

May 18, 2015

ADDENDUM #2

ISSUED BY EDiS COMPANY
110 S. POPLAR STREET, WILMINGTON, DE 19801

The bid due date has been extended.

Bids are being received until 3:30 p.m. on Wednesday, May 27, 2015 at the AI DuPont Middle School.

NOTICE: Attach this addendum to the Project Manual for this project. It modifies and becomes a part of the Contract Documents. Work for materials not specifically mentioned herein are to be as described in the main body of the specifications and as shown on the Drawings. Acknowledge receipt of this Addendum in the space provided on the Bid Form.

SPECIFICATION REVISIONS

- a) Specification Section 011100: Contract A-02, Carpentry and General Works
 - o Page 19 – Add Bullet #115, *"Paint all existing recessed wall convectors as shown on Hydronic Demolition Plans, M8.7, M8.8, M8.9, M8.10, M8.11, and M8.12. Prep all existing convectors as required to receive new paint finish."*
 - o Page 19 – Add Bullet #116, *"Provide new bleachers as part of the work included in Alternate #2. Include any required anchoring devices, fasteners, inserts, and other related items associated with the installation of these bleachers."*
 - o Page 19 – Add Bullet #117, *"Provide new window guards as detailed on Details 7 and 11 on Sheet A6.2."*
 - o Page 19 – Add Bullet #118, *"Provide insulation, sheet metal, and sealant at the existing mechanical louvers as shown in the project documents"*
- b) Specification Section 011100: Contract A-04, Glass and Glazing
 - o Page 21 – Remove bullet #5 and replace with the following, *"Provide new windows/storefronts. Demolition of existing windows/storefronts under this alternate will be provided by Contract A-01. Windows are to be replaced by Contract A-04 : Glass and Glazing in the same day. Estimate removal & replacement of two storefronts per day. This contractor to provide temporary weather protection at windows, storefronts, and curtain walls between demolition and installation of new windows, storefronts, and curtain walls if new windows cannot be installed in the same day as the existing are demolished."*
- c) Specification Section 011100: Contract A-05, Mechanical and Plumbing
 - o Page 24 – Delete Bullet #15, *"Testing and Balancing."*
 - o Page 24 – Delete Bullet #19, *"ATC"*
 - o Page 25 – Delete Bullet #24, *"Piping work associated with the emergency generator (including fuel piping and exhaust piping). Include initial fill up of fuel tanks."*
 - o Page 26 – Add Bullet #41, *"Include all necessary design labor and quick-ship costs to supply VAV's, Air Handling Units, and Cabinet Unit Heaters for installation in Phase 1 areas for installation prior to August 2015 as stated in the project schedule. This includes installation of Air Handlers AHU-2, 3, and 4. All other mechanical units must be ordered and delivered to site for installation during each phase as shown on the*

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construction schedule. New boilers must be delivered and installed in time for the start of the district's heating season, October 2, 2015."

- d) Specification Section 011100: Contract A-06, Building Management Systems
 - o Page 29 – Add Bullet #32, *"Provide demolition of existing pneumatic control system and air compressor. This contractor is to coordinate and sequence the demolition of the pneumatic control system with the installation of the new automatic control system and new mechanical equipment to ensure that there is no interruption of heating and conditioning to the school during the school year."*
- e) Specification Section 011100: Contract A-08, Electrical
 - o Page 32 – Delete Bullet #15, "Heat Tracing."
 - o Page 32 – Delete Bullet #17, "Lightning Protection with master UL certification."
 - o Page 33 – Add Bullet #30, *"Provide new main electrical feed as shown on Electrical Site Plan. Include all associated wiring, terminations, supply and installation of new wooden crossarms with hardware, pole top insulators/dead end insulators, surge arrestors, connector kits, termination kits, etc. Modifications to the building's main electrical feed are to be provided during Summer 2015 and completed by the start of the new school year. This work is to be scheduled and coordinated to keep loss of power in the school to a minimum. Electrical contractor is to provide power during this switchover as needed to maintain temporary lighting and power for small tools as well as maintaining power to the school's essential components (including but not limited to: fire alarm, security, kitchen refrigerators/freezers)."*
 - o Page 33 – Add Bullet #31, *"Provide a power connection for new auditorium aisle lighting at each row of seating as shown on the revised electrical prints. Electrical contractor is to provide saw-cutting, removal of concrete, and patching of concrete as shown on the electrical plans to facilitate installation of new electrical wiring for aisle lights. Coordinate exact locations of power connections with auditorium seating contractor."*
- f) Specification Section 011100: Contract A-09, Auditorium Seating
 - o Page 34 – Remove bullet #2 and replace with the following, *"The existing 26 seats located in the lowest row of the 2nd floor balcony of AI DuPont Middle School will be demolished by the owner prior to the start of the project."*

DRAWINGS REVISIONS

Architectural Drawings

- a) Remove existing drawing A-401 and insert attached drawings A-401 into the project documents.

Plumbing Drawings

- b) Remove existing drawing P10.1 and insert attached drawings P10.1 into the project documents.

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RESPONSES TO REQUESTS FOR INFORMATION

1. Drawings E-9.1 thru E-9.22: Can you show the phasing on the electrical drawings?
 - a. **Phasing of the project will be performed as shown on drawings P-1 through P-8 issued in Addendum #1. Replacement of existing electrical panels and installation of new panels will be performed during Phase 1 (Summer 2015).**
2. Contract A-08 Electrical: Line item 28- Does the \$15,000.00 allowance for Advantech include them coming in to remove and replace any video surveillance cameras located in the ceiling that need to be removed?
 - a. **Removal and replacement of existing video surveillance cameras in demolished ceilings will be performed under Contract A-08 Electrical's base bid. The allowance for Advantech is to be utilized for the supply and installation of card readers and final connection of new access control at door openings to the school's existing access control system.**
3. The scope for contract A-04 says the windows will be installed by A-03. Just wanted to check on the 08900 louvers going into my frames are indeed being supplied by A-02
 - a. **New windows are to be installed by Contract A-04 – Glass and Glazing. Please see revision to summary of work included in this addendum. New louvers shown in window openings on drawing A6.1 are mechanical louvers which will be provided by Contract A-10 : Mechanical and Plumbing. Contract A-04 and A-10 will coordinate shop drawings and installation sequencing for installation of these louvers in the new window framing.**
4. Who owns painting the convectors?
 - a. **Painting of the existing recessed wall convectors is to be performed under Contract A-02 : Carpentry and General Works. Please see changes to the summary of work included in this addendum.**
5. I assume that the following items listed in CONTRACT A-10 summary of work do not pertain to us: Testing and Balancing, ATC, Piping work associated with the emergency generator.
 - a. **Correct. Please see revisions to the summary of work noted in this addendum. Contract A-10 is responsible for coordination and sequencing with both the Building Management System and Testing and Balancing contractors.**
6. They show asphalt removal on DWG A2.1. Is this by the demo contractor?
 - a. **Asphalt removal, excavation, backfill, and asphalt patching for new stormwater piping is to be provided by Contract A-05 : Mechanical and Plumbing.**
7. Bid Package A-09 : Auditorium Seating - Item #1 in the revised scope issued with addendum #1 states to provide demolition (including removal of seats and anchor bolts...). Who will be responsible for patching the holes left by the old anchor bolts?

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- a. **Contract A-09 : Auditorium Seating will patch the holes left by the old anchor bolts. Sealing/Painting of the existing concrete slab will be provided by the district's painting contractor.**
8. Item #2 in the revised scope issued with addendum #1 states the existing 26 seats in the lowest row of the 2nd floor balcony of AI DuPont High School will be demolished by owner prior to the start of the project. Is this meant to be AI DuPont Middle School and not High School, if not is any work being done at AI DuPont High School?
 - a. **This was a misprint. The existing seats referenced in bullet #2 of the summary of work for Contract A-09 are located in the AI DuPont Middle School auditorium.**
9. Do any of the other schools require aisle lights, if so, please provide a quantity and location?
 - a. **Aisle Lights are not required in the other schools. Provide aisle lights in AI DuPont Middle School as detailed on the project documents.**
10. Which contract package is responsible for Alternate #2?
 - a. **Demolition of the existing bleachers under Alternate #2 is to be provided by Contract A-01 : Demolition. Supply and installation of new bleachers including blocking and anchoring devices as detailed in the project documents and required by the manufacturer's installation instructions is to be provided by Contract A-02 : Carpentry and General Works.**
11. Alternate #4 covers Drawing A-401. I see a note that says "update guardrails for IBC compliance" but there are no details. Please provide more information. This might affect the carpentry package if the work involves miscellaneous metals (carpentry SOW item 80).
 - a. **Drawings A-401, 402, and 403 were provided for the reference of Contract A-09 : Auditorium Seating only. Other items shown on these drawings including modifications to the guardrails is to be provided by the district.**
12. Alternate #5 covers Drawing A-404. There is a section for typical floor leveling that includes rough blocking and plywood but it doesn't identify where this detail is to be used.
 - a. **Drawings A-401, 402, and 403 were provided for the reference of Contract A-09 : Auditorium Seating only. Other items shown on these drawings including modifications to the guardrails is to be provided by the district.**
13. Please clarify if the demo of the existing pneumatic control system and air compressor should be included in the bid for Contract A-06 : Building Management Systems.
 - a. **Correct. Demolition of the existing pneumatic control system and air compressor shall be provided by Contract A-06 : Building Management Systems. This contractor is to coordinate and sequence the demolition of the pneumatic control system with the installation of the new automatic control system and new mechanical equipment to ensure that there is no interruption of heating and conditioning to the school during the school year.**

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14. Who provides window guards per detail 7 & 11/A6.2?
 - a. **Window guards as detailed on Details 7 and 11 on Sheet A6.2 are to be provided by Contract A-02 : Carpentry and General Works.**
15. Who is responsible for details 4, 5, & 6/A6.4 showing insulation and 14 ga. sheet fastened to existing mechanical louvers?
 - a. **Contract A-02 : Carpentry and General Works is to provide insulation, sheet metal, and sealant at the existing mechanical louvers as shown in the project documents.**

PREQUALIFICATION

The following contractors have submitted supplementary prequalification statements which have been reviewed and approved for this project:

- Mechanical and Plumbing
 - J.F. Sobieski Mechanical Contractors Inc.
 - Merit Mechanical Co., Inc.
 - Gaudelli Bros., Inc.
 - Ralph G. Degli Obizzi & Sons, Inc.
 - Worth and Company, Inc.

ATTACHMENTS

- Architectural Drawing A-401
- Plumbing Drawing P-10.1
- Addendum No. 2 from Studio JAED dated May 18, 2015.

END OF ADDENDUM #2

	SHEET KEYNOTES
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1. REMOVE WALL BASE AT WATER COOLER FOR ADA COMPLIANCE. PATCH AND REPAIR FLOOR AND WALL BASE TO MATCH EXISTING.
2. NOT USED



1621 N. Lincoln Street
Wilmington, DE 19806

(P) 302.658.6426
(F) 302.658.8431

abhagen@ABHA.com
www.ABHA.com

CONSULTANTS

FURLOW ASSOCIATES
MECHANICAL/ELECTRICAL ENGINEERS
1206 SOCIETY DR
CLAYMONT, DELAWARE 19703

PROJECT
2014 RCCSD
CAPITOL IMPROVEMENTS

201 JACKSON AVENUE
WILMINGTON, DELAWARE 19804

CONRAD SCHOOL
OF SCIENCE

OWNER

RED CLAY CONSOLIDATED
SCHOOL DISTRICT
1502 SPRUCE AVENUE
WILMINGTON, DE 19805

PROJECT NO:	1426
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FILE NAME

DRAWN BY: SMM

CHECKED BY: CN

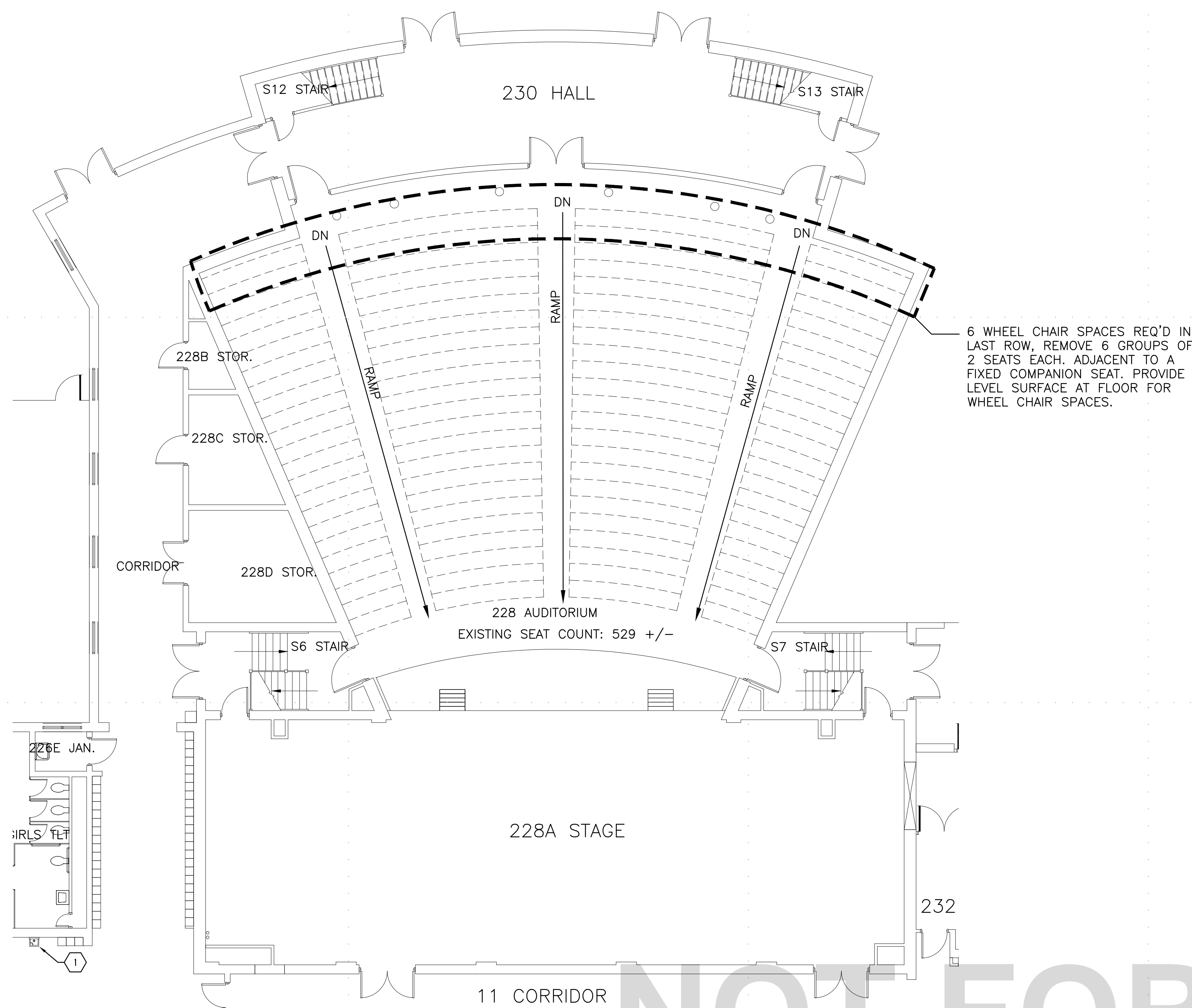
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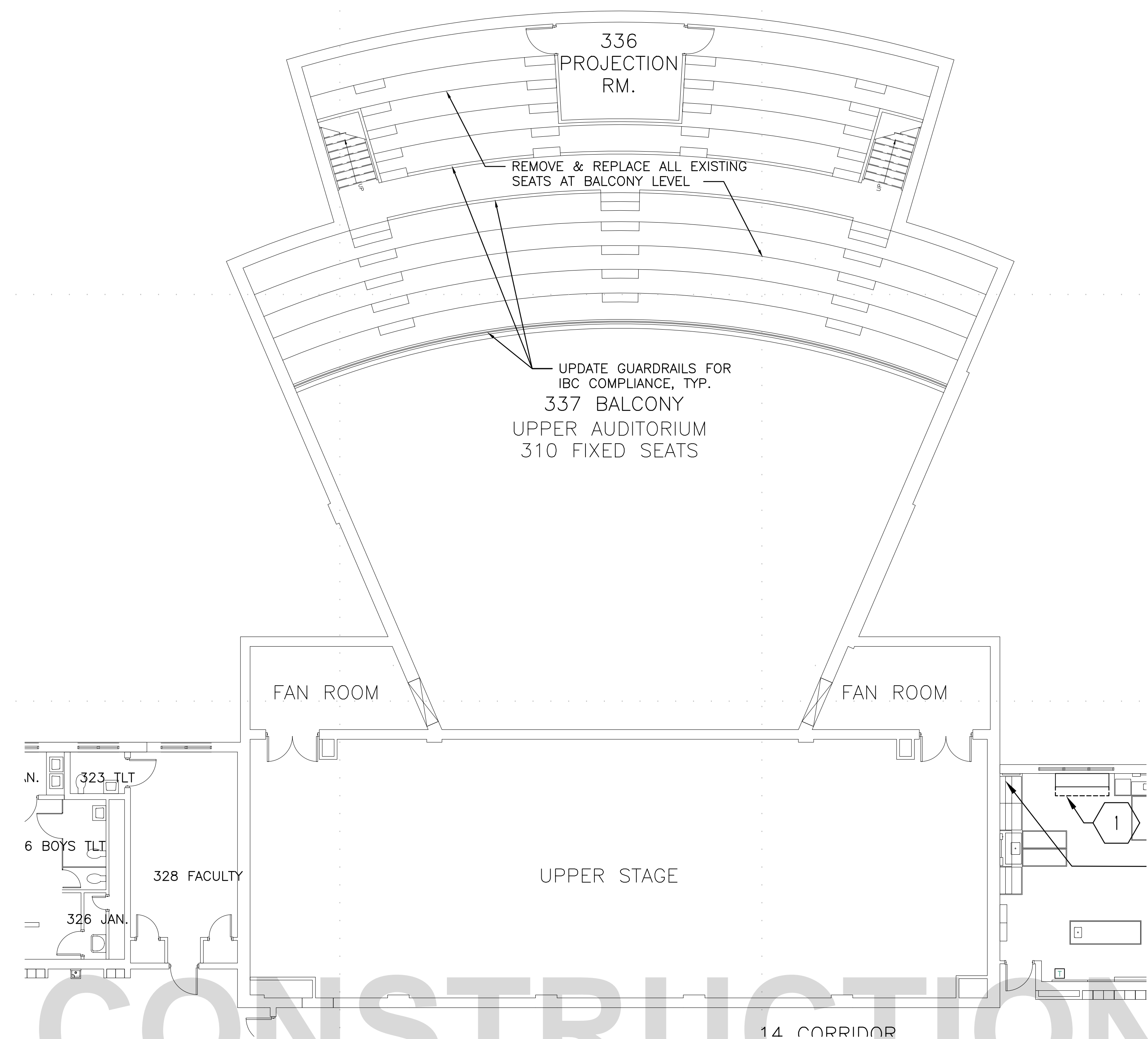
SHEET TITLE

AUDITORIUM —
EXISTING AUDITORIUM
FLOOR PLANS

A-401



6 WHEEL CHAIR SPACES REQ'D IN LAST ROW, REMOVE 6 GROUPS OF 2 SEATS EACH. ADJACENT TO A FIXED COMPANION SEAT. PROVIDE LEVEL SURFACE AT FLOOR FOR WHEEL CHAIR SPACES.

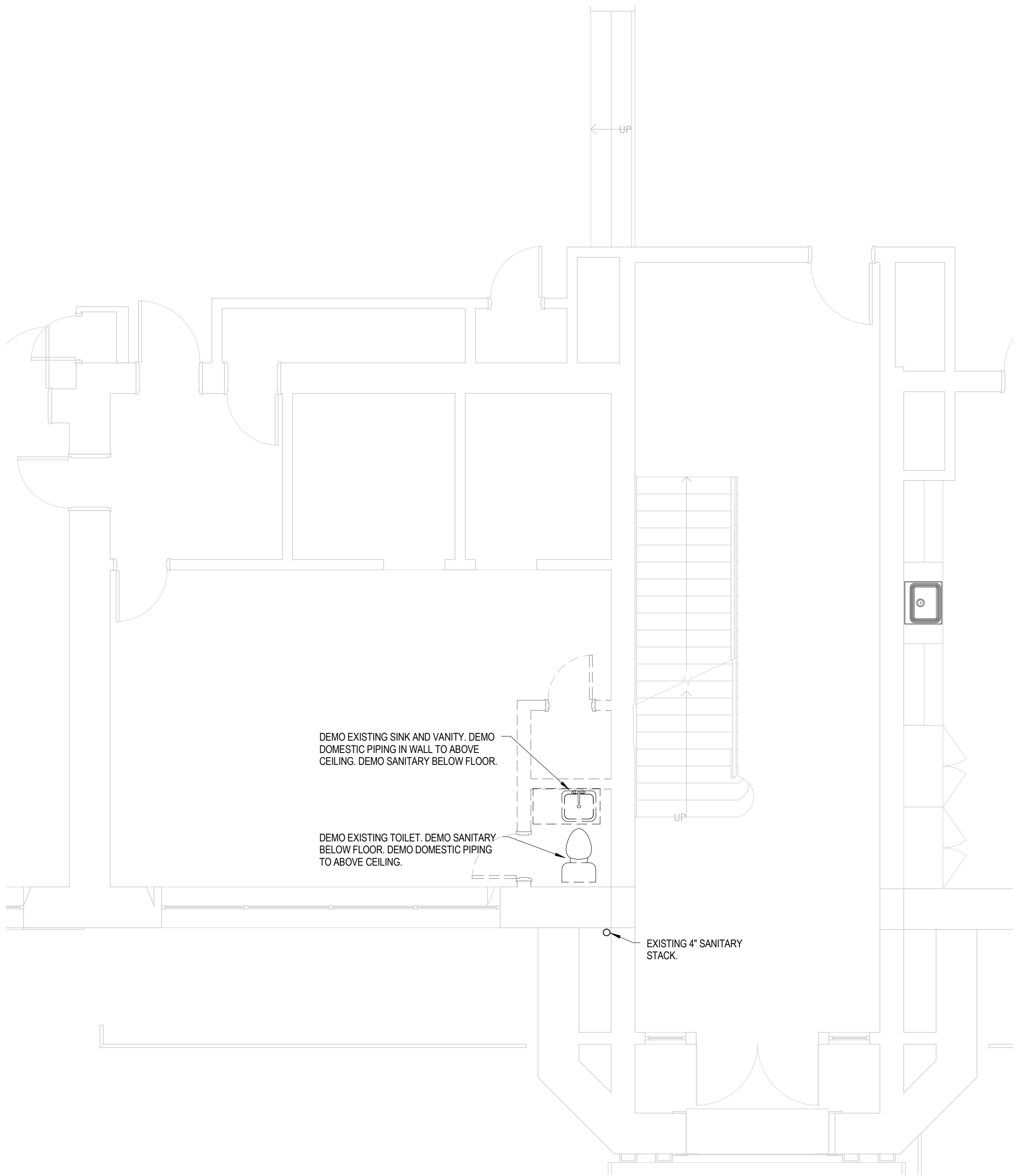


Al 1ST FLOOR - AUDITORIUM
SCALE: 1/8" = 1'-0"

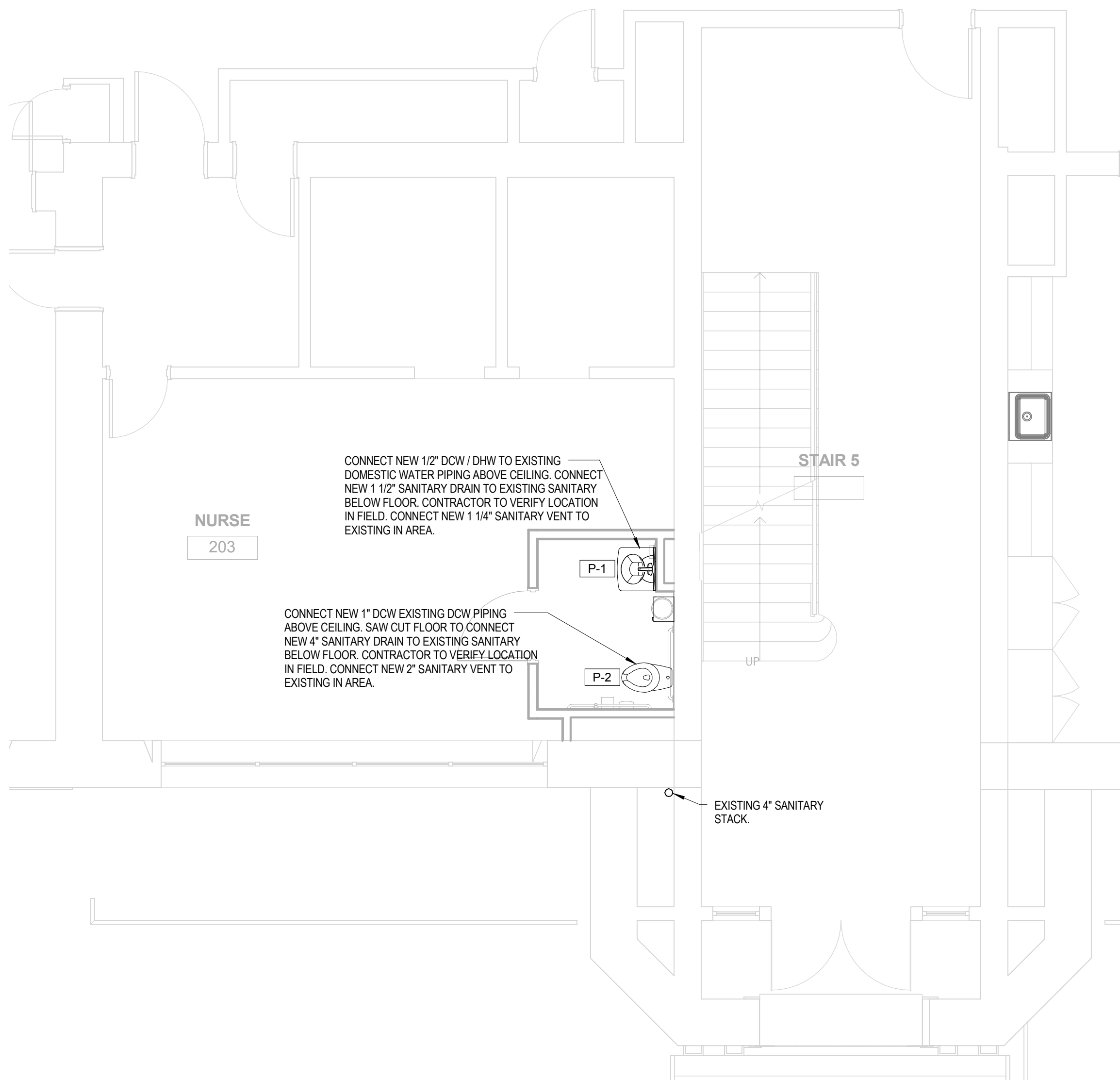
A4 AUDITORIUM BALCONY
SCALE: 1/8" = 1'-0"

NOT FOR CONSTRUCTION

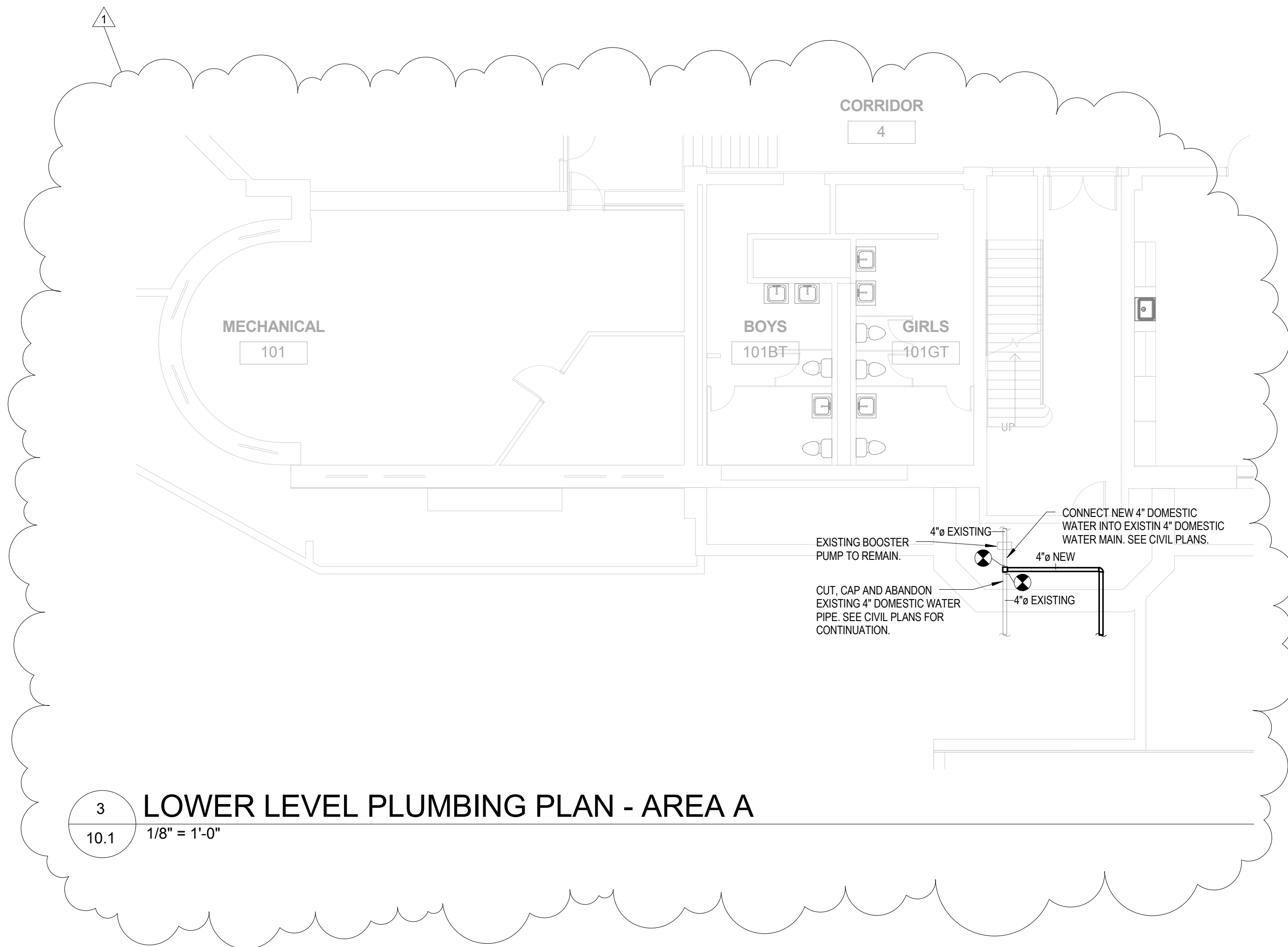
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1 FIRST FLOOR PLUMBING DEMOLITION PLAN - AREA A
10.1 1/4" = 1'-0"

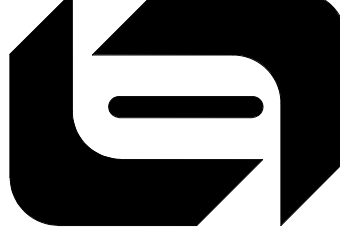


2 FIRST FLOOR PLUMBING PLAN - AREA A
10.1 1/4" = 1'-0"



3 LOWER LEVEL PLUMBING PLAN - AREA A
10.1 1/8" = 1'-0"

This drawing is the property of StudioJAED and is prepared for the exclusive use of its clients at the location indicated. No other use is authorized or intended.



STUDIOJAED

ARCHITECTS ■ ENGINEERS ■ FACILITIES SOLUTIONS

CORPORATE HEADQUARTERS

2800 WRANGLE HILL ROAD STE. 110

DELAWARE, DE 19717

P: (302) 682-1862 F: (302) 832-1423

E-Mail:

info@studiojaed.com

Website:

www.studiojaed.com

REVISIONS		
△	DESCRIPTION	DATE
1	ADDENDUM #1	5/13/2015

RED CLAY CONSOLIDATED SCHOOL DISTRICT

A. I. DuPont Middle School

HVAC RENOVATION

3130 KENNETT PIKE

WILMINGTON, DELAWARE 19807

LOWER LEVEL AND FIRST FLOOR PLUMBING DEMOLITION AND NEW PLAN

BID DOCUMENTS
MAY 1, 2015

DRAWN: JRB
CHKD / DESIGNER: BMZ

DISCIPLINE: P
SHEET NO. 10.1

PROJECT NO. 14036

**Addendum
No. 2****Date:** May 18, 2015**Project:** AI DuPont MS Renovations**Project No:** 14036

The work herein shall be considered part of the bid documents for the referenced project and carried out in accordance with the following supplemental instructions issued in accordance with the Contract Documents without change in Contract Sum or Contract Time. Acknowledge receipt of addendum on the bid form as indicated.

<i>Item</i>	<i>Description</i>
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Clarifications:

1. Ceiling contractor to own removal and reinstallation of escutcheon plates at sprinkler heads.
2. Note M-1 on sheet M8.27 requires the contractor to extend piping from location of demolished water heater (also shown on sheet M8.27) to new water heaters, with manifolded piping and controls. This piping is not shown on the drawings, but contractor is required to coordinate the extension of existing piping with existing and new utilities.
3. Prior to start of work shown on E9.24 (newly issued sheet), aerial conductors, under-ground conductors, and hardware to be removed where new conductors and hardware are to be provided.
4. Drawings E9.10 – E9.15, CT-Control Transformer to be SQ'D-TF-9070T100D13 or approved equal.
5. Drawings E9.1 – E9.6, Panel Replacement Notes: REMOVED notation of 1 through 32. It will read: UNLESS NOTED, FOR EXISTING PANELS:
6. Drawing E9.0; "ELECTRICAL GENERAL NOTES" Note #29: ADD: Provide Remote Test Switches For Duct Detectors Testing.
7. All duct smoke detectors are to be provided with monitoring module and control relay.
8. On Architectural reflected ceiling plans, ceiling type "D" is to be 24"x48".

RFI Responses:

1. **Question:** Drawing E-9.1 thru E- 9.22: Is there any way to turn on the layers of the walls or darken the lines. When the drawings print out it is very difficult to see the walls.
Answer: The walls are intentionally lightened per the documenting program standards so the scope of work is clearly visible. When plotted at full-scale with the PDF provided for bidding the walls should be visible.
2. **Question:** Drawings E9.1 thru E-9.22: Can you show column lines on the electrical drawings?
Answer: No column lines are available for this project.
3. **Question:** Drawings E9.17 thru E-9.22: Are the fire alarm devices shown on these drawings existing to remain and be re-used or are they new. Is it the intent to provide a new fire alarm detection system? There are no specs provided for the fire alarm detection.

Answer: There is no new fire alarm system. New devices are to be added to existing FACP. All FA devices shown on E9.17 through E9.22 are new.

4. **Question:** Drawings E-9.7 thru E-9.9: Are we to include removing all light fixtures shown on these drawings, temporarily storing and reinstalling after the mechanical and ceiling work has been completed? , and are we to assume all branch circuit wiring is to be reused?

Answer: All fixtures are to remain temporarily suspended during construction unless removal is needed to facilitate mechanical installation. All fixtures are to be reinstalled in new scheduled ceiling. Yes, all branch wiring is to be reused.

5. **Question:** Spec Section 260573 Coordination Study: Does this section apply to this project? The distribution equipment and incoming services appear to be existing.

Answer: No coordination study is required.

6. **Question:** Spec Section 260526(4) Ground Ring: This is an existing building. Is a new ground ring and rod system required to be installed around the perimeter of the building?

Answer: No new ground ring or rod system are required.

7. **Question:** Spec Section 0111-00 A8 Electrical Summary: Item 17 Lightning Protection- Is a new lightning protection system or modifications to an existing system required for this project? If modifications can you please indicate where and who installed the original system.

Answer: No new lightning protection is required.

8. **Question:** Spec Section 0111-00 A8 Electrical Summary: Item 16 Heat Trace- Is heat trace required for this project? If so please indicate where and supply a spec.

Answer: No new heat trace is required.

9. **Question:** Drawing E-9.1: Are we to assume that panels 1, 2, 3, 5, 6, 7, 9, and 12, 13 are 3 phase panels unless noted otherwise?

Answer: Yes, they are 3 phase 4 wire

10. **Question:** Drawing E-9.2: Are we to assume that panels 14, 15, 33 and 34 are 3 phase panels unless noted otherwise?

Answer: Yes, they are 3 phase 4 wire

11. **Question:** Drawing E-9.3: Are we to assume that panels 18 and 22 are 3 phase panels unless noted otherwise?

Answer: Yes, they are 3 phase 4 wire

12. **Question:** Drawing E-9.4: Are we to assume that panels 25 and 26 are 3 phase panels unless noted otherwise?

Answer: Yes, they are 3 phase 4 wire

13. **Question:** Drawing E-9.5: Are we to assume that panels 29 and 30 are 3 phase panels unless noted otherwise?

Answer: Yes, they are 3 phase 4 wire

14. **Question:** Drawing E-9.6: Are we to assume that panel 32 is 3 phase panels unless noted otherwise?

Answer: Yes, they are 3 phase 4 wire

15. **Question:** Drawing E-9.5 and E-9.6: On both of these drawings there are panels numbered 29 and 30. Please advise how they should be numbered.

Answer: See attached sketch SK-E.9.

16. **Question:** Drawing E-9.1: Panel #11 (EM): This panel is identified with a top section and a bottom section but the dimensions list a left and right side. Which is correct?

Answer: The panel has top and bottom sections, no left or right sections. Dimensions are 46" H x 14.5" W x 4.75" D.

17. **Question:** Drawing E-9.0: Partial Single Line: Are the circuit breakers shown in Existing SWBD-1 and SWBD-2 new circuit breakers into existing panels or do they currently exist?

Answer: The circuit breakers are new and are in existing switchboards.

18. **Question:** Drawing E-9.8: Can you identify this symbol? It does not appear on the demolition legend.



Answer: This symbol is also a speaker, same as an S within a circle.

19. **Question:** Drawing E-9.10: AHU-4 is shown to be fed by Circuit PLBR: (1/3/5)- (7/9/11)- and 13/15/17). The Panel for PLBR on drawing E-9.23 list AHU-4 as Circuits (2/4/6)- (8/10/12)- and (14/16/18). Which is correct?

Answer: Circuit numbers shown on scheduled panel PLBR on drawing E9.23 are correct.

20. **Question:** Drawing E-9.11: AHU-2 is shown to be fed by Circuit PLBR: (2/4/6)- (8/10/12)- and (14/16/18). Panel schedule for PLBR on drawing E-9.23 list AHU-2 as circuits (1/3/5)- 7/9/11)- and (19/21/23). Which is correct?

Answer: Circuit numbers shown on scheduled panel PLBR on drawing E9.23 are correct.

21. **Question:** Drawing E-9.12: CUH-1 is listed to be fed from circuit X-35. The schedule for Panel X on drawing E-9.23 list circuits X (31/33/35) to supply UV-2. What is the correct designation for CUH-1?

Answer: UV-2 requires 208V/1PH goes to CKT # X-31/35. CUH-1 goes to X-35.

22. **Question:** Drawings E-9.10, E-9.11, E-9.12, E-9.13, and E-9.14 show a list a control transformer with a description. Is this control transformer supplied and installed by the mechanical contractor, ATC contractor or the electrical contractor?

Answer: Electrical Contractor to provide control transformer with box.

23. **Question:** Drawing E-9.13: MAU-1 is shown to be fed from panel PL1A circuit 5/7/9. I do not see a panel schedule for this panel and no location shown on the drawings. Where is it located?
Answer: This panel is to be PL1B - 5/7/9.
24. **Question:** Panel Schedules listed as "No Labels": Will a panel designation be given to each these panels for labeling and identifying them?
Answer: Currently, there is no label.
25. **Question:** Drawing E-9.14: CUH-1 and UV-2 are both shown to be fed by circuit PL2A-10. Is this correct?
Answer: UV-2 to be powered from PL2A #5.
26. **Question:** In reviewing the lighting demolition drawings E-9.7 thru E-9.6 and comparing them to the fire alarm device drawings E-9.17 thru E-9.22 there are a major difference in the quantities between the 2 series of drawings. Which shows correct for demo and are new devices being added to the detection system?
Answer: Existing devices shown on demolition plans are to be reinstalled in new scheduled ceiling. Devices shown on Fire Alarm Device Plans E-9.17 thru E-9.22 are new FA devices to be connected to the existing FACP.
27. **Question:** Specification Section 004100 (Electrical Bid Form): Alternate No.1 Main Entrance Security Vestibule shown as Key note 3 on Sheet A3.3: Key note 3 on A3.3 on states to install new interior aluminum store front system. There are no security or fire alarm devices shown, power requirements indicated, quantities or locations, specification for new security devices. Please advise.
Answer: See attached revised sheet E9.12.
28. **Question:** Specification Section 004100 (Electrical Bid Form): Alternate No.2 Demo existing bleachers and provide new bleachers in Gym. There is no electrical shown on the drawings for the bleachers. Does this alternate apply to this bid and if so please identify what it is required electrically.
Answer: See attached sketch SK-A.32 for location and quantity of manual bleachers. See attached revised specification section 12 66 13.
29. **Question:** Drawing A-3.4 Note 4: This note reference a new ADA platform lift. Is there any electrical associated with this lift. There is nothing shown on the power plans.
Answer: See attached drawing E9.13.
30. **Question:** Auditorium Seating Drawings A-3.14 and A-3.15: What if anything is the electrical contractor required to supply in the base bid for AI Middle School auditorium seating replacement? Are we disconnecting existing aisle lighting and reconnecting to new aisle lighting at the same locations? Is there any new wiring or circuits required? There is nothing shown on the electrical drawings.
Answer: There is no existing aisle lighting. New aisle lighting is to be provided by auditorium seating contractor. See attached drawing E9.13 & E9.15 for new wiring,

conduit, and junction box locations. Aisle lighting is to be located where junction boxes are located on plan.

31. **Question:** Drawing E-9.0: The partial single line drawing shows a 125 amp circuit from SWBD-1 to AHU-4. Drawing E-9.10 shows 3 circuits from AHU-4 going back to panel PLBR including a 125amp circuit. Which is correct?

Answer: AHU-4 is powered from Panel –PBLR. Refer to panel schedule on drawing E9.23.

32. **Question:** Drawing E-9.0: The partial single line drawings shows a 175 amp circuit from SWBD-1 to AHU-2. Drawing E-9.11 shows an 80amp, 25 amp and 20 amp circuit to panel PLBR from AHU-2. Is the 175 amp circuit also required?

Answer: AHU-2 is powered from Panel-PLBR. Refer to panel schedule on drawing E9.23.

33. **Question:** Reference drawing A6.1: Per Efco the maximum size of a WV410 projected vent is 36 x 60 Many of the vents are over sized: Frame types ES11 ES12 ES14 ES21 ES26 ETC. Please advise.

Answer: Sheet attached reissued sheet A6.1.

34. **Question:** I wanted to submit our request to add “Enviro-Tec” as an acceptable manufacturer for the VAV Boxes under specification section 233600 on your A.I. DuPont MS Renovation project. We do a lot of design work with StudioJaed and they list our major product, Daikin, for most of the equipment except for the VAV Boxes where we’d like to have Enviro-Tec added. Enviro-Tec products are very familiar to engineers but I have attached product literature just in case it’s need for review.

Answer: Enviro-Tec is an acceptable VAV manufacturer. See “Changes to Specification Manual” below.

35. **Question:** Item #1 in the revised scope issued with addendum #1 stated several drawings that include layouts of the auditorium seating for each of the four schools. The drawing package we downloaded from EDiS’ ftp site did not include A-403, which we would assume is for HB DuPont Middle School. Can drawing A-403 be provided?

Answer: See attached sheet A-403 for HB DuPont Middle School Auditorium seating.

36. **Question:** Will Hussey Seating Company, Quattro Classic Traditional Series, model # S3.L.3.T. be approved for use on this project (substitution request attached)?

Answer: Hussey Seating Company is an approved substitution provided the substitution meets requirements of specifications, including but not limited to, upholstery is to be a slip cover with steel zipper, and seat side panels are to be hardwood. See attached additional specification information for Fixed Audience Seating 12 61 00.

37. **Question:** Section 126100, paragraph 2.03.B. specify the backs to be two panel construction with a protective back panel. There are several styles of back panel

construction available, which include plastic, laminate, wood veneer and upholstered. What is the construction of the outer back panel to be for the seating?
Answer: The outer back panel is to be plastic.

38. **Question:** Section 126100, paragraph 2.05.A. specifies aisle lights. Only drawing A3.15 seems to indicate aisle lights for the balcony seating, a total of 34 aisle lights for AI DuPont Middle School. No aisle lights junction boxes are indicated on the electrical drawings. Is the correct quantity of aisle lights for AI DuPont Middle School 34, if not what is the correct quantity?

Answer: There is no existing aisle lighting. New aisle lighting is to be provided by auditorium seating contractor. Aisle lights are required at each row of seating. See attached drawing E9.13 & E9.15 for new wiring, conduit, stub-up, and junction box locations. Electrical contractor is to provide a power connection at each row of seating as shown on the revised electrical prints. Electrical contractor is to provide saw-cutting, removal of concrete, and patching of concrete as shown on the electrical plans to facilitate installation of new electrical wiring for aisle lights.

39. **Question:** Alternate #2 issued in addendum #1 is for replacement bleachers in the gymnasium. The drawings and specifications do not include any information on these bleachers. Can a spec and drawing be provided for this alternate?

Answer: See attached sketch SK-A.32 for location and quantity of manual bleachers. See attached revised specification section 12 66 13.

40. **Question:** Will LAARS Condensing Boilers be approved for use on this project (substitution request attached)?

Answer: The submitted LAARS condensing boiler does not meet the turndown requirement of the specified boiler models. LAARS condensing boilers are not approved for this project.

41. **Question:** The drawings list Acoustical Ceiling types A, B, C, D & E. The drawings do not delineate what these are, and the specs only call for one type of tile. Is there a forthcoming specification adjustment for the ACT?

Answer: See attached revised specification section 09 51 00 for ceiling types.

42. **Question:** For the Stretch Wall system there are no interior elevations that indicate wall panel placement in the Music and Vocal Rooms, please advise.

Answer: Panels are to be provided from floor to ceiling including above doors where located on plan. There is approximately 1200SF of stretch wall panel per room.

43. **Question:** Will Draper Flexshades be approved for use on this project (Substitution request attached)?

Answer: Yes, Draper is an approved substitution.

44. **Question:** Alternate #6 covers Drawing A-403. This drawing is missing from the drawing set on the EDiS website. Please provide.

Answer: See attached sheet A-403 for HB DuPont Middle School Auditorium seating.

Changes to Drawings:

General

1. Add the following sheet to the drawing list: "Drawing E9.24 – Electrical Site Plan."
No sketch issued to reflect this change.

Architectural

1. Drawing A2.12 – Ceiling demolition keynote revised to read, "REMOVE EXISTING 2' X 4' SUSPENDED ACOUSTICAL TILE CEILING, GRID, HANGERS, FASTENERS, AND EXISTING CFMF ABOVE EXISTING CEILINGS AT CORRIDORS. TEMPORARILY SECURE ALL ELECTRICAL DEVICES, MECHANICAL DEVICES, FIRE PROTECTION DEVICES, SPRINKLER HEADS, AND EMERGENCY DEVICES AND REINSTALL IN NEW GRID." No sketch issued to reflect this change.
2. Drawing A2.11 – Sheet reissued with revisions to ceiling tags and corresponding keynotes. See attached sheet.
3. Drawing A3.11 - Sheet reissued with revisions to ceiling tags and corresponding keynotes. See attached sheet.
4. Drawing A2.7 – Additional ceiling demolition scope has been added. See attached sketch SK-A.26.
5. Drawing A3.7- Additional new ceiling installation scope has been added. See attached sketch SK-A.27.
6. Drawing A3.1 – Demolition and new installation of EIFS panels at front exterior elevation. See sketch SK-A.28.
7. Drawing A6.1 – Sheet reissued with revisions to vents at Storefront Elevations. See attached sheet.
8. Drawing A3.9 – Revision to new First Floor entry vestibule ceiling layout. See attached sketch SK-A.29.
9. Drawing A6.3 – CFMF wall above new First Floor vestibule storefront to extend to deck. See revised head detail on attached sketch SK-A.30.
10. Drawing A6.4 – CFMF wall above new First Floor vestibule storefront door to extend to deck. See revised head detail H-5 on attached sketch SK-A.31.
11. Drawings A2.3 & A3.3 – Existing Gymnasium bleachers to be removed and replaced. See attached sketch SK-A.32.
12. Drawings A3.14 & A3.15 – Existing concrete floor to be demolished, patched and repaired at locations of new conduit and junction box installation. See attached reissued sheets A3.14 and A3.15.

Mechanical

1. Drawing M8.18 – Sheet is re-issued. See attached revised M8.18. Add note to coordinate ductwork with attic duct routing. Move note that indicates where ductwork goes up into attic.
2. Drawing M8.7 – Add unit heater demolition. See sketch SK-M.18.
3. Drawing M8.20 – Add unit heaters & piping. See sketch SK-M.19.
4. Drawing M8.29 – Add unit heater schedule and schedule notes. See sketch SK-M.20.
5. Drawing M8.27 – Add unit heaters and piping. See sketch SK-M.21.

6. Drawing M8.28 – Pump Schedule – Add “Comments” to “P-3” which read “Provide with Vendor-Supplied VFD”. No sketch issued to reflect this change.
7. Drawing M8.28 – Condensing Unit Schedule – Add schedule note “Provide all units with variable speed compressors for capacity control.” No sketch issued to reflect this change.
8. Drawing M8.31 – Add note “All components are new unless otherwise noted.” No sketch issued to reflect this change.
9. Drawing M8.28 – Air Handling Unit Schedule – Add schedule note “Provide all units with airflow monitoring station at OA intake.”
10. Drawing M8.28 – Air Handling Unit with Energy Recovery Schedule – Add schedule note “Provide all units with airflow monitoring station at OA intake.”

Electrical

1. Drawing E9.24 – Add sheet. See attached.
2. Drawing SK-E.9 – Clarified panel designations/descriptions for Panels 27, 29 and 30.
3. Drawing SK-E.10 – Added receptacles to CU 2, 4, and 5 on roof.
4. Drawing SK-E.11 – Added circuit designation to panel PL2A for receptacles on roof to CUs.
5. Drawing E9.10 – Add GFCI receptacle at AHU-4. Add junction box for ATC power supply. Move CT location from ceiling to boiler room as indicated. See sketch SK-E.12.
6. Drawing E9.23 – Revise schedule for PNL-PLBR. See sketch SK-E.13.
7. Drawing E9.11 – Add GFCI receptacle at AHU-2. See sketch SK-E.14.
8. Drawing E9.11 – Move CT from ceiling space to Storage 115B. See sketch SK-E.15.
9. Drawing E9.11 – Delete CT at Classroom 128. See sketch SK-E.16. Delete associated ckt 42 from PNL-A (no sketch issued to reflect change to panel schedule).
10. Drawing E9.12 – Move (2) CTs from ceiling spaces and into Work Room 205S and Work Room 206S, respectively. See sketch SK-E.17.
11. Drawing E9.13 – Move CT out of ceiling space and relocate to Stage 217. See sketch SK-E.18.
12. Drawing E9.13 – Add GFCI at MAU-1. Add junction box for ATC power supply. See sketch SK-E.19.
13. Drawing E9.23 – Revise schedule for PNL-PL1B. Add ckt 12 as indicated and add ckt 13 as indicated. See sketch SK-E.20.
14. Drawing E9.16 – Add GFCI at AHU-5. See sketch SK-E.21.
15. Drawing E9.15 – Add junction box for ATC power supply and corrected circuits to UV-1 in Rm 316. See sketch SK-E.22.
16. Drawing E9.23 – Revise schedule for PNL-PL2A. Add ckt 23 as indicated. See sketch SK-E.23.
17. Drawing SK-E.24 – Revised panel description.
18. Drawing SK-E.25 – Revised panel description.
19. Drawing SK-E.26 – Revised panel description.
20. Drawing SK-E.27 – Revised panel description.
21. Drawing E9.1 – Add demolition of unit heater circuit. See sketch SK-E.28.
22. Drawing E9.0 – Revise single-line diagram. See sketch SK-E.29.
23. Drawing E9.10 – Add power circuits to unit heaters. See sketch SK-E.30.
24. Drawing E9.10 – Add power circuit to unit heater. See sketch SK-E.31.
25. Drawing E9.11 – Add power circuit to unit heater. Revise power note to P-3. See sketch SK-E.32.

26. Drawing E9.23 – Add unit heater circuits to panel schedule PNL-PLBR. See sketch SK-E.33.
27. Drawing E9.13 – Sheet is reissued. See attached E9.13. Add aisle lighting and power to lift chair.
28. Drawing E9.15 – Sheet is reissued. See attached E9.15. Add aisle lighting.
29. Drawing E9.12 – Sheet is reissued. See attached E9.12. Add vestibule lighting, add exit sign / emergency light, revise EX/EM light fixture note / type, add card readers, and add removal / reinstallation of exterior light fixtures.
30. Drawing E9.11 – Sheet is reissued. See attached E9.11. Add card readers.
31. Drawing E9.14 – SK-E.34: Revised ckt # to UV-2 in Girls Locker 309.
32. Drawing E9.0 – (No Sketch Issued) Under Custom Fully Hinged Surface Mounted Door and Trim Detail, note to read as follows:
NOTE: ALL EXISTING PANELBOARDS, EXCEPT ONES LOCATED IN BASEMENT ELECTRICAL ROOM, SHALL HAVE NEW BUSBARS INCLUDING NEUTRAL AND GROUND BARS, MATCHING CIRCUIT BREAKERS AND DOOR-IN-DOOR TRIMS. DISCONNECT ALL IN COMING FEEDERS AND OUTGOING BRANCH CIRCUIT WIRING FROM EXISTING CIRCUIT BREAKERS. REPLACE EXISTING BUSBARS, AND BRANCH CIRCUIT BREAKERS WITH NEW BUSBARS, MATCHING CIRCUIT BREAKERS AND DOOR-IN-DOOR TRIM. RECONNECT ALL INCOMING FEEDERS AND OUTGOING BRANCH CIRCUIT WIRING TO NEW CIRCUIT BREAKERS.

CONTRACTOR SHALL FIELD VERIFY DIMENSIONS OF EXISTING BOXES PRIOR TO BIDDING TO ACCERTAIN NEW BUSBARS, BREAKERS AND DOOR TRIMS WILL FIT IN EXISTING BOXES.

Plumbing

1. None.

Changes to Specification Manual:

1. *Specification Section 00 01 10 – Table of Contents:* Replace Section 00 01 10 in the project manual with the revised Section 00 01 10 attached to this addendum.
2. *Specification Section 08 41 13 10 – Aluminum Framed Storefronts Interior:* See attached specification section.
3. *Specification Section 08 71 00 – Door Hardware:* Replace Section 08 71 00 in Addendum #1 with the revised Section 08 71 00 attached to this addendum. Card readers have been added to door hardware schedules.
4. *Specification Section 09 51 00 – Acoustical Ceilings:* Replace Section 09 51 00 in the project manual with the revised Section 09 51 00 attached to this addendum.
5. *Specification Section 12 61 00 – Fixed Audience Seating :* Attached additional specifications for specified seating. See attached 12 61 00.01 and 12 61 00.02.
6. *Specification Section 12 66 13– Telescopic Bleachers:* See attached specification section.
7. *Specification Section 23 09 93 – Sequence Of Operation for HVAC Controls:* See attached revised specification clarifying control of single-zoned air handling units.
8. *Specification Section 23 36 00 – Air Terminal Units:* Approved manufacturers for VAV terminal units are: Trane Co., York / JCI, and Daikin / McQuay.
9. *Specification Section 23 62 13 – Packaged Air Cooled Refrigerant Compressor and Condensing Units:* See attached specification for reference.

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SECTION 08 41 13 10 ALUMINUM – FRAMED STOREFRONTS INTERIOR

System 402 Flush-Glazed Screw Spline Storefront

PART 1 GENERAL

1.01 Work Included

- A. Furnish and install aluminum architectural storefront system complete with hardware and related components as shown on drawings and specified in this section.
- B. All storefront systems shall be EFCO® System 402 Flush-Glazed Screw Spline Storefront. Other manufacturers requesting approval to bid their product as an equal must submit the following information fifteen days prior to close of bidding.
 - 1. A sample storefront system (size and configuration) as per requirements of architect.
 - 2. Test reports documenting compliance with requirements of Section 1.05.
- C. Glass
 - 1. Reference Section 08 81 00 for Glass and Glazing.
- D. Single Source Requirement 08 41 13
 - 1. All products listed in Section 1.02 shall be by the same manufacturer.

1.02 Related Work

- A. Section 08 44 13 – Glazed Aluminum Curtain Walls

1.05 Laboratory Testing and Performance Requirements

- A. Test Units
 - 1. Air, water, and structural test unit size shall be a minimum of two lites high and three lites wide.
- B. Test Procedures and Performance
 - 1. Air Infiltration Test
 - a. Test unit in accordance with ASTM E 283 at a static air pressure difference of 6.24 psf (299 Pa).
 - b. Air infiltration shall not exceed .06 cfm/SF (.30 l/s•m²) of unit.
 - 2. Water Resistance Test
 - a. Test unit in accordance with ASTM E 331.
 - b. There shall be no uncontrolled water leakage at a static test pressure of 12.0 psf (575 Pa).
 - 3. Uniform Load Deflection Test
 - a. Test in accordance with ASTM E 330.
 - b. Deflection under design load shall not exceed L/175 of the clear span.
 - 4. Uniform Load Structural Test
 - a. Test in accordance with ASTM E 330 at a pressure 1.5 times the design wind pressure in 1.05.B.3.b.
 - b. At conclusion of the test, there shall be no glass breakage, permanent damage to fasteners, storefront parts, or any other damage that would cause the storefront to be defective.
- C. Project Wind Loads
 - 1. The system shall be designed to withstand the following loads normal to the plane of the wall:
 - a. Positive pressure of 30 psf at non-corner zones.

- b. Negative pressure of 40 psf at non-corner zones.
- c. Negative pressure of 40 psf at corner zones.

1.06 Field Testing and Performance Requirements

- A. Test in accordance with AAMA 501.2 for spray test only or AAMA 503.92 for pressurized test.

1.07 Quality Assurance

- A. Provide test reports from AAMA accredited laboratories certifying the performance as specified in 1.05.
- B. Test reports shall be accompanied by the storefront manufacturer's letter of certification stating that the tested storefront meets or exceeds the referenced criteria for the appropriate storefront type.

1.08 References

1.09 Submittals

- A. Contractor shall submit shop drawings; finish samples, test reports, and warranties.
 - 1. Samples of materials as may be requested without cost to owner, i.e., metal, glass, fasteners, anchors, frame sections, mullion section, corner section, etc.
- B. An NFRC Component Modeling Approach (CMA) generated label certificate shall be provided by the manufacturer. The label certificate shall be project specific and will contain the thermal performance ratings of the manufacturer's framing combined with the specified glass, and the glass spacer used in the fabrication of the glass, at NFRC standard test size as defined in table 4-3 in NFRC 100-2010.

1.10 Warranties

- A. Total Storefront Installation
 - 1. The responsible contractor shall assume full responsibility and warrant for one year the satisfactory performance of the total storefront installation. This includes the glass (including insulated units), glazing, anchorage and setting system, sealing, flashing, etc., as it relates to air, water, and structural adequacy as called for in the specifications and approved shop drawings.
 - 2. Any deficiencies due to such elements not meeting the specifications shall be corrected by the responsible contractor at their expense during the warranty period.
- B. Window Material and Workmanship
 - 1. Provide written guarantee against defects in material and workmanship for 10 years from the date of final shipment.
- C. Glass
 - 1. Provide written warranty for insulated glass units that they will be free from obstruction of vision as a result of dust or film formation on the internal glass surfaces caused by failure of the hermetic seal due to defects in material and workmanship.
 - 2. Warranty period shall be for 10 (ten) years.
- D. Finish
 - 1. Warranty period shall be for 5 years from the date of final shipment.

PART 2 PRODUCTS

2.01 Materials

- A. Aluminum
 - 1. Extruded aluminum shall be 6063-T6 alloy and temper.

2.02 Fabrication

- A. General
 - 1. All aluminum frame extrusions shall have a minimum wall thickness of .080" (2 mm).
 - 2. All exposed work shall be carefully matched to produce continuity of line and design with all joints. System design shall be such that raw edges will not be visible at joints.
- B. Frame
 - 1. Depth of frame shall not be less than 4 1/2" (114 mm).
 - 2. Face dimension shall not be less than 2" (50 mm).
 - 3. Frame components shall be screw spline construction.
- C. Glazing
 - 1. All units shall be "dry glazed" with gaskets on both exterior and interior of the glass.
- D. Finish
 - 1. Anodic
 - a. Finish all exposed areas of aluminum windows and components with electrolytically deposited color in accordance with Aluminum Association Designation Color shall be Dark Bronze.

PART 3 EXECUTION

3.01 Inspection

- A. Job Conditions
 - 1. Verify that openings are dimensionally within allowable tolerances, plumb, level, clean, provide a solid anchoring surface, and are in accordance with approved shop drawings.
 - 2. Provide for manufacturer representation to conduct pre-installation site meeting.

3.02 Installation

- A. Use only skilled tradesmen with work done in accordance with approved shop drawings and specifications.
- B. Storefront system shall be erected plumb and true, in proper alignment and relation to established lines and grades.
- C. Entrance doors shall be securely anchored in place to a straight, plumb, and level condition, without distortion. Weather stripping contact and hardware movement shall be checked and final adjustments made for proper operation and performance of units.
- D. Furnish and apply sealing materials to provide a weather tight installation at all joints and intersections and at opening perimeters.
- E. Sealing materials specified shall be used in strict accordance with the manufacturer's printed instructions, and shall be applied only by mechanics specially trained or experienced in their use.

All surfaces must be clean and free of foreign matter before applying sealing materials. Sealing compounds shall be tooled to fill the joint and provide a smooth finished surface.

3.03 Anchorage

- A. Adequately anchor to maintain positions permanently when subjected to normal thermal movement, specified building movement, and specified wind loads.

3.04 Protection and Cleaning

- A. The general contractor shall protect the aluminum materials and finish against damage from construction activities and harmful substances. The general contractor shall remove any protective coatings as directed by the architect, and shall clean the aluminum surfaces as recommended for the type of finish applied.

SECTION 08 71 00

DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Commercial door hardware for the following:
 - a. Swinging doors.
 - b. Folding doors.
 - c. Other doors to the extent indicated.
- B. Related Sections include the following:
 - 1. Division 8 Section "Steel Doors and Frames"
 - 2. Division 8 Section "Flush Wood Doors"
 - 3. Division 8 Section "Aluminum Entrances and Storefronts"

1.3 SUBMITTALS

- A. Product Data: Include installation details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: Details of electrified door hardware, indicating the following:
 - 1. Wiring Diagrams: Detail wiring for power, signal, and control systems and differentiate between manufacturer-installed and field-installed wiring. Include the following:
 - a. System schematic.
 - b. Point-to-point wiring diagram.
 - c. Riser diagram.
 - d. Elevation of each door.
 - 2. Detail interface between electrified door hardware and access fire alarm, control, and security building control system.
- C. Samples for Initial Selection: Manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available for each type of door hardware indicated.

1. Samples will be returned to Contractor. Units that are acceptable and remain undamaged through submittal, review, and field comparison process may, after final check of operation, be incorporated into the Work, within limitations of keying requirements.
- D. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
 1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
 2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening.
 - a. Organize door hardware sets in same order as in the Door Hardware Schedule at the end of Part 3.
 3. Content: Include the following information:
 - a. Type, style, function, size, label, hand, and finish of each door hardware item.
 - b. Manufacturer of each item.
 - c. Fastenings and other pertinent information.
 - d. Location of each door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
 - e. Explanation of abbreviations, symbols, and codes contained in schedule.
 - f. Mounting locations for door hardware.
 - g. Door and frame sizes and materials.
 - h. Description of each electrified door hardware function, including location, sequence of operation, and interface with other building control systems.
 - 1) Sequence of Operation: Include description of component functions that occur in the following situations: authorized person wants to enter; authorized person wants to exit; unauthorized person wants to enter; unauthorized person wants to exit.
 4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.
 5. Submittal Sequence: Submit initial draft of final schedule along with essential Product Data to facilitate the fabrication of other work that is critical in the Project construction schedule. Submit the final Door Hardware Schedule after Samples, Product Data, coordination with Shop Drawings of other work, delivery schedules, and similar information has been completed and accepted.
- E. Keying Schedule: Prepared by or under the supervision of supplier, detailing Owner's final keying instructions for locks. Include schematic keying diagram and index each key set to unique door designations.
- F. Product Certificates: Signed by manufacturers of electrified door hardware certifying that products furnished comply with requirements.
 1. Certify that door hardware approved for use on types and sizes of labeled fire doors complies with listed fire door assemblies.

- G. Qualification Data: For firms and persons specified in "Quality Assurance" Article.
 - 1. Include lists of completed projects with project names and addresses of architects and owners, and other information specified.
- H. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, indicating current products comply with requirements.
- I. Maintenance Data: For each type of door hardware to include in maintenance manuals specified in Division 1.
- J. Warranties: Special warranties specified in this Section.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- B. Supplier Qualifications: Door hardware supplier with warehousing facilities in Project's vicinity and who is or employs a qualified Architectural Hardware Consultant, available during the course of the Work to consult with Contractor, Architect, and Owner about door hardware and keying.
 - 1. Electrified Door Hardware Supplier Qualifications: An experienced door hardware supplier who has completed projects with electrified door hardware similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance, and who is acceptable to manufacturer of primary materials.
 - a. Engineering Responsibility: Prepare data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.
 - 2. Scheduling Responsibility: Preparation of door hardware and keying schedules.
- C. Architectural Hardware Consultant Qualifications: A person who is currently certified by the Door and Hardware Institute as an Architectural Hardware Consultant and who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project.
 - 1. Electrified Door Hardware Qualifications: Experienced in providing consulting services for electrified door hardware installations.
- D. Source Limitations: Obtain each type and variety of door hardware from a single manufacturer, unless otherwise indicated.
 - 1. Provide electrified door hardware from same manufacturer as mechanical door hardware, unless otherwise indicated. Manufacturers that are listed to perform electrical modifications, by a testing and inspecting agency acceptable to authorities having jurisdiction, are acceptable.
- E. Regulatory Requirements: Comply with provisions of the following:
 - 1. Where indicated to comply with accessibility requirements, comply with Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and Facilities (ADAAG)," ANSI A117.1, FED-STD-795, "Uniform Federal Accessibility Standards," as follows:

- a. Handles, Pulls, Latches, Locks, and other Operating Devices: Shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist.
 - b. Door Closers: Comply with the following maximum opening-force requirements indicated:
 - 1) Interior Hinged Doors: 5 lbf (22.2 N) applied perpendicular to door.
 - 2) Sliding or Folding Doors: 5 lbf (22.2 N) applied parallel to door at latch.
 - 3) Fire Doors: Minimum opening force allowable by authorities having jurisdiction.
 - c. Thresholds: Not more than 1/2 inch (13 mm) high, Not more than 3/4 inch (19 mm) high for exterior sliding doors. Bevel raised thresholds with a slope of not more than 1:2.
2. NFPA 101: Comply with the following for means of egress doors:
- a. Latches, Locks, and Exit Devices: Not more than 15 lbf (67 N) to release the latch. Locks shall not require the use of a key, tool, or special knowledge for operation.
 - b. Delayed-Egress Locks: Lock releases within 15 seconds after applying a force not more than 15 lbf (67 N) for not more than 3 seconds.
 - c. Door Closers: Not more than 30 lbf (133 N) to set door in motion and not more than 15 lbf (67 N) to open door to minimum required width.
 - d. Thresholds: Not more than 1/2 inch (13 mm) high.
3. Electrified Door Hardware: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.
- F. Fire-Rated Door Assemblies: Provide door hardware for assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 252.
1. Test Pressure: Test at atmospheric pressure.
- G. Keying Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Meetings." Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including, but not limited to, the following:
1. Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
 2. Preliminary key system schematic diagram.
 3. Requirements for key control system.
 4. Address for delivery of keys.
- H. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Meetings."
- I. All Electric Door Hardware shall be furnished and installed by the General Contractor. All Electric Door Hardware shall be wired by the Electrical Contractor. Both the Electrical & General Contractor shall meet and coordinate all work before proceeding.
- J. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Meetings." Review methods and procedures related to electrified door hardware including, but not limited to, the following:
1. Inspect and discuss electrical roughing-in and other preparatory work performed by other trades.

2. Review sequence of operation for each type of electrified door hardware.
3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
4. Review required testing, inspecting, and certifying procedures.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up for door hardware delivered to Project site.
- B. Tag each item with Door Number related to the final Approved Door Hardware Schedule, and include basic installation instructions with each item or package.
- C. Deliver keys to manufacturer of key control system, or Owner as Directed.
- D. Deliver keys to Owner by registered mail or overnight package service.

1.6 COORDINATION

- A. Coordinate layout and installation of recessed pivots and closers with floor construction. Cast anchoring inserts into concrete. Concrete, reinforcement, and formwork requirements are specified in Division 3 Section "Cast-in-Place Concrete."
- B. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing door hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
- C. Electrical System Roughing-in: Coordinate layout and installation of electrified door hardware with connections to power supplies, fire alarm system and detection devices, access control system, security system, and building control system.

1.7 WARRANTY

- A. General Warranty: Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Special Warranty: Written warranty, executed by manufacturer agreeing to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period. Failures include, but are not limited to, the following:
 1. Structural failures including excessive deflection, cracking, or breakage.
 2. Faulty operation of operators and door hardware.
 3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
- C. Warranty Period for Locksets: Three, (3) years from date of Substantial Completion, unless otherwise indicated.
- D. Warranty Period for Manual Closers: Ten, (10) years from date of Substantial Completion, unless otherwise indicated.

- E. Warranty Period for Exit Devices: Three, (3) years from date of Substantial Completion, unless otherwise indicated.

1.8 MAINTENANCE SERVICE

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.
- B. Maintenance Service: Beginning at Substantial Completion, provide six months' full maintenance by skilled employees of door hardware Installer. Include quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper door hardware operation. Provide parts and supplies as used in the manufacture and installation of original products.
- C. Engage a factory authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

- A. General: Provide door hardware for each door to comply with requirements in this Section, door hardware sets indicated in door and frame schedule, and the Door Hardware Schedule at the end of Part 3.
 - 1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and named manufacturer's products. Retain subparagraph below for electrified door hardware.
 - 2. Sequence of Operation: Provide electrified door hardware function, sequence of operation, and interface with other building control systems indicated.
- B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Schedule at the end of Part 3. Products are identified by using door hardware designations, as follows:
 - 1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing minimum requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.
 - 2. References to BHMA Standards: Provide products complying with these standards and requirements for description, quality, and function.

2.2 HINGES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Butt Hinges:
 - a. Stanley Commercial Hardware
 - 2. Continuous Hinges:
 - a. Architectural Builders Hardware Mfg., Inc.

b. Stanley Commercial Hardware

- B. Standards: Comply with the following:
 - 1. Hinges ANSI/BHMA Standard A156.1 Grade 1
 - 2. Continuous Hinges ANSI/BHMA Standard A156.26 Grade 1
- C. Template Requirements: Except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames, provide only template-produced units.
- D. Concealed bearings are made from engineered polymer material with PTFE and Aramid fiber; bearing is maintenance free, no oil, no grease.
- E. Butt hinges equipped with easily seated, non-rising pin. Hole in bottom of pin enables quick pin removal for ease of installation.
- F. Continuous hinge material to be 14 gauge, 304 stainless steel
- G. Continuous hinge steel pin to be .25 diameter, 304 stainless steel
- H. Continuous hinge exterior barrel diameter .438 (7/16)
- I. Continuous hinge knuckle to be 2", including split nylon bearing at each separation for a quiet, smooth, self-lubricating operation
- J. All hinges to carry Warnock Hersey Int. or UL for fire rated doors and frames up to 3 hours
- K. Continuous hinges to have Symmetrically templated hole pattern
- L. Continuous hinge to have a 10 year Warranty
- M. Hinge Weight: Unless otherwise indicated, provide the following:
 - 1. Supports weights up to 600lbs.
- N. Hinge Base Metal: Unless otherwise indicated, provide the following:
 - 1. Exterior Continuous Hinges: Stainless steel, with stainless-steel pin,
 - 2. Interior Continuous Hinges: Stainless steel, with stainless-steel pin.
 - 3. Continuous Hinges for Fire-Rated Assemblies: Stainless steel, with stainless-steel pin.
 - 4. Exterior Butt Hinges: Stainless Steel or Brass or Bronze
 - 5. Interior Butt Hinges: Steel or Brass or Bronze
- O. Hinge Options: Comply with the following where indicated in the Door Hardware Schedule or on Drawings:
 - 1. Hospital Tips: Slope ends of hinge barrel.
 - 2. Maximum Security Pin: Fix pin in hinge barrel after it is inserted.
 - 3. Nonremovable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the following applications:
 - a. Outswinging exterior doors.
 - b. Outswinging corridor doors with locks.
- P. Fasteners: Comply with the following:
 - 1. Machine Screws: For metal doors and frames. Install into drilled and tapped holes.

2. Wood Screws: For wood doors and frames.
3. Threaded-to-the-Head Wood Screws: For fire-rated wood doors.
4. Screws: Phillips flat-head screws; machine screws drilled and tapped holes for metal doors, wood screws for wood doors and frames. Finish screw heads to match surface of hinges.

2.3 LOCKS AND LATCHES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Mechanical Locks and Latches:
 - a. Schlage Lock Corporation, Red Clay School District Standard
- B. Standards: Comply with the following:
 1. Bored Locks and Latches: BHMA A156.2.
- C. Bored Locks: ANSI A156.2, BHMA Series 4000, Grade 1, and is UL Listed.
- D. Certified Products: Provide door hardware listed in the following BHMA directories:
 1. Mechanical Locks and Latches: BHMA's "Directory of Certified Locks & Latches."
- E. Lock Trim: Comply with the following:
 1. Lever: Cylindrical Locks & Latches, Zinc material with a minimum wall thickness of .060
 2. Dummy Trim: Match lever lock trim and escutcheons.
- F. Lock Functions: Function numbers and descriptions indicated in the Door Hardware Schedule comply with the following:
 1. Bored Locks: BHMA A156.2.
- G. Lock Throw: Comply with testing requirements for length of bolts to comply with labeled fire door requirements, and as follows:
 1. Bored Locks: Minimum 9/16-inch latch bolt throw.
 2. Deadbolts: Minimum 1-inch bolt throw.
- H. Backset: 2-3/4 inches (70 mm), unless otherwise indicated.
- I. Cylindrical Locks & Latches to have solid shank with no opening for access to keyed lever keeper.

2.4 DOOR BOLTS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Flush Bolts:
 - a. Burns Manufacturing Company, Inc.
 - b. Triangle Brass Manufacturing Company, Inc.
- B. Standards: Comply with the following:

1. Automatic and Self-Latching Flush Bolts: BHMA A156.3.
 2. Manual Flush Bolts: BHMA A156.16.
- C. Flush Bolts: BHMA Grade 1, designed for mortising into door edge.
- D. Bolt Throw: Comply with testing requirements for length of bolts to comply with labeled fire door requirements, and as follows:
1. Mortise Flush Bolts: Minimum **3/4-inch (19-mm)** throw.

2.5 EXIT DEVICES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Von Duprin, Inc., Red Clay School District Standard
- B. Standard: BHMA A156.3.
1. BHMA Grade: Grade 1
- C. Certified Products: Provide exit devices listed in BHMA's "Directory of Certified Exit Devices."
- D. Panic Exit Devices: Listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for panic protection, based on testing according to UL 305.
- E. Fire Exit Devices: Complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire and panic protection, based on testing according to UL 305 and NFPA 252.
- F. Warranty: Exit device to have published Five (5) Year Warranty.
- G. Exit device shall be "touch pad" type with a touch pad that shall extend a minimum of one half (1/2) of the door width.
- H. Exit device shall have a one-quarter (1/4) gap between the face of the door and the touch bar channel eliminating the need for shims or cutting away the glass molding.
- I. Exit device lock stile chassis shall be investment cast steel. Stamped steel units will not be accepted. All device latch bolts shall be stainless steel and shall be deadlocking type.
- J. Exit device strikes shall be adjustable type investment cast stainless steel.
- K. Exit device shall include sound reduction dampening for both depression and extension of the touch pad.
- L. Exit device end cap shall be all metal and secured with a bracket that interlocks both at the touch bar channel base and hinge side filler to prevent end cap "peel-back".
- M. All exposed surfaces of the exit device housing shall be no less than 14 gauge brass or bronze; or no less than 16 gauge stainless steel. Aluminum housing type exit devices are not acceptable.
- N. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.
1. Operation: Rigid

- O. Outside Trim: Lever, Lever with cylinder, Pull, Pull with cylinder, material and finish to match locksets, unless otherwise indicated.
 - 1. Match design for locksets and latchsets, unless otherwise indicated.

2.6 CYLINDERS AND KEYING

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Cylinders:
 - a. Schlage Lock Corporation, Red Clay School District Standard
- B. Standards: Comply with the following:
 - 1. Cylinders: BHMA A156.5.
- C. Cylinder Grade: BHMA Grade 1, Cylinders: Manufacturer's standard tumbler type, constructed from brass or bronze, stainless steel, or nickel silver, and complying with the following:
 - 1. Number of Pins: Seven.
 - 2. Mortise Type: Threaded cylinders with rings and straight- or clover-type cam.
 - 3. Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
 - 4. Bored-Lock Type: Cylinders with tailpieces to suit locks.
- D. Keying System: Unless otherwise indicated, provide a factory-registered keying system complying with the following requirements:
 - 1. Existing System: Master key or grand master key locks to Owner's existing system.
- E. Keys: Provide nickel-silver keys complying with the following:
 - 1. Stamping: Permanently inscribe each key with a visual key control number and include the following notation:
 - a. Notation: **"DO NOT DUPLICATE."**
 - 2. Quantity: In addition to one extra blank key for each lock, provide the following:
 - a. Cylinder Change Keys: Three.
 - b. Master Keys: Five.
 - c. Grand Master Keys: Five.
 - d. Great-Grand Master Keys: Five.
 - e. Construction Master Keys: Ten
 - f. Construction Core Control Keys: Five

2.7 STRIKES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Electric Strikes:
 - a. Security Door Controls Inc.
 - b. Folger Adam Security Inc.

- B. Standards: Comply with the following:
 - 1. Strikes for Bored Locks and Latches: BHMA A156.2.
 - 2. Strikes for Auxiliary Deadlocks: BHMA A156.5.
- C. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:
 - 1. Flat-Lip Strikes: For locks with three-piece antifriction latch bolts, as recommended by manufacturer.
 - 2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
 - 3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.

2.8 OPERATING TRIM

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Burns Manufacturing Company, Inc.
 - 2. Stanley Commercial Hardware
- B. Standard: Comply with BHMA A156.6.
- C. Materials: Fabricate from aluminum, brass, bronze, stainless steel, unless otherwise indicated.

2.9 ACCESSORIES FOR PAIRS OF DOORS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Coordinators:
 - a. Burns Manufacturing Company, Inc.
 - b. Triangle Brass Manufacturing Company, Inc.
 - 2. Removable Mullions:
 - a. Von Duprin, Inc., Red Clay School District Standard
 - 3. Astragals:
 - a. Stanley Commercial Hardware
 - b. Architectural Builders Hardware, Inc.
- B. Standards: Comply with the following:
 - 1. Coordinators: BHMA A156.3.
 - 2. Removable Mullions: BHMA A156.3.
- C. Fire-Exit Removable Mullions: Provide removable mullions for use with fire exit devices complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire and panic protection, based on testing according to UL 305 and NFPA 252. Mullions shall be used only with exit devices for which they have been tested.

2.10 CLOSERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Surface-Mounted Closers:
 - a. LCN Door Closers, Red Clay School District Standard
- B. Standards: Comply with the following:
 - 1. Closers: BHMA A156.4.
- C. Surface Closers: BHMA Grade 1
- D. Certified Products: Provide door closers listed in BHMA's "Directory of Certified Door Closers."
- E. Size of Units: Unless otherwise indicated, comply with manufacturer's written recommendations for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force.

2.11 PROTECTIVE TRIM UNITS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Metal Protective Trim Units:
 - a. Burns Manufacturing Company, Inc.
 - b. Triangle Brass Manufacturing Company, Inc.
- B. Standard: Comply with BHMA A156.6.
- C. Materials: Fabricate protection plates from the following:
 - 1. Stainless Steel: 0.050 inch (1.3 mm) thick; beveled 4 sides.
- D. Fasteners: Provide manufacturer's standard exposed fasteners for door trim units consisting of either machine or self-tapping screws.
- E. Furnish protection plates sized 2" less than door width on push side and 1" less than door width on pull side, by height specified in Door Hardware Schedule.

2.12 STOPS AND HOLDERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Architectural Builders Hardware Mfg., Inc.
 - 2. Triangle Brass Manufacturing Company, Inc.
- B. Standards: Comply with the following:
 - 1. Stops and Bumpers: BHMA A156.16.
 - 2. Mechanical Door Holders: BHMA A156.16.
 - 3. Electromagnetic Door Holders: BHMA A156.15.
 - 4. Combination Overhead Holders and Stops: BHMA A156.8.
 - 5. Door Silencers: BHMA A156.16.

- C. Stops and Bumpers: BHMA Grade 1
- D. Mechanical Door Holders: BHMA Grade 1
- E. Combination Overhead Stops and Holders: BHMA Grade 1
- F. Electromagnetic Door Holders for Labeled Fire Door Assemblies: Coordinate with fire detectors and interface with fire alarm system.
- G. Silencers for Metal Door Frames: BHMA Grade 1; neoprene or rubber, minimum diameter **1/2 inch (13 mm)**; fabricated for drilled-in application to frame.

2.13 DOOR GASKETING

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Door Gasketing:
 - a. Reese Manufacturing Co., Inc.
 - b. National Guard Products, Inc.
 - 2. Door Bottoms:
 - a. Reese Manufacturing Co., Inc.
 - b. National Guard Products
- B. Standard: Comply with BHMA A156.22.
- C. General: Provide continuous weather-strip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated or scheduled. Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.
 - 1. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
 - 2. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.
 - 3. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.
- D. Air Leakage: Not to exceed **0.50 cfm per foot (0.000774 cu. m/s per m)** of crack length for gasketing other than for smoke control, as tested according to ASTM E 283.
- E. Smoke-Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke-control ratings indicated, based on testing according to UL 1784.
 - 1. Provide smoke-labeled gasketing on 20-minute-rated doors and on smoke-labeled doors.
- F. Fire-Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL 10B or NFPA 252.
- G. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated, based on testing according to ASTM E 1408.
- H. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.
- I. Gasketing Materials: Comply with ASTM D 2000 and AAMA 701/702.

2.14 THRESHOLDS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Reese Manufacturing Co., Inc.
 - 2. National Guard Products, Inc.
- B. Standard: Comply with BHMA A156.21.

2.15 FABRICATION

- A. Manufacturer's Nameplate: Do not provide manufacturers' products that have manufacturer's name or trade name displayed in a visible location (omit removable nameplates) except in conjunction with required fire-rated labels and as otherwise approved by Architect.
 - 1. Manufacturer's identification will be permitted on rim of lock cylinders only.
- B. Base Metals: Produce door hardware units of base metal, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18 for finishes. Do not furnish manufacturer's standard materials or forming methods if different from specified standard.
- C. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to commercially recognized industry standards for application intended. Provide Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.
 - 1. Concealed Fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware. Where through bolts are used on hollow door and frame construction, provide sleeves for each through bolt.
 - 2. Steel Machine or Wood Screws: For the following fire-rated applications:
 - a. Mortise hinges to doors.
 - b. Strike plates to frames.
 - c. Closers to doors and frames.
 - 3. Steel Through Bolts: For the following fire-rated applications, unless door blocking is provided:
 - a. Surface hinges to doors.
 - b. Closers to doors and frames.
 - c. Surface-mounted exit devices.
 - 4. Spacers or Sex Bolts: For through bolting of hollow metal doors.
 - 5. Fasteners for Wood Doors: Comply with requirements of DHI WDHS.2, "Recommended Fasteners for Wood Doors."

2.16 FINISHES

- A. Standard: Comply with BHMA A156.18.

- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- D. BHMA Designations: Comply with base material and finish requirements indicated by the following:
 - 1. BHMA 600: Primed for painting, over steel base metal.
 - 2. BHMA 626: Satin chromium plated over nickel, over brass or bronze base metal.
 - 3. BHMA 628: Satin aluminum, clear anodized, over aluminum base metal.
 - 4. BHMA 630: Satin stainless steel, over stainless steel base metal.
 - 5. BHMA 652: Satin chromium plated over nickel, over steel base metal.
 - 6. BHMA 689: Aluminum painted, over any base metal.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Steel Doors and Frames: Comply with DHI A115 series.
 - 1. Surface-Applied Door Hardware: Drill and tap doors and frames according to SDI 107.
- B. Wood Doors: Comply with DHI A115-W series.

3.3 INSTALLATION

- A. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
 - 1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
 - 2. Custom Steel Doors and Frames: DHI's "Recommended Locations for Builders' Hardware for Custom Steel Doors and Frames."
 - 3. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."

- B. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
 - 1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
 - 2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
- C. Key Control System: Place keys on markers and hooks in key control system cabinet, as determined by final keying schedule. Supply key cabinet with 25% expansion. Factory install keys in cabinet or in field with owner's representative. Key cabinet to be supplied with a "Complete System" equal to the Telkee System.
- D. Boxed Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings, in equipment room. Verify location with Architect.
 - 1. Configuration: Provide one power supply for each door opening.
 - 2. Configuration: Provide the least number of power supplies required to adequately serve doors with electrified door hardware.
- E. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

3.4 FIELD QUALITY CONTROL

- A. Independent Architectural Hardware Consultant: Owner or Architect will engage a qualified independent Architectural Hardware Consultant to perform inspections and to prepare inspection reports.
 - 1. Independent Architectural Hardware Consultant will inspect door hardware and state in each report whether installed work complies with or deviates from requirements, including whether door hardware is properly installed and adjusted.

3.5 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
 - 1. Spring Hinges: Adjust to achieve positive latching when door is allowed to close freely from an open position of 30 degrees.
 - 2. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
 - 3. Door Closers: Adjust sweep period so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches (75 mm) from the latch, measured to the leading edge of the door.
- B. Six-Month Adjustment: Approximately six months after date of Substantial Completion, Installer shall perform the following:

1. Examine and readjust each item of door hardware as necessary to ensure function of doors, door hardware, and electrified door hardware.
2. Consult with and instruct Owner's personnel on recommended maintenance procedures.
3. Replace door hardware items that have deteriorated or failed due to faulty design, materials, or installation of door hardware units.

3.6 CLEANING AND PROTECTION

- A. Clean adjacent surfaces soiled by door hardware installation.
- B. Clean operating items as necessary to restore proper function and finish.
- C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

3.7 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes.

Door Hardware Schedule A.I. DUPONT MIDDLE SCHOOL, HVAC RENOVATIONS

Hardware Set #: 0001 - SGL DRS FRP DRS & HMF EXTERIOR
D001 D111A D114 D123 D214 DS8

Opening to Have:

Qty	Description	Finish	Mfg
1	CONTINUOUS HINGE A500 x FULL HEIGHT	630	ABH
1	RIM CYLINDER (PRIMUS) 20-709	626	SCHLAGE
1	MORTISE CYLINDER (IC) 20-700 x XQ11-949	626	SCHLAGE
1	RIM EXIT DEVICE CD99NL-OP	626	VON DUPRIN
1	VANDAL RESISTANT TRIM VR910-NL	630	VON DUPRIN
1	DOOR CLOSER 4111 x SPRING-H-CUSH	689	LCN
1	DOOR CONTACT MC-7 x SPDT x 1" DIA		SDC
1	TEAR DROP SEAL 797B x HEAD & JAMBS	BLK	REESE
1	RAIN DRIP R201A x FULL WIDTH + 4"	628	REESE
1	THRESHOLD S483APR x SRS x FHSL x FULL WIDTH	628	REESE
1	ADJUSTABLE DOOR BOTTOM SWEEP BY FRP DOOR SUPPLIER (CONCEALED)		

Hardware Set #: 0002 - PRS DRS FRP DRS & HMF EXTERIOR
D215 D220 D3A DS3 DS7

Opening to Have:

Qty	Description	Finish	Mfg
2	CONTINUOUS HINGE A500 x FULL HEIGHT	630	ABH
1	RIM CYLINDER (PRIMUS) 20-709	626	SCHLAGE
2	MORTISE CYLINDER (IC) 20-700 x XQ11-949	626	SCHLAGE
1	MORTISE CYLINDER (IC) 20-700	626	SCHLAGE
1	RIM EXIT DEVICE CD99EO	626	VON DUPRIN
1	RIM EXIT DEVICE CD99NL-OP	626	VON DUPRIN
1	REMOVABLE MULLION KR4954 x (2) 154 x SIZE AS REQ	689	VON DUPRIN
1	MULLION WALL MOUNT KIT MT54	689	VON DUPRIN

1 VANDAL RESISTANT TRIM VR910-NL	630	VON DUPRIN
1 VANDAL RESISTANT TRIM VR910-DT	630	VON DUPRIN
2 DOOR CLOSER 4111 x SPRING-H-CUSH x SRI	689	LCN
2 DOOR CONTACT MC-7 x SPDT x 1" DIA		SDC
1 TEAR DROP SEAL 797B x HEAD & JAMBS	BLK	REESE
2 TEAR DROP SEAL 797B x MULLION x FULL HEIGHT	BLK	REESE
1 RAIN DRIP R201A x FULL WIDTH + 4"	628	REESE
1 THRESHOLD S483APR x SRS x FHSL x FULL WIDTH	628	REESE
2 ADJUSTABLE DOOR BOTTOM SWEEP BY FRP DOOR SUPPLER (CONCEALED)		

Hardware Set #: 0002.1 - PRS DRS FRP DRS & HMF EXTERIOR
D133V DS4

Opening to Have:

Qty	Description	Finish	Mfg
2	CONTINUOUS HINGE A500 x FULL HEIGHT	630	ABH
1	RIM CYLINDER (PRIMUS) 20-709	626	SCHLAGE
2	MORTISE CYLINDER (IC) 20-700 x XQ11-949	626	SCHLAGE
1	MORTISE CYLINDER (IC) 20-700	626	SCHLAGE
1	POWER TRANSFER PT1000	628	ABH
1	RIM EXIT DEVICE CD99EO	626	VON DUPRIN
1	RIM EXIT DEVICE SD-EL-99NL-OP	626	VON DUPRIN
1	REMOVABLE MULLION KR4954 x (2) 154 x SIZE AS REQ	689	VON DUPRIN
1	MULLION WALL MOUNT KIT MT54	689	VON DUPRIN
1	VANDAL RESISTANT TRIM VR910-NL	630	VON DUPRIN
1	VANDAL RESISTANT TRIM VR910-DT	630	VON DUPRIN
1	POWER SUPPLY PS914 x 900-2RS-FA	600	VON DUPRIN
2	DOOR CLOSER 4111 x SPRING-H-CUSH x SRI	689	LCN
2	DOOR CONTACT MC-7 x SPDT x 1" DIA		SDC
1	TEAR DROP SEAL 797B x HEAD & JAMBS	BLK	REESE
2	TEAR DROP SEAL 797B x MULLION x FULL HEIGHT	BLK	REESE
1	RAIN DRIP R201A x FULL WIDTH + 4"	628	REESE
1	THRESHOLD S483APR x SRS x FHSL x FULL WIDTH	628	REESE
2	ADJUSTABLE DOOR BOTTOM SWEEP BY FRP DOOR SUPPLER (CONCEALED)		
1	CARD READER BY SECURITY CONTRACTOR		

Hardware Set #: 0003 - SGL DRS FRP DRS & ALUM FR EXTERIOR
D110 D112V

Opening to Have:

Qty	Description	Finish	Mfg
1	CONTINUOUS HINGE A500 x FULL HEIGHT	630	ABH
1	RIM CYLINDER (PRIMUS) 20-709	626	SCHLAGE
1	MORTISE CYLINDER (IC) 20-700 x XQ11-949	626	SCHLAGE
1	RIM EXIT DEVICE CD99NL-OP	626	VON DUPRIN
1	VANDAL RESISTANT TRIM VR910-NL	630	VON DUPRIN
1	BLADE STOP SPACER 4040-61	689	LCN
1	DOOR CLOSER 4111 x SPRING-H-CUSH	689	LCN
1	DOOR CONTACT MC-7 x SPDT x 1" DIA		SDC
1	TEAR DROP SEAL 797B x HEAD & JAMBS	BLK	REESE
1	RAIN DRIP R201A x FULL WIDTH + 4"	628	REESE
1	THRESHOLD S483APR x SRS x FHSL x FULL WIDTH	628	REESE
1	ADJUSTABLE DOOR BOTTOM SWEEP BY FRP DOOR SUPPLER (CONCEALED)		

Hardware Set #: 0004 - PRS DRS FRP DRS & EXISTING WD-FR EXTERIOR
D6

Opening to Have:

Qty Description	Finish	Mfg
2 CONTINUOUS HINGE A500 x FULL HEIGHT	630	ABH
1 RIM CYLINDER (PRIMUS) 20-709	626	SCHLAGE
2 MORTISE CYLINDER (IC) 20-700 x XQ11-949	626	SCHLAGE
1 MORTISE CYLINDER (IC) 20-700	626	SCHLAGE
1 RIM EXIT DEVICE CD99EO	626	VON DUPRIN
1 RIM EXIT DEVICE CD99NL-OP	626	VON DUPRIN
1 REMOVABLE MULLION KR4954 x (2) 154 x SIZE AS REQ	689	VON DUPRIN
1 MULLION WALL MOUNT KIT MT54	689	VON DUPRIN
1 VANDAL RESISTANT TRIM VR910-NL	630	VON DUPRIN
1 VANDAL RESISTANT TRIM VR910-DT	630	VON DUPRIN
2 DOOR CLOSER 4111 x SPRING-H-CUSH x SRI	689	LCN
2 MOUNTING PLATE 4110-18CNS	689	LCN
2 DOOR CONTACT MC-7 x SPDT x 1" DIA		SDC
1 TEAR DROP SEAL 797B x HEAD & JAMBS	BLK	REESE
2 TEAR DROP SEAL 797B x MULLION x FULL HEIGHT	BLK	REESE
1 RAIN DRIP R201A x FULL WIDTH + 4"	628	REESE
1 THRESHOLD S483APR x SRS x FHSL x FULL WIDTH	628	REESE
2 ADJUSTABLE DOOR BOTTOM SWEEP BY FRP DOOR SUPPLER (CONCEALED)		

Hardware Set #: 0004.1 - PRS DRS FRP DRS & EXISTING WD-FR EXTERIOR
DS2 DS5

Opening to Have:

Qty Description	Finish	Mfg
2 CONTINUOUS HINGE A500 x FULL HEIGHT	630	ABH
1 RIM CYLINDER (PRIMUS) 20-709	626	SCHLAGE
2 MORTISE CYLINDER (IC) 20-700 x XQ11-949	626	SCHLAGE
1 MORTISE CYLINDER (IC) 20-700	626	SCHLAGE
1 RIM EXIT DEVICE CD99EO	626	VON DUPRIN
1 RIM EXIT DEVICE SD-EL-99NL-OP	626	VON DUPRIN
1 REMOVABLE MULLION KR4954 x (2) 154 x SIZE AS REQ	689	VON DUPRIN
1 MULLION WALL MOUNT KIT MT54	689	VON DUPRIN
1 VANDAL RESISTANT TRIM VR910-NL	630	VON DUPRIN
1 VANDAL RESISTANT TRIM VR910-DT	630	VON DUPRIN
1 POWER SUPPLY PS914 x 900-2RS-FA	600	VON DUPRIN
2 DOOR CLOSER 4111 x SPRING-H-CUSH x SRI	689	LCN
2 MOUNTING PLATE 4110-18CNS	689	LCN
2 DOOR CONTACT MC-7 x SPDT x 1" DIA		SDC
1 TEAR DROP SEAL 797B x HEAD & JAMBS	BLK	REESE
2 TEAR DROP SEAL 797B x MULLION x FULL HEIGHT	BLK	REESE
1 RAIN DRIP R201A x FULL WIDTH + 4"	628	REESE
1 THRESHOLD S483APR x SRS x FHSL x FULL WIDTH	628	REESE
1 POWER TRANSFER PT-3V x 18"		SDC
2 ADJUSTABLE DOOR BOTTOM SWEEP BY FRP DOOR SUPPLER (CONCEALED)		
1 CARD READER BY SECURITY CONTRACTOR		

Hardware Set #: 0005 - PRS DRS FRP DRS & ALUM FR EXTERIOR
D213 D281A D281B

Opening to Have:

Qty	Description	Finish	Mfg
2	CONTINUOUS HINGE A500 x FULL HEIGHT	630	ABH
1	RIM CYLINDER (PRIMUS) 20-709	626	SCHLAGE
2	MORTISE CYLINDER (IC) 20-700 x XQ11-949	626	SCHLAGE
1	MORTISE CYLINDER (IC) 20-700	626	SCHLAGE
1	RIM EXIT DEVICE CD99EO	626	VON DUPRIN
1	RIM EXIT DEVICE CD99NL-OP	626	VON DUPRIN
1	REMOVABLE MULLION KR4954 x (2) 154 x SIZE AS REQ	689	VON DUPRIN
1	MULLION WALL MOUNT KIT MT54	689	VON DUPRIN
1	VANDAL RESISTANT TRIM VR910-NL	630	VON DUPRIN
1	VANDAL RESISTANT TRIM VR910-DT	630	VON DUPRIN
2	BLADE STOP SPACER 4040-61	689	LCN
2	DOOR CLOSER 4111 x SPRING-H-CUSH x SRI	689	LCN
2	DOOR CONTACT MC-7 x SPDT x 1" DIA		SDC
1	TEAR DROP SEAL 797B x HEAD & JAMBS	BLK	REESE
2	TEAR DROP SEAL 797B x MULLION x FULL HEIGHT	BLK	REESE
1	RAIN DRIP R201A x FULL WIDTH + 4"	628	REESE
1	THRESHOLD S483APR x SRS x FHSL x FULL WIDTH	628	REESE
2	ADJUSTABLE DOOR BOTTOM SWEEP BY FRP DOOR SUPPLER (CONCEALED)		

Hardware Set #: 0006 - PRS DRS ALUM DRS & ALUM FR
D7A D7B

Opening to Have:

Qty	Description	Finish	Mfg
2	CONTINUOUS HINGE A500 x FULL HEIGHT	630	ABH
2	PUSH / PULL BAR 1747-1 x (2) TYPE-N x (1) TYPE-L	630	TRIMCO
2	BLADE STOP SPACER 4040-61	689	LCN
2	DOOR CLOSER 4111 x SPRING-H-CUSH	689	LCN
2	MOUNTING PLATE 4110-18CNS	689	LCN

Hardware Set #: 0006.1 - PRS DRS ALUM DRS & ALUM FR
D5

Opening to Have:

Qty	Description	Finish	Mfg
2	CONTINUOUS HINGE A500 x FULL HEIGHT	630	ABH
1	RIM CYLINDER (PRIMUS) 20-709	626	SCHLAGE
2	MORTISE CYLINDER (IC) 20-700 x XQ11-949	626	SCHLAGE
1	MORTISE CYLINDER (IC) 20-700	626	SCHLAGE
1	POWER TRANSFER PT1000	628	ABH
1	RIM EXIT DEVICE CD99EO	626	VON DUPRIN
1	MULLION WALL MOUNT KIT MT54	689	VON DUPRIN
1	REMOVABLE MULLION KR4954 x (2) 154 x SIZE AS REQ	689	VON DUPRIN
1	VANDAL RESISTANT TRIM VR910-NL	630	VON DUPRIN
1	VANDAL RESISTANT TRIM VR910-DT	630	VON DUPRIN
1	POWER SUPPLY PS914 x 900-2RS-FA	600	VON DUPRIN
1	RIM EXIT DEVICE SD-EL99NL-OP	626	VON DUPRIN
2	BLADE STOP SPACER 4040-61	689	LCN
2	DOOR CLOSER 4111 x SPRING-H-CUSH	689	LCN
2	MOUNTING PLATE 4110-18CNS	689	LCN
2	DOOR CONTACT MC-7 x SPDT x 1" DIA		SDC
1	CARD READER BY SECURITY CONTRACTOR		

Hardware Set #: 0007 - SGL DRS WD & HMF
D201

Opening to Have:

Qty	Description	Finish	Mfg
3	HINGE CB168 4.5 x 4.5 x NRP	652	STANLEY
2	PRIMUS CYLINDER 20-765 (ND-LINE)	626	SCHLAGE
1	CLASSROOM LOCKSET ND93LD x SPA x 10-025	626	SCHLAGE
1	DOOR CLOSER 4111 x SPRING-H-CUSH	689	LCN
1	KICK PLATE 10" x 2" LDW .050 x B4E x CTSK	630	TRIMCO
1	MOP PLATE 6" x 1" LDW .050 x B4E x CTSK	630	TRIMCO
3	SILENCERS 1229A	GRAY	TRIMCO

Hardware Set #: 0008 - SGL DRS WD & HMF
D203T

Opening to Have:

Qty	Description	Finish	Mfg
3	HINGE CB168 4.5 x 4.5 x NRP	652	STANLEY
1	PRIVACY LOCKSET ND40S x SPA x 10-025	626	SCHLAGE
1	KICK PLATE 10" x 2" LDW .050 x B4E x CTSK	630	TRIMCO
1	MOP PLATE 6" x 1" LDW .050 x B4E x CTSK	630	TRIMCO
1	O/H CONCEALED STOP 4024 x STOP (36" TO 48" DR)	630	ABH
3	SILENCERS 1229A	GRAY	TRIMCO

Hardware Set #: 0009 - PRS DRS HMD & HMF
D202

Opening to Have:

Qty	Description	Finish	Mfg
6	HINGE CB168 4.5 x 4.5 x NRP	652	STANLEY
2	FLUSH BOLT 3917 1" x 6-3/4" x 12"	626	TRIMCO
1	DUST PROOF STRIKE 3910	630	TRIMCO
1	PRIMUS CYLINDER 20-765 (ND-LINE)	626	SCHLAGE
1	STOREROOM LOCKSET ND96LD x SPA	626	SCHLAGE
1	ASTRAGAL A548S x SQUARE EDGE x FULL HEIGHT	630	ABH
2	KICK PLATE 16" x 1" LDW .050 x B4E x CTSK	630	TRIMCO
2	MOP PLATE 6" x 1" LDW .050 x B4E x CTSK	630	TRIMCO
2	WALL STOP 1270WV	630	TRIMCO
2	SILENCERS 1229A	GRAY	TRIMCO

Hardware Set #: 0010 - PRS DRS WD & HMF
D007

Opening to Have:

Qty	Description	Finish	Mfg
6	HINGE CB168 4.5 x 4.5 x NRP	652	STANLEY
2	FLUSH BOLT 3917 1" x 6-3/4" x 12"	626	TRIMCO
1	DUST PROOF STRIKE 3910	630	TRIMCO
1	PRIMUS CYLINDER 20-765 (ND-LINE)	626	SCHLAGE
1	CLASSROOM LOCKSET ND94LD x SPA	626	SCHLAGE
1	ASTRAGAL A548S x SQUARE EDGE x FULL HEIGHT	630	ABH
1	DOOR CLOSER 4111 x H-EDA	689	LCN
2	KICK PLATE 16" x 1" LDW .050 x B4E x CTSK	630	TRIMCO
2	MOP PLATE 6" x 1" LDW .050 x B4E x CTSK	630	TRIMCO

Red Clay Consolidated School District
A.I. DuPont MS Renovations
Architects/Engineers: StudioJAED
Addendum # 2

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2 WALL STOP 1270WV
2 SILENCERS 1229A

630 TRIMCO
GRAY TRIMCO

END OF SECTION

SECTION 09 51 00
ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Suspended metal grid ceiling system.
- B. Acoustical units.
- C. Support hangers, channels, and wires.

1.02 RELATED REQUIREMENTS

- A. Section 07 21 00 - Thermal Insulation: Acoustical insulation.
- B. Section 07 90 05 - Joint Sealers: Acoustical sealant.
- C. Section 28 31 00 - Fire Detection and Alarm: Fire alarm components in ceiling system.
- D. Section 23 37 00 - Air Outlets and Inlets: Air diffusion devices in ceiling.
- E. Section 26 51 00 - Interior Lighting: Light fixtures in ceiling system.

1.03 REFERENCE STANDARDS

- A. ASTM C635 - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
- B. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.
- C. ASTM E580/E580M - Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions.
- D. ASTM E1264 - Standard Classification for Acoustical Ceiling Products.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate grid layout and related dimensioning, junctions with other ceiling finishes, and mechanical and electrical items installed in the ceiling.
- C. Product Data: Provide data on suspension system components, acoustical units, and supplementary acoustical insulation.
- D. Samples: Submit two samples 4x4 inch in size illustrating material and finish of acoustical units.
- E.
- F. Samples: Submit two samples each, 6 inches long, of suspension system main runner, cross runner, and perimeter molding.
- G. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

1.05 QUALITY ASSURANCE

- A. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum ten years documented experience.
- B. Acoustical Unit Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum ten years documented experience.

1.06 FIELD CONDITIONS

- A. Maintain uniform temperature of minimum 60 degrees F, and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

1.07 PROJECT CONDITIONS

- A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.
- B. Install acoustical units after interior wet work is dry.

1.08 EXTRA MATERIALS

- A. See Section 01 60 00 - Product Requirements, for additional provisions.

PART 2 PRODUCTS

2.01 ACOUSTICAL UNITS

- A. Manufacturers:
 - 1. Armstrong World Industries, Inc: www.armstrong.com.
 - 2. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Acoustical Units - General: ASTM E1264, Class A.
 - 1. Units for Installation in Fire-Rated Suspension System: Listed and classified for the fire-resistive assembly the suspension system is a part of.
- C. Acoustical Tile Type A: Painted mineral fiber, ASTM E1264 Type III, with to the following characteristics:
 - 1. VOC Content: As specified in Section 01 61 16.
 - 2. Size: 24 x 48 inches.
 - 3. Thickness: 3/4 inches.
 - 4. Edge: Square.
 - 5. Surface Color: White.
 - 6. Product: Fine Fissured High NRC 1811 by Armstrong.
- D. Acoustical Tile Type C and E: Scrubbable faced mineral fiber, ASTM E1264 Type IV, with the following characteristics:
 - 1. VOC Content: As specified in Section 01 61 16.
 - 2. Size: 24 x 48 (type C), 24 x 24 inches (type E).
 - 3. Thickness: 3/4 inches.
 - 4. Edge: Square.
 - 5. Surface Color: White.
 - 6. Surface Pattern: Fine.
 - 7. Product: Health Zone Ultima by Armstrong.
- E. Acoustical Panels Type B: Painted composite fiberglass, ASTM E 1264 Type XII with the following characteristics:
 - 1. Size: 24x24 inches.
 - 2. Thickness: 1 inches.
 - 3. Composition: Fiberglass with composition acoustically transparent membrane ceiling surface.
 - 4. Density: .55 lbs./s.f.
 - 5. Light Reflectance: 90 percent, determined as specified in ASTM E1264.
 - 6. NRC: .95 , determined as specified in ASTM E 1264.
 - 7. Articulation Class (AC): 190, determined as specified in ASTM E1264.
 - 8. Ceiling Attenuation Class (CAC): N/A.
 - 9. Edge: Square tegular 9/16".
 - 10. Surface Pattern: Non-directional textured.
 - 11. Product: Fine Fissured High NRC 1811 by Armstrong.

- F. Acoustical Panels Type D: Vinyl faced composite fiberglass, ASTM E1264 Type XII, with the following characteristics:
1. Size: 24x48 inches.
 2. Thickness: 1 inches.
 3. Density: .55 lb/sq. ft.
 4. Light Reflectance: 90 percent, determined as specified in ASTM E1264.
 5. NRC Range: .95
 6. Articulation Class (AC): 190
 7. Ceiling Attenuation Class (CAC): N/A, determined as specified in ASTM E1264.
 8. Edge: Square tegular 9/16".
 9. Surface Pattern: Non-directional textured.
 10. Product: "Optima" Open plan, #3256, by Armstrong= Design Basis.

2.02 SUSPENSION SYSTEM(S)

- A. Manufacturers:
1. Same as for acoustical units.
 2. Armstrong World Industries, Inc: www.armstrong.com.
 3. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Suspension Systems - General: ASTM C635; die cut and interlocking components, with stabilizer bars, clips, splices, perimeter moldings, and hold down clips as required.
- C. Exposed Tee Steel Suspension System: Formed galvanized steel, commercial quality cold rolled; heavy-duty.
1. Profile: Tee; for square tegular edge panels 15/16 inch wide face.
 2. Construction: Double web.
 3. Finish: White painted.
 4. Product: Prelude XL, 15/16" by Armstrong.

2.03 ACCESSORIES

- A. Support Channels and Hangers: Galvanized steel; size and type to suit application and ceiling system flatness requirement specified.
- B. Perimeter Moldings: Same material and finish as grid.
- C. Acoustical Sealant For Perimeter Moldings: Specified in Section 07 90 05.
- D. Gasket For Perimeter Moldings: Closed cell rubber sponge tape.
- E. Touch-up Paint: Type and color to match acoustical and grid units.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that layout of hangers will not interfere with other work.

3.02 INSTALLATION - SUSPENSION SYSTEM

- A. Install suspension system in accordance with ASTM C 636, ASTM E 580, and manufacturer's instructions and as supplemented in this section.
- B. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:240.
- C. Lay out system to a balanced grid design with edge units no less than 50 percent of acoustical unit size.
- D. Locate system on room axis according to reflected plan.

- E. Install after major above-ceiling work is complete. Coordinate the location of hangers with other work.
- F. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
- G. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.
- H. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.
- I. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.
- J. Do not eccentrically load system or induce rotation of runners.
- K. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
 - 1. Install in bed of acoustical sealant or in bed of acoustical sealant.
 - 2. Use longest practical lengths.
 - 3. Miter or Overlap and rivet corners.
- L. Form expansion joints as detailed. Form to accommodate plus or minus 1 inch movement. Maintain visual closure.

3.03 INSTALLATION - ACOUSTICAL UNITS

- A. Install acoustical units in accordance with manufacturer's instructions.
- B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.
- C. Fit border trim neatly against abutting surfaces.
- D. Install units after above-ceiling work is complete.
- E. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.
- F. Cutting Acoustical Units:
 - 1. Cut to fit irregular grid and perimeter edge trim.
 - 2. Make field cut edges of same profile as factory edges.
 - 3. Double cut and field paint exposed reveal edges.
- G. Where round obstructions and bullnose corners occur, provide preformed closures to match perimeter molding.
- H. Install hold-down clips on panels within 20 ft of an exterior door.

3.04 TOLERANCES

- A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.
- B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

END OF SECTION

SPECIFICATIONS

CHAIR MODEL BW 220 CONTOUR

Standards

Standards shall be pedestal design made with a rectangular tube with 18 gauge steel 1" x 3". The tube shall be attached by a concealed weld to a 3-1/4" x 7-7/8" 14 gauge deep formed steel foot. The foot shall have four holes for attachment of the standard to a concrete floor with lead shielded expansion bolts. Two bolts shall be used for attachment of the stationary chair or lounge chair and four screws shall be used to attach to a wood floor surface (see wood floor surface thickness requirements). A reinforced 1/4" bracket for seat pan attachment shall be integrated into the standard which has an inlay at mid point for resistance upon force. The seat pan shall be anchored to the standard by use of a hexagon 5/16" fusion nut and a hexagon bolt of 5/16" x 3/4" through a threaded insert on the seat bracket. A lug support for attachment of the back shall be made of 14 gauge sheet metal. Welded to the top of the column shall be a 14 gauge plate for armrest attachment.

Aisle Standards

Aisle standards shall be fabricated in the same manner as the center standards with a formed frame of 18 gauge steel welded to the column to accept a decorator panel.

Riser Attached Standards

Riser mounted standards shall take into account the curvature of the riser. The standards shall be a rectangular tube, 1" x 3" with a break to ensure that the seat height is 18" from the floor. A 4" x 4" steel plate shall be continuously welded to the tube for attachment to the riser. The riser height must be at least 8" high and 90 degrees, plus or minus 1/8". Three expansion bolts are required to attach the standard to the surface.

Seat Cushion and Seat Pan and Hinge – Injection Molded Polypropylene

Seat cushion shall be of arch-spring type. The seat cushion frame shall be of one piece reinforced injection molded polypropylene. Serpentine springs of normalized steel of 10 gauge, painted in epoxy paint to prevent corrosion, shall span the frame and be secured to the injection molded frame so as to eliminate noise. The spring assembly shall be covered by a tough and durable inter-liner to provide a chafing barrier to protect the cold molded polyurethane seat cushion. The seat cushion shall be cold molded to the contour of the springs to provide a raised outer edge so that the overall seat foam is contoured for exceptional body support in the hip area. The foam shall have a density of 3.4 +/- point two. The seat frame shall have two steel bars that span the width of the cushion and which provide additional strength and support. The seat frame shall rotate on one 1/2" diameter cold rolled steel hinge rod securely attached to the seat frame. The additional hollow steel tube is attached to the rear of the frame for additional strength, support and stability. The specified fabric, carefully tailored, shall be of panel side construction and manufactured as a slip cover with a steel zipper. The slip cover fits over the entire assembly in order to allow ease in replacement.

The self lifting mechanism shall be a counter balance system integrated within the seat frame. It utilizes a weight inserted into the interior of the seat frame which allows the seat pan to return to a 75 or 90 degree vertical position by means of gravity. There shall be two 1/2" square tube stops, two counter-stops and two 1" cold rolled steel bushings, all reinforced.

The seat frame and return mechanism shall be enclosed with an:

- Injection molded polypropylene cover with a decorative embossment
- Steel cover with decorative embossment surfaced to powder coated paint
- Upholstered cover
- Laminate Cover
- Veneer cover

and attaches to the frame without screws or other fasteners but which can be removed with the use of a specially supplied tool. The rear of the injection molded and metal seat pan shall be vented to allow the foam to breathe.

Back

Chair back shall be padded with a cold molded polyurethane foam increasing in thickness from 2" thickness at the top to 3" at the bottom and contoured for additional lumbar support. The foam shall be cemented to 5 ply 7/16" plywood base with four 1/4" threaded inserts for the attachment of two die formed metal supports (back wings), 14 gauge, with four cold-rolled galvanized flat head steel screws 1/4" by 3/4". This shall be mounted onto a high impact, injection molded polyethylene outer back. All attachment screws shall be fully concealed. Back wings shall have provision for 16 degree, 20 degree or 24 degree pitch. The height of the back to the floor shall be 34" as measured in the 20 degree back pitch.

Armrests

Armrests shall be constructed of solid hardwood stained to the finish selected, laminated hardwood or MDF, injection molded or upholstered. The armrests are designed to have a perfect fit with the standards of the chair and are attached with four lag screws of cold-rolled galvanized steel 1/8" x 19/32". The armrest for the center standards shall be substantially similar in size to the aisle standard armrests.

Powder Paint

All metal parts, exposed and concealed, shall be stripped and cleaned with iron phosphate, hot water rinsed and then chromic acid rinsed. All metal parts are then coated with an epoxy powder paint which shall be electrostatically applied, resulting in dry film thickness of at least 2mm and will pass the 2H hardness test. All metal parts are baked in a gas fired convection oven at not less than 365 degrees.

Warranty

A five year limited warranty is included on all parts and materials due to workmanship or inherent defects.

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SECTION 12 66 13 – TELESCOPIC BLEACHERS

PART 1 – GENERAL

1.01 SUMMARY

- A. Section Includes: Telescoping Gym Seating includes, either manually or electrically operated systems of multiple-tiered seating rows comprising of seat, deck components, understructure that permits closing without requiring dismantling, into a nested configuration for storing or for moving purposes.
 - 1. Typical applications include the following:
 - a. Wall Attached Telescoping Gym Seats.
- B. Qualifications and Capabilities:
 - 1. BIDDER QUALIFICATIONS:
Bidders are required to be an authorized dealer or manufacturer for equipment proposed which on a day-to-day basis regularly provide the equipment offered.
 - 2. INSTALLER QUALIFICATIONS:
Bleacher installer shall be Factory Certified by the Manufacturer.
 - 3. SERVICE CAPABILITY: The Bleacher Contractor must be able to show proof of full time service capability by factory certified technicians directly employed by the Bleacher Contractor.

1.02 REFERENCE

- A. International Building Code (IBC)
- B. ICC 300 – Standard for Bleachers, Folding and Telescopic Seating and Grandstands
- C. American Welding Society (AWS)
 - 1. AWS D1.1 Structural Welding Code – Steel
 - 2. WS D1.3 Structural Welding Code - Sheet Steel
- D. American Institute of Steel Construction (AISC):
 - 1. AISC - Design of Hot Rolled Steel Structural Members.
- E. American National Standards Institute (ANSI).
- F. American Iron & Steel Institute (AISI):
 - 1. AISI - Design Cold Formed Steel Structural Members.
- G. Aluminum Association (AA):
 - 1. AA - Aluminum Structures, Construction Manual Series.
- H. American Society for Testing Materials (ASTM):
 - 1. ASTM - Standard Specification for Properties of Materials.
- I. National Forest Products Association (NFoPA):
 - 1. NFoPA - National Design Specification for Wood Construction.
- J. Southern Pine Inspection Bureau (SPIB):
 - 1. SPIB - Standard Grading Rules for Southern Pine.

K. National Bureau of Standards/Products Standard (NBS/PS):

1. PS1 - Construction and Industrial Plywood.

L. Americans with Disability Act (ADA)

1. ADA - Standards for Accessible Design.

1.03 MANUFACTURER'S SYSTEM ENGINEERING DESCRIPTION

A. Structural Performance: Engineer, fabricate and install telescopic gym seating systems to the following structural loads without exceeding allowable design working stresses of materials involved, including anchors and connections. Apply each load to produce maximum stress in each respective component of each gym seat unit.

1. Design Loads: Comply with ICC 300 – 2012 Edition

B. Manufacturer's System Design Criteria:

1. Gymnasium seat assembly; Design to support and resist, in addition to it's own weight, the following forces:
 - a. Live load of 120 lbs per linear foot [162.69 N/m] on seats and decking
 - b. Uniformly distributed live load of not less than 100 lbs per sq. ft. [135.58N/m] of gross horizontal projection.
 - c. Parallel sway load of 24 lbs. [32.53 N/m] per linear foot of row combined with (b.) above
 - d. Perpendicular sway load of 10 lbs. [13.56 N-m] per linear foot of row combined with (b.) above
2. Hand Railings, Posts and Supports: Engineered to withstand the following forces applied separately:
 - a. Concentrated load of 200 lbs. [90.72 kg] applied at any point and in any direction.
 - b. Uniform load of 50 lbs. per foot [.344 N/mm²] applied in any direction.
3. Guard Railings, Post and Supports: Engineered to withstand the following forces applied separately:
 - a. Concentrated load of 200 lbs. [90.72 kg] applied at any point and in any direction along top rail.
 - b. Uniform load of 50 lbs. per foot [.344 N/mm²] applied horizontally at top rail and a simultaneous uniform load of 100 lbs. per foot [.689 N/mm²] applied vertically downward.
4. Member Sizes and Connections: Design criteria (current edition) of the following shall be the basis for calculation of member sizes and connections:
 - a. AISC: Manual of Steel Construction
 - b. AISI: Specification for Design of Cold Formed Steel Structural Members
 - c. AA: Specification for Aluminum Structures
 - d. NFOPA: National Design Guide For Wood Construction.

1.04 SUBMITTALS

A. Section Cross-Reference: Required submittals in accordance with "Conditions of the Contract" and Division 1 General Requirements sections of this "Project Manual."

B. Project Data: Manufacturer's product data for each system. Include the following:

1. Project list: Ten (10) seating projects of similar size, complexity and in service for at least five (5) years.
2. Deviations: List of deviations from these project specifications, if any.

- C. Shop Drawings: Indicate Telescoping Gym Seat assembly layout. Show seat heights, row spacing and rise, aisle widths and locations, assembly dimensions, anchorage to supporting structure, material types and finishes.
 - 1. Wiring Diagrams: Indicate electrical wiring and connections.
 - 2. Graphics Layout Drawings: Indicate pattern of contrasting or matching seat colors
- D. Samples: Seat materials and color finish as selected by Architect from manufacturers standard offered color finishes.
- E. Manufacturer Qualifications: Certification of insurance coverage and manufacturing experience of manufacturer, and copy of a telescopic load test to all loads described in 1.03 above, observed by a qualified independent testing laboratory, and certified by a registered professional structural engineer verifying the integrity of the manufacturer's geometry design and base structural assumptions.
- F. Installer Qualifications: Installer qualifications indicating capability, experience, and official Certification Card issued by manufacturer of telescopic seating.
- G. Engineer Qualifications: Certification by a professional engineer registered in the state of manufacturer that the equipment to be supplied meets or exceeds the design criteria of this specification.
- H. Operating/Maintenance Manuals: Provide to Owner maintenance manuals. Demonstrate operating procedures, recommended maintenance and inspection program.
- I. Warranty: Manufacturers standard warranty documents.

1.05 QUALITY ASSURANCE

- A. Seating Layout: Comply with ICCC 300 -2012 Standard for Bleachers, Folding Telescopic Seating and Grandstands, except where additional requirements are indicated or imposed by authorities having jurisdiction.
- B. Welding Standards & Qualification: Comply with AWS D1.1 Structural Welding Code - Steel and AWS D1.3 Structural Welding Code - Sheet Steel.
- C. Manufacturer Qualifications: Manufacturer who has a minimum of 40 years of experience manufacturing telescoping gym seats and can demonstrate continual design enhancement and 25-year minimum product life-cycle support of telescopic seating.
- D. Installer Qualifications: Engage experienced Installer who has specialized in installation of telescoping gym seat types similar to types required for this project and who carries an official Certification Card issued by telescoping gym seat manufacturer.
- E. Engineer Qualifications: Engage licensed professional engineer experienced in providing engineering services of the kind indicated that have resulted in the successful installation of telescoping bleachers similar in material, design, fabrication, and extent to those types indicated for this project.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver telescopic gym seats in manufacturers packaging clearly labeled with manufacturer name and content.
- B. Handle seating equipment in a manner to prevent damage.
- C. Deliver the seating at a scheduled time for installation that will not interfere with other trades operating in the building.

1.07 PROJECT CONDITIONS

- A. Field Measurements: Coordinate actual dimensions of construction affecting telescoping bleachers installation by accurate field measurements before fabrication. Show recorded measurements on final shop drawings. Coordinate field measurements and fabrication schedule with construction progress to avoid delay of Work.

1.08 WARRANTY

- A. Manufacturer's Product Warranty: Submit manufacturer's standard warranty form for telescoping bleachers. This warranty is in addition to, and not a limitation of other rights Owner may have under Contract Documents.
 - 1. Warranty Period: Five years from Date of Acceptance.
 - 2. Beneficiary: Issue warranty in legal name of project Owner.
 - 3. Warranty Acceptance: Owner is sole authority who will determine acceptance of warranty documents.

1.09 MAINTENANCE AND OPERATION

- A. Instructions: Both operation and maintenance shall be transmitted to the Owner by the manufacturer of the seating or his representative.
- B. Service: Maintenance and operation of the seating system shall be the responsibility of the Owner or his duly authorized representative, and shall include the following:
 - 1. Operation of the Seating System shall be supervised by responsible personnel who will assure that the operation is in accordance with the manufacturer's instructions.
 - 2. Only attachments specifically approved by the manufacturer for the specific installation shall be attached to the seating.
 - 3. An annual inspection and required maintenance of each seating system shall be performed to assure safe conditions. At least biannually the inspection shall be performed by a professional engineer or factory qualified service personnel.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturer: Hussey Seating Company, U.S.A.

1. Product: MAXAM Telescopic Gym Seat System by Hussey Seating Company
 - a. Model: MAXAM26 Series Telescopic Gym Seats, adjustable row spacing in two inch increments from 22 inches to 26 inches.
 - b. MAXAM26 Series Telescopic Gym Seats, Rise Spacing: 11 5/8"
 - c. Aisle Type: foot level aisles
 - d. Seat Type: Classic (wood seat)
 - e. Rail Type: Self-storing end rail
 - (1) Rail color finish: Standard black
 - f. Operation: Manual
 2. Miscellaneous Product Accessories: Operating handles, front panels, end panels and rear panels.
 3. Handicap Seating Provisions: Provide first tier modular recoverable Flex-rows, handicap first-tier fixed end-section cutouts, full-section truncations per requirements of (ADA) Americans with Disability Act located as indicated.
- B. Substitutions: See Section 01 60 00 – Product Requirements.

2.02 MATERIALS

- A. Lumber: ANSI/Voluntary Product 20, B & B Southern Pine
- B. Plywood: ANSI/Voluntary Product PS1, APA A-C Exterior Grade.
- C. Structural Steel Shapes, Plates and Bars: ASTM A 36.
- D. Uncoated Steel Strip (Non-Structural Components): ASTM A569, Commercial Quality, Hot-Rolled Strip.
- E. Uncoated Steel Strip (Structural Components): ASTM A570 Grade 33, 40, 45, or 50, Structural Quality, Hot-Rolled Strip.
- F. Uncoated Steel Strip (Structural Components): ASTM A607 Grade 45 or 50, High-Strength, Low Alloy, Hot-Rolled Strip.
- G. Galvanized Steel Strip: ASTM A653 Grade 40, zinc coated by the hot-dip process, structural quality.
- H. Structural Tubing: ASTM A500 Grade B, cold-formed.
- I. Polyethylene Polymer: ASTM D 1248, Type III, Class B; molded, color-pigmented, textured, impact-resistant, structural formulation; in color indicated or, if not otherwise indicated, as selected by Architect from manufacturer's standard colors.
- J. Fasteners: Vibration-proof, of size and material standard with manufacturer.

2.03 UNDERSTRUCTURE FABRICATION

- A. Frame System:
 1. Wheels: Not less than 5" [127] diameter by 1 1/4" [32] with non-marring soft rubber face to protect wood and synthetic floor surfaces, with molded-in sintered iron oil-impregnated bushings to fit 3/8" [10] diameter axles secured with E-type snap rings.
 2. Lower Track: Continuous Positive Interglide System interlocks each adjacent CPI unit using an integral, continuous, anti-drift feature and through-bolted guide at front to prevent separation and

misalignment. CPI units at end sections of powered banks and manual sections shall contain a Low Profile Posi-Lock LX to lock each row in open position and allow unlocking automatically. Provide adjustable stops to allow field adjustment of row spacings.

3. Slant Columns: High tensile steel, tubular shape.
4. Sway Bracing: High tensile steel members through-bolted to columns.
5. Deck Stabilizer: High tensile steel member through-bolted to nose and riser at three locations per section. Interlocks with adjacent stabilizer on upper tier using low-friction nylon roller to prevent separation and misalignment. Incorporates multiple stops to allow field adjustment of row spacings.
6. Deck Support: Securely captures front and rear edge of decking at rear edge of nose beam and lower edge of riser beam for entire length of section.

B. Deck System:

1. Section Lengths: Each bank shall contain sections not to exceed 25'-6" [7772] in length with a minimum of two supporting frames per row, each section.
2. Nose beam and Rear Riser beam: Nose beam shall be continuously roll-formed closed tubular shape of ASTM A653 grade 40, Riser beam shall be continuously roll-formed of ASTM A653 grade 40. Nose and Riser beam shall be designed with no steel edges exposed to spectator after product assembly.
3. Attachment: Through-Bolted fore/aft to deck stabilizers, and frame cantilevers.
4. Decking: 5/8" [16], AC grade clear-top-coated tongue and groove Southern Yellow Pine; or BC grade polyethylene-top-coated tongue and groove Douglas Fir plywood; both of interior type with exterior glue, 5-ply, all plies with plugged cross-bands, produced in accordance with National Bureau of Standards PS-1-97. Plywood shall be cut and installed with top, center and bottom ply grain-oriented from front of deck to rear of deck (nose beam to riser beam). Adjacent pieces shall be locked together with tongue and groove joint from front to rear of deck. Longest unsupported span: MAXAM 26, 21 1/2" [546].
5. Deck End Overhang: Not to exceed frame support by more than 5'-11" [1804].

2.04 SEAT FABRICATION

A. Classic Wood Seat System:

1. Seats and Front Riser: 4/4" nominal thickness kiln dried, end finger joined only and/or solid Southern Pine Grade "B & B" in conformity with the Southern Pine Inspection Bureau (SPIB) Grading Rules. Mixed lumber species, edge glued strips, or plugs are unacceptable.
2. Seats: Bench seat posture pitched to the rear for spectator comfort. Seats and front risers shall have full-radiused comfort shaped edges.
3. Seat Supports: Seat supports shall be through-bolted to seats, front risers, and noses and shall be provided in sufficient number to limit unsupported length of bench seat to 3'-0" [914].

2.05 SHOP FINISHES

- A. Understructure:** For rust resistance, steel understructure shall be finished on all surfaces with black "Dura-Coat" enamel. Understructure finish shall contain a silicone additive to improve scratch resistance of finish.
- B. Wear Surfaces:** Surface subject to normal wear by spectators shall have a finish that does not wear to show different color underneath:
1. Steel nosing and rear risers shall be pre-galvanized with a minimum spangle of G-60 zinc plating.

2. Decking shall have use-surfaces to receive both a sealer coat and wear-resistant high gloss clear urethane finish. Optional decking to have 0.030" laminated polyethylene wear surface.
 3. Classic wood seats and fascia shall be triple sanded and receive a sealer coat with use surfaces to receive high gloss clear urethane finish.
- C. Railings: Steel railings shall be finished with powder-coated semi - gloss black or optional 15 standard colors to match polymer seat color.
- D. High Humidity finish: Above shop finishes shall include following modifications:
1. Understructure: All frames and other structural components shall be hot-dip galvanized per ASTM A103
 2. All top-side rails shall be e-coated prior to powder paint coating
 3. All hardware to be zinc-plated
 4. All posi-locks and other steel wear surfaces to be electroless-nickel plated
 5. Decking to be polyethylene-laminated plywood

2.06 FASTENINGS

- A. Welds: Performed by welders certified by AWS standards for the process employed.
- B. Structural Connections: Secured by structural bolts with prevailing torque lock nuts, free-spinning nuts in combination with lock washers, or Riv-nuts in combination with lock washers.

2.07 ACCESSORIES | STANDARD TELESCOPIC GYMSEAT ACCESSORIES

- A. Access Panels (Hatchway): Provide access to unit at 4th or 5th tier.
- B. Operating Handles: Provide and install manual operating handles constructed of ¾" [19] OD steel tubing. Handles to engage pull-bar installed at the first tier.
- C. Flex-Row: Provide first row modular recoverable seating units to be utilized by persons in wheelchairs and able-bodied persons. Each Flex-Row unit shall have an unlock handle for easy deployment if wheelchair or team seating access is needed. Unlock handle shall lock the bleacher seats into position when fully opened.
1. Provide a black full-surround steel skirting with no more than ¾" floor clearance for safety and improved aesthetics.
 2. Provide a black injection molded end cap for the nose beam for safety and improved aesthetics..
 3. Provide a mechanical positive lock when the Flex-Row system is in the open and used position.
 4. Flex-Row modular units are designed to achieve multi-use front row seating to accommodate team seating, ADA requirements and facility specific requirements. Flex-Row units are available in modular units from 2 to 7 seats wide as well as full section widths.
- D. Permanent Handicap Cut-Outs: Provide first tier permanent handicap cutouts per requirements of Americans with Disability Act (ADA) located as indicated. Provide a full width front closure panel at handicap cutout, extending from underside of second tier to within 1 1/2" [38] of finished floor.
- E. Provide a removable belt barrier with or without signage for the rear of each recoverable Flex-Row module to assist with seating identification.
- F. Front Aisle Steps: Provide at each vertical aisle location front aisle step. Front steps shall engage with front row to prevent accidental separation or movement. Steps shall be fitted with four non-skid rubber feet each 1/2" [13] in diameter. Blow molded end caps shall have full radius on all four edges. Quantity and location as indicated.

- G. Non-Slip Tread: Provide at front edge of each aisle location an adhesive-backed abrasive non-slip tread surface.
- H. Foot Level Aisles: Provide deck level full width vertical aisles located as indicated.
- I. Intermediate Aisle Steps: Intermediate aisle steps shall be of boxed fully enclosed type construction. Blow molded end caps shall have full radius on all four edges. Step shall have adhesive-backed abrasive non-slip tread surface. Quantity and location as indicated.
- J. Intermediate Aisle Handrails: Provide single pedestal mount handrails 34" [864] high with terminating mid rail. Handrails shall be attached to the socket and shall lift and rotate 90° for easy storage in socket. Aisle handrails that are detached from the socket for storage are unacceptable.
- K. Intermediate Folding Aisle Handrails: Provide single pedestal mount handrails 34" [864] high with terminating mid rail. Handrail to be permanently mounted to a rotating socket for rail storage on the intermediate aisle step.
- L. Front Panel: Provide front closure panels for truncated sections, permanent end cutouts or elevated front aisles. Panels shall extend vertically from underside of front row to within 1 1/2" [38] of floor. Paneling to be 5/8" [16] Southern Pine Plywood or grey Polydeck attached to a steel framework.
- M. End Panel: Provide closure end panels for closed stack position at each exposed bank end. End panels shall be constructed of 5/8" [16] Southern pine plywood or grey Polydeck.
- N. Rear Panel: Provide required seating units with full width rear closure panels. Panels shall extend vertically full height or up to 8'-0" [2438] high to within 1 1/2" [38] of floor. Paneling to be 5/8" [16] Southern Pine Plywood or grey Polydeck attached to a steel framework. Rear panels cannot extend above 8'-0" [2438] on portable sections.
- O. Front Rail: Provide not less than 30" [762] high above deck, steel rails with tubular supports and intermediate members designed with 4" [102] sphere passage requirements. Rails to be located at each required seating location.
- P. Self-Storing End Rails: Provide steel self-storing 42" [1066] high above seat, end rail with tubular supports and intermediate members designed with 4" [102] sphere passage requirements.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Verification of Conditions: Verify area to receive telescoping gym seats are free of impediments interfering with installation and condition of installation substrates are acceptable to receive telescoping gym seats in accordance with telescoping gym seats manufacturer's recommendations. Do not commence installation

until conditions are satisfactory.

3.02 INSTALLATION

- A.** Manufacturer's Recommendations: Comply with telescoping gym seats manufacturer's recommendations for product installation requirements.
- B.** General: Manufacturer's Certified Installers to install telescoping gym seats in accordance with manufacturer's installation instructions and final shop drawings. Provide accessories, anchors, fasteners, inserts and other items for installation of telescoping gym seats and for permanent attachment to adjoining construction.

3.03 ADJUSTMENT AND CLEANING

- A.** Adjustment: After installation completion, test and adjust each telescoping gym seats assembly to operate in compliance with manufacturer's operations manual.
- B.** Cleaning: Clean installed telescoping gym seats on both exposed and semi-exposed surfaces. Touch-up finishes restoring damage or soiled surfaces.

3.04 PROTECTION

- A.** General: Provide final protection and maintain conditions, in a manner acceptable to manufacturer and installer to ensure telescoping gym seats are without damage or deterioration at time of substantial completion.

END OF SECTION

SECTION 23 09 93
SEQUENCE OF OPERATIONS FOR HVAC CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. This section defines the manner and method by which controls function. Requirements for each type of control system operation are specified. Equipment, devices, and system components required for control systems are specified in other sections.
- B. Sequence of operation for:
 - 1. Hot Water Heating System
 - 2. Air Handling Units, including Variable Air Volume Terminals
 - 3. Fan Coil Units
 - 4. Ductless Split System Air Conditioning Units
 - 5. Heat Trace Systems
 - 6. Exhaust Fans
 - 7. Packaged Terminal Vertical Unit Ventilators.

1.02 RELATED SECTIONS

- A. Section 23 09 23 - Direct-Digital Control System for HVAC.
- B. Section 23 09 13 - Instrumentation and Control Devices for HVAC.
- C. Section 26 27 17 - Equipment Wiring: Electrical characteristics and wiring connections.

1.03 SYSTEM DESCRIPTION

- A. This Section defines the manner and method by which controls function. Requirements for each type of control system operation are specified. Equipment, devices, and system components required for control systems are specified in other Sections.

1.04 SUBMITTALS

- A. See Section 01 33 00 - Administrative Requirements, for submittal procedures.
- B. Sequence of Operation Documentation: Submit written sequence of operation for entire HVAC system and each piece of equipment.
 - 1. Preface: 1 or 2 paragraph overview narrative of the system describing its purpose, components and function.
 - 2. State each sequence in small segments and give each segment a unique number for referencing in Functional Test procedures; provide a complete description regardless of the completeness and clarity of the sequences specified in the contract documents.
 - 3. Include at least the following sequences:
 - a. Start-up.
 - b. Warm-up mode.
 - c. Normal operating mode.
 - d. Unoccupied mode.
 - e. Shutdown.
 - f. Capacity control sequences and equipment staging.
 - g. Temperature and pressure control, such as setbacks, setups, resets, etc.
 - h. Detailed sequences for all control strategies, such as economizer control, optimum start/stop, staging, optimization, demand limiting, etc.
 - i. Effects of power or equipment failure with all standby component functions.
 - j. Sequences for all alarms and emergency shut downs.
 - k. Seasonal operational differences and recommendations.
 - l. Interactions and interlocks with other systems.

4. Include initial and recommended values for all adjustable settings, setpoints and parameters that are typically set or adjusted by operating staff; and any other control settings or fixed values, delays, etc. that will be useful during testing and operating the equipment.
5. For packaged controlled equipment, include manufacturer's furnished sequence of operation amplified as required to describe the relationship between the packaged controls and the control system, indicating which points are adjustable control points and which points are only monitored.
6. Include schedules, if known.
- C. Control System Diagrams: Submit graphic schematic of the control system showing each control component and each component controlled, monitored, or enabled.
 1. Label with settings, adjustable range of control and limits.
 2. Include flow diagrams for each control system, graphically depicting control logic.
 3. Include the system and component layout of all equipment that the control system monitors, enables or controls, even if the equipment is primarily controlled by packaged or integral controls.
 4. Include draft copies of graphic displays indicating mechanical system components, control system components, and controlled function status and value.
 5. Include all monitoring, control and virtual points specified in elsewhere.
 6. Include a key to all abbreviations.
- D. Points List: Submit list of all control points indicating at least the following for each point.
 1. Name of controlled system.
 2. Point abbreviation.
 3. Point description; such as dry bulb temperature, airflow, etc.
 4. Display unit.
 5. Control point or setpoint (Yes / No); i.e. a point that controls equipment and can have its setpoint changed.
 6. Monitoring point (Yes / No); i.e. a point that does not control or contribute to the control of equipment but is used for operation, maintenance, or performance verification.
 7. Intermediate point (Yes / No); i.e. a point whose value is used to make a calculation which then controls equipment, such as space temperatures that are averaged to a virtual point to control reset.
 8. Calculated point (Yes / No); i.e. a "virtual" point generated from calculations of other point values.
- E. Project Record Documents: Record actual locations of components and setpoints of controls, including changes to sequences made after submission of shop drawings.

1.05 QUALITY ASSURANCE

- A. Design system under direct supervision of a Professional Engineer experienced in design of this Work and licensed in the State in which the Project is located.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 GENERAL SYSTEM DESIGN AND OPERATION STANDARDS

- A. The new BAS shall control the mechanical systems within the Rising Sun High School based upon a central heating plant with a hydronic distribution system serving air handling units and variable-air volume terminals throughout the facility. Boiler/burner systems shall be controlled via local fire-control units.
- B. Hot water hydronic distribution system shall be part of a 2-pipe variable-flow system with two-way control valves mounted at each unit.

- C. Each air handling unit shall be controlled by an individual DDC Controller. The DDC Controller shall be wired to a space temperature sensor, discharge air temperature sensor, return air temperature sensor, damper motors, control valve, and a serpentine freeze stat. Units shall include occupied/unoccupied control, night-setback, morning warm-up/cool-down, and enthalpy-based economizer functions.

3.02 HEATING WATER SYSTEM

A. General

1. The heating water system shall be manually enabled and disabled from the operator workstation. The hot water circulator pumps shall be energized and run continuously in a lead-lag manner whenever the heating system is enabled.
2. Heating lockout shall prevent heating water system from operating if outdoor air temperature rises above 55 F (adj.).

B. Boilers

1. The boilers shall be enabled / disabled by the BAS based on manual operator command. Once enabled, the boiler's integrated combustion controls and integral thermostat shall cycle the boiler.
2. When the designated lead boiler is enabled, its associated circulator pump shall run continuously. Operation of the circulator pump must be proven via a current switch mounted on one phase of power feeding the pump before the boiler is allowed to fire. An alarm shall be activated at the Operator's Terminal if pump operation is not detected when pump is commanded to operate.
3. The BAS shall monitor a general failure alarm and a low water cut off alarm from each boiler.
4. When an alarm is detected at the designated lead boiler, it shall be disabled by the BAS and the designated lag boiler shall be enabled while an alarm is generated at the Operator's Terminal.
5. If the lead boiler is unable to maintain the heating load as detected by the hot water loop return temperature sensor, the designated lag pump and boiler shall be activated.

C. Building Water Loop - Heating mode

1. When the heating system is enabled via manual operator command, the designated lead pump shall run continuously.
2. On a loss of flow, as indicated by a differential pressure switch, a "heating water loop failure" shall be indicated at the operator's terminal.
3. If the designated lead pump alone is unable to maintain the differential pressure setpoint, the designated lag pump shall be energized and the load shall be shared equally by both pumps to maintain the setpoint. Variable frequency drives on both building loop water pumps shall modulate in response to the differential pressure sensor to maintain a constant differential pressure of 7-10 psig. When the control signal for the two pumps drops below 45 percent, the lag pump shall be de-energized and the lead pump speed shall be increased to maintain setpoint.
4. The primary circulator pumps shall automatically alternate lead status weekly via the BAS. At no time shall more than two pumps be operating simultaneously.
5. The building system loop temperature sensor shall control the three-way hot water reset valve at the boiler primary/secondary connection to maintain the loop temperatures as shown in the reset schedules. All values are user adjustable.
 - a. Reset Schedule:
 - b. Outdoor Temperature Building Loop Temperature (All temperatures are user adjustable)
 - 1) <30 °F 130 °F
 - 2) <35 °F <125 °F
 - 3) <45 °F <120 °F

4) <50 °F<110 °F

D. Boiler Loop Heating Water Pumps

1. When the heating system is enabled via manual operator command, the boiler secondary circulator pumps shall run continuously.
2. On a loss of flow, as indicated by a differential pressure switch, and after a twenty second delay, the secondary circulator pump shall be de-energized and "secondary circulator heating water pump failure alarm" shall be displayed at the operator's terminal.

E. Heating Water System Monitoring

1. The following points shall be monitored:
2. Building Loop Supply Temperature
3. Building Loop Return Temperature
4. Boiler Loop Supply Temperature
5. Boiler Loop Return Temperature
6. Boiler Status Contacts
7. Boiler Alarm Contacts
8. Boiler low water cut off
9. Building Loop Circulator pump(s) status via current switch
10. Building Loop pump flow status via differential pressure switch
11. Boiler loop pump flow status via differential pressure switch
12. VFD status and alarm for each pump.
13. Lead / lag status of each boiler and pump
14. Diagram showing the layout of the boiler room, boiler loop, and building loop with major components and dynamic temperatures shown where temperature sensors exist in the system

3.03 MAKE UP AIR UNIT (KITCHEN)

- A. Unit shall be interlocked with kitchen exhaust hood. Provide new on/off switch for kitchen exhaust fan.
- B. On call for kitchen exhaust fan the following shall occur:
1. Outside air dampers for man-1 supply air and combustion air shall modulate open. When open dampers are proven open via end switch, exhaust fan and man-1 supply air fan shall be energized.
 2. The modulating control valve shall open and close as required to maintain space temperature of 70F (adjustable).
 3. A discharge air temperature controller shall prevent the air temperature from falling below 70F (adjustable) when the system is in heating mode.
 4. Upon activation of smoke detector fans shall de-energize, dampers shall modulate closed and a signal shall be sent to fire alarm control panel.

3.04 VARIABLE AIR VOLUME AIR HANDLING UNIT WITH DX COOLING, HOT GAS REHEAT, HOT WATER HEAT, ENERGY RECOVERY WHEEL, AND VAV TERMINAL UNITS

- A. Each unit shall be controlled by an individual DDC Controller. The DDC Controller shall be wired to the required air temperature sensors noted in paragraph "G" below, damper motors, control valve, duct static pressure sensor, energy recovery wheel, outdoor airflow monitoring station, and condensing unit control relays. Each VAV terminal unit shall also be provided with its own controller that shall be wired to a space temperature sensor, control valve, and damper actuator.
- B. Sequence of operation:
1. Cooling Mode: Cooling mode shall be selected based on outdoor air temperatures or manually enabled or scheduled from the workstation. During the programmed occupied mode, the supply fan shall run continuously with the outside air damper open to the

minimum position as defined by the outdoor airflow monitoring station CFM value. Unless economizer mode is engaged, the outdoor air damper shall modulate in response to the outdoor airflow monitoring station to maintain the minimum required airflow as defined by the drawing schedule. The variable frequency drive shall modulate the supply and return fans to maintain a given static pressure within the ductwork (0.25" wc, adjustable). The Energy Recovery Wheel will be energized and will rotate at the rate defined by the factory sequence of operation. The compressor(s) and hot-gas bypass system shall modulate to maintain a discharge air temperature of 55 degrees (adjustable). On a rise in space temperature above the setpoint (75 degrees, adjustable), the associated VAV terminal unit shall modulate open to allow greater airflow to meet the space setpoint. If the space temperature continues to rise more than 4 degrees (adjustable) above the setpoint, an alarm shall be generated at the workstation terminal noting "High Space Temperature." On a fall in space temperature the reverse shall occur. On a continued fall in more than one space temperature associated with the unit of more than 5 degrees (adjustable) below the setpoint the unit shall reset the discharge air to provide a 65 degree (adjustable) discharge air temperature. If the temperature space temperature continues to fall an alarm shall be generated at the workstation terminal noting "Low Space Temperature".

- a. For units equipped with an outdoor air economizer: The DDC Controller shall receive input from the Enthalpy Sensor. If the enthalpy of the outdoor air is lower than the defined minimum level (user adjustable) the mixing box economizer sequence shall be activated upon a call for cooling. The outside air damper shall never close past the minimum position called for by the outdoor airflow monitoring station during the occupied period.
2. Heating Mode: Heating mode shall be selected based on outdoor air temperatures or manually enabled or scheduled from the workstation. During the programmed occupied mode, the supply fan shall run continuously with the outside air damper open to the minimum position as defined by the outdoor airflow monitoring station CFM value. Unless economizer mode is engaged, the outdoor air damper shall modulate in response to the outdoor airflow monitoring station to maintain the minimum required airflow as defined by the drawing schedule. The variable frequency drive shall modulate the supply and return fans to maintain a given static pressure within the ductwork (0.25" wc, adjustable). The Energy Recovery Wheel will be energized and will turn at the rate defined by the factory sequence of operation. The hot water control valve in the primary heating coil shall modulate to maintain a discharge air setpoint of 55 degrees (adjustable). The VAV terminal unit modulating air damper shall be in its minimum position. On a fall in space temperature below the setpoint (68 degrees, adjustable), the associated VAV terminal unit shall modulate the associated hot water coil towards the open position. On a continued fall in space temperature of more than 4 degrees (adjustable) below setpoint, an alarm shall be generated at the workstation terminal noting "Low Space Temperature". On a rise in space temperature, the reverse shall occur. On a continued rise in space temperature, an alarm shall be generated at the workstation noting "High Space Temperature".
 - a. The sequence of operation shall provide frost-protection for the energy recovery wheel via modulation of wheel rotation speed, damper actuation, and control valve operation.
3. Unoccupied Mode: During the programmed un-occupied mode, the fan, compressor, hot water valves, and mixing box dampers shall be cycled / modulated to maintain the un-occupied setpoints (80 degrees cooling, 60 degrees heating, adjustable). The VAV boxes shall be opened to their maximum position in unoccupied cooling mode, and minimum position in unoccupied heating mode. Unless required for economizer cycle, the outside air damper shall remain closed. The VAV boxes shall be opened to their maximum position in unoccupied mode.
4. VAV / AHU Static Pressure Reset: The static pressure setpoint in the duct system shall be dynamically reset using a "trim and respond" logic program to control that static pressure

between 0.2" WG and 1" WG. When the fan is commanded off, the setpoint shall be 0.5" WG (Adjustable) when the fan is energized. The setpoint shall be adjusted (trimmed) every 2 minutes by 0.05" WG. The dynamic response shall be an increase in the setpoint by 0.04" WG times the number of zone pressure requests, but never higher than 0.15" WG per cycle. A zone pressure request is generated when the VAV damper of any given terminal unit is opened to greater than 95% until it falls under 80% open.

- C. Provide a current sensor on one phase of power feeding the supply fan, and compressor(s) for status indication at the Operator's Terminal.
- D. If the discharge temperature fails to rise to a programmed minimum temperature during a call for heating; a low temperature alarm shall be activated at the Operator's Terminal. If the discharge temperature fails to fall to a programmed minimum temperature on a call for mechanical cooling, a high temperature alarm shall be activated at the Operator's Terminal.
- E. A serpentine freeze stat shall be furnished, installed and wired in the unit by the BAS contractor. When tripped, the freeze stat shall function to de-energize the supply fan, mixing box damper actuators, and hot water control valve. When de-energized, the mixing box damper actuators shall spring return the outside and relief air dampers closed, the hot water or dual temperature water control valve shall spring return open to the coil, the freeze-protection pump associated with the unit shall be energized, and the isolation valve to the freeze-protection pump shall be opened (see detail on drawings). When the freeze stat trips, an alarm shall be generated at the Operator's Terminal.
- F. A duct smoke detector shall be furnished, installed and wired to the fire alarm system as required by the electrical contractor. The duct smoke detector shall be provided with an auxiliary alarm contact which will be used by the BAS Contractor to de-energize the supply fan, mixing box damper actuators, chilled water, hot water control valve. When de-energized, the mixing box damper actuators shall spring return the outside and relief air dampers closed, and an alarm shall be generated at the Operator's Terminal.
- G. The following items shall be displayed at the Operator's Terminal:
 - 1. Space temperature for each VAV unit.
 - 2. Space temperature setpoint for each VAV unit.
 - 3. Commanded position of each VAV damper.
 - 4. Commanded position of each VAV control valve.
 - 5. Outdoor Airflow Monitoring station flowrate reading
 - 6. Low Space temperature alarm
 - 7. High Space temperature alarm
 - 8. AHU Discharge temperature.
 - 9. AHU Return air temperature.
 - 10. AHU Mixed Air Temperature
 - 11. Dynamic temperatures on each side of the Energy Recovery Wheel section.
 - 12. Outside air temperature, humidity and enthalpy.
 - 13. Fan operational status via current sensor.
 - 14. Energy recovery wheel status via current sensor.
 - 15. Commanded status of fan.
 - 16. Commanded status of compressor(s).
 - 17. Commanded status of hot-water valve(s).
 - 18. Commanded position of dampers.
 - 19. Commanded status of energy recovery wheel.
 - 20. Diagram showing the layout of the unit with major components and dynamic temperatures shown where temperature sensors exist in the system.

3.05 SINGLE ZONE DX COOLING / HOT WATER HEATING AIR HANDLING UNIT WITH OR WITHOUT ENERGY RECOVERY WHEEL, OUTDOOR AIR ECONOMIZER, AND CO2 CONTROLS.

- A. Each unit shall be controlled by an individual DDC Controller. The DDC Controller shall be wired to a space temperature sensor, the required air temperature sensors noted, space CO2 sensor, return air temperature sensor, damper motors, control valve, and a freeze stat.
- B. Cooling Mode:
 - 1. During the programmed occupied mode, the supply fan shall run continuously with the outside air damper open to the minimum position (10% outdoor air unless otherwise shown on Schedule).
 - a. The supply fan shall modulate airflow to maintain space temperature. The supply fan shall not modulate below the minimum OA ventilation rate required in the space. If cooling or heating is required and the fan is at minimum airflow then the DAT setpoint shall be reset up or down to accommodate space requirements.
 - b. When in the occupied mode, the flow-measuring outdoor-air damper shall modulate to maintain the current outdoor airflow at setpoint. The BAS shall calculate and reset this outdoor airflow setpoint based on the current ventilation requirements based on field mounted CO2 sensor. The amount of outside air will be increased above the minimum setting on a rise in return air CO2 above the setpoint of 750 PPM (adjustable). On a return to setpoint the reverse occurs. Upon a rise in CO2 level above 1200 PPM, a high CO2 level will be displayed at the BAS workstation.
 - c. Setpoints are adjustable at the BAS workstation. As the outdoor air damper and supply air fan adjusts, the return exhaust fan shall automatically adjust it's speed to maintain a constant static pressure within the space (0.3" WC, adjustable).
 - 2. The DX cooling shall stage and modulate to maintain the discharge air temperature setpoint in cooling mode and shall modulate hot water valve in heating mode. If economizing is enabled the outside air damper shall also modulate to maintain the discharge air temperature setpoint. If the discharge air temperature sensor fails the chilled water valve shall close and an alarm shall be annunciated at the BAS.
 - a. As noted in paragraph B-1-a above, if cooling or heating is required and the fan is at minimum airflow then the DAT setpoint shall be reset up or down to accommodate space requirements.
 - 3. For units equipped with an outdoor air economizer: The DDC Controller shall receive input from the Global Enthalpy Sensor. If the enthalpy of the outdoor air is lower than the defined minimum level (user adjustable) the mixing box economizer sequence shall be activated upon a call for cooling. The outside air damper shall never close past the minimum position during the occupied period.
- C. Heating Mode:
 - 1. During the programmed occupied mode, the supply fan shall run continuously with the outside air damper open to the minimum position (10% outdoor air unless otherwise shown on Schedule).
 - a. The supply fan shall modulate airflow to maintain space temperature. The supply fan shall not modulate below the minimum OA ventilation rate required in the space. If cooling or heating is required and the fan is at minimum airflow then the DAT setpoint shall be reset up or down to accommodate space requirements.
 - b. When in the occupied mode, the flow-measuring outdoor-air damper shall modulate to maintain the current outdoor airflow at setpoint. The BAS shall calculate and reset this outdoor airflow setpoint based on the current ventilation requirements based on field mounted CO2 sensor. The amount of outside air will be increased above the minimum setting on a rise in return air CO2 above the setpoint of 750 PPM

- (adjustable). On a return to setpoint the reverse occurs. Upon a rise in CO₂ level above 1200 PPM, a high CO₂ level will be displayed at the BAS workstation.
- c. Setpoints are adjustable at the BAS workstation. As the outdoor air damper and supply air fan adjusts, the return exhaust fan shall automatically adjust it's speed to maintain a constant static pressure within the space (0.3" WC, adjustable).
 - 2. The hot water heating valve shall modulate to maintain the discharge air temperature setpoint as defined on the unit schedule. Temperatures shall be user-adjustable. As noted in paragraph C-1-a above, If cooling or heating is required and the fan is at minimum airflow then the DAT setpoint shall be reset up or down to accommodate space requirements.
- D. Energy Recovery Wheel Operation
- 1. FOR UNITS EQUIPPED WITH AN ENERGY RECOVERY WHEEL: The AHU shall be in cooling recovery mode when the outdoor air temperature is greater than the space temperature and higher than the energy wheel enable setpoint (system economizer setpoint temperature). When the wheel is enabled, both outdoor & exhaust air bypass dampers shall be closed, outdoor air damper shall be at minimum, return air damper shall be open, and cooling shall be enabled. In cooling the recovery wheel shall be disabled when the outdoor air temperature is less than the space temperature and both outdoor & exhaust air bypass dampers shall be open.
 - 2. The AHU shall be in heating recovery mode when the outdoor air temperature is less than the space temperature and less than the energy wheel enable setpoint and the supply air temperature is less than the discharge air setpoint. When heat recovery is enabled the wheel shall be enabled as the first stage of heat, the outdoor air damper shall be at minimum, the outdoor & bypass recovery bypass dampers shall be open, and the unit heat shall be disabled. On a continued call for heat the second stage is enabled, the outdoor recovery bypass damper shall close, and the exhaust recovery bypass damper shall modulate to maintain the space temperature setpoint. If additional heat is required the third stage is enabled, the return air damper shall be open, both recovery bypass dampers shall be closed, and the unit heat shall be enabled.
 - 3. If the outdoor air temperature drops below the outdoor air frost protection setpoint (adj.), the outdoor air bypass damper shall modulate to maintain the exhaust-side leaving temperature at setpoint. If the outdoor air bypass damper reaches 100% open for 5 minutes (adj.), the wheel shall be turned off to prevent frosting and an alarm shall be annunciated.
- E. Unoccupied Mode:
- F. Provide a current sensor on one phase of power feeding the supply fan and each compressor for status indication at the Operator's Terminal.
- G. If the discharge temperature fails to rise to a programmed minimum temperature during a call for heating; a low temperature alarm shall be activated at the Operator's Terminal. If the discharge temperature fails to fall to a programmed minimum temperature on a call for mechanical cooling, a high temperature alarm shall be activated at the Operator's Terminal.
- H. A serpentine freeze stat shall be furnished, installed and wired in the unit by the BAS contractor. When tripped, the freeze stat shall function to de-energize the supply fan, mixing box damper actuators, and hot water control valve. When de-energized, the mixing box damper actuators shall spring return the outside and relief air dampers closed, the hot water or dual temperature water control valve shall spring return open to the coil, the freeze-protection pump associated with the unit shall be energized, and the isolation valve to the freeze-protection pump shall be opened (see detail on drawings). When the freeze stat trips, an alarm shall be generated at the Operator's Terminal.

- I. A duct smoke detector shall be furnished, installed and wired to the fire alarm system as required by the electrical contractor. The duct smoke detector shall be provided with an auxiliary alarm contact which will be used by the BAS Contractor to de-energize the supply fan, mixing box damper actuators, chilled water, hot water control valve. When de-energized, the mixing box damper actuators shall spring return the outside and relief air dampers closed, and an alarm shall be generated at the Operator's Terminal.
- J. The following items shall be displayed at the Operator's Terminal:
 - 1. Space temperature for each unit.
 - 2. Space temperature setpoint for each unit.
 - 3. Low Space temperature alarm
 - 4. High Space temperature alarm
 - 5. AHU Discharge temperature.
 - 6. AHU Return air temperature.
 - 7. AHU Mixed Air Temperature
 - 8. Dynamic temperatures on each side of the Energy Recovery Wheel section.
 - 9. CO2 level and alarm status.
 - 10. Outside air temperature, humidity and enthalpy.
 - 11. Operational point of each fan via VFD feedback.
 - 12. Commanded status of fan.
 - 13. Commanded status of compressor(s).
 - 14. Commanded status of hot-water valve(s).
 - 15. Commanded position of dampers.
 - 16. Diagram showing the layout of the unit with major components and dynamic temperatures shown where temperature sensors exist in the system.
 - 17. Diagram showing the layout of the unit with major components and dynamic temperatures shown where temperature sensors exist in the system.

3.06 TWO-PIPE (HEATING ONLY) FAN COIL UNITS AND UNIT HEATERS

- A. Each Fan Coil unit shall be controlled by an individual DDC Controller. The DDC Controller shall be wired to a space temperature sensor, discharge air temperature sensor, return air temperature sensor, damper motors, and control valve.
- B. Heating Mode:
 - 1. During the programmed occupied mode, the supply fan shall run continuously. On a drop in temperature below the programmed heating setpoint, the modulating hot water control valve shall be modulated open towards the coil. On a rise in temperature the reverse shall occur.
- C. Unoccupied Mode:
 - 1. During the programmed un-occupied mode, the fan and hot water valve shall be cycled / modulated to maintain the un-occupied setpoints. Unless required for economizer cycle, the outside air damper shall remain closed.
- D. Provide a current sensor on one phase of power feeding the supply fan for status indication at the Operator's Terminal.
- E. If the discharge temperature fails to rise to a programmed minimum temperature during a call for heating; a low temperature alarm shall be activated at the Operator's Terminal. If the discharge temperature fails to fall to a programmed minimum temperature on a call for mechanical cooling, a high temperature alarm shall be activated at the Operator's Terminal.
- F. The following items shall be displayed at the Operator's Terminal:
 - 1. Space temperature.
 - 2. Space temperature setpoint.
 - 3. Low Space temperature alarm

4. Discharge temperature.
5. Return air temp sensor
6. Fan operational status via current sensor.
7. Commanded status of fan.
8. Commanded position of water control valves.
9. Commanded position of mixing box dampers or duct-mounted dampers.
10. Diagram showing the layout of the unit with major components and dynamic temperatures shown where temperature sensors exist in the system

3.07 WALL-HUNG DUCTLESS SPLIT SYSTEMS

- A. Each unit mounted in an MDF room shall be controlled by the factory-provided manual controls and remote thermostat provided with the unit.
- B. The space shall also be provided with a BAS supplied space temperature sensor that shall trigger an alarm if the space temperature in the MDF room rises above a designated setpoint (85 degrees, adjustable).

3.08 PACKAGED HEAT PUMP UNIT VENTILATORS WITH ENERGY RECOVERY WHEEL, HOT WATER BACK-UP HEATING, AND OUTDOOR AIR ECONOMIZER.

- A. Each unit ventilator shall be controlled by an individual DDC Controller. The DDC Controller shall be wired to a space temperature sensor, discharge air temperature sensor, damper motors, and the contacts to the factory-mounted unit control system controlling the compressor, energy recovery wheel, and hot water heating valve packages.
- B. Cooling Mode:
 1. During the programmed occupied mode, the supply fan shall run continuously with the outside air damper open to the minimum position. On a rise in temperature above the programmed cooling setpoint, the heat-pump compressor shall energize with the reversing-valve in the cooling position. On a fall in temperature the compressor shall de-energize.
 2. For units equipped with an outdoor air economizer: The DDC Controller shall receive input from the Global Enthalpy Sensor. If the enthalpy of the outdoor air is lower than the defined minimum level (user adjustable) the mixing box / ERV wheel economizer sequence shall be activated upon a call for cooling. The outside air damper shall never close past the minimum position during the occupied period.
- C. Heating Mode:
 1. During the programmed occupied mode, the supply fan shall run continuously with the outside air damper open to the minimum position. On a drop in temperature below the programmed heating setpoint, the, the heat-pump compressor shall energize with the reversing-valve in the heating position. On a continued drop in space temperature, the compressor shall de-energize and the hot water control valve shall modulate towards the open position. On a rise in temperature the compressor shall de-energize, or the hot water control valve shall modulate towards the closed position.
- D. Unoccupied Mode:
 1. During the programmed un-occupied mode, the fan, compressor, reversing valve, hot water control valve, and mixing box dampers shall be cycled / modulated to maintain the un-occupied setpoints. Unless required for economizer cycle, the outside air damper shall remain closed.
- E. Provide a current sensor on one phase of power feeding the supply fan and compressor unit for status indication at the Operator's Terminal.
- F. If the discharge temperature fails to rise to a programmed minimum temperature during a call for heating; a low temperature alarm shall be activated at the Operator's Terminal. If the

discharge temperature fails to fall to a programmed minimum temperature on a call for mechanical cooling, a high temperature alarm shall be activated at the Operator's Terminal.

- G. The following items shall be displayed at the Operator's Terminal:
1. Space temperature.
 2. Space temperature setpoint.
 3. Low Space temperature alarm
 4. High Space temperature alarm
 5. Discharge temperature.
 6. Return air temperature.
 7. Outside air temperature, humidity and enthalpy.
 8. Fan operational status via current sensor.
 9. Commanded status of fan.
 10. Commanded status of compressor.
 11. Commanded position of hot water control valve.
 12. Commanded position of dampers.
 13. Diagram showing the layout of the unit with major components and dynamic temperatures shown where temperature sensors exist in the system.

3.09 EXHAUST FANS

- A. Exhaust Fans Serving Toilet Rooms or Locker Rooms
1. Exhaust fans shall be scheduled for occupied and unoccupied cycles based on an operator adjustable time schedule. Fans may also be manually enabled and disabled at the operator workstation. Fan status shall be monitored by the BAS via the sensors capable of sensitivity adjustment.

3.10 SINGLE ZONE DX COOLING / HOT WATER HEATING PACKAGED AIR HANDLING UNIT WITH OUTDOOR AIR ECONOMIZER (EXISTING UNITS IN GYMNASIUM (2 UNITS TOTAL) AND LIBRARY (1 UNIT))

- A. Each unit shall be controlled by an individual DDC Controller. The DDC Controller shall be wired to a space temperature sensor, the required temperature sensors noted, damper motors, control valve, condensing unit control relays, and a freeze stat.
- B. Cooling Mode:
1. During the programmed occupied mode, the supply fan shall run continuously with the outside air damper open to the minimum position (10% outdoor air unless otherwise shown on Schedule). The amount of outside air will be increased above the minimum setting on a rise in return air CO₂ above the setpoint of 750 PPM (adjustable). On a return to setpoint the reverse occurs. Upon a rise in CO₂ level above 1200 PPM, a high CO₂ level will be displayed at the BAS workstation. Setpoints are adjustable at the BAS workstation. As the outdoor air damper adjusts, the return exhaust fan shall automatically adjust it's speed to maintain a constant static pressure within the space (0.3" WC, adjustable).
 2. On a rise in temperature above the programmed cooling setpoint, the unit shall energize the first compressor in the associated condensing unit. The hot-gas bypass valve shall be modulated by the factory provided HGPB controls to provide part-load capacity. On a continued rise in space temperature (and where so equipped), the second compressor shall be energized. On a fall in temperature the compressor(s) shall de-energize in stages as they were energized.
 3. For units equipped with an outdoor air economizer: The DDC Controller shall receive input from the Global Enthalpy Sensor. If the enthalpy of the outdoor air is lower than the defined minimum level (user adjustable) the mixing box economizer sequence shall be activated upon a call for cooling. The outside air damper shall never close past the minimum position during the occupied period.

- C. Heating Mode:
1. During the programmed occupied mode, the supply fan shall run continuously with the outside air damper open to the minimum position (10% outdoor air unless otherwise shown on Schedule). The amount of outside air will be increased above the minimum setting on a rise in return air CO₂ above the setpoint of 750 PPM (adjustable). On a return to setpoint the reverse occurs. Upon a rise in CO₂ level above 1200 PPM, a high CO₂ level will be displayed at the BAS workstation. Setpoints are adjustable at the BAS workstation. As the outdoor air damper adjusts, the return exhaust fan shall automatically adjust its speed to maintain a constant static pressure within the space (0.3" WC, adjustable).
 2. On a drop in temperature below the programmed heating setpoint, the modulating hot water control valve shall be modulated open towards the coil. On a rise in temperature the reverse shall occur.
- D. Unoccupied Mode:
- E. Provide a current sensor on one phase of power feeding the supply fan and each compressor for status indication at the Operator's Terminal.
- F. If the discharge temperature fails to rise to a programmed minimum temperature during a call for heating; a low temperature alarm shall be activated at the Operator's Terminal. If the discharge temperature fails to fall to a programmed minimum temperature on a call for mechanical cooling, a high temperature alarm shall be activated at the Operator's Terminal.
- G. A serpentine freeze stat shall be furnished, installed and wired in the unit by the BAS contractor. When tripped, the freeze stat shall function to de-energize the supply fan, mixing box damper actuators, and hot water control valve. When de-energized, the mixing box damper actuators shall spring return the outside and relief air dampers closed, the hot water or dual temperature water control valve shall spring return open to the coil, the freeze-protection pump associated with the unit shall be energized, and the isolation valve to the freeze-protection pump shall be opened (see detail on drawings). When the freeze stat trips, an alarm shall be generated at the Operator's Terminal.
- H. A duct smoke detector shall be furnished, installed and wired to the fire alarm system as required by the electrical contractor. The duct smoke detector shall be provided with an auxiliary alarm contact which will be used by the BAS Contractor to de-energize the supply fan, mixing box damper actuators, chilled water, hot water control valve. When de-energized, the mixing box damper actuators shall spring return the outside and relief air dampers closed, and an alarm shall be generated at the Operator's Terminal.
- I. The following items shall be displayed at the Operator's Terminal:
1. Space temperature.
 2. Space CO₂ levels (ppm).
 3. Space temperature setpoint.
 4. Low Space temperature alarm
 5. High Space temperature alarm
 6. Discharge temperature.
 7. Outside air temperature, humidity and enthalpy.
 8. Return air temp sensor
 9. Freeze stat status.
 10. Smoke detector status.
 11. Fan operational status via current sensor.
 12. Energy recovery wheel status via current sensor.
 13. Commanded status of fan.
 14. Commanded status of compressor(s).
 15. Commanded status of energy recovery wheel.

16. Commanded position of hot water control valves.
17. Commanded position of mixing box dampers.
18. Diagram showing the layout of the unit with major components and dynamic temperatures shown where temperature sensors exist in the system.

3.11 GLYCOL HEAT EXCHANGER CONTROL

- A. The hot water to glycol heat exchanger in the boiler room shall be controlled by a two-way modulating control valve on the heating-water side of the exchanger. The control valve shall modulate to match the reset schedule defined for the boiler loop in the glycol loop.
- B. The glycol loop pump shall be enabled whenever the boiler system is in heating mode. The pump shall be variable-flow, controlled by a differential pressure sensor on the glycol loop with feedback to the specified VFD.
 1. The glycol loop pump shall run continuously in heating mode, and be deactivated when heating mode is disabled on the system.
- C. If the glycol temperature fails to rise to a programmed minimum temperature during a call for heating; a low temperature alarm shall be activated at the Operator's Terminal.
- D. The following items shall be displayed at the Operator's Terminal:
 1. Glycol loop temperature.
 2. Low glycol loop temperature alarm
 3. Pump operational status and VFD operational point.
 4. Commanded status of pump.
 5. Commanded position of water control valves.
 6. Diagram showing the layout of the unit with major components and dynamic temperatures shown where temperature sensors exist in the system

END OF SECTION

SECTION 23 62 13

PACKAGED AIR-COOLED REFRIGERANT COMPRESSOR AND CONDENSER UNITS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Condensing unit package.
- B. Charge of refrigerant and oil.
- C. Controls and control connections.
- D. Refrigerant piping connections.
- E. Motor starters.
- F. Electrical power connections.

1.02 RELATED REQUIREMENTS

- A. Section 22 05 13 - Common Motor Requirements for Plumbing Equipment.
- B. Section 22 05 48 - Vibration and Seismic Controls for Plumbing Piping and Equipment: Placement of vibration isolators.
- C. Section 23 05 13 - Motor Requirements for HVAC and Plumbing Equip.
- D. Section 23 23 00 - Refrigerant Piping.
- E. Section 23 73 13 - Modular Indoor Central-Station Air-Handling Units.
- F. Section 23 09 93 - Sequence of Operations for HVAC Controls.
- G. Section 26 27 17 - Equipment Wiring: Electrical characteristics and wiring connections.

1.03 REFERENCE STANDARDS

- A. AHRI 210/240 - Standard for Performance Rating of Unitary Air Conditioning and Air-Source Heat Pump Equipment; Air-Conditioning, Heating, and Refrigeration Institute.
- B. ASHRAE Std 15 - Safety Standard for Refrigeration Systems; American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.; 2013 (ANSI/ASHRAE Std 15).
- C. ASHRAE Std 23.1 - Methods of Testing for Rating Positive Displacement Refrigerant Compressors and Condensing Units; American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc..
- D. ASHRAE Std 90.1 - Energy Standard for Buildings Except Low-Rise Residential Buildings; American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.; 2013 (ANSI/ASHRAE/IESNA Std 90).
- E. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); National Electrical Manufacturers Association.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide rated capacities, weights specialties and accessories, electrical nameplate data, and wiring diagrams. Include equipment served by condensing units in submittal, or submit at same time, to ensure capacities are complementary.
- C. Shop Drawings: Indicate components, assembly, dimensions, weights and loadings, required clearances, and location and size of field connections. Include schematic layouts showing condensing units, cooling coils, refrigerant piping, and accessories required for complete system.
- D. Design Data: Indicate pipe and equipment sizing.

May 11, 2015

- E. Manufacturer's Instructions: Submit manufacturer's complete installation instructions.
- F. Operation and Maintenance Data: Include start-up instructions, maintenance instructions, parts lists, controls, and accessories.
- G. Warranty: Submit manufacturer's warranty and ensure forms have been filled out in Owner's name and registered with manufacturer.
- H. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 60 00 - Product Requirements, for additional provisions.
 - 2. Extra Lubricating Oil: One complete change.

1.05 QUALITY ASSURANCE

- A. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Comply with manufacturer's installation instructions for rigging, unloading, and transporting units.

1.07 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Provide a five year warranty to include coverage for refrigerant compressors.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Trane Inc: www.trane.com.
- B. York International Corporation / Johnson Controls: www.york.com.
- C. Daikin / McQuay.
- D. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 MANUFACTURED UNITS

- A. Units: Self-contained, packaged, factory assembled and pre-wired units suitable for outdoor use consisting of cabinet, compressors, condensing coil and fans, integral sub-cooling coil, controls, liquid receiver, wind deflector, and screens.
- B. Construction and Ratings: In accordance with AHRI 210/240. Test in accordance with ASHRAE Std 23.
- C. Performance Ratings: Energy Efficiency Rating (EER) and Coefficient of Performance (COP) not less than prescribed by ASHRAE Std 90.1.

2.03 CASING

- A. House components in welded steel frame with galvanized steel panels with weather resistant, baked enamel finish.
- B. Mount starters, disconnects, and controls in weatherproof panel provided with full opening access doors. Provide mechanical interlock to disconnect power when door is opened.
- C. Provide removable access doors or panels with quick fasteners and piano hinges.

2.04 CONDENSER COILS

- A. Coils: Aluminum fins mechanically bonded to seamless copper tubing. Provide sub-cooling circuits. Air test under water to 425 psig, and vacuum dehydrate. Seal with holding charge of nitrogen.

2.05 FANS AND MOTORS

- A. Vertical discharge direct driven propeller type condenser fans with fan guard on discharge. Equip with roller or ball bearings with grease fittings extended to outside of casing.
- B. Weatherproof motors suitable for outdoor use, single phase permanent split capacitor or 3 phase, with permanent lubricated ball bearings and built in current and thermal overload protection. Refer to Section 23 05 13.

2.06 COMPRESSORS

- A. Compressor: Semi-hermetic reciprocating type.
- B. Mounting: Statically and dynamically balance rotating parts and mount on spring vibration isolators. Internally isolate hermetic units on springs. Refer to Section 22 05 48.
- C. Lubrication System: Reversible, positive displacement oil pump with oil charging valve, oil level sight glass, and magnetic plug or strainer.
- D. Motor: Constant speed 1800 rpm suction gas cooled with electronic sensor and winding over temperature protection, designed for across-the-line starting. Refer to Section 22 05 13. Furnish with starter.
- E. Capacity Reduction Equipment: Suction valve unloaders, with lifting mechanism operated by electrically actuated solenoid valve, with unloaded compressor start; controlled from suction pressure.
- F. Sump Oil Heater: Evaporates refrigerant returning to sump during shut down. Energize heater continuously when compressor is not operating.

2.07 REFRIGERANT CIRCUIT

- A. Provide each unit with one refrigerant circuit, or multiple circuits as indicated on drawings, factory supplied and piped. Refer to Section 23 23 00.
- B. For each refrigerant circuit, provide:
 - 1. Filter dryer replaceable core type.
 - 2. Liquid line sight glass and moisture indicator.
 - 3. Thermal expansion valve for maximum operating pressure.
 - 4. Insulated suction line.
 - 5. Suction and liquid line service valves and gage ports.
 - 6. Liquid line solenoid valve.
 - 7. Charging valve.
 - 8. Discharge line check valve.
 - 9. Compressor discharge service valve.
 - 10. Condenser pressure relief valve.
- C. For heat pump units, provide reversing valve, suction line accumulator, discharge muffler, flow control check valve, and solid-state defrost control utilizing thermistors.

2.08 CONTROLS

- A. On unit, mount weatherproof steel control panel, NEMA 250, containing power and control wiring, molded case disconnect switch, factory wired with single point power connection. Factory mount disconnect switch on unit under provisions of Section 26 27 17.
- B. For each compressor, provide across-the-line starter, non-recycling compressor overload, starter relay, and control power transformer or terminal for controls power. Provide manual reset current overload protection. For each condenser fan, provide across-the-line starter with starter relay.
- C. Provide safety controls arranged so any one will shut down machine:
 - 1. High discharge pressure switch (manual reset) for each compressor.

May 11, 2015

2. Low suction pressure switch (automatic reset) for each compressor.
3. Oil Pressure switch (manual reset).
- D. Provide the following operating controls:
 1. One minute off timer prevents compressor from short cycling.
 2. Periodic pump-out timer to pump down on high evaporator refrigerant pressure.
 3. Low ambient temperature controls.
 4. Hot gas bypass sized for minimum compressor loading on one compressor only, bypasses hot refrigerant gas to evaporator.
 5. Lead-lag switch to alternate compressor operation.
 6. Low ambient thermostat to lock out compressor at low ambient temperatures.
- E. Provide controls to permit operation down to 40 degrees F ambient temperature.
- F. Gages: Prepped for suction and discharge refrigerant pressures and oil pressure for each compressor.
- G. For multiple units, provide remote mounted sequence panel to allow operation with lead-lag switching and time delay timer.

PART 3 EXECUTION

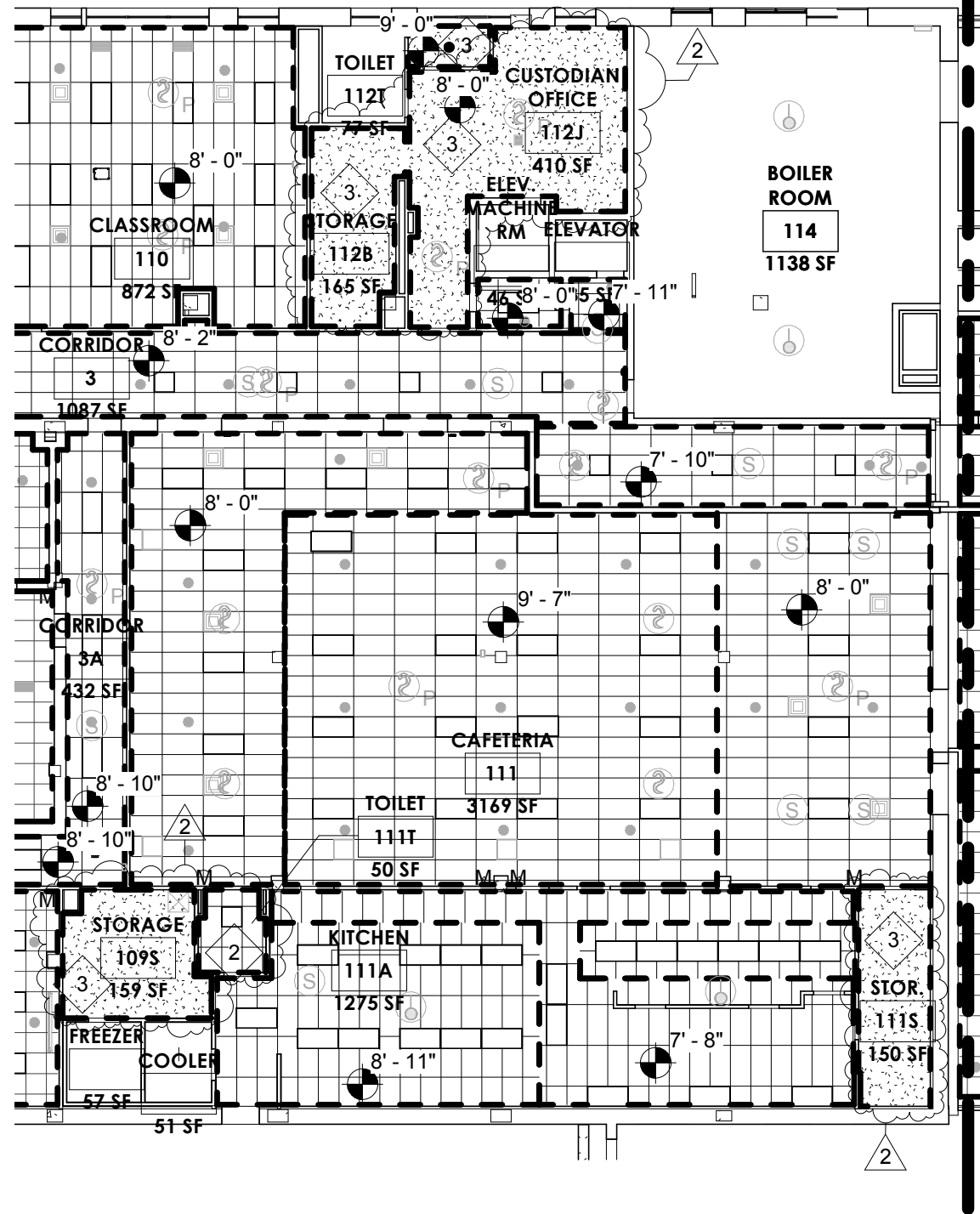
3.01 INSTALLATION

- A. Install in accordance with manufacturer's installation instructions.
- B. Complete structural, mechanical, and electrical connections in accordance with manufacturer's installation instructions.
- C. Provide for connection to electrical service. Refer to Section 26 27 17.
- D. Install units on vibration isolation. Refer to Section 23 05 48.
- E. Provide connection to refrigeration piping system and evaporators. Refer to Section 23 23 00. Comply with ASHRAE Std 15.

3.02 SYSTEM STARTUP

- A. Supply initial charge of refrigerant and oil for each refrigeration system. Replace losses of oil or refrigerant prior to end of correction period.
- B. Charge system with refrigerant and test entire system for leaks after completion of installation. Repair leaks, put system into operation, and test equipment performance.
- C. Shut-down system if initial start-up and testing takes place in winter and machines are to remain inoperative. Repeat start-up and testing operation at beginning of first cooling season.
- D. Provide cooling season start-up, and winter season shut-down for first year of operation.
- E. Inspect and test for refrigerant leaks every 4 months during first year of operation.

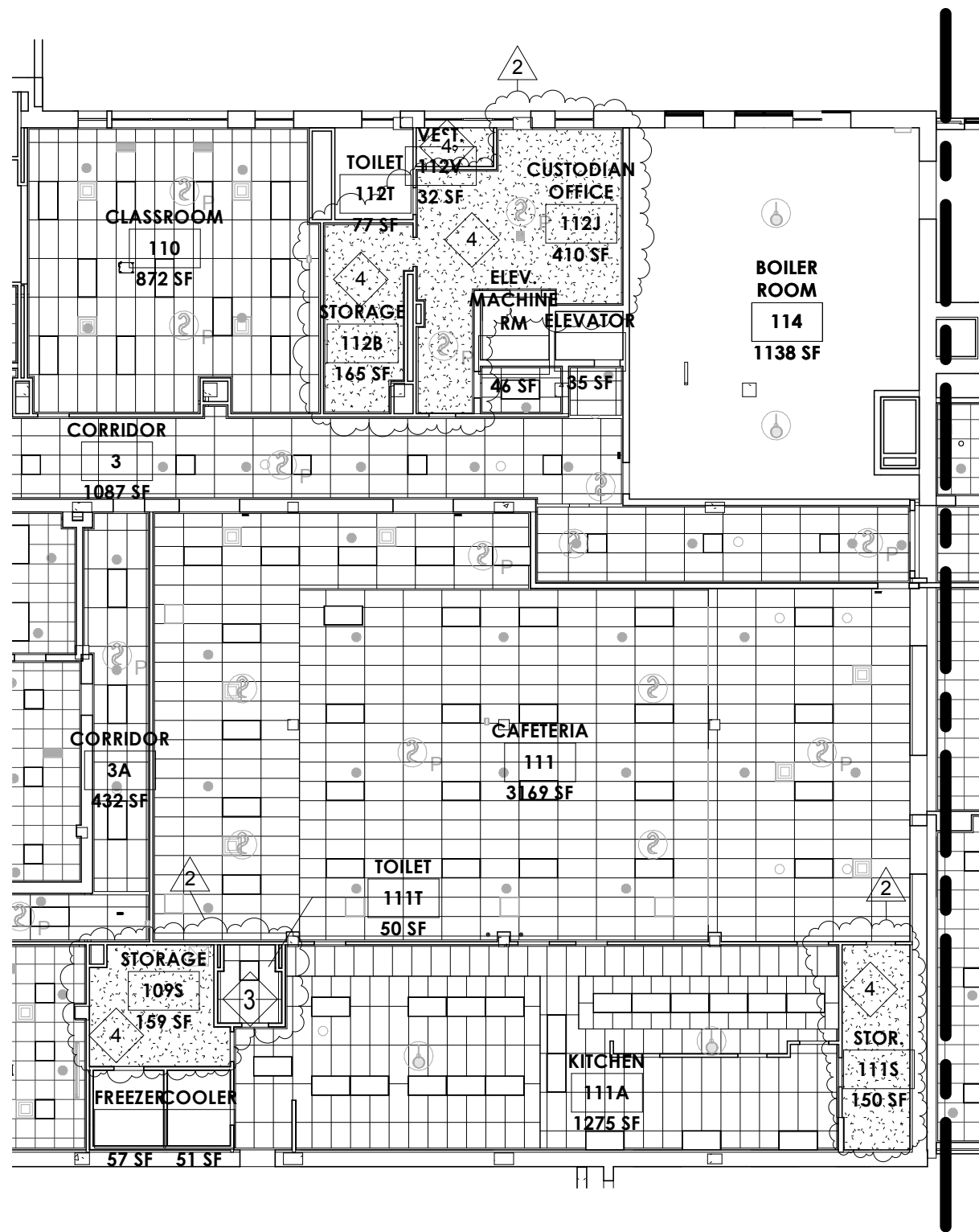
END OF SECTION



1
SK-A.26

PARTIAL LOWER LEVEL RCP DEMOLITION PLAN - AREA A - 1/A2.7

1/16" = 1'-0"



1
SK-A.27

PARTIAL LOWER LEVEL REFLECTED CEILING PLAN - AREA A - 1/A3.7

1/16" = 1'-0"

ADDENDUM #2

Project number	14036
Date	MAY 18, 2015
Drawn by	HMS
Checked by	PRC

SK-A.27

Scale 1/16" = 1'-0"

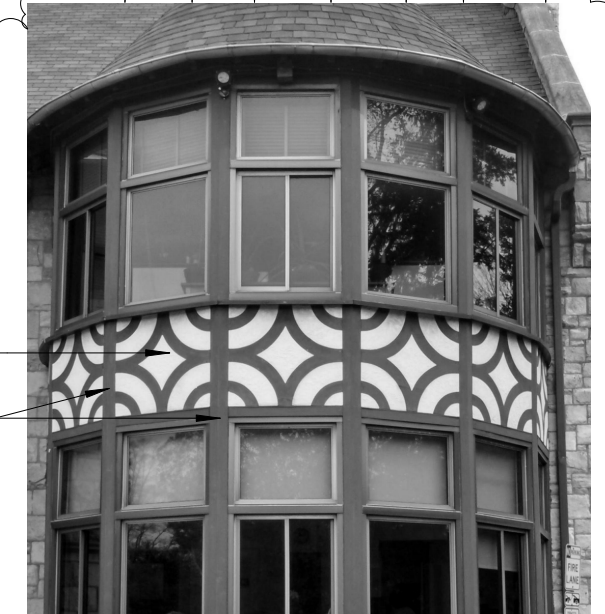


NEW 1X4 PVC VERTICAL TRIM TO MATCH STOREFRONT TRIM, TYP. SEE STOREFRONT DETAILS FOR MORE DETAILS.

EXISTING PANELS TO MATCH, TYP.

2

2 EXISTING EIFS PANELS TO MATCH
SK-A.28



EXISTING PANELS TO MATCH, TYP.

NEW 1X4 PVC VERTICAL TRIM TO MATCH STOREFRONT TRIM, TYP. SEE STOREFRONT DETAILS FOR MORE DETAILS.

2

3 EXISTING EIFS PANELS TO MATCH
SK-A.28



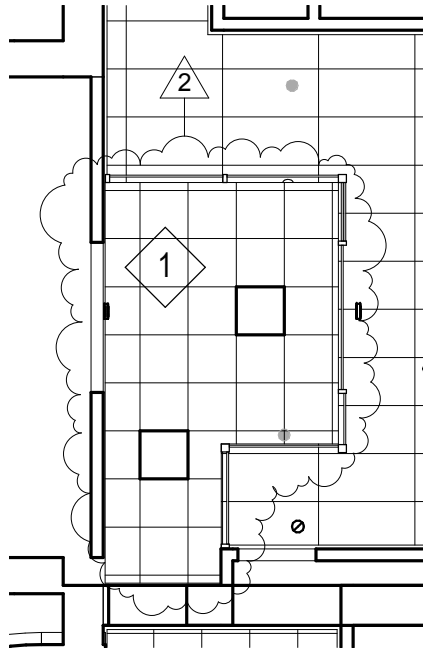
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EXISTING EIFS PANEL SYSTEM (7 TOTAL) TO BE REMOVED AND REPLACED WITH NEW EIFS PANELS. NEW PANELS TO RECEIVE TWO-TONE FINISH COAT TO MATCH EXISTING PATTERN. SEE EXISTING PHOTO 2/SK-A.28 FOR EXISTING DETAIL TO MATCH. APPROXIMATE SIZE OF EACH PANEL IS 42" x 42", V.I.F.

2

EXISTING EIFS PANEL SYSTEM (7 TOTAL) TO BE REMOVED AND REPLACED WITH NEW EIFS PANELS. NEW PANELS TO RECEIVE TWO-TONE FINISH COAT TO MATCH EXISTING PATTERN. SEE EXISTING PHOTO 3/SK-A.28 FOR EXISTING DETAIL TO MATCH. APPROXIMATE SIZE OF EACH PANEL IS 42" x 42", V.I.F.

1 PARTIAL EXTERIOR ELEVATION - 3/A4.1
SK-A.28 3/32" = 1'-0"



PARTIAL FIRST FLOOR RCP - AREA A - 1/A3.9



1/8" = 1'-0"

05/18/15
DATE
14036
PROJECT NO.

A3.9
SHEET NO.
SK-A.29

RED CLAY CONSOLIDATED SCHOOL DISTRICT
A. I. DuPont Middle School
HVAC RENOVATION
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STUDIO JAED
ARCHITECTS ■ ENGINEERS ■ FACILITIES SOLUTIONS

CORPORATE HEADQUARTERS
2500 WYMANVILLE HILL ROAD, STE. 110
IRVING, TX 75039
P: (972) 832-1652 F: (972) 832-1423

Website:
www.StudioJAED.com

E-Mail:
info@StudioJAED.com

2 ADDENDUM #2

UNDERSIDE OF STRUCTURAL
DECK ABOVE AT METAL DECK
LOCATIONS, SEAL OPEN ENDS
OF DECK FLUTES ABOVE
PARTITION HEAD WITH FIRE
SAFING

WHERE PARTITION IS PARALLEL TO DECK FLUTES,
PROVIDE CONT. 16 GA. FLAT COVER PLATE OVER
FLUTE - SEAL FLUTE WITH FIRE SAFING AT EA. END

CONTINUOUS 16 GA. CFMF DEFLECTION TRACK
ANCHOR SCREW 24" O.C. & 3" FROM END

SEALANT EACH SIDE

3 5/8" CFMF ATTACHED TO
STRUCTURAL DECK ABOVE
WITH 5/8" GWB BOTH SIDES

SOUND ATTENUATION
INSULATION

SCHEDULED CEILING

CFMF HEADER

SHIM, B.R. & SEALANT
TYP. EACH SIDE.

ALUM. STOREFRONT

TEMPERED 1/4"
GLAZING

4 1/2"

1

HEAD DETAIL (JAMB SIM) - 12/A6.3

SK-A.30

3" = 1'-0"

05/18/15
DATE
14036
PROJECT NO.

A6.3
SHEET NO.
SK-A.30

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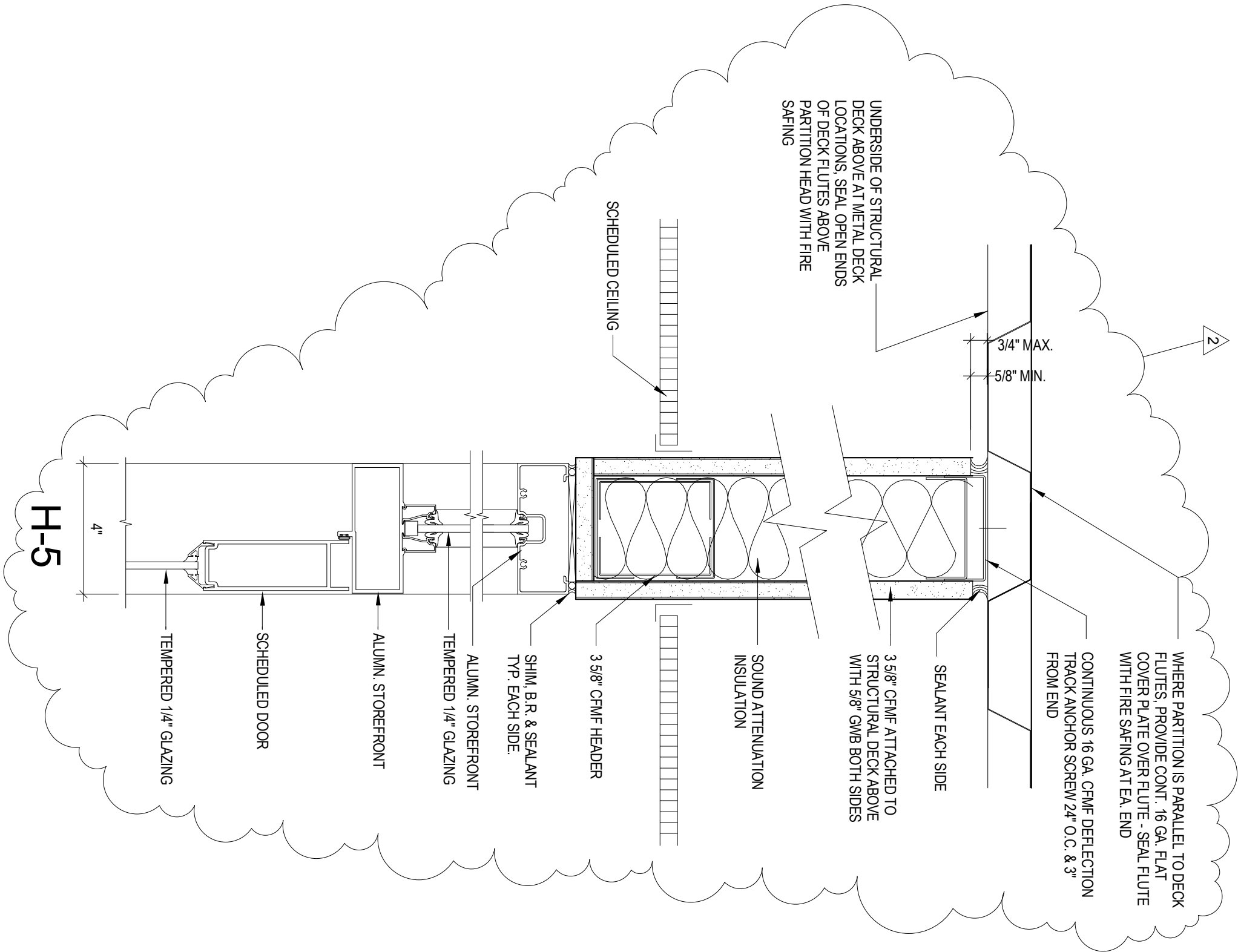
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2500 WRANGLER HILL ROAD, STE. 110
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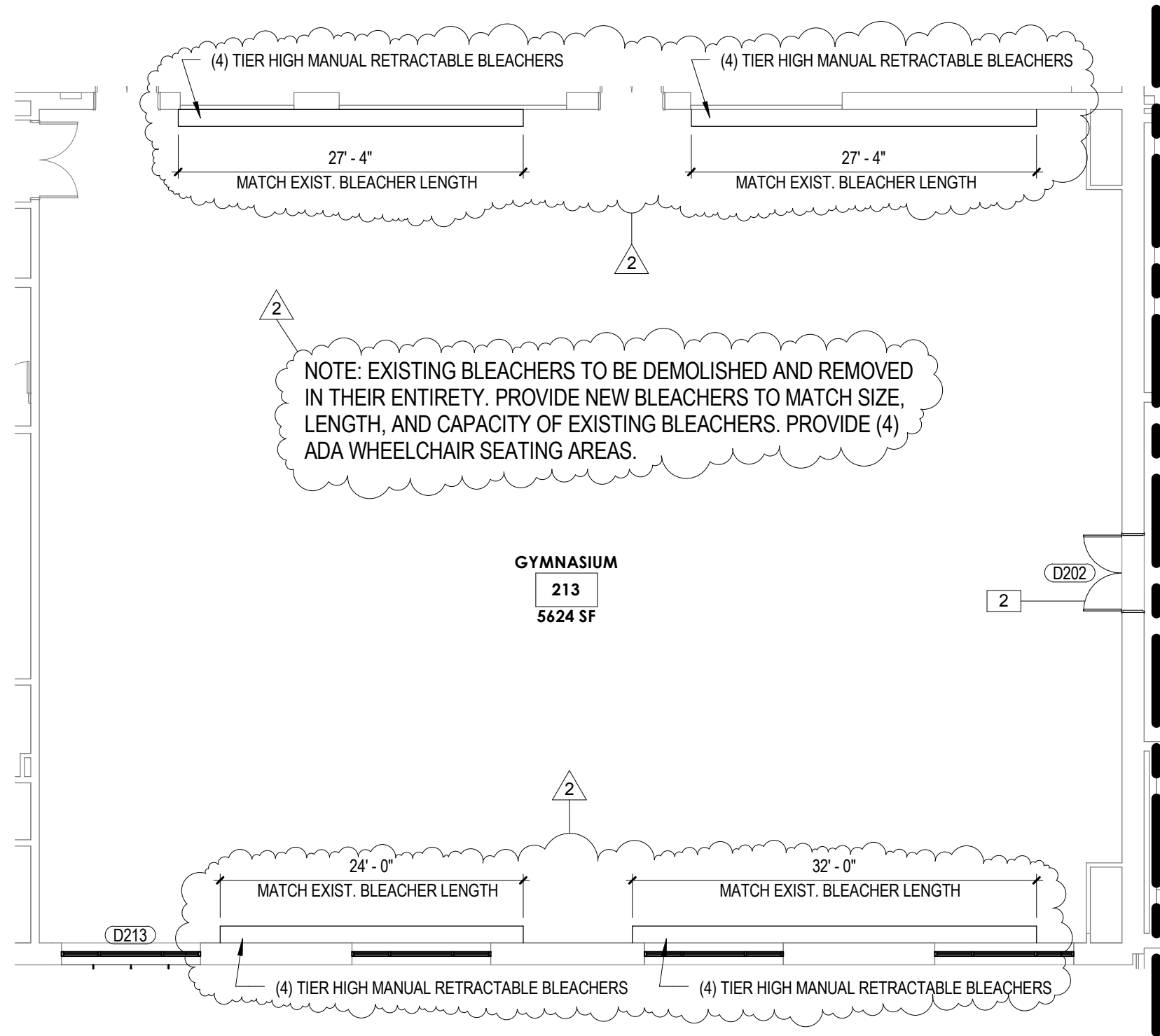
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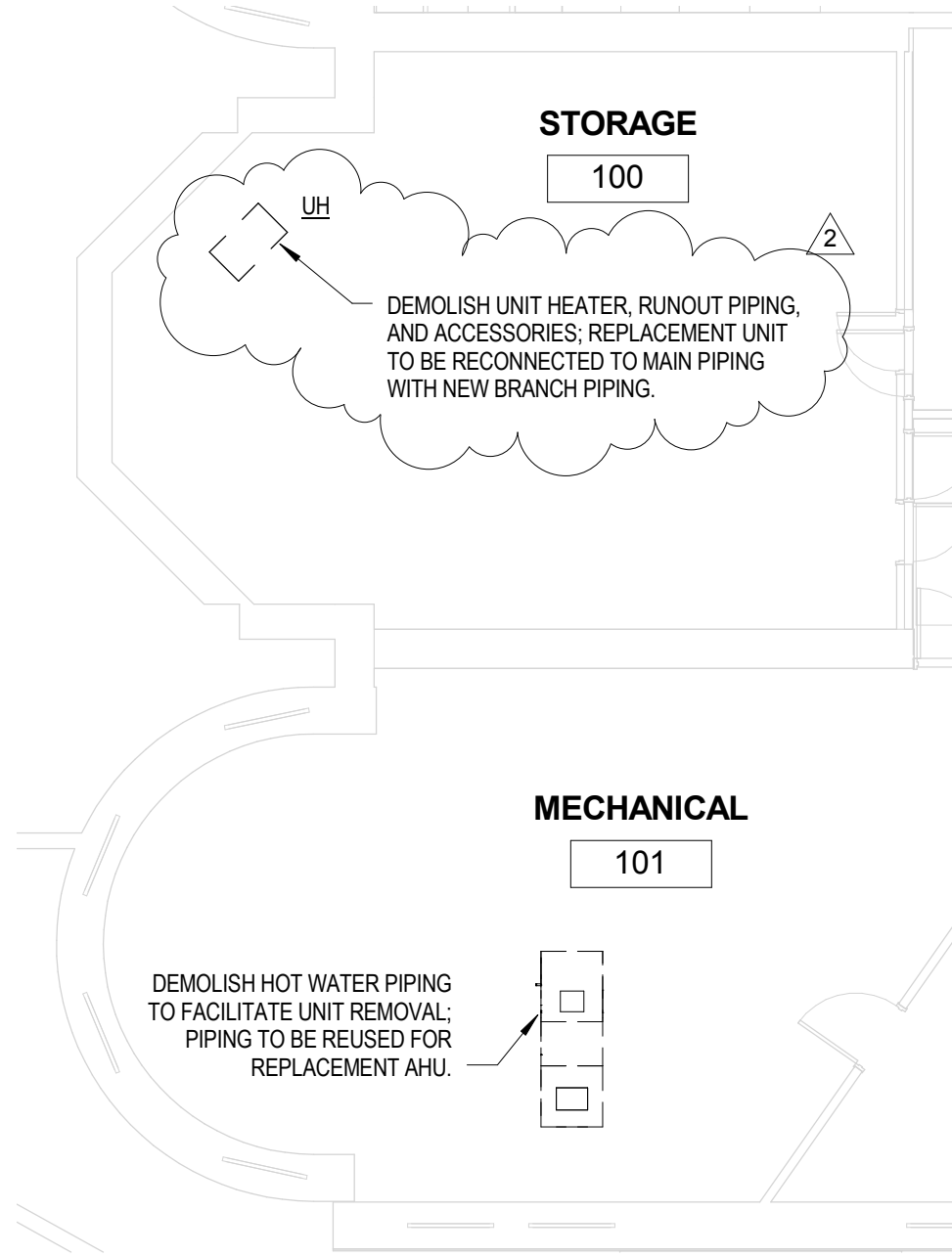
2 ADDENDUM #2



1 DOOR HEAD DETAIL - H-5/A6.4
 SK-A.31 3" = 1'-0"



1 PARTIAL FIRST FLOOR PLAN - AREA A -1/A3.3
 SK-A.32 3/32" = 1'-0"



1

PARTIAL LOWER LEVEL HYDRONIC DEMOLITION PLAN

SK-M.18

1/8" = 1'-0"

ADDENDUM #2

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CORPORATE HEADQUARTERS
10000 WILLOW CREEK DRIVE, SUITE 110
BIRMINGHAM, AL 35243
P: (205) 833-7000 F: (205) 833-7420
Website: www.studiojaed.com
E-Mail: info@studiojaed.com

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HVAC RENOVATION
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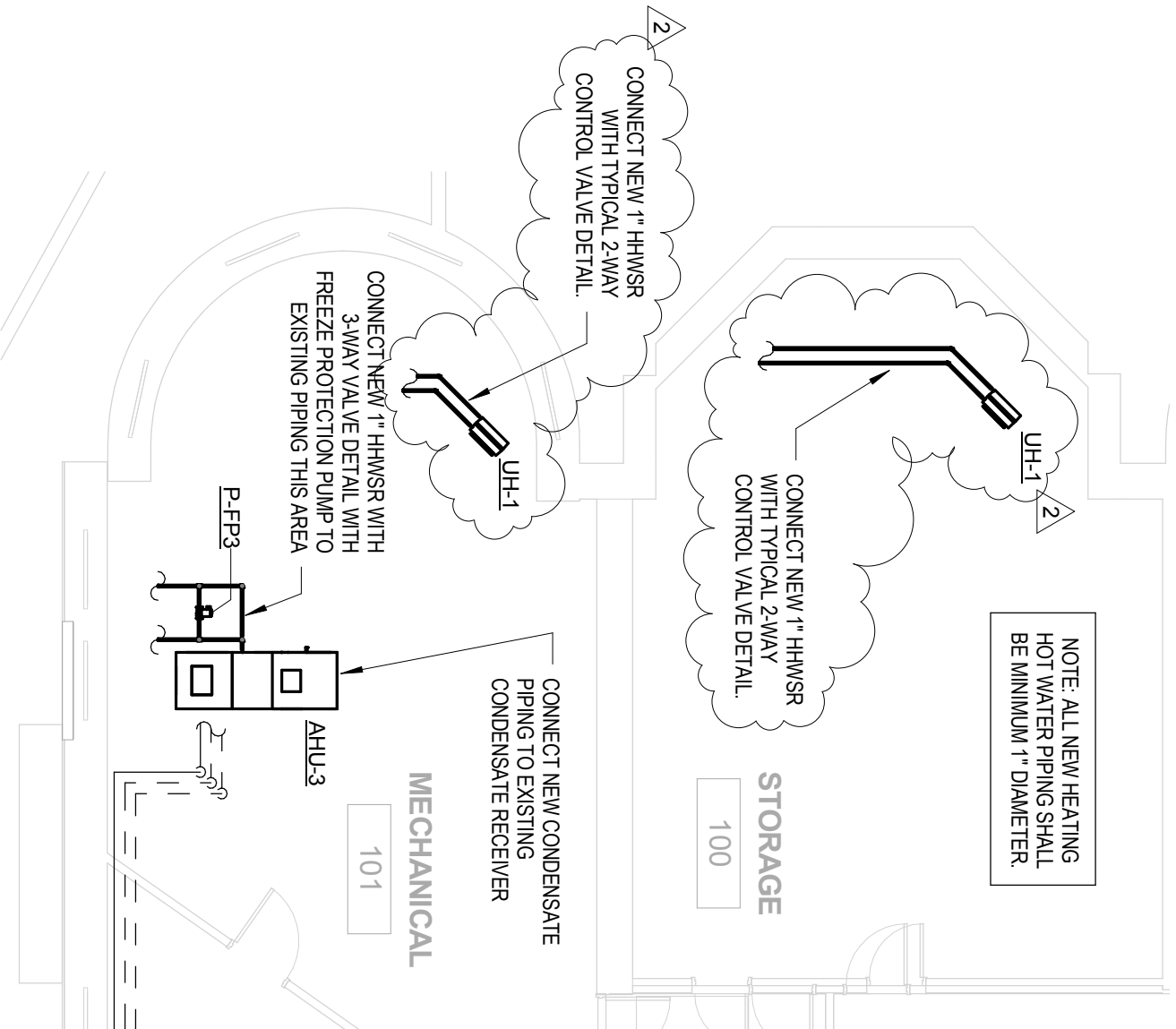
05/15/15
DATE

M8.7

SHEET NO.

14036
PROJECT NO.

SK-M.18



1 PARTIAL LOWER LEVEL HYDRONIC PLAN

SK-M.19 1/8" = 1'-0"

05/15/15 M8.20
DATE SHEET NO.
14036 SK-M.19
PROJECT NO.

RED CLAY CONSOLIDATED SCHOOL DISTRICT
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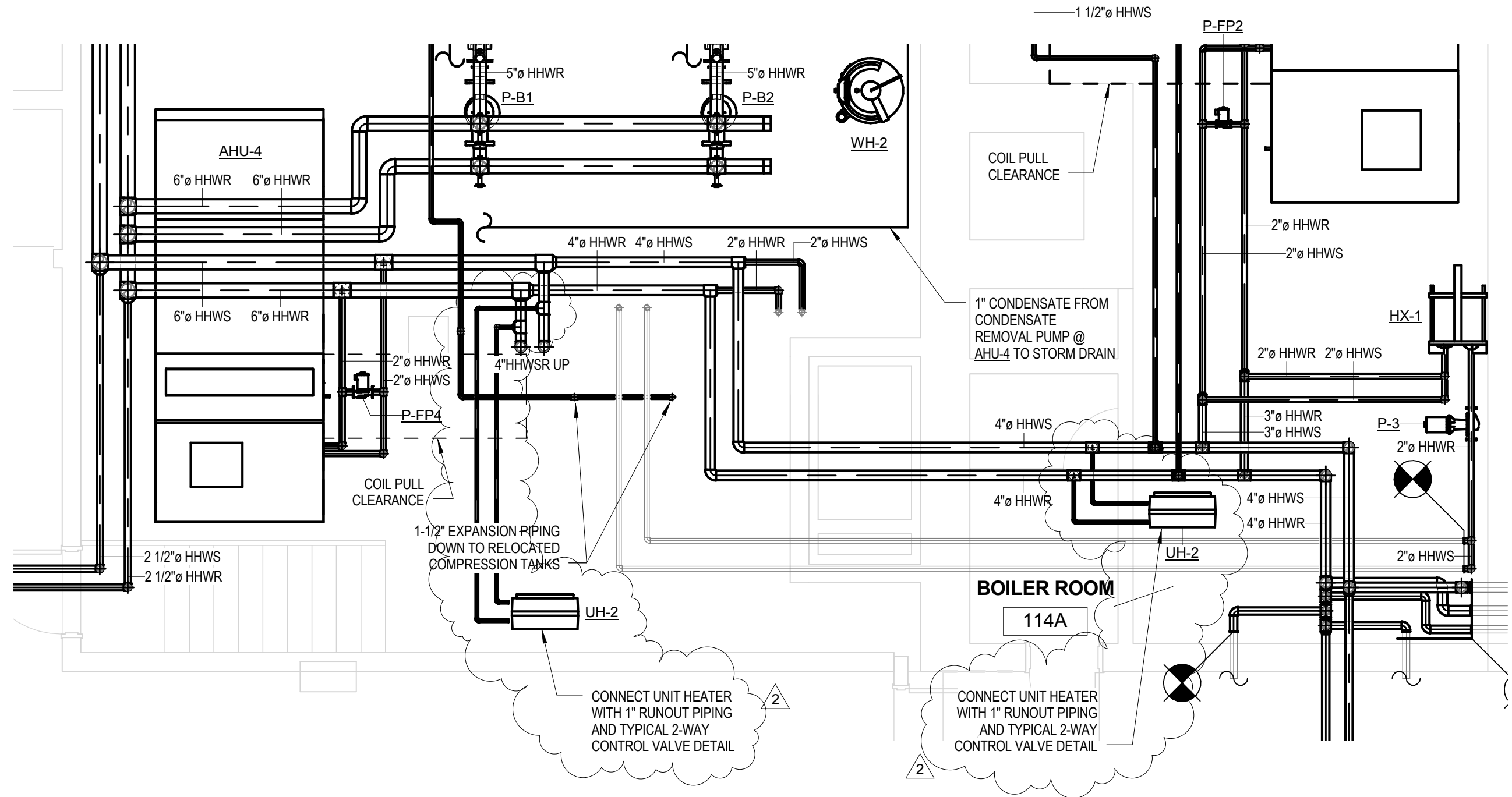
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CORPORATE HEADQUARTERS
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DENVER, CO 80202
P: 303.733.1425 F: 303.733.1426
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2 ADDENDUM #2

Unit Heater Schedule												
Mark	Airflow (CFM)	E.A.T. (deg. F)	L.A.T. (deg. F)	E.W.T. (deg. F)	L.W.T. (deg. F)	Flow Rate (GPM)	Heating Capacity (MBh)	W.P.D. (ft H2O)	Electrical	HP	Rittling Model #	Comments
UH-1	350	60.0	110.0	120.0	100.0	1.4	14.2	0.8	120/1/60	1/30	RH-24	
UH-2	1990	60.0	110.0	120.0	100.0	10.9	109.0	2.5	120/1/60	1/4	RH-165	

PROVIDE UNIT(S) AS SCHEDULED OR APPROVED EQUAL. PROVIDE ALL UNITS WITH HOT WATER HEATING COIL AND PROVIDE ALL UNITS WITH TYPICAL 2-WAY CONTROL VALVE DETAIL. PROVIDE 1" RUNOUT HHW PIPING AND CONNECT TO EXISTING PIPING.



1 PARTIAL BOILER ROOM HYDRONIC PLAN
SK-M.21 1/4" = 1'-0"

(AB) - PNL-RM 301

MFG./TYPE: PENN PANEL (RECESSED)
VOLTAGE: 120/208
AMPACITY OF BUSBARS: 100A
MAIN BREAKER OR MAIN LUGS: MLO
CIRCUIT SLOTS: 20
DIMENSIONS: 28 1/2"H x 20"W x 4 1/2"D
BREAKER COMBINATIONS:
(20) 20A/1P

(AE) - NO LABEL - CORRIDOR 9

MFG./TYPE: TRUMBULL ELEC (RECESSED)
VOLTAGE: 120/208
AMPACITY OF BUSBARS: 100A
MAIN BREAKER OR MAIN LUGS: MLO
CIRCUIT SLOTS: 26
DIMENSIONS: 34 1/2"H x 20"W x 4 1/2"D
BREAKER COMBINATIONS:
(26) 20A/1P

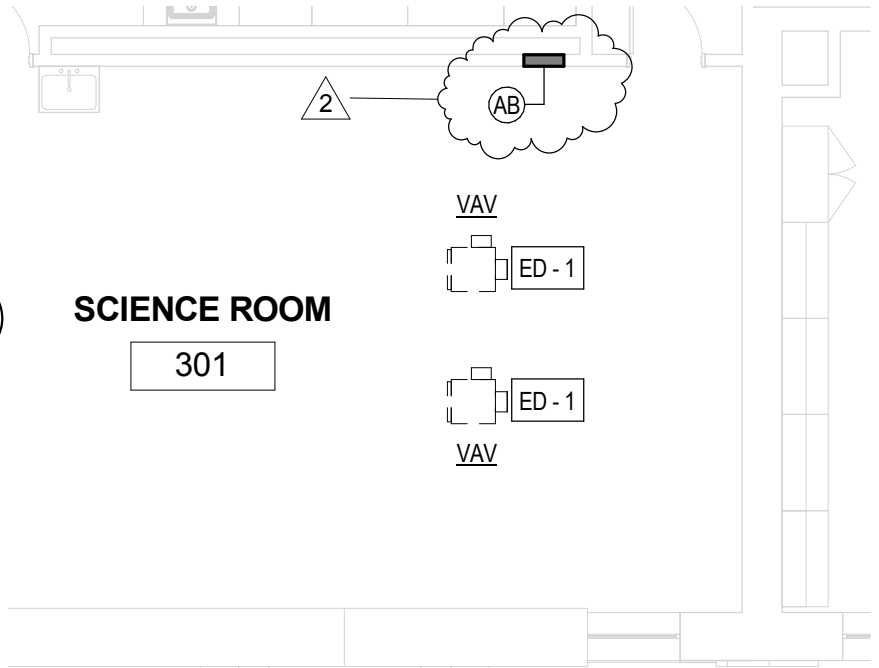
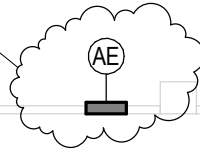
2



CORRIDOR

9

2



(27) - PNL-LB

MFG./TYPE: GE NLAB (RECESSED)
VOLTAGE: 120/208
AMPACITY OF BUSBARS: 225A
MAIN BREAKER OR MAIN LUGS: MLO
CIRCUIT SLOTS: 36
DIMENSIONS: 47 1/4"H x 21 1/4"W x 5 3/8"D
BREAKER COMBINATIONS:

(35) 20A/1P

2

SCIENCE ROOM

301

VAV



VAV

3

PARTIAL 2ND FLR ELEC. DEMO PLAN - AREA A

SK-E.9

1/8" = 1'-0"

05/14/15

E9.5

DATE

SHEET NO.

14036

SK-E.9

PROJECT NO.

RED CLAY CONSOLIDATED SCHOOL DISTRICT

A. I. DuPont Middle School
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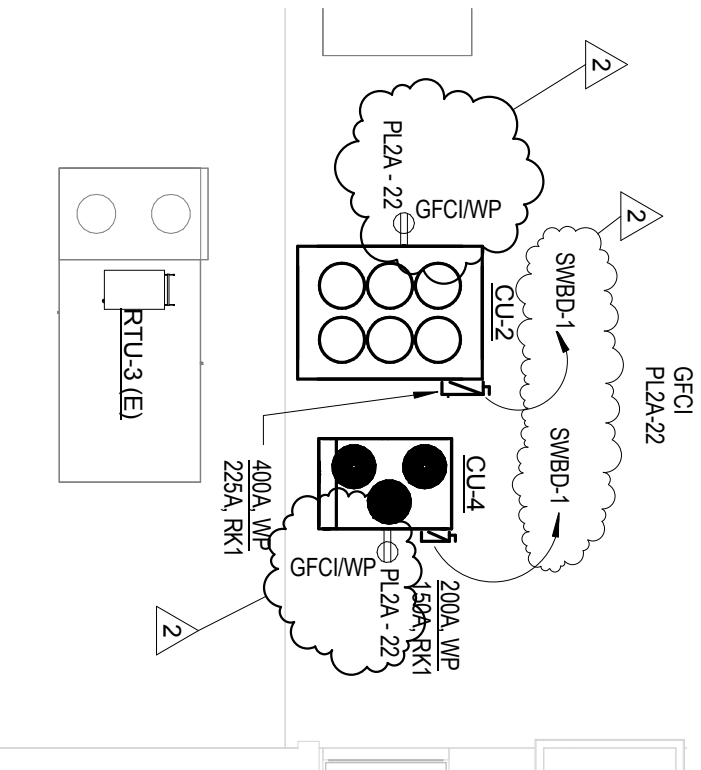
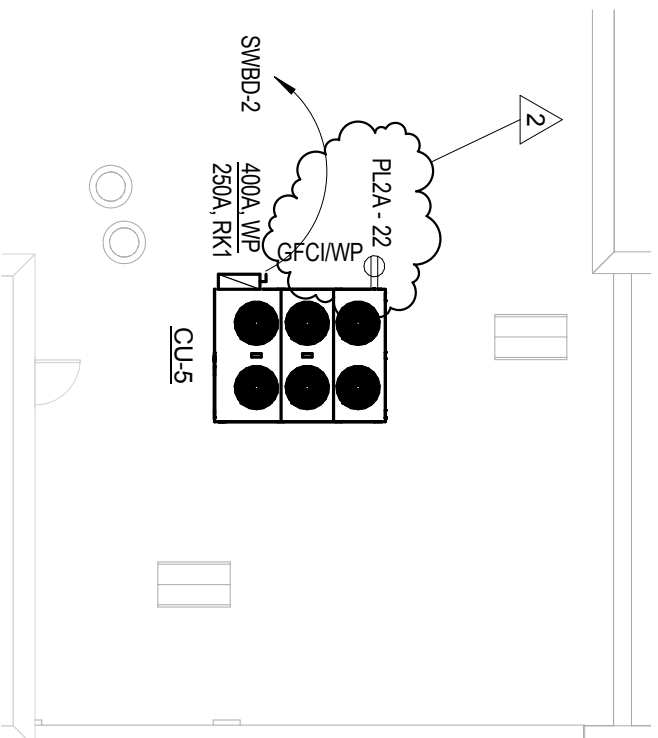
CORPORATE HEADQUARTERS
2500 WRANGLER HILL ROAD, STE. 110
IRVING, TX 75039
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www.StudioJAED.com

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2

ADDENDUM #2



PARTIAL ELECTRICAL ROOF PLAN

1
SK-E.10

3/32" = 1'-0"

05/14/15
DATE
14036
PROJECT NO.

EQ. 16
SHEET NO.

RED CLAY CONSOLIDATED SCHOOL DISTRICT
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2000 WILMINGTON HILLS DRIVE, SUITE 110
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E: JAE@STUDIOJAED.COM

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2
ADDENDUM #2

Branch Panel: PL2A

Location: CORRIDOR 2ND FLR
Supply From:
Mounting: RECESSED
Enclosure: NEMA 1

Volts: 120/208 Wye
Phases: 3
Wires: 4

A.I.C. Rating: 14,000
Mains Type: FULL
Mains Rating: 225 A, MLO
MCB Rating:
Manufacturer: --

CKT	Circuit Description	Wire Size	Trip	Poles	A	B	C	A	B	C	Poles	Trip	Wire Size	Circuit Description	CKT
1	CONTROL XMFR FOR VAVS	12	20	1	0.50 kVA			0.04 kVA			20	1	12	CABINET UNIT HEATER - CUH-3	2
3	CONTROL XMFR FOR VAVS	12	20	1		0.50 kVA			0.04 kVA		20	1	12	CABINET UNIT HEATER - CUH-3	4
5	UNIT VENTILATOR UV - 2	12	15	3			1.04 kVA			0.04 kVA	20	1	12	CABINET UNIT HEATER - CUH-3	6
7	--	12	--	--	1.04 kVA			0.04 kVA			20	1	12	CABINET UNIT HEATER - CUH-1	8
9	--	12	--	--		1.04 kVA			0.04 kVA		20	1	12	CABINET UNIT HEATER - CUH-1	10
11	UNIT VENTILATOR RM 316	8	35	3			3.12 kVA			3.12 kVA	35	3	8	UNIT VENTILATOR RM. 316	12
13	--	8	--	--	3.12 kVA			3.12 kVA			--	--	8	--	14
15	--	8	--	--		3.12 kVA			3.12 kVA		--	--	8	--	16
17	EXHAUST FAN EF-2	12	20	1			0.50 kVA			0.40 kVA	20	1	12	FREEZE PRETECTION PUMP	18
19	CONTROL XFMR SOME DAMPERS	12	20	1	0.05 kVA			0.40 kVA			20	1	12	FREEZE PROTECTION PUMP	20
21	CONTROL XFMR SOME DAMPERS	12	20	1		0.05 kVA			0.54 kVA		20	1	10	GFCI RECEPTACLES - ROOFTOP ON CU'S	22
23	--	--	--	--			-- kVA			-- kVA	--	--	--	--	24
25	--	--	--	--	-- kVA			-- kVA			--	--	--	--	26
27	--	--	--	--		-- kVA			-- kVA		--	--	--	--	28
29	--	--	--	--			-- kVA			-- kVA	--	--	--	--	30
31	--	--	--	--	-- kVA			-- kVA			--	--	--	--	32
33	--	--	--	--		-- kVA			-- kVA		--	--	--	--	34
35	--	--	--	--			-- kVA			-- kVA	--	--	--	--	36
37	--	--	--	--	-- kVA			-- kVA			--	--	--	--	38
39	--	--	--	--		-- kVA			-- kVA		--	--	--	--	40
41	--	--	--	--			-- kVA			-- kVA	--	--	--	--	42
Total Load:					-- kVA		-- kVA		-- kVA						
Total Amps:					-- A		-- A		-- A						

Notes:

1

SK-E.11

PANEL SCHEDULE

NTS



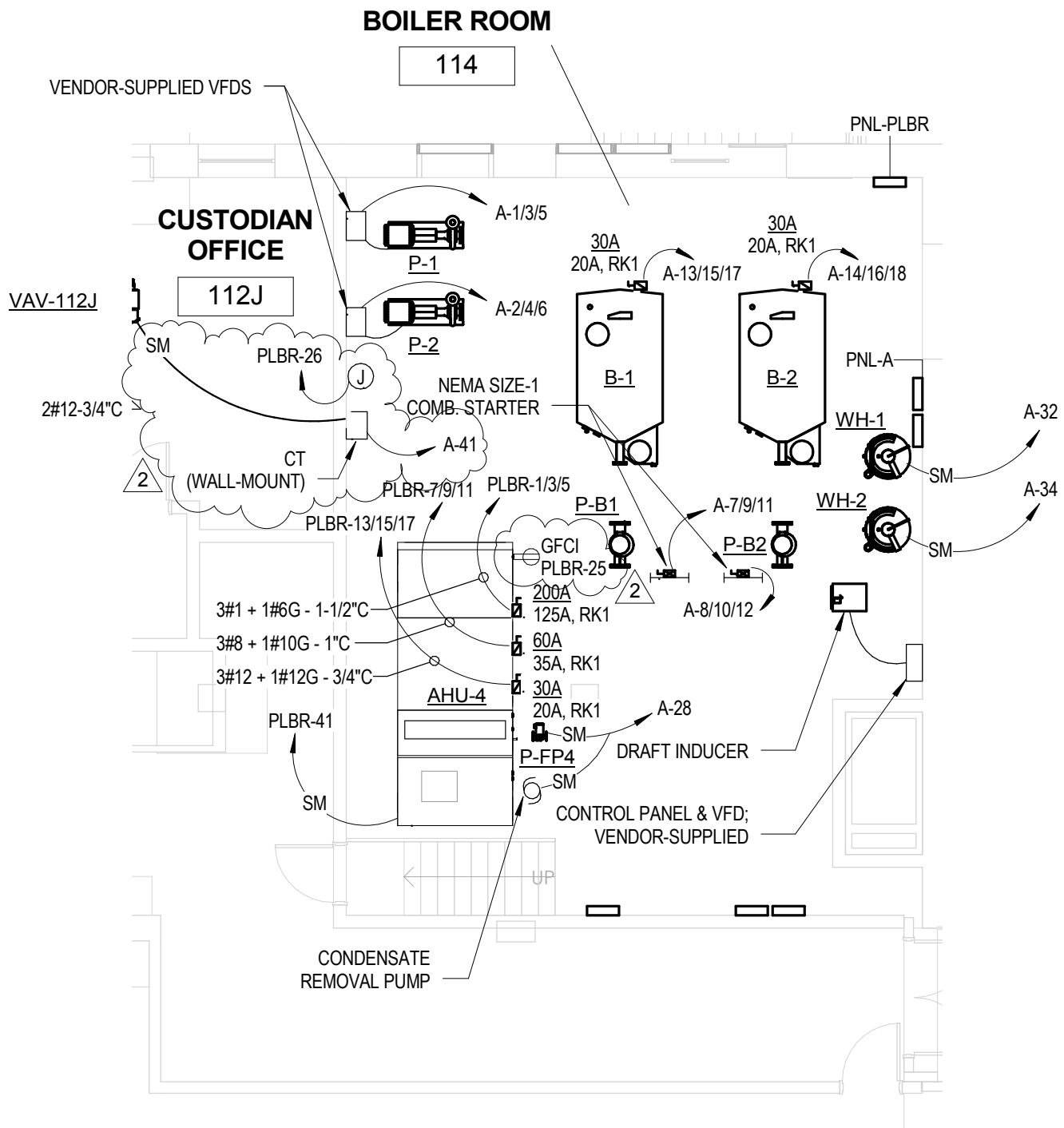
RED CLAY CONSOLIDATED SCHOOL DISTRICT
A. I. DuPont Middle School

ADDENDUM #2

Project number	14036
Date	MAY 1, 2015
Drawn by	Author
Checked by	Checker

SK-E.11

Scale 12" = 1'-0"



1
SK-E.12

PARTIAL LOWER LEVEL ELECTRICAL PLAN

1/8" = 1'-0"

05/14/15
DATE
14036
PROJECT NO.

E9.10
SHEET NO.
SK-E.12

RED CLAY CONSOLIDATED SCHOOL DISTRICT
A. I. DuPont Middle School
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CORPORATE HEADQUARTERS
2201 WINDLE HILL ROAD, STE. 110
BEAR, DE 19701
P: (302) 832-1852 F: (302) 832-1423

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2 ADDENDUM #2

Branch Panel: PLBR

Location: BOILER ROOM
Supply From:
Mounting: SURFACE
Enclosure: NEMA
1

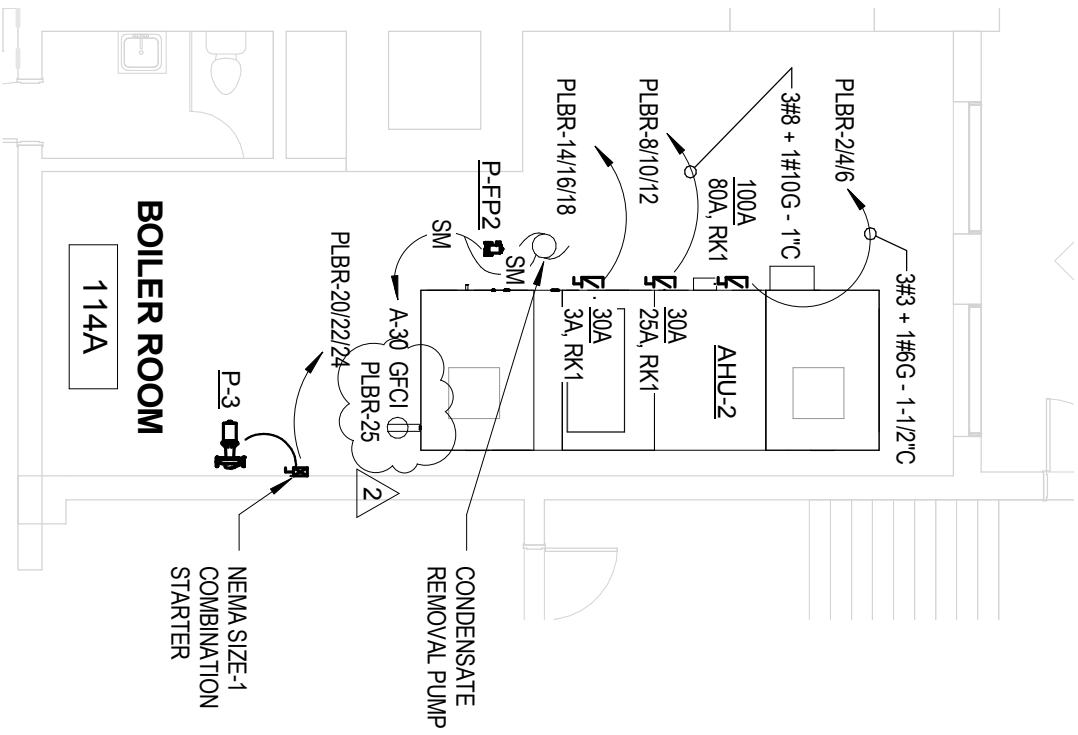
Volts: 120/208 Wye
Phases: 3
Wires: 4

A.I.C. Rating: 14,000
Mains Type: FULL
Mains Rating: 400 A,
MCB Rating: MLO
Manufacturer: --

CKT	Circuit Description	Wire Size	Trip	Poles	A	B	C	A	B	C	Poles	Trip	Wire Size	Circuit Description	CKT
1	AHU - 2 SUPPLY FANS	1	125	3	8.55 kVA			5.93 kVA			3	80	3	AHU - 4 SUPPLY FANS	2
3	--	1	--	--		8.55 kVA			5.93 kVA		--	--	3	--	4
5	--	1	--	--			8.55 kVA			5.93 kVA	--	--	3	--	6
7	AHU - 2 EXHAUST FANS	8	35	3	2.35 kVA			1.78 kVA			3	25	8	AHU - 4 SUPPLY FANS	8
9	--	8	--	--		2.35 kVA			1.78 kVA		--	--	8	--	10
11	--	8	--	--			2.35 kVA			1.78 kVA	--	--	8	--	12
13	AHU - 2 ENERGY WHEEL	12	20	3	0.16 kVA			0.16 kVA			3	20	12	AHU - 4 SUPPLY FANS	14
15	--	12	--	--		0.16 kVA			0.16 kVA		--	--	12	--	16
17	--	12	--	--			0.16 kVA			0.16 kVA	--	--	12	--	18
19	CONDENSING UNIT CU-3	8	20	3	5.00 kVA			0.9 kVA			3	20	12	PUMP P-3	20
21	--	8	--	--		5.00 kVA			0.9 kVA		--	--	12	--	22
23	--	8	--	--			5.00 kVA			0.9 kVA	--	--	12	--	24
25	GFCI - AHU-2/4	12	20	1	0.18 kVA			0.10 kVA			1	20	12	ATC POWER SUPPLY	26
27	--	--	--	--		-- kVA			-- kVA		--	--	--	--	28
29	--	--	--	--			-- kVA			-- kVA	--	--	--	--	30
31	--	--	--	--	-- kVA			-- kVA			--	--	--	--	32
33	--	--	--	--		-- kVA			-- kVA		--	--	--	--	34
35	EXHAUST FAN (EF) CORRIDOR 1	12	20	1			0.12 kVA			-- kVA	--	--	--	--	36
37	CABINET UNIT HEATER	12	20	1	0.04 kVA			-- kVA			--	--	--	--	38
39	CABINET UNIT HEATER	12	20	1		0.04 kVA			-- kVA		--	--	--	--	40
41	AHU-2 CONTROLS	12	20	1			0.04 kVA			-- kVA	--	--	--	--	42

Total Load: -- kVA -- kVA -- kVA
Total Amps: -- A -- A -- A

Notes:

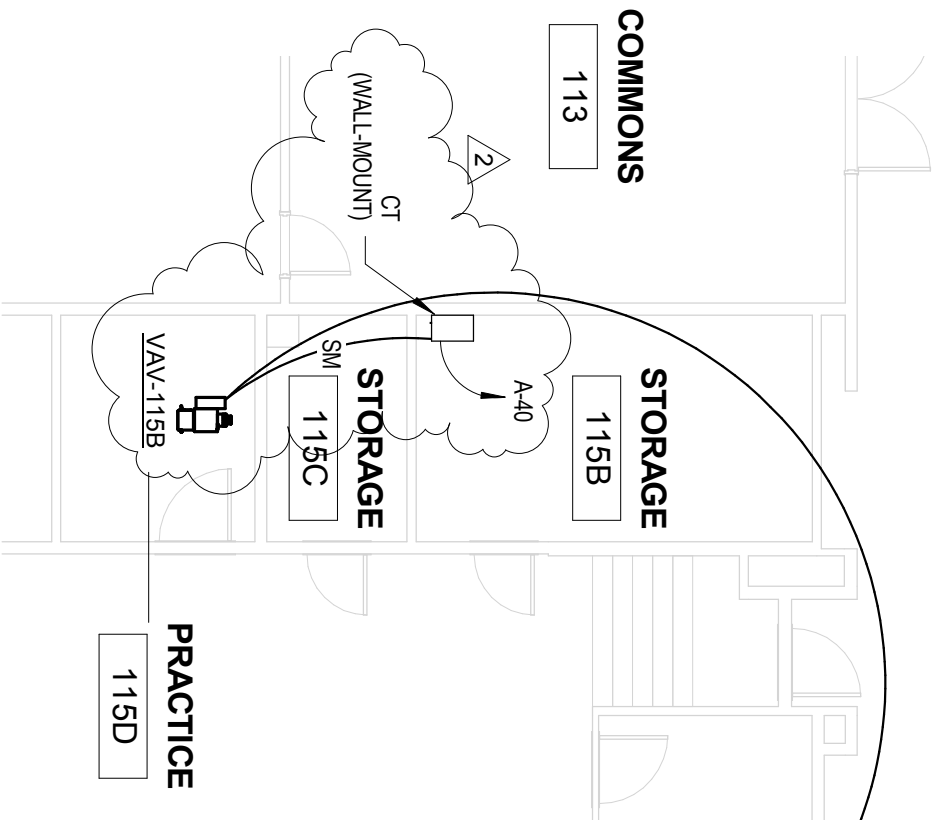


1 PARTIAL LOWER LEVEL ELECTRICAL PLAN

SK-E.14 1/8" = 1'-0"

05/14/15 DATE	E9.11 SHEET NO.	RED CLAY CONSOLIDATED SCHOOL DISTRICT A. I. DuPont Middle School HVAC RENOVATION 3130 KENNETT PIKE WILMINGTON, DELAWARE 19807	STUDIO JAED ARCHITECTS ■ ENGINEERS ■ FACILITIES SOLUTIONS <small>CORPORATE HEADQUARTERS 1000 N. 10TH ST., SUITE 100 P.O. BOX 83, WILMINGTON, DE 19801 www.studiojaed.com E-Mail: info@studiojaed.com</small>	ADDENDUM #2
14036 PROJECT NO.	SK-E.14			

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1 PARTIAL LOWER LEVEL ELECTRICAL PLAN

SK-E.15 1/8" = 1'-0"

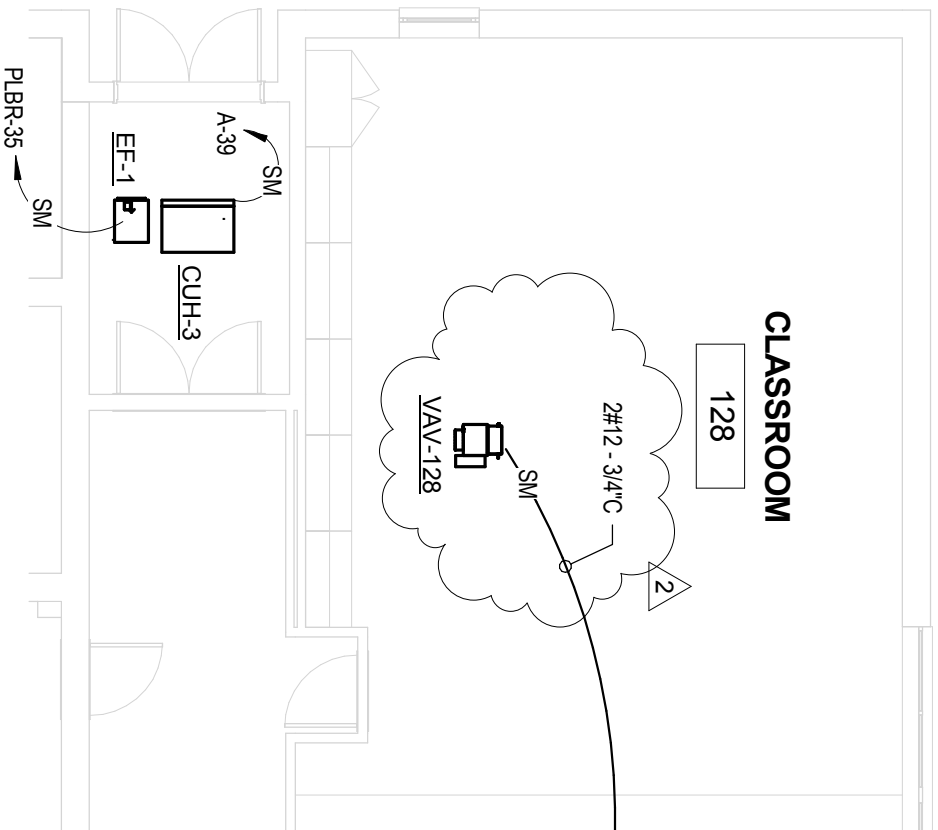
05/14/15 E9.11
DATE SHEET NO.
14036
PROJECT NO. SK-E.15

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2 ADDENDUM #2



1

PARTIAL LOWER LEVEL ELECTRICAL PLAN

SK-E.16

1/8" = 1'-0"

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14036
PROJECT NO.

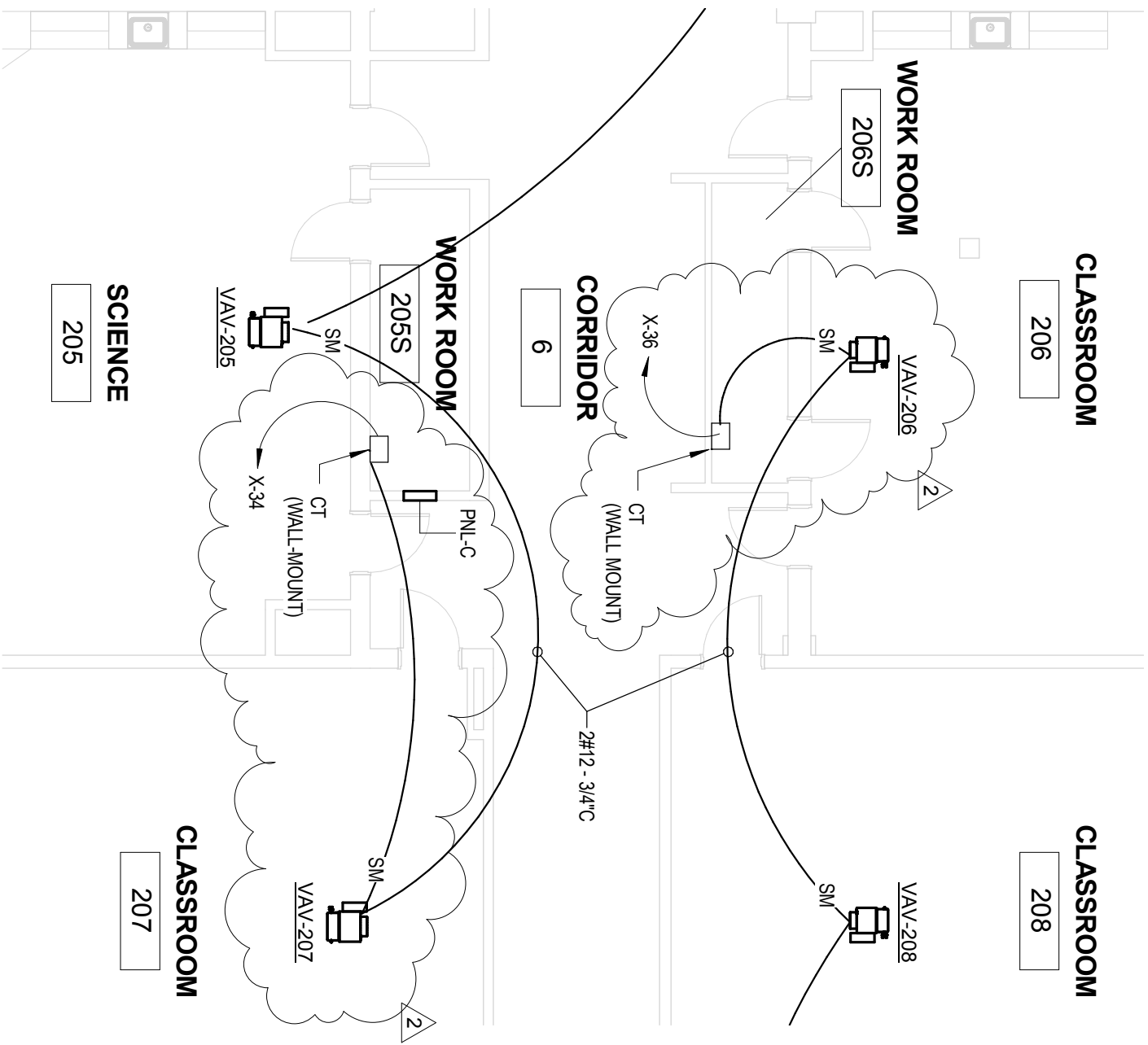
E9.11
SHEET NO.
SK-E.16

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1 PARTIAL FIRST FLOOR ELECTRICAL PLAN

SK-E.17 1/8" = 1'-0"

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14036
PROJECT NO.

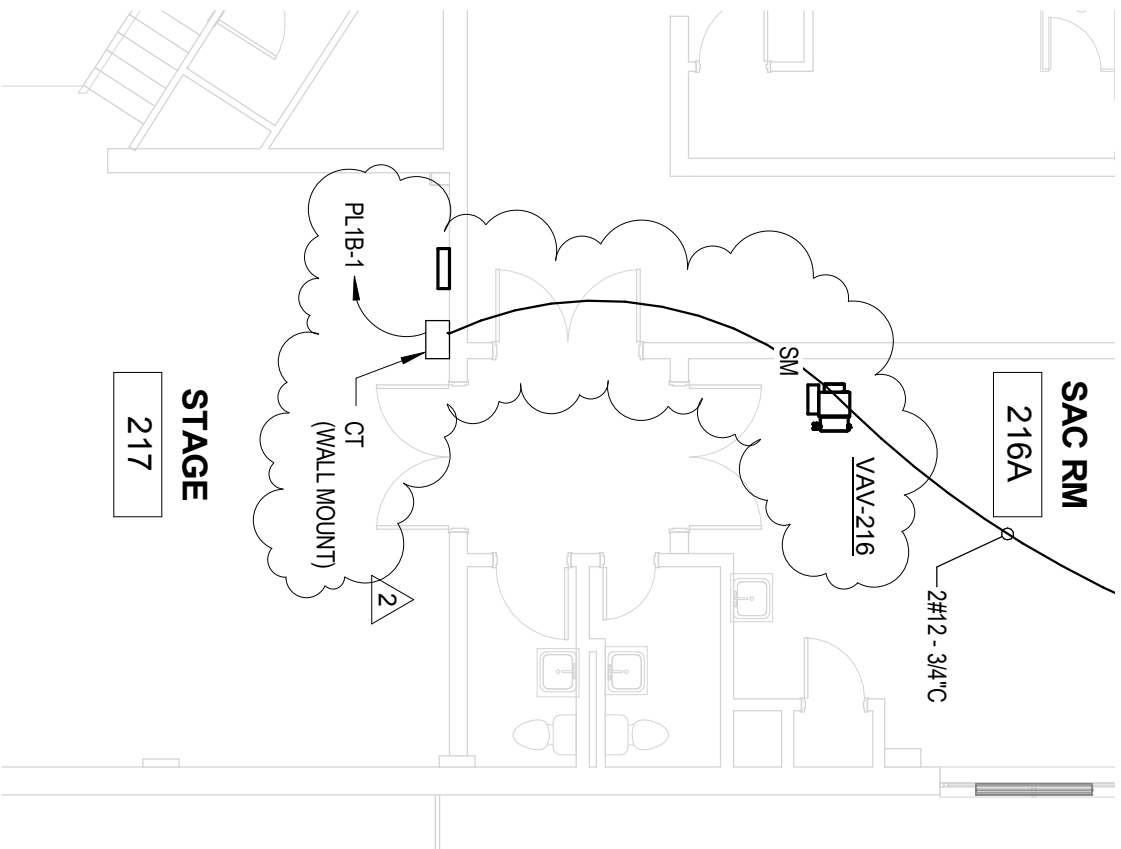
E9.12
SHEET NO.
SK-E.17

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2 ADDENDUM #2



PARTIAL FIRST FLOOR ELECTRICAL PLAN

1
SK-E.18 1/8" = 1'-0"

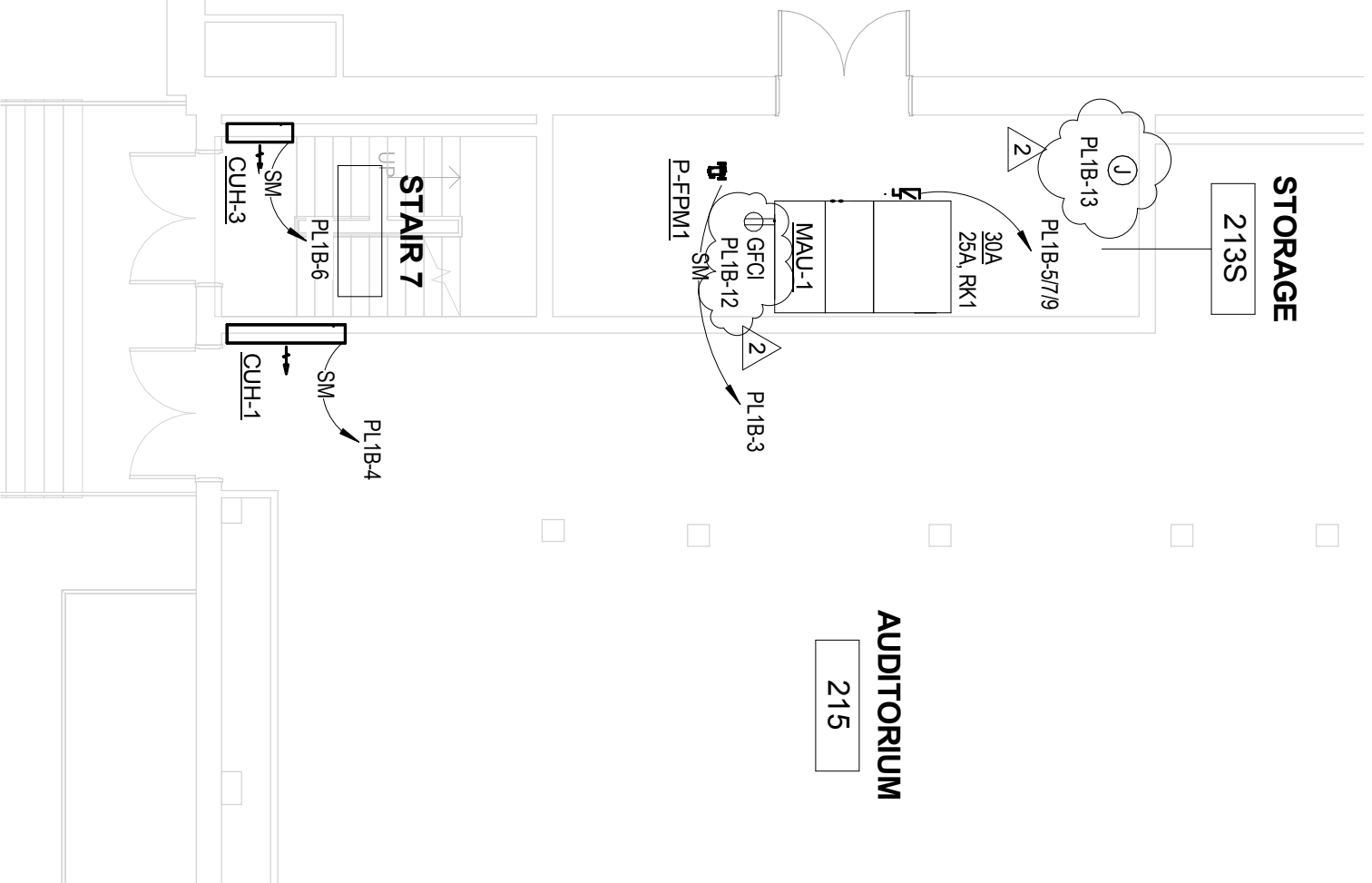
05/14/15 E9.13
DATE SHEET NO.
14036
PROJECT NO. SK-E.18

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2
APPENDUM #2



PARTIAL FIRST FLOOR ELECTRICAL PLAN

1
SK-E.19 1/8" = 1'-0"

Branch Panel: PL1B

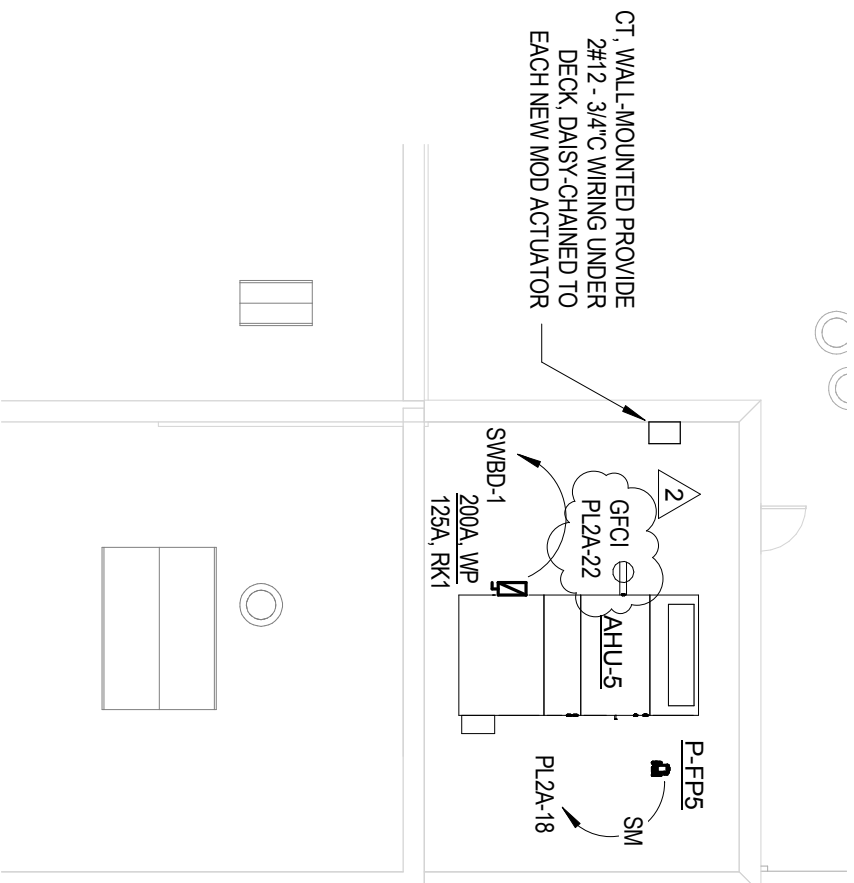
LOCATION: CORRIDOR 1ST FLR
Supply From:
Mounting: RECESSED
Enclosure: NEMA
1

Volts: 120/208 Wye
Phases: 3
Wires: 4

A.I.C. Rating: 14,000
Mains Type: FULL
Mains Rating: 225 A
MCB Rating:
Manufacturer: --

CKT	Circuit Description	Wire Size	Trip	Poles	A	B	C	A	B	C	Poles	Trip	Wire Size	Circuit Description	CKT
1	CONTROL XFMR FOR VAVS	12	20	1	0.05 kVA			0.04 kVA			1	20	12	CABINET UNIT HEATER	2
3	FREEZE PROTECTION PUMP	12	20	1		0.15 kVA			0.04 kVA		1	20	12	CABINET UNIT HEATER	4
5	MAU-1	8	25	3			2.00 kVA			0.04 kVA	1	20	12	CABINET UNIT HEATER	6
7	--	8	--	--	2.00 kVA			0.05 kVA			1	20	12	CONTROL XMFR SMOKE DAMPER	8
9	--	8	--	--		2.00 kVA			0.05 kVA		1	20	12	CONTROL XMFR SMOKE DAMPER	10
11	FREEZE PROTECTION PUMP	12	20	1			0.15 kVA			0.18 kVA	1	20	12	GFCI - MAU-1	12
13	ATC POWER SUPPLY	12	20	1	0.10 kVA			-- kVA			--	--	--	--	14
15	--	--	--	--		-- kVA			-- kVA		--	--	--	--	16
17	--	--	--	--			-- kVA			-- kVA	--	--	--	--	18
19	--	--	--	--	-- kVA			-- kVA			--	--	--	--	20
21	--	--	--	--		-- kVA			-- kVA		--	--	--	--	22
23	--	--	--	--			-- kVA			-- kVA	--	--	--	--	24
25	--	--	--	--	-- kVA			-- kVA			--	--	--	--	26
27	--	--	--	--		-- kVA			-- kVA		--	--	--	--	28
29	--	--	--	--			-- kVA			-- kVA	--	--	--	--	30
31	--	--	--	--	-- kVA			-- kVA			--	--	--	--	32
33	--	--	--	--		-- kVA			-- kVA		--	--	--	--	34
35	--	--	--	--			-- kVA			-- kVA	--	--	--	--	36
37	--	--	--	--	-- kVA			-- kVA			--	--	--	--	38
39	--	--	--	--		-- kVA			-- kVA		--	--	--	--	40
41	--	--	--	--			-- kVA			-- kVA	--	--	--	--	42
Total Load:					-- kVA		-- kVA		-- kVA						
Total Amps:					-- A		-- A		-- A						

Notes:



1
SK-E.21

PARTIAL ELECTRICAL ROOF PLAN

3/32" = 1'-0"

05/14/15
DATE

E9.16
SHEET NO.

14036
PROJECT NO.

SK-E.21

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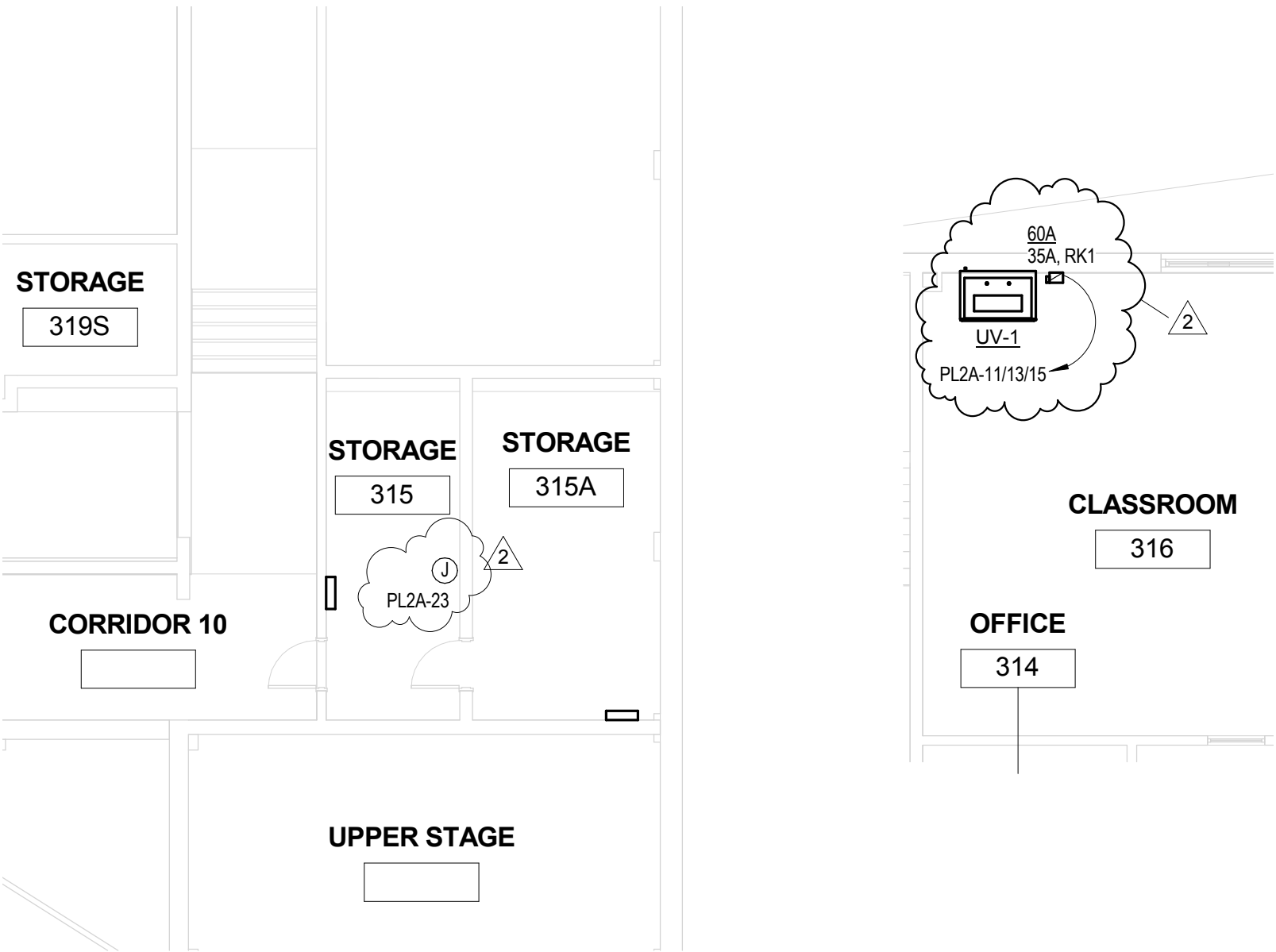
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2

ADDENDUM #2



1
SK-E.22

PARTIAL SECOND FLOOR ELECTRICAL PLAN

1/8" = 1'-0"

05/14/15
DATE
14036
PROJECT NO.

E9.15
SHEET NO.
SK-E.22

RED CLAY CONSOLIDATED SCHOOL DISTRICT
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ADDENDUM #2

Branch Panel: PL2A

Location: CORRIDOR 2ND FLR

Supply From:

Mounting: RECESSED

Enclosure: NEMA
1

Volts: 120/208 Wye

Phases: 3

Wires: 4

A.I.C. Rating: 14,000

Mains Type: FULL

Mains Rating: 225 A, MLO

MCB Rating:

Manufacturer: --

CKT	Circuit Description	Wire Size	Trip	Poles	A	B	C	A	B	C	Poles	Trip	Wire Size	Circuit Description	CKT
1	CONTROL XMFR FOR VAVS	12	20	1	0.50 kVA			0.04 kVA			20	1	12	CABINET UNIT HEATER - CUH-3	2
3	CONTROL XMFR FOR VAVS	12	20	1		0.50 kVA			0.04 kVA		20	1	12	CABINET UNIT HEATER - CUH-3	4
5	UNIT VENTILATOR UV - 2	12	15	3			1.04 kVA			0.04 kVA	20	1	12	CABINET UNIT HEATER - CUH-3	6
7	--	12	--	--	1.04 kVA			0.04 kVA			20	1	12	CABINET UNIT HEATER - CUH-1	8
9	--	12	--	--		1.04 kVA			0.04 kVA		20	1	12	CABINET UNIT HEATER - CUH-1	10
11	UNIT VENTILATOR RM 316	8	35	3			3.12 kVA			3.12 kVA	35	3	8	UNIT VENTILATOR RM. 316	12
13	--	8	--	--	3.12 kVA			3.12 kVA			--	--	8	--	14
15	--	8	--	--		3.12 kVA			3.12 kVA		--	--	8	--	16
17	EXHAUST FAN EF-2	12	20	1			0.50 kVA			0.40 kVA	20	1	12	FREEZE PRETECTION PUMP	18
19	CONTROL XFMR SOME DAMPERS	12	20	1	0.05 kVA			0.40 kVA			20	1	12	FREEZE PROTECTION PUMP	20
21	CONTROL XFMR SOME DAMPERS	12	20	1		0.05 kVA			0.54 kVA		20	1	10	GFCI RECEPTACLES - ROOFTOP ON CU'S	22
23	ATC POWER SUPPLY	12	20	1			0.10 kVA			-- kVA	--	--	--	--	24
25	--	--	--	--	-- kVA			-- kVA			--	--	--	--	26
27	--	--	--	--		-- kVA			-- kVA		--	--	--	--	28
29	--	--	--	--			-- kVA			-- kVA	--	--	--	--	30
31	--	--	--	--	-- kVA			-- kVA			--	--	--	--	32
33	--	--	--	--		-- kVA			-- kVA		--	--	--	--	34
35	--	--	--	--			-- kVA			-- kVA	--	--	--	--	36
37	--	--	--	--	-- kVA			-- kVA			--	--	--	--	38
39	--	--	--	--		-- kVA			-- kVA		--	--	--	--	40
41	--	--	--	--			-- kVA			-- kVA	--	--	--	--	42
Total Load:					-- kVA		-- kVA		-- kVA						
Total Amps:					-- A		-- A		-- A						

Notes:

④ - NO LABEL

MFG./TYPE: GE NLAB (SURFACE)
VOLTAGE: 120/208, 3PH4W
AMPACITY OF BUSBARS: 100A
MAIN BREAKER OR MAIN LUGS: MLO
CIRCUIT SLOTS: 24
BREAKER COMBINATIONS:

(20) 20A/1P

⑤ - NO LABEL

MFG./TYPE: GE NLAB (SURFACE)
VOLTAGE: 120/208, 1PH3W
AMPACITY OF BUSBARS: 225A
MAIN BREAKER OR MAIN LUGS: MLO
CIRCUIT SLOTS: 24
BREAKER COMBINATIONS:

(6) 50A/2P
(2) 30A/2P

2

① - NO LABEL

MFG./TYPE: BULLDOG PUSHMATIC (SURFACE)
VOLTAGE: 120/208, 1PH3W
AMPACITY OF BUSBARS: 100A
MAIN BREAKER OR MAIN LUGS: MLO
CIRCUIT SLOTS: 14
BREAKER COMBINATIONS:

(9) 20A/1P
(2) 15A/1P

2

⑧ - NO LABEL

MFG./TYPE: TRUMBELL (RECESSED)
VOLTAGE: 120/208
AMPACITY OF BUSBARS: 100A
MAIN BREAKER OR MAIN LUGS: MLO
CIRCUIT SLOTS: 42
DIMENSIONS: 28"H x 20"W x 5 3/4"D
BREAKER COMBINATIONS: (42) 20A/1P

1

LOWER LEVEL ELEC DEMO - AREA A

SK-E.24

NTS

05/14/15
DATE
E9.1
SHEET NO.
14036
PROJECT NO.
SK-E.24

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2 ADDENDUM #2

20 - PNL-LG

MFG./TYPE: SQ'D NQOD (RECESSED)
VOLTAGE: 120/208
AMPACITY OF BUSBARS: 225A
MAIN BREAKER OR MAIN LUGS: MLO
CIRCUIT SLOTS: 30
DIMENSIONS: 28"H x 20"W x 5 3/4"D
BREAKER COMBINATIONS:
(30) 20A/1P

* REPLACE FRAME, TRIM AND DOOR ONLY.
RETAIN EXISTING BREAKERS AND BUSBARS.

2

22 - NO LABEL

MFG./TYPE: SQ'D QOC30 (RECESSED)
VOLTAGE: 120/208
AMPACITY OF BUSBARS: 100A
MAIN BREAKER OR MAIN LUGS: MLO
CIRCUIT SLOTS: 30
DIMENSIONS: 30"H x 14 1/4"W x 3 5/8"D
BREAKER COMBINATIONS:

(10) 20A/1P

2

18 - NO LABEL

MFG./TYPE: GE NLAB (RECESSED)
VOLTAGE: 120/208
AMPACITY OF BUSBARS: 225A
MAIN BREAKER OR MAIN LUGS: MLO
CIRCUIT SLOTS: 42
DIMENSIONS: 51 1/2"H x 21"W x 5 1/8"D
BREAKER COMBINATIONS:

(36) 20A/1P

2

1

SK-E.25

1ST FLR. ELEC DEMO - AREA A

NTS

05/14/15
DATE
14036
PROJECT NO.

E9.3
SHEET NO.
SK-E.25

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2 ADDENDUM #2

2

②⑤ - NO LABEL

MFG./TYPE: PENN PANEL (SURFACE)
VOLTAGE: 120/208
AMPACITY OF BUSBARS: 200A
MAIN BREAKER OR MAIN LUGS: MLO
CIRCUIT SLOTS: 36
DIMENSIONS: 36 1/2"H x 20" W x 6"D
BREAKER COMBINATIONS:

(30) 20A/1P

②⑥ - NO LABEL

MFG./TYPE: GE NLAB (SURFACE)
VOLTAGE: 120/208
AMPACITY OF BUSBARS: 225A
MAIN BREAKER OR MAIN LUGS: MLO
CIRCUIT SLOTS: 40
DIMENSIONS: 28"H x 20"W x 5 3/4"D
BREAKER COMBINATIONS:

(30) 20A/1P

1

1ST FLR. ELEC. DEMO - AREA B

SK-E.26

NTS

05/14/15

DATE

SHEET NO.

14036

PROJECT NO.

SK-E.26

RED CLAY CONSOLIDATED SCHOOL DISTRICT

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29 - PNL-LP

MFG./TYPE: SQ'D NQOD (RECESSED)
VOLTAGE: 120/208
AMPACITY OF BUSBARS: 225A
MAIN BREAKER OR MAIN LUGS: MLO
CIRCUIT SLOTS: 42
DIMENSIONS: 33"H x 20"W x 5 3/4"D
BREAKER COMBINATIONS:
(42) 20A/1P

* REPLACE FRAME, TRIM AND DOOR ONLY.
RETAIN EXISTING BREAKERS AND BUSBARS.

30 - PNL-L2A

MFG./TYPE: SQ'D NQOD (RECESSED)
VOLTAGE: 120/208
AMPACITY OF BUSBARS: 225A
MAIN BREAKER OR MAIN LUGS: MLO
CIRCUIT SLOTS: 42
DIMENSIONS: 33"H x 20"W x 5 3/4"D
BREAKER COMBINATIONS:
(38) 20A/1P
(2) 20A/2P

* REPLACE FRAME, TRIM AND DOOR ONLY.
RETAIN EXISTING BREAKERS AND BUSBARS.

31 - PNL-F

MFG./TYPE: SQ'D NQOD (SURFACE)
VOLTAGE: 120/208
AMPACITY OF BUSBARS: 100A
MAIN BREAKER OR MAIN LUGS: MLO
CIRCUIT SLOTS: 30
DIMENSIONS: 26 1/4"H x 20 1/8"W x 5 3/4"D
BREAKER COMBINATIONS: N/A

* NO REPLACEMENT NEEDED.

32 - PNL-PB (IN MEZZANINE)

MFG./TYPE: PENN PANEL (SURFACE)
VOLTAGE: 120/208
AMPACITY OF BUSBARS: 200A
MAIN BREAKER OR MAIN LUGS: MLO
CIRCUIT SLOTS: 18
DIMENSIONS: 25"H x 20 1/4"W x 5 3/4"D
BREAKER COMBINATIONS:
(6) 15A/1P
(2) 20A/1P
(2) 20A/2P
(3) 70A/3P

1

SK-E.27

2ND FLOR. ELEC. DEMO - AREA B

NTS

05/14/15
DATE
14036
PROJECT NO.

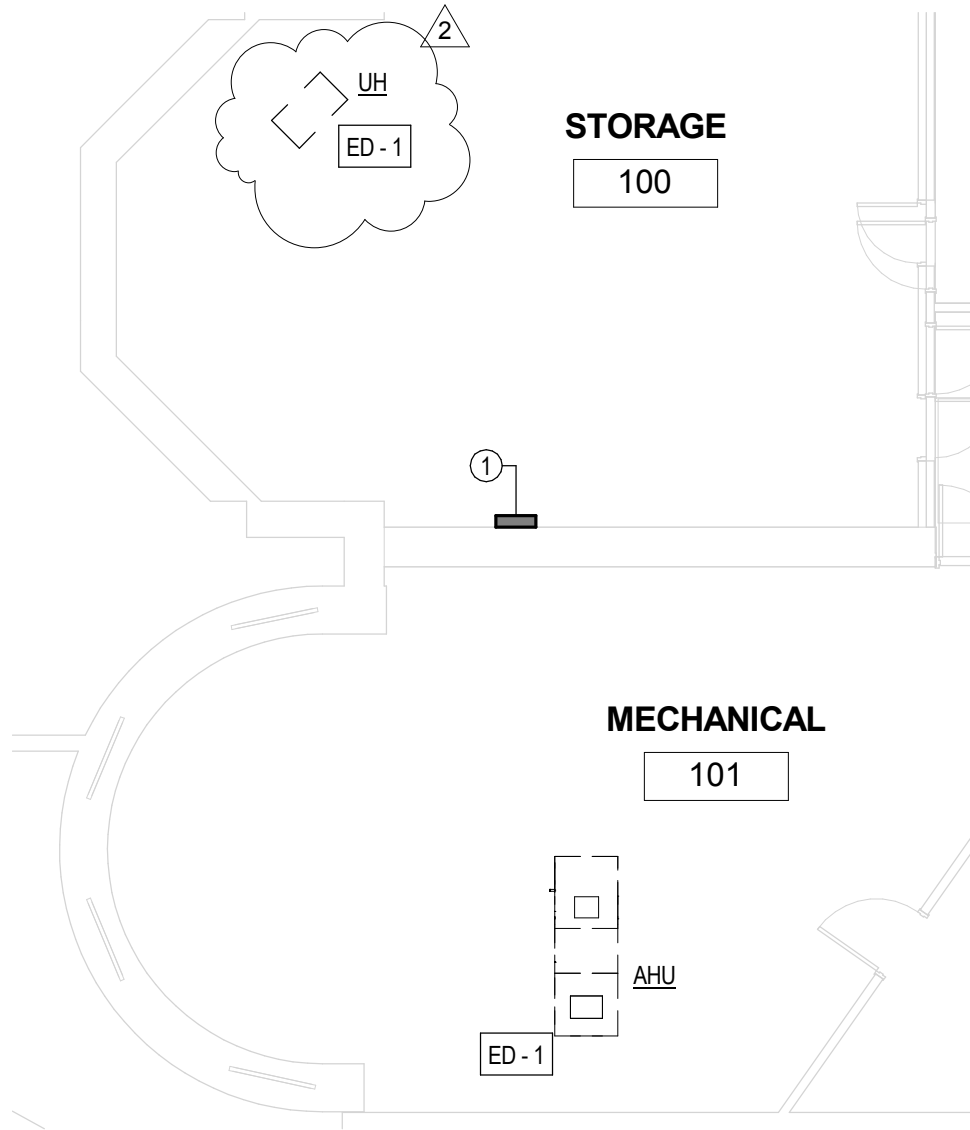
E9.6
SHEET NO.
SK-E.27

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P: (972) 832-1652 F: (972) 832-1423
Website: www.StudioJAED.com
E-Mail: info@StudioJAED.com

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1
SK-E.28

PARTIAL LOWER LEVEL ELECTRICAL DEMO PLAN

1/8" = 1'-0"

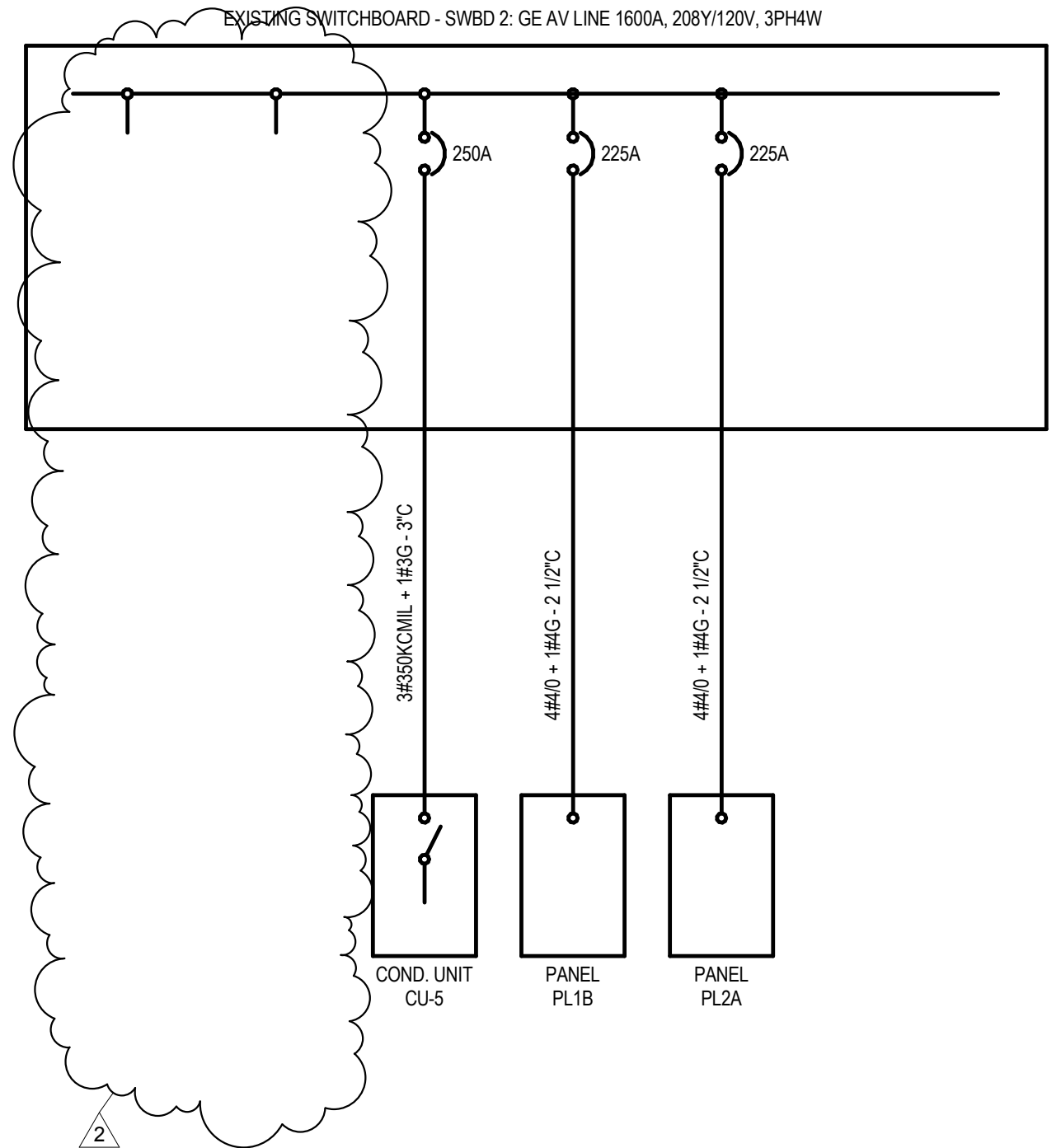
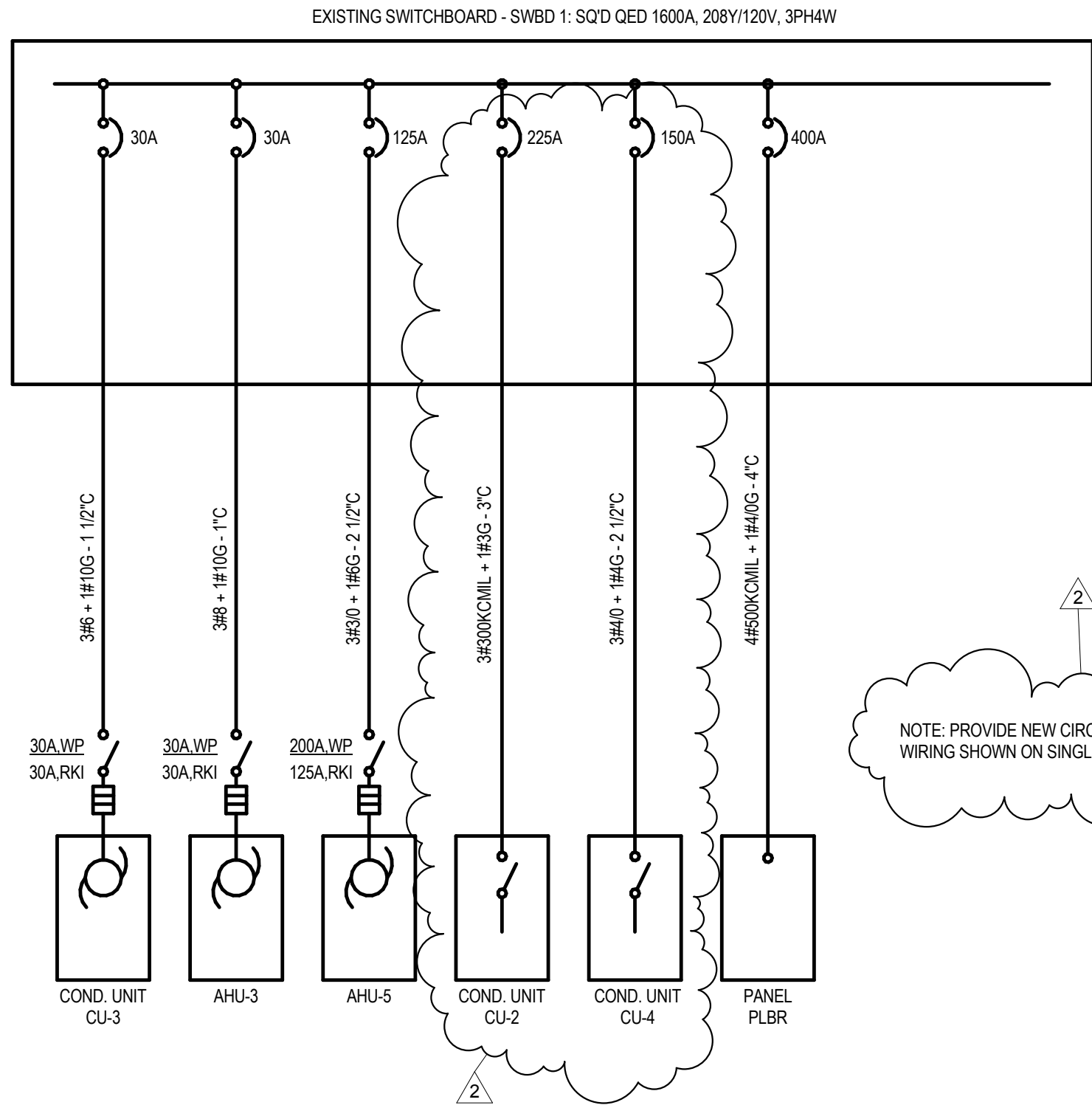
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1000 W. HILL ROAD, STE. 110
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E: AAE@studiojaed.com
W: www.studiojaed.com

RED CLAY CONSOLIDATED SCHOOL DISTRICT
A. I. DuPont Middle School
HVAC RENOVATION
3130 KENNETT PIKE
WILMINGTON, DELAWARE 19807

05/15/15
DATE
14036
PROJECT NO.
E9.1
SHEET NO.
SK-E.28



1
SK-E.29

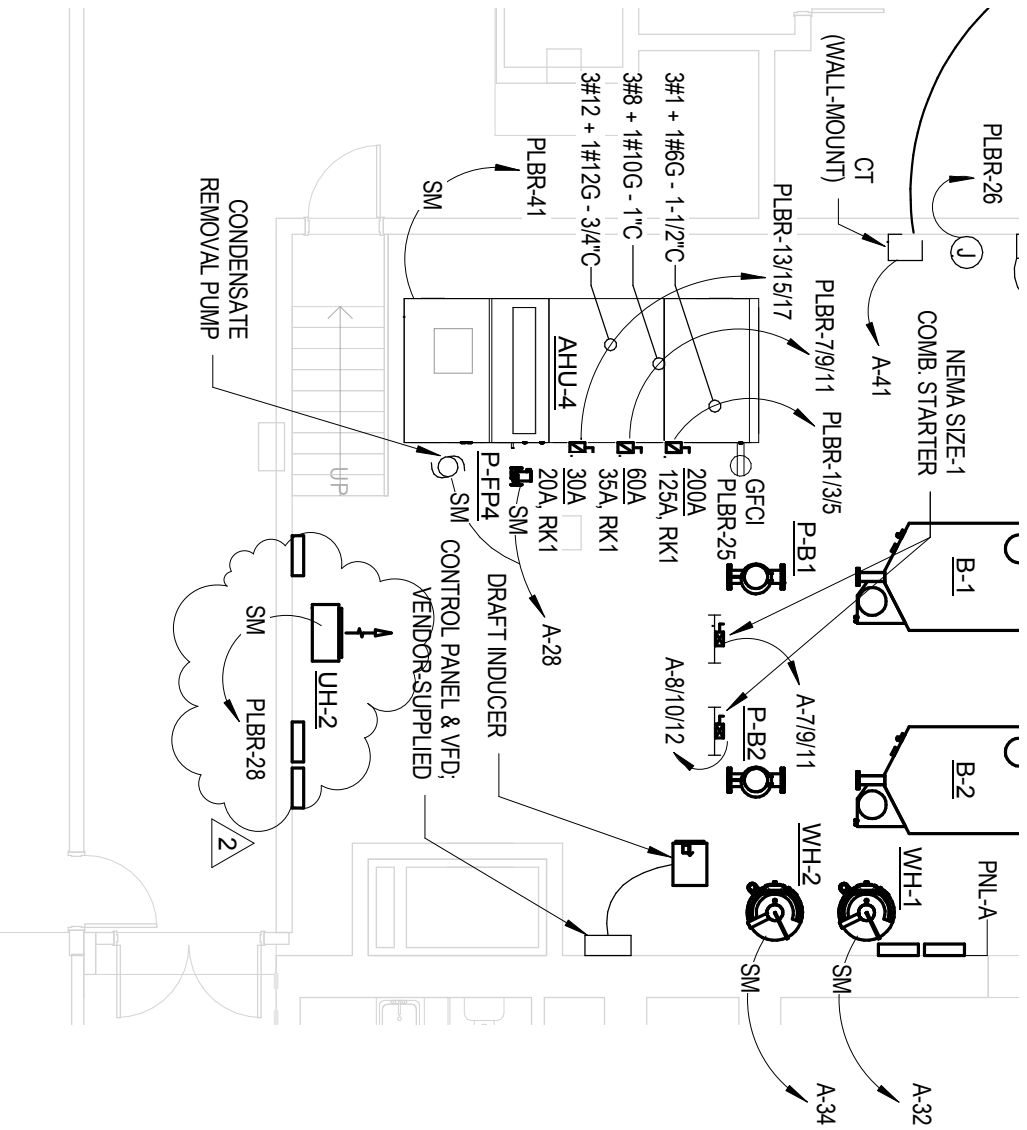
PARTIAL ELECTRICALSINGLE LINE DIAGRAMS

NTS



1 PARTIAL LOWER LEVEL ELECTRICAL PLAN

SK-E.30 1/8" = 1'-0"



1 PARTIAL LOWER LEVEL ELECTRICAL PLAN

SK-E.31 1/8" = 1'-0"

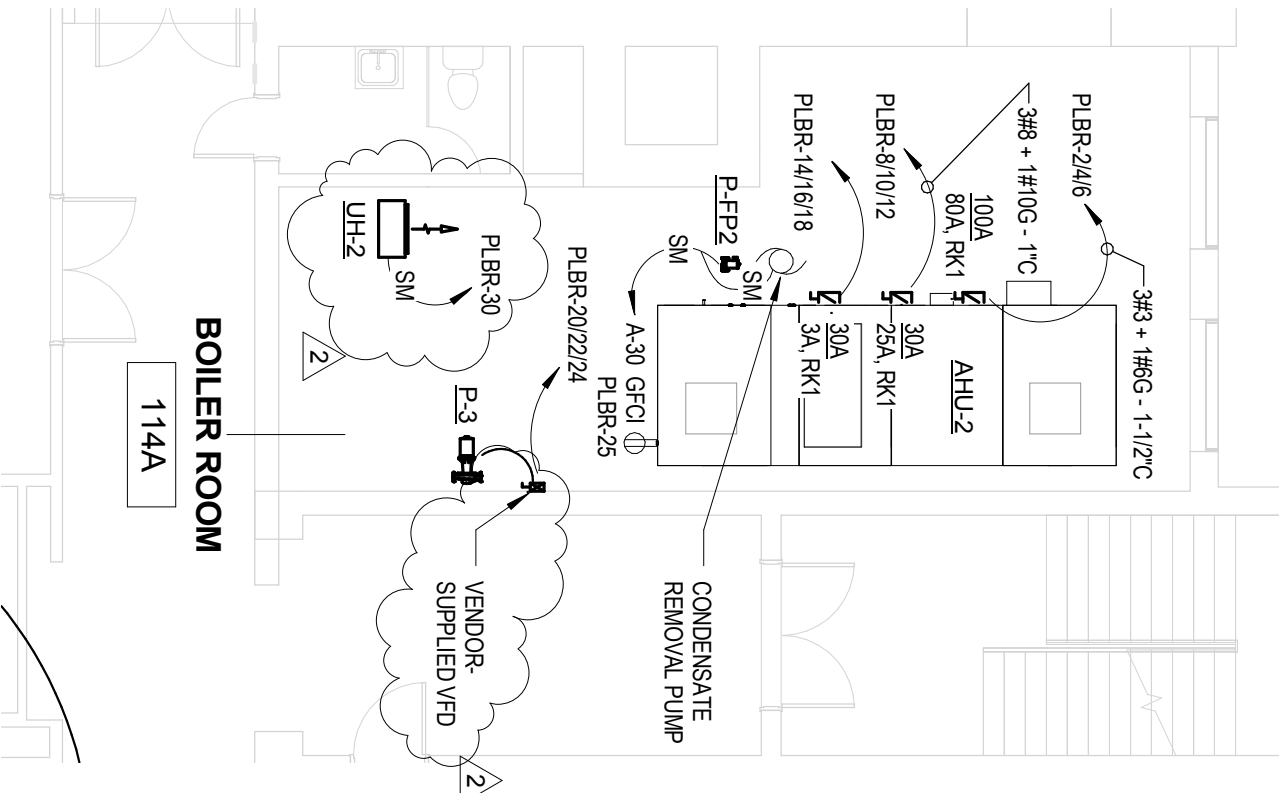
05/15/15 E9.10
DATE SHEET NO.
14036 SK-E.31
PROJECT NO.

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CORPORATE HEADQUARTERS
1000 N. MARKET STREET, SUITE 110
P.O. BOX 83, WILMINGTON, DE 19801
www.studiojaed.com
E-Mail: info@studiojaed.com

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2 ADDENDUM #2



1 PARTIAL LOWER LEVEL ELECTRICAL PLAN

SK-E.32 1/8" = 1'-0"

05/15/15 E9.11
DATE SHEET NO.
14036 SK-E.32
PROJECT NO.

RED CLAY CONSOLIDATED SCHOOL DISTRICT
A. I. DuPont Middle School
HVAC RENOVATION
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CORPORATE HEADQUARTERS
1000 N. 10TH ST., SUITE 100
P.O. BOX 1000 P.O. BOX 1000
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WWW.STUDIOJAED.COM
E-MAIL: info@studiojaed.com

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2 ADDENDUM #2

Branch Panel: PLBR

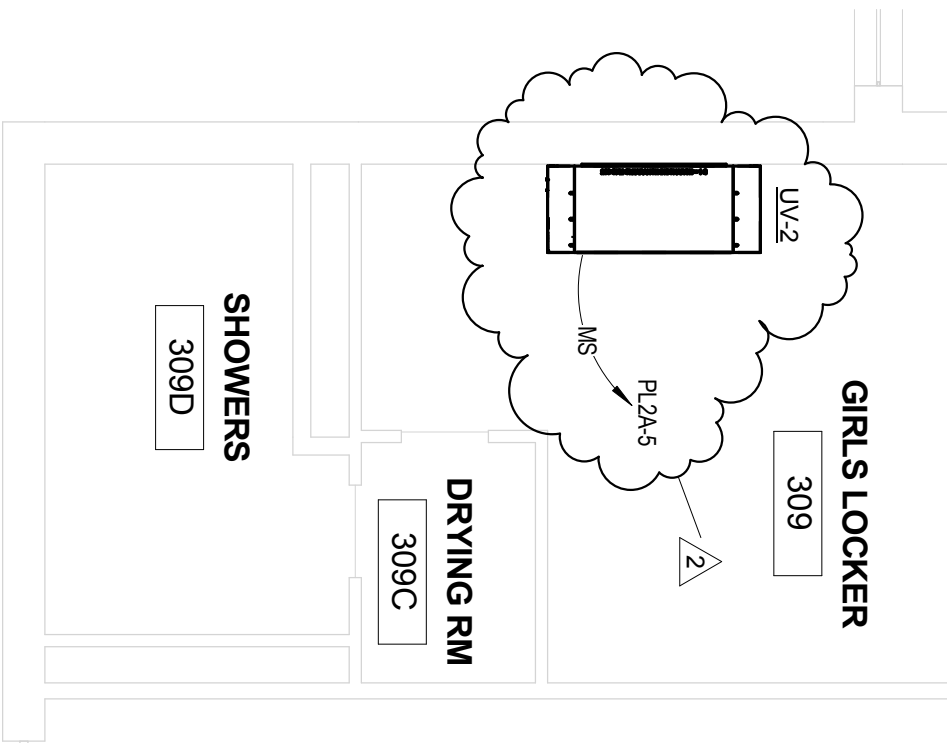
Location: BOILER ROOM
Supply From:
Mounting: SURFACE
Enclosure: NEMA
1

Volts: 120/208 Wye
Phases: 3
Wires: 4

A.I.C. Rating: 14,000
Mains Type: FULL
Mains Rating: 400 A,
MCB Rating: MLO
Manufacturer: --

CKT	Circuit Description	Wire Size	Trip	Poles	A	B	C	A	B	C	Poles	Trip	Wire Size	Circuit Description	CKT
1	AHU - 2 SUPPLY FANS	1	125	3	8.55 kVA			5.93 kVA			3	80	3	AHU - 4 SUPPLY FANS	2
3	--	1	--	--		8.55 kVA			5.93 kVA		--	--	3	--	4
5	--	1	--	--			8.55 kVA			5.93 kVA	--	--	3	--	6
7	AHU - 2 EXHAUST FANS	8	35	3	2.35 kVA			1.78 kVA			3	25	8	AHU - 4 SUPPLY FANS	8
9	--	8	--	--		2.35 KVA			1.78 kVA		--	--	8	--	10
11	--	8	--	--			2.35 KVA			1.78 kVA	--	--	8	--	12
13	AHU - 2 ENERGY WHEEL	12	20	3	0.16 kVA			0.16 kVA			3	20	12	AHU - 4 SUPPLY FANS	14
15	--	12	--	--		0.16 kVA			0.16 kVA		--	--	12	--	16
17	--	12	--	--			0.16 kVA			0.16 kVA	--	--	12	--	18
19	CONDENSING UNIT CU-3	8	20	3	5.00 kVA			0.9 kVA			3	20	12	PUMP P-3	20
21	--	8	--	--		5.00 kVA			0.9 kVA		--	--	12	--	22
23	--	8	--	--			5.00 kVA			0.9 kVA	--	--	12	--	24
26	GFCI - AHU-2/4	12	20	1	0.18 kVA			0.10 kVA			1	20	12	ATC POWER SUPPLY	26
27	UH-1: STORAGE 100	12	20	1		0.20 kVA			0.69 kVA		1	20	12	UH-2: BOILER ROOM 114	28
29	UH-1: MECHANICAL 101	12	20	1			0.20 kVA			0.69 kVA	1	20	12	UH-2: BOILER ROOM 114A	30
31	--	--	--	--	-- kVA			-- kVA			--	--	--	--	32
33	--	--	--	--		-- kVA			-- kVA		--	--	--	--	34
35	EXHAUST FAN (EF) CORRIDOR 1	12	20	1			0.12 kVA			-- kVA	--	--	--	--	36
37	CABINET UNIT HEATER	12	20	1	0.04 kVA			-- kVA			--	--	--	--	38
39	CABINET UNIT HEATER	12	20	1		0.04 kVA			-- kVA		--	--	--	--	40
41	AHU-2 CONTROLS	12	20	1			0.04 kVA			-- kVA	--	--	--	--	42
Total Load:					-- kVA			-- kVA			-- kVA				
Total Amps:					-- A			-- A			-- A				

Notes:



1

PARTIAL 2ND FLR ELEC. PLAN - AREA A

SK-E.34

1/8" = 1'-0"

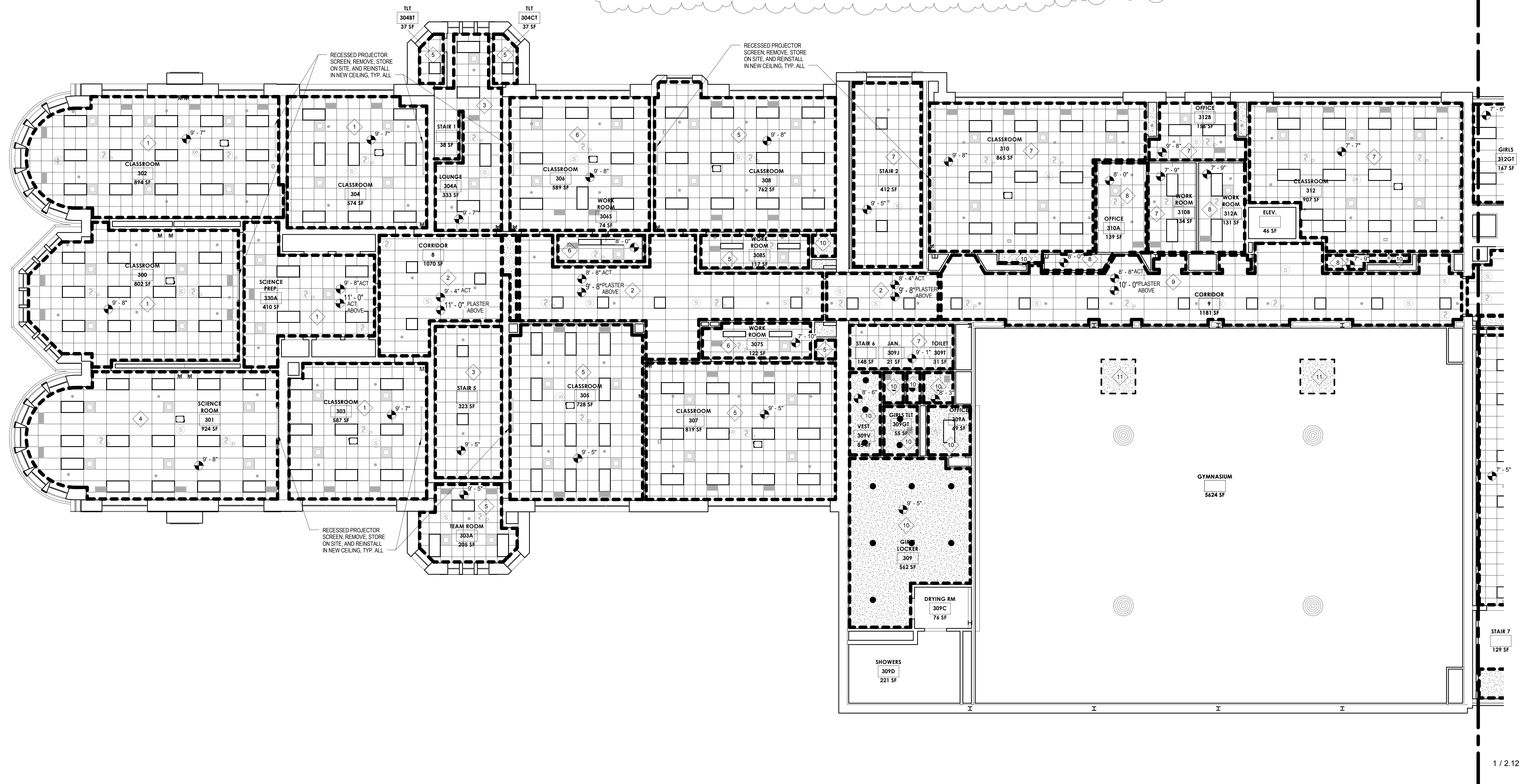
05/15/15
DATE
EQ.14
SHEET NO.
14036
PROJECT NO. SK-E.34

RED CLAY CONSOLIDATED SCHOOL DISTRICT
A. I. DuPont Middle School
HVAC RENOVATION
3130 KENNETT PIKE
WILMINGTON, DELAWARE 19807

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ARCHITECTS ■ ENGINEERS ■ FACILITIES SOLUTIONS
CORPORATE HEADQUARTERS
2000 WILMINGTON AVENUE, SUITE 110
P. (302) 552-7872 F. (302) 132-1442
WWW.STUDIOJAED.COM
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2 ADDENDUM #2



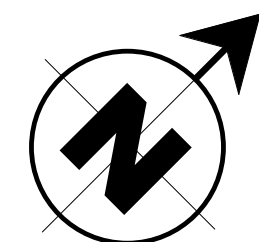
1 SECOND FLOOR RCP DEMOLITION PLAN - AREA A
2.11 1/8" = 1'-0"

RCP HATCH LEGEND

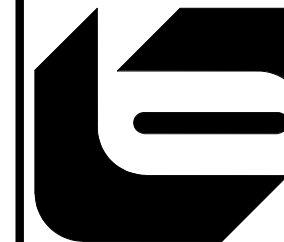
KEYNOTE #		Description
1	REMOVE EXISTING 2 X 2 SUSPENDED ACOUSTICAL TILE CEILING, GRID, HANGERS FASTENERS, AND BATT INSULATION ABOVE IN ITS ENTIRETY. TEMPORARILY SECURE ALL ELECTRICAL DEVICES, MECHANICAL DEVICES, FIRE PROTECTION DEVICES, SPRINKLER HEADS, AND EMERGENCY DEVICES AND REINSTALL IN NEW GRID.	
2	REMOVE EXISTING 2 X 4 SUSPENDED ACOUSTICAL TILE CEILING, GRID, HANGERS FASTENERS, AND BATT INSULATION ABOVE IN ITS ENTIRETY. EXISTING PLASTER CEILING ABOVE TO REMAIN AT CORRIDORS AND STAIRWELLS. TEMPORARILY SECURE ALL ELECTRICAL DEVICES, MECHANICAL DEVICES, FIRE PROTECTION DEVICES, SPRINKLER HEADS, AND EMERGENCY DEVICES AND REINSTALL IN NEW GRID.	
3	REMOVE EXISTING 2 X 2 SUSPENDED ACOUSTICAL TILE CEILING, GRID, HANGERS FASTENERS, AND BATT INSULATION ABOVE IN ITS ENTIRETY. EXISTING PLASTER CEILING ABOVE TO REMAIN AT CORRIDORS AND STAIRWELLS. TEMPORARILY SECURE ALL ELECTRICAL DEVICES, MECHANICAL DEVICES, FIRE PROTECTION DEVICES, SPRINKLER HEADS, AND EMERGENCY DEVICES AND REINSTALL IN NEW GRID.	
4	REMOVE EXISTING 2 X 2 SUSPENDED ACOUSTICAL TILE CEILING, GRID, HANGERS FASTENERS, AND BATT INSULATION ABOVE IN ITS ENTIRETY. TEMPORARILY SECURE ALL ELECTRICAL DEVICES, MECHANICAL DEVICES, FIRE PROTECTION DEVICES, SPRINKLER HEADS, AND EMERGENCY DEVICES AND REINSTALL IN NEW GRID.	
5	REMOVE EXISTING 2 X 2 SUSPENDED ACOUSTICAL TILE CEILING, GRID, HANGERS FASTENERS, AND BATT INSULATION ABOVE IN ITS ENTIRETY. REMOVE ADDITIONAL LEVEL OF EXISTING PLASTER CEILING ABOVE IN ITS ENTIRETY. TEMPORARILY SECURE ALL ELECTRICAL DEVICES, MECHANICAL DEVICES, FIRE PROTECTION DEVICES, SPRINKLER HEADS, AND EMERGENCY DEVICES AND REINSTALL IN NEW GRID.	
6	REMOVE EXISTING 2 X 4 SUSPENDED ACOUSTICAL TILE CEILING, GRID, HANGERS FASTENERS, AND BATT INSULATION ABOVE IN ITS ENTIRETY. REMOVE ADDITIONAL LEVEL OF EXISTING PLASTER CEILING ABOVE IN ITS ENTIRETY. TEMPORARILY SECURE ALL ELECTRICAL DEVICES, MECHANICAL DEVICES, FIRE PROTECTION DEVICES, SPRINKLER HEADS, AND EMERGENCY DEVICES AND REINSTALL IN NEW GRID.	
7	REMOVE EXISTING 2 X 2 SUSPENDED ACOUSTICAL TILE CEILING, GRID, HANGERS AND FASTENERS. TEMPORARILY SECURE ALL ELECTRICAL DEVICES, MECHANICAL DEVICES, FIRE PROTECTION DEVICES, SPRINKLER HEADS, AND EMERGENCY DEVICES AND REINSTALL IN NEW GRID.	
8	REMOVE EXISTING 2 X 4 SUSPENDED ACOUSTICAL TILE CEILING, GRID, HANGERS AND FASTENERS. TEMPORARILY SECURE ALL ELECTRICAL DEVICES, MECHANICAL DEVICES, FIRE PROTECTION DEVICES, SPRINKLER HEADS, AND EMERGENCY DEVICES AND REINSTALL IN NEW GRID.	
9	REMOVE EXISTING 2 X 4 SUSPENDED ACOUSTICAL TILE CEILING, GRID, HANGERS FASTENERS, AND PLASTER CEILING ABOVE IN ITS ENTIRETY. TEMPORARILY SECURE ALL ELECTRICAL DEVICES, MECHANICAL DEVICES, FIRE PROTECTION DEVICES, SPRINKLER HEADS, AND EMERGENCY DEVICES AND REINSTALL IN NEW GRID.	
10	REMOVE EXISTING SUSPENDED GYPSUM OR PORTLAND CEMENT PLASTER CEILING AND / OR SOFFITS, GRID, HANGERS AND FASTENERS TEMPORARILY SECURE ALL ELECTRICAL DEVICES, MECHANICAL DEVICES, FIRE PROTECTION DEVICES, SPRINKLER HEADS, AND EMERGENCY DEVICES AND REINSTALL.	
11	REMOVE EXISTING SURFACE PORTLAND CEMENT PLASTER CEILING TO FACILITATE DEMOLITION AND INSTALLATION OF MECHANICAL UNITS. APPROXIMATE AREA OF DEMOLITION TO BE 6'-0" x 6'-0". TEMPORARILY SECURE ALL ELECTRICAL DEVICES, MECHANICAL DEVICES, FIRE PROTECTION DEVICES, SPRINKLER HEADS, AND EMERGENCY DEVICES AND REINSTALL. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING NECESSARY PERMITS FROM THE CITY OF CHICAGO AND THE STATE OF ILLINOIS PRIOR TO ANY FLOOR DURING DURATION OF CONSTRUCTION. REFER TO MEP DRAWINGS FOR COORDINATION OF SIZE AND LOCATIONS.	

- ## GENERAL DEMOLITION NOTES
1. PERFORM ALL NECESSARY DISASSEMBLY, REMOVAL, AND DISPOSAL OF BUILDING MATERIALS AND EQUIPMENT WHERE "NOTES" ON THE DRAWINGS REFER TO "REPLACE," OR "INSTALL NEW," OR IMPLY REMOVAL OF (E) AND REPLACEMENT WITH NEW ITEMS.
 2. FOR EXTENT OF PLUMBING FIXTURE DEMOLITION, SEE PLUMBING DRAWINGS.
 3. FOR EXTENT OF ELECTRICAL EQUIPMENT DEMOLITION, SEE ELECTRICAL DRAWINGS.
 4. FOR EXTENT OF HVAC EQUIPMENT DEMOLITION, SEE MECHANICAL DRAWINGS.
 5. COORDINATE WITH NEW RECEPTED CEILING PLANS FOR EXTENT OF CEILING DEMOLITION WHERE NEW CEILINGS ARE SCHEDULED.
 6. AT NEW DOOR AND/OR INTERIOR WINDOW INSTALLATION, REMOVE SUFFICIENT MASONRY AT JAMB, HEAD AND SILL TO ALLOW FOR NEW MASONRY LINTEL, SOLID BLOCK SILL, AND JAMB EXACT CMU DIMENSION SHOWN FOR NEW OPENINGS DOES NOT REPRESENT EXTENT OF MASONRY TO BE REMOVED FOR PROPER INSTALLATION. VERIFY EXACT AMOUNT IN FIELD.
 7. DEMOLITION WORK AS SHOWN DASHED ON DRAWINGS IS TO INDICATE, IN A GENERAL MANNER, THE REMOVAL OF EXISTING CONSTRUCTION AND IS NOT INTENDED TO BE ALL-INCLUSIVE. PROTECT ALL INTERIOR FINISHES TO ACCOMMODATE OR INSTALL ALL NEW WORK.
 8. EXERCISE CARE TO PREVENT ANY DAMAGE TO EXISTING CONDITIONS, UTILITIES, BUILDING ELEMENTS, AND FINISHES, INCLUDING, BUT NOT LIMITED TO, CONCRETE SLABS, FINISH FLOORING, EXTERIOR INTERIOR WALLS AND FINISHES THAT ARE TO REMAIN. DAMAGED ITEMS SHALL BE REMOVED AND PROMPTLY RETURNED TO SERVICE OR PATCHED/REPLACED WITH NEW MATERIAL, TO MATCH EXISTING AT NO ADDITIONAL COST TO THE OWNER.
 9. MAINTAIN ALL EXISTING SERVICES IN USE AT ALL TIMES UNLESS WRITTEN PERMISSION IS RECEIVED FROM THE OWNER TO TEMPORARILY INTERRUPT ANY SUCH SERVICE. PERMANENTLY RECONNECT ALL SERVICES DISRUPTED BY THE ALTERATION AND DEMOLITION WORK.
 10. MATERIALS AND/OR ITEMS DESIGNATED TO BE REINSTALLED AND/OR RELOCATED AS SHOWN SHALL BE STORED AND PROTECTED UNTIL REINSTALLED. DAMAGED ITEMS SHALL BE REPLACED WITH SIMILAR NEW MATERIAL.
 11. COORDINATE ARCHITECTURAL, STRUCTURAL, MECHANICAL, ELECTRICAL, PLUMBING, AND FIRE PROTECTION DEMOLITION ACCORDINGLY AND AS NECESSARY TO REMOVE AND/OR INSTALL ALL NEW WORK.
 12. SELECTIVE AREAS TO BE REMOVED FOR UTILITY DISTRIBUTION AND PENETRATIONS ARE TO BE REPAIRED AND PATCHED TO MATCH EXISTING UNLESS NOTED OTHERWISE, INCLUDING BUT NOT LIMITED TO, CMU AND BRICK MASONRY WALLS, MTL, ROOFING, MTL, STUD AND GYP. BRD, PARTITIONS, CONCRETE SLABS, PORCELAIN AND VINYL COMPOSITION TILES, AND TERRAZZO FLOORING.
 13. EXISTING SPRINKLER HEADS TO REMAIN (IN U.O.)

NOTE: THIS SHEET HAS BEEN REISSUED TO REFLECT NEW CEILING KEYNOTES. FOR CLARITY PURPOSES, REVISION BUBBLES HAVE BEEN MOVED OFF OF THE PLAN BELOW.



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CORPORATE HEADQUARTERS
10000 W. 11TH AVENUE, SUITE 110
DENVER, CO 80202
P: (303) 832-1652 F: (303) 832-1423
www.StudioJAED.com

E-Mail:
info@StudioJAED.com

REVISIONS	
△	DESCRIPTION
2	ADDENDUM #2

RED CLAY CONSOLIDATED SCHOOL DISTRICT

A. I. DuPont Middle School
HVAC RENOVATION
3130 KENNETT PIKE
WILMINGTON, DELAWARE 19807

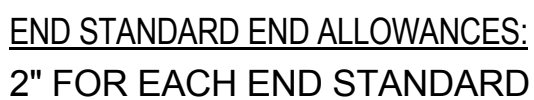
SECOND FLOOR RCP
DEMOLITION PLAN -
AREA A

BID
DOCUMENTS
MAY 15, 2015

DRAWN	CHK'D / DESIGNER
HMS	PRC
DISCIPLINE	SHEET NO.

A
PROJECT NO. **2.11**

14036



- ① PLEASE VERIFY RISER HEIGHTS, TREAD DEPTHS, FLOOR SLOPES, AND INCLINE BREAK LOCATIONS VIA FIELD CHECK.
- ② COMPANION CHAIRS ARE LOCATED TO PROVIDE SEATER ALIGNMENT WITH THE WHEELCHAIR POSITIONS AS REQUIRED BY ADA CODE.

WHEELCHAIR LOCATIONS ARE SUGGESTED BY IRWIN SEATING COMPANY. PLEASE REVIEW AND ADVISE.


ADA DESIGNATED AISLE SEATS WITH RETRACTABLE ARMREST ARE SHOWN AT SUGGESTED LOCATIONS FOR ADA CODE COMPLIANCE. PLEASE REVIEW AND ADVISE.

AISLE LIGHT LOCATIONS SHOWN ARE SUGGESTED BY IRWIN SEATING COMPANY. PLEASE REVIEW AND ADVISE.

CHAIR NUMBER/LETTER SCHEME SHOWN IS SUGGESTED. CUSTOMER MAY REQUEST AN ALTERNATE SCHEME. NOTE LETTERS "I" AND "O" CURRENTLY ARE NOT USED IN ROW LETTERING SCHEME SHOWN.

ALL STANDARDS AT ENDS OF ROW ARE AISLE ENDS UNLESS OTHERWISE NOTED.

CEB ANCHORS TO BE SUPPLIED.

ACCESSORY LEGEND		
SYMBOL	ACCESSORY DESCRIPTION	QTY
	ROW TAGS: LP1 2" RD BRONZE IN END PANEL	PER PRINT
	SEAT TAGS: LP2 OVAL BRONZE ON SEAT	PER PRINT
	ADA DESIGNATED AISLE SEAT (WITH RETRACTABLE ARMREST)	6
	CONCEALED 12V WARM WHITE LED AISLE LIGHTS	34

REVISIONS	
△	DESCRIPTION
2	ADDENDUM #2

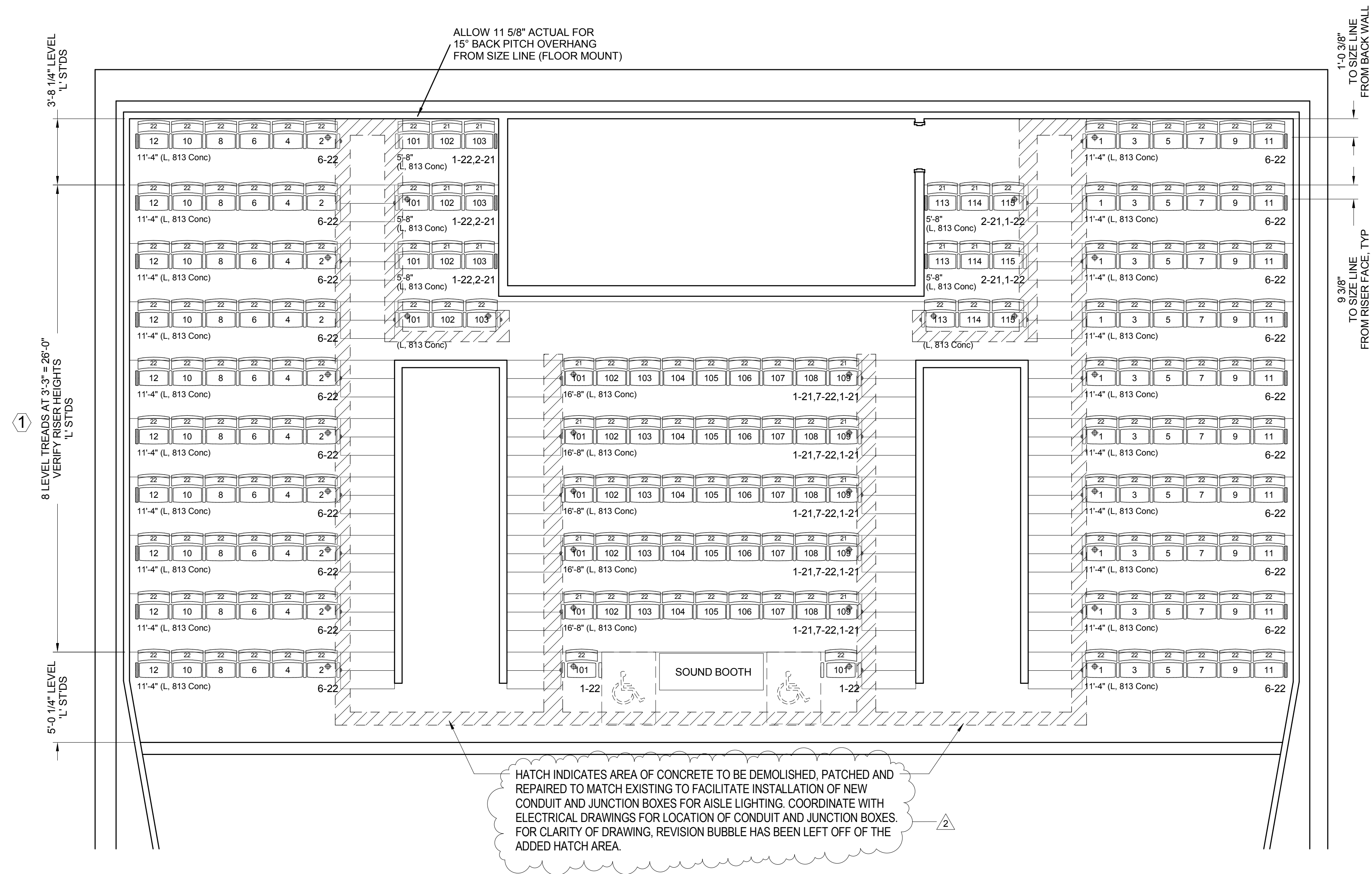
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HVAC RENOVATION
3130 KENNETT PIKE
WILMINGTON, DELAWARE 19807

A
PROJECT NO. 3.15

14036

NOTES:

1. CONCEALED LED ONLY: 100 LIGHTS MAXIMUM PER TRANSFORMER
2. BEACON LED ONLY: 68 LIGHTS MAXIMUM PER TRANSFORMER.
3. FOCAL LED ONLY: 63 LIGHTS MAXIMUM PER TRANSFORMER.
4. CONCEALED, BEACON, OR FOCAL LED MIXED: TOTAL LOAD OF ALL LIGHTS COMBINED NOT TO EXCEED 48 WATTS.
5. TOTAL LOAD USED FOR ALL LIGHTS NOT TO EXCEED 48 WATTS WITHOUT ENGINEERING APPROVAL.

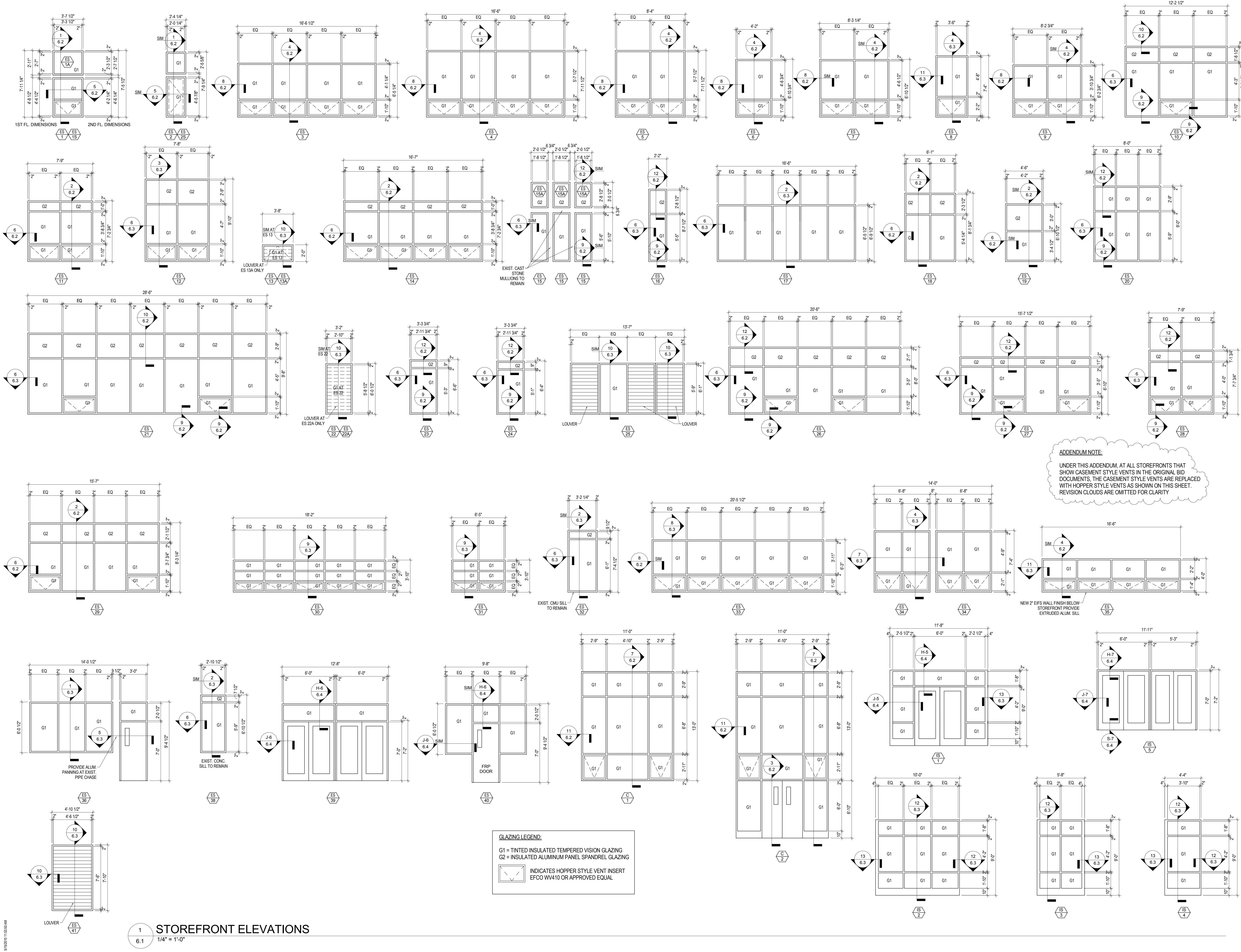
$$3.15 \quad 1/4'' = 1'-0''$$




PROJECT NO. **A-403**
14036

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5/20/2015 11:53:50 AM



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CORPORATE HEADQUARTERS
2500 WRANGLE HILL ROAD STE. 110
SEASIDE, DE 19771
P: (410) 682-1862 F: (302) 832-1423
E-Mail: info@StudioJAED.com
Website: www.StudioJAED.com

REVISIONS	
DESCRIPTION	DATE
2 ADDENDUM #2	5/15/2015

PROJECT
SHEET TITLE

RED CLAY CONSOLIDATED SCHOOL DISTRICT
A. I. DuPont Middle School
HVAC RENOVATION
3130 KENNETT PIKE
WILMINGTON, DELAWARE 19807

BID DOCUMENTS
MAY 15, 2015

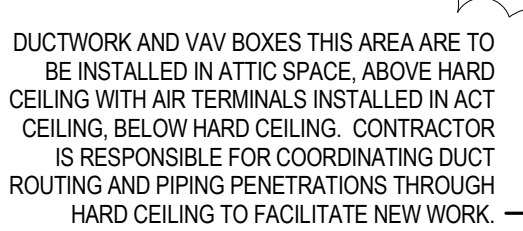
DRAWN
Author

CHKD / DESIGNER
PRC

DISCIPLINE
SHEET NO.

PROJECT NO.
14036

6.1



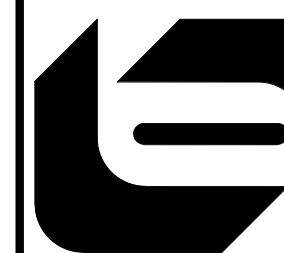
1. ALL WALL AND FLOOR PENETRATIONS TO FACILITATE MECHANICAL WORK ARE AT THE RESPONSIBILITY OF THE CONTRACTOR, AND ARE NOT SPECIFICALLY CALLED OUT. FOR TYPICAL BRICK AND CMU WALL PENETRATION DETAILS, INCLUDING LITEL GUIDELINES, SEE STRUCTURAL PLANS (S2.1).

2. EACH ZONE-LEVEL TERMINAL UNIT IS TO BE PROVIDED WITH A NEW TEMPERATURE SENSOR IN THE SAME LOCATION AS THE REMOVED TEMPERATURE SENSOR. BLANK WALL PLATES SHALL BE PROVIDED FOR ANY EXTRA THERMOSTAT / TEMPERATURE SENSOR LOCATIONS.

1
8.18

$$1/8'' = 1'-0''$$

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CORPORATE HEADQUARTERS
2500 WRANGLE HILL ROAD STE. 110
BEAR, DE 19701
P: (302) 832-1652 F: (302) 832-1423

Website:
www.StudioJAED.com

E-Mail:
info@StudioJAED.com

REVISIONS	
△	DESCRIPTION
2	ADDENDUM #2

RED CLAY CONSOLIDATED SCHOOL DISTRICT

A. I. DuPont Middle School
HVAC RENOVATION
3130 KENNETT PIKE
WILMINGTON, DELAWARE 19807

PROJECT
SHEET TITLE

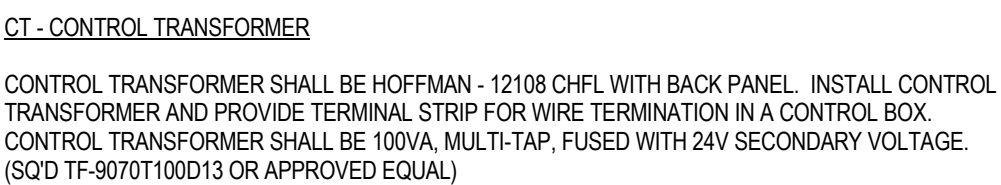
SECOND FLOOR
MECHANICAL PLAN -
AREA A

BID
DOCUMENTS
MAY 1, 2015

DRAWN	CHK'D / DESIGNER
JRB/DS	BMZ
DISCIPLINE	SHEET NO.

M
PROJECT NO. **8.18**

14036



1 LOWER LEVEL ELECTRICAL PLAN - AREA B
9.11 1/8" = 1'-0"



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CORPORATE HEADQUARTERS
1001 HILL ROAD STE. 110
BEAR, DE 19701
P: (302) 832-1652 F: (302) 832-1423
www.StudioJAED.com

E-Mail:
info@StudioJAED.com

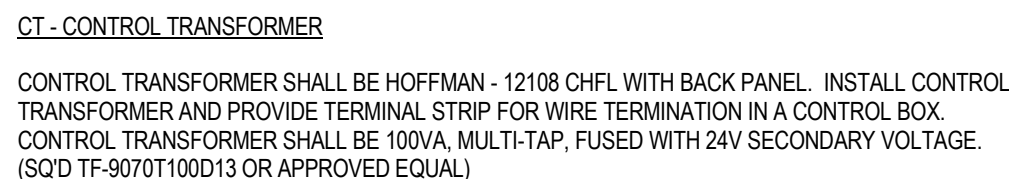
REVISIONS		
△	DESCRIPTION	DATE
2	ADDENDUM #2	5/15/2015

A. I. DuPont Middle School
HVAC RENOVATION
3130 KENNETT PIKE
WILMINGTON, DELAWARE 19807

LOWER LEVEL
ELECTRICAL PLAN -
AREA B

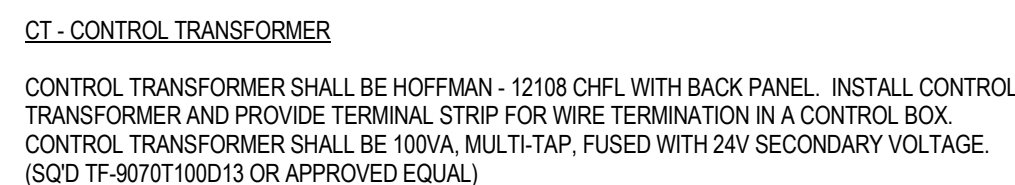
BID
DOCUMENTS
MAY 15, 2015


DISCIPLINE **E**
PROJECT NO. **9.11**



9.12 $1/8" = 1'-0"$

14036


$$1/8'' = 1'-0''$$

 **STUDIO JAED**
ARCHITECTS ■ ENGINEERS ■ FACILITIES SOLUTIONS

CORPORATE HEADQUARTERS
2800 W. RANGEL HILL ROAD STE. 110
DALLAS, TEXAS 75243
P. (972) 832-1692 F. (302) 832-1423
WWW.STUDIOJAED.COM

E-Mail:
info@StudioJAED.com

△	DESCRIPTION	DATE
2	ADDENDUM #2	5/15/2015

A. I. DuPont Middle School
HVAC RENOVATION
3130 KENNETT PIKE
WILMINGTON, DELAWARE 19807

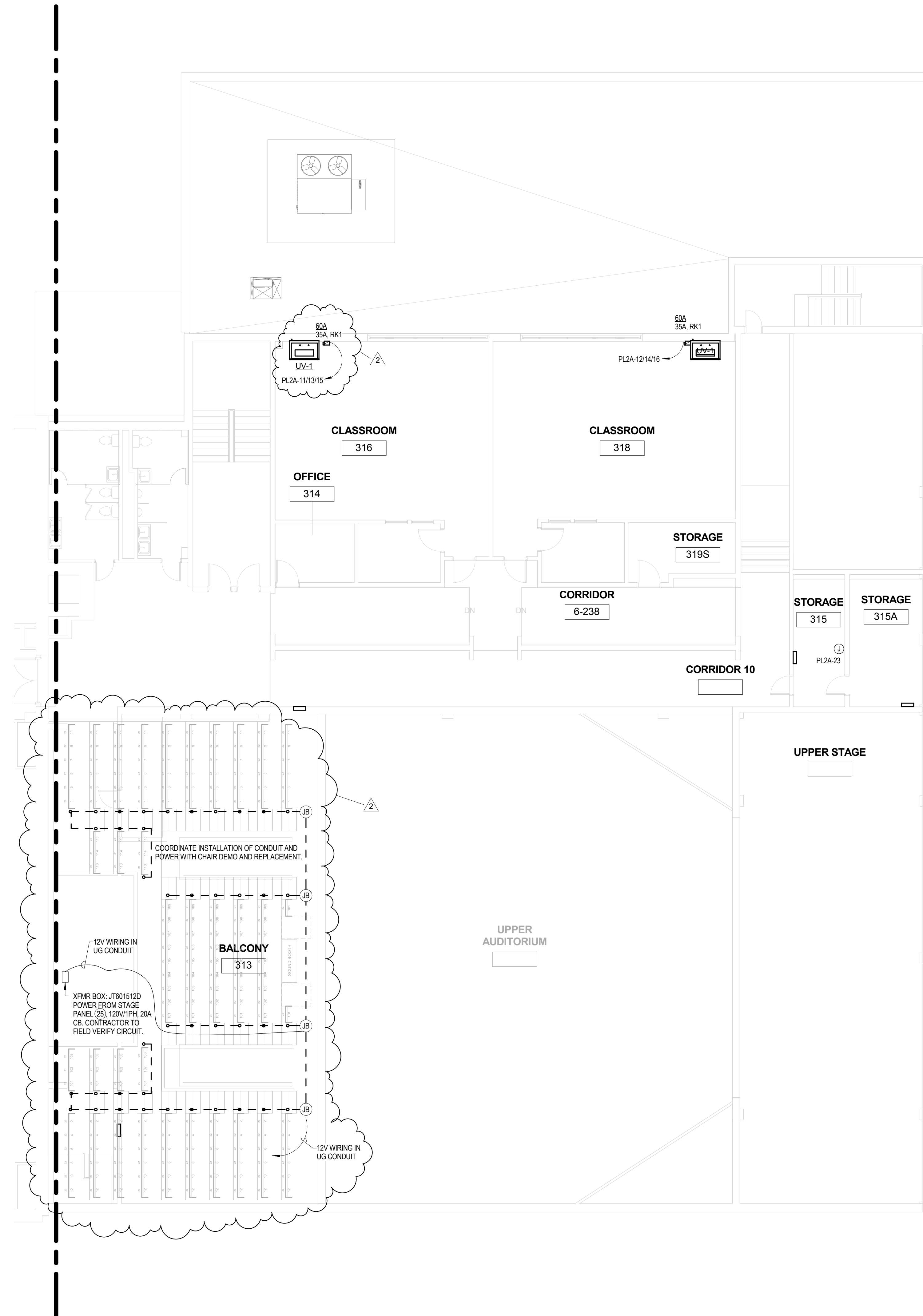
SHEET TITLE

FIRST FLOOR
ELECTRICAL PLAN -
AREA B

BID
DOCUMENTS
MAY 15, 2015

JRB	PP
DISCIPLINE	SHEET NO.

PROJECT NO. 9 13



1 SECOND FLOOR ELECTRICAL PLAN - AREA B
9.15 1/8" = 1'-0"

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REVISIONS		
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SECOND FLOOR
ELECTRICAL PLAN -
AREA B

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MAY 15, 2015

DRAWN DLS	CHK'D / DESIGNER PP
DISCIPLINE	SHEET NO.

E
PROJECT NO. **9.15**

1 ELECTRICAL SITE PLAN
9.24 1/16" = 1'-0"

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ARCHITECTS ■ ENGINEERS ■ FACILITIES SOLUTIONS

CORPORATE HEADQUARTERS
1111 ROAD STE. 110
BEAR DE 19701
P: (302) 832-1652 F: (302) 832-1423

Website:
www.StudioJAED.com

E-Mail:
info@StudioJAED.com

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DESCRIPTION	DATE
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RED CLAY CONSOLIDATED SCHOOL DISTRICT

A. I. DuPont Middle School
HVAC RENOVATION
3130 KENNETT PIKE
WILMINGTON, DELAWARE 19807

ELECTRICAL SITE PLAN

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SCIENCE SHEET NO. 2
E
PROJECT NO. 9.24

4036