

SCOPE OF WORK NOTES

FURNISH ALL LABOR, MATERIALS, EQUIPMENT AND INCIDENTALS REQUIRED TO COMPLETE ALL MECHANICAL WORK SHOWN ON THE CONTRACT DRAWINGS. THE WORK REQUIRED CONSISTS BASICALLY OF, BUT IS NOT LIMITED TO, THE FOLLOWING:

- DEMOLITION OF EXISTING DIFFUSERS & GRILLES
- INSTALLATION OF NEW DIFFUSERS, GRILLES, & FLEX
- TEST AND BALANCE OF THE SUPPLY AND RETURN AIR TO BE PROVIDED BY THE MECHANICAL CONTRACTOR

CODES

THE INSTALLATION SHALL COMPLY WITH THE INDICATED EDITION OF THE FOLLOWING CODES AND ORDINANCES. WHERE SPECIFIC EDITION IS NOT INDICATED, COMPLY WITH THE LATEST PUBLISHED EDITION.

FLORIDA STATE UNIVERSITY DESIGN GUIDELINES
NFPA 70, NATIONAL ELECTRIC CODE
NFPA 90 A, AIR CONDITIONING & VENTILATION SYSTEMS
FLORIDA BUILDING CODE BUILDING (2023)
FLORIDA BUILDING CODE MECHANICAL (2023)
FLORIDA BUILDING CODE PLUMBING (2023)
FLORIDA BUILDING CODE FUEL GAS (2023)
FLORIDA FIRE PREVENTION CODE (2023 EDITION)
STATE AND LOCAL CODES AND ORDINANCES

GENERAL NOTES

THE WORK WILL BE COMPLETE, FULLY OPERATIONAL, AND SUITABLE FOR THE SERVICE REQUIRED. DRAWINGS INDICATE SCOPE AND DO NOT SHOW ALL DETAILS. DEVICES AND INCIDENTAL MATERIALS NECESSARY TO ACCOMPLISH THE WORK. IT IS UNDERSTOOD THAT SUCH DEVICES AND INCIDENTAL MATERIALS REQUIRED WILL BE FURNISHED.

INSTALLERS ARE EXPECTED TO PROVIDE PROFESSIONAL WORK PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND GOOD PRACTICE.

UPON COMPLETION OF THE WORK THE INSTALLERS WILL CLEAN SPACES THAT WERE OCCUPIED BY TEMPORARY WORK AND TEMPORARY FACILITIES. REMOVE DEBRIS, RUBBISH AND EXCESS MATERIALS FROM THE SITES. REPAIR DAMAGES CAUSED BY INSTALLATION OR USE OF TEMPORARY FACILITIES.

THE INSTALLERS WILL DELIVER TO THE OWNER, UPON SUBSTANTIAL COMPLETION OF THE WORK, ELECTRONIC COPIES OF DESCRIPTIVE LITERATURE RELATED TO THE EQUIPMENT INSTALLED UNDER THIS CONTRACT, INCLUDING PARTS LISTS, WIRING DIAGRAMS, MAINTENANCE AND OPERATION MANUALS AND WARRANTIES CUSTOMARILY SUPPLIED BY MANUFACTURERS FOR EQUIPMENT INCORPORATED IN THIS WORK. THE LITERATURE WILL BE NEATLY ORGANIZED ON A USB STORAGE DRIVE AND DELIVERED PRIOR TO FINAL ACCEPTANCES.

THE CONTRACTOR SHALL GIVE A PHYSICAL DEMONSTRATION AND VERBAL INSTRUCTIONS FOR PROPER OPERATION AND MAINTENANCE OF EQUIPMENT TO THE OWNER OR HIS DESIGNATED REPRESENTATIVE; SCHEDULE THESE DEMONSTRATIONS AND INSTRUCTIONS AT THE OWNER'S CONVENIENCE.

LAYOUT & COORDINATION:

INSTALLERS ARE EXPECTED TO COORDINATE IN ORDER TO AVOID INTERFERENCE BETWEEN TRADES. THE INSTALLERS ARE EXPECTED TO VERIFY CRITICAL DIMENSIONS AND FIELD FABRICATE PIPING AS NECESSARY TO ACCOMMODATE CONDITIONS. INSTALLERS ARE EXPECTED TO INSTALL EQUIPMENT SUCH THAT PROPER MAINTENANCE CLEARANCES ARE MAINTAINED FOR EQUIPMENT OF ALL TRADES.

THE CONTRACTOR SHALL TAKE FULL AND COMPLETE RESPONSIBILITY FOR AVOIDING CONFLICTS WITH EXISTING BUILDING STRUCTURE, PIPING AND EQUIPMENT. BEFORE FABRICATING ANY DUCTWORK OR PIPING, FIELD VERIFY THE SPACE AVAILABLE WHILE MAINTAINING REQUIRED ACCESS TO EQUIPMENT FROM ALL TRADES. ANY CHANGES REQUIRED SO THAT DUCTWORK OR PIPING WILL FIT EXISTING CONDITIONS AND ANY DUCTWORK OR PIPING RENDERED AS SCRAP BY FAILING TO VERIFY FIELD CONDITIONS WILL BE AT THE EXPENSE OF THE CONTRACTOR.

HAZARDOUS MATERIALS

CONTRACTORS ARE EXPECTED TO NOTIFY THE OWNER WHENEVER THEY DISCOVER THAT THEIR WORK WILL EXPOSE THEM TO ANY MATERIALS THAT ARE THE LEAST BIT SUSPICIOUS. REMOVAL OF CONTAMINATED MATERIALS WILL BE THE RESPONSIBILITY OF THE OWNER. HOWEVER THE CONTRACTOR IS RESPONSIBLE TO INSPECT FUTURE WORK AREAS IN A TIMELY FASHION SO AS NOT TO BE HELD UP WAITING FOR ABATEMENT.

SPECIAL CONDITIONS

THE BUILDING MAY BE OCCUPIED DURING CONSTRUCTION. TAKE EVERY PRECAUTION TO INSURE THE SAFETY OF THE OCCUPANTS. PROVIDE FOR REASONABLE SAFETY PRECAUTIONS, SIGNAGE AND OTHER WARNINGS. KEEP EXITS CLEAR. COORDINATE THE WORK TO MINIMIZE THE DISTURBANCE OF BUILDING OCCUPANTS. KEEP CONSTRUCTION AREAS CLEAN ON A DAILY BASIS. TAKE CARE TO MAINTAIN THE CONDITION OF EXISTING MATERIALS AND SURFACES. REPAIR ANY DAMAGE TO MATCH EXISTING.

THE CONTRACTOR IS EXPECTED TO TAKE EVERY PRECAUTION AGAINST THE INITIATION OF FIRES AND WILL, AS A MINIMUM, MAINTAIN FIRE EXTINGUISHERS FOR USE BY HIS EMPLOYEES. NO SMOKING WILL BE ALLOWED INSIDE THE BUILDING.

DUCTWORK:

- ALL WORK SHALL COMPLY WITH SMACNA HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE. STATIC PRESSURE REQUIREMENTS FOR VAV SINGLE-ZONE SYSTEMS: SUPPLY (2") AND RETURNS (-1").

- USE EITHER ROUND OR RECTANGULAR DUCT WITH EQUAL OR GREATER EQUIVALENT FREE AREA TO ACCOMMODATE EXISTING STRUCTURE.

- FLEXIBLE DUCT ON RUNOUTS SHALL NOT EXCEED 10'. USE SPIRAL ROUND DUCT FOR LONGER RUNS.

- DUCT SIZES MAY BE CHANGED TO ACCOMMODATE CONDITION AS LONG AS THE INTERNAL FREE AREA IS NOT DIMINISHED.

- RUN-OUT DUCTS TO DIFFUSERS SHALL BE EQUAL TO DIFFUSER NECK SIZE, SEE GRILLE/FLOW SCHEDULES.

- TAG ALL DAMPER LOCATIONS WITH ORANGE FLAG TAPE.

- PERMANENTLY MARK ALL DAMPER SHAFTS TO INDICATE DAMPER POSITION.

TEST AND BALANCE WORK SUMMARY

TEST AND BALANCE WORK INCLUDES:
- RE-BALANCE OF SUPPLY AIR AND RETURN AIR SYSTEMS

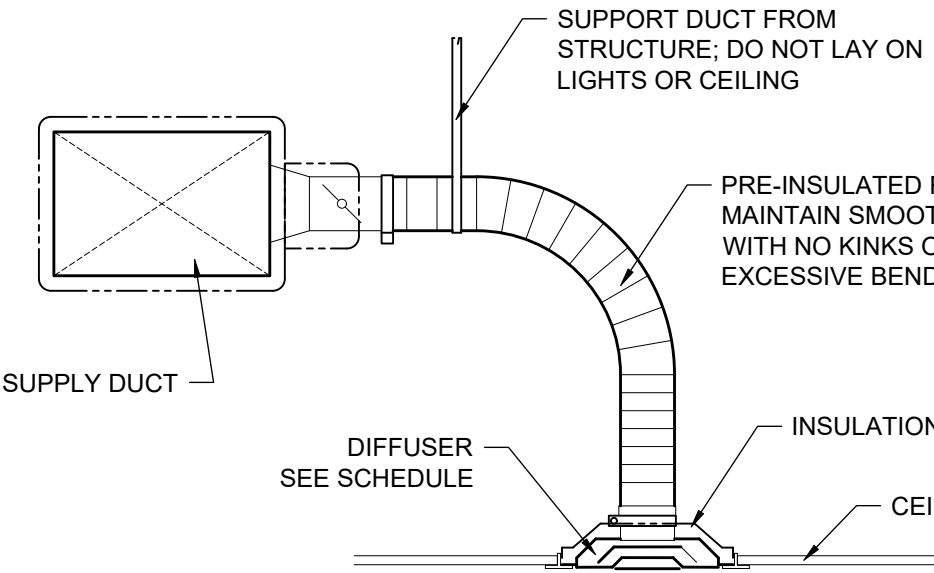
HVAC SYMBOLS/LEGEND	
DESIGNATION	DESCRIPTION
	LAY-IN SUPPLY AIR DIFFUSER
	LAY-IN RETURN AIR DIFFUSER WITH OUT DUCT CONNECTION
	SURFACE MOUNT SUPPLY GRILLE
	SURFACE MOUNT RETURN GRILLE
	ROUND DUCT WITH SIZE INDICATED
	THERMOSTAT/TEMPERATURE SENSOR & WIREWAY
	TEMP/RELATIVE HUMIDITY SENSOR AND WIREWAY
	RECTANGULAR DUCTWORK & INTERNAL SIZE (FREE AREA)
	RECTANGULAR DUCTWORK W/LINER & INTERNAL SIZE (FREE AREA)
	FLEXIBLE DUCT CONNECTION
	MITERED ELBOW FITTING WITH DOUBLE THICKNESS TURNING VANES
	MITERED TAKEOFF WITH MVD (PROVIDE INSULATION STANDOFF)
	MITERED TAKEOFF WITHOUT MVD (USE AT TAKEOFFS FOR VAV TERMINALS)
	EXTENT OF DEMOLITION
	DUCT SMOKE DETECTOR
	POINT OF CONNECTION TO EXISTING
	MANUAL VOLUME DAMPER WITH LOCKING QUADRANT
	ELECTRIC OPERATED CONTROL DAMPER
	FIRE DAMPER
	COMBINATION FIRE/SMOKE DAMPER
	SMOKE DAMPER
	AIR FLOW VIA 1" DOOR UNDERCUT
	AIR FLOW DIRECTION
	GRILLE AND FLOWRATE (CFM) DESIGNATION
	CEILING MOUNTED EXHAUST FAN
	RELOCATE AND RELOCATED
	SERVICE AREA - MAINTAIN CLEAR
	ACCESS DOOR WITH LATCH, DIMENSION INDICATES SIZE
	FLEXIBLE DUCT

ABBREVIATIONS	
AD	ACCESS DOOR
AFF	ABOVE FINISHED FLOOR
AHAP	AS HIGH AS POSSIBLE
BAS	BLDG AUTOMATION SYSTEM
BD	BACKDRAFT DAMPER
BHP	BRAKE HORSE POWER
BOD	BOTTOM OF DUCT
BTUH	BRITISH THERMAL UNIT/HOUR
CFM	CUBIC FEET PER MINUTE
CLG	CEILING
CONC	CONCRETE
CHWS	CHILLED WATER SUPPLY
CHWR	CHILLED WATER RETURN
D	DUCT DETECTOR
DB	DRY BULB
DIA OR Ø	DIAMETER
DG	DOOR GRILLE
DTL	DETAIL
DW	DOMESTIC WATER
EF	EXHAUST FAN
ETR (EX)	EXISTING TO REMAIN
EXT	EXISTING
	EXTERNAL OR EXTERIOR
FD	FLOOR DRAIN
FL	FLOOR
GPM	GALLONS PER MINUTE
H	HIGH
HD	HUB DRAIN
L	LONG
LAT	LEAVING AIR TEMPERATURE
MAX	MAXIMUM
MBH	1000 BTU/HOUR
MIN	MINIMUM
N	NEW
NIC	NOT IN CONTRACT
NPS	NOMINAL PIPE SIZE
OA	OUTSIDE AIR
OC	ON CENTER
PL	PLACES
PNL	PANEL
RA	RETURN AIR
RAG	RETURN AIR GRILLE
RLA	RATED LOAD AMPS
RV	ROOF VENT
SA	SUPPLY AIR
SAG	SUPPLY AIR GRILLE
SP	STATIC PRESSURE
SQ	SQUARE
T	TEMPERATURE
XFR	TRANSFER
THK	THICK
TOD	TOP OF DUCT
TYP	TYPICAL
UG	UNDERGROUND
UOS	UNLESS OTHERWISE SPECIFIED
VAV	VARIABLE AIR VOLUME
V	VOLTS
WB	WET BULB
W	WIDE
WG	WATER GAUGE

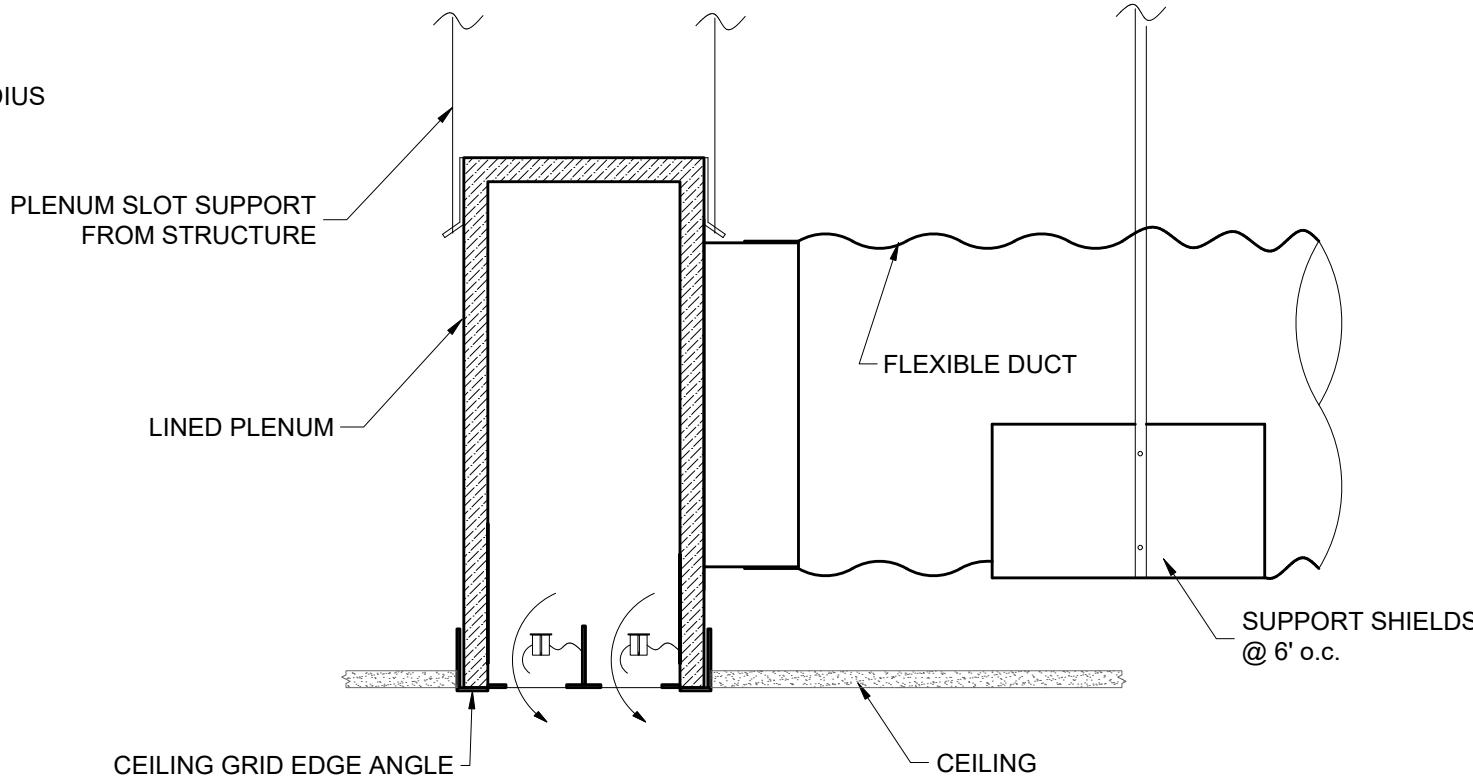
DIFFUSER & GRILLE SCHEDULE					
TYPE	QTY	DESCRIPTION	MODEL	REMARKS	AIR PATTERN DAMPER
	13	LINEAR SLOT DIFFUSER	GREENHECK LSD-BB	ALUMINUM LINEAR DIFFUSER, 48" LONG, 3/4" LAY-IN, (2) 1/2" SLOTS W/ ADJ. PATTERN CONTROLLERS, END CAP, WHITE FINISH, INSULATED UNIVERSAL PLENUM SIZE 8	ADJ NO
	8	LINEAR SLOT DIFFUSER	GREENHECK LSD-BB	RETURN ALUMINUM LINEAR DIFFUSER, 48" LONG, 3/4" LAY-IN, (2) 1/2" SLOTS, END CAP, WHITE FINISH	N/A NO
	25	PERFORATED RETURN GRILLE	TITUS PAR-AA	LAY-IN TYPE, 3/16" Ø HOLES ON 1/4" CENTERS, ALUMINUM CONSTRUCTION, WHITE FINISH, 24x24 MODULE SIZE, 22x22 PLENUM OPENING, INCLUDE RETURN CANOPY FOR SOUND ATTENUATION	NA NO
	11	ARCHITECTURAL SQUARE PLAQUE SUPPLY AIR GRILLE	TITUS OMNI-AA	LAY-IN TYPE 3, SQUARE PLAQUE, ALUMINUM CONSTRUCTION, WHITE FINISH, 24x24 MODULE SIZE, WITH OPTIONAL FACTORY MOLDED INSULATION BLANKET, 10" ROUND NECK SIZE.	4-WAY NO
	15	ARCHITECTURAL SQUARE PLAQUE SUPPLY AIR GRILLE	TITUS OMNI-AA	LAY-IN TYPE 3, SQUARE PLAQUE, ALUMINUM CONSTRUCTION, WHITE FINISH, 24x24 MODULE SIZE, WITH OPTIONAL FACTORY MOLDED INSULATION BLANKET, 8" ROUND NECK SIZE.	4-WAY NO
	5	ARCHITECTURAL SQUARE PLAQUE SUPPLY AIR GRILLE	TITUS OMNI-AA	LAY-IN TYPE 3, SQUARE PLAQUE, ALUMINUM CONSTRUCTION, WHITE FINISH, 24x24 MODULE SIZE, WITH OPTIONAL FACTORY MOLDED INSULATION BLANKET, 6" ROUND NECK SIZE.	4-WAY NO

LAY-IN SUPPLY AIR GRILLE NECK SIZES	
AIR FLOW RANGE (CFM)	NECK SIZE SIZE (IN)
25-120	6"Ø
125-225	8"Ø
230-350	10"Ø
351-500	12"Ø
NOTES: 1. EQUIVALENT SQUARE/RECT SIZES ARE ACCEPTABLE.	

LAY-IN RETURN/EXHAUST/TRANSFER AIR GRILLE CONNECTION SIZES (UOS)	
AIR FLOW RANGE (CFM)	NECK/DUCT CONNECTION SIZE (UOS) (IN)
0-100	6"Ø
101-175	8"Ø
176-300	10"Ø
301-450	12"Ø
451-750	14"Ø



DIFFUSER INSTALLATION DETAIL



LINEAR SLOT DIFFUSER

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DATE: 10-31-2025
REVIEWED: 11-14-2025
DRAWN: J.B.
REVISION: J.B.
ID: J.B.
PHASE: 50% CONSTRUCTION DOCUMENTS
100% CONSTRUCTION DOCUMENTS

Client: Florida State University

Job Title: UCD - Third Floor Office Improvements Tallahassee, FL

Consultant: MCGINNIS + FLEMING ENGINEERING

Project #: 19370.69

Phase: 100% Construction Documents

Seal:

ALW

Architects Lewis + Whitlock
206 West Virginia St.
Tallahassee, Florida 32301
850.942.1718
www.think3d.net

Description:

General Notes and Legend

Sheet No.:

M1.0



- 1 DEMO DIFFUSERS, GRILLES, AND FLEX DUCT IN SPACES THAT WILL RECEIVE NEW CEILINGS. DUCT TAKE-OFFS ARE TO REMAIN AND WILL BE REUSED.
- 2 UNLESS SPECIFICALLY NOTED, ALL OTHER VAVS, DUCTS, TRANSFER DUCTS, DIFFUSERS, GRILLES, FLEX, ETC. ARE TO REMAIN IN SERVICE.
- 3 ALL CONTROLS WILL REMAIN IN SERVICE, EXCEPT ROOM D3306.
- 4 ADD TEMPORARY FILTERS TO ALL DUCT OPENINGS INTO THE MECHANICAL ROOM. MONITOR FILTERS ON AIR HANDLER AND CHANGE REGULARLY DURING CONSTRUCTION TO LIMIT DUST ON COILS AND IN SUPPLY AIR. ADD A TEMPORARY FILTER TO THE EXHAUST CONNECTION ABOVE CORRIDOR D3300C.
- 5 RELOCATE TEMPERATURE SENSOR IN ROOM D3306 TO ALLOW FOR NEW DOOR.

[illegible]

PHASE:	DATE:
50% CONSTRUCTION DOCUMENTS	10-31-2025
100% CONSTRUCTION DOCUMENTS	11-14-2025

Job Title: **UCD - Third Floor Office Improvements**
Tallahassee, FL

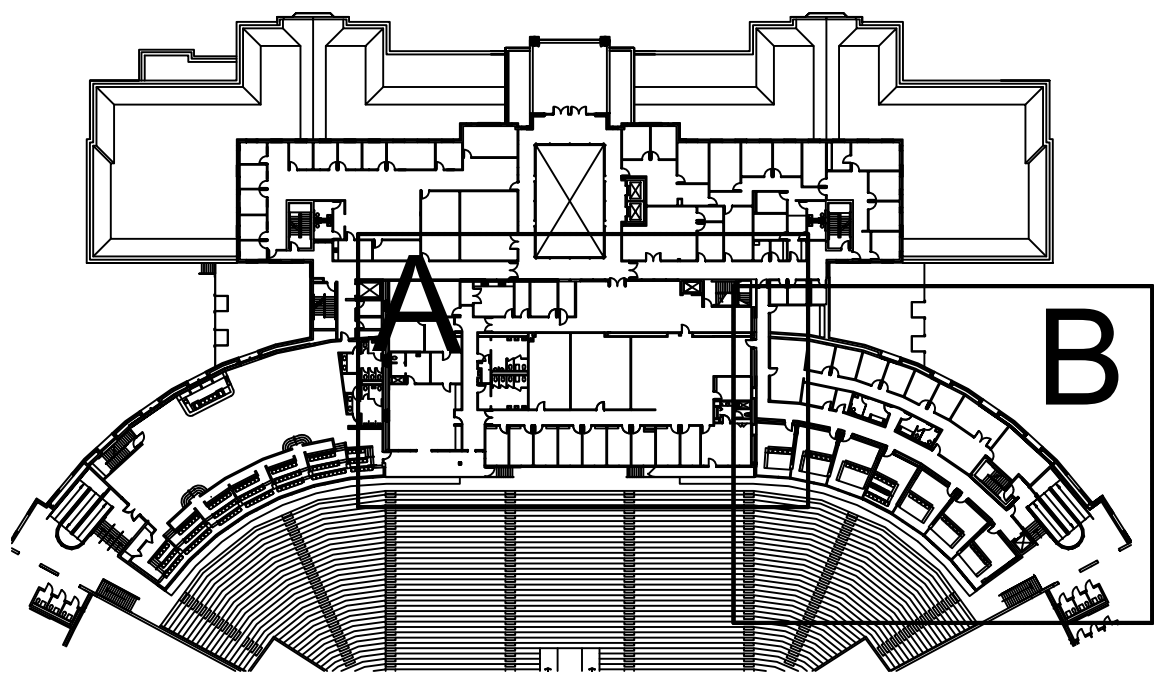
Project #: 19370.69
Phase: 100% Construction Documents



M2.0A



1 Demolition - HVAC - Third Floor Plan - B
1/8" = 1'-0"



Key Plan

- DEMO NOTES:
- 1 DEMO DIFFUSERS, GRILLES, AND FLEX DUCT IN SPACES THAT WILL RECEIVE NEW CEILINGS. DUCT TAKE-OFFS ARE TO REMAIN AND WILL BE REUSED.
 - 2 UNLESS SPECIFICALLY NOTED, ALL OTHER VAVS, DUCTS, TRANSFER DUCTS, DIFFUSERS, GRILLES, FLEX, ETC. ARE TO REMAIN IN SERVICE.
 - 3 ALL CONTROLS WILL REMAIN IN SERVICE, EXCEPT ROOM D3306.
 - 4 ADD TEMPORARY FILTERS TO ALL DUCT OPENINGS INTO THE MECHANICAL ROOM. MONITOR FILTERS ON AIR HANDLER AND CHANGE REGULARLY DURING CONSTRUCTION TO LIMIT DUST ON COILS AND IN SUPPLY AIR. ADD A TEMPORARY FILTER TO THE EXHAUST CONNECTION ABOVE CORRIDOR D3300C.
 - 5 RELOCATE TEMPERATURE SENSOR IN ROOM D3306 TO ALLOW FOR NEW DOOR.

 Consultant: 19370 69 Phase: 100% Construction Documents	Client: Florida State University Job Title: UCD - Third Floor Office Improvements Tallahassee, FL	PHASE:	50% CONSTRUCTION DOCUMENTS	DRAWN:	J.B.	REVIEWED:	J.B.	DATE:	10-31-2025
		100% CONSTRUCTION DOCUMENTS	J.B.	J.B.	11-14-2025				
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Description:
Mechanical Demolition-Third Floor Plan 'B'

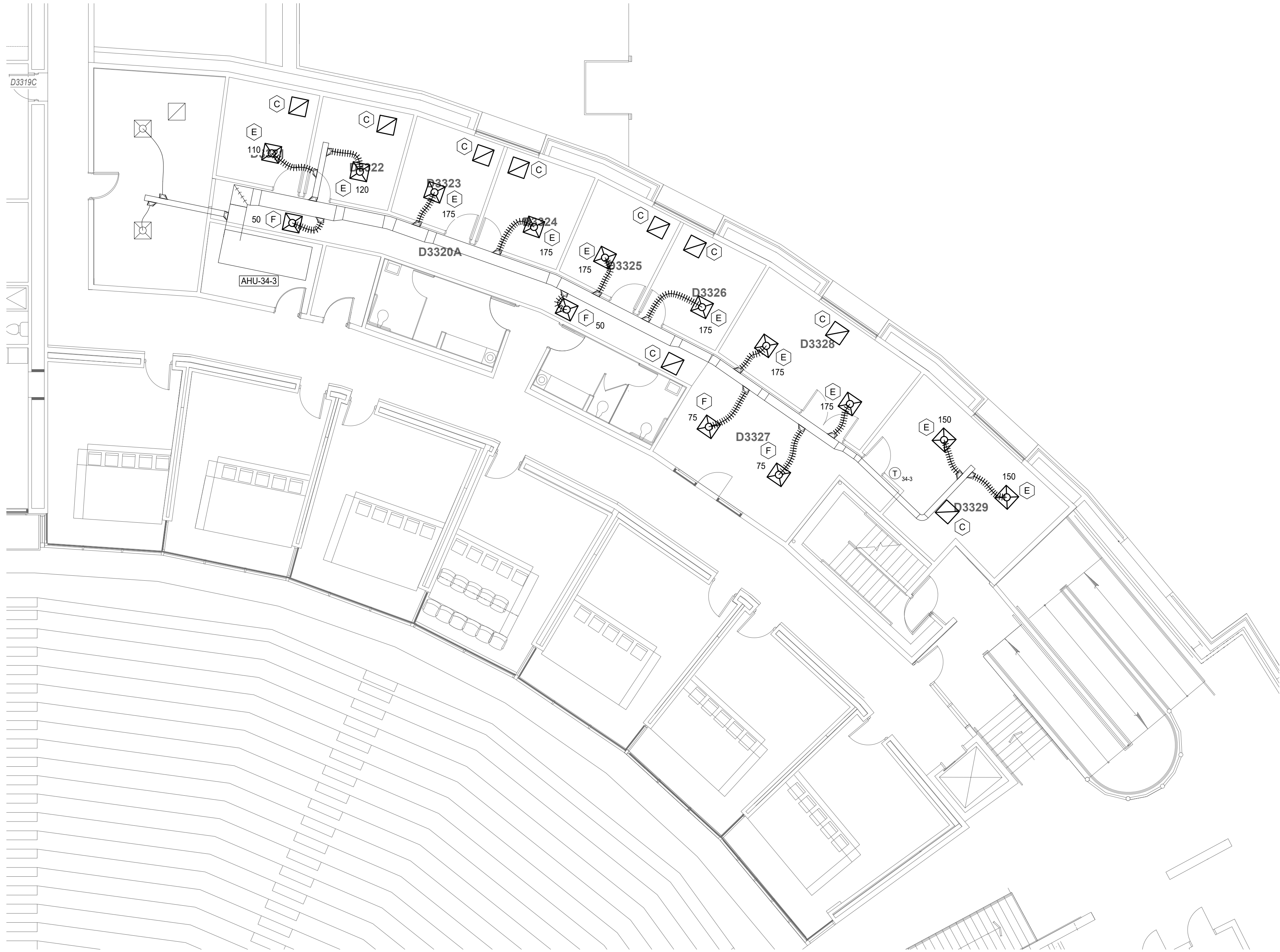
Sheet No.:
M2.0B



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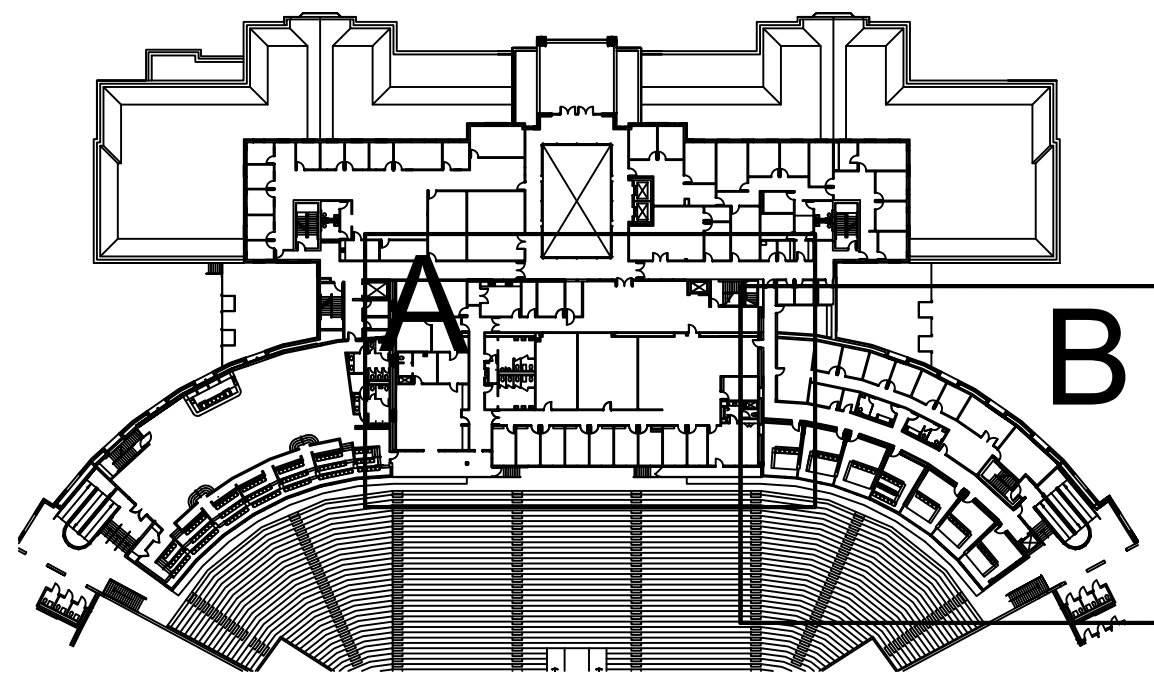
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Seal:	
	
Architects Lewis + Whitlock 206 West Virginia St. Tallahassee, Florida 32301 850.942.1718 www.think3d.net	
Description:	Mechanical New Work-Third Floor Plan 'A'
Sheet No.:	M3.0A



1 New Work - HVAC - Third Floor Plan - B
1/8" = 1'-0"

- NEW WORK NOTES:
- 1 INSTALL NEW SUPPLY AIR DIFFUSERS, PLENUMS, AND FLEX IN THE NEW CEILINGS; USE EXISTING TAKE-OFF. ADJUST CONTROLLERS OF LINEAR DIFFUSERS FOR EVEN AIR DISTRIBUTION.
 - 2 INSTALL RETURN AIR GRILLES IN THE NEW CEILINGS; GRILLES WILL BE OPEN TO CEILING PLENUM.
 - 3 RELOCATE TEMPERATURE SENSOR IN ROOM D3306. VAV & TEMP CONTROL WILL REMAIN AS-IS.
 - 4 PROVIDE T&B FOR ALL DIFFUSERS AND EXHAUST IN THE SUITE.



Key Plan

CONSULTANT: McGinniss + Engineering P.L.L.C. 215 WEST VIRGINIA ST., SUITE 200 TALLAHASSEE, FL 32301 850.942.1718 WWW.THINK3D.NET	Client: Florida State University	Job Title: UCD - Third Floor Office Improvements Tallahassee, FL	Project #: 19370.69	Phase: 100% Construction Documents	PHASE:	DRAWN:	REVIEWED:	DATE:	ID:	REVISION:	DRAWN:	REVIEWED:	DATE:
					50% CONSTRUCTION DOCUMENTS	J.B.	J.B.	10-31-2025					
					100% CONSTRUCTION DOCUMENTS	J.B.	J.B.	11-14-2025					

Seal:

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Description:
**Mechanical
New Work-Third Floor
Plan 'B'**

Sheet No.:
M3.0B

23 01 00 MECHANICAL - GENERAL PROVISIONS

PART 1 - GENERAL

GENERAL CONDITIONS

The work described hereunder shall be installed subject to the Contractual Conditions for the entire Specifications.

CORRELATION

This Section of the Specifications and its accompanying Drawings are made separate for the convenience of the General Contractor in preparing his bid and in no way relieves the General Contractor of his responsibility to correlate the work under this Section with that of all other trades as regards the items to be furnished by various Subcontractors, the exact location of all equipment and materials and the necessity of planning the work of all trades to avoid interference.

PLANS AND SPECIFICATIONS

Drawings and Specifications are intended to clearly set forth all work, and the detailed description is added to assist in establishing the scope and the location of the several parts of the work. Collectively, they shall govern and control the scope, character, and design of the Work, and any item called for in any one of the documents shall be as though mentioned in all.

Failure to refer in the Specifications to any items of the work shown on the Drawings, but necessary to the completion of the Work shall not relieve the Contractor of the full responsibility to furnish the materials and perform the work of such items, in a manner comparable to other items of similar nature for which detailed Specifications are included.

PROJECT FAMILIARIZATION

The bidder is expected to visit the site and familiarize himself with conditions at the site before submitting his bid. He shall familiarize himself with the work required throughout the entire project and shall make allowances for contingencies which may occur in the interconnection of the various systems.

ALTERNATES AND ADDENDA

The Contractor shall investigate all Alternates, Addenda and Allowances as they relate to the Work of this Section.

TESTING

The Work shall include complete testing of all equipment and piping at the completion of the Work and making any connection changes or adjustments necessary for the proper functioning of the system and equipment.

WORK INCLUDED

Work covered under this Section consists of furnishing all labor, materials, tools, equipment, transportation, scaffolding, services, supervision, and performing of all operations required to properly complete all mechanical work in accordance with this Division of the Specifications and as indicated on the applicable Drawings, subject to terms and conditions of the Contract.

SUPERVISION OF WORK

The Mechanical Contractor shall have a qualified and experienced superintendent on the job when any related work is in progress.

RELATED WORK SPECIFIED ELSEWHERE

The Contractor is cautioned to note carefully other Sections of the project Specifications with their cross references to other specific standard specifications, standard detail, etc., describing work to be furnished under these Specifications as well as any mechanical work that may be shown on electrical, structural, architectural, or other drawings, in order that he may fully understand the requirements and work to be provided under this Section of the Specifications.

ORDINANCES AND REGULATIONS

All work shall conform with all local and State ordinances or regulations governing the installation of such equipment. If work as laid out, indicated or specified is recognized to be contrary to or conflicting with local ordinances or regulations, the Subcontractor shall report same to the Architect/Engineer before submitting a bid. The Architect/Engineer will then issue instructions as to procedure.

CODES AND STANDARDS

The currently adopted standards of the following organizations, and individual standards named, shall be followed the same as if they were fully written herein and constitute a part of the Specification requirements except where otherwise specified:

- National Fire Protection Associations - Standards
NFPA 70, National Electric Code
NFPA 90-A, Installation of Air Conditioning and Ventilating Systems.
- FL Building Code
FL Mechanical Code
FL Gas Code
FL Plumbing Code
Florida Fire Prevention Code
National Board of Fire Underwriters
SMACNA HVAC Duct Construction Standard
ANSI/ASME B31.1, Power Piping
ANSI/ASME B31.9, Building Services Piping

The foregoing rules, standards, regulations, specifications, recommendations, and requirements shall be followed by the Contractor as minimum requirements. They shall not relieve the Contract from furnishing and installing higher grades of materials and workmanship which are specified herein or indicated on the Drawings.

Any material, equipment or workmanship specified by reference to the number, symbol or title of Specification or detail, or other standard rules, codes, regulations, etc., shall comply with the latest edition amendments and revisions thereto in effect on the date of these Specifications.

The Contractor shall submit proof, if requested by the Engineer or his representative, that the materials, appliances, equipment, or devices that he furnishes and installs under this Contract meet the requirements of the Underwriters' Laboratories, Inc., or Factory Mutual, as regards fire and casualty hazards.

PERMITS, INSPECTIONS AND UTILITY FEES

Coordinate costs of taps with the Owners Representative & the CM.

The Contractor shall obtain necessary permits and inspections required for work and pay all charges incidental thereto. Contractor shall coordinate all utility taps and shall pay all associated fees, impact charges, etc. Upon completion of the work the Contractor shall deliver to the Engineer a certificate of inspection and approval from the local inspection department, if required.

MINOR DEVIATIONS

The Contractor shall note that the Mechanical Drawings are intended to indicate only the extent diagrammatically, general character and location of the work included. Work intended, but having minor details obviously omitted or not shown, shall be furnished and installed complete to perform the functions intended.

Arrangements of piping, ductwork, and equipment that differ materially from the obvious intent of the Drawings will not be permitted except where necessary to avoid interferences, and only where specifically approved by the Architect/Engineer. Drawings shall be furnished showing all changes. Any change resulting in a saving in labor and materials shall be made in accordance with a Contract change order.

BASIC MATERIALS AND METHODS

The materials and methods specified in this article are to be used for work specified throughout this Section of the Specifications.

All materials and workmanship shall be of the highest quality.

Any materials on the job rejected by the Architect/Engineer shall be removed from the premises.

The installation shall be made in a workmanlike manner in accordance with acceptable industry standards except where specific procedures are called for in these Specifications, in which case they shall be followed.

All materials shall be new, free of defects and of the manufacturers latest standard design.

Reference to a particular material or specific equipment by name, make or catalog number is to describe equipment which will meet the requirements of the project and is not intended to restrict bidding.

It is the intent that all of the equipment of a similar type shall be the products of the same (one) manufacturer when practicable, providing unit responsibility for each group.

REVIEW OF MATERIALS

Submittals shall be made in compliance with the General Conditions of the Contract for Construction and the following:

Submittals shall be identified by items numbers as listed in the pertinent section of the specifications and shall be accompanied by a letter of transmittal.

Certificates shall be in triplicate and where required in conjunction with other submittals shall accompany such submittals.

Materials and other items subject to approval shall not be purchased or incorporated in the work before receipt of written approval.

Submittals shall be rendered all at one time for the entire project. Partial submittals will not be accepted or acknowledged. Exception: If a few items have long shop drawing preparation time, then these items will be accepted later to avoid delaying the shop drawing procedure.

SHOP DRAWINGS

Shop Drawings are drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are prepared by the Contractor or any subcontractor, manufacturer, supplier or distributor and which illustrates some portion of the Work.

All shop drawings submitted shall bear the stamps of approval of the Contractor as evidence that the drawings have been checked by the Contractor. If the shop drawings show variances from the other requirements of the contract because of standard shop practice or other reason, the Contractor shall make specific mention of such variation in his letter of transmittal in order that, if acceptable, suitable action may be taken for proper adjustment. Otherwise, the Contractor will not be relieved of the responsibility for executing the work even though such shop drawings have been approved.

Submit electronic copies of the shop drawings to be retained and additional copies as required by the Contractor, all items required under appropriate sections of the Specifications.

All materials are to be submitted in a hard cover, three ring binder. All materials are to be labeled with the pertinent Specification Section and are to be separated with dividers for each section of the Mechanical Specifications.

All materials submitted late or re-submitted shall be 3-ring punched and marked with the appropriate Specification Section Numbers.

PROJECT CLOSEOUT

The Contractor shall remove all temporary work and temporary facilities prior to final pay request.

The Contractor shall clean spaces that were occupied by temporary work and temporary facilities. Remove debris, rubbish and excess materials from the sites. Burning or burying is not permitted on the sites.

Repair damages caused by installation or use of temporary facilities. Restore to original condition.

Restore grass, landscaping, hardscaping to original condition.

GUARANTEES, BONDS AND AFFIDAVITS

Warranties:

The Contractor shall submit to the Owner all manufacturer's warranties on equipment furnished and installed under this Contract.

In addition, to the guarantee of equipment by the manufacturer of each piece specified herein, the Contractor shall also guarantee such equipment and shall be held for a period of one year from final acceptance test to make good any defects of the materials or workmanship occurring during this period, without expense to the Owner.

Affidavits:

The Contractor shall provide affidavits as required in the non-technical portion of these Specifications.

Provide Warranty Labels:

All warrantied mechanical equipment see Mechanical Identification requirements.

OPERATION AND MAINTENANCE DATA

Manuals and Instructions:

The Contractor shall deliver to the Engineer, upon substantial completion of the Work, two copies of descriptive literature related to the equipment installed under this Contract, including parts lists, wiring diagrams, maintenance and operation manuals and warranties customarily supplied by manufacturers for equipment incorporated in this work. The literature shall be neatly bound in a 3-ring binder and delivered to the Engineer prior to final acceptances. Each manual shall include a copy of the Control Diagrams and a complete description of the operation of the control systems.

The Contractor shall give physical demonstration and verbal instructions for proper operation and maintenance of equipment to the Owner or his designated representative. Schedule these demonstrations and instructions at the Owner's convenience.

Provide four (4) hours of tour and demonstration of all equipment installed under this project.

AS-BUILT DRAWINGS

As-Built Drawings are required. Maintain a current and legible record set (full size set) on the job. Final record prints will be drafted by the Engineer and signed off by the contractor. The Contractor is solely responsible for providing accurate as-builts.

QUALITY ASSURANCE

Products Criteria:

Standard Products: Material and equipment shall be the standard products of a manufacturer regularly engaged in the manufacture of the products. Items of equipment shall essentially duplicate equipment that has been in satisfactory use at least two (2) years prior to bid opening. Provide list of users upon request.

Equipment having less than a two-year use record, which in the opinion of the Engineer, provided significant benefits to the Owner such as improved energy efficiency, will be acceptable if it is a product of a manufacturer who has been regularly engaged in the manufacture of that specific type of product which has been used in similar applications for a period of two years. The Engineer reserves the right to require the Contractor to submit evidence to this effect for his approval.

Equipment Service: Products shall be supported by a service organization which maintains an adequate inventory of repair parts and is located, in the opinion of the Engineer, reasonably close to the site.

Manufacturer's Nameplates: Nameplate bearing manufacturer's name or identifiable trademark shall be securely affixed in a conspicuous place on equipment, or name or trademark cast integrally with equipment, stamped or otherwise permanently marked on each item of equipment.

Welding: Before any welding is performed submit a copy of the Welding Procedure Specification (WPS) together with the Procedure Qualification Record as required by Section IX of the ASME Boiler and Pressure Vessel Code.

Before any welder performs any welding, submit a copy of the Manufacturer's Record of Welder or Welding Operator Qualification Tests as required by Section IX of the ASME Boiler and Pressure Code. The letter or symbol (as shown on the qualification test form) shall be used to identify the work of that welder and shall be affixed, in accordance with appropriate construction code, to each completed weld.

The types and extent of non-destructive examinations required for pipe welds are shown in Table 136.4 of the Code for Pressure Piping, ANSI/ASME B 31.1.

Manufacturer's Recommendations: Where installation procedures or any part thereof are required to be in accordance with the recommendations of the manufacturer of the material being installed, printed copies of these recommendations shall be furnished to the Engineer prior to installation. Installation of the item will not be allowed to proceed until the recommendations are received. Failure to furnish these recommendations can be cause for rejection of the material.

FIRESTOPPING

Provide for firestopping of all mechanical systems. UL listed methods conforming to the situations present shall be utilized. Submit shop drawings of intended methods, including installation instructions and proof of UL Listing.

WALL, FLOOR AND CEILING PLATES

Material and Type: Chrome plated brass or chrome plated steel. Use plates that fit tight around pipes, cover openings around pipes, and cover the entire pipe sleeve projection.

Thickness: Not less than 3/32 inch for floor plates. For wall and ceiling plates, not less than 0.025 for up to 3 inch pipe, 0.035 for larger pipe.

Locations: Use where pipe penetrates floors, walls and ceilings in exposed locations, except mechanical rooms or chases. Use also where insulation ends on exposed water supply pipe drop from overhead. Provide a watertight joint in spaces where brass or steel pipe sleeves are specified.

INSTALLATION

Coordinate location of piping, sleeves, inserts, hangers, ductwork and equipment. Locate piping, sleeves, inserts, hangers, ductwork and equipment clear of windows, doors, openings, light outlets, and other services and utilities. Follow manufacturer's published recommendations for installation methods not otherwise specified.

Protection and Cleaning:

Equipment and materials shall be carefully handled, properly stored, and adequately protected to prevent damage before and during installation, in accordance with the manufacturer's recommendations and as approved by the Engineer. Damaged or defective items, in the opinion of the Engineer, shall be replaced.

Protect all finished parts of equipment, such as shafts and bearings, where accessible, from rust prior to operation by means of protective grease coating and wrapping. Close pipe openings with caps or plugs during installation. Tightly cover and protect fixtures and equipment against dirt, water, chemical or mechanical injury. At completion of all work thoroughly clean fixtures, exposed materials and equipment.

Concrete and Grout: Use concrete and shrink-compensating grout, 3000 psi minimum.

Install gauges, thermometers, valves and other devices with due regard for ease in reading or operating and maintaining said devices. Locate and position thermometers and gauges to be easily read by operator or staff standing on floor or walkway provided. Servicing shall not require dismantling adjacent equipment or pipe work.

PAINTING

Paint all bare steel pipe, supports, hangers, fabricated parts, etc. with two coats of enamel paint. Prepare surfaces in accordance with the manufacturer's recommendations. Coordinate colors with existing like components or per the Owner.

Paint all cut or heat affected galvanized steel components with two coats of cold galvanizing spray paint, ZRC Cold Galvanizing compound or equal. Prepare surfaces per the manufacturer's recommendations.

PIPE AND EQUIPMENT SUPPORTS

Generally, support in accordance with industry standards and as described in Section 23 15 00.

Use of chain, wire or strap hangers, wood for blocking, stays and bracing, nor hangers suspended from piping above will not be permitted.

Use hanger rods that are straight and vertical. Turnbuckles for vertical adjustments may be omitted where limited space prevents use. Provide a minimum of 1" clearance between pipe or pipe covering and adjacent work.

LUBRICATION

Field check and lubricate equipment requiring lubrication prior to initial operation.

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Consultant:	MCGINNIS + FLEMING ENGINEERING P.C. 2100 WEST PALM BLVD., SUITE 200 TALLAHASSEE, FL 32304 850.942.1718 WWW.ALW.COM	Project #:	19370.69
		Phase:	100% Construction Documents

Seal:



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Tallahassee, Florida 32301
850.942.1718
www.think3d.net

Description:
Specifications

Sheet No.:
M4.0

23 31 13 MECHANICAL - METAL AND FLEXIBLE DUCTWORK AND ACCESSORIES

GENERAL CONDITIONS

The work described hereunder shall be installed in accordance with the "Mechanical General Conditions," Section 15010.

DESCRIPTION OF WORK:

Extent of metal ductwork is indicated on drawings and in schedules, and by requirements of this section. In general, the work consists of, but is not limited to, the following:

- A system of heating and air-conditioning supply and return air ductwork.
- Smoke/fire dampers, air diffusers, and miscellaneous accessories.
- Miscellaneous volume/control dampers.

QUALITY ASSURANCE:

Manufacturer's Qualifications: Firms regularly engaged in manufacture of metal ductwork products of types, materials, and sizes required, whose products have been in satisfactory use in similar service for not less than 5 years.

Installer's qualifications: Firm with at least three (3) years of successful installation experience on projects with metal ductwork systems similar to that required for project.

Codes and Standards:

- SMACNA Standards: Comply with SMACNA's "HVAC Duct Construction Standards, Metal and Flexible" for fabrication and installation of metal ductwork.
- NFPA Compliance: Comply with NFPA 90A "Standard for the Installation of Air Conditioning and Ventilation Systems".
- NFPA Compliance: Comply with NFPA 96 "Standard for the Installation of Equipment for the Removal of Smoke and Grease-Laden Vapors from Commercial Cooking Equipment".

SUBMITTALS:

Submit to the Architect/Engineer for approval six (6) copies of brochures, technical data and/or shop drawings of the following, and as many additional copies as required for Contractor use:

- Ductwork and materials
- Ductwork insulation
- Mastics
- Grilles & accessories
- Smoke and fire dampers, miscellaneous dampers and installation instructions

DELIVERY, STORAGE AND HANDLING:

Handle ductwork and equipment carefully to prevent damage. Do not install damaged sections or components; replace with new.

Store ductwork and equipment in clean dry place. Protect from weather, dirt, fumes, water, construction debris, and physical damage.

DUCTWORK MATERIALS:

Sheet Metal: Except as otherwise indicated, fabricate ductwork from galvanized sheet steel complying with ASTM A 527, lockforming quality; with G-90 zinc coating in accordance with ASTM A 525.

Single-Wall Spiral Round Duct: Round duct with mechanical fastening, spiral flat seams, complying with ASTM A527, with G-90 zinc coating in accordance with ASTM A 525.

DUCTWORK INSULATION MATERIALS:

Duct Insulation values: Provide R=6 insulation.

Rigid Fiberglass Board Insulation: Federal Specification HH-1-558B, 3 pcf density, k=0.23, rated to 450 degrees F operating temperature. FSK reinforced foil vapor retarder. Owens / Corning Quiet R, Manville Type 814 or an approved equivalent.

Fiberglass Duct Wrap: Federal Specification HH-1-558B, 1 pcf density, k=0.24, rated to 450 degrees F operating temperature. FSK reinforced foil vapor retarder. Owens / Corning Type 100 or an approved equivalent.

Plenum Liner: Fiberglass liner with erosion resistant surface of thermosetting resin bonded glass fibers. R value is 4.3 / inch thickness. Air stream surface is to be treated with an EPA registered antimicrobial agent. Insulation requirements:

MISCELLANEOUS MATERIALS:

General: Provide miscellaneous materials and products of types and sizes indicated and, where not otherwise indicated, provide type and size required to comply with ductwork system requirements including proper connections of ductwork and equipment.

Duct Sealant: Non-hardening, non-migrating mastic or liquid elastic sealant, type applicable for fabrication/installation detail, as compounded and recommended by manufacturer specifically for sealing joints and seams in ductwork.

Ductwork Support Materials: Except as otherwise indicated, provide hot-dipped galvanized steel fasteners, anchors, rods, straps, trim and angles for support of ductwork.

Flexible Ducts: Insulated spiral-wound spring steel with flame proof vinyl sheathing complying with UL 181, Class I air duct (duct connectors will not be accepted).

Smoke Dampers: Dampers shall meet the requirements listed in NFPA 90A, 92A and 92B and shall be classified as leakage rated dampers for use in smoke control systems in accordance with the UL555S. Provide factory installed electric actuators qualified under UL555S. For each damper provide an access door 4" smaller than sheet metal size in width (up to 18") and 18" in length.

Fire Dampers: Dampers shall meet UL 555 for dynamic systems and shall be provided with angles, hardware, etc. Dampers shall be airfoil blade type or Style "B" out of the airstream type.

Damper procurement and installation shall accommodate existing conditions. Provide damper access either via the duct or grille.

Smoke Damper Actuators: Actuators to be normally closed (powered open), spring return (selectable), 120 VAC with end position indication (two built in auxiliary switches), overload protection with disconnect switch. It will meet UL555 and UL555S requirements and be factory mounted to the smoke damper.

Grilles & Registers: Provide as scheduled on the drawings or an approved equivalent.

FABRICATION:

Duct sizes are internal free area unless otherwise noted.

Shop fabricate ductwork of gages and reinforcement complying with SMACNA "HVAC Duct Construction Standards".

Construct high pressure VAV supply duct (upstream of VAV terminal boxes) for 2.5" static pressure.

Construct low pressure supply air duct for 1.5" static pressure.

Construct return and outside air duct for 1" static pressure.

Limit angular tapers to 30 degrees for contracting tapers and 20 degrees for expanding tapers.

INSTALLATION OF METAL DUCTWORK

Examine areas and conditions under which metal ductwork is to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to installer.

Install metal ductwork in accordance with SMACNA HVAC "Duct Construction Standards". Assemble and install ductwork in accordance with recognized industry practices, which will achieve airtight and noiseless systems, capable of performing each indicated service. Install each run with minimum number of joints. Support ducts rigidly with suitable ties, braces, hangers and anchors of type which will hold ducts true-to-shape and to prevent buckling.

Use single-wall spiral seam round duct where specified and/or as needed to accommodate existing conditions.

Duct sizes shown are internal dimensions. Maintain free area equivalence when making transitions or when transforming between round and/or rectangular duct.

Seal all transverse and longitudinal joints, seams, etc. regardless of pressure class with approved duct mastic.

Routing: Field verify duct route prior to any fabrication. Coordinate layout with existing structure, suspended ceiling and lighting layouts and similar finished work.

Hangers for steel ducts shall be fabricated from sheet metal. Ducts shall be supported from the structure.

Penetrations: Where ducts pass through interior partitions and exterior walls, conceal space between construction opening and duct or duct insulation with sheet metal flanges/collars two gauges heavier than duct. Minimum width of flanges/collars shall be 1-1/2" or as required to completely seal opening. Overlap opening on rectangular openings by at least 1-1/2". Fasten to duct and substrata. Where ducts pass through fire-rated floors, walls, or partitions, provide in accordance with approved UL listed details and accepted industry practice.

Hard Ceiling or Sidewall Connections: Provide insulated sheet metal boots sized to fit the grille size as indicated. Secure boot to ceiling structure. Boot insulation shall be semi-rigid foil faced where exposed to the air stream and sealed with tape.

INSTALLATION OF SMOKE/FIRE DAMPERS:

General: Install dampers in accordance with the manufacturers' installation instructions in order to maintain the UL listing. Fire dampers shall be out of the air stream as specified on the plans.

INSTALLATION OF FLEXIBLE DUCTS:

Maximum Length: For any duct run using flexible ductwork, do not exceed ten (10) feet extended length -- use round spiral seam steel duct for longer runs. Install shortest possible length.

Installation: Install in accordance with Section III of SMACNA "HVAC Duct Construction Standards, Metal and Flexible". No bends shall be made with center-line radius of less than one duct diameter.

Flexible duct hangers shall be constructed from hanger wire and 3" wide sheet metal saddles. Wire gauge shall be per SMACNA and saddles shall have hemmed edges and corners. Support as needed to avoid kinks and flow obstructions.

END OF SECTION

23 05 93 MECHANICAL - TEST AND BALANCE

PART 1 - GENERAL

GENERAL REQUIREMENT

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

QUALITY ASSURANCE

The Testing Contractor shall be independent of the Mechanical Subcontractor, certified by NEBB member of AABC, and shall have a registered engineer in responsible charge of the work. The engineer must be a full time, direct employee of the Testing Contractor. Outside consultants will not be accepted.

The personnel involved in performing the tests shall be experienced and specifically trained in balancing mechanical systems.

SUBMITTALS:

Prior to any test & balance work, submit the TAB agency and job supervisor qualifications for approval. Also submit TAB agenda including sample forms, system diagrams for each air and water system and a synopsis of testing and adjusting procedures.

After completion of test, submit draft test reports.

Prior to Contractors request for final completion inspections, submit final test reports.

Submit 3 copies in accordance with general submittal requirements.

DESCRIPTION OF WORK:

The TAB work shall include:

Adjust and balance the complete HVAC system included in this specific project.

All grille air flowrates shall be tested and balanced to the specified flowrates.

Test and record space temperatures and setpoints, space relative humidity and setpoints, etc.

Record all test data and submit reports upon completion.

At the completion of the balancing contract instruct the owner's personnel in the proper operation and maintenance of each piece of equipment.

Check all control devices for proper operation, calibration and location.

Test, adjust, and balance the following mechanical systems:

Supply air systems

Equipment to be tested includes but is not necessarily limited to the following:

- Verify temperature control system operation.
- VAV boxes
- All associated control devices.

Testing and balancing shall not begin until the system has been completed and in full working order. The mechanical contractor shall be responsible for putting all heating, ventilating and air conditioning systems and equipment into full operation and shall continue the operation of same during each working day of testing and balancing.

The Contractor shall furnish the Test and Balance Subcontractor with a full set of Drawings and Specification, applicable submittal data, and manufacturer's performance data.

The contractor shall make any changes required for correct balance, as recommended by the balancing contractor, at no additional cost to the owner. Such changes may encompass but are not necessarily restricted to pulleys, belts, ductwork, dampers, or the addition of dampers and access doors.

Mark equipment settings, including damper control positions, valve indicators, fan speed control levers, and similar controls and devices, to show final settings. Mark with paint or other suitable, permanent identification materials.

PART 2 - PRODUCTS: (NOT APPLICABLE)

PART 3 - EXECUTION:

GENERAL

All systems shall be tested, adjusted and balanced in accordance with applicable NEBB or AABC standards and the TAB agenda.

All instruments will have been calibrated recently and verification of calibration shall be provided with submittal data.

Coordinate TAB procedures with any phased construction requirements for the project so that usable increments of finished work may be accepted for beneficial occupancy. Systems serving partially occupied phases of the project may require balancing for each phase prior to final balancing.

The Agenda shall also include the following detailed narrative procedures, system diagrams and forms for test results.

Specific standard procedures required and proposed for each system. Additional procedures for variable flow systems shall be developed by the TAB Agency and included for review and approval.

Report Format: Report forms shall be those standard forms prepared by the referenced standard for each respective item and system to be tested, adjusted, and balanced. Bind report forms complete with schematic systems diagrams and other data in reinforced, vinyl, three-ring binders. Provide binding edge labels with the project identification and a title descriptive of the contents. Divide the contents of the binder into the below listed divisions, separated by divider tabs:

- General Information and Summary
- Air Systems

General Information and Summary: Inside cover sheet to identify testing, adjusting, and balancing agency, Contractor, Owner, Architect, Engineer, and Project. Include addresses, and contact names and telephone numbers. Also include a certification sheet containing the seal and name, address, telephone number, and signature of the Certified Test and Balance Engineer. Include in this division a listing of the instrumentations used for the procedures along with the proof of calibration.

Calibration Reports: Submit proof that all required instrumentation has been calibrated to tolerances specified in the referenced standards, within a period of six months prior to starting the project.

AIR BALANCE:

Make flow measurements at each terminal device, and each supply, return, or exhaust diffuser. Adjust each air outlet unit within plus or minus 10 percent of design requirements, but total air for each system shall be not less than shown. Adjust grilles and diffusers to minimize drafts in all areas.

Adjust outside air and return air quantities N/A

Adjust exhaust systems N/A

Test function of automatic dampers and operation of air terminal units. Check all controls for proper operation. N/A

Ductless Split Systems N/A

EQUIPMENT ELECTRICAL OPERATION:

N/A

CONTROLS OPERATION:

Proper operation of all new control devices shall be verified and certified.

END OF SECTION

THESE DRAWINGS ARE PREPARED BY THE ARCHITECT AND ARE NOT TO BE USED FOR ANY OTHER PROJECT WITHOUT THE WRITTEN PERMISSION OF THE ARCHITECT. THE ARCHITECT IS NOT RESPONSIBLE FOR ANY ERRORS OR OMISSIONS IN THESE DRAWINGS. THE USER OF THESE DRAWINGS SHALL BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS. THE ARCHITECT IS NOT RESPONSIBLE FOR ANY ERRORS OR OMISSIONS IN THESE DRAWINGS. THE USER OF THESE DRAWINGS SHALL BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS.		DATE:	
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