

ADDENDUM NO. 4

TO

RED CLAY CONSOLIDATED SCHOOL DISTRICT
WILMINGTON CAMPUS RENOVATIONS
BID PACKAGE 'B'

This addendum is hereby made part of the Project Manual and Drawings dated 28 May 2013.

The Project Manual and Drawings shall be supplemented or amended as specified herein.

This Addendum contains changes to the requirement of the Project Manual. Such changes shall be incorporated into the Contract Documents and shall apply to work with the same meaning and force as if they had been included in the original Documents. Whenever this Addendum modifies a portion of a paragraph of the Project Manual, the remainder of the paragraph affected shall remain in force. Added information is shown as **Bold**, deleted information is shown as ~~strike through~~.

This Addendum contains changes to the requirement of the Drawings. Such changes shall be incorporated into the Contract Documents and shall apply to work with the same meaning and force as if they had been included in the original Documents. Whenever this Addendum modifies a portion of any drawing, the remainder of the drawing affected shall remain in force. Added, deleted or revised information is shown as "clouded".

The conditions and terms of the basic Contract Documents shall govern work unless otherwise described in this Addendum. Whenever the conditions of work, and the quality or quantity of materials, or workmanship are not fully described in this Addendum, the conditions of work included in the basic Contract Documents for similar items of work shall apply to the work described in this Addendum.

If no similar items of work are included in the basic Contract Document, the best quality of material and workmanship shall apply and all work shall be subject to the written acceptance of the Architect.

THE BID OPENING DATE HAS BEEN CHANGED. ALL BIDS ARE DUE AT THE MAIN OFFICE OF THE CAB CALLOWAY SCHOOL OF THE ARTS, 100 NORTH DUPONT ROAD, WILMINGTON, DELAWARE 19807 UNTIL 3:30 PM LOCAL TIME ON TUESDAY JULY 9, 2013.

BIDDERS ARE ADVISED THAT THE ONLY RELIABLE SOURCE OF DOCUMENTS FOR THIS SOLICITATION IS THE EDIS FTP SITE. BIDDERS THAT RELY ON INFORMATION PUBLISHED ON ANY OTHER COMMERCIAL WEBSITES DO SO AT THEIR OWN RISK.

BIDDERS CAN CONTACT CRAIG HENRY TO SCHEDULE A SITE VISIT AT 302-753-2405

Addendum No. 4 – Consists of the following:

- I. Response to Bidders' Questions
- II. Revisions to Project Manual/Specifications

I. RESPONSES TO BIDDERS' QUESTIONS

- A. A copy of the responses to RFI No. 25, 26, 27, & 28 are attached hereto.

II. REVISIONS TO PROJECT MANUAL/SPECIFICATIONS

- A. **SECTION 011100 – SUMMARY OF WORK:** Make the following pen and ink changes to this section and annotate these changes as Addendum No. 4.

1. Contract B-07 – Carpentry and General Work

- a) ADD the following NEW items after item 7-36 on page 011100-17:

“7-37. Install Owner supplied plaques. ”

“7-38. Provide full height temporary demising partitions from the floor to underside of the roof deck. Partitions shall be braced back to the existing structure. The partitions shall have no mechanical attachments to the finished floor or existing wall systems. Partitions shall be sound attenuated with insulation and sealed to assure no migration of sound, dust or odors. Provide ½” drywall on both sides. The Occupant side shall receive a level 4 finish. Provide (3) three double door openings w/ locking hardware. This contractor shall also remove and dispose of the demising partitions and doors upon completion of construction. Refer to the Construction Barrier Delineation Sketch# EDIS-20130627-01 in Section 015200 – Construction Facilities & Temporary Controls. ”

2. Contract B-11 – Metal Studs and Drywall

- a) DELETE item 11-6 on page 011100-25. Installation of hollow metal frames is assigned to Contract B-07 Carpentry and General Work.

3. Contract B-12 – Painting

- a) ADD the following NEW item after item 12-20 on page 011100-28:

“12-21 Paint exterior side of the construction barrier wall and doors, color TBD. Refer to the Construction Barrier Delineation Sketch# EDIS-20130627-01 in Section 015200 – Construction Facilities & Temporary Controls.”

4. Contract B-17 – Mechanical and Plumbing – Theater

- a) ADD the following NEW item after item 17-32 on page 011100-36:

“17-33 Provide and maintain a temporary and complete exhaust system that will serve both the theatre and stage areas. This system shall utilize the existing roof openings in both areas to place the fans, duct work, and applicable components. Where the location of any units require temporary removal of existing roof components, such as smoke hatches, hoods, etc., this contractor shall store, protect, and re-install those components to proper working condition upon removal of the temporary exhaust system. Provide bird screening on both the inlet and outlet sides

of the units. Provide removal and disposal of all temporary exhaust system components when directed by the Construction Manager. All units shall be installed in such a manner as to not allow any weather infiltration into the work space or adjacent spaces at any time. The electrical contractor will provide the means of power, disconnects, and switching. Consider that the system will be utilized in its entirety when in use. Calculations in sizing the system units will be based on achieving four (4) air exchanges per hour. At a minimum, the theatre area fan sizing should be 16,000 cfm and the stage area 5,000 cfm. Any considerations for relief air locations, outside of the exterior door openings, must be coordinated and approved by the Construction Manager."

5. Contract B-18 – Electrical, Fire Alarm & Special Systems

- a) REPLACE item 18-1.n on page 011100-37 with the following REVISED item 18-1.n:

"n. Provide electrical service to Natatorium Unit, HRU-1. The starter/disconnect has been changed to the 100A-3/P fused W/P disconnect."

- b) REPLACE item 18-19 on page 011100-39 with the following REVISED item 18-19:

"18-19. Provide complete sound and video systems to include conduits, boxes, wiring, controls, equipment, etc."

- c) ADD the following NEW item after item 18-30 on page 011100-39:

"18-31. Provide and maintain the necessary means of temporary power, disconnects, raceway, and switching for the temporary exhaust system as provided by the mechanical/plumbing contractor. Provide the removal and disposal of all temporary power components upon the removal of the temporary exhaust system. Locations for this work will be as coordinated with the applicable trade(s) and the Construction Manager."

B. SECTION 015200 – CONSTRUCTION FACILITIES & TEMPORARY CONTROLS

1. INSERT the attached Construction Barrier Delineation Sketch# EDIS-20130627-01 after the statement "END OF SECTION" on page 015200-8.

C. SECTION 06 10 00 ROUGH CARPENTRY.

1. Page 1, Article 2.01: DELETE Sentence C and D. Sustainably harvested wood is not required.

D. SECTION 12 61 16 – FIXED AUDIENCE SEATING.

1. DELETE Section and REPLACE with new section of the same name, included in this addendum.

E. SECTION 23 04 50 – REFRIGERATION EQUIPMENT – HVAC

1. Page 7, Article 2.1.I: ADD Trane to list of Manufacturers.

F. SECTION 23 07 30 – TERMINAL HEATING AND COOLING EQUIPMENT

1. INSERT New section attached. (This section is the attachment identified in Addendum No. 3 dated 27 June 2013.)

G. SECTION 23 07 32 – TERMINAL HEAT PUMPS

1. Insert New section attached. (This section is the attachment identified in Addendum No. 3 dated 27 June 2013.)

H. SECTION 23 07 60 – AIR HANDLING EQUIPMENT

1. Page 9, Article 2.2.L: ADD Trane to list of Manufacturers

END OF ADDENDUM NO. 4



REQUEST FOR INFORMATION

TO: CHANDRA NILEKANI, ABHA

PRE-BID RFI#: 25

FROM: VINNIE COLONNA

DATE: 24 JUNE 2013

PROJECT: WILMINGTON CAMPUS RENOVATIONS – BID PACK 'B'

DWG. # / DETAIL: _____ SPEC. SECTIONS: _____ PAGE: _____

REQUEST:

The drywall scope of work lists installation of all hollow metal frames in all drywall partitions, bullet 11-6. The carpentry scope of work states to provide hollow metal and wood doors and frames, bullet 7-4. Please clarify which package installation of hollow metal doors frames are in. I am assuming carpentry.

Submitted By: Ken Coldiron, BCI

Date: 24 June 13

RESPONSE:

Contract B-07 Carpentry & General Work.

Response By: Vinnie Colonna, EDiS

Date: 25 June 13



REQUEST FOR INFORMATION

TO: CHANDRA NILEKANI, ABHA PRE-BID RFI#: 26

FROM: VINNIE COLONNA DATE: 25JUNE 2013

PROJECT: WILMINGTON CAMPUS RENOVATIONS – BID PACK 'B'

DWG. # / DETAIL: _____ SPEC. SECTIONS: _____ PAGE: _____

REQUEST:

Should we assume that the scaffolding in the auditorium is for the use of all trades and could be utilized by the drywall package for high walls and cloud installation?

Submitted By: Ken Coldiron, BCI Date: 25June 13

RESPONSE:

The scaffolding is specifically for the rough-in and finishing of items in the ceiling, installation of ceiling clouds. The scaffolding will not be utilized for high walls of the drywall package or Masonry.

Response By: Vinnie Colonna, EDiS Date: 02 July 13



REQUEST FOR INFORMATION

TO: CHANDRA NILEKANI, ABHA

PRE-BID RFI#: 27

FROM: VINNIE COLONNA

DATE: 27 JUNE 2013

PROJECT: WILMINGTON CAMPUS RENOVATIONS – BID PACK ‘B’

DWG. # / DETAIL: _____ SPEC. SECTIONS: _____ PAGE: _____

REQUEST:

1. Drawing TL-108 shows a conduit riser for what I believe to be controls. Note # 4 tells me to install a pull string in all conduit.
2. Drawing TL-105 shows a bunch of CAT 5 data cables and some fiber optic cables. (I’m thinking they go into the riser shown on TL-108 but nothing tells me to do that.) Item 18-20 on the electrical scope of work says just pull strings for tele/datawiring by others.
3. I think there may be a hole here. Is the intent to have the electrical install the cat 5 cables shown on TL-105?
4. If so they should they have been included on the Riser on TL-108?

Submitted By: Matt Healy, Nickle Electrical Companies

Date: 27 June 13

RESPONSE:

All the work is the responsibility of the Electrical Contractor (EC) – especially if the stage lighting contractor is a sub to the EC, which I believe is true on this project.

Typically we ask that the EC do all the back boxes, conduit, etc. for the low voltage control wiring and leave pull string in for the stage lighting (sub) contractor to pull and terminate the data/control wiring. If the EC wants to do it all, that’s between them and their sub...

Additional follow up... If Nickel Electrical is bidding this job as a “complete” Division 26 contractor, and are including all of the work of Section 26 55 31 in their bid, they are responsible for all the control conduit and wring - whether by themselves directly or by a stage lighting subcontractor - as the work is parceled out in section 26 55 31. Specification Section 26 55 31 (Stage Lighting Systems) says:

1.01 - WORK INCLUDED



- A. Without restricting volume or generality of above "Scope," work to be performed under this section shall include, but not be limited to, the furnishing and installation of the following:
 1. Auditorium and Stage
 - a) A computer controlled dimming system with approximately 268 dimmers and 40 120V non dim circuits and 20 208-240V nondim circuits. The design shall incorporate two of house catwalk position, four front of house torm lighting positions, four on stage lighting battens, apron lighting, two onstage plugging boxes, eight on stage floor pockets one orchestra pit plugging box, and two concert ceilings. Lighting network receptacles shall be located at each of the previously listed lighting positions. There shall be three follow spotlights. The stage lighting system consists of the stage dimmer cabinets, non-dim panels, auxiliary racks, circuit distribution raceways, a fiber optic backbone, wire, DMX-512 computer based stage lighting console, video display, console plug-in stations, a backstage control panel, a mix of conventional, LED and moving head stage lighting fixtures, cables, accessories and spares. The system infrastructure will be network based.
 - b) A separate house lighting dimmer rack with 24 dimmers shall be included. House Lighting Control shall consist of a backstage control station, a control booth control station, a control booth entry station and entry stations located at the auditorium exits
- B. The Contractor shall examine the plans in detail to familiarize himself with the scope of work.
- C. The Contractor shall provide the required manufacturers' shop drawings.
- D. The Contractor shall provide all the necessary specialty equipment for the complete lighting and dimming system installation as specified herein, and shown on the drawings.
- E. The Contractor shall coordinate the system control wire conduit and device locations with the Division 26 Contractor.
- F. The Contractor shall deliver to the job site, and coordinate the installation of, the specialty equipment with the Division 26 Contractor.
- G. The Contractor shall provide, install and terminate all system control wires.
- H. The Contractor shall provide and install all system control devices.
- I. The Contractor shall uncrate, assemble, lamp, hang and aim all the stage lighting fixtures as shown on the drawings.
- J. The Contractor shall provide for the system activation.
- K. The Contractor shall provide the system manuals.
- L. The Contractor shall provide the system warranty.
- M. It is the Contractor's responsibility to ensure that the system and all of the system components, fixtures, equipment, devices, wire, terminations, field assemblies (including custom assemblies), etc pass all required inspections by the local authority having jurisdiction.



N. Procurement of all required permits.

1.02 - WORK NOT INCLUDED

A. The following work, although in another section, has a significant impact on the scope of this work. The Contractor is responsible for the successful coordination of the following:

1. System conduit.
2. Installation and termination of Line supply.
3. Installation and termination of Load wire.
4. Dimmer rack installation.
5. Distribution installation.

So if Nickel Electrical is bidding this job as a "complete" Division 26 contractor, and are including the work of Section 26 55 31 in their bid, they are responsible for all the control conduit and wiring, either by themselves or by the stage lighting subcontractor.

Response By: Peter Scheu, ASTC Date: 02 July 13



REQUEST FOR INFORMATION

TO: CHANDRA NILEKANI, ABHA PRE-BID RFI#: 28

FROM: VINNIE COLONNA DATE: 2 JULY 2013

PROJECT: WILMINGTON CAMPUS RENOVATIONS – BID PACK 'B'

DWG. # / DETAIL: _____ SPEC. SECTIONS: _____ PAGE: _____

REQUEST:

Some things were added in addendum 3 that lead to the following questions regarding the scope of the B-10 Steel Package:

1. Specifications changes:

A. Pages 3 and 4 of 24:

D. SECTION 011100 – SUMMARY OF WORK

1. Contract B-07 – Carpentry and General Work

- a) ADD the following NEW items after item 7-32 on page 011100-17:
“7-33. Provide metal support brackets for countertops.”

Does this remove the metal brackets from the steel package?

B. Pages 5 of 24:

SECTION 11 61 23 – ORCHESTRA PIT FILLER SYSTEM

1. Page 6, Article 3.02 Standard Manufactured Components:

INSERT item 3.02.E after item

3.02.D:

“E. Additional Items

1. Add a performance level position 1/2 way between the orchestra pit floor and the auditorium floor level.
2. Provide one set of 4'-0" wide steps with handrail up to this level from the pit floor, and one set of 4'-0" wide steps with handrail down to this level from the auditorium floor
3. Provide a 42" high removable railing assembly, attached to the platform, adjacent to the closure panel at the stage, across the rear of the platforms.”

Is any of the above mentioned railing in the steel package?



2. Drawing changes:

A. Drawing A-114: Note 11 added with reference to detail E3/A-506. Drawing A 506: Detail E3/A-506 added with 16 GA. Deck infills.

Is the supply and install of this deck in the steel package?

Submitted By: Bill Baum, Kinsley Steel

Date: 2 July 13

RESPONSE:

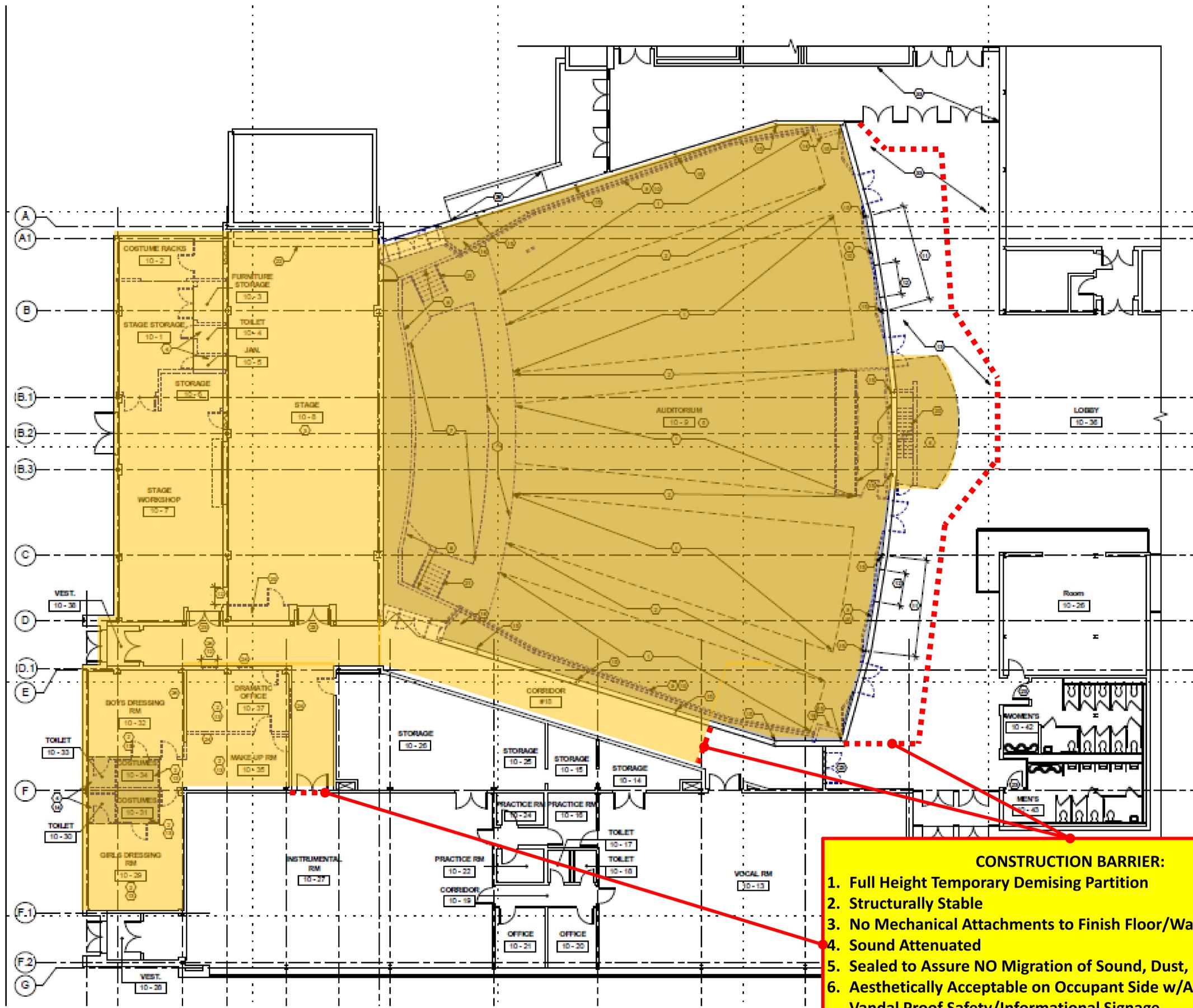
1A – These brackets support the countertops shown on drawing A-402 and are not part of Contract B-10 Structural Steel and Misc Metal's scope.

1B – The railing and stairs described in Addendum No. 3 are part of the orchestra pit filler system and is the responsibility of Contract B-15 Stage Rigging and Equipment. Contract B-10 Structural Steel is responsible for the removable handrail on 3 sides of the orchestra pit as shown on A-508. This work is part of scope item 10-18. The wood panels on the removable rails are assigned to Contract B-07 Carpentry and General Work.

2A – Yes. See scope item 10-32 on page 011100-24.

Response By: Christian McCone, EDiS

Date: 02 July 13



- CONSTRUCTION BARRIER:**
1. Full Height Temporary Demising Partition
 2. Structurally Stable
 3. No Mechanical Attachments to Finish Floor/Wall Systems
 4. Sound Attenuated
 5. Sealed to Assure NO Migration of Sound, Dust, or Odors
 6. Aesthetically Acceptable on Occupant Side w/Appropriate Vandal Proof Safety/Informational Signage
 7. Consider (3) Three Double Door Openings w/Locking Hardware

Sketch # EDIS-20130627-01
 Bid Pac B
 Construction Barrier Delineation

SECTION 12 61 16
FIXED AUDIENCE SEATING

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Refer to Scope Information Sheets for this contract bound in the Project Manual under Section 01 10 00, Summary of Work. The scope Information Sheets describe generally the work included in each contract, but the work is not necessarily limited to that described.
- B. Provide all material, labor, equipment and services and perform all operations necessary or required for the work of the section, in accordance with Drawings and Specifications, and including fabrication and installation of fixed audience seating.

1.02 SUMMARY

- A. Deliver and install fixed and movable seats as specified, with self-lifting seat which rises to a $\frac{3}{4}$ safety fold position and can be pushed back to full fold.
- B. Layout shown on Drawing 1-121 is for design intent only. Provide seats as follows:
 - a. Provide a total of 990 fixed seats, approximately 10 of which will be knock-down for extra parts.
 - b. Provide a total of 38 movable seats on 16 bases
 - c. Provide up to 8 retractable armrests at end of aisle. (location to be determined)

1.03 COORDINATION

- A. Do not deliver or install seating until space is free of lifts and/or scaffolding used by other trades which may interfere with installation and/or damage seating.
- B. Coordinate concrete requirements needed for proper installation.

1.04 ACTION SUBMITTALS

- A. Product data for each chair model specified to include construction details, material descriptions and finish options
- B. Seating layout (shop drawings) developed from the contract drawings which show aisle widths, chair spacing for each row, row-lettering and chair-numbering scheme, chair dimensions and back pitch. Layout drawings to also include locations for accessories, electrical devices, accessibility provisions and attachments to other work.
- C. Samples for verification & finish selection to include:
 - 1. Finish selections to be made from manufacturer's standard color and fabric guides.
- D. Maintenance instructions and inspection guidelines furnished for each chair model specified.
- E. Manufacturer's standard warranty.

1.05 INFORMATIONAL SUBMITTALS

- A. Welding certificates.

1.06 QUALITY ASSURANCE

- A. Source Limitations:
 - 1. Obtain each type of fixed seating required, including accessories and mounting components, from a single manufacturer.
 - 2. Obtain fabric of a single dye lot for each color and pattern of fabric required except when yardage requirement exceeds maximum dye lot. Multiple dye lots shall be color matched for quality assurance.

- B. Fire Performance Characteristics of Upholstered Seating:
 - 1. Fabric shall be Class 1 according to DOC CS 191 and 16 CFR 1610.61, tested according to California Technical Bulletin 117.
 - 2. Padding shall comply with California Technical Bulletin 117.

1.07 PROJECT CONDITIONS

- A. Environmental Limitations:
 - 1. Do not deliver or install seating until spaces are enclosed and weather tight, wet work in spaces is complete and dry, work above ceilings is complete, and temporary or permanent HVAC system is operating and maintaining ambient temperature and humidity at occupancy levels during the remainder of the construction period.
- B. Field Measurements:
 - 1. Take field measurements to verify or supplement dimensions indicated on contract drawings prior to manufacturing.

1.08 WARRANTY

- A. Provide a manufacturer's warranty covering the material and workmanship for the specified warranty period from date of final acceptance.
- B. Warranty Periods:
 - 1. Structural Components: five years.
 - 2. Operating Mechanisms: five years.
 - 3. Plastic, Wood and Painted Components: five years.
 - 4. Upholstery Fabric: one year.
 - 5. Electrical components: one year.

PART 2 PRODUCTS

2.01 MATERIALS AND FINISHES

- A. Steel shall meet requirements for ASTM A 36/A 36M plates, shapes, and bars; ASTM A 513 mechanical tubing; ASTM A 1008/A 1008M cold-rolled sheet; and ASTM A 1011 hot-rolled sheet and strip.
- B. All exposed metal parts shall be powder coated. The powder coat finish shall be applied by electrostatic means to a thickness of 2 - 5 mils. Manufacturer's standard color range shall be used.
- C. Exposed plywood shall meet requirements for HPVA HP-1, Face Grade A, hardwood veneer core with color-matched hardwood-veneer faces, made with adhesive containing no urea formaldehyde.
 - 1. Hardwood lumber and veneer faces shall be maple selected to be free of visible defects. Exposed wood shall be sanded smooth and stained to color selected with low-VOC water-based stain and top coat to provide with a high quality finish. Color to be chosen from manufacturer's standard offering.
- D. Plastic Laminate shall meet requirements NEMA LD 3, Grade VGS for vertical surfaces and Grade HGS. Color and pattern to be chosen from manufacturer's standard offering.
- E. Fabric: Shall meet Class 1 flammability requirements of the U.S. Department of Commerce Commercial Standard 191-53 per Bulletin #117 (California Code).
- F. Upholstery padding shall be molded or slab polyurethane foam.
- G. Molded Plastics:

1. Structural components shall be mar and dent resistant high density glass-filled polypropylene with UV stabilizers
2. Decorative components shall be mar and dent resistant high density polyethylene (HDPE) with UV stabilizers.
3. Plastic components shall be chosen from manufacturer's standard offering.

2.02 MANUFACTURERS

A. Manufacturers:

1. Approved Manufacturer shall furnish list of at least 5 similar school projects with chairs installed for a minimum of 5 years.
2. Manufacturer shall have been in business for a minimum of 15 years with at least 10 years of experience in manufacturing auditorium type seating similar to specifications.

2.03 FIXED AUDITORIUM SEATING

A. Basis-of-Design:

1. Subject to compliance with requirements, the following are approved.
 - a. Irwin Seating Company No. 90.12.80.4 Citation.
 - b. Seating Concepts LLC; Product: BW-220, Contour.
2. For pre-approved products in 1: Where gauges and details of construction vary from minimums listed in this specification, manufacturer's standards are acceptable.

B. Chair Mounting Minimum Standards

1. Center standards: Pedestal design with a 1" x 3" rectangular 16 gauge steel tube attached by concealed weld to a 3-1/4" x 8" 14 gauge deep formed steel foot with four holes for attachment of the standard to a concrete floor with lead shielded expansion bolts.
2. Seat pan attachment: 1/4" steel bracket integrated into the standard at mid point.
3. Anchor for seat pan to standard: 5/16" hexagon fusion nut and hexagon bolt of 5/16" x 3/4" through a threaded insert on the steel seat bracket.
4. Back attachment: 14 gauge sheet metal lug support.
5. Armrest attachment: 16 gauge plate welded to the top of the column.
6. Aisle standards: Oval, fabricated same as the center standards with frame securely attached to the column to accept a end panel.
7. End Panel: laminated plastic from manufacturer's standard to be selected by architect.
8. End panels to be furnished as shown on seating plan.

C. End Aisle Panels:

1. Curved design or as listed for approved models.
2. LED aisle light – provide at each row. Seat manufacturer to provide transformers as required.

D. Armrests:

1. Armrests: solid hardwood, stained to a finish, curved top, rounded edges.

E. Chair Backs

1. Chair back padding: cold molded polyurethane foam of 2" thickness minimum.
2. 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".
3. All attachment screws shall be fully concealed.

4. Back wings shall have provision for 15 degree, 19 degree or 23 degree pitch or standard for approved models.
 5. Overall height of the chair from floor to top of the back is a minimum 34" as measured in the 19 degree or equivalent back pitch.
- F. Seats:
1. Seat cushion: Ergonomic.
 2. Foundation: One piece reinforced injection molded polypropylene.
 3. Seat cushion: Cold molded to the contour of the foundation
 4. Flanges for attachment to the standards: 7 gauge steel.
 5. High resistant nylon bushings are used at the pivot points to prevent metal to metal contact.
 6. The specified fabric: panel side construction and manufactured as a slip cover with a draw string application, and secured to foundation.
 7. Self lifting mechanism: gravity lift or spring actuated
 8. Enclose seat frame and return mechanism with injection molded polypropylene cover with a decorative embossment and attaches to the frame without screws or other fasteners.
- G. Chair width shall vary to accommodate row lengths.
- H. Back height and pitch shall be fixed as shown on seating layout drawings.
- I. Fabric
1. Basis-of-Design:
 - a. Guilford of Maine Guildford-of-Maine Grade J Pattern Open House
 - b. Absecon Mills Grade F Pattern SherpaColors to be selected from manufacturer's standard colors and patterns.
- J. Accessories
1. Number and letter plates (Manufacturer Standard Rectangular Size: 11/16" X 1 5/8")
 2. Lift up arm ADA aisle standard
 3. Aisle lights (concealed LED)
- K. Accessible Seating:
1. Shall be designated on the seating layout drawings and designed to allow an individual to transfer from a wheelchair to the theatre chair.
 2. The aisle standard shall be equipped with an armrest capable of lifting to a position parallel with the support column, opening sideways access to the seat.
 3. Aisle standards so equipped shall be provided with a label, displaying an easily recognizable "handicapped" symbol.
 4. Decorative requirements of aisle standards are waived for the handicapped access standards.
- L. Extra Materials:
1. Furnish extra materials from the same production run that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 2. Provide 10 yards of additional fabric (of each color).
 3. Replacement Seat and Back Covers: A quantity of cut and sewn seat and back upholstery covers shall be provided. Covers shall be pro-rated according to sizes & colors of chairs in the seating layout. Quantity of covers to be provided shall be sufficient to re-upholster 5% of the chairs.
 4. Provide spare chairs as knock-down in quantity noted in specification or drawing.

M. Fabrication:

1. Manufacture fabric-covered cushions with molded padding beneath fabric and with fabric covering free of welts, creases, stretch lines, and wrinkles. For each upholstered component, install pile and pattern run in a consistent direction.
2. Fabricate floor attachment plates to conform to floor slope.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Prior to layout and installation examine floors, risers, and other adjacent work and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the work including, but not limited to, plumb of riser faces and concrete conditions.
- B. Examine locations of electrical connections.
- C. Examine locations of HVAC supply ducts.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Install seating in locations indicated and fastened securely to substrates according to manufacturer's written installation instructions.
- B. Use installation methods and fasteners that produce fixed audience seating assemblies with individual chairs capable of supporting an evenly distributed 600-lb static load applied 3" from front edge of the seat without failure or other conditions that might impair the chair's usefulness.
- C. Install seating with chair end standards aligned from first to last row and with backs and seats varied in width and spacing to optimize sightlines.
- D. Install chairs in curved rows at a smooth radius.
- E. Install seating so moving components operate smoothly and quietly.

3.03 ADJUSTING

- A. Adjust chair backs so that they are properly aligned with each other.
- B. Adjust self-rising seat mechanisms so seats in each row are aligned when in upright position.
- C. Verify that all components and devices are operating properly.
- D. Repair minor abrasions and imperfections in finishes with coating that matches factory-applied finish.
- E. Replace upholstery fabric damaged during installation.

3.04 CLEANING

- A. All debris caused by this work shall be removed from the auditorium and other work areas, and the areas left clean and free of debris. Cardboard from cartons shall be broken down into manageable piles and stacked neatly in the designated trash collection area on site.

END OF SECTION

SECTION 23 07 30

TERMINAL HEATING AND COOLING EQUIPMENT

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the contract, including the conditions of the contract (General, Supplementary and other Conditions, if any) and Division 1 as appropriate, apply to the work specified in this section.
- B. Refer to Section 230200 for HVAC General Provisions
- C. Refer to Section 230210 for HVAC Basic Materials & Methods.

1.2 DESCRIPTION OF WORK

- A. This Section includes work necessary and/or required and materials and equipment for construction of a complete system. Such work includes, but is not limited to the following:
 - 1. Belt-Driven Fan Coil Units

1.3 REFERENCE STANDARDS

- A. Refer to Section 230200 for a general description of requirements applying to this section.
- B. Media type air filters shall comply with U.L. Standard 900.

1.4 QUALITY ASSURANCE

- A. Refer to Section 230210 for a general description of requirements applying to this Section.

1.5 SUBMITTALS

- A. Submit shop drawings in accordance with Section 230200.
- B. Submit shop drawings and descriptive data for all equipment specified in this section.

1.6 SUBSTITUTIONS

- A. The listed equivalent or substituted manufacturers along with the bidding related contractor shall be completely responsible to comply with all requirements on all contract documents. This shall include, but not limited to, space requirements, code clearances, the type, horsepower, capacities, number and size of services required from other trades, including all required ancillary items provided by other trades. If the manufacturer or related bidding contractor does not comply with these requirements, this Contractor shall be responsible for any and all additional costs associated with the changes required by other trades.

1.7 WARRANTY/GUARANTEE

- A. All work and materials are subject to the general warranty as described in the General Conditions of the Contract and in Division 1, General Requirements. In addition, the following special guarantee applies:
 - 1. Each compressor unit shall be provided with manufacturer's five (5) year warranty.

PART 2 – PRODUCTS

2.1 BELT-DRIVE FAN COIL UNITS

- A. Provide belt-drive fan coil air conditioners scheduled on the plans.
- B. Basic unit and cabinet shall be fabricated of 18 gauge galvanized steel. Interior cabinet surfaces shall be acoustically and thermally insulated with 1-inch coated glass fiber insulation meeting NFPA 90A requirements.
- C. All units shall have a side access panel to provide for servicing and removal of the motor-blower assembly. The front panel is to be provided with a 1-inch supply air duct collar. The rear panel shall be provided with a 2-inch return air duct collar which permits side filter removal without removing any panels.
- D. Coils shall be 6 rows and have 1/2 inch OD copper tubes with aluminum fins mechanically bonded to the tubes. Hot water coils shall be fitted with manual air vents. Coils shall be factory leak tested at 360 psig and suitable for working pressure up to 250 psig. Coil connections shall be sweat fittings.
- E. Motors shall be 1725 RPM either single phase (resiliently mounted) or three-phase (welded base mounted) or bolted to an adjustable platform to permit ease of belt adjustment.
- F. Fans shall be of the double inlet, centrifugal, forward-curved type. Fan wheels shall be statically and dynamically balanced.
- G. Drive Package: Adjustable drives are standard for balancing the air flow.
- H. Drain pans shall be fabricated of 18-gauge galvanized steel with interior surfaces insulated with a sprayed-on, closed cell polyurethane material.
- I. Filters: All units shall be furnished two (2) sets of 1-inch woven glass fiber throwaway filters.
- J. Manufacturers: Carrier, International Environmental Corp., McQuay, Trane, USA Coil & Air, York/Johnson Controls.
 - 1. Any listed equivalent manufacturer and the Mechanical Contractor shall be completely responsible to comply with all requirements on the contract documents. This shall include, but not be limited to, space requirements, code clearances, the type, horsepower, capacities, number and size of services required from other trades.

PART 3 – EXECUTION

3.1 INSPECTION

- A. Examine areas and conditions under which equipment is to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.
- B. Install in accordance with manufacturer's recommendations. Unit and all component sections shall be properly supported and vibration isolated.

3.2 INSTALLATION

- A. Verify that coils, filters, motors, drives and other components are matched with the proper unit.
- B. Assemble unit components following manufacturer's instructions for handling, testing and operating. Repair damaged galvanized areas, and paint in accordance with manufacturer's written recommendations.
- C. Vacuum clean interior of units prior to operation.
- D. Repair air leaks from or into casing that can be heard or felt during normal operation.
- E. Perform field mechanical balancing in accordance with Section 230950: TESTING AND BALANCING OF MECHANICAL SYSTEMS.
- F. The Mechanical Contractor shall own as a part of his work, the following:

Provide one (1) additional drive set, if necessary, to obtain final design balancing requirements. The Mechanical Contractor shall coordinate with Balancing Contractor and equipment manufacturer for drive selection, including belts and pulleys.

END OF SECTION 230730

SECTION 23 07 32

TERMINAL HEAT PUMPS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the contract, including the conditions of the contract (General, Supplementary and other Conditions, if any) and Division 1 as appropriate, apply to the work specified in this section.
- B. Refer to Section 230200 for HVAC General Provisions
- C. Refer to Section 230210 for HVAC Basic Materials & Methods.
- D. Refer to Section 230216 for Geothermal Piping, Fittings and Valves.

1.2 DESCRIPTION OF WORK

- A. This Section includes work necessary and/or required and materials and equipment for construction of a complete system. Such work includes, but is not limited to the following:
 - 1. Floor Standing Heat Pump with Heating Coil (Heat Wheel)

1.3 REFERENCE STANDARDS

- A. Refer to Section 230200 for a general description of requirements applying to this section.
- B. Media type air filters shall comply with U.L. Standard 900.

1.4 QUALITY ASSURANCE

- A. Refer to Section 230210 for a general description of requirements applying to this section.

1.5 SUBMITTALS

- A. Submit shop drawings in accordance with Section 230200.
- B. Submit shop drawings and descriptive data for all equipment specified in this section.

1.6 SUBSTITUTIONS

- A. The listed equivalent or substituted manufacturers along with the bidding related contractor shall be completely responsible to comply with all requirements on all contract documents. This shall include, but not limited to, space requirements, code clearances, the type, horsepower, capacities, number and size of services required from other trades, including all required ancillary items furnished and installed by other trades. If the manufacturer or related bidding contractor does not

comply with these requirements, this Contractor shall be responsible for any and all additional costs associated with the changes required by other trades.

1.7 WARRANTY/GUARANTEE

- A. All work and materials are subject to the general warranty as described in the General Conditions of the Contract and in Division 1, General Requirements. In addition, the following special guarantee applies:
 - 1. Each compressor unit shall be provided with manufacturer's five (5) year warranty.

PART 2 – PRODUCTS

2.1 FLOOR-STANDING HEAT PUMP WITH HEATING COIL (HEAT WHEEL)

- A. Furnish and install a self-contained floor standing through-the-wall, air-to-air heat pump. The floor-mounted heat pump shall be completely factory assembled and tested, and shall include compressor, indoor and outdoor coils, fans and motors as required, interconnecting refrigerant tubing, wiring, circuit breakers, built-in fresh air ventilation feature, and other necessary components mounted in a corrosion resistant cabinet. The system shall be shipped from the factory with a full operating refrigerant and oil charge. The manufacturer shall provide DDC controllers, mixing box temperature sensors, discharge air sensors from the BAS vendor for factory installation and wiring.
- B. The units shall be capable of accepting factory supplied optional plenums providing freeblow conditioned air into the space. Further, the units shall be equipped with factory supplied hot water heat accessories.
- C. Approvals: Each heat pump shall be certified in accordance with ARI Standard 240-81, and listed by Underwriters Laboratories (UL).
- D. Performance: (As Scheduled on the Drawings)
- E. Design Features:
 - 1. Sound Level: The heat pump shall be tested in accordance with ARI Standard 350, "Sound Rating of Non-ducted Indoor Air Conditioning Equipment". Standard rating cooling capacity temperature conditions will be maintained during the testing. The unit shall be tested in the cooling mode with the freeblow plenum attached.
 - 2. Cabinet: The cabinet of the heat pump shall be constructed of 20-gauge galvanized steel with a mark and scratch resistant polyester finish tested and accepted to 1000 hours salt spray resistance per NCCA bull 111-2/ASTM B-117, covering the front and side of the cabinet exterior surface. Interior surface of cabinet shall be lined with a flexible resilient acoustical and thermal insulation (Thermo Mat or equivalent) composed of glass fibers bonded with a thermosetting resin. thickness of insulation shall be 1-1/2". All outside cabinet panels shall be fastened with a tamper-resistant sheet metal screws. Access to electrical breaker for heat pump power supply shall be through a single key lock cover on the indoor front panel of the unit.

3. Air Filter: The heat pump shall accept a 1" thick air filter, mounted internally and factory supplied, and located behind the return air grille.
 4. Compressor: The compressor shall be a fully hermetic type, either reciprocating or scroll design. All heat pumps equipped with reciprocating compressors shall have an acoustical blanket wrap factory installed as standard equipment and shall be equipped with an immersion type self-regulating crankcase heater.
 5. Refrigeration Circuit: The refrigeration circuit shall contain a liquid filter dryer, and suction and liquid access valves. The refrigeration circuit shall be protected from high pressure and loss of charge by a positive lockout device.
 6. Condensate Removal: The condensate removal shall have two exits from the heat pump, back and bottom. The heat pump shall have a factory assembled and supplied trapping system internal to the unit, eliminating the requirement for an external trap in the condensate drain system.
 7. Humidity Controls: The unit shall be supplied with hot gas reheat. The manufacturer shall provide a remote humidistat to be installed by the Mechanical Contractor.
 8. Air Distribution: Conditioned air leaving the heat pump shall leave through a freeblow plenum.
 9. Provide a factory enclosure on top of the discharge plenum.
- F. Sound Attenuation: The manufacturer shall provide a sound reduction panel for each unit. The panel shall be able to attached to the front of the unit and reduce the dbA level to 45 to 50 dbA.
- G. Heat Wheel Module:
1. Console heat pump system shall have a total energy recovery system with desiccant wheel.
 2. Wheel module shall simultaneously exhaust indoor air and bring in up to 450 cfm of outdoor air for required ventilation.
 3. Wheel shall provide up to 75% energy exchange efficiency; include fresh air and exhaust air filter.
 4. The wheel media shall be made of aluminum which is coated to prohibit corrosion. Etched or oxidized surfaces are not acceptable. All media surfaces shall be coated with a non-migrating solid adsorbent layer prior to being formed into the honeycomb media structure to insure that all surfaces are coated and that adequate latent capacity is provided. Desiccant coatings that are sprayed on or dip coated, or desiccants that must be reapplied over time are not acceptable.
 5. The desiccant shall be specifically developed for the selective adsorption of water vapor. Verification in writing shall be presented from the desiccant manufacturer confirming that the internal pore diameter distribution inherent in the desiccant being provided limits

adsorption to materials not larger than the critical diameter of a water molecule (2.8 angstroms). The desiccant must be inorganic. The desiccant utilized shall be a 3A molecular sieve.

6. Equal sensible and latent recovery efficiencies shall be clearly documented through a certification program conducted in accordance with ASHRAE 84-78P and the results shall be presented in accordance with ARI 1060 Standards. The certification shall have been conducted by a qualified independent organization.
7. Independent wheel testing to document that the desiccant material utilized does not transfer pollutants typically encountered in the indoor air environment shall be provided from a test laboratory. The cross-contamination and performance certification reports shall be provided as part of the submittals for this project.
8. The media shall be cleanable with low temperature steam, hot water or light detergent, without degrading the latent recovery. Dry particles up to 800 microns shall freely pass through the media.
9. Purge Sector - the unit shall be provided with a factory set, field adjustable purge sector designed to limit cross contamination to less than .04 percent of that of the exhaust airstream concentration when operated under appropriate conditions.
10. Rotor System:
 - a. Rotor Seals: The rotor shall be supplied with labyrinth seals which shall not make contact with any rotating surface of the exchanger rotor face. These multi-pass seals shall utilize four labyrinth stages for optimum performance.
 - b. Rotor Support System: The rotor media shall be provided in segmented fashion to allow for field erection or replacement of one section at a time without requiring side access. The media shall be rigidly held by a structural spoke system made of extruded aluminum.
 - c. Rotor Housing: The rotor housing shall be a structural framework which limits the deflection of the rotor due to air pressure loss to less than 1/32". The housing shall be made of galvanized steel to prevent corrosion. The rotor shall be supported by two pillow block bearings which can be maintained or replaced without the removal of the rotor from its casing or the media from its spoke system.
 - d. Drive System: The rotor shall be driven by a self-adjusting belt system. A/C motors shall be utilized for both constant and variable speed applications.
- H. Grilles: The outdoor louvered grille shall be manufactured in heavy duty commercial grade extruded aluminum, provided by the factory in clear anodized finish. Nominal blade thickness for the grille shall be .058 inch or greater. The return, supply and exhaust air grilles shall be manufactured in commercial grade extruded aluminum with a clear anodized finish.
- I. Indoor Blower and Motor: The indoor blower shall be two direct drive, centrifugal, forwarded curved blowers. Blower shall have a low voltage relay to operate fan motor.

- J. Outdoor Fan and Motor: Single outdoor air mover shall provide required cfm through exterior louver.
- K. Single Point Power Entry: The units shall have a single point power entry for line voltage.
- L. Controls:
 - 1. The internal circuit shall consist of a current limiting type transformer to generate 24 VAC, switching devices to operate the compressor, indoor fan motor and motorized damper. The control circuit shall incorporate a manual reset safety circuit to render the refrigerant system (compressor and outdoor blower motor) inoperative should there be a loss of air flow or refrigerant. The safety circuit shall be resettable. The defrost circuit shall consist of a single device and shall be time and temperature initiated. A 90-minute timer, readily adjustable to 30 to 45 minutes, shall initiate a defrost cycle on if the outdoor coil temperature indicated the possibility of an iced condition. The device shall terminate the defrost cycle when the coil temperature has been elevated to a satisfactory level that assures all ice has been removed, or at the end of ten minutes of defrost operation. To prevent rapid compressor short-cycling and to delay start-up of compressor, an automatic resetting anti-short cycle circuit shall be factory installed. An EMS relay shall be provided, available with 24, 120 or 240 VAC coils to control unit operation from a future energy management system, and an outdoor thermostat to prevent second stage heat above an outdoor temperature setpoint.
 - 2. The heat pump shall be factory tested and inspected after receiving the prescribed refrigerant charge in final assembly.
- M. Approved Manufacturers: Airedale, Bard, Marvair, Temspec.
 - 1. Any listed equivalent manufacturer and the Mechanical Contractor shall be completely responsible to comply with all requirements on the contract documents. This shall include, but not be limited to, space requirements, code clearances, the type, horsepower, capacities, number and size of services required from other trades.

PART 3 – EXECUTION

3.1 INSPECTION

- A. Examine areas and conditions under which equipment is to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.
- B. Install in accordance with manufacturer's recommendations. Unit and all component sections shall be properly supported and vibration isolated.
- C. When unit has been used during the construction period, the following shall be done prior to balancing and adjusting of system:
 - 1. Permanent filters shall be washed as required to obtain clean condition and coated with proper adhesive.

2. Throwaway type filters shall be replaced with new. The Mechanical Contractor is responsible to provide and install new throwaway filters upon project's substantial completion. The Mechanical Contractor shall notify Owner's maintenance personnel prior to installation.

3.2 INSTALLATION

- A. Verify that coils, filters, motors, drives and other components are matched with the proper unit.
- B. Assemble unit components following manufacturer's instructions for handling, testing and operating. Repair damaged galvanized areas, and paint in accordance with manufacturer's written recommendations.
- C. Vacuum clean interior of units prior to operation.
- D. Repair air leaks from or into casing that can be heard or felt during normal operation.
- E. Install units plumb and level, firmly anchored in locations indicated, and maintain manufacturer's recommended clearances.
- F. Perform field mechanical balancing in accordance with Section 230950: TESTING AND BALANCING OF MECHANICAL SYSTEMS.
- G. The Mechanical Contractor shall own as a part of his work, the following:

Provide one (1) additional drive set, if necessary, to obtain final design balancing requirements. The Mechanical Contractor shall coordinate with Balancing Firm and equipment manufacturer for drive selection, including belts and pulleys.

END OF SECTION 230732