



HOUSTON COMMUNITY COLLEGE

HVAC REPLACEMENT AT FANNIN BUILDING

3601 FANNIN ST
HOUSTON, TEXAS
FEBRUARY 21, 2020

Prime Consultant / Engineer:

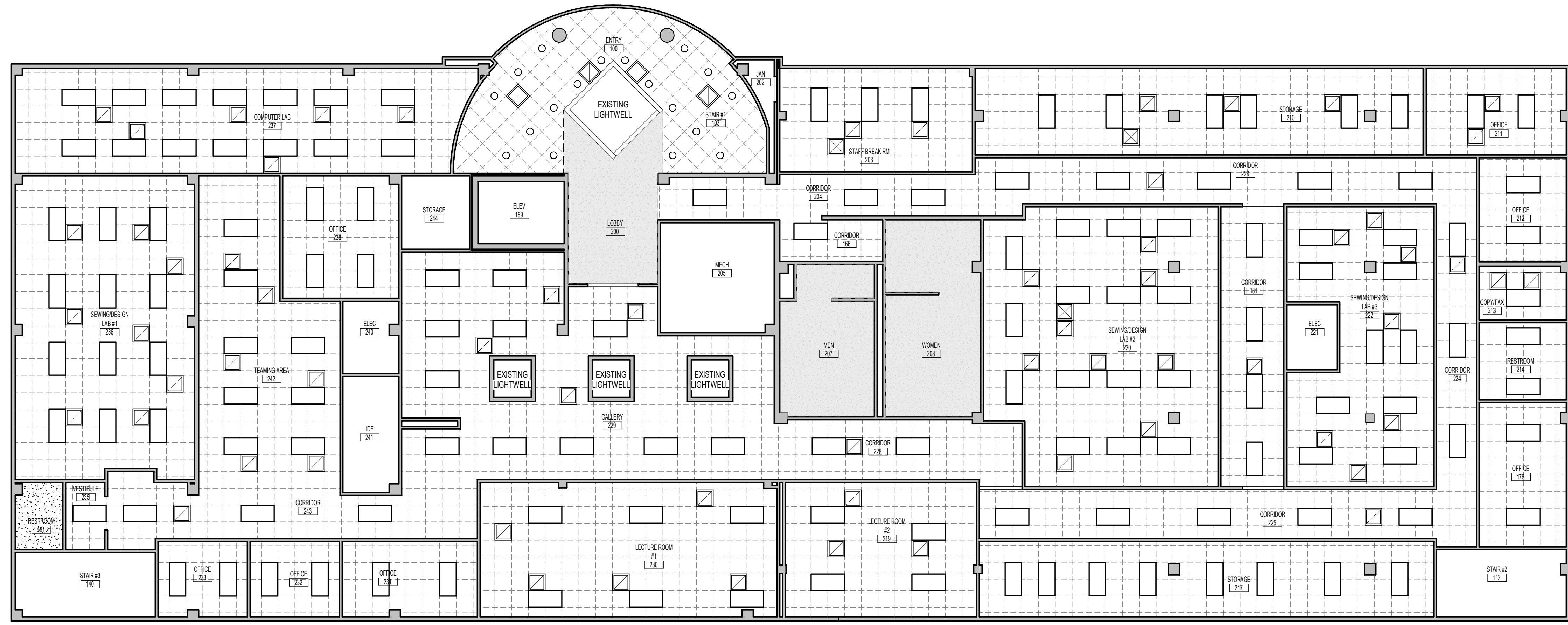
DBR

9990 Richmond Avenue
South Building, Suite 300
Houston, TX 77042
P. 713.914.0888
F. 713.914.0886
TBPE Firm Registration No. 2234

Architectural:

ERO Architects

5444 WESTHEIMER
SUITE 1000, OFFICE 1054
HOUSTON, TX 77056



2 DEMO RCP - LEVEL 2
1/8" = 1'-0"

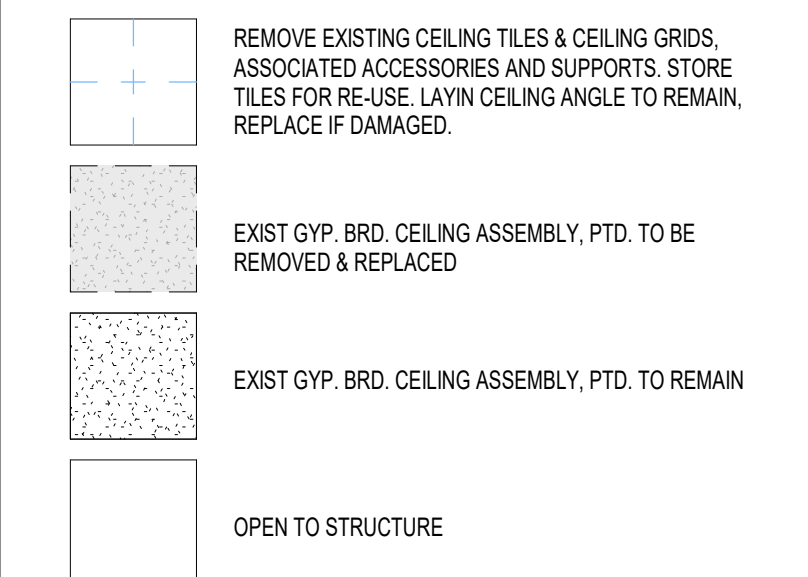


1 DEMO RCP - LEVEL 1
1/8" = 1'-0"

RCP DEMO GENERAL NOTES

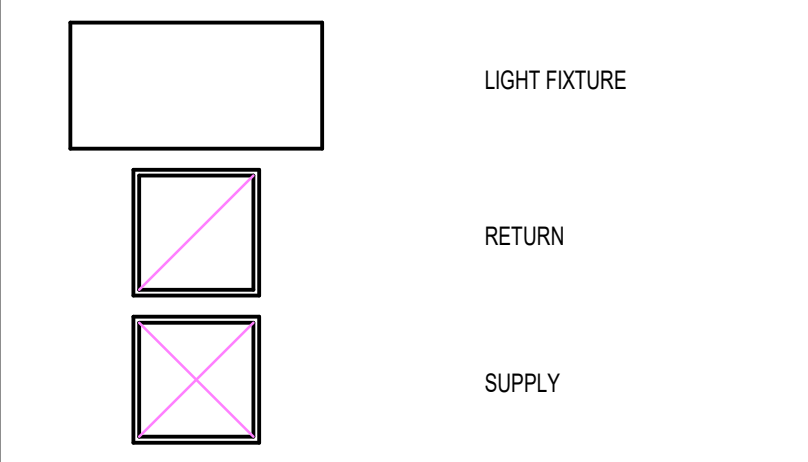
1. ALL LIGHTS IN GYP CEILINGS TO REMAIN.
2. ALL GYP. CEILINGS TO REMAIN.
3. CEILING TILE SHOULD BE REMOVED CAREFULLY AND STORED FOR RE-USE & RE-INSTALLATION.
4. ALL EXISTING LIGHTS, SUPPLIES, RETURNS, SPEAKERS, ETC. (CEILING DEVICES) TO REMAIN & RE-INSTALLED IN NEW CEILINGS, UNLESS NOTED OTHERWISE.

RCP LEGEND



NOTE:
ALL ELECTRICAL, MECHANICAL AND RISER ROOMS ARE OPEN TO STRUCTURE ABOVE. W/STRUCTURE PAINTED. U.N.O.

LEGEND



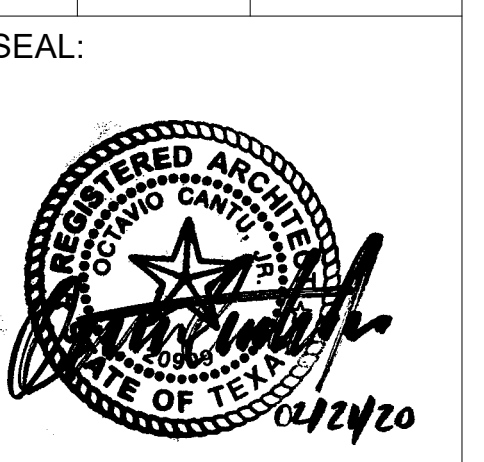
NOTE:
ALL ELECTRICAL, MECHANICAL AND RISER ROOMS ARE OPEN TO STRUCTURE ABOVE. W/STRUCTURE PAINTED. U.N.O.

713.914.0888 x 713.914.0888 f
9900 Richmond Ave., South Bldg., Suite 100
Houston, Texas 77056
TBP# Firm Registration NO. 2234



ERO
5444 Westheimer
Suite 1000, Office 1054
Houston, TX 77056

REVISION:
No. / DATE / DISCUSSION



Houston Community College System
HVAC Replacement at Fannin
Central Campus

DATE:
02/21/2020

DRAWN BY:

CHECKED BY:

PROJECT NUMBER
20004

SHEET TITLE

ARCHITECTURAL
DEMO PLANS

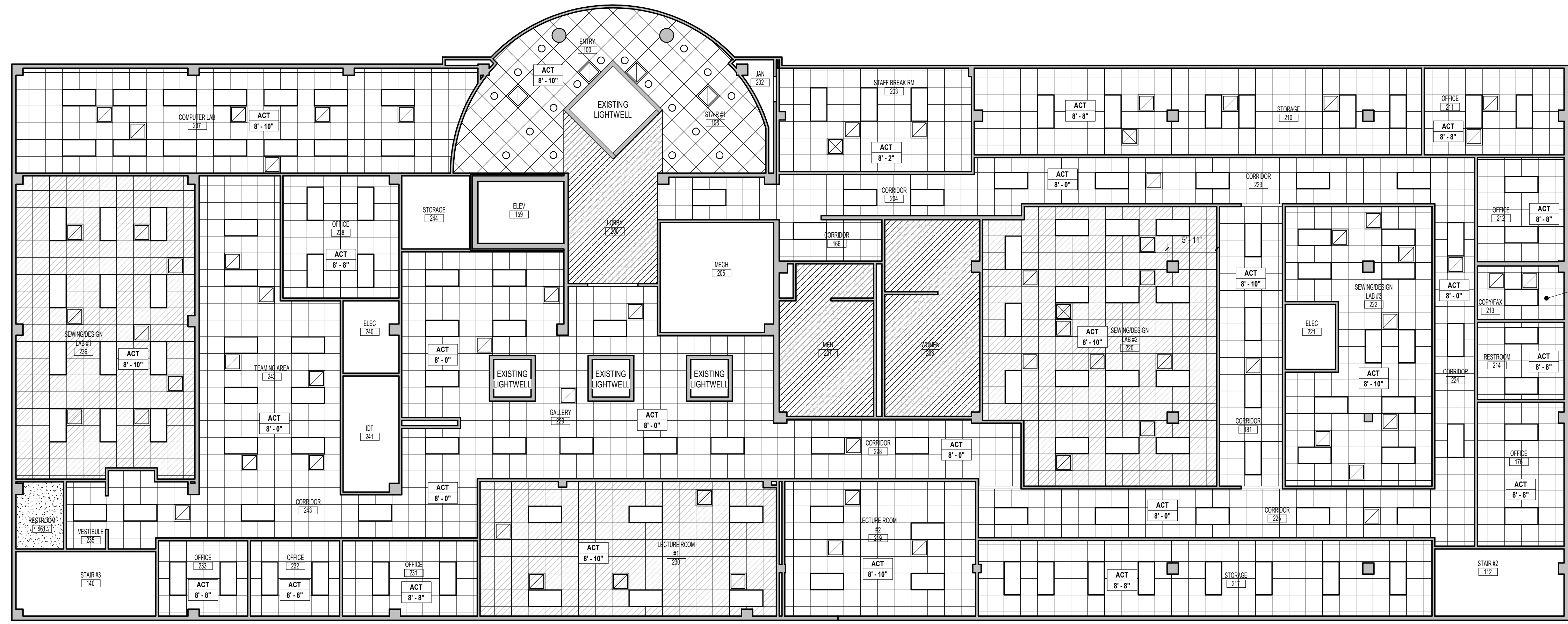
SHEET NUMBER

AD101

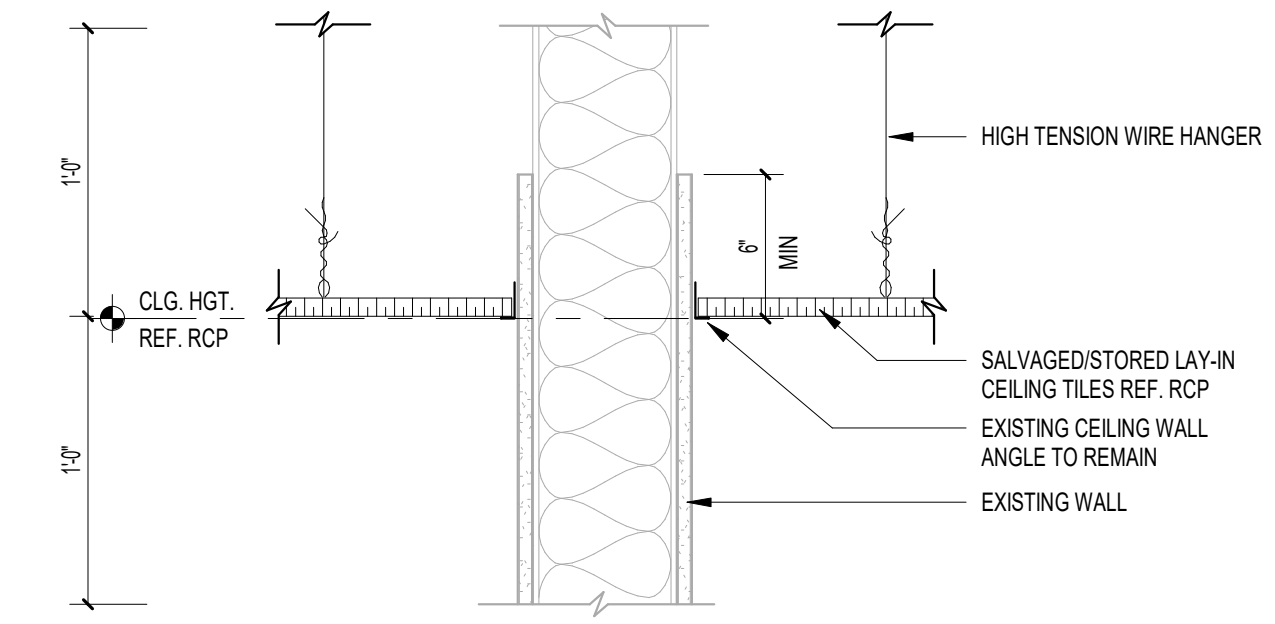
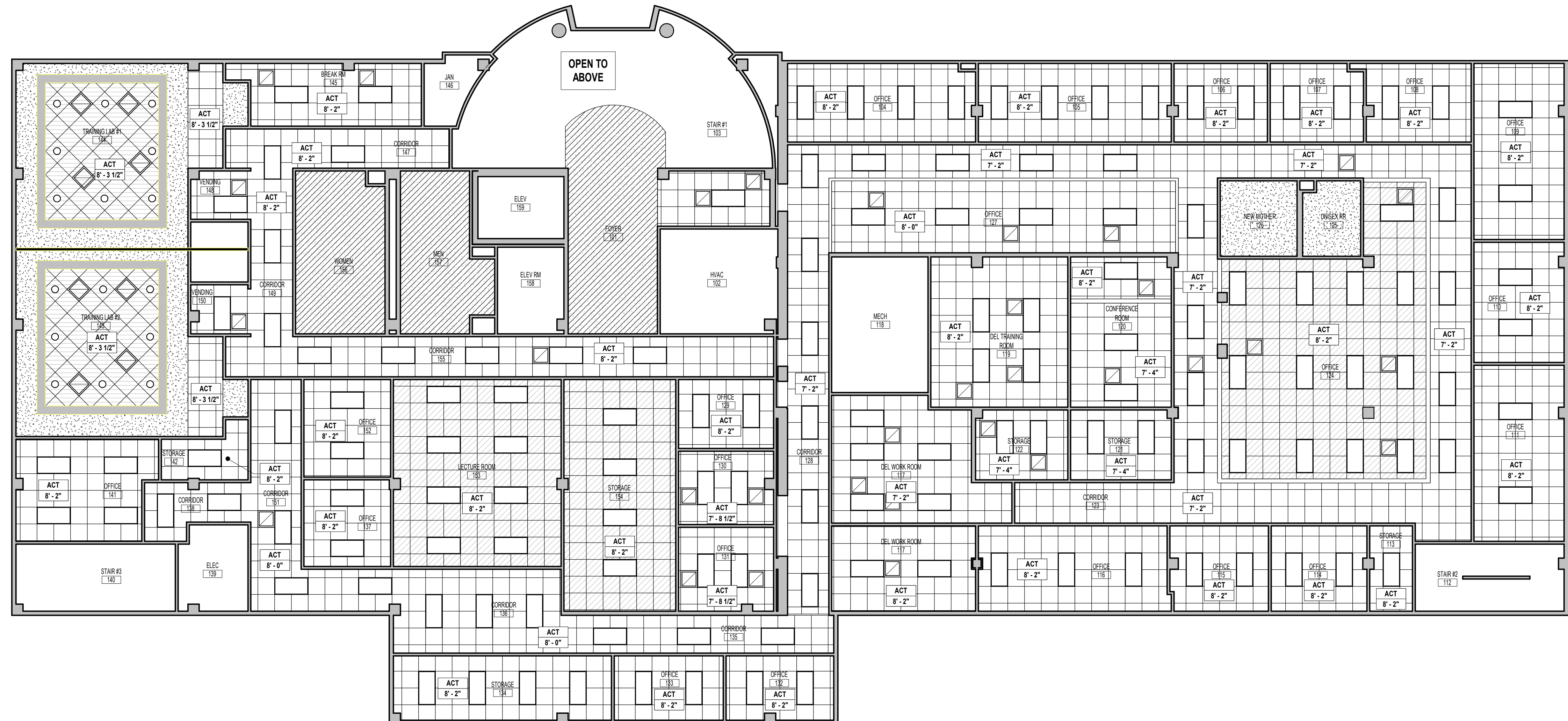


DBR Project Number 190317.000
EM | MECH | ELEC | PLBG | TECH

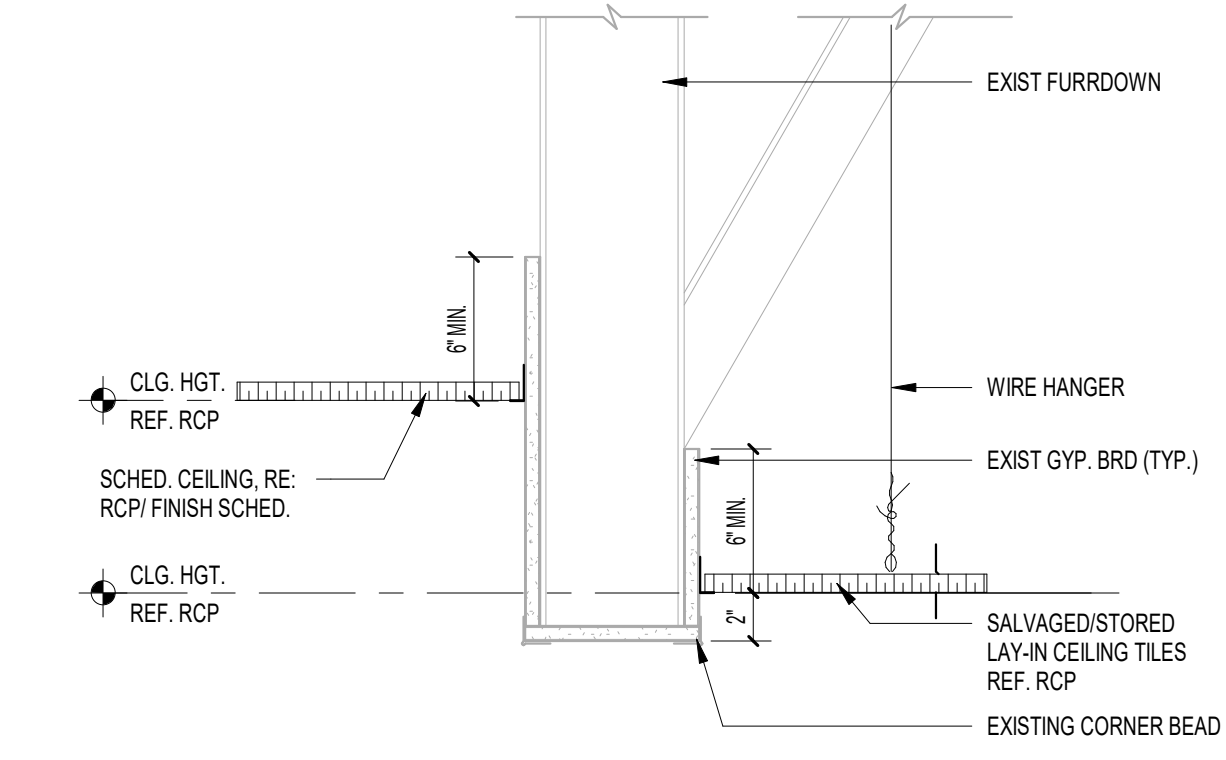
2 | RCP - LEVEL 2
1/8" = 1'-0"



1 | RCP - LEVEL 1
1/8" = 1'-0"



3 | RCP DETAIL
1 1/2" = 1'-0"

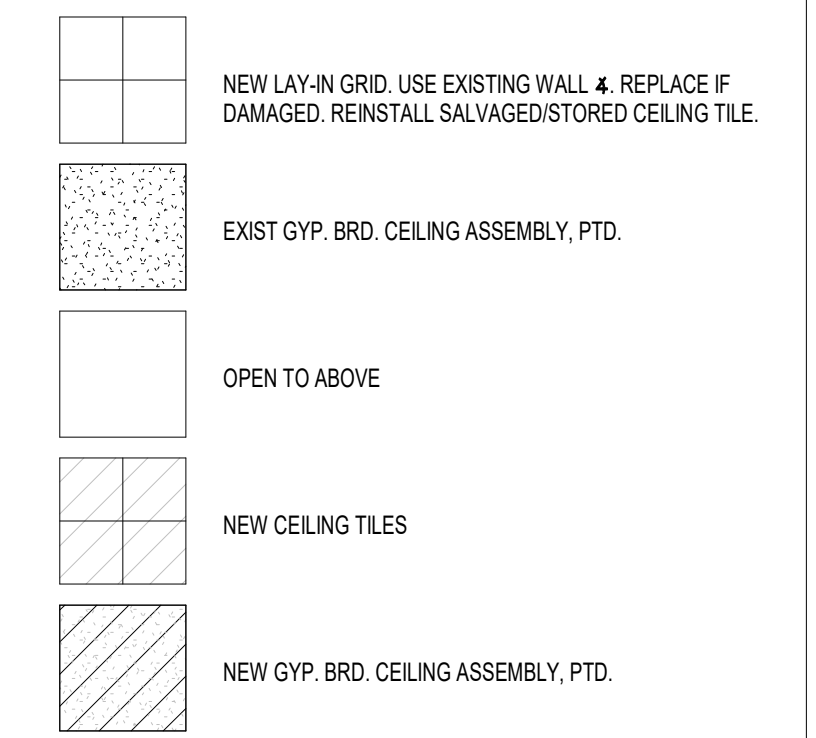


4 | RCP DETAIL - FURDOWN
1 1/2" = 1'-0"

RCP GENERAL NOTES

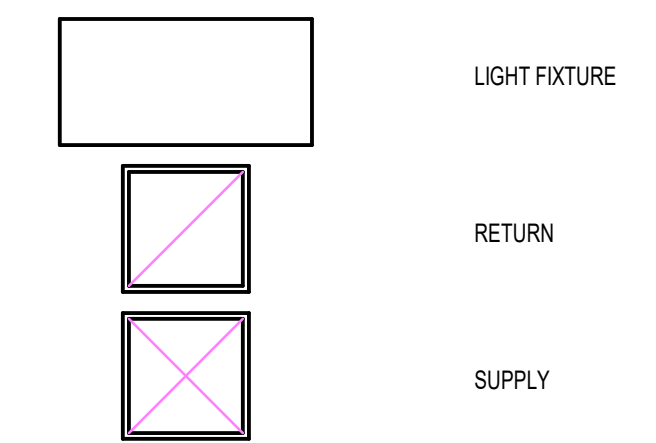
1. ALL CEILING HEIGHTS INDICATED ARE FROM FINISH FLOOR LEVEL. COORDINATE ANY MEP DISCREPANCIES W/CEILING HEIGHT PROVIDED ON RCP.
2. COORDINATE ALL LIGHTING FIXTURES, DIFFUSERS, ETC. SEE MEP DRAWINGS FOR ADDITIONAL INFORMATION, INSTRUCTIONS, NOTIFY ENGINEER IF THERE ARE ANY DISCREPANCIES.
3. SEE MEP DRAWINGS FOR SPECIFIC LIGHT FIXTURES, EXIT SIGNS, VISUAL ALARMS ETC.
4. SEE MEP DRAWINGS FOR SPECIFIC MECHANICAL DIFFUSERS.
5. LIGHT FIXTURES THAT ARE NOT THE FULL SIZE OF A CEILING PANEL SHALL BE LOCATED IN THE CENTER OF THE CEILING PANEL. COORDINATE WITH ARCHITECTURAL DRAWINGS FOR LOCATIONS AND SIZES.
6. PAINT ALL EXPOSED TO VIEW AREAS, INCLUDING STRUCTURAL MEMBERS AND MEP EQUIPMENT.
7. COORDINATE ALL CEILING MOUNTED EQUIPMENT LOCATIONS WITH OTHER TRADES.
8. CEILING GRIDS TO BE CENTERED IN ROOMS U.N.O.
9. CENTER ALL DEVICES IN CEILING PANELS, (I.E. DOWNLIGHTS, SPRINKLER HEADS, ETC) U.N.O.
10. COORDINATE ALL MECHANICAL DUCT WORK, PIPING, SPRINKLER LINES AND CABLE TRAYS TO AVOID CONFLICTS WITH LIGHT FIXTURES AND STRUCTURAL ELEMENTS.
11. PAINT ALL EXPOSED CONDUITS, JUNCTION BOXES, ELECTRICAL ITEMS (NOT FACTORY FINISHED), SPRINKLER LINES, MECHANICAL DUCTWORK, PIPING ETC. U.N.O.
12. SPRINKLER HEADS TO BE CENTERED IN TILES U.N.O., TYP.

RCP LEGEND



NOTE:
ALL ELECTRICAL, MECHANICAL, AND RISER ROOMS ARE OPEN TO STRUCTURE ABOVE, W/STRUCTURE PAINTED U.N.O.

LEGEND



NOTE:
ALL ELECTRICAL, MECHANICAL, AND RISER ROOMS ARE OPEN TO STRUCTURE ABOVE, W/STRUCTURE PAINTED U.N.O.



ERO
5444 Westheimer
Suite 1000, Office 1054
Houston, TX 77056

REVISION:
No. / DATE / DISCUSSION

SEAL:



Houston Community College System
HVAC Replacement at Fannin
Central Campus

DATE:
02/21/2020

DRAWN BY:

CHECKED BY:

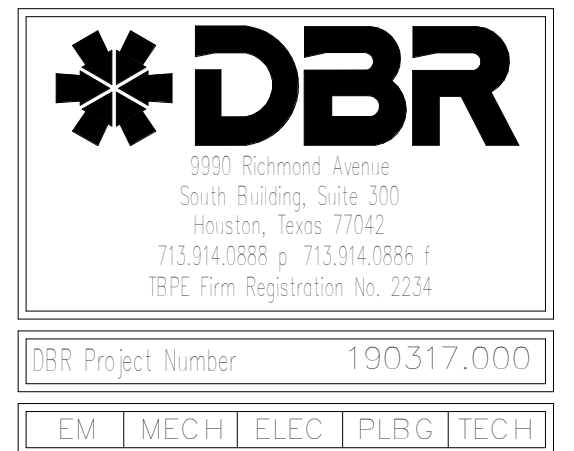
PROJECT NUMBER
20004

SHEET TITLE

REFLECTED
CEILING PLANS

SHEET NUMBER

AE101



713.914.0888 x 713.914.0888 f
5100 Westheimer Road, Suite 300
Houston, Texas 77042
TBP# Firm Registration NO. 2234

ABBREVIATIONS

Table with 2 columns: Abbreviation and Description. Section A includes items like ABV (AMPERES ABOVE), ACC (AIR COOLED CHILLER), and ACU (AIR COOLED CONDENSING UNIT).

Table with 2 columns: Abbreviation and Description. Section B includes BAS (BUILDING AUTOMATION SYSTEM), BC (BELOW COUNTER), and BKR (BREAKER).

Table with 2 columns: Abbreviation and Description. Section C includes CATV (CABLE TELEVISION SYSTEM), CTV (CLOSED CIRCUIT TELEVISION), and CWP (CONDENSER WATER PUMP).

Table with 2 columns: Abbreviation and Description. Section D includes dB (DECIBEL), DC (DIRECT CURRENT), and DDC (DIRECT DIGITAL CONTROL).

Table with 2 columns: Abbreviation and Description. Section E includes EX (EXISTING), EA (EACH), and EC (ELECTRICAL CONTRACTOR).

Table with 2 columns: Abbreviation and Description. Section F includes FAH (FAHRENHEIT), FA (FIRE ALARM), and FACP (FIRE ALARM CONTROL PANEL).

Table with 2 columns: Abbreviation and Description. Section G includes GA (GAUGE), GAL (GALLON), and GALV (GALVANIZED).

Table with 2 columns: Abbreviation and Description. Section H includes HACR (HEATING, AIR CONDITIONING RATED CIRCUIT BREAKER), HD (HAND-OPERATED DISCHARGE), and HOA (HAND-OFF-AUTOMATIC).

Table with 2 columns: Abbreviation and Description. Section I includes ID (INSIDE DIAMETER), IG (ISOLATED GROUND), and IN (INCH).

Table with 2 columns: Abbreviation and Description. Section J includes JB (JUNCTION BOX), JP (JOCKEY PUMP), and KEC (KITCHEN EQUIPMENT CONTRACTOR).

Table with 2 columns: Abbreviation and Description. Section K includes KD (KNOCKOUT), KVA (KILOVOLT-AMPS), and KW (KILOWATT).

Table with 2 columns: Abbreviation and Description. Section L includes LED (LIGHT EMITTING DIODE), LF (LINEAR FEET), and LRA (LOCKED ROTOR AMPS).

Table with 2 columns: Abbreviation and Description. Section M includes M (METER), MAP (MASTER ALARM PANEL), and MATV (MASTER ANTENNA TELEVISION SYSTEM).

Table with 2 columns: Abbreviation and Description. Section N includes NJR (NEMA 3R ENCLOSURE), N4X (NEMA 4X ENCLOSURE), and N.C. (NORMALLY CLOSED).

Table with 2 columns: Abbreviation and Description. Section O includes OAF (OUTSIDE AIR FAN), OAHU (OUTSIDE AIR HANDLING UNIT), and OC (ON CENTER).

Table with 2 columns: Abbreviation and Description. Section P includes P (POLE, PUMP), P (PUSHBUTTON), and PB (PHOTOCELL).

Table with 2 columns: Abbreviation and Description. Section Q includes QTY (QUANTITY).

Table with 2 columns: Abbreviation and Description. Section R includes R (EXISTING TO BE REMOVED), RA (RETURN AIR), and RFD (REFRIGERATED AIR DRYER).

Table with 2 columns: Abbreviation and Description. Section S includes SA (SUPPLY AIR), SAF (SUPPLY AIR FAN), and SCHED (SCHEDULE).

Table with 2 columns: Abbreviation and Description. Section T includes TC (TEMPERATURE CONTROL), TEL (TELEPHONE), and TF (TRANSFER FAN).

Table with 2 columns: Abbreviation and Description. Section U includes UG (UNDERGROUND), UH (UNIT HEATER), and UL (UNDERWRITERS LABORATORIES, INC.).

Table with 2 columns: Abbreviation and Description. Section V includes V (VOLT), VA (VOLT-AMPERE), and VAV (VARIABLE AIR VOLUME).

Table with 2 columns: Abbreviation and Description. Section W includes W (WATT, WIRE, WIDTH), W (WIRE), and W (WITH).

Table with 2 columns: Abbreviation and Description. Section X includes X (TRANSFORMER).

Table with 2 columns: Abbreviation and Description. Section Z includes Z (ZONE).

ELECTRICAL SYMBOLS

Table of electrical symbols for Motors and Controls. Includes symbols for single or three phase motor, electric duct heater, disconnect switch, and motor starter.

RECEPTACLES AND OUTLETS

Table of electrical symbols for Receptacles and Outlets. Includes symbols for simplex wall receptacle, duplex wall receptacle, duplex receptacle on a circuit, and controlled duplex wall receptacle.

LIGHTING

Table of lighting symbols and descriptions. Includes symbols for 2' x 4' lighting fixture, 2' x 2' lighting fixture, 1' x 4' lighting fixture, and various types of downlight fixtures.

RACEWAYS AND WIRING

Table of raceway and wiring symbols. Includes symbols for cap and stake, emergency conduit, exposed conduit, and homerun to panel.

ELECTRICAL EQUIPMENT

Table of electrical equipment symbols. Includes symbols for distribution panel, switchboard, floor mounted transformer, and automatic transfer switch.

COMMUNICATIONS

Table of communications symbols. Includes symbols for school intercommunication system handset, microphone floor outlet, and ceiling mounted speaker.

ONE LINE AND RISER DIAGRAMS

Table of one line and riser diagram symbols. Includes symbols for transformer, circuit breaker, fuse, shunt trip, and ground fault relay.

GENERAL NOTES: A NOT ALL SYMBOLS SHOWN ON THIS SYMBOL LIST ARE USED IN THE CONTRACT DOCUMENTS.

Table of miscellaneous symbols and notes. Includes notes on shaded symbols, drawing note reference, and symbols for time switch, photocell, and push button.

FIRE ALARM

Table of fire alarm symbols and notes. Includes symbols for water flow switch, supervisory switch, smoke detector, and heat detector.

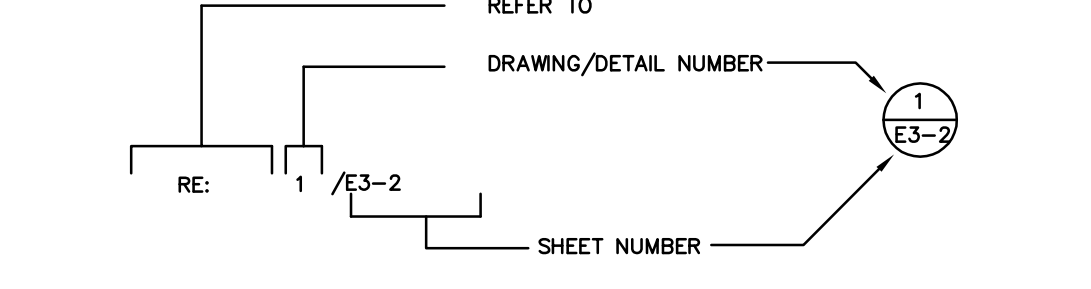
SECURITY

Table of security symbols and notes. Includes symbols for keypad, glass break sensor, hold up button, and intercom door station.

SWITCHES

Table of switch symbols and notes. Includes symbols for switch, dimmer control switch, three-way key switch, and motor rated switch.

DRAWING/DETAIL REFERENCE KEY



GENERAL NOTES

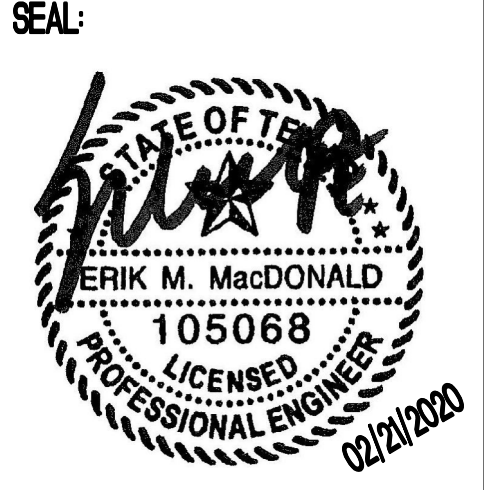
NOT ALL SYMBOLS SHOWN ON THIS SYMBOL LIST ARE USED IN THE CONTRACT DOCUMENTS.



5444 Westheimer Suite 1000, Office 1054 Houston, TX 77056

REVISION No. / DATE / DESCRIPTION

Table with 3 columns: No., DATE, DESCRIPTION. Shows revision 02/21/2020 for 100X CD.



Houston Community College System HVAC Replacement at Fannin Central Campus

DATE: 02/06/2020

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER: 190317.000

SHEET TITLE

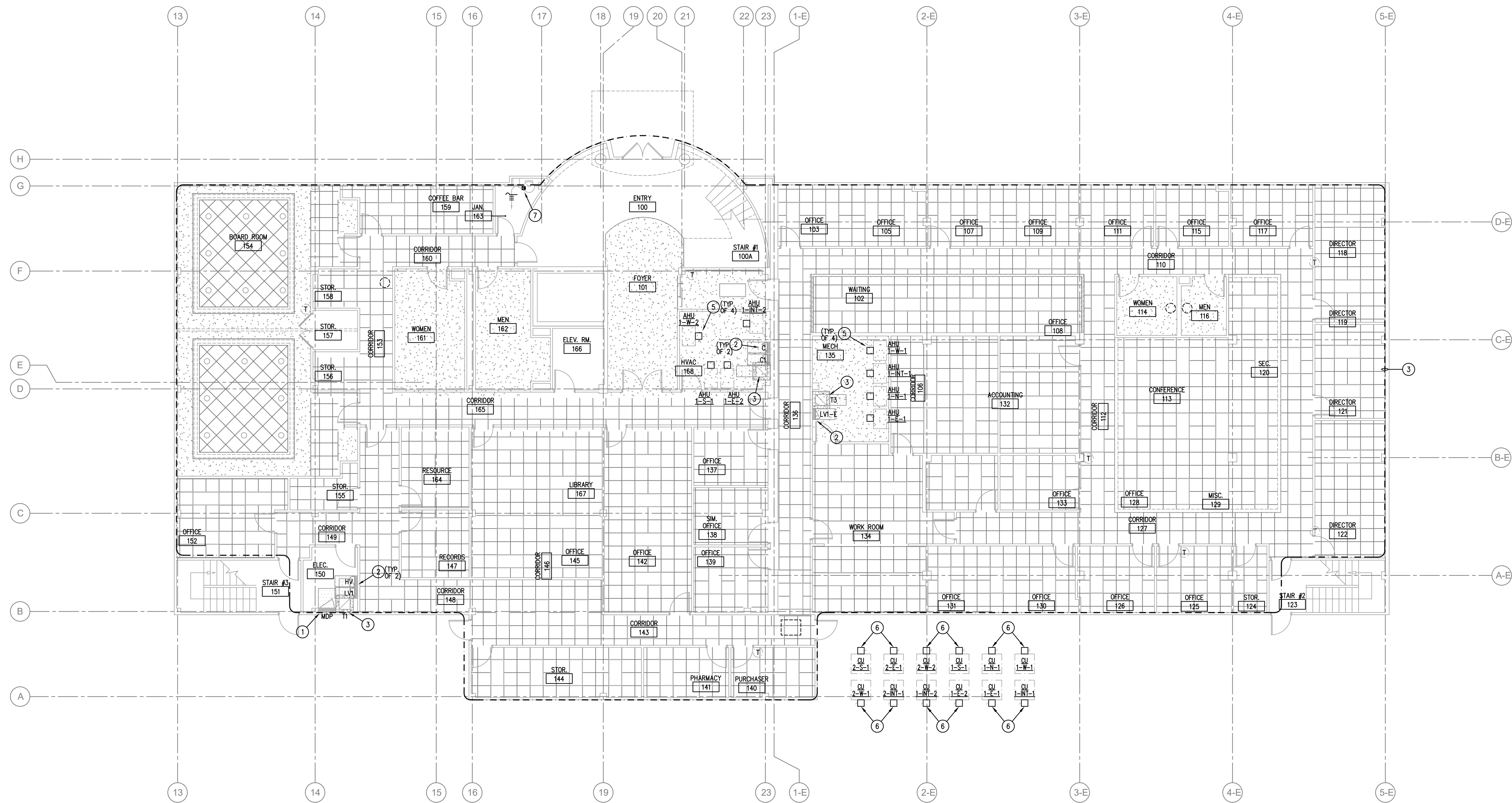
ELECTRICAL SYMBOLS AND ABBREVIATIONS

SHEET NUMBER

E001



DBR Project Number 190317.000



1 LEVEL 1 ELECTRICAL DEMO PLAN
 E101 1/8"=1'-0"

GENERAL ELECTRICAL REMODELING NOTES:

- A. IT IS THE CONTRACTOR'S RESPONSIBILITY TO HAVE VERIFIED EXISTING JOB-SITE CONDITIONS DURING THE BIDDING PERIOD TO OBTAIN THE SCOPE OF ELECTRICAL WORK INVOLVED AS A RESULT OF ARCHITECTURAL MODIFICATIONS TO THE EXISTING STRUCTURE. THE SCOPE OF WORK SHALL INCLUDE MATERIALS AND OUTLETS, CONSISTING OF FIXTURES, DEVICES, EQUIPMENT OR APPARATUS, WHICH MUST BE REROUTED, RELOCATED OR REMOVED EITHER TEMPORARILY OR PERMANENTLY, OR WHICH MUST BE PROVIDED, SO THAT THE INDICATED REMODELING MAY BE ACCOMPLISHED. NOT ALL EXISTING OUTLETS ARE NECESSARILY INDICATED ON THE DRAWINGS.
- B. WHEN OUTLETS ARE ABANDONED, WIRE MUST BE PULLED OUT OF THE CONDUIT BACK TO THE NEAREST REMAINING BOX OR CABINET. EXPOSED CONDUIT THAT HAS BEEN ABANDONED MUST BE REMOVED.
- C. RE-ESTABLISH SERVICE TO ALL OUTLETS THAT MAY BE INTERRUPTED DUE TO REMODELING WORK.
- D. PROVIDE ALL APPURTENANCES REQUIRED TO REROUTE, RELOCATE, REMOVE OR REINSTALL ALL ITEMS DESCRIBED IN THESE NOTES.
- E. VERIFY THE LOADING OF EACH CIRCUIT AFFECTED BY REMODELING WORK. THE MAXIMUM LOAD OF ANY BRANCH CIRCUIT MUST NOT EXCEED BOX OR ITS BREAKER RATING.
- F. REMOVE ALL OUTLETS AND WIRING ASSOCIATED WITH ALL EQUIPMENT BEING REMOVED, INCLUDING MECHANICAL AND PLUMBING EQUIPMENT.
- G. ALL EXISTING LIGHT FIXTURES TO BE RELOCATED MUST BE CLEANED, RELAMPED AS REQUIRED AND TOUCHED UP WITH PAINT. ALL DAMAGED PARTS MUST BE REPLACED. THE FIXTURES SHALL THEN BE REINSTALLED AS REQUIRED. PROVIDE NEW BALLAST AS REQUIRED.
- H. ALL ELECTRICAL OUTLET COVER PLATES SHALL BE LABELED WITH PANEL AND CIRCUIT NUMBER.
- K. CIRCUIT NUMBERS ARE FOR PLAN REFERENCE ONLY, CONTRACTOR SHALL FIELD VERIFY ACTUAL NUMBERS AND UPDATE PANEL DIRECTORIES.
- L. TYPICAL VOICE/DATA OUTLET. ELECTRICAL CONTRACTOR TO PROVIDE SINGLE GANG WALL BOX WITH 1" EMPTY CONDUIT WITH FULLSTRING FROM WALL BOX TO ABOVE CEILING. VOICE/DATA CABLING, FACEPLATE AND INSERTS PROVIDED AND INSTALLED BY OTHERS. TYPICAL UNLESS NOTED OTHERWISE.
- M. EXISTING CIRCUIT BREAKERS VACATED DUE TO REMODELING WORK SHALL REMAIN AS SPARE BREAKERS.
- N. EXISTING CONDUITS ROUTED IN CORRIDORS SHALL BE REMOVED AND RELOCATED TO FACILITATE THE INSTALLATION OF NEW DUCTWORK INCLUDING BUT NOT LIMITED TO 600V CIRCUITS, FIRE ALARM, DATA, ETC.
- O. CONTRACTOR SHALL TEST EXISTING CONDUIT FOR CONTINUITY OF THE GROUNDING SYSTEM. NOTE CONDUIT IS USED AS THE GROUNDING PATH. TEST SHALL BE LESS THAN 5 OHMS. IF ANY TEST IS HIGHER PROVIDE IN WRITING TO ENGINEER OF RECORD.

ELECTRICAL KEYED NOTES:

1. EXISTING MAIN DISTRIBUTION PANEL SHALL REMAIN.
2. EXISTING PANELBOARD SHALL REMAIN.
3. EXISTING TRANSFORMER SHALL REMAIN.
4. ELECTRICAL CONTRACTOR SHALL REMOVE AND SALVAGE ALL EXISTING LIGHTING FIXTURES AND CEILING MOUNTED ELECTRICAL AND FIRE ALARM DEVICES, PA AND SECURITY DEVICES WITHIN THIS AREA DUE TO HVAC SYSTEM IMPROVEMENT.
5. EXISTING AIR HANDLING UNIT SHALL BE DEMOLISHED. ELECTRICAL CONTRACTOR SHALL DISCONNECT CIRCUIT, REMOVE DISCONNECT AND PULL WIRING AND CONDUIT BACK TO ASSOCIATED PANELBOARD. CIRCUITS MADE AVAILABLE DUE TO HVAC EQUIPMENT REMOVAL SHALL REMAIN AS SPARE, UNLESS NOTED OTHERWISE.
6. EXISTING CONDENSING UNIT SHALL BE DEMOLISHED. ELECTRICAL CONTRACTOR SHALL DISCONNECT CIRCUIT, REMOVE DISCONNECT AND PULL WIRING AND CONDUIT BACK TO ASSOCIATED PANELBOARD. CIRCUITS MADE AVAILABLE DUE TO HVAC EQUIPMENT REMOVAL SHALL REMAIN AS SPARE, UNLESS NOTED OTHERWISE.
7. ELECTRICAL WATER HEATER SHALL BE DEMOLISHED AND REPLACED WITH NEW ELECTRICAL CONTRACTOR SHALL DISCONNECT WATER HEATER AND PULL WIRING AND CONDUIT BACK TO ASSOCIATED DISCONNECT SWITCH. FEEDER SHALL BE REUSED.



ERO
 5444 Westheimer
 Suite 1000, Office 1054
 Houston, TX 77056

REVISION	No.	DATE	DESCRIPTION
	02/21/2020	100% CD	



Houston Community College System
HVAC Replacement at Fannin
 Central Campus

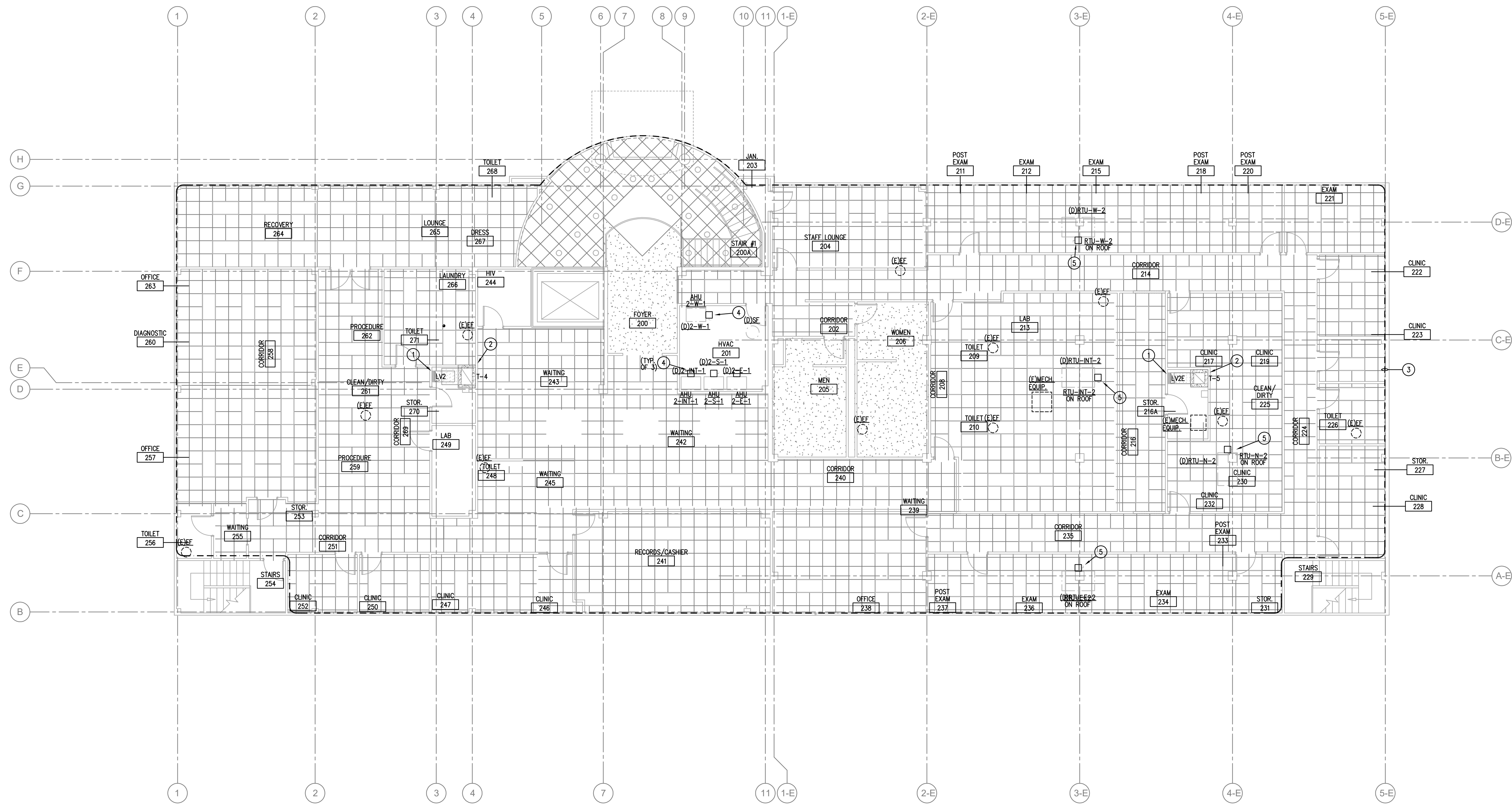
DATE:	02/06/2020
DRAWN BY:	DBR
CHECKED BY:	DBR
PROJECT NUMBER:	190317.000
SHEET TITLE:	

**LEVEL 1
 ELECTRICAL
 DEMO PLAN**

SHEET NUMBER:

E101

DBR Project Number 190317.000
 E M MECH ELEC PLBG TECH



1 LEVEL 2 ELECTRICAL DEMO PLAN
 E102 1/8"=1'-0"

GENERAL ELECTRICAL REMODELING NOTES:

- A. IT IS THE CONTRACTOR'S RESPONSIBILITY TO HAVE VERIFIED EXISTING JOB-SITE CONDITIONS DURING THE BIDDING PERIOD TO OBTAIN THE SCOPE OF ELECTRICAL WORK INVOLVED AS A RESULT OF ARCHITECTURAL MODIFICATIONS TO THE EXISTING STRUCTURE. THE SCOPE OF WORK SHALL INCLUDE MATERIALS AND OUTLETS, CONSISTING OF FIXTURES, DEVICES, EQUIPMENT OR APPARATUS, WHICH MUST BE REROUTED, RELOCATED OR REMOVED EITHER TEMPORARILY OR PERMANENTLY, OR WHICH MUST BE PROVIDED, SO THAT THE INDICATED REMODELING MAY BE ACCOMPLISHED. NOT ALL EXISTING OUTLETS ARE NECESSARILY INDICATED ON THE DRAWINGS.
- B. WHEN OUTLETS ARE ABANDONED, WIRE MUST BE PULLED OUT OF THE CONDUIT BACK TO THE NEAREST REMAINING BOX OR CABINET. EXPOSED CONDUIT THAT HAS BEEN ABANDONED MUST BE REMOVED.
- C. RE-ESTABLISH SERVICE TO ALL OUTLETS THAT MAY BE INTERRUPTED DUE TO REMODELING WORK.
- D. PROVIDE ALL APPURTENANCES REQUIRED TO REROUTE, RELOCATE, REMOVE OR REINSTALL ALL ITEMS DESCRIBED IN THESE NOTES.
- E. VERIFY THE LOADING OF EACH CIRCUIT AFFECTED BY REMODELING WORK. THE MAXIMUM LOAD OF ANY BRANCH CIRCUIT MUST NOT EXCEED BOX OF ITS BREAKER RATING.
- F. REMOVE ALL OUTLETS AND WIRING ASSOCIATED WITH ALL EQUIPMENT BEING REMOVED, INCLUDING MECHANICAL AND PLUMBING EQUIPMENT.
- G. ALL EXISTING LIGHT FIXTURES TO BE RELOCATED MUST BE CLEANED, RELAMPED AS REQUIRED AND TOUCHED UP WITH PAINT. ALL DAMAGED PARTS MUST BE REPLACED. THE FIXTURES SHALL THEN BE REINSTALLED AS REQUIRED. PROVIDE NEW BALLAST AS REQUIRED.
- H. ALL ELECTRICAL OUTLET COVER PLATES SHALL BE LABELED WITH PANEL AND CIRCUIT NUMBER.
- I. CIRCUIT NUMBERS ARE FOR PLAN REFERENCE ONLY, CONTRACTOR SHALL FIELD VERIFY ACTUAL NUMBERS AND UPDATE PANEL DIRECTORIES.
- J. TYPICAL VOICE/DATA OUTLET. ELECTRICAL CONTRACTOR TO PROVIDE SINGLE GANG WALL BOX WITH 1" EMPTY CONDUIT WITH FULLSTRING FROM WALL BOX TO ABOVE CEILING. VOICE/DATA CABLE, FACEPLATE AND INSERTS PROVIDED AND INSTALLED BY OTHERS. TYPICAL UNLESS NOTED OTHERWISE.
- K. EXISTING CIRCUIT BREAKERS VACATED DUE TO REMODELING WORK SHALL REMAIN AS SPARE BREAKERS.
- L. EXISTING CONDUITS ROUTED IN CORRIDORS SHALL BE REMOVED AND RELOCATED TO FACILITATE THE INSTALLATION OF NEW DUCTWORK INCLUDING BUT NOT LIMITED TO 600V CIRCUITS, FIRE ALARM, DATA, ETC.
- M. CONTRACTOR SHALL TEST EXISTING CONDUIT FOR CONTINUITY OF THE GROUNDING SYSTEM. NOTE CONDUIT IS USED AS THE GROUNDING PATH. TEST SHALL BE LESS THAN 5 OHMS. IF ANY TEST IS HIGHER PROVIDED IN WRITING TO ENGINEER OF RECORD.

ELECTRICAL KEYED NOTES:

1. EXISTING PANELBOARD SHALL REMAIN.
2. EXISTING TRANSFORMER SHALL REMAIN.
3. ELECTRICAL CONTRACTOR SHALL REMOVE AND SALVAGE ALL EXISTING LIGHTING FIXTURES AND CEILING MOUNTED ELECTRICAL AND FIRE ALARM DEVICES, PA AND SECURITY DEVICES WITHIN THIS AREA DUE TO HVAC SYSTEM IMPROVEMENT.
4. EXISTING AIR HANDLING UNIT SHALL BE DEMOLISHED. ELECTRICAL CONTRACTOR SHALL DISCONNECT CIRCUIT, REMOVE DISCONNECT AND PULL WIRING AND CONDUIT BACK TO ASSOCIATED PANELBOARD. CIRCUITS MADE AVAILABLE DUE TO HVAC EQUIPMENT REMOVAL SHALL REMAIN AS SPARE, UNLESS NOTED OTHERWISE.
5. EXISTING ROOF TOP UNIT SHALL BE DEMOLISHED. ELECTRICAL CONTRACTOR SHALL DISCONNECT CIRCUIT, REMOVE DISCONNECT AND PULL WIRING AND CONDUIT BACK TO ASSOCIATED PANELBOARD. CIRCUITS MADE AVAILABLE DUE TO HVAC EQUIPMENT REMOVAL SHALL REMAIN AS SPARE, UNLESS NOTED OTHERWISE.



ERO
 5444 Westheimer
 Suite 1000, Office 1054
 Houston, TX 77056

REVISION:

No.	DATE	DESCRIPTION
02/21/2020	100% CD	

SEAL:



Houston Community College System
HVAC Replacement at Fannin
 Central Campus

DATE:	02/06/2020
DRAWN BY:	DBR
CHECKED BY:	DBR
PROJECT NUMBER:	190317.000
SHEET TITLE:	

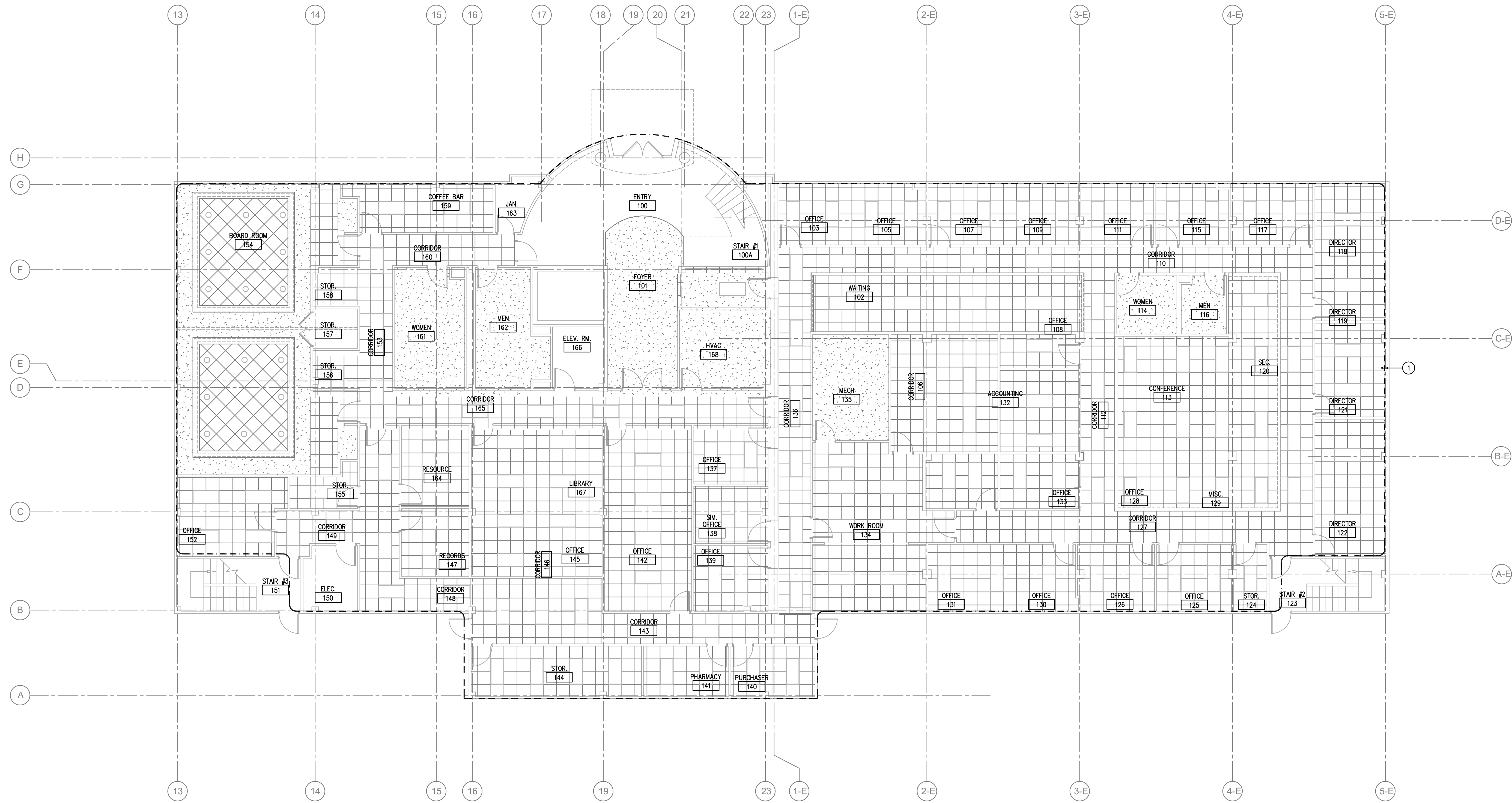
**LEVEL 2
 ELECTRICAL
 DEMO PLAN**

SHEET NUMBER:

E102

DBR
 8990 Richmond Avenue
 South Building, Suite 300
 Houston, Texas 77042
 713.914.0888 f 713.914.0888 f
 TBP Firm Registration No. 2234

DBR Project Number 190317.000
 EM | MECH | ELEC | PLBG | TECH



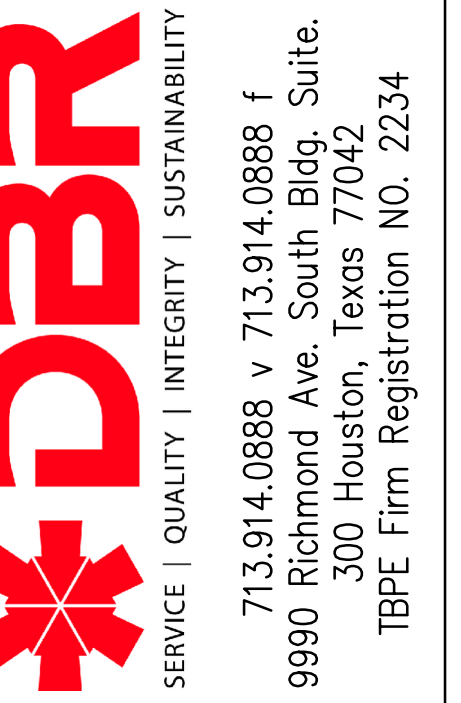
1 LEVEL 1 LIGHTING PLAN
EL201 1/8"=1'-0"

GENERAL ELECTRICAL REMODELING NOTES:

- A. IT IS THE CONTRACTOR'S RESPONSIBILITY TO HAVE VERIFIED EXISTING JOB-SITE CONDITIONS DURING THE BIDDING PERIOD TO OBTAIN THE SCOPE OF ELECTRICAL WORK INVOLVED AS A RESULT OF ARCHITECTURAL MODIFICATIONS TO THE EXISTING STRUCTURE. THE SCOPE OF WORK SHALL INCLUDE MATERIALS AND OUTLETS, CONSISTING OF FIXTURES, DEVICES, EQUIPMENT OR APPARATUS, WHICH MUST BE REROUTED, RELOCATED OR REMOVED EITHER TEMPORARILY OR PERMANENTLY, OR WHICH MUST BE PROVIDED, SO THAT THE INDICATED REMODELING MAY BE ACCOMPLISHED. NOT ALL EXISTING OUTLETS ARE NECESSARILY INDICATED ON THE DRAWINGS.
- B. WHEN OUTLETS ARE ABANDONED, WIRE MUST BE PULLED OUT OF THE CONDUIT BACK TO THE NEAREST REMAINING BOX OR CABINET. EXPOSED CONDUIT THAT HAS BEEN ABANDONED MUST BE REMOVED.
- C. RE-ESTABLISH SERVICE TO ALL OUTLETS THAT MAY BE INTERRUPTED DUE TO REMODELING WORK.
- D. PROVIDE ALL APPURTENANCES REQUIRED TO REROUTE, RELOCATE, REMOVE OR REINSTALL ALL ITEMS DESCRIBED IN THESE NOTES.
- E. VERIFY THE LOADING OF EACH CIRCUIT AFFECTED BY REMODELING WORK. THE MAXIMUM LOAD OF ANY BRANCH CIRCUIT MUST NOT EXCEED BOX OF ITS BREAKER RATING.
- F. REMOVE ALL OUTLETS AND WIRING ASSOCIATED WITH ALL EQUIPMENT BEING REMOVED, INCLUDING MECHANICAL AND PLUMBING EQUIPMENT.
- G. ALL EXISTING LIGHT FIXTURES TO BE RELOCATED MUST BE CLEANED, RELAMPED AS REQUIRED AND TOUCHED UP WITH PAINT. ALL DAMAGED PARTS MUST BE REPLACED. THE FIXTURES SHALL THEN BE REINSTALLED AS REQUIRED. PROVIDE NEW BALLAST AS REQUIRED.
- H. ALL ELECTRICAL OUTLET COVER PLATES SHALL BE LABELED WITH PANEL AND CIRCUIT NUMBER.
- K. CIRCUIT NUMBERS ARE FOR PLAN REFERENCE ONLY, CONTRACTOR SHALL FIELD VERIFY ACTUAL NUMBERS AND UPDATE PANEL DIRECTORIES.
- L. TYPICAL VOICE/DATA OUTLET. ELECTRICAL CONTRACTOR TO PROVIDE SINGLE GANG WALL BOX WITH 1" EMPTY CONDUIT WITH FULLSTRING FROM WALL BOX TO ABOVE CEILING. VOICE/DATA CABLING, FACEPLATE AND INSERTS PROVIDED AND INSTALLED BY OTHERS. TYPICAL UNLESS NOTED OTHERWISE.
- M. EXISTING CIRCUIT BREAKERS VACATED DUE TO REMODELING WORK SHALL REMAIN AS SPARE BREAKERS.
- N. EXISTING CONDUITS ROUTED IN CORRIDORS SHALL BE REMOVED AND RELOCATED TO FACILITATE THE INSTALLATION OF NEW DUCTWORK INCLUDING BUT NOT LIMITED TO 600V CIRCUITS, FIRE ALARM, DATA, ETC.
- O. CONTRACTOR SHALL TEST EXISTING CONDUIT FOR CONTINUITY OF THE GROUNDING SYSTEM. NOTE CONDUIT IS USED AS THE GROUNDING PATH. TEST SHALL BE LESS THAN 5 OHMS. IF ANY TEST IS HIGHER PROVIDE IN WRITING TO ENGINEER OF RECORD.

ELECTRICAL KEYED NOTES:

1. ELECTRICAL CONTRACTOR SHALL REINSTALL ALL EXISTING LIGHTING FIXTURES AND CEILING MOUNTED ELECTRICAL AND FIRE ALARM DEVICES, PA AND SECURITY DEVICES WITHIN THIS AREA DUE TO HVAC SYSTEM IMPROVEMENT.



ERO
5444 Westheimer
Suite 1000, Office 1054
Houston, TX 77056

REVISION:

No. / DATE / DESCRIPTION
02/21/2020 100% CD

SEAL:



Houston Community College System
HVAC Replacement at Fannin
Central Campus

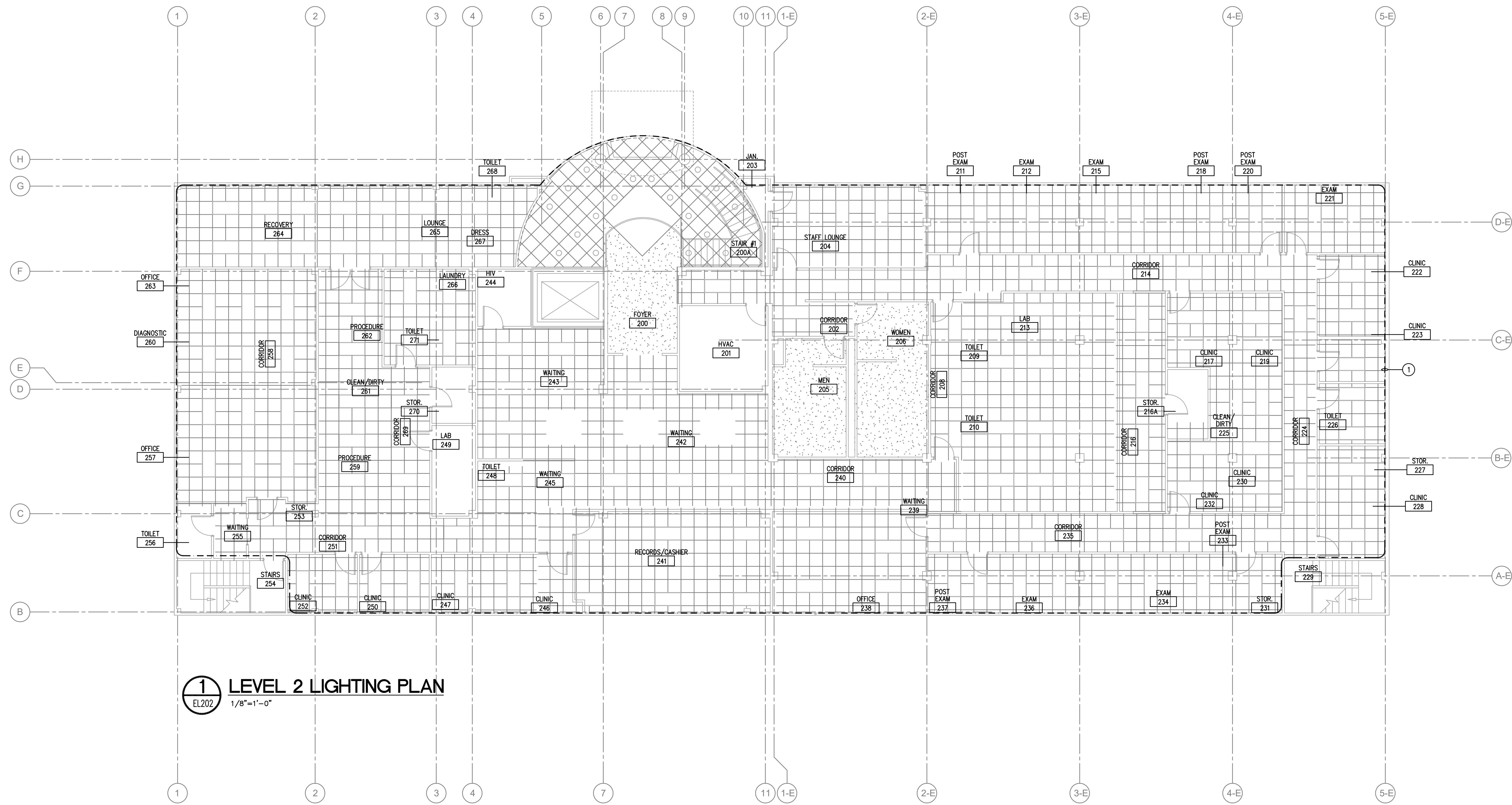
DATE: 02/06/2020
DRAWN BY: DBR
CHECKED BY: DBR
PROJECT NUMBER: 190317.000
SHEET TITLE:

ELECTRICAL LIGHTING PLAN

SHEET NUMBER:

EL201

DBR Project Number 190317.000
EM | MECH | ELEC | PLBG | TECH



1 LEVEL 2 LIGHTING PLAN
 EL202 1/8"=1'-0"

GENERAL ELECTRICAL REMODELING NOTES:

- A. IT IS THE CONTRACTOR'S RESPONSIBILITY TO HAVE VERIFIED EXISTING JOB-SITE CONDITIONS DURING THE BIDDING PERIOD TO OBTAIN THE SCOPE OF ELECTRICAL WORK INVOLVED AS A RESULT OF ARCHITECTURAL MODIFICATIONS TO THE EXISTING STRUCTURE. THE SCOPE OF WORK SHALL INCLUDE MATERIALS AND OUTLETS, CONSISTING OF FIXTURES, DEVICES, EQUIPMENT OR APPARATUS, WHICH MUST BE REROUTED, RELOCATED OR REMOVED EITHER TEMPORARILY OR PERMANENTLY, OR WHICH MUST BE PROVIDED, SO THAT THE INDICATED REMODELING MAY BE ACCOMPLISHED. NOT ALL EXISTING OUTLETS ARE NECESSARILY INDICATED ON THE DRAWINGS.
- B. WHEN OUTLETS ARE ABANDONED, WIRE MUST BE PULLED OUT OF THE CONDUIT BACK TO THE NEAREST REMAINING BOX OR CABINET. EXPOSED CONDUIT THAT HAS BEEN ABANDONED MUST BE REMOVED.
- C. RE-ESTABLISH SERVICE TO ALL OUTLETS THAT MAY BE INTERRUPTED DUE TO REMODELING WORK.
- D. PROVIDE ALL APPURTENANCES REQUIRED TO REROUTE, RELOCATE, REMOVE OR REINSTALL ALL ITEMS DESCRIBED IN THESE NOTES.
- E. VERIFY THE LOADING OF EACH CIRCUIT AFFECTED BY REMODELING WORK. THE MAXIMUM LOAD OF ANY BRANCH CIRCUIT MUST NOT EXCEED BOX OF ITS BREAKER RATING.
- F. REMOVE ALL OUTLETS AND WIRING ASSOCIATED WITH ALL EQUIPMENT BEING REMOVED, INCLUDING MECHANICAL AND PLUMBING EQUIPMENT.
- G. ALL EXISTING LIGHT FIXTURES TO BE RELOCATED MUST BE CLEANED, RELAMPED AS REQUIRED AND TOUCHED UP WITH PAINT. ALL DAMAGED PARTS MUST BE REPLACED. THE FIXTURES SHALL THEN BE REINSTALLED AS REQUIRED. PROVIDE NEW BALLAST AS REQUIRED.
- H. ALL ELECTRICAL OUTLET COVER PLATES SHALL BE LABELED WITH PANEL AND CIRCUIT NUMBER.
- K. CIRCUIT NUMBERS ARE FOR PLAN REFERENCE ONLY; CONTRACTOR SHALL FIELD VERIFY ACTUAL NUMBERS AND UPDATE PANEL DIRECTORIES.
- L. TYPICAL VOICE/DATA OUTLET. ELECTRICAL CONTRACTOR TO PROVIDE SINGLE GANG WALL BOX WITH 1" EMPTY CONDUIT WITH FULLSTRUNG FROM WALL BOX TO ABOVE CEILING. VOICE/DATA CABLEING, FACEPLATE AND INSERTS PROVIDED AND INSTALLED BY OTHERS. TYPICAL UNLESS NOTED OTHERWISE.
- M. EXISTING CIRCUIT BREAKERS VACATED DUE TO REMODELING WORK SHALL REMAIN AS SPARE BREAKERS.
- N. EXISTING CONDUITS ROUTED IN CORRIDORS SHALL BE REMOVED AND RELOCATED TO FACILITATE THE INSTALLATION OF NEW DUCTWORK INCLUDING BUT NOT LIMITED TO 600V CIRCUITS, FIRE ALARM, DATA, ETC.
- O. CONTRACTOR SHALL TEST EXISTING CONDUIT FOR CONTINUITY OF THE GROUNDING SYSTEM. NOTE CONDUIT IS USED AS THE GROUNDING PATH. TEST SHALL BE LESS THAN 5 OHMS. IF ANY TEST IS HIGHER PROVIDE IN WRITING TO ENGINEER OF RECORD.

ELECTRICAL KEYED NOTES:

- 1. ELECTRICAL CONTRACTOR SHALL REINSTALL ALL EXISTING LIGHTING FIXTURES AND CEILING MOUNTED ELECTRICAL AND FIRE ALARM DEVICES, PA AND SECURITY DEVICES WITHIN THIS AREA DUE TO HVAC SYSTEM IMPROVEMENT.



ERO
 5444 Westheimer
 Suite 1000, Office 1054
 Houston, TX 77056

REVISION:

No.	DATE	DESCRIPTION
02/21/2020	100% CD	

SEAL:



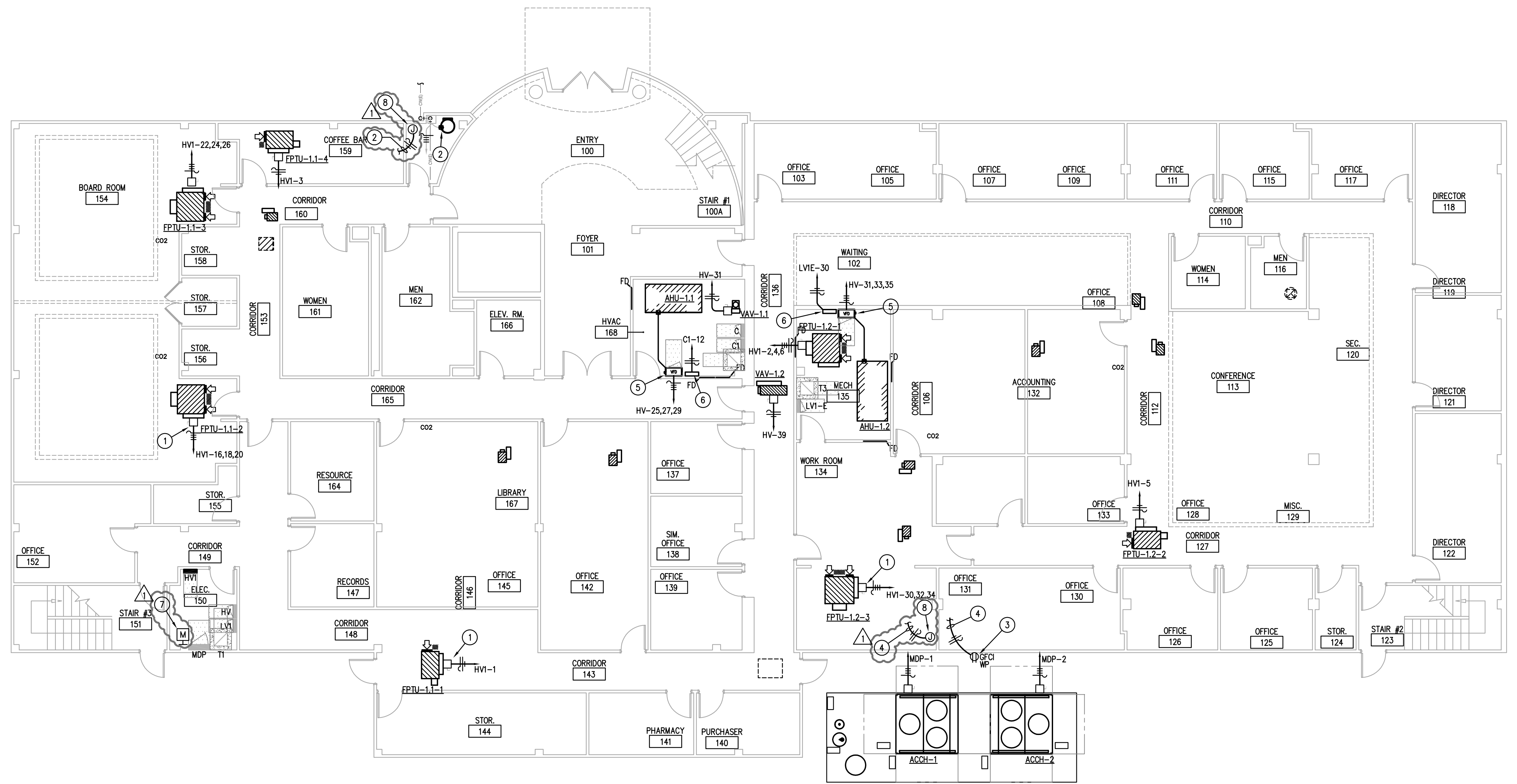
Houston Community College System
HVAC Replacement at Fannin
 Central Campus

DATE:	02/06/2020
DRAWN BY:	DBR
CHECKED BY:	DBR
PROJECT NUMBER:	190317.000
SHEET TITLE:	ELECTRICAL LIGHTING PLAN

SHEET NUMBER:

EL202

DBR Project Number 190317.000
 EM | MECH | ELEC | PLBG | TECH



D-E
C-E
B-E
A-E

GENERAL ELECTRICAL REMODELING NOTES:

- A. IT IS THE CONTRACTOR'S RESPONSIBILITY TO HAVE VERIFIED EXISTING JOB-SITE CONDITIONS DURING THE BIDDING PERIOD TO OBTAIN THE SCOPE OF ELECTRICAL WORK INVOLVED AS A RESULT OF ARCHITECTURAL MODIFICATIONS TO THE EXISTING STRUCTURE. THE SCOPE OF WORK SHALL INCLUDE MATERIALS AND OUTLETS, CONSISTING OF FIXTURES, DEVICES, EQUIPMENT OR APPARATUS, WHICH MUST BE RELOCATED, RELOCATED OR REMOVED EITHER TEMPORARILY OR PERMANENTLY, OR WHICH MUST BE PROVIDED, SO THAT THE INDICATED REMODELING MAY BE ACCOMPLISHED. NOT ALL EXISTING OUTLETS ARE NECESSARILY INDICATED ON THE DRAWINGS.
- B. WHEN OUTLETS ARE ABANDONED, WIRE MUST BE PULLED OUT OF THE CONDUIT BACK TO THE NEAREST REMAINING BOX OR CABINET. EXPOSED CONDUIT THAT HAS BEEN ABANDONED MUST BE REMOVED.
- C. RE-ESTABLISH SERVICE TO ALL OUTLETS THAT MAY BE INTERRUPTED DUE TO REMODELING WORK.
- D. PROVIDE ALL APPURTENANCES REQUIRED TO REROUTE, RELOCATE, REMOVE OR REINSTALL ALL ITEMS DESCRIBED IN THESE NOTES.
- E. VERIFY THE LOADING OF EACH CIRCUIT AFFECTED BY REMODELING WORK. THE MAXIMUM LOAD OF ANY BRANCH CIRCUIT MUST NOT EXCEED BOX OF ITS BREAKER RATING.
- F. REMOVE ALL OUTLETS AND WIRING ASSOCIATED WITH ALL EQUIPMENT BEING REMOVED, INCLUDING MECHANICAL AND PLUMBING EQUIPMENT.
- G. ALL ELECTRICAL OUTLET COVER PLATES SHALL BE LABELED WITH PANEL AND CIRCUIT NUMBER.
- H. CIRCUIT NUMBERS ARE FOR PLAN REFERENCE ONLY. CONTRACTOR SHALL FIELD VERIFY ACTUAL NUMBERS AND UPDATE PANEL DIRECTORIES.
- I. EXISTING CIRCUIT BREAKERS VACATED DUE TO REMODELING WORK SHALL REMAIN AS SPARE BREAKERS.

ELECTRICAL KEYED NOTES:

- 1. DISCONNECT PROVIDED BY MECHANICAL CONTRACTOR. WIRED AND INSTALLED BY ELECTRICAL CONTRACTOR. TYPICAL UNLESS NOTED OTHERWISE.
- 2. NEW ELECTRICAL WATER HEATER. ELECTRICAL CONTRACTOR SHALL PROVIDE ALL MATERIALS AND LABOR TO EXTEND EXISTING FEEDER PREVIOUSLY SERVING DEMOLISHED WATER HEATER AND CONNECT TO NEW WATER HEATER. FIELD COORDINATE EXACT LOCATION AND ADDITIONAL REQUIREMENTS WITH PLUMBING CONTRACTOR PRIOR PLACEMENT.
- 3. PROVIDE 20A @ 120V GFCI TYPE RECEPTACLE FOR HVAC EQUIPMENT SERVICE. FIELD COORDINATE LOCATION WITH MECHANICAL CONTRACTOR. INSTALL AT NO MORE THAN 25' FROM HVAC EQUIPMENT.
- 4. CONNECT TO EXISTING 20A @ 120V RECEPTACLE CIRCUIT SERVING THIS AREA.
- 5. VARIABLE FREQUENCY DRIVE PROVIDED BY MECHANICAL CONTRACTOR. INSTALLED AND WIRED BY ELECTRICAL CONTRACTOR. TYPICAL UNLESS NOTED OTHERWISE.
- 6. PROVIDE 120V POWER FOR DDC PANEL. FIELD COORDINATE EXACT LOCATION AND ADDITIONAL REQUIREMENTS WITH MECHANICAL CONTRACTOR PRIOR PLACEMENT.
- 7. PROVIDE NEW METER FOR MAIN DISTRIBUTION PANEL. FIELD COORDINATE EXACT LOCATION WITH ACTUAL ELECTRICAL ROOM CONDITIONS AND OTHER TRADES. REFER TO ONE LINE DIAGRAM FOR ADDITIONAL REQUIREMENTS.
- 8. 120V JUNCTION BOX CONNECTION FOR WATER METER POWER SUPPLY. FIELD COORDINATE EXACT LOCATION AND ADDITIONAL REQUIREMENTS WITH PLUMBING CONTRACTOR PRIOR TO ROUGH IN.

1 LEVEL 1 POWER PLAN
EP201 1/8"=1'-0"



ERO
5444 Westheimer
Suite 1000, Office 1054
Houston, TX 77056

REVISION	No.	DATE	DESCRIPTION
	01	02/21/2020	100% CD
	01	03/04/2020	ADDENDUM 01



Houston Community College System
HVAC Replacement at Fannin
Central Campus

DATE:	02/06/2020
DRAWN BY:	DBR
CHECKED BY:	DBR
PROJECT NUMBER:	190317.000
SHEET TITLE:	ELECTRICAL POWER PLAN

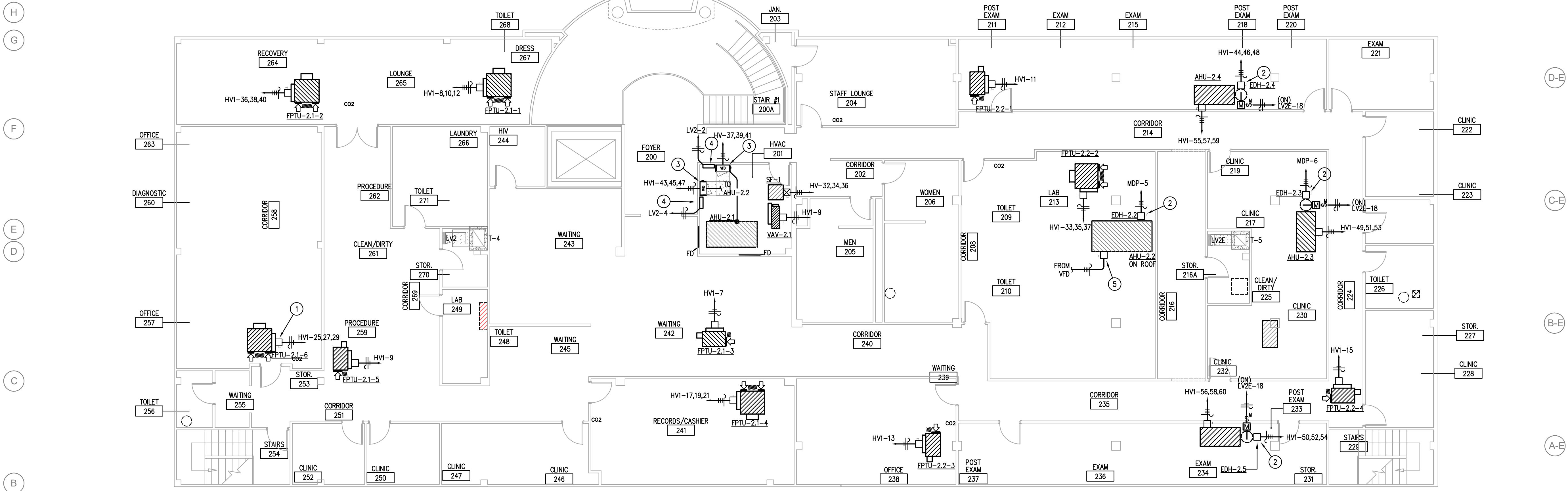
ELECTRICAL POWER PLAN

SHEET NUMBER:

EP201

DBR Project Number 190317.000
EM | MECH | ELEC | PLBG | TECH

1 2 3 4 5 6 7 8 9 10 11 1-E 2-E 3-E 4-E 5-E



1 LEVEL 2 POWER PLAN
EP202 1/8"=1'-0"

GENERAL ELECTRICAL REMODELING NOTES:

- A. IT IS THE CONTRACTOR'S RESPONSIBILITY TO HAVE VERIFIED EXISTING JOB-SITE CONDITIONS DURING THE BIDDING PERIOD TO OBTAIN THE SCOPE OF ELECTRICAL WORK INVOLVED AS A RESULT OF ARCHITECTURAL MODIFICATIONS TO THE EXISTING STRUCTURE. THE SCOPE OF WORK SHALL INCLUDE MATERIALS AND OUTLETS, CONSISTING OF FIXTURES, DEVICES, EQUIPMENT OR APPARATUS, WHICH MUST BE RELOCATED, RELOCATED OR REMOVED EITHER TEMPORARILY OR PERMANENTLY, OR WHICH MUST BE PROVIDED, SO THAT THE INDICATED REMODELING MAY BE ACCOMPLISHED. NOT ALL EXISTING OUTLETS ARE NECESSARILY INDICATED ON THE DRAWINGS.
- B. WHEN OUTLETS ARE ABANDONED, WIRE MUST BE PULLED OUT OF THE CONDUIT BACK TO THE NEAREST REMAINING BOX OR CABINET. EXPOSED CONDUIT THAT HAS BEEN ABANDONED MUST BE REMOVED.
- C. RE-ESTABLISH SERVICE TO ALL OUTLETS THAT MAY BE INTERRUPTED DUE TO REMODELING WORK.
- D. PROVIDE ALL APPURTENANCES REQUIRED TO REROUTE, RELOCATE, REMOVE OR REINSTALL ALL ITEMS DESCRIBED IN THESE NOTES.
- E. VERIFY THE LOADING OF EACH CIRCUIT AFFECTED BY REMODELING WORK. THE MAXIMUM LOAD OF ANY BRANCH CIRCUIT MUST NOT EXCEED BOX OF ITS BREAKER RATING.
- F. REMOVE ALL OUTLETS AND WIRING ASSOCIATED WITH ALL EQUIPMENT BEING REMOVED, INCLUDING MECHANICAL AND PLUMBING EQUIPMENT.
- G. ALL ELECTRICAL OUTLET COVER PLATES SHALL BE LABELED WITH PANEL AND CIRCUIT NUMBER.
- H. CIRCUIT NUMBERS ARE FOR PLAN REFERENCE ONLY. CONTRACTOR SHALL FIELD VERIFY ACTUAL NUMBERS AND UPDATE PANEL DIRECTORIES.
- I. EXISTING CIRCUIT BREAKERS VACATED DUE TO REMODELING WORK SHALL REMAIN AS SPARE BREAKERS.

ELECTRICAL KEYED NOTES:

- 1. DISCONNECT PROVIDED BY MECHANICAL CONTRACTOR. WREED AND INSTALLED BY ELECTRICAL CONTRACTOR. TYPICAL UNLESS NOTED OTHERWISE.
- 2. PROVIDE 30A/3P/NF/N1 SAFETY DISCONNECT FOR ELECTRICAL DUCT HEATER. FIELD COORDINATE EXACT LOCATION WITH MECHANICAL CONTRACTOR PRIOR PLACEMENT.
- 3. VARIABLE FREQUENCY DRIVE PROVIDED BY MECHANICAL CONTRACTOR. INSTALLED AND WREED BY ELECTRICAL CONTRACTOR. TYPICAL UNLESS NOTED OTHERWISE.
- 4. PROVIDE 120V POWER FOR DDC PANEL. FIELD COORDINATE EXACT LOCATION AND ADDITIONAL REQUIREMENTS WITH MECHANICAL CONTRACTOR PRIOR PLACEMENT.
- 5. PROVIDE 30A/3P/NF/N4X DISCONNECT SWITCH WITH EARLY BREAK AUXILIARY CONTACTS. FIELD COORDINATE EXACT LOCATION WITH MECHANICAL CONTRACTOR PRIOR PLACEMENT. ROUTE AND ADDITIONAL 3/4" CONDUIT WITH CONTROL WIRING TO ASSOCIATED VARIABLE FREQUENCY DRIVE. COORDINATE CONTROL WIRING WITH MECHANICAL CONTRACTOR.



ERO
5444 Westheimer
Suite 1000, Office 1054
Houston, TX 77056

REVISION

No.	DATE	DESCRIPTION
02/21/2020	100% CD	



Houston Community College System
HVAC Replacement at Fannin
Central Campus

DATE: 02/06/2020
DRAWN BY: DBR
CHECKED BY: DBR
PROJECT NUMBER: 190317.000
SHEET TITLE:

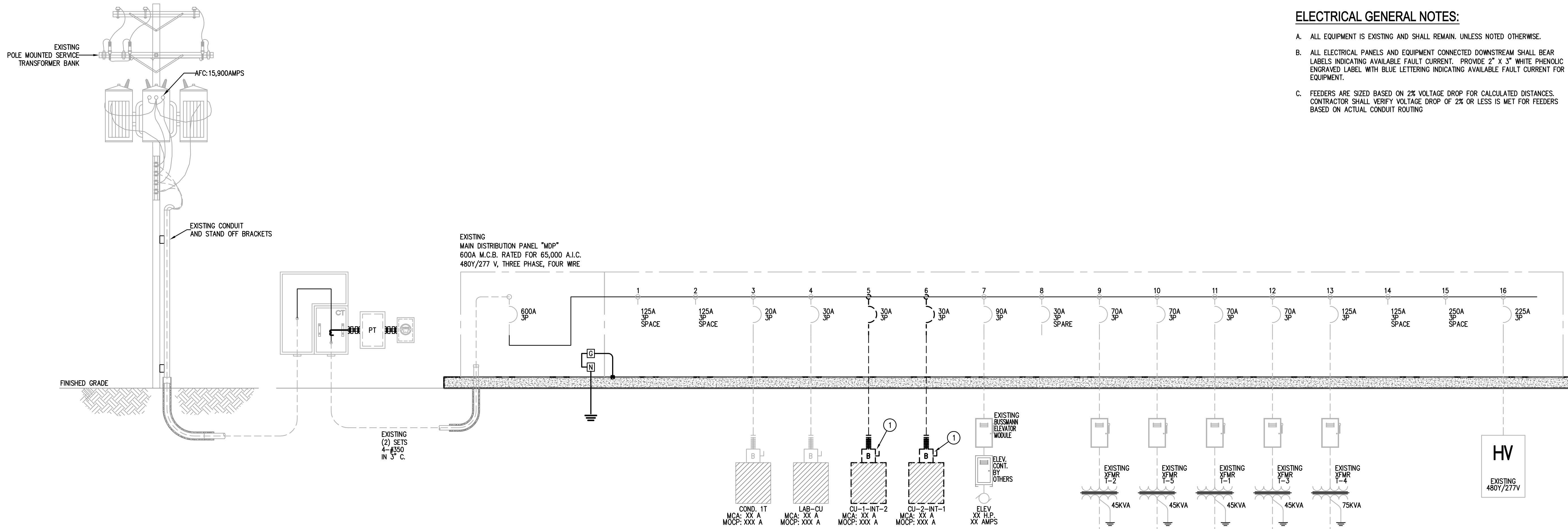
ELECTRICAL POWER PLAN

SHEET NUMBER:

EP202

DBR Project Number 190317.000
EM | MECH | ELEC | PLBG | TECH

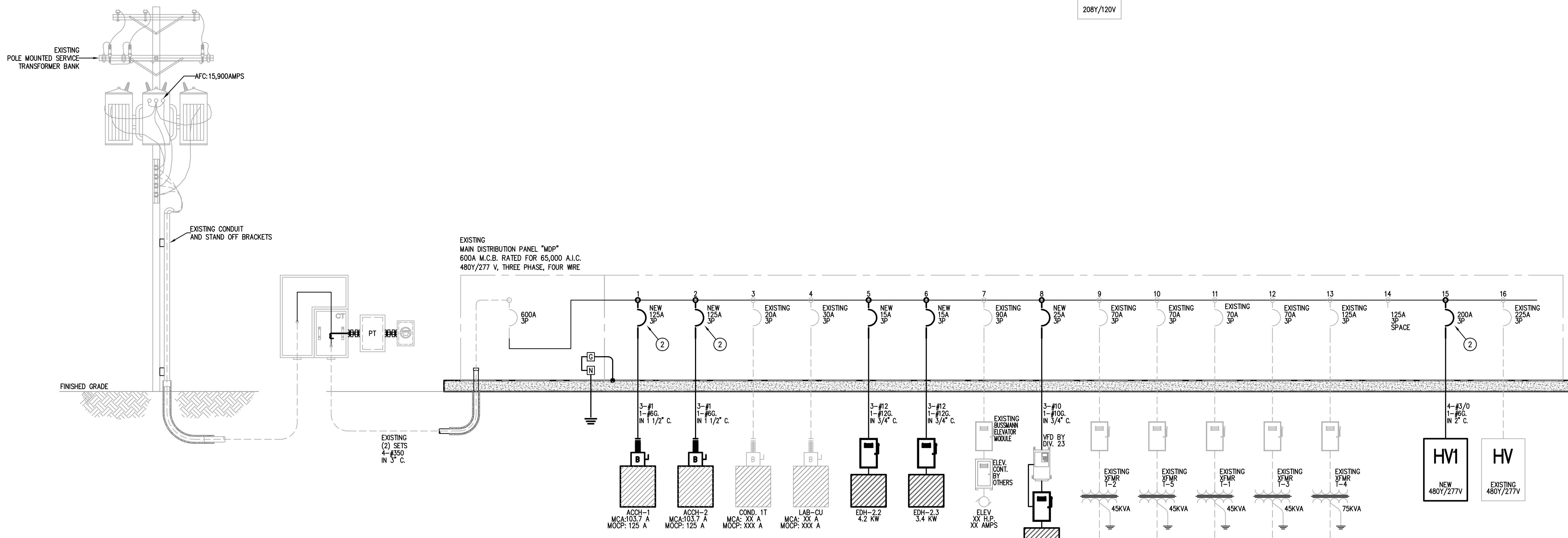
Project: Fc_21_0206_10.dwg, 10:26:10 PM, User: rbruce, Saved: 2/21/2020 by user: rbruce, H:\19\190317\1000\Drawings\SEP-190317.dwg



1 ELECTRICAL ONE-LINE DIAGRAM - DEMO
E401 N.T.S.

- ELECTRICAL GENERAL NOTES:**
- ALL EQUIPMENT IS EXISTING AND SHALL REMAIN, UNLESS NOTED OTHERWISE.
 - ALL ELECTRICAL PANELS AND EQUIPMENT CONNECTED DOWNSTREAM SHALL BEAR LABELS INDICATING AVAILABLE FAULT CURRENT. PROVIDE 2" X 3" WHITE PHENOLIC ENGRAVED LABEL WITH BLUE LETTERING INDICATING AVAILABLE FAULT CURRENT FOR EQUIPMENT.
 - FEEDERS ARE SIZED BASED ON 2% VOLTAGE DROP FOR CALCULATED DISTANCES. CONTRACTOR SHALL VERIFY VOLTAGE DROP OF 2% OR LESS IS MET FOR FEEDERS BASED ON ACTUAL CONDUIT ROUTING.

- ELECTRICAL KEYED NOTES:**
- EXISTING MECHANICAL EQUIPMENT SHALL BE DEMOLISHED. ELECTRICAL CONTRACTOR SHALL DISCONNECT FEEDER, REMOVE DISCONNECT, REMOVE CIRCUIT BREAKER AND PULL WIRING AND CONDUIT BACK TO ASSOCIATED PANEL.
 - PROVIDE NEW CIRCUIT BREAKER AS SHOWN. NEW CIRCUIT BREAKER SHALL MATCH EXISTING AIC RATING AND BE COMPATIBLE WITH MAIN DISTRIBUTION PANELBOARD.



2 ELECTRICAL ONE-LINE DIAGRAM - NEW
E401 N.T.S.

Houston Community College System - HVAC Replacement at Fannin
480 / 277 V, 3-PHASE 4-WIRE

DESCRIPTION	NEC	KVA
New Loads		
Chiller	111,300 x 1 = 111,300.0 VA	0.0
Heating Load	86,212 x 2 = 172,424.1 VA	172.4
1/3 H.P. FPLU Fans	803 x 25 = 20,075.0 VA	20.9
Supply Fan Load	1,673 x 1 = 1,673.0 VA	1.7
DDC controls	500 x 4 = 2,000.0 VA	2.0
1 H.P. AHUs	1,673 x 3 = 5,019.0 VA	5.0
5 H.P. AHUs	695 x 4 = 24,220.0 VA	24.2
SUB TOTAL		226.2
	New Load Total:	226.2
	New Load Amps:	272.1
EXISTING SERVICE		
Peak Demand	88,000 VA x 1.25	110.0
New Load	226,214 VA	226.2
	Total Load (KVA):	336.2
	Amps:	404.4
	Existing Service (amps):	600.0
	Spare Capacity (amps):	195.6



ERO
5444 Westheimer
Suite 1000, Office 1054
Houston, TX 77056

REVISION

No.	DATE	DESCRIPTION
02/21/2020	100% CD	



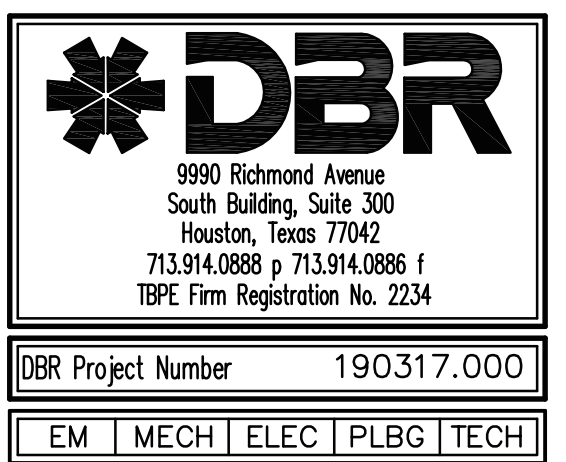
Houston Community College System
HVAC Replacement at Fannin
Central Campus

DATE: 02/06/2020
DRAWN BY: DBR
CHECKED BY: DBR
PROJECT NUMBER: 190317.000
SHEET TITLE:

ELECTRICAL ONE-LINE DIAGRAMS

SHEET NUMBER:

E401

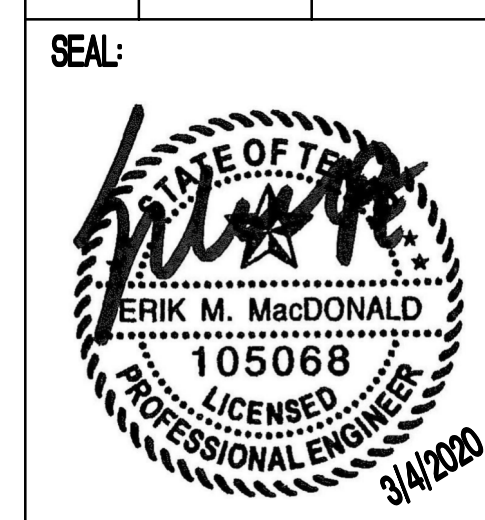


Project: E401 - 02/06/2020 10:50 PM by user: dbrook. Sheet: 02/08/2020 by user: dbrook. H:\19\190317\190317\Drawings\AE\190317-DETAILS & SCHEDULES.dwg



ERO
5444 Westheimer
Suite 1000, Office 1054
Houston, TX 77056

REVISION
No. / DATE / DESCRIPTION
01 / 02/21/2020 / 1007 CD
02 / 03/04/2020 / ADDENDUM 01



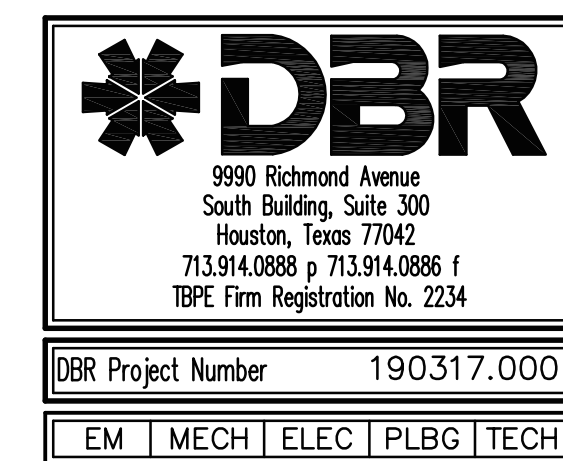
Houston Community College System
HVAC Replacement at Fannin
Central Campus

DATE
02/06/2020
DRAWN BY:
DBR
CHECKED BY:
DBR
PROJECT NUMBER:
190317.000
SHEET TITLE

ELECTRICAL
SCHEDULES

SHEET NUMBER:

E501



Panelboard HV. 65,000 AIC Rating. X Existing, X New. Table with columns: Notes, Load (VA), Description, Type, Wire, CB, OLT #, OLT #, CB, Wire, Type, Description, Load (VA), Notes. Includes subtotals for N.E.C. and Total Connected Load (101,783 VA).

Panelboard LV1. 10,000 AIC Rating. X Existing, X New. Table with columns: Notes, Load (VA), Description, Type, Wire, CB, OLT #, OLT #, CB, Wire, Type, Description, Load (VA), Notes. Includes subtotals for N.E.C. and Total Connected Load (18,855 VA).

Panelboard C. 10,000 AIC Rating. X Existing, X New. Table with columns: Notes, Load (VA), Description, Type, Wire, CB, OLT #, OLT #, CB, Wire, Type, Description, Load (VA), Notes. Includes subtotals for N.E.C. and Total Connected Load (37,196 VA).

Panelboard C1. 10,000 AIC Rating. X Existing, X New. Table with columns: Notes, Load (VA), Description, Type, Wire, CB, OLT #, OLT #, CB, Wire, Type, Description, Load (VA), Notes. Includes subtotals for N.E.C. and Total Connected Load (18,656 VA).

Panelboard LV1E. 10,000 AIC Rating. X Existing, X New. Table with columns: Notes, Load (VA), Description, Type, Wire, CB, OLT #, OLT #, CB, Wire, Type, Description, Load (VA), Notes. Includes subtotals for N.E.C. and Total Connected Load (17,920 VA).

Panelboard LV2. 10,000 AIC Rating. X Existing, X New. Table with columns: Notes, Load (VA), Description, Type, Wire, CB, OLT #, OLT #, CB, Wire, Type, Description, Load (VA), Notes. Includes subtotals for N.E.C. and Total Connected Load (12,300 VA).

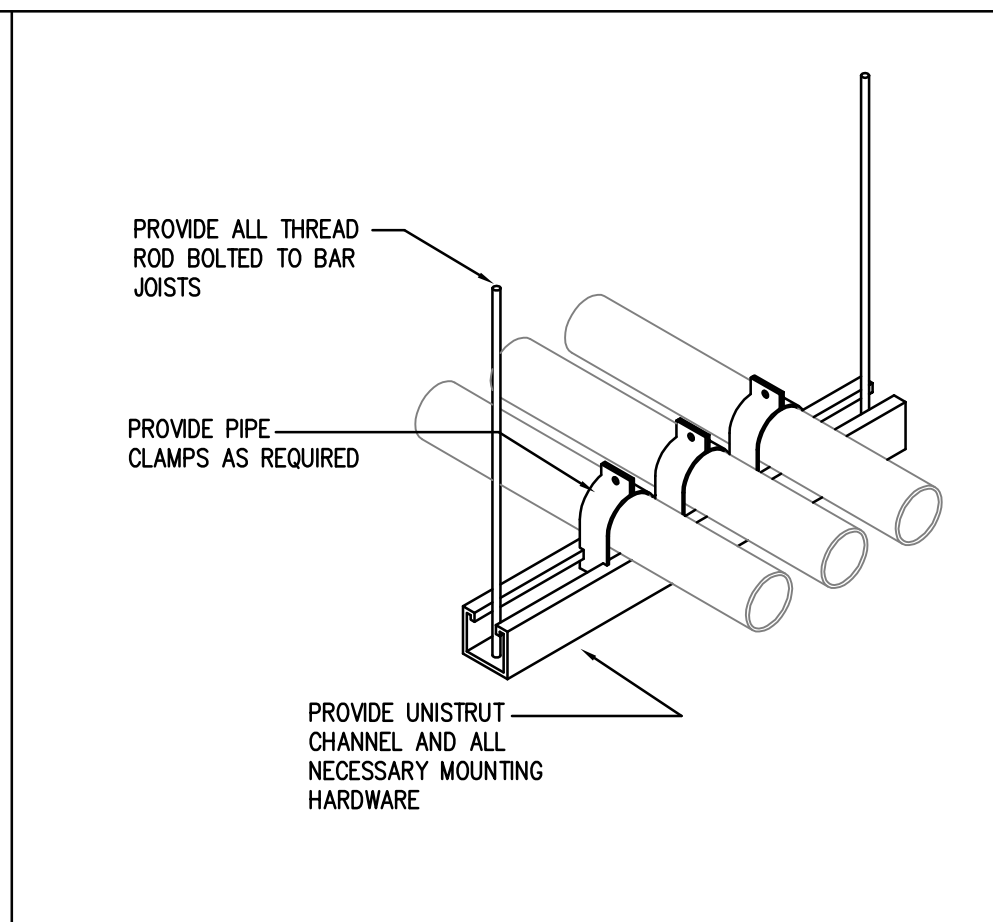
Panelboard LV2E. 10,000 AIC Rating. X Existing, X New. Table with columns: Notes, Load (VA), Description, Type, Wire, CB, OLT #, OLT #, CB, Wire, Type, Description, Load (VA), Notes. Includes subtotals for N.E.C. and Total Connected Load (26,860 VA).

Panelboard HV1. 65,000 AIC Rating. X Existing, X New. Table with columns: Notes, Load (VA), Description, Type, Wire, CB, OLT #, OLT #, CB, Wire, Type, Description, Load (VA), Notes. Includes subtotals for N.E.C. and Total Connected Load (136,171 VA).

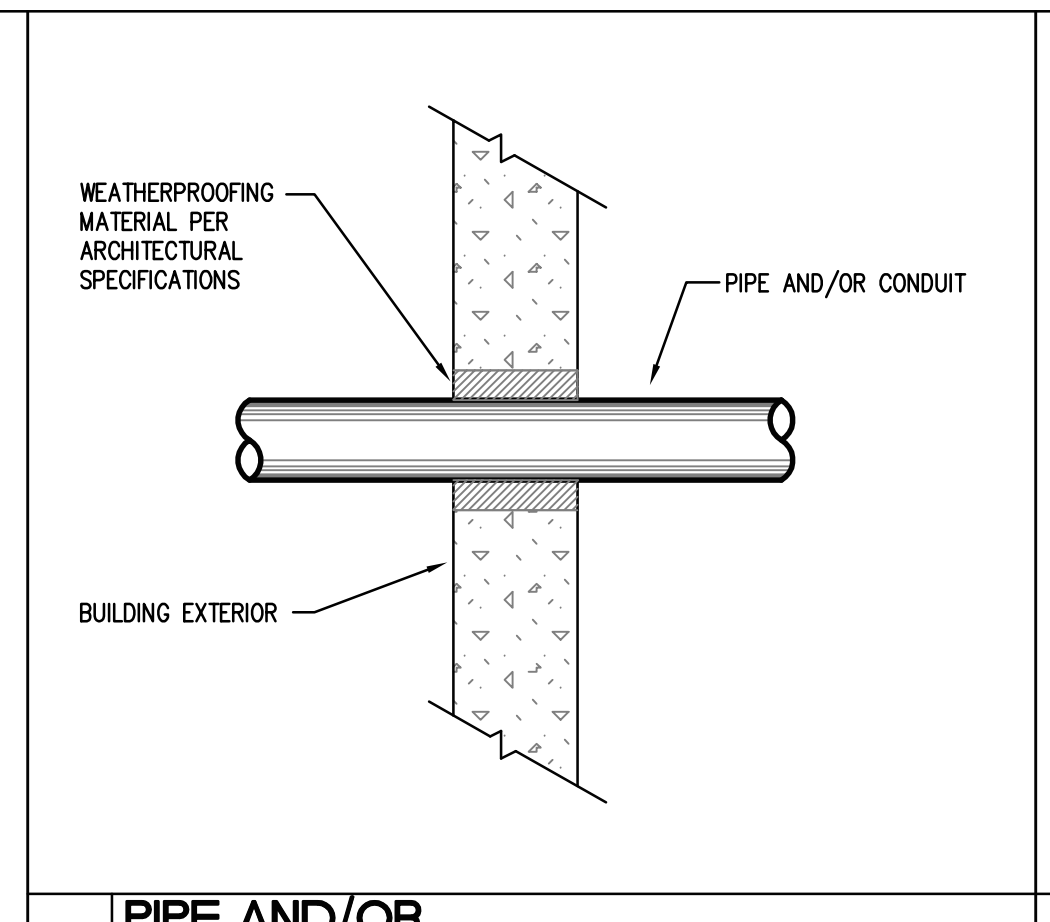
PANEL SCHEDULES GENERAL NOTES:
A. ALL PANEL SCHEDULES SHALL BE UPDATED AT THE END OF CONSTRUCTION.

PANEL SCHEDULES KEYED NOTES:
1. EXISTING BRANCH CIRCUIT SHALL REMAIN.
2. EXISTING BRANCH CIRCUIT SHALL BE REMOVED. EXISTING CIRCUIT BREAKER SHALL REMAIN AS SPARE.
3. EXISTING BRANCH CIRCUIT SHALL BE REMOVED. PROVIDE NEW CIRCUIT/SPACE AS SHOWN.
4. PROVIDE NEW CIRCUIT AS SHOWN.

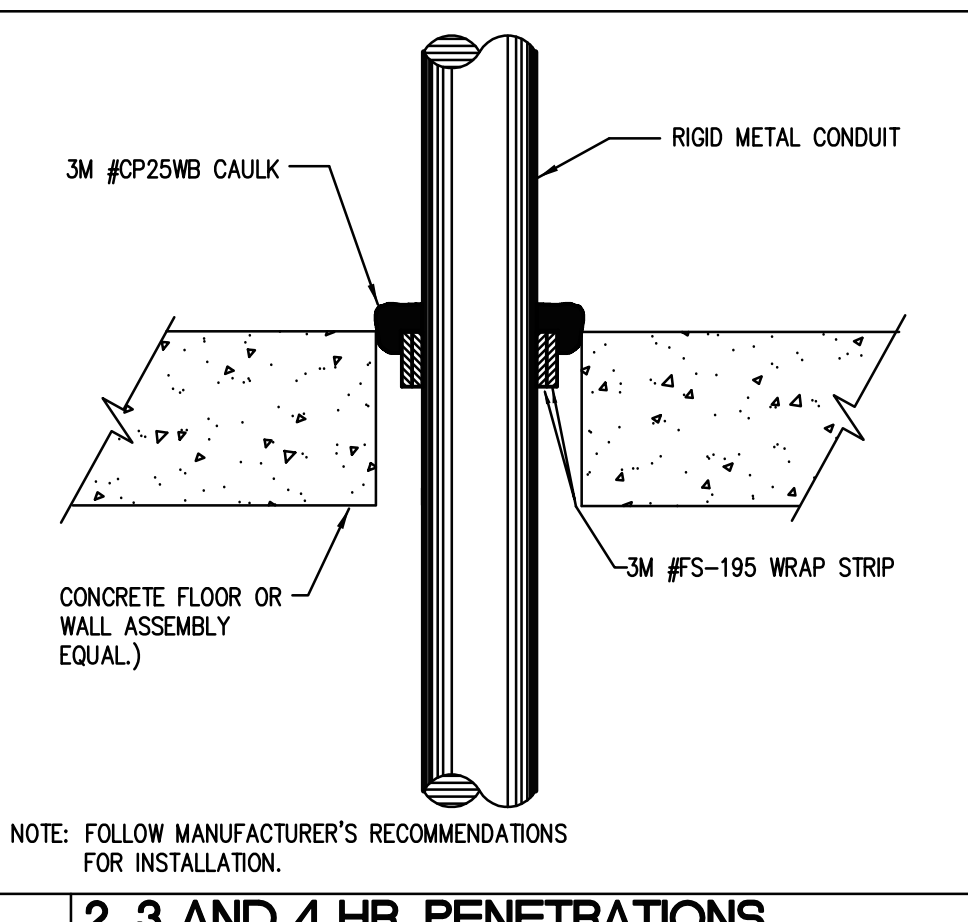
Reference: HCC-2020-0520-0520-PHV, Project Name: HVAC Replacement at Fannin Central Campus, Date: 02/06/2020, By: jmc@dbrcorp.com, H:\190317\190317\000\Drawings\ME-190317-DETALS & SCHEDULES.dwg



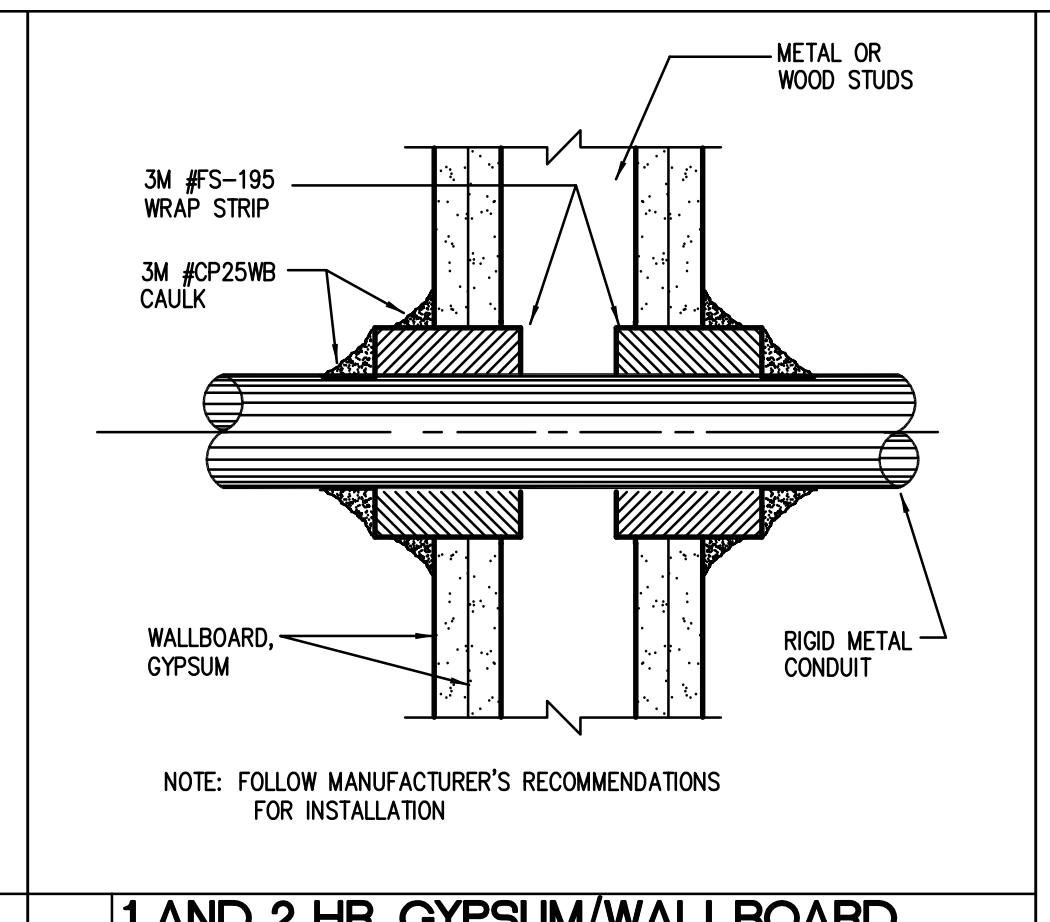
1 UNISTRUT CONDUIT DETAIL
NOT TO SCALE



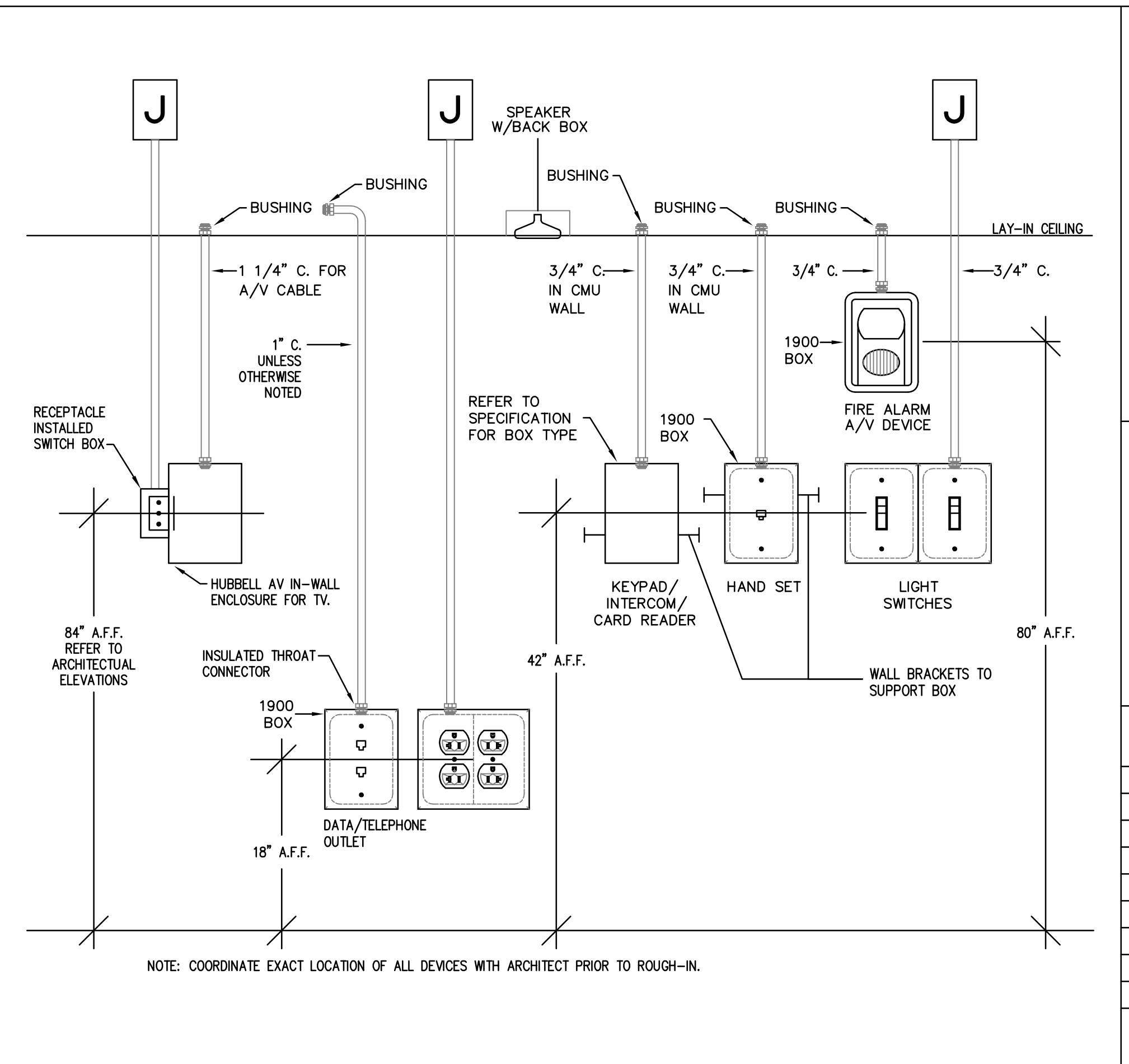
2 PIPE AND/OR CONDUIT PENETRATION
NOT TO SCALE



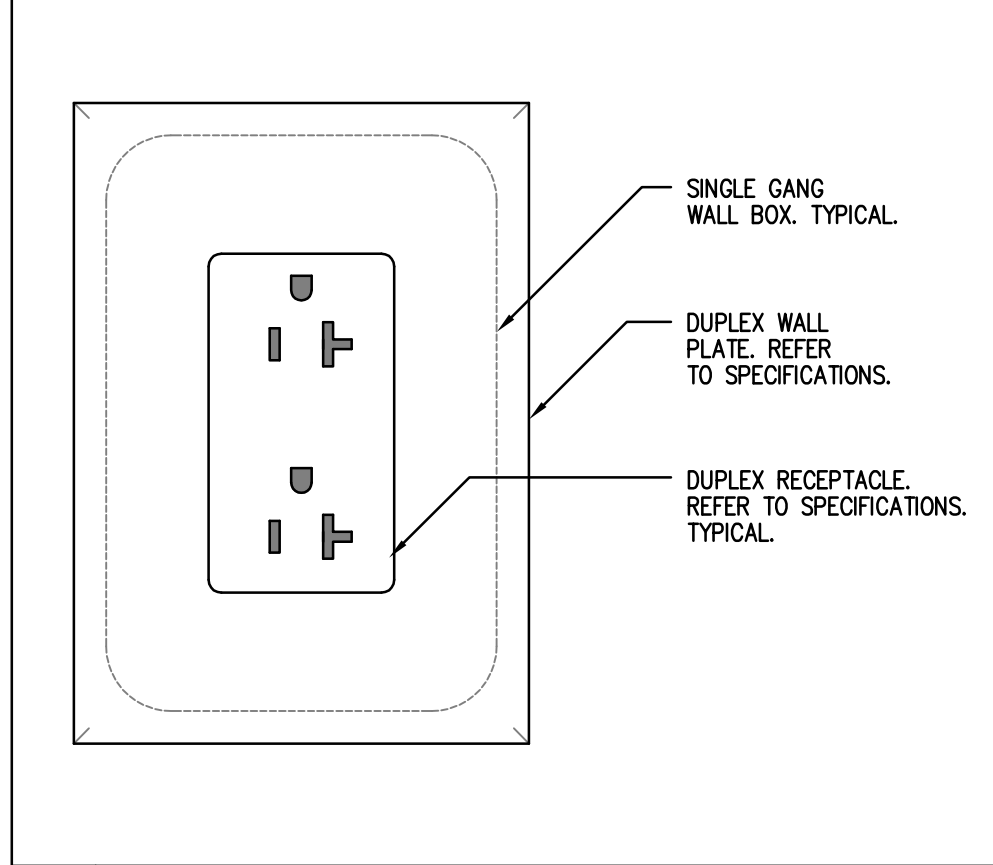
3 2, 3 AND 4 HR. PENETRATIONS FOR CONCRETE FLOOR AND WALL
NOT TO SCALE



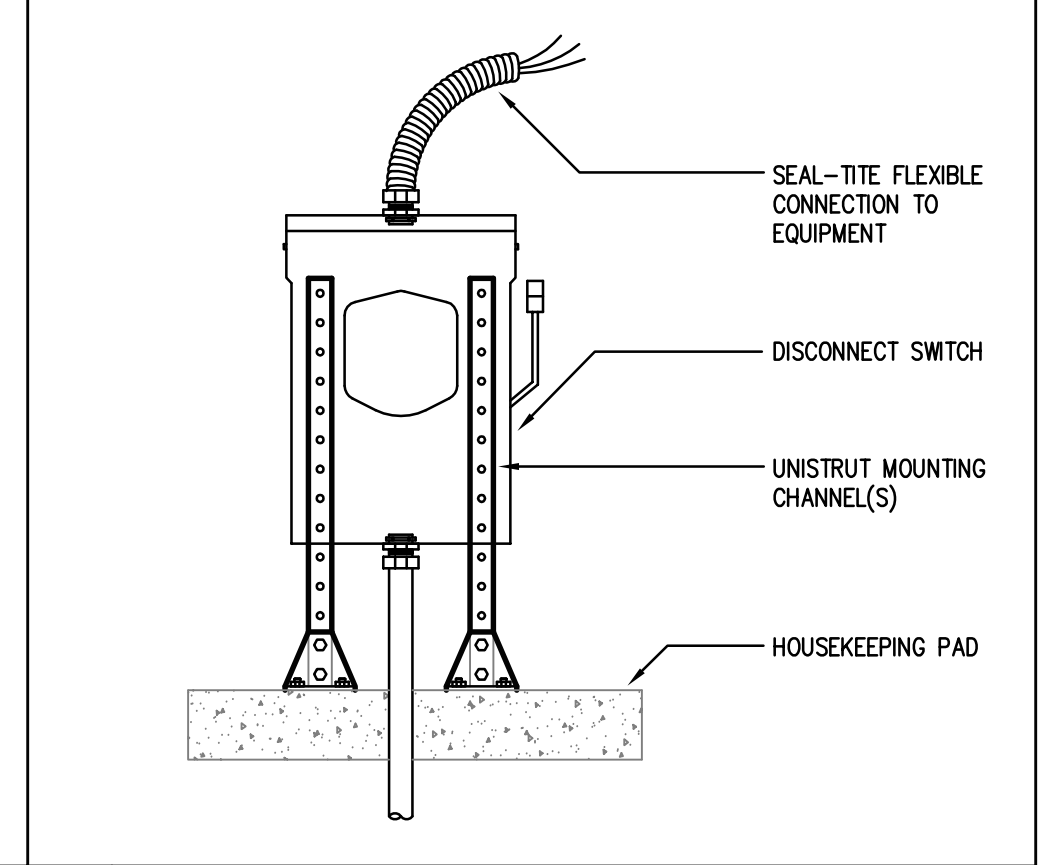
4 1 AND 2 HR. GYPSUM/WALLBOARD PIPE PENETRATION
NOT TO SCALE



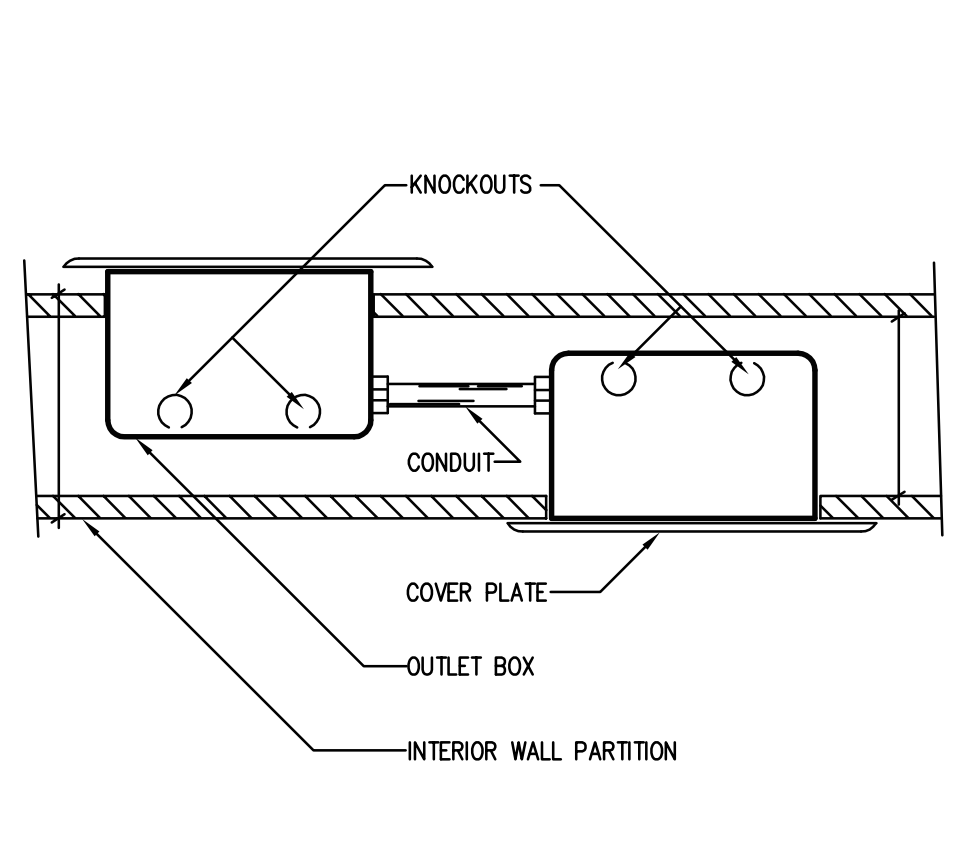
5 TYPICAL DEVICE ELEVATIONS
NOT TO SCALE



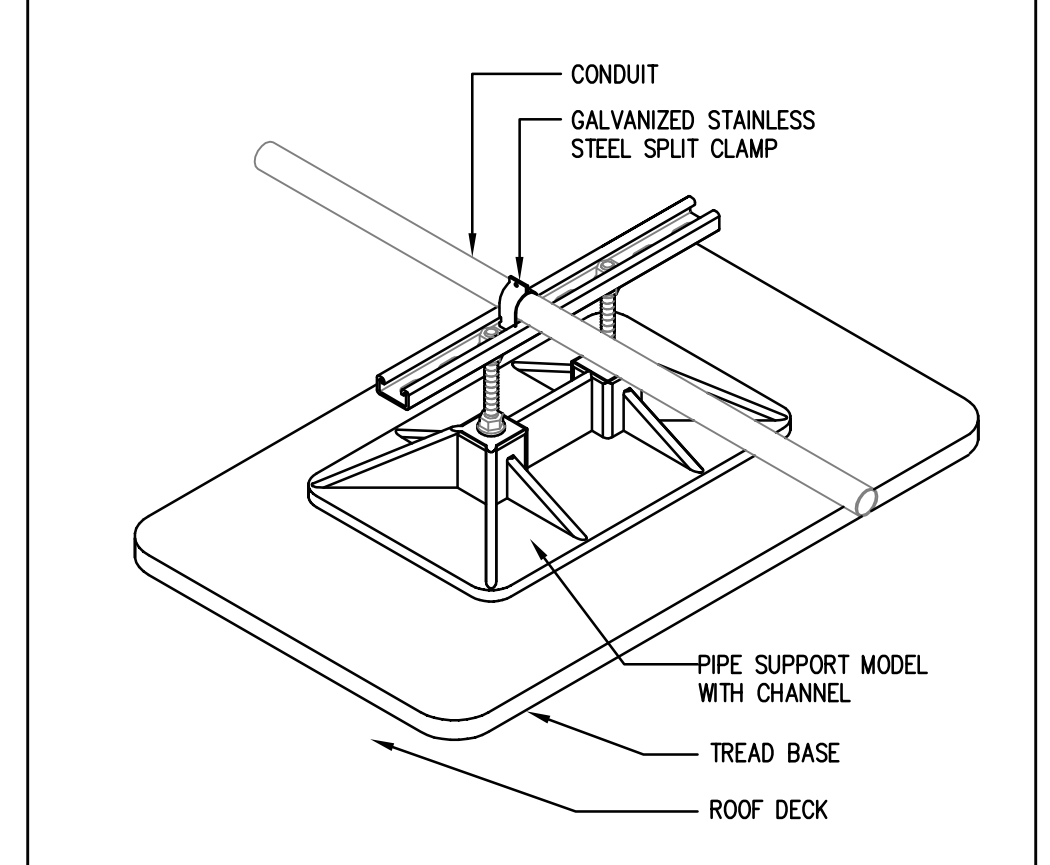
6 TYPICAL RECEPTACLE MOUNTING DETAIL
NOT TO SCALE



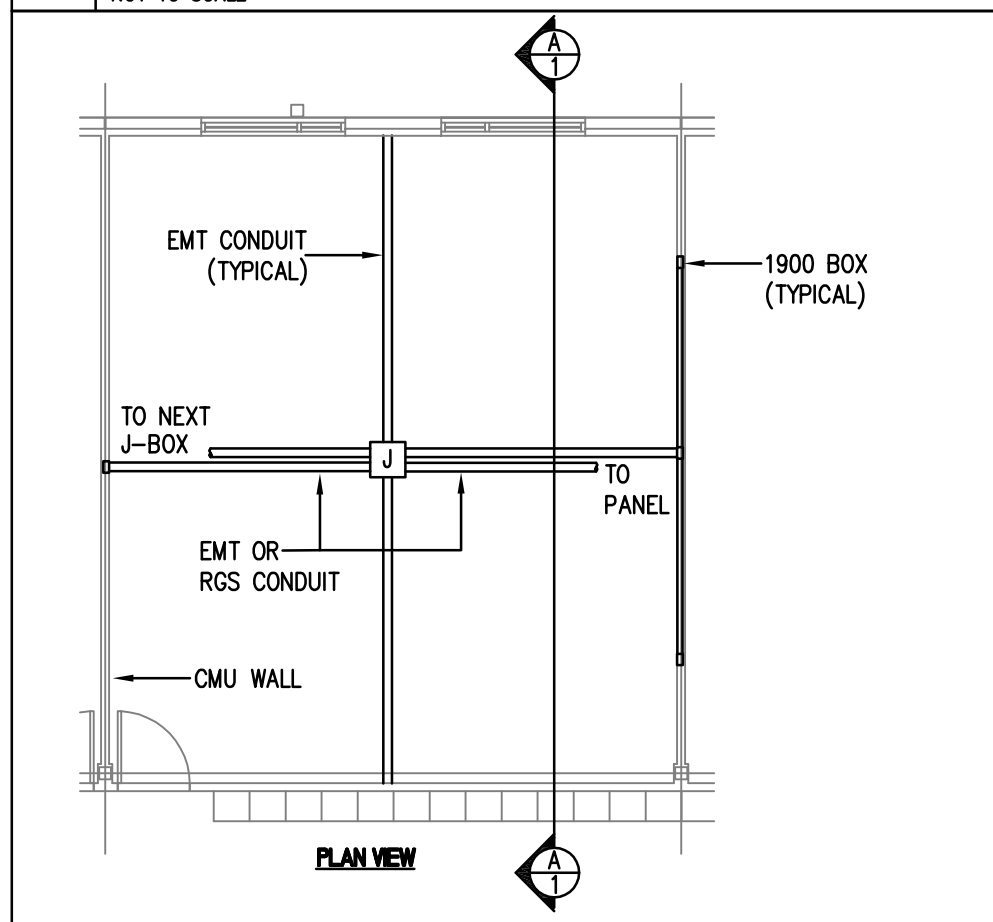
7 DISCONNECT SWITCH MOUNTING AT CONCRETE PAD
NOT TO SCALE



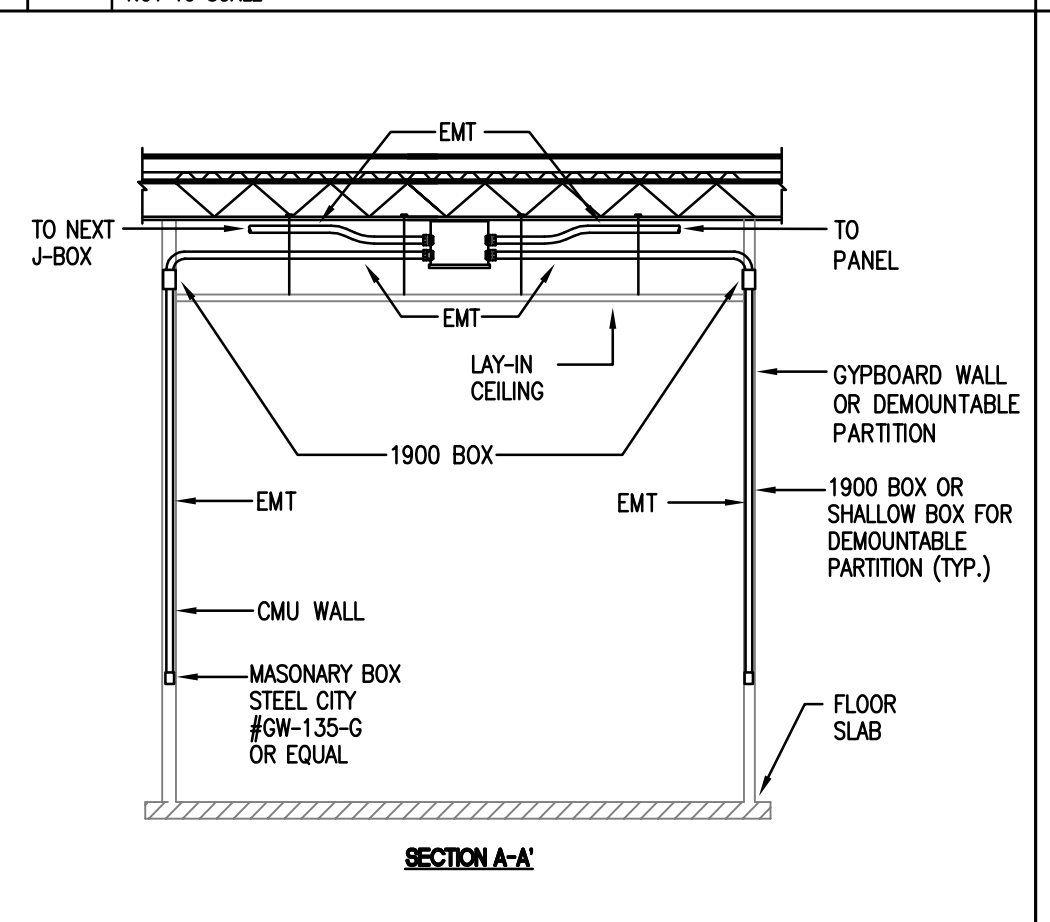
8 BACK-TO-BACK OUTLETS
NOT TO SCALE



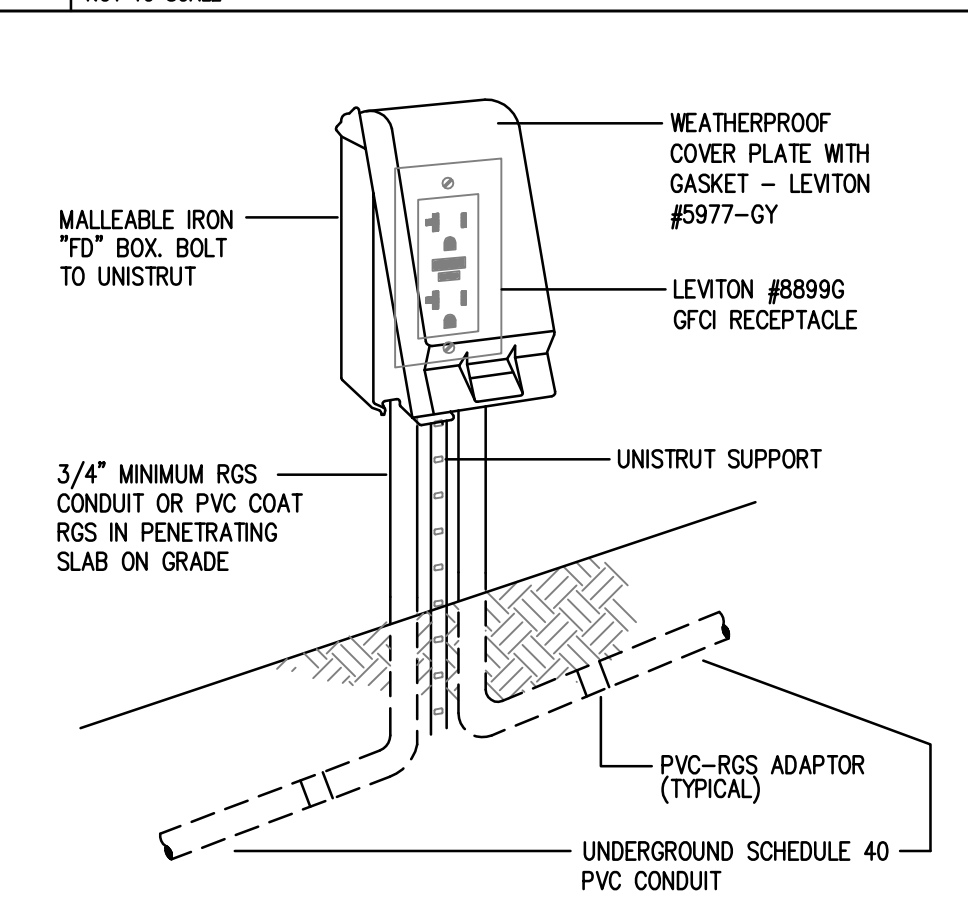
9 ROOF CONDUIT SUPPORT DETAIL
NOT TO SCALE



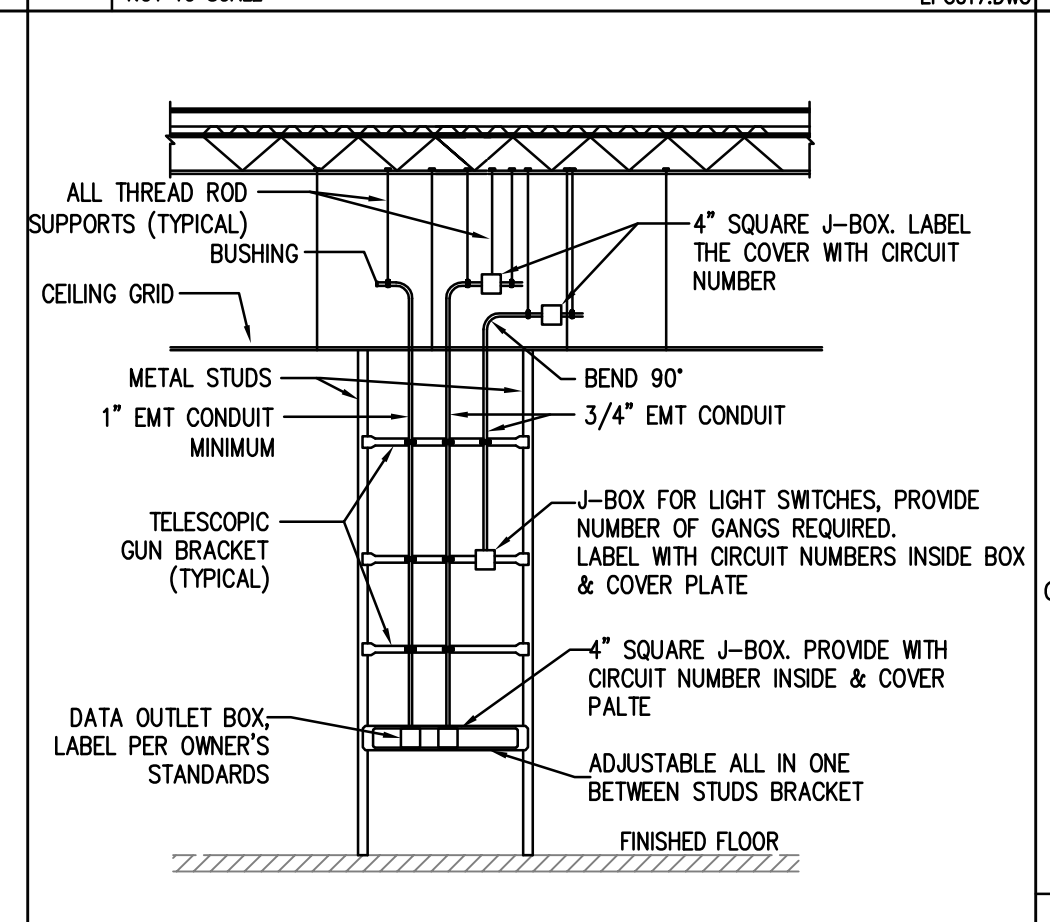
11 TYP. RACEWAY CONFIGURATION
NOT TO SCALE



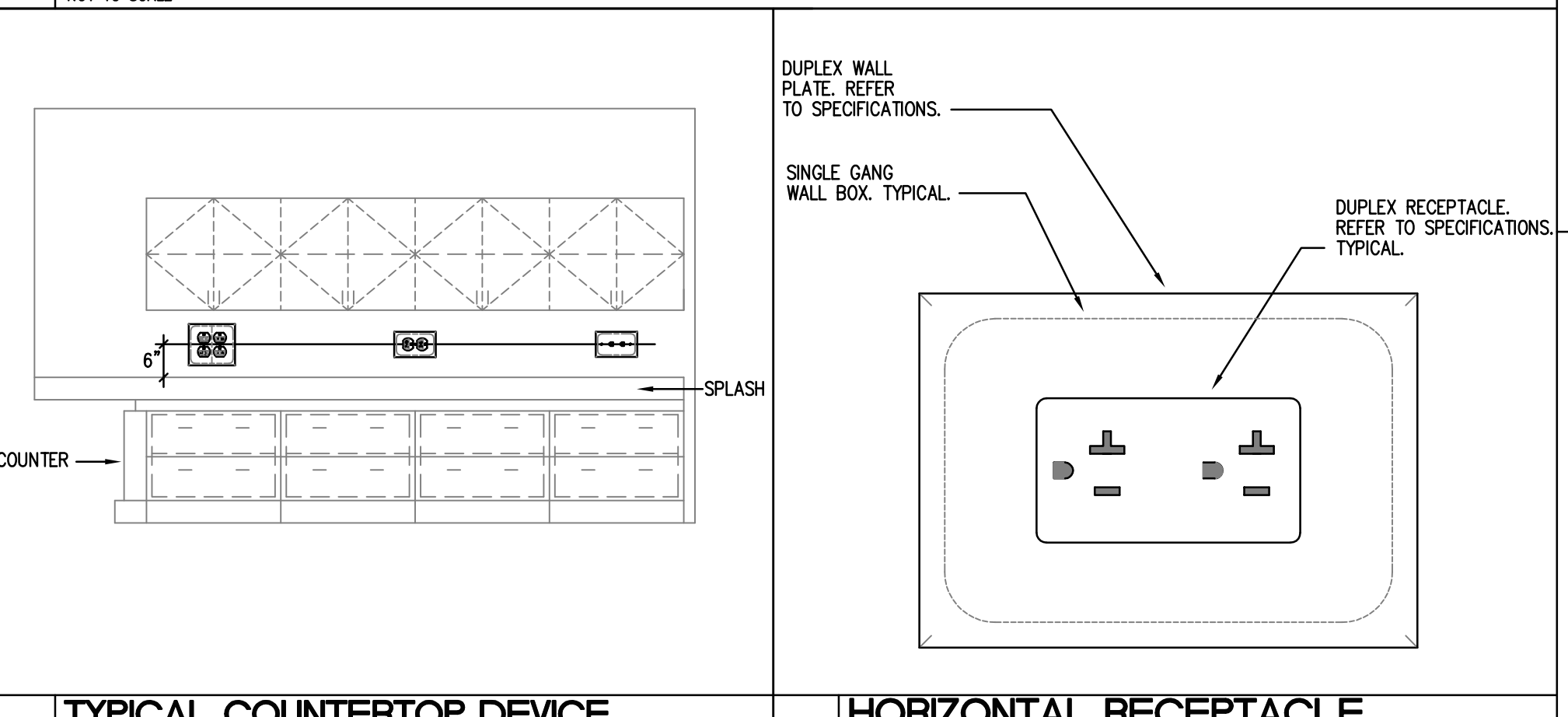
12 RECEPTACLE MOUNTING DETAIL
NOT TO SCALE



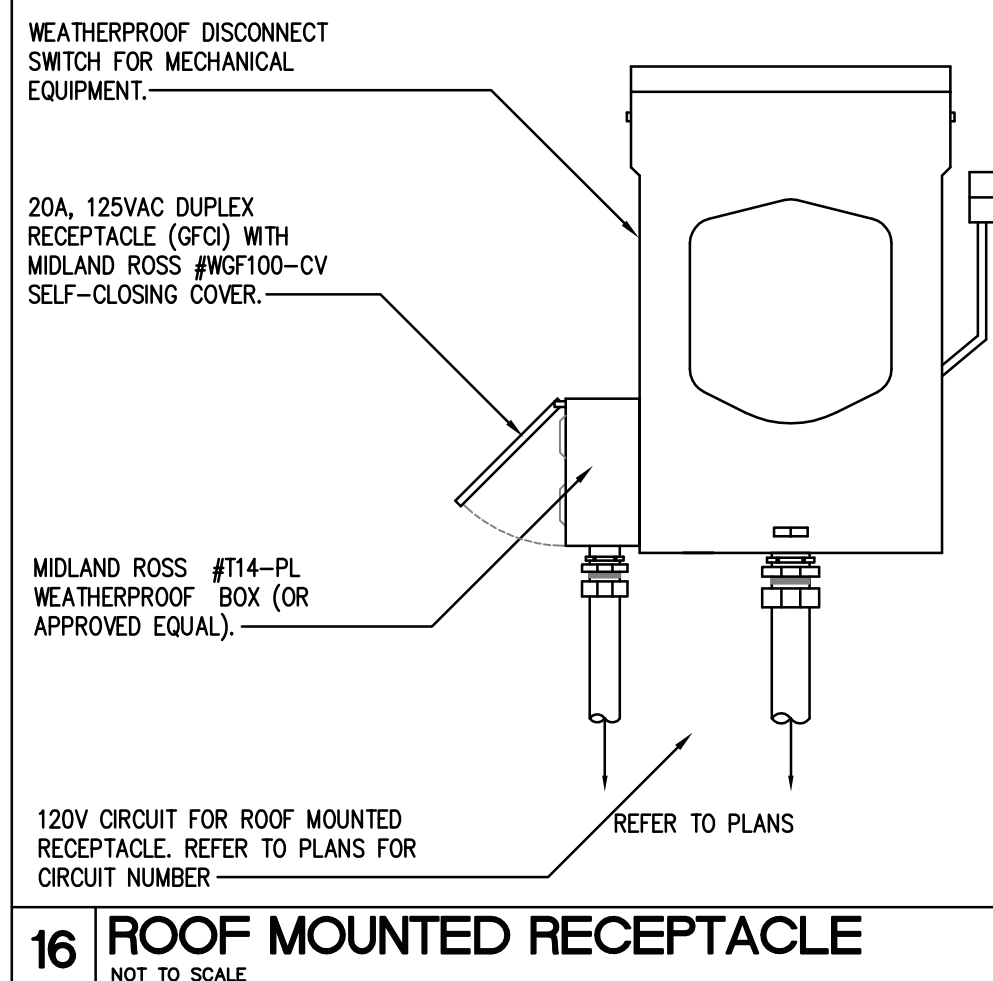
13 CONDUIT ROUGH-IN DETAIL
NOT TO SCALE



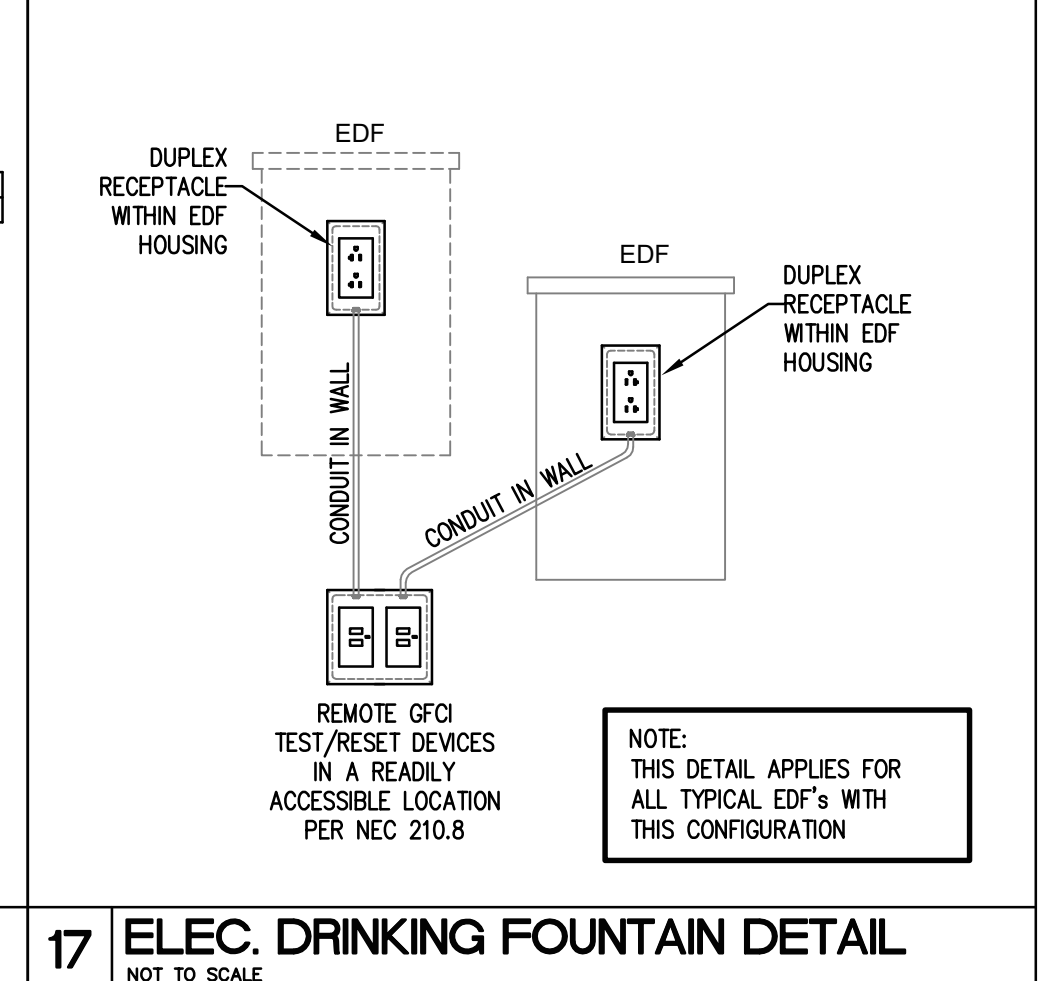
14 TYPICAL COUNTERTOP DEVICE ELEVATION
NOT TO SCALE



15 HORIZONTAL RECEPTACLE MOUNTING DETAIL
NOT TO SCALE



16 ROOF MOUNTED RECEPTACLE
NOT TO SCALE



17 ELEC. DRINKING FOUNTAIN DETAIL
NOT TO SCALE



ERO
5444 Westheimer
Suite 1000, Office 1054
Houston, TX 77056

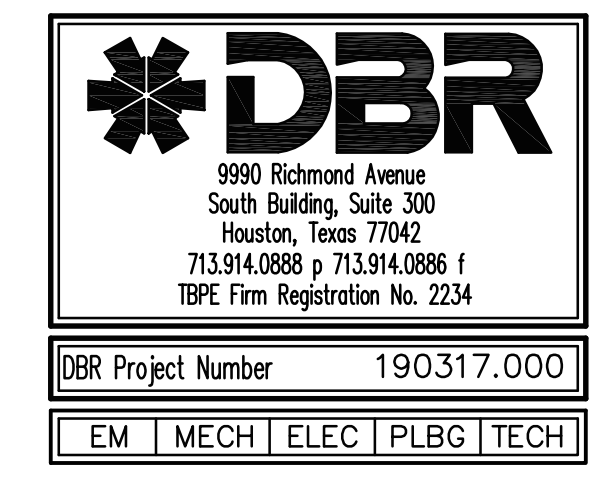
REVISION	No.	DATE	DESCRIPTION



Houston Community College System
HVAC Replacement at Fannin
Central Campus

DATE: 02/06/2020
DRAWN BY: DBR
CHECKED BY: DBR
PROJECT NUMBER: 190317.000
SHEET TITLE: ELECTRICAL DETAILS

SHEET NUMBER: **E601**



Project: E-6-21_0200_10.00 PM, User: dbur, Sheet: 02/06/2020, By: user: dbur, H:\19\190317\190317\Drawings\AE\190317\DETAILS & SCHEDULES.dwg

REVISION:

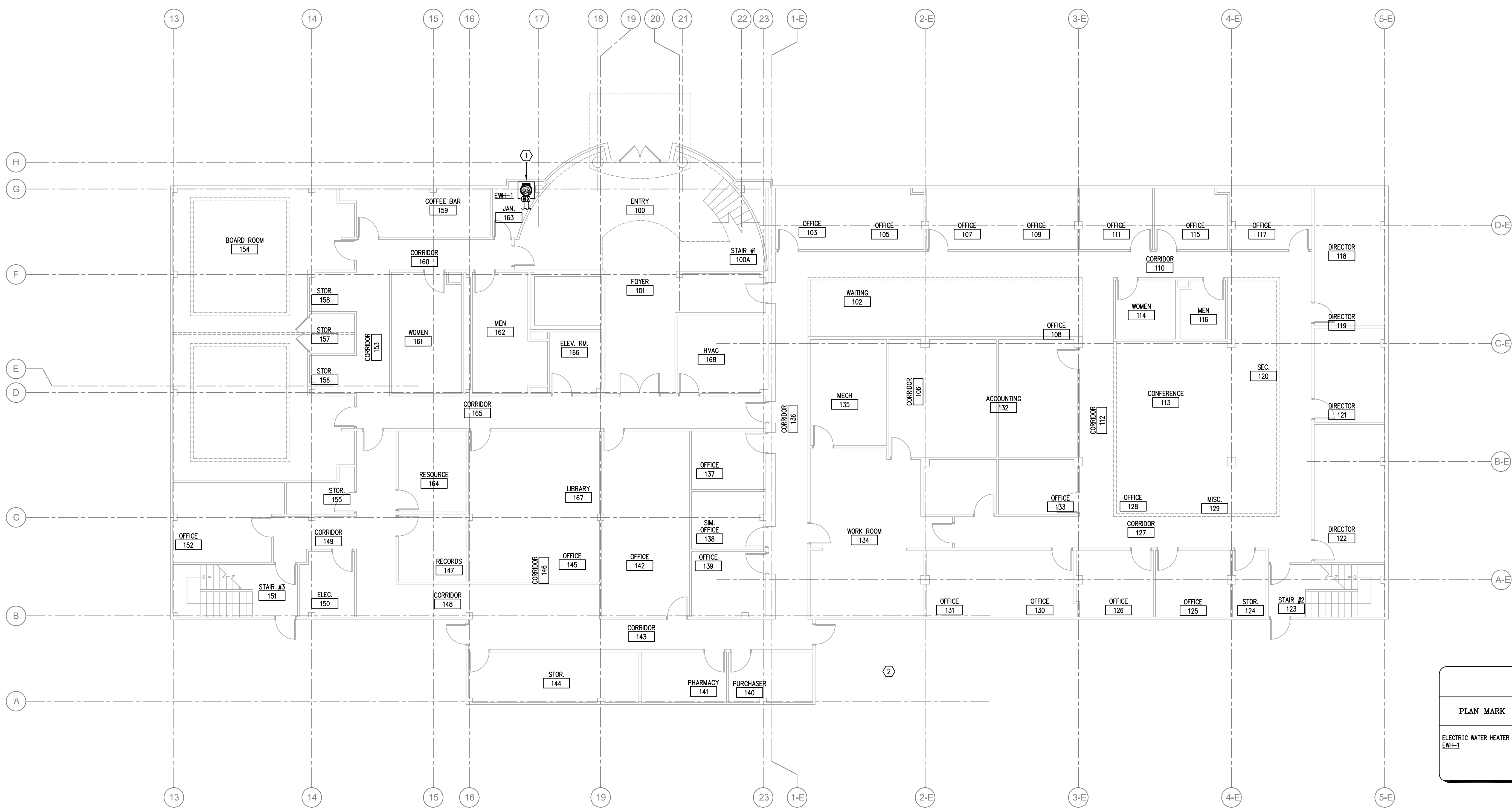
No.	DATE	DESCRIPTION
02/21/2020	100% CD	



Houston Community College System
HVAC Replacement at Fannin
 Central Campus

DATE:
02/06/2020
 DRAWN BY:
DBR
 CHECKED BY:
DBR
 PROJECT NUMBER:
190317.000
 SHEET TITLE:

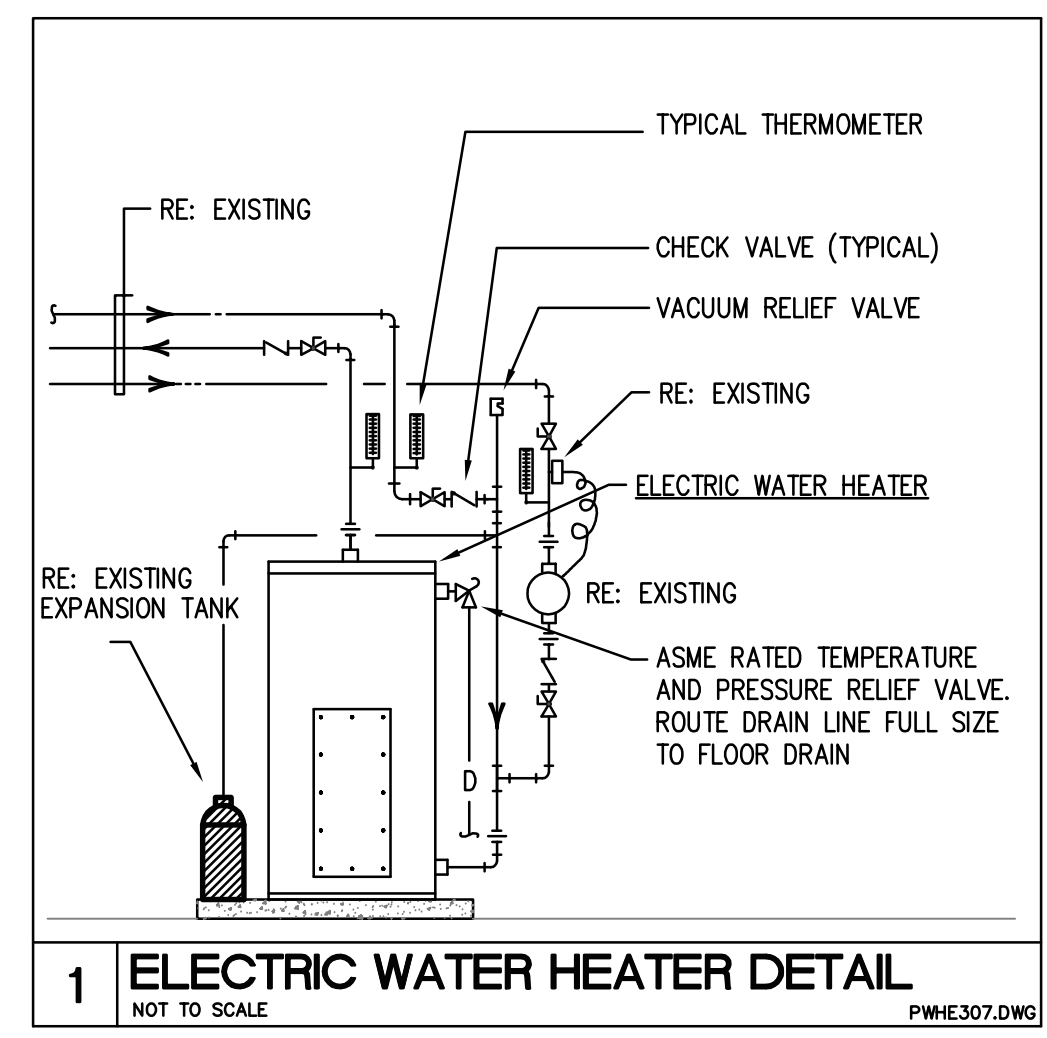
PLUMBING PLAN
 SHEET NUMBER:
P201



- PLUMBING KEYED NOTES:**
- REPLACE EXISTING FOR NEW ELECTRIC WATER HEATER; COORDINATE WITH ELECTRICAL FOR REQUIREMENTS. INSTALL PER MANUFACTURER'S RECOMMENDATIONS. EXTEND EXISTING CW, HW, AND RECONNECT.
 - PROVIDE NEW MAKE-UP WATER LINE FOR MECHANICAL EQUIPMENT.

PLUMBING FIXTURE SCHEDULE

PLAN MARK	MINIMUM ROUGH-IN SIZES					DESCRIPTION
	WST & VENT	DRAIN	CW	HW		
ELECTRIC WATER HEATER EWH-1	---	---	---	3/4"	3/4"	RHEEM NO. ELD-80, 80 GALLON ASME STORAGE TANK WITH 5 KW AND 47 GPH RECOVERY RATE AT 80° TEMPERATURE RISE; REFER TO ELECTRICAL FOR WIRING REQUIREMENTS. CONTRACTOR SHALL VERIFY WITH ELECTRICAL CONTRACTOR PRIOR TO ORDERING EQUIPMENT.



1 LEVEL 1 PLUMBING PLAN
 P201 1/8"=1'-0"

Plot: 190317_000_P201.dwg, 11:54 AM, by user: pascodonaldf - Saved: 2/21/2020 by user: jfanns
 H:\190317_000\Drawings\190317_P1.dwg

ABBREVIATIONS (NOT ALL ITEMS INDICATED APPLY TO THIS PROJECT)

A	
A	AIR (COMPRESSED)
ABV	ABOVE
A/C	AIR CONDITIONING
AC	ALTERNATING CURRENT AIR COMPRESSOR
ACCH	AIR COOLED CHILLER
ACCU	AIR COOLED CONDENSING UNIT
AD	ACCESS DOOR, AREA DRAIN
ADJ	ADJUSTABLE
AF	AIR FILTER
AFC	ABOVE FINISHED CEILING
AFI	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHU	AIR HANDLING UNIT
AL	ALUMINUM
AMB	AMBIENT
AP	ACCESS PANEL
APD	AIR PRESSURE DROP
ARI	AMERICAN REFRIGERANT INSTITUTE
ARCH	ARCHITECT, ARCHITECTURAL
AS	AIR SEPARATOR
ASHRAE	AMERICAN SOCIETY OF HEATING AND REFRIGERATION ENGINEERS
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS
ASTM	AMERICAN SOCIETY OF TESTING AND MATERIALS
AV	ACID VENT, AIR VENT
AVG	AVERAGE
AWS	AMERICAN WELDING SOCIETY
AUX	AUXILIARY

D	
D	DEPTH, DRAIN, DRYER
DB	DRY BULB
DC	DOUBLE DUCT CONSTANT VOLUME, DIRECT CURRENT
DDC	DIRECT DIGITAL CONTROL
DESIG	DESIGNATION
DTL	DETAIL
DF	DRINKING FOUNTAIN
DIA	DIAMETER
DIF	DIFFUSER
DM	DIMENSION
DISC	DISCONNECT
DN	DOWN
DPR	DAMPER
DS	DOWNSPOUT, DOUBLE SUCTION
DV	DOUBLE DUCT VAV
DW	DISHWASHER
DWG	DRAWING
DWH	DOMESTIC WATER HEATER
DWP	DOMESTIC WATER PUMP
DX	DIRECT EXPANSION

H	
HB	HOSE BIBB
HD	HEAD, HUB DRAIN
HE	HEAT EXCHANGER
HF	HUMIDIFIER
HORZ	HORIZONTAL
HP	HORSEPOWER, HALON PANEL
HPU	HEAT PUMP UNIT
HKP	HOUSEKEEPING PAD
HSC	HORIZONTAL SPLIT CASE
HSTAT	HUMIDISTAT
HT	HEIGHT
HTG	HEATING
HTR	HEATER
HW	HOT WATER
HWC	HOT WATER CIRCULATOR
HWP	HEATING WATER PUMP
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
HZ	HERTZ

P	
P	PUMP, PLUMBING EQUIPMENT
PC	PLUMBING CONTRACTOR
PCR	PUMPED CONDENSATE RETURN
PD	PRESSURE DROP, PLANTER DRAIN
PH	PHASE, POST HYDRANT
PIV	POST INDICATOR VALVE
PLBG	PLUMBING
PNEU	PNEUMATIC
PNL	PANEL
PNTH	PENTHOUSE
PP	POLYPROPYLENE
PPM	PART PER MILLION
PR	PRIMARY
PRS	PRESSURE REDUCING STATION
PRV	PRESSURE REDUCING VALVE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PSIG	POUNDS PER SQUARE INCH GAUGE
PT	PLUMBING TRIM
PLV	PLUG VALVE
PVC	POLYVINYL CHLORIDE

Q	
QTY	QUANTITY

R	
RA	RETURN AIR
RAD	REFRIGERATED AIR DRYER
RAF	RETURN AIR FAN
RAG	RETURN AIR GRILL
RAT	RETURN AIR TEMPERATURE
RCP	REFLECTED CEILING PLAN, REINFORCED CONCRETE PIPE
RD	ROOF DRAIN
RE	REFERENCE, REFER
REGRIC	RECORDULATE
RED	REDUCER
REFR	REFRIGERATOR
REG	REGISTER
RENF	REINFORCING
REQD	REQUIRED
REV	REVISION, REVISE
RH	RELATIVE HUMIDITY
RHG	REFRIGERANT HOT GAS
RKVA	RUNNING KILOWATT-AMPS
RKW	RUNNING KILOWATTS
RL	REFRIGERANT LIQUID
RLA	RUNNING LOAD AMPS
RM	ROOM, REFRIGERATION MACHINE
RPM	REVOLUTIONS PER MINUTE
RS	REFRIGERANT SUCTION
RTU	ROOFTOP UNIT
RV	RELIEF VALVE

S	
S	STEAM
SA	SUPPLY AIR
SAF	SUPPLY AIR FAN
SAG	SUPPLY AIR GRILLE
SAN	SANITARY SEWER
SAR	SUPPLY AIR REGISTER
SC	STEAM CONDENSATE
SCHED	SCHEDULED
SCR	SILICON CONTROLLED RECTIFIER
SD	STORM DRAIN
SE	SEWAGE EJECTOR
SEC	SECONDARY
SECT	SECTION
SENS	SENSIBLE
SF	SQUARE FEET
SFCS	SPRINKLER FLOOR CONTROL STATION
SH	SHOWER
SHT	SHEET
SM	SIMILAR
SK	SINK
SKVA	STARTING KILOWATT-AMPS
SM	STARTING KILOWATTS
SN	SHEETMETAL
SP	SUMP PUMP, STATIC PRESSURE
SPEC	SPECIFICATION
SPR	SPRINKLER
SQ	SQUARE
SS	SEWER SINK
SSD	SUBSURFACE DRAIN
SSFU	SANITARY SEWER FIXTURE UNITS
SSSC	SOLID STATE SPEED CONTROL
STD	STANDARD
STL	STEEL
STR	STRAINER
SURF	SURFACE
SUSP	SUSPEND
SV	SANITARY VENT

T	
TC	TEMPERATURE CONTROL
TCC	TEMPERATURE CONTROL COMPRESSOR
TD	TRENCH DRAIN
TF	TRANSFER FAN
TDH	TOTAL DYNAMIC HEAD
TH BLK	THRUST BLOCK
TP	TRAP PRIMER
TPD	TRAP PRIMER DEVICE
TSP	TOTAL STATIC PRESSURE
TSTAT	THERMOSTAT
Typ	TYPICAL

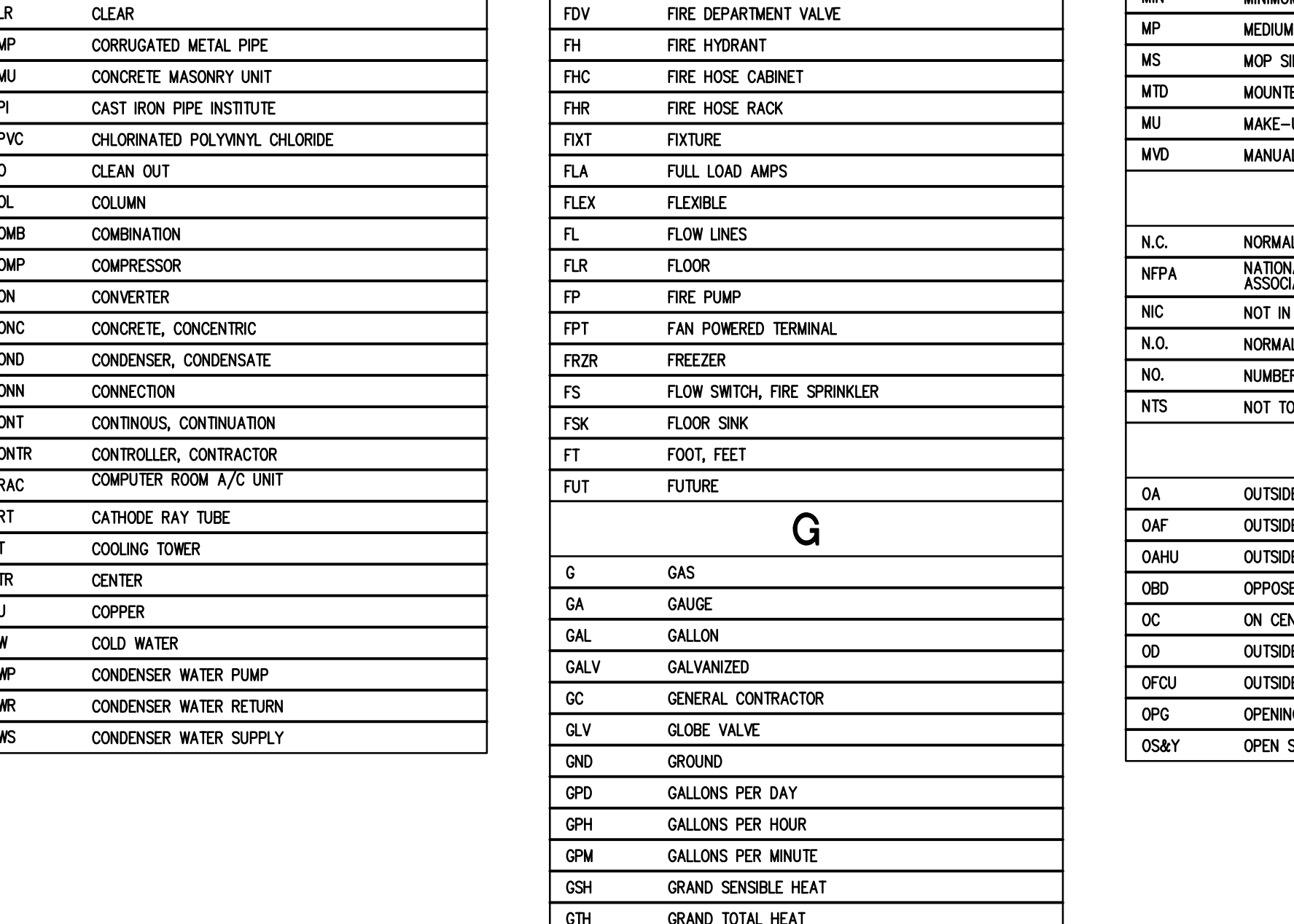
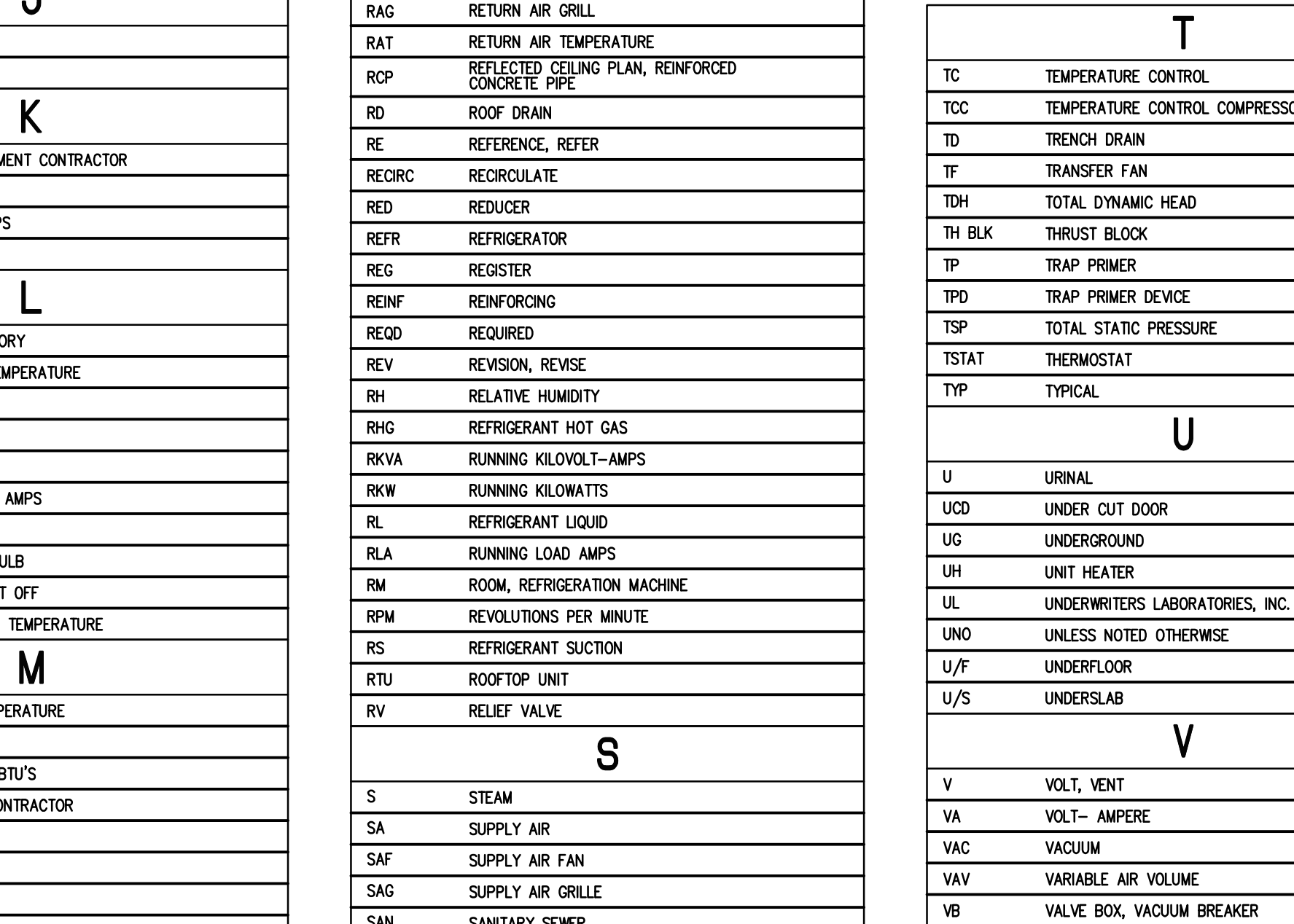
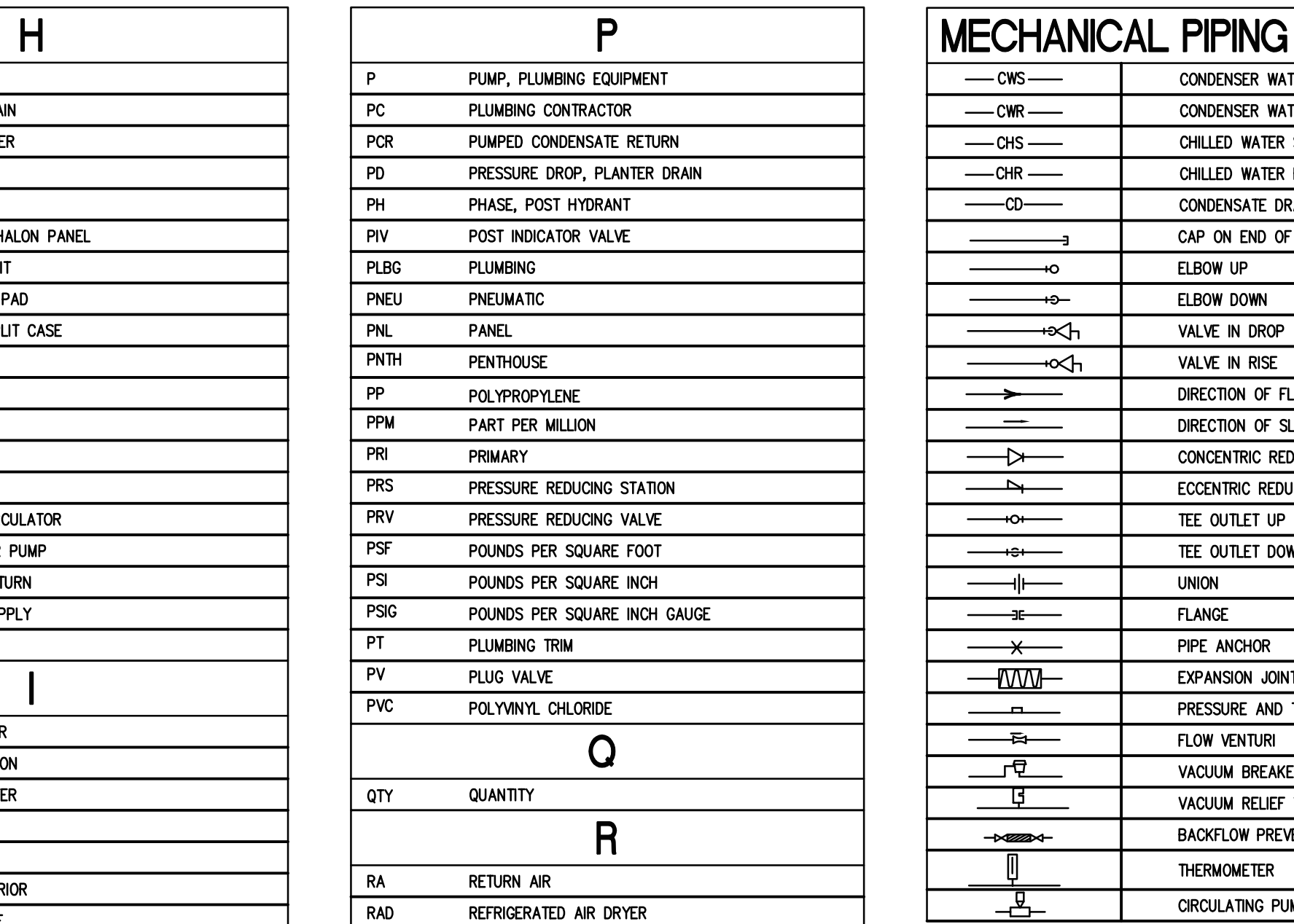
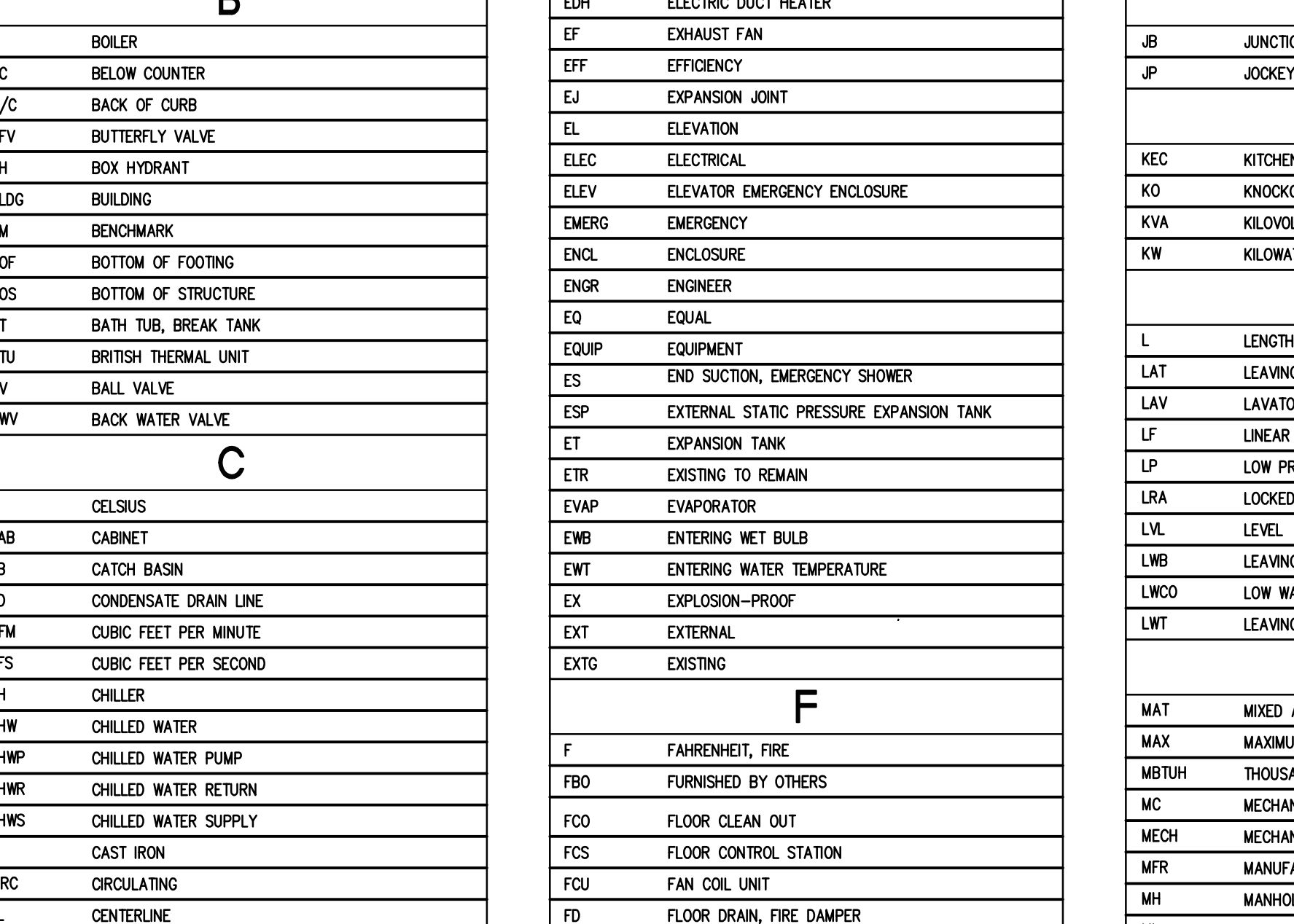
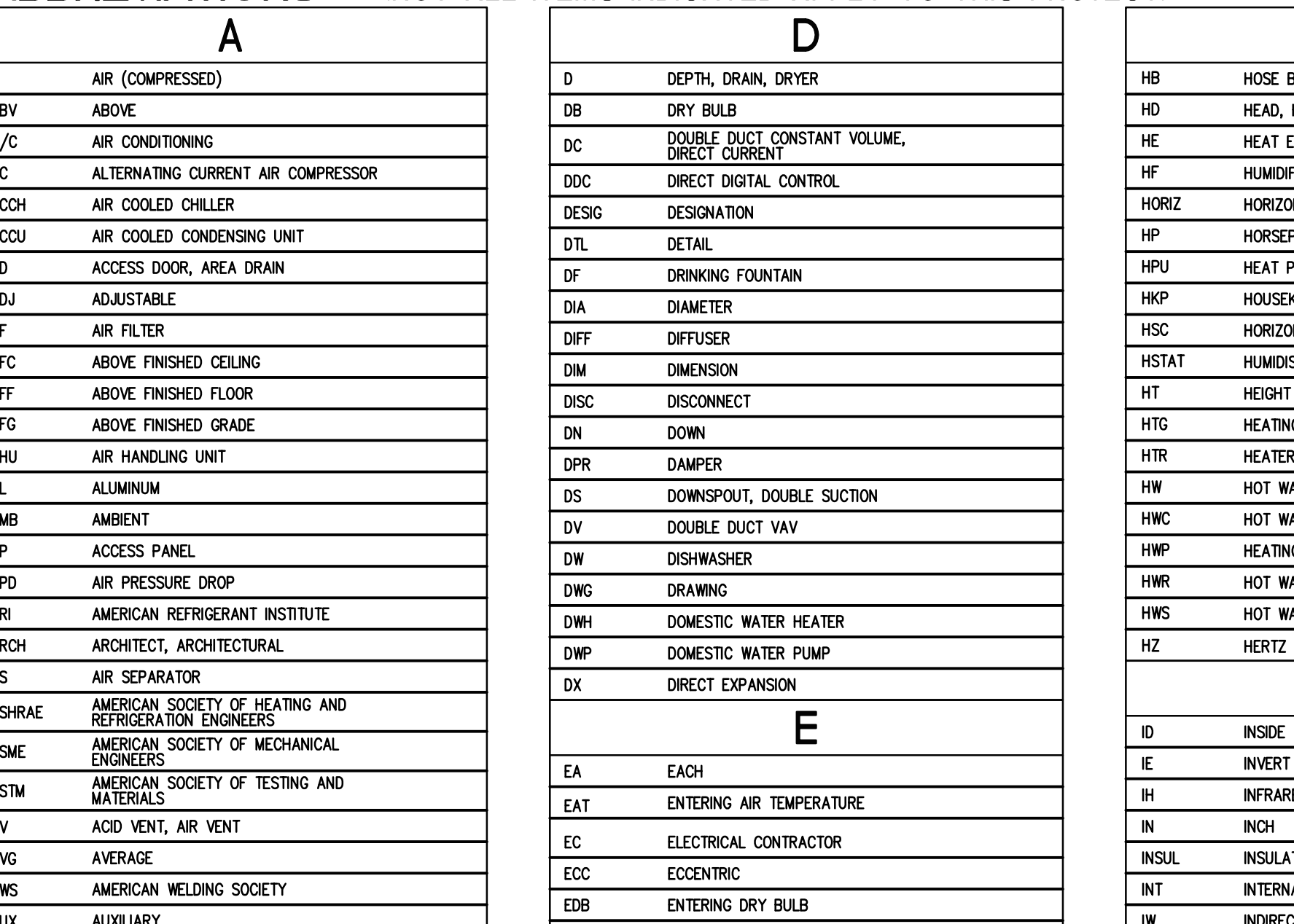
U	
U	URNAL
UCD	UNDER CUT DOOR
UG	UNDERGROUND
UH	UNIT HEATER
UL	UNDERWRITERS LABORATORIES, INC.
UNO	UNLESS NOTED OTHERWISE
U/F	UNDERFLOOR
U/S	UNDERSLAB

V	
V	VOLT, VENT
VA	VOLT- AMPERE
VAC	VACUUM
VAV	VARIABLE AIR VOLUME
VB	VALVE BOX, VACUUM BREAKER
VCP	VITRIFIED CLAY PIPE
VD	VOLUME DAMPER
VEL	VELOCITY
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VB	VALVE IN BOX
VOV	VALVE ON VERTICAL
VP	VACUUM PUMP
VR	VARIABLE AIR VOLUME REHEAT
VR	VENT THRU ROOF

W	
W	WATT, WASTE, WIDTH, WASHER
W/	WITH
W/O	WITHOUT
WB	WET BULB
WC	WATER CLOSET
WCD	WALL CLEAN OUT
WH	WALL HYDRANT
WM	WATER METER
WP	WEATHERPROOF
WPD	WATER PRESSURE DROP
WPF	WELED WIRE FABRIC
WT	WATERTIGHT, WEIGHT

Y	
Y	YARD HYDRANT

Z	
Z	ZONE



DBR
9900 Richmond Avenue
South Building, Suite 300
Houston, Texas 77042
713.914.0888 • 713.914.0886 f
TBE Firm Registration No. 2234

DBR Project Number 190317.000
EM | MECH | ELEC | PLBG | TECH

Houston Community College System
HVAC Replacement at Fannin Central Campus

DATE: 02/06/2020
DRAWN BY: DBR
CHECKED BY: DBR
PROJECT NUMBER: 190317.000
SHEET TITLE: MECHANICAL SYMBOLS AND ABBREVIATIONS
SHEET NUMBER: M001

DBR
SERVICE | QUALITY | INTEGRITY | SUSTAINABILITY
713.914.0888 • 713.914.0888 f
9990 Richmond Ave., South Bldg., Suite 300
Houston, Texas 77042
TBE Firm Registration No. 2234

ERO
5444 Westheimer
Suite 1000, Office 1054
Houston, TX 77056

REVISION:
No. / DATE / DESCRIPTION
01 / 02/21/2020 / 100X CD
02 / 03/04/2020 / ADDENDUM 01

SEAL:
ERIK M. MacDONALD
105068
LICENSED PROFESSIONAL ENGINEER
2/4/2020

Plotfile: Mar 3, 2020, 8:27 PM by user: hdb • Subject: 302020 by user: hdb
101191198317.000D:\awings\30M-190317-DETAILS & SCHEDULES.dwg

REVISION		
No.	DATE	DESCRIPTION
02/21/2020	100% CD	

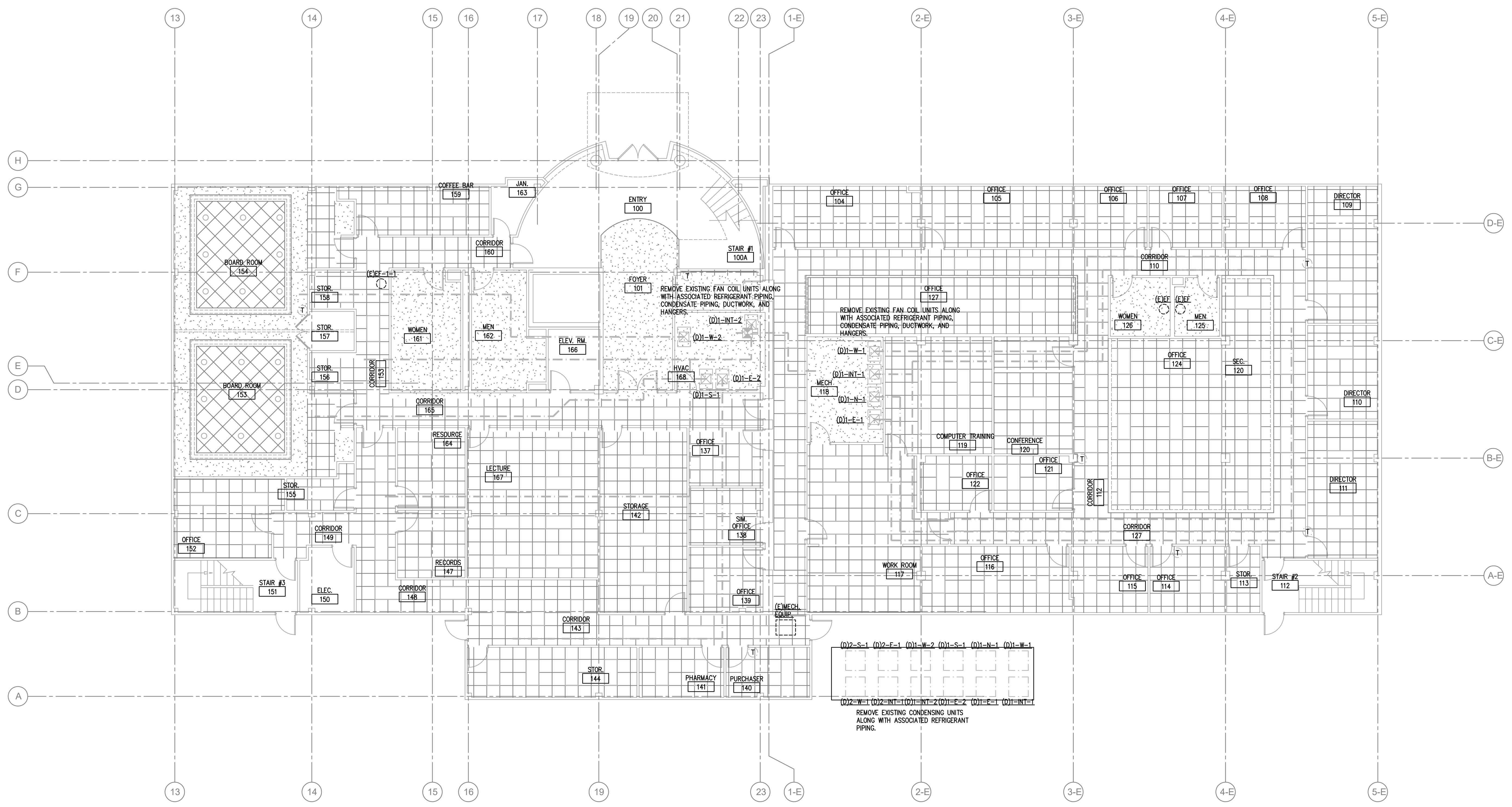


Houston Community College System
HVAC Replacement at Fannin
 Central Campus

DATE	02/06/2020
DRAWN BY:	DBR
CHECKED BY:	DBR
PROJECT NUMBER:	190317.000
SHEET TITLE	

**LEVEL 1
 MECHANICAL
 DEMO PLAN**

SHEET NUMBER:	M101
---------------	-------------



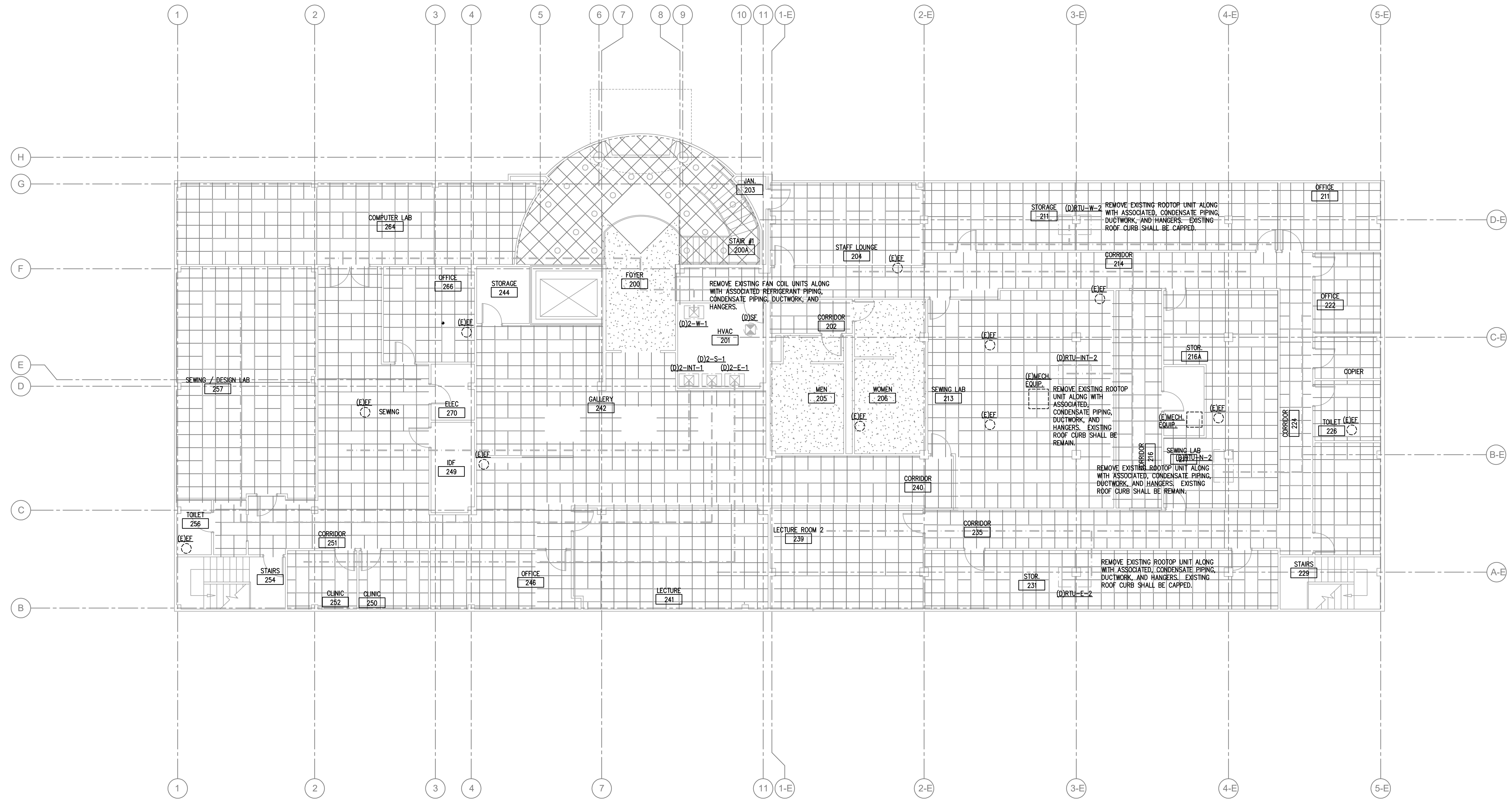
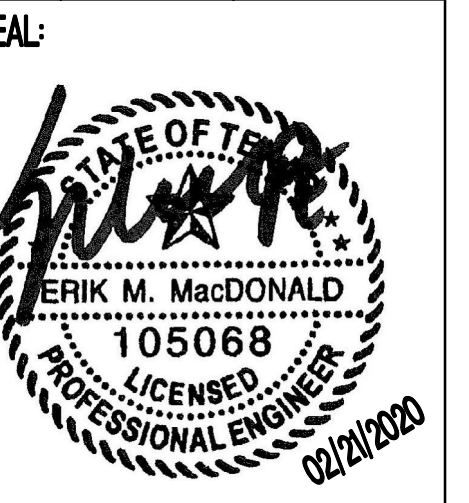
1 LEVEL 1 MECHANICAL DEMO PLAN
 M101 1/8"=1'-0"

DBR
 9990 Richmond Avenue
 South Building, Suite 300
 Houston, Texas 77042
 713.914.0888 p. 713.914.0888 f.
 TBPE Firm Registration No. 2234

DBR Project Number 190317.000
 EM | MECH | ELEC | PLBG | TECH

Project: Fannin_21_0200_1-50_Plan_Mechanical - Saved: 2/21/2020 by user: jvela
 H:\19\190317\190317\Drawings\01-M-100317-1.dwg

REVISION		
No.	DATE	DESCRIPTION
02/21/2020	100% CD	



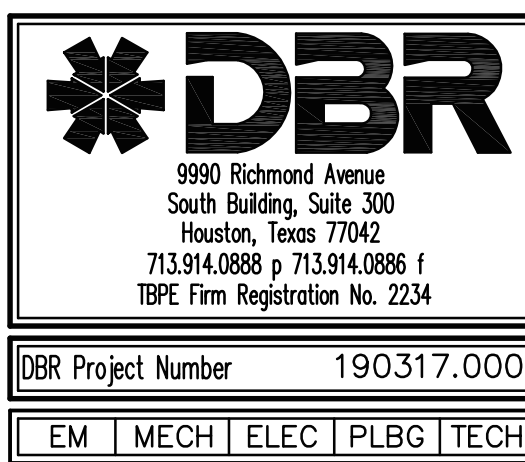
1 LEVEL 2 MECHANICAL DEMO PLAN
 M102 1/8"=1'-0"

Houston Community College System
HVAC Replacement at Fannin
 Central Campus

DATE: 02/06/2020
 DRAWN BY: DBR
 CHECKED BY: DBR
 PROJECT NUMBER: 190317.000
 SHEET TITLE:

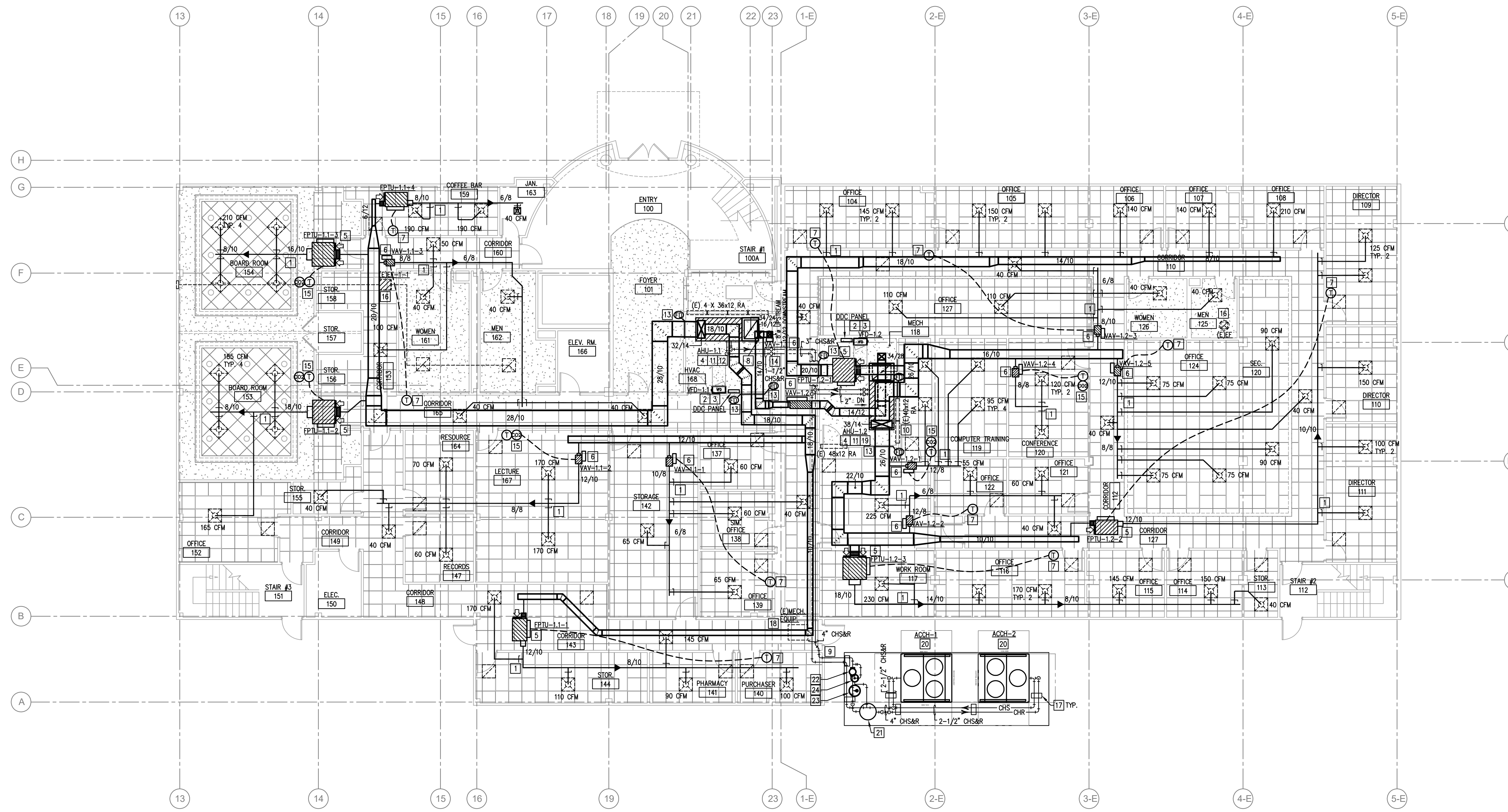
LEVEL 2
 MECHANICAL
 DEMO PLAN

SHEET NUMBER:
M102



Project: Fc_21_0200_450.Plot1; user: jvela; Saved: 2/21/2020 by user: jvela
 H:\190317\190317\000\Drawings\04-M102.dwg

RELOCATE EXISTING CONDUIT, PIPING, WIRING, CABLE TRAYS, AND ASSOCIATED HANGERS AND SUPPORTS TO ACCOMMODATE NEW MECHANICAL DUCTWORK, PIPING, AND EQUIPMENT.



1 LEVEL 1 MECHANICAL PLAN
 M201 1/8"=1'-0"

MECHANICAL GENERAL NOTES:

1. REFER TO M001 FOR MECHANICAL GENERAL NOTES.
 2. ROUND DUCTS FROM LOW PRESSURE SUPPLY MAINS TO DIFFUSERS SHALL BE SIZED PER TABLE ON SHEET. SWITCH OUT EXISTING DIFFUSERS TO GET MINIMUM NECK SIZE. PROVIDE NEW DIFFUSERS TO MATCH EXISTING TYPE IF NOT AVAILABLE.
- MECHANICAL KEYS NOTES:**
- 1] PROVIDE SPIN-IN FITTING WITH LOCKING QUADRANT BUTTERFLY DAMPER FOR ALL ROUND DUCT CONNECTIONS TO RECTANGULAR DUCT. RE: DETAIL 5/M501.
 - 2] PROVIDE NEW VARIABLE FREQUENCY DRIVE FOR ASSOCIATED MECHANICAL EQUIPMENT AS SHOWN. CONTRACTOR TO FIELD VERIFY FINAL LOCATION AND INSTALL VFD.
 - 3] PROVIDE NEW DDC PANEL IN MECHANICAL ROOM. CONTRACTOR TO FIELD VERIFY FINAL LOCATION OF DDC PANEL.
 - 4] PROVIDE 1" CONDENSATE DRAIN LINE FROM AHU TO NEAREST FLOOR DRAIN. RE: DETAIL 15/M501.
 - 5] PROVIDE AND INSTALL FAN POWERED TERMINAL UNIT AND DUCTWORK AT APPROXIMATE LOCATION SHOWN. SUPPORT UNIT FROM STRUCTURE ABOVE. RE: DETAIL 4/M501.
 - 6] PROVIDE AND INSTALL VARIABLE AIR VOLUME BOX AND DUCTWORK AT APPROXIMATE LOCATION SHOWN. SUPPORT UNIT FROM STRUCTURE ABOVE. RE: DETAIL 5/M501.
 - 7] PROVIDE WALL MOUNTED TEMPERATURE SENSOR FOR ASSOCIATED MECHANICAL EQUIPMENT AT LOCATION SHOWN. TYPICAL. COORDINATE WITH ARCHITECT FOR FINAL LOCATION AND MOUNTING HEIGHTS.
 - 8] ROUTE OUTSIDE AIR DUCT UP THROUGH FLOOR TO LEVEL ABOVE. SEE PLAN FOR SIZE.
 - 9] ROUTE CHILLED WATER SUPPLY AND RETURN THROUGH EXTERIOR WALL AT APPROXIMATE LOCATION SHOWN. RE: DETAIL 24/M501.
 - 10] RELOCATE EXISTING TWO 40X12 RETURN AIR OPENINGS WITH FIRE DAMPER TO LOCATION SHOWN.
 - 11] PROVIDE NEW AIR HANDLING UNIT AS SHOWN AND SCHEDULED. RE: M401 FOR SCHEDULE. INSTALL NEW UNIT WITH CLEARANCE FOR UNIT SERVICE AS RECOMMENDED BY AHU MANUFACTURER. ROUTE NEW 1" CONDENSATE DRAIN PIPE TO FLOOR DRAIN AS SHOWN. PROVIDE NEW 4" THICK HOUSEKEEPING PAD AS REQUIRED FOR NEW AHU FOOTPRINT.
 - 12] PROVIDE NEW MIXING BOX PLENUM FULL SIZE OF UNIT AND 30" DEEP. PROVIDE NEW OUTSIDE AIR DUCTWORK AS SHOWN. ROUTE 12" X 12" OUTSIDE AIR DUCT FROM VAV BOX AND TAP INTO BACK OF MIXING BOX PLENUM. TRANSITION AS REQUIRED. PROVIDE 36" X 24" RETURN AIR DUCT ON TOP OF MIXING BOX PLENUM. PROVIDE MINIMUM RETURN AIR DUCTWORK REQUIRED TO INSTALL MOTORIZED DAMPER AND VOLUME DAMPER.
 - 13] PROVIDE FIRE DAMPER IN DUCT AT WALL PENETRATION. RE: DETAIL 28/M501.
 - 14] ROUTE CHSR PIPING UP THROUGH FLOOR TO LEVEL ABOVE.
 - 15] PROVIDE WALL MOUNTED TEMPERATURE AND CARBON DIOXIDE SENSOR FOR ASSOCIATED MECHANICAL EQUIPMENT AT LOCATION SHOWN. TYPICAL. COORDINATE WITH ARCHITECT FOR FINAL LOCATION AND MOUNTING HEIGHTS.
 - 16] EXISTING EXHAUST FAN TO REMAIN. EXHAUST FAN SHALL BE INTEGRATED INTO NEW ENERGY MANAGEMENT AND CONTROL SYSTEM.
 - 17] PROVIDE PIPE SUPPORT AT APPROXIMATE LOCATION SHOWN. TYPICAL. RE: DETAIL 23/M501.
 - 18] EXISTING CONDENSING UNIT SHALL REMAIN.
 - 19] PROVIDE NEW MIXING BOX PLENUM FULL SIZE OF UNIT AND 32" DEEP. PROVIDE NEW OUTSIDE AIR DUCTWORK AS SHOWN. ROUTE 14" X 12" OUTSIDE AIR DUCT FROM VAV BOX AND TAP INTO BACK OF MIXING BOX PLENUM. TRANSITION AS REQUIRED. PROVIDE 34" X 28" RETURN AIR DUCT ON TOP OF MIXING BOX PLENUM. PROVIDE MINIMUM RETURN AIR DUCTWORK REQUIRED TO INSTALL MOTORIZED DAMPER AND VOLUME DAMPER.
 - 20] PROVIDE AIR COOLED CHILLER AS SCHEDULED. ROUTE REFRIGERANT RELIEF 20 FT FROM DOOR OPENINGS. RE: DETAIL 19/M501.
 - 21] PROVIDE 180 GALLON MINIMUM VOLUME TANK FOR CHILLED WATER SYSTEM. TACO BT1090 OR EQUAL. RE: DETAIL 20/M501.
 - 22] PROVIDE TACO 4909A9 AIR/DIRT SEPARATOR WITH REMOVABLE COVER OR APPROVED EQUAL FOR CHILLED WATER SYSTEM AT LOCATION SHOWN. RE: DETAIL 21/M501.
 - 23] PROVIDE FULL ACCEPTANCE CAPTIVE AIR PRE-CHARGED BLADDER TYPE EXPANSION TANK FOR CHILLED WATER SYSTEM AT LOCATION SHOWN. MINIMUM 23 GAL. VOLUME. TACO C90 OR EQUAL. RE: DETAIL 21/M501.
 - 24] PROVIDE NEW CHEMICAL TREATMENT FEEDER FOR CHILLED WATER SYSTEM AT LOCATION SHOWN. RE: DETAIL 22/M501.

MIN. DUCT SIZE	CFM
6"	0-120
8"	125-220
10"	225-340
12"	345-500



ERO
 5444 Westheimer
 Suite 1000, Office 1054
 Houston, TX 77056

REVISION:
 No. / DATE / DESCRIPTION
 02/21/2020 100X CD



Houston Community College System
**HVAC Replacement at Fannin
 Central Campus**

DATE:
 02/06/2020
 DRAWN BY:
 DBR
 CHECKED BY:
 DBR
 PROJECT NUMBER:
 190317.000
 SHEET TITLE:

**LEVEL 1
 MECHANICAL
 PLAN**

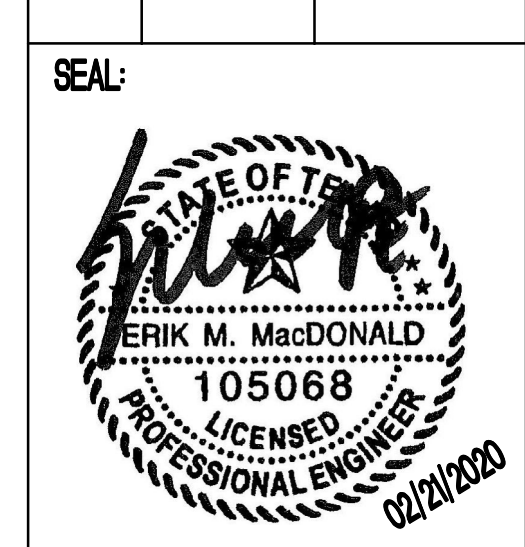
SHEET NUMBER:

M201

Project: Ec-21_2020_4530_R141_mech_pln1.dwg, Sheet: 2/21/2020 by user: jvela
 H:\19\190317\190317\000\Drawings\04-M-190317-1.dwg

REVISION

No.	DATE	DESCRIPTION
02/21/2020	100% CD	



Houston Community College System
HVAC Replacement at Fannin
 Central Campus

DATE: 02/06/2020
DRAWN BY: DBR
CHECKED BY: DBR
PROJECT NUMBER: 190317.000
SHEET TITLE:

LEVEL 2
MECHANICAL
PLAN

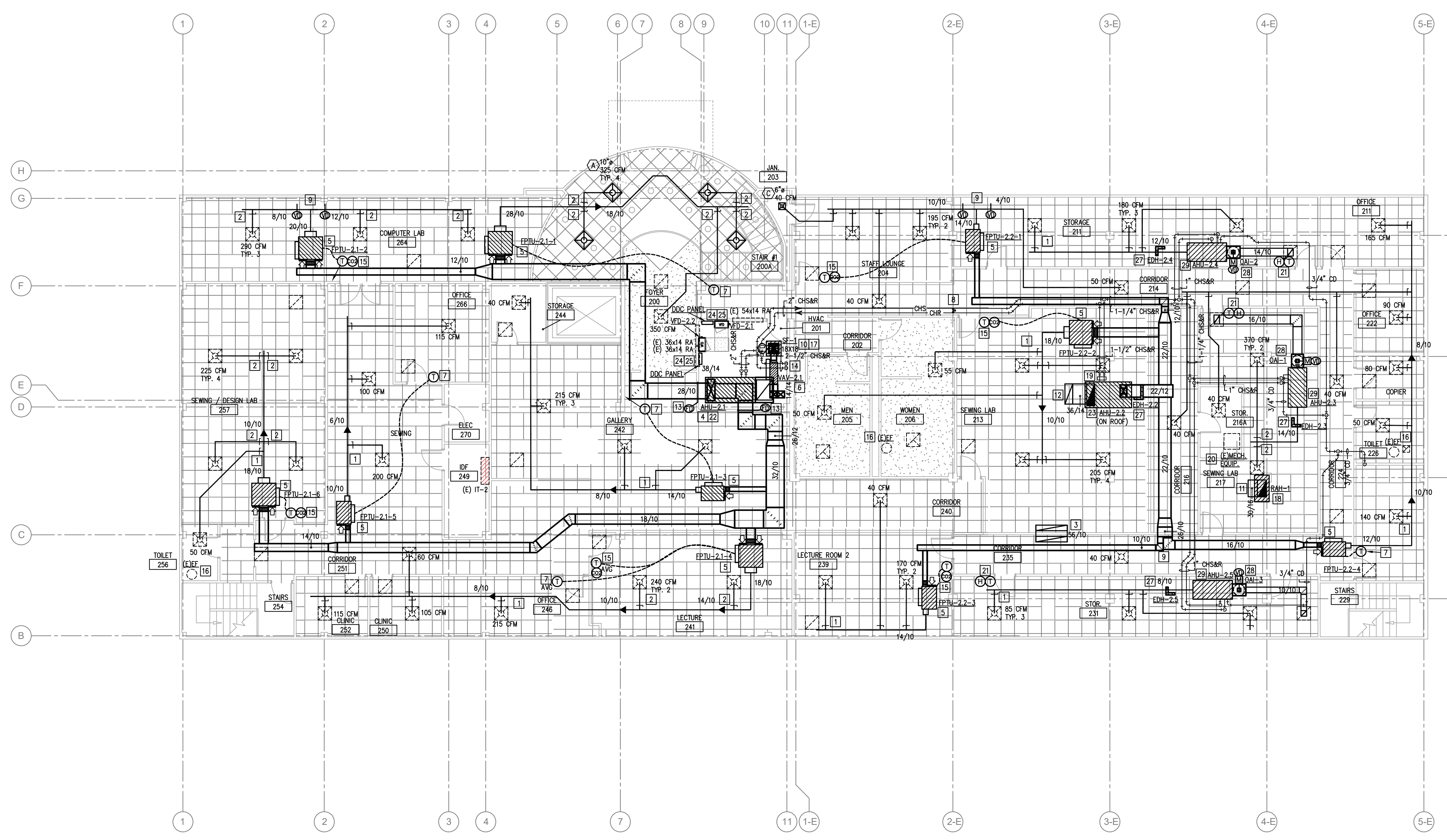
SHEET NUMBER:

M202

DBR
 9990 Richmond Avenue
 Suite 300
 Houston, Texas 77042
 713.914.0888 f
 TBPE Firm Registration No. 2234

DBR Project Number 190317.000
 DBR | MECH | ELEC | PLBG | TECH

RELOCATE EXISTING CONDUIT, PIPING, WIRING, CABLE TRAYS, AND ASSOCIATED HANGERS AND SUPPORTS TO ACCOMODATE NEW MECHANICAL DUCTWORK, PIPING, AND EQUIPMENT.



1 LEVEL 2 MECHANICAL PLAN
 M202 1/8"=1'-0"

- MECHANICAL GENERAL NOTES:**
- REFER TO M001 FOR MECHANICAL GENERAL NOTES.
 - ROUND DUCTS FROM LOW PRESSURE SUPPLY MAINS TO DIFFUSERS SHALL BE SIZED PER TABLE ON SHEET. SWITCH OUT EXISTING DIFFUSERS TO GET MINIMUM NECK SIZE. PROVIDE NEW DIFFUSERS TO MATCH EXISTING TYPE IF NOT AVAILABLE.
- MECHANICAL KEYED NOTES:**
- PROVIDE SPIN-IN FITTING WITH LOCKING QUADRANT BUTTERFLY DAMPER FOR ALL ROUND DUCT CONNECTIONS TO RECTANGULAR DUCT. RE: DETAIL 3/M501.
 - PROVIDE RECTANGULAR TAP TO ROUND TRANSITION FOR ROUND DUCT CONNECTIONS TO RECTANGULAR DUCT OF SAME HEIGHT OR SHORTER. TYPICAL. RE: DETAIL 7/M501.
 - PROVIDE RETURN AIR BOOT, SIZE AS SHOWN. RE: DETAIL 1/M401.
 - PROVIDE 1" CONDENSATE DRAIN LINE FROM AHU TO NEAREST FLOOR DRAIN. RE: DETAIL 15/M501.
 - PROVIDE AND INSTALL FAN POWERED TERMINAL UNIT AND DUCTWORK AT APPROXIMATE LOCATION SHOWN. SUPPORT UNIT FROM STRUCTURE ABOVE. RE: DETAIL 4/M501.
 - PROVIDE AND INSTALL VARIABLE AIR VOLUME BOX AND DUCTWORK AT APPROXIMATE LOCATION SHOWN. SUPPORT UNIT FROM STRUCTURE ABOVE. RE: DETAIL 5/M501.
 - PROVIDE WALL MOUNTED TEMPERATURE SENSOR FOR ASSOCIATED MECHANICAL EQUIPMENT AT LOCATION SHOWN. TYPICAL. COORDINATE WITH ARCHITECT FOR FINAL LOCATION AND MOUNTING HEIGHTS.
 - PROVIDE 2" CHILLED WATER BYPASS WITH 2-WAY MODULATING CONTROL VALVE AS SHOWN. VALVE SHALL BE SIZED FOR MINIMUM CHILLER FLOW RATE.
 - INSTALL DUCTWORK TEE AS SHOWN. RE: DETAIL 29 & 30/M501.
 - PROVIDE FIRE DAMPER IN DUCT AT FLOOR PENETRATION. RE: DETAIL 29 & 30/M501.
 - PROVIDE ELBOW AT RELIEF AIR DUCT. COVER OPENING WITH 1/2" HARDWARE CLOTH. ROUTE RELIEF AIR DUCT UP THROUGH ROOF TO RELIEF HOOD. PROVIDE BAROMETRIC DAMPER IN VERTICAL SECTION OF RELIEF AIR DUCT. REFER TO PLAN FOR DUCT SIZE.
 - PROVIDE ELBOW AT RETURN AIR DUCT. COVER OPENING WITH 1/2" GALVANIZED HARDWARE CLOTH. REFER TO PLAN FOR SIZE.
 - PROVIDE FIRE DAMPER IN DUCT AT WALL PENETRATION. RE: DETAIL 28 & 30/M501.
 - CHSR PIPING FROM FLOOR BELOW.
 - PROVIDE WALL MOUNTED TEMPERATURE AND CARBON DIOXIDE SENSOR FOR ASSOCIATED MECHANICAL EQUIPMENT AT LOCATION SHOWN. TYPICAL. COORDINATE WITH ARCHITECT FOR FINAL LOCATION AND MOUNTING HEIGHTS.
 - EXISTING EXHAUST FAN TO REMAIN. EXHAUST FAN SHALL BE INTEGRATED INTO NEW ENERGY MANAGEMENT AND CONTROL SYSTEM.
 - PROVIDE ROOF MOUNTED OUTSIDE AIR SUPPLY FAN AS SCHEDULED. MOUNT FAN ON PRE-FABRICATED ROOF CURB. CONNECT OUTSIDE AIR DUCT TO FAN OUTLET AND ROUTE DOWN THROUGH ROOF TO ASSOCIATED AHU'S AS SHOWN. REFER TO PLAN FOR SIZE. PROVIDE TRANSITIONS AS REQUIRED. RE: DETAIL 12/M501.
 - PROVIDE ROOF MOUNTED RELIEF AIR HOOD AS SCHEDULED. MOUNT HOOD ON PRE-FABRICATED ROOF CURB. CONNECT RELIEF AIR DUCT TO HOOD INLET AND ROUTE DOWN THROUGH ROOF. REFER TO PLAN FOR SIZE. PROVIDE TRANSITIONS AS REQUIRED. RE: DETAIL 11/M501.
 - PROVIDE PIPE SUPPORT AT LOCATION SHOWN. TYPICAL. RE: DETAIL 18/M501.
 - EXISTING CONDENSING UNIT SHALL REMAIN.
 - PROVIDE WALL MOUNTED TEMPERATURE AND HUMIDITY SENSOR FOR ASSOCIATED MECHANICAL EQUIPMENT AT LOCATION SHOWN. TYPICAL. COORDINATE WITH ARCHITECT FOR FINAL LOCATION AND MOUNTING HEIGHTS.
 - PROVIDE NEW AIR HANDLING UNIT AS SHOWN AND SCHEDULED. RE: M401 FOR SCHEDULE. INSTALL NEW UNIT WITH CLEARANCE FOR UNIT SERVICE AS RECOMMENDED BY AHU MANUFACTURER. ROUTE NEW 1" CONDENSATE DRAIN PIPE TO FLOOR DRAIN AS SHOWN. PROVIDE NEW 4" THICK HOUSEKEEPING PAD AS REQUIRED FOR NEW AHU FOOTPRINT.
 - PROVIDE ROOFTOP AIR HANDLING UNIT AS SHOWN AND SCHEDULED. RE: M401 FOR SCHEDULE. MOUNT ROOFTOP UNIT ON CURB ADAPTER. ROUTE NEW 1" CONDENSATE DRAIN PIPE TO NEAREST ROOF DRAIN. RE: DETAIL 14/M501.
 - PROVIDE NEW VARIABLE FREQUENCY DRIVE FOR ASSOCIATED MECHANICAL EQUIPMENT AS SHOWN. CONTRACTOR TO FIELD VERIFY FINAL LOCATION AND INSTALL VFD.
 - PROVIDE NEW DDC PANEL IN MECHANICAL ROOM. CONTRACTOR TO FIELD VERIFY FINAL LOCATION OF DDC PANEL.
 - PROVIDE NEW MIXING BOX PLENUM FULL SIZE OF UNIT AND 32" DEEP. PROVIDE NEW OUTSIDE AIR DUCTWORK AS SHOWN. ROUTE 14" X 14" OUTSIDE AIR DUCT FROM VAV BOX AND TAP INTO BACK OF MIXING BOX PLENUM. TRANSITION AS REQUIRED. PROVIDE 36" X 28" RETURN AIR DUCT ON TOP OF MIXING BOX PLENUM. PROVIDE MINIMUM RETURN AIR DUCTWORK REQUIRED TO INSTALL MOTORIZED DAMPER AND VOLUME DAMPER.
 - PROVIDE IN-LINE ELECTRIC DUCT HEATER AT LOCATION SHOWN. REFER TO M401 FOR SCHEDULE. RE: 13/M501.
 - PROVIDE ROOF MOUNTED OUTSIDE AIR INTAKE AT LOCATION SHOWN. MOUNT ON PREFABRICATED ROOF CURB. ROUTE DUCTWORK DOWN TO ASSOCIATED AHU AS SHOWN. REFER TO M401 FOR SCHEDULE. RE: 10/M501.
 - PROVIDE NEW AIR HANDLING UNIT SUSPENDED FROM STRUCTURE AS SHOWN AND SCHEDULED. RE: M401 FOR SCHEDULE. INSTALL NEW UNIT WITH CLEARANCE FOR UNIT SERVICE AS RECOMMENDED BY AHU MANUFACTURER. SUPPLY AND RETURN DUCTWORK INCLUDING FLEX DUCT SHALL BE R-8. ROUTE NEW 3/4" CONDENSATE DRAIN PIPE TO NEAREST LAVATORY AS SHOWN. MAIN CONDENSATE DRAIN LINE SHALL BE SLOPED NOT LESS THAN 1/8" PER FOOT.

MIN. DUCT SIZE	CFM
6"	0-120
8"	125-220
10"	225-340
12"	345-500

AIR HANDLING UNIT SCHEDULE		
MARK		AHU-5
TYPE		CV
UNIT CONFIGURATION		VERTICAL
DISCHARGE		TOP
DESIGN SUPPLY AIR (CFM)		1,200
DESIGN OUTDOOR AIR (CFM)		270
EXTERNAL S.P. (IN. W.G.)		0.750
TOTAL S.P. (IN. W.G.)		2.510
FAN MOTOR BRAKE HORSEPOWER (HP)		1.0
FAN MOTOR HORSEPOWER (HP)		1.5
VOLTS/PHASE/HERTZ		480/3/60
MAX FAN RPM		1,757.0
MCA / MOCP		2.8 / 3
MAX COIL FACE VELOCITY (FPM)		500
MIN COIL ROWS		6
MAX FINS PER INCH		11
COIL CFM		1,200
EAT DB/WB (°F)		81.5 / 66.7
LAT DB/WB (°F)		53.0 / 52.9
DESIGN TOTAL COOLING CAPACITY (MBH)		50.4
TOTAL COOLING CAPACITY PROVIDED BY UNIT (MBH)		49.7
DESIGN SENSIBLE COOLING CAPACITY (MBH)		37.1
SENSIBLE COOLING CAPACITY PROVIDED BY UNIT (MBH)		36.5
EWTLW/T (°F)		42 / 54
COIL WATER FLOW (GPM)		8.2
MAX WATER P.D. (FT. HD.)		10.0
MAX COIL FACE VELOCITY (FPM)		500
POSITION		REHEAT
MIN COIL ROWS		1
MAX FINS PER INCH		11
COIL CFM		1,200
EAT DB/WB (°F)		59.3
LAT DB/WB (°F)		90.0
DESIGN HEATING CAPACITY (MBH)		40.0
HEATING CAPACITY PROVIDED BY UNIT (MBH)		39.8
EWTLW/T (°F)		180 / 160
COIL WATER FLOW (GPM)		4.1
MAX WATER P.D. (FT. HD.)		10.0
MANUFACTURER		CARRIER
MODEL NUMBER		39MN03
OPERATING WEIGHT (LBS.)		1081
NOTES		1, 2, 3, 4

- NOTES:
- EXTERNAL STATIC PRESSURE DOES NOT INCLUDE LOSSES DUE TO COILS, FILTERS, AND CASING.
 - PROVIDE UNIT WITH STACKED DRAW THRU BELT DRIVE CENTRIFUGAL FAN SECTION, HOT WATER COIL SECTION, CHILLED WATER COIL SECTION, AND 2" MERV 8 FLAT FILTER RACK MOUNTED TO AHU.
 - UNIT SHALL NOT EXCEED 47" WIDTH X 42" LENGTH.
 - UNIT MANUFACTURER TO PROVIDE SHIPPING SPLITS TO ENSURE FIT THROUGH A 3'-0" WIDE DOORWAY. CONTRACTOR TO ASSEMBLE THE UNIT INTO POSITION.

FAN SCHEDULE

MARK	SF-1
SERVES	AHU-1.1, 1.2, 2.1
TYPE/DRIVE	ROOF / BELT
CFM	2,565
EXT. S.P. (IN. W.G.)	0.750
HORSEPOWER	1
MOTOR CONTROL	SEE NOTE 3
FAN RPM	726
SONES	
VOLTS/PHASE/HERTZ	480 / 3 / 60
WEIGHT WITH ACCESSORIES - LBS	
MANUFACTURER	GREENHECK
MODEL NUMBER	SAF-115-10
NOTES	1, 2, 3, 4

- NOTES:
- EXTERNAL STATIC PRESSURE DOES NOT ACCOUNT FOR LOSSES DUE TO FILTERS, HOUSING, NOR ACCESSORIES.
 - PROVIDE FAN WITH MOTOR RATED TOGGLE SWITCH AND 1" WASHABLE ALUMINUM FILTERS.
 - PROVIDE FAN WITH VFD, PREMIUM EFFICIENCY MOTOR AND SHAFT GROUNDING RINGS FOR DEMAND CONTROL VENTILATION SEQUENCE.
 - PROVIDE FAN WITH ROOF CURB ADAPTER. FIELD VERIFY EXISTING ROOF CURB DIMENSIONS PRIOR TO ORDERING.

AIR HANDLING UNIT SCHEDULE								
MARK	AHU-1.1	AHU-1.2	AHU-2.1	AHU-2.2	AHU-2.3	AHU-2.4	AHU-2.5	
TYPE	VAV	VAV	VAV	VAV	CV	CV	CV	
UNIT CONFIGURATION	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL	
DISCHARGE	TOP	TOP	TOP	BOTTOM	FRONT	FRONT	FRONT	
DESIGN SUPPLY AIR (CFM)	4,005	4,755	4,960	2,265	740	540	255	
MINIMUM SUPPLY AIR (CFM)	1,180	1,320	1,670	990	225	165	255	
DESIGN OUTDOOR AIR (CFM)	640	950	975	760	70	60	65	
MINIMUM OUTSIDE AIR (CFM)	340	410	465	345	70	60	65	
EXTERNAL S.P. (IN. W.G.)	1.325	1.250	1.125	1.250	0.500	0.500	0.500	
TOTAL S.P. (IN. W.G.)	3.080	2.910	2.840	3.020	3.090	2.780	2.530	
FAN MOTOR BRAKE HORSEPOWER (HP)	3.0	3.3	3.4	1.9	0.8	0.6	0.3	
FAN MOTOR HORSEPOWER (HP)	5	5	5	3	1	1	1	
VOLTS/PHASE/HERTZ	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	
MAX FAN RPM	1,932.0	1,717.0	1,735.0	1,650.0	4,262.0	3,785.0	3,371.0	
MCA / MOCP	8.3 / 10	8.3 / 10	8.3 / 10	5.1 / 6				
MAX COIL FACE VELOCITY (FPM)	500	500	500	500	500	500	500	
MIN COIL ROWS	6	6	6	6	6	6	6	
MAX FINS PER INCH	11	11	11	11	11	11	11	
COIL CFM	4,005	4,755	4,960	2,265	740	540	255	
EAT DB/WB (°F)	77.5 / 65.0	78.2 / 66.2	80.4 / 66.3	83.3 / 69.4	82.8 / 54.7	83.3 / 55.2	88.5 / 60.1	
LAT DB/WB (°F)	50.8 / 50.6	50.0 / 50.0	50.0 / 50.0	51.00 / 50.8	46.2 / 44.8	46.2 / 45.0	46.2 / 44.6	
DESIGN TOTAL COOLING CAPACITY (MBH)	156.4	210.9	215.9	130.3	18.1	13.7	10.1	
TOTAL COOLING CAPACITY PROVIDED BY UNIT (MBH)	156.2	209.9	219.6	131.3	17.7	14.1	11.8	
DESIGN SENSIBLE COOLING CAPACITY (MBH)	109.3	138.7	151.7	81.5	13.7	9.9	6.1	
SENSIBLE COOLING CAPACITY PROVIDED BY UNIT (MBH)	111.5	138.8	155.3	81.3	12.4	9.9	7.7	
EWTLW/T (°F)	42 / 56	42 / 56	42 / 56	42 / 56	42 / 56	42 / 56	42 / 56	
COIL WATER FLOW (GPM)	22.2	29.9	31.3	18.7	5.9	4.7	3.9	
MAX WATER P.D. (FT. HD.)	10.0	10.0	10.0	10.0	11.0	11.0	11.0	
MANUFACTURER	CARRIER	CARRIER	CARRIER	CARRIER	CARRIER	CARRIER	CARRIER	
MODEL NUMBER	39MN09	39MN11	39MN11	39MW06	39S00	39S00	39S00	
OPERATING WEIGHT (LBS.)	1427	1666	1666	1695	592.0	592.0	592.0	
NOTES	1, 2, 3, 4, 5	1, 2, 3, 4, 5	1, 2, 3, 4, 5	1, 3, 4, 6, 8, 10	1, 4, 5, 7, 9	1, 4, 5, 7, 9	1, 4, 5, 7, 9	

- NOTES:
- EXTERNAL STATIC PRESSURE DOES NOT INCLUDE LOSSES DUE TO COILS, FILTERS, AND CASING.
 - PROVIDE UNIT WITH DRAW THRU DIRECT DRIVE PLENUM FAN SECTION, ACCESS SECTION, CHILLED WATER COIL SECTION, AND 2" MERV 11 FLAT FILTER SECTION.
 - PROVIDE UNIT WITH REMOTE MOUNTED VARIABLE FREQUENCY DRIVE AND PREMIUM EFFICIENCY MOTORS WITH SHAFT GROUNDING RINGS.
 - PROVIDE CHILLED WATER COIL WITH 2-WAY AUTOMATIC CONTROL VALVE.
 - UNIT MANUFACTURER TO PROVIDE SHIPPING SPLITS TO ENSURE FIT THROUGH A 3'-0" WIDE DOORWAY. CONTRACTOR TO ASSEMBLE THE UNIT INTO POSITION.
 - UNIT SHALL BE OUTDOOR RATED CONSTRUCTION WITH BOTTOM DISCHARGE, ROOFCURB ADAPTER, AND OUTSIDE AIR INTAKE HOOD WITH DAMPER.
 - PROVIDE UNIT WITH DRAW THRU DIRECT DRIVE PLENUM FAN SECTION, CHILLED WATER COIL SECTION, AND COMBINATION 2" MERV 8/4" MERV 13 FLAT FILTER SECTION.
 - PROVIDE UNIT WITH DRAW THRU BELT DRIVE CENTRIFUGAL FAN SECTION, ACCESS SECTION, CHILLED WATER COIL SECTION, AND 2" MERV 11 FLAT FILTER SECTION.
 - PROVIDE UNIT WITH COMBINATION STARTER/DISCONNECT SWITCH.
 - PROVIDE UNIT WITH WEATHERPROOF DISCONNECT SWITCH.

SINGLE INLET VAV BOX SCHEDULE

MARK	COOLING CFM		INLET SIZE	VOLTS/PHASE/Hz	MANUFACTURER	MODEL
	MAX	MIN				
VAV-1.1-1	290	90	6"Ø	24/1/60	TITUS	DESV-6
VAV-1.1-2	550	170	8"Ø	24/1/60	TITUS	DESV-8
VAV-1.1-3	310	90	6"Ø	24/1/60	TITUS	DESV-6
VAV-1.2-1	380	110	6"Ø	24/1/60	TITUS	DESV-6
VAV-1.2-2	380	110	6"Ø	24/1/60	TITUS	DESV-6
VAV-1.2-3	340	70	6"Ø	24/1/60	TITUS	DESV-6
VAV-1.2-4	240	70	6"Ø	24/1/60	TITUS	DESV-6
VAV-1.2-5	560	170	8"Ø	24/1/60	TITUS	DESV-8

- NOTES:
- PROVIDE TERMINAL UNIT CASING WITH 1" INTERNALLY LINED FIBERGLASS FREE INSULATION.
 - 24 VOLTS AC SHALL BE PROVIDED BY CONTROLS CONTRACTOR.

SINGLE INLET VAV BOX WITH REHEAT SCHEDULE

MARK	HEATING CFM		REHEAT KW	INLET SIZE	VOLTS/PHASE/Hz	MFR	MODEL NO.
	MAX	MIN					
VAV-1.1	640	340	1.6	8"Ø	277/1/60	TITUS	DESV-8
VAV-1.2	950	410	4.9	10"Ø	277/1/60	TITUS	DESV-10
VAV-2.1	975	465	3.2	10"Ø	277/1/60	TITUS	DESV-10

- NOTES:
- PROVIDE TERMINAL UNIT WITH INTEGRAL DISCONNECT SWITCH.
 - PROVIDE DISCONNECT WITH BOXES.
 - PROVIDE ELECTRIC REHEAT COIL WITH 0-10V SCR MODULATING CAPACITY CONTROL.
 - PROVIDE TERMINAL UNIT CASING WITH 1" INTERNALLY LINED FIBERGLASS FREE INSULATION.
 - PROVIDE AEROCROSS MULTI-POINT CENTER AVERAGING VELOCITY SENSOR IN PRIMARY AIR INLET.

FAN POWERED TERMINAL UNIT SCHEDULE

MARK	PRIMARY AIR CFM		REHEAT KW	INLET SIZE	VOLTS/PHASE/Hz	ECM HP	MFR	MODEL NO.
	MAX	MIN						
FPTU-1.1-1	615	180	4.0	8"Ø	277/1/60	1/3	TITUS	DFLS-3
FPTU-1.1-2	905	270	5.5	8"X16"	480/3/60	(2) 1/3	TITUS	DFLS-4
FPTU-1.1-3	840	250	5.5	8"X16"	480/3/60	(2) 1/3	TITUS	DFLS-4
FPTU-1.1-4	420	130	3.0	8"Ø	277/1/60	1/3	TITUS	DFLS-3
FPTU-1.2-1	1,120	340	7.0	8"X16"	480/3/60	(2) 1/3	TITUS	DFLS-4
FPTU-1.2-2	600	180	4.0	8"Ø	277/1/60	1/3	TITUS	DFLS-3
FPTU-1.2-3	905	270	5.5	8"X16"	480/3/60	(2) 1/3	TITUS	DFLS-4
FPTU-2.1-1	1,650	500	10.0	8"X16"	480/3/60	(2) 1/3	TITUS	DFLS-4
FPTU-2.1-2	870	260	5.5	8"X16"	480/3/60	(2) 1/3	TITUS	DFLS-4
FPTU-2.1-3	685	210	4.5	8"Ø	277/1/60	1/3	TITUS	DFLS-3
FPTU-2.1-4	975	290	6.0	8"X16"	480/3/60	(2) 1/3	TITUS	DFLS-4
FPTU-2.1-5	415	120	2.5	8"Ø	277/1/60	1/3	TITUS	DFLS-3
FPTU-2.1-6	950	290	6.0	8"X16"	480/3/60	(2) 1/3	TITUS	DFLS-4
FPTU-2.2-1	520	190	3.5	8"Ø	277/1/60	1/3	TITUS	DFLS-3
FPTU-2.2-2	925	340	6.0	8"X16"	480/3/60	(2) 1/3	TITUS	DFLS-4
FPTU-2.2-3	630	230	4.5	8"Ø	277/1/60	1/3	TITUS	DFLS-3
FPTU-2.2-4	635	230	4.5	8"Ø	277/1/60	1/3	TITUS	DFLS-3

- NOTES:
- PROVIDE AEROCROSS MULTI-POINT CENTER AVERAGING VELOCITY SENSOR IN PRIMARY AIR INLET.
 - PROVIDE TERMINAL UNIT CASING WITH 1" INTERNALLY LINED FIBERGLASS FREE INSULATION.
 - PROVIDE TERMINAL UNIT WITH INTEGRAL DISCONNECT SWITCH.
 - PROVIDE ELECTRIC REHEAT COIL WITH 0-10V SCR MODULATING CAPACITY CONTROL.
 - PROVIDE LOW PROFILE TERMINAL UNIT.

ELECTRIC DUCT HEATER SCHEDULE

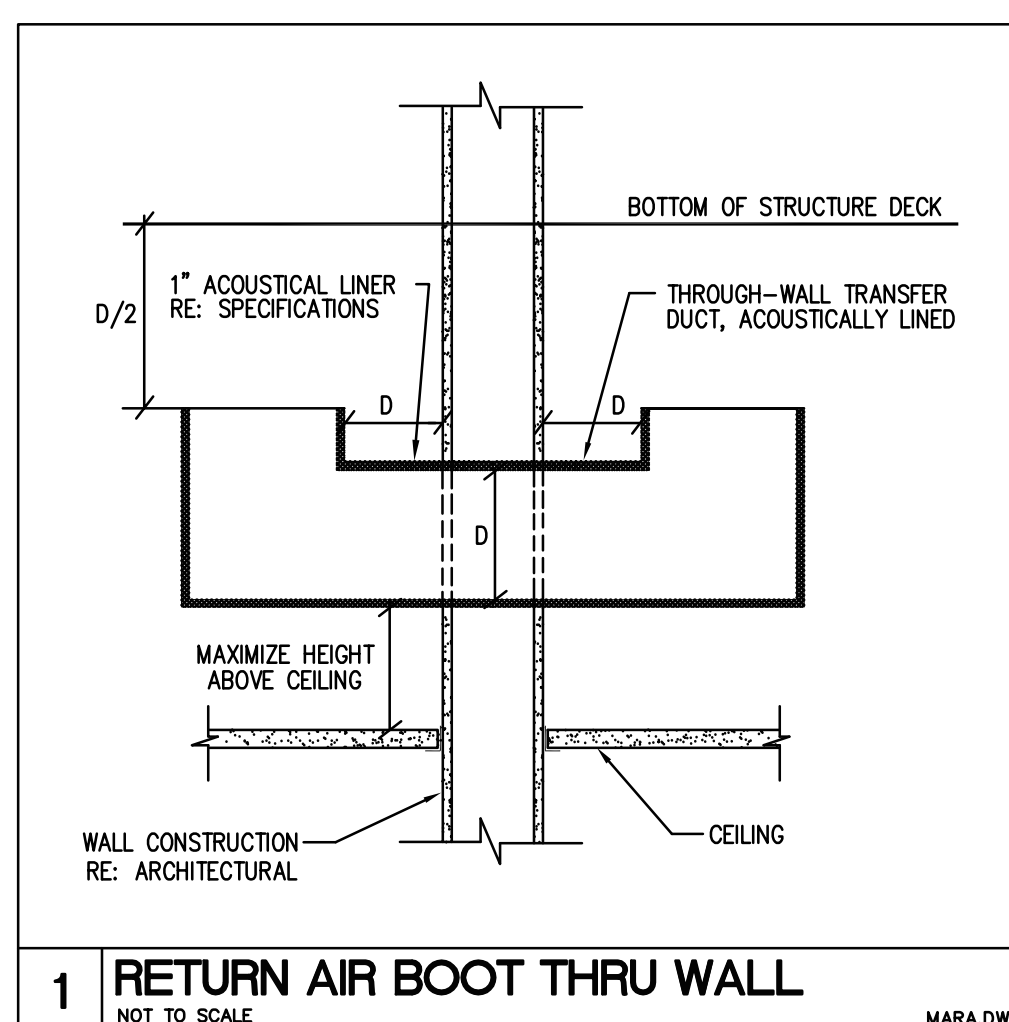
MARK	EDH-2.2		EDH-2.3		EDH-2.4		EDH-2.5	
	SERVES	RE-HEAT	SERVES	RE-HEAT	SERVES	RE-HEAT	SERVES	RE-HEAT
FUNCTION	RE-HEAT	RE-HEAT	RE-HEAT	RE-HEAT	RE-HEAT	RE-HEAT	RE-HEAT	RE-HEAT
HEATER TYPE	INLINE	INLINE	INLINE	INLINE	INLINE	INLINE	INLINE	INLINE
DESIGN CFM	3,180	740	540	255				
MINIMUM CFM	990	740	540	255				
EAT (°F)	38.5	66.1	65.4	59.5				
LAT (°F)	52.0	85.0	85.0	85.0				
CAPACITY (KW)	4.2	4.4	3.4	2.1				
DUCT DIMENSION WxH (INSIDE)	22 x 12	14 x 10	12 x 10	8 x 10				
VOLTS/PHASE/HERTZ	480/3/60	480/3/60	480/3/60	480/3/60				
CONTROL TYPE	SCR	SCR	SCR	SCR				
MANUFACTURER	INDEECO	INDEECO	INDEECO	INDEECO				
MODEL	QUA	QUA	QUA	QUA				
NOTES	1	1	1	1				

- NOTES:
- PROVIDE REQUIRED WORKING CLEARANCES PER ELECTRICAL CODE, PRIOR TO INSTALLATION.

GRAVITY VENTILATOR SCHEDULE

MARK	OAI-1		OAI-2		OAI-3		RAH-1	
	SERVISE	AHU-2.3	AHU-2.4	AHU-2.5	BUILDING RELIEF			
INTAKE / RELIEF	INTAKE	INTAKE	INTAKE	RELIEF				
CFM	70	60	65	1,545				
THROAT SIZE (LENGTH x WIDTH)	8"Ø	8"Ø	8"Ø	30 x 16				
MAX. P.D. (IN. W.G.)	0.05	0.05	0.05	0.05				
MANUFACTURER	GREENHECK	GREENHECK	GREENHECK	GREENHECK				
MODEL NO.	GRS1	GRS1	GRS1	FGR				
NOTES	2, 4, 5	2, 4, 5	2, 4, 5	1, 2, 3				

- NOTES:
- PROVIDE HIGH WIND RATED PRE-FABRICATED ROOF CURB.
 - PROVIDE UNIT WITH BIRD SCREEN.
 - PROVIDE UNIT WITH BAROMETRIC RELIEF DAMPER SET TO BUILDING PRESSURE OF 0.05 IN. W.G.
 - PROVIDE WITH MOTORIZED DAMPER. MOTORIZED DAMPER AND ACTUATOR SHALL BE PROVIDED BY CONTROLS CONTRACTOR.
 - PROVIDE CABLE TIE DOWNS FOR STAINLESS STEEL CABLES. CONTRACTOR TO PROVIDE MIN. 1/8" DIA. CABLES.



1 RETURN AIR BOOT THRU WALL
NOT TO SCALE

PACKAGED AIR-COOLED WATER CHILLER WITH CHP SCHEDULE

MARK	ACCH-1		ACCH-2	
	UNIT NOMINAL TONNAGE	45	45	
DESIGN COOLING CAPACITY (TONS)	31.5			

REVISION	No.	DATE	DESCRIPTION
	01	02/21/2020	100% CD
	01	03/04/2020	ADDENDUM 01

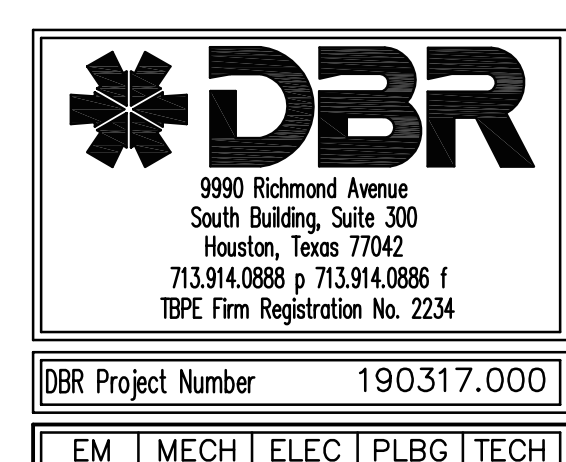


Houston Community College System
HVAC Replacement at Fannin
 Central Campus

DATE	02/06/2020
DRAWN BY:	DBR
CHECKED BY:	DBR
PROJECT NUMBER:	190317.000
SHEET TITLE	

MECHANICAL CONTROLS

SHEET NUMBER:	M601
---------------	-------------



Building Domestic Water Metering
 The EMCS shall monitor the building domestic water meter, which is to be furnished by the Division 22 contractor and installed by Division 22 contractor at the service entry to the building. This flow meter shall be provided regardless of any water metering provisions on site. The EMCS shall display and trend log the following: the monthly usage, yearly usage, accumulative total usage, and alarm when excessive flow is measured. The EMCS shall report alarms to the computers, pagers, and/or text message compatible devices designated by the Owner.

IDF and MDF Room Monitoring
 The EMCS shall monitor the space temperature and humidity in the IDF and MDF rooms. The primary cooling for IDF and MDF rooms will be supplied by the packaged computer room units. The EMCS shall report high/low temperature/humidity alarms to the computers, pagers, and/or text message compatible devices designated by the Owner. Alarms shall be sent if the space conditions deviate from the following: temperature between 60 °F and 80 °F (adj), humidity between 40% RH and 70% RH (adj), for more than 10 minutes.

Elevator Machine Room Monitoring
 The EMCS shall monitor the space temperature in the machine rooms. The primary cooling for these rooms will be supplied by the packaged AC units. The EMCS shall report high/low temperature alarms to the computers, pagers, and/or text message compatible devices designated by the Owner. Alarms shall be sent if the space conditions deviate from the following: temperature between 60 °F and 80 °F (adj), for more than 10 minutes.

Chilled Water Make-up Water Metering
 The EMCS shall monitor the chiller make-up water meter, which is to be furnished by the EMCS contractor and installed by Division 23 contractor at the service entry to the building. This flow meter shall be provided regardless of any water metering provisions on site. The EMCS shall display and trend log the following: the monthly usage, yearly usage, accumulative total usage, and alarm when excessive flow is measured. The EMCS shall report alarms to the computers, pagers, and/or text message compatible devices designated by the Owner.

Outdoor Air Conditions
 The sensors shall be mounted in an area on the north side of the building where the representative temperature and humidity can be monitored, both shall have sun shields. Based on the outdoor air temperature and humidity the EMCS shall calculate the outdoor air enthalpy, wet bulb and dew point temperatures. These outdoor air conditions shall be broadcast as global data points for use by other control programs. These shall be displayed on all major air and water systems graphics.

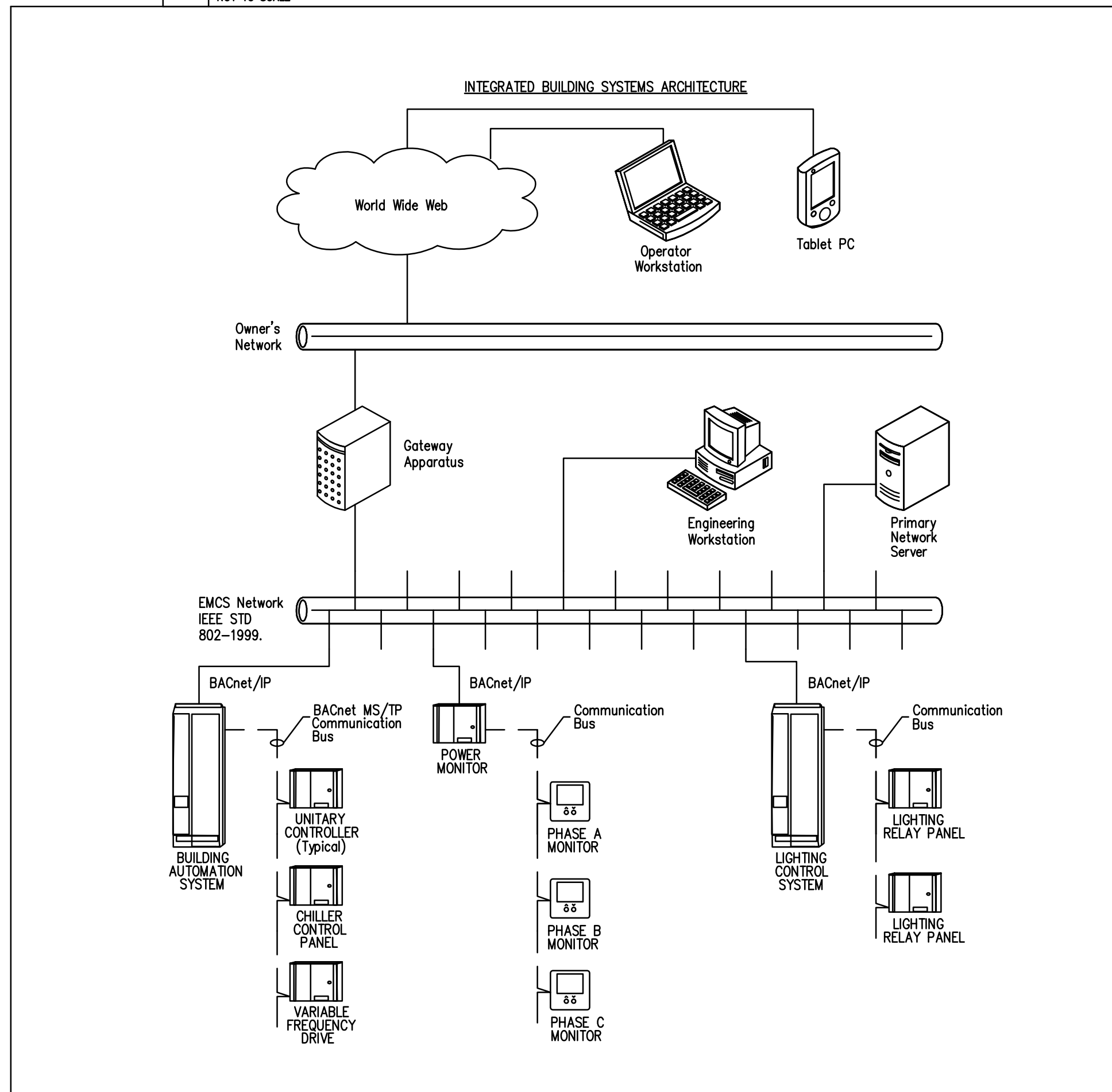
Electrical Switchgear Power Meter Monitoring
 The EMCS shall provide BACnet/IP or Modbus TCP communications to the interface modules to monitor the building power usage. The interface modules shall be provided by the switchgear manufacturer per Division 26. The EMCS shall monitor building kW, kWh, kVAR, Power Factor, 3-Phase Amps and Volts, along with all variables available via this interface. The EMCS shall provide a graphic representation to show the current usage, monthly usage, year to date usage, and time and date of the highest peak demand for the month and year. Demand thresholds may be set to adjust setpoints and shed loads in order to reduce peak consumption.

Electrical Branch Circuit Power Meter Monitoring
 The EMCS shall provide BACnet/IP or Modbus TCP communications to the power monitor. The power monitor locations shall be shown on the Division 26 drawings. The EMCS shall monitor kW, kWh, kVAR, Power Factor, 3-Phase Amps and Volts, along with all variables available via this interface. The EMCS shall provide a graphic representation to show the current usage, monthly usage, year to date usage, and time and date of the highest peak demand for the month and year. Demand thresholds may be set to adjust setpoints and shed loads in order to reduce peak consumption.

Sump Pumps and Sump Pits Monitoring
 The EMCS shall monitor the run status of the pumps and alarm outputs on the water level indicators. The EMCS shall display the values and trend log all Change of State (COS) events. The EMCS shall report alarms to the computers, pagers, and/or text message compatible devices designated by the Owner.

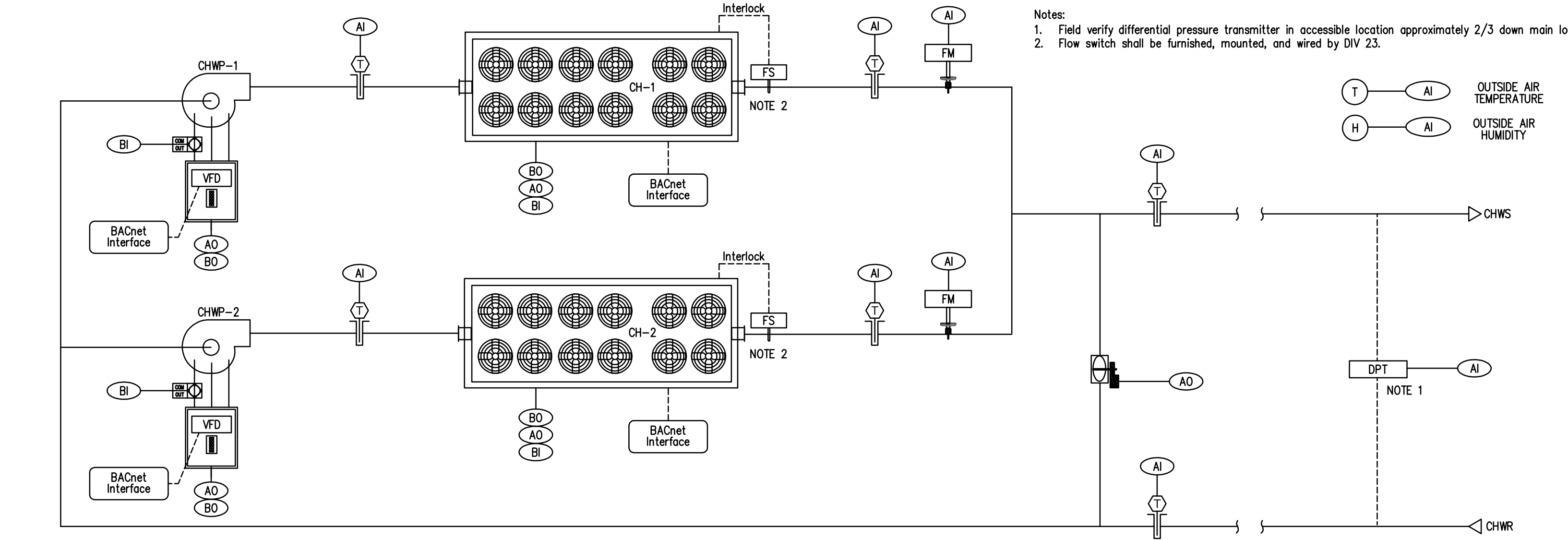
ANALOG INPUT	WALL SENSOR/THERMOSTAT
ANALOG OUT PUT	CARBON DIOXIDE SENSOR
DIGITAL/BINARY INPUT	SET POINT
DIGITAL/BINARY OUTPUT	SUPPLY AIR
ON-OFF MOTORIZED DAMPER	RETURN AIR
MODULATING TYPE MOTORIZED DAMPER	OUTSIDE AIR
AIR FLOW MEASURING STATION	HEATING COIL
CONTROL VALVE MODULATING TYPE	COOLING COIL
VARIABLE FREQUENCY DRIVE	DIRECT EXPANSION COOLING COIL
CURRENT SENSING RELAY	PRESSURE INDEPENDENT CHARACTERIZED CONTROL VALVE
FREEZESTAT	AIRFLOW CROSS
HIGH STATIC LIMIT	DIFFERENTIAL PRESSURE SWITCH
STATIC PRESSURE TRANSMITTER	
DIFFERENTIAL PRESSURE TRANSDUCER	
FLOW METER	
FLOW SWITCH	
DISCHARGE AIR TEMPERATURE SENSOR	

1 CONTROL SCHEMATIC LEGEND
 NOT TO SCALE



2 EMCS Network Architecture - Control Schematic
 NOT TO SCALE

3 MISCELLANEOUS SYSTEMS
 NOT TO SCALE



System Off - When the system is off:
 The chillers shall be off.
 The pumps shall be off.
 The bypass valve shall be closed.
 The control loops shall be disabled.

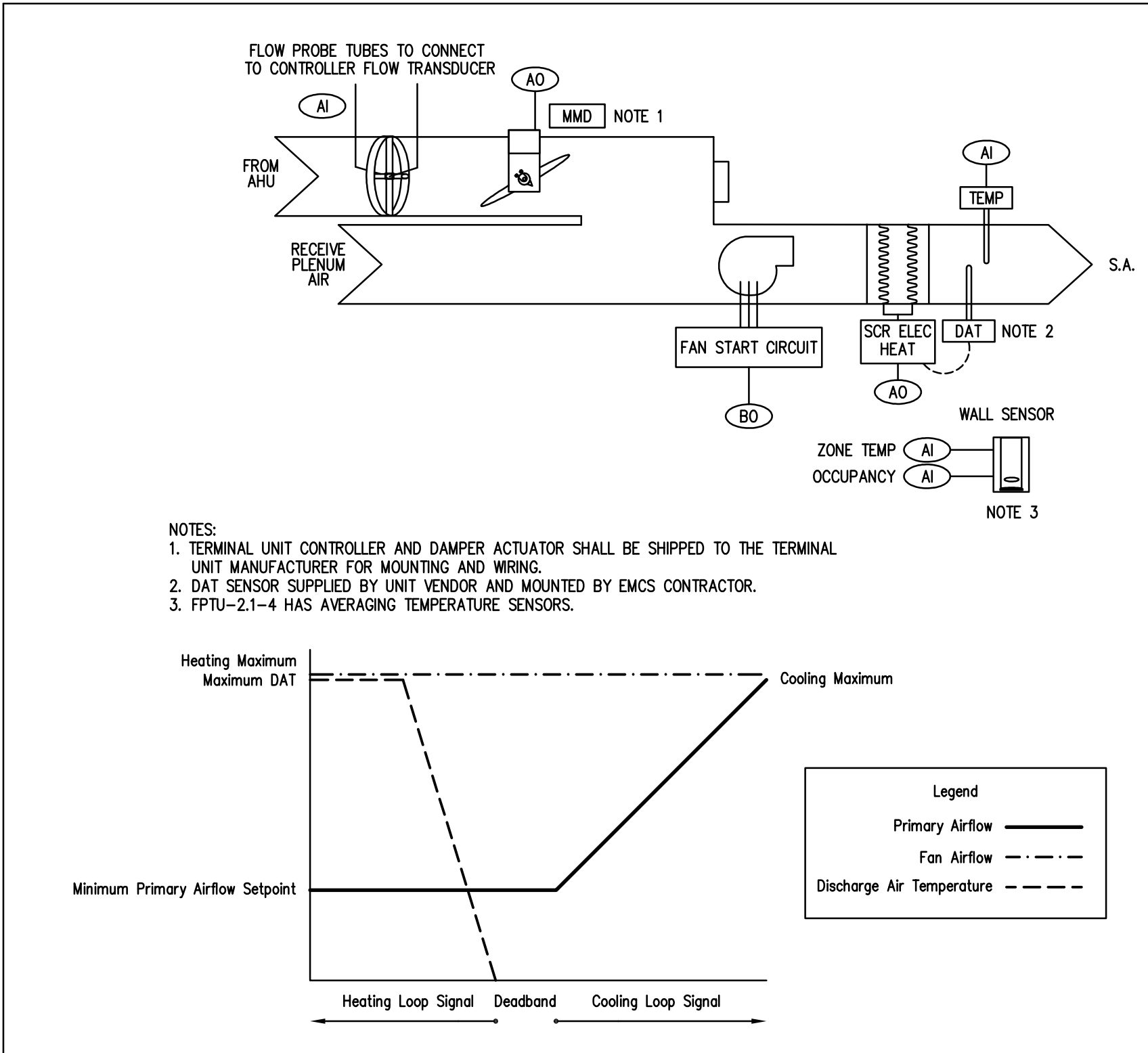
System Startup - System startup shall be initiated:
 Manually by an Operator command on the chiller graphic at the EMCS.
 Automatically by the EMCS, when a call for cooling has been received.

System Operation - When system start-up has been initiated:
 The outside air temperature must be above the outside air lockout setpoint, before the chiller can be activated. The number of cooling requests required and the length of time the requests must be received before activating the chiller plant shall be adjustable. The chiller/pump systems shall be lead/tag and rotated weekly at a time and on a day of the week when the chiller plant is not in operation. Rotation shall be based on accumulated runtime of the chillers.
 When the chiller plant is activated, the EMCS shall enable the lead chiller pump. A current switch shall prove the pump status at the EMCS, which shall generate an alarm, if the switch is not made within 45 seconds (adjustable). There shall also be a 10 second (adjustable) de-bounce time to prevent nuisance alarms from a bouncing switch. If the pump run status is not proven, the EMCS shall discontinue the enable signal to the pump and rotate chiller systems. The EMCS shall then energize the a lag chiller pump to run in the same manner as described above. That chiller system shall become the lead system.
 When the lead pump status is proven, the EMCS shall enable the lead chiller. A flow switch in the chilled water piping shall complete the circuit to the chiller factory installed controller proving that flow has been established. If the chiller alarm input closes (indicating that the chiller has alarm), the EMCS shall generate an alarm, discontinue the start signal to the lead chiller system and energize the lag chiller system to run in the same manner as described above. That chiller system now becomes the lead system. The chiller shall run to maintain the supply water setpoint.
 The EMCS shall monitor the "Chiller Output" point from each chiller. If the point is not available, the EMCS shall monitor the kW of the chiller and calculate the Chiller Output by the equation, (Instantaneous kW / full load kW) * (nominal capacity). The combined total Chiller Output of all operating chillers shall be the Plant Output. The combined total Nominal Capacity of all operating chillers shall be the Total Capacity. The EMCS shall monitor temperature inputs from sensors mounted in the common supply and return piping and flow meters mounted in the chiller supply piping, and calculate the building load in Tons.

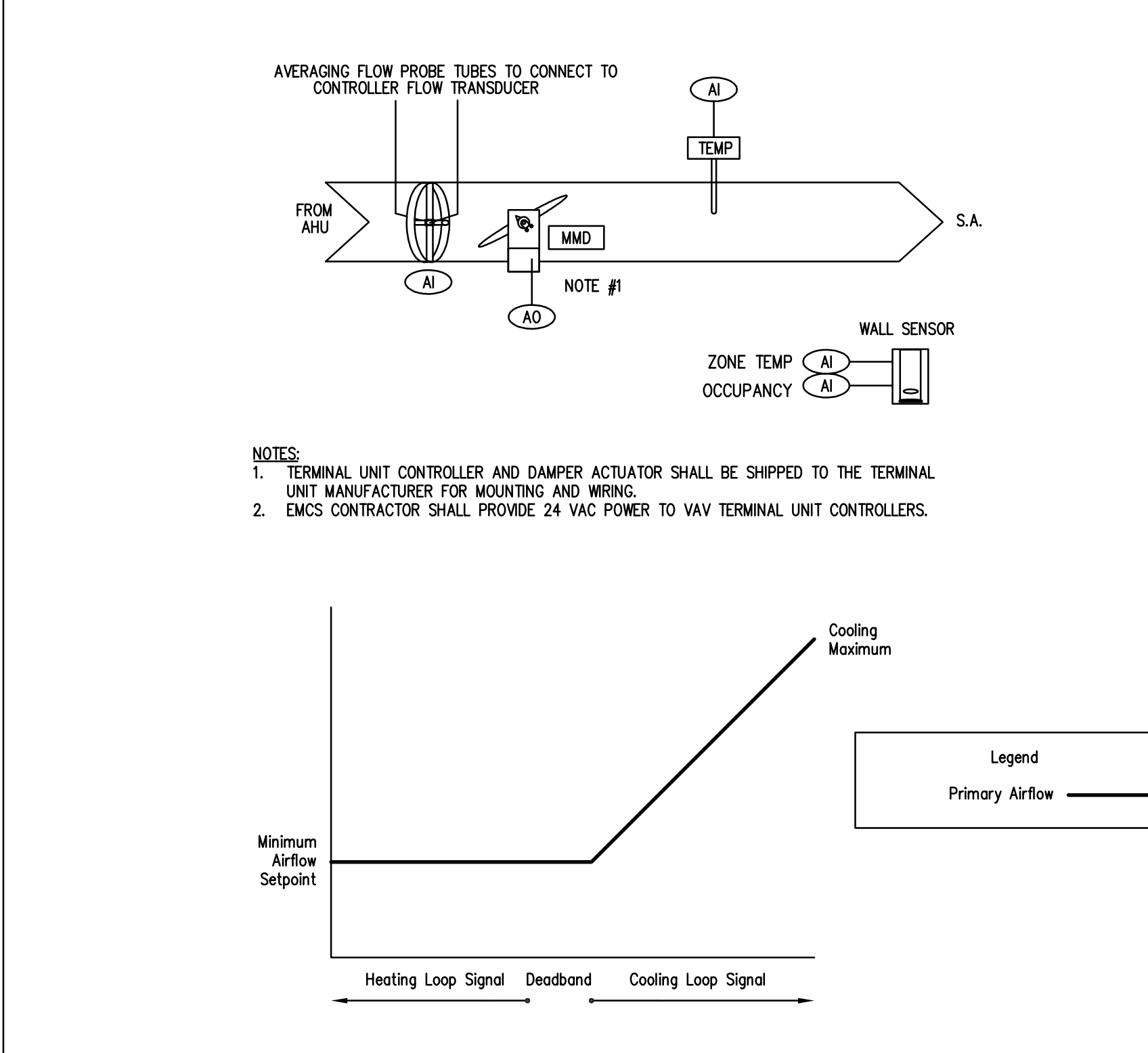
If the value of ((Plant Output / Total Capacity) * 100) is greater than the stage-up setpoint for 10 minutes (adjustable) or the CHW supply temperature rises greater than 4 °F (adjustable) above setpoint, a lag chiller shall be enabled into operation. If the value of ((Plant Output / Total Capacity) * 100) is less than the stage-down setpoint for 10 minutes (adjustable), a lag chiller shall be disabled.
 A differential pressure sensor monitoring the pressure between the building CHWS and CHWR piping shall be used to modulate the speed of the CHW pumps. A PID control loop shall modulate the speed of the CHW pumps from their minimum speed to their maximum speed as the differential pressure deviates from setpoint. The EMCS shall monitor the position of all of the chilled water valves at the units that the plant serves and the differential pressure setpoint shall be reset based on achieving a target valve position of 90%. There shall be a dead band of 5% to prevent hunting of the reset program. The chilled water flow shall not change by more than 10% per minute. The target valve position, the reset time, the deadband, and the rate of change values shall be adjustable.
 While only one chiller system is in operation, the corresponding flow meter shall be used to maintain the chiller minimum flow rate by modulating the bypass valve open. The chilled water flow shall not change by more than 10% per minute.
 When a chiller system is to be disabled, the EMCS shall discontinue the command for the chiller to run. The EMCS shall continue to control the speed of its CHW pump until the chiller status has indicated that it is off.
 When the outdoor air temperature drops below the freeze protection setpoint, the EMCS shall open the chilled water valves to 50% open (adj.) for flow through the AHU coils and the lead chilled water pump shall be activated to run at its minimum referenced speed value until ambient temperature rises above setpoint.
 The EMCS shall monitor the outside air temperature and humidity. The EMCS shall calculate the outside air enthalpy, wet bulb temperature, and dew point temperature. These values shall be displayed on all air and water systems graphics.
System Setpoints - The setpoints for the system shall be set as follows:
 The outside air temperature lockout setpoint shall be 50 °F (adjustable).
 The chiller leaving water temperature setpoint shall be 42 °F (adjustable).
 The chiller stage-up capacity setpoint shall be 90% (adjustable).
 The chiller stage-down capacity setpoint shall be 60% (adjustable).
 The chiller minimum flow setpoint shall be 53 gpm (adjustable). Verify with chiller manufacturer for minimum flow.
 The chilled water system differential pressure shall be 8 psi (adjustable).
 The outdoor air temperature freeze protection setpoint shall be 38 °F (adjustable).

4 Chilled Water System - Air Cooled - Variable Primary Flow with Dedicated Pumps - Control Schematic and Sequence of Operations
 NOT TO SCALE

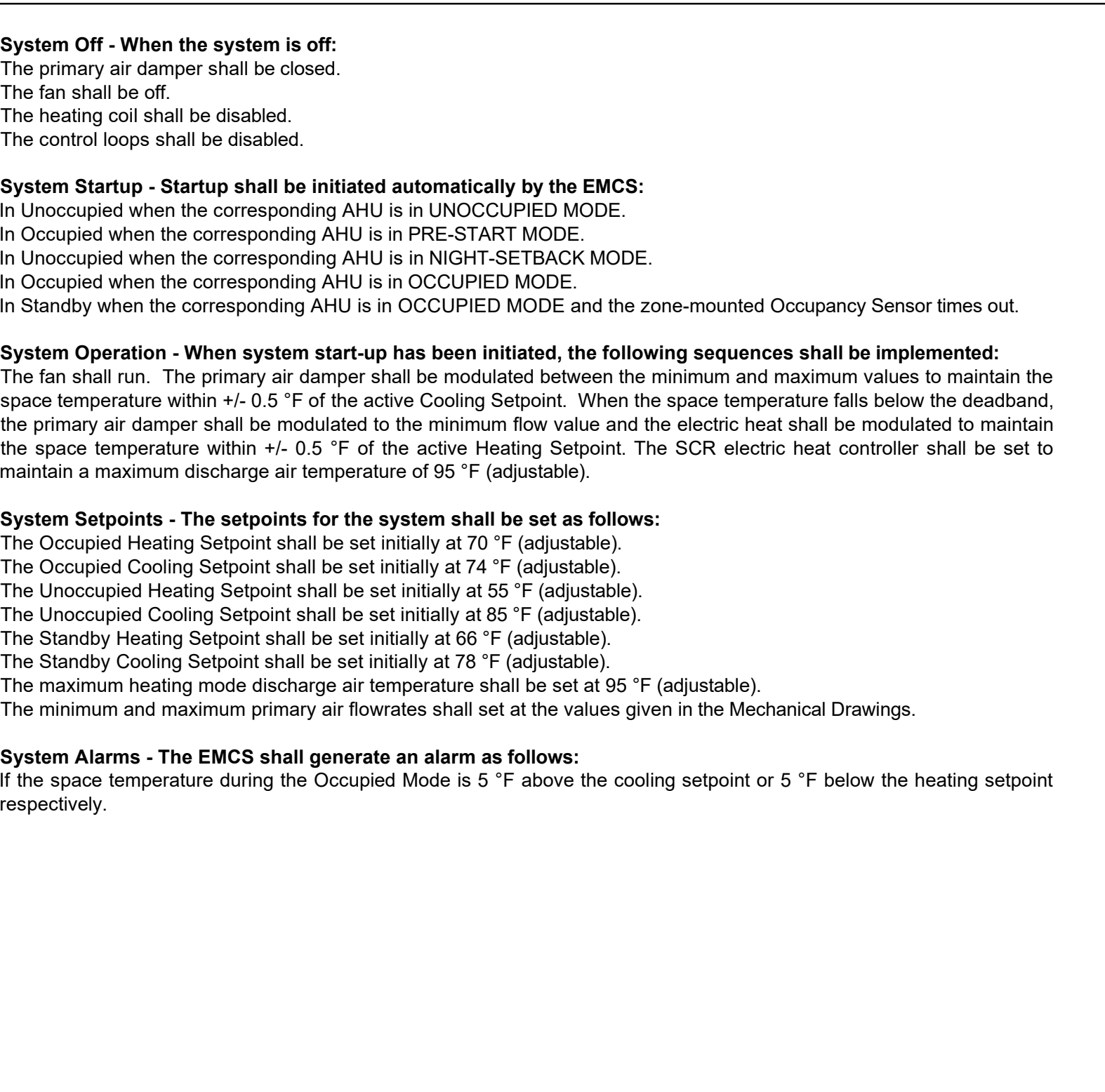
Plotted: Mar 3, 2020, 8:27 PM by user: heda - Subject: 3/3/2020 by user: heda
 H:\191198317_000\Drawings\DM-190317-DETAILS & SCHEDULES.dwg



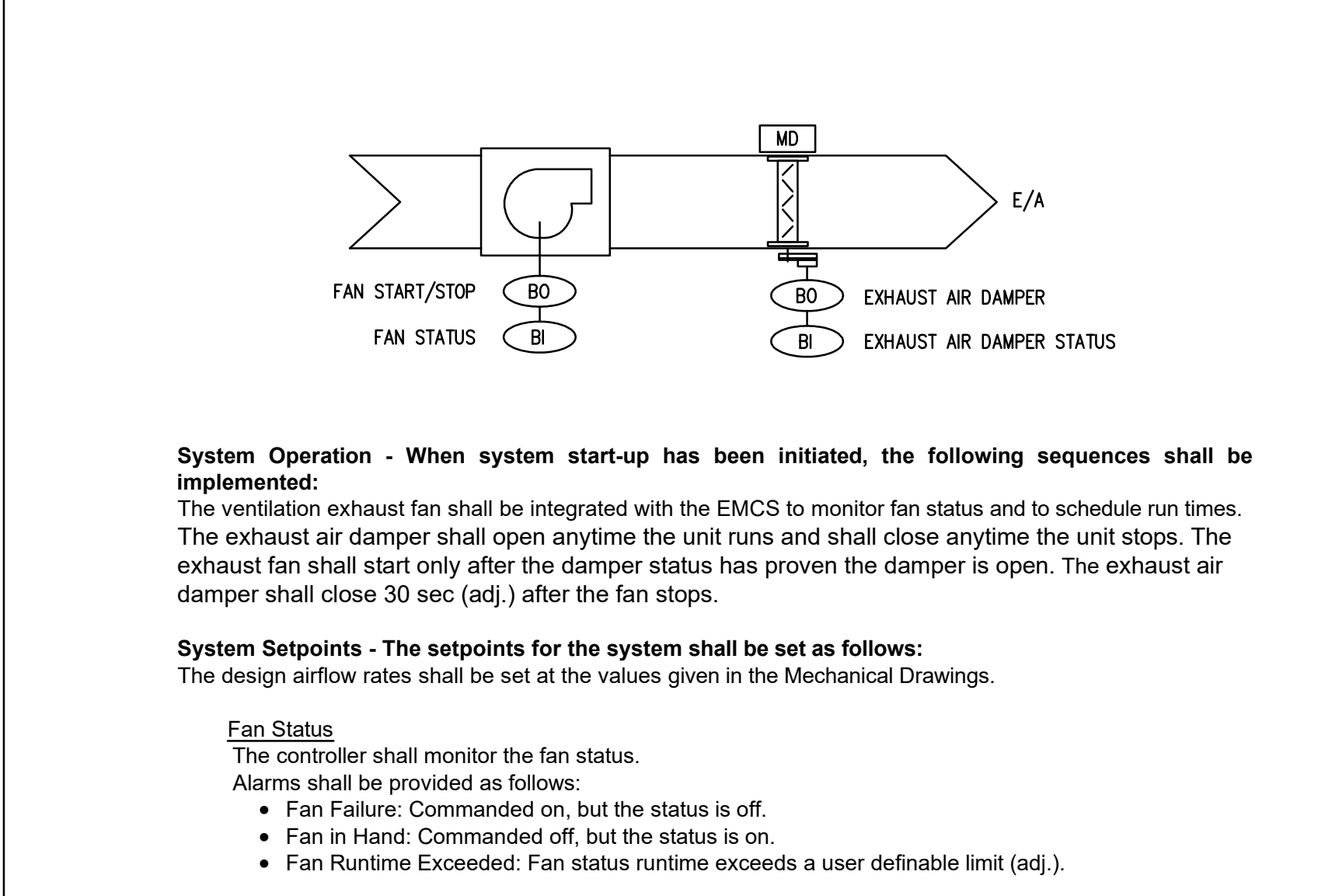
1 Series Fan-Powered Terminal Unit with Modulating Electric Heat - Control Schematic and Sequence of Operations
NOT TO SCALE



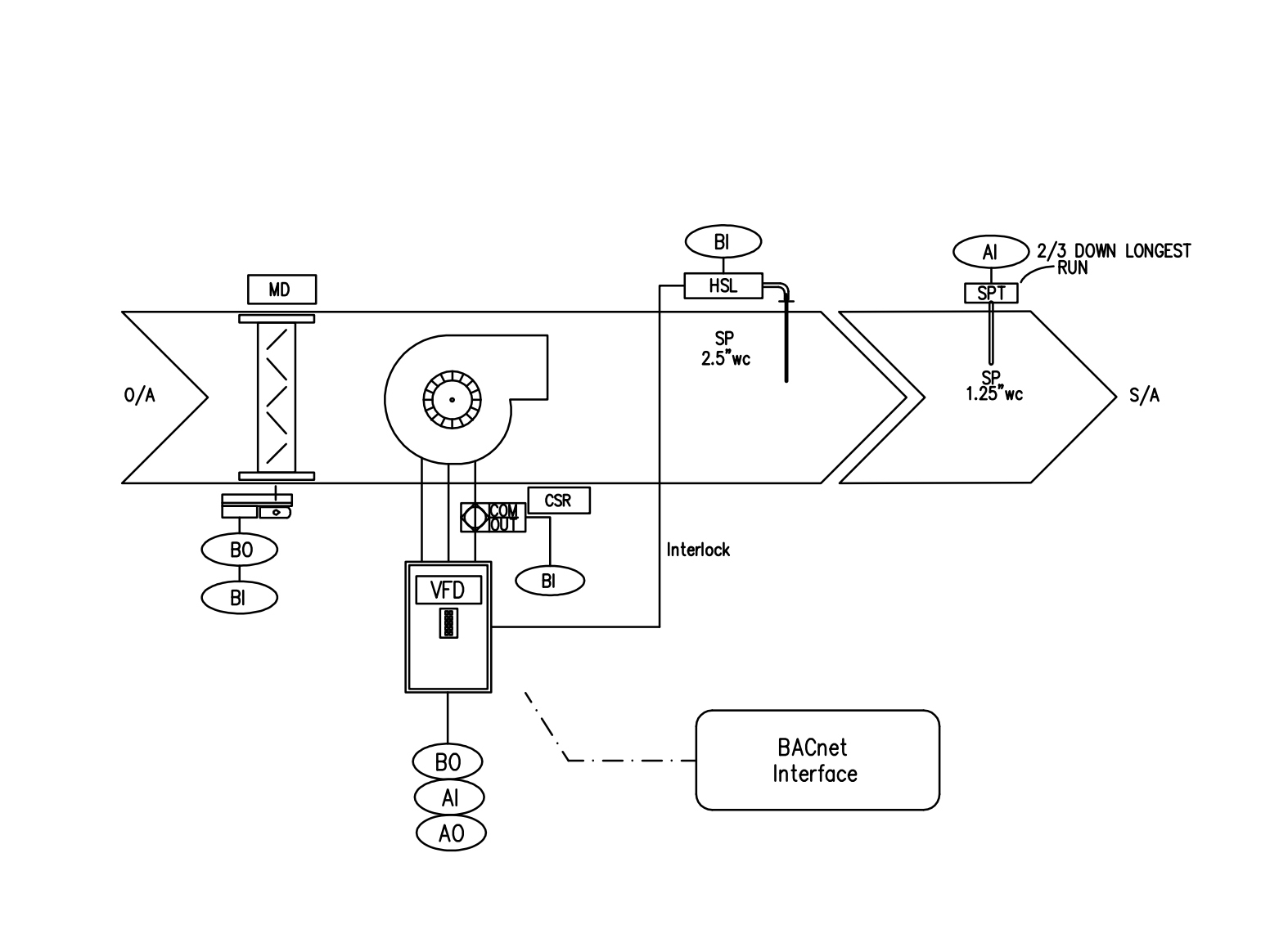
2 VAV Terminal Unit - Cooling Only - Control Schematic and Sequence of Operations
NOT TO SCALE



3 VAV Air Handling Unit - Control Schematic and Sequence of Operations
NOT TO SCALE



4 Ventilation Exhaust Fan - Control Schematic and Sequence of Operations
NOT TO SCALE

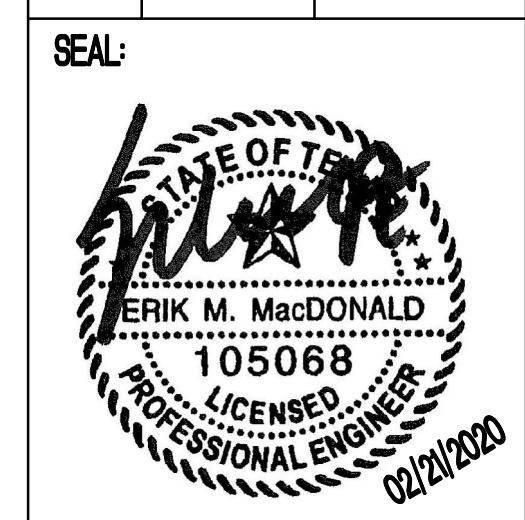


5 Outside Air Fan - Control Schematic and Sequence of Operations
NOT TO SCALE



ERO
5444 Westheimer
Suite 1000, Office 1054
Houston, TX 77056

REVISION No.	DATE	DESCRIPTION
02/21/2020	100X CD	



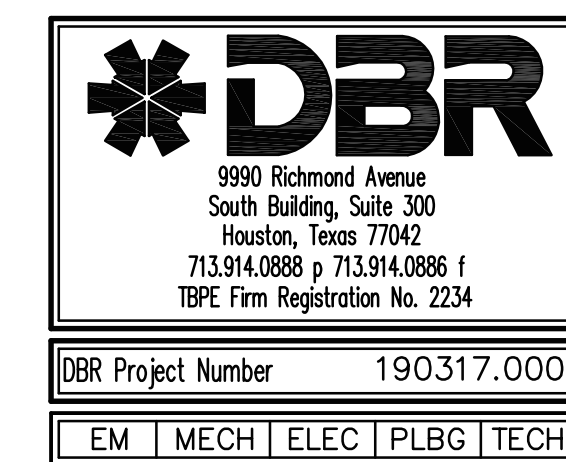
Houston Community College System
HVAC Replacement at Fannin Central Campus

DATE:	02/06/2020
DRAWN BY:	DBR
CHECKED BY:	DBR
PROJECT NUMBER:	190317.000
SHEET TITLE:	

MECHANICAL CONTROLS

SHEET NUMBER:

M602



DBR Project Number	190317.000
EM	MECH ELEC PLBG TECH

Project: Eca-21_0200_6_16.Plt; User: jch; Scale: 0.75; Date: 02/06/2020; Plt: user-jch; Path: H:\19160317\2020Drawings\01-190317-CAET-PLB & SCHEDULES.dwg

REVISION	DATE	DESCRIPTION
No. /	DATE	DESCRIPTION
	02/21/2020	100% CD



Houston Community College System
HVAC Replacement at Fannin
 Central Campus

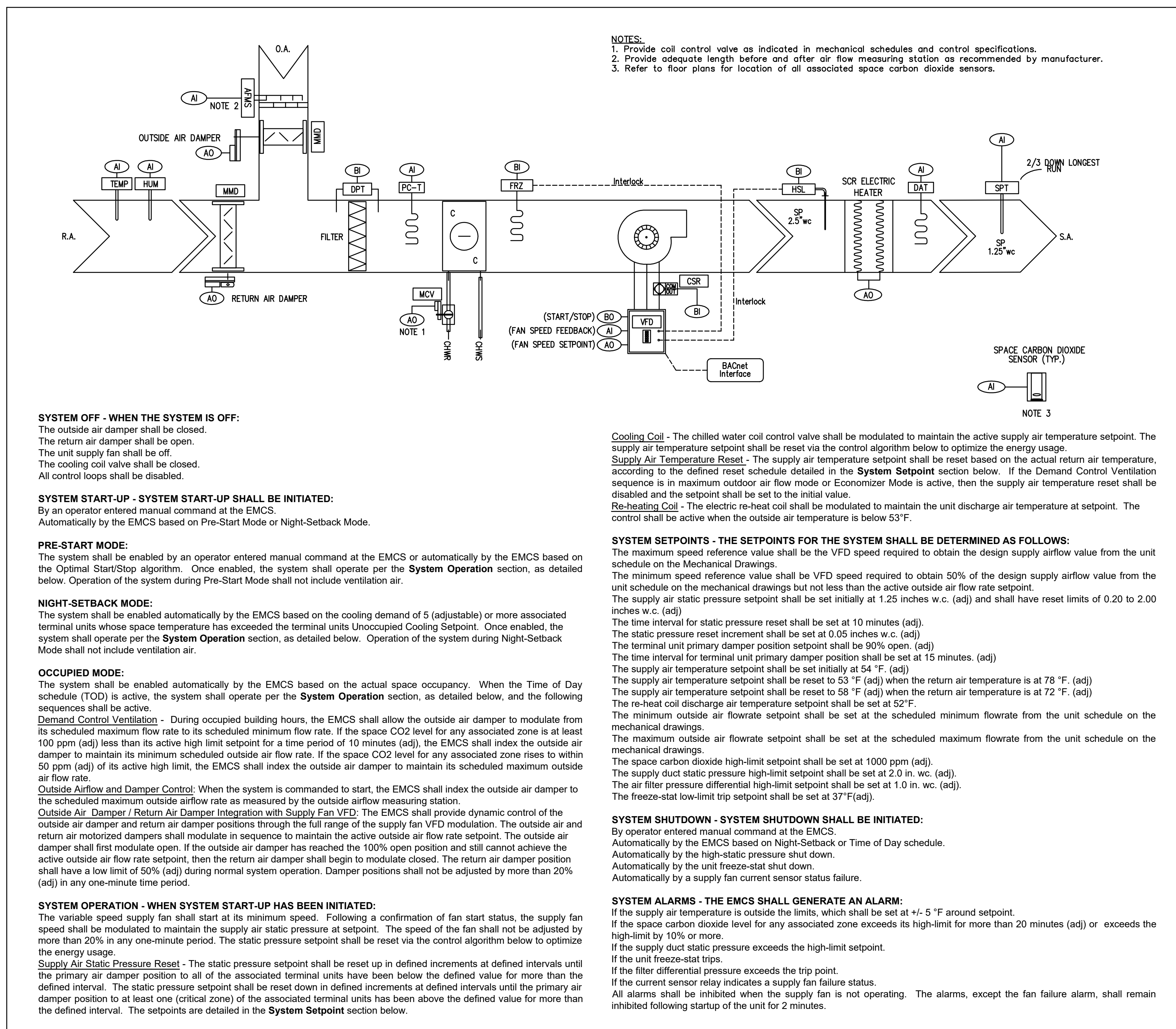
DATE: 02/06/2020
 DRAWN BY: DBR
 CHECKED BY: DBR
 PROJECT NUMBER: 190317.000
 SHEET TITLE:

MECHANICAL CONTROLS

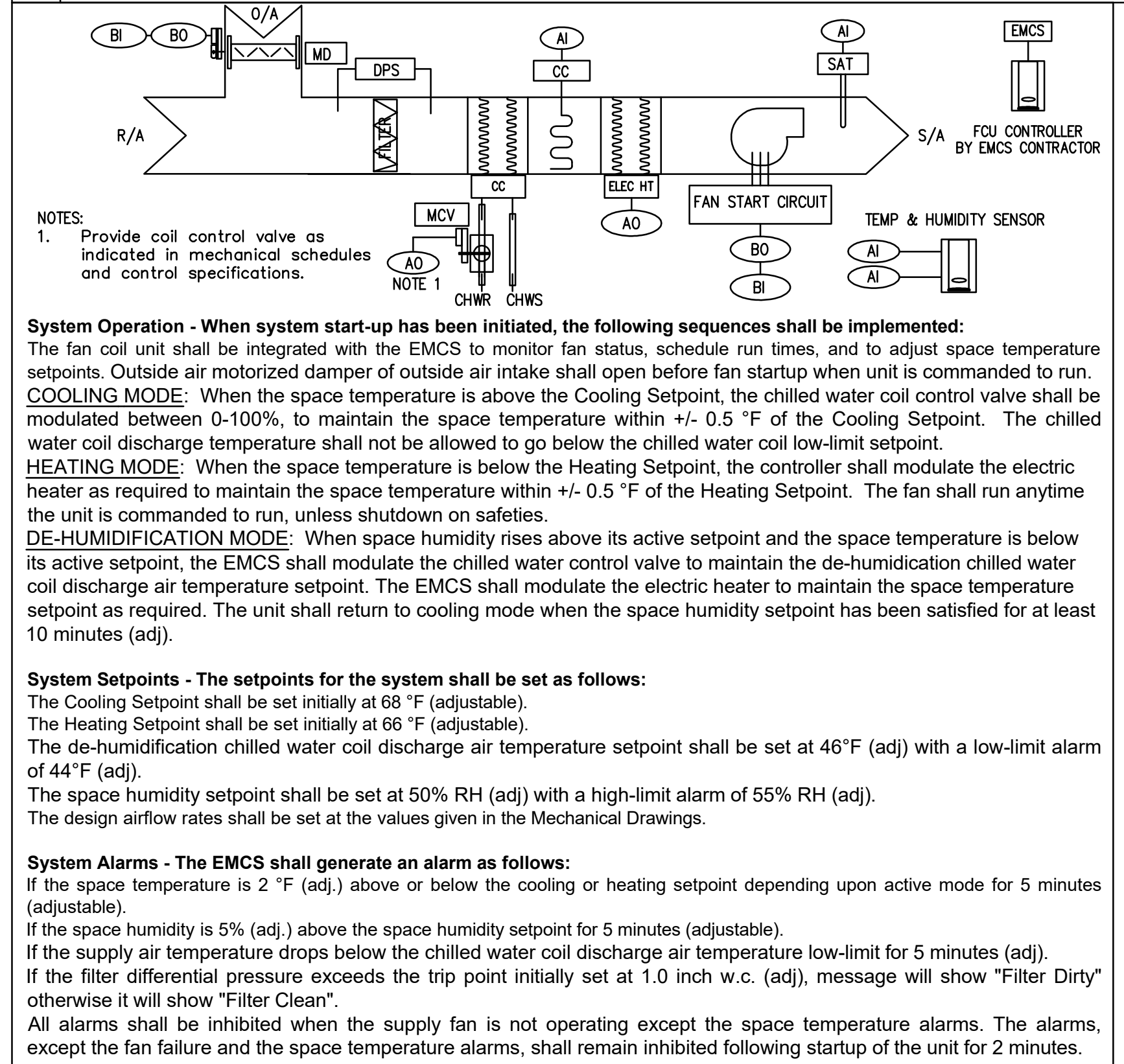
SHEET NUMBER:
M603

9990 Richmond Avenue
 South Building, Suite 300
 Houston, Texas 77042
 713.914.0888 p 713.914.0888 f
 TBPE Firm Registration No. 2234

DBR Project Number 190317.000
 EM | MECH | ELEC | PLBG | TECH



1 VAV Air Handling Unit (AHU-2.2) - Control Schematic and Sequence of Operations
 NOT TO SCALE



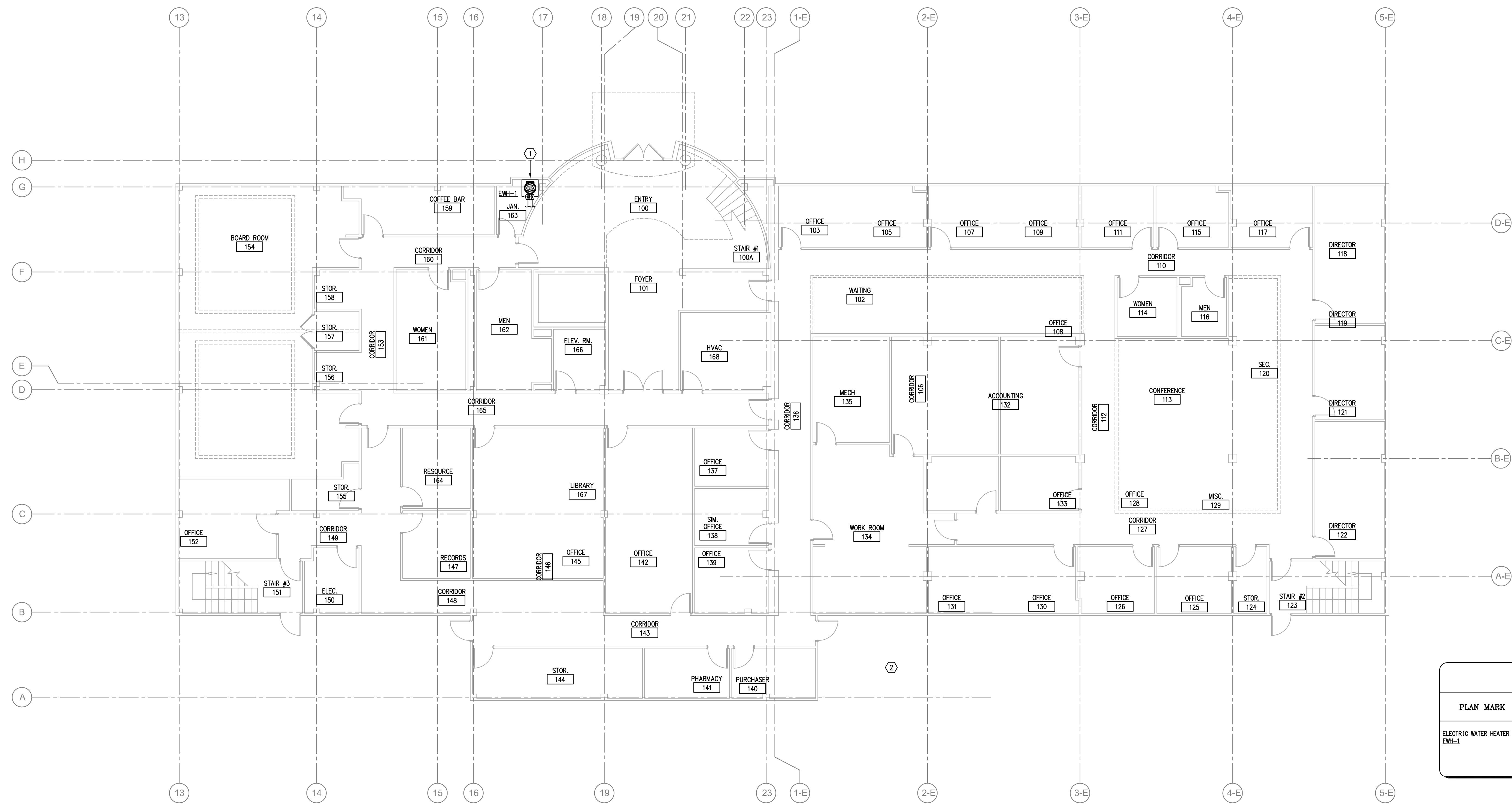
2 Fan Coil Unit - 2 Pipe - Control Schematic and Sequence of Operations
 NOT TO SCALE

Project: E-01_0200_6.16.19.dwg, Issue: 1, Date: 02/06/2020, By: jeha
 H:\191403317\2020Drawings\04-190317-DET\AIR & SCHEDULES.dwg



Houston Community College System
 HVAC Replacement at Fannin
 Central Campus

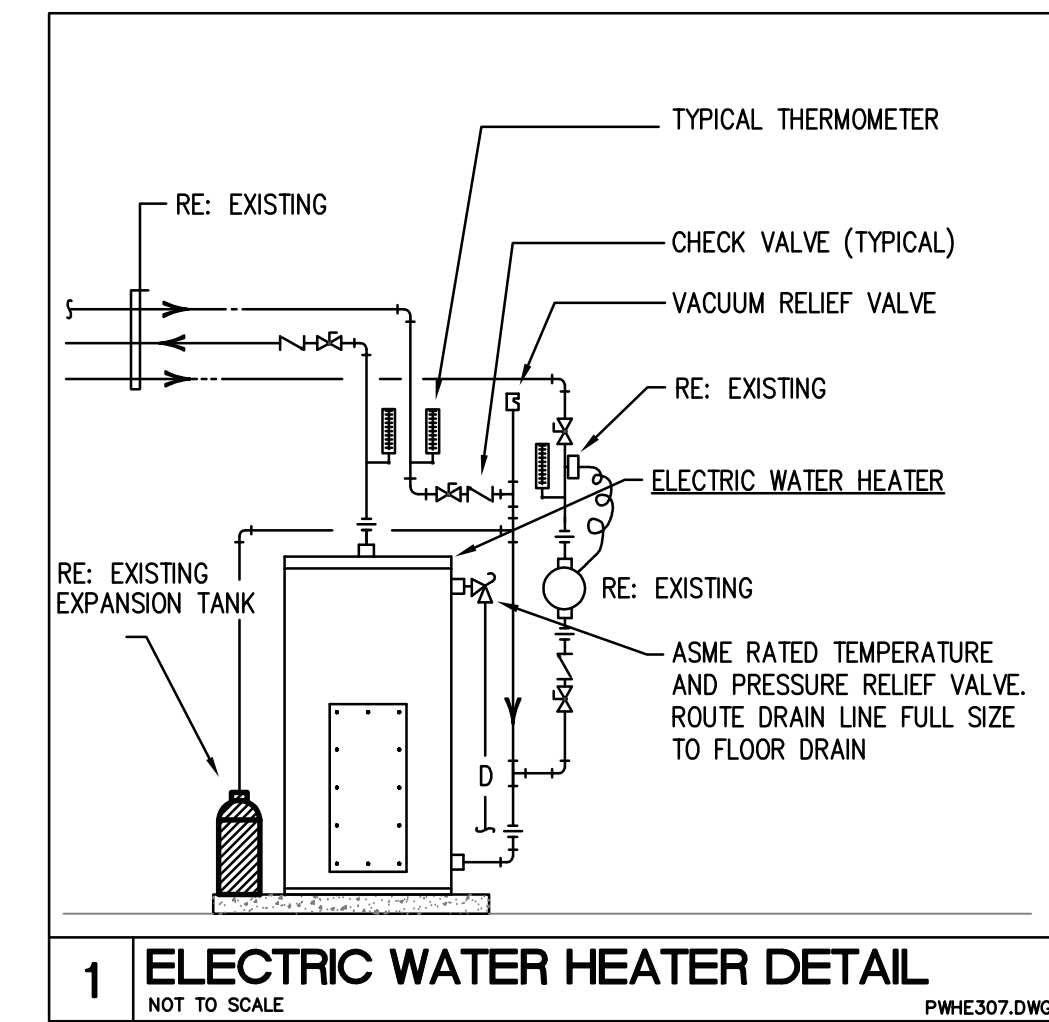
PLUMBING
 PLAN



- PLUMBING KEYED NOTES:**
- ① REPLACE EXISTING FOR NEW ELECTRIC WATER HEATER; COORDINATE WITH ELECTRICAL FOR REQUIREMENTS. INSTALL PER MANUFACTURER'S RECOMMENDATIONS. EXTEND EXISTING CW, HW, AND RECONNECT.
 - ② PROVIDE NEW MAKE-UP WATER LINE FOR MECHANICAL EQUIPMENT.

PLAN MARK	MINIMUM ROUGH-IN SIZES					DESCRIPTION
	WST & VENT	DRAIN	CW	HW		
ELECTRIC WATER HEATER EWH-1	---	---	---	3/4"	3/4"	RHEEM NO. ELD-80, 80 GALLON ASME STORAGE TANK WITH 5 KW AND 47 GPH RECOVERY RATE AT 80° TEMPERATURE RISE; REFER TO ELECTRICAL FOR WIRING REQUIREMENTS. CONTRACTOR SHALL VERIFY WITH ELECTRICAL CONTRACTOR PRIOR TO ORDERING EQUIPMENT.

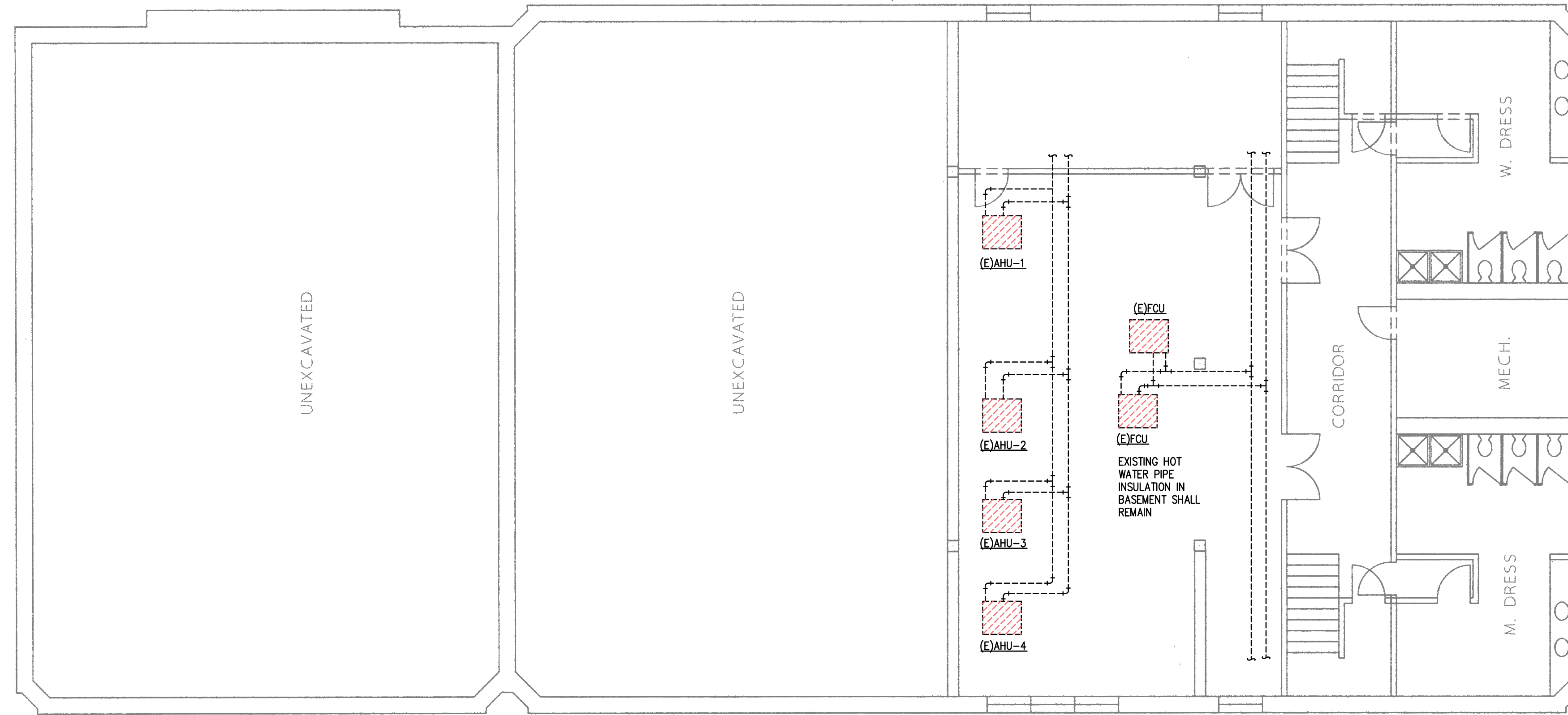
1 LEVEL 1 PLUMBING PLAN
 P201 1/8"=1'-0"



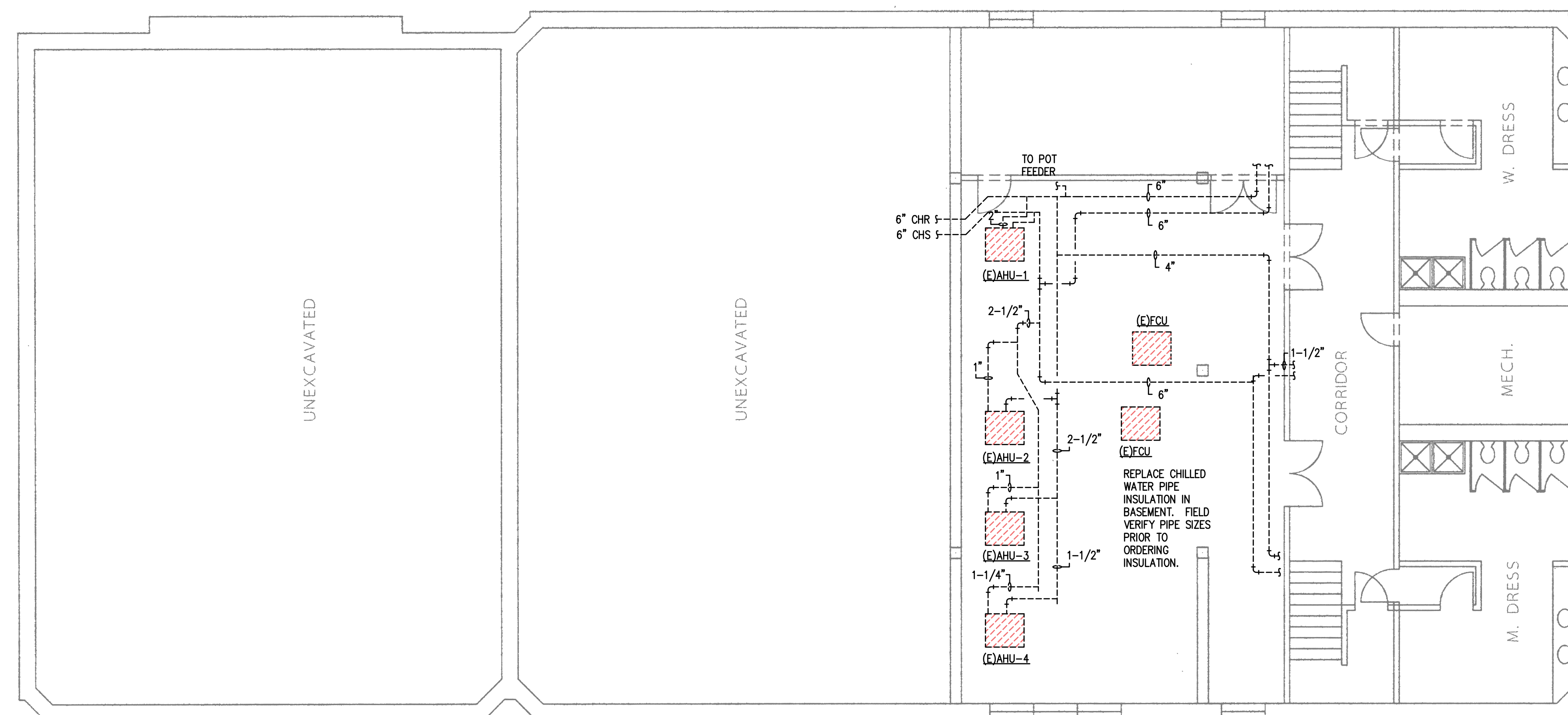
DBR
 9990 Richmond Avenue
 South Building, Suite 300
 Houston, Texas 77042
 713.914.0888 v. 713.914.0888 f.
 TBP Firm Registration No. 2234

DBR Project Number 190317.000
 EM | MECH | ELEC | PLBG | TECH

Plot Date: Feb 21, 2020, 11:54 AM by user: pascodonaldf - Saved: 2/21/2020 by user: jfanns
 H:\190317\2020Drawings\DWG\2020\190317-1.dwg



**HOT WATER
BASEMENT MECHANICAL PLAN**
1
M203 1/8"=1'-0" APPROX.



**CHILLED WATER
BASEMENT MECHANICAL PLAN**
1
M203 1/8"=1'-0" APPROX.

REVISION:

No.	DATE	DESCRIPTION
02/21/2020	100% CD	



Houston Community College System
**HVAC Replacement at Fannin
Central Campus**

DATE:
02/06/2020
DRAWN BY:
DBR
CHECKED BY:
DBR
PROJECT NUMBER:
190317.000
SHEET TITLE:

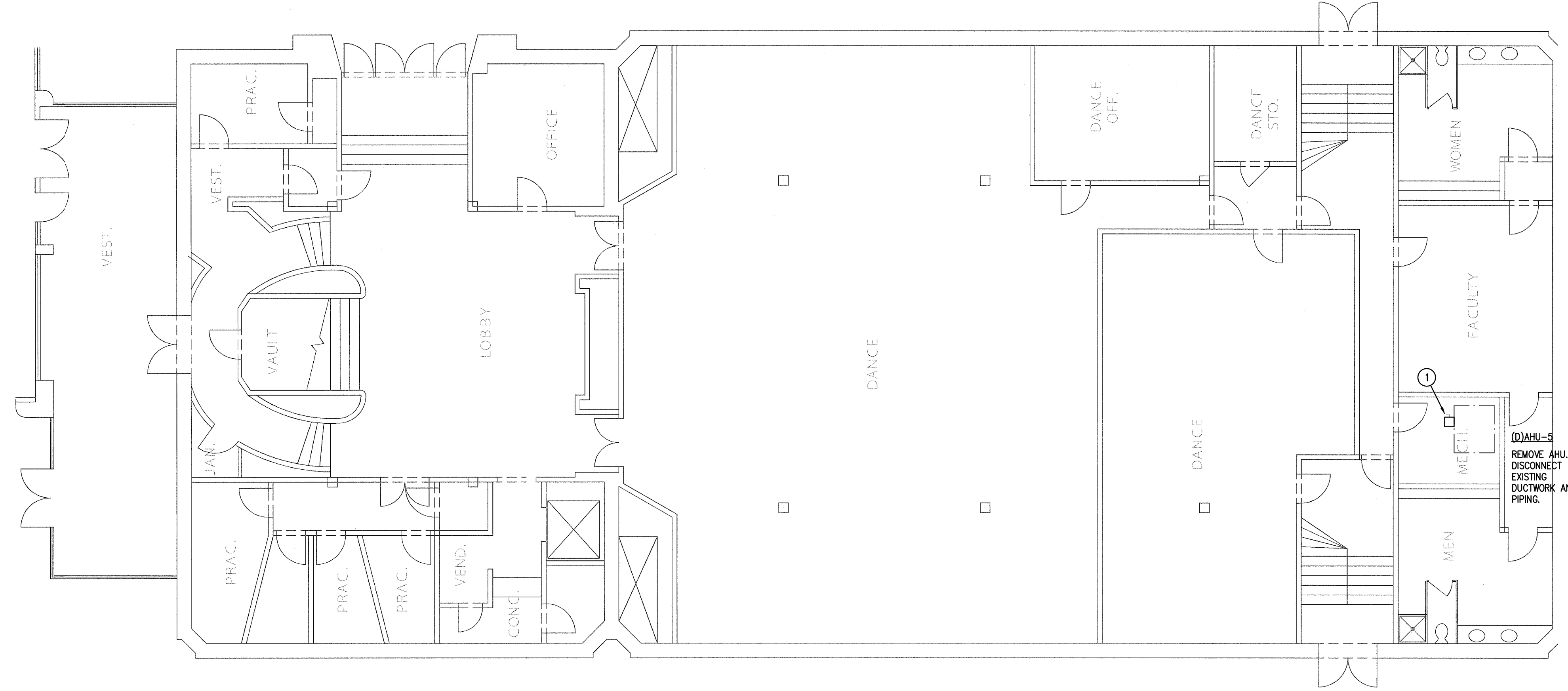
LEVEL 1
MECHANICAL
PLAN -
THEATER
SHEET NUMBER:

M203

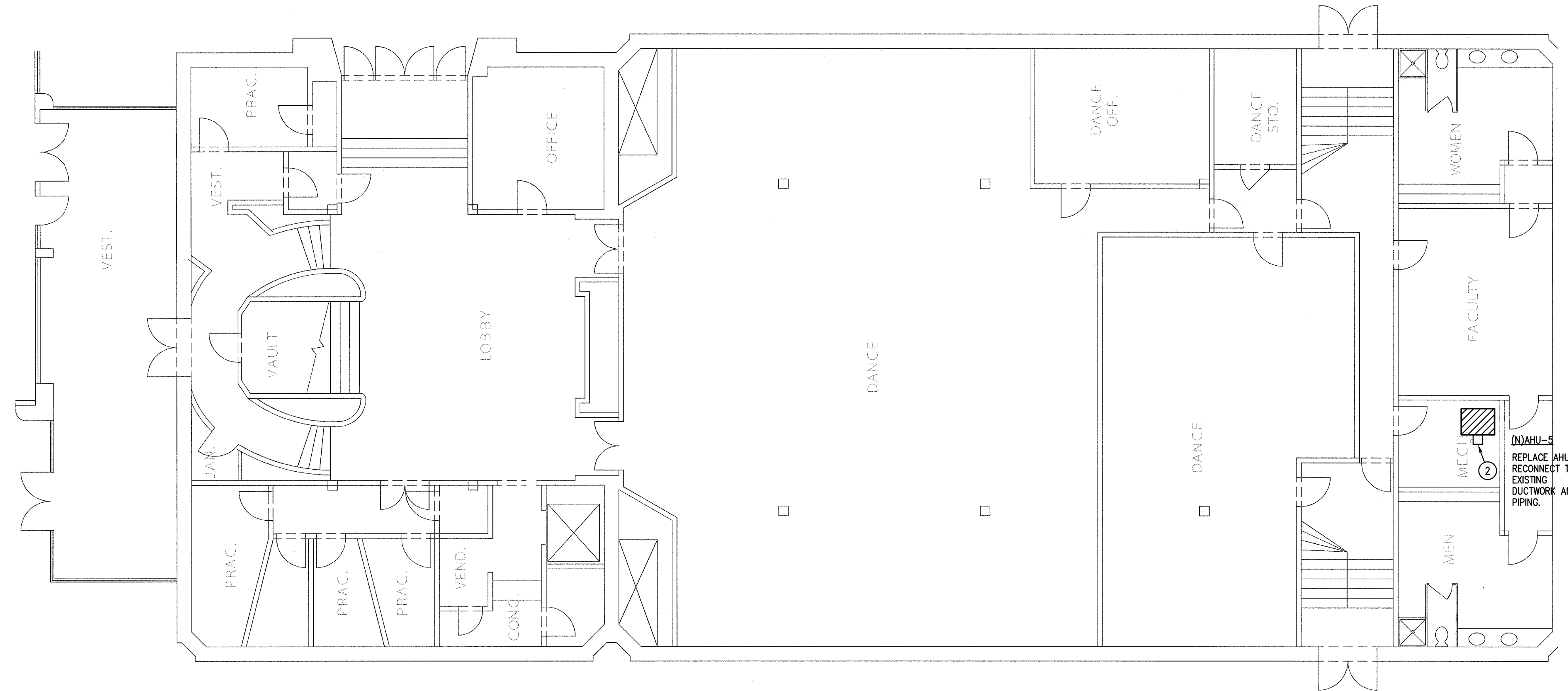
DBR
9990 Richmond Avenue
South Building, Suite 300
Houston, Texas 77042
713.914.0888 p. 713.914.0888 f.
TBP Firm Registration No. 2234

DBR Project Number 190317.000
EM | MECH | ELEC | PLBG | TECH

Plot Date: Feb 21, 2020 6:58 PM. User: jch. Sheet: 1 of 17/2/20 by user: jch
HV19190317.000Drawing004-190317.rvt - Theater.dwg



1
ME204
HOT WATER
LEVEL 1 MECHANICAL AND ELECTRICAL PLAN
1/8"=1'-0" APPROX.



1
ME204
CHILLED WATER
LEVEL 1 MECHANICAL AND ELECTRICAL PLAN
1/8"=1'-0" APPROX.

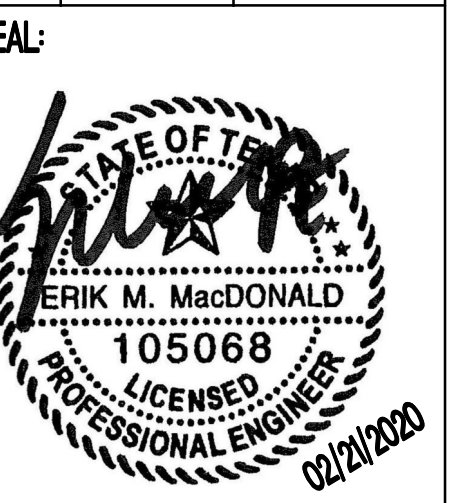
ELECTRICAL KEYED NOTES:

- EXISTING AIR HANDLING UNIT SHALL BE DEMOLISHED. ELECTRICAL CONTRACTOR SHALL DISCONNECT EXISTING FEEDER AND REMOVE EXISTING DISCONNECT. EXISTING FEEDER SHALL REMAIN TO SERVE NEW UNIT.
- ELECTRICAL CONTRACTOR SHALL CONNECT NEW AIR HANDLING UNIT REUSING EXISTING FEEDER PREVIOUSLY SERVING DEMOLISHED AIR HANDLING UNIT. PROVIDE ALL MATERIALS AND LABOR TO EXTEND EXISTING FEEDER TO NEW UNIT'S POINT OF CONNECTION. NEW DISCONNECT PROVIDED BY MECHANICAL CONTRACTOR, INSTALLED AND WIRED BY ELECTRICAL CONTRACTOR.



ERO
5444 Westheimer
Suite 1000, Office 1054
Houston, TX 77056

REVISION	No.	DATE	DESCRIPTION
	02/21/2020	100% CD	



Houston Community College System
HVAC Replacement at Fannin
Central Campus

DATE:
02/06/2020
DRAWN BY:
DBR
CHECKED BY:
DBR
PROJECT NUMBER:
190317.000
SHEET TITLE:
LEVEL 1
MECHANICAL AND
ELECTRICAL PLAN
- THEATER

SHEET NUMBER:
ME204



DBR Project Number 190317.000
EM | MECH | ELEC | PLBG | TECH