

Addendum

v 713.914.0888

## **DATE** 04/22/2020

#### ADDENDUM NO.

2

#### PROJECT 190317.000 | IFB 20-24 HVAC REPLACEMENTS FOR CENTRAL CAMPUS

The work described herein shall be added to the scope of work defined by the contract documents or it shall modify the scope of work defined by the contract documents as described. This work shall become a part of the contract documents by addendum.

#### **GENERAL**

# Item 01See attached responses to bidder's questions.Item 02See attached existing facility mechanical plans. Please note these documents have not been field verified.

#### DRAWINGS

Item 03	Sheet N	11.1 – Level 1 Mechanical Plan
	Α.	Added existing drawing.
ltem 04	Sheet N	12.1 – Level 2 Mechanical Plan
	A.	Added existing drawing.
ltem 05	Sheet N	/IEP.1 – Levels 1&2 MEP General Notes, Details, & Legends
	A.	Added existing drawing.
ltem 06	Sheet N	1203 – Basement Mechanical Plan - Theater
	A.	Added to notes for chilled water to paint pipe insulation.

#### END OF ADDENDUM

#### **INVITATION FOR BID**

#### PROJECT NO. IFB 20-24 HVAC REPLACEMENTS FOR CENTRAL CAMPUS

#### **ENGINEER'S ADDENDUM NO. 2**

#### **QUESTIONS AND ANSWERS No. 1**

#### Date: April 22, 2020

To: Prospective Bidders

- From: Procurement Operations Department, Houston Community College
- Subject: Questions and Answers Responses
- Q1. Will the Engineer be pulling the building permit or are they simply submitting the drawings to the city for approval?

#### Response: The drawings are being submitted to the city for review.

Q2. Are there any existing drawings showing existing duct system?

## Response: The drawings that we have are attached. These have not been verified with existing conditions.

Q3. Does the fence around the existing condenser's get reinstalled around the new chillers?

#### **Response: No**

Q4. Is the existing roof under warranty and who is the Campus's roofer?

### Response: it is up to the contractor to hire a firm to flash around existing curbs. The campus doesn't have a "roofer"

Q5. Is the replaced pipe insulation in the Theater Basement get painted as the existing?

#### **Response: Yes**

Q6. Will all furniture be removed from building during remodel?

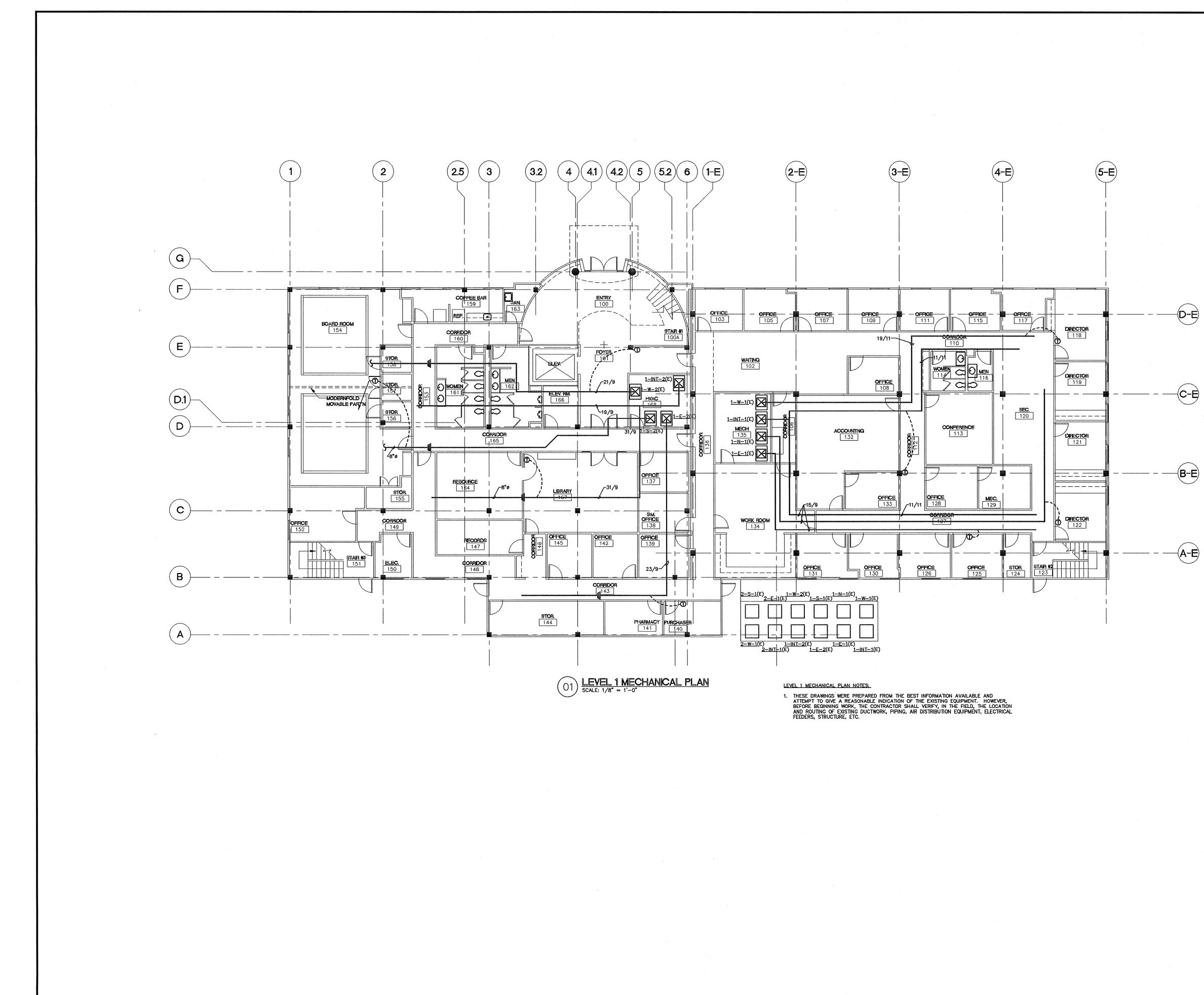
#### Response: No, the furniture will have to be protected

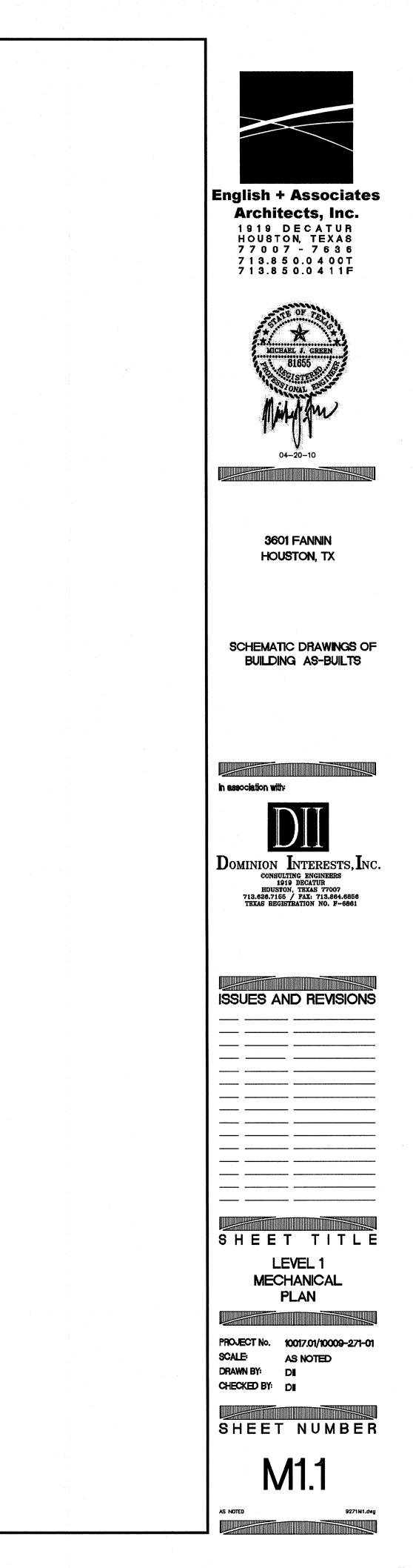
Q7. Is the existing refrigerant being recovered to be returned to HCC?

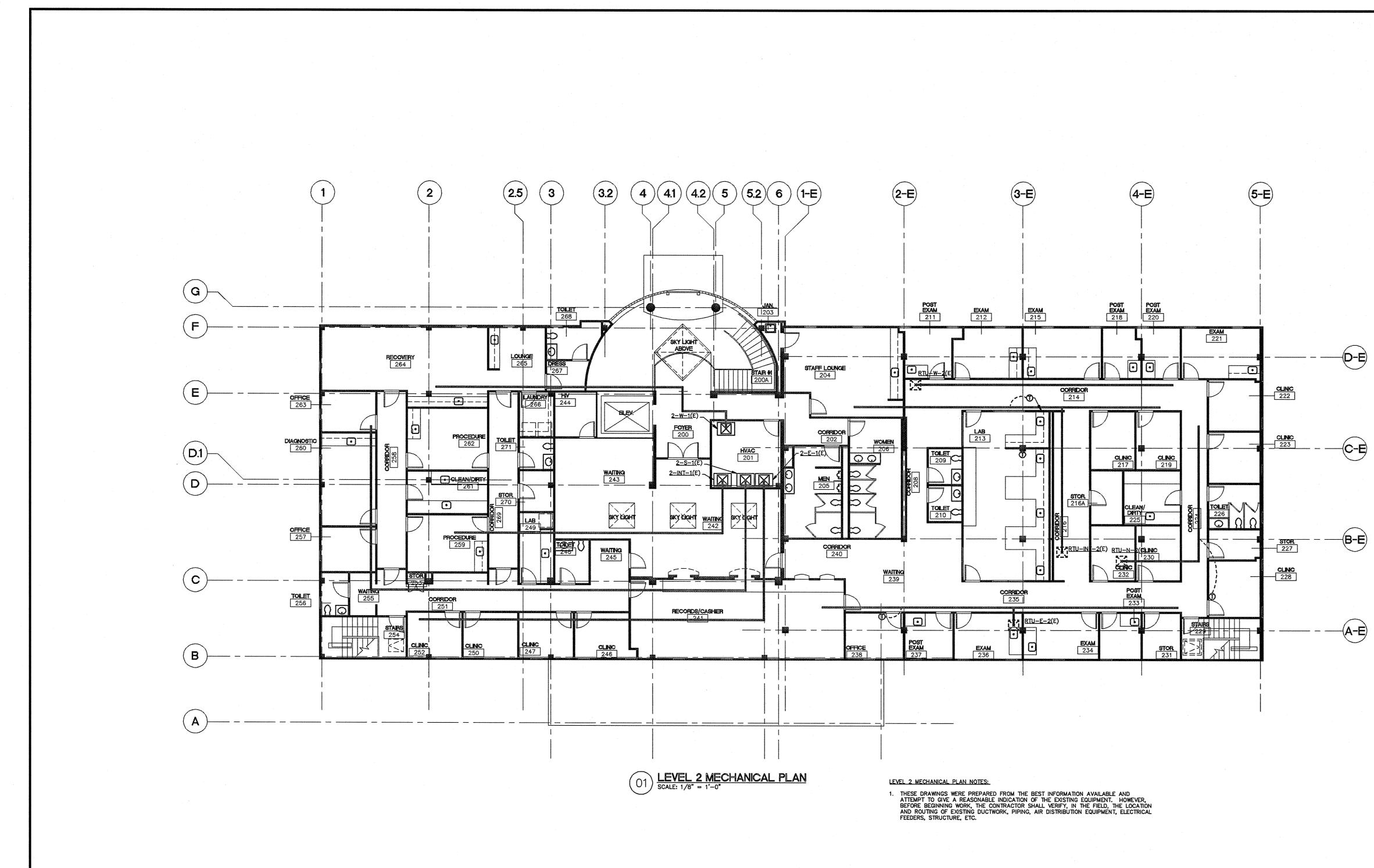
#### Response: Refrigerant shall be disposed of.

Q8. JCI would like to bid Metasys controls as requested by some contractors who are interested in the HCC IFB 20-24 HVAC Replacements for Central Campus as well as, a bid to include controls by the JCI owner direct for the entire project. In the documents it states the ability to provide an approved equal on controls to Schneider Electric, and I would like to see if JCI/ Metasys would be considered as approved equal. I know HCC has some JCI/ Metasys products and, would request the opportunity to be able to bid the controls on this project.

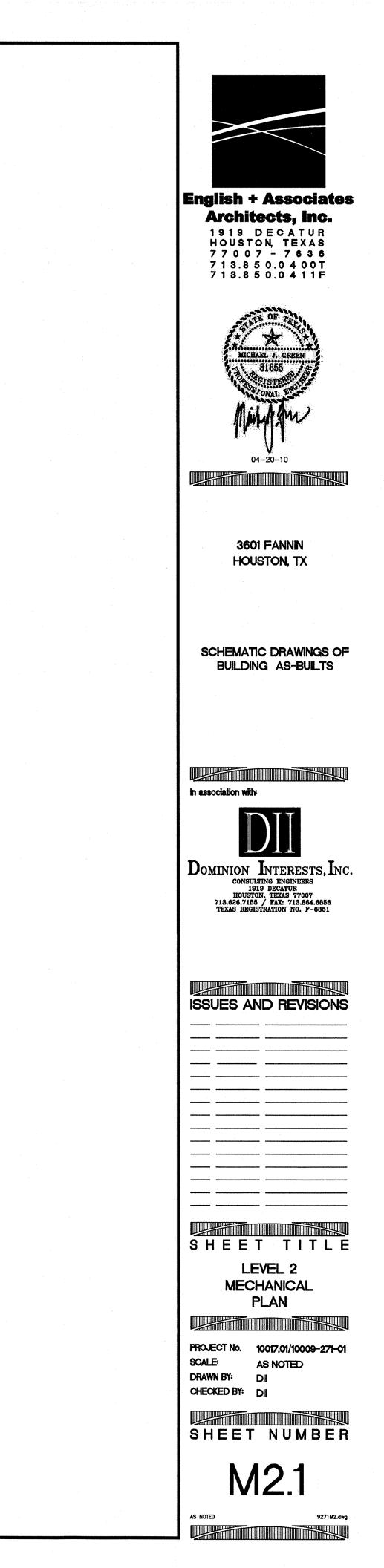
Response: Provide an alternate to be taken into consideration. Provide a written request for substitution outlining how the product meets or exceeds the specified product. Provide documentation of capability of integrating with HCC's existing front end.







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		SCHEDULE OF RO	OFTOP UNITS (EX	(ISTING)		
DESIG.	MANUF.	MODEL #	SERIAL #	MANUF. DATE	VOLT/PH	REFRIG.
RTU-INT-2	YORK	D3CE076A46A	NLAM165013	1992	460/3	R-22
RTU-N-2	YORK	D3PS024A06A	NHAM149403	1992	460/3	R-22
RTU-E-2	YORK	D3PS036A06A	NHAM150145	1992	460/3	R-22
RTU-W-2	YORK	D1EB036A46B	NON6291072	1992	460/3	R-22
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				· · · · · · · · · · · · · · · · · · ·		

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DESIG.	MANUF.	MODEL #	SERIAL #	MANUF.	VOLT/PH	FAN MTR		HEATING	
DL010.	W////01.		SENIAL #	DATE		(HP)	VOLT/PH	AMPS	KW
1-INT-1	MAGIC AIRE	90-BVW/BVX	920335257	3/27/1992		1 1/2			
I-INT-2	MAGIC AIRE	90-BVW/BVX	920335261	3/27/1992	115/1	1 1/2			
1-N-1	MAGIC AIRE	24-BVW/BVX	920537024	5/4/1992	115/1	1/4	208/1		3.5
1-E-1	MAGIC AIRE	36-BVW/BVX	920435218	4/6/1992	115/1	1/3	208/1		4.5
1-E-2	MAGIC AIRE	36-BVW/BVX	920435198	4/6/1992	115/1	1/3	208/1	24	
1-S-1	MAGIC AIRE	36-BVW/BVX	920435217	4/6/1992	115/1	1/3	208/1	24	
1-W-1	MAGIC AIRE	60-BVW/BVX	920435426	4/13/1992	115/1	3/4	208/1	24	
1-W-2	MAGIC AIRE	120-BWW/BVX	920333874	3/9/1992	115/1	1/5	208/1	55.3	
2-INT-1	MAGIC AIRE	90-BVW/BVX	920335255	3/27/1992	115/1	1 1/2	208/1	31.2	
2-E-1	MAGIC AIRE	36-BVW/BVX	920435214	4/6/1992	115/1	1/3	208/1	24	
2-S-1	MAGIC AIRE	36-BVW/BVX	920435207	4/6/1992	115/1	1/3	208/1	16.8	
2-W-1	MAGIC AIRE	60-BVW/BVX	920435427	4/13/1992	115/1	3/4	208/1	33.6	
IT-1	YORK	HIDA018S06A	EAAM002889		208/1				
IT-2	RUUD	UAND-048DAZ	730ZF510507049		460/3				

DESIG.	MANUF.	MODEL #	SERIAL #	MANUF. DATE	REFRIG.	VOLT/PH	AMPS
1-INT-1	RUUD	RAWE-091DAZ	7185F070612146	2/2006	R-22	153 1/3	
*1-INT-2	YORK	10-TON					
*1-N-1							
*1-E-1	YORK		ECAM085430	3/1992	R-22	208/1	24.1
*1-E-2	YORK		ENYM196756	12/1991	R-22	208/1	18,1
1-S-1	YORK	HIRA060S4G	W0F5363996	8/3/2005	R-102	460/3	
1-W-1	YORK	HIRO60SA46G					
*1-W-2	RUUD	RAWE-120DAZ	6687F340607731	2006		460/3	
*2-INT-1	YORK	10-TON					
2-E-1	YORK	HIDA036S06A	EDAM152716	4/1992	R-22	208/1	24.1
*2-S-1	YORK	HZRD030S06B	W0D7703244		R-102		
2-W-1	YORK	HIDA060S46A	EWAM339364	8/1992	R-22	460/3	13.8
LAB-1	YORK	DIEB036A46B	NKKM104488			460/3	

#### GENERAL NOTES: A. SCOPE OF WORK:

- HEREIN
- PURCHASE, FABRICATION, OR INSTALLATION.
- B. GENERAL REQUIREMENTS: 1. DRAWINGS:
- INSTALLATION
- ELECTRICAL FEEDERS, STRUCTURE, ETC.
- TO THE OWNER'S REPRESENTATIVE.
- SHOWN MAY REQUIRE PREMIUM TIME TO AVOID DISRUPTION OF OTHER TENANT'S ACTIVITIES AND MEP SERVICES. CONTRACTOR SHALL CONFIRM THE REQUIREMENTS FOR PREMIUM TIME OR SPECIAL PROCEDURES WITH THE LANDLORD AND INCLUDE THE COST IN HIS BID PROPOSAL. THE CONTRACTOR BY SUBMITTING HIS BID PROPOSAL AGREES TO

- 7. A SET OF RECORD/COORDINATION DRAWINGS SHALL BE MAINTAINED IN THE GENERAL OF THE WORK.
- RELOCATED WITHOUT ADDITIONAL COST
- TESTING AGENCIES SHALL NOT BE REMOVED. 12. GUARANTEES:
- TO THE OWNER.
- RECEIVE A COPY OF THE CERTIFICATION.
- C. SUBMITTALS:

D. SITE REVIEWS:

REVIEWS TO BE SCHEDULED.

SYSTEM INSTALLATION.

### 1. <u>WORK INCLUDED:</u> FURNISH ALL LABOR, MATERIALS, EQUIPMENT, SERVICES, TRANSPORTATION, AND TESTING NECESSARY FOR AND REASONABLY INCIDENTAL TO THE PROPER AND SATISFACTORY INSTALLATION OF THE MECHANICAL, ELECTRICAL, AND PLUMBING (MEP) TENANT IMPROVEMENTS INDICATED ON THE DRAWINGS AND SPECIFIED

2. EXECUTION: WORK SHALL BE EXECUTED IN A WORKMANLIKE MANNER AND SHALL INCLUDE ALL LABOR AND MATERIALS ESSENTIAL TO PROVIDE THE COMPLETE AND FUNCTIONING SYSTEMS DESCRIBED. IN CASES OF DOUBT AS TO THE WORK INTENDED, OR IN THE EVENT OF NEED FOR EXPLANATION THEREOF, THE CONTRACTOR SHALL REQUEST SUPPLEMENTARY INSTRUCTIONS FROM THE ENGINEER PRIOR TO PROCEEDING WITH THE

a) DUE TO THE DRAWING SCALE, IT IS NOT POSSIBLE TO INDICATE ALL OFFSETS, FITTINGS, AND ACCESSORIES WHICH MAY BE REQUIRED. THE CONTRACTOR SHALL CAREFULLY INVESTIGATE THE CONDITIONS SURROUNDING THE INSTALLATION OF HIS WORK AND INVESTIGATE THE CONDITIONS OF ADDRESS OF THE INSTALLATION OF HIS WORK AND INVESTIGATE THE CONDITIONS OF ADDRESS OF THE INSTALLATION OF HIS WORK AND INVESTIGATE THE CONDITIONS OF ADDRESS OF THE INSTALLATION OF HIS WORK AND INVESTIGATE THE CONDITIONS OF ADDRESS OF THE INSTALLATION OF HIS WORK AND SHALL FURNISH THE NECESSARY FITTINGS WHICH MAY BE REQUIRED TO COMPLETE THE

b) THE DRAWINGS WERE PREPARED FROM THE BEST INFORMATION AVAILABLE AND ATTEMPT TO GIVE A REASONABLE INDICATION OF THE EXISTING EQUIPMENT. HOWEVER, BEFORE BEGINNING WORK, THE CONTRACTOR SHALL VERIFY, IN THE FIELD, THE LOCATION AND ROUTING OF EXISTING DUCTWORK, PIPING, AIR DISTRIBUTION EQUIPMENT,

2. ALL WORK AND EQUIPMENT SHALL COMPLY WITH ALL APPLICABLE LAWS, CODES, ETC., OF ALL AUTHORITIES HAVING JURISDICTION, INCLUDING FEDERAL, STATE, DISTRICT, AND LOCAL AUTHORITIES. MODIFICATIONS REQUIRED BY THE ABOVE SAID AUTHORITIES SHALL BE MADE WITHOUT ADDITIONAL CHARGE TO THE TENANT. WHERE CONTRACT DOCUMENT REQUIREMENTS ARE IN EXCESS OF CODE REQUIREMENTS, THE CONTRACT DOCUMENTS SHALL GOVERN. DEVIATIONS FROM THE CONTRACT DOCUMENTS REQUIRED BY THE ABOVE SAID AUTHORITIES SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW.

3. <u>PERMIT. FEES</u>. <u>AND LICENSES</u>: FEES, PERMITS, AND LICENSES REQUIRED BY THE LEGALLY CONSTITUTED AUTHORITIES FOR INSTALLATION OF THE WORK ACCORDING TO THE PLANS AND SPECIFICATIONS SHALL BE OBTAINED AND PAID FOR BY THE CONTRACTOR. THE CONTRACTOR SHALL DELIVER THE ABOVE MENTIONED CERTIFICATES

4. THE CONTRACTOR SHALL REVIEW THE SITE PRIOR TO BID SUBMISSION AND SHALL INCLUDE IN HIS BID THE COST OF REPLACEMENT, REPAIR, RELOCATION, OR REMOVAL OF EXISTING MEP ELEMENTS AS REQUIRED TO COMPLETE INSTALLATION OF ALL SYSTEMS SHOWN ON THESE DRAWINGS. ALL UNUSED TENANT EQUIPMENT SERVING THIS LEASE AREA SHALL BE REMOVED AND RETURNED TO THE LANDLORD'S STOCK. SOME WORK

ACCEPT ALL EXISTING SITE CONDITIONS NOT SPECIFICALLY EXCEPTED. ALL EXCEPTIONS SHALL BE PROVIDED IN WRITING TO THE ARCHITECT AND ENGINEER.

5. <u>EXISTING CONDITIONS</u>: THE TENANT MEP DESIGN SHOWN ON THESE DRAWINGS IS SUPPORTED BY EXISTING BASE BUILDING MEP SYSTEMS WHICH HAVE BEEN ASSUMED TO BE IN GOOD WORKING ORDER. ANY DEFICIENCY IN THE BASE BUILDING MEP SYSTEMS WHICH PREVENTS A COMPLETE INTERFACE WITH THE TENANT SYSTEMS OR PREVENTS THE TENANT SYSTEMS FROM BEING FULLY FUNCTIONAL AT THE COMPLETION OF CONSTRUCTION SHALL BE IDENTIFIED IN WRITING BY THE CONTRACTOR TO THE BUILDING MANAGER, ARCHITECT, AND ENGINEER AS SOON AS PRACTICAL AFTER DISCOVERY.

6. ACCESS: PROVIDE FREE AND CLEAR ACCESS TO EXISTING OR NEW EQUIPMENT FOR MAINTENANCE. NOTHING SHALL INHIBIT THE REMOVAL OF ACCESS PANELS ON THE BOTTOM OR SIDES OF EQUIPMENT, OR INHIBIT ACCESS TO THE POWER SWITCH OR CONTROL EQUIPMENT MOUNTED ON THE EXTERIOR OF THE EQUIPMENT. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING: BEAMS, WALLS, LIGHT FIXTURES, PIPING OF ANY KIND, CONDUIT, AND CEILING SUPPORTS (OTHER THAN RUNNERS).

CONTRACTOR'S OFFICE AT THE JOB SITE CONSISTING OF REPRODUCIBLE SEPIAS OF THE MECHANICAL, ELECTRICAL, AND PLUMBING CONSTRUCTION DRAWINGS (WITH THE ENGINEER'S NAME REMOVED). ACTUAL LOCATIONS OF ALL EQUIPMENT PIPING DUCTWORK, ETC. AND ALL DEVIATIONS OF THE WORK FROM THAT SHOWN ON THE CONTRACT DOCUMENTS SHALL BE MARKED ON THE RECORD/COORDINATION DRAWINGS. FACH TRADE SHALL REVIEW THE RECORD/COORDINATION DRAWINGS AND RESOLVE ANY POTENTIAL CONFLICTS WITH OTHER TRADES PRIOR TO INSTALLING ANY PORTION OF THEIR WORK. THE GENERAL CONTRACTOR SHALL SUBMIT THE RECORD/COORDINATION DRAWINGS TO THE ARCHITECT AND ENGINEER FOR REVIEW PRIOR TO FINAL ACCEPTANCE

8. IT SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO BRING TO THE ATTENTION OF THE MECHANICAL ENGINEER ANY SLAB-TO-SLAB PARTITIONS OTHER THAN THOSE SHOWN ON THE MECHANICAL DRAWINGS IN ORDER TO PRESERVE RETURN AIR PATHWAYS. ALL PENETRATIONS OF SLAB-TO-SLAB PARTITIONS SHALL BE SEALED

9. NEW DUCTWORK, CONDUIT, AND PIPING SHOWN ON THE DRAWINGS SHALL BE INSTALLED AS HIGH AS POSSIBLE. CONTRACTORS SHALL COORDINATE DUCTWORK, CONDUIT, AND PIPING INSTALLATION WITH LIGHTING FIXTURES, SPECIAL CEILING CONSTRUCTION, AIR DISTRIBUTION, EQUIPMENT, ETC., AND PROVIDE ADDITIONAL RISES, DROPS, AND OFFSETS AS REQUIRED. IF INSTALLED, NEW DUCTWORK, CONDUIT, OR PIPING IS FOUND TO BE IN CONFLICT WITH ARCHITECTURAL OR MEP ELEMENTS WHICH ARE EITHER EXISTING OR SHOWN ON THE CONTRACT DOCUMENTS, THE DUCTWORK, CONDUIT, OR PIPING SHALL BE

10. TENANT MEP EQUIPMENT AND ASSOCIATED SERVICES WHICH MAY EXIST WITHIN THE PROJECT AREA ARE TO BE REMOVED BACK TO THE POINT OF CONNECTION WITH BASE BUILDING SYSTEMS UNLESS NOTED OTHERWISE ON THE DRAWINGS. EXISTING TENANT EQUIPMENT WHICH IS SHOWN AS "EXISTING TO REMAIN" ON THE DRAWINGS SHALL BE RENDERED FULLY FUNCTIONAL BY THE CONTRACTOR

11. EACH ITEM OF TENANT EQUIPMENT SHALL BE IDENTIFIED BY A PERMANENTLY ATTACHED LAMINATED BAKELITE NAMEPLATE WITH ENGRAVED LETTERS WITH A DESIGNATION CORRESPONDING TO THE CONTRACT DOCUMENTS. IN FINISHED SPACES NO PRODUCT SHALL HAVE A VISIBLE TRADEMARK, INSIGNIA, ETC. INTENDED TO IDENTIFY THE MANUFACTURER OR VENDOR OF THE PRODUCT, EXCEPT THAT LABELS OF REQUIRED

a) THE CONTRACTOR SHALL GUARANTEE HIS WORK UNCONDITIONALLY FOR A PERIOD OF ONE (1) YEAR AFTER FINAL ACCEPTANCE. IF, DURING THIS PERIOD, ANY MATERIALS, EQUIPMENT, OR ANY PART OF THE SYSTEM FAILS TO FUNCTION PROPERLY, THE CONTRACTOR SHALL MAKE GOOD THE DEFECTS PROMPTLY AND WITHOUT ANY EXPENSE

b) THE EQUIPMENT AND MATERIALS INSTALLED ON THIS PROJECT SHALL CONTAIN NO ASBESTOS OR PCB. PRIOR TO OWNER'S ACCEPTANCE OF THIS PROJECT, THE CONTRACTOR SHALL CERTIFY IN WRITING TO THE OWNER THAT THE INSTALLED EQUIPMENT AND MATERIALS CONTAIN NO ASBESTOS OR PCB. THE ENGINEER SHALL

1. EACH DIVISION 15 AND 16 SUBCONTRACTOR SHALL PREPARE AND SUBMIT TO THE TENANT'S REPRESENTATIVE SIX (6) BOUND BOOKLETS CONTAINING A COMPLETE LIST AND DESCRIPTION OF THE MATERIALS, SPECIALTIES, AND EQUIPMENT HE INTENDS TO FURNISH FOR THE INSTALLATION. ALL PROPOSED DEVIATIONS FROM THE CONTRACT DOCUMENTS SHALL BE DESCRIBED IN THE SUBMITTALS. THE BOOKLETS SHALL INCLUDE THE FOLLOWING CERTIFICATION STATEMENT SIGNED BY AN AUTHORIZED REPRESENTATIVE OF THE SUBCONTRACTOR AND GENERAL CONTRACTOR: I HEREBY CERTIFY THAT THIS SHOP DRAWING, PRODUCT DATA, AND/OR SAMPLE HAS BEEN CHECKED PRIOR TO SUBMITTAL AND THAT IT COMPLIES

IN ALL RESPECTS WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS AND PHYSICAL SPACE LIMITATIONS FOR THE PROJECT.

AT THE COMPLETION OF THE PROJECT TWO (2) BOUND BOOKLETS EACH CONTAINING ONE COPY OF ALL DIVISION 15 AND 16 SUBMITTALS FOR THE PROJECT SHALL BE PREPARED BY THE CONTRACTOR AS OPERATIONS AND MAINTENANCE MANUALS. ONE BOOKLET SHALL BE PROVIDED TO THE TENANT'S REPRESENTATIVE AND ONE BOOKLET SHALL BE PROVIDED TO THE LANDLORD'S REPRESENTATIVE.

1. ENGINEERING SITE REVIEWS MAY BE PERFORMED AT VARIOUS STAGES OF CONSTRUCTION. THE CONTRACTOR SHALL FURNISH A CONSTRUCTION SCHEDULE AND TIMELY UPDATES TO THE ENGINEER TO ALLOW ENGINEERING QUALITY ASSURANCE

2. THE CONTRACTOR SHALL PROVIDE AT LEAST ONE (1) WEEKS NOTICE TO THE ENGINEER PRIOR TO THE START OF CEILING TILE INSTALLATION AND THE COMPLETION OF THE MEP

MECHANICAL SYSTEM GENERAL NOTES:

A. GENERAL REQUIREMENTS:

1. ALL NEW RECTANGULAR DUCTWORK SHALL BE OF THE LOW PRESSURE TYPE (+ OR - 2 INCHES W.G., 2500 FPM, SEAL CLASS "A") CONSTRUCTED OF LOCK FORMING GALVANIZED STEEL IN ACCORDANCE WITH THE "DUCT MANUAL AND SHEET METAL CONSTRUCTION FOR VENTILATING AND AIR CONDITIONING SYSTEMS," FIRST EDITION 1985, PUBLISHED BY THE "SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION, INC. (SMACNA). VOLUME DAMPERS SHALL BE PROVIDED IN ALL SPIN-IN OR OTHER CONNECTIONS TO INDIVIDUAL AIR DISTRIBUTION DEVICES; DOUBLE FIN TYPE TURNING VANES SHALL BE PROVIDED IN ALL 90 DEGREE ELBOWS; EXTRACTORS SHALL BE PROVIDED AT ALL 90 DEGREE TAKE-OFFS, AND SPLITTERS SHALL BE PROVIDED AT ALL TAKE-OFFS AT LESS THAN 90 DEGREES. DUCTWORK SHALL BE HUNG AS HIGH AS POSSIBLE FROM THE BUILDING STRUCTURE WITH HANGER ASSEMBLIES IN ACCORDANCE WITH "SMACNA" REQUIREMENTS. PROVIDE ADDITIONAL RISES, DROPS, AND OFFSETS IN DUCTWORK AS REQUIRED. ALL NEW RECTANGULAR SUPPLY AND RETURN DUCTWORK SHALL BE EXTERNALLY INSULATED WITH FIBERGLASS FLEXIBLE BLANKET INSULATION HAVING A THERMAL RESISTANCE VALUE OF NOT LESS THAN R-5.6, FLAME SPREAD LESS THAN OR EQUAL TO 25, SMOKE DEVELOPED LESS THAN OR EQUAL TO 50, SECURED TO THE DUCTS WITH BENJAMIN FOSTER NO. 85-20 ADHESIVE IN 6 INCH WIDE STRIPS ON 12 INCH CENTERS UNLESS OTHERWISE NOTED. WHERE SPECIFICALLY NOTED ON THE DRAWINGS, DUCTWORK SHALL BE INTERNALLY LINED WITH 1/2 INCH, 2 POUND, FIBERGLASS, U.L. LISTED CLASS 1 WITH FLAME SPREAD LESS THAN OR EQUAL TO 25 AND SMOKE DEVELOPED LESS THAN OR EQUAL TO 50. DUCT DIMENSIONS INDICATED ARE INSIDE CLEAR DIMENSIONS. U.L. CLASSIFIED NON-COMBUSTIBLE FABRIC FLEXIBLE CONNECTORS WITH 1 INCH SLACK SHALL BE INSTALLED AT DUCT CONNECTIONS TO ALL AIR HANDLING UNITS (AHUS), FANS, AND FAN POWERED TERMINALS (FPTS).

2. ALL FLEXIBLE DUCTWORK SHALL CONSIST OF A FACTORY APPLIED FIBERGLASS INSULATION BLANKET (THERMAL RESISTANCE OF NOT LESS THAN R-5.6, FIBERGLASS, U.L. LISTED CLASS 1 WITH FLAME SPREAD LESS THAN OR EQUAL TO 25, SMOKE DEVELOPED LESS THAN OR EQUAL TO 50) WITH EXTERNAL VAPOR BARRIER JACKET AROUND A MACHINE WOUND SPIRAL ALUMINUM HELIX AND SHALL BE FLEXMASTER TYPE III EQUIVALENT IN SIZE TO THE NECK DIAMETER OF THE DIFFUSER UNLESS OTHERWISE NOTED ON THE DRAWINGS. MINIMUM FLEXIBLE DUCT BEND RADIUS OF CURVATURE SHALL BE 3 DUCT DIAMETERS, MAXIMUM LENGTH SHALL BE 8 FEET, AND NO MORE THAN THE EQUIVALENT OF TWO (2) 90 DEGREE BENDS WILL BE ACCEPTABLE.

3. ALL NEW ROUND SHEET METAL DUCTWORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH FIGURES 3-1 THROUGH 3-5 AND TABLE 3-2 OF THE "SMACNA" MANUAL. SNAP LOCK LONGITUDINAL SEAMS AND DRAW BAND JOINT CONNECTIONS ARE NOT ACCEPTABLE. ALL NEW ROUND RIGID DUCTWORK SHALL BE EXTERNALLY INSULATED WITH FIBERGLASS BLANKET INSULATION HAVING A THERMAL RESISTANCE VALUE OF NOT LESS THAN R-5.6, FLAME SPREAD LESS THAN OR EQUAL TO 25, SMOKE DEVELOPED LESS THAN OR EQUAL TO 50, SECURED TO THE DUCTS WITH BENJAMIN FOSTER NO. 85-20 ADHESIVE IN 6 INCH WIDE STRIPS ON 12 INCH CENTERS.

4. CONTRACTOR SHALL VERIFY THAT THE LOCATION OF ALL CEILING AND WALL MOUNTED AIR DISTRIBUTION DEVICES AND THERMOSTATS ARE ACCEPTABLE TO THE ARCHITECT PRIOR TO INSTALLATION. THERMOSTAT MOUNTING HEIGHTS SHALL MATCH LIGHT SWITCH MOUNTING HEIGHTS UNLESS OTHERWISE NOTED.

5. AUTOMATIC TEMPERATURE CONTROL SYSTEM INSPECTION AND MODIFICATION SHALL BE ACCOMPLISHED BY AN AUTOMATIC TEMPERATURE CONTROL SUBCONTRACTOR ACCEPTABLE TO THE BUILDING ENGINEER. ALL EXISTING DEVICES SERVING THIS LEASE SPACE INCLUDING ROOM THERMOSTATS, DAMPER OPERATORS AND LINKAGES,

CONTROL VALVE ACTUATORS, TEMPERATURE SENSORS AND TRANSMITTERS, PE SWITCHES, ETC. SHALL BE INSPECTED TO VERIFY THAT THEY ARE PROPERLY FUNCTIONING AND IN CALIBRATION. AN INSPECTION REPORT IDENTIFYING DEFICIENCIES WHICH WOULD PREVENT THE SYSTEM FROM PROVIDING SATISFACTORY SERVICE TO THE TENANT SHALL BE PROVIDED TO THE BUILDING MANAGER AND THE ENGINEER. A COMPLETE COMPOSITE WRING DIAGRAM AND PNEUMATIC PIPING DIAGRAM FOR NEW CONTROL SYSTEMS SHOWNG ALL INTERLOCKS AND DEVICES SHALL BE PREPARED AND SUBMITTED TO THE ENGINEER FOR REVIEW. SEQUENCES OF OPERATION SHALL BE AS SPECIFIED ON THE DRAWINGS

6. SOME DIFFUSERS AND FLEXIBLE DUCT CONNECTIONS TO ZONE DUCTWORK ARE SHOWN ON THE DRAWINGS AS EXISTING TO REMAIN. UNLESS OTHERWISE NOTED, AIR BALANCE EACH DIFFUSER TO THE CFM SHOWN ON THE DRAWINGS. CONTRACTOR SHALL VERIFY THAT EACH DIFFUSER EXISTS AND MEETS THE BASE BUILDING OR TENANT SPECIFICATION REQUIREMENTS FOR THE INDICATED TYPE OF DIFFUSER AND SHALL PAINT DAMAGED FINISHES, REPAIR DAMAGED DIFFUSERS, DUCTWORK OR CONNECTIONS, AND SHALL REPLACE THOSE ELEMENTS DAMAGED BEYOND REPAIR. REPLACEMENT, REINSTALLATION, OR REPAIR OF DIFFUSERS, SHALL BE INCLUDED IN THE RASE BID. REINSTALLATION, OR REPAIR OF DIFFUSERS SHALL BE INCLUDED IN THE BASE BID.

7. AFTER ALL AIR SYSTEMS ARE INSTALLED, EACH SUPPLY AIR OUTLET AND EXHAUST AIR INLET SHALL BE AIR BALANCED TO WITHIN 10 PERCENT OF THE CFM SHOWN WITH AIR PATTERNS SET AS INDICATED ON THE DRAWINGS. SUPPLY AIR OUTLETS AND EXHAUST AIR INLETS SHALL INITIALLY BE PROPORTIONALLY BALANCED USING AN ANALOG READING SHORT RIDGE FLOWHOOD (DIGITAL READING FLOWHOODS ARE NOT ACCEPTABLE). FINAL ZONE AIR QUANTITIES SHALL BE SET USING ZONE DUCT TRAVERSES OR PROPERLY CALIBRATED AIR FLOW SENSING DEVICES PERMANENTLY INSTALLED IN THE DUCT SYSTEM. AFTER OCCUPANCY THE AIR BALANCE CONTRACTOR SHALL ADJUST OUTLET AIR FLOWS TO ACHIEVE OCCUPANCY THE AIR BALANCE CONTRACTOR SHALL ADJUST OUTLET AIR FLOWS TO ACHIEVE OCCUPANT COMFORT IN EACH AREA. FAN RPMS AND ZONE DAMPERS SHALL BE ADJUSTED AND SHEAVES SHALL BE REPLACED AS REQUIRED TO ACHIEVE AIR BALANCE. ALL ZONES OR PORTIONS THEREOF SERVING OTHER SPACES AND WHICH MAY BE AFFECTED BY THE PROJECT SHALL BE TRAVERSED PRIOR TO CONSTRUCTION. THE FINAL AIR BALANCE SHALL RESTORE THESE AIR QUANTITIES. BEFORE AND AFTER AIR QUANTITIES SHALL BE LISTED IN THE AIR BALANCE REPORT. NEBB OR AABC CERTIFIED AIR BALANCE CONTRACTORS WHICH ARE ACCEPTABLE TO THE LANDLORD AND ENGINEER SHALL BE USED. WRITCH AIR BALANCE REPORT SHALL BE BOOMED TO THE ENCINEER SHALL BE USED. WRITTEN AIR BALANCE REPORTS SHALL BE PROVIDED TO THE ENGINEER AND THE LANDLORD'S REPRESENTATIVE.

8. AIR IS RETURNED TO THE AIR HANDLING UNITS THROUGH BASE BUILDING STANDARD 2'X2' AND 2'X4' LIGHTING FIXTURE SIDE SLOTS AND LAMP CAVITIES AND ARCHITECTURAL RETURN SLOTS. ALL FLUORESCENT LIGHTING FIXTURE SIDE SLOTS AND TENANT ARCHITECTURAL SLOTS NOT USED FOR SUPPLY SHALL BE OPEN FOR RETURN AIR UNLESS OTHERWISE NOTED.

9. CONDENSATE AND AUXILIARY DRAIN PIPING SHALL BE SCHEDULE 40 GALVANIZED STEEL OR ASTM B88-72 TYPE "L" HARD DRAWN COPPER WITH ASTM B32-76 GRADE 95TA IIN-ANTIMONY SOLDERED JOINTS. CONDENSATE DRAINS ABOVE FINISHED CEILINGS SH BE INSULATED WITH 1/2 INCH, ASTM C547, GLASS FIBER PIPE INSULATION WITH VAPOR BARRIER JACKET SECURED WITH FOSTER 85-75. PROVIDE PROTECTION BLOCKING AND SHIELDS AT EACH HANGER. ALL JOINTS SHALL BE FINISHED AND VAPOR SEALED WITH FOSTER 30-35 AND REINFORCED WITH 20X20 GLASS FABRIC

10. <u>SUBMITTAL REQUIREMENTS:</u> - DIVISION 15 PRODUCTS, PROCESSES, AND MATERIALS TO BE INCLUDED IN THE SUBMITTAL PACKAGE SHALL INCLUDE THE FOLLOWING, WHERE THE LISTED ITEM IS REQUIRED FOR THE INSTALLATION OF THE MECHANICAL SYSTEMS SHOWN ON THE DRAWINGS:

a) AIR WATER BALANCE REPORTS (REPORT FORMS SHALL BE SUBMITTED PRIOR TO CONSTRUCTION AND SHALL INCLUDED PROPOSED CONTRACTOR NAME). b) AIR DISTRIBUTION DEVICES (GRILLES, REGISTERS, AND DIFFUSERS).

A FLEXIBLE DUCTWORK d) THERMAL INSULATION.

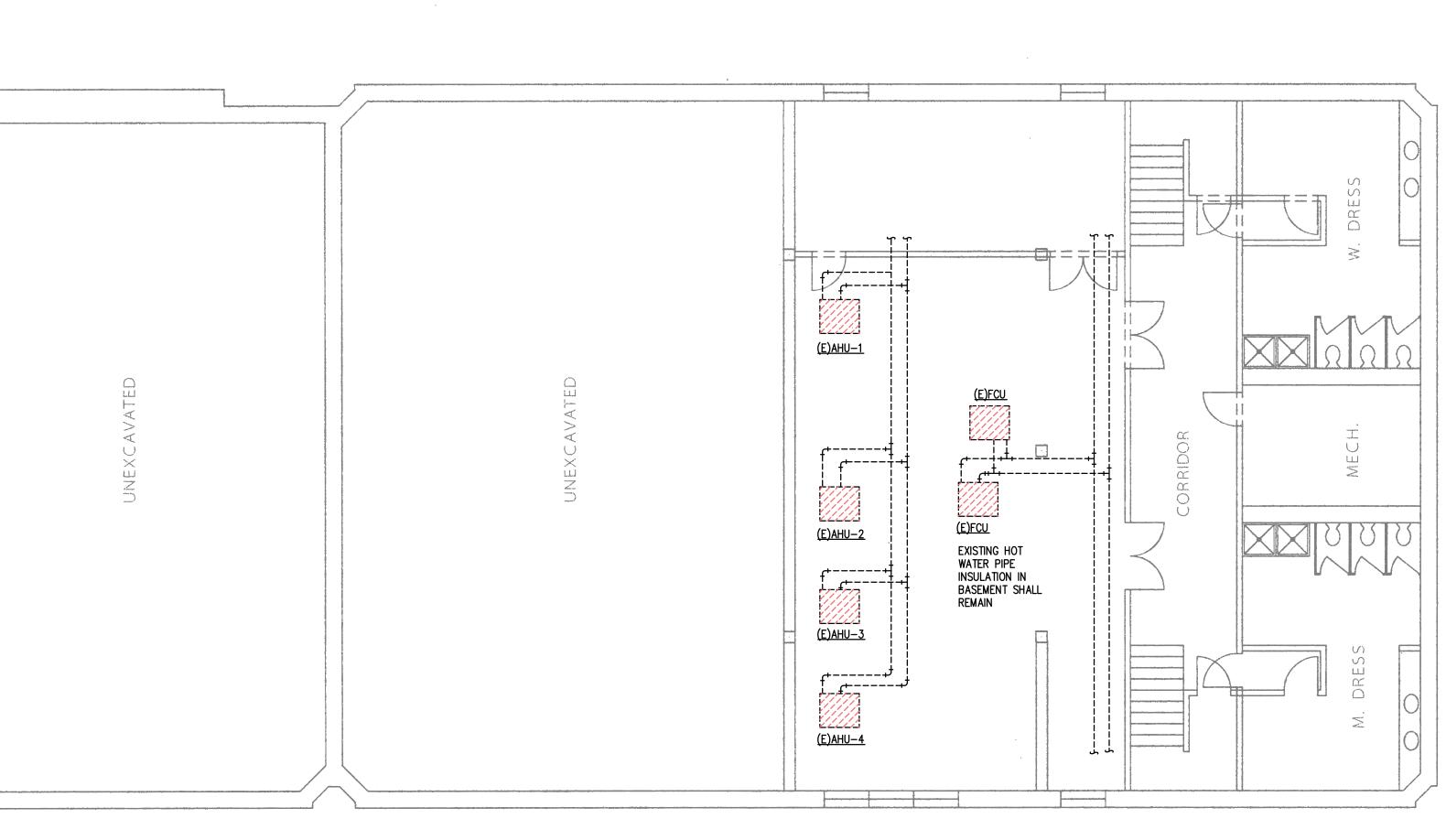
AIR HANDLING UNITS AND AIR CONDITIONING UNITS. f) AUTOMATIC TEMPERATURE CONTROLS.

g) OTHER ITEMS AS REQUIRED BY THE DRAWINGS.

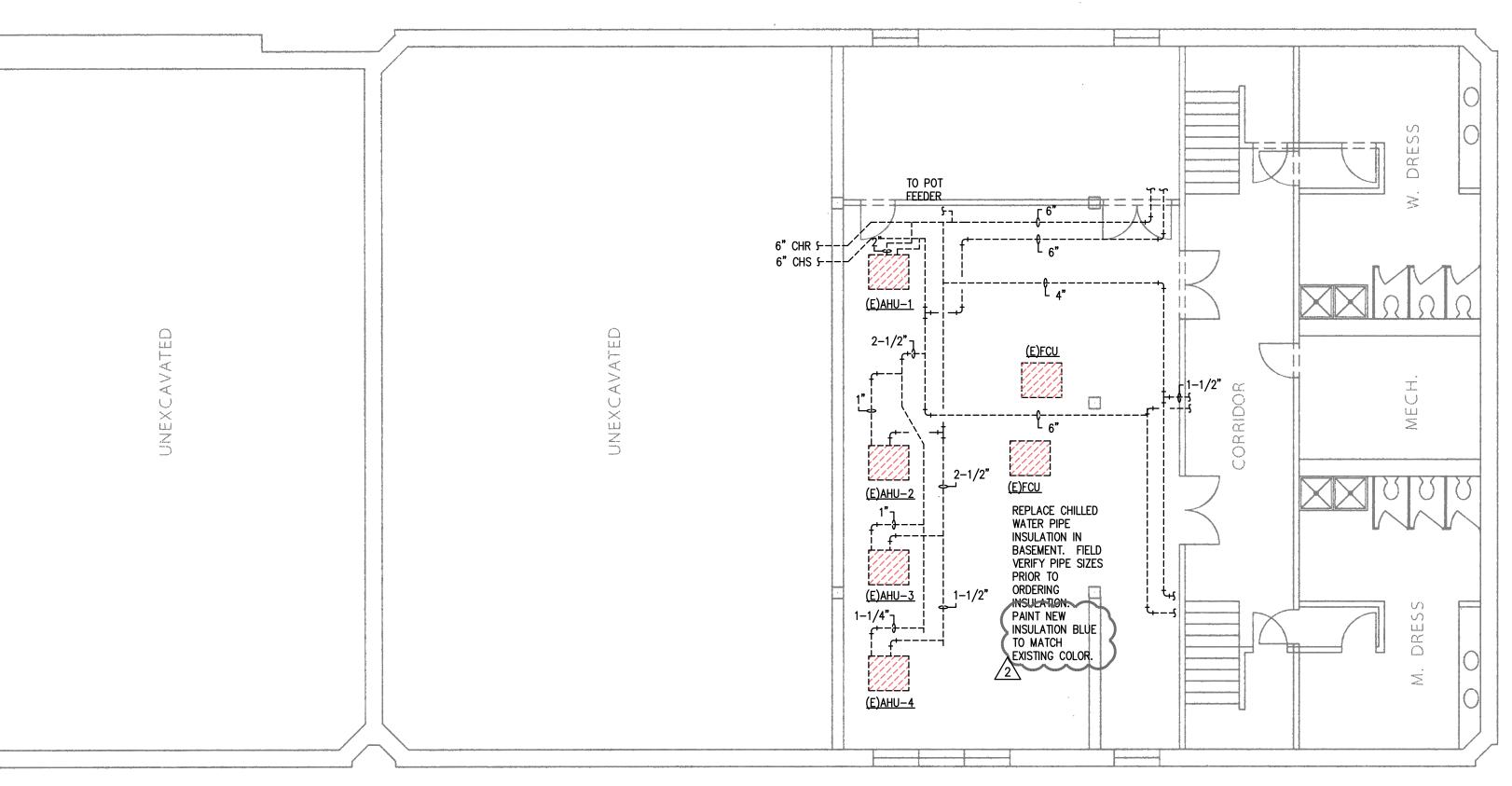
	lgend	OF MECH	ANICAL	SYMBOLS			
	MBOL		SYMBOL	DESCRIPTION			
	CHWS —	SUPPLY					
	SCHWS-	WATER SUPPLY					
		RETURN	<u> </u>	FLOW SWITCH		l.	
		WATER RETURN					
	cws —	SUPPLY		WITH GAGE COCK			1919 DECATUR
	CWR -	RETURN		FIRE DAMPER TYPE			HOUSTON, TEXAS
	HWS —	SUPPLY		A OR B WITH ACCESS DOOR. COMBINATION MANUAL			713.850.0400T
	HHWS —	HOT WATER SUPPLY	$-X^{\bullet}$	W/ACCESS DOOR			7 1 0.0 0 0.0 4 1 11
	HWR —	RETURN	$\vdash X \frown$	(MOTORIZED)			and the second sec
		HOT WATER RETURN	⊢X—	ACCESS DOOR			A STATE OF THE REAL
	5	AUTOMATIC AIR VENT	<b>⊢</b> ————————————————————————————————————				
	<b>X</b>		$\vdash X -$	COMBINATION			81655
				DAMPER TYPE B			CISTER A
	┋		<u></u>	ELBOW WITH			Millin
	<b>■</b>			TURNING VANES			11 MAY ISM
		BASKET TYPE		EXTRACTOR WITH			
				ADJUSTABLE OPERATOR			
	╇╧┥			SPLITTER DAMPER SUPPLY DUCT.			
		NON-SLAM SPRING		VIEW INTO DUCT RETURN OR EXHAUST			
		OPERATED CHECK		VIEW INTO DUCT SUPPLY DUCT.			
				VIEW HEEL OF ELBOW RETURN OR EXHAUST.			
				VIEW HEEL OF ELBOW			
		3-WAY CONTROL					
		STRAIGHT THROUGH		SQUARE TO ROUND			
	<u> </u>			1			BUILDING AS-BUILTS
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HOT WATER BASEMENT MECHANICAL PLAN 1/8"=1'-0" APPROX.



1CHILLED WATERM203BASEMENT MECHANICAL PLAN1/8"=1'-0" APPROX.

