THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ORIGINAL PLOT SETS

2018 APPENDIX B
BUILDING CODE SUMMARY FOR ALL COMMERCIAL PROJECTS
MECHANICAL DESIGN
(PROVIDE ON THE MECHANICAL SHEETS IF APPLICABLE)

MECHANICAL SUMMARY

MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT

Thermal Zone
winter dry bulb: 18
summer dry bulb: 91

Interior design conditions
winter dry bulb: 72
summer dry bulb: 75
relative humidity: 50%

Building heating load: 330 MBH

Building cooling load: 61.7 TONS

Mechanical Spacing Conditioning System
Unitary
description of unit:
heating efficiency:
cooling efficiency:
size category of unit:
Boiler
Size category. If oversized, state reason.:
Chiller
Size category. If oversized, state reason.:

FOR CENTRAL PLANT SIZING, SEE BUILDING F/G DRAWINGS ON SHEET M101

List equipment efficiencies:

2018 NC Administrative Code and Policies

GENERAL NOTES - MECHANICAL

A. COORDINATE THE LOCATION OF DRAINS, THERMOSTATS, ETC., WITH ALL CASEWORK EQUIPMENT, MECHANICAL ROOM EQUIPMENT, ETC., PRIOR TO COMMENCING INSTALLATION. WORK NOT SO COORDINATED SHALL BE REMOVED AND PROPERLY INSTALLED AT THE EXPENSE OF THE CONTRACTOR.
B. THE CONTRACTOR SHALL EXERCISE EXTREME CARE IN THE COURSE OF THEIR WORK SO AS TO ENSURE THAT THEY DO NOT INTERRUPT ANY EXISTING SERVICE. FOR SAFETY PURPOSES, PAY PARTICULAR ATTENTION TO THIS PRECAUTION RELATIVE AND ELECTRICAL LINES. VERIFY THE LOCATION, SIZE, TYPE, ETC., OF EACH UNDERGROUND OR OVERHEAD UTILITY. ALL WORK SHALL BE PERFORMED IN ACCORD WITH ALL FEDERAL, STATE AND/OR LOCAL RULES, REGULATIONS, STANDARD AND SAFETY REQUIREMENTS. UTILITIES SHALL BE INSTALLED IN ACCORD WITH THE APPLICABLE MUNICIPALITY OR UTILITY COMPANY STANDARDS. IN ALL CASES, THE MOST STRINGENT REQUIREMENT SHALL APPLY.
C. ALL NEW WORK SHALL BE HUNG FROM STRUCTURE, NOT FROM THE WORK OF OTHER TRADES, WHETHER EXISTING OR NEW.
D. COORDINATE ALL WORK WITH PROJECT PHASING REQUIREMENTS.
E. OBSERVE ALL APPLICABLE CODES, RULES AND REGULATIONS THAT MAY APPLY TO THE WORK UNDER THIS CONTRACT. (CITY, COUNTY, LOCAL, FEDERAL, MUNICIPALITY, UTILITY COMPANY, ETC.)
F. ALL PENETRATIONS OF FIRE AND SMOKE RATED ASSEMBLIES SHALL BE APPROPRIATELY FIRE STOPPED PER AN APPROVED U.L. LISTED STANDARD. CONTRACTOR SHALL PAY PARTICULAR ATTENTION TO INSULATED PIPING PENETRATIONS.
G. ALL DUCTWORK, PIPING, CONDUITS, ETC. IN ROOMS WITH CEILINGS SHALL BE ABOVE CEILING EXCEPT AS NOTED.
H. INSTALL AIR VENTS AT HIGH POINTS IN PIPING AND DRAINS IN LOW POINTS. USE CARE TO AVOID FREEZING OF EXTERIOR VENTS.
I. LOCATIONS OF PIPING, DUCTS AND EQUIPMENT ARE APPROXIMATE AND SUBJECT TO MINOR ADJUSTMENTS IN THE FIELD. DO NOT SCALE THE DRAWINGS.
J. ALL OFFSETS IN DUCTS AND PIPING ARE NOT NECESSARILY SHOWN. PROVIDE ADDITIONAL OFFSETS WHERE NECESSARY.
K. COORDINATE ALL HVAC WORK WITH ELECTRICAL, PLUMBING AND OTHER TRADES TO AVOID INTERFERENCE WITH PIPING, DUCTS, CONDUIT AND OTHER EQUIPMENT.
L. INSTALL ALL PIPING, DUCTWORK AND EQUIPMENT IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTION. IF IN CONFLICT WITH THE DESIGN INDICATED IN CONTRACT DOCUMENTS, ADVISE THE ENGINEERS PRIOR TO INSTALLATION FOR CLARIFICATION. PROVIDE RECOMMENDED ACCESS AND SERVICE CLEARANCES FOR ALL EQUIPMENT.
M. SEAL AIRTIGHT AROUND ALL DUCTS AND PIPING PENETRATIONS THROUGH WALLS, FLOORS AND ROOF. PROVIDE FIRE STOPPING IN FIRE PARTITION. ALL MOTOR DRIVEN EQUIPMENT SHALL BE INSTALLED WITH FLEXIBLE CONNECTIONS TO DUCTWORK, PIPING, ETC., UNLESS OTHERWISE NOTED. WHERE MOUNTING HEIGHTS ARE NOT INDICATED OR ARE IN CONFLICT WITH ANY OTHER BUILDING SYSTEM, CONTACT THE ENGINEERS BEFORE INSTALLATION. REFER ALSO TO ARCHITECTURAL WALL INTERIOR AND EXTERIOR WALL ELEVATIONS, CEILING HEIGHTS AND OTHER DETAIL OF THESE DOCUMENTS.
N. DOUBLE WIDTH TURNING VANES SHALL BE INSTALLED IN ALL SUPPLY, RETURN, AND EXHAUST DUCTWORK ELBOWS.
O. ANY VIBRATING, OSCILLATING OR OTHER NOISE OR MOTION PRODUCING EQUIPMENT SHALL BE ISOLATED FROM SURROUNDING SYSTEMS IN AN APPROVED MANNER. NOISY OR STRUCTURALLY DAMAGING INSTALLATIONS SHALL BE SATISFACTORILY REPLACED OR REPAIRED AT THE INSTALLING CONTRACTOR'S EXPENSE. THE FINAL DECISION ON THE SUITABILITY OF A PARTICULAR INSTALLATION'S ACCEPTABILITY SHALL BE THAT OF THE ENGINEER.
P. DEVIATIONS IN SIZE, CAPACITIES, FIT, FINISH, ETC. FOR EQUIPMENT FROM THAT USED AS BASIS OF DESIGN SHALL BE THE RESPONSIBILITY OF THE PURCHASER OF THAT EQUIPMENT. ANY PROVISIONS REQUIRED TO ACCOMMODATE A DEVIATION, WHETHER APPROVED BY THE ENGINEERS OR NOT, SHALL BE THE RESPONSIBILITY OF THE PURCHASER.
Q. VALVES, BALANCING DAMPERS OR ANY MECHANICAL/ELECTRICAL ITEM REQUIRING ACCESS SHALL NOT BE LOCATED ABOVE A HARD CEILING. IF THIS IS NOT POSSIBLE, THEN AN APPROPRIATELY SIZED ACCESS DOOR SHALL BE PLACED UNDER THE ITEM TO ALLOW EASY MAINTENANCE AND ADJUSTMENT. ADDITIONALLY ALL SUCH ITEMS SHALL NOT BE LOCATED AN UNREASONABLE DISTANCE ABOVE THE CEILINGS. IN GENERAL ALL SUCH ITEMS UNLESS INDICATED OTHERWISE SHALL BE MOUNTED SIX TO TWELVE INCHES ABOVE THE CEILING. IF IN DOUBT, CONTACT ENGINEER PRIOR TO INSTALLING.
R. WORK IN CONFINED AREAS SHALL BE IN ACCORDANCE WITH THE OWNER'S SAFETY POLICY REQUIREMENTS.
S. SEISMIC RESTRAINTS SHALL BE PROVIDED FOR SYSTEMS AS REQUIRED BY NCSBC CHAPTER 16 AND ASCE CHAPTER 7. REFER TO STRUCTURAL DRAWINGS SHEETS FOR BUILDING RISK CATAGORY, SITE CLASSIFICATION, AND SEISMIC DESIGN CATAGORY.

ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR
AFR	ABOVE FINISHED ROOF
AHJ	AUTHORITY HAVING JURISDICTION
APD	AIR PRESSURE DROP
DD	DUCT SMOKE DETECTOR
ESP	EXTERNAL STATIC PRESSURE
FD	FIRE DAMPER
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
OFCI	CONTRACTOR FURNISHED, CONTRACTOR INSTALLED
OFOI	OWNER FURNISHED, OWNER INSTALLED
SD	SMOKE DAMPER

MECHANICAL PIPING LEGEND

	PIPE ELBOW TURNING UP
	PIPE ELBOW TURNING DOWN
	PIPE TEE; CONNECTION ON TOP
	PIPE TEE; CONNECTION ON BOTTOM
	PIPE CAP
CD	CONDENSATE DRAIN
HWS/R	HOT WATER SUPPLY/RETURN
CHWS/R	CHILLED WATER SUPPLY/RETURN
	TWO-WAY CONTROL VALVE
	THREE-WAY CONTROL VALVE
	AUTOMATIC AIR VENT (AAV)
	PRESSURE RELIEF VALVE
	MANUAL BALANCING VALVE (BV)
	BALL VALVE
	BUTTERFLY VALVE
	TRIPLE DUTY VALVE (TDV)
	STRAINER
	MANUAL ISOLATION VALVE
	PRESSURE REDUCING VALVE (GAS, WATER, ETC.)
	CHECK VALVE
	FLEXIBLE PIPE CONNECTION
	FLOW METER (VENTURI)
	PIPING UNION
FS	FLOW SWITCH
PS	PRESSURE SWTICH
TS	TAMPER SWITCH
	THERMOMETER
D	DIGITAL THERMOMETER
	PETE'S PLUG; TEMPERATURE/PRESSURE PORT
P	PRESSURE SENSOR

GENERAL SYMBOLS

#	TAGGED NOTE DESIGNATOR
	REVISION TRIANGLE
ROOM NAME 104.21	ROOM TAG
TAG G MARK INSTANCE MARK	EQUIPMENT TAG
	POINT OF CONNECTION / CONNECT TO EXISTING
	POINT OF DEMOLITION

HVAC LEGEND

	SUPPLY AIR DIFFUSER
	RETURN AIR DIFFUSER
	EXHAUST AIR DIFFUSER
	TRANSFER AIR DIFFUSER W/ SOUND ATTENUATING BOOT
	SIDEWALL DIFFUSER/GRILLE
	SIDEWALL DIFFUSER/GRILLE
XXX/XXX	AIR DEVICE TAG (REGISTER, GRILLE, DIFFUSER,LOUVER)
# #x# #	RECTANGULAR DUCT
#ø	ROUND/SPIRAL DUCT
SA	SUPPLY AIR DUCT
RA	RETURN AIR DUCT
EA	EXHAUST AIR DUCT
OA	OUTSIDE AIR DUCT
TA	TRANSFER AIR DUCT
FLUE	FLUE EXHAUST DUCT
CAI	COMBUSTION AIR INTAKE DUCT
SA	SA AIR DUCT TURNING UP
SA	SA AIR DUCT TURNING DOWN
RA	RA AIR DUCT TURNING UP
RA	RA AIR DUCT TURNING DOWN
EA	EA AIR DUCT TURNING UP
EA	EA AIR DUCT TURNING DOWN
	MITERED ELBOW WITH TURNING VANES
	FLEXIBLE DUCT
T	THERMOSTAT
T	TEMPERATURE SENSOR
CO	CARBON MONOXIDE SENSOR
K	BOILER KILL SWITCH
	MANUAL BALANCING/VOLUME DAMPER
	MOTORIZED DAMPER
FD	FIRE DAMPER
SD	SMOKE DAMPER
CD	COMBINATION FIRE & SMOKE DAMPER
DD	DUCT SMOKE DETECTOR

ZONE LEVEL

	Zones served by system	C100 - CORRIDOR	C101 - STAIR A	C102 - MS SOCIAL STUDIES	C103 - MS CTE	C104 - STORAGE	C106 - MS SOCIAL STUDIES	C107 - STAIR B	C108 - MECH A	C109 - MECH B	C110 - MS MATH	C113 - MS SOCIAL STUDIES	C122 - CUSTODIAN	C138 - STAFF TLT	C141 - ELEV	C142 - MACHINE ROOM	C144 - VESTIBULE	C200 - CORRIDOR	C201 - STAIR A	C205 - MS MATH	C232 - MS AP	C233- CONF ROOM	C234 - WORKROOM	C208A - STAFF TLT	C209 - VESTIBULE	C209A - CORRIDOR	C209B - IDF	C214 - MS MATH	C217 - STAIR B	C218 - GIRLS
	Space type (select from pull-down list)	Corridors	Corridors	Classrooms (age 9 plus)	Classrooms (age 9 plus)	Storage rooms	Classrooms (age 9 plus)	Corridors	Unoccupied	Unoccupied	Classrooms (age 9 plus)	Classrooms (age 9 plus)	Unoccupied	Unoccupied	Unoccupied	Unoccupied	Corridors	Corridors	Corridors	Classrooms (age 9 plus)	Office space	Conference / meeting	Office space	Unoccupied	Corridors	Corridors	Unoccupied	Classrooms (age 9 plus)	Corridors	Unoccupied
Az	Floor area of zone, ft2	1491	172	841	1015	90	841	184	544	259	754	791	227	72	64	69	281	1479	175	842	161	200	200	69	77	149	112	841	187	221
Pz	Zone population, largest # of people expected to occupy zone	0	0	30	30	0	30	0	0	0	30	30	0	0	0	0	0	0	0	30	1	6	0	0	0	0	0	30	0	0
Rp	People outdoor air rate from Table 6.1, cfm/person	0	0	7.5	7.5	0	7.5	0	0	0	7.5	7.5	0	0	0	0	0	0	0	7.5	5	5	5	0	0	0	0	7.5	0	0
Ra	Area outdoor air rate from Table 6.1, cfm/ft2	0.06	0.06	0	0	0.12	0	0.06	0	0	0	0	0	0	0	0	0.06	0.06	0.06	0	0.06	0.06	0.06	0	0.06	0.06	0	0	0.06	0
Pz*Rp		0	0	225	225	0	225	0	0	0	225	225	0	0	0	0	0	0	0	225	5	30	0	0	0	0	0	225	0	0
Az*Ra		89.46	10.32	0	0	10.8	0	11.04	0	0	0	0	0	0	0	0	16.86	88.74	10.5	0	9.66	12	12	0	4.62	8.94	0	0	11.22	0
Ez	Zone air distribution effectiveness, Table 6.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Voz	Outdoor airflow to the zone corrected for zone air distribution effectiveness, (Pz*Rp + Az*Ra)/Ez, cfm	89	10	225	225	11	225	11	0	0	225	225	0	0	0	0	17	89	11	225	15	42	12	0	5	9	0	225	11	0
Vpz	Primary airflow to zone from air handler. **In VAV systems, use the design value.** cfm	400	250	1250	1250	75	1250	275	0	0	1250	1050	0	0	0	0	375	275	125	1250	400	500	100	0	275	50	400	1250	225	0
Vpzm	The minimum value of the primary airflow to zone from air handler. **In CAV systems, Vpzm = Vpz.** cfm	160	100	500	500	30	500	110	0	0	500	420	0	0	0	0	150	110	50	500	160	200	40	0	110	20	160	500	90	0
Zp	Primary outdoor air fraction, Voz/Vpzm	0.56	0.10	0.45	0.45	0.36	0.45	0.10	NA	NA	0.45	0.54	NA	NA	NA	NA	0.11	0.81	0.21	0.45	0.09	0.21	0.30	NA	0.04	0.45	NA	0.45	0.12	NA

	Zones served by system	C219 - MS MATH	C222 - MS MATH	C227 - MS MATH	C228 - BOYS	C241 - ELEV	C242 - STORAGE	C244 - CIRCULATION	C300 - CORRIDOR	C301 - STAIR A	C302 - MS ENGLISH	C303 - MS ENGLISH	C304 - STORAGE	C305 - MS ENGLISH	C306 - STAFF TLT	C306 - STAIR B	C307 - GIRLS	C308 - MS ENGLISH	C309 - MS ENGLISH	C314 - MS ENGLISH	C315 - BOYS	C341 - ELEV	C342 - STORAGE	C344 - UPPER LOUNGE
	Space type (select from pull-down list)	Classrooms (age 9 plus)	Classrooms (age 9 plus)	Classrooms (age 9 plus)	Unoccupied	Unoccupied	Storage rooms	Corridors	Corridors	Corridors	Classrooms (age 9 plus)	Classrooms (age 9 plus)	Storage rooms	Classrooms (age 9 plus)	Unoccupied	Corridors	Unoccupied	Classrooms (age 9 plus)	Classrooms (age 9 plus)	Classrooms (age 9 plus)	Unoccupied	Unoccupied	Storage rooms	Office space
Az	Floor area of zone, ft2	701	820	748	226	64	69	131	1447	175	861	855	202	841	69	187	221	701	820	744	226	64	69	282
Pz	Zone population, largest # of people expected to occupy zone	30	30	30	0	0	0	0	0	0	30	30	0	30	0	0	0	30	30	30	0	0	0	0
Rp	People outdoor air rate from Table 6.1, cfm/person	7.5	7.5	7.5	0	0	0	0	0	0	7.5	7.5	0	7.5	0	0	0	7.5	7.5	7.5	0	0	0	5
Ra	Area outdoor air rate from Table 6.1, cfm/ft2	0	0	0	0	0	0.12	0.06	0.06	0.06	0	0	0.12	0	0	0.06	0	0	0	0	0	0	0.12	0.06
Pz*Rp		225	225	225	0	0	0	0	0	0	225	225	0	225	0	0	0	225	225	225	0	0	0	0
Az*Ra		0	0	0	0	0	8.28	7.86	86.82	10.5	0	0	24.24	0	0	11.22	0	0	0	0	0	0	8.28	16.92
Ez	Zone air distribution effectiveness, Table 6.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Voz	Outdoor airflow to the zone corrected for zone air distribution effectiveness, (Pz*Rp + Az*Ra)/Ez, cfm	225	225	225	0	0	8	8	87	11	225	225	24	225	0	11	0	225	225	225	0	0	8	17
Vpz	Primary airflow to zone from air handler. **In VAV systems, use the design value.** cfm	1350	1400	1125	0	0	50	400	275	250	1250	1250	250	1250	0	225	0	1325	1400	1000	0	0	50	325
Vpzm	The minimum value of the primary airflow to zone from air handler. **In CAV systems, Vpzm = Vpz.** cfm	540	560	450	0	0	20	160	110	100	500	500	100	500	0	90	0	530	560	400	0	0	20	130
Zp	Primary outdoor air fraction, Voz/Vpzm	0.42	0.40	0.50	NA	NA	0.41	0.05	0.79	0.11	0.45	0.45	0.24	0.45	NA	0.12	NA	0.42	0.40	0.56	NA	NA	0.41	0.13

SYSTEM LEVEL

Ps	System population, maximum simultaneious # of occupants of space served by system	487	487
D	Occupant diversity, ratio of system peak occupancy to sum of space peak occupancies, = Ps/ΣPz	1.00	
Vou	Uncorrected outdoor air intake, = D*ΣRp*Pz +ΣRa*Az,	4105	

1 VENTILATION CALCULATIONS
NO SCALE

NORTHWEST SCHOOL OF THE ARTS
DANCE MUSIC THEATRE VISUAL ARTS

CMS - Northwest School of the Arts

LS3P
227 WEST TRADE STREET, SUITE 700
CHARLOTTE, NORTH CAROLINA 28202
TEL. 704.333.6686 FAX. 704.333.2926
WWW.LS3P.COM

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NWSA Building C Admin - Reno
1415 Beatties Ford Road
Charlotte, NC 28216

LS3P PROJECT: 9201-224030

Δ	DATE	DESCRIPTION

SHEET NAME: MECHANCIAL LEGEND

ORIG SUBMISSION: 05/15/24

SHEET: M100.C

CONFORMANCE SET

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THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ARCH E SHEETS ORIGINAL PAGE SIZE

COMcheck Software Version COMcheckWeb

Mechanical Compliance Certificate

Project Information

Energy Code:	2015 IECC
Project Title:	NWSA Building E
Location:	Charlotte, North Carolina
Climate Zone:	3a
Project Type:	Alteration

Construction Site:
1415 Beatties Ford Road
Charlotte, North Carolina 28216

Owner/Agent:
Charlotte Mecklenburg Schools
Charlotte Mecklenburg County
Charlotte, North Carolina

Designer/Contractor:
Kyle Novak
LS3P Associates
227 West Trade Street Suite #700
Charlotte, North Carolina 28202
704-371-7876

Mechanical Systems List

Quantity System Type & Description

1 AHU-E1 (Multiple-Zone):
Heating: 1 each - Hydronic or Steam Coil, Hot Water, Capacity = 207 kBtu/h
No minimum efficiency requirement applies
Cooling: 1 each - Hydronic Coil, Capacity = 340 kBtu/h, Air Economizer
No minimum efficiency requirement applies
Fan System: FAN SYSTEM 1 -- Compliance (Motor nameplate HP and fan efficiency method) : Passes

Fans:
AHU-G Supply, Multi-Zone VAV, 10000 CFM, 15.0 motor nameplate hp, 85.0 fan efficiency grade, 79.0 total fan efficiency, 65.5 design fan efficiency

1 AHU-E2 (Multiple-Zone):
Heating: 1 each - Hydronic or Steam Coil, Hot Water, Capacity = 207 kBtu/h
No minimum efficiency requirement applies
Cooling: 1 each - Hydronic Coil, Capacity = 340 kBtu/h, Air Economizer
No minimum efficiency requirement applies
Fan System: FAN SYSTEM 1 -- Compliance (Motor nameplate HP and fan efficiency method) : Passes

Fans:
AHU-G Supply, Multi-Zone VAV, 10000 CFM, 15.0 motor nameplate hp, 85.0 fan efficiency grade, 79.0 total fan efficiency, 65.5 design fan efficiency

1 AHU-E3 (Multiple-Zone):
Heating: 1 each - Hydronic or Steam Coil, Hot Water, Capacity = 232 kBtu/h
No minimum efficiency requirement applies
Cooling: 1 each - Hydronic Coil, Capacity = 287 kBtu/h, Air Economizer
No minimum efficiency requirement applies
Fan System: FAN SYSTEM 2 -- Compliance (Motor nameplate HP and fan efficiency method) : Passes

Fans:
FAN 5 Supply, Multi-Zone VAV, 8000 CFM, 10.0 motor nameplate hp, 80.0 fan efficiency grade, 76.0 total fan efficiency, 61.0 design fan efficiency

Mechanical Compliance Statement

Compliance Statement: The proposed mechanical alteration project represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the 2015 IECC requirements in *COMcheck* Version COMcheckWeb and to comply with any applicable

mandatory requirements listed in the Inspection Checklist.

Nicholas Rogers - Engineer — Name - Title
Signature
09/28/2023 — Date

NORTHWEST SCHOOL OF THE ARTS
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NWSA Building C Admin - Reno

1415 Beatties Ford Road
Charlotte, NC 28216

LS3P PROJECT: 9201-224030

Δ	DATE	DESCRIPTION

SHEET NAME:
MECHANICAL
COMCHECK

ORIG SUBMISSION: 05/15/24

SHEET:
M101.C

CONFORMANCE SET

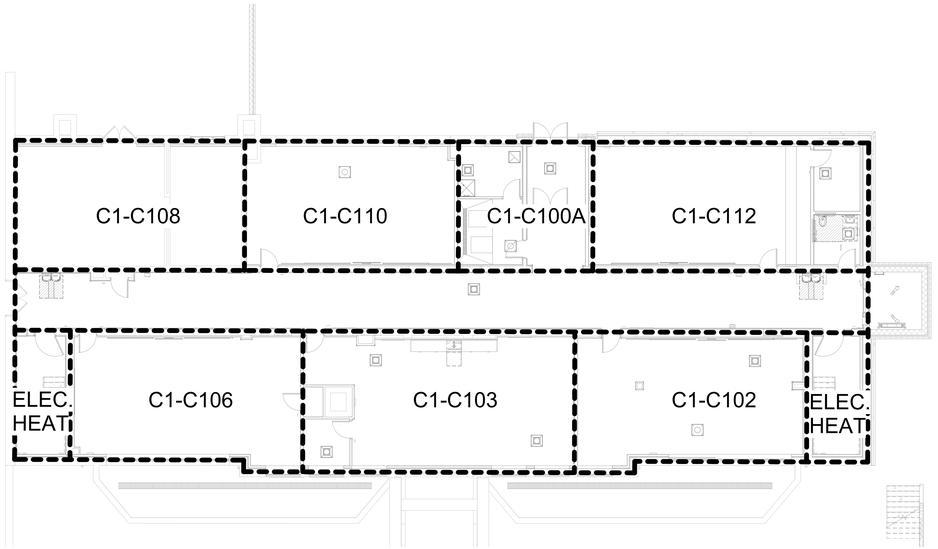
5/16/2024 4:31:27 PM

THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ARCH D SHEETS ORIGINAL PLOT SIZE

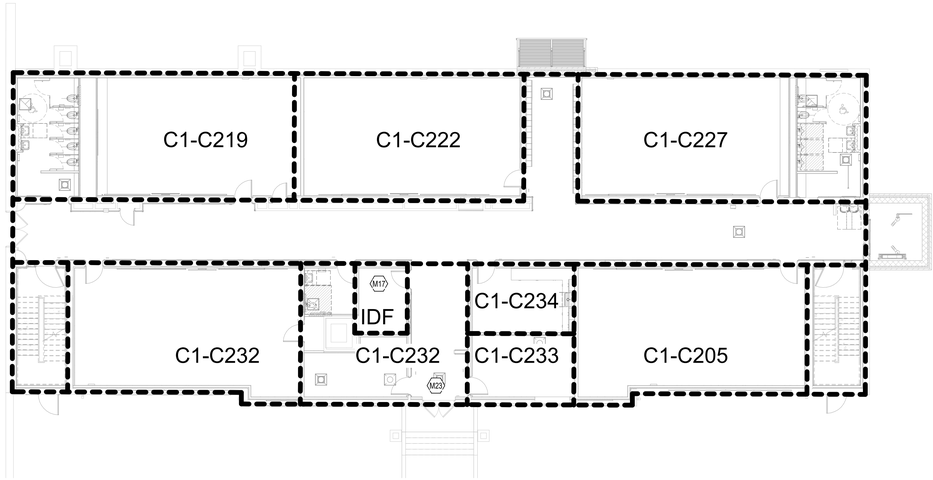
KEYNOTES

M17 IDF ROOM TO BE COOLED BY VAV BOXES DURING OCCUPIED HOURS. DURING UNOCCUPIED HOURS, IDF ROOM TO BE COOLED BY DUCTLESS MINI SPLIT SYSTEM.

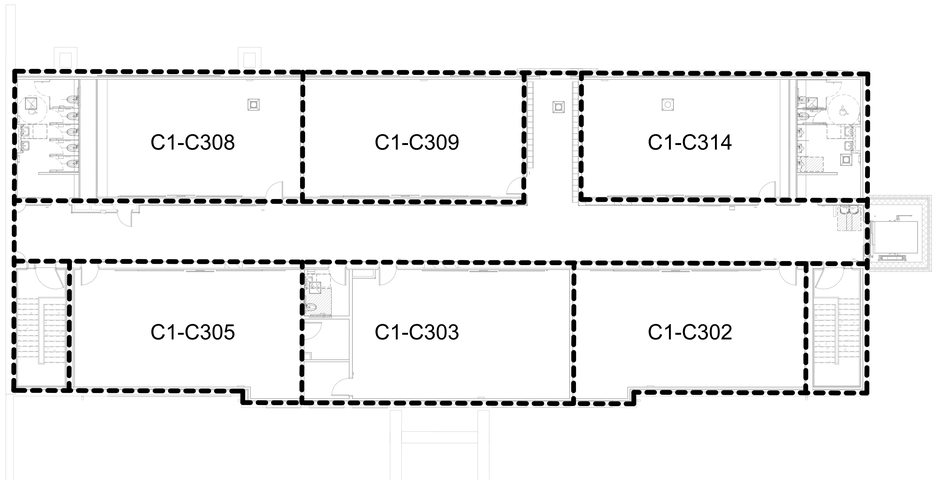
M23 SUPPLEMENTAL ELECTRIC HEAT PROVIDED IN VESTIBULE.



1 FLOOR PLAN - BASEMENT - ZONING PLAN
NO SCALE



2 FLOOR PLAN - LEVEL 1 - ZONING PLAN
NO SCALE



3 FLOOR PLAN - LEVEL 2 - ZONING PLAN
NO SCALE

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NWSA Building C Admin - Reno
1415 Beatties Ford Road
Charlotte, NC 28216

LS3P PROJECT: 9201-224030

Δ	DATE	DESCRIPTION

SHEET NAME:
MECHANICAL ZONING PLAN

ORIG SUBMISSION: 05/15/24

SHEET:
M102.C
CONFORMANCE SET

5/16/2024 4:31:32 PM

E D C B A

1 2 3 4 5 6

THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ALL SHEETS ORIGINAL PLOT SIZE

AIR HANDLING UNIT SCHEDULE

MARK	MANUF.	MODEL	SERVICE	LOCATION	NOM. SIZE L x W x H (IN.)	SUPPLY AIR FAN										ACOUSTICS		
						WEIGHT (LBS)	SUPPLY AIR CFM	MIN. OA CFM	# OF FANS - RPM	SA FAN TYPE	T.S.P/E.S.P (IN WG)	MOTOR HP/BHP (PER FAN)	VOLT.	PH.	HZ	FLA	RADIATED (dB) 63 / 125 / 250 / 1000 / 2000 / 4000 / 8000 Hz	UNIT RETURN (dB) 63 / 125 / 250 / 500 / 1000 / 2000 / 4000 / 8000 Hz	UNIT DISCHARGE (dB) 63 / 125 / 250 / 500 / 1000 / 2000 / 4000 / 8000 Hz
AHU-1	TRANE	CSAA050	BUILDING C	MECH ROOM C108	238"x126"x80"	7177	22250	4100	4-2285	DIRECT DRIVE	4.24 / 2.5	7.5 / 6.1	460 V	3	60	10 A	81/82/86/79/77/70/67/62	83/81/89/81/79/83.80/69	79/81/85/81/82/82/77/65

AIR HANDLING UNIT SCHEDULE - CONT.

MARK	CHILLED WATER COIL									HEATING COIL								FILTER			REMARKS
	COOLING AIRFLOW (CFM)	TOTAL COOLING CAP. (MBH)	SENSIBLE COOLING CAP. (MBH)	EAT (DB/WB) (F)	LAT (DB/WB) (F)	EWT/LWT (F)	MAX FACE VELOCITY (FPM)	MAX. APD (IN WG)	FLOW RATE (GPM)	MAX. WPD (FT)	HEATING AIRFLOW (CFM)	TOTAL HEATING CAP. (MBH)	EAT (F)	LAT (F)	EWT/LWT (F)	FACE VELOCITY (FPM)	MAX. APD (IN WG)	FLOW RATE (GPM)	MAX. WPD (FT)	TYPE	CFM / MAX VELOCITY	CONDITION	
AHU-1	22250	740	575	76.5 / 64.2	53/52.9	44/56	454	0.6	123	5.22	11125	330	51.9	79.2	160/120	236	0.33	16.5	0.33	PLEATED MEDIA - MERV 10 / MERV 13	22250 / 223	MID-LIFE	ALL

REMARKS:
1. PROVIDE WITH FACTORY START-UP UTILIZING MANUFACTURERS STANDARD FORMS AND THE FORMS INCLUDED IN THE SPECIFICATIONS.
2. ENTIRE UNIT SHALL BE DOUBLE WALL CONSTRUCTION WITH 6" BASE RAIL.
3. SUPPLY STAINLESS STEEL IAQ CONDENSATE PAN. ENTIRE DRAIN SHALL BE PITCHED TO OUTLET. WATER CARRY OVER IS NOT ALLOWED. SELECT CHILLED WATER COILS ACCORDINGLY. PROVIDE STAINLESS STEEL INTERMEDIATE DRAIN PANS FOR STACKED CHILLED WATER COILS ALL PRE-PIPED TO MAIN DRAIN PAN.
4. CHILLED WATER COILS SHALL BE A MAXIMUM OF 8 ROWS AND 10 FPI
5. PROVIDE STAINLESS STEEL CHILLED WATER COIL CASING.
6. REFER TO DRAWINGS FOR FULL UNIT CONFIGURATION
7. THE TOTAL STATIC PRESSURE FOR THE FANS SHALL INCLUDE THE FOLLOWING. (A) LISTED ESP, (B) DESIGN FILTER ALLOWANCE, (C) PRESSURE DROPS THROUGH UNIT CONFIGURATION INCLUDING (COILS, DAMPERS, FILTERS, ETC.
8. PROVIDE HIGH EFFICIENCY INVERTER DUTY MOTORS.
9. UNIT DESIGN FAN HORSEPOWER, DIMENSIONS AND WEIGHT ARE LISTED IN THE SCHEDULE. IT IS THE CONTRACTOR'S AND ALTERNATE MANUFACTURER'S RESPONSIBILITY TO ENSURE THAT THE HORSEPOWER, FIT AND ALL CLEARANCES ARE MAINTAINED SHOULD EQUIPMENT OTHER THAN SPECIFIED BE FURNISHED.
10. COORDINATE SHIPPING SPLITS AS REQUIRED FOR INSTALLATION. ALL MANUFACTURERS MUST COORDINATE SHIPPING SPLITS OF AHU TO FIT THROUGH 72"x104" LOUVER.
11. VFD'S ARE TO BE FIELD INSTALLED AND MOUNTED TO THE WALL WITH IN THE SAME MECHENICAL ROOM. EACH VFD SHALL BE WIRED AND GROUNDED INDEPENDENTLY AS PER THE MANUFACTURERS RECOMMENDATIONS AND VFD PARAMETERS SET FOR THE SPECIFIC APPLICATION AND RECORDED IN THE CONTROLS "AS-BUILTS".
12. THE MAXIMUM MOTOR SIZE SHALL BE 10 HP. PROVIDE DUAL PLENUM FANS WHERE REQUIRED TO MEET THIS REQUIREMENT. BACK DRAFT DAMPERS SHALL BE PROVIDED ON WHERE DUAL FANS ARE REQUIRED.
13. PROVIDE UNIT WITH PERMANENT AIR FILTER FRAMES FOR 2" THROW AWAY MERV 10 MEDIA.
14. UNIT SHALL BE PROVIDED WITH FOUR (4) COMPLETE MEDIA CHANGES.
15. SINGLE VFD PROVIDED FOR MULTIPLE MOTORS. PROVIDE MANUAL MOTOR PROTECTOR AND AND CT FOR STATUS FOR EACH FAN MOTOR BETWEEN THE VFD AND MOTOR.
16. CONTROLS FOR THE AHU MUST BE PROVIDED BY THE BAS SYSTEM PROVIDER.

ELECTRIC UNIT HEATER SCHEDULE

MARK	MANUFACTURER	MODEL	TYPE	DIMENSIONS (LxWxD)	WEIGHT (LBS)	NOM. CFM	kW	VOLTAGE	PHASE	REMARKS
EH-1	MARKEL	3340 SERIES	SURFACE MOUNTED	31"x20"x4"	50	320	6	480 V	3	ALL

REMARKS:
1. PROVIDE WITH INTEGRAL DISCONNECT.
2. PROVIDE UNIT WITH BUILT-IN THERMOSTAT.
3. PROVIDE WITH THERMAL OVERHEAT PROTECTION AND AIRFLOW SWITCH.
4. COLOR AND FINISH BY ARCHITECT.

EXHAUST FAN SCHEDULE

MARK	MANUFACTURER	MODEL	SERVICE	TYPE	CFM / ESP	DRIVE / FAN RPM	FAN HP	ELECTRICAL			REMARKS
								VOLTS	PH	HZ	
EF-C1	GREENHECK	CUE-099-VG	BLDG C RESTOOM/CUSTODIAL	CENTRIFUGAL UPBLAST	500 / 0.5	DIRECT ECM / 1,357	1/4	115 V	1	60	ALL
EF-C2	GREENHECK	CUE-099-VG	BLDG C RESTROOM	CENTRIFUGAL UPBLAST	825 / 0.5	DIRECT ECM / 1,405	1/4	115 V	1	60	ALL

REMARKS:
1. OUTDOOR FANS: PROVIDE WITH NEMA-3R FACTORY MOUNTED NON-FUSED DISCONNECT SWITCH. INDOOR FANS: PROVIDE WITH NEMA-1 FACTORY MOUNTED NON-FUSED DISCONNECT SWITCH.
2. PROVIDE WITH MOTORIZED DAMPER AND 24 V ACTUATOR.
3. PROVIDE WITH AN 18" INSULATED ROOF CURB.
4. THE EXHAUST FAN SHALL BE UL 705 LISTED.
5. PROVIDE WITH A FACTORY MOUNTED MOTOR SPEED CONTROLLER AND 0-10 VDC SIGNAL INPUT.
6. EXHAUST FAN SHALL BE OPERATE CONTINUOUSLY WHEN BUILDING IS SCHEDULED OCCUPIED.
7. APPROVED MANUFACTURERS: TWIN CITY, GREENHECK, LOREN COOK.
8. ALL LARGE MOTORS SHALL BE PROVIDED WITH A MOTOR STARTER AND HOA SWITCH. FRACTIONAL HP MOTORS SHALL BE PROVIDED WITH A FRACTIONAL HP MOTOR SWITCH WITH THERMAL OVERLOADS.

VARIABLE FREQUENCY DRIVE SCHEDULE

MARK	MANUFACTURER	MODEL	SERVICE	MOTOR HP	VOLTS	PHASE	FREQUENCY	FUSED DISCONNECT	NEMA RATING	BYPASS STARTER	REMARKS
VFD-AHUC1	YASKAWA	Z1000	AHU-C1	30	460 V	3	60	YES	NEMA 1	YES	ALL
VFD-RAF-C1	YASKAWA	Z1000	RAF-C1	5	460 V	3	60	YES	NEMA 3R	YES	ALL

REMARKS:
1. COORDINATE ALL VFDS WITH EQUIPMENT; SINGLE MANUFACTURER TO BE PROVIDED FOR ALL VFDS. REFER TO SPECIFICATIONS.
2. SYSTEM REQUIRES COMMISSIONING AND THE MANUFACTURER SHALL BE AVAILABLE TO ASSIST IN THE COMMISSIONING PROCESS.
3. PROVIDE ALL REQUIRED WIRING, ENCLOSURES, AND SUPPORT TO INSTALL THE VFDS THAT ARE NOT INTEGRAL WITH THE EQUIPMENT
4. VFD FOR RAF-C1 TO BE NEMA-3R RATED FOR OUTDOOR APPLICATION.

RELIEF FAN SCHEDULE

MARK	MANUFACTURER	MODEL	SERVICE	TYPE	CFM / ESP	DRIVE / FAN RPM	FAN HP	ELECTRICAL			REMARKS
								VOLTS	PH	HZ	
RAF-C1	GREENHECK	GB-420-50	BLDG C RELIEF	ROOF MOUNTED UPBLAST	12,900 / 0.5	BELT / 412	5	460 V	3	60	ALL

REMARKS:
1. PROVIDE WITH NEMA-3R FACTORY MOUNTED NON-FUSED DISCONNECT SWITCH.
2. PROVIDE WITH MOTORIZED DAMPER WITH BLADE AND JAMB SEALS AND 24V ACTUATOR.
3. PROVIDE WITH AN INSULATED ROOF CURB ADAPTER AS REQUIRED. FIELD VERIFY EXISTING CURB DIMENSIONS.
4. THE RELIEF FAN SHALL BE UL 705 LISTED.
5. MOTOR SHALL BE RATED FOR USE WITH VFD, INCLUDE SHAFT GROUNDING RING. (VFD BY OTHERS)
6. APPROVED MANUFACTURERS: TWIN CITY, GREENHECK, LOREN COOK.
7. REFER TO VFD SCHEDULE FOR ASSOCIATED VFD SERVING RELIEF FAN.

AIRFLOW DAMPER SCHEDULE

MARK	MANUFACTURER	MODEL #	TYPE	SIZE	MAX. APD	CFM	ELECTRICAL DATA			REMARKS
							V	ø	HZ	
AFD-OA-0	GREENHECK	AMD-42	OUTSIDE AIR	56x24	0.15 in-wg	2250 CFM	60 V	1	60 Hz	ALL
AFD-RA-0	GREENHECK	AMD-42	RETURN AIR	30x18	0.15 in-wg	6700 CFM	60 V	1	60 Hz	ALL
AFD-RA-1	GREENHECK	AMD-42	RETURN AIR	44x16	0.15 in-wg	8000 CFM	60 V	1	60 Hz	ALL
AFD-RA-2	GREENHECK	AMD-42	RETURN AIR	44x16	0.15 in-wg	7500 CFM	60 V	1	60 Hz	ALL

REMARKS:
1. PROVIDE WITH FACTORY 24 VAC EXTERNALLY MOUNTED ACTUATOR WITH TRANSFORMER
2. PROVIDE WITH FACTORY SUPPLIED PRESSURE TRANSDUCER
3. CONTROLS CONTRACTOR TO PROVIDE FIELD MOUNTED CONTROLLER. PROVIDE ACCESS DOOR IN DUCT UP STREAM OF UNIT FOR MAINTENANCE ACCESS

BUILDING PRESSURE SUMMARY NORMAL AHU OPERATION	
EQUIPMENT	CFM
AHU-C1	+ 4,100
EF-C1, C2	- 1,325
CFM OFFSET	**+ 2775**

BUILDING PRESSURE SUMMARY ECONOMIZER AHU OPERATION	
EQUIPMENT	CFM
AHU-C1	+ 17,000
EF-C1, C2	- 1,325
RELIEF FAN	-12,900
CFM OFFSET	**+ 2,775**

REMARKS:
1. 75% OF THE CONNECTED AHU MAXIMUM AIRFLOW WAS USED IN THE ECONOMIZER CALCULATION. THIS IS BASED ON LOAD CALCULATIONS THAT INDICATE THAT THE AIR HANDLING UNITS WILL NOT OPERATE AT MAXIMMUM AIRFLOW DURING ECONOMIZER MODE SINCE THE ENVELOPE LOAD IS REDUCED AT PART LOAD CONDITIONS

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CMS - Northwest School of the Arts

LS3P
227 WEST TRADE STREET, SUITE 700
CHARLOTTE, NORTH CAROLINA 28202
TEL. 704.333.6686 FAX. 704.333.2926
WWW.LS3P.COM

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LS3P PROJECT: 9201-224030

Δ	DATE	DESCRIPTION
3	11/07/23	CMS COORDINATION

SHEET NAME:
MECHANICAL SCHEDULES

ORIG SUBMISSION: 05/15/24

SHEET:
M103.C

CONFORMANCE SET

5/16/2024 4:31:34 PM

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THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ORIGINAL PLOT SHEETS

LOUVER SCHEDULE

MARK	MANUFACTURER	MODEL	SERVICE	CFM	HEIGHT	WIDTH	FREE AREA	MAX VELOCITY (FPM)	MAX APD (IN)	WATER PENETRATION VELOCITY	REMARKS
L-1	GREENHECK	ESD-635	AHU-C1 INTAKE	18000	8'-8"	6'-0"	50%	695	0.07	1250 FPM	ALL

REMARKS:
1. FREE AREA LISTED IS MINIMUM ACCEPTABLE. ALTERNATE LOUVER MANUFACTURERS SHALL MEET OR EXCEED AREA LISTED. NO EXCEPTIONS!
2. UTILIZE SHEETMETAL, PLENUM AT LOUVERS TO CREATE PLENUM CONNECTIONS FOR OA/RELIEF/EXHAUST AIR DUCTWORK.
3. ALL LOUVERS SHALL BE EXTRUDED ALUMINUM, CHANNEL FRAME WITH CONCEALED MULLIONS.
4. ALL LOUVER S SHALL HAVE 70% KYNER FINISH WITH COLOR BY ARCHITECT
5. LOUVERS ARE SIZED TO ALLOW FOR REMOVAL OF HVAC EQUIPMENT.
6. REFER TO ARCHITECTURE ELEVATION OF LOUVERS.
7. COORDINATE WITH CONSTRUCTION FOR FINAL SIZING OF ALL LOUVER SIZES BEFORE PURCHASING.

SPLIT SYSTEM INDOOR UNIT SCHEDULE

MARK	MODEL #	MANUF.	DIMENSIONS (IN.) LENGTH	WIDTH	HEIGHT	WEIGHT (LBS)	AIRFLOW (CFM)	ELECTRICAL VOLTAGE	PHASE	REMARKS
WM-12	FTKB12AXVJU	DAIKIN	35	8	12	20	360 CFM	208	1	ALL

SPLIT SYSTEM OUTDOOR UNIT SCHEDULE

MARK	MANUF.	MODEL #	DIMENSIONS (IN.) LENGTH	WIDTH	HEIGHT	WEIGHT (LBS)	TOTAL COOLING (MBH)	REFRIGERANT	EFFICIENCY (SEER)	ELECTRICAL MCA	MOCP	VOLTAGE	PHASE	REMARKS
CU-12	DAIKIN	RKB12AXVJU	26	11	22	57	12.0	R-410A	17	7.7	15	208	1	ALL

REMARKS:
1. PROVIDE UNIT WITH SINGLE POINT POWER CONNECTION. INDOOR UNIT SHALL BE POWERED FROM OUTDOOR UNIT.
2. INSTALL OUTDOOR UNIT PER DETAIL ON SHEET M-603.
3. PROVIDE UNIT WITH WIRE WALL MOUNTED THERMOSTAT.
4. TRANE, LG, MITSUBISHI, ARE ACCEPTABLE ALTERNATE MANUFACTURERS.

REGISTERS, GRILLES, AND DIFFUSERS

MARK	MANUFACTURER	MODEL	TYPE	GRILLE SIZE	INLET DUCT SIZE	NECK SIZE	CFM	REMARKS
E-1	TITUS	45F	ALUMINUM 1/2" EGG CRATE - SIGHT PROOF	24"x24"	22"x22"	6" DIA.	0-100	ALL
E-2	TITUS	45F	ALUMINUM 1/2" EGG CRATE - SIGHT PROOF	24"x24"	22"x22"	8" DIA.	101-225	ALL
E-3	TITUS	45F	ALUMINUM 1/2" EGG CRATE - SIGHT PROOF	24"x24"	22"x22"	10" DIA.	226-400	ALL
R-1	TITUS	45F	ALUMINUM 1/2" EGG CRATE - SIGHT PROOF	24"x24"	22"x22"	-	-	ALL
S-1	TITUS	OMNI-AA	ALL ALUMINUM PLAQUE FACE DIFFUSER	24"x24"	6" DIA.	6" DIA.	0-100	ALL
S-2	TITUS	OMNI-AA	ALL ALUMINUM PLAQUE FACE DIFFUSER	24"x24"	8" DIA.	8" DIA.	101-225	ALL
S-3	TITUS	OMNI-AA	ALL ALUMINUM PLAQUE FACE DIFFUSER	24"x24"	10" DIA.	10" DIA.	226-400	ALL
S-4	TITUS	OMNI-AA	ALL ALUMINUM PLAQUE FACE DIFFUSER	24"x24"	12" DIA	12" DIA	401-600	ALL
S-10	TITUS	350FL	ALUMINUM AEROBLADE GRILLE, DOUBLE DEFLECTION, 3/4" BLADE SPACING, FRONT BLADE PARALLEL TO LONG DIMENSION	18"x10"	16"x8"	16"x8"	0-400	ALL

REMARKS:
1. CEILING T-BAR MOUNTED IN 24"X24" ALUMINUM PANEL.
2. PROVIDE ALL ACCESSORIES AS NECESSARY FOR CEILING INSTALLATION. REFER TO ARCHITECTURAL PLANS FOR CEILING TYPES.
3. COLOR TO BE SELECTED BY ARCHITECT.
4. ACCEPTABLE MANUFACTURERS: TITUS, PRICE, NAILOR, KRUEGER, METALAIRE.

VAV/CAV BOX SCHEDULE - AHU-C1

MARK	ZONE NUMBER	ROOM SERVED	MANUFACTURER	MODEL	INLET	AHU SERVED BY	COOLING AIRFLOWS MAXIMUM (CFM)	COOLING AIRFLOWS MINIMUM (CFM)	HEATING AIRFLOW (CFM)	MAX. TOTAL APD AT MAX. CFM	HOT WATER COIL CAPACITY (MBH)	EAT / LAT	EWT / LWT	FLOW (GPM)	NO. OF ROWS	MAX WPD	RUNOUT PIPE SIZE	REMARKS
VAV-08	C1-C100A	C100A VESTIBULE	TRANE	VCWF 08	8" DIA	AHU-C1	425	200	200	0.5" WG	11.53	55/100	160/120	0.58	2	0.5 FT	3/4"	ALL
VAV-12	C1-C102	C102 MS SOCIAL STUDIES	TRANE	VCWF 12	12" DIA	AHU-C1	1250	625	625	0.5" WG	26.57	55/100	160/120	1.33	2	0.5 FT	3/4"	ALL
VAV-12	C1-C103	C103 MS CTE	TRANE	VCWF 12	12" DIA	AHU-C1	1350	675	675	0.5" WG	28.13	55/100	160/120	1.41	2	0.5 FT	3/4"	ALL
VAV-12	C1-C106	C106 MS SOCIAL STUDIES	TRANE	VCWF 12	12" DIA	AHU-C1	1250	625	625	0.5" WG	26.57	55/100	160/120	1.33	2	0.5 FT	3/4"	ALL
VAV-08	C1-C108	C108 MECH A	TRANE	VCWF 08	8" DIA	AHU-C1	350	175	175	0.5" WG	8.54	55/100	160/120	0.5	2	0.5 FT	3/4"	ALL
VAV-12	C1-C110	C110 MS MATH	TRANE	VCWF 12	12" DIA	AHU-C1	1250	625	625	0.5" WG	28.13	55/100	160/120	1.33	2	0.5 FT	3/4"	ALL
VAV-12	C1-C112	C113 MS SOCIAL STUDIES	TRANE	VCWF 12	12" DIA	AHU-C1	1250	625	625	0.5" WG	28.13	55/100	160/120	1.33	2	0.5 FT	3/4"	ALL
VAV-12	C1-C134	C134 MS ENGLISH	TRANE	VCWF 12	12" DIA	AHU-C1	1150	575	575	0.5" WG	24.91	55/100	160/120	1.25	2	0.5 FT	3/4"	ALL
VAV-12	C1-C205	C205 MS MATH	TRANE	VCWF 12	12" DIA	AHU-C1	1250	625	625	0.5" WG	28.13	55/100	160/120	1.33	2	0.5 FT	3/4"	ALL
VAV-12	C1-C214	C214 MS MATH	TRANE	VCWF 12	12" DIA	AHU-C1	1250	625	625	0.5" WG	28.13	55/100	160/120	1.33	2	0.5 FT	3/4"	ALL
VAV-12	C1-C219	C219 MS MATH	TRANE	VCWF 12	12" DIA	AHU-C1	1275	625	625	0.5" WG	28.13	55/100	160/120	1.33	2	0.5 FT	3/4"	ALL
VAV-12	C1-C222	C222 MS MATH	TRANE	VCWF 12	12" DIA	AHU-C1	1450	725	725	0.5" WG	29.62	55/100	160/120	1.48	2	0.5 FT	3/4"	ALL
VAV-12	C1-C227	C227 MS MATH	TRANE	VCWF 12	12" DIA	AHU-C1	1175	600	600	0.5" WG	25.75	55/100	160/120	1.29	2	0.5 FT	3/4"	ALL
VAV-08A	C1-C231	C231 IDF	TRANE	VCWF 08	8" DIA	AHU-C1	575	285	0	0.5" WG	-	-	-	-	-	-	-	ALL
VAV-08	C1-C232	C232 MS AP	TRANE	VCWF 08	8" DIA	AHU-C1	675	325	325	0.5" WG	13.14	55/100	160/120	0.86	2	0.5 FT	3/4"	ALL
VAV-08	C1-C233	C233 CONF RM	TRANE	VCWF 08	8" DIA	AHU-C1	500	250	250	0.5" WG	13.97	55/100	160/120	0.70	2	0.5 FT	3/4"	ALL
VAV-05	C1-C234	C234 WORKROOM	TRANE	VCWF 05	5" DIA	AHU-C1	100	50	50	0.5" WG	4.42	55/100	160/120	0.5	2	0.5 FT	3/4"	ALL
VAV-12	C1-C302	C302 MS ENGLISH	TRANE	VCWF 12	12" DIA	AHU-C1	1350	675	675	0.5" WG	28.13	55/100	160/120	1.41	2	0.5 FT	3/4"	ALL
VAV-12	C1-C303	C303 MS ENGLISH	TRANE	VCWF 12	12" DIA	AHU-C1	1350	675	675	0.5" WG	32.94	55/100	160/120	1.41	2	0.5 FT	3/4"	ALL
VAV-12	C1-C305	C305 MS ENGLISH	TRANE	VCWF 12	12" DIA	AHU-C1	1300	650	650	0.5" WG	32.94	55/100	160/120	1.85	2	0.5 FT	3/4"	ALL
VAV-12	C1-C308	C308 MS ENGLISH	TRANE	VCWF 12	12" DIA	AHU-C1	1275	625	625	0.5" WG	26.57	55/100	160/120	1.33	2	0.5 FT	3/4"	ALL
VAV-12	C1-C309	C309 MS ENGLISH	TRANE	VCWF 12	12" DIA	AHU-C1	1500	750	750	0.5" WG	36.6	55/100	160/120	1.52	2	0.5 FT	3/4"	ALL

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REMARKS:
1. ALL BOXES SHALL BE SINGLE WALLL WITH 1/2" FOIL FACED INSULATION.
2. ALL HEATING COILS SHALL BE 2-ROWS.
3. PROVIDE EACH BOX WITH AN INDEPENDENT CONTROLLER. NO BOX SHALL BE OPERATED BY ANOTHER CONTROLLER LOCATED ON ANOTHER BOX.
4. PROVIDE BOTTOM ACCESS PANEL.
5. BOX LABELED WITH "A" SHALL BE COOLING ONLY BOX, NO HEATING COIL.
6. ZONE NUMBER DESCRIPTION: XX-Y-Z - XX = AHU #, Y = AREA, Z - VAV #

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227 WEST TRADE STREET, SUITE 700
CHARLOTTE, NORTH CAROLINA 28202
TEL. 704.333.6686 FAX. 704.333.2926
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Δ	DATE	DESCRIPTION
2	11/07/23	DPI REVIEW 1

SHEET NAME:
MECHANICAL SCHEDULES

ORIG SUBMISSION: 05/15/24

SHEET:
M104.C

CONFORMANCE SET

5/16/2024 4:31:38 PM

THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ALL SHEETS ORIGINAL PAGE SIZE

KEYNOTES

D1 EXISTING FAN COIL TO BE REMOVED COMPLETELY. DEMOLISH ASSOCIATED PIPING, SUPPORTS, ELECTRICAL CONNECTIONS, ETC.

D2 OUTSIDE AIR DUCTWORK TO BE REMOVED COMPELETY. PATCH WALLS AS REQUIRED TO MATCH FINISHES.

D3 DEMOLISH EXISTING LOUVER.

D4 DEMOLISH ALL EXISTING DUAL TEMPERATURE PIPING.

D6 REMOVE EXISTING CONDENSATE LINES TO WALL AND CAP. PATCH WALL WHERE REQUIRED. TYPICAL.

D7 EXISTING UNIT VENTILATORS SHALL BE REMOVED COMPLETELY. DEMOLISH ASSOCIATED PIPING, SUPPORTS, ELECTRICAL CONNECTIONS, ETC.

D9 REMOVE EXISTING CABINET HEATER AND ASSOCIATED PIPING. PATCH AND REPAIR WALL OPENING TO MATCH EXISTING.

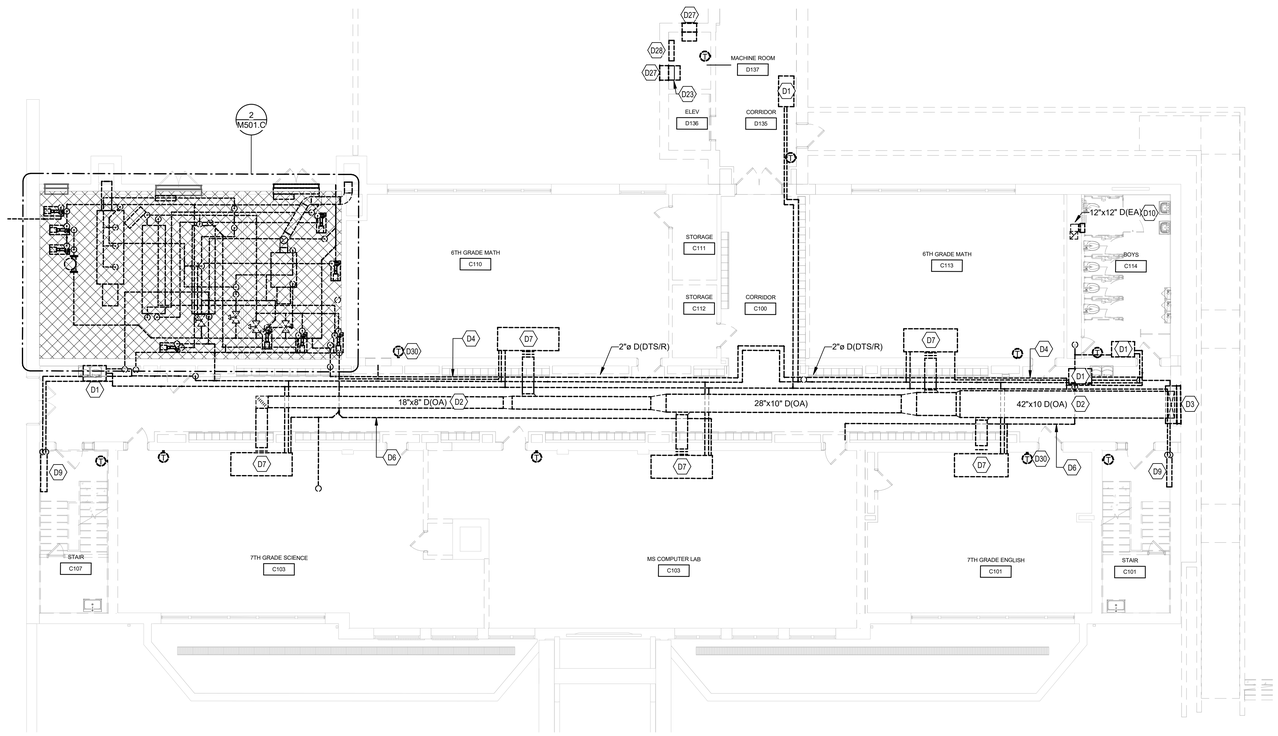
D10 REMOVE ALL EXHAUST DUCTWORK AND ASSOCIATED R,G,D'S. PATCH WALLS AS REQUIRED TO MATCH FINISHES.

D23 DEMOLISH EXISTING VENTILATION FAN.

D27 DEMOLISH EXISTING LOUVER.

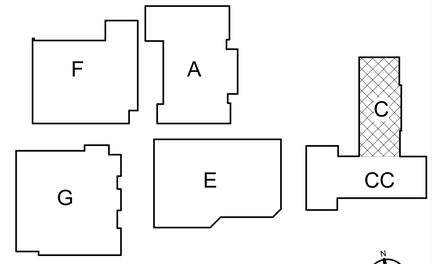
D28 DEMOLISH EXISTING ELECTRIC HEATER.

D30 DEMOLISH ALL EXISTING THERMOSTATS. TYPICAL OF ALL ROOMS.



1 FLOOR PLAN - BASEMENT - MECHANICAL DEMOLITION

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



KEYPLAN

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TEL. 704.333.6686 FAX. 704.333.2926
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ORIG SUBMISSION: 05/15/24

SHEET: **M201.C**

CONFORMANCE SET

THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG AT 24" X 36" SHEETS ORIGINAL PAGE SIZE

KEYNOTES

D1 EXISTING FAN COIL TO BE REMOVED COMPLETELY. DEMOLISH ASSOCIATED PIPING, SUPPORTS, ELECTRICAL CONNECTIONS, ETC.

D2 OUTSIDE AIR DUCTWORK TO BE REMOVED COMPELETY. PATCH WALLS AS REQUIRED TO MATCH FINISHES.

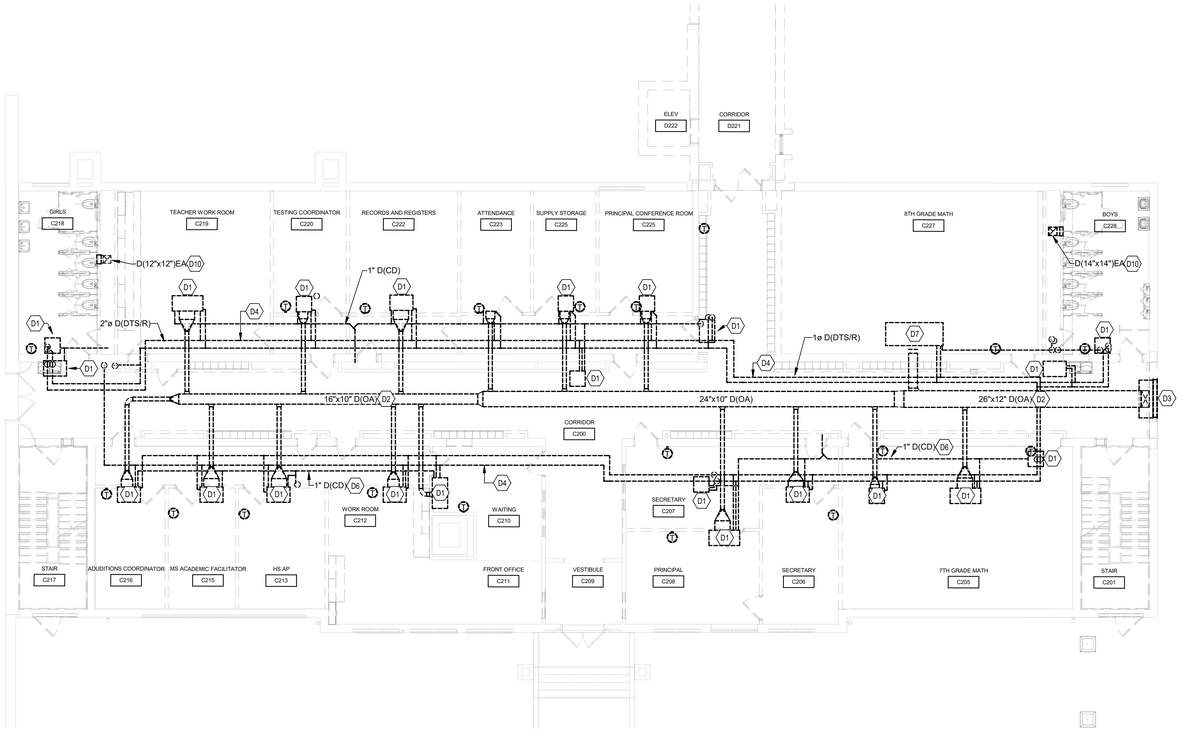
D3 DEMOLISH EXISTING LOUVER.

D4 DEMOLISH ALL EXISTING DUAL TEMPERATURE PIPING.

D6 REMOVE EXISTING CONDENSATE LINES TO WALL AND CAP. PATCH WALL WHERE REQUIRED. TYPICAL.

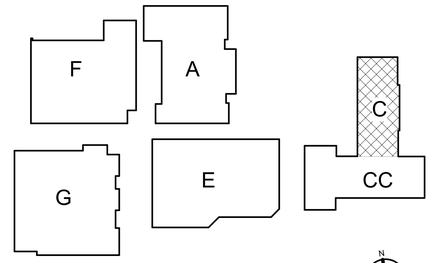
D7 EXISTING UNIT VENTILATORS SHALL BE REMOVED COMPLETELY. DEMOLISH ASSOCIATED PIPING, SUPPORTS, ELECTRICAL CONNECTIONS, ETC.

D10 REMOVE ALL EXHAUST DUCTWORK AND ASSOCIATED R,G,D'S. PATCH WALLS AS REQUIRED TO MATCH FINISHES.



1 FLOOR PLAN - LEVEL 1 - MECHANICAL DEMOLITION

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



KEYPLAN

NORTHWEST SCHOOL OF THE ARTS
DANCE MUSIC THEATRE VISUAL ARTS

CMS - Northwest School of the Arts

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227 WEST TRADE STREET, SUITE 700
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1415 Beatties Ford Road
Charlotte, NC 28216

LS3P PROJECT: 9201-224030

Δ	DATE	DESCRIPTION

SHEET NAME: FLOOR PLAN - LEVEL 1 - MECHANICAL DEMOLITION

ORIG SUBMISSION: 05/15/24

SHEET: **M202.C**

CONFORMANCE SET

5/16/2024 4:31:44 PM

THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ARCH E SHEETS ORIGINAL PLOT SIZE

KEYNOTES

D1 EXISTING FAN COIL TO BE REMOVED COMPLETELY. DEMOLISH ASSOCIATED PIPING, SUPPORTS, ELECTRICAL CONNECTIONS, ETC.

D3 DEMOLISH EXISTING LOUVER.

D4 DEMOLISH ALL EXISTING DUAL TEMPERATURE PIPING.

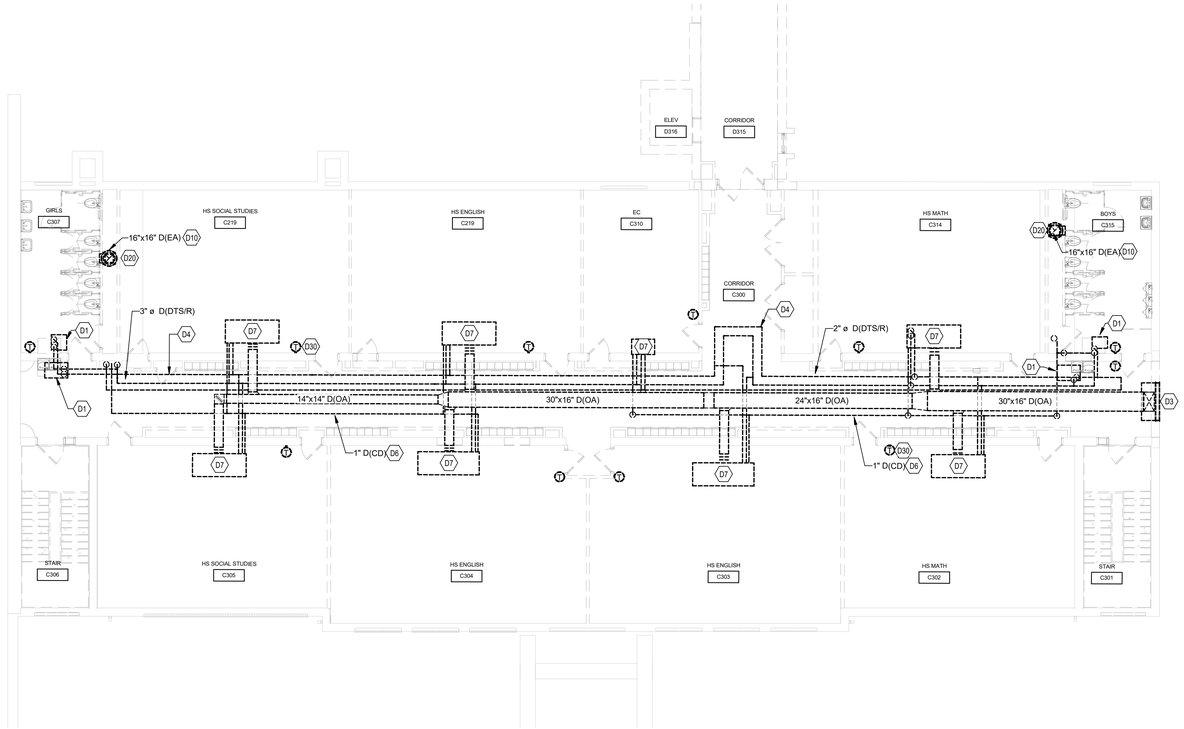
D6 REMOVE EXISTING CONDENSATE LINES TO WALL AND CAP. PATCH WALL WHERE REQUIRED. TYPICAL.

D7 EXISTING UNIT VENTILATORS SHALL BE REMOVED COMPLETELY. DEMOLISH ASSOCIATED PIPING, SUPPORTS, ELECTRICAL CONNECTIONS, ETC.

D10 REMOVE ALL EXHAUST DUCTWORK AND ASSOCIATED R,G,D'S. PATCH WALLS AS REQUIRED TO MATCH FINISHES.

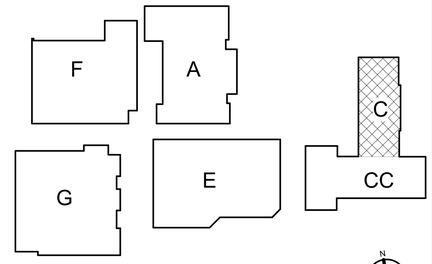
D20 DEMOLISH EXISTING ROOF MOUNTED EXHAUST FAN. CAP EXISTING CURB PER DETAIL ON SHEET M602.C.

D30 DEMOLISH ALL EXISTING THERMOSTATS. TYPICAL OF ALL ROOMS.



1 FLOOR PLAN - LEVEL 2 - MECHANICAL DEMOLITION

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



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LS3P PROJECT: 9201-224030

Δ	DATE	DESCRIPTION

SHEET NAME:
FLOOR PLAN - LEVEL 2 - MECHANICAL DEMOLITION

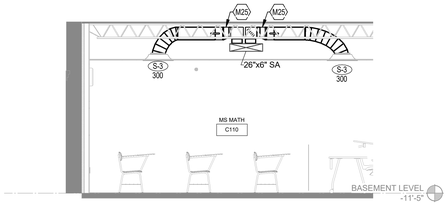
ORIG SUBMISSION: 05/15/24

SHEET: **M203.C**

CONFORMANCE SET

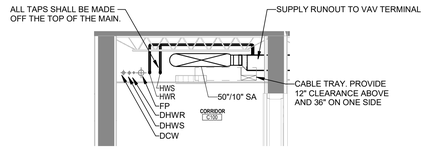
5/16/2024 4:31:47 PM

THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ARCH E SHEETS ORIGINAL PAGE SIZE



2 TYPICAL BASEMENT CLASSROOM SECTION

SCALE: 1/4" = 1'-0"



3 TYPICAL CORRIDOR SECTION

SCALE: 1/4" = 1'-0"

KEYNOTES

M2 PROVIDE RETURN AIR CANOPY PER DETAIL ON SHEET M603. TYPICAL OF ALL PLENUM RETURN GRILLES.

M3 24"x12" TRANSFER AIR DUCT. DUCT SHALL BE SINGLE WALL LINED WITH 1" THICK SONIC XP FIBERGLASS DUCLINER OR EQUAL. TYPICAL.

M6 INSTALL DRYER EXHAUST DUCT PER REQUIREMENTS SHOWN ON DRYER EXHAUST DETAIL ON SHEET M603.C.

M7 TERMINATE DRYER EXHAUST DUCT WITH CODE APPROVED ALUMINIUM DRYER VENT CAP WITH BACKDRAFT DAMPER. CENTER BETWEEN WINDOWS. TERMINATE 10'-0" AFF.

M24 TRANSITION FROM RECTANGULAR DUCTWORK TO OVAL DUCTWORK.

M25 TRANSITION FROM 10"x8" DUCTWORK TO 10" DIAMETER ROUND DUCTWORK. ROUTE DUCTWORK BETWEEN JOISTS.

M28 TRANSITION FROM 14"x8" RECTANGULAR DUCT TO ROUND DUCT DIAMETER LISTED IN VAV RUNOUT SCHEDULE.

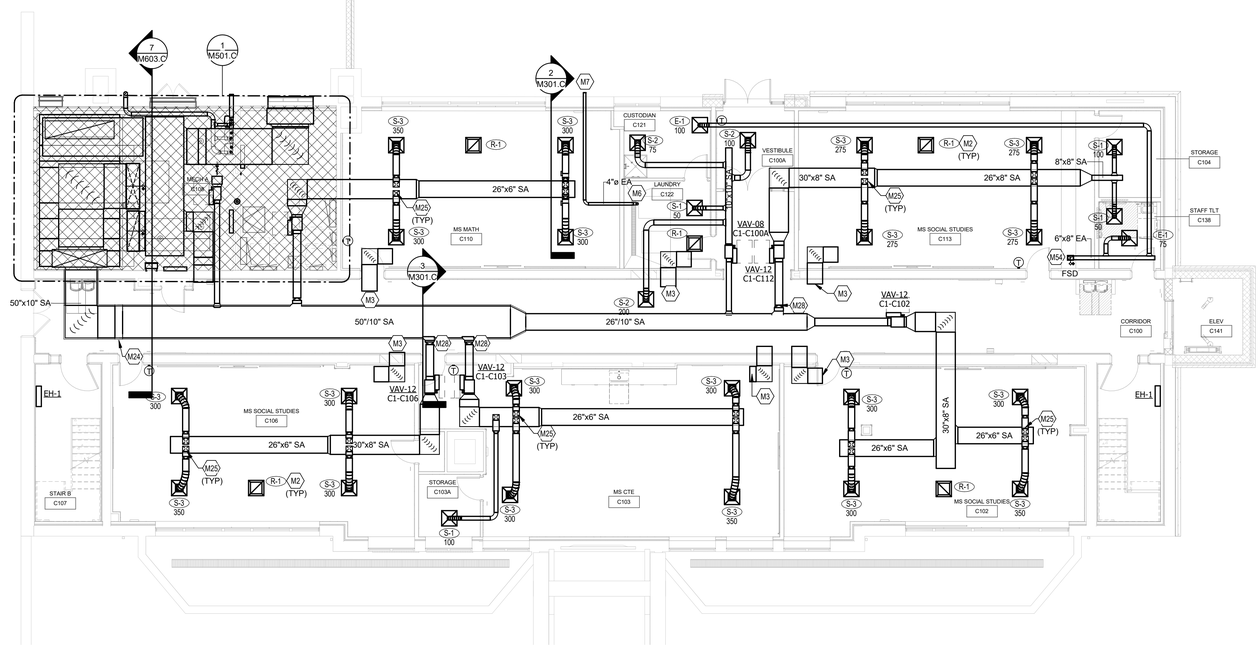
M54 FIRE/SMOKE DAMPER (FSD) INSTALLED IN VERTICAL ORIENTATION AT BOTTOM OF RATED SHAFT.

VAV BOX RUNOUT SCHEDULE

MARK	DUCT INLET SIZE
VAV-05	6" DIA
VAV-08	8" DIA
VAV-08A	8" DIA
VAV-12	12" DIA

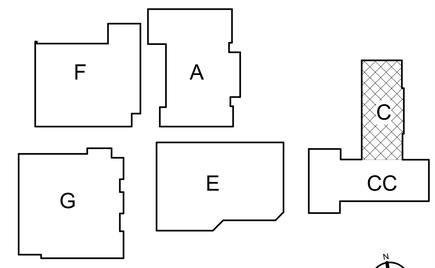
R,G,D RUNOUT SCHEDULE.

MARK	DUCT SIZE
E-1	6" DIA.
E-2	8" DIA.
E-3	10" DIA.
R-1	-
S-1	6" DIA.
S-2	8" DIA.
S-3	10" DIA.
S-4	12" DIA
S-10	16"x8"



1 FLOOR PLAN - BASEMENT - MECHANICAL

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



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LS3P PROJECT: 9201-224030

Δ	DATE	DESCRIPTION

SHEET NAME: FLOOR PLAN - BASEMENT - AIR DISTRIBUTION

ORIG SUBMISSION: 05/15/24

SHEET: **M301.C**

CONFORMANCE SET

5/16/2024 4:31:50 PM

THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ALL SHEETS ORIGINAL PAGE SIZE

KEYNOTES

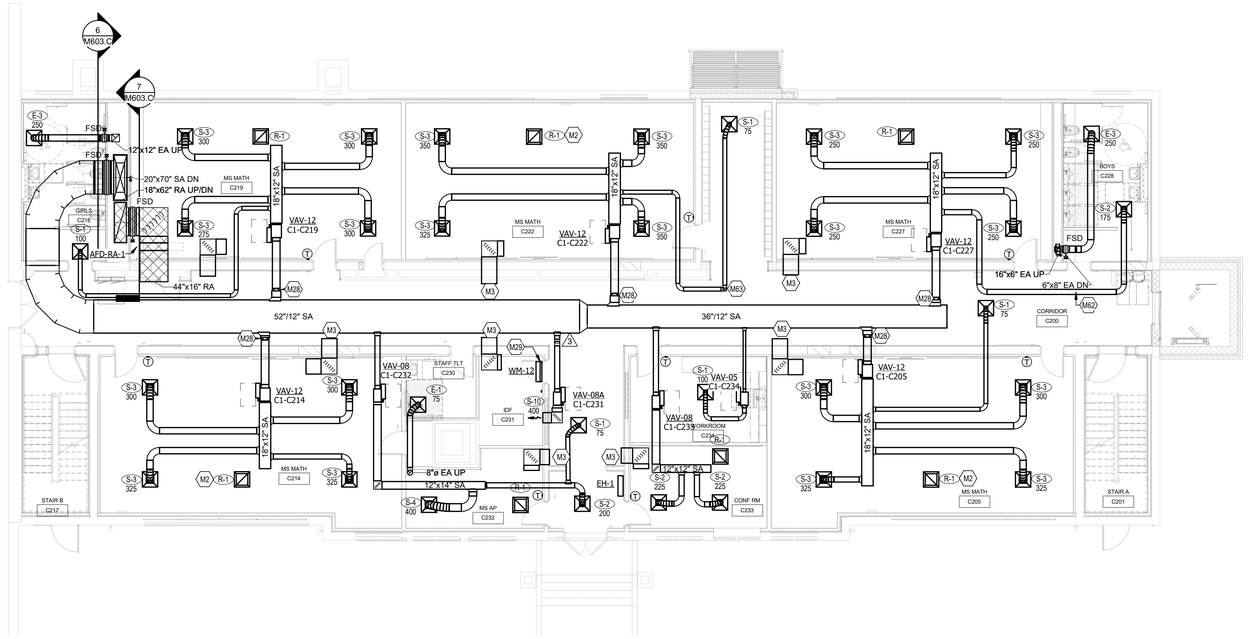
M2	PROVIDE RETURN AIR CANOPY PER DETAIL ON SHEET M603. TYPICAL OF ALL PLENUM RETURN GRILLES.
M3	24"x12" TRANSFER AIR DUCT. DUCT SHALL BE SINGLE WALL LINED WITH 1" THICK SONIC XP FIBERGLASS DUCLINER OR EQUAL. TYPICAL.
M28	TRANSITION FROM 14"x8" RECTANGULAR DUCT TO ROUND DUCT DIAMETER LISTED IN VAV RUNOUT SCHEDULE.
M29	COORDINATE HEIGHT AND INSTALLATION OF SPLIT SYSTEM RELATIVE TO THE LADDER RACKING WRAPPING THE IDF ROOM WITH THE TELECOM CONTRACTOR PRIOR TO INSTALLATION.
M62	ROUTE DUCTWORK AROUND RATED SHAFT.
M63	TRANSITION PIPING UP BETWEEN JOIST SPACE.

VAV BOX RUNOUT SCHEDULE

MARK	DUCT INLET SIZE
VAV-05	6" DIA
VAV-08	8" DIA
VAV-08A	8" DIA
VAV-12	12" DIA

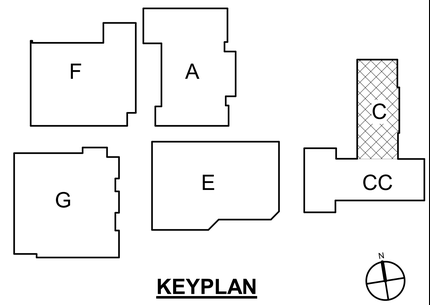
R,G,D RUNOUT SCHEDULE.

MARK	DUCT SIZE
E-1	6" DIA.
E-2	8" DIA.
E-3	10" DIA.
R-1	-
S-1	6" DIA.
S-2	8" DIA.
S-3	10" DIA.
S-4	12" DIA
S-10	16"x8"



1 FLOOR PLAN - LEVEL 1 - MECHANICAL

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



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LS3P PROJECT: 9201-224030

Δ	DATE	DESCRIPTION
3	11/07/23	CMS COORDINATION

SHEET NAME:
FLOOR PLAN - LEVEL 1 - AIR DISTRIBUTION

ORIG SUBMISSION: 05/15/24

SHEET:
M302.C

CONFORMANCE SET

5/16/2024 4:31:55 PM

E D C B A

1 2 3 4 5 6

THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ARCH D SHEETS ORIGINAL PLOT SIZE

KEYNOTES

M2 PROVIDE RETURN AIR CANOPY PER DETAIL ON SHEET M603. TYPICAL OF ALL PLENUM RETURN GRILLES.

M3 24"x12" TRANSFER AIR DUCT. DUCT SHALL BE SINGLE WALL LINED WITH 1" THICK SONIC XP FIBERGLASS DUCLINER OR EQUAL. TYPICAL.

M8 DUCTWORK CONTINUES UP TO ROOF MOUNTED EXHAUST FAN.

M10 ENTIRE RETURN DUCT INDICATED BY HATCH SHALL BE LINED WITH 2" THICK FIBROUS-GLASS DUCLINER. DUCT SHALL BE DOUBLE WALL WITH PERFORATED INNER SHELL PER SPECIFICATIONS. PROVIDE OPEN ENEDED SCREEN FOR RETURN AIR PLENUM OPENING.

M53 INSTALL DIFFERENTIAL PRESSURE SENSOR AT LOCATION INDICATED.

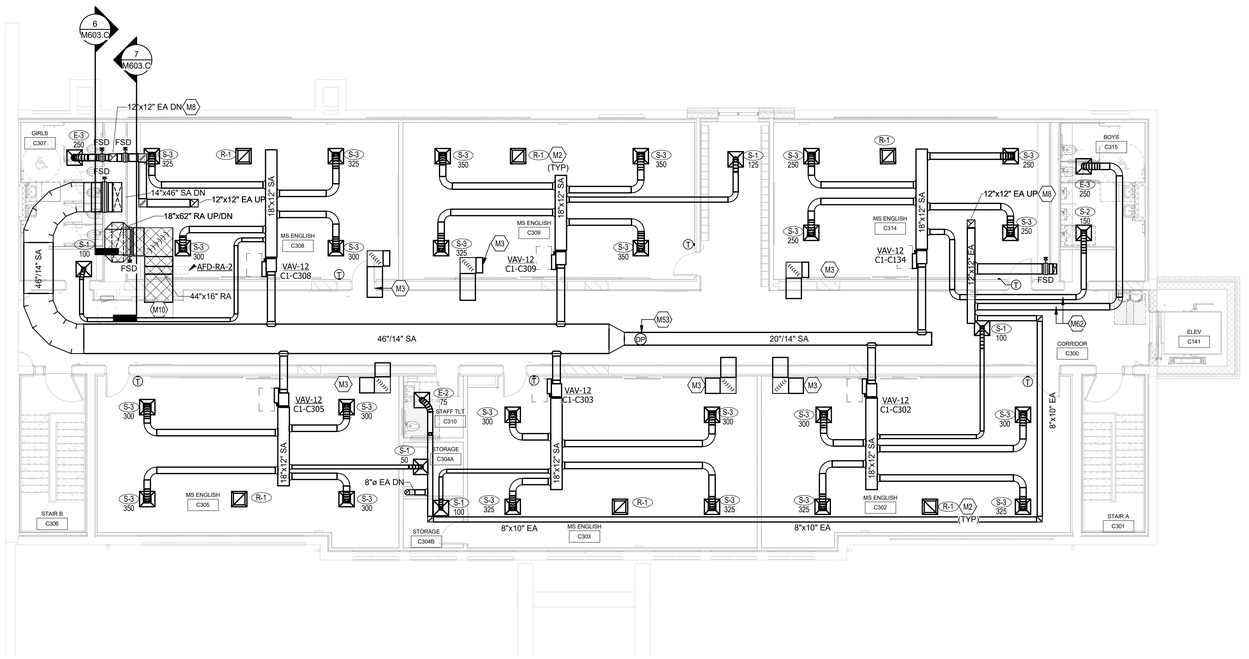
M62 ROUTE DUCTWORK AROUND RATED SHAFT.

VAV BOX RUNOUT SCHEDULE

MARK	DUCT INLET SIZE
VAV-05	6" DIA
VAV-08	8" DIA
VAV-08A	8" DIA
VAV-12	12" DIA

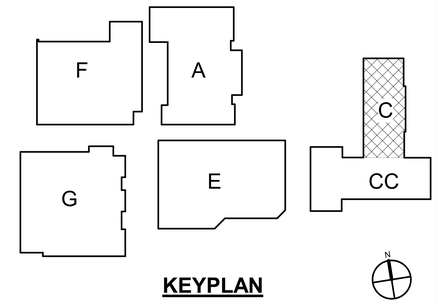
R,G,D RUNOUT SCHEDULE.

MARK	DUCT SIZE
E-1	6" DIA.
E-2	8" DIA.
E-3	10" DIA.
R-1	-
S-1	6" DIA.
S-2	8" DIA.
S-3	10" DIA.
S-4	12" DIA
S-10	16"x8"



1 FLOOR PLAN - LEVEL 2 - MECHANICAL

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



KEYPLAN

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CHARLOTTE, NORTH CAROLINA 28202
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LS3P PROJECT: 9201-224030

Δ	DATE	DESCRIPTION

SHEET NAME: FLOOR PLAN - LEVEL 2 - AIR DISTRIBUTION

ORIG SUBMISSION: 05/15/24

SHEET: **M303.C**

CONFORMANCE SET

5/16/2024 4:32:00 PM

THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ARCH E SHEETS ORIGINAL PAGE SIZE

KEYNOTES

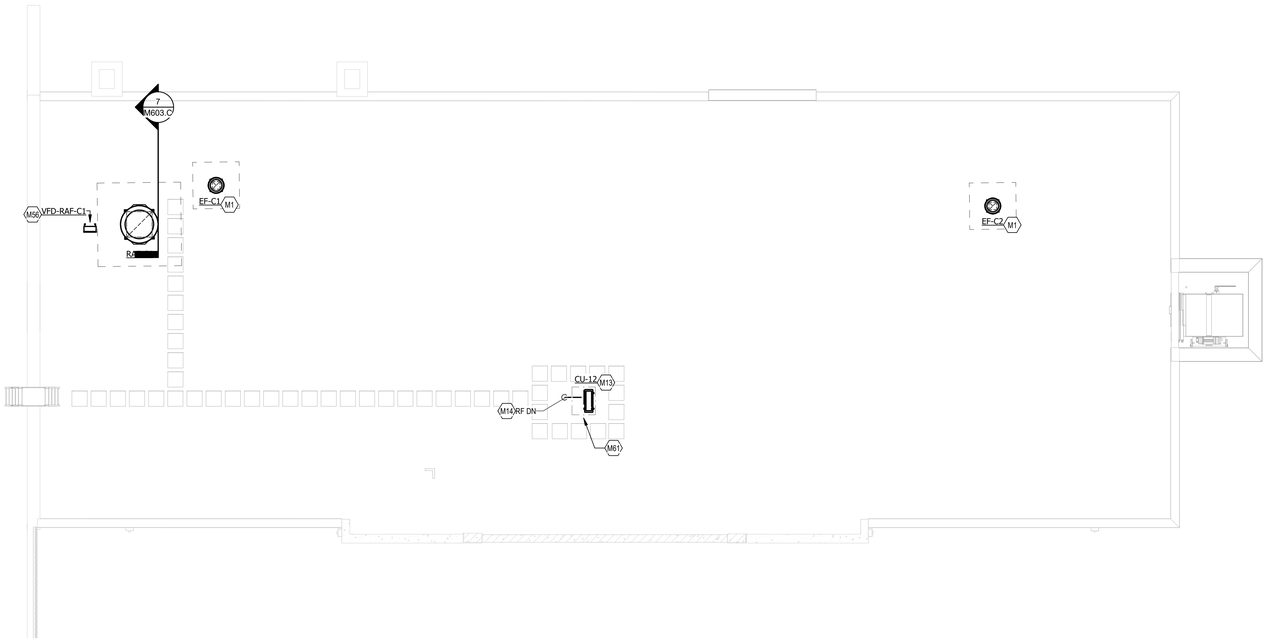
M1 INSTALL ROOFTOP EXHAUST FAN MINIMUM OF 10'-0" AWAY FROM ALL ROOF EDGES.

M13 MOUNT CONDENSING UNIT ON ROOF CURB. INSTALL PER REQUIRMENTS SHOWN IN CONDENSING UNIT DETAIL ON SHEET M603.

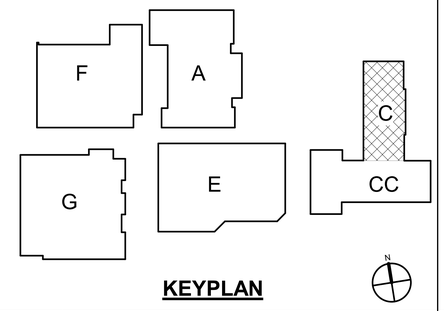
M14 REFER TO PIPE CHASE / ROOF CURB DETAIL ON SHEET M602 FOR REFRIGERANT PIPE PENETRATION REQUIREMENTS.

M56 INSTALL VFD ON UNISTRUT RACK. VFD SHALL BE NEMA-3R RATED FOR OUTDOOR APPLICATIONS.

M61 COORDINATE ORIENTATION OF ALL ROOFTOP EQUIPMENT TO ALIGN MAINTENANCE ACCESS WITH WALKPAD LOCATIONS.



1 ROOF PLAN - MECHANICAL
SCALE: 1/8" = 1'-0"



KEYPLAN

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CHARLOTTE, NORTH CAROLINA 28202
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LS3P PROJECT: 9201-224030

Δ	DATE	DESCRIPTION

SHEET NAME: ROOF PLAN - MECHANICAL

ORIG SUBMISSION: 05/15/24

SHEET: **M304.C**

CONFORMANCE SET

5/16/2024 4:32:01 PM

E D C B A

1 2 3 4 5 6

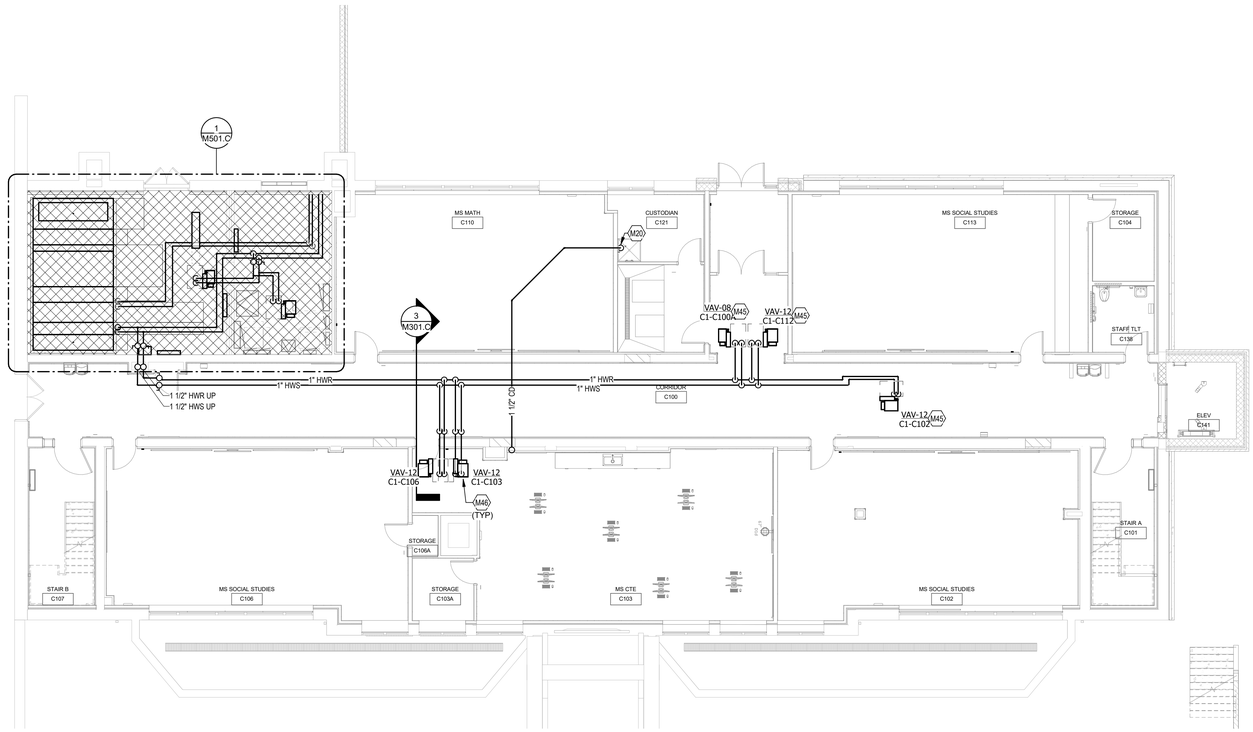
THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ARCH E SHEETS ORIGINAL PLOT SIZE

KEYNOTES

M20 INDIRECTLY SPILL CONDENSATE PIPING TO MOP BASIN. TERMINATE CONDENSATE LINE 2'-0" ABOVE MOP SINK DRAIN.

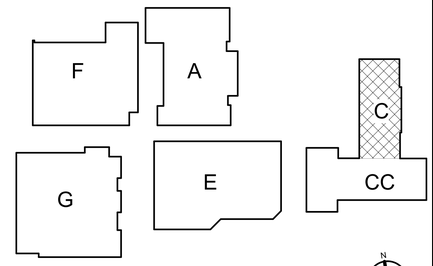
M45 PROVIDE FULL-SIZE 3 WAY VALVE AT VAV BOX INDICATED. REFER TO REHEAT COIL PIPING SCHEMATIC ON SHEET M602.C.

M46 UNLESS SPECIFICALLY INDICATED, PROVIDE 2-WAY CONTROL VALVES FOR VAV BOXES. TYPICAL.



1 FLOOR PLAN - BASEMENT - HYDRONICS

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



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LS3P PROJECT: 9201-224030

Δ	DATE	DESCRIPTION
3	11/07/23	CMS COORDINATION

SHEET NAME: FLOOR PLAN - BASEMENT - HYDRONICS

ORIG SUBMISSION: 05/15/24

SHEET: M401.C

CONFORMANCE SET

5/16/2024 4:32:04 PM

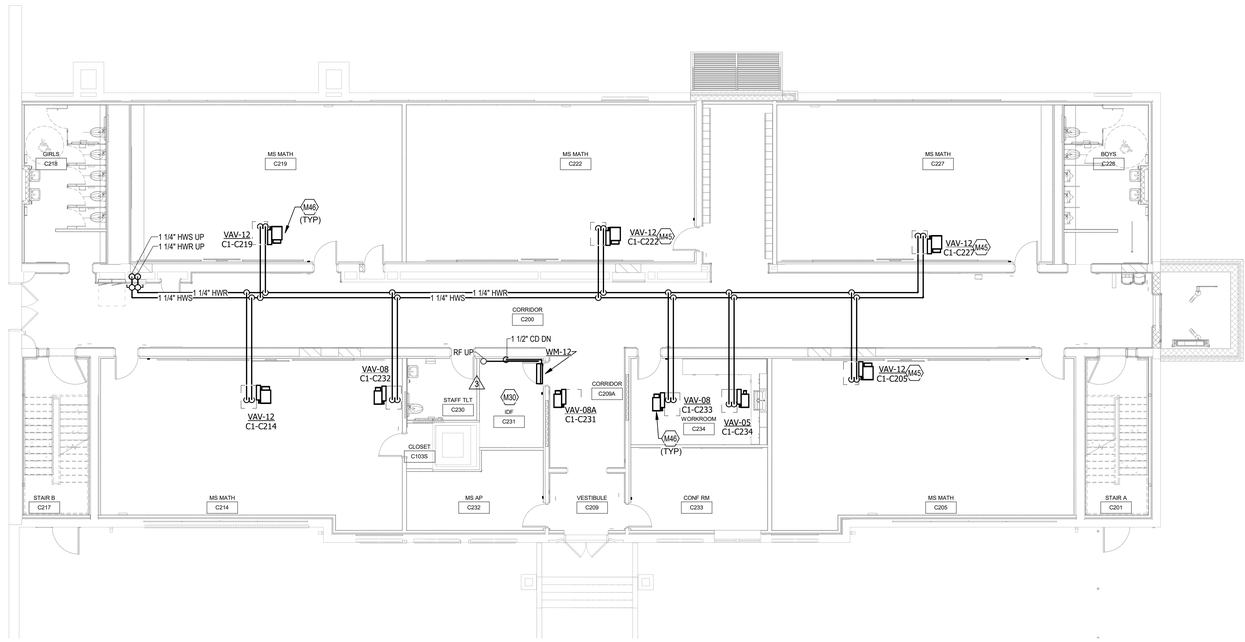
THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ARCH E SHEETS ORIGINAL PLOT SIZE

KEYNOTES

M30 NO HWS OR HWR PIPING SHALL BE RUN WITHIN IDF ROOM.

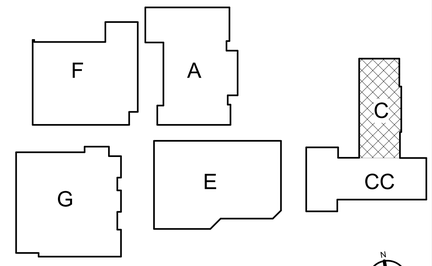
M45 PROVIDE FULL-SIZE 3 WAY VALVE AT VAV BOX INDICATED. REFER TO REHEAT COIL PIPING SCHEMATIC ON SHEET M602.C.

M46 UNLESS SPECIFICALLY INDICATED, PROVIDE 2-WAY CONTROL VALVES FOR VAV BOXES. TYPICAL.



1 FLOOR PLAN - LEVEL 1 - HYDRONICS

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



KEYPLAN

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LS3P PROJECT: 9201-224030

Δ	DATE	DESCRIPTION
3	11/07/23	CMS COORDINATION

SHEET NAME: FLOOR PLAN - LEVEL 1 - HYDRONICS

ORIG SUBMISSION: 05/15/24

SHEET: M402.C

CONFORMANCE SET

5/16/2024 4:32:08 PM

E D C B A

1 2 3 4 5 6

THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ARCH E SHEETS ORIGINAL PLOT SIZE

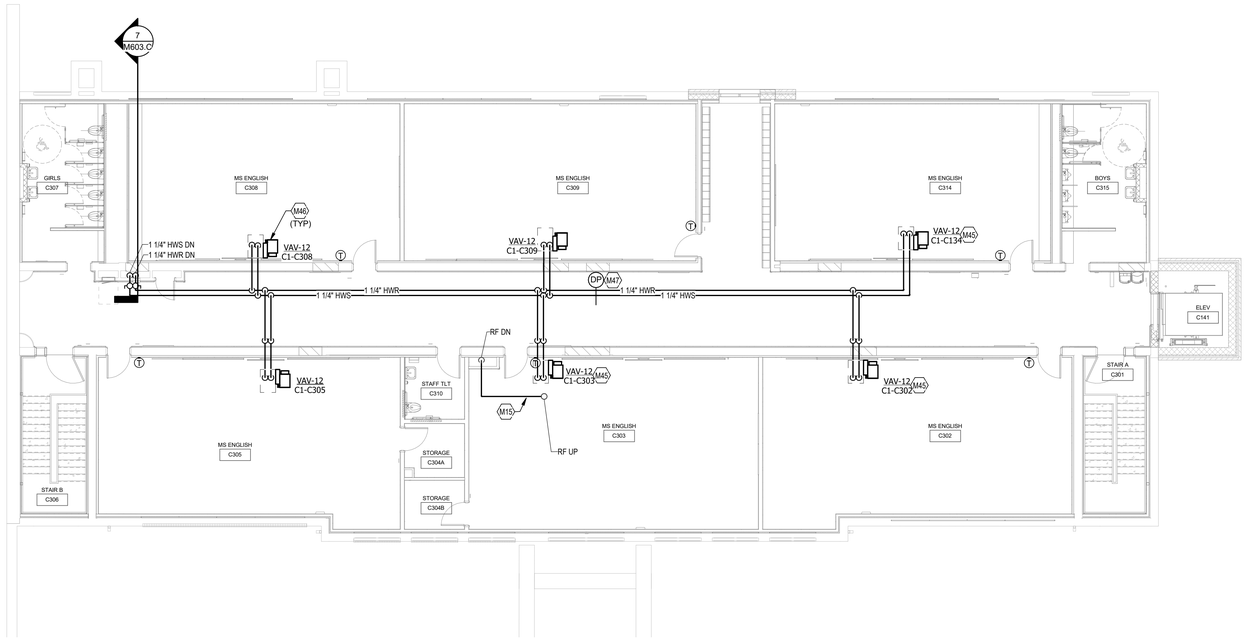
KEYNOTES

M15 SIZE REFRIGERANT PIPING PER MANUFACTURERS REQUIREMENTS.

M45 PROVIDE FULL-SIZE 3 WAY VALVE AT VAV BOX INDICATED. REFER TO REHEAT COIL PIPING SCHEMATIC ON SHEET M602.C.

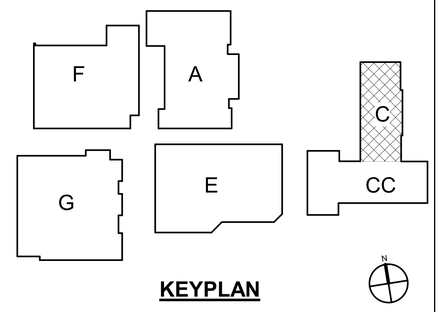
M46 UNLESS SPECIFICALLY INDICATED, PROVIDE 2-WAY CONTROL VALVES FOR VAV BOXES. TYPICAL.

M47 INSTALL BUILDING C HOT WATER DIFFERENTIAL PRESSURE SENSOR AT LOCATION INDICATED. REFER TO CONTROLS DRAWINGS IN BUILDING F DRAWING SET FOR FURTHER INFORMATION.



1 FLOOR PLAN - LEVEL 2 - HYDRONICS

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



KEYPLAN

5/16/2024 4:32:12 PM

NORTHWEST SCHOOL OF THE ARTS
DANCE MUSIC THEATRE VISUAL ARTS

CMS - Northwest School of the Arts

LS3P

227 WEST TRADE STREET, SUITE 700
CHARLOTTE, NORTH CAROLINA 28202
TEL. 704.333.6686 FAX. 704.333.2926
WWW.LS3P.COM

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NWSA Building C Admin - Reno

1415 Beatties Ford Road
Charlotte, NC 28216

LS3P PROJECT: 9201-224030

Δ	DATE	DESCRIPTION
3	11/07/23	CMS COORDINATION

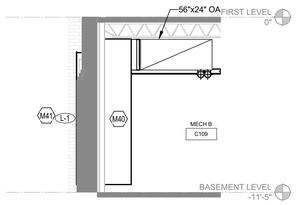
SHEET NAME: FLOOR PLAN - LEVEL 2 - HYDRONICS

ORIG SUBMISSION: 05/15/24

SHEET: M403.C

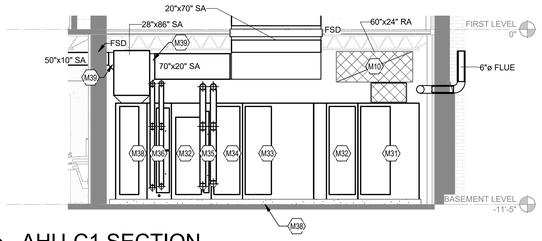
CONFORMANCE SET

THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ALL SHEETS ORIGINAL PAGE SIZE



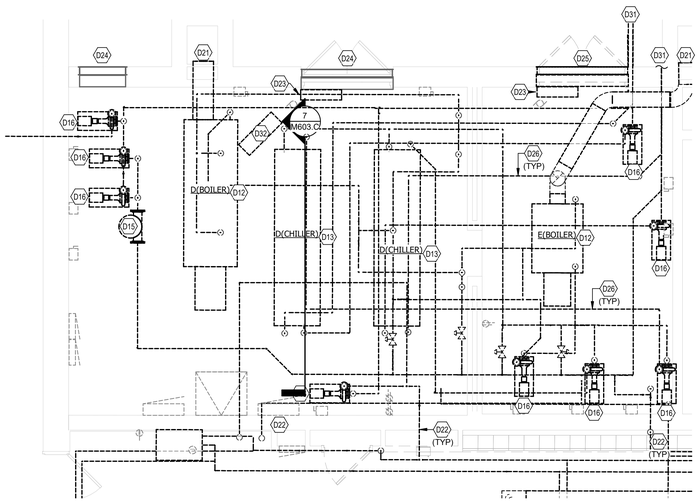
4 PLENUM BOX SECTION

SCALE: 1/4" = 1'-0"



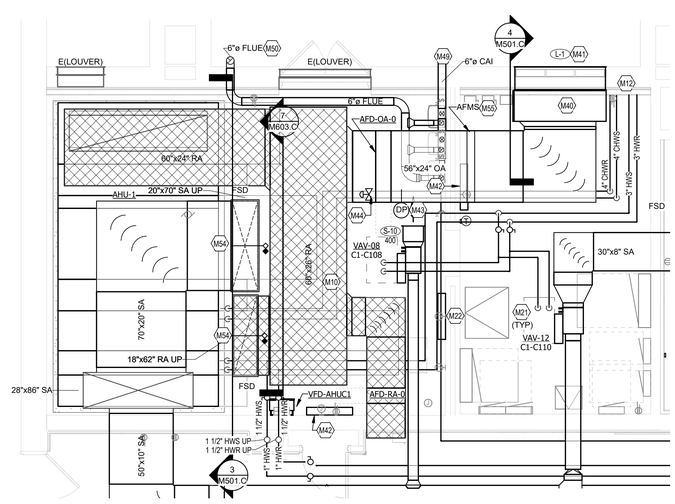
3 AHU-C1 SECTION

SCALE: 1/4" = 1'-0"



2 ENLARGED PLAN - BASEMENT - MECH C108/C109 DEMOLITION

SCALE: 1/4" = 1'-0"



1 ENLARGED PLAN - BASEMENT - MECH C108/C109

SCALE: 1/4" = 1'-0"

KEYNOTES

D12 DEMOLISH EXISTING BOILER AND ASSOICATED VENTS, CONCRETE PAD, ETC. REPAIR FLOOR IN A WORKMAN LIKE MANNER TO ALLOW FOR INSTALLATION OF NEW MECHANICAL EQUIPMENT.

D13 DEMOLISH EXISTING CHILLER AND ASSOCIATED CONCRETE PAD. REPAIR FLOOR IN A WORKMAN LIKE MANNER TO ALLOW FOR INSTALLATION OF NEW MECHANICAL EQUIPMENT.

D15 DEMOLISH AIR SEPARATOR.

D16 DEMOLISH EXISTING BASE MOUNTED PUMP AND ASSOCIATED CONCRETE PAD. REPAIR FLOOR IN A WORKMAN LIKE MANNER TO ALLOW FOR INSTALLATION OF NEW MECHANICAL EQUIPMENT.

D21 DEMOLISH ALL BOILER FLUE PIPING. PATCH AND REPAIR WALL OPENING FROM FLUE PIPING WITH 2" INSULATION AND SHEET METAL.

D22 PATCH AND REPAIR ALL WALL OPENINGS CREATED FROM DEMOLISHED PIPING. TYP.

D23 DEMOLISH EXISTING VENTILATION FAN.

D24 EXISTING LOUVER TO REMAIN. SEAL BACK OF LOUVER WITH 2" INSULATION AND SHEET METAL.

D25 DEMOLISH EXISTING LOUVER. EXISTING WALL OPENINING TO BE RE-USED AND ENLARGED AS REQUIRED FOR NEW LOUVER. REFER TO NEW WORK PLAN FOR FURTHER INFORMATION.

D26 DEMOLISH ALL HYDRONIC PIPING INCLUDING ALL DUAL TEMPERATURE PIPING, ALL CONDENSER WATER PIPING, AND ALL CHILLED WATER PIPING AND ALL ASSOCIATED HANGERS AND SUPPORTS.

D31 REFER TO SITE PLAN IN BUILDING G DRAWING SET FOR CONTINUATION OF DEMOLITION SCOPE OF DUAL TEMPERATURE PIPING, CONDENSER WATER PIPING, AND COOLING TOWERS SERVING BUILDING C.

D32 DEMOLISH EXISTING ELECTRIC HEATER.

M10 ENTIRE RETURN DUCT INDICATED BY HATCH SHALL BE LINED WITH 2" THICK FIBROUS-GLASS DUCLINER. DUCT SHALL BE DOUBLE WALL WITH PERFORATED INNER SHELL PER SPECIFICATIONS. PROVIDE OPEN ENEDED SCREEN FOR RETURN AIR PLENUM OPENING.

M12 PIPING CONTINUES TO SITE. REFER TO SITE PLAN WITHIN BUILDING G DRAWING SET FOR CONTINUATION.

M21 ELECTRICAL EQUIPMENT SHOWN FOR REFERNECE ONLY. NO PIPING SHALL BE RUN ABOVE ELECTRICAL EQUIPMENT.

M22 PROVIDE BAS PANEL AT LOCATION INIDCATED.

M31 RETURN AIR SECTION WITH FILTER.

M32 ACCESS SECTION.

M33 FAN SECTION.

M34 ACCESS SECTION.

M35 HOT WATER COIL SECTION. INSTALL PER REQUIREMENTS SHOWN IN AHU HOT WATER COIL PIPING SCHEMATIC.

M36 CHILLED WATER COIL SECTION. INSTALL PER REQUIREMENTS SHOWN IN AHU HOT WATER COIL PIPING SCHEMATIC.

M38 INSTALL UNIT ON 4" CONCRETE PAD. PAD SHALL BE MINIMUM OF 6" WIDER THAN THE AHU ON ALL SIDES.

M39 FLARED DUCT CONNECTION. DUCT FITTING SHALL BE 6" GREATER IN EACH DIMENSION.

M40 72" WIDE, 114" TALL, 24" DEEP INSULATED PLENUM BOX.

M41 REFER TO ARCHITECTURAL ELEVATIONS FOR INSTALLATION HEIGHT OF LOUVER.

M42 VAV CONTROL PANEL. CONTROLS CONTRACTOR TO COORDINATED NUMBER OF REQUIRED CONTROLLERS WITH ELECTRICAL CONTRACTOR AND PROVIDE ALL REQUIRED CONTROLLERS AS NEEDED.

M43 INSTALL BUILDING C CHILLED WATER DIFFERENTIAL PRESSURE SENSOR AT LOCATION INDICATED.

M44 PROVIDE FULL SIZE MODULATING 2-WAY BYPASS VALVE AT LOCATION INICATED TO MAINTAIN CAMPUS MINIMUM FLOW. INITIAL ESTIAMATE OF BYPASS FLOW IS 250 GPM. COORDINATE FINAL SETTING OF BYPASS VALVE WITH TEST AND BALANCE CONTRACTOR.

M49 TERMINATE COMBUSTION AIR PIPING PER MANUFACTURERS REQUIREMENTS. PROVIDE WITH MANUFACTURER APPROVED RAIN CAP.

M50 TERMINATE FLUE PIPING PER MANUFACTURERS REQUIREMENTS. MAINTAIN MINIMUM OF 4'-0" OF DISTANCE BETWEEN FIRST FLOOR WINDOW ABOVE AND FLUE PIPE TERMINATION.

M54 FIRE/SMOKE DAMPER (FSD) INSTALLED IN VERTICAL ORIENTATION AT BOTTOM OF RATED SHAFT.

M55 INSTALL AIR FLOW MONITORING STATION AT LOCATION INDICATED. MAINTAIN MANUFACTURERS RECOMMENDED STRAIGHT LENGTH OF DUCT.

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1415 Beatties Ford Road
Charlotte, NC 28216

LS3P PROJECT: 9201-224030

Δ	DATE	DESCRIPTION
3	11/07/23	CMS COORDINATION

SHEET NAME:
ENLARGED PLANS - MECHANICAL

ORIG SUBMISSION: 05/15/24

SHEET:
M501.C

CONFORMANCE SET

5/16/2024 4:32:19 PM

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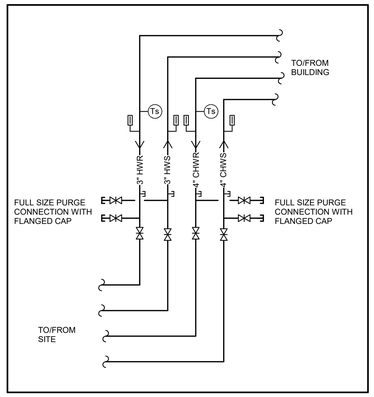
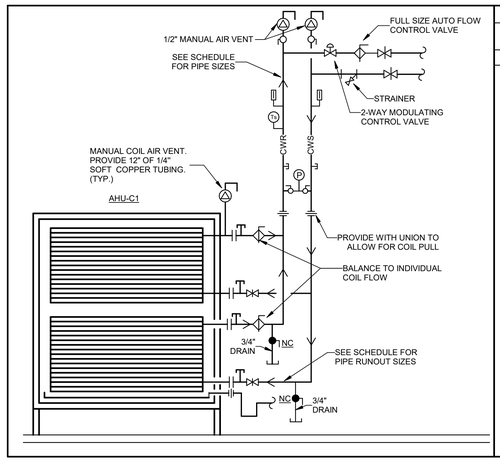


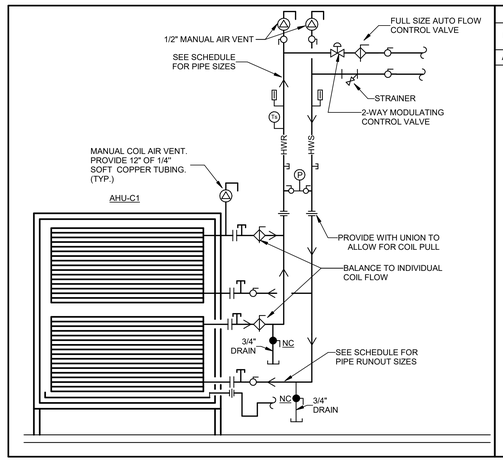
1 BUILDING PIPING ENTRY SCHEMATIC
NO SCALE



AIR HANDLING UNIT - PIPE SCHEDULE

MARK	TOTAL GPM	GPM PER COIL	MAIN PIPE SIZE	COIL RUNOUT SIZE	CD PIPE SIZE
AHU-C1	123	62	4"	3"	2"

5 AHU CHILLLED WATER PIPING SCHEMATIC
NTS



AIR HANDLING UNIT - PIPE SCHEDULE

MARK	TOTAL GPM	GPM PER COIL	MAIN PIPE SIZE	COIL RUNOUT SIZE
AHU-C1	16.5	8	2"	1-1/4"

3 AHU HOT WATER COIL PIPING SCHEMATIC
NTS

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LS3P PROJECT: 9201-224030

Δ	DATE	DESCRIPTION
3	11/07/23	CMS COORDINATION

SHEET NAME:
PIPING SCHEMATICS

ORIG SUBMISSION: 05/15/24

SHEET:
M601.C

CONFORMANCE SET

5/16/2024 4:32:20 PM

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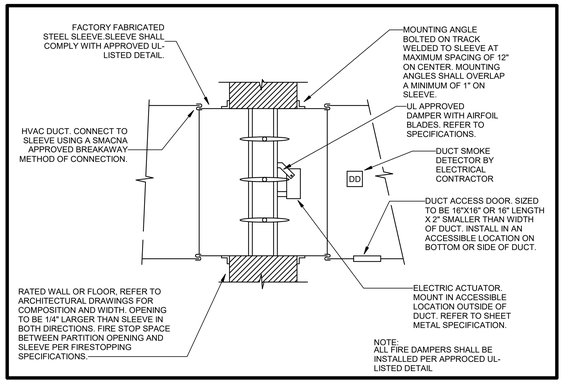
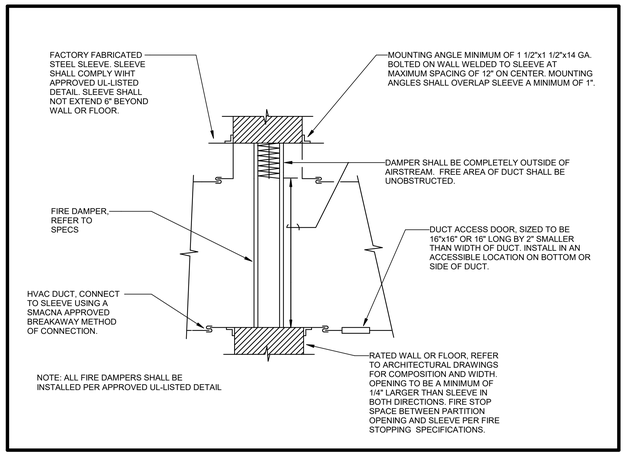
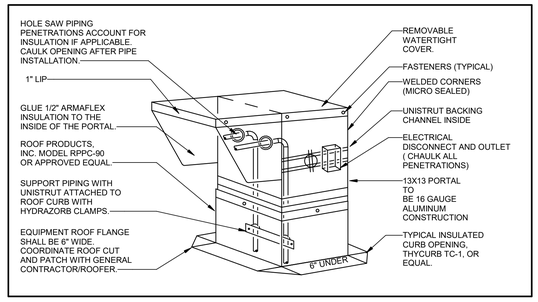


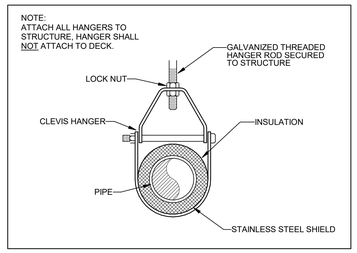
1 FIRE/SMOKE DAMPER DETAIL
NTS



2 FIRE DAMPER DETAIL
NTS



3 PIPE CHASE/ROOF CURB DETAIL
NTS



4 PIPE HANGER DETAIL
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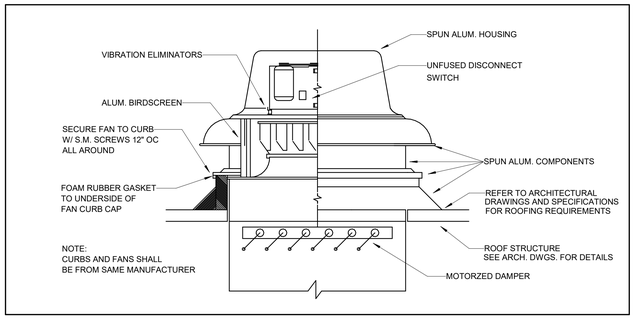
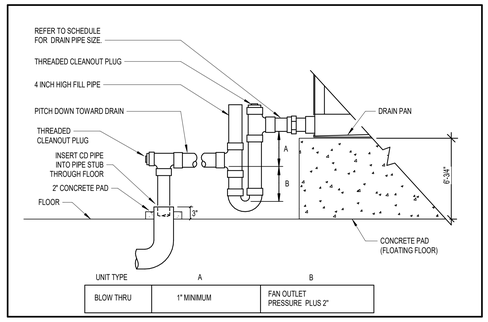
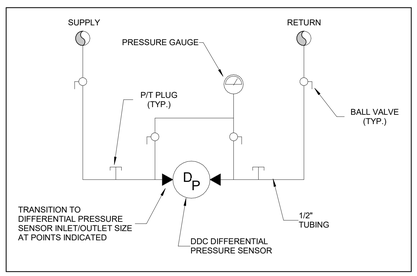


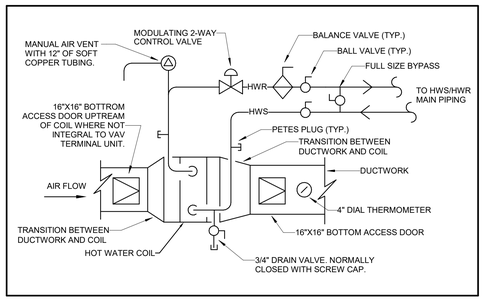
5 ROOF MOUNTED EXAHUST FAN DETAIL
NTS



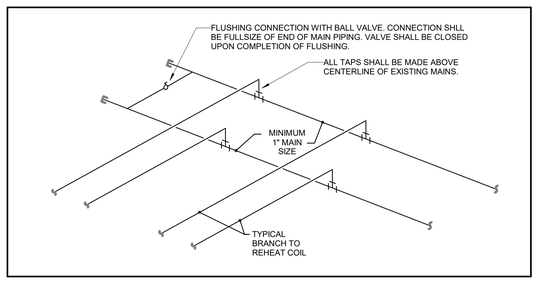
6 AIR HANDLING UNIT DRAIN TRAP DETAIL
NTS



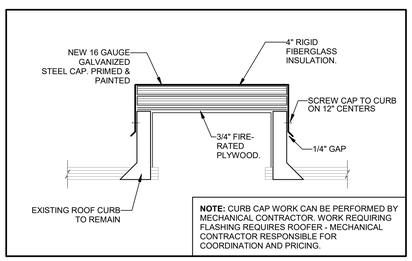
7 DIFFERENTIAL PRESSURE SENSOR DETAIL
NTS



8 REHEAT COIL PIPING SCHEMATIC (2-WAY)
NTS



9 VAV REHEAT PIPING END OF MAIN DETAIL
NTS



10 CURB CAP DETAIL
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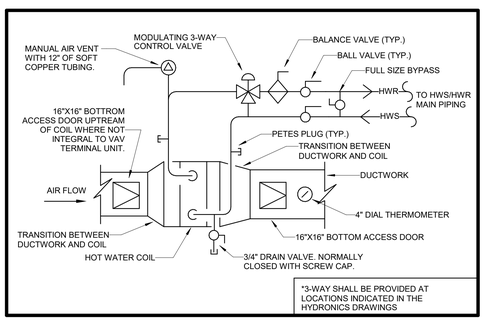

11 REHEAT COIL PIPING SCHEMATIC (3-WAY)
NTS

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Charlotte, NC 28216
LS3P PROJECT: 9201-224030

Δ	DATE	DESCRIPTION
3	11/07/23	CMS COORDINATION

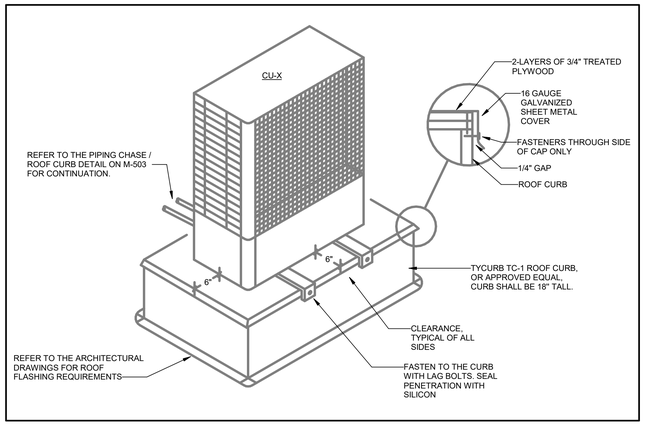
SHEET NAME:
MECHANICAL DETAILS

ORIG SUBMISSION: 05/15/24

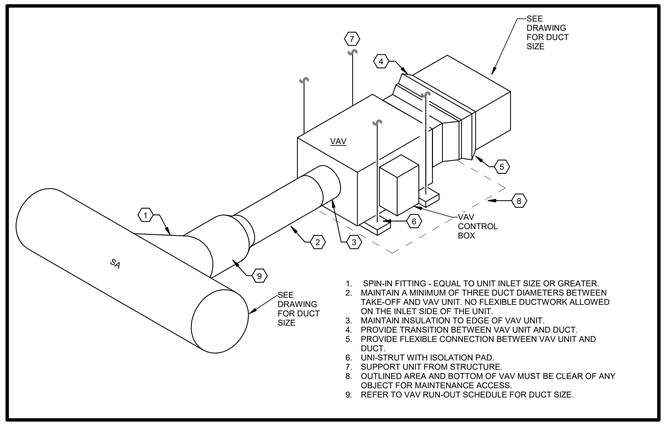
SHEET:
M602.C
CONFORMANCE SET

5/16/2024 4:32:21 PM

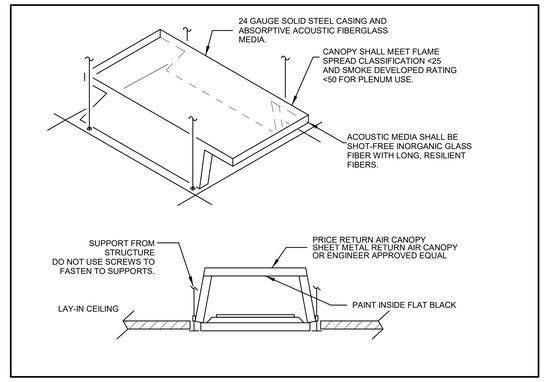
THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ALL SHEETS ORIGINAL PLOT SIZE



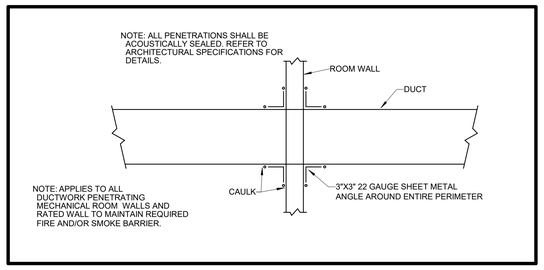
1 CONDENSING UNIT DETAIL
NTS



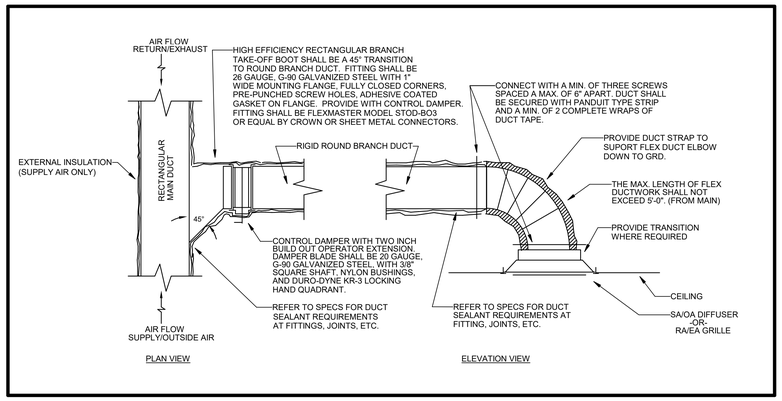
2 VAV BOX BRANCH DUCT CONNECTION DETAIL
NTS



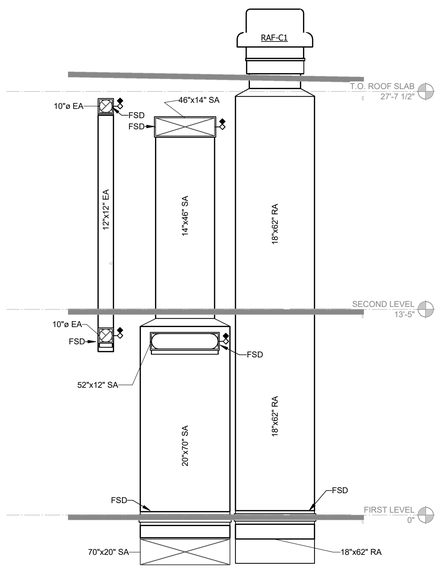
3 TYPICAL RETURN AIR CANOPY DETAIL
NTS



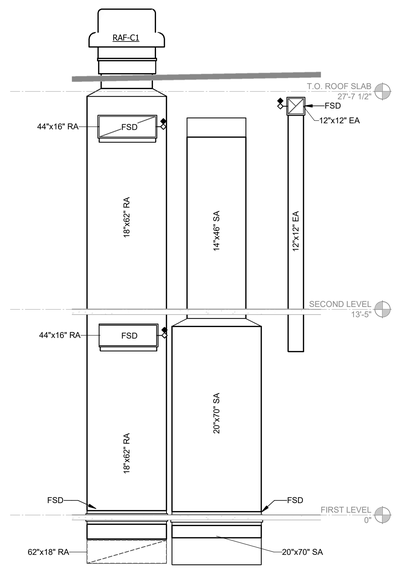
4 DUCT WALL PENETRATION DETAIL
NTS



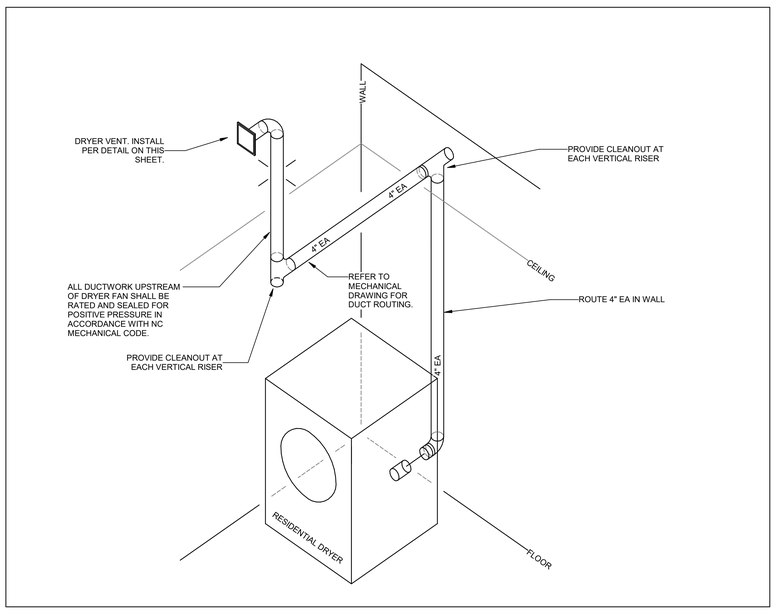
5 TYPICAL RECT TO ROUND BRANCH DUCT DETAIL
NTS



6 SHAFT RISER SECTION A
SCALE: 1/4" = 1'-0"



7 SHAFT RISER SECTION B.
SCALE: 1/4" = 1'-0"



8 DRYER EXHAUST DETAIL
NO SCALE

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Charlotte, NC 28216

LS3P PROJECT: 9201-224030

Δ	DATE	DESCRIPTION

SHEET NAME:
MECHANICAL DETAILS

ORIG SUBMISSION: 05/15/24

SHEET:
M603.C

CONFORMANCE SET

5/16/2024 4:32:25 PM

E D C B A

1 2 3 4 5 6

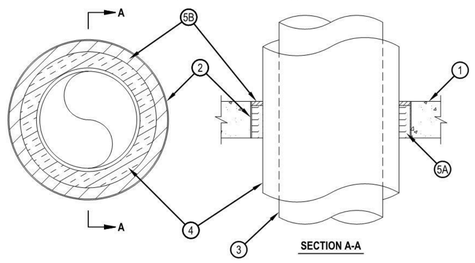
THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ALL SHEETS ORIGINAL PAGE SIZE

System No. C-AJ-5091

CAJ 5091

Classified by Underwriters Laboratories, Inc. to UL 1479 and CAN/ULC-S115

F Rating — 2 Hr
T Ratings — 0 and 1 Hr (See Items 2 and 4)
L Rating At Ambient — 4 CFM/Sq Ft
L Rating At 400 F — Less Than 1 CFM/Sq Ft



1. Floor or Wall Assembly — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m³) concrete. Wall may also be constructed of any UL Classified Concrete Blocks*. Max diam of opening is 29 in. (737 mm).
See Concrete Blocks (CAZT) category in the Fire Resistance directory for names of manufacturers.
2. Metallic Sleeve — (Optional) — Nom 30 in. (762 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe sleeve cast or grouted into floor or wall assembly, flush with floor or wall surfaces or extending a max of 3 in. (76 mm) above floor or beyond both surfaces of wall. If the steel sleeve extends beyond the top surface of the floor or both surfaces of the wall, the T Rating of the firestop system is 0 hr.
2A. Sheet Metal Sleeve — (Optional) - Max 6 in. (152 mm) diam, min 26 ga galv steel provided with a 26 ga galv steel square flange spot welded to the sleeve at approximately mid- height, or flush with bottom of sleeve in floors, and sized to be a min of 2 in. (51 mm) larger than the sleeve diam. The sleeve is to be cast in place flush with bottom surface of floor and may extend a max of 1 in. (25 mm) above the top surface of the floor.
2B. Sheet Metal Sleeve — (Optional) - Max 12 in. (305 mm) diam, min 24 ga galv steel provided with a 24 ga galv steel square flange spot welded to the sleeve at approximately mid- height, or flush with bottom of sleeve in floors, and sized to be a min of 2 in. (51 mm) larger than the sleeve diam. The sleeve is to be cast in place flush with bottom surface of floor and may extend a max of 1 in. (25 mm) above the top surface of the floor.
3. Through Penetrants — One metallic pipe or tubing to be installed either concentrically or eccentrically within the firestop system. Pipe or tubing to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of metallic pipes or tubing may be used:
A. Steel Pipe — Nom 12 in. (305 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.
B. Iron Pipe — Nom 12 in. (305 mm) diam (or smaller) cast or ductile iron pipe.
C. Copper Pipe — Nom 6 in. (152 mm) diam (or smaller) Regular (or heavier) copper pipe.
D. Copper Tubing — Nom 6 in. (152 mm) diam (or smaller) Type L (or heavier) copper tubing.

Hilti Firestop Systems

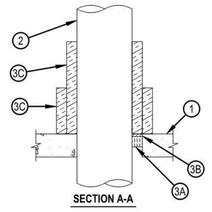
Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc.
July 18, 2011

System No. F-A-1105

FA 1105

Classified by Underwriters Laboratories, Inc. to UL 1479 and CAN/ULC-S115

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating - 2 Hr	F Rating - 2 Hr
T Rating - 2 Hr	FT Rating - 2 Hr
L Rating At Ambient - Less Than 1 CFM/sq ft	FH Rating - 2 Hr
L Rating At 400 F - 4 CFM/sq ft	FTH Rating - 2 Hr
W Rating - Class 1 (See Item 3B)	L Rating At Ambient - Less Than 1 CFM/sq ft
	L Rating At 400 F - 4 CFM/sq ft



1. Floor Assembly — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete. As an alternate, any min 2 hr fire rated D700, D800 or D900 Series Floor-Ceiling Design in the UL Fire Resistance Directory having a min 2-1/2 in. (64 mm) thickness of lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete topping over the steel deck may be used. Max diam of opening is 12-3/4 in. (324 mm).
2. Through-Penetrant — One metallic pipe installed concentrically or eccentrically within opening. Annular space between penetrant and periphery of opening shall be min of 0 in. (point contact) to max 2 in. (51 mm). Penetrant to be rigidly supported on both sides of floor assembly. The following types and sizes of penetrants may be used:
A. Steel Pipe — Nom 10 in. (254 mm) diam (or smaller) Schedule 40 (or heavier) steel pipe.
B. Iron Pipe — Nom 10 in. (254 mm) diam (or smaller) cast or ductile iron pipe.
C. Conduit — Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing or nom 6 in. (152 mm) diam (or smaller) rigid steel conduit.

Hilti Firestop Systems

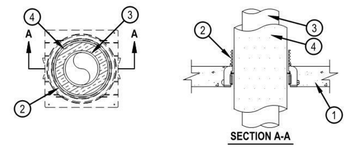
Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc.
January 17, 2014

System No. F-A-5017

FA 5017

Classified by Underwriters Laboratories, Inc. to UL 1479 and CAN/ULC-S115

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating — 2 Hr	F Rating — 2 Hr
T Rating — 3/4 and 1 Hr (See Item 3)	FT Rating — 3/4 and 1 Hr (See Item 3)
	FH Rating — 2 Hr
	FTH Rating — 3/4 and 1 Hr (See Item 3)



1. Floor Assembly — Min 2-1/2 in. (38 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete.
1A. Floor Assembly - (Optional - Not Shown) — The fire rated unprotected concrete and steel floor assembly shall be constructed of the materials and in the manner specified in the individual D900 Series Designs in the Fire Resistance Directory and as summarized below:
A. Concrete — Min 2-1/2 in. (38 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete.
B. Steel Floor and Form Units* — Composite or non-composite max 3 in. (76 mm) deep galv steel fluted units as specified in the individual Floor-Ceiling Design.
2. Firestop Device* — Cast in place firestop device permanently embedded during concrete placement or grouted in concrete floor assembly in accordance with accompanying installation instructions with a max 2 in. (51 mm) projection above the top surface of the concrete.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 680-75/2.5"N, CP 680-110/4"N, CP 680-160/6"N, CP 682-75/2.5", CP 682-110/4", CP 680-M 2", CP 680-M 3", CP 680-M 4", CP 680-M 6", CP 680-P 2", CP 680-P 3", CP 680-P 4", CP 680-P 6", CP 680-PX 2", CP 680-PX 3"
3. Through Penetrants — One metallic pipe or tubing to be installed within the firestop device. Pipe or tubing to be rigidly supported on both sides of floor assembly. The following types of pipe or tubing may be used:
A. Steel Pipe — Nom 4 in. (102 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.
B. Copper Tubing — Nom 4 in. (102 mm) diam (or smaller) Type L (or heavier) copper tubing.
C. Copper Pipe — Nom 4 in. (102 mm) diam (or smaller) Regular (or heavier) copper pipe.

Hilti Firestop Systems

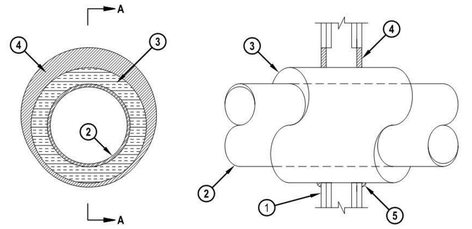
Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc.
June 29, 2015

System No. W-L-5029

WL 5029

Classified by Underwriters Laboratories, Inc. to UL 1479 and CAN/ULC-S115

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings — 1, 2 and 3 Hr (See Items 1, 3 and 4)	F Ratings — 1, 2 and 3 Hr (See Items 1, 3 and 4)
T Ratings — 0, 1/2, 1 and 1-1/4 Hr (See Item 3)	FT Ratings — 0, 1/2, 1 and 1-1/4 Hr (See Item 3)
L Rating At Ambient — 4 CFM/Sq Ft	FH Ratings — 1, 2 and 3 Hr (See Items 1, 2 and 4)
L Rating At 400 F — Less Than 1 CFM/Sq Ft	FTH Ratings — 0, 1/2, 1 and 1-1/4 Hr (See Item 3)
	L Rating At Ambient — 4 CFM/Sq Ft
	L Rating At 400 F — Less Than 1 CFM/Sq Ft



Hilti Firestop Systems

Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc.
May 30, 2012

System No. C-AJ-5091

CAJ 5091

Classified by Underwriters Laboratories, Inc. to UL 1479 and CAN/ULC-S115

F Rating — 2 Hr
T Ratings — 0 and 1 Hr (See Items 2 and 4)
L Rating At Ambient — 4 CFM/Sq Ft
L Rating At 400 F — Less Than 1 CFM/Sq Ft

4. Pipe Covering — Min 1/2 in. (13 mm) to max 2 in. (51 mm) thick hollow cylindrical heavy density (min 3.5 pcf or 56 kg/m³) glass fiber units jacketed on the outside with an all-service jacket. Longitudinal joints sealed with metal fasteners or factory-applied, self-sealing lap tape. Transverse joints secured with metal fasteners or with butt tape supplied with the product. The annular space between the insulated pipe and the edge of the periphery of the opening shall be min 1/2 in. (13 mm) to max 12 in. (305 mm). When thickness of pipe covering is less than 2 in. (51 mm), the T Rating for the firestop system is 0 hr.
See Pipe Equipment Covering — Materials — (BRGU) category in the Building Materials Directory for names of manufacturers. Any pipe covering material meeting the above specifications and bearing the UL Classification Marking with a Flame Spread Index of 25 or less and a Smoke Developed Index of 50 or less may be used.
4A. Pipe Covering — (Not Shown) — As an alternate to Item 4, max 2 in. (51 mm) thick cylindrical calcium silicate (min 14 pcf or 224 kg/m³) units sized to the outside diam of the pipe or tube may be used. Pipe insulation secured with stainless steel bands or min 18 AWG stainless steel wire spaced max 12 in. (305 mm) OC. The annular space shall be min 1/2 in. (13 mm) to max 12 in. (305 mm).
5. Firestop System — The firestop system shall consist of the following:
A. Packing Material — Min 4 in. (102 mm) thickness of min 4 pcf (64 kg/m³) mineral wool batt insulation firmly packed into opening as a permanent form. Packing material to be recessed from top surface of floor or from both surfaces of wall as required to accommodate the required thickness of fill material.
B. Fill, Void or Cavity Material* — Sealant — Min 1/2 in. (13 mm) thickness of fill material applied within the annulus, flush with top surface of floor or with both surfaces of wall.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-One Sealant
*Bearing the UL Classification Mark

Hilti Firestop Systems

Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc.
July 18, 2011

System No. F-A-1105

FA 1105

3. Firestop System — The firestop system shall consist of the following:
A. Packing Material — Min 2 in. (51 mm) thickness of min 4 pcf (64 kg/m3) mineral wool batt insulation firmly packed into opening as a permanent form. When CP 604, CFS-S SIL GG or CFS-S SIL SL sealant is used (see Item 3B), min thickness of packing material is 4 in. (102 mm) and min thickness of floor is 4-1/2 in. (114 mm). Packing material to be recessed from top surface of floor to accommodate the required thickness of fill material.
B. Fill, Void or Cavity Materials* - Sealant — Min 1/2 in. (13 mm) thickness of sealant applied within the annulus, flush with top surface of floor.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant or CP 604 Self-Leveling Firestop Sealant, CFS-S SIL GG or CFS-S SIL SL Sealant
W Rating applies only when CP 604, CFS-S SIL GG or CFS-S SIL SL Sealant is used.
C. Duct Wrap Material* — Encapsulated duct wrap tightly wrapped around penetrant to extend 24 in. (610 mm) above the floor for penetrants of nom 4 in. (102 mm) diam or smaller, and 36 in. (914 mm) above floor for penetrants greater than a nom 4 in. (102 mm) diam. An additional layer of encapsulated duct wrap tightly wrapped around the first layer of duct wrap to extend 12 in. (305 mm) (914 mm) above floor. All longitudinal seams of both layers of duct wrap and joints between layers of duct wrap are sealed with foil tape. One of the following types and thicknesses of duct wrap may be used:
C1. Nom 1-1/2 in. (38 mm) or 2 in. (51 mm) thick encapsulated duct wrap.
UNIFRAX I L L C — Fyrewrap Duct Insulation or FireWrap Duct 1.5 Insulation
C2. Nom 1-1/2 in. (38 mm) thick encapsulated duct wrap.
THERMAL CERAMICS INC — FireMaster FastWrap XL Duct Insulation
*Bearing the UL Classification Mark

Hilti Firestop Systems

Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc.
January 17, 2014

System No. F-A-5017

FA 5017

The firestop device, metallic penetrant and pipe covering shall be sized as follows:

Nom Pipe Diam, in. (mm)	Nom Pipe Covering Thickness, in. (mm)	Firestop Device	T Rating, Hr
1/2 (13)	1 (25)	CP 680-75/2.5"N, CP 682-75/2.5" CP 680-M 2", CP 680-P 2", CP 680-PX 2"	3/4
1 (25)	1 (25)	CP 680-M 3", CP 680-P 3", CP 680-PX 3"	3/4
1 (25) (See Item 5)	1-1/2 (38)	CP 682-110/4" CP 680-M 4", CP 680-P 4"	3/4
2 (51)	1 (25)	CP 680-110/4"N, CP 682-110/4" CP 680-M 4", CP 680-P 4"	1
2 (51)	2 (51)	CP 680-160/6"N CP 680-M 6", CP 680-P 6"	3/4
4 (102)	1 (25)	CP 680-160/6"N CP 680-M 6", CP 680-P 6"	3/4

4. Pipe Covering* — Nom 1, 1-1/2 and 2 in. (25, 38 and 51 mm) thick hollow cylindrical heavy density (min 3.5 pcf or 56 kg/m3) glass fiber units, jacketed on the outside with an all service jacket. Longitudinal joints sealed with metal fasteners or factory-applied SSL tape. Transverse joints secured with metal fasteners or with butt tape supplied with the product.
See Pipe and Equipment Covering-Materials (BRGU) category in the Building Materials Directory for names of manufacturers. Any pipe covering material meeting the above specifications and bearing the UL Classification Marking with a Flame Spread Index of 25 or less and a Smoke Developed Index of 50 or less may be used.
5. Packing Material — When using a 1 in. (25 mm) diam pipe with 1-1/2 in. (38 mm) thick glass fiber pipe insulation in a 4 in. (102 mm) device, a min 2 in. (51 mm) thickness of min 4 pcf (64 kg/m3) mineral wool batt insulation shall be firmly packed into top of device, flush with the top of the device.

* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

Hilti Firestop Systems

Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc.
June 29, 2015

System No. W-L-5029

WL 5029

1. Wall Assembly — The 1, 2 or 3 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400, V400 or W400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
A. Studs — Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced 16 in. (406 mm) OC. Steel studs to be min 2-1/2 in. (64 mm) wide for 1 and 2 hr F and FH rating and 3-1/2 in. (89 mm) wide for 3 hr F and FH rating and spaced max 24 in. (610 mm) OC.
B. Gypsum Board* — Min 5/8 in. (16 mm) thick with square or tapered edges. The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual Wall and Partition Design. Max diam of opening is 18-5/8 in. (473 mm).
The hourly F and FH Ratings of the firestop system are equal to the hourly fire rating of the wall assembly in which it is installed.
2. Through Penetrants — One metallic pipe or tubing to be installed within the firestop system. Pipe or tubing to be rigidly supported on both sides of wall assembly. The following types and sizes of metallic pipes or tubing may be used:
A. Steel Pipe — Nom 12 in. (305 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.
B. Iron Pipe — Nom 12 in. (305 mm) diam (or smaller) cast or ductile iron pipe.
C. Copper Tubing — Nom 6 in. (152 mm) diam (or smaller) Type L (or heavier) copper tubing. When the hourly F or FH Rating of the firestop system is 3 hr, the nom diam of copper tube shall not exceed 4 in. (102 mm).
D. Copper Pipe — Nom 6 in. (152 mm) diam (or smaller) Regular (or heavier) copper pipe. When the hourly F or FH Rating of the firestop system is 3 hr, the nom diam of copper pipe shall not exceed 4 in. (102 mm).
3. Pipe Covering* — Nom 1, 1-1/2 or 2 in. (25, 38 or 51 mm) thick hollow cylindrical heavy density (min 3.5 pcf or 56 kg/m3) glass fiber units jacketed on the outside with an all service jacket. Longitudinal joints sealed with metal fasteners or factory-applied self-sealing lap tape. Transverse joints secured with metal fasteners or with butt tape supplied with the product. For 1 and 2 hr F and FH Ratings, the annular space between insulated penetrant and periphery of opening shall be min 0 in. (point contact) to max 1-7/8 in. (48 mm). For 3 hr F and FH Ratings, the annular space shall be min 0 in. (point contact) to max 1-1/4 in. (32 mm).
See Pipe and Equipment Covering — Materials (BRGU) category in the Building Material Directory for the names of manufacturers. Any pipe covering material meeting the above specifications and bearing the UL Classification Marking with a Flame Spread Index of 25 or less and a Smoke Developed Index of 50 or less may be used.
The hourly T, FT, FTH Ratings of the firestop system are 1/2 hr for 1 hr rated walls and 1 hr for 2 hr rated walls. For 3 hr rated walls, the hourly T, FT and FTH Ratings when steel and iron pipes are used are 1 hr. For 3 hr rated walls, the hourly T, FT and FTH Ratings when copper penetrants are used are 1-1/4 hr for 2 in. (51 mm) thick pipe covering and 0 hr for pipe covering thickness less than 2 in. (51 mm).
3A. Pipe Covering* — (Not Shown) — As an alternate to Item 3, max 2 in. (51 mm) thick cylindrical calcium silicate (min 14 pcf) units sized to the outside diam of the pipe or tube may be used. Pipe insulation secured with stainless steel bands or min 18 AWG stainless steel wire spaced max 12 in. (305 mm) OC. When the alternate pipe covering is used, the T and FT Rating shall be as specified in item 3 above.
See Pipe and Equipment Covering — Materials (BRGU) category in the Building Materials Directory for names of manufacturers. Any pipe covering material meeting the above specifications and bearing the UL Classification Marking with a Flame Spread Index of 25 or less and a Smoke Developed Index of 50 or less may be used.
4. Fill, Void or Cavity Material* — Sealant — For 1 and 2 hr F and FH Rating, min 5/8 in. (16 mm) thickness of fill material applied within the annulus, flush with both surfaces of wall. For 3 hr F and FH Rating, min 1 in. (25 mm) thickness of fill material applied within the annulus, flush with both surfaces of wall. At the point contact location between pipe covering and gypsum board, a min 1/2 in. (13 mm) diam bead of fill material shall be applied at the pipe covering/gypsum board interface on both surfaces of wall.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-One Sealant

*Bearing the UL Classification Mark

Hilti Firestop Systems

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May 30, 2012

5/16/2024 4:32:26 PM

NORTHWEST SCHOOL OF THE ARTS
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CMS - Northwest School of the Arts

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WWW.LS3P.COM

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Admin -

NWSA Building C Addition
Reno
1415 Beatties Ford Road
Charlotte, NC 28216

LS3P PROJECT: 9201-224030

Δ	DATE	DESCRIPTION

SHEET NAME:
MECHANICAL DETAILS

ORIG SUBMISSION: 05/15/24

SHEET:
M701.C

CONFORMANCE SET

THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ARCH E SHEETS ORIGINAL PLOT SIZE

STRUCTURE OF THE CHARLOTTE MECKLENBURG SCHOOLS (CMS) ENERGY MANAGEMENT SYSTEMS(EMS) BUILDING AUTOMATION SYSTEM (BAS) GEO-GRAPHICAL USER INTERFACE (GUI)

1. The GUI shall be accessible by entering individual unique user ID's and passwords with varying levels of administrator functionality from any IP connected user device accessing the server without the need for special software or a dedicated PC.
2. The layout, structure and nomenclature including all fonts, colors and graphics should be consistent throughout each vendors site for both dynamic and static text and graphics regardless of layers.
3. Graphics should be designed for a 16:9 aspect ratio, 1920 by 1080 resolution and 120 Hz refresh rate. Full use of the entire screen is required.
4. Navigation shall be via point and click mouse selection and keyboard entry by personnel requiring little or no formal training.
5. A "Global Start Page" shall be depicted upon initial startup along with a navigation tree with four initial branches. The initial "Global Start Page" graphic will have a CMS icon and "list" ALL CMS sites by "Last Name" descending alphabetically with dynamic links directly to the individual "Site Page" and a Site High Level Alarm Summery indication shall also be provided adjacent to each link. The Global Page shall also have a "Global Schedule" link for the district.
6. A navigation Tree shall be provided with four (4) primary branches grouping locations by; "High Schools," "Middle Schools," "Elementary Schools" and non-academic "Auxiliary Sites." Each school shall be grouped by highest level of education at the site.
7. Sub-branches on the tree groups for each category shall provide branches for each School/Site by Full Formal name/designation with Courier Code, in descending alphabetical order.
8. The "Site Page" for each school branch shall depict a dynamic plot plan of the school site showing all access from public roads, buildings, lots, and fields on the property with designations for each building which will then be used as the dynamic key plan for all subsequent site drawings. The "Site Page" graphic shall have the following information as a minimum;
   a. Complete Site Plot Plan showing all general structures and major amenities (e.g., Athletic fields and parking lots, access.) In the correct orientation and scale.
   b. Arrow Reference to true North. Bottom right above key plan
   c. Orientation to match Mechanical drawings or front of school at bottom of page.
   d. Formal Site Name, Courier Number, US Postal Address. Top Left corner of Graphic
   e. Building/Zone Designation, shown overlayed on each building/zone on the plot/key plan.
   f. Site Outside Air, Temp, Humidity, CO2 readings, current Building Occupancy, Date and Time. Top Right Corner
   g. Links to all Chiller, Boiler Plant(s), and link to all Building(s) Ventilation Equipment with generalized high level alarm condition next to each link. Middle Top of page
   h. Occupancy Scheduling link. Right Top of page.
   i. Links to Mechanical and Controls Drawing PDF's. Top Right of Graphic
   j. A one click means to go back to the last screen or forward to the next screen viewed, (by Vendor.)
9. Subsequent sub-branch(s) from the "Site Page" shall then list each Buildings ome branch for n descending order.
10. The initial "Building Page" GUI for each school shall depict the ground elevation and the following additional information;
    a. Indication of main entrance to building.
    b. Building Zone/Segments designations overlayed on building plot plan. (if applicable.)
    c. Arrow Reference to true North. Bottom right corner of Graphic
    d. Site Outside Air, Humidity, CO2 readings. Top Right Corner
    e. Building Chiller(s), Boiler(s) and AHU summery links with grouped high level failure alarm conditions only next to each link. Links to occupancy Schedules and Global occupancy temperature setpoints. Middle Top of page
    f. Lighting, Burglar and Fire Alarm links with general status condition indication. Middle Top of Graphics page
    g. Links to Graphics for each elevation and Roof. Bottom Left of Graphics page.
11. The sub-branches of the "Building Page" tree shall list in descending order each plan "Elevation" for the building and each tree graphic for the specific elevation shall provide all the Building Page information including links on the bottom left-hand corner of the "Elevation" plan graphical drawing to jump directly to other levels of the specific building elevations including roof, Basement and Mezzanines.
12. Building Plan elevation drawings shall utilize the Mechanical Drawings showing all duct runs and complete ventilation paths for all spaces from OA to Relief/Exhaust from building.
13. Each "Elevation" plan drawing shall be provided with "Thermographic" temperature indication of all ventilated spaces overlayed on all plan drawings by space;
    a. (Dark Blue) = lower than <4F below setpoint;
    b. (Light Blue) = from more than 2F below setpoint to 4F below setpoint
    c. (Green) = At setpoint +/- 2F;
    d. (Light Red) = from more than 2F to 4F above setpoint;
    e. (Dark Red) = greater than 4F above setpoint.
    f. Thermographic set points shall adjust automatically for occupied and unoccupied / heating and cooling conditions.
14. School sites with only one building on the plot may omit "Site Plan" and integrate information into "Building Page" Home Screen.
15. Zoom of floor plan GUI screens shall be either mouse wheel or point-n-click levels of plan drawings to provide the sufficient level of details.
16. ALL individual GUI plan drawings shall be oriented to match the key. All subsequent levels of zoom for floor plans shall retain the same orientation.
17. "Elevation" tree branches shall list each Floor from lowest elevation to the highest elevation, including Roof in descending order.
18. "Elevation" Graphics shall provide the geographic location of every monitored and controlled piece of equipment and field sensor placed in the physically installed position overlayed on the mechanical floorplans, showing duct work, fire dampers, exhaust ducts, fans, and transitions in for every ventilated path.
19. Subsequent sub-branches from the "Elevation" graphic shall also list and provide graphics for Mezzanines, lofts, or other disjointed equipment elevations with the access path to the equipment (e.g., stair locations) shown on both elevations.
20. All building Elevation floor plans must show all fixed structural elements, and fixtures, walls, doors, room designations, stairs, shaft ways, plumbing fixtures including access hatches and walk paths on roofs.
21. All equipment shall be enumerated based on the architectural drawing designations. Room designations shall dictate equipment designations based on controlling device.
22. All floor plan graphics shall be provided with dynamic links to major equipment for drilling down into specific equipment details and pictorials.
23. All equipment links and tree branches for equipment shall flow logically from the largest system or piece of equipment downstream to the smallest attached device.
24. The pictorial, riser and schematic graphics for all equipment shall depict all sub-components and end of line devices in their physical geographic position within a room and in proper alignment with the one-line flow diagrams, mechanical floorplan drawings, and the detailed equipment graphics. The origin and destination of the air shall also be indicated on the dynamic graphic.
25. Additional Floor plan graphics shall be required in Electrical branches to accurately depict lighting zones. (Yellow) shall indicate lighting "ON" and (**Grey**) shall indicate lighting "OFF" and Network point-to-point node and device locations shall indicate fault and loss of Comm conditions. (Purple) good Comm, (Grey) loss of Comm.
26. Additional sub-links shall be provided on tree branches with pictorials for all integrated equipment such as Boilers, Chillers, RTU's, AHU's. All equipment downstream of the major piece of equipment shall be provided with additional subsequent links to related integrated equipment such as VFD's, Electric heat coils, or independent pump controllers.
27. Ventilation Equipment graphics shall depict all associated ancillary equipment in the ventilation path. All sources of Outside Air and Exhaust/Relief including supplementary exhaust fans shall be shown on the equipment graphic for each ventilated space.
28. All equipment ID's shall be enumerated based on a sequence starting from left to right with the major equipment type designation (abbreviated) then the specific units building or zone (if applicable) and then room number.
29. Dedicated pumps and fans shall be enumerated with the same numerical designation as the major equipment the pump or fan serves. If more than one of the same types or devices exists for dedicated equipment in the same location, an alpha character shall also be sub-assigned to each device within a room. Where multiple rooms are served by a single piece of equipment, the area containing the controlling device shall dictate primary upstream equipment's unique enumeration.
30. All equipment down to the end line devices shall be clearly identified with sufficient branches, zoom and scale to make it clear to the operator specifically where in a building by room the equipment is physically located relevant to the field installation.
31. All relevant Controls Documentation derived from installation, including operational design parameters, sequences, schedules, fail safe positions, point to point wiring diagrams, marked up device catalogue cuts, riser diagrams, device details, maintenance manuals, repair procedures and Mechanical Drawings shall be segregated then embedded on the Home Page with a point-n-click navigation from the Site Summery Page

MECHANICAL CONTROL LEGEND

AFF	ABOVE FINISHED FLOOR
AI	ANALOG INPUT
AO	ANALOG OUTPUT
BAS	BUILDING AUTOMATION SYSTEM
BP	BOOSTER PUMP
CCF	100 CUBIC FEET NATURAL GAS
CMD	COMMAND
CO2	CARBON DIOXIDE
CR	CONDENSER RETURN
CS	CONDENSER SUPPLY
CSR	CURRENT SENSOR RELAY
CWR	CHILLED WATER RETURN
CWS	CHILLED WATER SUPPLY
DAT	DISCHARGE AIR TEMPERATURE
DI	DIGITAL INPUT
DO	DIGITAL OUTPUT
DP	DEWPOINT
DPR	DAMPER
EA	EXHAUST AIR PATH
FBD	FACE AND BYPASS DAMPER
HL	HIGH LIMIT
HP	HEAT PUMP
HR	HEAT PUMP RETURN
HS	HEAT PUMP SUPPLY
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
LL	LOW LIMIT
LPC	LOW PRESSURE CONDENSATE
LPS	LOW PRESSURE STEAM
MAT	MIXED AIR TEMPERATURE
MAU	MAKE-UP AIR UNIT
MIN	MINIMUM
NSW	NON-SOFTENED WATER
NC	NORMALLY CLOSED
O/C	OCCUPIED COOLING SETPOINT
O/H	OCCUPIED HEATING SETPOINT
OA	OUTSIDE AIR PATH
OAD	OUTSIDE AIR DAMPER
OAH	OUTSIDE AIR HUMIDITY
OAT	OUTSIDE AIR TEMPERATURE
OCC	OCCUPANCY
PRESS	PRESSURE
RA	RETURN AIR PATH
RF	RETURN FAN
RH	RELATIVE HUMIDITY
SA	SUPPLY AIR PATH
SETPT	SETPOINT
SF	SUPPLY FAN
SFA	SUPPLY FAN ARRAY
STS	STATUS
SW	SOFT WATER
TCC	TEMPERATURE CONTROL CONTRACTOR
TEMP	TEMPERATURE
U/C	UNOCCUPIED COOLING SETPOINT
U/H	UNOCCUPIED HEATING SETPOINT
VFD	VARIABLE FREQUENCY DRIVE

Ta	AVERAGING TEMPERATURE SENSOR
Ts	INSERTION TEMPERATURE SENSOR
H	HUMIDITY SENSOR
LL	LOW LIMIT TEMPERATURE SENSOR
P	PRESSURE SENSOR
DP	DUCT STATIC PRESSURE SENSOR
DPSW	DIFFERENTIAL PRESSURE SWITCH
ES	DAMPER END SWITCH
DP	DIFFERENTIAL PRESSURE SENSOR
C	START/STOP COMMAND
M	MOTORIZED DAMPER
F	FLOW METER
CS	CURRENT SENSOR
SD	DUCT MOUNTED SMOKE DETECTOR
COS	CONDENSATE OVERFLOW SWITCH
DSP-HL	DUCT STATIC PRESSURE HIGH LIMIT
DSP-LL	DUCT STATIC PRESSURE LOW LIMIT
ZN-DP	ZONE DEW POINT
ZN-OCC	ZONE OCCUPANCY SENSOR
ZN-T	ZONE TEMPERATURE - 48" AFF
H / W	HEATING COIL
Co2	CARBON DIOXIDE SENSOR
C / W	CHILLED WATER COIL
E / R	ENERGY RECOVERY COIL
HUMID	HUMIDIFIER
DAT	DISCHARGE AIR SENSOR
VFD	VARIABLE FREQUENCY DRIVE
AFM	AIR FLOW MONITORING STATION

NORTHWEST SCHOOL OF THE ARTS
DANCE MUSIC THEATRE VISUAL ARTS

CMS - Northwest School of the Arts

LS3P

227 WEST TRADE STREET, SUITE 700
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NWSA Building C Admin - Reno

1415 Beatties Ford Road
Charlotte, NC 28216

LS3P PROJECT: 9201-224030

Δ	DATE	DESCRIPTION

SHEET NAME:
CONTROLS LEGEND

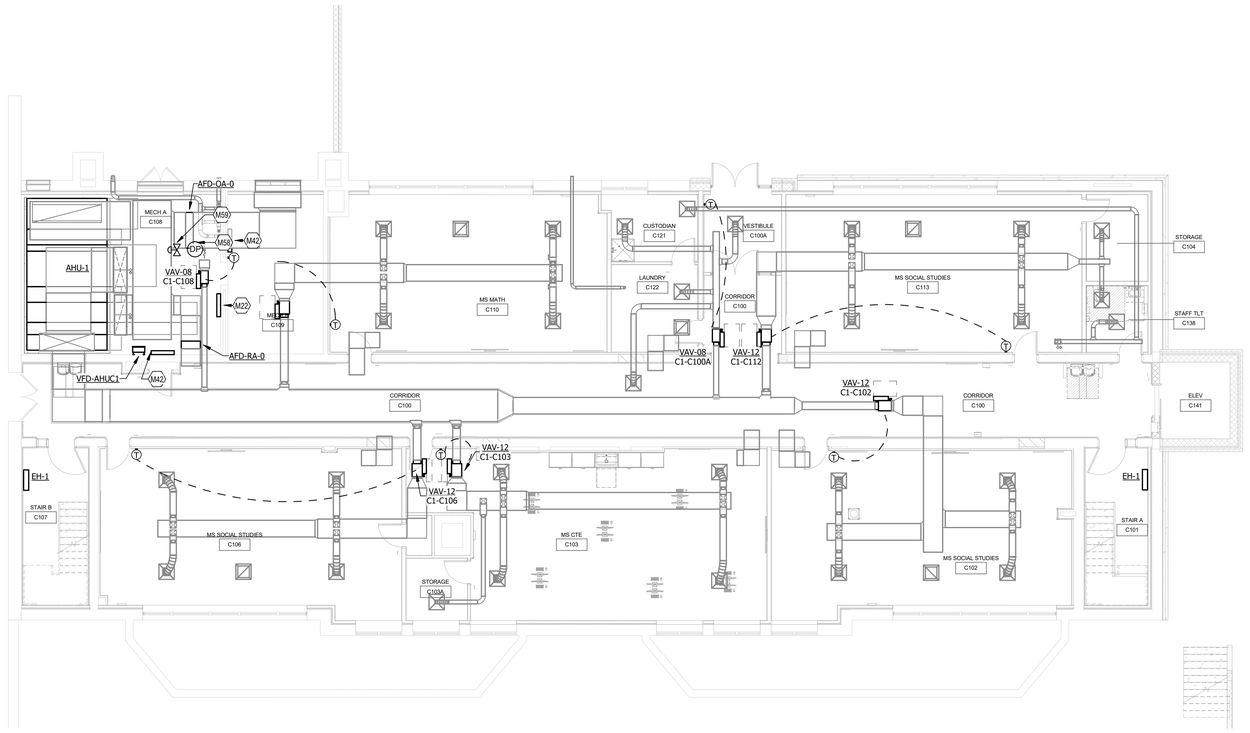
ORIG SUBMISSION: 05/15/24

SHEET:
M800.C

CONFORMANCE SET

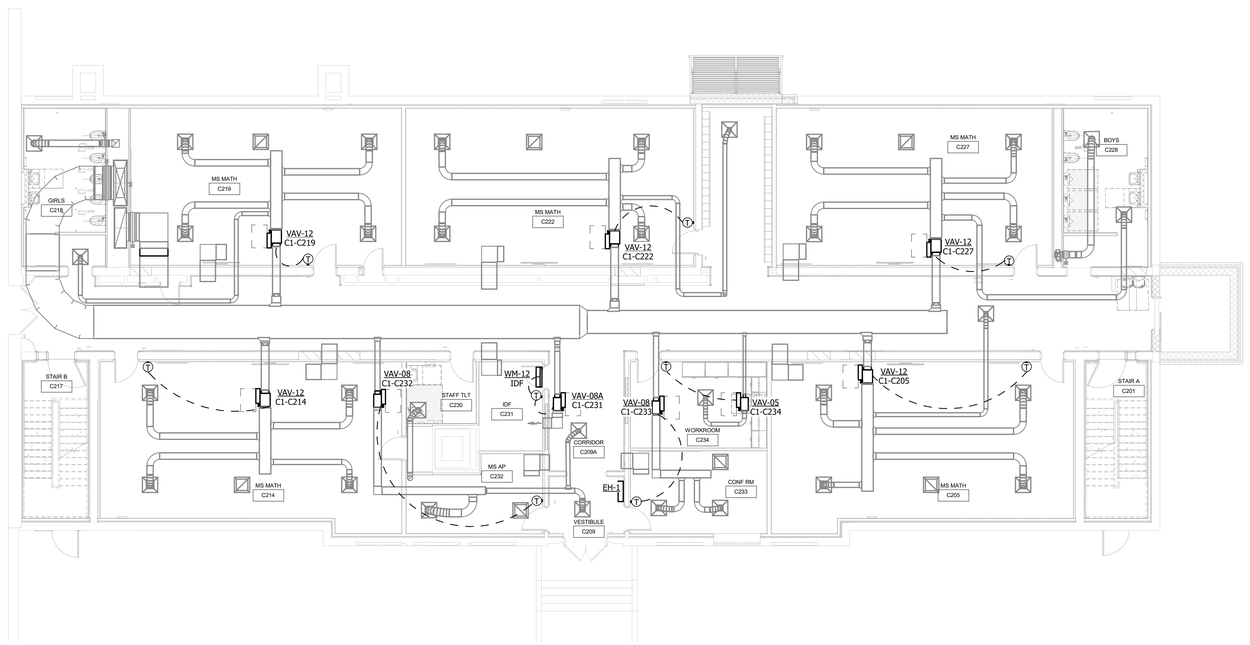
5/16/2024 4:32:26 PM

THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ARCH E SHEETS ORIGINAL PLOT SIZE



1 FLOOR PLAN - BASEMENT - CONTROLS

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



2 FLOOR PLAN - LEVEL 1 - CONTROLS

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

CONTROLS GENERAL NOTES

1. CONTROLS CONTACTOR IS RESPONSIBLE FOR CREATING A NEW "CONTROLS FLOOR PLAN" WHERE THE CONTROLS CONTRACTOR CREATES A NEW BUILDING WIDE CONTROLS GRAPHIC THAT DISPLAYS THE EXISTING BUILDING ARCHITECTURAL LAYOUT, ALL MECHANICAL EQUIPMENT, ALL THERMOSTAT LOCATIONS, ALL DUCTWORK AND GRILLES, ETC.

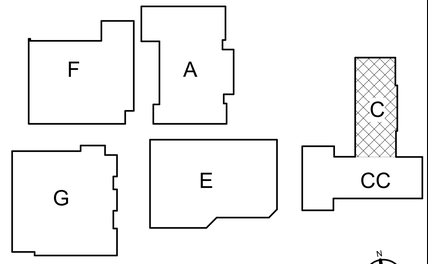
KEYNOTES

M22 PROVIDE BAS PANEL AT LOCATION INIDCATED.

M42 VAV CONTROL PANEL. CONTROLS CONTRACTOR TO COORDINATED NUMBER OF REQUIRED CONTROLLERS WITH ELECTRICAL CONTRACTOR AND PROVIDE ALL REQUIRED CONTROLLERS AS NEEDED.

M58 CHILLED WATER DIFFERNTIAL PRESSURE SENSOR LOCATION.

M59 CHILLED WATER BYPASS VALVE LOCATION.



KEYPLAN

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CHARLOTTE, NORTH CAROLINA 28202
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LS3P PROJECT: 9201-224030

Δ	DATE	DESCRIPTION

SHEET NAME: FLOOR PLAN - CONTROLS GRAPHICS

ORIG SUBMISSION: 05/15/24

SHEET: M801.C

CONFORMANCE SET

5/16/2024 4:32:32 PM

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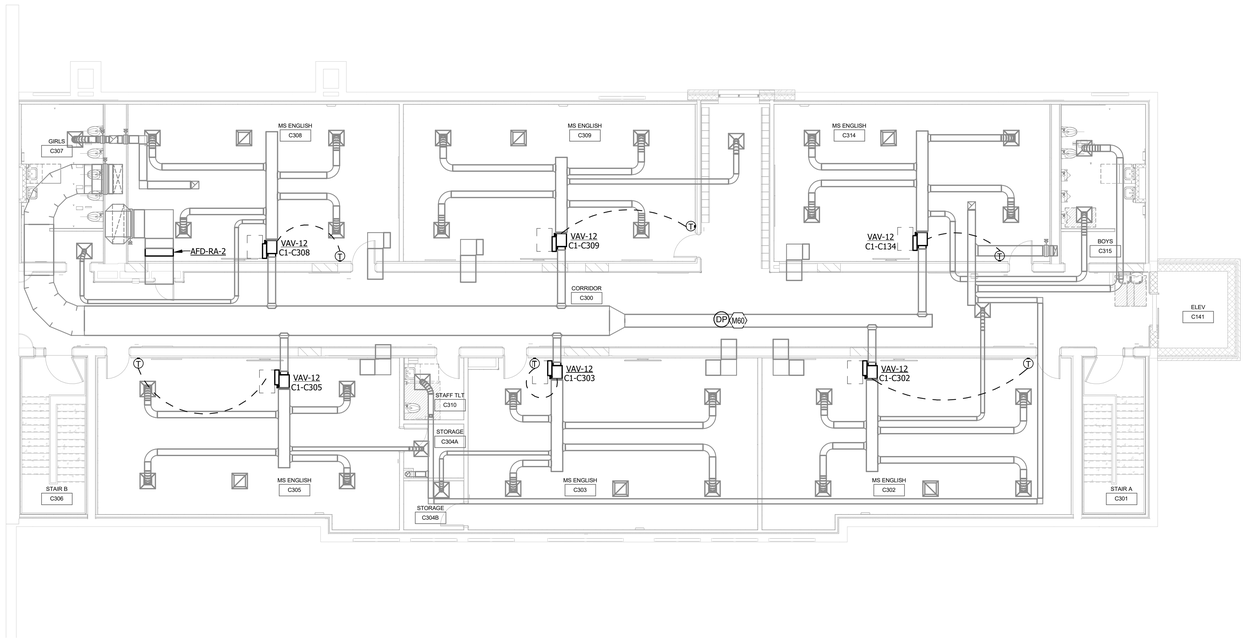
CONTROLS GENERAL NOTES

1. CONTROLS CONTACTOR IS RESPONSIBLE FOR CREATING A NEW "CONTROLS FLOOR PLAN" WHERE THE CONTROLS CONTRACTOR CREATES A NEW BUILDING WIDE CONTROLS GRAPHIC THAT DISPLAYS THE EXISTING BUILDING ARCHITECTURAL LAYOUT, ALL MECHANICAL EQUIPMENT, ALL THERMOSTAT LOCATIONS, ALL DUCTWORK AND GRILLES, ETC.

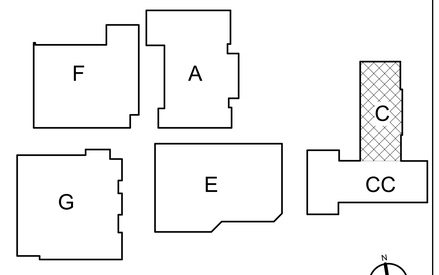
KEYNOTES

M60 HOT WATER DIFFERENTIAL PRESSURE SENSOR LOCATION.



1 FLOOR PLAN - LEVEL 2 - CONTROLS

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



KEYPLAN

5/16/2024 4:32:35 PM

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LS3P PROJECT: 9201-224030

Δ	DATE	DESCRIPTION

SHEET NAME: FLOOR PLAN - CONTROLS GRAPHICS

ORIG SUBMISSION: 05/15/24

SHEET: **M802.C**

CONFORMANCE SET

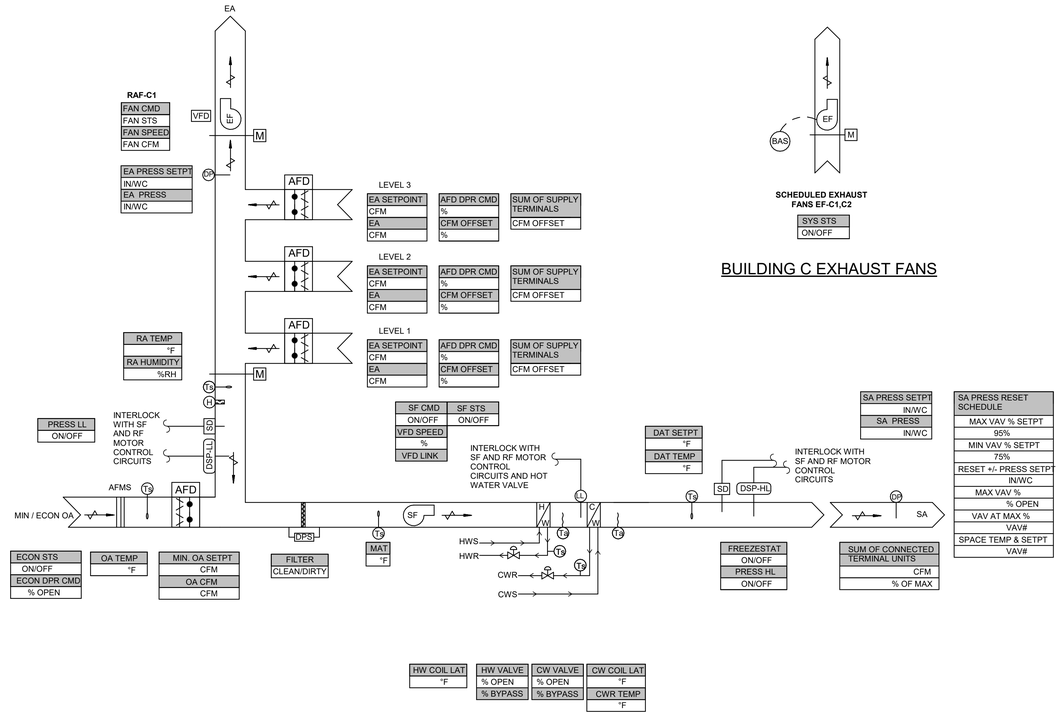
THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ARCH E SHEETS ORIGINAL PAGE SIZE

AHU#:
LOCATION:
AREA SERVED:
HOME PAGE LINK
FLOOR PLAN LINK
SEQUENCE LINK
CONTROL VALVE TABLES LINK
OCCUPIED/UNOCCUPIED/LOW OCCUPANCY

(QTY:1) (P) REFER TO PLANS FOR LOCATION

OA T	OA H	DATE & TIME
°F	%RH	

BUILDING STATIC PRESSURE
IN.WC



HW COIL LAT	HW VALVE	CW VALVE	CW COIL LAT
°F	% OPEN	% OPEN	°F
	% BYPASS	% BYPASS	CWR TEMP
			°F

BUILDING C VAV AIR HANDLING UNIT
(AHU-C1)

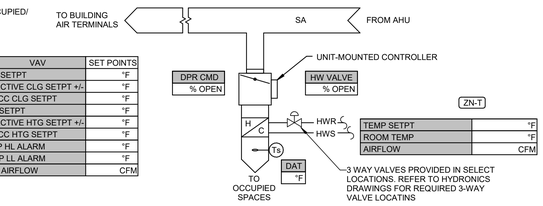
SCHEDULED EXHAUST FANS EF-C1,C2

SYS STS
ON/OFF

BUILDING C EXHAUST FANS

LOCATION:
ROOM#:
HOME PAGE LINK
AHU# LINK
FLOOR PLAN LINK
SEQUENCE LINK
OCCUPIED/UNOCCUPIED/
LOW OCCUPANCY

OA T	OA H	DATE & TIME
°F	%RH	



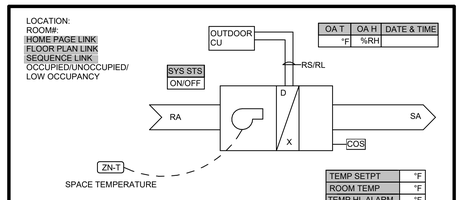
VAV	SET POINTS
CLG SETPT	°F
EFFECTIVE CLG SETPT +/-	°F
UNOCC CLG SETPT	°F
HTG SETPT	°F
EFFECTIVE HTG SETPT +/-	°F
UNOCC HTG SETPT	°F
TEMP HL ALARM	°F
TEMP LL ALARM	°F
MAX AIRFLOW	CFM

TEMP SETPT	°F
ROOM TEMP	°F
AIRFLOW	CFM

BUILDING C VARIABLE AIR VOLUME (VAV) BOX

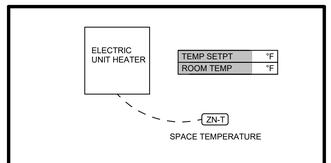
LOCATION:
ROOM#:
HOME PAGE LINK
FLOOR PLAN LINK
SEQUENCE LINK
OCCUPIED/UNOCCUPIED/
LOW OCCUPANCY

OA T	OA H	DATE & TIME
°F	%RH	



TEMP SETPT	°F
ROOM TEMP	°F
TEMP HL ALARM	°F
BAS SPACE TEMP	°F

BUILDING C DUCTLESS SPLIT SYSTEMS



ELECTRIC UNIT HEATER

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LS3P PROJECT: 9201-224030

Δ	DATE	DESCRIPTION

SHEET NAME:
MECHANICAL CONTROLS - BUILDING C

ORIG SUBMISSION: 05/15/24

SHEET:
M803.C

CONFORMANCE SET

5/16/2024 4:32:36 PM