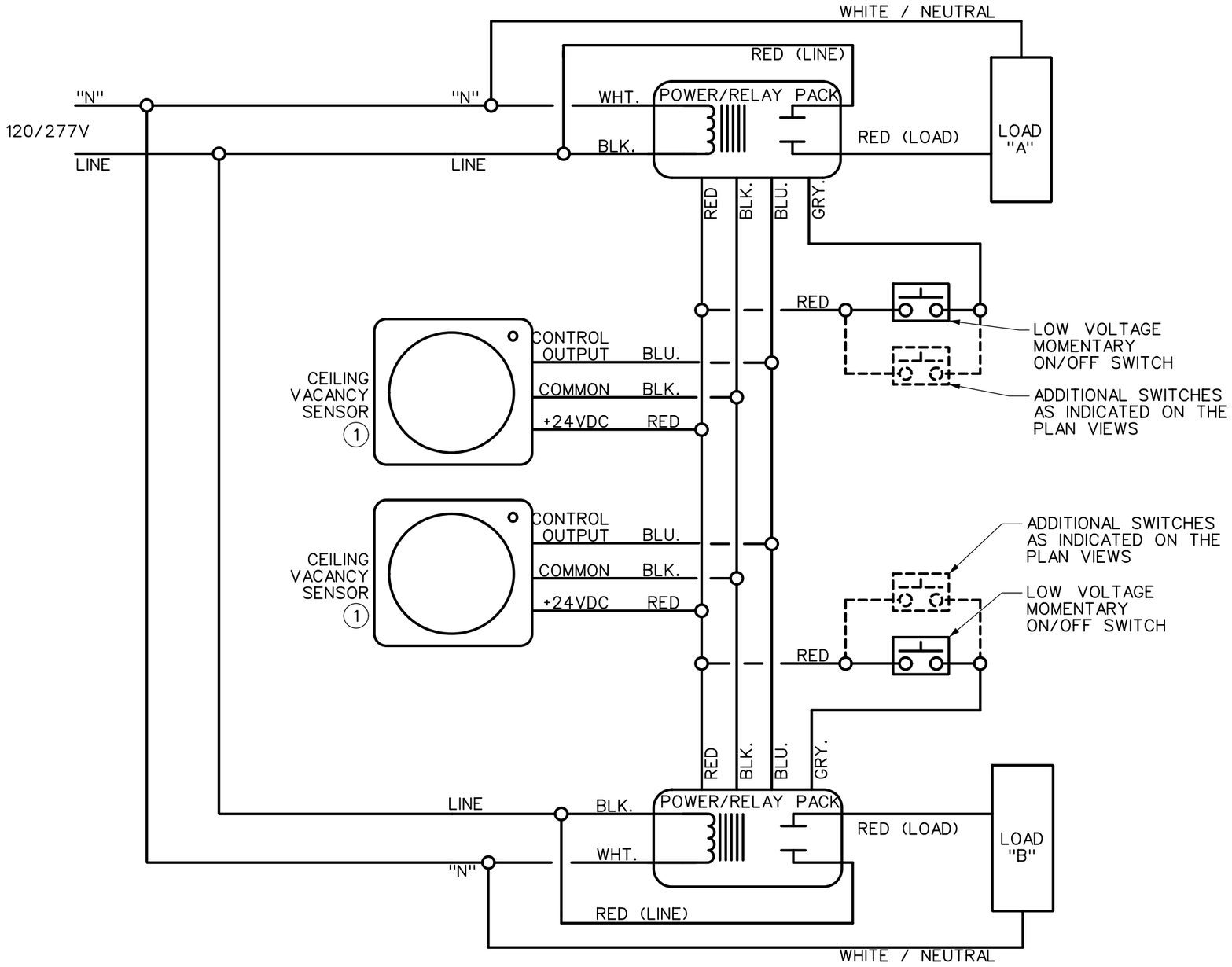
CHAINTREUIL | JENSEN | STARK ARCHITECTS, LLP
54 South Union Street
Rochester, N.Y. 14607
(585) 244.3780 tel.
(585) 244.1294 fax.
www.cjsarchitects.com

Rochester City School District
James Monroe High School
164 Alexander Street
Rochrester, New York

SED #: 26-16-00-01-0-107-029
DWT #: 26-16-00-01-7-999-019

PROJECT: RSMP - JAMES MONROE HIGH SCHOOL PHASE 2A
DRAWING TITLE: VACANCY SENSOR DIAGRAM
PROJECT NO: 1522
DRAWN BY: DJP
SCALE: AS NOTED
ISSUE DATE: 7/26/16
REVISION DATE: 7/26/16

DRAWING REFERENCE NUMBER(S): E503
DRAWING NUMBER: ADD2-E01



DETAIL NOTES:

1. PROVIDE ADDITIONAL OCCUPANCY SENSORS AS INDICATED ON THE PLANS VIEWS. ADDITIONAL POWER/RELAY PACKS SHALL BE PROVIDED TO ACCOMMODATE THE SENSOR QUANTITIES AS REQUIRED BY THE MANUFACTURER.

1 CEILING MOUNTED VACANCY SENSOR
N.T.S. **MULTIPLE SENSORS, DUAL SWITCHED LOAD**

CHAINTREUIL | JENSEN | STARK ARCHITECTS, LLP
54 South Union Street
Rochester, N.Y. 14607
(585) 244.3780 tel.
(585) 244.1294 fax.
www.cjsarchitects.com

Rochester City School District
James Monroe High School
164 Alexander Street
Rochester, New York

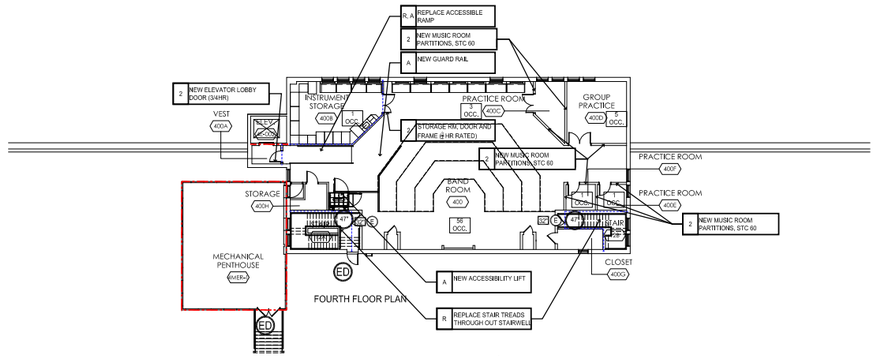
SED #: 26-16-00-01-0-107-029
DWT #: 26-16-00-01-7-999-019

PROJECT: RSMP - JAMES MONROE HIGH SCHOOL PHASE 2A
DRAWING TITLE: VACANCY SENSOR DIAGRAM
PROJECT NO: 1522
DRAWN BY: DJP
SCALE: AS NOTED
ISSUE DATE: 7/26/16
REVISION DATE: 7/26/16

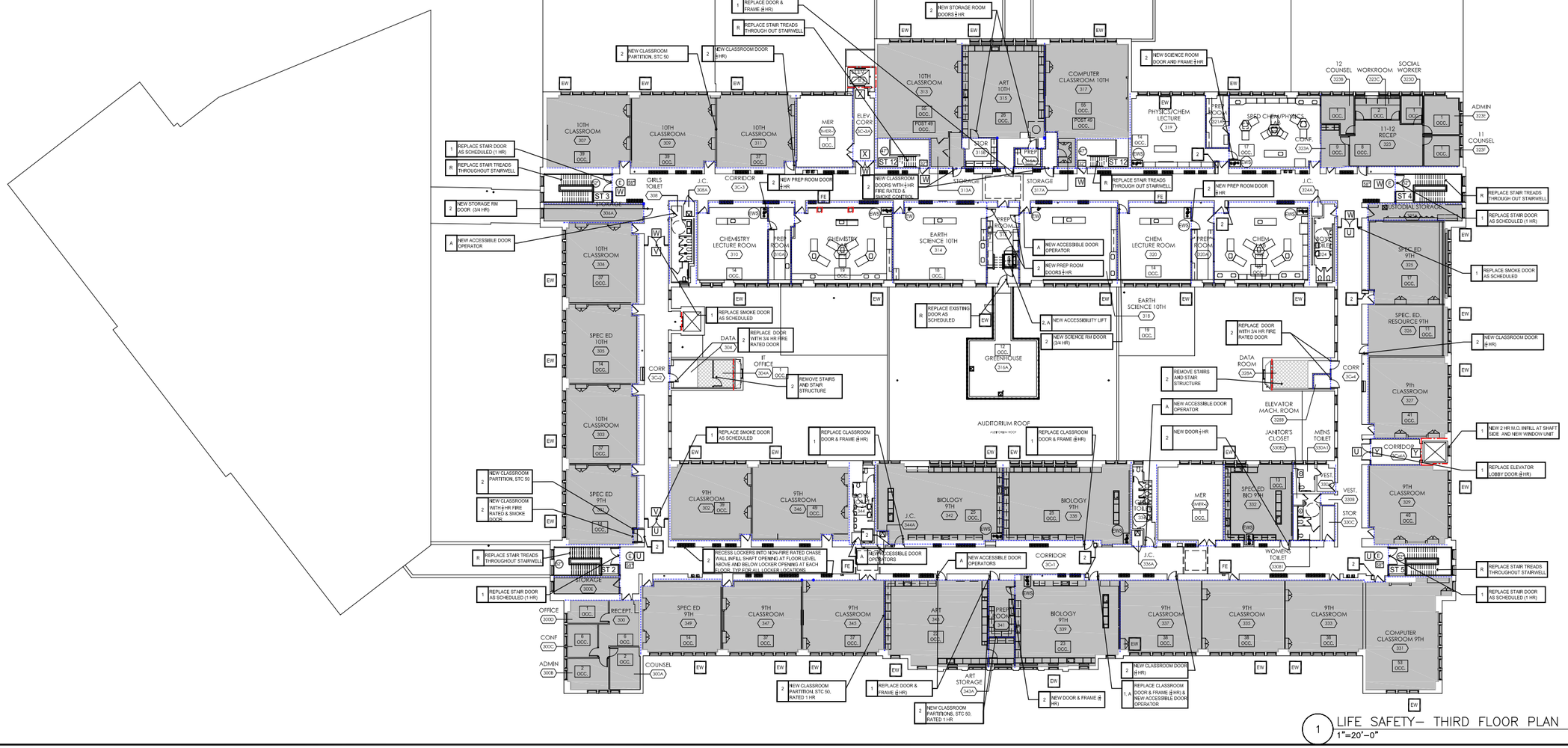
DRAWING REFERENCE NUMBER(S): E503
DRAWING NUMBER: ADD2-E02

STATE OF NEW YORK W. BRUCE KNAPP 072078 LICENSED PROFESSIONAL ENGINEER

THIS DRAWING IS IN COLOR, ALL REPRODUCTIONS SHALL BE IN COLOR



2 LIFE SAFETY– FOURTH FLOOR PLAN
1"=20'-0"



1 LIFE SAFETY– THIRD FLOOR PLAN
1"=20'-0"

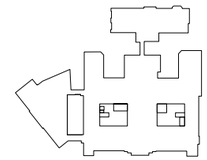
CHAINTREUIL | JENSEN | STARK ARCHITECTS, LLP

755 Seneca Street
Buffalo, NY 14210
716.856.6448 tel
716.852.1722 fax

54 South Union Street
Rochester, NY 14607
585.244.3780 tel
585.244.1294 fax

www.cjsarchitects.com

SCHOOL NO. 15



JAMES MONROE HIGH SCHOOL

KEY PLAN

ROCHESTER CITY SCHOOL DISTRICT

Every child is a work of art.
Create a masterpiece.

RCSD
James Monroe High School
Rochester Schools Modernization Program
Phase 2A

164 Alexander Street
Rochester NY, 14607

SED #: 26-16-00-01-0-107-029
DWT #: 26-16-00-01-7-999-019

DRAWING TITLE

LIFE SAFETY THIRD AND FOURTH FLOOR PLANS

JOB NO.	1522
SCALE	1" = 20'
DATE	JULY 1, 2016
DRAWN BY	JC, ME
CHECKED BY	CJ
REVISIONS	
⚠ 7.27.16	DISPLAY ROOM NAMES & NUMBERS

THIS IS A SINGLE SHEET OF A COHESIVE SET OF CONSTRUCTION DOCUMENTS (INCLUDING DRAWINGS AND SPECIFICATIONS). INTERPRETATION OF THE INFORMATION AS PRESENTED SHOULD BE BASED ON THE ENTIRE SET OF DOCUMENTS.

DRAWING NO.

LS103

BID SET