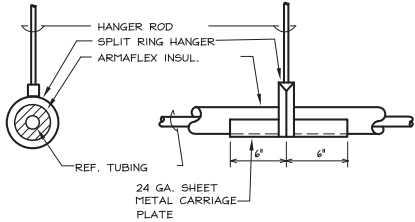


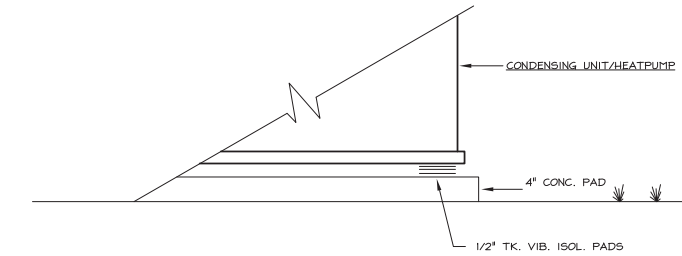
MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT METHODS OF COMPLIANCE		
	PREScriptive	<input checked="" type="checkbox"/> ENERGY COST BUDGET <input type="checkbox"/>
Thermal Zone		3A
Exterior Design Conditions		8°F 94°F
Winter Dry Bulb		
Summer Dry Bulb		
Interior Design Conditions		70°F 74°F 50%
Winter Dry Bulb		
Summer Dry Bulb		
Relative Humidity		
Building Heating Load		304.3 MBH
Building Cooling Load		377.8 MBH
Mechanical Space Conditioning System		
Unitary		
Description of Unit		
Heating Efficiency		
Cooling Efficiency		
Heat Output of Units		
Cooling Output of Units		
Boiler		
Total Boiler Output, If Oversized, State Reason		
Chiller		
Total Chiller Capacity, If Oversized, State Reason		
List Equipment Efficiencies		
Equipment Schedules with Motors (Mechanical Systems)		
Motor Horsepower		
Number of Phases		
Minimum Efficiency		
Motor Type		
# of Poles		
Designer Statement:		
To the best of my knowledge and belief, the design of this building complies with the mechanical systems, service systems and equipment requirements of North Carolina State Building Code.		
Signed:		
Name:		
Title:		
Note: See Schedules for individual equipment performance		



HANGER DETAIL

SCALE NONE

OUTSIDE AIR CALCULATIONS									
BASED ON 2012 NC Mechanical Code Table 6.0.3									
Units	FC-1								
Type of Area	Area	Propor	OA	OA	OA	OA	OA	OA	OA
A	sf	1000 sf	Rp	Ra	Ra	Ra	Ra	Ra	Used
Office	740	5	5	0.06	63.23				
Storage	80	0	0	0.12	9.60				
Corridor	740	0	0	0.06	45.60				
OA Subtotal = Vn Prp + Aa					118.43				
Zone Effectiveness = E2 from Table 6.2					0.80				
Corrected Outside Air = Vn + VnE2					142.16				
Primary Airflow to Zone from RTU					142.16				
Minimum Primary Airflow					142.16				
Primary Airflow Fraction					1.00				
MIN OA FOR UNITS					150				
Units	FC-2								
Type of Area	Area	Propor	OA	OA	OA	OA	OA	OA	OA
A	sf	1000 sf	Rp	Ra	Ra	Ra	Ra	Ra	Used
Office	740	5	5	0.06	63.75				
Storage	80	0	0	0.12	9.60				
Corridor	740	0	0	0.06	45.60				
OA Subtotal = Vn Prp + Aa					119.95				
Zone Effectiveness = E2 from Table 6.2					0.80				
Corrected Outside Air = Vn + VnE2					143.69				
Primary Airflow to Zone from RTU					143.69				
Minimum Primary Airflow					143.69				
Primary Airflow Fraction					1.00				
MIN OA FOR UNITS					150				
Units	CHP-1 & 2 & 3 & 4								
Type of Area	Area	Propor	OA	OA	OA	OA	OA	OA	OA
A	sf	1000 sf	Rp	Ra	Ra	Ra	Ra	Ra	Used
Classroom	650	30	7.5	0	170.63				
OA Subtotal = Vn Prp + Aa					170.63				
Zone Effectiveness = E2 from Table 6.2					1.00				
Corrected Outside Air = Vn + VnE2					170.63				
Primary Airflow to Zone from RTU					170.63				
Minimum Primary Airflow					170.63				
Primary Airflow Fraction					1.00				
MIN OA FOR UNITS					200				
Units	CHP-4								
Type of Area	Area	Propor	OA	OA	OA	OA	OA	OA	OA
A	sf	1000 sf	Rp	Ra	Ra	Ra	Ra	Ra	Used
Classroom	450	30	7.5	0	118.13				
OA Subtotal = Vn Prp + Aa					118.13				
Zone Effectiveness = E2 from Table 6.2					1.00				
Corrected Outside Air = Vn + VnE2					118.13				
Primary Airflow to Zone from RTU					118.13				
Minimum Primary Airflow					118.13				
Primary Airflow Fraction					1.00				
MIN OA FOR UNITS					150				



COND/HP UNIT MOUNTING DETAIL

SCALE NONE

HEAT PUMP UNIT SCHEDULE																						
UNIT TAG	FAN DATA			COOLING DATA				HEAT (REJECTION/ELEC COIL)				INDOOR ELECTRICAL			HEAT PUMP ELECTRICAL			CONDENSER ENTERING AIR (°F)	UNIT ACCESSORIES	MFR & MODEL NO.		
	FAN CFM	ESP (* WG)	OUTDOOR (CFM)	TOTAL (MBH)	SENSIBLE (MBH)	E DB (°F)	E WB (°F)	EFF	REJECTION (MBH)	EFF (COP)	KW	STEPS	EAT (°F)	VOLTAGE (V)	MCA (A)	MOCP (A)	VOLTAGE (V)				MCA (A)	MOCP (A)
FC-1	1400	0.7*	150	42.9	32.8	80	67	15.5 SEER	39.0 @ 47* 25.6 @ 17*	9.0 HSPF	10.8	1	70	208/1#	41.0	45.0	208/1#	28.0	45.0	95°F	SINGLE POINT ELECT. CONNECTION	TRANE TAM7AOC36H TRANE 4THR3042B
FC-2	1600	0.7*	150	49.7	36.7	80	67	15.5 SEER	47.5 @ 47* 30.8	9.0 HSPF	10.8	1	70	208/1#	41.0	45.0	208/1#	30.0	50	95°F	SINGLE POINT ELECT. CONNECTION	TRANE TAM7AOC36H TRANE 4THR3048B
CHP-1 CHP-2 CHP-6	1500	0.3	200	47.0	34.6	80	67	15.0 EER	44.5 @ 47* 25.2 @ 10*	3.7 COP (47)	9.0	1	70	208/3#	53.0	60.0	---	---	---	95°F	SEE BELOW, WT 1200# HGR = 25.5 MBH	BARD 148HIDB09
CHP-3 CHP-7	1700	0.3	200	54.0	39.1	80	67	10.7 EER	54.0 @ 47* 32.9 @ 10*	3.5 COP (47)	15.0	1	70	208/3#	58.0	60.0	---	---	---	95°F	SEE BELOW, WT 1250# HGR = 24.8 MBH	BARD 160HIDB09
CHP-4 CHP-5	1150	0.3*	150	36.0	27.3	80	67	12.0 EER	32.8 @ 47* 16.7 @ 10*	3.7 COP (47)	9.0	1	70	208/3#	49.0	50.0	---	---	---	95°F	SEE BELOW, WT 1200# HGR = 25.5 MBH	BARD 136HIDB09
ALL SYSTEMS TO INCLUDE PROGRAMMABLE THERMOSTATS, AUX DRAIN PANS, FLOAT SWITCH/SENSOR IN DRAIN PAN TO TURN OFF UNIT UPON ACTIVATION, HIGH AND LOW PRESSURE SWITCHES, TIME DELAY, RA SMOKE DETECTOR CRANKCASE HEATERS, LOW AMBIENT CONTROLLER AND SINGLE POINT ELECTRICAL CONNECTION ON INDOOR UNIT. 410A REFRIGERANT. PROVIDE MFD PLENUM BASE FOR UNIT BOTTOM INTAKE (SEE DETAIL). CHP UNITS: PROVIDE 4" DRAINABLE LOUVER, SA PLENUM, HOT GAS REHEAT (DEHUM), MERV 8 FILTERS ON PERM. FRAMES, SIDE SKIRT KIT, OUTSIDE AIR CONNECTION, PROGRAMMABLE WALL T"STAT- TEMP, HUMIDITY, CO2, OCCUPANCY ALL SYSTEMS -INCLUDING FCU: PROVIDE PERMANENT FILTER FRAMES AS DESCRIBED IN CLASSROOM HEATPUMP SPECIFICATIONS SPLIT SYSTEM EQUALS BY CARRIER, YORK CHP SYSTEM EQUALS BY MARVAIR SCHOLAR , MODINE CLASSMATE																						

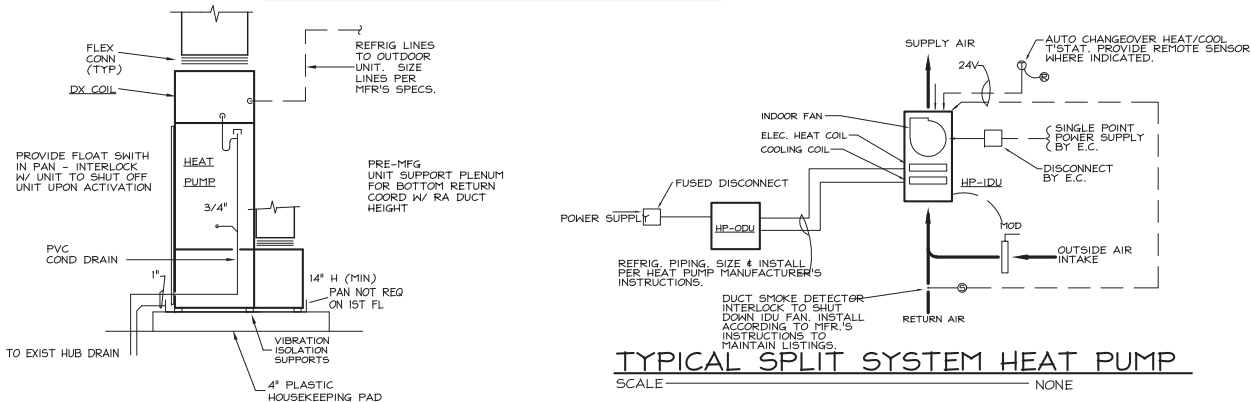
GRILLE & DIFFUSER SCHEDULE						
SYM	NECK SIZE	PANEL SIZE	NC @ CFM	FINISH	USE	DAMPER IN NECK
AS	6\" 6\"x6\"	24\"x24\"	17 NC@ 125	WHITE	CLG SA	OBD
BS	8\" 8\"x8\"	24\"x24\"	-- NC@ 225	WHITE	CLG SA	OBD
CS	10\" 10\"x10\"	24\"x24\"	17 NC@ 400 CFM	WHITE	CLG SA	OBD
DS	12\" 12\"x12\"	24\"x24\"	24 NC@ 500 CFM	WHITE	CLG SA	OBD
AR	6\" 6\"x6\"	24\"x24\"	-- NC@ 120 CFM	WHITE	CLG RA	OBD
BR	8\" 8\"x8\"	24\"x24\"	-- NC@ 220 CFM	WHITE	CLG RA	OBD
CR	10\" 10\"x10\"	24\"x24\"	-- NC@ 380 CFM	WHITE	CLG RA	OBD
DR	12\" 12\"x12\"	24\"x24\"	-- NC@ 626 CFM	WHITE	CLG RA	OBD
NOTE: PROVIDE MODEL SR3 SQUARE TO ROUND NECK ADAPTERS AS NEEDED COORDINATE FRAME TYPES WITH REFLECTED CEILING PLAN PRICE DIFFUSERS SHALL BE STEEL						

GENERAL MECHANICAL NOTES

- WORK SHALL CONFORM TO ALL APPLICABLE STATE AND LOCAL CODES. THE MOST STRINGENT SHALL APPLY.
- COORDINATE WITH ALL OTHER TRADES TO AVOID CONFLICTS.
- COORDINATE ALL PENETRATIONS THROUGH WALLS, FLOORS, ROOFS, ETC. WITH THE OWNER.
- THERMOSTAT. THOSE LOCATED ON EXTERIOR WALLS SHALL HAVE INSULATED BASE. ALL SHALL HAVE TAMPERPROOF GUARDS.
- PIPE AND DUCT PENETRATIONS TO BE INSTALLED ACCORDING TO CODE AND SUPPORTING DETAILS.
- M.C. SHALL FURNISH AND INSTALL ANY MISC. STEEL REQUIRED FOR THE SUPPORT AND INSTALLATION OF THE EQUIPMENT. SPAN MINIMUM OF 3 JOISTS.
- MANUFACTURER'S RECOMMENDED SERVICE ACCESS CLEARANCE SHALL BE MAINTAINED. DO NOT SCALE DRAWINGS.
- M.C. SHALL BE RESPONSIBLE FOR FURNISHING AND INSTALLING ALL ACCESS DOORS.
- LABEL ALL THERMOSTATS AND CONTROL COMPONENTS AS TO THEIR FUNCTION.
- M.C. SHALL BALANCE THE EQUIPMENT TO THE AIR AND WATER QUANTITIES SCHEDULED.
- ALL VALVES, DAMPERS, CONTROLLERS, ETC. SHALL BE ACCESSIBLE.
- COILS SHALL BE FURNISHED WITH RIGHT OR LEFT HAND CONNECTIONS AS REQUIRED FOR ADEQUATE SERVICE CLEARANCE ACCESS.
- CONTRACTOR SHALL PROVIDE PHENOLIC TAGS FOR EQUIPMENT AND ATTACH TO CEILING GRID BELOW BOX.
- ALL ROOFING WORK SHALL BE BY CFS APPROVED ROOFING CONTRACTOR THAT MAINTAINS THE SITE WARRANTY WORK.
- CONTRACTOR SHALL VISIT THE SITE PRIOR TO BIDDING AND CONSTRUCTION TO FAMILIARIZE THEMSELVES WITH THE PROJECT AND EXISTING CONDITIONS. COORDINATE NEW WORK/EXISTING CONDITIONS.

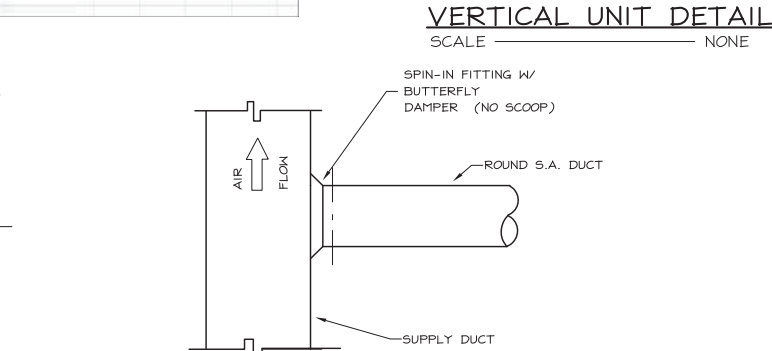
HVAC LEGEND

- RECTANGULAR DUCT
- ROUND DUCT W/INSULATION AS NOTED
- DUCT W/\" LINED INSULATION AS NOTED
- DUCT TRANSITION
- T\"STAT W/ INSULATED BASE
- UNDERCUT DOOR
- S.A. DIFFUSER W/FLEX DUCT
- R.A. GRILLE W/FLEX DUCT
- DUCT HTD. SMOKE DETECTOR
- WALL SWITCH
- UL LISTED/LABELED TYPE B DYNAMIC FIRE DAMPER
- UL 555 LISTED/LABELED FIRE/SMOKE DAMPER



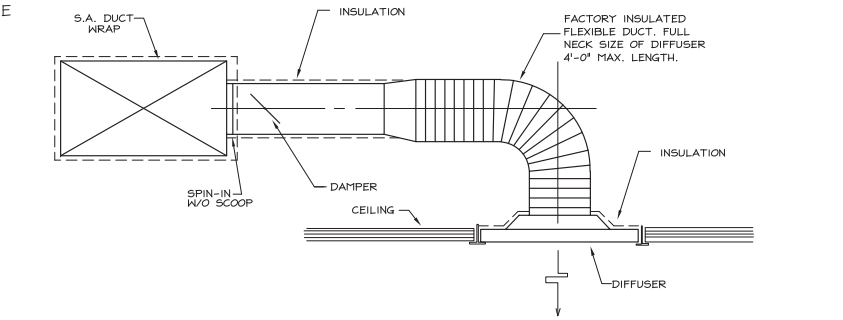
TYPICAL SPLIT SYSTEM HEAT PUMP

SCALE NONE



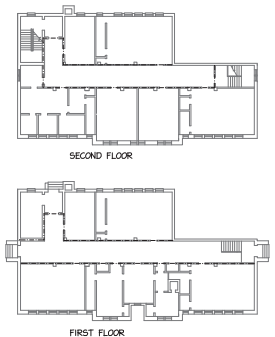
ROUND DUCT TAKE-OFF DETAIL

SCALE NONE

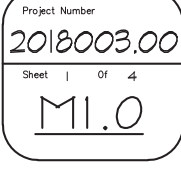
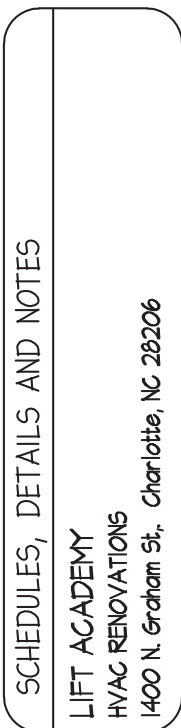
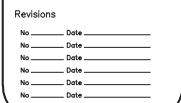
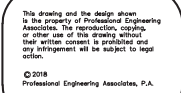
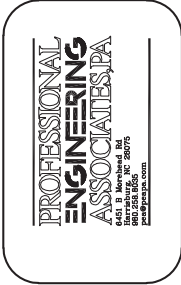


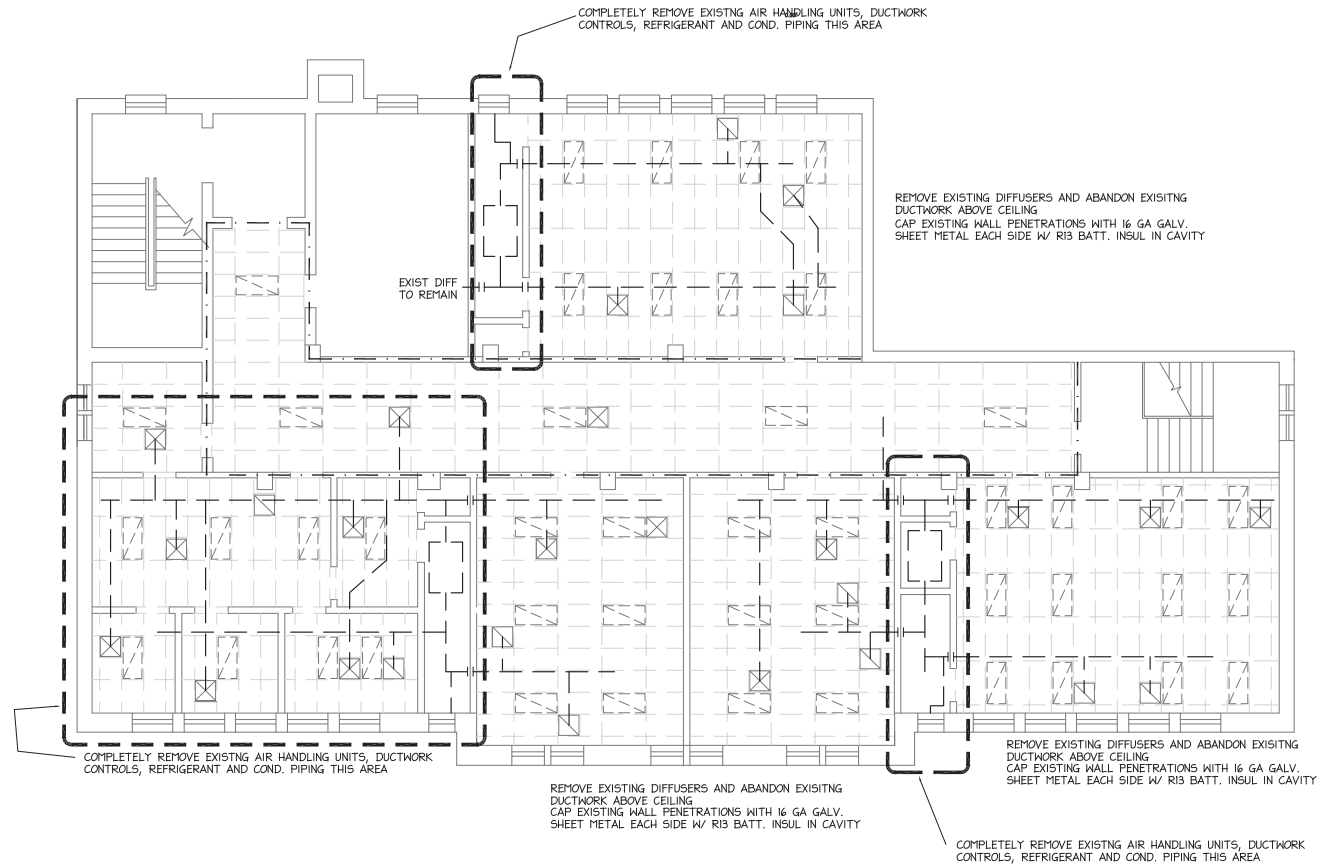
SECTION AT TYPICAL BRANCH DUCT TAKE-OFF

SCALE NONE

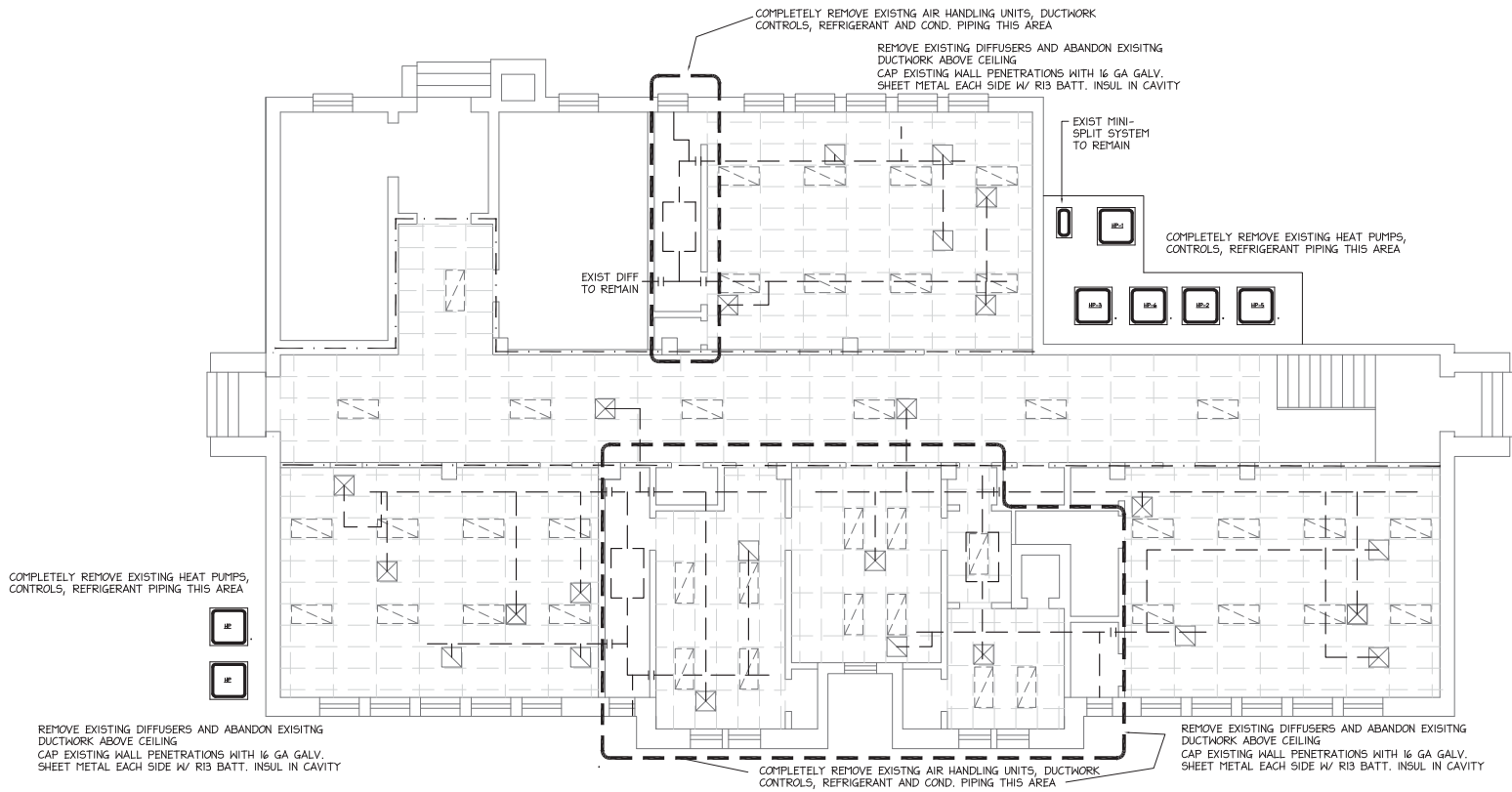


KEYPLAN

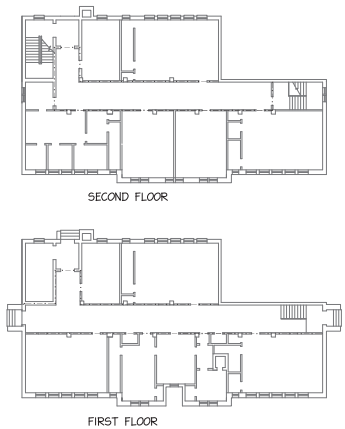




SECOND FLOOR PLAN
SCALE: 1/8" = 1'-0"



FIRST FLOOR PLAN
SCALE: 1/8" = 1'-0"



This drawing and the design shown is the property of Professional Engineering Associates, P.A. The reproduction, copying or other use of this drawing without their written consent is prohibited and any infringement will be subject to legal action.

© 2018
Professional Engineering Associates, P.A.

Project Manager
Project Engineer
Drawn By
Checked By
Date Issued
5-15-18

Revisions

No.	Date

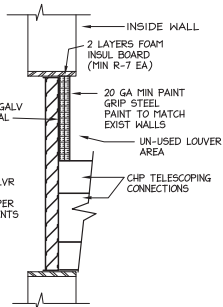
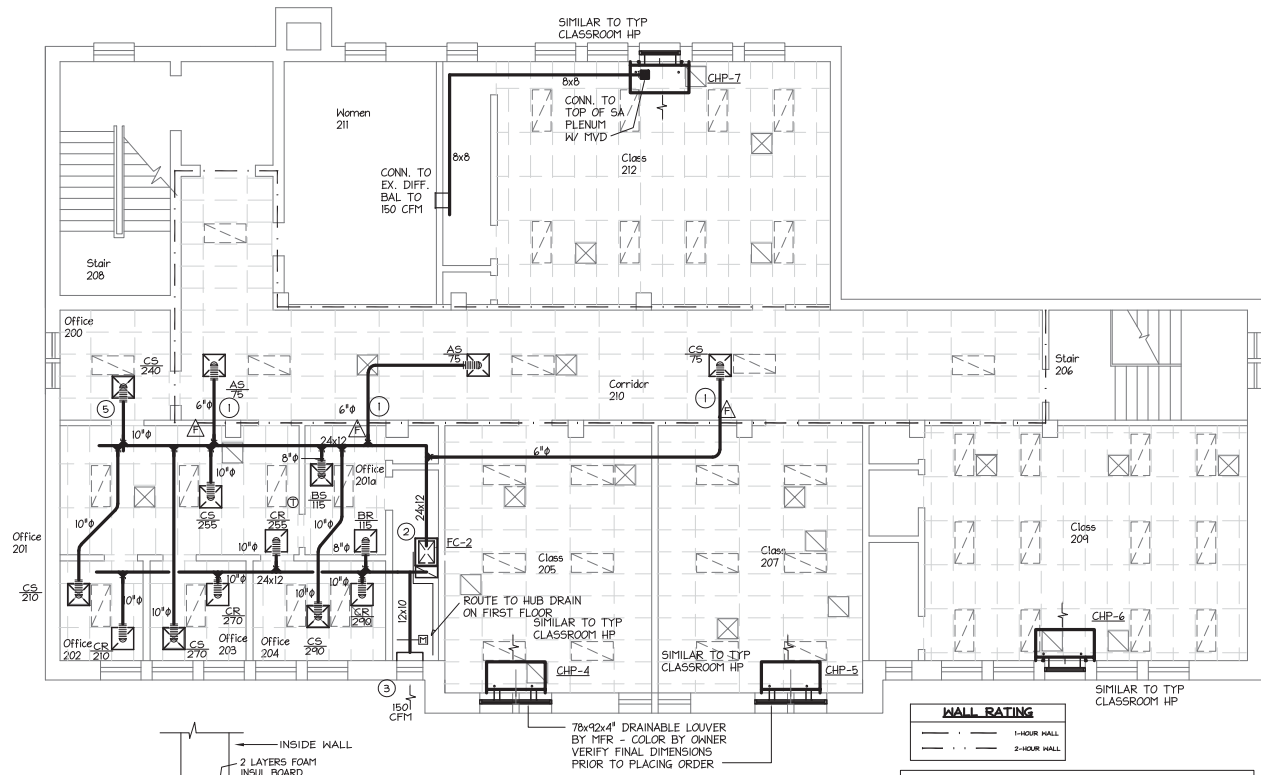
DEMOLITION PLANS

LIFT ACADEMY
HVAC RENOVATIONS
1400 N. Graham St., Charlotte, NC 28206

Project Number
2018003.00

Sheet 2 of 4

M2.0



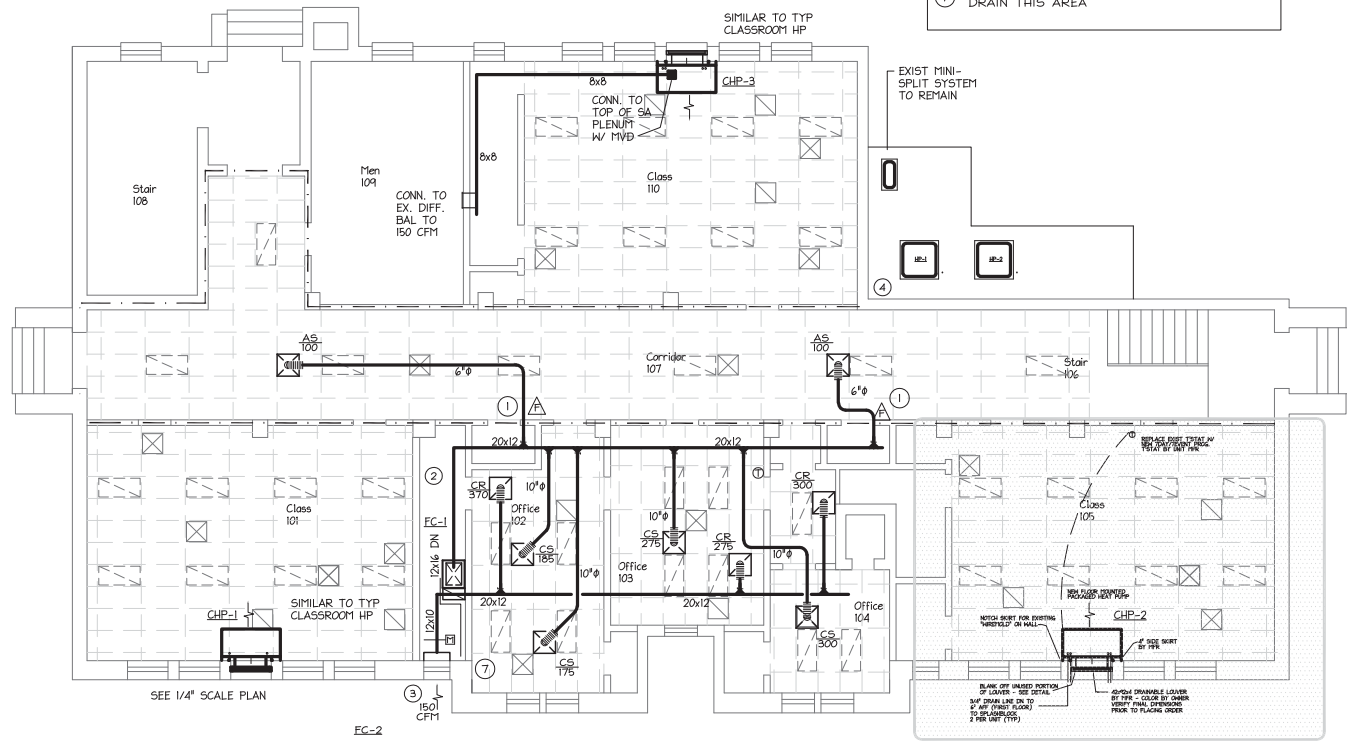
TYPICAL LOUVER DETAIL
SCALE: NONE

SECOND FLOOR PLAN
SCALE: 1/8" = 1'-0"

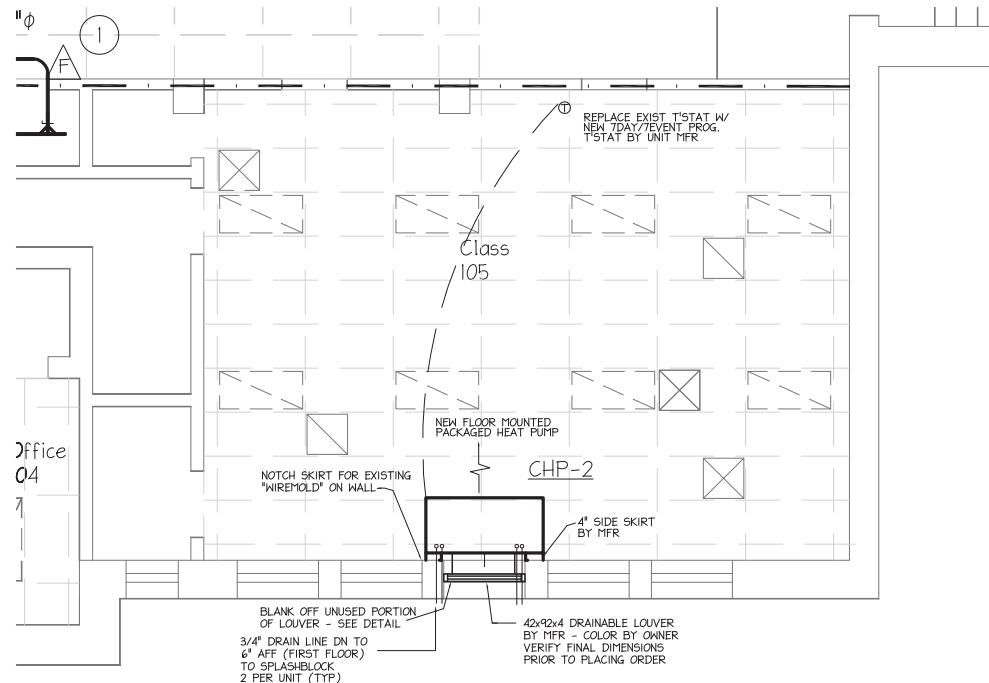
WALL RATING	
---	1-HOUR WALL
---	2-HOUR WALL

KEYED NOTES

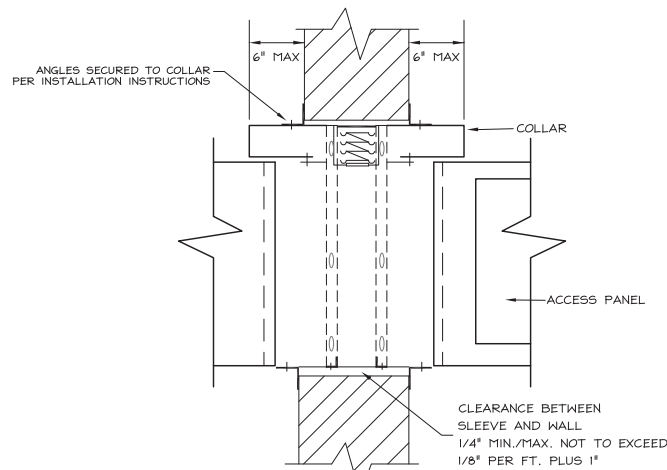
- 1 REPLACE EXISTING FIRE DAMPERS WITH NEW DYNAMIC TYPE
- 2 COORDINATE Fila LOCATION WITH OWNER
- 3 CONNECT TO EXIST. 24x12 LOUVER - PROVIDE NEW MOD W/ BELIMO ACTUATOR BALANCE AS SHOWN
- 4 CONTROL & REFRIGERANT LINES IN ENCLOSURE TO INDOOR UNITS. REF PIPING SIZED BY UNIT MFR FOR TOTAL LENGTH & LIFT. MAX 3 PSI DROP
- 5 EXIST DOOR GRILLE TO REMAIN
- 6 COORDINATE ROUTING W/EXISTING PIPING & EQUIPMENT TO MAINTAIN PROPER ACCESS
- 7 ROUTE 3/4" COND DRAIN TO EXIST HUB DRAIN THIS AREA



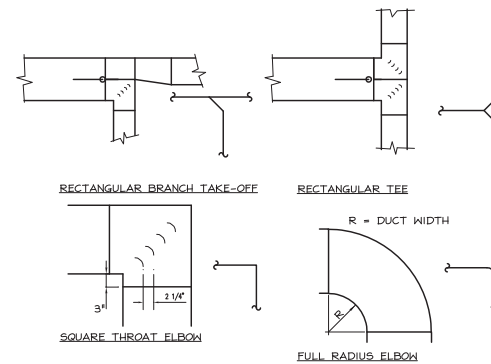
FIRST FLOOR PLAN
SCALE: 1/8" = 1'-0"



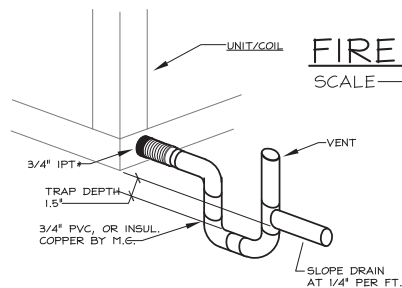
TYPICAL CLASSROOM HEATPUMP PLAN
SCALE: 1/4" = 1'-0"



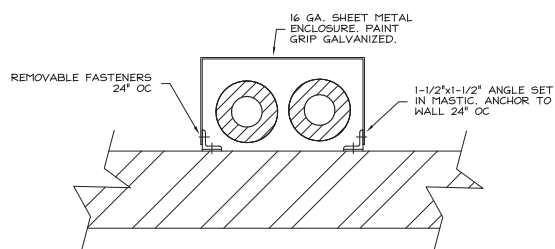
FIRE DAMPER DETAIL
SCALE: NONE



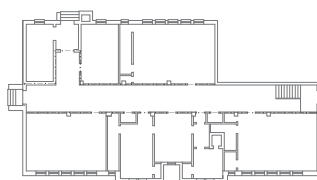
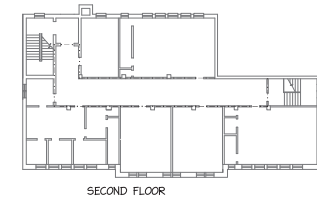
DUCT CONNECTION DETAIL
SCALE: NONE



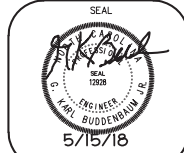
CONDENSATE CONNECTION DETAIL
SCALE: NONE



REMOVABLE PIPE CHASE
SCALE: NONE



KEYPLAN



This drawing and the design shown is the property of Professional Engineering Associates, PA. The reproduction, copying or other use of this drawing without their written consent is prohibited and any infringement will be subject to legal action.

© 2018 Professional Engineering Associates, PA.

Project Manager
Project Engineer
Drawn By
Checked By
Date Issued
Revisions

MECHANICAL RENOVATION PLANS
LIFT ACADEMY
HVAC RENOVATIONS
1400 N. Graham St., Charlotte, NC 28206

Project Number
2018003.00
Sheet 3 of 4
M2.1



**SHULTZ
ENGINEERING
GROUP, PC**
212 N. McDowell St., Suite 204
Charlotte, NC 28204
(P) 704.334.7363 | (F) 704.347.0093
www.shultzeg.com | SEG - 18-069
NC FIRM LICENSE NUMBER: C-0099



CORPORATE SEAL



This drawing and the design shown
is the property of Professional Engineering
Associates. The reproduction, copying
or other use of this drawing without
their written consent is prohibited and
any infringement will be subject to legal
action.
© 2018
Professional Engineering Associates, P.A.

Project Manager
SES
Project Engineer
SES
Drawn By
MBC
Checked By
TAP
Date Issued
5-15-18

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

DEMOLITION PLAN

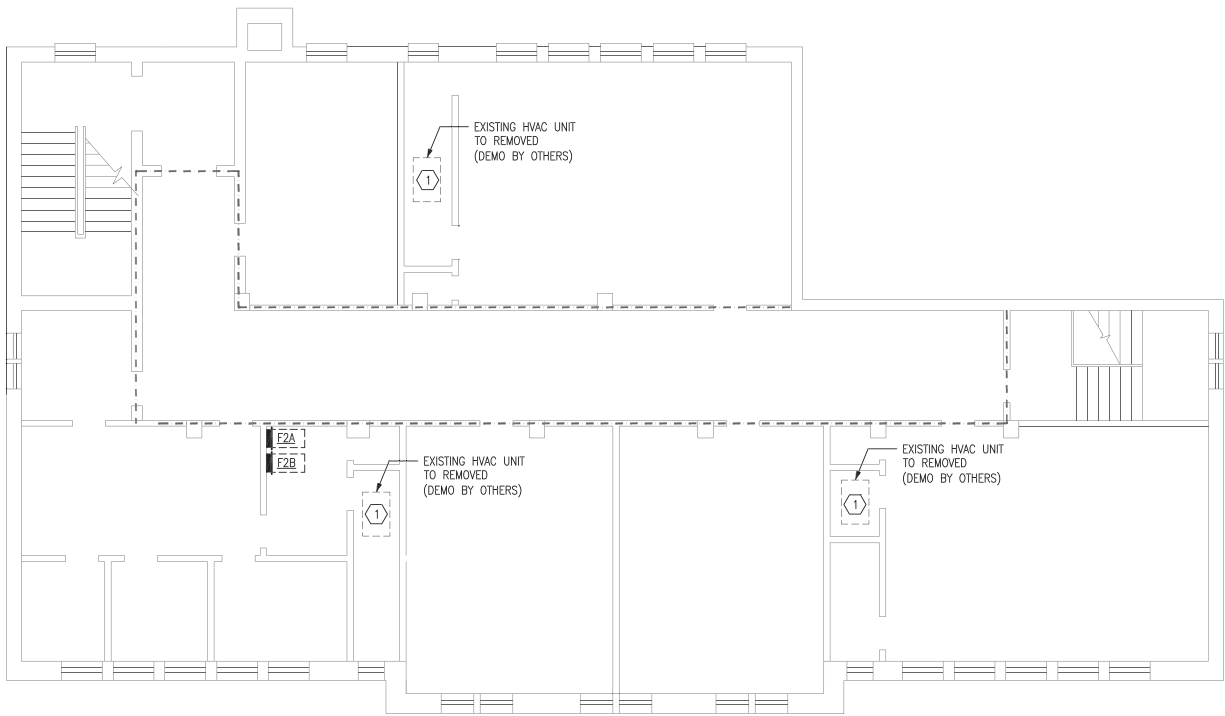
LIFT ACADEMY
HVAC RENOVATIONS
1400 N. Graham St., Charlotte, Nc 28206

Project Number

2018003.00

Sheet 3 of 4

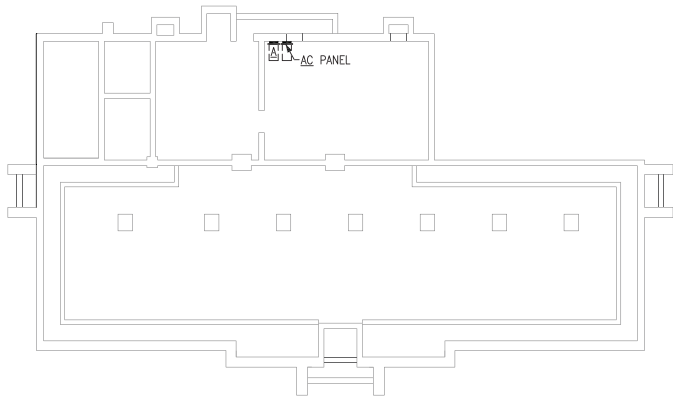
E1.0



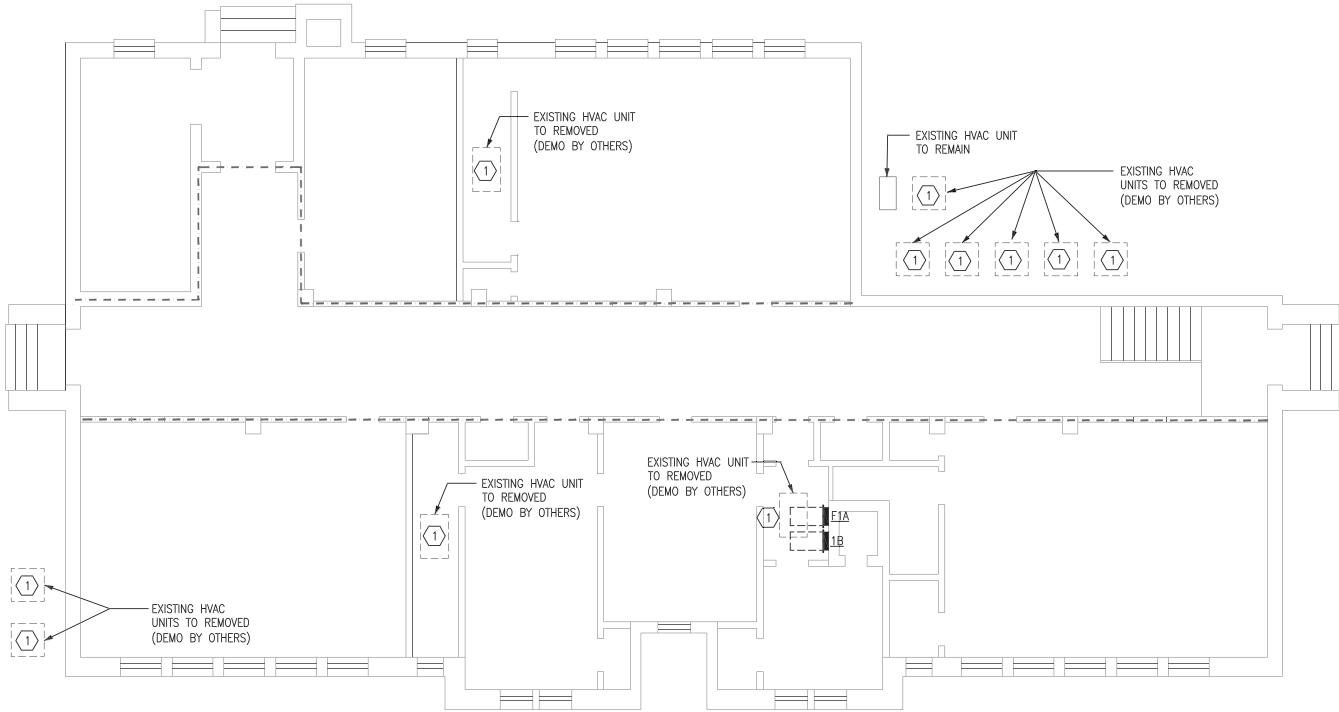
3 ELECTRICAL PLAN - SECOND FLOOR - DEMO
SCALE: 1/8"=1'-0"

ELECTRICAL DEMO NOTES

1. ALL EXISTING HVAC EQUIPMENT TO BE DEMOLISHED. DEMOLISH EXISTING CIRCUIT AND REMOVE BREAKER FROM PANEL, UNLESS NOTED OTHERWISE.

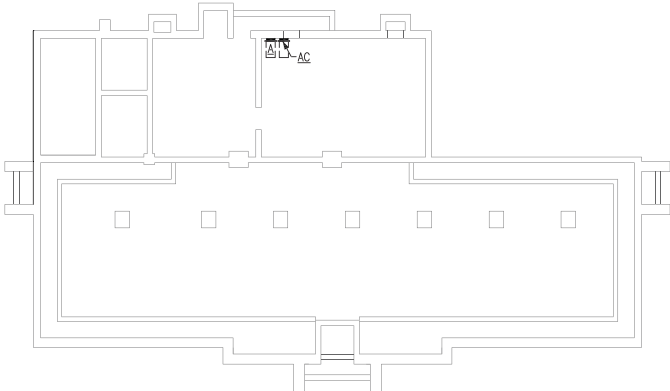


1 ELECTRICAL PLAN - BASEMENT FLOOR - DEMO
SCALE: 1/16"=1'-0"

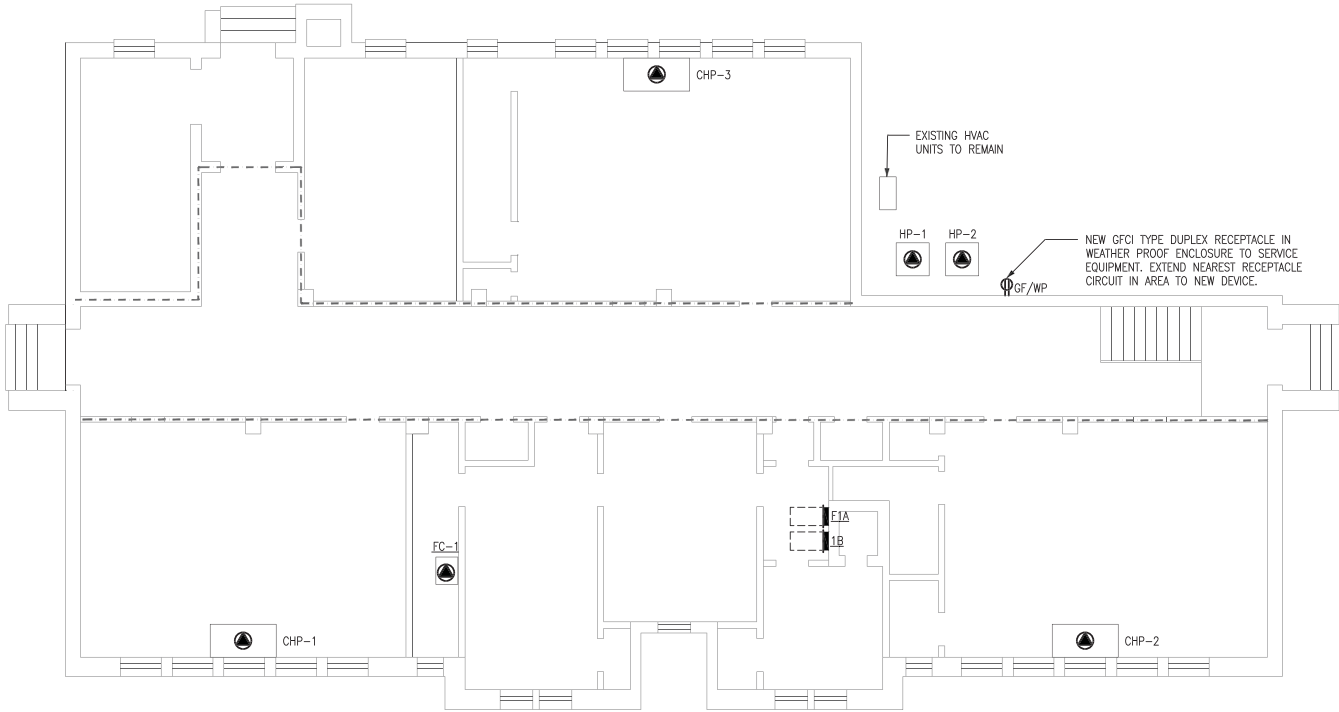


2 ELECTRICAL PLAN - FIRST FLOOR - DEMO
SCALE: 1/8"=1'-0"

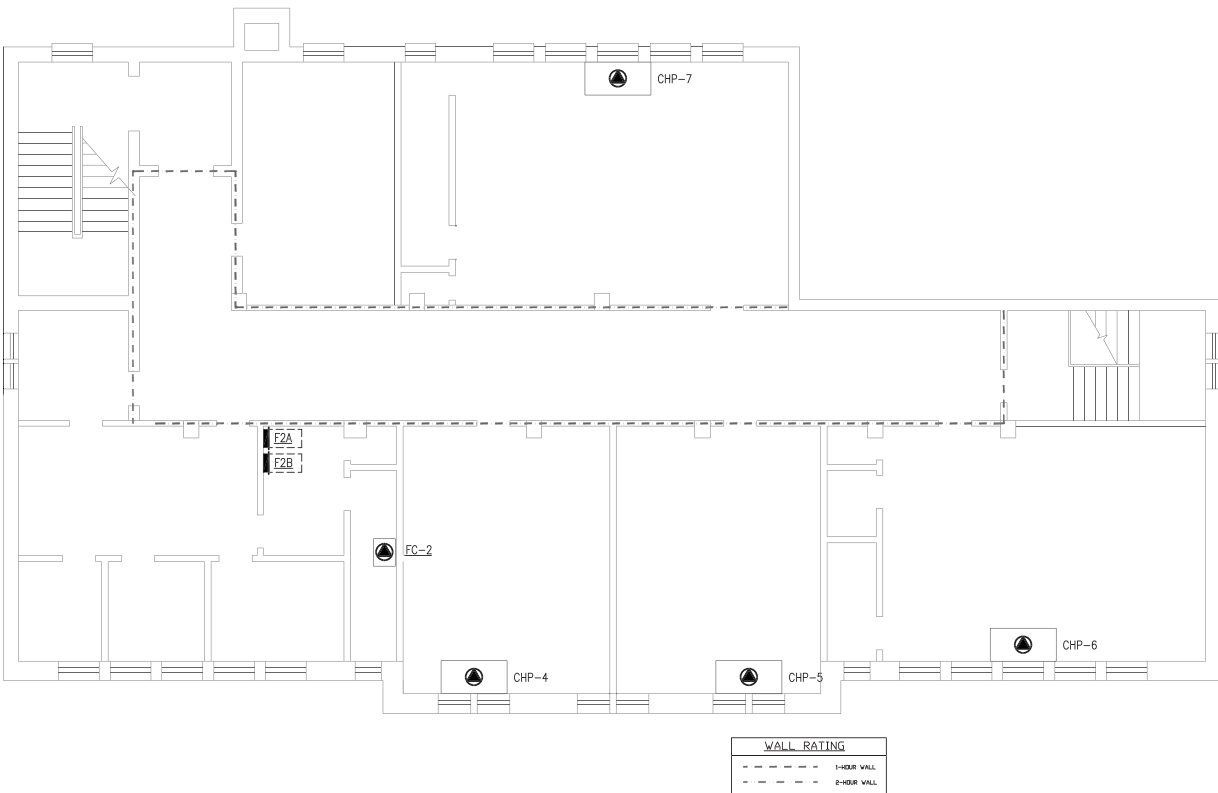
ELECTRICAL EQUIPMENT CONNECTION SCHEDULE																
CONNECTION DESIGNATION	LOAD DESCRIPTION	VOLTS /PH	LOAD INFORMATION				DISCONNECT INFORMATION							CONNECTION NOTES	CONNECTION DESIGNATION	
			HP	LOAD (KVA)	MCA	MOCP	FURN. BY	INSTALLED BY	TYPE	SWITCH RATING	POLE	FUSE OR TRIP RATING	NEMA ENCL. TYPE			CIRCUIT ID
CHP-1	PACKAGED HEATPUMP	208/3	-	17.3 KVA	53	60	EQ. MFG.	EQ. MFG.	-	-	-	-	-	AC-3	NOTE 1	CHP-1
CHP-2	PACKAGED HEATPUMP	208/3	-	17.3 KVA	53	60	EQ. MFG.	EQ. MFG.	-	-	-	-	-	AC-9	NOTE 1	CHP-2
CHP-3	PACKAGED HEATPUMP	208/3	-	17.3 KVA	58	60	EQ. MFG.	EQ. MFG.	-	-	-	-	-	AC-15	NOTE 1	CHP-3
CHP-4	PACKAGED HEATPUMP	208/3	-	17.3 KVA	49	60	EQ. MFG.	EQ. MFG.	-	-	-	-	-	F1A-4	NOTE 1	CHP-4
CHP-5	PACKAGED HEATPUMP	208/3	-	14.4 KVA	49	50	EQ. MFG.	EQ. MFG.	-	-	-	-	-	F1A-10	NOTE 1	CHP-5
CHP-6	PACKAGED HEATPUMP	208/3	-	17.3 KVA	53	60	EQ. MFG.	EQ. MFG.	-	-	-	-	-	F2A-4	NOTE 1	CHP-6
CHP-7	PACKAGED HEATPUMP	208/3	-	17.3 KVA	58	60	EQ. MFG.	EQ. MFG.	-	-	-	-	-	F2A-10	NOTE 1	CHP-7
HP-1	HEAT PUMP UNIT	208/1	-	5.8 KVA	28	45	ELEC. CNTR.	ELEC. CNTR.	FUSED	60	1	FPN	3R	AC-6	-	HP-1
HP-2	HEAT PUMP UNIT	208/1	-	6.2 KVA	30	50	ELEC. CNTR.	ELEC. CNTR.	FUSED	60	1	FPN	3R	AC-2	-	HP-2
FC-1	AIR HANDLING UNIT	208/1	-	8.5 KVA	41	45	ELEC. CNTR.	ELEC. CNTR.	FUSED	60	1	FPN	1	F1A-38	-	FC-1
FC-2	AIR HANDLING UNIT	208/1	-	8.5 KVA	41	45	ELEC. CNTR.	ELEC. CNTR.	FUSED	60	1	FPN	1	F2A-34	-	FC-2
NOTES:																
1. EXTEND POWER CIRCUIT TO LINE-SIDE OF INTEGRAL DISCONNECT SWITCH/CIRCUIT BREAKER PROVIDED WITH EQUIPMENT.																



1 ELECTRICAL PLAN - GROUND FLOOR - NEW
SCALE: 1/16"=1'-0"



2 ELECTRICAL PLAN - FIRST FLOOR - NEW
SCALE: 1/8"=1'-0"



3 ELECTRICAL PLAN - SECOND FLOOR - NEW
SCALE: 1/8"=1'-0"



SHULTZ
ENGINEERING
GROUP, PC
212 N. McDowell St., Suite 204
Charlotte, NC 28204
(P) 704.334.7363 | (F) 704.347.0093
www.shultzeg.com | SEG - 18-069
NC FIRM LICENSE NUMBER: C-0099



CORPORATE SEAL

PROFESSIONAL
ENGINEERING
ASSOCIATES, P.A.
Charlotte, NC
www.shultzeg.com

This drawing and the design shown
is the property of Professional Engineering
Associates. The reproduction, copying
or other use of this drawing without
their written consent is prohibited and
any infringement will be subject to legal
action.

© 2018
Professional Engineering Associates, P.A.

Project Manager
Project Engineer
Drawn By
Checked By
Date Issued
5-15-18

Revisions
No. Date
No. Date
No. Date
No. Date
No. Date

NEW PLAN
LIFT ACADEMY
HVAC RENOVATIONS
1400 N. Graham St., Charlotte, NC 28206

Project Number
2018003.00
Sheet 4 of 4
E2.0