

PERMIT SET- ISSUED FOR CONSTRUCTION

SHEET INDEX

M0.01	MECHANICAL LEAD SHEET
M0.02	MECHANICAL LEAD SHEET CONT.
M0.03	MECHANICAL SCHEDULES
M1.00	MECHANICAL DEMOLITION OVERALL PLAN
M1.01	MECHANICAL DEMOLITION PLAN
M2.00	MECHANICAL OVERALL PLAN
M2.01	MECHANICAL PLAN
M2.02	MECHANICAL HEATING HOT WATER PIPING PLAN
M3.01	MECHANICAL ENLARGED PLANS
M3.02	MECHANICAL ENLARGED PLANS CONT.
M3.03	MECHANICAL ENLARGED PLANS CONT.
M5.01	MECHANICAL DETAILS
M5.02	MECHANICAL DETAILS CONT.
M6.01	CONTROLS SYSTEM ARCHITECTURE
M6.02	CONTROLS
M6.03	CONTROLS CONT.
M6.04	CONTROLS CONT.
M7.01	MECHANICAL SHEET SPECIFICATIONS
M7.02	MECHANICAL SHEET SPECIFICATIONS CONT.
M7.03	MECHANICAL SHEET SPECIFICATIONS CONT.
M7.04	TITLE 24
M7.05	TITLE 24 CONT.

DEMOLITION NOTES

- THE MECHANICAL DRAWINGS ARE DIAGRAMMATIC ONLY. DO NOT SCALE THE DRAWINGS TO DETERMINE THE LOCATION OF EQUIPMENT OR UTILITIES. SEE ARCHITECTURAL PLANS, WHERE PROVIDED ON PROJECT, FOR EXTENT OF DEMOLITION.
- ITEMS NOT INDICATED TO BE REMOVED SHALL BE PROTECTED IN PLACE.
- OWNER SHALL HAVE FIRST RIGHT OF REFUSAL FOR ALL ITEMS INDICATED TO BE REMOVED. PENDING OWNER'S INSPECTION AND REVIEW, ALL SUCH ITEMS SHALL BE REMOVED INTACT, FULLY FUNCTIONAL AND SUITABLE FOR REUSE, AND SHALL BE PROTECTED FROM DAMAGE. CONTRACTOR SHALL CONFIRM WITH THE OWNER'S REPRESENTATIVE ACCEPTANCE OR REFUSAL OF SUCH ITEMS. ALL ITEMS ACCEPTED BY THE OWNER SHALL BE DELIVERED BY THE CONTRACTOR TO ONSITE STORAGE LOCATIONS AS DIRECTED BY THE OWNER'S REPRESENTATIVE. ALL ITEMS REFUSED BY THE OWNER SHALL BE DISPOSED OF BY THE CONTRACTOR IN AN APPROVED MANNER.
- NO EXISTING EQUIPMENT OR MATERIAL SHALL BE REUSED WITHOUT THE SPECIFIC APPROVAL OF THE OWNER'S REPRESENTATIVE.
- REMOVAL OF CERTAIN EXISTING WORK WILL BE NECESSARY FOR THE SATISFACTORY PERFORMANCE OF THE GENERAL WORK. NOT ALL EXISTING CONDITIONS ARE DETAILED ON THE DRAWINGS. CONTRACTOR SHALL SURVEY THE SITE AND MAKE ALL NECESSARY CHANGES REQUIRED BASED ON THE EXISTING CONDITIONS FOR THE PROPER INSTALLATION OF NEW WORK.
- REMOVE AND/OR RELOCATE EXISTING FIXTURES AND EQUIPMENT AS INDICATED. EXISTING HOT WATER, COLD WATER, GAS AND/OR VENT PIPING SERVING SUCH ITEMS SHALL BE REMOVED TO A SUITABLE CONCEALED LOCATION WITHIN EXISTING TO REMAIN WALL OR ABOVE CEILING AND CAPPED WATERTIGHT. SOILWASTE PIPING SERVING SUCH FIXTURES SHALL BE REMOVED TO A SUITABLE CONCEALED LOCATION BELOW FINISHED FLOOR OR WITHIN EXISTING TO REMAIN WALL AND CAPPED WATERTIGHT.
- UNLESS NOTED OTHERWISE, EXISTING PIPING AND COMPONENTS RENDERED DEFUNCT AS PART OF THIS PROJECT SHALL BE ADDRESSED IN THE FOLLOWING MANNER: DEFUNCT PIPING LOCATED IN CONCEALED AREAS WITHIN EXISTING TO REMAIN WALLS, BELOW SLAB, OR BELOW GRADE SHALL BE ABANDONED IN PLACE OR REMOVED AS NECESSARY TO AVOID INTERFERENCE WITH NEW WORK. EXISTING DEFUNCT PIPING AND COMPONENTS LOCATED IN EXPOSED AREAS AND IN ATTIC SPACE SHALL BE REMOVED TO THE NEAREST OPERATIONAL PIPING MAIN AND CAPPED, INCLUDING ALL ASSOCIATED HANGERS AND STRUCTURAL SUPPORTS. EXISTING DEFUNCT VENTS THROUGH ROOF SHALL BE CAPPED ABOVE ROOF.
- CONTRACTOR SHALL FIELD VERIFY EXISTING PIPING & DUCT RUNS, REUSE AS REQUIRED AND REMOVE ALL UNUSED DUCT AND PIPING. UNUSED PIPING & DUCT IN INACCESSIBLE LOCATIONS (WALLS/SHAFTS) TO CAN BE ABANDONED IN PLACE
- THE EXISTING CONDITIONS SHOWN ARE FROM AVAILABLE RECORD DRAWINGS AND SHOWN FOR REFERENCE CONTRACTOR SHALL VERIFY ACTUAL EXISTING CONDITIONS AT SITE PRIOR TO SUBMITTING BID. ALL DEMOLITION, ALTERATION, EXTENSION, RELOCATION, REHABILITATION WORK SHALL BE INCLUDED IN CONTRACT. NO ADDITIONAL ALLOWANCE OR CHANGE ORDERS WILL BE ACCEPTED.
- CONTRACTOR IS RESPONSIBLE TO RELOCATE OR REMOVE FROM WALLS, CEILINGS, FLOOR SPACES, ETC. ANY EXISTING PIPING, DUCT, FIRE-SMOKE DAMPERS, OR OTHER MECHANICAL EQUIPMENT WHICH INTERFERES WITH PLANNED REMODEL WORK.
- NOTIFY THE ENGINEER IMMEDIATELY WHEREVER EXISTING EQUIPMENT IS ENCOUNTERED WHICH MUST BE RELOCATED DUE TO THE NEW CONSTRUCTION, OR NOT INDICATED ON "AS-BUILT" DRAWINGS OR WAS BURIED UNDERGROUND OR EMBEDDED IN STRUCTURE WALLS.
- CAREFULLY PROTECT ALL WALLS, TRIM, FLOORS, EQUIPMENT, UTILITY LINES AND MATERIALS. WHEN WORKING ON FINISHED SURFACES, LIMIT DAMAGE TO THE SMALLEST AREA POSSIBLE AND RESTORE TO THE ORIGINAL CONDITION ALL SURFACES WHICH ARE DAMAGED BECAUSE OF THE INSTALLATION OF THIS WORK.
- EQUIPMENT, MATERIALS AND SUPPLIES TEMPORARILY REMOVED FOR PROTECTION SHALL BE REPLACED IN ORIGINAL LOCATIONS. ANY MATERIALS DAMAGED SHALL BE REPLACED WITH NEW MATERIALS OF LIKE KIND AND QUALITY.
- DEMOLITION WORK SHALL BE DONE IN A MANNER WHICH WILL NOT CAUSE UNNECESSARY INCONVENIENCE OR DANGER TO USERS OF THE PREMISES AND ADJACENT SITE, AND NOT INTERFERE WITH ITS OPERATION. ANY DEMOLITION WORK TO BE PERFORMED MUST BE PLANNED IN ADVANCE.
- RESEAL ALL PENETRATIONS OR OPENING THROUGH WALLS, CEILING, FLOORS, ETC., TO MAINTAIN THE RATING OF STRUCTURE.
- ALL REMOVED MATERIALS AND EQUIPMENT WHICH ARE SALVAGED MATERIALS SHALL REMAIN IN THE PROPERTY OF THE OWNER. DELIVER SUCH SALVAGED MATERIALS AND EQUIPMENT ON THE PREMISES AS DIRECTED BY OWNER AND NEATLY PILE OR STORE AND PROTECT FROM DAMAGE. DISPOSE OF ALL HAZARDOUS MATERIAL PER FEDERAL, STATE AND LOCAL REGULATIONS AND OTHER AGENCIES HAVING JURISDICTION.
- ALL DEMOED, ALTERED AND RELOCATED COMPONENTS SHALL BE REFLECTED ON THE AS-BUILT RECORD DOCUMENTS.

CAL GREEN NOTES

- HVAC, REFRIGERATION AND FIRE SUPPRESSION EQUIPMENT SHALL NOT CONTAIN CFC'S OR HALONS. (CALGREEN 5.508.1)
- PROVIDE MERV 8 (OR BETTER) FILTRATION FOR MECHANICALLY VENTILATED SPACES, OUTSIDE AIR, AND RETURN AIR. (CALGREEN 5.504.5.3)
- CALGREEN COMMISSIONING IS ONLY REQUIRED FOR NEW BUILDINGS 10,000SF AND GREATER. (CALGREEN 5.410.2)
- ALL ENVELOPE AND MECHANICAL CERTIFICATE OF ACCEPTANCE FORMS AND ALL RELATED ACCEPTANCE DOCUMENTS SHALL BE SUBMITTED TO THE FIELD INSPECTOR DURING CONSTRUCTION. CERTIFICATE OF OCCUPANCY WILL NOT BE ISSUED UNTIL THESE FORMS ARE REVIEWED AND APPROVED. PER CALGREEN 5.714.4
- PERMANENT HVAC SYSTEMS SHALL ONLY BE USED DURING CONSTRUCTION IF NECESSARY TO CONDITION THE BUILDING WITHIN THE REQUIRED TEMPERATURE RANGE FOR MATERIAL AND EQUIPMENT INSTALLATION. IF THE HVAC SYSTEM IS USED DURING CONSTRUCTION, USE RETURN AIR FILTERS WITH A MINIMUM EFFICIENCY REPORTING VALUE (MERV) OF 8, BASED ON ASHRAE 52.2 1989, OR AN AVERAGE EFFICIENCY OF 30% BASED ON ASHRAE 52.1 1992. REPLACE ALL FILTERS IMMEDIATELY PRIOR TO OCCUPANCY.
- DURING CONSTRUCTION (AT TIME OF INSTALLATION AND WHILE BEING STORED ON SITE) AND UNTIL FINAL STARTUP OF HEATING AND COOLING EQUIPMENT, ENDS OF DUCT OPENINGS ARE TO BE SEALED, AND MECHANICAL EQUIPMENT IS TO BE COVERED PER CALGREEN SECTION 5.714.4.3.
- ALL ADHESIVES, SEALANTS, CAULKS, PAINTS AND COATINGS, AEROSOL PAINTS AND COATINGS SHALL COMPLY WITH VOC LIMITS PER CALGREEN 5.714.4.1.

EQUIPMENT ANCHORAGE AND SYSTEM BRACING

- ALL MECHANICAL, PLUMBING, AND ELECTRICAL COMPONENTS SHALL BE ANCHORED AND INSTALLED PER THE DETAILS ON THE APPROVED CONSTRUCTION DOCUMENTS, WHERE NO DETAIL IS INDICATED, THE FOLLOWING COMPONENTS SHALL BE ANCHORED OR BRACED TO MEET THE FORCE AND DISPLACEMENT REQUIREMENTS PRESCRIBED IN THE 2016 CALIFORNIA BUILDING CODE REQUIREMENTS IN ACCORDANCE WITH THE AMERICAN SOCIETY OF CIVIL ENGINEERS - ASCE 7-10, SECTION 13.6 AND TABLE 13.6-1.
 - ALL PERMANENT EQUIPMENT AND COMPONENTS.
 - TEMPORARY OR MOVABLE EQUIPMENT THAT IS PERMANENTLY ATTACHED (E.G. HARD WIRED) TO THE BUILDING UTILITY SERVICE SUCH AS ELECTRICITY, GAS OR WATER.
 - MOVABLE EQUIPMENT WHICH IS STATION IN ONE PLACE FOR MORE THAN 8 HOURS AND HEAVIER THAN 400 POUNDS ARE REQUIRED TO BE ANCHORED WITH TEMPORARY ATTACHMENTS.
- THE FOLLOWING MECHANICAL AND ELECTRICAL COMPONENTS SHALL BE POSITIVELY ATTACHED TO THE STRUCTURE, BUT THE ATTACHMENT NEED NOT TO BE DETAILED ON PLAN. THESE COMPONENTS SHALL HAVE FLEXIBLE CONNECTIONS PROVIDED BETWEEN THE COMPONENT AND ASSOCIATED DUCTWORK, PIPING AND CONDUIT.
 - COMPONENTS WEIGHING LESS THAN 400 POUNDS AND HAVE A CENTER OF MASS LOCATED 4 FEET OR LESS ABOVE THE ADJACENT FLOOR OR ROOF LEVEL THAT DIRECTLY SUPPORT THE COMPONENT.
 - COMPONENTS WEIGHING LESS THAN 20 POUNDS, OR IN THE CASE OF DISTRIBUTED SYSTEMS, LESS THAN 5 POUNDS PER FOOT, WHICH ARE SUSPENDED FROM A ROOF OR FLOOR HUNG FROM WALL.
- FOR THOSE ELEMENTS THAT DO NOT REQUIRE DETAILS ON THE APPROVED DRAWINGS, THE INSTALLATION SHALL BE INSTALLED PER SMACNA GUIDELINES AND/OR MANUFACTURER'S RECOMMENDATIONS.
- SEISMIC ANCHORAGE OF EQUIPMENT AND BRACING OF PIPING/DUCTWORK SYSTEMS SHALL BE PROVIDED IN ACCORDANCE WITH THE AMERICAN SOCIETY OF CIVIL ENGINEERS - ASCE 7-10, SECTION 13.6 AND TABLE 13.6-1.

APPLICABLE CODES

2019	CALIFORNIA BUILDING CODE
2019	CALIFORNIA MECHANICAL CODE
2019	CALIFORNIA PLUMBING CODE
2019	CALIFORNIA ELECTRICAL CODE
2019	CALIFORNIA FIRE CODE
2019	CALIFORNIA ENERGY STANDARDS
2019	CAL GREEN CODE
	ALL OTHER APPLICABLE LOCAL AND STATE LAWS AND REGULATIONS

DELEGATED DESIGN NOTES

- THERMAL EXPANSION DELEGATED-DESIGN SUBMITTALS: FOR EACH ANCHOR AND ALIGNMENT GUIDE, INCLUDING ANALYSIS DATA, SIGNED AND SEALED BY THE QUALIFIED PROFESSIONAL ENGINEER RESPONSIBLE FOR THEIR PREPARATION.
 - DESIGN CALCULATIONS: CALCULATE REQUIREMENTS FOR THERMAL EXPANSION OF PIPING SYSTEMS AND FOR SELECTING AND DESIGNING EXPANSION JOINTS, LOOPS, AND SWING CONNECTIONS.
 - ANCHOR DETAILS: DETAIL FABRICATION OF EACH ANCHOR INDICATED. SHOW DIMENSIONS AND METHODS OF ASSEMBLY AND ATTACHMENT TO BUILDING STRUCTURE.
 - ALIGNMENT GUIDE DETAILS: DETAIL FIELD ASSEMBLY AND ATTACHMENT TO BUILDING STRUCTURE.
 - SCHEDULE: INDICATE TYPE, MANUFACTURER'S NUMBER, SIZE, MATERIAL, PRESSURE RATING, END CONNECTIONS, AND LOCATION FOR EACH EXPANSION JOINT.
- HANGERS & SUPPORTS DELEGATED-DESIGN SUBMITTALS: FOR HANGERS, TRAPEZE HANGERS, ROOF/FLOOR SUPPORTS, WALL SUPPORTS, AND EQUIPMENT SUPPORTS FOR HVAC PIPING, DUCTWORK, AND EQUIPMENT SHALL COMPLY WITH PERFORMANCE REQUIREMENTS AND DESIGN CRITERIA, INCLUDING ANALYSIS DATA SIGNED AND SEALED BY THE QUALIFIED PROFESSIONAL ENGINEER RESPONSIBLE FOR THEIR PREPARATION.
 - DETAIL FABRICATION AND ASSEMBLY OF HANGERS, TRAPEZE HANGERS, ROOF/FLOOR SUPPORTS, WALL SUPPORTS, AND EQUIPMENT SUPPORTS FOR HVAC PIPING, DUCTWORK, AND EQUIPMENT.
 - INCLUDE DESIGN CALCULATIONS FOR DESIGNING HANGERS, TRAPEZE HANGERS, ROOF/FLOOR SUPPORTS, WALL SUPPORTS, AND EQUIPMENT SUPPORTS FOR HVAC PIPING, DUCTWORK, AND EQUIPMENT.
- VIBRATION & SEISMIC DELEGATED-DESIGN SUBMITTALS: FOR EACH VIBRATION ISOLATION AND SEISMIC-RESTRAINT DEVICE.
 - INCLUDE DESIGN CALCULATIONS AND DETAILS FOR SELECTING VIBRATION ISOLATORS, SEISMIC RESTRAINTS, AND VIBRATION ISOLATION BASES COMPLYING WITH PERFORMANCE REQUIREMENTS, DESIGN CRITERIA, AND ANALYSIS DATA SIGNED AND SEALED BY THE QUALIFIED PROFESSIONAL ENGINEER RESPONSIBLE FOR THE PREPARATION.
 - DESIGN CALCULATIONS: CALCULATE STATIC AND DYNAMIC LOADING DUE TO EQUIPMENT WEIGHT, OPERATION, AND SEISMIC FORCES REQUIRED TO SELECT VIBRATION ISOLATORS AND SEISMIC RESTRAINTS AND FOR DESIGNING VIBRATION ISOLATION BASES.
 - COORDINATE DESIGN CALCULATIONS WITH WIND LOAD CALCULATIONS REQUIRED FOR EQUIPMENT MOUNTED OUTDOORS. COMPLY WITH REQUIREMENTS IN OTHER SECTIONS FOR EQUIPMENT MOUNTED OUTDOORS.
 - RISER SUPPORTS: INCLUDE RISER DIAGRAMS AND CALCULATIONS SHOWING ANTICIPATED EXPANSION AND CONTRACTION AT EACH SUPPORT POINT, INITIAL AND FINAL LOADS ON BUILDING STRUCTURE, SPRING DEFLECTION CHANGES, AND SEISMIC LOADS. INCLUDE CERTIFICATION THAT RISER SYSTEM WAS EXAMINED FOR EXCESSIVE STRESS AND THAT NONE EXISTS.
 - SEISMIC-RESTRAINT DETAILS:
 - DESIGN ANALYSIS: TO SUPPORT SELECTION AND ARRANGEMENT OF SEISMIC RESTRAINTS. INCLUDE CALCULATIONS OF COMBINED TENSILE AND SHEAR LOADS.
 - DETAILS: INDICATED FABRICATION AND ARRANGEMENT. DETAIL ATTACHMENTS OF RESTRAINTS TO THE RESTRAINED ITEMS AND TO THE STRUCTURE. SHOW ATTACHMENT LOCATIONS, METHODS, AND SPACINGS. IDENTIFY COMPONENTS, LIST THEIR STRENGTHS, AND INDICATE DIRECTIONS AND VALUES OF FORCES TRANSMITTED TO THE STRUCTURE DURING SEISMIC EVENTS. INDICATE ASSOCIATION WITH VIBRATION ISOLATION DEVICES.
 - COORDINATE SEISMIC-RESTRAINT AND VIBRATION ISOLATION DETAILS WITH WIND-RESTRAINT DETAILS REQUIRED FOR EQUIPMENT MOUNTED OUTDOORS, COMPLY WITH REQUIREMENTS IN OTHER SECTIONS FOR EQUIPMENT MOUNTED OUTDOORS.
 - PREAPPROVAL AND EVALUATION DOCUMENTATION: BY AN AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION, SHOWING MAXIMUM RATINGS OF RESTRAINT ITEMS AND THE BASIS OF APPROVAL (TESTS OR CALCULATIONS).

MECHANICAL GENERAL NOTES

- ALL DRAWINGS ARE CONSIDERED TO BE PART OF THE CONTRACT DOCUMENT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REVIEW AND COORDINATION OF ALL DRAWINGS PRIOR TO ANY CONSTRUCTION, INCLUDING STRUCTURAL, PLUMBING, AIR CONDITIONING AND ELECTRICAL. ANY DISCREPANCIES THAT OCCUR SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE START OF CONSTRUCTION SO THAT A CLARIFICATION CAN BE ISSUED. ANY WORK PERFORMED IN CONFLICT WITH THE CONTRACT DOCUMENTS OR ANY CODE REQUIREMENT SHALL BE CORRECTED BY THE CONTRACTOR AT HIS OWN EXPENSE, AND AT NO EXPENSE TO THE OWNER.
- ALL SYMBOLS AND ABBREVIATIONS USED ON THE DRAWINGS ARE CONSIDERED TO BE CONSTRUCTION STANDARDS. IF CLARIFICATION IS REQUIRED, THE CONTRACTOR SHALL NOTIFY ENGINEER PRIOR TO PROCEEDING WITH THE WORK.
- DO NOT SCALE DRAWINGS. ALL DIMENSIONS AND JOB SITE CONDITIONS SHALL BE VERIFIED BY THE CONTRACTOR AT THE JOB SITE PRIOR TO BID SUBMITTAL. START OF CONSTRUCTION AND/OR FABRICATION OF MATERIALS. IF DISCREPANCIES ARE ENCOUNTERED, THE ENGINEER SHALL BE NOTIFIED FOR CLARIFICATION.
- THE CONTRACTOR SHALL FURNISH ALL MATERIALS, LABOR, EQUIPMENT, TRANSPORTATION AND SERVICES NECESSARY FOR COMPLETION OF THE WORK AND PROVIDE A FULLY OPERATIONAL SYSTEM. ALL MATERIALS AND WORK SHALL COMPLY WITH APPLICABLE CODES AND GOVERNING REGULATIONS AND MEET THE APPROVAL OF THE CITY AND STATE FIRE MARSHALL.
- CONTRACTOR SHALL PROVIDE AND BE RESPONSIBLE FOR PROTECTION AND REPAIR OF ADJACENT EXISTING SURFACES AND AREAS WHICH MAY BE DAMAGED AS A RESULT OF DEMOLITION AND/OR NEW WORK.
- ALL EQUIPMENT THAT IS REMOVED AND NOT REUSED SHALL BE COORDINATED WITH, AND/OR RETURNED TO, THE BUILDING OWNER.
- ALL EXISTING DUCT TAPS THAT ARE REMOVED AND NOT REUSED SHALL BE CAPPED AIRTIGHT AND SEALED WITH "MIRACLE" DUCT SEALER AND D-617 OR EQUAL.
- VERIFY FINAL LOCATION OF THERMOSTATS WITH ARCHITECT AND/OR TENANT CONSTRUCTION COORDINATOR PRIOR TO ANY INSTALLATION WORK.
- CONTRACTOR SHALL PROVIDE RECORD/AS BUILT DOCUMENTS TO CONSTRUCTION COORDINATOR, ARCHITECT AND ENGINEER AT COMPLETION OF CONSTRUCTION.
- MAINTAIN NET FREE AREA EQUAL TO DUCT SIZE WHERE FIRE DAMPERS OCCUR.
- ROOM THERMOSTATS SHALL BE CAPABLE OF BEING SET TO MAINTAIN SPACE TEMPERATURE SET POINTS FOR 55° F TO 85° F AND SHALL BE CAPABLE OF OPERATING THE HEATING AND COOLING IN SEQUENCE. THERMOSTATS SHALL BE ADJUSTABLE TO PROVIDE A TEMPERATURE RANGE OF UP TO 5° F BETWEEN FULL HEATING AND FULL COOLING BEING SUPPLIED. TEMPERATURE CONTROL SYSTEM SHALL OPERATE IN ACCORDANCE WITH THE BASE BUILDING SEQUENCE OF OPERATION
- PROVIDE MINIMUM DUCT RADIUS ON ELBOWS AT 1-1/2 TIMES DUCT SIZE.
- ALL CEILING DIFFUSERS ARE 4-WAY THROW UNLESS NOTED OTHERWISE.
 - DIFFUSERS SHALL BE ADJUSTED BY MECHANICAL CONTRACTOR AND/OR TEST & BALANCE CONTRACTOR FROM 4-WAY TO 3-WAY OR 2-WAY WHEN WITHIN 3'-0" OF ADJACENT WALL OR CORNER. SUBMIT PROPOSED ADJUSTMENTS IN WRITING PRIOR TO ADJUSTING.
- CONTRACTOR SHALL STRICTLY COORDINATE ALL CEILING DIFFUSERS AND GRILLES WITH ARCHITECTURAL REFLECTED CEILING PLAN. IF ANY DISCREPANCIES ARE ENCOUNTERED THE ENGINEER SHALL BE NOTIFIED FOR CLARIFICATION. VERIFY WITH OWNERS REPRESENTATIVE IN FIELD PRIOR TO INSTALLATION.
- RETURN AIR PLENUM SHALL NOT CONTAIN ANY COMBUSTIBLES.
- MATERIALS EXPOSED WITHIN DUCT OR PLENUM SHALL COMPLY WITH SECTION 602.2 OF THE 2016 CMC. ALL MATERIALS EXPOSED WITHIN THE CEILING PLENUM SHALL HAVE A FLAME-SPREAD INDEX OF NOT MORE THAN 25 AND A SMOKE DEVELOPED RATING OF NOT MORE THAN 50.
- PROVIDE SMOKE DETECTORS IN MAIN SUPPLY AIR DUCTS OF AIR MOVING SYSTEMS EXCEEDING 2,000 CFM AND COMBINATION OF SYSTEMS SERVING AREAS PERMANENTLY OPEN TO EACH OTHER WHOSE COMBINED SUPPLY AIR EXCEEDS 2,000 CFM PER SECTION 608.0 CMC.
- MECHANICAL SYSTEMS SHALL COMPLY WITH REQUIREMENTS OF 2016 CFC SECTION 606
- HEATING HOT WATER PIPING SHALL BE INSTALLED AS HIGH AS POSSIBLE.
- THE CONTRACTOR SHALL COORDINATE ALL CEILING ACCESS PANELS FOR SERVICING MECHANICAL EQUIPMENT/DEVICES WITH THE ARCHITECT AND INTERIOR DESIGNER AS APPLICABLE.
- PRIOR TO ROUGH-IN OF ELECTRICAL, PROVIDE COORDINATION SHOP DRAWINGS OF T-STAT LOCATIONS TO ARCH./ENG. FOR REVIEW.
- DUCT SEALING:
 - DUCTWORK SHALL BE SEALED PRIOR TO DELIVERY TO JOB SITE.
 - DUCTWORK SHALL BE SEALED DURING DELIVERY.
 - DUCTWORK SHALL BE SEALED UPON INSTALLATION.
 - OPENINGS INTO EQUIPMENT AND DUCTWORK SHALL BE SEALED DURING CONSTRUCTION.
- ALL CONTROL WIRING ROUTED IN CEILING PLENUM SHALL BE CLEARLY IDENTIFIED & SECURED TO DUCTWORK OR TIGHT TO STRUCTURE TO PREVENT DAMAGE DURING FUTURE TENTANT IMPROVEMENT PROJECTS.
- THE CONTRACTOR SHALL VERIFY ALL DIFFUSER/GRILLE/REGISTER/BORDER AND FRAME TYPES WITH THE ARCHITECTURAL REFLECTED CEILING PLAN PRIOR TO ORDERING. COORDINATE ALL FINISHES WITH ARCHITECT.
- ALL HVAC SYSTEMS INCLUDING HYDRONIC SYSTEMS SHALL BE BALANCED IN ACCORDANCE WITH AN APPROVED METHOD PER THE CMC SECTION 314.1, CALGREEN AND THE ENERGY EFFICIENCY STANDARDS.
- THROUGH-PENETRATIONS AND MEMBRANE PENETRATIONS SHALL BE PROTECTED BY AN APPROVED PENETRATION FIRESTOP SYSTEM OR MEMBRANE PENETRATION FIRESTOP SYSTEM INSTALLED AS TESTED IN ACCORDANCE WITH ASTM E 814 OR UL 1479, WITH MINIMUM POSITIVE PRESSURE DIFFERENTIAL OF 0.01 INCH (2.49 PA) OF WATER OR AS OTHERWISE PERMITTED BY CBC, SECTION 714. LISTED THROUGH-PENETRATION FIRESTOP SYSTEMS AND MEMBRANE PENETRATIONS SHALL BE INSTALLED IN ACCORDANCE WITH THE INSTALLATION FOR DETAILS LISTED SYSTEMS. LISTED THROUGH-PENETRATION FIRESTOP SYSTEMS, MEMBRANE PENETRATION PROTECTION AND OTHER PERMITTED MEANS AND METHODS OF PENETRATION PROTECTION SHALL BE SUBMITTED FOR OSHPD FDD REVIEW AND APPROVAL PRIOR TO INSTALLATION.
- PROVIDE BALANCING VOLUME DAMPERS IN EACH BRANCH DUCT AND IN EACH MAIN DUCT TO PROVIDE FOR COMPLETE AIR BALANCING. PROVIDE ADEQUATE ACCESS. OPPOSED BLADE DAMPERS (OBDs) ARE NOT CONSIDERED BALANCING DAMPERS. COORDINATE ALL LOCATIONS WITH ARCHITECT'S REFLECTED CEILING PLAN WHERE REMOTE BALANCING DAMPERS ARE REQUIRED.
- PROVIDE INTERNALLY LINED DUCTWORK FOR SUPPLY AND RETURN AIR PLENUMS ON ALL FAN COILS WITH MINIMUM ONE-INCH THICK ACOUSTICAL DUCT LINER.
- INSTALL DIELECTRIC INSULATION WHERE COPPER PIPES CONNECT TO FERROUS PIPES, COMPONENTS AND EQUIPMENT.

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Issued/Revised

No.	Date	Description
09-17-21	Permit Set	
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Drawing Title

MECHANICAL LEAD
SHEET

Scale	As Noted
Date	09-17-2021
Drawn By	RS
Project No.	19022
Drawing No.	PC

M0.01

PERMIT SET- ISSUED FOR CONSTRUCTION

HVAC LEGEND	
SYMBOL	DESCRIPTION
GENERAL	
	LIMIT OF DEMOLITION
	POINT OF CONNECTION
	KEYNOTE
	FURNISHED & INSTALLED BY MECHANICAL
	FURNISHED BY MECHANICAL INSTALLED BY ELECTRICAL
	FURNISHED BY ELECTRICAL INSTALLED BY MECHANICAL
	FURNISHED & INSTALLED BY ELECTRICAL
	SUPPLY, RETURN, & EXHAUST REGISTER
	NECK SIZE AIR QUANTITY (C.F.M.)
	RELIEF AIR GRILLE
	NECK SIZE AIR QUANTITY (CFM)
	LINEAR SUPPLY & RETURN # OF SLOTS - SLOT WIDTH CFM/FT
	TOTAL LENGTH (FT)

HVAC LEGEND CONT.	
PIPING	
	PIPE TAG (E.G. 2\"-CHWS)
	PIPE RISE
	PIPE DROP
	PIPE BRANCH
	GATE VALVE
	GLOBE VALVE
	CHECK VALVE
	BALL VALVE
	BUTTERFLY VALVE
	CIRCUIT SETTER
	REDUCER
	STRAINER
	UNION
	AIR VENT VALVE
	PRESSURE GAUGE
	THERMOMETER
	CONTROL VALVE
	PRESSURE REDUCING VALVE
	PRESSURE & TEMPERATURE RELIEF VALVE
	PIPE ANCHOR

DUCTWORK	
	REMOVE EXIST. EQUIP., PIPES, OR DUCT SHOWN HATCHED
	EXIST. DIFFUSER, RETURN AIR GRILLE OR EXHAUST GRILLE TO BE REMOVED
	RELOCATED EXIST. DIFFUSER, RETURN AIR GRILLE OR EXHAUST GRILLE TO
	EXIST. DIFFUSER, RETURN AIR GRILLE OR EXHAUST GRILLE TO REMAIN OR BE RELOCATED
	EXIST. MECHANICAL EQUIPMENT & DUCT
	EXIST. DUCTWORK TO BE REMOVED & CAPPED
	LINEAR DIFFUSER
	SUPPLY AIR
	RETURN AIR
	EXHAUST AIR
	RECTANGULAR DUCT SIZE (WIDTH x DEPTH IN INCHES)
	ROUND DUCT SIZE (WIDTH x DEPTH IN INCHES)
	DUCT RISE / DUCT DROP
	DUCT WITH SOUND INSULATION
	STAINLESS STEEL DUCTWORK
	FLEXIBLE DUCT
	RECTANGULAR DUCT UP
	RECTANGULAR DUCT DOWN
	DUCT TRANSITION (RECTANGULAR TO ROUND)
	DOOR LOUVER OR UNDERCUT
	AUTOMATIC DAMPER (WITH ACTUATOR)
	BACKDRAFT DAMPER
	MANUAL VOLUME DAMPER
	COMBINATION FIRE & SMOKE DAMPER
	FIRE DAMPER

CONTROLS (PLAN)	
	CO2 SENSOR
	NITROGEN DIOXIDE SENSOR
	HUMIDITY SENSOR
	OXYGEN SENSOR
	ROOM THERMOSTAT & ZONE NUMBER
	SWITCH (MANUAL WALL MOUNT OR DOOR INTERLOCK)
	SMOKE DETECTOR
	CARBON MONOXIDE SENSOR
	PRESSURE SENSOR (DUCT MOUNTED)
	PRESSURE SENSOR (ROOM PRESSURE)
	PURGE EXHAUST CONTROL SWITCH
	VISUAL STROBE AND AUDIBLE HORN
	REFRIGERANT LEAK DETECTION SENSOR

ABBREVIATIONS	
A/C	AIR CONDITIONING
ABV	ABOVE
ACCEPT	ACCEPTANCE
ACU	AIR CONDITIONING UNIT
AD	ACCESS DOOR
ADA	AMERICANS WITH DISABILITIES ACT
ADD	ADDITION
AFF	ABOVE FINISH FLOOR
AHJ	AUTHORITY HAVING JURISDICTION
AHU	AIR HANDLING UNIT
AP	ACCESS PANEL
APPROX	APPROXIMATE
ARCH	ARCHITECTURAL
ARI	AMERICAN REFRIGERATION INSTITUTE
AS	AIR SEPARATOR
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
AUTO	AUTOMATIC
AUX	AUXILIARY
AV	AIR VENT
B	BOILER
BAS	BUILDING AUTOMATION SYSTEM
BDD	BACKDRAFT DAMPER
BFF	BELOW FINISH FLOOR
BLDG	BUILDING
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BSMT	BASEMENT
BV	BALL VALVE
BYV	BUTTERFLY VALVE
C	COMMON, CONDENSATE OR CONDUIT
CA	CONTROL AIR, or COMBUSTION AIR
CAC	CALIFORNIA ADMINISTRATIVE CODE
CAP	CAPACITY
CAV	CONSTANT AIR VOLUME
CB	CHILLED BEAM
CBC	CALIFORNIA BUILDING CODE
CC	COOLING COIL OR CONTROLS CONTRACTOR
CD	CONSTRUCTION DOCUMENTS
CEC	CALIFORNIA ELECTRICAL CODE
CFC	CALIFORNIA FIRE CODE
CFM	CUBIC FEET PER MINUTE
CH	CHILLER
CHV	CHECK VALVE
CHWP	CHILLED WATER PUMP
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CL	CENTERLINE
CLG	CEILING
CMC	CALIFORNIA MECHANICAL CODE
CONN	CONNECTION
CP	CONTROL PANEL
CPC	CALIFORNIA PLUMBING CODE
CV	CONSTANT VOLUME OR CONTROL VALVE
CWP	CONDENSER WATER PUMP
CWR	CONDENSER WATER RETURN
CWS	CONDENSER WATER SUPPLY
D	DROP OR DRAIN
DDC	DIRECT DIGITAL CONTROL
DEMO	DEMOLISH / DEMOLITION
DEPT	DEPARTMENT
DET	DETAIL
DIA	DIAMETER
DIFF	DIFFERENCE
DISCH	DISCHARGE
DN	DOWN
DTR	DOWN THRU ROOF
DV	DIAPHRAGM VALVE
DWG	DRAWING
DX	DIRECT EXPANSION
(E)	EXISTING TO REMAIN
EA	EXHAUST AIR OR EACH
EC	ELECTRICAL CONTRACTOR
ECON	ECONOMIZER
EF	EXHAUST FAN
EL	ELEVATION
ELEC	ELECTRICAL
EQUIP	EQUIPMENT
ESP	EXTERNAL STATIC PRESSURE
ET	EXPANSION TANK
EXH	EXHAUST
FC	FLEXIBLE CONNECTION OR FAIL CLOSED
FCU	FAN COIL UNIT
FD	FIRE DAMPER
FF	FINISH FLOOR OR FINAL FILTER
HWP	HEATING WATER PUMP
HWR	HEATING WATER RETURN
HWS	HEATING WATER SUPPLY
HX	HEAT EXCHANGER
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IN	INCH
IW	INDUSTRIAL WASTE
L	LENGTH
LBS	POUNDS
LP	LOW PRESSURE
LPC	LOW PRESSURE CONDENSATE
LPS	LOW PRESSURE STEAM
M	MOTOR
MA	MIXED AIR
MAU	MAKEUP AIR
MAX	MAXIMUM
MC	MECHANICAL CONTRACTOR
MCC	MOTOR CONTROL CENTER
MECH	MECHANICAL
MIN	MINIMUM
MPC	MEDIUM PRESSURE CONDENSATE
MPS	MEDIUM PRESSURE STEAM
MV	MANUAL AIR VENT
(N)	NEW
N/A	NOT APPLICABLE
NC	NORMALLY CLOSED
NO	NORMALLY OPENED
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OBD	OPPOSED BLADE DAMPER
OC	ON CENTER
OD	OUTSIDE DIAMETER
OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
OFOI	OWNER FURNISHED OWNER INSTALLED
P	PUMP OR PRESSURE OR POLE
PC	PUMPED CONDENSATE
PCR	PRESSURIZED CONDENSATE RETURN
PD	PRESSURE DROP
PE	PNEUMATIC ELECTRIC
PF	PRE FILTER
PG	PIPE GUIDE OR PRESSURE GAUGE
PH	PHASE
PLBG	PLUMBING
POC	POINT OF CONNECTION
POD	POINT OF DISCONNECTION
PS	PRESSURE SENSOR
PSI	POUNDS PER SQUARE INCH
PSIG	POUNDS PER SQUARE INCH - GAUGE
QTY	QUANTITY
(R)	REMOVE
R	RISERS, RELOCATE OR RISE
RA	RETURN AIR
REB	REBALANCE
REF	RELIEF FAN
REFRIG	REFRIGERANT
REL	RELOCATE
REQ'D	REQUIRED
REV	REVISE, REVISION OR REVOLUTIONS
RF	RETURN FAN
RHC	REHEAT COIL
RL	REFRIGERANT LIQUID
RM	ROOM
RS	REFRIGERANT SUCTION
RTU	ROOFTOP UNIT
SA	SUPPLY AIR
SAN	SANITARY
SD	SMOKE DAMPER
SEN	SENSIBLE
SF	SUPPLY FAN OR SQUARE FEET
SP	STATIC PRESSURE
SPEC	SPECIFICATION

ABBREVIATIONS CONT.	
T	THERMOSTAT OR THERMOMETER OR THROAT
TCP	TEMPERATURE CONTROL PANEL
TDH	TOTAL DYNAMIC HEAD
TEMP	TEMPERATURE
THRU	THROUGH
SQ FT	SQUARE FEET
SQ IN	SQUARE INCH
ST	STRAINER OR SOUND TRAP OR STEAM TRAP
STD	STANDARD
STRUC	STRUCTURAL
TI	TENANT IMPROVEMENT
TOP	TOP OF DUCT
TS	TEMPERATURE SENSOR
TSP	TOTAL STATIC PRESSURE
TYP	TYPICAL
UC	UNDERCUT DOOR
UG	UNDERGROUND
UH	UNIT HEATER
UNO	UNLESS NOTED OTHERWISE
UTR	UP THRU ROOF
V	VENT
VAV	VARIABLE AIR VOLUME
VD	VOLUME DAMPER
VEL	VELOCITY
VFD	VARIABLE FREQUENCY DRIVE
W/	WITH
W/O	WITHOUT
WG	WATER GAUGE
WMS	WIRE MESH SCREEN
WPD	WATER PRESSURE DROP
WSHP	WATER SOURCE HEAT PUMP
WT	WEIGHT
XFMR	TRANSFORMER
FFE	FINISH FLOOR ELEVATION
FLR	FLOOR
FPB	FAN POWERED BOX
FR	FIRE WRAP
FSD	FIRE/SMOKE DAMPER
FT	FOOT / FEET
G	GAS
GA	GAUGE, GAGE
GALV	GALVANIZED
GLV	GLOBE VALVE
GN	GENERAL NOTE
GND	GROUND
GPM	GALLON PER MINUTE
GV	GATE VALVE
HC	HEATING COIL
HP	HORSEPOWER
HP	HIGH PRESSURE
HP	HEAT PUMP
HPC	HIGH PRESSURE CONDENSATE
HPS	HIGH PRESSURE STEAM
HRU	HEAT RECOVERY UNIT
HVAC	HEATING, VENTILATION & AIR CONDITIONING
HW	HEATING WATER

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Drawing Title
MECHANICAL LEAD
SHEET

Scale As Noted
Date 09-17-2021
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Project No. 19022
Drawing No. PC

M0.02

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AIR TERMINAL UNITS - SINGLE-DUCT																			
TAG	#	MANUFACTURER	MODEL NUMBER	INLET SIZE (IN)	COOLING MAX AIR FLOW (CFM)	MIN AIR FLOW (CFM)	HEATING MAX AIR FLOW (CFM)	HEATING HOT WATER COIL						ELECTRICAL CONNECTION			REMARKS		
								REHEAT CAPACITY (BTU/Hr)	EAT DB (°F)	LAT DB (°F)	ROWS	FLUID FLOW (GPM)	BWT (°F)	LWT (°F)	VALVE TYPE	VOLTAGE (V)		PHASE	HERTZ (HZ)
CAV	F6	TITUS	DESX	10	900	900	1640	22360	55	78	2	2.7	140	110	2-WAY	120	1	60	NEW VAV BOX WITH REHEAT COIL. LINE PLENUM WITH ELASTOMERIC DUCT INSULATION.
CAV	F7	TITUS	DESX	10	900	900	1640	22360	55	78	2	1.5	140	110	2-WAY	120	1	60	EXISTING VAV BOX WITH REHEAT COIL. LINE PLENUM WITH ELASTOMERIC DUCT INSULATION.
CAV	F8	TITUS	DESX	14	1800	1300	1300	22360	55	78	2	2.2	140	110	2-WAY	120	1	60	NEW VAV BOX WITH REHEAT COIL. LINE PLENUM WITH ELASTOMERIC DUCT INSULATION.

FANS																							
TAG	#	MANUFACTURER	MODEL NUMBER	SERVICE	TYPE	DRIVE TYPE	AIR FLOW (CFM)	EXTERNAL STATIC PRESSURE (IN WG)	EFFICIENCY (%)	FAN SPEED (RPM)	MOTOR ENCLOSURE	MOTOR (BHP)	ELECTRICAL CONNECTION					VFD TAG	VIBRATION ISOLATION TAG	DETAIL REFERENCE	CONTROL DIAGRAM	OPERATING WEIGHT (LBS)	REMARKS
													MOTOR (HP)	VOLTAGE (V)	PHASE	HERTZ (HZ)	EMERGENCY POWER (YES/NO)						
EF	7	GREENHECK	SQ-100-VG	MENS LOCKERS	INLINE CENTRIFUGAL	DIRECT	1100	0.36	37	1522	ODP	0.17	0.25	208	60	1	NO		VI-1	4/M5.02		70	PROVIDE WITH VARGREEN CONTROLS FOR 0-10VDC CONTROL BY OTHERS
EF	8	GREENHECK	SQ-160-VG	WOMENS LOCKERS	INLINE CENTRIFUGAL	DIRECT	2800	0.55	42	1167	TENV	0.58	1	208	60	1	NO		VI-1	4/M5.02		160	PROVIDE WITH VARGREEN CONTROLS FOR 0-10VDC CONTROL BY OTHERS

VIBRATION ISOLATION							
TAG	#	MANUFACTURER	MODEL NUMBER	SERVICE	DEFLECTION (IN)	BASE TYPE	DETAIL REFERENCE
VI	1	VIBREX	RMKA	EF	1.0	SPRING HANGER	4/M5.02

DIFFUSERS & GRILLES						
UNIT NO.	MANUFACTURER & MODEL NO.	CFM	FACE SIZE	NECK SIZE	MAX NC	REMARKS
S1	TITUS PAS-AA	0-140	12"X12"	6"X6"	25	PROVIDE WITH ALUMINUM FACE AND HEAVY DUTY ENVIRO-THANE ENAMEL COATING FROM FACTORY.
S2	TITUS PAS-AA	141-200	20"X20"	8"	25	PROVIDE WITH ALUMINUM FACE AND HEAVY DUTY ENVIRO-THANE ENAMEL COATING FROM FACTORY.
S3	TITUS PAS-AA	201-500	20"X20"	14"	25	PROVIDE WITH ALUMINUM FACE AND HEAVY DUTY ENVIRO-THANE ENAMEL COATING FROM FACTORY.
E1	TITUS PAR-AA	0-210	12"X12"	10"X10"	25	PROVIDE WITH ALUMINUM FACE AND HEAVY DUTY ENVIRO-THANE ENAMEL COATING FROM FACTORY.
E2	TITUS PAR-AA	211-300	20"X20"	18"X18"	25	PROVIDE WITH ALUMINUM FACE AND HEAVY DUTY ENVIRO-THANE ENAMEL COATING FROM FACTORY.

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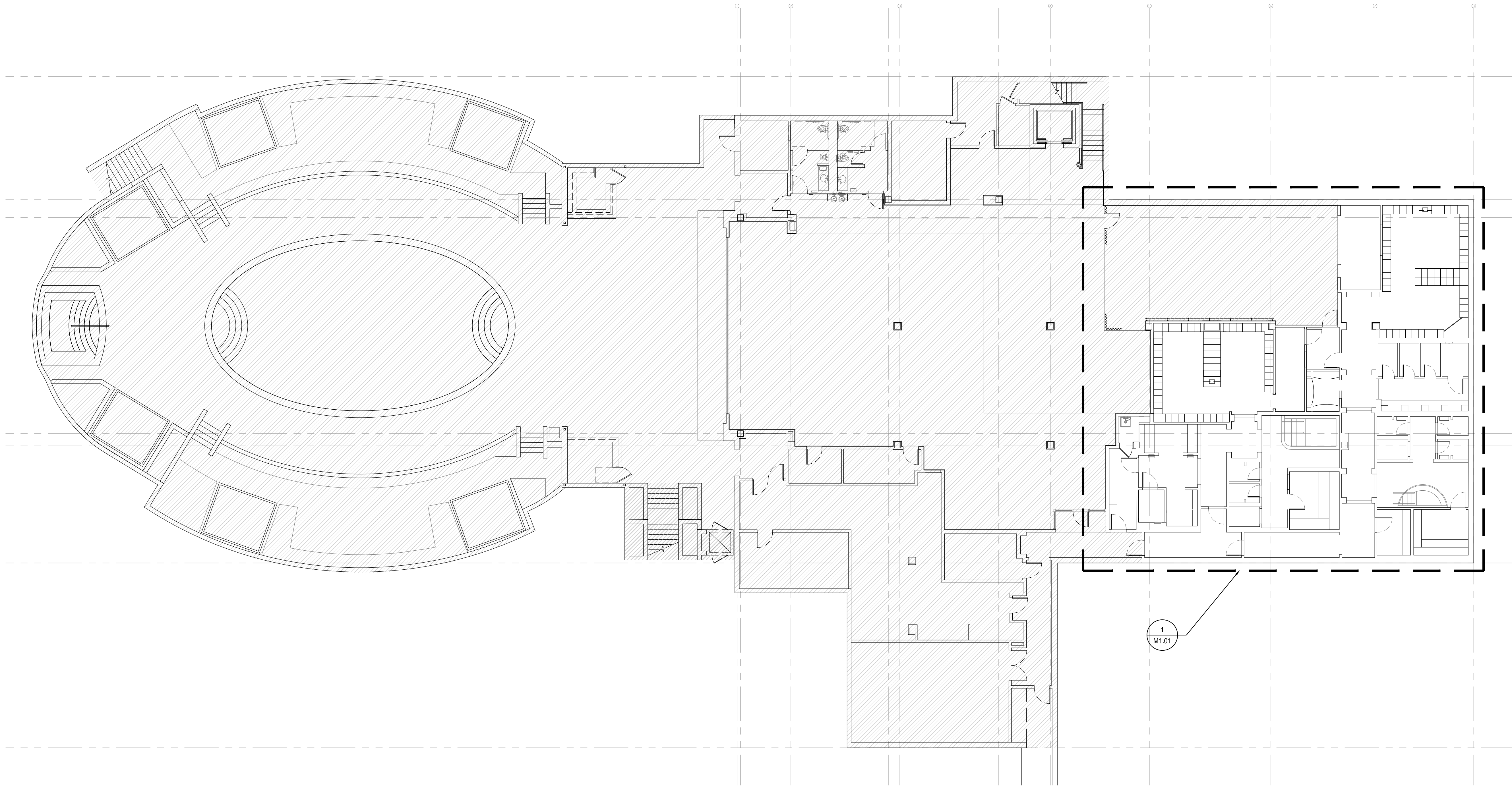
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Project No.
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1 MECHANICAL DEMO OVERALL PLAN - MEMBERS LOCKER AND LOUNGE
Scale: 3/32" = 1' - 0"

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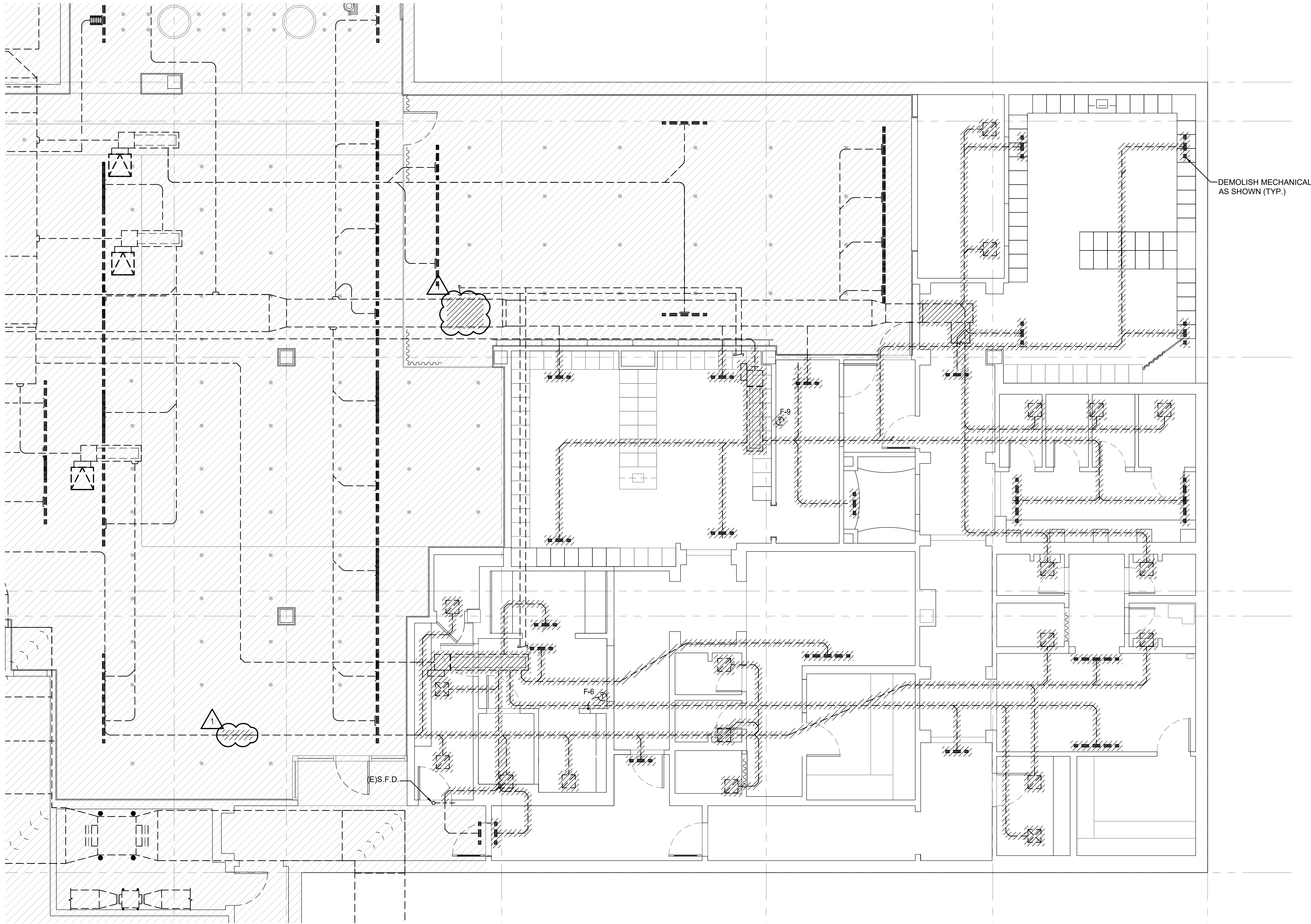
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Drawing Title
**MECHANICAL DEMO
OVERALL PLAN -
MEMBERS LOCKER AND
LOUNGE**

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Date _____ 09-17-2021
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Project No. _____ 19022
Drawing No. _____ ES

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1 MECHANICAL DEMO PLAN - MEMBERS LOCKER AND LOUNGE
Scale: 3/16" = 1' - 0"

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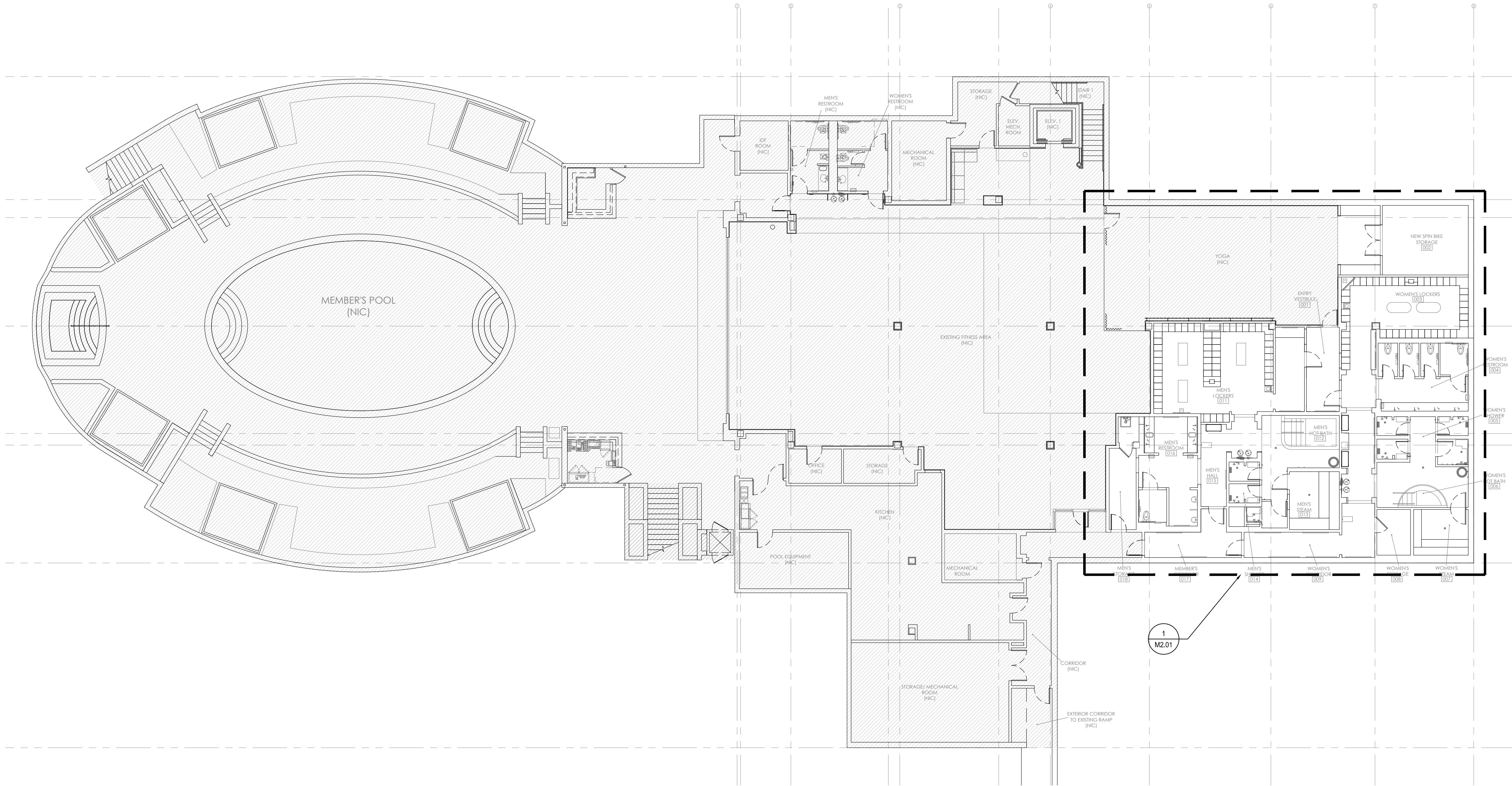
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**MECHANICAL DEMO
PLAN - MEMBERS
LOCKER AND LOUNGE**

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1 MECHANICAL OVERALL PLAN - MEMBERS LOCKER AND LOUNGE
Scale: 3/32" = 1' - 0"

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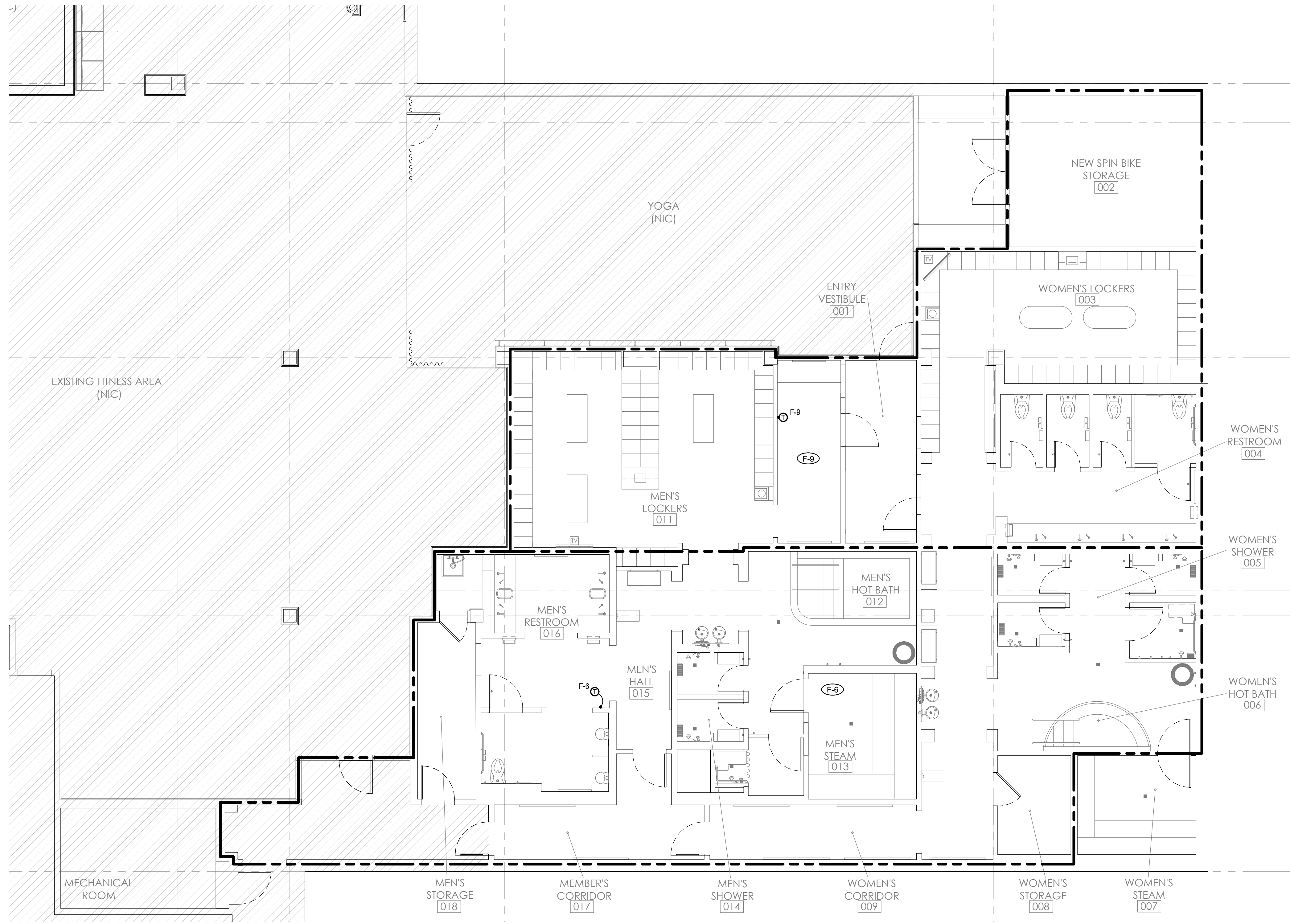
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Drawing Title
MECHANICAL OVERALL
PLAN - MEMBERS
LOCKER AND LOUNGE

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1 MECHANICAL ZONING PLAN - MEMBERS LOCKER AND LOUNGE
Scale: 3/16" = 1' - 0"

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PLAN - MEMBERS
LOCKER AND LOUNGE**

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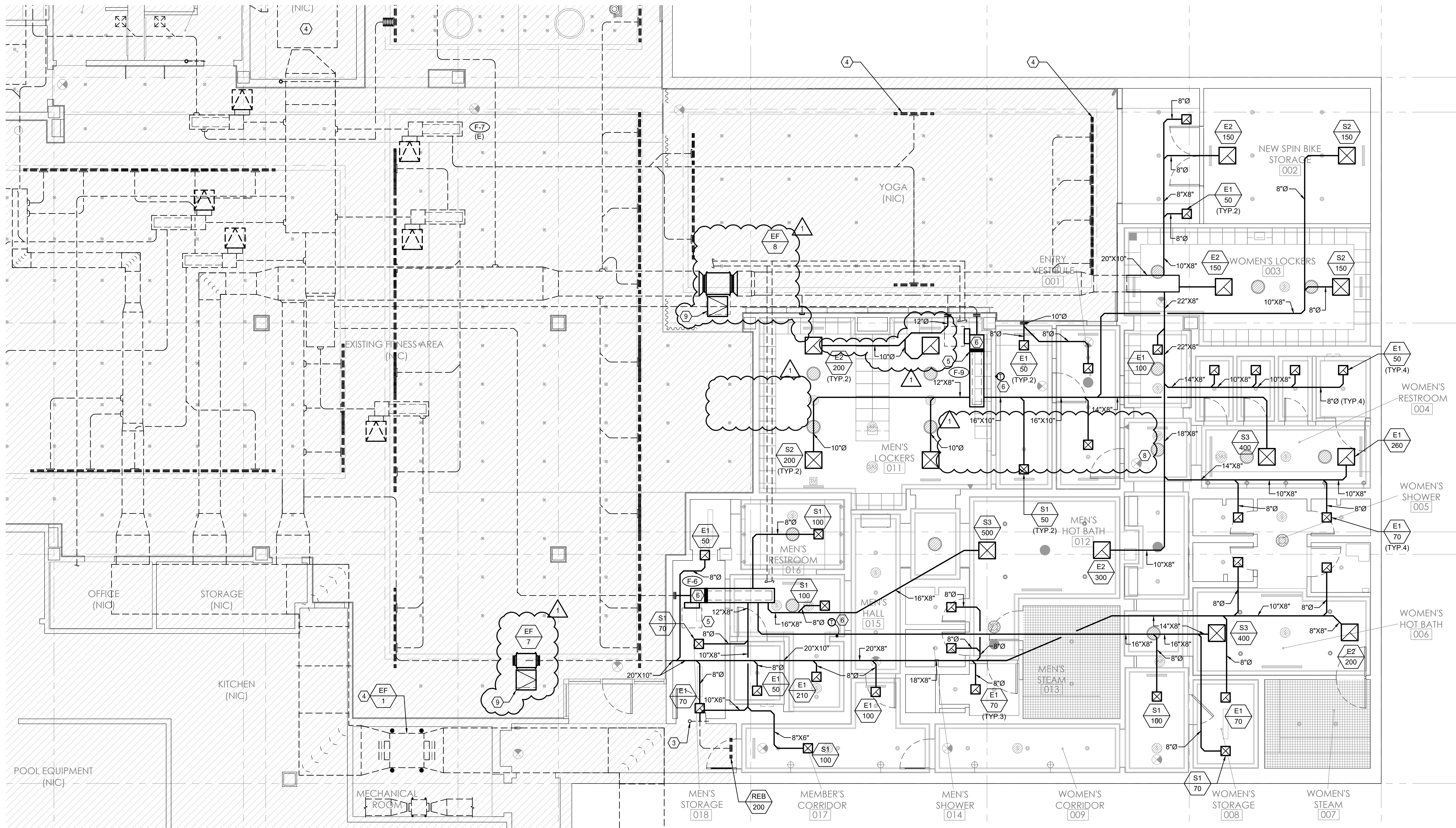
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MECHANICAL PLAN -
MEMBERS LOCKER AND
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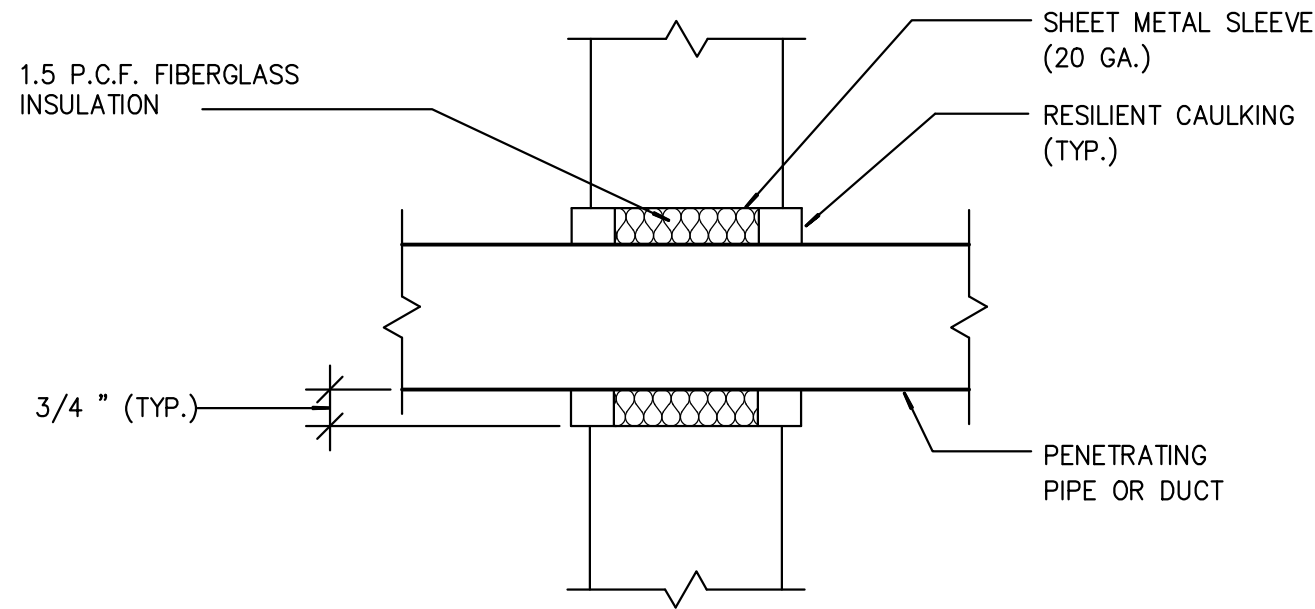
1 MECHANICAL PLAN - MEMBERS LOCKER AND LOUNGE
Scale: 3/16" = 1' - 0"

KEYED NOTES:

- REFER TO ARCHITECTURAL PLANS FOR EXACT DIFFUSER LOCATION. (TYP.)
- DIFFUSER SHALL BE ALUMINUM CONSTRUCTION FOR CORROSION RESISTANCE. SEE DIFFUSER SCHEDULE. (TYP. ALL AIR DISTRIBUTION)
- MAINTAIN ACCESS TO EXISTING SMOKE FIRE DAMPER.
- EXISTING EXHAUST FAN, EF-1, AND EXISTING AIR HANDLER, AH-1, AND ALL ASSOCIATED AIR DISTRIBUTION, COOLING COILS AND HEATING COILS SHALL BE REBALANCED TO THE APPLICABLE FLOW RATES INDICATED ON SHEETS M2.03 AND M2.01 OF THE FITNESS RENOVATION PACKAGED. FITNESS RENOVATION PACKAGE IS A PREVIOUSLY PERMITTED SET.
- MAINTAIN EXISTING ACCESS TO MECHANICAL EQUIPMENT.
- ADD/ ALTERNATE: REPLACE VAV BOX DDC CONTROLLER AND THERMOSTAT WITH NEW BUILDING STANDARD TYPE.
- 42\"X18\" EGGRATE GRILLE. FULL ALUMINUM CONSTRUCTION.
- 18\"X18\" EGGRATE GRILLE. FULL ALUMINUM CONSTRUCTION.
- GRPC ACCESS PANEL WITH A TAPED EDGE BY OTHERS.

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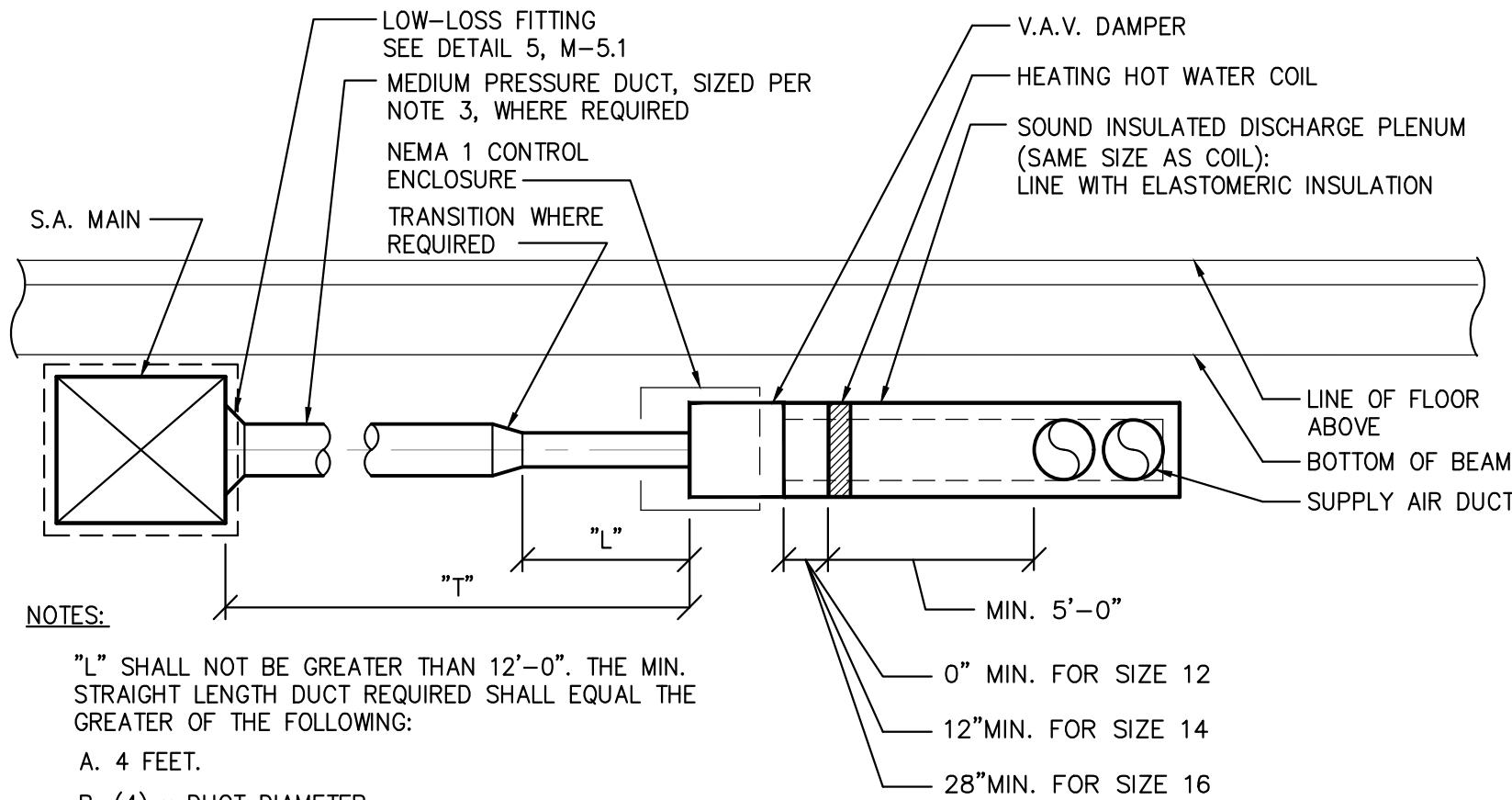


NOTE:

1. CENTER DUCT/PIPE IN OPENING AND KEEP SPACE CLEAR OF ANY FOREIGN MATERIAL.
2. PROVIDE AT ALL PENETRATIONS OF DUCTS/PIPES THROUGH FULL HEIGHT WALLS UNLESS NOTED OTHERWISE

DUCT/ PIPE THRU FULL HEIGHT WALL

SCALE	5
NONE	

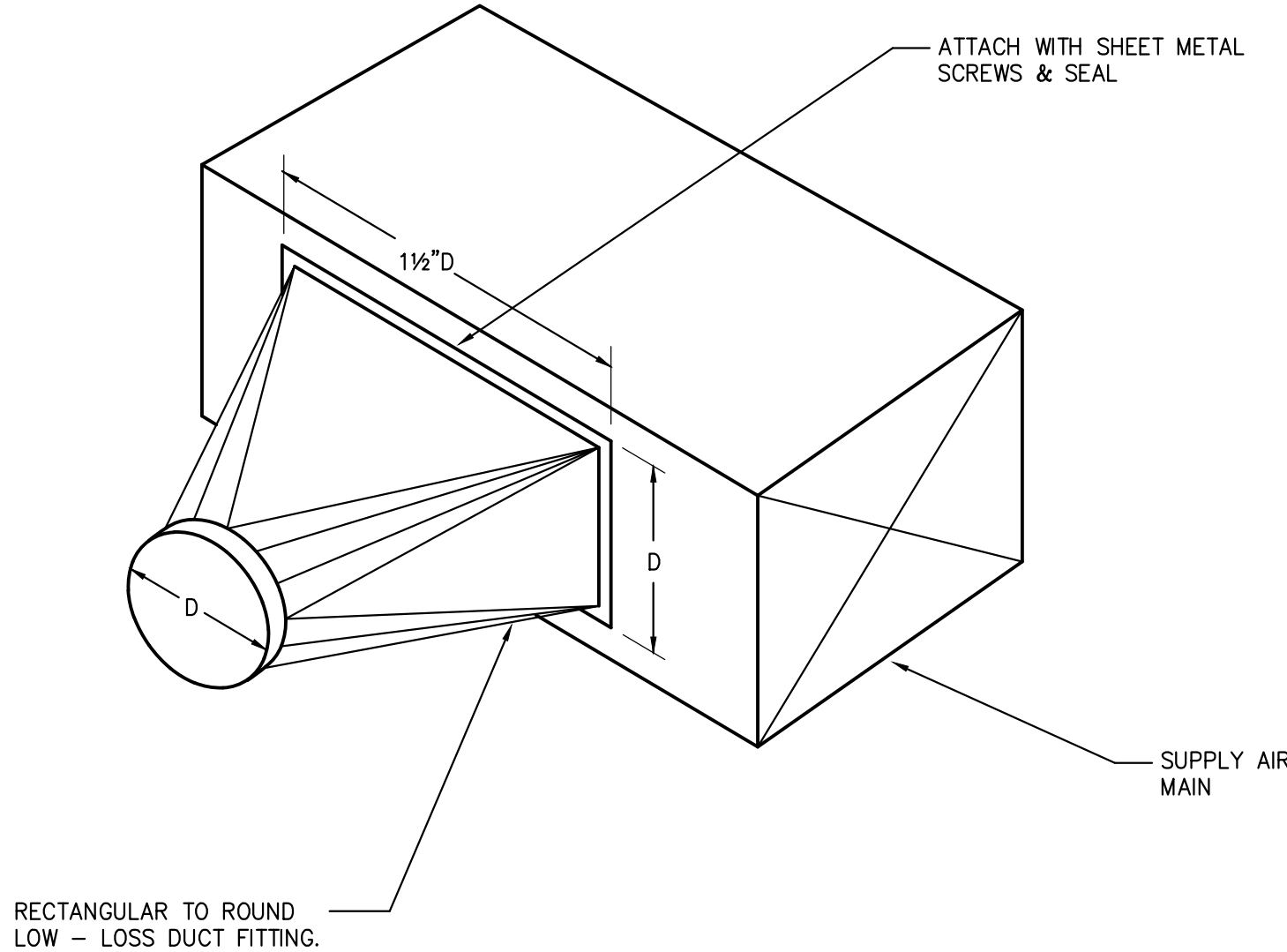


NOTES:

- "L" SHALL NOT BE GREATER THAN 12'-0". THE MIN. STRAIGHT LENGTH DUCT REQUIRED SHALL EQUAL THE GREATER OF THE FOLLOWING:
- A. 4 FEET.
 - B. (4) x DUCT DIAMETER.
 - C. V.A.V. BOX MANUFACTURER RECOMMENDATION.
- THE DUCT DIAMETER OF "L" SHALL EQUAL THE VAV BOX INLET SIZE.
- IF "T" IS GREATER THAN 12'-0", OR THERE ARE ELBOWS UPSTREAM OF THE VAV BOX INLET, THEN PROVIDE TAP-OFF OF SUPPLY AIR MAIN W/ DUCT DIAMETER EQUAL TO VAV BOX INLET SIZE PLUS 2", U.N.O.
4. THE CAV/VAV BOX ARRANGEMENT SHALL BE EASILY ACCESSIBLE FROM A SINGLE POINT OF CEILING ACCESS. THIS INCLUDES ACCESS TO THE DAMPER, DAMPER LINKAGE, DAMPER MOTOR, CONTROL ENCLOSURE, DISCONNECT SWITCH & HEATING COIL ARRANGEMENT IN ROOMS WHERE THE SUPPLY & RETURN BOXES ARE LOCATED ADJACENT TO ONE ANOTHER, ACCESS TO ALL COMPONENTS OF BOTH BOXES SHALL BE EASILY ACCESSIBLE FROM A SINGLE POINT OF CEILING ACCESS.

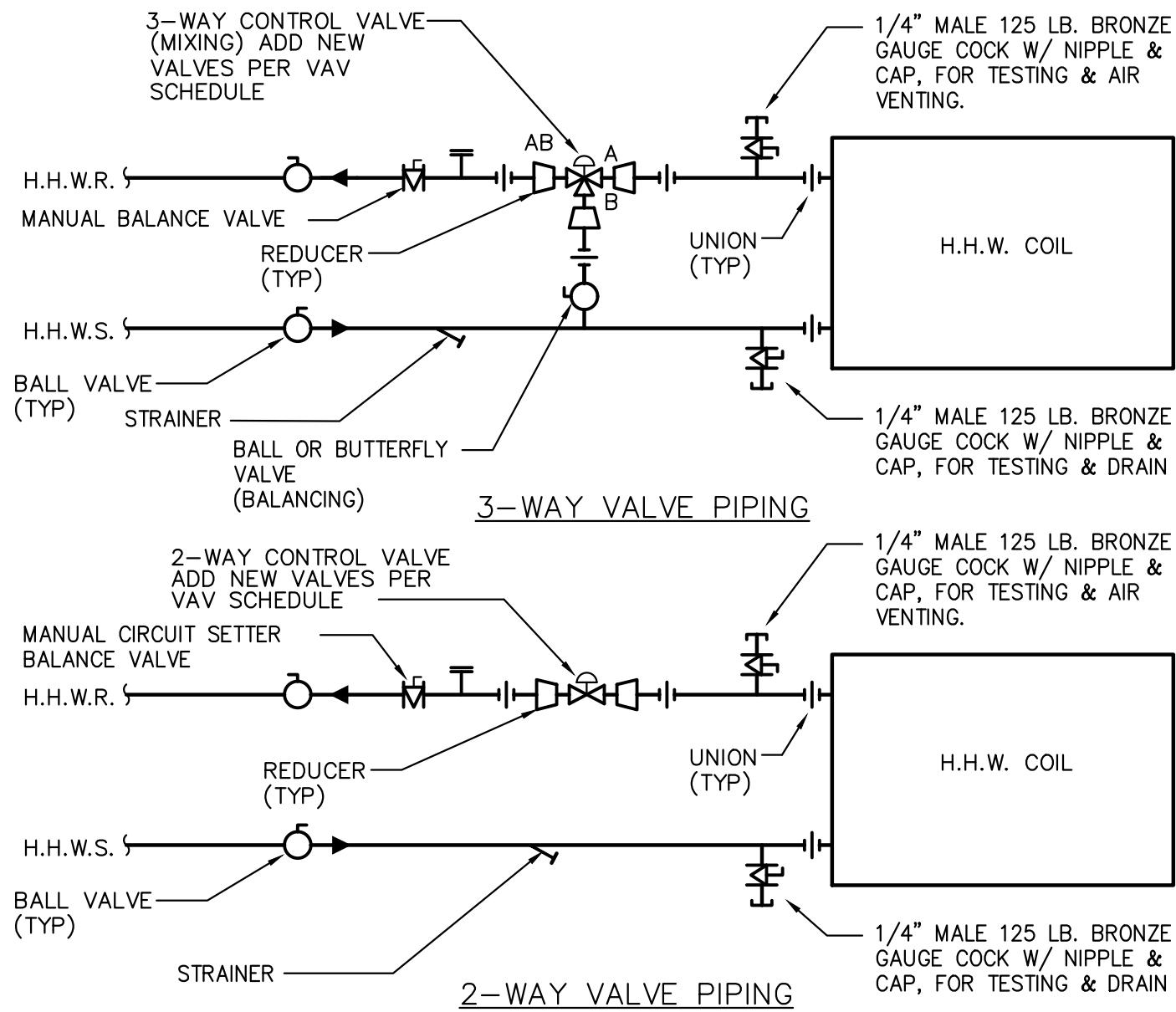
VAV BOX CONNECTION TO MAIN DUCT

SCALE	3
NONE	



LOW LOSS FITTING

SCALE	1
NONE	

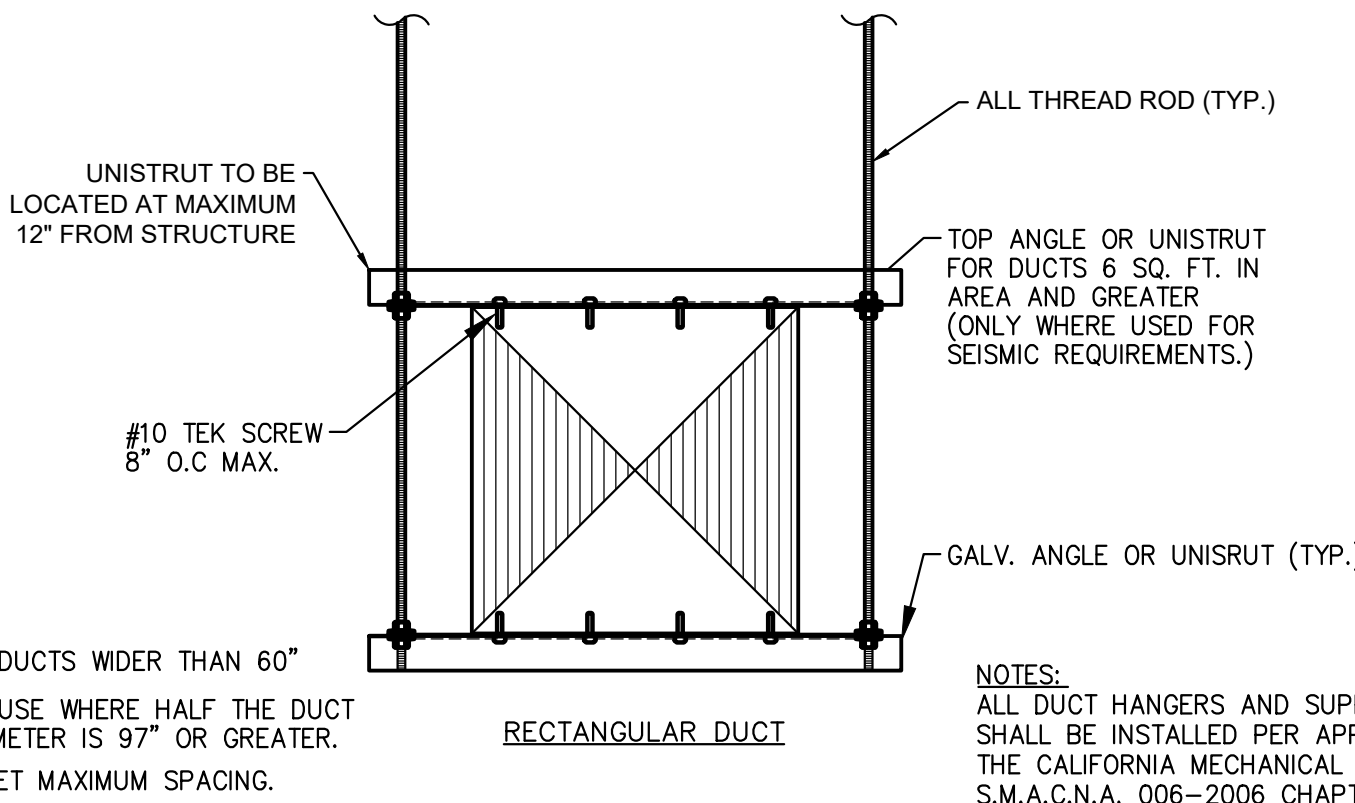


NOTES:

1. PROVIDE NEW VALVES PER VAV BOX SCHEDULE AND NEW APPURTENANCES WHERE REQUIRED.

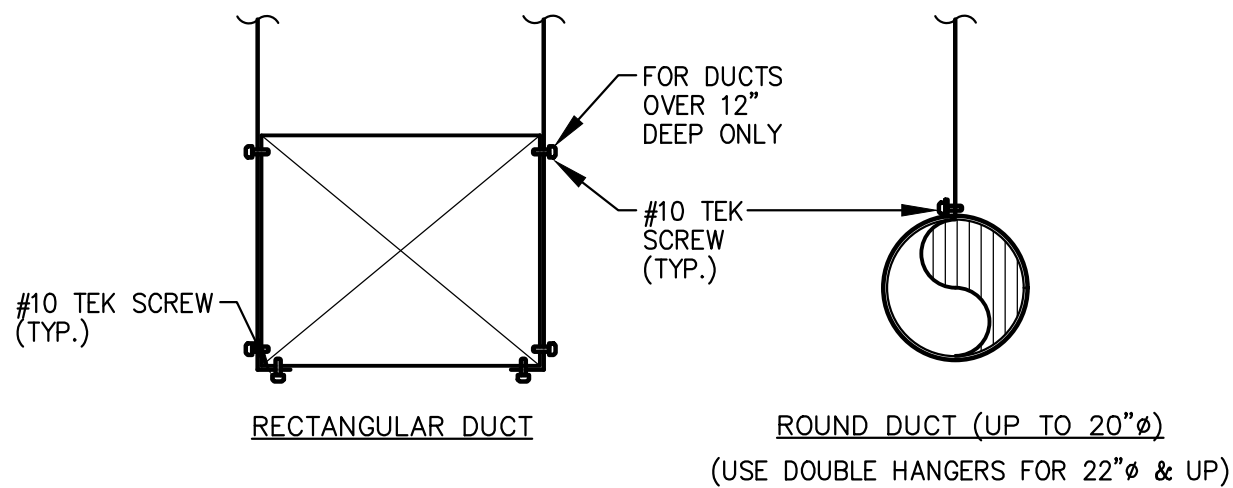
HEATING HOT WATER PIPING

SCALE	6
NONE	



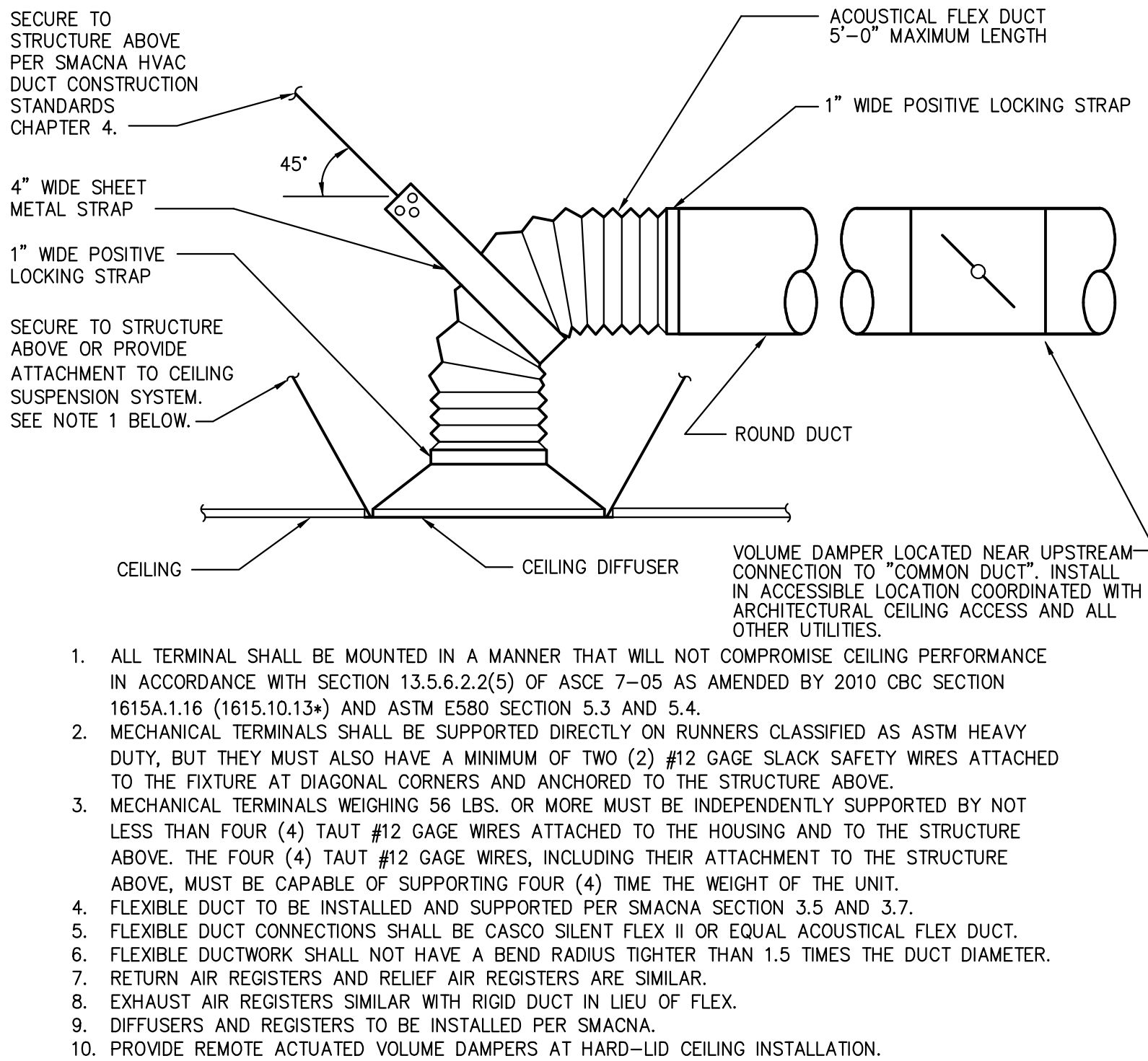
NOTES:

1. FOR DUCTS WIDER THAN 60"
 2. FOR USE WHERE HALF THE DUCT PERIMETER IS 97" OR GREATER.
 3. 8 FEET MAXIMUM SPACING.
- NOTES: ALL DUCT HANGERS AND SUPPORTS SHALL BE INSTALLED PER APPENDIX A OF THE CALIFORNIA MECHANICAL CODE AND S.M.A.C.N.A. 006-2006 CHAPTER 5.



DUCT SUPPORT DETAIL

SCALE	4
NONE	



1. ALL TERMINAL SHALL BE MOUNTED IN A MANNER THAT WILL NOT COMPROMISE CEILING PERFORMANCE IN ACCORDANCE WITH SECTION 13.5.6.2.2(5) OF ASCE 7-05 AS AMENDED BY 2010 CBC SECTION 1615A.1.16 (1615.10.13+) AND ASTM E580 SECTION 5.3 AND 5.4.
2. MECHANICAL TERMINALS SHALL BE SUPPORTED DIRECTLY ON RUNNERS CLASSIFIED AS ASTM HEAVY DUTY, BUT THEY MUST ALSO HAVE A MINIMUM OF TWO (2) #12 GAGE SLACK SAFETY WIRES ATTACHED TO THE FIXTURE AT DIAGONAL CORNERS AND ANCHORED TO THE STRUCTURE ABOVE.
3. MECHANICAL TERMINALS WEIGHING 56 LBS. OR MORE MUST BE INDEPENDENTLY SUPPORTED BY NOT LESS THAN FOUR (4) TAUT #12 GAGE WIRES ATTACHED TO THE HOUSING AND TO THE STRUCTURE ABOVE. THE FOUR (4) TAUT #12 GAGE WIRES, INCLUDING THEIR ATTACHMENT TO THE STRUCTURE ABOVE, MUST BE CAPABLE OF SUPPORTING FOUR (4) TIME THE WEIGHT OF THE UNIT.
4. FLEXIBLE DUCT TO BE INSTALLED AND SUPPORTED PER SMACNA SECTION 3.5 AND 3.7.
5. FLEXIBLE DUCT CONNECTIONS SHALL BE CASCO SILENT FLEX II OR EQUAL ACOUSTICAL FLEX DUCT.
6. FLEXIBLE DUCTWORK SHALL NOT HAVE A BEND RADIUS TIGHTER THAN 1.5 TIMES THE DUCT DIAMETER.
7. RETURN AIR REGISTERS AND RELIEF AIR REGISTERS ARE SIMILAR.
8. EXHAUST AIR REGISTERS SIMILAR WITH RIGID DUCT IN LIEU OF FLEX.
9. DIFFUSERS AND REGISTERS TO BE INSTALLED PER SMACNA.
10. PROVIDE REMOTE ACTUATED VOLUME DAMPERS AT HARD-LID CEILING INSTALLATION.

CEILING DIFFUSER

SCALE	2
NONE	

HOTEL DEL CORONADO.

Fitness Members Area Renovation

1500 Orange Avenue
Coronado, CA 92118



González Architects
Hospitality

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Mechanical Lead - Kenneth McClendon
tk1sc Job #: 2019-0727



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No.	Date	Description
09-17-21	Permit Set	
01-05-22	Owner Revisions	

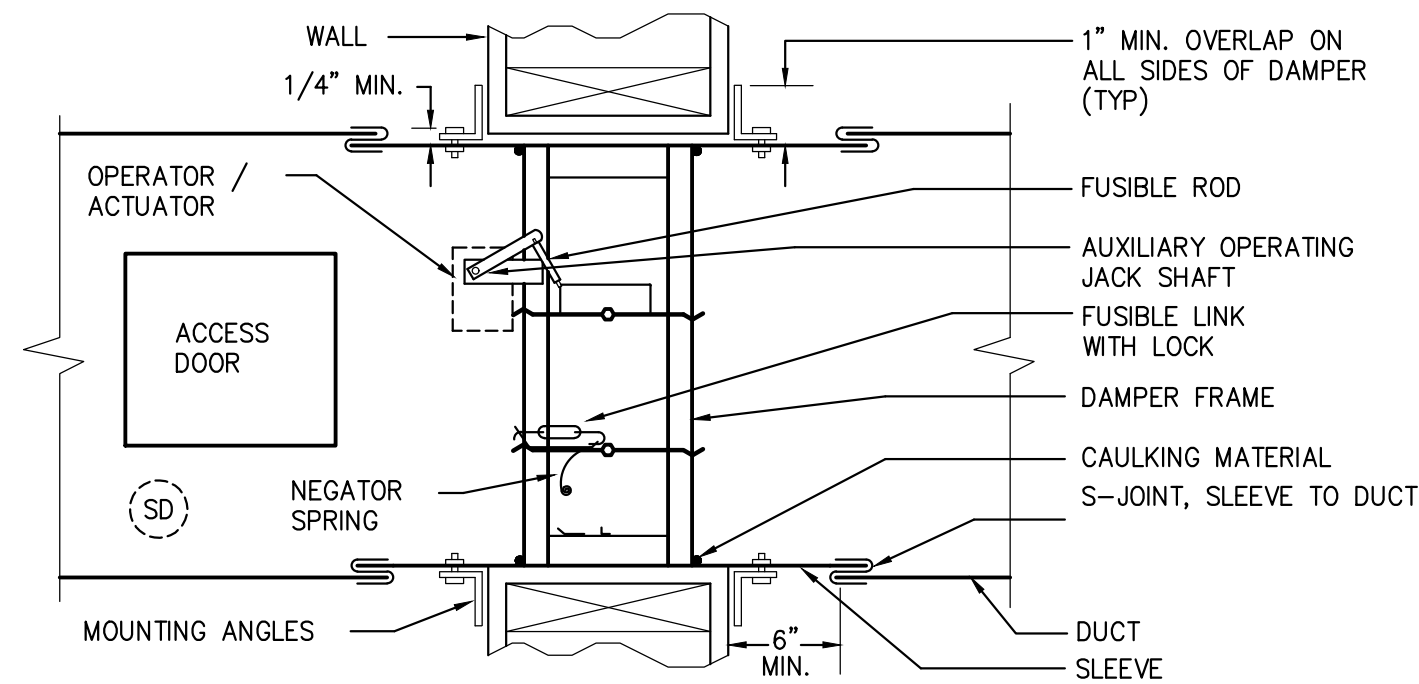
Drawing Title

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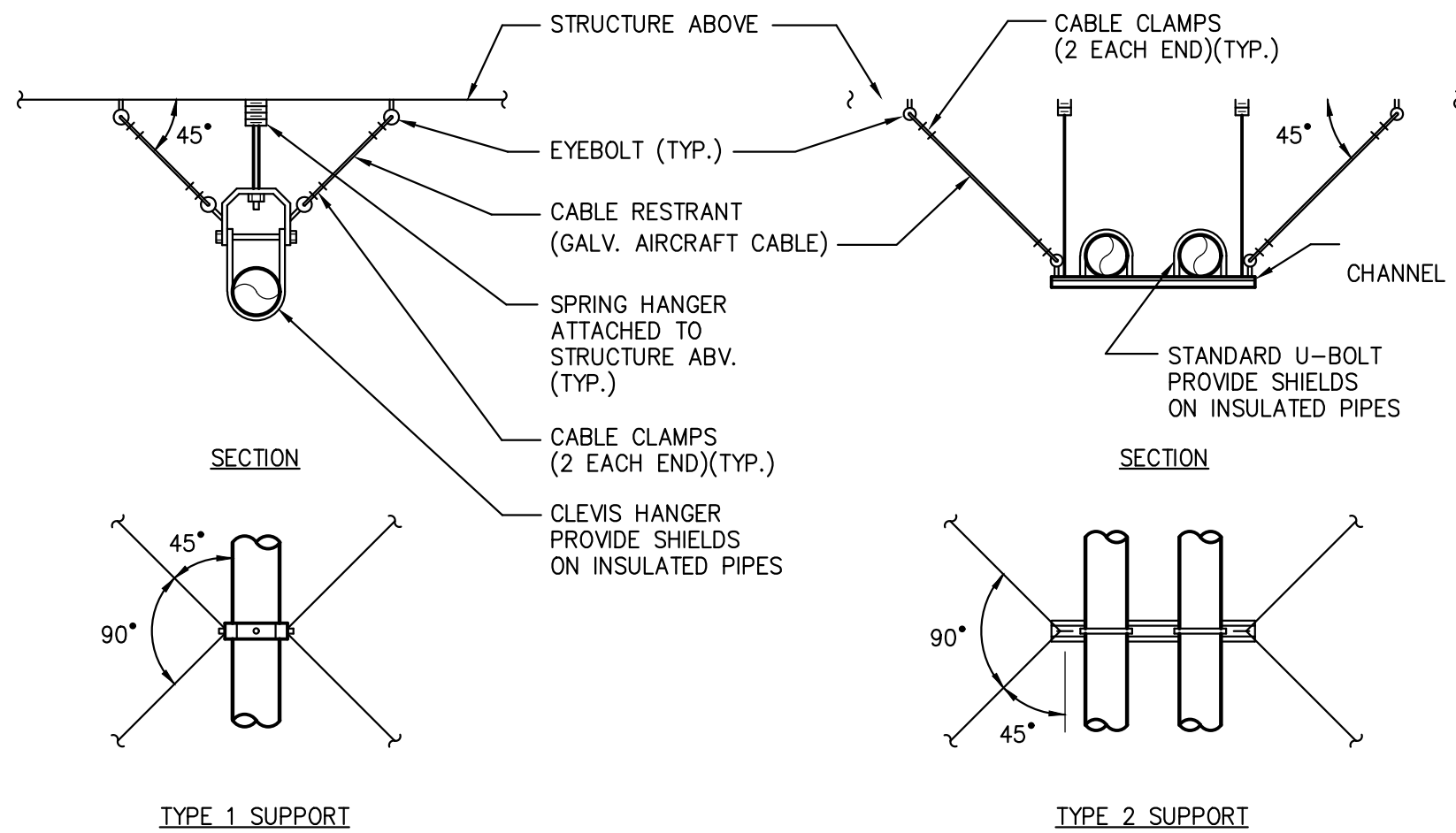
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Date	09-17-2021
Drawn By	RS
Project No.	19022
Drawing No.	PC

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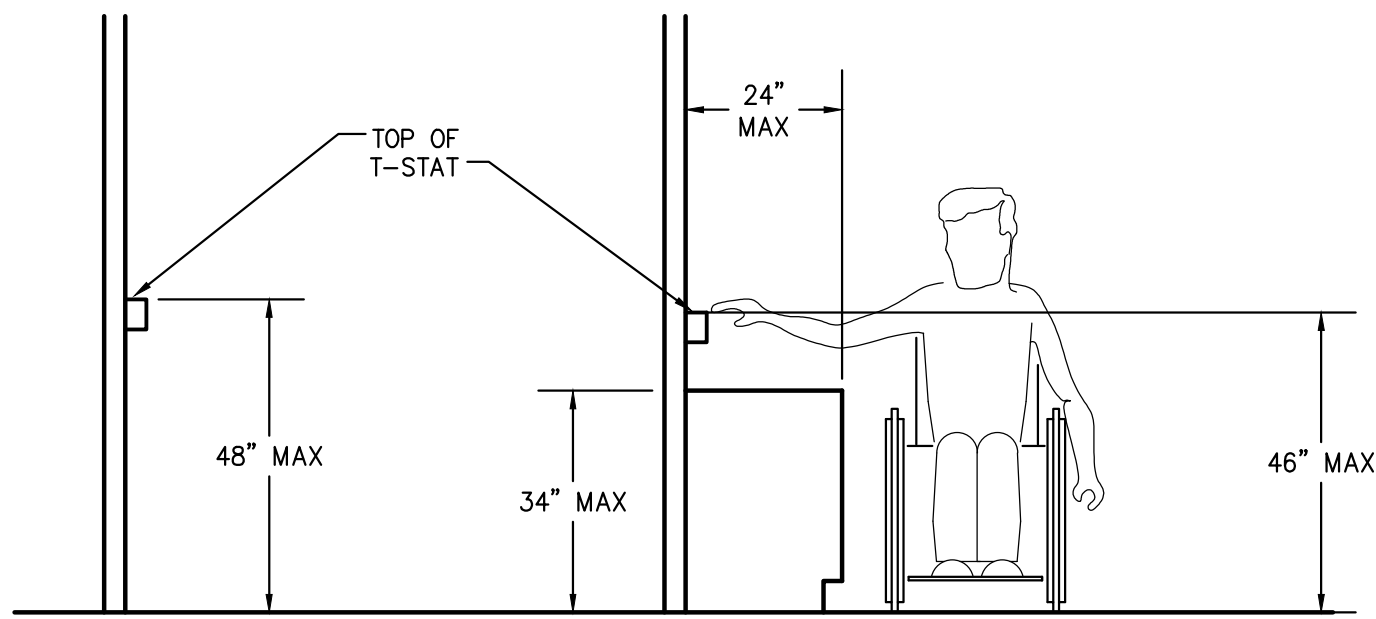
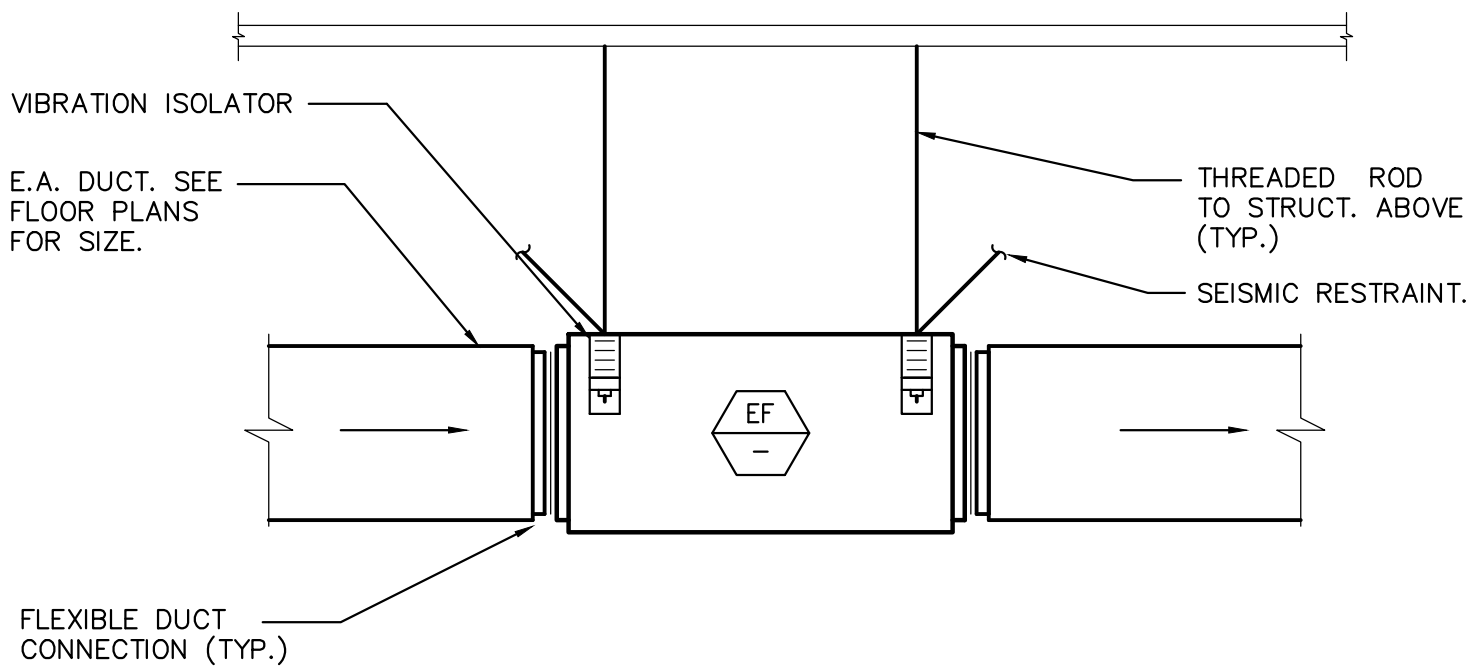
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- COMBINATION SMOKE & FIRE DAMPER NOTES:
1. MOUNTING ANGLES SHALL BE 1-1/2 IN. x 1-1/2 IN x 16 GAGE MIN FASTENED WITH NO. 10 SCREWS 8 IN. ON CENTER
 2. ACCESS DOORS SHALL BE PROVIDED IN DUCT AND SHALL BE OF ADEQUATE SIZE AND LOCATION TO PERMIT MAINTENANCE & RESETING OF DAMPER.
 3. SMOKE FIRE DAMPER DETAIL FOR REFERENCE ONLY.
 4. SMOKE FIRE DAMPERS SHALL BE STATE FIRE MARSHALL APPROVED AND INSTALLED IN COMPLIANCE WITH TITLE 24, C.C.R. STANDARD 12-43-2 AND STRICT PER MANUFACTURERS PRINTED INSTRUCTIONS.
 5. MANUFACTURER'S INSTALLATION INSTRUCTIONS SHALL BE MADE AVAILABLE TO INSPECTING AUTHORITIES.
 6. FLANGES AND RETAINING ANGLES SHALL OVERLAP FRAMEWORK OF OPENING BY A MIN. OF 1".
 7. SECURE FIRE DAMPER TO SLEVE WITH 1" BOLT, MAX. SPACING 12" O.C. BEGIN FROM EACH CORNER.
 8. INTERIOR OF OPENINGS LINED WITH U.L. LISTED MATERIAL OF SAME FIRE RESISTIVE RATING AS WALL.
 9. COORDINATE 120V/1PH POWER AND FLS INTEGRATION WITH ELECTRICAL.



- NOTES:
1. CABLE SIZE IS DETERMINED ASSUMING TOTAL LOAD ON ONE CABLE .
 2. ANCHOR BOLTS ARE KWK-BOLT CONCRETE INSERTS (OR EQUAL)
 3. BOLT SIZE IS DETERMINED ASSUMING TOTAL LOAD ON ONE BOLT OR BOLT GROUP .
 4. SIZES SHOWN ARE MINIMUM .
 5. CABLE TO BE SLACK & ALLOW 1/4" MOVEMENT BEFORE BECOMING TAUT .
 6. TRAPEZE CHANNELS REQUIRE WEB STIFFENERS 1/4" MINIMUM .
 7. SUPPORTS TO BE CONSTRUCTED PER SMACNA STANDARDS.



- NOTES:
1. PROVIDE ALTERNATE PRICING TO REPLACE NON-WHITE COLOR THERMOSTAT COVERS WITH WHITE. THIS SHOULD BE PRICED SEPARATELY FOR ICOP CONSIDERATION. IF ALTERNATE IS ACCEPTED, CONTRACTOR TO PROCEED WITH REPLACEMENT OF ALL NON-WHITE COLOR THERMOSTAT COVERS WITH WHITE WITHIN SCOPE OF WORK.
 2. PRIOR TO ROUGH-IN OF THERMOSTATS, CONTRACTOR SHALL PROVIDE DIMENSIONED SHOP DRAWINGS SHOWING ALL WALL DEVICES TO ARCHITECT FOR COORDINATION WITH FURNITURE LAYOUT.
 3. ALL CONTROL DEVICES SHALL MATCH IN COLOR.
 4. THERMOSTATS ON EXTERIOR WALLS/ COLUMN COVERS SHALL BE PROVIDED WITH INSULATED BACKING TO PREVENT FALSE READINGS.
 5. UPON PROJECT COMPLETION, CALIBRATE THERMOSTATS AND ENSURE ACCURACY AND REPEATABILITY.
 - A. PNEUMATIC THERMOSTATS: INSPECT PNEUMATIC TUBING AND INFORM ENGINEER / LANDLORD OF NEED FOR REPLACEMENT. SPLICING OF TUBING IS UNACCEPTABLE.
 - B. DDC THERMOSTATS: INSPECT CONDITION AND ROUTING OF CONTROL WIRING. CONTROL WIRING TO BE ROUTED TIGHT TO STRUCTURE. CONFIRM ALL THERMOSTATS ARE COMMUNICATING TO CONTROL SYSTEM.

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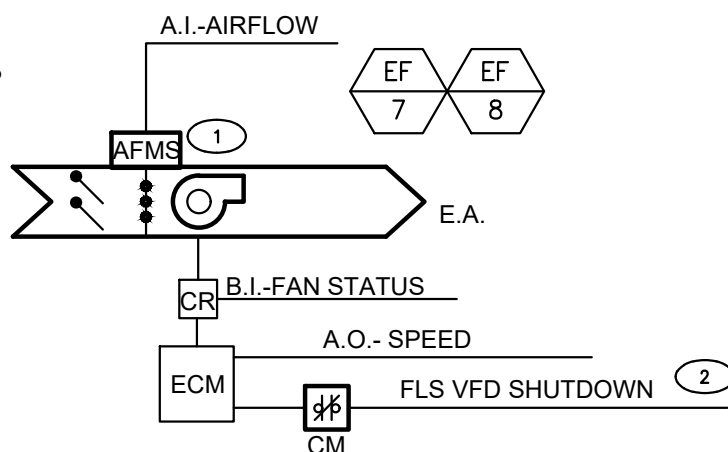
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KEYNOTES:

- 1 AIR FLOW SHALL BE MONITORED WITH A KELE FXP SERIES DIFFERENTIAL PRESSURE AIR VELOCITY SENSOR AND A SENTRA M264 SERIES DIFFERENTIAL PRESSURE TRANSMITTER.
- 2 THE EXHAUST FAN SHALL BE SHUT DOWN THROUGH THE FIRE ALARM SYSTEM UPON DETECTION OF SMOKE. THE SUPPLY AIR SMOKE DETECTOR OR AREA SMOKE DETECTION SYSTEM SHALL BE HARD-WIRED TO A FIRE ALARM RELAY INTERRUPTING POWER AT EXHAUST FAN. COORDINATE METHOD AND ALL REQUIREMENTS WITH DESIGN-BUILD FIRE ALARM CONTRACTOR

GENERAL NOTES:

1. UNLESS OTHERWISE NOTED, ALL SENSORS AND CONTROL DEVICES ARE FURNISHED AND FIELD INSTALLED BY THE BAS CONTRACTOR.



EXHAUST FANS - BUILDING EXHAUST
UNLESS OTHERWISE NOTED, ALL SETPOINTS ARE ADJUSTABLE.

RUN CONDITIONS: INTERLOCKED. FANS SHALL RUN WHEN EXISTING EF-1 RUNS.

EXHAUST AIRFLOW CONTROL (CONSTANT VOLUME): THE CONTROLLER SHALL MEASURE THE EXHAUST FAN AIRFLOW.

THE FAN SHALL RUN TO MAINTAIN THE CFM INDICATED ON THE M0.03 EQUIPMENT SCHEDULES.

FAN:
THE FAN SHALL HAVE A USER DEFINABLE MINIMUM RUNTIME OF 60 MINUTES.

FAN STATUS:
THE CONTROLLER SHALL MONITOR THE FAN STATUS.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- FAN FAILURE
ALARM CONDITION: FAN IS COMMANDED ON, BUT THE STATUS IS OFF FOR MORE THAN 1 MINUTE.
RETURN-TO-NORMAL CONDITION: THE ALARM SHALL AUTOMATICALLY CLEAR WHEN THE FAN STATUS MATCHES THE COMMAND FOR MORE THAN 1 MINUTE.

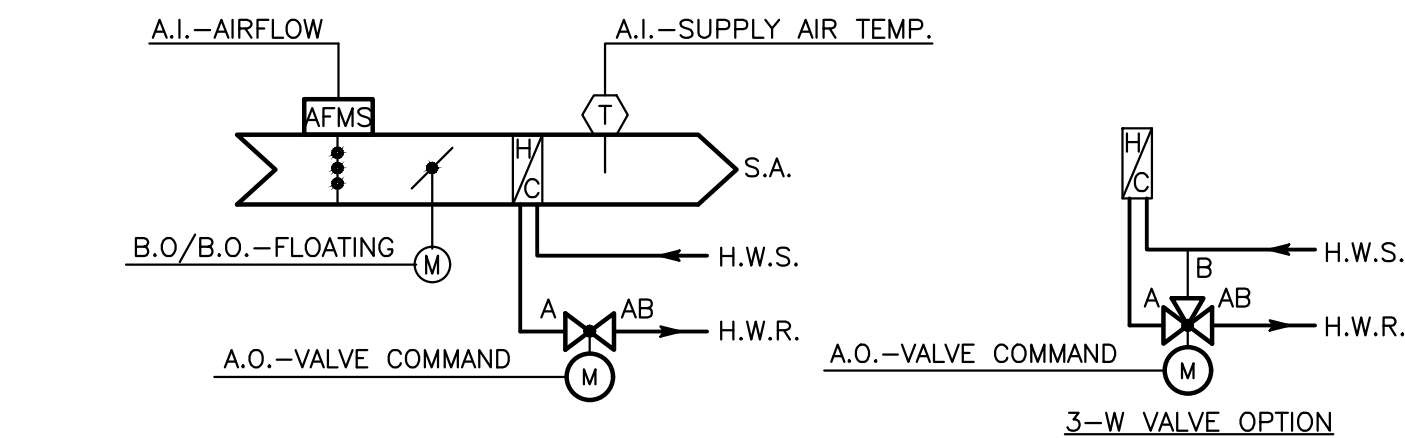
- FAN IN HAND ALARM CONDITION: FAN IS COMMANDED OFF, BUT THE STATUS IS ON FOR MORE THAN 1 MINUTE.
RETURN-TO-NORMAL CONDITION: THE ALARM SHALL AUTOMATICALLY CLEAR WHEN THE FAN STATUS MATCHES THE COMMAND FOR MORE THAN 1 MINUTE.
- EXHAUST FAN VFD FAULT
ALARM CONDITION: VFD FAULT IS ACTIVE FOR MORE THAN 1 MINUTE.
RETURN TO NORMAL CONDITION: THE ALARM SHALL AUTOMATICALLY CLEAR WHEN THE VFD FAULT IS NOT ACTIVE FOR MORE THAN 1 MINUTE.

EXHAUST FAN

SCALE

NONE

2



B.I.-ZONE OVERRIDE
A.I.-ZONE SETPOINT
A.I.-ZONE TEMP.

B.I.-OCCUPANCY SENSOR
BACnet POINT

CAV BOX COOLING AND HEATING:

UNLESS OTHERWISE SPECIFIED, ALL SETPOINTS, TIME PARAMETERS, AND SETPOINT RESET PARAMETERS ARE ADJUSTABLE. THE FOLLOWING SETPOINTS ARE RECOMMENDED VALUES. VALUES SHALL BE FIELD ADJUSTED DURING THE STARTUP AND TUNING PERIOD TO MEET THE REQUIREMENTS OF ACTUAL FIELD CONDITIONS THROUGHOUT THE YEAR.

RUN CONDITIONS - SCHEDULED:

THE UNIT SHALL RUN ACCORDING TO A USER DEFINABLE TIME SCHEDULE IN THE FOLLOWING MODES:

OCCUPIED MODE: THE UNIT SHALL MAINTAIN

- A 75°F COOLING SETPOINT
- A 70°F HEATING SETPOINT
- A DEADBAND OF 5°F BETWEEN COOLING AND HEATING.

STANDBY MODE: THE UNIT SHALL MAINTAIN:

- A 78°F COOLING SETPOINT
- A 68°F HEATING SETPOINT

UNOCCUPIED MODE (NIGHT SETBACK): THE UNIT SHALL MAINTAIN

- A 85°F COOLING SETPOINT
- A 55°F HEATING SETPOINT

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- HIGH ZONE TEMPERATURE: THE ZONE TEMPERATURE IS GREATER THAN THE COOLING SETPOINT BY 5°F FOR 10 MINUTES. THE ALARM SHALL AUTOMATICALLY CLEAR WHEN THE ZONE TEMPERATURE RETURNS BELOW THE ALARM THRESHOLD FOR 5 MINUTES.
- LOW ZONE TEMPERATURE: THE ZONE TEMPERATURE IS LESS THAN THE HEATING SETPOINT BY 5°F FOR 10 MINUTES. THE ALARM SHALL AUTOMATICALLY CLEAR WHEN THE ZONE TEMPERATURE RETURNS ABOVE THE ALARM THRESHOLD FOR 5 MINUTES.

TIME OF DAY SCHEDULE:

OCCUPIED MODE SHALL BE INITIATED UPON A START REQUEST FROM A CAV BOX.

ZONE LEVEL OPTIMAL START [TITLE 24 SECTION 120.2(k)]:

AN ADAPTIVE ZONE LEVEL OPTIMAL START ALGORITHM SHALL BE USED TO MINIMIZE THE ENERGY REQUIRED AND WARM-UP OR COOL-DOWN TIME DURING THE UNOCCUPIED PERIOD, NECESSARY TO ACHIEVE ZONE OCCUPIED TEMPERATURE SETPOINTS BY THE START OF SCHEDULED OCCUPIED PERIOD. THE LEARNING ADAPTIVE ALGORITHM SHALL COMPARE THE ZONE TEMPERATURE TO ITS SETPOINT AT BEGINNING OF SCHEDULED OCCUPIED PERIOD AND SHALL AUTOMATICALLY ADAPT THE HEATING OR COOLING RESPONSE TIME FOR THE NEXT UNOCCUPIED PERIOD.

STANDBY MODE - OCCUPANCY SENSING ZONE CONTROLS (WHERE NOTED ON FLOOR PLANS) [TITLE 24 SECTION 120.2(e)(3)]:
DURING OCCUPIED HOURS, THE CONTROLLER SHALL MONITOR THE ZONE OCCUPANCY.

WHEN ALL ROOM(S) SERVED BY THE ZONE ARE UNOCCUPIED FOR 5 MINUTES, THE UNIT SHALL BE PLACED IN STANDBY MODE:

- THE UNIT SHALL MAINTAIN THE STANDBY MODE COOLING AND HEATING SETPOINTS.
- WHEN THE ZONE TEMPERATURE IS BETWEEN THE STANDBY COOLING AND HEATING SETPOINTS, THE DAMPER SHALL MODULATE CLOSED.
- WHEN OCCUPANCY IS DETECTED IN ANY OF THE ROOM(S) FOR 60 SECONDS, THE ZONE SHALL RETURN TO OCCUPIED MODE.

ZONE SETPOINT ADJUST:

THE OCCUPANT SHALL BE ABLE TO ADJUST THE ZONE TEMPERATURE HEATING AND COOLING SETPOINTS AT THE ZONE SENSOR. THE RANGE OF ADJUSTMENT SHALL BE +/- 2°F.

ZONE UNOCCUPIED OVERRIDE [TITLE 24 SECTION 120.2(e)(1)]:

A TIMED LOCAL OVERRIDE CONTROL SHALL ALLOW AN OCCUPANT TO OVERRIDE THE SCHEDULE AND PLACE THE UNIT INTO AN OCCUPIED MODE FOR A 60 MINUTE PERIOD OF TIME. AT THE EXPIRATION OF THIS TIME, CONTROL OF THE UNIT SHALL AUTOMATICALLY RETURN TO THE SCHEDULE.

CONSTANT VOLUME TERMINAL UNIT - AIR FLOW AND TEMPERATURE CONTROL:

THE CONTROLLER SHALL MEASURE THE AIRFLOW AND MODULATE THE ZONE DAMPER TO MAINTAIN A CONSTANT AIRFLOW SETPOINT. WHEN ZONE TEMPERATURE IS LESS THAN ITS HEATING SETPOINT, THE CONTROLLER SHALL ENABLE HEATING TO MAINTAIN THE ZONE TEMPERATURE AT ITS HEATING SETPOINT.

REHEATING - HIGH DISCHARGE AIR TEMPERATURE LIMIT:

THE CONTROLLER SHALL MEASURE THE SUPPLY AIR TEMPERATURE AND LIMIT THE SUPPLY AIR TEMPERATURE TO A MAXIMUM PER THE CAV SCHEDULE.

- THE REHEAT VALVE SHALL MODULATE TO SATISFY THE SUPPLY AIR TEMPERATURE SETPOINT UNTIL THE MAXIMUM CAV BOX SUPPLY AIR TEMPERATURE IS REACHED.

SUPPLY AIR TEMPERATURE MONITORING:

THE CONTROLLER SHALL MONITOR THE SUPPLY AIR TEMPERATURE.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- HIGH SUPPLY AIR TEMP: THE SUPPLY AIR TEMPERATURE IS GREATER THAN 105°F FOR 10 MINUTES. THE ALARM SHALL AUTOMATICALLY CLEAR WHEN THE SUPPLY AIR TEMPERATURE RETURNS BELOW THE ALARM THRESHOLD FOR 5 MINUTES.
- LOW SUPPLY AIR TEMP: THE SUPPLY AIR TEMPERATURE IS LESS THAN 45°F FOR 10 MINUTES. THE ALARM SHALL AUTOMATICALLY CLEAR WHEN THE SUPPLY AIR TEMPERATURE RETURNS ABOVE THE ALARM THRESHOLD FOR 5 MINUTES.

COOLING SUPPLY AIR TEMPERATURE RESET REQUESTS:

THE CONTROLLER SHALL MONITOR THE ZONE TEMPERATURE. COOLING SUPPLY AIR TEMPERATURE RESET REQUESTS SHALL BE SENT ACCORDING TO THE FOLLOWING:

- IF THE COOLING LOOP SIGNAL IS LESS THAN 85%, SEND 0 COOLING SUPPLY AIR TEMPERATURE RESET REQUESTS.
- IF THE COOLING LOOP SIGNAL IS GREATER THAN 95%, SEND 1 COOLING SUPPLY AIR TEMPERATURE RESET REQUEST.
- IF THE ZONE TEMPERATURE EXCEEDS THE ZONE COOLING SETPOINT BY 2°F FOR 2 MINUTES, SEND 2 COOLING SUPPLY AIR TEMPERATURE RESET REQUESTS.
- IF THE ZONE TEMPERATURE EXCEEDS THE ZONE SETPOINT BY 3°F FOR 2 MINUTES, SEND 3 COOLING SUPPLY AIR TEMPERATURE RESET REQUESTS.

CONSTANT AIR VOLUME BOX W/ HW REHEAT

SCALE

NONE

2

LEGEND & SYMBOLS

SCALE

NONE

1

SYMBOL

DESCRIPTION

AFMS

AIR FLOW MEASURING STATION

C/C

COOLING COIL

H/C

HEATING COIL

CR

CURRENT SENSING RELAY OR
TRANSMITTER

CO2

CO2 SENSOR - DUCT MOUNTED

CO2

CO2 TRANSMITTER - WALL

DP

DIFFERENTIAL PRESSURE SWITCH
OR TRANSMITTER - FILTER

DP

DIFFERENTIAL PRESSURE SWITCH
OR TRANSMITTER -DUCT

DP

DIFFERENTIAL PRESSURE
TRANSMITTER - BUILDING

H

HUMIDITY TRANSMITTER - WALL

H

HUMIDITY SWITCH

OS

OCCUPANCY SENSOR - WALL

E

FURNISHED AND INSTALLED BY
ELECTRICAL

SD

SMOKE DETECTOR

T

TEMPERATURE SENSOR - WALL

T

TEMPERATURE SENSOR - DUCT

T

TEMPERATURE SENSOR -
AVERAGING

T

TEMPERATURE SENSOR - OUTDOOR
AIR

T

TEMPERATURE SENSOR - PIPE

M

BUTTERFLY VALVE WITH ACTUATOR

A

2-WAY VALVE WITH ACTUATOR

M

3-WAY MIXING VALVE WITH
ACTUATOR

M

3-WAY DIVERTING VALVE WITH
ACTUATOR

M

ANALOG INPUT

B.I.

BINARY INPUT

A.O.

ANALOG OUTPUT

B.O.

BINARY OUTPUT

BN

BUILDING NETWORK CONTROLLER

VAV

VAV CONTROLLER

AAC

ADVANCED APPLICATION CONTROLLER

ASC

APPLICATION SPECIFIC CONTROLLER

MS/TP

MANUFACTURER'S BACNET INTERFACE

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WIRING & CONTROLS

Scale As Noted

Date 09-17-2021

Drawn By RS

Project No. 19022

Drawing No. PC

M6.01

PART 1-GENERAL

1.01 GENERAL CONDITIONS

- A. General Description:
- Air conditioning for indicated area complete with supply ducts, return air ducts, air distribution equipment and controls.
 - Air conditioning units complete with required supply fans, cooling coils, filters, ductwork, diffusers, grilles, dampers, controls and other items herein specified.
 - Ventilation of miscellaneous rooms with exhaust fans, ducting and controls.
 - Removal of existing ductwork and piping as indicated on the drawings.

1.02 RELATED WORK INCLUDED IN THIS SECTION

- A. Furnish electrical devices necessary for mechanical work, except disconnects unless indicated otherwise.
- B. Line and low voltage wiring for mechanical controls including final connections.
- C. Conduit for line and low voltage wiring for mechanical controls.
- D. Responsibility for obtaining clarification of discrepancies between mechanical and electrical work prior to proceeding with the work.
- E. Responsibility for proper operation of automatic pneumatic/electric controls and equipment and of electric power driven equipment furnished under this section.
- F. Miscellaneous steel for ducts and pipes hangers and supports including structural calculations prepared by a California licensed Structural Engineer.

1.03 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Concrete work including miscellaneous metal in connection with pits, trenches and catch basins with foundations or concrete pads under rooftop package units, boiler units, pump and other mechanical equipment. Templates for spacing and sizes of concrete pads and anchor bolts under this section.
- B. Electrical work as follows will be provided Electrical contract scope:
- Conduit for line wiring for equipment and devices as indicated or specified except conduit for line and low voltage wiring for mechanical controls as specified under Division 26.
 - Line wiring for equipment and devices as indicated or specified herein except line and low voltage wiring for mechanical controls as specified under Division 26.
 - Providing disconnect switches.
 - Installing electrical devices such as starters and disconnects, and when indicated, furnishing all such devices.
- C. Building Management and Control System Temperature Controls.

1.04 QUALITY ASSURANCE

- A. Codes and Standards: In addition to the requirements of all governing codes, ordinances and agencies, conform to the requirements of the following codes and standards:
- Applicable City regulations and ordinances
 - California Building Code, 2019 Edition
 - California Mechanical Code, 2019 Edition
 - The California Code of Regulations (CCR) Title 24, 2019.
 - Health and Safety Code, State of California
 - National Board of Fire Underwriters Publications:
 - Pamphlet # 70 National Electrical Code
 - Pamphlet # 90A Air Conditioning Systems

1.05 SUBMITTALS

- A. Shop Drawings: Before any of the materials of this Section are delivered at the jobsite, submit complete shop drawings. Show all details of all ductwork, piping and equipment pads. The shop drawings shall represent a coordinated set of drawings with other disciplines.
- B. Product Data:
- Submit copies of all manufacturers' product data simultaneously with all shop drawing submittals.
 - Product data to include all air conditioning equipment, hangers, fans, ductwork construction, piping, and other standard items as required to complement shop drawings for a submittal indicating all products to be used on this work.
 - Manufacturers and suppliers of equipment shall provide all data necessary for compliance with the State of California Energy Efficiency Code: Compliance certification for all equipment shall be included in equipment submittals.
- C. Record Drawings: Maintain throughout the progress of the work project record drawings and submit to the Architect at completion of work.
- D. Operating Manuals and Maintenance Manuals:
- Submit copies of all operating instructions and maintenance manuals.
 - Fully instruct Owner operating personnel and demonstrate performance, operation and maintenance of equipment. Amount of time allocated for said instruction and demonstrations of equipment and systems shall be part of these obligations. Submit a letter to Architect signed by Owner representative who will operate system stating that he is fully instructed by contractor about operation and maintenance of equipment and system.
 - Submit one additional set of approved instructions and one additional set of approved 11 inch x 17 inch control diagrams suitably framed behind glass for mounting as directed.

1.06 PRODUCT HANDLING

- A. Protection: Take all precautions necessary to protect the materials of this section before, during, and after installation.
- B. Replacements: In the event of damage, immediately repair all damaged and defective work to the approval of the Architect at no additional cost to Owner.

1.07 JOB CONDITIONS

- A. Examination of the Site: Examine the site and include all conditions in bid proposal under which work is to be performed.

1.08 MISCELLANEOUS

- A. Locations and Accessibility: Contractor shall fully inform himself regarding peculiarities and limitations of spaces available for installation of work under this section. Valves, motors, controls and other devices requiring service, maintenance and adjustment shall be placed in fully accessible positions and locations. Provide access doors where required in ductwork or construction whether specially detailed or not, and render all such devices accessible.
- B. Drawings indicate desired location and arrangement of ductwork, piping, equipment and other items, and are to be followed as closely as possible. All offsets and interferences may not be indicated due to the scale of the Drawings. Contractor shall assume responsibility for coordinating work with all other trades. Work specified and not clearly defined by the drawings shall be installed and arranged in a manner satisfactory to Architect. In the event changes in indicated locations and arrangements are deemed necessary by Architect, they shall be made by Contractor without additional charges provided the change is ordered before work is installed and no extra materials are required.

PART 2-PRODUCTS

2.00 ACCESS PANELS

A. PERFORMANCE REQUIREMENTS

- FIRE-RATED ACCESS DOORS AND FRAMES: ASSEMBLIES COMPLYING WITH NFPA 80 THAT ARE LISTED AND LABELED BY A QUALIFIED TESTING AGENCY, FOR FIRE-PROTECTION RATINGS INDICATED ACCORDING TO NFPA 252 OR UL 10 B.
 - FLUSH ACCESS DOORS WITH CONCEALED FLANGES
- DESCRIPTION: FACE OF DOOR FLUSH WITH FRAME; WITH CONCEALED FLANGE FOR GYPSUM BOARD INSTALLATION AND CONCEALED HINGE.
 - LOCATIONS: CEILING.
 - UNCOATED STEEL SHEET FOR DOOR: NOMINAL 0.060 INCH, 16 GAGE, FACTORY PRIMED.
 - FRAME MATERIAL: SAME MATERIAL AND THICKNESS AS DOOR.
 - LATCH AND LOCK: CAM LATCH, SCREWDRIVER OPERATED.
- C. FIRE-RATED ACCESS DOORS AND FRAMES

- DESCRIPTION: DOOR FACE FLUSH WITH FRAME, WITH A CORE OF MINERAL-FIBER INSULATION ENCLOSED IN SHEET METAL, WITH CONCEALED FLANGE FOR GYPSUM BOARD INSTALLATION, SELF-CLOSING DOOR, AND CONCEALED HINGE.
- LOCATIONS: CEILING.
- FIRE-RESISTANCE RATING: NOT LESS THAN THAT OF ADJACENT CONSTRUCTION.
- UNCOATED STEEL SHEET FOR DOOR: NOMINAL 0.036 INCH, 20 GAGE, FACTORY PRIMED.
- FRAME MATERIAL: SAME MATERIAL, NOMINAL 0.060 INCH, 16 GAGE, AND SAME FINISH AS DOOR.
- LATCH AND LOCK: SELF-CLOSING, SELF-LATCHING DOOR HARDWARE, OPERATED BY KEY, WITH INTERIOR RELEASE.

2.01 PIPE HANGERS

- A. Hangers shall be complete with threaded steel rods and vibration isolators, sound and electrolysis isolators as required and hereinafter specified. Concrete inserts shall be furnished and installed under this section.
- B. 2-1/2 inches and smaller: Grinnell 104 or approved equal.
- C. 3 inches and larger: Grinnell 260.
- D. Concrete inserts: Grinnell 280.

2.02 VIBRATION ISOLATION

- A. Provide vibration isolation equipment for all mechanical equipment and piping as specified herein and indicated on the drawings. The vibration isolation system shall be installed in a manner to prevent the transmission of vibration to the structure. No rigid connections between rotating or oscillating equipment or piping and the building will be permitted.
- B. General Requirements:
- Vibration isolation manufacturer shall furnish written instructions covering the installation and adjustment of all isolators. The manufacturer shall replace any isolation that has been improperly sized.
 - Mechanical subcontractor shall coordinate his work with the other trades. Contractor following him, such as plastering or electrical, shall be notified and instructed to avoid any contact with his installation that would reduce the effectiveness of the system.
 - Inspections: Vibration isolation manufacturer shall make an inspection of the vibration installation, and inform the Contractor in writing of any necessary corrections and/or adjustments.
 - Bases: Where called for in the specifications and on the drawings, all structural steel bases, including concrete pouring form bases, shall be designed and fabricated by the vibration isolation manufacturer. The concrete for the pouring form bases shall be by others.
 - Vibration isolation shall be manufactured by a single manufacturer. All isolation shall be in strict accordance with the following specifications and manufactured by M.W. Sausse and Co., Inc. The isolation manufacturer shall include in the submittal the following information:
 - Type of isolator.
 - Deflection.
 - Free or unloaded height.
 - All physical characteristics of springs used.
 - Size of structural members.
 - Efficiency calculations.
 - Any other pertinent information to make the submittal

complete.

C. Technical Requirements:

- Isolators shall be designed or treated for resistance to corrosion. Structural steel bases shall be cleaned of welding slag and painted with primer and finish coat. All nuts, bolts and washers shall be zinc-electroplated.
- All equipment shall be equipped with seismic restraints in accordance with the requirements of all governing agencies. These restraints shall be designed and supplied by the vibration isolation manufacturer. Suspended equipment and piping shall be restrained by steel cable. This cable and the method of installation shall be the responsibility of the mechanical contractor. The cable restraints shall be installed in such a manner as to not short circuit the vibration isolation. The Contractor shall submit details for approval.

2.03 INSULATION

- A. All insulation shall comply with California Code of Regulations, Title 24.
- B. Install pipe insulation after piping is installed, tested and approved, and is in clean dry condition. Firmly butt insulation joints.
- C. Hydronic Supply and Return: Insulate piping with flexible elastomeric insulation with factory applied jacket, Armacell AP ARMAFLEX, 1-1/2" thick. Insulate fittings, flanges and valves mitered section of insulation and adhere longitudinal laps and butt strips of jacket with pressure sensitive tape system.
- D. Unions: Insulate in same manner as fittings, flanges and valve bodies. Conspicuously mark locations on pipe coverings.
- E. Shields: For pipes 4 inches and larger, at each hanger protect insulation with 12 inches long 18 gauge galvanized metal shield over heavy density calcium silicate insulation insert. For pipes 3 inches and smaller, at each hanger protect insulation with 4 inch long 18 gauge galvanized metal shield.
- F. Thermal Duct Insulation: Insulate all concealed cold supply air, return air and plenums unless otherwise specified, with Johns Manville Microtite fiberglass duct insulation, wrapped entirely around duct with joints lapped at least 2 inches and secured with 16 gauge galvanized wire on 12 inch centers. Insulation value shall comply with Title 24 requirements. Insulation shall cover all surfaces including standing seams.
- H. Mechanical fasteners shall be flush with the liner surface and shall start within 2 inches of the leading edge of each section and within 3 inches of the leading edge of all cross joints within the duct section. All exposed edges and the leading edge of all cross joints of the liner shall be heavily coated with an approved fire resistant adhesive. The duct liner shall be cut to assure snug closing corner joints, the black surface of the liner shall face the air stream, transverse joints shall be neatly butted, and heavily coated with an approved fire resistant adhesive.
- I. Contractor s Option: Concealed main supply air ducts and plenums may be lined in lieu of external wrapping as hereinbefore specified.
- J. Lined Duct: Where indicated, line ducts with flexible elastomeric duct insulation 1" in thickness.

2.04 VALVES

Valves shall be of same manufacturer or equivalent by comparator chart of approved manufacturer. Provide adapters for valves in copper tubing where necessary. Provide chain operated valves for valves located 7 feet above finished floor in equipment rooms and equipment areas.

- A. Gate Valves: 150 lb. SWB, Nibco F-617-0
- B. Globe Valves:

- 2 inches and smaller: 150 lb. SWP, Nibco T-235Y
- 2-1/2 inches and larger: 125 lb. SWP, iron body, Nibco F-718-B

C. Check Valves:

- Horizontal Swing:
 - 2 inches and smaller: 125 lb. SWP, screwed, Nibco T-413 solder.
 - 2-1/2 inches and larger: 125 lb. SWP, iron body, flanged, Nibco F-918 B.

- Silent type (at pump discharge): All sizes: 125 lb. SWP, iron body (all bronze in copper pipe system), Miller 162.

D. Balancing Valves:

- 1-1/4 inches through 2-1/2 inches: 125 lb. SWP, Bell & Gossett circuit setter, bronze, screwed.
- 2-1/2 inches and larger: Rockwell 175 lb. WWP lubricated semi-steel plug valves with plugs and bolted yokes, operating wrench, with adjustable locking step indicator and arc when balancing cock is used as a shutoff valve.

- E. Butterfly valves for condenser and hot water systems shall be provided in lieu of gate valves. Crane No. 42F quartermaster, cast iron body, lug water type with EPT seats and gear operator with position indicator. 200 lb. WWP pressure tight shut-off at differential pressures up to 200 psi. Provide extended stem for insulated lines.
- F. Ball Valves: 150 lb. SWP, bronze body, Nibco T-585-20.

2.05 STRAINERS

- A. Y-type with semi-steel body and stainless steel basket with 1/8 inch perforations and lined with 20 mesh stainless steel screen. Strainer shall be of same size as pipeline in which installed. Provide hose gate valve with each strainer blowoff.

- 2-1/2 inches and smaller: Armstrong AISC series, 125 lb., screwed ends with screwed gasket cap.
- 3 inches and larger: Armstrong AIFL series, 125 lb., flanged ends and bolted gasketed cap.

2.06 PIPING ACCESSORIES

- A. Pressure Gauges: Ashcroft Duragauge 1379-A, complete with 4-1/4 inch diameter dial and gauge cock. One pressure gauge cock and gauge shall be installed on suction and discharge side of each pump and elsewhere indicated to accept a master pressure gauge.

- B. Thermometers: Weiss 7VS 3-1/2 inch Vari-Angle adjustable angle red mercury industrial thermometers with 7 inch chrome-plated bronze case, 3-1/2 inch stem with swivel nut, 3/4 inch NPT brass separable socket and etched scale with gradations as indicated or required.
- C. Air Vent Valves:
- Water: 75 psi working pressure. Hoffman No. 79
 - Water: 150 psi working pressure. Hoffman No. 78
- D. Tank Fittings: Bell & Gossett series ATF of size corresponding to compression tank diameters.
- E. Flexible Pipe Connections: Braided stainless steel for condenser water piping and braided bronze for hot water systems.

2.07 HYDRONIC PIPING

A. Chilled, Hot and Condenser Water Piping:

- 2 Inches and Smaller: Type L hard-drawn copper tubing, wrought copper fittings with soldered joints.
- 2-1/2 Inches and above: Schedule 40 black steel pipe with standard welded fittings.

B. Pipe Insulation:

- All insulation shall comply with the State of California Energy Conservation Standards.
- See section 2.03

2.08 UNIONS AND GASKETS

- A. 2 inches and under for steel pipe: Screwed malleable iron, ground joint, 300 lb. WOG Class with brass to iron seat, black.
- B. 2-1/2 inches and larger for steel pipe: Cast iron flanged gasket type, conforming to ANSI B16.1, black to suit service, or 150 lb. forged steel slip-on flanges.
- C. Unions for copper tubing: Anaconda 1633 or 1733.
- D. Dielectric unions: EPCO, complete with isolators and gaskets of same size as pipe, galvanized or black to suit service.
- E. Dielectric flanges: F.H. Maloney Co. flanges for cathodic insulation.
- F. Gaskets: 1/16 inch Garlock 17022.

2.09 DUCTS AND SHEET METAL WORK

Provide ducts, plenums, access doors, fresh air intakes and exhausts as indicated and required. All ductwork shall be constructed, erected and tested in accordance with the most restrictive of local regulations, procedures detailed in the ASHRAE Handbook of Fundamentals or the applicable standards adopted by the Sheet Metal and Air Conditioning Contractors National Association. Provide prefabricated spiral lockseam ducts and fittings and rectangular ducts of galvanized steel. Primary cold supply air shall be medium pressure, 4 inch S.P. Distribution ductwork downstream of VAV boxes shall be low pressure, 1 inch S.P. Outside air and exhaust air ductwork shall be low pressure, 2 inch S.P.

- A. Final connections to ceiling diffuser boxes and linear diffusers shall be made with flexible glass fiber duct. Thermaflex M-KE. Connections of flexible duct to round ducts shall be made with ½ inch wide positive locking straps.
- B. All connections to main cold supply ducts shall be made with low loss fittings.
- C. Flat duct surfaces shall be crimped diagonally regardless of size. Longitudinal joints in all duct sizes may be flat-lock joints. Transverse joints and intermediate bracing shall be constructed of galvanized sheet metal or galvanized structural angles in accordance with requirements of the ASHRAE guide and public authorities having jurisdiction.
- D. Lock joints shall be hammered to make them airtight. Inside of duct shall present a smooth surface to flow of air.
- E. Changes in size of ducts shall increase gradually with a slope of not more than 12 inches in 5 feet where possible, but not more than 12 inches in 3 feet in any event.
- F. Turns shall be made with a throat radius of not less than the duct width.
- G. Horizontal ductwork shall be strongly supported with galvanized hangers in accordance with the requirements of the ASHRAE guide and public authorities having jurisdiction.
- H. Provide double thickness turning vanes at all sharp right angle turns.
- I. Plenums shall be made of 18 gauge galvanized sheet steel reinforced horizontally on a maximum of 48 inch centers by 1-1/2 x 1-1/4 x 1/8 inch galvanized angles and reinforced vertically by 1-1/2 inch standing seams.
- J. Plenum access doors 24 x 54 inch minimum size shall be galvanized sheet steel doors and frames properly reinforced to prevent breathing. Door shall be of same gauge as the duct or casing and shall have 1 inch insulation with galvanized sheet steel on both sides. Each door shall be hung on 5% tee hinges with one or more catches which are operable from both sides and similar to Ventfabrics, Inc. 260 Ventlock Hatch. Doors shall be hung to open against pressure and shall be fitted with felt to ensure airtightness.
- K. Flexible connections for air ducts shall be 16 oz. airtight Ventglass noncombustible fabric with fire retardant neoprene coating on outside. Attach to ductwork by lock seam. Install not more than 6 inches long. Provide where required or indicated.
- L. Seal joints on main cold supply air ducts at each floor with UL classified sealant. Sealant shall be specifically designed to seal high pressure ductwork.

2.10 TURNING VANES

- A. Both dimensions less than 48 inches: Single vane or approved double thickness airfoil vanes.
- B. Either dimension greater than 48 inches: Double thickness airfoil vanes of approved pattern.
- C. Rectangular smooth radius elbows: Provide multiple splitter vanes.

2.11 DAMPERS

- A. Provide balancing volume dampers in each branch duct and in each main duct of constant volume systems to provide for complete air balancing. Fit each manual volume damper with bearings and an adjusting device having a locking mechanism. Provide access panels if concealed or inaccessible through ceiling or wall.
- B. Balancing dampers where neither dimension of duct exceeds 17 inches may be a job fabricated butterfly type consisting of a blade constructed of 18 gauge galvanized steel securely riveted or welded at its center

- axis to a square operating rod.
- C. Balancing dampers where either dimension exceeds 18 inches shall be Air Balance
- AC-116, opposed blade type.
- D. Fire dampers: Fusible link out of airstream type manufactured in accordance with requirements of State Fire Marshal and public authorities having jurisdiction, with permanent labeling identification. Provide suitable access for servicing dampers.
- E. Combination Smoke and Fire Dampers:

- General Description: Ruskin FSD-36 or equal by Greenheck, Leakage class 2, for wall, floor, grille, or out of wall application as indicated on the plans. Labeled according to UL 555S. Combination fire and smoke dampers shall be labeled according to UL 555 for 1-1/2 hour rating.
- Fusible Links: Resettable, 165 deg F rated
- Frame and Blades: 0.064-inch thick galvanized sheet steel.
- Mounting Sleeve: Factory-installed, galvanized sheet steel; length to suit wall or floor application.
- Damper Motors: Provide actuator by manufacturer. Electrical connection shall be 115 V, single phase, 60 Hz.

- F. Install fire and smoke dampers according to manufacturer's UL-approved written instructions.
- G. Backdraft Dampers: Ruskin CBD2 and CBD6 with extruded aluminum frames, aluminum blades, and vinyl edge seals and adjustable counterweights.

2.12 INLINE CENTRIFUGAL FANS

- A. Greenheck Model SQ. Fan shall be duct mounted, direct driven centrifugal square inline.
- B. Fan shall be manufactured at an ISO 9001 certified facility. Fan shall be listed by Underwriters Laboratories (UL 705). Fan shall bear the AMCA certified ratings seal for sound and air performance.
- C. The fan shall be of bolted construction utilizing corrosion resistant fasteners. Housings shall be minimum 18 gauge galvanized steel with integral duct collars. Bolted access doors shall be provided on three sides, sealed with closed cell neoprene gasketing.
- D. Wheel shall be centrifugal backward inclined, constructed of 100% aluminum, including a precision machined cast aluminum hub. Wheel shall be balanced in accordance with AMCA Standard 204-96, Balance Quality and Vibration Levels for Fans.
- E. Motor shall be heavy duty type with permanently lubricated sealed ball bearings and furnished at the specified voltage, phase, and enclosure.
- F. Bearings shall be permanently lubricated, sealed ball bearings and selected for a minimum L50 life in excess of 200,000 hours at maximum catalogue operating speed.
- G. The fan shall be provided with Varigen type motor that accepts 0-10VDC signal for motor speed adjustment.

2.13 SINGLE DUCT VARIABLE AIR VOLUME BOXES (DDC)

- A. Terminal units shall be PRICE Model SDV, pressure independent, single inlet type. Units shall be provided with factory installed electronic actuator, as furnished under Section 15900, flow controller and required relays to change set point in response to thermostat control. Regulators shall be factory preset for minimum and maximum air quantities designated. Units shall be capable of varying air quantity from the maximum set point within the normal operating range to minimum set point indicated. At maximum set point the air volume shall not vary more than +/- 5% when subjected to inlet variations from 1 to 6 inches of water. On a call for less than maximum cooling, the unit shall reduce the primary air volume to satisfy the requirements. For exterior zones, the reheat coil shall be activated in sequence after the minimum setting is reached.
- B. Terminal units shall be selected as indicated without exceeding pressure drop and noise criteria curve of NC 30. Provide sound insulation downstream as indicated and required to attain above noise criteria.

2.14 DIFFUSERS, REGISTERS AND GRILLES

- A. Air distribution equipment shall be of sizes and capacities indicated, furnished in factory finished enamel of color selected. Submit paint samples for approval.
- B. Square Ceiling Diffusers: Titus model PAS, steel construction with baked on heavy duty envirothane enamel coating with aluminum perforated face. Mounting shall be adapted to ceiling suspension system. 12 x 12 inch and 20 x 20 inch ceiling module shall be used for hard ceiling installation and in all restrooms.
- D. Return and Relief Air Grilles: Titus model PDR, steel construction with baked on heavy duty envirothane enamel coating with aluminum perforated face to match ceiling diffusers.
- M. Provide branch balancing damper with remote damper operator by Pottorff or Young Regulator in inaccessible locations where no access panels are indicated on the drawings.

2.15 HVAC INSTRUMENTATION AND CONTROLS

- A. Contractor shall familiarize himself with the existing controls system at the job site prior to proposal of work to assure that scope is adequately understood.
- B. Direct digital controls:

- New and remodel VAV boxes - New and remodel boxes shall be provided with controllers which are compatible with existing installed DDC systems where present. Contractor shall include all points to match existing configuration of boxes. Submit manufacturer and points list for approval. Thermostats shall match existing. Submit sample of thermostat to architect for approval.
- New fans and unitary equipment - New and remodeled equipment shall be tied into existing DDC controls systems in a manner to match the existing. Include all reprogramming of the existing DDC controls system to operate and sequence new equipment. Submit manufacturer, points list, and sequences proposed. Thermostats shall match existing. Submit sample of thermostat to architect for approval.

HOTEL DEL CORONADO.

Fitness Members Area Renovation

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Issued/Revised	
No.	Date Description
09-17-21	Permit Set
01-05-22	Owner Revisions

Drawing Title

SPECIFICATIONS

Scale	As Noted
Date	09-17-2021
Drawn By	RS
Project No.	19022
Drawing No.	PC

M7.01

PERMIT SET: ISSUED FOR CONSTRUCTION

2.16 EQUALS AND SUBSTITUTIONS

- A. In addition to manufacturers specified, the following shall also be considered equal, providing corresponding models meet specified requirements. Equivalent substituted equipment named herein shall be submitted to Architect for approval. Submit alternate selections at time of bid listing major equipment.

Item: Manufacturer:

1. Pipe Hangers & Supports: Fee & Mason, Elcen
2. Vibration Isolation: Mason Industries
3. Insulation: Owens-Corning, Certainteed, Knauf
4. Valves: Nibco, Crane
5. Strainers: Crane, Walworth, Strong, Keckley, Mueller
6. Pressure Gauges: Marsh, Marshalltown, Terice
7. Thermometers: Palmer, Terice
8. Gas-Fired Make-up Air Units: Modine
9. Computer Room AC Units: Data-Aire
10. Rooftop Packaged Unit: Trane
11. Split System AC Unit: Trane
12. Water Source Heat Pump: Climate Master
13. Four-pipe Fan Coil Units: Enviro-Tec
14. Dampers: Pottorff, Greenheck
15. Fans: Greenheck, Twin City
16. VAV Boxes: Titus, Kreuger
17. Diffusers, Registers, Grilles: Price, Krueger

PART 3-EXECUTION

3.01 STATEMENT

- A. All Heating, ventilation and air conditioning shall be installed in accordance with the requirements of all governing authorities.

3.02 LOCATIONS AND ACCESSIBILITY

- A. Drawings indicate desired location and arrangement of piping, ductwork, equipment and other items, and are to be followed as closely as possible. All offsets and interferences may not be indicated due to the scale of the Drawings. Coordinate work with all other trades.
- B. Valves, motors, controls and other devices requiring service, maintenance and adjustment shall be placed in fully accessible positions and locations. Provide access doors where required in ductwork and construction and render all such devices accessible.

3.03 EQUIPMENT IDENTIFICATION

- A. All major equipment shall bear firmly attached metal nameplates which state name of manufacturer, model number and electrical data. An additional permanent label shall be affixed to each equipment which will clearly indicate by number which operating and maintenance manual explains maintenance requirements in detail.
- B. Valve Identification:

1. Valve charts: Typewritten charts not less than 8x10 inches shall be made showing assigned numbers controlled in each system by each valve in mechanical equipment rooms only. Charts shall be mounted behind aluminum framed glass in chiller room.
2. Valve tags: Provide tag consisting of 2 inch diameter, 20 gauge, stainless steel or copper disk for each main line shut-off valve or cock. Fasten tags in place with continuous steel ring or chain around stem of valves and around pipe for cock. Disks shall be stamped with a number corresponding to identification (or location) number shown on valve chart and with service designation with 1/4 inch high letters.

- C. Pipe Identification: Mark each individual pipe for quick and easy identification with Idento Bands, aluminum with enamel finish, 1-1/2 inches wide, installed as recommended by manufacturer after completion of piping and finish painting. Unless otherwise specified, coding shall conform to Scheme for the Identification of Piping Systems (ANSI A13.1-1956). Color scheme shall be approved. Base color for markers shall be as follows:

Compressed air: Orange
Condenser water: Green
Space heating hot water: Orange
Make-up water: Green
Refrigerant piping: Yellow

3.04 INITIAL LUBRICATION, ADJUSTING AND FILLING SYSTEMS

- A. Before operating any mechanical systems, equipment bearings shall be lubricated and bolts, pulleys, and other moving parts checked for alignment and tolerances in accordance with manufacturer s operating instructions. Piping and liquid systems shall be flushed out and filled with operating fluids. After tests, valves and other parts of work shall be adjusted for quiet operation. Strainers shall be cleaned out by removing and washing basket or screen. Compressors shall have lubricating oil changed. Vibrations and noise shall be suppressed.

3.05 CLEANING OF EQUIPMENT, MATERIALS AND PREMISES

- A. Clean equipment and materials thoroughly. Leave surfaces to be painted smooth, clean, and ready for painters. Clean entire premise of unused materials, rubbish, debris, grease spots and dirt left by subcontractors. Remove, clean and replace pipeline strainers after systems have been in operation for a period of 30 calendar days.

3.06 HANGERS AND SUPPORTS

- A. Hold horizontal pipe runs firmly in place using approved steel and iron hangers, supports, and/or pipe rests, unless otherwise indicated. Suspend hanger rods from concrete inserts or from approved brackets, clamps or clips. Hang pipes individually or in groups if supporting structure is adequate to support weight of piping and fluid. Except for buried piping, hang or support pipe runs so they may expand or contract freely without strain to pipe or equipment.
- B. Horizontal Steel Piping: Provide hangers or supports every 10 feet except every 8 feet for piping under 1 inch in diameter, unless otherwise specified.
- C. Horizontal Copper Tubing: For 2 inch diameter and over, provide hangers, every 10 feet, for 1-1/2 inch diameter and smaller, every 6

- feet.
- D. Vertical Piping: Support at every floor with wrought iron pipe clamps.
- E. Branches: Provide separate hangers or supports for branch lines 6 feet or more in length.

3.07 EQUIPMENT AND MATERIALS

- A. Install per manufacturer's recommendations.

3.08 ACCESSIBILITY

- A. Install work readily accessible for normal operation, reading of instruments, adjustment, service, inspection and repair. Provide access panels where indicated and required.

3.09 EXPANSION AND CONTRACTION

- A. Install piping subject to expansion and contraction with expansion loops made up of bends or fittings, expansion joints, swing joints, or other approved methods or devices. Branch lines from main subject to expansion and contraction shall have a swing joint at point of connection with the main. Risers which pass through one or more floors shall have swing joints at their base. Anchor lines subject to expansion and contraction by approved methods to restrict movement.

3.10 SYSTEM BALANCING

- A. Section Includes: Testing, adjusting and balancing of mechanical equipment and systems.
- B. Provide and be responsible for protection and repair of adjacent surfaces and areas which may become damaged as a result of Work of this Section. Protect Work hereunder until completion and final acceptance. Repair or replace damaged or defective Work to original specified conditions, at no extra cost to the Owner.
- C. All performance testing and balancing of the mechanical systems including:

1. Supply air systems.
2. Return air, fresh air and exhaust air systems.
3. Hydronic systems.
4. Report and report forms.

- D. Submittals: Submit a complete testing and balancing procedure indicating all test equipment that will be used, testing procedures, test data sheets, systems schematics and points of testing.

1. Test and Balance Data: Submit test and balance data on completion of work under this Section.
2. Certification: Certify in writing that system has been adjusted and balanced and design conditions have been attained.

- E. Contractor shall provide to the Architect, HVAC Contractor and Electrical Contractor requirements for drive changes, installation of additional dampers, vanes, grille baffles or other items as may be required to balance the system to the Owner s satisfaction.

- F. Verification of Conditions: Prior to testing and balancing, balancing contractor shall inspect equipment and materials to assure that all balancing operations can be performed. Balance subcontractor shall arrange with HVAC Contractor and Electrical Contractor for satisfactory correction of all defects in workmanship and/or material that could affect the work specified herein.

- G. System Operation: Contractor shall coordinate with HVAC specifications and controls specifications and contractors to have all parts of systems in full operation and shall continue the operation of same during each working day of testing and balancing.

- H. System testing and balancing shall be performed by an independent agency certified by the Associated Air Balance Council (AABC) or NEBB.

- I. All test instruments shall be accurately calibrated and maintained in good working order. Test instruments shall have certification by the manufacturer or by an approved test laboratory within one year of the testing date.

- J. Air Distribution Testing and Balancing:

1. Test and adjust blower RPM to design requirements.
2. Test and record motor full load amperes.
3. Make pitot tube transverse of main supply, return, exhaust and outside air ducts and obtain design CFM.
4. Test and record system static pressures, suction and discharge.
5. Test and adjust system for design exhaust air CFM.
6. Test and adjust system for design outside air CFM.
7. If more than one outside air design condition exists (demand control ventilation), balance report shall include separate tests for minimum condition and maximum condition.
8. Test and record entering air temperature (D.B. heating and cooling).
9. Test and record entering air temperature (W.B. cooling).
10. Test and record leaving air temperatures (D.B. heating and cooling).
11. Test and record leaving air temperature (W.B. cooling).
12. Adjust all main supply and return air ducts to proper design CFM.
13. Test and adjust each VAV box to within plus-minus 5% of design.
14. Test and adjust each diffuser, grille and register to within plus-minus 5% of the amount shown on the drawings.
15. Each grille, diffuser and register shall be identified as to location and area.
16. Size, type and manufacturer of diffusers, grilles, registers and all tested equipment shall be identified and listed. Manufacturer s ratings on all equipment shall be used to make required calculations.
17. Readings and tests of diffusers, grilles and registers shall include the required FPM velocity and test velocity, required CFM and test result CFM after adjustments.
18. In cooperation with the control manufacturer s representative, the setting adjustment of automatically operated controls to operate as specified, indicated and/or noted.
19. All diffusers, registers and grilles and all equipment shall be adjusted to maintain the design conditions.

- K. Duct Leakage Testing:
1. Test apparatus shall be a high pressure portable blower with an orifice flow measuring device. Each orifice assembly shall be

- accurately calibrated with its own calibration curve.
2. Contractor to close off and seal all openings in the duct section to be tested.
 3. Each section duct mains shall be tested at a pressure corresponding to its pressure rated, as tabulated below. Total allowable leakage at the testing pressure shall not exceed 2.5% of the total design CFM for the section being tested.

Pressure	Test Rating	Pressure
1 in.	1.5 in.	
2 in.	2.5 in.	
4 in.	4.5 in.	
6 in.	6.5 in.	

4. Duct system for smoke control shall be tested in accordance with Section 905 of the California Building Code by the required special inspector or special inspection agency.

- L. Space pressure testing

1. For separate air systems serving separate rooms, balance contractor shall perform space pressure testing..
2. Pressure measurements shall be recorded for each system at system boundaries and outside doors..
3. Pressure testing shall occur with doors closed.

- M. Hydronic System Balancing: Test, balance and adjust all water systems. Adjust water flows to boilers, pumps, coils, etc., to amounts shown on Drawings. Record following points where applicable to the respective system and any other items necessary to establish that each equipment item is operating properly and at designed capacities and conditions.

1. Outside air temperatures D.B. and W.B.
2. Boilers:

Water inlet and outlet temperatures.
Water inlet and outlet pressures.
Water inlet and outlet flows.

3. Pumps:

Pump discharge pressure.
Pump suction pressure.
Pump differential head.
Pump cut-off head.

- N. Coordinate Tests with the manufacturer of each equipment.

- O. Witness: Notify Architect in writing two weeks prior to testing and balancing of all major equipment in order to arrange that Architect s representative will witness the tests.

- P. Reporting

1. Reports shall include all outlets, balanced to tolerances indicated above. Indications of "not accessible" or "not operating" are not acceptable. Balance contractor shall resolve any access issues with mechanical subcontractor before submitting report.
2. For any new pump or fan (e.g. exhaust fan, supply fan), include pump curve or fan curve in the report.
3. Drive changes, if required to achieve design air quantities, are the responsibility of contractor.

- Q. Mechanical and balancing contractors shall be responsible for all Title 24 Acceptance testing requirements as indicated on the compliance documentation. Copies of all Acceptance tests shall be included in the air balance report and submitted to the engineer and the owner for record.

3.11 CONNECTION

- A. Connections between two dissimilar metal pipes shall be made with dielectric unions.

3.12 TESTS

- A. Furnish necessary labor and equipment for testing.
- B. Hydrostatic Tests: Make by completely filling piping system with water and eliminating accumulations of air so that leakage, no matter how small, will be apparent on testing gauge immediately. Maintain pressure until pipe under test has been examined, but in no case less than 24 hours. Test systems at following pressure:

SYSTEM	TEST PRESSURE
Chilled Water	125 psig
Condenser Water	125 psig
Hot Water	125 psig

3.13 INSTALLATION

- A. Cooling towers, boiler, pumps, air handling units, exhaust fans and other equipment shall be installed on concrete bases and bolted to vibration isolators and then anchored to structures.

3.14 COCKS

- A. Upon balancing of system, all balancing cocks shall have body plug permanently set to indicate balance position of plug.

3.15 AIR DISTRIBUTION EQUIPMENT LOCATIONS

- A. Air distribution equipment locations shall be coordinated with architectural drawings.

3.16 TURNING VANES

- A. Turning vanes shall be installed in all right angle sharp turns in ducts.

3.17 DUCT LINING

- A. Where indicated, specified duct dimensions are net clear dimensions, i.e., clear dimensions, after insulation has been installed.

3.18 REPAIR OF EXISTING SURFACES

- A. Contractor shall provide and be responsible for protection and repair of adjacent existing surfaces and areas that may have been damaged as a result of demolition and new work.

3.19 CAPPING OF DUCTS

- A. All existing ducts that are removed and not reused shall be capped airtight and sealed with "miracle" duct sealer and D-617 or equal.

3.20 CEILING DIFFUSER COORDINATION

- A. Contractor shall strictly coordinate all ceiling diffusers and grilles with architectural reflected ceiling plan. If any discrepancies are encountered, the engineer shall be notified for clarification.

3.21 THERMOSTAT LOCATION

- A. Contractor shall coordinate final location of all thermostats with architect and tenant construction coordinator prior to any rough-in installation work. Coordinated shop drawings showing thermostats, sensors, switches, and all other wall devices should be provided to the design team for review.
- B. Provide insulated backing on all thermostats located on exterior walls so fluctuations in wall temperature do not provide false readings. Verify that thermostats will not be installed in direct sunlight.
- C. Provide white thermostat covers for all locations within scope of work.

3.22 AS-BUILT DRAWINGS

- A. Contractor shall provide record as-built drawings to tenant construction coordinator and architect at the completion of tenant construction.

3.23 SMOKE DAMPERS IN DUCTWORK

- A. Maintain net free area equal to duct size at all smoke and fire dampers.
- B. Smoke and fire dampers shall be provided with adequate access doors by this contractor.

3.24 THERMOSTAT REQUIREMENTS

- A. Room thermostats shall be capable of being set to maintain space temperature set points for 55 degrees to 85 degrees and shall be capable of operating the heating and cooling in sequence. Thermostats shall be adjustable to provide a temperature range of 5 degrees between full heating and full cooling being supplied. Temperature control system shall operate in accordance with the base building sequence of operation.

3.25 DUCT ELBOWS

- A. Provide minimum duct radius on elbows at one and one half times duct sizes.

3.26 DIFFUSER THROW PATTERN

- A. All ceiling diffusers shown on the plans shall be provided as four way throw unless otherwise noted. Pattern blades shall be set in a horizontal position unless otherwise noted.

3.27 DUCTWORK REQUIREMENTS OF UMC

- A. All ductwork shall conform to chapter 6 of the Uniform Mechanical Code.

3.28 DUCT AND EQUIPMENT REQUIREMENTS OF TITLE 24

- A. All supply air ducts and fire dampers shall be installed per Title 24 regulations.
- B. All mechanical equipment shall be certified by the manufacturer for compliance with Title 24 energy requirements.

3.29 RETURN AIR PLENUM REQUIREMENTS

- A. Return air plenum shall not contain any combustible material.

3.30 ACCESS REQUIREMENTS

- A. Provide access and clearance requirements per 2016 Mechanical code and manufacture installation whichever is more restrictive.

3.31 DUCTWORK PROTECTION DURING CONSTRUCTION

- A. At the time of rough installation or during storage on the construction site and until final startup of the heating and cooling equipment, all ducts and other related air distribution component openings shall be covered with tape and plastic to reduce the amount of dust and debris which may collect in the system.

3.32 TEMPORARY VENTILATION DURING CONSTRUCTION

- A. The permanent HVAC system shall only be used during construction if necessary to condition the building within the required temperature range for material and equipment installation. If the HVAC system is used during construction, use return air filters with MERV-8 Filtration. Replace all filters immediately prior to occupancy.

3.33 CONTROLS INSTALLATION

- A. WIRING
- a. Low voltage (Class 2) wiring in concealed accessible spaces may be plenum rated and is not required to be enclosed in conduit.
 - b. NEC Class 1 (Line Voltage) wiring shall be UL listed in approved raceway as specified by NEC.
 - c. Low-Voltage wiring shall meet NEC Class 2 requirements. Subfuse Low-Voltage power circuits as required to meet Class 2 current limit.
 - d. Conduit: All conduit shall comply with the minimum requirements of the local authority having jurisdiction.
 - e. Install wiring in conduit where subject to mechanical damage and at levels below 10ft in mechanical, electrical, or service room.

- f. Install wiring in conduit for wall sensors and extend the conduit 6" above the ceiling. Install a bushing on the end of the conduit.
 - i. Install wiring in conduit above inaccessible ceilings.
 - ii. Install class 1 and class 3 wiring in separate conduits. Boxes and panels containing high voltage wiring and equipment shall not be used for Low-Voltage wiring 3except for the purpose of interfacing the two through relays and transformers.
 - iii. Conceal conduit except within mechanical. Electrical, or service rooms, maintain minimum clearance of 6" between raceway and high-temperature equipment such as team pipes or flues.
 - iv. Flexible metal conduit and liquid tight flexible metal conduit less than ½ inch electrical trade size.
- B. BAS contractor shall provide stepdown transformers.

3.34 CONTROLS INSTALLATION

- A. Project record documents. Submit three copies of record (as-built) documents upon completion of installation for approval prior to final completion. Submittal shall consist of:
- B. Project record drawings of as-built versions of submittal shop drawings and product data shall be provided in electronic. As-built floor plans indicating the routing of MSTP communication wiring shall be included.

END OF SECTION

HOTEL DEL CORONADO.

Fitness Members Area Renovation

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Issued/Revised	
No.	Date Description
09-17-21	Permit Set
01-05-22	Owner Revisions

Drawing Title

SPECIFICATIONS

Scale As Noted
Date 09-17-2021
Drawn By RS
Project No. 19022
Drawing No. PC

M7.02

