
05/12/2025

CONDRAY
DESIGN GROUP, INC.

# ADDENDUM No. 1

| | | | |
|---|---|---|---|
| PROJECT: | University Medical Center<br>CV/CICU Renovation &<br>NICU Renovation<br>602 Indiana Avenue<br>Lubbock, Texas 79415 | DATE:<br>PROJECT NO.: | 05/12/2025<br>22307 & 22419 |

The following items take precedence over the drawings and project manual for the above-named project and in closing a contract shall become a part of the contract documents.

Where any item called for in the specifications or indicated on the drawings, is supplemented here, the original requirements remain in effect. Consider all supplemental conditions as added to the specifications and drawings.

Where any original item is amended, voided or superseded here, the provisions of such items not specifically amended, voided or superseded remain in effect.

## ALL PROPOSALS

**ITEM #1: Addition of Door Hardware Schedule** – Refer to attached Specification Section 087100, Section 1.1 Door Hardware Schedule. This schedule includes door hardware for both Proposals.

**ITEM #2: Revision of Proposal Form** – Refer to attached Specification Section 001000 Proposal Form that has been updated to include Alternate #4A & 4B.

## PROPOSAL #1 – CV/CICU RENOVATION

**ITEM #3: Addition of Alternates** – Refer to attached Specification Section 0123000 Alternates. This includes previous Additive Alternates #1-3 and newly added #4A & 4B. Refer to attached Architectural Sheets A8, A10 & A11 and Interior Sheet ID5.

A. **Alternate #1:** Replace plastic laminate at windowsills in all CICU Patient Rooms, including Isolation Rooms, with solid surface SSM1.

**ITEM #4: Addition of Isolation Room Modifications** – Refer to Supplemental Drawing SD01 and MEP Addenda Items as noted below and attached.

**ITEM #5: Interior Finish Items** – Refer to interior finish items below:

A. Patient Isolation Rooms 628 & 629:
   1. Hard ceilings to be painted P1.
   2. Touch up paint on walls with paint P2 where needed due to construction work.

**ITEM #6: Addition of MEP Addendum #1 Items** – Refer to attached MEP Addendum Sheet and drawings.

**PROPOSAL #2 – NICU RENOVATION**

**ITEM #7: Interior Finish Items** – Refer to interior finish items below:

A. PL2 – This Plastic Laminate has been removed from the project.
B. PL3 – This Plastic Laminate has been removed from the project.
C. Millwork in Corridor 1022 is now to be fabricated using Plastic Laminate PL1 in lieu of originally scheduled Plastic Laminates PL2 and PL3.

End of Addendum

1.1 DOOR HARDWARE SCHEDULE

**Proposal Item #1 – CV/CICU Renovation**

| Door Hardware Set No. 1 Double door, Non-Rated | | | | |
|---|---|---|---|---|
| Door No. 601A, 601B, 602A, 602B, 619A, 619B, 620A, 620B; each to have the following: | | | | |
| **Qty.** | **Description** | **Item** | **Manufacturer** | **Finish** |
| 2 ea. | Continuous Hinge | CFM83HD1 | Pemko | 652 |
| 2 ea. | Surface Rod Exit Device | NB8713 x ETL VE | Sargent | 626 |
| 2 ea. | Closer/hold open | TB-351 CPSH EN | Sargent | 689 |
| 2 ea. | Wall Stop | RM861 | Rockwood | US26D |
| 1 set | Silencers | 608 | Rockwood | Grey |
| 2 ea. | Kickplate | K1050 10” x 2” LDW | Rockwood | US32D |
| 1 ea. | Overlapping Astragal | 355CS | Pemko | 628 |

| Door Hardware Set No. 2 Entry/Office | | | | |
|---|---|---|---|---|
| Door No. 603A, 604A, 617A, 622A, 623A, 658A, 659A, 660A; each to have the following: | | | | |
| **Qty.** | **Description** | **Item** | **Manufacturer** | **Finish** |
| 3 ea. | Hinges | TA2714 4-1/2 x 4-1/2 | Mckinney | 652 |
| 1 ea. | Entry/Office Lockset | 21-8205 LNL VE | Sargent | 626 |
| 1 set | Silencers | 608 | Rockwood | Grey |
| 1 ea. | Wall Stop | RM861 | Rockwood | US26D |

| Door Hardware Set No. 3 Single Toilet | | | | |
|---|---|---|---|---|
| Door No. 605A; each to have the following: | | | | |
| **Qty.** | **Description** | **Item** | **Manufacturer** | **Finish** |
| 3 ea. | Hinges | TA2714 4-1/2 x 4-1/2 | Mckinney | 652 |
| 1 ea. | Privacy Lockset | V50 8265 | Sargent | 626 |
| 1 ea. | Closer | TB-351 UO EN | Sargent | 689 |
| 1 set | Gasketing | S88GR | Rockwood | Grey |
| 1 ea. | Auto Door Bottom | 411APKL | Pemko | 628 |

| Door Hardware Set No. 4 Fire-Rated Storage - Public | | | | |
|---|---|---|---|---|
| Door No. 610A, 610B, 618A, 618B; each to have the following: | | | | |
| **Qty.** | **Description** | **Item** | **Manufacturer** | **Finish** |
| 3 ea. | Hinges | TA2714 4-1/2 x 4-1/2 | Mckinney | 652 |
| 1 ea. | Classroom Lockset | 21-8237 LNL VE | Sargent | 626 |
| 1 ea. | Closer | TB-351 UO EN | Sargent | 689 |
| 1 ea. | Wall Stop | RM861 | Rockwood | US26D |
| 1 set | Gasketing | HSS2000-S88GR | Rockwood | Grey |
| 1 ea. | Armor Plate | K1050 30”x2”LDW | Rockwood | 626 |

Door Hardware Set No. 5 Classroom with Access Control - Med Room

Door No. 611A, 611B; each to have the following:

| Qty. | Description | Item | Manufacturer | Finish |
|---|---|---|---|---|
| 3 ea. | Hinges | TA2714 4-1/2 x 4-1/2 | Mckinney | 652 |
| 1 ea. | Classroom Lockset | 21-8237 LNL VE | Sargent | 626 |
| 1 ea. | Card Reader* | By Security Contractor | | |
| 1 ea. | Electric Strike* | 1006CLB (Fail Secure) | HES | 630 |
| 1 ea. | Closer | TB-351 UO EN | Sargent | 689 |
| 1 set | Silencers | 608 | Rockwood | Grey |
| 1 ea. | Wall Stop | RM861 | Rockwood | US26D |
| 1 ea. | Position Switch | DPS-W-W | Securitron | |

* Power supply and card reader by security contractor. Coordinate with security contractor and provide all required relays, power packs, connectors, harnesses, etc. for a complete and functional system.
Remote Push Buttons are to be located at the two registration desks and interior Nurse Station and connected to electric strike to allow timed entry function.

Door Hardware Set No. 6 Entry/Office Secured Staff - Breakroom

Door No. 616A; each to have the following:

| Qty. | Description | Item | Manufacturer | Finish |
|---|---|---|---|---|
| 3 ea. | Hinges | TA2714 4-1/2 x 4-1/2 | Mckinney | 652 |
| 1 ea. | Entry/Office Lockset | 21-8225 LNL VE | Sargent | 626 |
| 1 ea. | Closer | TB-351 UO EN | Sargent | 689 |
| 1 ea. | Wall Stop | RM861 | Rockwood | US26D |
| 1 set | Silencers | 608 | Rockwood | Grey |
| 2 ea. | Door Viewer | 622 | Rockwood | DCRM |

Door Hardware Set No. 7 Passage Patient Isolation Room

Door No. 628A, 629A; each to have the following:

| Qty. | Description | Item | Manufacturer | Finish |
|---|---|---|---|---|
| 3 ea. | Hinges | TA2714 4-1/2 x 4-1/2 | Mckinney | 652 |
| 1 ea. | Passage | 8215 LNL | Sargent | 626 |
| 1 ea. | Closer/hold open | TB-351 CPSH EN | Sargent | 689 |
| 1 set | Gasketing | S88GR | Rockwood | Grey |
| 1 ea. | Auto Door Bottom | 411APKL | Pemko | 628 |

Door Hardware Set No. 8 Passage Patient Room

Door No. 638A, 639A, 640A, 641A, 650A, 651A; each to have the following:

| Qty. | Description | Item | Manufacturer | Finish |
|---|---|---|---|---|
| 3 ea. | Hinges | TA2714 4-1/2 x 4-1/2 | Mckinney | 652 |
| 1 ea. | Passage | 8215 LNL | Sargent | 626 |
| 1 set | Gasketing | S88GR | Rockwood | Grey |
| 1 ea. | Auto Door Bottom | 411APKL | Pemko | 628 |
| 1 ea. | Closer/hold open | TB-351 CPSH EN | Sargent | 689 |

| Door Hardware Set No. 9 Fire-Rated Electrical | | | | |
|---|---|---|---|---|
| Door No. 652A, 654A; each to have the following: | | | | |
| **Qty.** | **Description** | **Item** | **Manufacturer** | **Finish** |
| 3 ea. | Hinges | TA2714 4-1/2 x 4-1/2 | Mckinney | 652 |
| 1 ea. | Storeroom Lockset | 12 21-8204 LNL VE | Sargent | 626 |
| 1 ea. | Closer | TB-351 UO EN | Sargent | 689 |
| 1 set | Gasketing | HSS2000-S88GR | Rockwood | Grey |
| 1 ea. | Wall Stop | RM861 | Rockwood | US26D |

| Door Hardware Set No. 10 Entry/Office Fire-Rated | | | | |
|---|---|---|---|---|
| Door No. 655A, 656A ; each to have the following: | | | | |
| **Qty.** | **Description** | **Item** | **Manufacturer** | **Finish** |
| 3 ea. | Hinges | TA2714 4-1/2 x 4-1/2 | Mckinney | 652 |
| 1 ea. | Classroom Lockset | 21-8237 LNL VE | Sargent | 626 |
| 1 ea. | Closer | TB-351 UO EN | Sargent | 689 |
| 1 set | Gasketing | HSS2000-S88GR | Rockwood | Grey |
| 1 ea. | Wall Stop | RM861 | Rockwood | US26D |

**Proposal Item #2 – NICU Renovation**

| Door Hardware Set No. 11 Double door Controlled Access | | | | |
|---|---|---|---|---|
| Door No. 1004A; each to have the following: | | | | |
| **Qty.** | **Description** | **Item** | **Manufacturer** | **Finish** |
| 1 ea. | Card Reader* | By Security Contractor | | |
| 1 ea. | Electric Strike* | 1006CLB (Fail Secure) | HES | 630 |
| 1 ea. | Position Switch | DPS-W-W | Securitron | |
| * Power supply and card reader by security contractor. Coordinate with security contractor and provide all required relays, power packs, connectors, harnesses, etc. for a complete and functional system.<br>Remote Push Buttons are to be located at the two registration desks and interior Nurse Station and connected to electric strike to allow timed entry function. | | | | |

| Door Hardware Set No. 12 Single Toilet Room | | | | |
|---|---|---|---|---|
| Door No. 11032A; each to have the following: | | | | |
| **Qty.** | **Description** | **Item** | **Manufacturer** | **Finish** |
| 1 | Privacy Lockset | V50 8265 | Sargent | 626 |

END OF SECTION 087100

**PROPOSAL FORM**
**REVISED 05/12/2025**

Date:_____, 2025

UMC Health System
Medical Office Plaza II
808 Joliet Avenue, Suite 400
Lubbock, Texas 79415

The undersigned, having carefully examined the proposal documents that include the specifications, drawings, and related documents entitled:

**UNIVERSITY MEDICAL CENTER**
**CV/CICU & NICU RENOVATIONS**
**602 INDIANA AVENUE**
**LUBBOCK, TEXAS 79415**

all as prepared by Condray Design Group, 3708 Upland Avenue, Lubbock, Texas 79407, as well as having attended a Pre-Proposal Conference, and made an on-site inspection of the premises and all other conditions affecting the cost and/or execution of the work, proposes to furnish all materials, labor, and equipment necessary to complete the work in accordance with said documents, of which this proposal is a part, for the following sum:

**BASE BID – PROPOSAL ITEM #1 CV/CICU RENOVATION:**

_____

Dollars ($_____)

(Note: All amounts shall be shown in both written and figure form. In case of discrepancy between the written amount and the figure, the written amount will govern. For alternates, check whether it is an add, deduct or no change.)

**BASE BID – PROPOSAL ITEM #2 NICU RENOVATION:**

_____

Dollars ($_____)

(Note: All amounts shall be shown in both written and figure form. In case of discrepancy between the written amount and the figure, the written amount will govern. For alternates, check whether it is an add, deduct or no change.)

**ALTERNATE ONE:** (Proposal Item #1 CV/CICU – Additive Alternate for replacing patient room flooring) add / deduct (circle one):_____

Dollars ($_____)

(Note: All amounts shall be shown in both written and figure form. In case of discrepancy between the written amount and the figure, the written amount will govern. For alternates, check whether it is an add, deduct or no change.)

**ALTERNATE TWO:** (Proposal Item #1 CV/CICU – Additive Alternate for replacing hallway finishes)
add / deduct (circle one): _____

Dollars ($ _____) _____

(Note: All amounts shall be shown in both written and figure form. In case of discrepancy between the written amount and the figure, the written amount will govern. For alternates, check whether it is an add, deduct or no change.)

**ALTERNATE THREE:** (Proposal Item #1 CV/CICU – Additive Alternate for replacing VAV boxes)
add / deduct (circle one): _____

Dollars ($ _____) _____

(Note: All amounts shall be shown in both written and figure form. In case of discrepancy between the written amount and the figure, the written amount will govern. For alternates, check whether it is an add, deduct or no change.)

**ALTERNATE FOUR:** (Proposal Item #1 CV/CICU – Additive Alternate for south elevator lobby finishes)
add / deduct (circle one): _____

**4-A** Dollars ($ _____) _____

**4-B** Dollars ($ _____) _____

(Note: All amounts shall be shown in both written and figure form. In case of discrepancy between the written amount and the figure, the written amount will govern. For alternates, check whether it is an add, deduct or no change.)

_____
CONTRACTOR'S PROJECT MANAGER
(Name Required)

_____
CONTRACTOR'S SUPERINTENDENT
(Name Required)

We have included, in the Proposal sum, all applicable taxes and all material allowances.

The undersigned acknowledges receipt of _____ addenda to the Drawings and Project Manual as follows:

No. _____ Date _____ No. _____ Date _____ No. _____ Date _____

No. _____ Date _____ No. _____ Date _____ No. _____ Date _____

(The Proposer is to fill in I.D. Number and date of each thereby acknowledging receipt of Addenda).

If awarded the contract, the undersigned agrees to commence work under this contract on or before a date to be specified in Written Notice to Proceed, and to substantially complete the project within _____ (Proposer to fill in number) **calendar days** from said commencement date, unless modified by change order.

**Notice to Proceed will be issued after material procurement has been completed and material is on site.**

The **total calendar days above** will be divided into **six (6) Phases of the Project Scope of Work** as follows: (Proposer to fill in number of days associated with each Phase of Work.)

**Note: Phasing for Proposal Items #1 & #2 will happen concurrently.**
**Phases 1-6 Base Bid for Proposal Items #1 & #2.**
**Phases 7-12 apply to Additive Alternates #1 & #3 only.**

| | | | |
|---|---|---|---|
| **Phase 1** | _____ | **Phase 7** | _____ |
| **Phase 2** | _____ | **Phase 8** | _____ |
| **Phase 3** | _____ | **Phase 9** | _____ |
| **Phase 4** | _____ | **Phase 10** | _____ |
| **Phase 5** | _____ | **Phase 11** | _____ |
| **Phase 6** | _____ | **Phase 12** | _____ |

Proposer agrees to pay the Owner **$1,000.00** per day, as liquidated damages, for each day the substantial completion of this project extends beyond the stipulated substantial completion date.

If notified of the acceptance of this proposal within **seventy-five (75) days from the time set for the opening of proposals**, proposer agrees within ten (10) days of notification, to execute a contract in the form of the AIA Document A101-2017, Standard Form of Agreement Between Owner and Contractor Where the Basis of Payment Is a Stipulated Sum, as amended for the above work, for the above stated compensation.

PROPOSAL SECURITY, as defined in the Advertisement For Proposals and Instructions to Proposers, which the Undersigned agrees to disposition of, as stated in Advertisement For Proposals and Instructions to Proposers, is attached to this Proposal.

Upon acceptance of this Proposal by Owner, Contractor shall furnish, before beginning the Work and, in any case, no later than ten (10) days after of the signing of the contract, a PERFORMANCE BOND AND LABOR/MATERIAL PAYMENT BOND, in the amount of 100% of the Contract Price. Surety shall meet requirements specified in the Owner/Contractor Agreement.

It is understood that the Owner reserves the right to accept or reject any and all Proposals and to waive all formalities in accordance with State law.

ATTACHMENTS

In accordance with Instructions to Proposers, the following documents will be submitted with and made a condition of the Proposal:

Proposal security in form of _____

Proposer's qualifications statement and supporting data.

**The Procurement Form Supplement to be turned in to UMC no later than Twenty-Four (24) hours after Proposal Opening and to be made a condition of the Proposal.**

Respectfully Submitted,

By: _____

Title: _____

Business Address with Zip Code (SEAL: If by Corporation)

_____

_____

_____

_____

Telephone Number with Area Code: _____

Fill in the applicable information:

A Corporation, chartered in the State of _____.

Authorized to do business in the State of Texas.

A Partnership, composed of _____, and

_____, and _____.

An Individual operating under the name of _____

_____.

Corporate Seal:

END OF SECTION

**PROCUREMENT FORM SUPPLEMENT**

To: UMC Health System
Medical Office Plaza 1
3502 9th Street, Suite 240
Lubbock, Texas 79415
Attn: Maria "Alex" Villarreal, Contract Administrator

Project: **University Medical Center**
**CV/CICU & NICU Renovations**
**602 Indiana Avenue**
**Lubbock, Texas 79415**

Date: _____

Submitted by: _____
(full name)

Full Address _____

_____

In accordance with the Instructions to Proposers and the Proposal Form, we include the Proposal Form Supplements listed below designated as the Procurement Form Supplement. The information provided shall be considered an integral part of the Proposal Form.

**This Procurement Form Supplement must be turned in to UMC Purchasing no later than Twenty-Four (24) hours after Proposal Opening.**

Please provide the following information:

1. Mechanical Subcontractor (Included in Proposal Amount):

Firm Name: _____

Address: _____

Phone No.: _____

Contact: _____

1a. Mechanical Subcontractor (First Alternate):

Firm Name: _____

Address: _____

Phone No.: _____

Contact: _____

Total Change to Proposal Amount, Add / Deduct (circle one):

_____

1b. Mechanical Subcontractor (Second Alternate):

Firm Name: _____

Address: _____

Phone No.: _____

Contact: _____

Total Change to Proposal Amount, Add / Deduct (circle one):

_____

2. Plumbing Subcontractor (Included in Proposal Amount):

Firm Name: _____

Address: _____

Phone No.: _____

Contact: _____

2a. Plumbing Subcontractor (First Alternate):

Firm Name: _____

Address: _____

Phone No.: _____

Contact: _____

Total Change to Proposal Amount, Add / Deduct (circle one):

_____

2b. Plumbing Subcontractor (Second Alternate):

Firm Name: _____

Address: _____

Phone No.: _____

Contact: _____

Total Change to Proposal Amount, Add / Deduct (circle one):

_____

3. Electrical Subcontractor (Included in Proposal Amount):

Firm Name: _____

Address: _____

Phone No.: _____

Contact: _____

3a. Electrical Subcontractor (First Alternate):

Firm Name: _____

Address: _____

Phone No.: _____

Contact: _____

Total Change to Proposal Amount, Add / Deduct (circle one):

_____

3b. Electrical Subcontractor (Second Alternate):

Firm Name: _____

Address: _____

Phone No.: _____

Contact: _____

Total Change to Proposal Amount, Add / Deduct (circle one):

_____

4. Painting Subcontractor:

   Firm Name: _____

   Address: _____

   Phone No.: _____

   Contact: _____

5. Flooring Subcontractor:

   Firm Name: _____

   Address: _____

   Phone No.: _____

   Contact: _____

6. Fire Sprinkler Subcontractor:

   Firm Name: _____

   Address: _____

   Phone No.: _____

   Contact: _____

7. Millwork Subcontractor:

   Firm Name: _____

   Address: _____

   Phone No.: _____

   Contact: _____

8. Drywall and Ceiling Subcontractor:

   Firm Name: _____

   Address: _____

   Phone No.: _____

   Contact: _____

Please answer the following questions:

1. Is your principal place of business in Texas: Yes No
(Circle one)

2. If no, in which state is your principal place of business: _____

3. If your principal place of business is not Texas, does your state favor resident proposers in your state by some dollar increment or percentage? Yes No
(Circle one)

4. For information regarding this series of questions, see Tex. Gov't Code § 2252.002.

By submitting this form, signed below by authorized signing officer under the Proposer information on the Proposal Form, information contained within shall amend the Proposal.

Respectfully Submitted,

By: _____

Title: _____

END OF SECTION 001000

# SECTION 012300 - ALTERNATES

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

A. Section includes administrative and procedural requirements for alternates.

### 1.3 DEFINITIONS

A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

### 1.4 PROCEDURES

A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.

1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.

B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated revisions to alternates.

C. Execute accepted alternates under the same conditions as other work of the Contract.

D. Schedule: A schedule of alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

## PART 2 - PRODUCTS (Not Used)

## PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

A. **Alternate No. 1:** Proposal Item #1 CV/CICU – Additive Alternate for replacing patient room flooring.

1. Base Bid: Base bid does not include any flooring work in the CICU Patient Rooms.
2. Alternate: Alternate includes removing existing flooring and replacing with new rubber flooring and wall base in CICU Patient Rooms. Refer to Drawings.

B. **Alternate No. 2:** Proposal Item #1 CV/CICU – Additive Alternate for replacing hallway finishes.

1. Base Bid: Base bid does not include work in south Hallway 601, Hallway 671 nor CICU Waiting Room 665.
2. Alternate: Alternate includes removing existing flooring and replacing with sheet vinyl and new base as well as paint and new wall protection in south Hallway 601, Hallway 671 and CICU Waiting Room 665. Refer to Drawings.

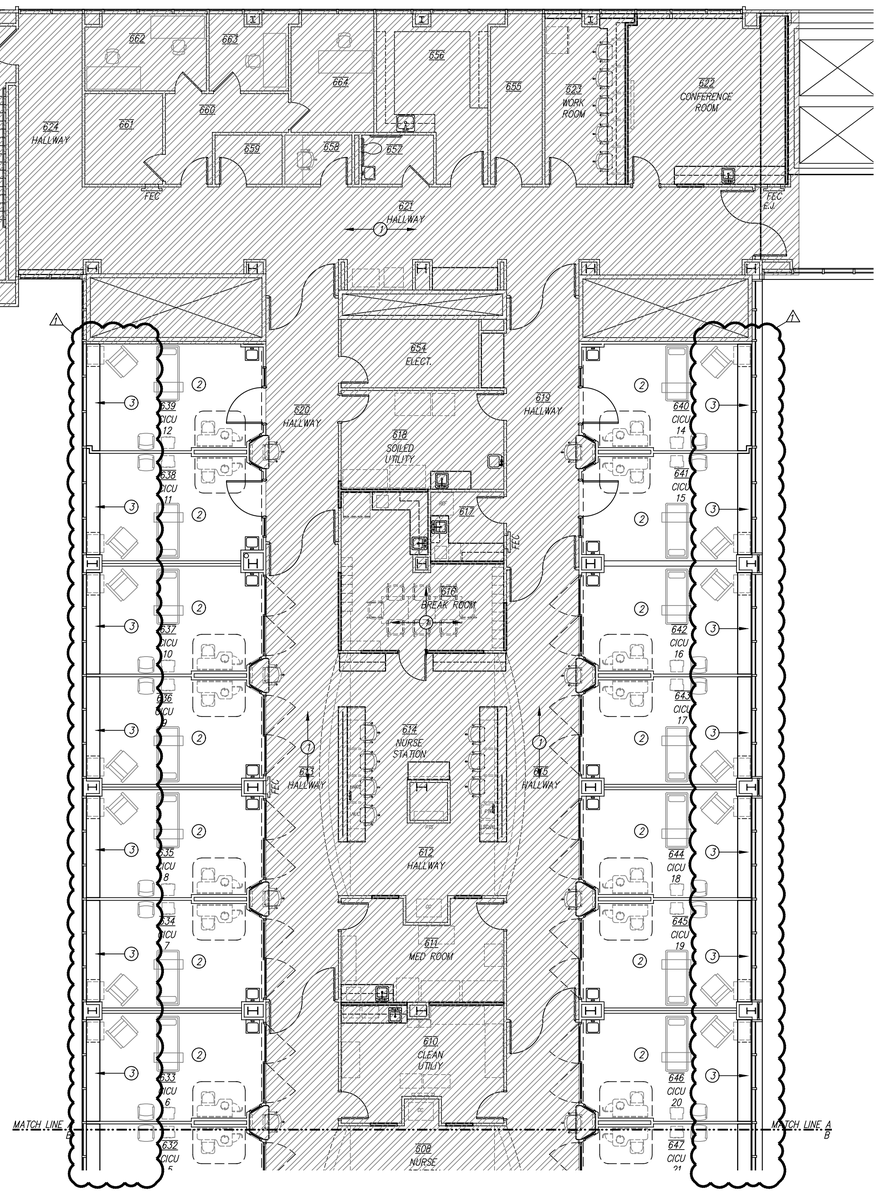
C. **Alternate No. 3:** Proposal Item #1 CV/CICU – Additive Alternate for replacing VAV boxes.

1. Base Bid: Base bid does not include replacement of existing VAV boxes and controls.
2. Alternate: Alternate includes removal of existing VAVs and pneumatic controls, replacing with new VAVs and digital controls per UMC Standard. Refer to Drawings.

D. **Alternate No. 4:** Proposal Item #1 CV/CICU – Additive Alternate for replacing finishes in south elevator lobby area.

1. Base Bid: Base bid does not include work in south elevator lobby, waiting area, registration or adjacent offices.
2. **Alternate 4-A:** Alternate includes terrazzo in elevator lobby only and all other new finishes. Refer to Drawings.
3. **Alternate 4-B:** Alternate includes terrazzo in elevator lobby and waiting room and all other new finishes. Refer to Drawings.

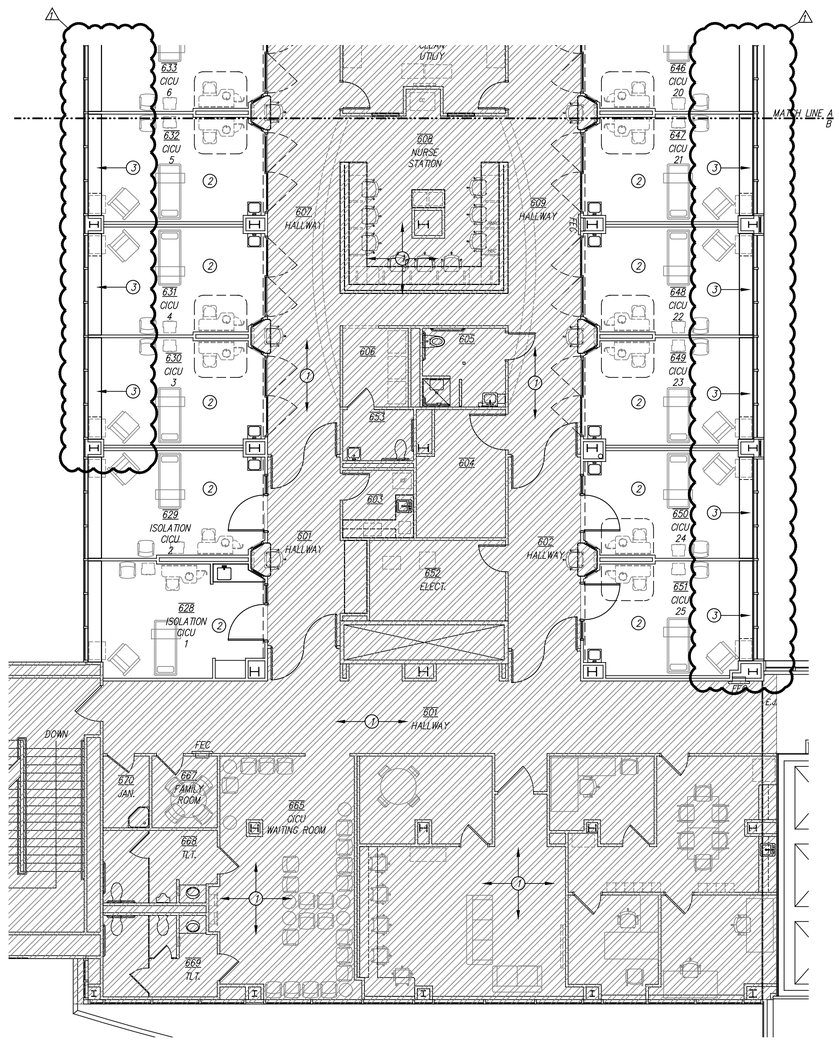
END OF SECTION 012300




28/A8 SIXTH FLOOR - DEMOLITION PLAN - ALTERNATE #1

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

NORTH




15/A8 SIXTH FLOOR - DEMOLITION PLAN - ALTERNATE #1

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

NORTH

## GENERAL NOTES

1). ON ALL WALLS SCHEDULED TO REMAIN TO BE REWORKED OR RECEIVE NEW FINISH, CONTRACTOR SHALL REMOVE ANY EXISTING EQUIPMENT, DECORATIONS, DEVICES, ETC. AND SALVAGE FOR REINSTALLATION AS DIRECTED BY OWNER. CONTRACTOR IS TO PATCH BACK ANY HOLES OR ABANDONED ANCHORS AND RETEXTURE. WALLS IF NECESSARY, AND PREP FOR NEW FINISH AS SCHEDULED.

2). NOTIFY ARCHITECT OF ANY DISCREPANCIES WITH EXISTING OR NEW CONDITIONS.

3). CONTRACTOR SHALL PATCH AND REPAIR WALLS, FLOOR, AND CEILINGS AT ALL INTERSECTIONS WHERE WALLS ARE REMOVED OR WHERE DEVICES, EQUIPMENT, ACCESSORIES, ETC. ARE REMOVED. PREP WALLS TO RECEIVE NEW FINISH. NEW CONSTRUCTION SHOULD MATCH ADJACENT FINISHES AND MATERIALS AND PROVIDE SMOOTH AND COMPLETE TRANSITION.

4). ALL ITEMS INDICATED TO BE SALVAGED ARE TO BE VERIFIED WITH THE OWNER. IF OWNER DECLINES SALVAGE, CONTRACTOR SHALL REMOVE ITEMS FROM THE SITE AND DISPOSE OF THEM PROPERLY.

5). ALL EXISTING FLOORING TO BE REMOVED AS REQUIRED TO ACCOMMODATE NEW WORK. REFER TO FINISH SCHEDULE.

## KEYED NOTES

DESIGNATED BY: ←(#)

(1) NO WORK IN THIS AREA.

(2) REMOVE EXISTING FLOORING AND WALL BASE IN THEIR ENTIRETY. PREP FLOOR FOR NEW FINISH. REFER TO ID SHEETS.

(3) REMOVE PLASTIC LAMINATE WINDOW SILL/COUNTERTOP AND REPLACE WITH SOLID SURFACE. MILLWORK TO REMAIN, PROTECT DURING CONSTRUCTION.

## DEMOLITION PLAN LEGEND

- EXISTING DOOR TO BE REMOVED
- EXISTING DOOR TO REMAIN
- EXISTING WALL TO BE REMOVED
- EXISTING WALL TO REMAIN
- FLOORING EXTENT
- NOT IN SCOPE OF WORK

CONDRAY DESIGN GROUP
ARCHITECTURE & INTERIOR DESIGN
3708 UPLAND AVE.
LUBBOCK, TX 79407
806.748.6190
condray.com

REGISTERED ARCHITECT STACEY MINCEY WITT 17857 STATE OF TEXAS
05/12/2025

FINCHER ENGINEERING, LLC
FINCHER ENGINEERING, LLC
TX FIRM #F-16408
5621 114TH ST., SUITE 100
LUBBOCK, TX 79424
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UNIVERSITY MEDICAL CENTER
6TH FLOOR CV/CICU RENOVATION
PROPOSAL ITEM #1

602 INDIANA AVENUE
LUBBOCK, TX 79415

REVISIONS:
1 05/12/2025

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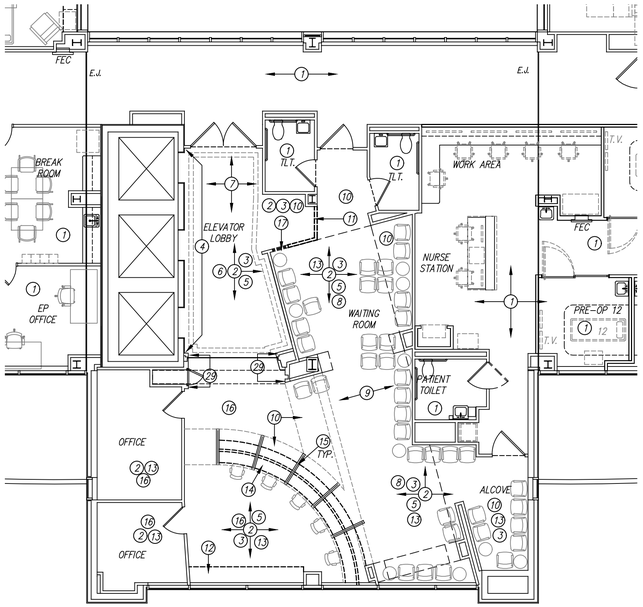
PROJECT NO. 22307
DATE: 05/01/2025

SHEET NO.
A8

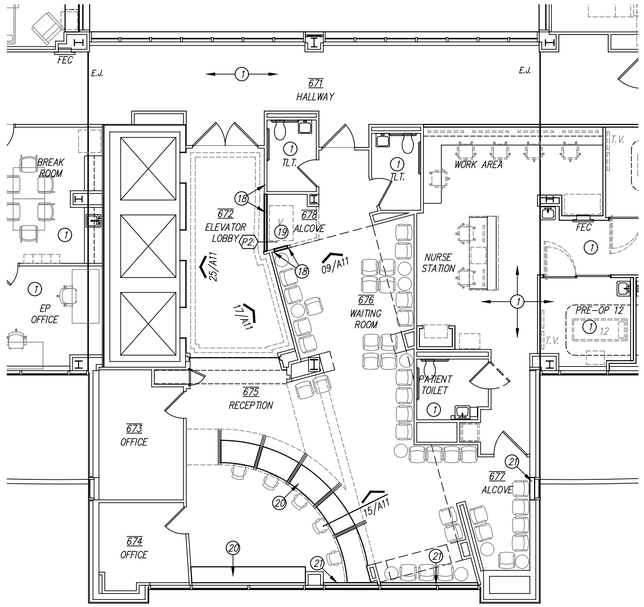
8 OF 11




26/A10 SIXTH FLOOR-PARTIAL DEMOLITION PLAN - ALTERNATE #4

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

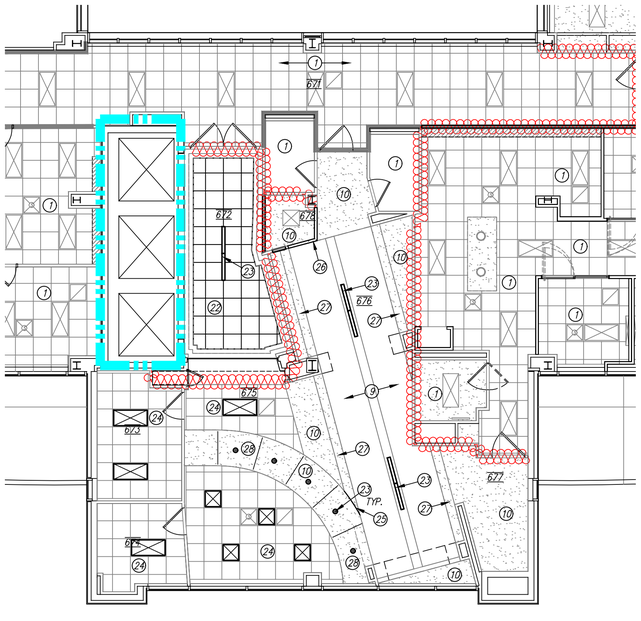
NORTH




14/A10 SIXTH FLOOR - PARTIAL ANNOATED PLAN - ALTERNATE #4

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

NORTH




28/A10 SIXTH FLOOR - PARTIAL REFLECTED CEILING PLAN - ALTERNATE #4

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

NORTH

## GENERAL NOTES

1). REFER TO ORIGINAL DRAWINGS FOR MORE INFORMATION.

## KEYED NOTES

DESIGNATED BY: (#)

1. NO WORK IN THIS AREA.
2. REMOVE EXISTING FLOORING AND WALL BASE IN THEIR ENTIRETY. PREP FLOOR FOR NEW FINISH. REFER TO ID5 SHEET FOR MORE INFORMATION.
3. REMOVE EXISTING VINYL WALL COVERING AND PREP WALL FOR NEW FINISH.
4. PREP ELEVATOR WALL TO RECEIVE NEW FINISH. CONTRACTOR TO PROVIDE REQUIRED SUPPORT FOR WALL SYSTEM. COORDINATE REMOVAL OF WALL DEVICES WITH OWNER.
5. REMOVE EXISTING WOOD AND BASE TRIM IN ALL LOCATIONS.
6. REMOVE LAY-IN CEILING GRID, WOOD PANELS, LIGHT FIXTURES AND OTHER CEILING MOUNTED DEVICES.
7. PERIMETER FURRDOWN TO REMAIN, PROTECT DURING CONSTRUCTION.
8. EXISTING SCONCE LIGHT FIXTURES AND RECESSED CAN LIGHTS TO REMAIN, PROTECT DURING CONSTRUCTION. REMOVE ALL PENDANT LIGHTING.
9. EXISTING METAL BARREL VAULTED CEILING TO REMAIN, PROTECT DURING CONSTRUCTION.
10. EXISTING HARD CEILINGS AND/OR FURRDOWNS TO REMAIN. PREP TO RECEIVE NEW PAINT.
11. REMOVE PORTION OF WALL TO ACCOMMODATE NEW WORK.
12. REPLACE PLASTIC LAMINATE COUNTERTOP WITH NEW SOLID SURFACE COUNTERTOP. EXISTING MILLWORK TO REMAIN. PROTECT DURING CONSTRUCTION.
13. COORDINATE REMOVAL OR RELOCATION OF EXISTING EQUIPMENT WITH OWNER. SALVAGE FOR OWNER REUSE.
14. REMOVE COUNTERTOP AND REPLACE WITH NEW SOLID SURFACE COUNTERTOP. REMOVE PLASTIC LAMINATE PANELS AND PREP EXISTING FRAME FOR NEW PLASTIC LAMINATE PANELS. REFER TO MILLWORK SECTION 15/A11 FOR MORE INFORMATION.
15. EXISTING LOW WALL AND GLASS PANEL TO REMAIN, REMOVE PLASTIC LAMINATE PANELS AND PREP EXISTING METAL STUD FRAME FOR NEW PLASTIC LAMINATE PANELS. INSTALL SOLID SURFACE TOP WITHOUT REMOVING EXISTING GLASS PANELS, PROTECT DURING CONSTRUCTION. REFER TO MILLWORK SECTION 07/A11 FOR MORE INFORMATION.
16. REMOVE AND REPLACE LIGHT FIXTURES. REFER TO ELECTRICAL FOR MORE INFORMATION. EXISTING CEILING GRID AND TILES TO REMAIN. REPLACE TILES AS NEEDED.
17. REMOVE EXISTING WINDOW IN ITS ENTIRETY.
18. ALIGN FINISH.
19. VENDING MACHINE. OWNER FURNISHED, OWNER INSTALLED.
20. NEW SOLID SURFACE COUNTERTOP.
21. NEW SOLID SURFACE WINDOW SILL AS SCHEDULED. REFER TO DETAIL 15/A7.
22. NEW LAY-IN CEILING TILES AND GRID. INSTALL AT EXISTING CEILING HEIGHT.
23. NEW DECORATIVE/PENDANT LIGHT FIXTURE. REFER TO ELECTRICAL FOR MORE INFORMATION.
24. NEW LIGHT FIXTURE IN EXISTING CEILING.
25. NEW FURRDOWN CONTROL JOINT.
26. NEW FURRDOWN AT 9'-0" A.F.F.
27. PAINT P3 AS SCHEDULED.
28. PAINT P4 AS SCHEDULED.
29. PREP TRIM AROUND SLIDING FIRE WALL FOR NEW PAINT.

## PLAN LEGEND

- EXISTING DOOR TO BE REMOVED
- EXISTING DOOR TO REMAIN
- EXISTING WALL TO BE REMOVED
- EXISTING WALL TO REMAIN
- EXTENT OF FLOORING WORK
- 2x4 LIGHT FIXTURE – REFER TO ELECTRICAL SHEETS
- 2-HOUR FIRE-RATED WALL ASSEMBLY FRAMED TO THE STRUCTURE ABOVE. SEAL ALL PENETRATIONS AND JOINTS WITH A UL LISTED SYSTEM.
- SMOKE BARRIER
  1-HOUR FIRE-RATED-ASSEMBLY FRAME NEW WALLS TO DECK AND SEAL TOP AND BOTTOM JOINTS WITH UL RATED JOINT SYSTEM. AT EXISTING WALL, EXTEND TO DECK ABOVE AS NECESSARY AND SEAL JOINTS. ALL PENETRATIONS, NEW OR EXISTING ARE TO BE SEALED WITH UL RATED SYSTEMS.
- NON-RATED SMOKE PARTITION
  WALL PARTITION THAT IS NOT FIRE-RATED AND DOES NOT EXTEND TO STRUCTURAL DECK ABOVE. WALL MAY TERMINATE 6" ABOVE CEILING. MUST PREVENT PASSAGE OF SMOKE.

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REGISTERED ARCHITECT STANLEY MINCEY SMITH 17837 STATE OF TEXAS
05/12/2025

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PROJECT NO. 22307
DATE: 05/12/2025

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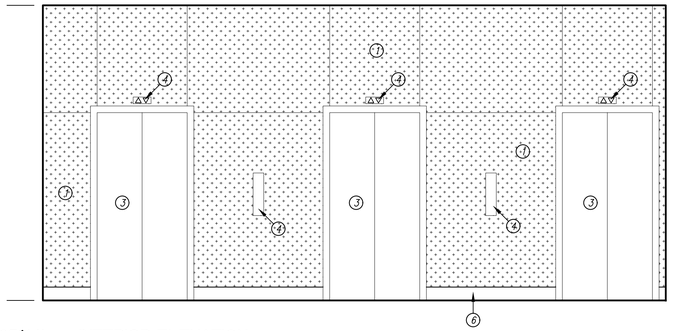
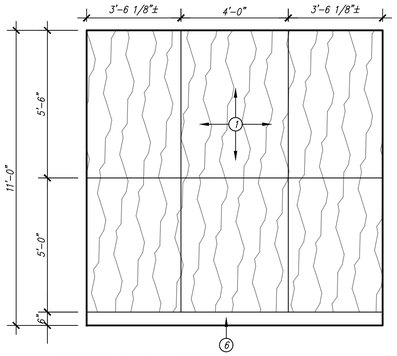
A10



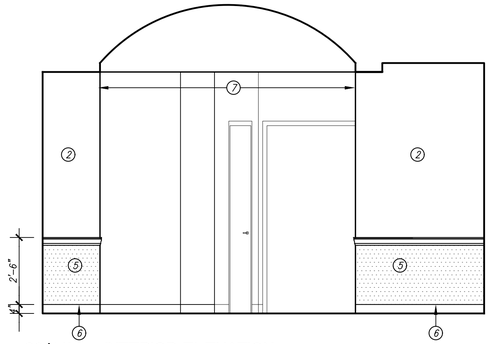

25/A11 INTERIOR ELEVATION

SCALE: 3/8" = 1'-0"




17/A11 INTERIOR ELEVATION

SCALE: 3/8" = 1'-0"




09/A11 INTERIOR ELEVATION

SCALE: 3/8" = 1'-0"

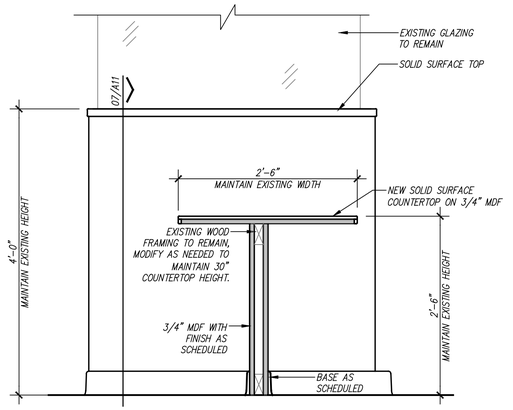
## GENERAL NOTES

1). REFER TO ORIGINAL DRAWINGS FOR MORE INFORMATION.

## KEYED NOTES

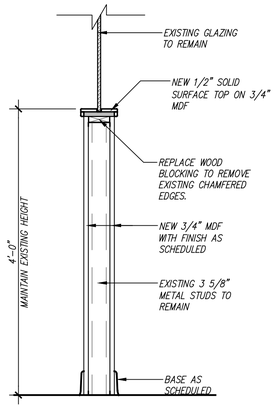
DESIGNATED BY: ← #

1. PSI PANEL SYSTEM. REFER TO ID5 SHEET FOR MORE INFORMATION.
2. PREP ALL WALLS FOR NEW FINISH.
3. EXISTING ELEVATOR DOORS TO REMAIN. CONTRACTOR TO COORDINATE WITH EXISTING CONDITIONS.
4. PANELS TO BE CUT OUT AT THESE LOCATIONS.
5. WAINSCOT WITH TRIM CAP. REFER TO ID5 SHEET FOR MORE INFORMATION.
6. BASE AS SCHEDULED.
7. REMOVE WEST WALL BACK TO BE SYMMETRICAL TO EAST WALL AT BARREL VAULT.




15/A11 MILLWORK SECTION

SCALE: 1" = 1'-0"




07/A11 MILLWORK SECTION

SCALE: 1" = 1'-0"

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REGISTERED ARCHITECT STANLEY WINCEY SMITH IV 17857 STATE OF TEXAS
05/12/2025

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A11

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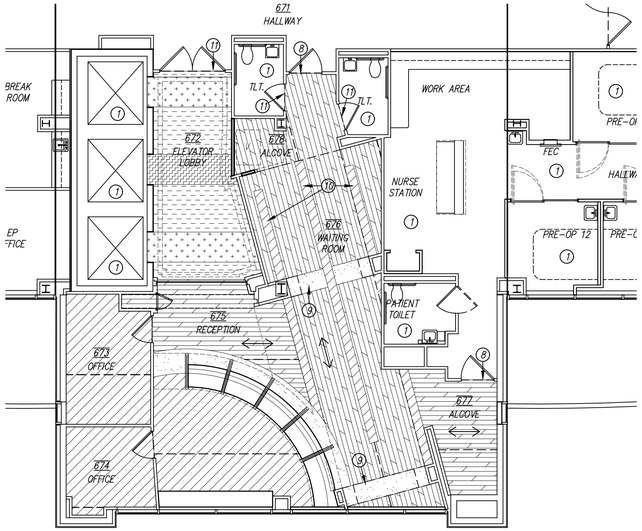
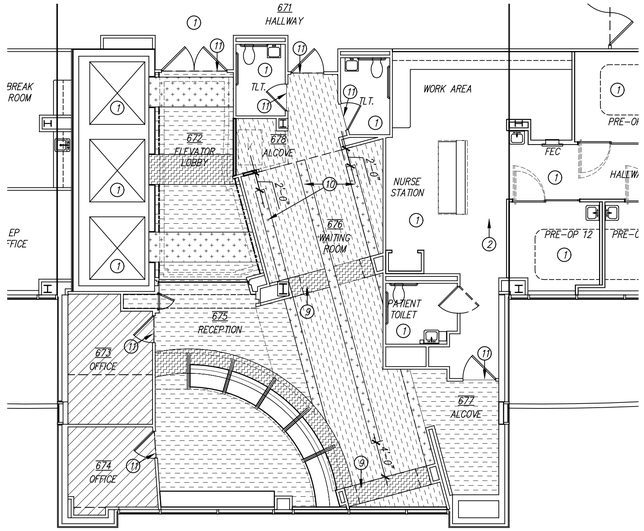



## 26/ID5 SIXTH FLOOR - FLOOR FINISH PLAN - ALTERNATE #4A

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

NORTH




## 14/ID5 SIXTH FLOOR - FLOOR FINISH PLAN - ALTERNATE #4B

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

NORTH

## KEYED NOTES

DESIGNATED BY: (#)

1. NO WORK IN THIS AREA.
2. PAINT P1 AS SCHEDULED IN THIS AREA.
3. PAINT P3 AS SCHEDULED.
4. PAINT P4 AS SCHEDULED.
5. WPS1 WALL PANELS TO BE INSTALLED AT THIS LOCATION AS SCHEDULED.
6. WPS2 WALL PANELS TO BE INSTALLED AT THIS LOCATION AS SCHEDULED.
7. INSTALL WC2 WAINSCOT IN THIS LOCATION WITH TOP OF TRIM CAP AT APPROXIMATELY 34"AFF.
8. NEW SHEET VINYL TO BE HEAT WELDED TO EXISTING SHEET VINYL IN THIS LOCATION.
9. PATTERN TO ALIGN WITH CORNERS OF PILASTERS IN THIS AREA.
10. PATTERN TO ALIGN WITH CEILING ELEMENTS IN THIS LOCATION.
11. INSTALL APPROPRIATE TRANSITION TO PROVIDE A SEAMLESS TRANSITION BETWEEN DISSIMILAR MATERIALS.
12. EXISTING VERTICAL WOOD TRIM TO BE PAINTED P1 IN THIS AREA.
13. ALL SIDES OF FURRDOWN ABOVE NURSE STATION TO BE PAINTED P4 AS SCHEDULED.
14. SSM1 SOLID SURFACE TO BE INSTALLED IN THIS AREA.
15. WB3 WALL BASE TO BE INSTALLED IN ELEVATOR LOBBY ONLY. WB2 IN OTHER AREAS IN SCOPE OF ALTERNATE #4 WORK.
16. WALLS TO BE PAINTED P1 IN ELEVATOR LOBBY ONLY. P2 IS FIELD COLOR IN OTHER AREAS IN SCOPE OF ALTERNATE #4 WORK.

## GENERAL NOTES

1). REFER TO THE PROJECT MANUAL AND FINISH SCHEDULE FOR ADDITIONAL INFORMATION. SHOULD THERE BE A DISCREPANCY BETWEEN THE DOCUMENTS, SUCH DISCREPANCY IS TO BE BROUGHT TO THE ATTENTION OF THE ARCHITECT AND THE CONTRACTOR SHALL RECEIVE INSTRUCTION PRIOR TO INSTALLATION OR PERFORMANCE OF SAID WORK. WORK PERFORMED IN CONFLICT WITH THE DRAWINGS OR SCHEDULE SHALL BE CORRECTED BY THE CONTRACTOR AT THEIR OWN EXPENSE.

2). ALL WORK IS TO BE PERFORMED ACCORDING TO MANUFACTURER'S RECOMMENDED METHODS.

3). FIELD VERIFY ALL DIMENSIONS NEW OR EXISTING PRIOR TO CONSTRUCTION AND ADJUST WHERE REQUIRED TO PROVIDE A PROPER AND COMPLETE INSTALLATION. NOTIFY THE ARCHITECT OF ANY DISCREPANCIES WITH EXISTING OR NEW CONDITIONS.

4). REPAIR EXISTING WALLS AND FLOORS AS SCHEDULED TO REMAIN AND REFINISH AS INDICATED.

5). PROVIDE SMOOTH TRANSITION WHERE NEW CONSTRUCTION INTERSECTS WITH EXISTING CONDITIONS. IN ALL AREAS ADJACENT TO NEW CONSTRUCTION, REPAIR/REFINISH AND INSTALL NEW WALL BASE, PAINT, ETC. WHERE NECESSARY TO AVOID PATCHES OR INCONSISTENT FINISHES.

6). INCLUDE ALL TRIM, INSIDE/OUTSIDE CORNER, CONNECTOR, AND END CAP PIECES FOR COMPLETE INSTALLATION OF FINISHES.

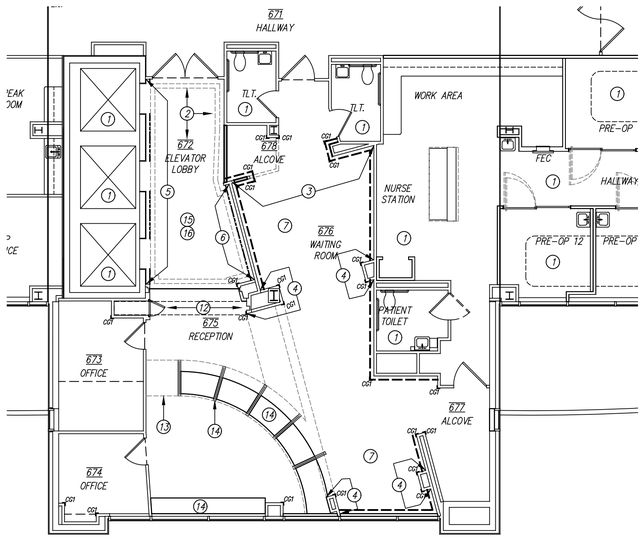
7). A PRE-INSTALLATION MEETING WITH THE ARCHITECT IS REQUIRED PRIOR TO THE INSTALLATION OF TILE, VINYL FLOORING, AND WALL PROTECTIVE PRODUCTS.

8). ON ALL WALLS SCHEDULED TO REMAIN, PATCH ANY EXISTING HOLES, CRACKS, OR OTHERWISE DAMAGED AREAS AND RE-TEXTURE AND PAINT AS SCHEDULED.

9). INSTALL NEW BASE AT NEW WALL CONSTRUCTION. PROVIDE SMOOTH TRANSITION BY RETURNING BASE TO CORNER.

10). INSTALL CORNER GUARDS FROM TOP OF BASE TO UNDERSIDE OF TRIM CAP WHERE TRIM CAP IS PROVIDED.

11). ALL DOOR FRAMES, INCLUDING EXISTING, TO BE PAINTED P3 IN THIS AREA.




## 28/ID5 SIXTH FLOOR - WALL FINISH PLAN - ALTERNATE #4

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

NORTH

| Material | Code | Manufacturer's Description |
|---|---|---|
| | | **Alternate #4 Supplemental Finishes** |
| Wall Base | WB2 | Johnsonite/Tarkett, Millwork Wall Base, MW-179-F Reveal profile, 179 Steel, 4 1/4"H |
| | WB3 | Johnsonite/Tarkett, Millwork Wall Base, MW-179-F Reveal profile, 179 Steel, 6"H |
| Wall Panel System | WPS1 | Panel Specialists Inc., PSI System 310 with Wilsonart, **Lapis Blue** D417-01 Gloss finish plastic laminated panels on MDF with .018" (.5mm) EB Edge Band in color Platinum, clear anodized aluminum finish on metal trim pieces, Class A fire-rated. PSI Trims: Horizontal/Vertical Reveal #302A; Horizontal bottom edge trim #604; Vertical Edge trim #604A; Top Trim #604A; 90 Degree outside corner trim #603-90. Installed full height unless specified otherwise. Contact: Al Skrabanek, al.skrabanek@panelspec.com, 254-742-9062 |
| | WPS2 | Panel Specialists Inc., PSI System 310 with Wilsonart, **Fawn Cypress** 8208-16 Casual Rustic texture plastic laminated panels on MDF with .018" (.5mm) EB Edge Band in color Platinum, (wood grain to be installed vertically) clear anodized aluminum finish on metal trim pieces, Class A fire-rated. PSI Trims: Horizontal/Vertical Reveal #302A; Horizontal bottom edge trim #604; Vertical Edge trim #604A; Top Trim #604A; 90 Degree outside corner trim #603-90. Installed full height unless specified otherwise. Contact: Al Skrabanek, al.skrabanek@panelspec.com, 254-742-9062 |
| Wainscot | WC2 | Panel Specialists Inc., PSI System 310 with Formica, **Pearl** 934-58, Matte finish plastic laminated panels on MDF with .018" (.5mm) EB Edge Band in color Platinum, clear anodized aluminum finish on metal trim pieces, Class A fire-rated. PSI Trims: Horizontal/Vertical trim #302A; Horizontal bottom edge trim #604; Vertical Edge trim #604A; Top Trim #604A; 90 Degree inside corner trim #604. Top Cap to be TC1 painted wood trim. Contact: Al Skrabanek, al.skrabanek@panelspec.com, 254-742-9062 |
| Terrazzo Flooring | TF1 | Epoxy-Resin System, 3/8" thickness, white epoxy background (equal to PPG1007-1 Willow Springs), 70% North American Mina White / Blanco Mexicano marble chips (Size 1 & 2), 20% Crystal Clear glass chips (Size 1 & 2), 10% Modern / Fresh Water Mother of Pearl chips (Size 1 & 2) (White) |
| | TF2 | Epoxy-Resin System, 3/8" thickness, white epoxy background (equal to PPG1007-1 Willow Springs), 50% Cobalt / Midnight Blue recycled glass chips (Size 1 & 2), 30% North American Mina White / Blanco Mexicano marble chips (Size 1 & 2), 10% Crystal Clear recycled glass chips (Size 1 & 2), 10% Modern / Fresh Water Mother of Pearl chips (Size 1 & 2) (Blue & White) |
| | TF3 | Epoxy-Resin System, 3/8" thickness, blue epoxy background (equal to Sherwin Williams, SW6966 Blueblood), 70% Cobalt / Midnight Blue recycled glass chips (Size 1 & 2), 20% Crystal Clear recycled glass chips (Size 1 & 2), 10% Modern / Freshwater Mother of Pearl chips (Size 1 & 2) (Blue) |
| | ACP2 | Armstrong, Ultima #1910, Square Lay-in ceiling panels, 24"x24"x5/8" (Include #1910 Center-Cut tiles to be coordinated with lighting schedule) |

## 16/ID5 SIXTH FLOOR - MATERIAL SCHEDULE - ALTERNATE #4

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

## WALL FINISH LEGEND

- CG — CORNER GUARD AS SCHEDULED
- WPS — FULL HEIGHT WALL PROTECTION
- WC — WAINSCOT WITH WOOD TRIM CAP TC1

## FLOOR FINISH LEGEND

- INDICATES PATTERN DIRECTION
- INDICATES SEAM LOCATION
- TF1 — TERRAZZO FLOORING (WHITE)
- TF2 — TERRAZZO FLOORING (BLUE & WHITE)
- TF3 — TERRAZZO FLOORING (BLUE)
- SV1 — SHEET VINYL (WOOD LOOK)
- SV2 — SHEET VINYL (NEUTRAL ACCENT)
- SV3 — SHEET VINYL (BLUE ACCENT)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#1041
STATE OF TEXAS
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UNIVERSITY MEDICAL CENTER
6TH FLOOR CV/CICU RENOVATION
PROPOSAL ITEM #1

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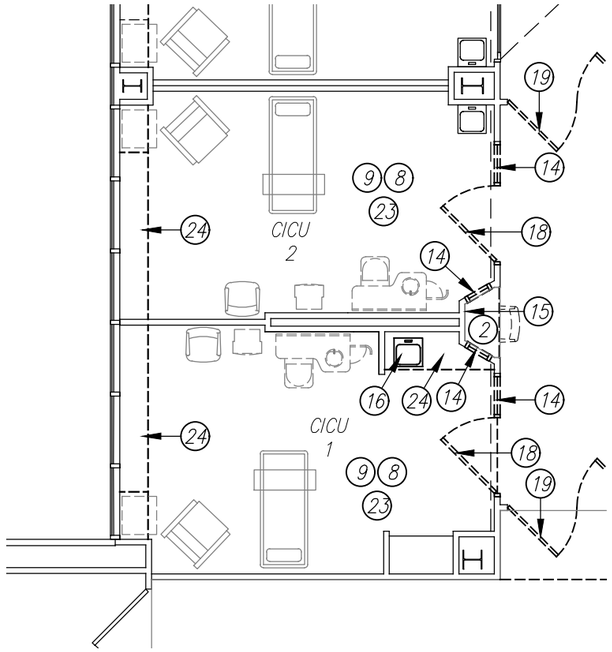
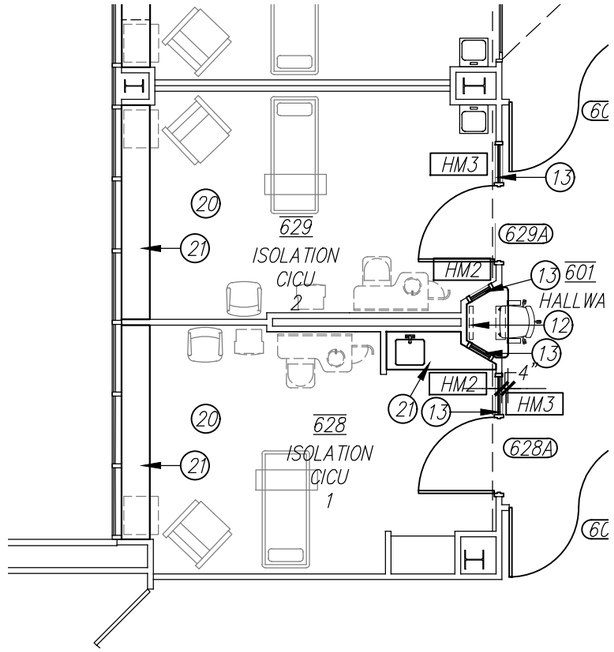
PROJECT NO. 22307
DATE: 05/12/2025

SHEET NO.
ID5

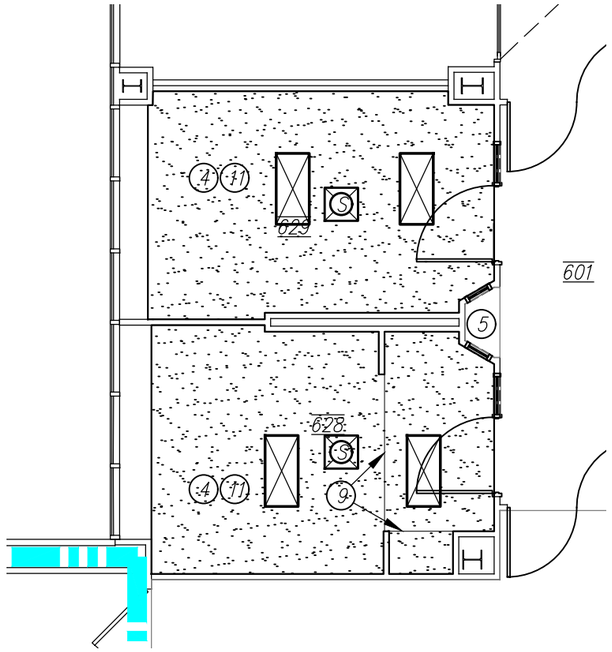
5 OF 5




** REFER TO ORIGINAL DEMOLITION PLAN SHEET FOR KEYED NOTES AND FOR MORE INFORMATION.




** REFER TO ORIGINAL ANNOTATED PLAN SHEET FOR KEYED NOTES AND FOR MORE INFORMATION.




** REFER TO ORIGINAL REFLECTED CEILING PLAN SHEET FOR KEYED NOTES AND FOR MORE INFORMATION.

## 01/SD01 DEMOLITION PLAN

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

NORTH

## 02/SD01 ANNOTATED PLAN

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

NORTH

## 03/SD01 REFLECTED CEILING PLAN

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

NORTH

## DEMOLITION KEYED NOTES

DESIGNATED BY: ←(#)

(23) PATCH, REPAIR AND PAINT EXISTING WALLS AS NEEDED TO MATCH SURROUNDING FINISH.

(24) REMOVE PLASTIC LAMINATE WINDOW SILL AND/OR COUNTERTOP AND REPLACE WITH SOLID SURFACE AS SCHEDULED. MILLWORK TO REMAIN. PROTECT DURING CONSTRUCTION.

## ANNOTATED KEYED NOTES

DESIGNATED BY: ←(#)

(20) TOUCH UP EXISTING WALL AS NEEDED, PAINT P2 AS SCHEDULED.

(21) NEW SOLID SURFACE COUNTERTOP AS SCHEDULED.

## RCP KEYED NOTES

DESIGNATED BY: ←(#)

(11) PAINT NEW CEILING P1 AS SCHEDULED.

REGISTERED ARCHITECT
STACEY MINCEY WITTRY
17827
STATE OF TEXAS

05/12/2025

# UNIVERSITY MEDICAL CENTER
# 6TH FLOOR CV/CICU RENOVATION-PROPOSAL ITEM #1
# SD01: ISOLATION CICU ROOMS 628 & 629

SCALE: AS NOTED

PROJ. NO. 22307
DATE: 05/12/2025

CONDRAY DESIGN GROUP, INC.

# ADDENDUM #1



May 13, 2025

**UMC 6th Floor CV/CICU Renovation**
**Proposal Item #1**
602 Indiana Avenue
Lubbock, TX 79415


05/13/2025

NOTICE TO BIDDERS:

The following shall be incorporated in and become a part of the original Drawings and Specifications of the above identified project. Please acknowledge receipt of this Addendum by noting it on your Proposal.

Mechanical Items:

Item 1. Drawing Sheet M1:

a. Remove additional ductwork and pressure sensors for CICU 1 and CICU 2 Rooms in order to convert these rooms into Isolation Rooms.

b. Remove additional ductwork on Fifth Floor serving low exhaust for CICU 1 and CICU 2 Rooms in order to convert these rooms into Isolation Rooms.

c. Replace existing VAV Box and ceiling diffusers and grilles serving elevator lobby. The VAV Box replacement shall be under Bid Alternate #3. The replacement of the ceiling diffusers and grilles shall be under Bid Alternate #4.

Item 2. Drawing Sheet M2:

a. Provide supply air valves, additional ductwork, and pressure sensors for CICU 1 and CICU 2 Rooms in order to convert these rooms into Isolation Rooms.

b. Provide additional ductwork and exhaust air valves on Fifth Floor serving low exhaust for CICU 1 and CICU 2 Rooms in order to convert these rooms into Isolation Rooms.

c. Provide new VAV Box and ceiling diffusers and grilles serving elevator lobby. The VAV Box replacement shall be under Bid Alternate #3. The replacement of the ceiling diffusers and grilles shall be under Bid Alternate #4.

Item 3. Drawing Sheet M3:

a. VAV Box Schedule: 6V-21 and 6V-22 have been removed. 6V-57 has been added.

b. Air Distribution Schedule: S-3 Supply Diffuser type has been added.

c. Air Valve Schedule: Provide air valves as scheduled.

d. Isolation Exhaust Duct Riser Diagram has been added.

e. Dual Duct Supply Room Control Schematic has been added.

Item 4. Specifications:

a. Specification Section 230590 “Temperature Regulation” has been revised to include the air valves for the Isolation Rooms.

b. Specification Section 230910 “Critical HVAC Controls” has been added to include the air valves and controls required for the Isolation Rooms.

c. Specification Section 2331134 “Metal Ducts” has been revised to include the high-pressure exhaust duct requirements for the Isolation exhaust ducts.

<u>Plumbing Items:</u>

Item 1. Drawing Sheet P1:

a. Remove the existing sink in CICU 1 Room, to be replaced with new sink.

Item 2. Drawing Sheet P2:

a. Provide new sink in CICU 1 Room as scheduled.

# ADDENDUM #1



Item 3. Drawing Sheet P3:

a. Added sink S-2 to Plumbing Fixture Schedule.

Electrical Items:

Item 1. Drawing Sheet E1:

a. Added scope of work for alternate no.4 including light fixtures, switches and ceiling mounted devices in lobby area.

b. Provide 120v circuit to serve new fire alarm equipment, power supplies, batteries, etc. Extend and connect to nearest 120v “life safety” emergency panel with available capacity. Coordinate location with fire alarm contractor.

Item 2. Drawing Sheet E2:

a. Added scope of work for alternate no.4 including light fixtures and switches in lobby area.

Item 3. Drawing Sheet E3:

a. Added scope of work for alternate no.4 including VAV power and vending machine receptacle in lobby area.

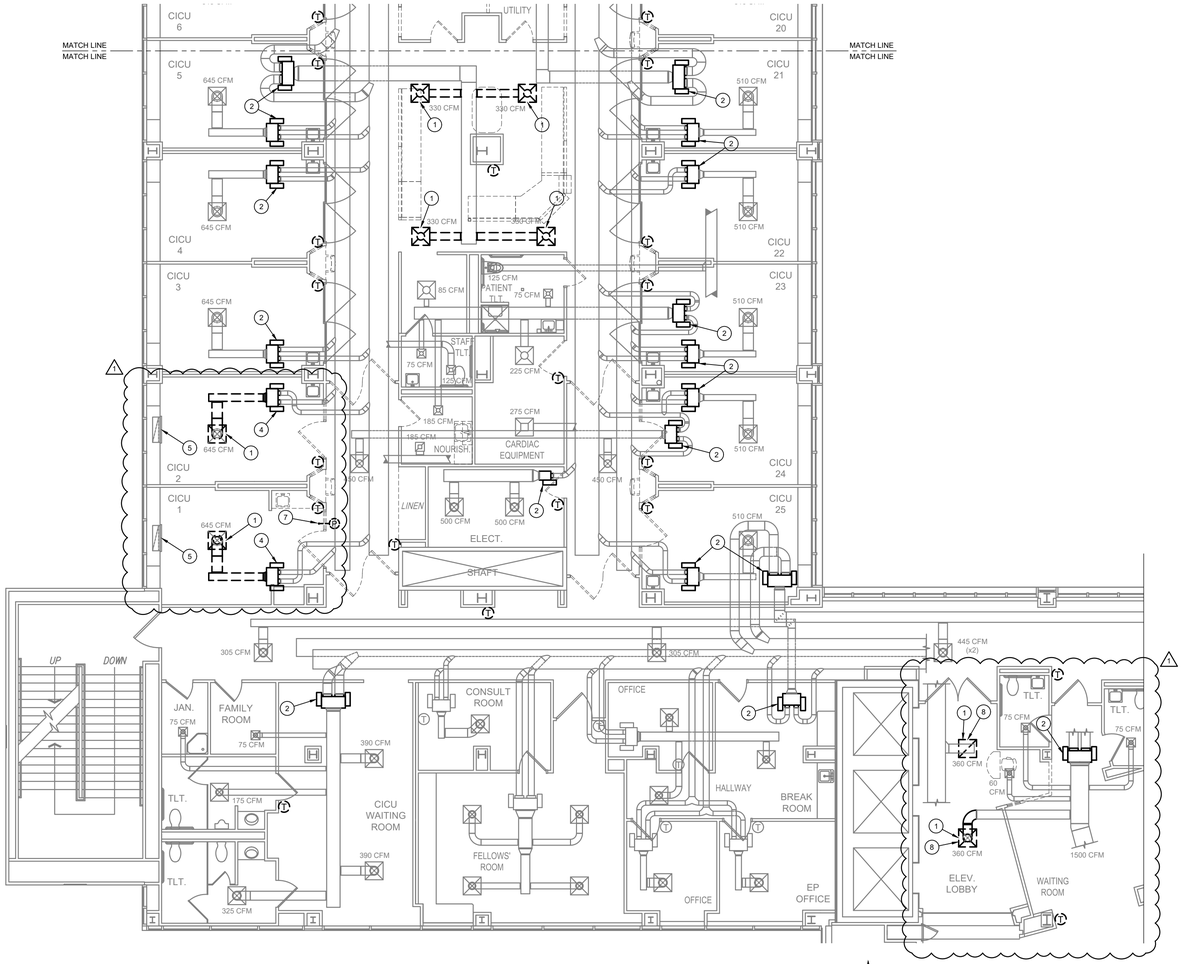
b. Added 120v circuit and fire alarm connection to serve new fire smoke damper.

c. Added 120v circuit and fire alarm connection to serve new isolation room exhaust system.

d. Drawing Sheet E4:

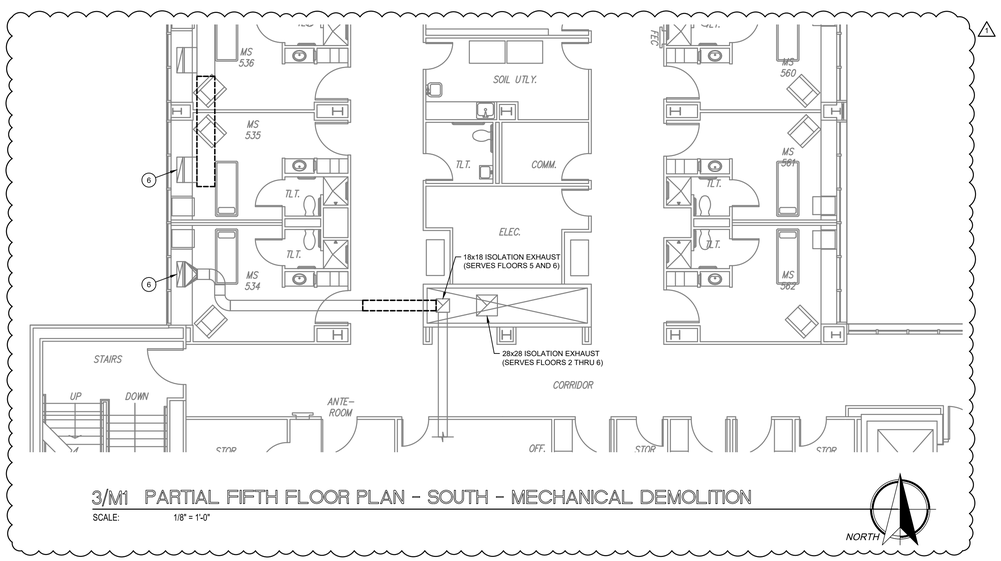
e. Added scope of work for alternate no.4 light fixtures to schedule.

End of Fincher Engineering, LLC Addendum



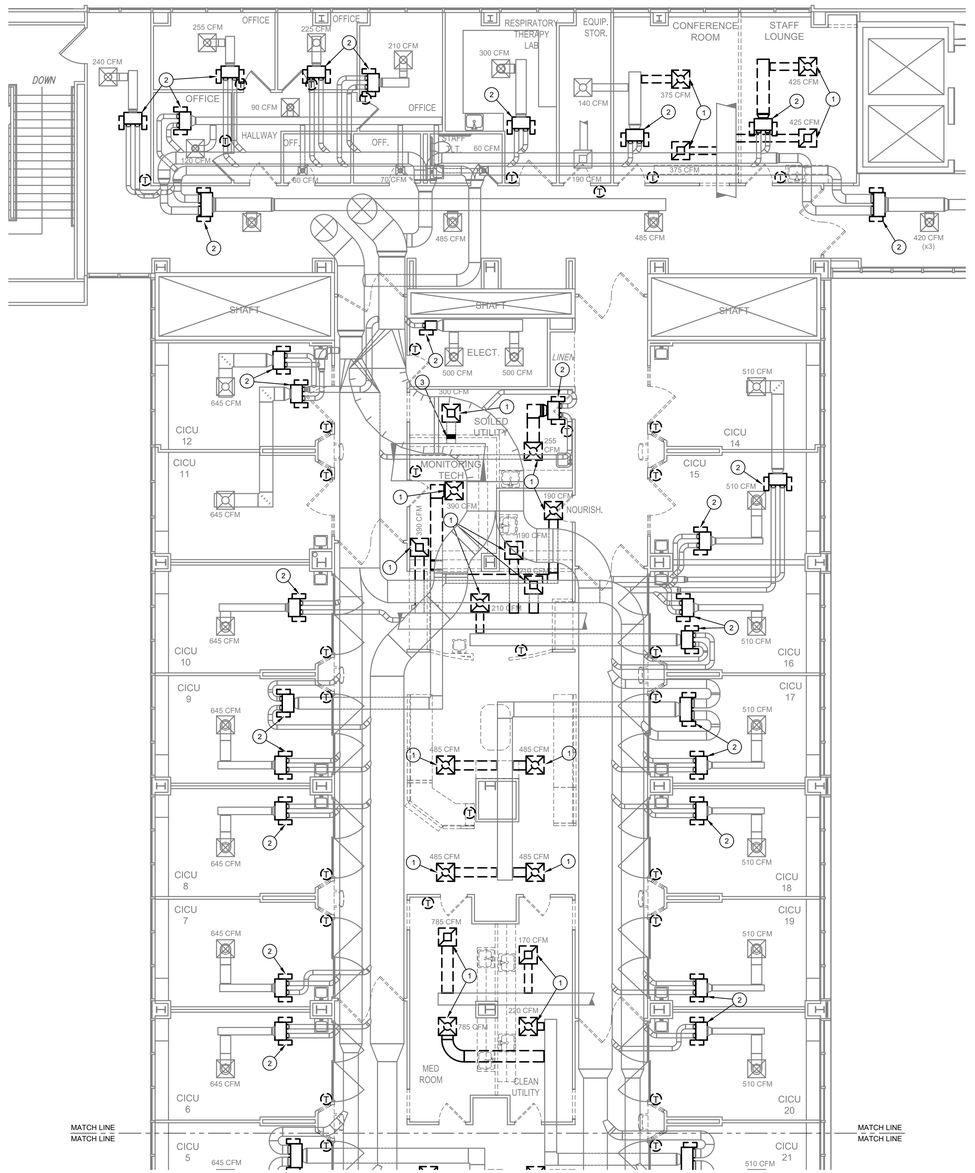

1/M1 PARTIAL SIXTH FLOOR PLAN - SOUTH - MECHANICAL DEMOLITION

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




3/M1 PARTIAL FIFTH FLOOR PLAN - SOUTH - MECHANICAL DEMOLITION

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




2/M1 PARTIAL SIXTH FLOOR PLAN - NORTH - MECHANICAL DEMOLITION

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

## GENERAL NOTES

A. REFER TO SHEET M0 FOR ALL GENERAL NOTES APPLICABLE TO THIS SHEET.

## DEMOLITION KEYED NOTES

1. REMOVE EXISTING CEILING DIFFUSER/ GRILLE SHOWN DASHED, EXISTING AIRFLOW SHOWN FOR REFERENCE ONLY. MODIFY EXISTING DUCT RUNOUT TO BE REUSED IF REQUIRED.
2. UNDER ALTERNATE BID #3 : REMOVE EXISTING PNEUMATIC VAV BOX, SHOWN DASHED, AND ASSOCIATED THERMOSTAT. MAINTAIN EXISTING INLET AND OUTLET DUCTWORK TO CONNECT TO NEW DDC VAV BOX IN SAME LOCATION.
3. REMOVE EXISTING FIRE SMOKE DAMPER.
4. REMOVE EXISTING DUAL DUCT VAV BOX, SHOWN DASHED. REMOVE EXISTING ASSOCIATED THERMOSTAT AND ALL WIRING. MAINTAIN EXISTING DUCTWORK TO CONNECT TO NEW AIR VALVE IN SAME LOCATION.
5. EXISTING LOW RETURN/ EXHAUST GRILLE IN MILLWORK TO REMAIN. EXISTING GRILLE SHALL BE UTILIZED FOR NEW ISOLATION EXHAUST SYSTEM.
6. EXISTING RETURN/ EXHAUST DUCT SERVING LOW GRILLE ON 6TH FLOOR ABOVE. REMOVE PORTIONS OF DUCTWORK SHOWN DASHED IN ORDER TO BE UTILIZED FOR NEW ISOLATION EXHAUST SYSTEM SHOWN ON NEW PLAN.
7. REMOVE EXISTING ROOM PRESSURE SENSOR, SHOWN DASHED.
8. UNDER ALTERNATE BID #4, REPLACE CEILING DIFFUSER/ GRILLE IN ELEVATOR LOBBY.

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6TH FLOOR CV/CICU RENOVATION
PROPOSAL ITEM #1

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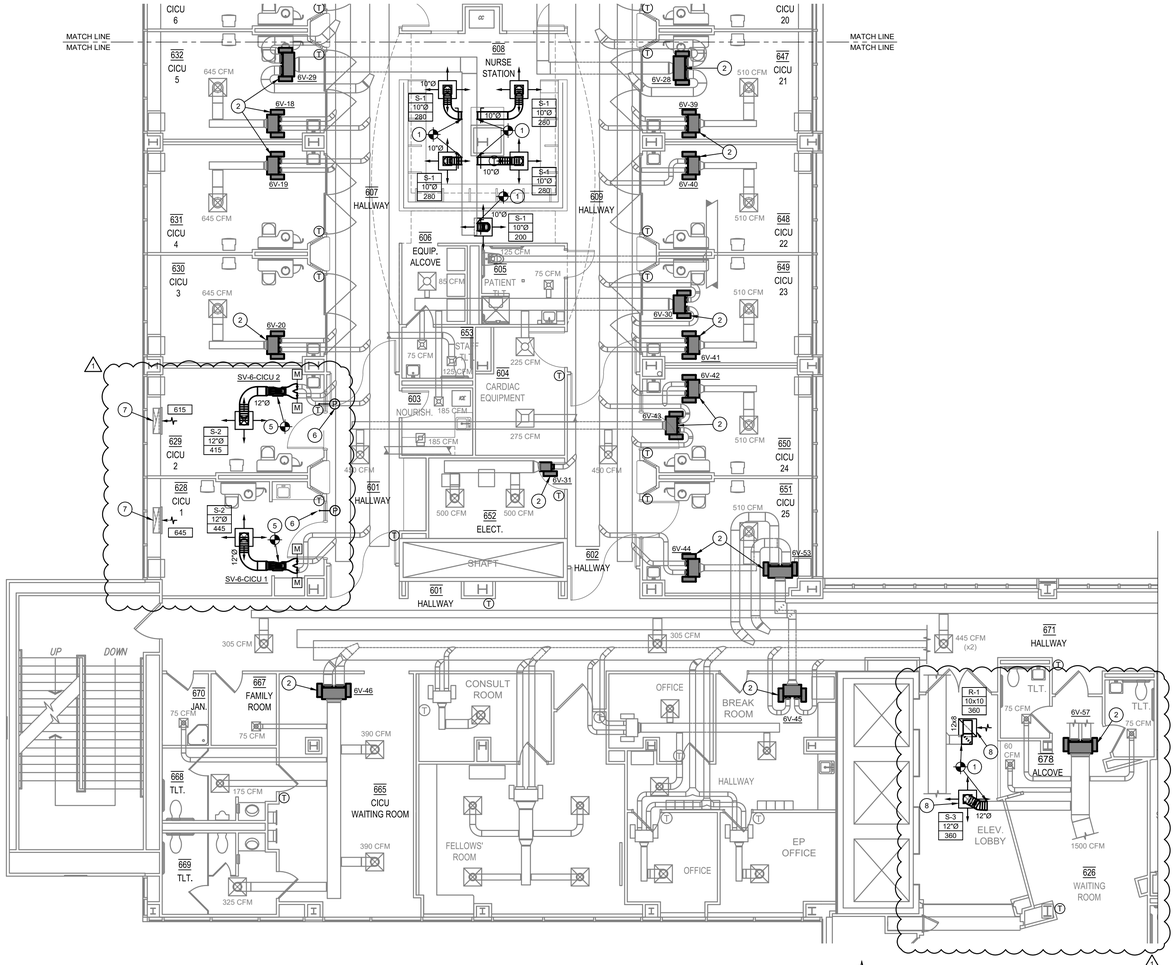
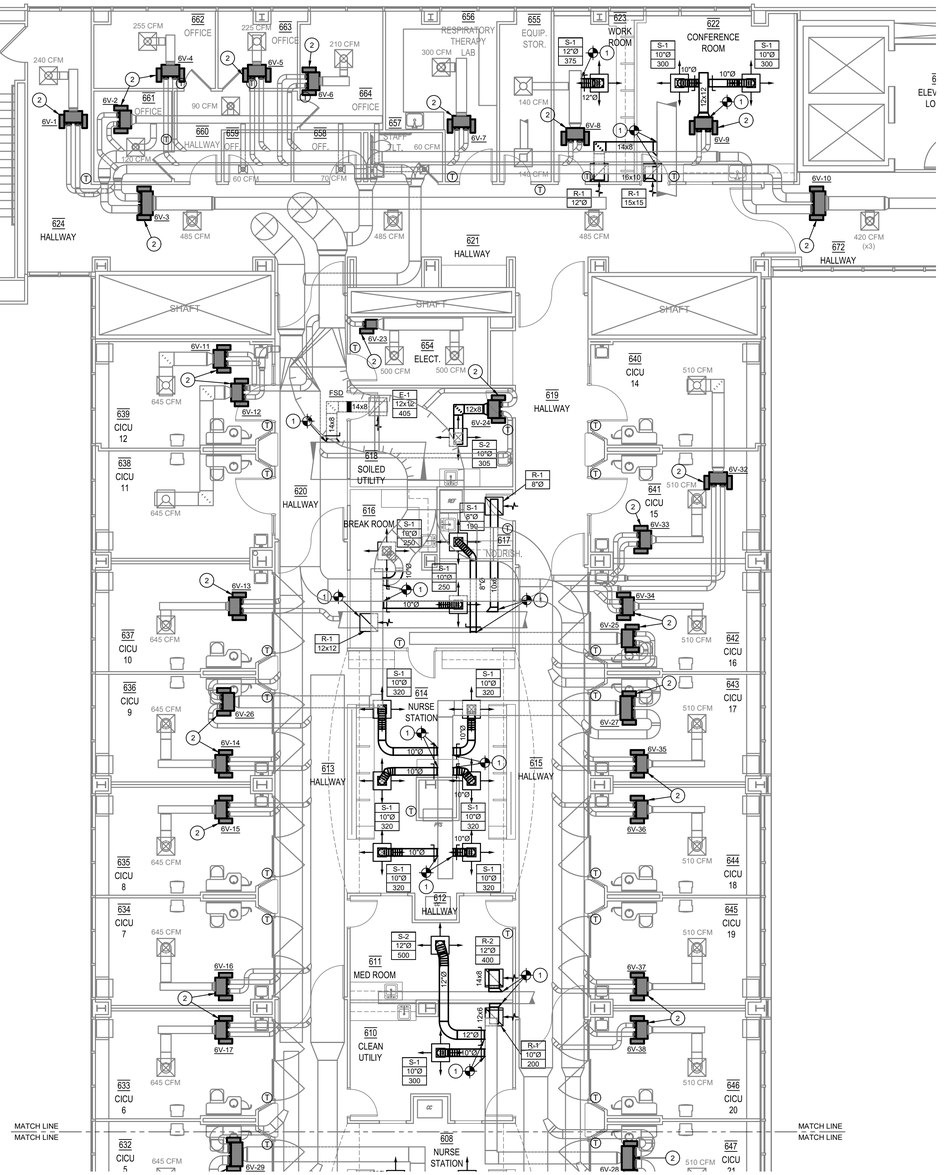



## 1/M2 PARTIAL SIXTH FLOOR PLAN - SOUTH - MECHANICAL

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

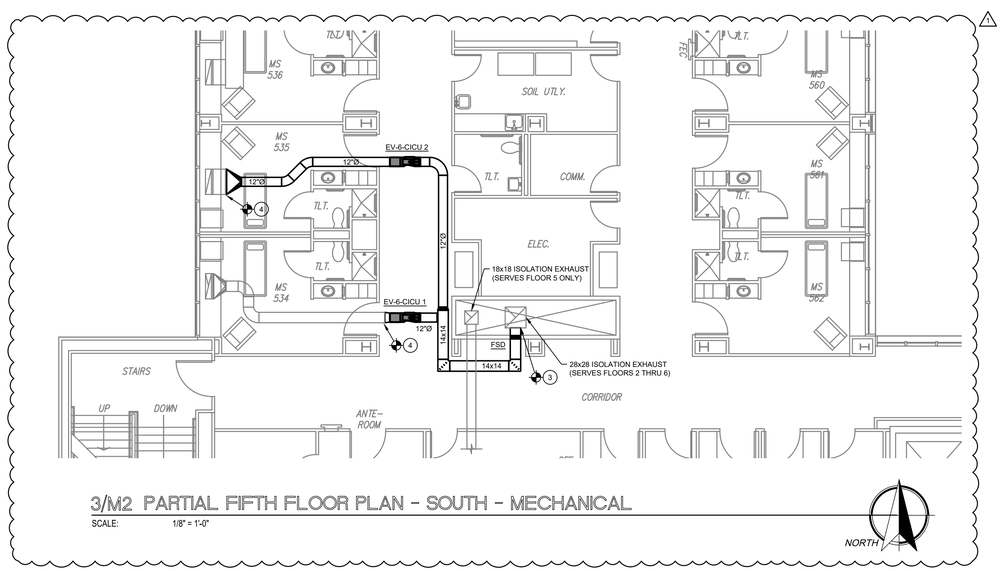
NORTH




## 2/M2 PARTIAL SIXTH FLOOR PLAN - NORTH - MECHANICAL

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

NORTH




## 3/M2 PARTIAL FIFTH FLOOR PLAN - SOUTH - MECHANICAL

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

NORTH

## GENERAL NOTES

A. REFER TO SHEET M0 FOR ALL GENERAL NOTES APPLICABLE TO THIS SHEET.

## KEYED NOTES

1. CONNECT NEW DUCTWORK OR DIFFUSER/ GRILLE TO EXISTING DUCTWORK AT THIS POINT, PROVIDE DUCT TRANSITION AS REQUIRED.
2. UNDER ALTERNATE BID #3 : PROVIDE NEW VAV BOX LOCATED IN SAME LOCATION AS REMOVED VAV BOX. MODIFY INLET AND OUTLET DUCTWORK AND PROVIDE TRANSITIONS AS REQUIRED TO MATCH UNIT CONNECTION SIZES. PROVIDE NEW DIGITAL THERMOSTAT IN PLACE OF EXISTING PNEUMATIC THERMOSTAT. BALANCE NEW VAV BOX AND ALL CONNECT DIFFUSERS TO AIRFLOWS LISTED ON PLANS.
3. CONNECT NEW 14x14 ISOLATION EXHAUST DUCT TO EXISTING 28x28 ISOLATION EXHAUST DUCT MAIN IN CHASE. REFER TO RISER DIAGRAM.
4. CONNECT NEW ISOLATION EXHAUST DUCT TO EXISTING DUCT SERVING FLOOR ABOVE. EXISTING DUCT SHALL BE FULLY INSPECTED. SEAL ANY EXISTING LEAKS IN DUCTWORK.
5. CONNECT NEW COLD AND HOT HIGH PRESSURE DUCTS TO EXISTING DUCTS AND ROUTE TO NEW SUPPLY AIR VALVE. PROVIDE MOTORIZED DAMPERS IN EACH DUCT AND CONNECT BOTH DUCTS INTO WYE FITTING TO INLET ON SUPPLY AIR VALVE. PROVIDE INLET AND OUTLET TRANSITIONS AS REQUIRED.
6. NEW ROOM DIFFERENTIAL PRESSURE SENSOR. READOUT SCREEN SHALL BE ON HALLWAY SIDE OF WALL.
7. EXISTING LOW RETURN/ EXHAUST GRILLE TO BE UTILIZED FOR NEW ISOLATION EXHAUST SYSTEM. CLEAN EXISTING GRILLE AND INSIDE OF EXISTING DUCTWORK AS MUCH AS POSSIBLE. EXHAUST AIR VALVE SERVING THIS GRILLE IS LOCATED ON FLOOR BELOW.
8. UNDER ALTERNATE BID #4, REPLACE CEILING DIFFUSER/ GRILLE IN ELEVATOR LOBBY

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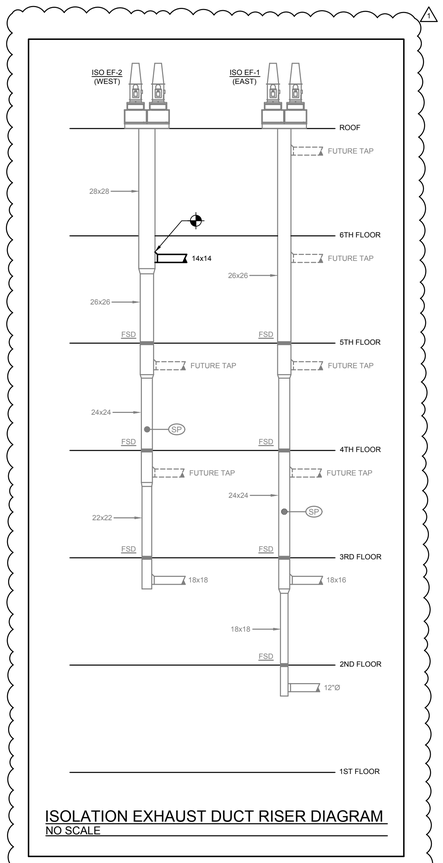
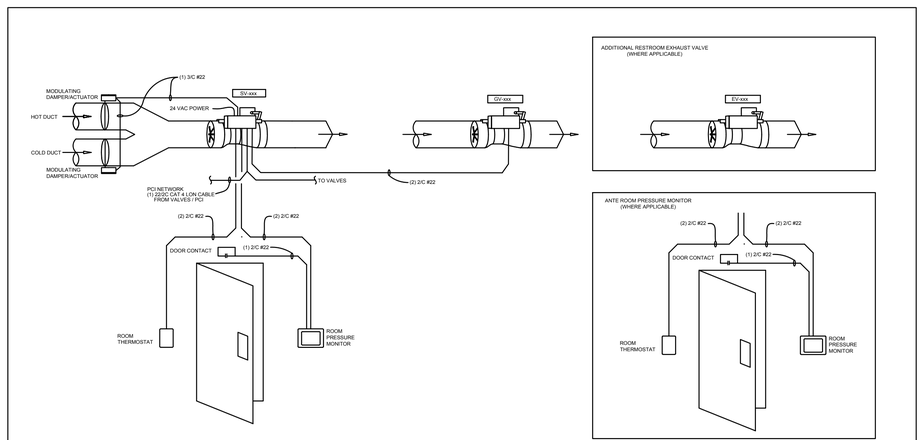



ISOLATION EXHAUST DUCT RISER DIAGRAM
NO SCALE




DUAL DUCT SUPPLY ROOM CONTROL SCHEMATIC
NO SCALE

## DUAL DUCT VAV BOX SCHEDULE (ALTERNATE #3)

| MARK | BASIS OF DESIGN | | COOLING MAX CFM | HEATING MAX CFM | MINIMUM CFM | COLD INLET SIZE | HOT INLET SIZE | ESP |
|---|---|---|---|---|---|---|---|---|
| | MANUFACTURER | MODEL | | | | | | |
| 6V-1 | TITUS | DEDV | 240 | 180 | 120 | 6"Ø | 6"Ø | 0.5" |
| 6V-2 | TITUS | DEDV | 400 | 300 | 200 | 7"Ø | 6"Ø | 0.5" |
| 6V-3 | TITUS | DEDV | 1,455 | 1,090 | 725 | 12"Ø | 10"Ø | 0.5" |
| 6V-4 | TITUS | DEDV | 255 | 190 | 125 | 6"Ø | 5"Ø | 0.5" |
| 6V-5 | TITUS | DEDV | 225 | 170 | 110 | 6"Ø | 5"Ø | 0.5" |
| 6V-6 | TITUS | DEDV | 210 | 160 | 105 | 6"Ø | 5"Ø | 0.5" |
| 6V-7 | TITUS | DEDV | 300 | 225 | 150 | 6"Ø | 5"Ø | 0.5" |
| 6V-8 | TITUS | DEDV | 515 | 385 | 260 | 7"Ø | 6"Ø | 0.5" |
| 6V-9 | TITUS | DEDV | 600 | 450 | 300 | 8"Ø | 7"Ø | 0.5" |
| 6V-10 | TITUS | DEDV | 1,260 | 945 | 630 | 12"Ø | 10"Ø | 0.5" |
| 6V-11 | TITUS | DEDV | 645 | 480 | 325 | 8"Ø | 7"Ø | 0.5" |
| 6V-12 | TITUS | DEDV | 645 | 480 | 325 | 8"Ø | 7"Ø | 0.5" |
| 6V-13 | TITUS | DEDV | 645 | 480 | 325 | 8"Ø | 7"Ø | 0.5" |
| 6V-14 | TITUS | DEDV | 645 | 480 | 325 | 8"Ø | 7"Ø | 0.5" |
| 6V-15 | TITUS | DEDV | 645 | 480 | 325 | 8"Ø | 7"Ø | 0.5" |
| 6V-16 | TITUS | DEDV | 645 | 480 | 325 | 8"Ø | 7"Ø | 0.5" |
| 6V-17 | TITUS | DEDV | 645 | 480 | 325 | 8"Ø | 7"Ø | 0.5" |
| 6V-18 | TITUS | DEDV | 645 | 480 | 325 | 8"Ø | 7"Ø | 0.5" |
| 6V-19 | TITUS | DEDV | 645 | 480 | 325 | 8"Ø | 7"Ø | 0.5" |
| 6V-20 | TITUS | DEDV | 645 | 480 | 325 | 8"Ø | 7"Ø | 0.5" |
| NOT USED | | | | | | | | |
| NOT USED | | | | | | | | |
| 6V-23 | TITUS | DESV | 1,000 | --- | 0 | 10"Ø | --- | 0.5" |
| 6V-24 | TITUS | DEDV | 305 | 305 | 305 | 6"Ø | 6"Ø | 0.5" |
| 6V-25 | TITUS | DEDV | 190 | 145 | 95 | 6"Ø | 5"Ø | 0.5" |
| 6V-26 | TITUS | DEDV | 500 | 375 | 250 | 7"Ø | 6"Ø | 0.5" |
| 6V-27 | TITUS | DEDV | 1,920 | 1,440 | 960 | 14"Ø | 12"Ø | 0.5" |
| 6V-28 | TITUS | DEDV | 800 | 800 | 800 | 10"Ø | 10"Ø | 0.5" |
| 6V-29 | TITUS | DEDV | 1,120 | 840 | 560 | 12"Ø | 10"Ø | 0.5" |
| 6V-30 | TITUS | DEDV | 645 | 485 | 325 | 8"Ø | 7"Ø | 0.5" |
| 6V-31 | TITUS | DESV | 1,000 | --- | 0 | 10"Ø | --- | 0.5" |
| 6V-32 | TITUS | DEDV | 510 | 380 | 255 | 7"Ø | 6"Ø | 0.5" |
| 6V-33 | TITUS | DEDV | 510 | 380 | 255 | 7"Ø | 6"Ø | 0.5" |
| 6V-34 | TITUS | DEDV | 510 | 380 | 255 | 7"Ø | 6"Ø | 0.5" |
| 6V-35 | TITUS | DEDV | 510 | 380 | 255 | 7"Ø | 6"Ø | 0.5" |
| 6V-36 | TITUS | DEDV | 510 | 380 | 255 | 7"Ø | 6"Ø | 0.5" |
| 6V-37 | TITUS | DEDV | 510 | 380 | 255 | 7"Ø | 6"Ø | 0.5" |
| 6V-38 | TITUS | DEDV | 510 | 380 | 255 | 7"Ø | 6"Ø | 0.5" |
| 6V-39 | TITUS | DEDV | 510 | 380 | 255 | 7"Ø | 6"Ø | 0.5" |
| 6V-40 | TITUS | DEDV | 510 | 380 | 255 | 7"Ø | 6"Ø | 0.5" |
| 6V-41 | TITUS | DEDV | 510 | 380 | 255 | 7"Ø | 6"Ø | 0.5" |
| 6V-42 | TITUS | DEDV | 510 | 380 | 255 | 7"Ø | 6"Ø | 0.5" |
| 6V-43 | TITUS | DEDV | 450 | 335 | 225 | 7"Ø | 6"Ø | 0.5" |
| 6V-44 | TITUS | DEDV | 510 | 380 | 255 | 7"Ø | 6"Ø | 0.5" |
| 6V-45 | TITUS | DEDV | 610 | 460 | 305 | 8"Ø | 6"Ø | 0.5" |
| 6V-46 | TITUS | DEDV | 1,430 | 1075 | 715 | 12"Ø | 10"Ø | 0.5" |
| 6V-53 | TITUS | DEDV | 890 | 670 | 445 | 10"Ø | 7"Ø | 0.5" |
| 6V-57 | TITUS | DEDV | 2,070 | 1,555 | 1,035 | 14"Ø | 12"Ø | 0.5" |

NOTES:

A. ALL VAV BOXES LISTED IN THIS SCHEDULE SHALL BE PROVIDED UNDER BID ALTERNATE #3.

B. IF REQUIRED, CONTRACTOR TO PROVIDE TRANSITION FROM DUCT SIZE SHOWN ON PLANS TO SCHEDULED BOX SIZE.

C. PROVIDE ALL VAV BOXES WITH TITUS 'STERILOC' LINER.

D. INLET DUCT SIZE SHALL MATCH SCHEDULED VAV BOX SIZE UNLESS NOTED OTHERWISE ON PLANS WITH 6"Ø BEING MINIMUM DUCT SIZE.

E. ALL CONTROLS AND CONTROLS TRANSFORMER SHALL BE FACTORY MOUNTED. VAV BOX MANUFACTURER SHALL COORDINATE ALL REQUIREMENTS WITH JOHNSON CONTROLS PRIOR TO BID.

## AIR DISTRIBUTION SCHEDULE

| MARK | TYPE | BASIS OF DESIGN | | FACE SIZE | LOCATION | FRAME (NOTE C) | FINISH | MATERIAL | MAX NC | MAX PD | DAMPER | PATTERN | DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MANUFACTURER | MODEL | | | | | | | | | | |
| S-1 | SUPPLY | TITUS | TDC | 24x24 | CEILING | TB | WHITE | STEEL | 20 | 0.08" | NONE | 4-WAY | SQUARE LOUVERED FACE DIFFUSER |
| S-2 | SUPPLY | TITUS | TDC | 24x24 | CEILING | PF | WHITE | STEEL | 20 | 0.08" | NONE | 4-WAY | SQUARE LOUVERED FACE DIFFUSER |
| S-3 | SUPPLY | TITUS | OMNI | 24x24 | CEILING | TB | WHITE | STEEL | 25 | 0.08" | NONE | 4-WAY | SQUARE PLAQUE FACE DIFFUSER |
| R-1 | RETURN | TITUS | PAR | 24x24 | CEILING | TB | WHITE | STEEL | 25 | 0.09" | NONE | PERFORATED | SQUARE PERFORATED GRILLE |
| R-2 | RETURN | TITUS | PAR | 24x24 | CEILING | PF | WHITE | STEEL | 25 | 0.09" | NONE | PERFORATED | SQUARE PERFORATED GRILLE |
| E-1 | EXHAUST | TITUS | PAR | 24x24 | CEILING | PF | WHITE | STEEL | 25 | 0.09" | NONE | PERFORATED | SQUARE PERFORATED GRILLE |

NOTES:

A. BORDER TYPES AND MOUNTING REQUIREMENTS SHALL BE COORDINATED WITH ARCHITECTURAL REFLECTED CEILING PLAN.

B. PROVIDE TRANSITIONS (INCLUDING SQUARE TO ROUND) WHERE REQUIRED TO TRANSITION FROM DUCT SIZE SHOWN TO AIR DEVICE NECK SIZE.

C. MOUNTING AND FRAMING NOTES:

- TB = LAY-IN DEVICE FOR INSTALLATION IN LAY-IN CEILINGS
- PF = LAY-IN DEVICE WITH MOUNTING FRAME FOR HARD CEILINGS EQUAL TO TITUS RAPID MOUNT FRAME
- DM = AIR DEVICE MOUNTED DIRECTLY TO DUCT OR DUCT TAP AS SHOWN ON DRAWING.
- SM = SURFACE MOUNT FOR MOUNTING DIRECTLY TO CEILING OR SIDEWALL.
- SP = CURVED FACE DIFFUSER/GRILLE FOR MOUNTING DIRECTLY TO SPIRAL DUCTWORK.

## AIR VALVE SCHEDULE

| AIR VALVE TAG | DEVICE TYPE | DEVICE MATERIAL | PRESSURE DROP ACROSS | SUPPLY CFM | EXHAUST CFM | ROOM OFFSET | VALVE SIZE | DUAL DUCT INLET MOTORIZED DAMPERS WITH WYE FITTING | SOUND ATTENUATOR | EXAMPLE: PHOENIX |
|---|---|---|---|---|---|---|---|---|---|---|
| SV-6-CICU 1 | SUPPLY | ALUMINUM | 0.3" W.C. | 445 | | -200 | 10 | YES | - | TSVA110L-AIEHZ-PSL |
| EV-6-CICU 1 | EXHAUST | ALUMINUM | 0.3" W.C. | | 645 | | 12 | - | YES | TEVA112L-AINHZ-PSL |
| SV-6-CICU 2 | SUPPLY | ALUMINUM | 0.3" W.C. | 415 | | -200 | 10 | YES | - | TSVA110L-AIEHZ-PSL |
| EV-6-CICU 2 | EXHAUST | ALUMINUM | 0.3" W.C. | | 615 | | 12 | - | YES | TEVA112L-AINHZ-PSL |

NOTES:
1. ROOM SUPPLY RATE SHALL BE ADJUSTABLE VIA THE BUILDING MANAGEMENT SYSTEM.
2. AIR VALVES SHALL BE VENTURI TYPE AND NOT UTILIZE AIRFLOW VELOCITY SENSORS IN THE AIRSTREAM.
3. SOUND ATTENUATORS SHALL BE PHOENIX 'NEUTRALIZER' OR EQUAL. SHALL BE SAME SIZE AS AIR VALVE, AND INSTALLED ON LOW PRESSURE SIDE OF AIR VALVE.

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# SECTION 230590 – TEMPERATURE REGULATION

## 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 control equipment for HVAC systems and components.

### 1.3 DEFINITIONS

A. FMS: Facility Management System.
B. ASC: Application Specific Controller.
C. BMS: Building Management System.
D. DDC: Direct Digital Control
E. GUI: Graphical User Interface
F. HVAC: Heating, Ventilation, and Air Conditioning
G. LAN: Local Area Network.
H. PID: Proportional, Integral, Derivative
I. NAE: Network Automation Engineer
J. UNT: Unitary Controller
K. VAV: Variable Air Volume
L. UDP: User Datagram Protocol

### 1.4 SCOPE

A. Furnish and install a BMS to control the equipment as shown on the drawings and described herein.

B. Scope of work consist of providing controls for new dual duct terminal units. A new SNE network controller shall be provided for BACnet MS/TP communication.

C. New SNE network controller shall be added to existing JCI server.

D. Furnish and install CVM terminal unit field controllers with integrated actuators for DDC control of single & dual duct terminal units.

E. Provide and install the 120V/24V transformers for adequate power to all the new electronic controls. All 120V power requirements to control panels shall be provided by division 26 contractor.

F. Furnish all labor, materials, equipment, and service necessary for a complete and operating temperature control system, utilizing a high-speed peer to peer network of Direct Digital Controls as shown on the drawings and as described herein.

G. Drawings are diagrammatic only. Equipment and labor not specifically referred to herein or on the plans, that are required to meet the functional intent, shall be provided without additional cost to the Owner.

H. Complete temperature control system to be DDC with electronic sensors and electric actuation of valves and dampers and electronic actuation of terminal equipment valves and actuators as specified herein.

I. All work described in this section shall be installed, wired, circuit tested and calibrated by factory certified technicians qualified for this work and in the regular employment of the temperature control system manufacturer. The local installing office shall be a manufactured owned branch and shall have a minimum of twenty years of installation experience. Supervision, calibration and checkout of the system shall be by the employees of the local temperature control contracting office. Supplier shall have an in-place support facility within 150 miles of the site with technical staff, spare parts inventory and all necessary test and diagnostic equipment.

J. All installation labor (i.e. wiring, conduit, tubing, etc.) and installation material for the installation of the control system, including all power requirements, shall be provided by the temperature control subcontractor.

## 1.5 FMS DESCRIPTION

A. The FMS shall be a complete system designed for use on Intranets and the Internet. This functionality shall extend into the equipment rooms. Contractor shall be responsible for coordination with the owner's IT staff to ensure that the FMS will perform in the owner's environment without disruption to any of the other activities taking place on that LAN.

B. All points of user interface shall be on standard PCs that do not require the purchase of any special software from the FMS manufacturer for use as a building operations terminal. The primary point of interface on these PCs will be a standard Web Browser such as Internet Explorer or Netscape.

C. The FMS work shall consist of all labor, materials, tools, equipment, software, software licenses, wiring, tubing, installation, engineering, calibration, documentation, submittals, testing, verification, training services, permits and licenses, management, warranties, services and items as Specified in these Division documents which are required for the complete, fully functional and commissioned FMS.

## 1.6 QUALITY ASSURANCE

A. Bids by wholesalers, franchised, and non-franchised contractors shall not be acceptable.

B. The system manufacturer shall, as a minimum, manufacture and supply the Application Specific Controllers, Supervisory Controllers, Graphical User Interface, damper actuators, and valve actuator assembly.

C. The Building Management System contractor shall have a full service facility that is staffed with engineers in Johnson Controls systems and technicians fully capable of providing instructions and routine emergency maintenance service on all Johnson Controls system components.

D. Mechanical equipment manufacturers desiring to provide DDC type controls as factory mounted equipment shall not be acceptable.

E. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

F. Comply with NFPA 90A, "Installation of Air Conditioning and Ventilation Systems."

G. Comply with National Electric Code.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Factory-Mounted Components: Where control devices specified in this Section are indicated to be factory mounted on equipment, arrange for shipping of control devices to unit manufacturer.

1.8 COORDINATION

A. Coordinate location of thermostats and other exposed control sensors with plans and room details before installation.

B. Coordinate supply of conditioned electrical circuits for control units and panels; electrical circuits provided by electrical contractor.

1.9 SYSTEM INSTALLATION GUIDELINES

A. All exposed temperature control and interlock wiring shall be installed in conduit, unless otherwise noted on the plans. Power or interlock wiring shall be run in separate conduit from sensor and communications wiring.

B. All non-plenum rated cable will be run in conduit from termination to termination points.

C. Plenum rated cabling run in the return plenum above dropped ceilings does not need to be run in conduit, but shall be installed and supported as close as possible to the structural members. Main cable bundles shall, in general, run above Corridor ceilings, with individual cables extending above ceiling to the terminal units. Cable shall not lay on the ceiling grid, lights, ductwork etc. It will be run at right angles, parallel and perpendicular to the building lines with run outs into rooms being perpendicular to the main cable bundles.

D. All wiring within Mechanical Rooms or Air Handling Rooms shall be run in conduit. Wiring extending from these rooms shall be installed in conduit that extends a minimum of 12” beyond the mechanical room wall. Remote satellite boxes used for housing control transformers shall be located above accessible ceilings of Corridors within 10 feet of mechanical rooms. Control transformers shall not be installed above ceilings of limited access areas such as offices, conference rooms, office suites, etc. or above non-accessible ceilings.

E. All plenum rated cabling run in standard drywall construction will be run inside the wall in new or existing conduit which extends six inches above the top plate of the wall and exiting the wall through standard wall boxes.

F. On wall constructed of solid concrete, cinder block or plaster, cables will be run in concealed conduit, surface wire mold or other approved raceway.

G. No ceiling tiles will be removed or holes punched out to accommodate cable penetration into a room.

H. Cabling shall be bundled neatly and well secured using nylon zip straps. It shall not be wrapped around piping or conduit. Support cabling at walls, to sub-ceiling or structural steel with wall locks or clamps. Cabling shall not be installed with excessive slack.

I. Cables requiring crimp-on connectors must have those connectors attached with an appropriate and recommended specialized crimping tool.

J. Identify each item, mounted on the face of a control panel, with a label (1/4" letters minimum).

K. Thermostats or sensors mounted on outside walls shall be mounted on an insulated mounting base (or equal).

L. All sensor elements in water lines shall be installed in separable wells, packed with heat conductive compound.

## 1.10 SYSTEM PERFORMANCE

A. Performance Standards. The system shall conform to the following:

1. Graphic Display. The system shall display a graphic with 20 dynamic points with all current data within 20 seconds.
2. Graphic Refresh. The system shall update a graphic with 20 dynamic points with all current data within 20 seconds.
3. Object Command. The maximum time between the command of a binary object by the operator and the reaction by the device shall be less than 5 seconds. Analog objects should start to adjust within 5 seconds.
4. Object Scan. All changes of state and change of analog values will be transmitted over the high-speed network such that any data used or displayed at a controller or workstation will be updated within 60 seconds.
5. Alarm Response Time. The maximum time from when an object goes into alarm to when it is annunciated at the workstation shall be 20 seconds.
6. Program Execution Frequency. Custom and standard applications shall be capable of running as often as once every 5 seconds. The Contractor shall be responsible for selecting execution times consistent with the mechanical process under control.
7. Performance. Digital controllers shall be able to execute DDC PID control loops at a selectable frequency of at least once per second. The controller shall scan and update the process value and output generated by this calculation at this same frequency.
8. Multiple Alarm Annunciation. All workstations on the network must receive alarms within 5 seconds of each other.
9. Reporting Accuracy. The system shall report all values with an end-to-end accuracy as listed or better than those listed below:

| Measure Variable | Reported Accuracy |
|---|---|
| Space Temperature | ±1ºF |
| Ducted Air | ±1ºF |
| Outside Air | ±2ºF |
| Dew point | ±3ºF |
| Water Temperature | ±1ºF |
| Relative Humidity | ±5% RH |
| Water Flow | ±5% of full scale |
| Airflow (terminal) | ±10% of reading |
| Airflow (measuring stations) | ±5% of full scale |
| Air Pressure (ducts) | ±0.1 "W.G. |
| Air Pressure (space) | ±0.01 "W.G. |
| Water Pressure | ±2% of full scale (absolute or differential) |
| Electrical | 5% of reading (A, V, W, Power factor) |
| Carbon Dioxide (CO2) | ±5% of reading |

10. Stability of Control. Control loops shall maintain measured variable at set point within the tolerances listed below:

| Controlled Variable | Control Accuracy | Range of Medium |
|---|---|---|
| Air Pressure | ±0.2" w.g. | 0-6" w.g. |

| | | |
|---|---|---|
| | ±0.01" w.g. | -0.1 to 0.1" w.g. |
| Airflow | ± 5% of full scale | |
| Temperature | ±1.0ºF | |
| Humidity | ±5% RH | |
| Fluid Pressure | ±1.5 psi | 1-150 psi |
| | ±1.0" w.g. | 0-50"w.g. |

differential

1.11 WORK BY OTHERS

A. Automatic Valves: Installed under applicable piping section under supervision of the temperature control subcontractor. All reducers and fittings necessary to install smaller than pipe size valves shall be furnished and installed under applicable piping sections.

B. Automatic Dampers: Installed under Division 23, Air Distribution System, under supervision of the temperature control subcontractor.

C. Smoke detectors shall be furnished and installed by the Division 26 contractor. The temperature controls subcontractor shall be responsible for interlock wiring between the smoke detectors and the air handling unit safety circuits.

D. Motor starters shall be furnished and installed by the Division 26 contractor. The temperature controls subcontractor shall be responsible for all wiring necessary involving the starter to perform the sequence of operation specified.

E. All line voltage to each DDC controller shall be provided by the Division 26 contractor.

1.12 QUALITY ASSURANCE

A. Ten (10) copies of shop drawings of the entire control system shall be submitted and shall consist of a complete list of equipment and materials, including manufacturer's catalog data sheets and installation instructions. Shop drawings shall also contain complete wiring and schematic diagrams, software descriptions, calculations, and any other details required to demonstrate that the system has been coordinated and will properly function as a system. Terminal identification for all control wiring shall be shown on the shop drawings.

B. A complete written Sequence of Operation as well as a hard copy graphical depiction of the application control programs shall also be included with the submittal package. Device identification as shown on the control schematics and wiring diagrams shall be referenced in the written Sequence of Operation.

C. Listing and explanation of both standard and user defined configuration parameters for the device.

D. System Architecture: Provide a schematic diagram of the Local Area Network and a controls network architecture diagram indicating supervisory controllers and Graphical User Interface(s). This should be accompanied by explicit information regarding configuration of Routers, Bridges and Repeaters. Each schematic shall have all control points labeled. The schematic shall graphically show all control elements. The point name format shall be approved by the Engineer before any drawing or programming proceeds.

1.13 WARRANTY

A. The temperature control system contractor shall provide a one (1) year warranty that will commence from the Date of Substantial Completion.

B. The contractor shall respond during normal business hours to the job site within a 24 hour period for any emergency relating to the control system during the warranty period.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Johnson Controls, Inc.; Controls Group. No Exceptions.

2.2 GENERAL

A. All materials and equipment used shall be standard components, of regular manufacture for this application. All systems and components shall have been thoroughly tested and proven in actual use.

B. All products used in this project shall be new, currently under manufacture, and shall be applied in similar installations for a minimum of 2 years. This installation shall not be used as a test site for any new products unless explicitly approved by the Owner's Representative in writing. Spare parts shall be available for at least 5 years after completion of this contract.

2.3 MATERIALS

A. Wiring and Conduit:

1. All wire shall be copper and meet the minimum wire size and insulation class listed below:

| Wire Class | Wire Size | Isolation Class |
|---|---|---|
| Power | 12 Gauge | 600 Volt |
| Class One | 14 Gauge Std. | 600 Volt |
| Class Two | 18 Gauge Std. | 300 Volt |
| Class Three | 18 Gauge Std. | 300 volt |
| Communications | Per Mfr. Recommendations | |

2. Power and Class One wiring may be run in the same conduit. Class Two and Three wiring and communications wiring may be run in the same conduit.
3. Where different wiring classes terminate within the same enclosure, maintain clearances and install barriers per the National Electric Code.
4. Where wiring is required to be installed in conduit, EMT shall be used. Conduit shall be minimum ½ inch galvanized EMT. Watertight compression fittings shall be used. Provide conduit seal off fitting where exterior conduits enter the building or between areas of high temperature/moisture differential.
5. Flexible metallic conduit (max. 3 feet) shall be used for connections to controllers, and sensors mounted on vibration producing equipment. Liquid-tight flexible conduit shall be use in exterior locations and interior locations subject to moisture.
6. Junction boxes shall be provided at all cable splices, equipment terminations, and transitions from EMT to flexible conduit. Interior dry location J-boxes shall be galvanized pressed steel, nominal four-inch square with blank cover. Exterior and damp location JH-boxes shall be cast alloy FS boxes with threaded hubs and gasketed covers.

A. Damper and Valve Actuators:
1. Control air damper actuators shall be electric, low voltage (24 VAC) utilizing a 4-20 mA modulating control signal as required by the sequence of operation. Each actuator shall incorporate a spring return to position the dampers to their normal positions upon a loss of the 24 VAC control power. Control air damper actuators shall be properly sized to provide sufficient torque to their respective dampers throughout the actuator's operating range. All control air damper actuators shall be mounted outside of the air stream. Provide low leakage controls dampers to prevent air leakage for better pressure control of the zone. Provide fast acting actuators for better smoke purge reaction time.
2. Valve actuators for heating water and chilled water systems shall be electric. Operators shall be sized to operate their appropriate valves with sufficient reserve power to provide smooth modulating action or two position action as specified.

B. Control Panels
1. All application specific direct digital controllers, not specifically designed for direct mounting on the equipment served, shall be installed in NEMA 1 enclosures. Enclosures shall be of suitable size to accommodate all power supplies, relays and accessories required for the application. Each enclosure shall include a perforated subpanel for direct mounting on the enclosure devices.

C. Temperature Sensors:
1. Duct/Wall Sensors:
a. As required by the sequence of operation, provide either 1,000 OHM Balco or 10K OHM Thermistor type sensors. Where the element is used for sensing mixed air or coil discharge temperatures and/or the duct cross-sectional area is in excess of 14 square feet, the element shall be of the averaging type. Where temperature elements are used for sensing liquid temperatures, they shall be furnished with separable stainless steel wells. Cold Deck and Hot Duct temperature sensor product shall be a Johnson Controls TE-6311M-1. Mixed air temperature sensor product shall be a Johnson Controls TE-6316M-1. Discharge air temperature sensors for zone sensors shall be Johnson Controls NS-BTN7001-0
2. Space Temp/Humidity Sensors:
a. Space temperature/humidity sensors shall be Resistance temperature devices (RTD) or thermistor equipped with set point adjustment, override switch, and communication port. Humidity accuracy shall be 3%. LCD shall be provided for the temperature and the humidity. Product shall be a Johnson Controls NS-BHB7002-0.
3. Binary Temperature Devices:
a. Low-voltage space thermostat shall be 24 V, bimetal-operated, snap action type, with either adjustable or fixed anticipation heater, concealed setpoint adjustment, 55°F to 85°F setpoint range, 2°F maximum differential, and vented ABS plastic cover.
b. Line-voltage space thermostat shall be bimetal-actuated, open contact or bellows-actuated, enclosed, snap-switch type, or equivalent solid-state type, with heat anticipator, UL listed for electrical rating, concealed setpoint.
c. Low-limit thermostats. Low-limit thermostats shall be vapor pressure type with an element 20 ft minimum length. Element shall respond to the lowest temperature sensed by any 1 ft section. The low-limit thermostat shall be manual reset only. Product shall be a Johnson Controls A70HA-1C. This shall be installed on the hot deck and cold deck coils.

D. Analog Current Sensors:
1. As required by the sequence of operation, provide split-core, sensors for indication of equipment amperage. Span shall be adjustable for improved resolution. Current sensors shall incorporate trip indication LED's and shall be sized for proper operation with equipment they serve. Current sensors and installation to be provided under work of this section.

E. Pressure Sensors:
1. Differential pressure type switches shall be UL Listed, SPDT snap acting, pilot duty rated, NEMA 4 enclosure, with scale range and differential suitable for intended applications, or as shown.

2. Differential pressure sensors used for sensing pressure in the ductwork shall be Johnson Controls DPT2641-005D-1 with a FTG18A-600R.
3. As required by the sequence of operation, provide a differential pressure switch across each air handling unit filter section for unit filter alarm indication. Product shall be a Johnson Controls P32AC-2C with a FTG18A-600R.
4. Differential pressure sensors used for high static pressure in duct work shall be a Johnson Control AFS-460 with a FTG18A-600R.

F. Duct Temperature/Humidity Sensor:
1. The temperature and humidity combination sensor shall be used in calculated enthalpy for the economizer function. Product shall have 3% accuracy with a 1k Ohm nickel temperature sensor. Product shall be Johnson Control HE-67N3-0N00P. This device will be installed in the return air and outside air duct work.

G. Damper Actuators
1. The damper actuators shall be incremental, non spring return, with a torque of 35 lb*in, and a built in pressure differential transmitter. The damper actuators shall be a Johnson Controls M9104-AGS-2N.

## 2.4 DDC EQUIPMENT

## 2.5 DDC EQUIPMENT

A. Workstation Client Hardware Stations: The system shall be capable of supporting clients using a standard Web browser such as Internet Explorer™ operating on any standard computer that supports the current version of Internet Explorer™.

B. Web Browser Clients:
1. The Web browser shall provide the same view of the system, in terms of graphics, schedules, calendars, logs, etc., and provide the same interface methodology as is provided by the Graphical User Interface. Systems that require different views or that require different means of interacting with objects such as schedules, or logs, shall not be permitted.
2. The Web browser client shall support at a minimum, the following functions:
   a. User log-on identification and password shall be required. If an unauthorized user attempts access, a blank web page shall be displayed. Security using Java authentication and encryption techniques to prevent unauthorized access shall be implemented.
   b. Graphical screens developed for the GUI shall be the same screens used for the Web browser client. Any animated graphical objects supported by the GUI shall be supported by the Web browser interface.
   c. HTML programming shall not be required to display system graphics or data on a Web page. HTML editing of the Web page shall be allowed if the user desires a specific look or format.
   d. Storage of the graphical screens shall be in the Building Control Units (BC), without requiring any graphics to be stored on the client machine. Systems that require graphics storage on each client are not acceptable.
   e. Real-time values displayed on a Web page shall update automatically without requiring a manual “refresh” of the Web page.
   f. User’s shall have administrator-defined access privileges. Depending on the access privileges assigned, the user shall be able to perform the following:
      1) Modify common application objects, such as schedules, calendars, and set points in a graphical manner.
      2) Schedule times will be adjusted using a graphical slider, without requiring any keyboard entry from the operator.

3) Holidays shall be set by using a graphical calendar, without requiring any keyboard entry from the operator.
4) Commands to start and stop binary objects shall be done by right-clicking the selected object and selecting the appropriate command from the pop-up menu.
5) View logs and charts.
6) View and acknowledge alarms.
7) The system shall provide the capability to specify a user's (as determined by the log-on user identification) home page. Provide the ability to limit a specific user to just their defined home page. From the home page, links to other views, or pages in the system shall be possible, if allowed by the system administrator.
8) Graphic screens on the Web Browser client shall support hypertext links to other locations on the Internet or on Intranet sites, by specifying the Uniform Resource Locator (URL) for the desired link.

C. Control Units General:
1. Provide an adequate number of control units to achieve monitoring and control of all data points specified and necessary to satisfy the sequence of operation for all mechanical systems shown on the plans. Provide a minimum of one separate controller for each AHU or other HVAC system. Multiple DDC controllers may control one system provided that all points associated with individual control loops are assigned to the same DDC controller. Points used for control loop reset such as outside air or space temperature are exempt from this requirement. Each of the following panel types shall meet the following requirements.
2. Controllers shall be suitable for the anticipated ambient conditions.
3. Controllers used outdoors and/or in wet ambient conditions shall be mounted within waterproof enclosures, and shall be rated for operation at -40°F to 140°F and 5 to 95% RH, non condensing.
4. Controllers used in conditioned ambient space shall be mounted in dust-proof enclosures, and shall be rated for operation at 32°F to 122°F and 5 to 95% RH, non condensing.
5. Serviceability: Provide diagnostic LEDs for power, communication, and processor. All wiring connections shall be made to field-removable, modular terminal strips or to a termination card connected by a ribbon cable.
6. Memory: The Control Units shall maintain all BIOS and programming information in the event of a power loss for at least 72 hours.
7. Diagnostics: The Building Controller shall continually check the status of its processor and memory circuits. If an abnormal operation is detected, the controller shall assume a predetermined failure mode and generate an alarm notification.
8. Immunity to power and noise: Controller shall be able to operate at 90% to 110% of nominal voltage rating and shall perform an orderly shutdown below 80% nominal voltage. Operation shall be protected against electrical noise of 5 to 120 Hz and from keyed radios up to 5 W at 3 ft.
9. Automatic staggered restart of field equipment after restoration of power and short cycle protection.

D. General Purpose Application Controllers (CGM04060 & CGM09090):
1. Standalone DDC panels shall be microprocessor-based, multi-tasking, multi-user, real-time digital control processors. Each standalone DDC panel shall consist of modular hardware with plug-in enclosed processors, communication controllers, power supplies, and input/output modules. A sufficient number of controllers shall be supplied to fully meet the requirements of this Specification and the attached point list.
2. Hardware Overrides – As indicated in the point schedule, the operator shall have the ability to manually override automatic or centrally execute commands.
3. Hardware Override Monitoring – DDC panels shall monitor the status or position of all overrides, and include this information in logs and summaries to inform the operator that automatic control has been inhibited. DDC panels shall also collect override activity information for daily and monthly reports.
4. Sensor Support
   a. The controller shall communicate over the Sensor-Actuator Bus (SA Bus) with a Network sensor.

b. The Network Sensor shall support an LCD display room sensor.

E. VAV Box Controller
1. The VAV Box Controller (hereafter referred to as CVM) shall provide both standalone and networked DDC of pressure-independent, VAV terminal units.
2. The CVM controller shall be a fully programmable, digital controller that communicates via BACnet MS/TP protocol.
   a. The CVM shall support BACnet Standard ANSI/ASHRAE 135.
      1) The CVM shall be BTL listed/certified.
      2) The CVM shall be tested and certified as a BACnet Advanced Application Controller (B-AAC).
      3) A BACnet Protocol Implementation Conformance Statement shall be provided for the CVM.
      4) The Conformance Statement shall be submitted 10 days prior to bidding.
3. The CVM shall employ finite state programming to eliminate unnecessary conflicts between control functions at crossover points in their operational sequences. Suppliers using non-state based DDC shall provide separate control strategy diagrams for all controlled functions in their submittals.
4. The CVM shall include an integral real-time clock and support time-based tasks which enables these equipment controllers to monitor and control:
   a. Schedules
   b. Calendars
   c. Alarms
   d. Trends
5. The CVM can continue time-based monitoring when offline for extended periods of time from a network.
6. The CVM shall include an integral differential pressure transducer and damper actuator. An additional configuration option shall be available that also includes an integral potentiometer for actual damper position feedback. All components shall be connected and mounted as a single assembly, removable as one piece.
7. The integral damper actuator shall be a fast response stepper motor capable of stroking 90 degrees in 60 seconds for quick damper positioning to speed commissioning and troubleshooting tasks.
8. The CVM shall have the ability to automatically calibrate the flow sensor to eliminate pressure transducer offset error due to ambient temperature / humidity effects.
9. The CVM can operate as a stand-alone controller in applications that do not require a networked supervisory device or for network applications where it is preferred to have the scheduling, alarming, and/or trending performed locally in the equipment controllers.
10. Sensor Support
    a. The controller shall communicate over the Sensor-Actuator Bus (SA Bus) with a Network sensor.
    b. The Network Sensor shall support an LCD display room sensor.

F. Network Sensors
1. The Network Sensors shall have the ability to monitor the following variables as required by the systems sequence of operation:
   a. Zone temperature
   b. Zone humidity
   c. Zone setpoint
   d. Discharge air temperature
   e. Zone $CO_2$
2. The Network Sensor shall transmit the information back to the controller on the SA Bus using BACnet standard protocol SSPC-135.
3. The Network Zone Temperature Sensor shall include the following items:
   a. A backlit LCD to indicate the temperature, humidity and setpoint.
   b. An LED to indicate the status of the override feature.
   c. A button to toggle the temperature display between Fahrenheit and Celsius

d. A button to initiate a times override command

## PART 3 - EXECUTION

### 3.1 INSTALLATION AND WORKSMANSHIP

A. Install equipment, piping and wiring raceway parallel to the building lines (i.e., horizontal, vertical and parallel to walls) wherever possible.

B. Provide sufficient slack and flexible connections to allow for vibration of piping and equipment.

C. Install all equipment in readily accessible locations as defined by Chapter 1, Article 100, Part A of the National Electric Code (NEC).

D. Verify integrity of all wiring to ensure continuity and freedom from shorts and grounds.

E. All equipment, installation and wiring shall comply with acceptable industry specifications and standards for performance, reliability and compatibility and be executed in strict adherence to local codes and standard practices.

### 3.2 ELECTRICAL INTERLOCKS

A. All electrical interlocks shall be provided as specified. All electrical interlocks shall be made by means of motor starters or shall be accomplished by separate relays. No motor power lead shall be utilized in an interlock circuit. All interlocked starters with disconnect switches shall be provided with auxiliary contacts on the disconnect switch so that interlocking circuits are interrupted when the disconnect switch is in the off position.

### 3.3 OWNERSHIP OF PROPRIETARY MATERIAL

A. The owner shall sign a copy of the manufacturer’s standard software and firmware licensing agreement as a condition of this contract. Such license shall grant use of all programs and application software to owner as defined by the manufacturer’s license agreement, but shall protect manufacturer’s rights to disclosure of trade secrets contained within such software. All project developed software and documentation shall become the property of the owner. These include, but are not limited to project graphic images, record drawings, project database, project specific application programming code, and all other associated documentation.

### 3.4 TRAINING

A. Provide a minimum of 8 hours of on-site training throughout the contract period for personnel designated by the Owner. Train the designated staff of Owners Representative and Owner to enable them to:
1. Proficiently operate the system.
2. Understand control system architecture and configuration.
3. Understand DDC system components.
4. Understand system operation, including DDC system control and optimizing routines (algorithms).
5. Operate the workstation and peripherals.
6. Log on and off the system.
7. Access graphics, point reports, and logs.
8. Adjust and change system set points, time schedules, and holiday schedules.

9. Recognize malfunctions of the system by observation of the printed copy and graphical visual signals.
10. Understand system drawings, and Operation and Maintenance manual.
11. Understand the job layout and location of control components.
12. Access data from DDC controller.
13. Operate portable operator's terminals.

## PART 4 - SEQUENCE OF OPERATIONS

### 4.1 DUAL DUCT VAV

A. COLD DUCT DAMPER: During the occupied mode, the damper will modulate to provide air flow at or below maximum cold duct flow setpoint. Air flow setpoint will be determined from zone temperature and cooling setpoint control loop. On a rise in zone temperature cold air flow will increase. On a drop in zone temperature cold air flow will decrease until the damper is closed.

B. HOT DUCT DAMPER: During the occupied mode, the damper will modulate to provide hot air flow at or below maximum dot duct flow setpoint. Air flow setpoint will be determined from zone temperature and heating setpoint control loop. On a drop in zone temperature hot air glow will increase. On a rise in zone temperature the hot air flow will decrease until the damper is closed.

C. TOTAL AIRFLOW: The total sum of hot deck and cold deck airflows will remain constant as scheduled.

D. UNOCCUPIED MODE: Durning the occupied mode of operation the sequence above will apply. However the box will set back and setup the zone cooling and heating setpoints as well as reduce the air flow requirements.

E. DISCHARGE AIR TEMP SENSOR: A discharge air temp sensor is provided on each box for monitoring purposes.

F. UNIT ENABLED: A network unit enable signal will control the mode of the box.

G. NETWORK WARMUP-COOLDOWN: Warm-up and cooldown modes will be activated by a network command.

### 4.2 PHOENIX LAB SYSTEM

A. Provide BACnet over IP BACnet integration into Phoenix Lab System. Owner to provide IP drop for Phoenix BACnet gateway.

B. Discover points for Phoenix Lab System and room pressure monitors through Phoenix BACnet interface.

C. Create graphical user interface for Phoenix Lab System.

END OF SECTION 230900

# SECTION 230910 - CRITICAL HVAC CONTROLS

## 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 equipment for HVAC systems and components serving the operating rooms.

### 1.3 SCOPE

A. Critcal Airflow and Temperature Control System (CATCS) shall be furnished and installed to control the airflow into and out of isolation rooms and maintain room temperature setpoint. The CATCS shall vary the amount of make-up/supply air into the isolation room to operate at the lowest possible airflow rates necessary to maintain temperature control, achieve minimum ventilation rates and negative pressurization in relation to adjacent spaces. The CATCS shall be capable of operating as a standalone system or as a system integrated with the Building Management System (BMS).

**B. Systems using sensors in the airstream to calculate airflow velocity are not acceptable.**

C. The intent of this specification is to define the hardware, installation, and control requirements for CATCS.

D. All control equipment required to fulfill this specification shall be manufactured and provided by the CATCS equipment manufacturer.

E. Air valves and re-heat coil water control valves are provided under this section for installation by the Mechanical Contractor.

F. Installation of the Critical airflow and temperature control components (not to include air valves or re-heat coil water control valves), low voltage control cabling to include low voltage (less than 50 volts) power, sensor and communication is provided under this section. All power supplies, monitoring components, space and duct sensors, routers, control panels and ancillary components for a fully functioning CATCS shall be provided and installed.

G. Duct devices shall be installed by the Mechanical Contractor. Standard fittings, hangers, and ancillary devices required to install duct devices shall be provided by the Mechanical Contractor.

H. Equipment start-up shall be provided by factory certified personnel. Demonstrate system functionality as need for commissioning activities.

I. The CATCS shall digitally interface to the Central Building Management System (BMS) as provided by the temperature controls contractor. The CATCS Contractor shall provide a BACnet IP or MSTP interface device between the CATCS and the BMS, including standardized communications protocol software and data mapping tables as required. The Temperature Controls

Contractor shall be responsible for software indigenous to the BMS, and graphic displays for the CATCS at the central BMS station.

J. If items in the specifications or drawings require clarification, the effected contractors shall contact the Architect/Engineer for clarification.

K. It shall be understood that the Drawings and Specifications describe the approximate locations of the work. Do not scale the drawings to determine exact positions and clearances. Obtain from Architect, Engineer, Commissioning Agent or the Owner any dimensions not shown.

L. Details of construction and of workmanship where not specifically described herein or indicated on the drawings shall be subject to the Engineer's or Owner's approval. It is the intent of these Specifications to provide complete systems, left in good working order, ready for operation, including necessary labor and materials, whether or not specifically shown on the Drawings or mentioned herein.

M. Before submitting proposals, examine the Specifications and all Drawings relating to the work and become fully informed as to the extent and character of the work and the relation of the work to that of other Sections. Examine the Drawings of other Sections to become familiar with all the problems and details of the building construction and to note conditions, which affect the work.

N. Any changes required in the ductwork, air handling equipment or any other mechanical systems, which would be required for the application of any proposed Critical Airflow equipment other than the specified "Base Bid" or "Basis of Design" shall be the responsibility of the Critical airflow control system supplier. Any additional engineering, sheet metal or mechanical equipment (i.e. upsized supply/exhaust systems) costs other than that as required by the "Basis of Design" shall be borne by the Critical airflow control system supplier. All changes shall be subject to prior approval by the Architect/Engineer.

## 1.4 APPLICATION

A. Provide CATCS based on Phoenix Controls Traccel Line for tracking pairs of supply and exhaust valves, single supply valves or single exhaust valves for areas where fume hoods are not present or high speed actuation is not required.

## 1.5 WARRANTY

A. Warranty shall commence upon the date of shipment and extend for a period of 36 months, whereupon any defects in materials or Critical airflow control system performance shall be repaired by the CATCS supplier at no cost to the owner.

# PART 2 - PRODUCTS

## 2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Phoenix Controls Corp.

2. Other manufacturer systems will be considered via prior approval during bidding process. **Systems using sensors in the airstream to calculate airflow velocity are not acceptable.**

## 2.2 SYSTEM PERFORMANCE REQUIREMENTS

A. Airflow Control System Operation Description – Traccel
1. Each space shall have a dedicated airflow control system. Each dedicated airflow control system shall support a minimum of 64 network controlled airflow devices.
2. The airflow and temperature control system shall maintain specific airflow (±5% of signal within one second of a change in duct static pressure) regardless of the magnitude of the pressure change, airflow change or quantity of airflow control devices on either the supply air or exhaust air manifold. Venturi valve operation range shall be 0.6" wc – 3.0"wc for medium pressure valves, 0.3"wc – 3.0"wc for low pressure valves. The airflow and temperarture control system shall use volumetric offset control to maintain room pressurization. The system shall maintain proper room pressurization polarity (negative or positive) regardless of any change in room/system conditions, such as point of use exhaust (i.e. snorkels) being manually shut-off by a user activated switch, or rapid changes in duct static pressure.
3. The airflow control system shall maintain specific airflow (±5% of signal) with a minimum 11 to 1 airflow turndown to ensure accurate pressurization at low airflow and assure maximum energy efficiency.
4. In the event of a power failure, airflow control devices shall fail to the last position and continue to maintain flow control within ±5% of signal within one second of a change in duct static pressure.

## 2.3 SYSTEM COMPONENTS

A. System Integration Device(s)
1. The System Integration device shall be a Phoenix Controls Integrator (PCI8000). The device shall be a standalone piece of hardware with embedded Niagara will be used for commissioning and configuration of venturi valves and ancillary components such as Fume Hood Displays, and Input Output (I/O) modules when connected to a Phoenix Controls Workbench, Room Manager, or Supervisor.
2. After the Room Level Interface is commissioned it shall provide a web based user interface for device, network, and platform diagnostics as well as a Test and Balance web application for zone balance and airflow validation. This device shall have an integral secure Wireless Access Point.
3. The device will also provide a means of integrating on an open BACnet network via IP, Ethernet, or MS/TP to be field selectable at time of commissioning.

B. Airflow Control Device - General
1. The airflow control device shall be a Phoenix Controls Accel II pressure independent venturi valve.
2. The valve assembly manufacturer's Quality Management System shall be registered to ISO 9001:2008.
3. Airflow control device shall be OSHPD tested and certified per 2013 CBC, 2012, IBC, ASCE 7-10, and ICC-ES-AC-156.
4. All Components of the valve, its controllers, and wiring shall be ROHS compliant.
5. The airflow control device shall be mechanically pressure independent over its specified differential static pressure operating range. An integral pressure independent assembly shall respond and maintain specific airflow within one second of a change in duct static pressure irrespective of the magnitude of pressure and/or flow change (within product specifications) or quantity of airflow controllers on a manifolded system.
6. The airflow control device shall maintain accuracy within ±5% of signal to set point over an airflow turndown range of no less than:
   a. 12.5 to 1 (medium pressure all valve sizes)
   b. 16 to 1 (medium pressure w/o 14" valve)
   c. 7 to 1 (low pressure all valve sizes)
   d. 11 to 1 (low pressure w/o 14" valve)

e. 8 to 1 (medium pressure shut-off all valve sizes)
f. 14 to 1 (medium pressure shut-off w/o 14" valve)
g. 5 to 1 (low pressure shut-off all valve sizes)
h. 9 to 1 (low pressure shut-off w/o 14" valve)

7. No minimum entrance or exit duct diameters shall be required to ensure accuracy and/or pressure independence.
8. No rotational/axial orientation requirements shall be required to ensure accuracy and/or pressure independence.
9. The airflow control device shall maintain pressure independence regardless of loss of power. "Electronically pressure independent" devices will not be acceptable.
10. Airflow control devices utilizing ASHRAE 130 minimum operating pressure as a rating for minimum design pressure at required flow will not be acceptable on basis on minimum operating pressure alone. Valve manufacturer will provide minimum required differential pressure in writing for each size valve they offer.
11. Airflow control device shall be able to achieve its maximum turndown ratio at its stated minimum operating differential pressure. I.E. if minimum operating pressure is 0.6" wc dp, a 10" air valve must be able to achieve its minimum of 50cfm and its maximum of 1000 cfm at stated 0.6" wc dp. Devices that require duct static pressure to be increased to achieve maximum flow shall not be acceptable.
12. The airflow control device shall be constructed of one of the following four types:
    a. Class A—The airflow control device for non-corrosive airstreams, such as supply and general exhaust, shall be constructed of 16-gauge aluminum. The device's shaft and internal "S" link shall be made of 316 stainless steel. The shaft support brackets shall be made of galvaneal (non shutoff valves) or 316 stainless steel (shutoff valves). The pivot arm shall be made of aluminum (for non shutoff valves) and 303/304 stainless (for shut off valves). The pressure independent springs shall be a spring-grade stainless steel. All shaft bearing surfaces shall be made of a PP (polypropylene) or PPS (polyphenylene sulfide) composite. Sound attenuating devices used in conjunction with general exhaust or supply airflow control devices shall be constructed using 24 gauge galvanized steel or other suitable material used in standard duct construction. No sound absorptive materials of any kind shall be used.
    b. Class B—The airflow control device for corrosive airstreams, such as fume hoods, shall have a baked-on, corrosion-resistant phenolic coating. The device's shaft shall be made of 316 stainless steel with a Teflon coating. The shaft support brackets shall be made of 316 stainless steel. The pivot arm and internal "S" link shall be made of 316 or 303 stainless steel. The pressure independent springs shall be a spring-grade stainless steel. The internal nuts, bolts and rivets shall be stainless steel. All shaft bearing surfaces shall be made of PP (polypropylene) or PPS (polyphenylene sulfide) composite.
13. Actuation
    a. For high speed electrically actuated VAV operation, a CE certified, UL Listed, IP56 rated for dust and water, electronic actuator shall be factory mounted to the valve. Loss of main power shall cause the valve to position itself in an appropriate failsafe state. Options for these failsafe states include: normally open-maximum position, normally closed-minimum position and fail-to-last position. This position shall be maintained constantly without external influence, regardless of external conditions on the valve (within product specifications).

       In fail safe conditions the Airflow Control Device must remain pressure independent and in control of airflow at its failed position. I.E. if a device fails in position at 500 cfm, the airflow control device must remain pressure independent regardless of having power/controller operating and will deliver the 500cfm at that given control point regardless of duct pressure. Airflow control devices with single or dual blades that fail in position or fail open will not be acceptable as the airflow delivered cannot be guaranteed due to device not being mechanically pressure independent.

b. During normal operation, the high speed actuated airflow control device shall initiate valve movement and achieve the commanded airflow value with no more than 5% overshoot or undershoot within 1 second or less.

c. For Standard Speed electrically actuated VAV operation, a CSA certified, UL recognized (IP54 rating and CE certification optional on single valves, standard on dual valves) electronic actuator shall be factory mounted to the valve. The fail-safe state for standard speed operation valves shall be fail to last position unless otherwise noted.

In fail-safe conditions the Airflow Control Device must remain pressure independent and in control of airflow at its failed position. I.E. if a device fails in position at 500 cfm, the airflow control device must remain pressure independent regardless of having power/controller operating and will deliver the 500cfm at that given control point regardless of duct pressure. Airflow control devices with single or dual blades that fail in position or fail open will not be acceptable as the airflow delivered cannot be guaranteed due to device not being mechanically pressure independent.

d. During normal operation, the standard speed actuated airflow control device shall initiate valve movement and achieve the commanded airflow value with no more than 5% overshoot or undershoot within 60 seconds (90 seconds for a shutoff valve from shutoff to maximum flow or vice Versa).

i. Standard speed actuation should not be used for valves that are connected to VAV fume hoods.
ii. Standard speed actuation can be used on 2-state fume hoods or vented cabinets or snorkels with on/off conditions.
iii. Constant volume valves do not require actuators.

14. The controller for the airflow control devices shall be microprocessor based and operate using peer-to-peer control architecture. The room-level airflow control devices shall function as a standalone network. The room-level control network shall utilize a LonTalk communications protocol.
15. There shall be no reliance on external or building-level control devices to perform room-level control functions. Each Critical control system shall have the capability of performing fume hood control, pressurization control, standard and advanced temperature control, humidity control, and implement occupancy and emergency mode control schemes. A Room controller or PLC performing these functions shall not be acceptable.
16. The CATCS shall have digital integration with the BMS or BAS. If digital integration device, room controller, Critical space controller or similar is lost or offline or fails then the valve controllers shall have distributed controllability and will keep the basic room functions of zone balance, temperature, humidity control, offset control, etc. operating to maintain a safe and comfortable zone.
17. NVLAP Accreditation (Lab Code 200992-0)
    a. Each airflow control device shall be factory characterized on air stations NVLAP Accredited (a program administered by NIST) to ISO/IEC 17025:2005 standards.
    b. Each airflow control device shall be factory characterized to the job specific airflows as detailed on the plans and specifications using NVLAP Accredited air stations and instrumentation having a combined accuracy of no more than ±1% of signal (5,000 to 250cfm), ±2% of signal (249 to 100cfm) and ±3% of signal (199 to 35cfm). Electronic airflow control devices shall be further characterized and their accuracy verified to ±5% of signal at a minimum of 48 different airflows across the full operating range of the device.
    c. Each airflow control device shall be marked with device-specific factory characterization data. At a minimum, it should include the room number, tag number, serial number, model number, eight-point characterization information (for electronic devices), date of manufacture and quality control inspection numbers. All information shall be stored by

the manufacturer for use with as-built documentation. Characterization data shall be stored indefinitely by the manufacturer and backed up off site for catastrophic event recovery.

C. Exhaust And Supply Airflow Device Controller
1. The airflow control device shall be a microprocessor-based design and shall use closed loop control to linearly regulate airflow based on a digital control signal. The device shall generate a digital feedback signal that represents its airflow. The controller shall be factory installed on the valve assembly, and factory tested as an assembly.
2. During normal operation the airflow control device shall initiate valve movement and achieve the commanded airflow value with no more than 5% overshoot or undershoot within:
   a. 1 second or less with high speed actuation.
   b. 60 seconds for standard speed actuation (90 seconds from shutoff to max flow and vice versa).
3. The airflow control device shall store its control algorithms in non-volatile, re-writeable memory. The device shall be able to stand-alone or to be networked with other room-level digital airflow control devices using an industry standard protocol.
4. Room-level control functions shall be embedded in and carried out by the airflow device controller using distributed control architecture. Critical control functions shall be implemented locally; no separate room-level controller shall be required.
5. The airflow control device shall use industry standard 24 VAC power.
6. The airflow control device shall have provisions to connect a Phoenix Controls Workbench (WKB100) commissioning tool and every node on the network shall be accessible from any point in the system.
7. The airflow control device shall have built-in integral input/output connections that address fume hood control, temperature control, humidity control occupancy control, emergency control, and non-network sensors switches and control devices. At a minimum, the airflow controller shall have:
   a. Three universal inputs capable of accepting 0 to 10 VAC, 4 to 20 mA, 0 to 65 K ohms, or Type 2 or Type 3 10 K ohm @ 25 degree C thermistor temperature sensors.
   b. One digital input capable of accepting a dry contact or logic level signal input.
   c. Two analog outputs capable of developing either a 0 to 10 VAC @ 1 mA (10Kohm min) or 4 to 20 mA (500 ohm max) linear control signal.
   d. One Form C (SPDT) relay output capable of driving up to 1 A @ 24 VAC/VAC.
8. The airflow control device shall meet FCC Part 15 Subpart J Class A, CE, and CSA Listed per file #228219.
9. The airflow control device shall be ROHS compliant.

D. Two-Position Exhaust Airflow Control Device

The airflow control device shall maintain a factory characterized fixed maximum and minimum flow set point based on a remote contact/sash switch for electronic valves or a switched 0 to 20 psi pneumatic signal for pneumatic valves. Two-position devices requiring feedback shall generate a 0 to 10 volt feedback signal that is linearly proportional to its airflow. All two-position devices shall be either networked or hard-wired into the room-level network to be considered under pressurization control.

E. Critical Airflow Control Device

The airflow control device shall maintain a temperature set point by controlling the airflow and the reheat valve (if required) in response to a room temperature sensor. An additional output shall be provided for supplementary cooling or heating of the office space. If the office airflow supply device is not required for make-up airflow control for fume hoods, then the one-second speed of response and fail-safe conditions required of the CATCS shall not apply.

Hot deck and cold deck temperature control dampers upstream of the Supply Airflow Control device (venture valve) shall be equal to Potorff CD-25R low leakage damper suitable for medium and high pressure duct applications, shall include a damper actuator mounting bracket with

insulation standard. The damper actuator shall be modulating type, non-fail safe, and shall be provided under this section.

F. Constant Volume Airflow Control Device
   1. The airflow control device shall maintain a constant airflow set point. It shall be factory characterized and set for the desired airflow. It shall also be capable of field adjustment for future changes in desired airflow.
   2. Constant volume valves must be 100% mechanically pressure independent, and require no actuation to maintain set point.
   3. Constant volume valves shall have no required electronics to maintain set point

G. Room Pressure Monitors
   Each isolation and isolation ante room shall be provided with a Room Pressure Monitor equal to a Phoenix Controls APM2. Each monitor shall include a minimum 4.3" color touch screen TFT display, visual and audible alarming, message banner, door indicator status, and BACnet MSTP connection. Room sensors shall terminate in the ceiling/wall of each isolation/ante room with stainless wall plate probe.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

A. The CATCS contractor shall install all routers and repeaters in an accessible location in or around the designated room.

B. The CATCS contractor shall install an appropriately sized and fused 24 Vac transformer suitable for NEC Class II wiring.

C. All cable shall be furnished and installed by the CATCS contractor. The CATCS contractor shall terminate and connect all cables as required. Cables specifically recommended by the Critical airflow controls manufacturer shall be utilized.

D. The mechanical contractor shall install all airflow control devices in the ductwork and shall connect all airflow control valve linkages.

E. The mechanical contractor shall provide and install all reheat coils, water control valves, duct fittings and transitions.

F. The mechanical contractor shall provide and install insulation as required.

G. The electrical contractor shall wire a dedicated, single phase 120vac power circuit to each control unit and/or wall-mounted power supply.

H. Low voltage (less than 50 Volts) NEC class 2 current limited circuits, communication, actuator and sensor cabling may be installed without conduit where located above lay-in ceilings and is concealed and accessible. Cabling shall be installed in a neat and workmanlike manner, secured to structural members parallel and perpendicular to building lines. All other wiring shall be installed in conduit per the applicable sections of the project specifications.

I. Plenum rated cable shall be utilized where the above ceiling space is considered a return air path.

J. Control transformers shall not be installed above non-accessible ceilings. The control transformer secondary shall have a disconnect switch a resettable circuit breaker.

K. On walls constructed of solid concrete, cinder block or plaster, cables will be run in concealed conduit, surface wire mold or other approved raceway.

L. Cabling shall be bundled neatly and well secured using nylon zip straps. It shall not be wrapped around piping or conduit. Support cabling at walls, to sub-ceiling or structural steel with wall locks or clamps. Cabling shall not be installed with excessive slack.

M. Cables requiring crimp-on connectors must have those connectors attached with an appropriate and recommended specialized crimping tool.

## 3.2 SYSTEM START-UP, TRAINING, AND SUPPORT

A. System start-up shall be provided by a factory-authorized representative of the Critical airflow control system manufacturer**. Due to the nature of the areas to be served by the CATCS, all start-up and warranty support shall be provided by full-time personnel of the representative, who have a minimum of 5 years start-up experience with the CATCS provided, and are normally officed within 50 miles of the project site**. Start-up shall include calibrating the fume hood monitor and any combination sash sensing equipment, where applicable. Start-up shall also provide electronic verification of airflow (fume hood/bio-safety cabinet exhaust, supply, make-up, general exhaust or return), system programming and integration to BMS (when applicable).

B. The balancing contractor shall be responsible for final verification and reporting of all airflows.

C. The Critical airflow control system supplier shall furnish a minimum of 8 hours of owner training by factory trained and certified personnel. The training will provide an overview of the job specific airflow control components, general procedures for verifying airflows of air valves and general troubleshooting procedures.

D. Operation and maintenance manuals, including as-built wiring diagrams and component lists, shall be provided for each training attendee.

E. It shall be the responsibility of the General Contractor to secure the room envelope sufficiently to maintain required pressure levels with the airflow volumes specified. The representative of the Critical Airflow Control Manufacturer shall advise the General Contractor of any condition which might compromise the ability of the room to achieve the specified pressure levels.

F. The representative of the Critical Airflow Control Manufacturer shall demonstrate to the engineer the ability of the controls to maintain setpoints in all modes of operation.

## 3.3 SEQUENCES OF OPERATION

A. Room Airflow Control Sequence of Operation:
1. Airflow and Temperature Controls in each isolation room consists of a supply air valve, hot-cold deck temperature control dampers or hot water reheat coil, general exhaust valve(s), a room pressure monitor, and room temperature sensor.
2. Each room will have a pre-determined room airflow offset setpoint. The room offset is equal to the difference to total room supply airflow and the total room exhaust airflow. The room offset will be adjustable by the BMS.
3. The supply and general exhaust valves are constant volume, will maintain a pre-set airflow setpoint as per the air valve schedule.

B. Dual Duct Supply Temperature Control

1. Room temperature control in achieved by modulation of the hot and cold deck temperature control dampers. When room temperature is above the room temperature setpoint, the cold deck damper will be fully open, and the hot deck damper will be fully closed. As the room temperature falls below the room temperature setpoint, the cold deck damper shall begin to modulate closed as the hot deck damper simultaneously modulates open. The room temperature setpoint shall be locally adjustable.

C. Room Pressure Monitor
1. The room pressure monitor will display the room pressure condition and alarm locally and at the BMS when the room pressure rises above the room negative pressure alarm setpoint. A door monitoring switch will disable the alarm when the isolation room door is open

END OF SECTION

# SECTION 233113 - METAL DUCTS

## 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. Section Includes:

1. Rectangular ducts and fittings.
2. High pressure ducts and fittings.
3. Sheet metal materials.
4. Sealants and gaskets.
5. Hangers and supports.

### 1.3 PERFORMANCE REQUIREMENTS

A. Delegated Duct Design: Duct construction, including sheet metal thicknesses, seam and joint construction, reinforcements, and hangers and supports, shall comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" and performance requirements and design criteria indicated.

1. Static-Pressure Classes:

a. Supply Ducts (Upstream from Air Terminal Units): 6-inch wg.
b. Supply Ducts (Downstream from Air Terminal Units): 1.5-inch wg.
c. Return Ducts (Negative Pressure): 1.5-inch wg.
d. General Exhaust Ducts (Negative Pressure): 1.5-inch wg.
e. Exhaust Ducts for Isolation Rooms (Downstream from Air Valves): 4-inch wg.
f. Exhaust Ducts for Isolation Rooms (Upstream from Air Valves): 1.5-inch wg.

B. Structural Performance: Duct hangers and supports shall withstand the effects of gravity loads and stresses within limits and under conditions described in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible".

### 1.4 SUBMITTALS

A. Product Data: For each type of the following products:

1. Liners and adhesives.
2. Sealants and gaskets.

B. Shop Drawings: CAD-generated and drawn to 1/8 inch equals 1 foot scale are required for all high pressure ducts. Drawing shall have floor plan as background. Show fabrication and installation details for metal ducts.

1.5 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel," for hangers and supports. AWS D9.1M/D9.1, "Sheet Metal Welding Code," for duct joint and seam welding.

B. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel," for hangers and supports.
2. AWS D9.1M/D9.1, "Sheet Metal Welding Code," for duct joint and seam welding.

PART 2 - PRODUCTS

2.1 RECTANGULAR DUCTS AND FITTINGS

A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" based on indicated static-pressure class unless otherwise indicated.

B. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 1-4, "Transverse (Girth) Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

C. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 1-5, "Longitudinal Seams - Rectangular Ducts," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

D. Elbows, Transitions, Offsets, Branch Connections, and Other Duct Construction: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 2, "Fittings and Other Construction," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

E. Formed-On Flanges: Ducts with transverse duct joints 28” and larger shall be constructed according to SMACNA's "HVAC Duct Construction Standards--Metal and Flexible," Figure 1-4, using corner, bolt, cleat, and gasket details.

1. Manufacturers:

a. Ductmate Industries, Inc.
b. Lockformer.

2. The installation of flanged system shall be in accordance with the manufacturers printed instruction and installation manuals.
3. Construction of the duct, such as gauge, reinforcing, etc., shall be as indicated in the addendum to the SMACNA manuals as provided by the manufacturer and as tested by Pittsburgh Testing Laboratory.

F. Cross Breaking or Cross Beading: Cross break or cross bead duct sides 19 inches and larger and 0.0359 inch thick or less, with more than 10 sq. ft. of nonbraced panel area unless ducts are lined.

2.2 HIGH PRESSURE DUCTS (UPSTREAM FROM TERMINAL UNITS AND SUPPLY AIR VALVES OR DOWNSTREAM OF EXHAUST AIR VALVES)

A. This ductwork shall be defined as that between the discharge of the supply fan and pressure reducing terminal boxes. This work shall be provided and installed as shown and as specified hereinafter.

B. This ductwork shall be round in cross-section, flat oval or rectangular as shown on the drawings. It shall be constructed according to the latest edition of the ASHRAE HANDBOOK. Duct construction details shall be in accordance with the "HVAC DUCT CONSTRUCTION STANDARDS, FIRST EDITION, published by the Sheet Metal and Air Conditioning Contractors National Association Inc. except as may be abridged herein.

C. All job-constructed ducts shall be made with longitudinal joints butted and welded. Round ducts 48" in diameter and smaller and all flat oval ducts shall be factory fabricated spirally wound conduit made from zinc coated steel strips. All such ducts shall be delivered in standard lengths and shall be cut to proper length at the site by power saw to insure proper fit and square alignment.

D. Fittings used on round or flat oval ducts shall be shop fabricated by welding. Changes in direction shall be made with mitered fittings of at least 3 sections; 90 degree elbows shall contain not less than five sections. Branch takeoffs shall be at 45 degree, except where indicated on the drawings they may be 90 degree conical taps. The run of a conical take-off shall be not less than the diameter of the branch which it serves. This contractor shall furnish for review drawings of fittings which he proposes to use and shall not proceed with fabrication until review by the Architect.

E. A high degree of dimensional accuracy is required in both conduit and fittings in order that the installation may be strong, rigid, and within allowable limits of air leakage. Inside diameter of conduits when checked with ring gages shall show a variation from nominal diameter of not more than 0.030". Fittings shall be provided with male connections and, when checked with ring gages, shall show a variation from nominal outside diameter of not more than 0.015 inch.

F. Transitions shall be all welded construction. In any required rectangular ells, provide Airsan "Acoustiturn" double thick acoustical turning vanes.

G. All high pressure ducts having a dimension of 36" or greater shall be assembled using gasketed companion flanges.

H. All other joints between conduits and between conduits and fittings shall be made with "Hardcast" cement reinforced with self-tapping drill screws. Conduits shall be joined with couplings. Adjoining surfaces of fitting or coupling and conduit at each joint shall be thoroughly cleaned, and after receiving a uniform coat of cement shall be pressed together. Joints so formed shall be further strengthened by the use of hex head No. 7x12 self-tapping drill screws installed with a screw gun. Screws shall be equally spaced around the circumference and centered longitudinally on the joint. Use three screws per joint on conduit with diameters of 3" through 8" and space screws approximately 6" apart on conduit with diameters of 9" and over. Then seal the joint with "Hardcast" assembled using manufacturer's instructions.

I. It is essential that all high velocity ductwork be practically air tight. After erection in place, and before being insulated or connected to the air distribution units, each high velocity duct system shall be tested for leaks. For the test, each system shall be capped at all openings. Pressure test according to the SMACNA procedure, admitting air through a precision orifice and using pressure taps and a manometer. Under this test there shall be no whistling leaks and the pressure drop across the orifice shall not exceed the pressure drop corresponding to 1% air loss according to SMACNA Tables of the design air quantity in that branch.

## 2.3 SHEET METAL MATERIALS

A. General Material Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.

B. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.

1. Galvanized Coating Designation: G90.
2. Finishes for Surfaces Exposed to View: Mill phosphatized.

C. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

## 2.4 SEALANT AND GASKETS

A. General Sealant and Gasket Requirements: Surface-burning characteristics for sealants and gaskets shall be a maximum flame-spread index of 25 and a maximum smoke-developed index of 50 when tested according to UL 723; certified by an NRTL.

B. Water-Based Joint and Seam Sealant: Flexible, adhesive sealant, resistant to UV light when cured, UL 723 listed, and complying with NFPA requirements for Class 1 ducts.

C. Solvent-Based Joint and Seam Sealant: One-part, nonsag, solvent-release-curing, polymerized butyl sealant formulated with a minimum of 75 percent solids.

D. Flange Gaskets: Butyl rubber, neoprene, or EPDM polymer with polyisobutylene plasticizer.

E. Round Duct Joint O-Ring Seals:

1. Seal shall provide maximum leakage class of 3 cfm/100 sq. ft. at 1-inch wg and shall be rated for 10-inch wg static-pressure class, positive or negative.
2. EPDM O-ring to seal in concave bead in coupling or fitting spigot.
3. Double-lipped, EPDM O-ring seal, mechanically fastened to factory-fabricated couplings and fitting spigots.

## 2.5 HANGERS AND SUPPORTS

A. Hanger Rods for Noncorrosive Environments: Cadmium-plated steel rods and nuts.

B. Hanger Rods for Corrosive Environments: Electrogalvanized, all-thread rods or galvanized rods with threads painted with zinc-chromate primer after installation.

C. Strap and Rod Sizes: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 4-1, "Rectangular Duct Hangers Minimum Size," and Table 4-2, "Minimum Hanger Sizes for Round Duct."

D. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.

E. Trapeze and Riser Supports:

1. Supports for Galvanized-Steel Ducts: Galvanized-steel shapes and plates.

## PART 3 - EXECUTION

### 3.1 DUCT INSTALLATION

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of duct system. Indicated duct locations, configurations, and arrangements were used to size ducts and calculate friction loss for air-handling equipment sizing and for other design considerations. Install duct systems as indicated unless deviations to layout are approved on Shop Drawings and Coordination Drawings.

B. Install ducts according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" unless otherwise indicated.

C. Install round and flat-oval ducts in maximum practical lengths.

D. Install ducts with fewest possible joints.

E. Install factory- or shop-fabricated fittings for changes in direction, size, and shape and for branch connections.

F. Unless otherwise indicated, install ducts vertically and horizontally, and parallel and perpendicular to building lines.

G. Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.

H. Install ducts with a clearance of 1 inch, plus allowance for insulation thickness.

I. Route ducts to avoid passing through transformer vaults and electrical equipment rooms and enclosures.

J. Where ducts pass through non-fire-rated interior partitions and exterior walls and are exposed to view, cover the opening between the partition and duct or duct insulation with sheet metal flanges of same metal thickness as the duct. Overlap openings on four sides by at least 1-1/2 inches.

K. Where ducts pass through fire-rated interior partitions and exterior walls, install fire dampers. Comply with requirements in Division 15 Section "Duct Accessories" for fire and smoke dampers.

L. Protect duct interiors from moisture, construction debris and dust, and other foreign materials. Comply with SMACNA's "Duct Cleanliness for New Construction Guidelines."

### 3.2 INSTALLATION OF EXPOSED DUCTWORK

A. Protect ducts exposed in finished spaces from being dented, scratched, or damaged.

B. Trim duct sealants flush with metal. Create a smooth and uniform exposed bead. Do not use two-part tape sealing system.

C. Grind welds to provide smooth surface free of burrs, sharp edges, and weld splatter. When welding stainless steel with a No. 3 or 4 finish, grind the welds flush, polish the exposed welds, and treat the welds to remove discoloration caused by welding.

D. Maintain consistency, symmetry, and uniformity in the arrangement and fabrication of fittings, hangers and supports, duct accessories, and air outlets.

E. Repair or replace damaged sections and finished work that does not comply with these requirements.

## 3.3 DUCT SEALING

A. Seal ducts for duct static-pressure, seal classes, and leakage classes specified in "Duct Schedule" Article according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

B. Seal ducts to the following seal classes according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible":

1. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
2. Outdoor, Supply-Air Ducts: Seal Class A.
3. Outdoor, Exhaust Ducts: Seal Class C.
4. Outdoor, Return-Air Ducts: Seal Class C.
5. Unconditioned Space, Supply-Air Ducts in Pressure Classes 2-Inch wg and Lower: Seal Class B.
6. Unconditioned Space, Supply-Air Ducts in Pressure Classes Higher Than 2-Inch wg: Seal Class A.
7. Unconditioned Space, Exhaust Ducts: Seal Class C.
8. Unconditioned Space, Return-Air Ducts: Seal Class B.
9. Conditioned Space, Supply-Air Ducts in Pressure Classes 2-Inch wg and Lower: Seal Class C.
10. Conditioned Space, Supply-Air Ducts in Pressure Classes Higher Than 2-Inch wg: Seal Class B.
11. Conditioned Space, Exhaust Ducts: Seal Class B.
12. Conditioned Space, Return-Air Ducts: Seal Class C.

## 3.4 HANGER AND SUPPORT INSTALLATION

A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 4, "Hangers and Supports."

B. Building Attachments: Concrete inserts, powder-actuated fasteners, or structural-steel fasteners appropriate for construction materials to which hangers are being attached.

1. Where practical, install concrete inserts before placing concrete.
2. Install powder-actuated concrete fasteners after concrete is placed and completely cured.
3. Use powder-actuated concrete fasteners for standard-weight aggregate concretes or for slabs more than 4 inches thick.
4. Do not use powder-actuated concrete fasteners for lightweight-aggregate concretes or for slabs less than 4 inches thick.

C. Hanger Spacing: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 4-1, "Rectangular Duct Hangers Minimum Size," and Table 4-2, "Minimum Hanger Sizes for Round Duct," for maximum hanger spacing; install hangers and supports within 24 inches of each elbow and within 48 inches of each branch intersection.

D. Hangers Exposed to View: Threaded rod and angle or channel supports.

E. Support vertical ducts with steel angles or channel secured to the sides of the duct with welds, bolts, sheet metal screws, or blind rivets; support at each floor and at a maximum intervals of 16 feet.

F. Install upper attachments to structures. Select and size upper attachments with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

## 3.5 CONNECTIONS

A. Make connections to equipment with flexible connectors complying with Division 15 Section "Duct Accessories."

B. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for branch, outlet and inlet, and terminal unit connections.

## 3.6 PAINTING

A. Paint interior of metal ducts that are visible through registers and grilles and that do not have duct liner. Apply one coat of flat, black, latex paint over a compatible galvanized-steel primer. Paint materials and application requirements are specified in Division 9 painting Sections.

## 3.7 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Leakage Tests:

1. Comply with SMACNA's "HVAC Air Duct Leakage Test Manual." Submit a test report for each test.
2. **Test the following systems:**

   **a. Supply Ducts with a Pressure Class of 2-Inch wg or Higher: Test all sections. On 2nd floor project, test all sections of new and existing medium pressure ducts throughout 2nd floor from the point where duct leaves the chases to each VAV box. Repair, reseal, replace any sections of leaking duct as required to pass pressure test.**

   **b. On 3RD Floor also test the existing return and exhaust ducts serving this floor that are remaining. Test from connection at chase all the way to last runout as possible. Patch, reseal, and repair existing ducts as required to accommodate leakage testing and for compliance with test requirements.**

3. Disassemble, reassemble, and seal segments of systems to accommodate leakage testing and for compliance with test requirements.
4. Test for leaks before insulation application.
5. Conduct tests at static pressures equal to maximum design pressure of system or section being tested. If static-pressure classes are not indicated, test entire system at maximum system design pressure. Do not pressurize systems above maximum design operating pressure. Give seven days' advance notice for testing.

## 3.8 DUCT CLEANING

A. Clean duct system(s) before testing, adjusting, and balancing.

3.9 DUCT SCHEDULE

A. Fabricate ducts with galvanized sheet steel.

B. Intermediate Reinforcement:

1. Galvanized-Steel Ducts: Galvanized steel.

C. Elbow Configuration:

1. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-2, "Rectangular Elbows." **The use of radius elbow with square inner throat is NOT acceptable for any duct velocities.**

a. Velocity 1000 fpm or Lower:

1) Radius Type RE 1 with minimum 0.5 radius-to-diameter ratio.
2) Mitered Type RE 4 without vanes.

b. Velocity 1000 to 1500 fpm:

1) Radius Type RE 1 with minimum 1.0 radius-to-diameter ratio.
2) Radius Type RE 3 with minimum 0.5 radius-to-diameter ratio and two vanes.
3) Mitered Type RE 2 with vanes complying with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-3, "Vanes and Vane Runners," and Figure 2-4, "Vane Support in Elbows."

c. Velocity 1500 fpm or Higher:

1) Radius Type RE 1 with minimum 1.5 radius-to-diameter ratio.
2) Radius Type RE 3 with minimum 1.0 radius-to-diameter ratio and two vanes.
3) Mitered Type RE 2 with vanes complying with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-3, "Vanes and Vane Runners," and Figure 2-4, "Vane Support in Elbows."

2. Round Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-3, "Round Duct Elbows."

a. Minimum Radius-to-Diameter Ratio and Elbow Segments: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 3-1, "Mitered Elbows." Elbows with less than 90-degree change of direction have proportionately fewer segments.

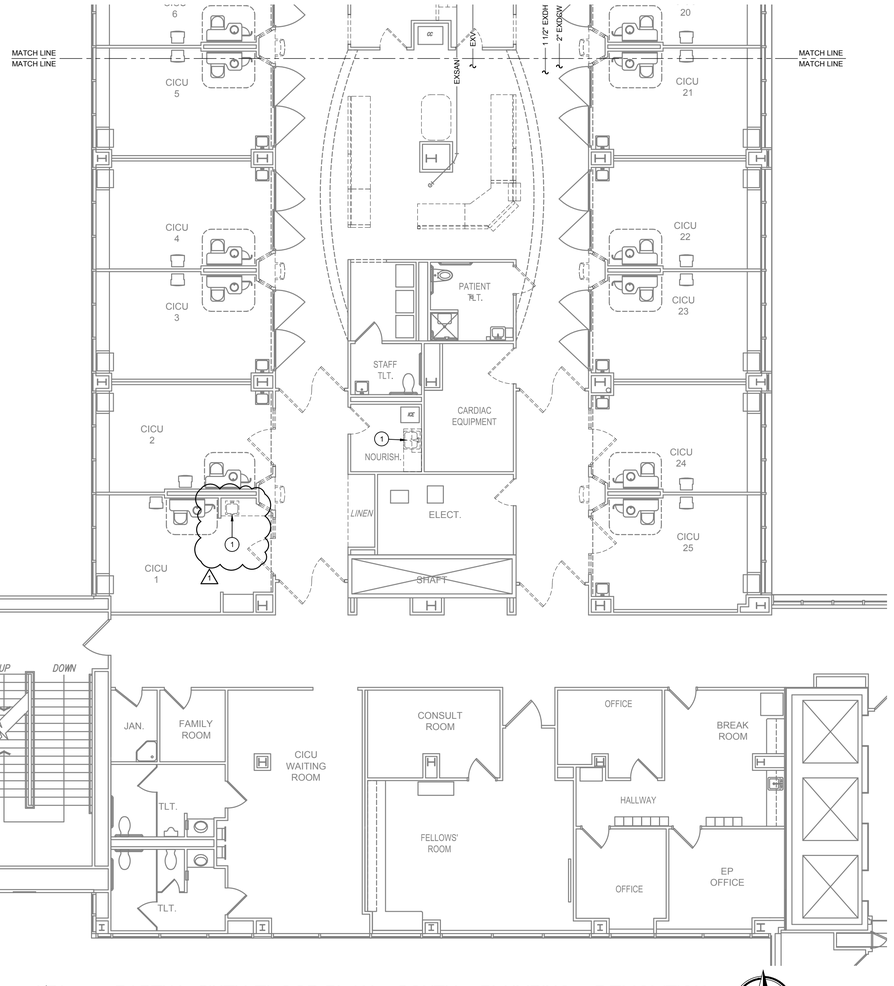
1) Velocity 1000 fpm or Lower: 0.5 radius-to-diameter ratio and three segments for 90-degree elbow.
2) Velocity 1000 to 1500 fpm: 1.0 radius-to-diameter ratio and four segments for 90-degree elbow.
3) Velocity 1500 fpm or Higher: 1.5 radius-to-diameter ratio and five segments for 90-degree elbow.

D. Branch Configuration:

1. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-6, "Branch Connections."

2. Round and Flat Oval: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-4, "90 Degree Tees and Laterals," and Figure 3-5, "Conical Tees." Saddle taps are permitted in existing duct.

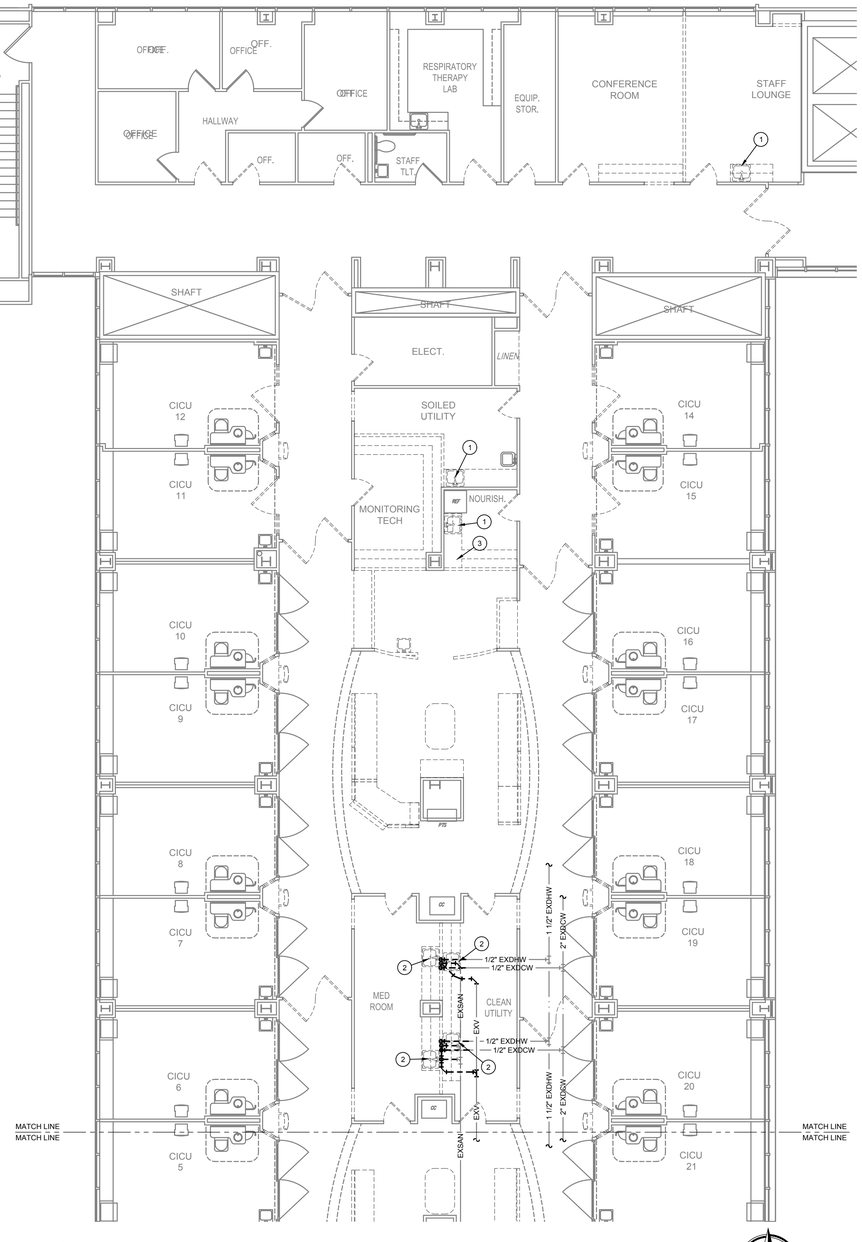
END OF SECTION 233113




1/P1 PARTIAL SIXTH FLOOR PLAN - SOUTH - PLUMBING - DEMOLITION

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

NORTH




2/P1 PARTIAL SIXTH FLOOR PLAN - NORTH - PLUMBING - DEMOLITION

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

NORTH

## GENERAL NOTES

A. CONTRACTOR SHALL TAKE CARE TO PROTECT ALL OPERATIONAL SYSTEMS. ANY EXISTING SYSTEMS THAT ARE DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED OR REPLACED AT THE EXPENSE OF THE CONTRACTOR.

B. FOR ALL ITEMS SHOWN OR NOTED TO BE REMOVED, REMOVE ALL ASSOCIATED ITEMS INCLUDING ALL HANGERS, INSULATION, VALVES, ETC.

C. VERIFY EXACT LOCATION OF ALL EXISTING UTILITIES, PLUMBING FIXTURES, AND PIPING AT THE JOBSITE. CONTRACTOR SHALL FIELD VERIFY EXACT LOCATION OF ALL UTILITIES PRIOR TO BID.

D. CONTRACTOR SHALL COORDINATE ALL PLUMBING DISCONNECTIONS AND INTERRUPTIONS WITH BUILDING OWNER. VERIFY EXACT SCHEDULE WITH ARCHITECT AND OWNER.

E. ALL EXISTING MEDICAL GAS PIPING, VALVES, ALARMS TO REMAIN AS EXISTING IN THIS FLOOR. CONTRACTOR SHALL REMOVE AND REPLACE ANY COVER PLATES OR TRIM PLATES AS REQUIRED TO ACCOMMODATE NEW WALL FINISHES, REFER TO ARCHITECTURAL.

## KEYED NOTES

1. REMOVE EXISTING SINK. MODIFY EXISTING ROUGH-IN AS REQUIRED TO ACCOMMODATE NEW SINK AS SHOWN ON NEW WORK PLAN.
2. REMOVE EXISTING SINK. REMOVE WASTE, VENT, AND WATER LINES BACK AS REQUIRED AND MODIFY AS REQUIRED TO SERVE NEW FIXTURES IN THIS AREA AS SHOWN ON NEW WORK PLAN.
3. REMOVE EXISTING ICE MACHINE PLUMBING CONNECTIONS BACK TO ACTIVE MAINS AND CAP.

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UNIVERSITY MEDICAL CENTER
6TH FLOOR CV/CICU RENOVATION
PROPOSAL ITEM #1

602 INDIANA AVENUE
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REVISIONS:
1 ADDENDUM #1 05/13/2025

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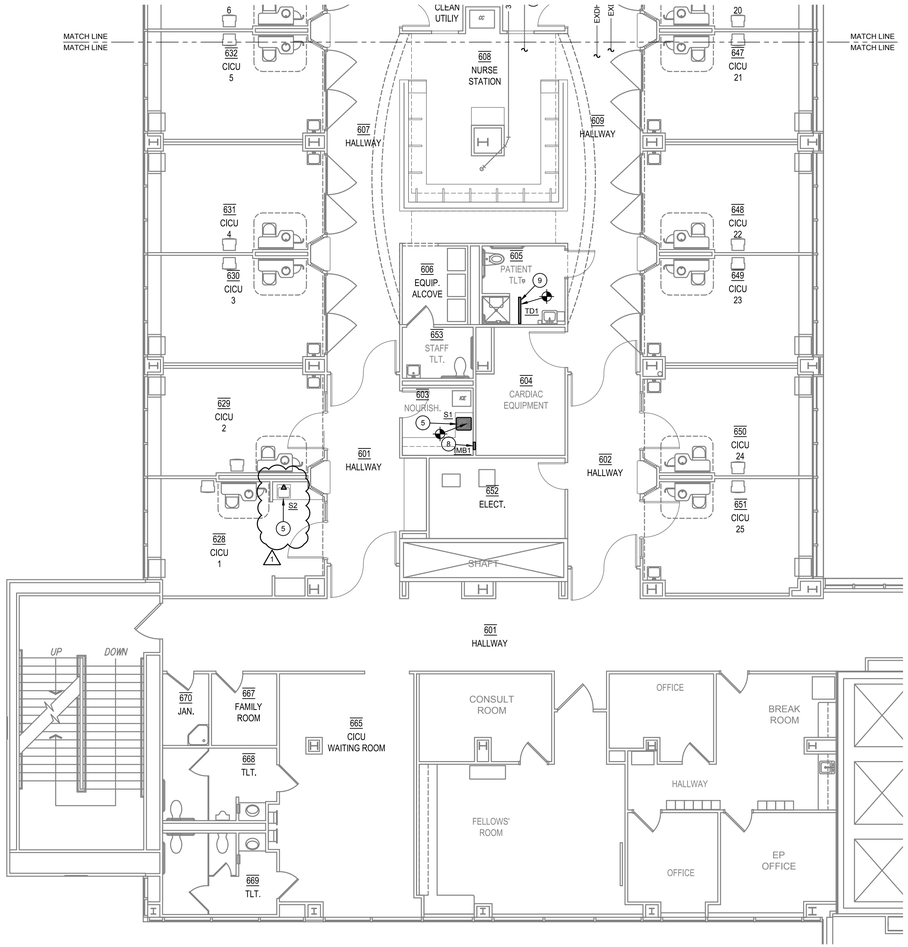
SHEET NO.
P1

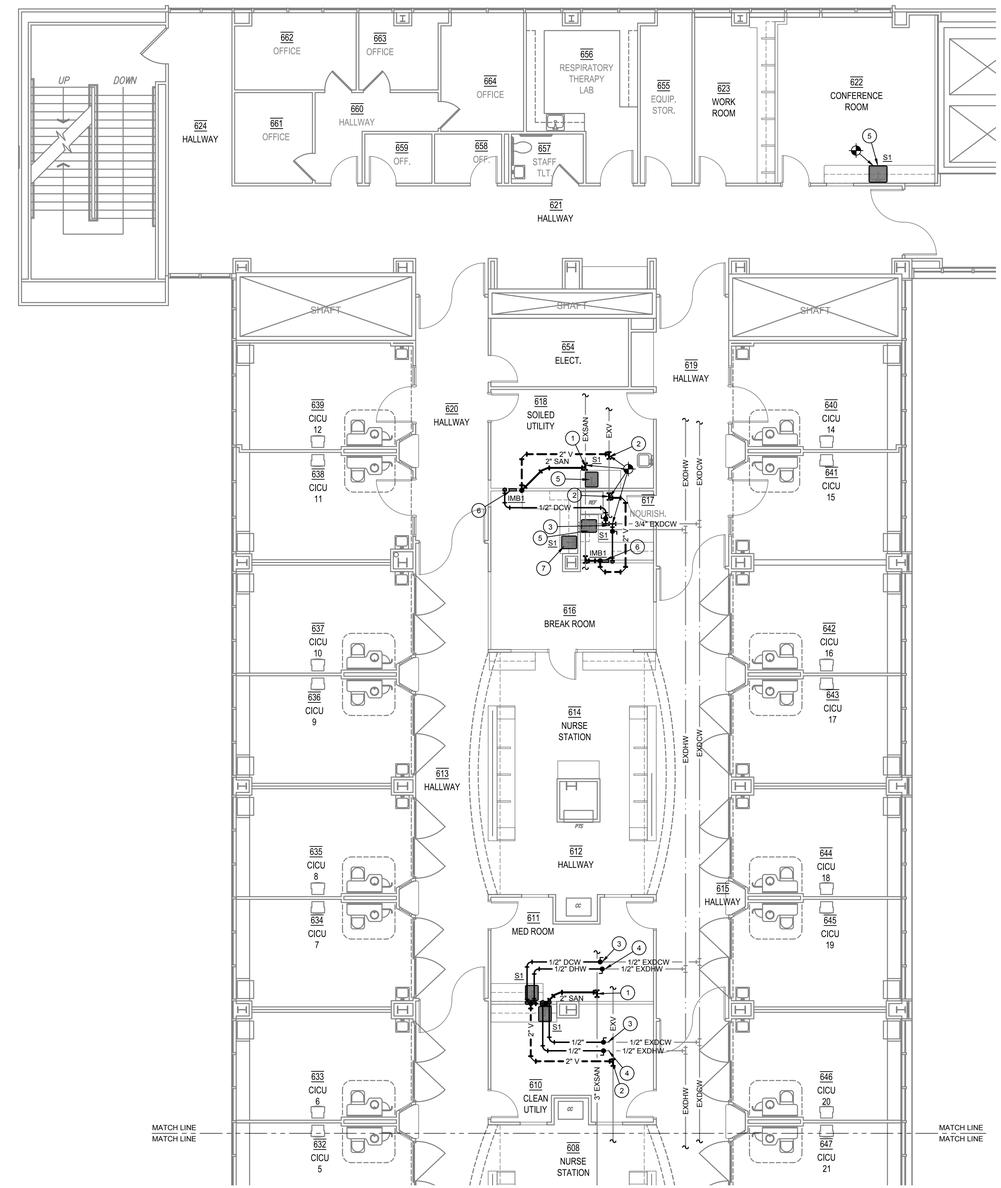
2 OF 4




## 1/P2 PARTIAL SIXTH FLOOR PLAN - SOUTH - PLUMBING

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

NORTH




## 2/P2 PARTIAL SIXTH FLOOR PLAN - NORTH - PLUMBING

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

NORTH

### FIRE SPRINKLER SYSTEM

A. THIS BUILDING IS CURRENTLY PROTECTED BY AN AUTOMATIC SPRINKLER SYSTEM. MODIFY EXISTING SYSTEM TO ACCOMMODATE FINISH OUT FLOOR PLAN AS REQUIRED BY NFPA 13.

B. PROVIDE NEW SPRINKLER HEADS IN ALL ROOM WITH NEW CEILINGS AND LOCATE CENTER OF CEILING TILE. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN.

### GENERAL NOTES

A. REFER TO SHEET P0 FOR ALL APPLICABLE GENERAL NOTES.

B. ALL EXISTING MEDICAL GAS PIPING, VALVES, ALARMS TO REMAIN AS EXISTING IN THIS FLOOR. CONTRACTOR SHALL REMOVE AND REPLACE ANY COVER PLATES OR TRIM PLATES AS REQUIRED TO ACCOMMODATE NEW WALL FINISHES, REFER TO ARCHITECTURAL.

### KEYED NOTES

1. CONNECT NEW SEWER/WASTE LINE TO EXISTING SEWER/WASTE LINE IN THIRD FLOOR CEILING SPACE IN APPROXIMATELY THIS LOCATION. VERIFY EXACT LOCATION OF EXISTING LINE AT JOBSITE.
2. CONNECT NEW VENT LINE TO EXISTING VENT LINE IN CEILING SPACE IN APPROXIMATELY THIS LOCATION. VERIFY EXACT LOCATION OF EXISTING LINE AT JOBSITE.
3. CONNECT NEW COLD WATER LINE TO EXISTING COLD WATER LINE IN CEILING SPACE IN APPROXIMATELY THIS LOCATION. VERIFY EXACT LOCATION OF EXISTING LINE AT JOBSITE.
4. CONNECT NEW HOT WATER LINE TO EXISTING HOT WATER LINE IN CEILING SPACE IN APPROXIMATELY THIS LOCATION. VERIFY EXACT LOCATION OF EXISTING LINE AT JOBSITE.
5. INSTALL NEW SINK ON EXISTING MODIFIED ROUGH-IN. EXTEND PLUMBING LINES IN WALL AS REQUIRED.
6. COORDINATE WITH ARCHITECT FOR EXACT LOCATION AND MOUNTING HEIGHT OF ALL ICE MACHINE WATER AND DRAIN BOXES PRIOR TO ROUGH-IN.
7. NEW SINK. EXTEND 2" WASTE, 2" VENT, 1/2" DCW AND 1/2" DHW LINES IN WALL TO CONNECT TO LINES SERVING ADJACENT SINK ON OTHER SIDE OF WALL.
8. NEW IMB1 WATER/DRAIN BOX IN WALL FOR COUNTER TOP COFFEE MAKER. EXTEND WASTE AND DCW LINES OVER IN WALL TO CONNECT TO LINES SERVING ADJACENT SINK. CUT, PATCH AND REPAIR EXISTING WALL AS DIRECTED BY ARCHITECT. REFER TO NOTE 6 ABOVE.
9. NEW TRENCH DRAIN TO SERVE EXISTING SHOWER IN PATIENT TOILET ROOM. EXTEND 2" WASTE AND 2" VENT LINES TO CONNECT TO EXISTING LINES SERVING EXISTING SHOWER DRAIN. PATCH FLOOR AS DIRECTED BY ARCHITECT.

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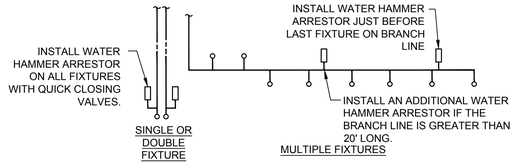
DATE: 05/01/2025

SHEET NO.
P2

3 OF 4

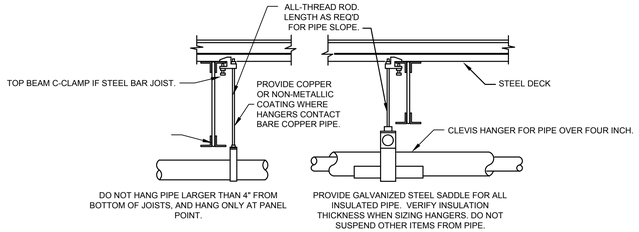



| PDI SIZE | PIPE SIZE | FIXTURE UNIT LOAD |
|---|---|---|
| A | 1/2" | 1-11 |
| B | 3/4" | 12-32 |
| C | 1" | 33-60 |
| D | 1-1/4" | 61-113 |
| E | 1-1/2" | 114-154 |
| F | 2" | 154-330 |

| WATER SUPPLY FIXTURE UNIT (WSFU) | | |
|---|---|---|
| FIXTURE | COLD | HOT |
| VALVE WATER CLOSET | 5 | -- |
| URINAL | 4 | -- |
| LAVATORY/SINK | 1.5 | 1.5 |
| JANITOR'S SINK | 3 | 3 |
| | | |
| | | |

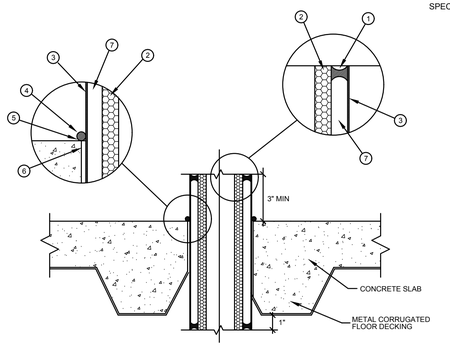
COMMENTS:
1. WATER HAMMER ARRESTERS SHALL BE HAVE PISTON AND 0-RING CONSTRUCTION WITH PDI #WH-201, ASSE # 1010 AND ANSI # A112.26.1M CERTIFICATION. INSTALL IN HORIZONTAL OR VERTICAL POSITION, BUT NEVER UPSIDE DOWN. SIZE THE UNITS AS SHOWN PER THE TABLES SHOWN ABOVE.

## WATER HAMMER ARRESTER DETAIL
NO SCALE



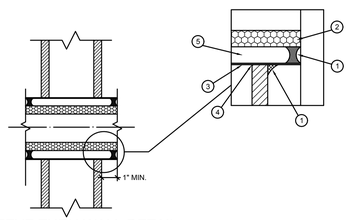

COMMENTS:
1. PROVIDE UPPER ATTACHMENT AS REQUIRED FOR CASES NOT SHOWN HERE. DO NOT INSTALL HANGER INSIDE INSULATION OR OTHERWISE PENETRATE VAPOR BARRIER. DO NOT HANG ONE PIPE FROM ANOTHER EXCEPT IN CHASES. TRAPEZE HANGERS MAY BE USED FOR MULTIPLE PARALLEL PIPES. SLOPE ALL WATER PIPING SLIGHTLY TOWARD DRAINABLE LOCATIONS. HANGER SPACING FOR PIPE SIZE: COPPER: 2"=9' 1½"=8' 1¼"=7' 1"=6' ¾"=6' ½"=5'. CAST IRON: 10' AND ONE NEAR ALL JOINTS. STEEL: 3"=12' 2½"=11' 2"=10' 1 ¼"=9' 1"=7' ¾"=6' ½"=5'. LOCATE HANGERS AS CLOSE AS POSSIBLE TO TURNS AND TEES OF PIPE. PROVIDE SUPPLEMENTARY STEEL STRUTS BETWEEN JOISTS IF REQUIRED. LOCATE HANGERS TO TAKE LOAD OFF OF EQUIPMENT CONNECTIONS. ANCHOR WATER PIPE AGAINST SWAYING DUE TO CHANGES IN WATER VELOCITY. PROVIDE SEISMIC BRACING AS REQUIRED BY LOCAL AUTHORITIES. CHAINS OR PERFORATED STRAP IRON OR STEEL IS NOT ACCEPTABLE. DO NOT SUSPEND PIPE FROM JOIST BRACING MEMBERS. REFER TO CODES AND SPECIFICATIONS FOR FURTHER INFORMATION.

## PIPE HANGER DETAIL
NO SCALE




## PIPE SLEEVE THRU FLOOR DETAIL
NO SCALE

### PIPE SLEEVE THRU FLOOR DETAIL GENERAL NOTES
1. CAULK CONTINUOUS WITH 3M # 2000 FIRE PROOF 1/2" BEAD (MADE BY 3M COMPANY.)
2. CONTINUOUS INSULATION THROUGH FLOOR PENETRATION FOR PIPING THAT REQUIRES INSULATION.
3. 16 GA. PIPE MINIMUM FOR SLEEVES.
4. 1/4" COLD ROLL RING, WRAPPED AND WELDED. CLEAN JOINT, HEAVY CAULK BEAD SO THAT EXCESS CAULK CREATES A WATER REPELLANT JOINT.
5. CAULKED CONTINUOUS WITH VULKEM 116 POLYURETHANE SEALANT (MADE BY MAMECO INTERNATIONAL INC.)
6. HOLES WITLL BE CORED (DRY OR WET NO HAMMER DRILL PENETRATION. PENETRATIONS WILL FIT SNUG TO SLEEVE.
7. MAX. 1/4" ANNULAR SPACE BETWEEN INSULATION AND PIPE FOR NON INSULATED LINES FOR EXAMPLE (AIR, GAS, VAC, ELEC.).

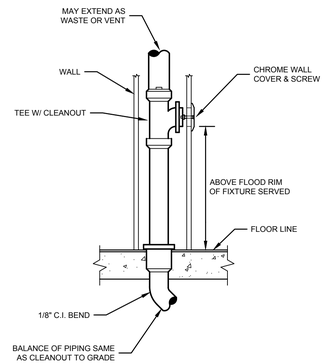



## PIPE SLEEVE THRU WALL DETAIL
NO SCALE

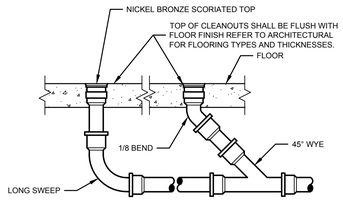
### PIPE SLEEVE THRU WALL DETAIL GENERAL NOTES
1. CAULK CONTINUOUS WITH 3M # 2000 FIRE PROOF 1/2" BEAD (MADE BY 3M COMPANY.)
2. CONTINUOUS INSULATION THROUGH WALL PENETRATION FOR PIPING THAT REQUIRES INSULATION.
3. 16 GA. PIPE MINIMUM FOR SLEEVES.
4. HOLES WILL BE CORED (DRY OR WET NO HAMMER DRILL PENETRATION. PENETRATIONS WILL FIT SNUG TO SLEEVE.
5. MAX. 1/4" ANNULAR SPACE BETWEEN INSULATION AND PIPE FOR NON INSULATED LINES FOR EXAMPLE (AIR, GAS, VAC, ELEC.)

## PLUMBING FIXTURE SCHEDULE

| MARK | REFERENCE IMAGE | FIXTURE SPECIFICATION (FIXTURES ARE EXAMPLES ONLY, EQUAL FIXTURES FROM ALTERNATE MANUFACTURERS IS ACCEPTABLE. REFER TO SPECIFICATION FOR ACCEPTABLE MANUFACTURERS) | FIXTURE CONNECTIONS (RUNOUT LINE SIZES) CW | HW | SS | V |
|---|---|---|---|---|---|---|
| **SINKS** | | | | | | |
| S1 |  | Fixture: Elkay LRAD-1918, 19" x 18" x 6" deep, single compartment, off-center drain, 18 gage type 302 self rimming stainless steel with 2 holes. TAS compliant.<br>Supply: T&S Brass B-2742, single lever side mounted remote on/off contral base faucet, ceramic cartridge, swivel gooseneck, 16" flexible stainless steel supply hoses and 2.2GPM aerator. TAS compliant.<br>Strainer: McGuire 1151WC, adjustable brass offset sink strainer with 17 gauge seamless brass waste arm and tailpiece, cast brass slip nuts and heavy cast elbow.<br>P-trap: McGuire 8912C-F P-trap shall be chrome plated cast brass body with cleanout, with 17 gauge seamless wall bend, slip nuts and Chrome Plated Forged Brass Set Screw Flange.<br>Stops, risers: McGuire BV2165-F Supply kit shall include commercial pattern chrome plated Quarter-Turn Brass Ball Valve with convertible loose key handle, Chrome Plated copper riser and Chrome Plated Forged Brass Set Screw Flange.<br>Protective Insulation: Plumberex X4333/X4114, Insulate per ADA 4.19.4 and or IBC all exposed lavatories drain piping, hot/cold stops and supplies. Protectors will consist of molded closed cell PVC, with anti-fungal and anti-microbial properties. To be one piece continuous smooth design. | 1/2" | 1/2" | 2" | 2" |
| S2 |  | Fixture: Sink is provided integral to countertop. Provide all accessories scheduled below.<br>Supply: T&S Brass B-0892-01-F05 , 4" Center Set mixing faucet with ½" NPSM male shanks, 4" wrist action handles, rigid gooseneck and 0.5 GPM Aerator. TAS compliant.<br>Tailpiece: McGuire 155WC Cast Brass Chrome Plated Offset Wheelchair Strainer with polished chrome cast brass elbow and 17 gauge 1-1/4" inch seamless brass offset tailpiece.<br>P-trap: McGuire 8872C-F P-trap shall be chrome plated cast brass body with cleanout, with 17 gauge seamless wall bend, slip nuts and Chrome Plated Forged Brass Set Screw Flange.<br>Stops, risers: McGuire BV2165-F Supply kit shall include commercial pattern chrome plated Quarter-Turn Brass Ball Valve with convertible loose key handle, Chrome Plated copper riser and Chrome Plated Forged Brass Set Screw Flange.<br>Protective Insulation: Plumberex X4333/X4114, Insulate per ADA 4.19.4 and or IBC all exposed lavatories drain piping, hot/cold stops and supplies. Protectors will consist of molded closed cell PVC, with anti-fungal and anti-microbial properties. To be one piece continuous smooth design. | 1/2" | 1/2" | 2" | 2" |
| WB1 |  | Fixture: Guy Gray SSWB1 stainless steel washer box with quarter turn valves. Connect 1/2" cold water line to both valves and label both as cold water. Coordinate mounting height with Architect prior to rough in. | 1/2" (x2) | 1/2" | 2" | 2" |
| TD1 |  | Zurn ZPT1 shallow stainless steel linear drain with membrane flange and drop in outlet. 3" width, 36" length. Low-profile, 1/2" deep, Type 304, 18 gauge fabricated stainless steel anti-ponding V-shaped channel with independent 2" No-Hub offset. Type 304, stainless steel drop-in bottom outlet, 12" long. Grate pattern selected by Arhcitect. | ___ | ___ | 2" | 2" |




## WALL CLEANOUT DETAIL
NO SCALE




## INTERIOR CLEANOUT DETAIL
NO SCALE

### PLUMBING LEGEND

| SYMBOL | DESCRIPTION |
|---|---|
| VTR ● | VENT THROUGH ROOF |
| ——— | SANITARY SOIL LINE (SAN) |
| -DEMO-XXX- | DEMO PLUMBING LINE (XXX = SYSTEM INDICATED) |
| — — — — — | SANITARY VENT LINE (V) |
| ——— · ——— | COLD WATER LINE (DCW) |
| ——— ·· ——— | HOT WATER LINE (DHW) |
| ——— ··· ——— | HOT WATER RETURN LINE (DHC) |
| ——— G ——— | GAS LINE (G) |
| ——— RO ——— | REVERSE OSMOSIS WATER LINE (RO) |
| ——— CA ——— | COMPRESSED AIR LINE (CA) |
| ——— MA ——— | MEDICAL AIR LINE (MA) |
| ——— N ——— | NITROGEN LINE (N) |
| ——— NO ——— | NITROUS OXIDE LINE (NO) |
| ——— O ——— | OXYGEN LINE (O) |
| ——— VAC ——— | MEDICAL VACUUM LINE (VAC) |
| EXO | EXISTING OXYGEN |
| EXCA | EXISTING MEDICAL AIR |
| EXVAC | EXISTING MEDICAL VACUUM |
| EXNO | EXISTING NITROUS OXIDE |
| EXN | EXISTING NITROGEN |
| DCW | DOMESTIC COLD WATER |
| DHW | DOMESTIC HOT WATER |
| AD | ACCESS DOOR |
| SAN | SANITARY SOIL |
| V | SANITARY VENT |
| G | NATURAL GAS |
| DHC | DOMESTIC HOT WATER CIRCULATING |
| A.F.F. | ABOVE FINISHED FLOOR |
| B.F.C. | BELOW FINISHED CEILING |
| WCO | WALL CLEANOUT |
| CO | CLEANOUT |
| DCO | DOUBLE CLEANOUT |
| | BALL VALVE |
| | ELBOW TURNED DOWN |
| | ELBOW TURNED UP |
| | FLOW IN DIRECTION OF ARROW |
| WH/HB | WALL HYDRANT \ HOSE BIBB |
| FD/FS | FLOOR DRAIN/SINK |
| | UNION |
| | VALVE IN BOX |
| | CHECK VALVE |
| | GAS COCK |
| | CONNECT TO EXISTING |
| | |

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STATE OF TEXAS — JUSTIN M. FINCHER — 98476 — LICENSED PROFESSIONAL ENGINEER — 5-13-2025

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UNIVERSITY MEDICAL CENTER
6TH FLOOR CV/CICU RENOVATION
PROPOSAL ITEM #1
602 INDIANA AVENUE
LUBBOCK, TX 79415

REVISIONS:
1 ADDENDUM #1 05/13/2025

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PROJECT NO. 22307
DATE: 05/01/2025

SHEET NO.
P3

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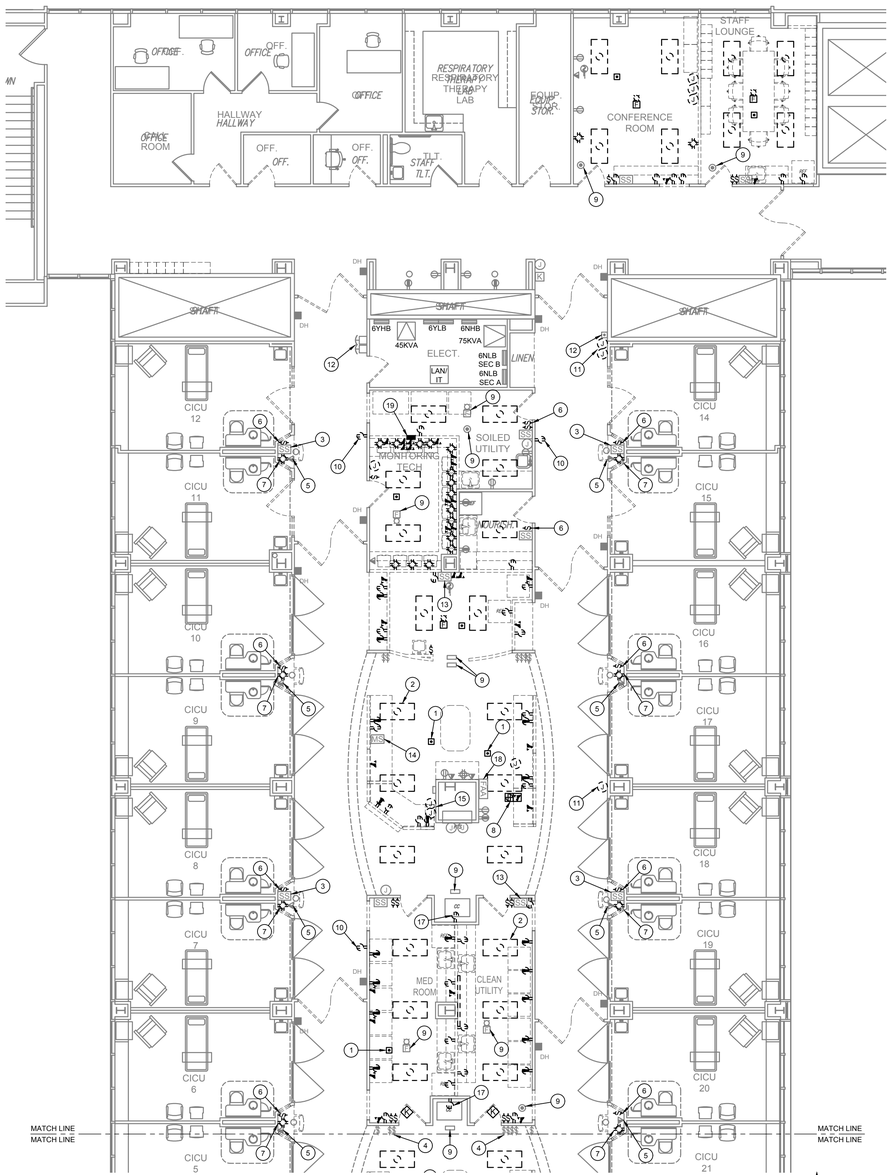
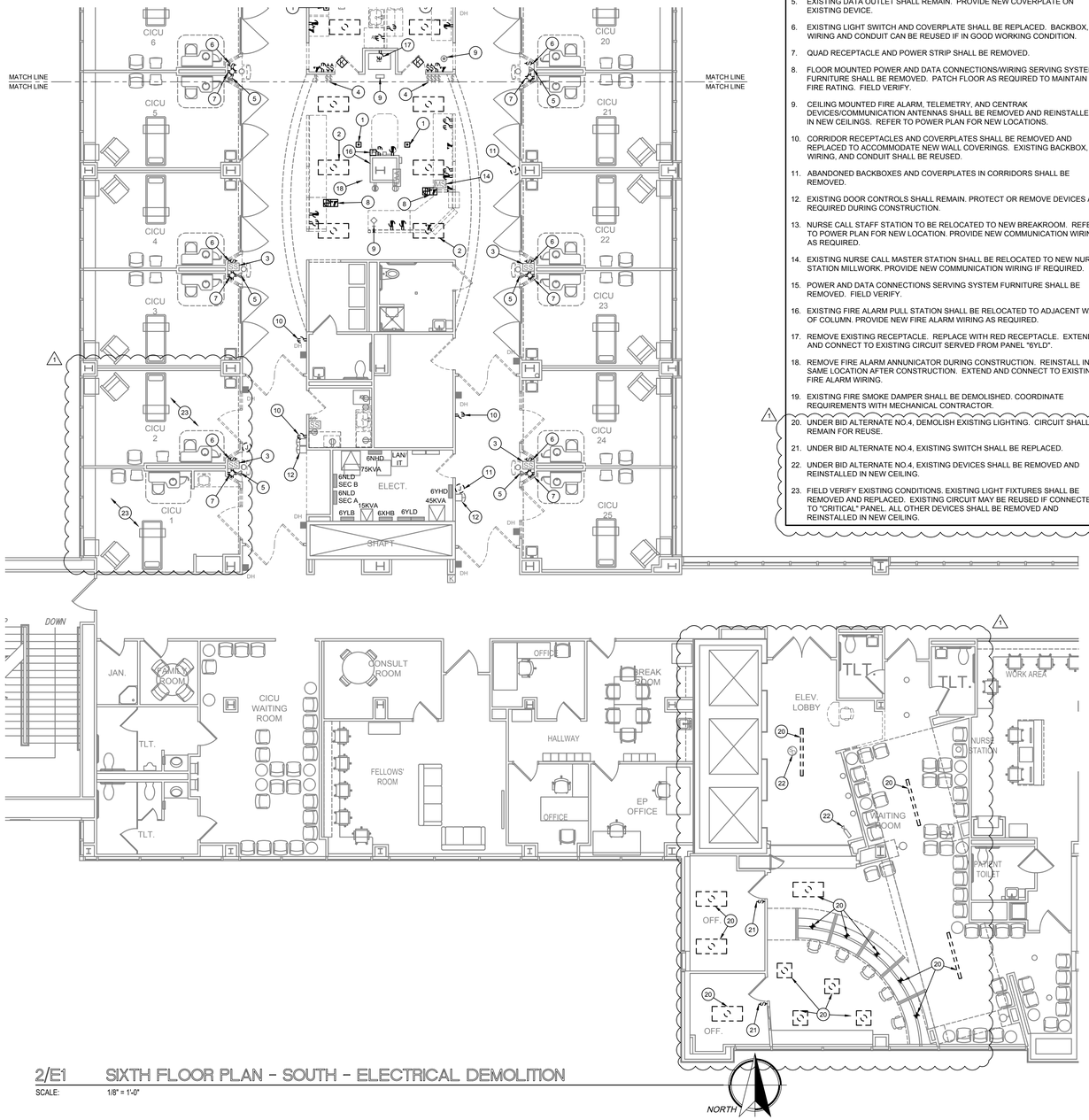



1/E1 SIXTH FLOOR PLAN - NORTH - ELECTRICAL DEMOLITION

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




2/E1 SIXTH FLOOR PLAN - SOUTH - ELECTRICAL DEMOLITION

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

## KEYED NOTES

1. WHERE CEILINGS ARE BEING DEMOLISHED, ABANDONED SYSTEMS SHALL BE REMOVED. COORDINATE ADDITIONAL REQUIREMENTS WITH UMC IT PERSONNEL (TYPICAL).
2. WHERE CEILINGS ARE BEING DEMOLISHED, LIGHT FIXTURES SHALL BE REMOVED. CIRCUIT SHALL REMAIN FOR REUSE. (TYPICAL)
3. EXISTING HILLROM STAFF STATIONS SHALL BE REMOVED AND REINSTALLED IN NEW WALLS/WALL COVERINGS AS REQUIRED. DURING CONSTRUCTION, PROTECT ALL HILLROM DEVICES NOT BEING REMOVED. REFER TO INTERIOR DRAWINGS FOR ADDITIONAL INFORMATION. PROVIDE NEW COMMUNICATION WIRING IF REQUIRED (TYPICAL)
4. FIELD VERIFY EXISTING SWITCHING CONFIGURATION. RECONFIGURE LIGHT SWITCHES AS REQUIRED TO ACCOMMODATE NEW LIGHT FIXTURES. REFER TO LIGHTING PLAN FOR NEW FIXTURE LOCATIONS.
5. EXISTING DATA OUTLET SHALL REMAIN. PROVIDE NEW COVERPLATE ON EXISTING DEVICE.
6. EXISTING LIGHT SWITCH AND COVERPLATE SHALL BE REPLACED. BACKBOX, WIRING AND CONDUIT CAN BE REUSED IF IN GOOD WORKING CONDITION.
7. QUAD RECEPTACLE AND POWER STRIP SHALL BE REMOVED.
8. FLOOR MOUNTED POWER AND DATA CONNECTIONS/WIRING SERVING SYSTEM FURNITURE SHALL BE REMOVED. PATCH FLOOR AS REQUIRED TO MAINTAIN FIRE RATING. FIELD VERIFY.
9. CEILING MOUNTED FIRE ALARM, TELEMETRY, AND CENTRAK DEVICES/COMMUNICATION ANTENNAS SHALL BE REMOVED AND REINSTALLED IN NEW CEILINGS. REFER TO POWER PLAN FOR NEW LOCATIONS.
10. CORRIDOR RECEPTACLES AND COVERPLATES SHALL BE REMOVED AND REPLACED TO ACCOMMODATE NEW WALL COVERINGS. EXISTING BACKBOX, WIRING, AND CONDUIT SHALL BE REUSED.
11. ABANDONED BACKBOXES AND COVERPLATES IN CORRIDORS SHALL BE REMOVED.
12. EXISTING DOOR CONTROLS SHALL REMAIN. PROTECT OR REMOVE DEVICES AS REQUIRED DURING CONSTRUCTION.
13. NURSE CALL STAFF STATION TO BE RELOCATED TO NEW BREAKROOM. REFER TO POWER PLAN FOR NEW LOCATION. PROVIDE NEW COMMUNICATION WIRING AS REQUIRED.
14. EXISTING NURSE CALL MASTER STATION SHALL BE RELOCATED TO NEW NURSE STATION MILLWORK. PROVIDE NEW COMMUNICATION WIRING IF REQUIRED.
15. POWER AND DATA CONNECTIONS SERVING SYSTEM FURNITURE SHALL BE REMOVED. FIELD VERIFY.
16. EXISTING FIRE ALARM PULL STATION SHALL BE RELOCATED TO ADJACENT WALL OF COLUMN. PROVIDE NEW FIRE ALARM WIRING AS REQUIRED.
17. REMOVE EXISTING RECEPTACLE. REPLACE WITH RED RECEPTACLE. EXTEND AND CONNECT TO EXISTING CIRCUIT SERVED FROM PANEL "6YLD".
18. REMOVE FIRE ALARM ANNUNICATOR DURING CONSTRUCTION. REINSTALL IN SAME LOCATION AFTER CONSTRUCTION. EXTEND AND CONNECT TO EXISTING FIRE ALARM WIRING.
19. EXISTING FIRE SMOKE DAMPER SHALL BE DEMOLISHED. COORDINATE REQUIREMENTS WITH MECHANICAL CONTRACTOR.

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20. UNDER BID ALTERNATE NO.4, DEMOLISH EXISTING LIGHTING. CIRCUIT SHALL REMAIN FOR REUSE.
21. UNDER BID ALTERNATE NO.4, EXISTING SWITCH SHALL BE REPLACED.
22. UNDER BID ALTERNATE NO.4, EXISTING DEVICES SHALL BE REMOVED AND REINSTALLED IN NEW CEILING.
23. FIELD VERIFY EXISTING CONDITIONS. EXISTING LIGHT FIXTURES SHALL BE REMOVED AND REPLACED. EXISTING CIRCUIT MAY BE REUSED IF CONNECTED TO "CRITICAL" PANEL. ALL OTHER DEVICES SHALL BE REMOVED AND REINSTALLED IN NEW CEILING.

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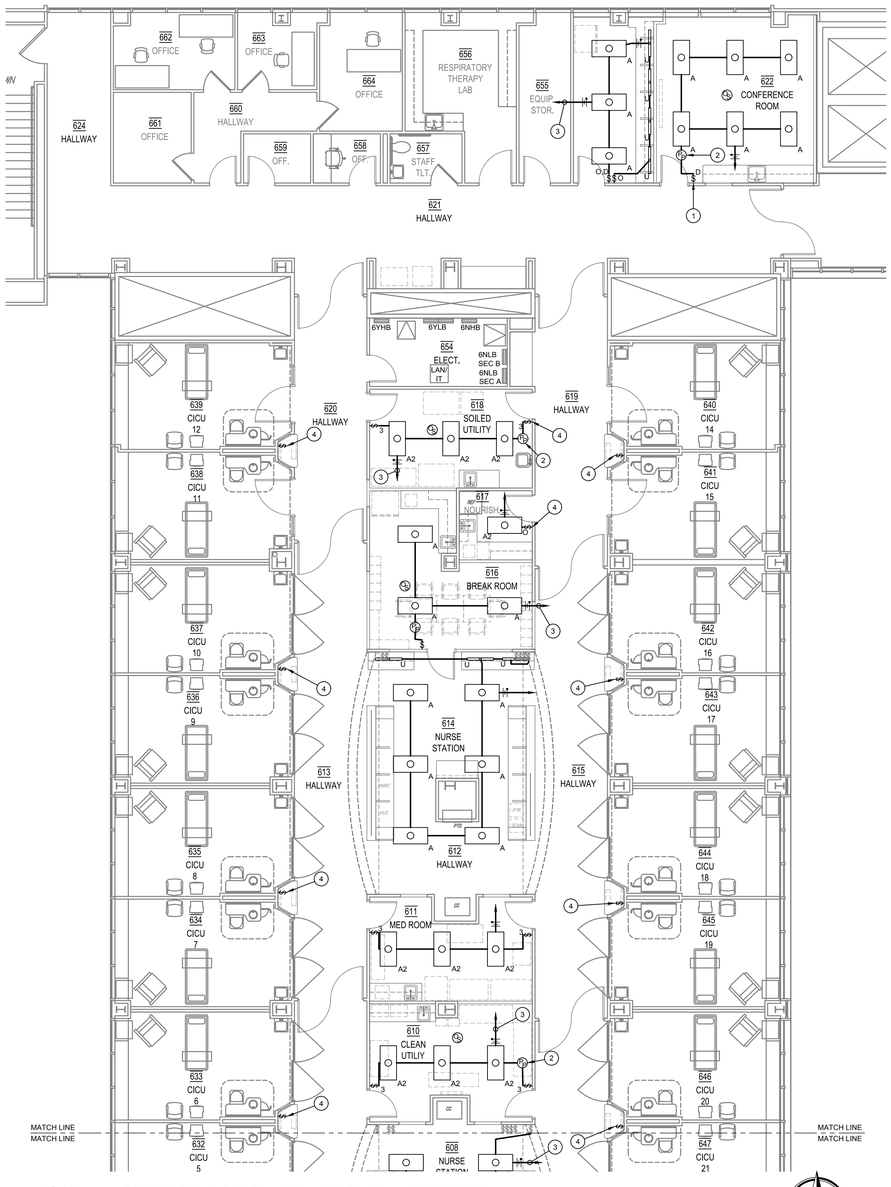
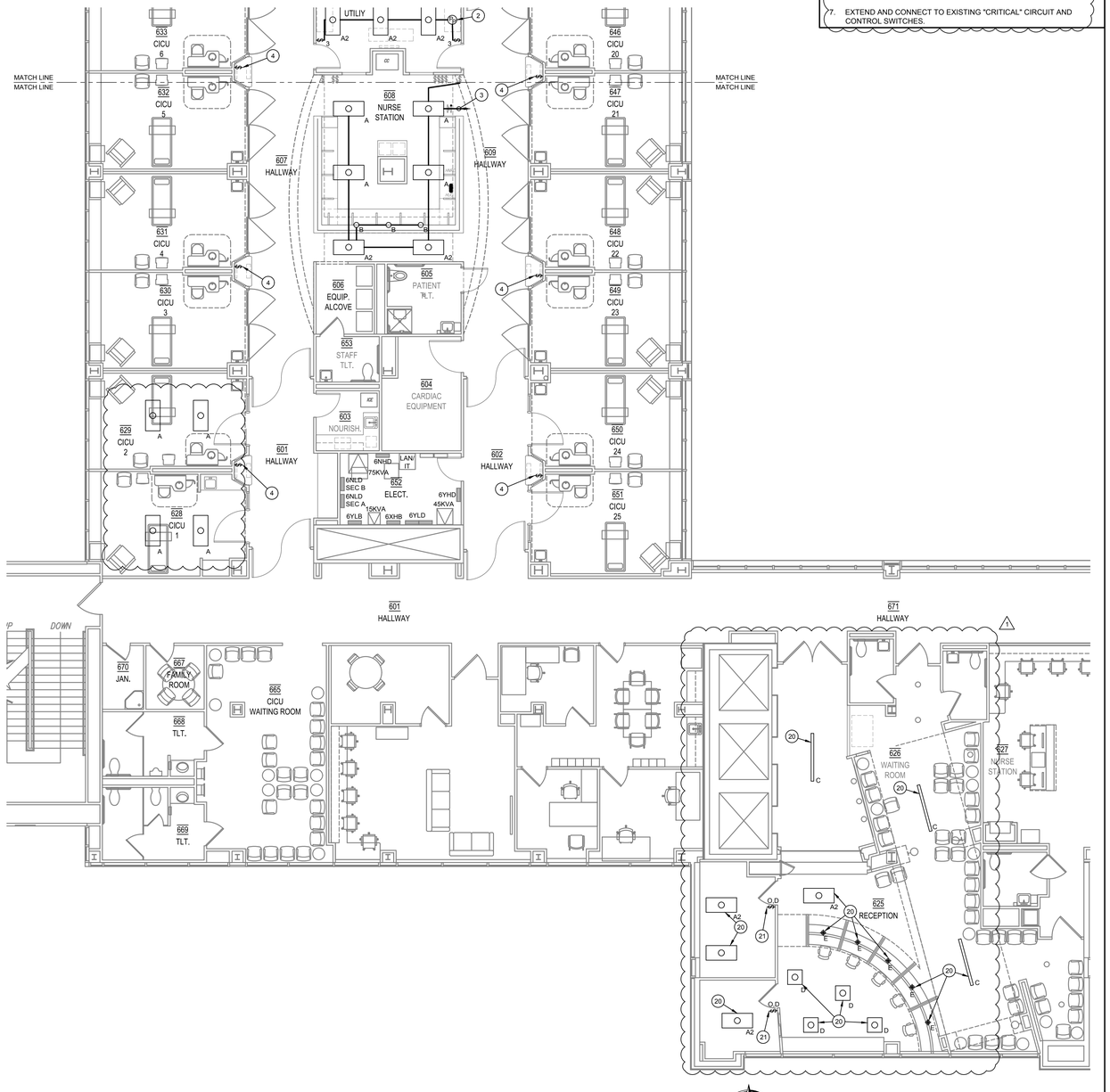
2 OF 5




1/E2 SIXTH FLOOR PLAN - NORTH - LIGHTING

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




2/E2 SIXTH FLOOR PLAN - SOUTH - LIGHTING

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

## KEYED NOTES

1. LOW VOLTAGE LIGHT DIMMER SWITCH WITH 0-10V CONTROL. REFER TO LIGHTING CONTROL DETAILS FOR ADDITIONAL INFORMATION.
2. POWER PACK TO OPERATE OCCUPANCY SENSOR AND DIMMER SWITCH. MOUNT POWER PACK ABOVE CEILING.
3. EXTEND AND CONNECT TO EXISTING CRITICAL BRANCH LIGHTING PANEL SERVING AREA. (TYPICAL).
4. NEW LIGHT SWITCH IN EXISTING BACKBOX.
5. UNDER BID ALTERNATE NO.4, PROVIDE NEW LIGHT FIXTURE IN EXISTING LOCATION. UTILIZE EXISTING CIRCUIT AND CONTROLS.
6. UNDER BID ALTERNATE NO.4, PROVIDE NEW LIGHT SWITCH IN EXISTING LOCATION.
7. EXTEND AND CONNECT TO EXISTING "CRITICAL" CIRCUIT AND CONTROL SWITCHES.

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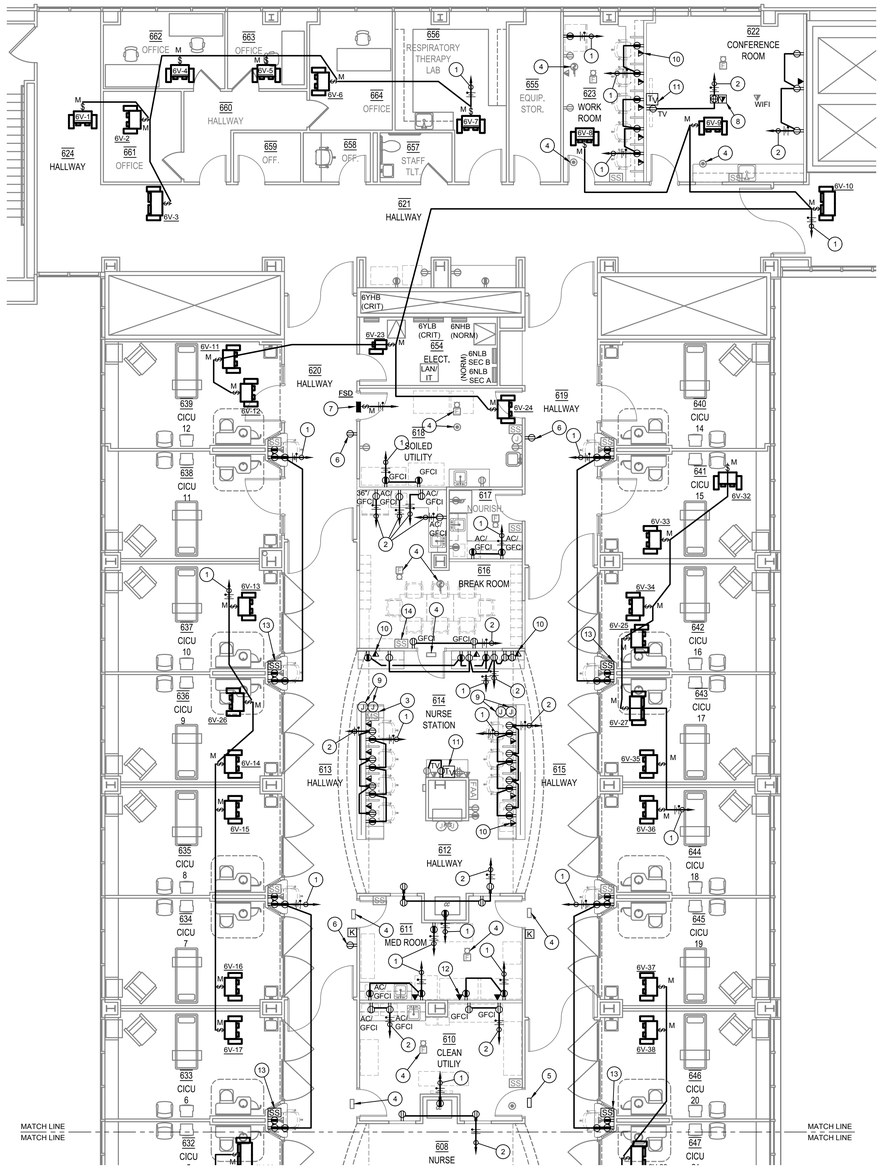
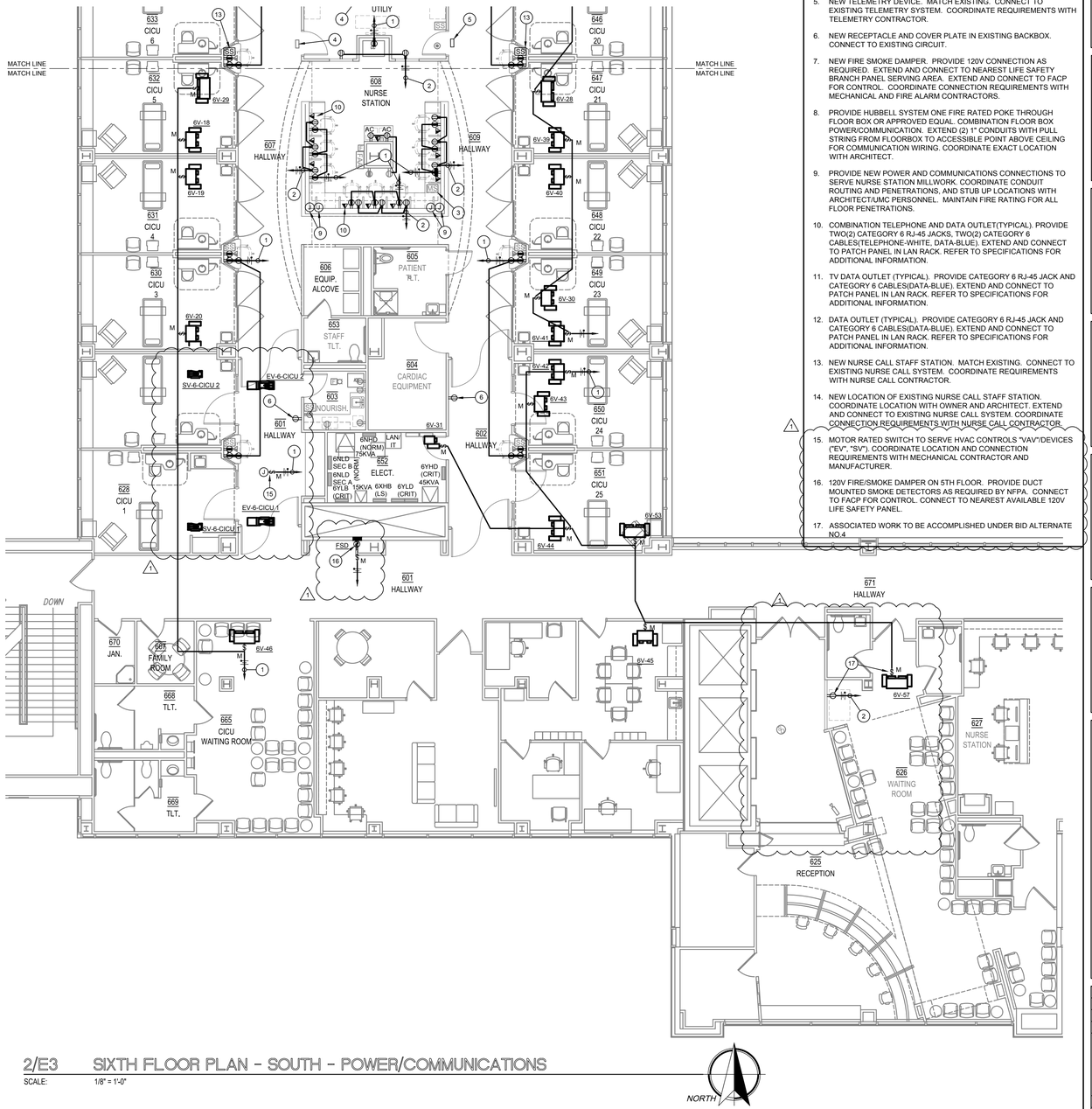



1/E3 SIXTH FLOOR PLAN - NORTH - POWER/COMMUNICATIONS

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

NORTH




2/E3 SIXTH FLOOR PLAN - SOUTH - POWER/COMMUNICATIONS

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

NORTH

## KEYED NOTES

1. EXTEND AND CONNECT TO CRITICAL BRANCH PANEL SERVING AREA.
2. EXTEND TO AND CONNECT NORMAL BRANCH PANEL SERVING AREA.
3. NEW LOCATION OF EXISTING NURSE CALL MASTER STATION. COORDINATE LOCATION WITH OWNER AND ARCHITECT. EXTEND AND CONNECT TO EXISTING NURSE CALL SYSTEM AND CRITICAL BRANCH CIRCUIT. COORDINATE CONNECTION REQUIREMENTS WITH NURSE CALL CONTRACTOR.
4. NEW LOCATION OF EXISTING FIRE ALARM DEVICES, REMOTE DUCT DETECTOR ANNUNCIATOR, TELEMETRY, CENTRACK DEVICE/COMMUNICATION ANTENNA. EXTEND AND CONNECT TO EXISTING SYSTEMS. PROVIDE NEW WIRING AND CONDUIT AS REQUIRED.
5. NEW TELEMETRY DEVICE. MATCH EXISTING. CONNECT TO EXISTING TELEMETRY SYSTEM. COORDINATE REQUIREMENTS WITH TELEMETRY CONTRACTOR.
6. NEW RECEPTACLE AND COVER PLATE IN EXISTING BACKBOX. CONNECT TO EXISTING CIRCUIT.
7. NEW FIRE SMOKE DAMPER. PROVIDE 120V CONNECTION AS REQUIRED. EXTEND AND CONNECT TO NEAREST LIFE SAFETY BRANCH PANEL SERVING AREA. EXTEND AND CONNECT TO FACP FOR CONTROL. COORDINATE CONNECTION REQUIREMENTS WITH MECHANICAL AND FIRE ALARM CONTRACTORS.
8. PROVIDE HUBBELL SYSTEM ONE FIRE RATED POKE THROUGH FLOOR BOX OR APPROVED EQUAL. COMBINATION FLOOR BOX POWER/COMMUNICATION. EXTEND (2) 1" CONDUITS WITH PULL STRING FROM FLOORBOX TO ACCESSIBLE POINT ABOVE CEILING FOR COMMUNICATION WIRING. COORDINATE EXACT LOCATION WITH ARCHITECT.
9. PROVIDE NEW POWER AND COMMUNICATIONS CONNECTIONS TO SERVE NURSE STATION MILLWORK. COORDINATE CONDUIT ROUTING AND PENETRATIONS, AND STUB UP LOCATIONS WITH ARCHITECT/UMC PERSONNEL. MAINTAIN FIRE RATING FOR ALL FLOOR PENETRATIONS.
10. COMBINATION TELEPHONE AND DATA OUTLET(TYPICAL). PROVIDE TWO(2) CATEGORY 6 RJ-45 JACKS, TWO(2) CATEGORY 6 CABLES(TELEPHONE-WHITE, DATA-BLUE), EXTEND AND CONNECT TO PATCH PANEL IN LAN RACK. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.
11. TV DATA OUTLET (TYPICAL). PROVIDE CATEGORY 6 RJ-45 JACK AND CATEGORY 6 CABLES(DATA-BLUE). EXTEND AND CONNECT TO PATCH PANEL IN LAN RACK. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.
12. DATA OUTLET (TYPICAL). PROVIDE CATEGORY 6 RJ-45 JACK AND CATEGORY 6 CABLES(DATA-BLUE). EXTEND AND CONNECT TO PATCH PANEL IN LAN RACK. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.
13. NEW NURSE CALL STAFF STATION. MATCH EXISTING. CONNECT TO EXISTING NURSE CALL SYSTEM. COORDINATE REQUIREMENTS WITH NURSE CALL CONTRACTOR.
14. NEW LOCATION OF EXISTING NURSE CALL STAFF STATION. COORDINATE LOCATION WITH OWNER AND ARCHITECT. EXTEND AND CONNECT TO EXISTING NURSE CALL SYSTEM. COORDINATE CONNECTION REQUIREMENTS WITH NURSE CALL CONTRACTOR.

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15. MOTOR RATED SWITCH TO SERVE HVAC CONTROLS "VAV"/DEVICES ("EV", "SV"). COORDINATE LOCATION AND CONNECTION REQUIREMENTS WITH MECHANICAL CONTRACTOR AND MANUFACTURER.
16. 120V FIRE/SMOKE DAMPER ON 5TH FLOOR. PROVIDE DUCT MOUNTED SMOKE DETECTORS AS REQUIRED BY NFPA. CONNECT TO FACP FOR CONTROL. CONNECT TO NEAREST AVAILABLE 120V LIFE SAFETY PANEL.
17. ASSOCIATED WORK TO BE ACCOMPLISHED UNDER BID ALTERNATE NO.4

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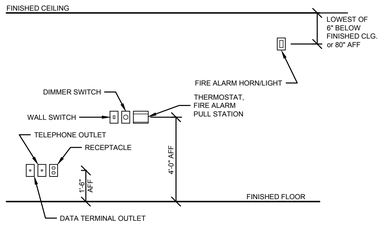
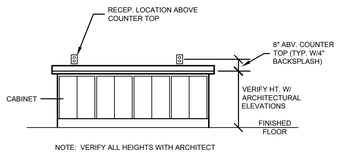


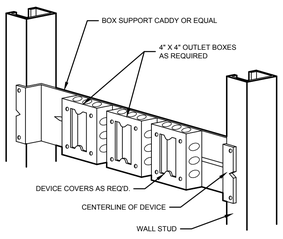

NOTE: VERIFY ALL HEIGHTS WITH ARCHITECT

## WIRING DEVICE MOUNTING HEIGHTS - TYPICAL
NO SCALE



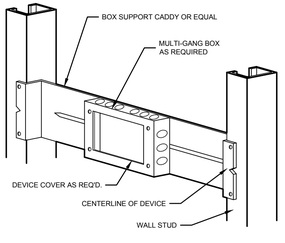

NOTE: VERIFY ALL HEIGHTS WITH ARCHITECT

## WIRING DEVICE MOUNTING HEIGHT
NO SCALE



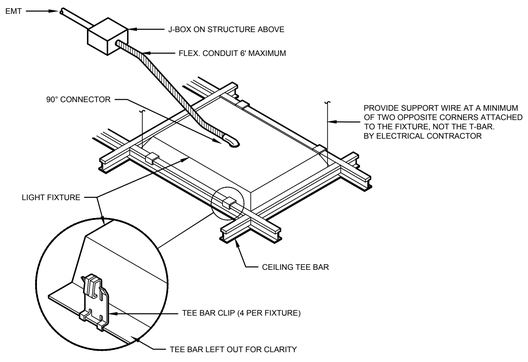

NOTE: TYPICAL FOR ALL OUTLET BOXES

## MULTIPLE OUTLET BOX DETAIL
NO SCALE



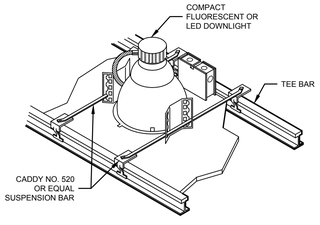

NOTE: TYPICAL FOR ALL OUTLET BOXES

## MULTI-GANG OUTLET BOX DETAIL
NO SCALE




NOTE: TYPICAL FOR ALL LIGHT FIXTURES

## LAY-IN LIGHT FIXTURE DETAIL
NO SCALE




## DOWNLIGHT DETAIL
NO SCALE

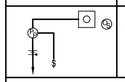
## LIGHT FIXTURE SCHEDULE

| MARK | REFERENCE IMAGE | MANUFACTURER | MODEL | DESCRIPTION | MOUNTING | FINISH | TYPE | VOLTS | WATTS | LUMENS | TEMP(°K) | DIMMING | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A |  | LITHONIA | ENVX-2X4-HRG-7200LM-80CRI-40K-MIN10-ZT-MVOLT | 2'x4' FLAT PANEL WITH DIMMING DRIVER | RECESSED | WHITE | LED | 277 | 64 | 7200 | 4000 | 0-10V | |
| AE |  | LITHONIA | ENVX-2X4-HRG-7200LM-80CRI-40K-MIN10-ZT-MVOLT | 2'x4' FLAT PANEL WITH DIMMING DRIVER CONNECTED TO LIFE SAFETY CIRCUIT | RECESSED | WHITE | LED | 277 | 64 | 7200 | 4000 | 0-10V | |
| A2 |  | LITHONIA | ENVX-2X4-HRG-4800LM-80CRI-40K-MIN10-ZT-MVOLT | 2'x4' FLAT PANEL WITH DIMMING DRIVER | RECESSED | WHITE | LED | 277 | 40 | 4800 | 4000 | 0-10V | |
| A2E |  | LITHONIA | ENVX-2X4-HRG-4800LM-80CRI-40K-MIN10-ZT-MVOLT | 2'x4' FLAT PANEL WITH DIMMING DRIVER CONNECTED TO LIFE SAFETY CIRCUIT | RECESSED | WHITE | LED | 277 | 40 | 4800 | 4000 | 0-10V | |
| B |  | GOTHAM | IVO6-D-15LM-40K-80CRI-MD-MIB10-MVOLT-ZT-ICAT-P-WR-LSS-F | 6" ROUND DOWNLIGHT WITH DIMMING DRIVER | RECESSED | WHITE | LED | 277 | 10 | 1000 | 4000 | 0-10V | |
| C |  | BARBICAN | 25-01-4W-3W-72L-ACM-SCDL-UNV-WCF-WEC-WPC-NOFP-1320LM-4000K90CRI-S010V10-NOMC | 6' LED FOM CUBE FIXTURE WITH AIR CRAFT CABLE MOUNTING | PENDANT | WHITE | LED | 277 | 79 | 7900 | 4000 | 0-10V | |
| D |  | LITHONIA | ENVX-2X2-HRG-4800LM-80CRI-40K-MIN10-ZT-MVOLT | 2'x2' FLAT PANEL WITH DIMMING DRIVER | RECESSED | WHITE | LED | 277 | 33 | 4000 | 4000 | 0-10V | |
| E |  | VISA | CP4341-L40L-MVOLT-MED-BSIL | DECORATIVE PENDANT LIGHT FIXURE | PENDANT | WHITE | LED | 277 | 22 | 1900 | 4000 | 0-10V | |
| U |  | HEALTHCARE | HUC535-MVOLT-LED40-S1-GW | UNDERCABINET LIGHT | SURFACE | WHITE | LED | 277 | 20 | 1800 | 4000 | | |

### LIGHT FIXTURE SCHEDULE GENERAL NOTES

A. COORDINATE/CONFIRM ALL FIXTURE FINISHES WITH ARCHITECT DURING SUBMITTAL STAGE.

## LIGHTING CONTROL DETAILS

| ROOMS WITH THESE LIGHTING CONTROL SYMBOLS (REFER TO PLAN FOR EXACT QUANTITIES) | TYPICAL LOCATION (REFER TO PLAN FOR EXACT LOCATIONS) | LIGHTING CONTROL DESCRIPTION | EXAMPLE MODEL #'S |
|---|---|---|---|
| $_{VD}$ $_{V}$ $_{O}$ | OFFICE AND STORAGE | WALL MOUNTED WALL BOX CONTROL WITH OCCUPANCY/VACANCY SENSOR | WALLBOX (VAC): NLIGHT WSX-SA-WH<br>WALLBOX (OCC): NLIGHT WSX-WH<br>WALLBOX (VAC WITH DIM): NLIGHT WSX-D-SA-WH |
|  | MULTPURPOSE, STORAGE | NLIGHT CEILING MOUNTED OCCUPANCY SENSOR ACTIVATION. MANUAL SWITCH FOR OVERRIDE CONTROL. | OCC SENSOR: NLIGHT NCM-9-RJB<br>POWER PACK: NLIGHT NPP16<br>SWITCH: NLIGHT NPODM-WH |

NOTES:
A. REFER TO MANUFACTURER'S DETAILS FOR LIGHTING CONTROL WIRING DIAGRAMS.

B. COORDINATE WITH LIGHTING CONTROLS MANUFACTURER PRIOR TO ROUGH-IN OF ANY CONDUIT OR WIRING FOR LIGHTING SYSTEM TO VERIFY WIRING REQUIREMENTS WITH LIGHTING CONTROL SYSTEM PROVIDED ON PROJECT.SENSOR SHALL PROVIDE COVERAGE OF ROOM/AREA. PROVIDE ADDITIONAL SENSORS AS REQUIRED BY MANUFACTURER.

C. LIGHTING CONTROL SYSTEM TO BE FULLY COMMISSIONED AND PROGRAMMED BY FACTORY TRAINED MANUFACTURERS REPRESENTATIVE. PROVIDE COMPLETE TRAINING TO OWNER. CONTRACTOR SHALL CONTACT MANUFACTURER AT LEAST 3 WEEKS PRIOR TO COMPLETION OF WORK TO SCHEDULE COMMISSIONING.

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