GENERAL SHEET NOTES

A. REFER TO ELECTRICAL DEMOLITION DRAWING FOR ADDITIONAL DEMOLITION REQUIREMENTS OUTSIDE OF MECHANICAL SCOPES.

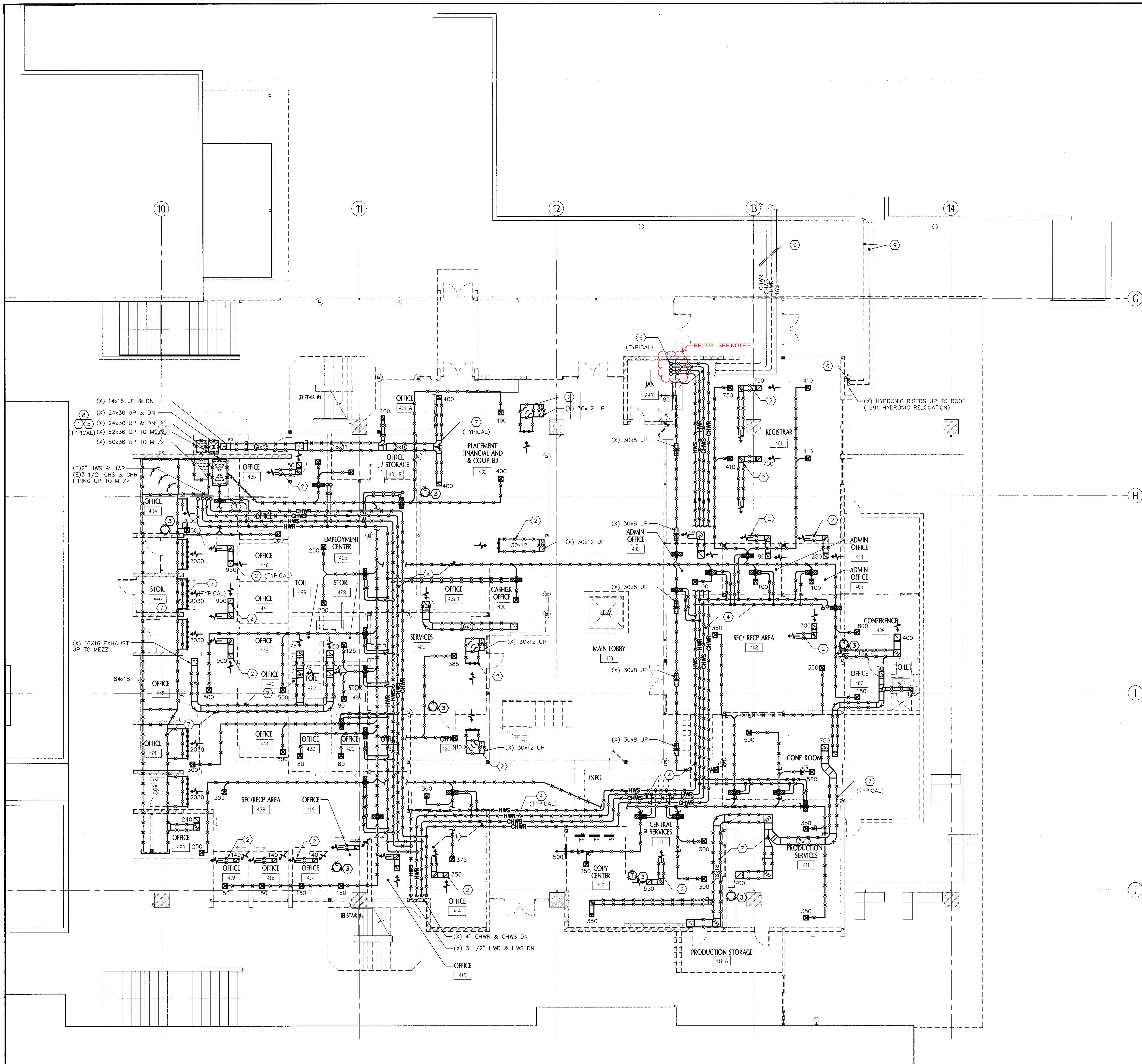
B. REFER TO ELECTRICAL DEMOLITION DRAWING FOR ADDITIONAL DEMOLITION REQUIREMENTS OUTSIDE OF MECHANICAL SCOPES

C. DEMOLITION SCOPE OF WORK INCLUDES:
- REMOVAL OF ALL DUCTWORK, HANGERS, RISERS AND ACCESSORIES SERVING THE THIRD FLOOR
- REMOVAL OF ALL HYDRONIC PIPING, REHEAT COILS, HANGERS, RISERS, AND ISOLATION VALVES SERVING THE 3RD FLOOR.
- REMOVAL OF ALL DUCT AND HYDRONIC RISERS SERVING THE 2ND FLOOR.
- REMOVAL OF ALL THERMOSTATS AND ASSOCIATED WIRING.

D. (E) HYDRONIC PIPING FOR REMAIN IN PLACE UNLESS OTHERWISE NOTED, VERIFY & LABEL FOR REMAIN.

DEMOLITION SHEET KEYNOTES

1 REMOVE (E) DUCT RISERS SERVING THE 2ND FLOOR.
2 REMOVE ALL EXISTING TRANSFER AIR DUCT AND GRILLE. (TYPICAL)
3 REMOVE ALL EXISTING THERMOSTAT AND ASSOCIATED (E)CONTROL WIRING AND DELIVER TO BUILDINGS & GROUNDS.
4 REMOVE ALL (E) HYDRONIC PIPING, (E) REHEAT COILS AND ALL ASSOCIATED PIPE HANGERS SERVING THE SS3 LOWER LEVEL. (TYPICAL)
5 REMOVE ALL (E) DUCT RISERS SERVING THE SS3 LOWER LEVEL.
6 REMOVE (E) HYDRONIC RISERS AND ALL (E) ISOLATION VALVES.
7 REMOVE ALL (E) DUCTWORK AND ALL ASSOCIATED DUCT HANGERS SERVING THE SS3 LOWER LEVEL. (TYPICAL)
8 REMOVE (E) HYDRONIC RISERS SERVING THE 2ND FLOOR.
9 CAP AND ABANDON (E) HYDRONIC PIPING IN PLACE.



1 SS3 LOWER LEVEL DEMO PLAN - MECHANICAL

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

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L-612 STUDENT SERVICES CENTER REMODEL COLLEGE COMPLEX

BID DOCUMENTS

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tBP project number : 20610.00
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SS3 LOWER LEVEL DEMO PLAN - MECHANICAL

drawing no.:
MD-1.1
drawing of

GENERAL SHEET NOTES

A. REFER TO ELECTRICAL DEMOLITION DRAWING FOR ADDITIONAL DEMOLITION REQUIREMENTS OUTSIDE OF MECHANICAL SCOPES.

B. ALL EXISTING SHALL REMAIN UNLESS OTHERWISE NOTED FOR DEMOLITION.

C. DEMOLITION SCOPE OF WORK INCLUDES:
- REMOVAL OF ALL DUCTWORK, HANGERS, RISERS AND ACCESSORIES SERVING THE THIRD FLOOR
- REMOVAL OF ALL HYDRONIC PIPING, REHEAT COILS, HANGERS, RISERS, AND ISOLATION VALVES SERVING THE 3RD FLOOR.
- REMOVAL OF ALL DUCT AND HYDRONIC RISERS SERVING THE 2ND FLOOR.
- REMOVAL OF ALL THERMOSTATS AND ASSOCIATED WIRING.

D. ALL EXISTING MECH EQUIPMENT TO BE DEMOLISHED SHALL BE SALVAGED AND OFFER TO RETURN TO COLLEGE. IF THE DISTRICT REJECTS THE EXISTING EQUIPMENT, CONTRACTOR SHALL DEMOLISH & REMOVE EXISTING.

E. ALL EXISTING MECH EQUIPMENT WILL BE REVIEWED AND TAGGED AT PRE-CONSTRUCTION SITE WALK WITH COLLEGE FACILITIES PERSONNEL. IF THE DISTRICT REJECTS THE EXISTING EQUIPMENT, CONTRACTOR SHALL DEMOLISH & REMOVE EXISTING.

F. UNLESS OTHERWISE NOTED FOR DEMOLITION, SALVAGE ALL EXISTING.

SHEET KEYNOTES

1 DEMOLISH (E) DUCT RISERS.

2 DEMOLISH ALL EXISTING EXHAUST HOOD CONNECTION AND ALL ASSOCIATED DUCT WORK ACCESSORIES. REFER TO STRUCTURAL FOR CONCRETE INFILL AT EXISTING ROOF OPENING.

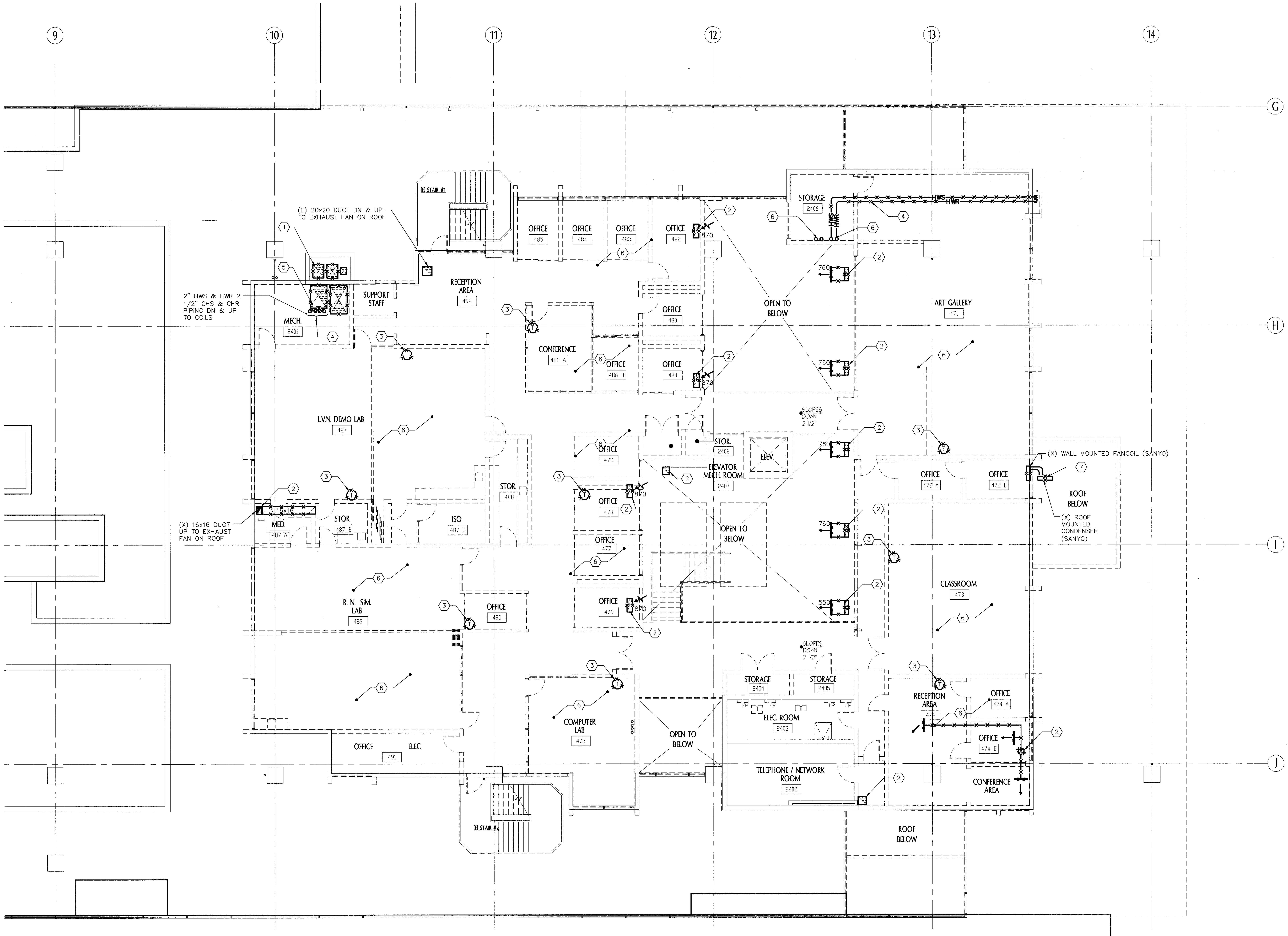
3 DEMOLISH ALL EXISTING THERMOSTAT AND ASSOCIATED (E)CONTROL WIRING. VERIFY LOCATIONS AND REMOVE ALL.

4 DEMOLISH ALL (E) HYDRONIC PIPING, (E) REHEAT COILS AND ALL ASSOCIATED PIPE HANGERS.

5 DEMOLISH (E) HYDRONIC RISERS AND ALL (E) ISOLATION VALVES, EXCEPT FOR THOSE SERVING THE 2ND FLOOR.

6 DEMOLISH ALL (E) DUCTWORK AND ALL ASSOCIATED DUCT HANGERS SERVING THE SS4 UPPER LEVEL.

7 SALVAGE (E) OUTDOOR CONDENSER AND (E) INDOOR FAN COILS AND OFFER TO THE DISTRICT FOR REUSE. DEMOLISH ALL REFRIGERANT PIPING AND ALL ASSOCIATED COMPONENTS.



1 SS4 UPPER LEVEL DEMO PLAN - MECHANICAL

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

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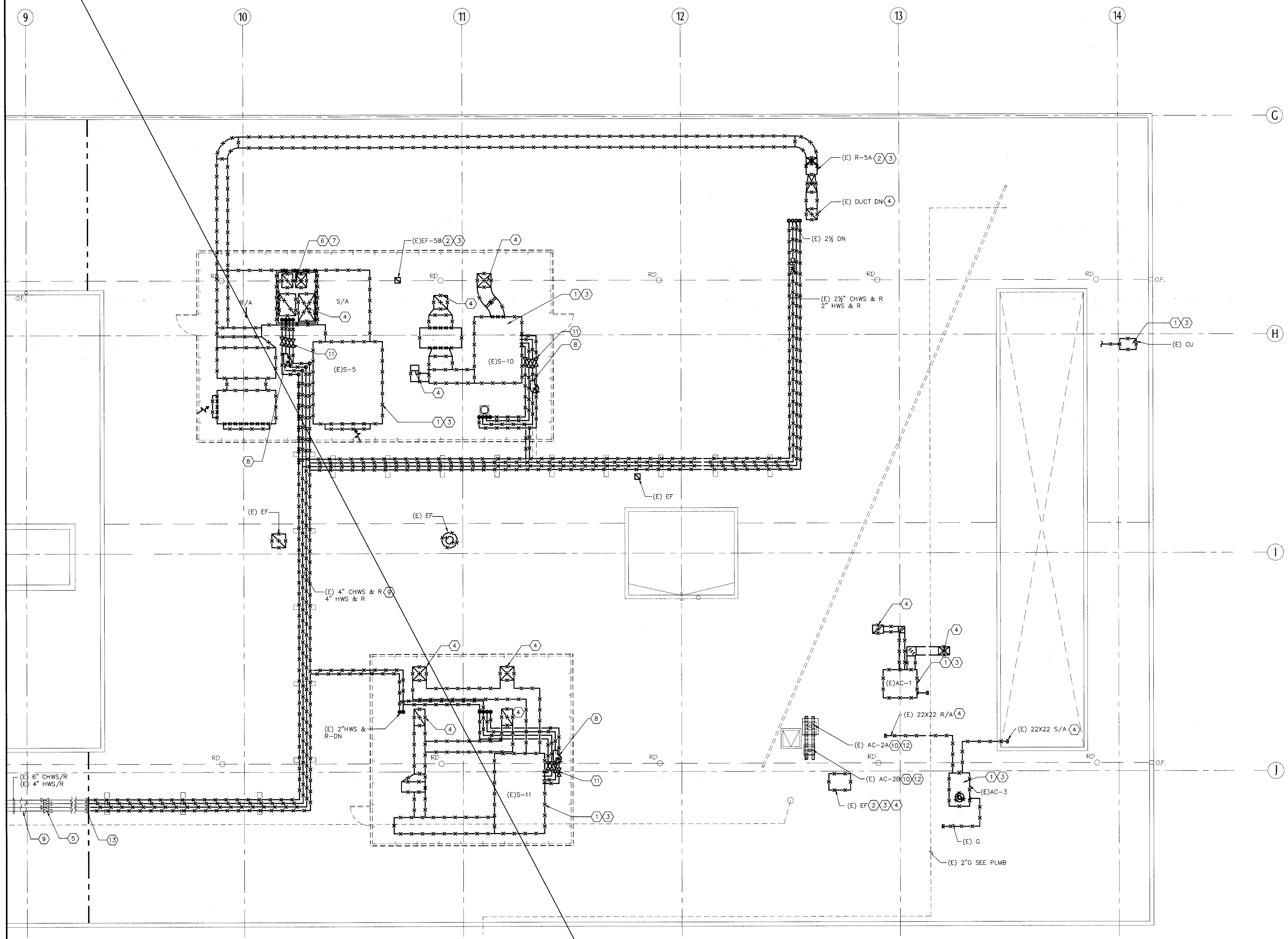
MD-1.2



1 ROOF DEMOLITION PLAN - MECHANICAL

0 4' 8' 16'

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

GENERAL SHEET NOTES

A. REFER TO ELECTRICAL DEMOLITION DRAWING FOR ADDITIONAL DEMOLITION REQUIREMENTS OUTSIDE OF MECHANICAL SCOPES.

B. ALL EXISTING SHALL REMAIN UNLESS OTHERWISE NOTED FOR DEMOLITION.

C. CONTRACTOR SHALL COORDINATE PHASE I DEMOLITION SEQUENCE WITH THE FACILITY IN ORDER TO MINIMIZE IMPACT TO THE OPERATION OF THE FACILITY.

D. ALL OTHER DEMOLITION WORK SHOWN ON THIS DRAWING SHALL BE PHASE II.

E. ALL EXISTING MECH EQUIPMENT TO BE DEMOLISHED SHALL BE SALVAGED AND OFFERED TO COLLEGE FOR RE-USE ON CAMPUS. ALL ROOFTOP MECH EQUIPMENT WILL BE REVIEWED AND TAGGED AT PRE-CONSTRUCTION SITE WALK WITH COLLEGE FACILITIES PERSONNEL. IF THE DISTRICT REJECTS THE EXISTING EQUIPMENT, CONTRACTOR SHALL DEMOLISH & REMOVE EXISTING.

SHEET KEYNOTES

1 DEMOLISH EXISTING HVAC EQUIPMENT AND ALL ASSOCIATED COMPONENTS. SALVAGE & DELIVER ENTIRE UNIT UNDAMAGED. NOTE: DURING DEMOLITION, CONTRACT SHALL TAKE PRECAUTION NOT TO DAMAGE OR DESTROY ANY PARTS OR COMPONENTS OF THE HVAC EQUIPMENT.

2 DEMOLISH EXISTING ROOF MOUNTED EXHAUST FAN, ROOF CURB AND ALL ASSOCIATED DUCT WORK ACCESSORIES.

3 ELECTRICAL POWER TO HVAC EQUIPMENT IS TO BE DEMOLISHED AND PULLED BACK TO THE MAIN CIRCUIT BREAKER. SEE ELECTRICAL DRAWING FOR DEMOLITION REQUIREMENT.

4 REFER TO STRUCTURAL FOR CONCRETE INFILL AND PATCHING AT EXISTING ROOF OPENING.

5 (PHASE I) PROVIDE NEW ISOLATION VALVES FOR ISOLATION OF (E) BUILDING HYDRONIC LOOP. REFER TO M-2.3 FOR NEW ISOLATION VALVES LOCATION.

6 DEMOLISH (E) DUCT RISERS DOWN TO 2ND FLOOR.

7 DEMOLISH (E) DUCT RISERS SERVING 3RD FLOOR.

8 DEMOLISH EXISTING BOOSTER PUMPS. SALVAGE AND OFFER PUMPS TO COLLEGE FOR RE-USE ON CAMPUS.

9 EXISTING HYDRONIC PIPING TO REMAIN. REFER TO ARCH DEMO DRAWING FOR REROOFING AREA SCOPE OF WORK.

10 EXISTING AC UNITS SERVING THE MAIN CAMPUS TELECOM ROOM SHALL REMAIN OPERATIONAL DURING CONSTRUCTION.

11 CLOSE ALL ISOLATION VALVES AND PROVIDE CAP-OUTS PRIOR TO DEMOLITION WORK. REFER TO FACILITY MANAGER FOR LOCATION OF EXISTING MAIN HYDRONIC ISOLATION VALVES SERVING THE BUILDING.

12 PROVIDE TEMPORARY PRE-FAB SLEEPERS FOR (E)AC-2A & (E)AC-2B TO ACCOMMODATE RE-ROOFING.

13 LINE OF RE-ROOFING WHERE (E) HYDRONICS ARE TO BE REMOVED OR REMAINED

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MECHANICAL SYMBOL LIST

NOTE: This is a standard symbol list and not all items listed may be used.

Abbreviations

(E)	EXISTING
(N)	NEW
(X)	DEMOLISH
(RL)	RELOCATE
A/C	AIR CONDITION(ED)
AD	ACCESS DOOR
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
B	BOILER
BDD	BACKDRAFT DAMPER
BFF	BELOW FINISHED FLOOR
BFP	BACKFLOW PREVENTER
BHP	BRAKE HORSEPOWER
CD	CEILING DIFFUSER
CD	CONDENSATE DRAIN
CF	CUBIC FOOT
CFM	CUBIC FEET PER MINUTE
CH	CHILLER
CL	CENTERLINE
CONT.	CONTINUATION
COP	COEFFICIENT OF PERFORMANCE
CT	COOLING TOWER
CU	CONDENSING UNIT
CV	CHECK VALVE
CV	VALVE FLOW COEFFICIENT
CW	COLD WATER
D	DROP
DB	DECIBEL
DB	DRY BULB
DG	DOOR GRILLE
DIA	DIAMETER
DEF	DISHWASHER EXHAUST FAN
DX	DIRECT EXPANSION
EAT	ENTERING AIR TEMPERATURE
EDH	ELECTRIC DUCT HEATER
EER	ENERGY EFFICIENCY RATING
EF	EXHAUST FAN
EFF	EFFICIENT
EL	ELEVATION
ELECT	ELECTRICAL
EWT	ENTERING WATER TEMPERATURE
EXH	EXHAUST
F	FAHRENHEIT
FA	FACE AREA
FC	FAN COIL
FC	FLEXIBLE CONNECTOR
FD	FIRE DAMPER
FF	FOULING FACTOR
FLA	FULL LOAD AMPS
FM	FLOW METER
FPI	FINS PER INCH
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FS	FLOW SWITCH
FT	FEET
FVEL	FACE VELOCITY
GAL	GALLONS
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
HD	HEAD
HP	HEAT PUMP
HP	HORSEPOWER
HTG	HEATING
HTR	HEATER
HWC	HOT WATER COIL
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IN	INCHES
KEF	KITCHEN HOOD EXHAUST FAN
KW	KILOWATT
LBS.	POUNDS
LH	LATENT HEAT
LWT	LEAVING WATER TEMPERATURE
MA	MIXED AIR
MAX	MAXIMUM
MBH	THOUSAND BTU'S PER HOUR
MD	MOTORIZED DAMPER
MH	MOUNTING HEIGHT
MIN	MINIMUM
MS	MOTOR STARTER
MW	MAKE-UP WATER
N/A	NOT APPLICABLE
NC	NOISE CRITERIA
NIC	NOT IN CONTRACT
NO.	NUMBER
NOP	NORMALLY OPEN
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OBD	OPPOSED BLADE DAMPER
OC	ON CENTER
OD	OUTSIDE DIAMETER
P	PUMP
PD	PRESSURE DROP
PH	PHASE
PRV	PRESSURE REDUCING VALVE
PSI	POUNDS PER SQUARE INCH
QTY	QUANTITY
R	RISE
RA	RETURN AIR
REF	REFRIGERANT
RET	RETURN
RH	RELATIVE HUMIDITY
RL	REFRIGERANT LIQUID
RLD	RELIEF DAMPER
RPM	REVOLUTIONS PER MINUTE
RS	REFRIGERANT SUCTION
SA	SUPPLY AIR
SEER	SEASONAL ENERGY EFFICIENCY RATING
SEF	SALON/SHOP EXHAUST FAN
SH	SENSIBLE HEAT
SOV	SHUT OFF VALVE
SP	STATIC PRESSURE
SST	SATURATED SUCTION TEMPERATURE
T, TEMP	TEMPERATURE
TD	TEMPERATURE DIFFERENCE
TH	TOTAL HEAT
TP	TOTAL PRESSURE
TVE	TURNING VANE ELBOW
UD	UNDERCUT DOOR
UH	UNIT HEATER
V	VOLT
VAV	VARIABLE AIR VOLUME
VD	VOLUME DAMPER (HAND OPERATOR)
VEL	VELOCITY
W	WATT
W/	WITH
WB	WET BULB
WC	WATER COLUMN

Dampers

- FD — FIRE DAMPER
- FSD — FIRE/SMOKE DAMPER
- MD — MOTORIZED DAMPER
- SD — SMOKE DAMPER
- VD — VOLUME DAMPER

Ductwork Fittings

- ACCOUSTICALLY LINED DUCT (SIZES SHOWN ARE NET INSIDE)
- BELLMOUTH
- CONCENTRIC SQUARE TO ROUND
- CONCENTRIC TRANSITION, RECTANGULAR OR ROUND
- ECCENTRIC TRANSITION, RECTANGULAR OR ROUND
- EX — EXTRACTOR
- FLEXIBLE CONNECTION
- MITERED ELBOW WITH TURNING VANES
- NON-SYMMETRICAL WYE
- RADIUSED ELBOW
- RECTANGULAR DUCT DROP
- RECTANGULAR DUCT RISER

(Duct)

- RECTANGULAR MAIN WITH RECTANGULAR BRANCH
- RECTANGULAR MAIN WITH ROUND BRANCH
- RECTANGULAR OFFSET LESS THAN 15°
- RECTANGULAR OFFSET MORE THAN 15°
- ROUND DUCT DROP
- ROUND DUCT RISER
- ROUND DUCT WITH ROUND BRANCH
- ROUND WYE
- SYMMETRICAL WYE
- DUCT ROOF SUPPORT

Equipment

- AIR TERMINAL UNIT / VAV BOX
- AIR HANDLING UNIT
- CHILLED / HEATING WATER PUMP

General

- 12x12 / 100, CD-1 — DIFFUSER OR GRILLE IDENTIFICATION
- OUTSIDE AIR
- RETURN OR EXHAUST AIR
- SUPPLY AIR

Piping Fittings

- AUTOMATIC AIR VENT
- BACKFLOW PREVENTER
- CAP
- CONCENTRIC REDUCER
- CONTINUATION
- ECCENTRIC REDUCER
- EXPANSION JOINT
- EXPANSION LOOP
- ET — EXPANSION TANK
- FLOW DIRECTION
- FLOW SWITCH
- HOSE BIBB
- MANUAL AIR VENT
- PIPE BELOW GRADE
- PIPE DROP
- PIPE REMOVED IN DEMOLITION
- PIPE RISE
- PIPE TO DRAIN
- PRESSURE GAUGE WITH COCK
- PRESSURE RELIEF VALVE
- PRESSURE SENSOR
- SHOCK ABSORBER
- T&P RELIEF VALVE WITH PIPE TO DRAIN
- TEE DOWN ON PIPE
- TEE UP ON PIPE
- TEMPERATURE SENSOR
- TEST PORT (PETE'S PLUG OR EQUAL)
- THERMOMETER
- UNION
- VENT TO ATMOSPHERE

Piping Systems

- —CHWR— CHILLED WATER RETURN
- —CHWS— CHILLED WATER SUPPLY
- —CHWSR— CHILLED WATER SUPPLY AND RETURN
- —HWR— HEATING WATER RETURN
- —HWS— HEATING WATER SUPPLY
- —RL— REFRIGERANT LIQUID
- —RS— REFRIGERANT SUCTION

Piping Valves

- BALANCING VALVE
- CHECK VALVE
- GATE VALVE
- GLOBE VALVE
- MOTORIZED, 2-WAY VALVE
- MOTORIZED, 3-WAY VALVE
- PRESSURE REDUCING VALVE
- QUARTER TURN VALVE
- VALVE
- VALVE, GENERAL
- REHEAT COIL CONNECTION KIT: INCLUDING PIPE FLEX CONNECTOR, STRAINER, FLOW CONTROL BALANCING VALVE, QUARTER TURN, SHUT OFF VALVE, DIGITAL CONTROL BOX AND ALL APPURTENANCE COMPONENTS FOR A COMPLETE VAV BOX.
- T — THERMOSTAT SENSOR (LOCAL DISPLAY)
- TS — THERMOSTAT SENSOR (STANDARD)
- S CO2 — CARBON DIOXIDE SENSOR
- COMBINATION FIRESMOKE DAMPER

GENERAL DEMOLITION NOTES

A. COORDINATE DEMOLITION AND CUTTING PATCHING WITH GENERAL CONTRACTOR, REVIEW AS-BUILT DRAWINGS AND SURVEY EXISTING FIELD CONDITIONS PRIOR TO SUBMITTING CONSTRUCTION CONTRACT BIDS. SEE SPECIFICATIONS GENERAL PROVISIONS, NOT ALL DUCT AND PIPING ARE ILLUSTRATED.

B. REFER TO ARCHITECTURAL, STRUCTURAL, PLUMBING AND ELECTRICAL DRAWINGS FOR SPACE ALLOTMENT, BEAM LOCATION AND COORDINATION PURPOSES. CONFLICTS REGARDING SPACE REQUIREMENTS, CLEARANCES, INTERFERENCE WITH STRUCTURE OR OTHER WORK, ETC., SHALL BE DIRECTED TO THE ARCHITECT FOR RESOLUTION PRIOR TO INSTALLATION OF WORK.

C. CUTTING, PATCHING AND PAINTING OF EXISTING WALLS, CEILINGS AND FLOOR TO ACCOMODATE WORK AS SHOWN OR SPECIFIED HEREIN, SHALL BE INCLUDED IN THE WORK FOR EACH TRADE.

D. VERIFY AND COORDINATE ALL CHILLED AND HEATING WATER PIPING CONNECTION BETWEEN EXISTING AND NEW. CONTRACTOR SHALL REROUTE/REPIPE EXISTING PIPING TO REMAIN AS REQUIRED TO MAINTAIN SERVICE.

E. EXISTING DUCTS AND PIPING SERVING THE SECOND FLOOR SPACES ARE TO REMAIN.

F. ALL BIDDERS ARE REQUIRED TO COLLECT ALL AS BUILTS INFORMATION, ATTEND THE PRE-BID SITE WALK TO UNDERSTAND THE SCOPE, OR THEY MAY SUBMIT PRE-BID RFI PRIOR TO BIDDING. UNFORSEEN CONDITION MAY ARISE DURING DEMOLITION. IN THE EVENT WHERE CONFLICTS ARISE, CONTRACTOR SHALL SUBMIT RFI FOR CLARIFICATION. FAILURE TO DO SO WILL RESULT NO ADDITIONAL COST TO THE OWNER.

G. PROVIDE TEMPORARY HEATING & COOLING SERVING THE CHILDCARE CENTER FOR THE DURATION OF THE CONSTRUCTION & RELOCATING OF THE HYDRONIC HEATING & CHILLED WATER PIPING.

GENERAL SEISMIC BRACING

A. ANCHORAGE OF ALL EQUIPMENT TO BE INSTALLED, AS A PART OF THIS PROJECT SHALL BE DETAILED ON THESE PLANS, EXCEPT FOR THE FOLLOWING:

1. EQUIPMENT WEIGHING LESS THAN 400 POUNDS SUPPORTED DIRECTLY ON THE FLOOR PLAN.
2. EQUIPMENT WEIGHING LESS THAN 20 POUNDS SUPPORTED BY VIBRATION ISOLATOR.
3. EQUIPMENT WEIGHTING THAN 20 POUNDS SUSPENDED FROM A ROOF OR FLOOR OR HUNG FROM A WALL.

REFERENCE: PERMANENT EQUIPMENT IN ITEMS 1, 2 AND 3 MUST BE SUPPORTED AND ANCHORED TO RESIST THE FORCES PRESCRIBED BY CHAPTER 13 OF ASCE 7-05 AS MODIFIED BY THE CBC 2010 SECTION 1613A / 1614A AND THE ANCHORAGE SHALL BE APPROVED BY THE APPROPRIATE DESIGN PROFESSIONAL OF RECORD AS A PART OF FIELD REVIEWS / OBSERVATIONS. THE INSPECTOR OF RECORD SHALL ASSURE THAT THE ABOVE REQUIREMENTS ARE ENFORCED.

REFERENCE: CBC 2010 TITLE 24 PART 1 SECTION 7-125(C)(2)(L), 7-125(C)(3)(C), 7-125(C)(4)(M) AND 7-125(C)(5)(L)

B. REFER TO STRUCTURAL DRAWINGS FOR CONCRETE ANCHOR TYPE AND INSTALLATION REQUIREMENTS.

C. ALL PIPING AND CONDUIT CROSSING BUILDING SEISMIC SEPARATIONS SHALL BE PROVIDED WITH APPROVED FLEXIBLE CONNECTORS.

D. A COPY OF THE BRACING SYSTEMS INSTALLATION MANUAL SHALL BE ON THE JOB SITE PRIOR TO STARTING THE INSTALLATION OF THE HANGERS AND/OR BRACES. SUBMIT APPLICABLE DETAILS FOR REVIEW AND APPROVAL.

E. LATERAL SUPPORT FOR PIPES AND DUCTS SHALL COMPLY WITH THE REQUIREMENTS OF THE LATEST ADDITION OF THE "GUIDELINES FOR SEISMIC RESTRAINTS OF MECHANICAL SYSTEMS AND PLUMBING SYSTEMS" BY SMACNA.

F. UNLESS THE STRUCTURAL DRAWINGS HAVE AN ENGINEERED SYSTEM, PIPING SHALL BE SUPPORTED AND BRACED WITH ONE OF THE FOLLOWING PRE-APPROVED SYSTEMS:
1. OPA - 0300 TOLCO SEISMIC RESTRAINT SYSTEM.
2. OPA-0349, MASON SEISMIC RESTRAINT GUIDELINES FOR MECHANICAL SYSTEMS AND PLUMBING SYSTEMS. OPA-0114, B-LINE SEISMIC RESTRAINT SYSTEM.
3. OPA-0125, NUSIG SEISMIC SUPPORT DEVICES.

G. SEISMIC BRACING POINTS SHALL BE SUBMITTED ON CONTRACTOR'S COORDINATED SHOP DRAWINGS.

H. ALL PRE-APPROVED MUST BE SATISFIED. IF DEVIATED FROM PRE-APPROVAL SCOPE, THE PRE-APPROVAL STATUS BECOMES INVALID FOR APPLICATION. DSA/IOR MAY CHOOSE TO COMMENT OR ACCEPT THE MODIFIED PORTIONS.

RFI 209 - NO SEIMIC BRACING REQUIRED FOR SUSPENDED PLUMBING PIPE, MECH PIPE AND HAVC

I. CONTRACTOR TO SUBMIT WRITTEN CERTIFICATION, BY A STRUCTURAL OR CIVIL ENGINEER REGISTERED IN THE STATE OF CALIFORNIA THAT THE PIPING AND DUCTWORK IS INSTALLED IN COMPLIANCE WITH THE REQUIREMENTS OF THE 2010 CALIFORNIA BUILDING CODE.

J. LAYOUT DRAWINGS, SHOWING THE BRACING/SUPPORT LOCATIONS AND REFERENCES TO DETAILS FROM THE RELEVANT DSA PRE-APPROVALS FOR PIPING/DUCTS/CONDUITS EXCEPT FIRE SPRINKLERS, NEED TO BE SUBMITTED FOR USE BY THE IOR FIELD STAFF. THE LAYOUT DRAWINGS, PREPARED PER SECTION 13.6, ASCE 7-05 AS AMENDED BY SECTION 1615A1.14, CBC 2010, NEED TO BE REVIEWED AND ACCEPTED BY THE IOR AND EOR (SE AND/OR ME/EE) PRIOR TO STARTING INSTALLATION OF THE BRACING/SUPPORT. IOR SHALL ENSURE THE ABOVE REQUIREMENTS ARE SATISFIED.

K. A COPY OF THE CHOSEN BRACING SYSTEM(S) INSTALLATION GUIDE/MANUAL SHALL BE ON THE JOBSITE PRIOR TO STARTING THE INSTALLATION OF THE COMPONENT, EQUIPMENT, HANGERS AND/OR BRACES.

GENERAL MECHANICAL NOTES

A. ALL NEW CONSTRUCTION SHALL CONFORM TO CURRENT CITY, STATE, AND NATIONAL CODES, STANDARDS, AND REQUIREMENTS.

B. ALL MATERIALS AND WORKMANSHIP ARE SUBJECT TO APPROVAL BY OWNER. ANY DEFECTIVE WORK SHALL BE REPLACED BY THE CONTRACTOR AS PART OF THIS CONTRACT AT NO ADDITIONAL COST TOT THE OWNER.

C. ANY NEW OR EXISTING DUCT OR PIPING OFFSETS REQUIRED AS RESULT OF JOB CONDITIONS OR LACK OF COORDINATION WITH OTHER TRADES SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.

D. CONTRACTOR SHALL PROVIDE DUCTWORK AND TRANSITION EQUAL TO DUCT FREE AREA OF DUCTWORK AS SHOWN ON DRAWINGS, TO PREVENT A CONFLICT WITH EXISTING CONDITIONS OR TO RESOLVE DUCTWORK CONFLICTS.

E. PROVIDE MANUAL VOLUME DAMPERS TO FACILITATE PROPER BALANCE OF THE AIR DISTRIBUTION SYSTEM. VOLUME DAMPER AT DIFFUSERS AND REGISTERS SHALL NOT BE USED FOR AIR BALANCING.

F. SEAL ALL OPENINGS AROUND PIPING AND DUCTWORK PENETRATING FIRE RESISTIVE RATED WALLS TO MAINTAIN RATING INTEGRITY.

G. COORDINATE EXACT LOCATION OF CEILING, WALL OR FLOOR ACCESS PANELS FOR FIRE, SMOKE OR COMBINATION FIRE SMOKE DAMPERS AND VOLUME DAMPERS WITH ARCHITECT.

H. COORDINATE EXACT LOCATION OF CORE DRILLING, CUTTING OF FLOOR SLAB, OR WALLS OF THE BUILDING WITH THE ARCHITECTURAL AND STRUCTURAL DRAWINGS.

I. PROVIDE ACCESS DOOR FOR ALL EQUIPMENT, VALVES AND CLEANOUTS WHICH REQUIRE ACCESS FOR ADJUSTMENT OR SERVICING, AND WHICH ARE LOCATED IN OTHERWISE INACCESSIBLE LOCATIONS. OPENINGS SHALL BE LARGE ENOUGH TO PERMIT MAINTENANCE AND ADJUSTMENT OF THE DEVICE.

J. DUCTS STORED ON THE CONSTRUCTION SITE SHALL BE PROTECTED AND ISOLATED FROM DUST CONTAMINATION.

K. PITCH PIPELINES AS REQUIRED FOR PROPER DRAINAGE AND ELIMINATION OF AIR.

L. PROVIDE CONDENSATE DRAIN PIPING WITH DRAINAGE AND CLEANOUT FITTINGS FOR ALL COOLING COILS AND ROUTE TO A NEAREST APPROVED RECEPTOR.

M. THE PROJECT DESIGN SHOWN ON THE DRAWINGS AND SPECIFIC ITEMS REFERENCED IN THE SPECIFICATIONS IS IN COMPLIANCE WITH THE CODES AND ORDINANCES LISTED IN DIVISION 23 SPECIFICATIONS.

N. PROVIDE SEISMIC ANCHORAGE AND BRACING FOR MECHANICAL EQUIPMENT, PIPING AND DUCTWORK. SEE "GENERAL SEISMIC NOTES" FOR DETAIL REQUIREMENTS.

O. COORDINATE WITH DIVISION 26 CONTRACTOR FOR LOCATION OF POWER AND LOCAL DISCONNECTS FOR MECHANICAL EQUIPMENT DEVICES.

P. INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS UNLESS SPECIFICALLY INDICATED OTHERWISE OR WHERE THE LOCAL CODES OR REGULATIONS TAKE PRECEDENCE.

Q. DRAWINGS ARE DIAGRAMMATIC IN NATURE AND EXISTING CONDITIONS SHALL BE FIELD VERIFIED FOR EXACT LOCATION AND SIZES OF EXISTING UTILITIES, THE PROPOSED POINT OF CONNECTIONS TO EXISTING SYSTEMS, AND NEW ROUTINGS. THE CONTRACTOR IS RESPONSIBLE TO THOROUGHLY VERIFY ALL EXISTING CONDITIONS BEFORE SUBMITTING BID.

R. KEEP CUTTING TO THE MINIMUM REQUIRED FOR PROPER EXECUTION OF WORK. BE RESPONSIBLE FOR ALL CUTTING AND PATCHING NECESSARY FOR THE COMPLETION OF WORK. NO CUTTING SHALL BE PERFORMED WITHOUT THE APPROVAL OF THE ARCHITECT.

S. PROVIDE OFFSETS, ELBOWS AND TRANSITIONS IN DUCTWORK AND PIPING AS REQUIRED AT NO ADDITIONAL COST TO THE OWNER.

T. VERIFY ALL CONNECTIONS WITH MANUFACTURER'S CERTIFIED DRAWINGS. PROVIDE TRANSITIONS FOR FINAL CONNECTION TO EQUIPMENT. FIELD VERIFY ALL DIMENSIONS PRIOR TO FABRICATION OF WORK.

U. VERIFY DIFFUSERS, GRILLS, AND REGISTER MOUNTING FRAME TYPES WITH CEILING TYPE AND CONFIGURATION.

V. PROVIDE DUCT ACCESS DOORS FOR ALL DUCTS AS REQUIRED BY DISTRICT STANDARDS.

W. PROVIDE HANGER, SUPPORT AND SWAY BRACES FOR ALL DUCTWORK AND EQUIPMENT AS REQUIRED BY THE LATEST EDITION OF THE SMACNA GUIDELINES.

X. DUCT SYSTEMS SHALL BE BALANCED TO CFM ON DRAWINGS. FANS SHALL BE FIELD TESTED TO ENSURE COMPLIANCE WITH SCHEDULED FAN PERFORMANCE, AIR FLOW AT DESIGN STATIC PRESSURE.

Y. ALL WORK AND MATERIALS SHALL BE IN COMPLIANCE WITH THE SPECIFICATIONS IN THE EVENT OF A CONFLICT BETWEEN THE CONTRACT DRAWINGS AND THE SPECIFICATIONS, THE MOST STRINGENT SHALL GOVERN.

Z. INSTALL ALL PIPING AND DUCTWORK TO BEST SUIT FIELD CONDITIONS AND COORDINATE WITH OTHER TRADES. THE DRAWINGS ARE DIAGRAMMATIC, AND SHALL NOT BE SCALED TO DETERMINE THE EXACT LOCATIONS OF THE PIPING OR DUCTWORK.

AA. CONTRACTOR SHALL FIELD-VERIFY EXISTING CONDITIONS AND SHALL REPORT ANY DISCREPANCIES AND/OR INCONSISTENCIES BETWEEN THE DRAWINGS AND EXISTING CONDITIONS TO THE ENGINEER BEFORE COMMENCEMENT OF WORK.

AB. CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING ALL TRADE PERMITS AND INSPECTIONS.

AC. CONTRACTOR SHALL PROVIDE ALL MATERIALS, LABOR, AND EQUIPMENT TO COMPLETE WORK AS SET FORTH IN THESE PLANS UNLESS OTHERWISE NOTED. THE SUBMISSION OF A BID OR PROPOSAL SHALL BE CONSIDERED AS CONCLUSIVE EVIDENCE THAT THE CONTRACTOR IS THOROUGHLY FAMILIAR WITH THE INTENT OF THE CONTRACT DOCUMENTS, AND NO CHANGE ORDER WILL BE ISSUES FOR ANY ADDITIONAL LABOR OR MATERIAL REQUIRED TO RECTIFY ANY DISCREPANCY DISCOVERED OR REPORTED TO THE ENGINEER AFTER THE EXECUTION OF CONTRACT.

AD. "PROVIDE ACOUSTICAL INTERNAL DUCT LINING WHERE SHOWN ON PLANS OR INDICATED IN SPECIFICATIONS."

AE. MINIMUM ALLOWABLE FOR END RUNS HYDRONIC PIPING ARE GENERALLY SIZED AT ¾" FOR VAV TERMINAL.

AF. COORDINATION DOCUMENTS FOR ALL DIVISION 15 AND 16 TRADES SHALL BE SUBMITTED AND SIGNED OFF BY ALL TRADES. NO SHOP DRAWINGS SHALL BE REVIEWED BY AOR AND ENGINEERS UNLESS COORDINATION DOCUMENTS ARE SIGNED OFF.

CONTRACTOR TO REVIEW REQUIREMENTS FOR COORDINATION DRAWINGS IN DIVISION 1, 15, AND 16 SECTIONS. PROVIDE ADEQUATE TIME IN SCHEDULE TO ASSESS SITE CONDITIONS IN FIELD, ATTEND MEETINGS, CREATE COORDINATION DOCUMENTATION AS SPECIFIED, AND ALLOW FOR FOUR WEEKS OF REVIEW PERIOD AFTER SUBMISSION OF FINAL COORDINATION DOCUMENTS. INSTALLATION OF SYSTEMS AND EQUIPMENT WILL NOT BE ALLOWED UNTIL COORDINATION DOCUMENTS ARE REVIEWED BY ARCHITECT.

DSA STRUCTURAL ANCHORAGE COORDINATION SHEET

EQUIPMENT TAG	EQUIPMENT DESCRIPTION	INTERFACE PLAN DRAWING	INTERFACE SCHEDULE DRAWING	INTERFACE DETAIL DRAWING	STRUCTURAL DETAIL (SUPPORT)	ARCHITECTURAL DETAIL (SUPPORT)	REMARKS
AHU-1 THRU AHU-7	AIR HANDLING UNITS	M-2.3	--	--	--	--	
CHWP-1 & HWP-1	CHILLED & HEATING WATER PUMP	M-2.3	--	--	--	--	
AC-1	WALL MOUNTED DUCTLESS SPLIT SYSTEM	M-2.1A	--	--	--	--	
CU-1	ROOF MOUNTED CONDENSING UNIT	M-2.3	--	--	--	--	
EF-1, EF-2, EF-3, EF-4	ROOF MOUNTED EXHAUST FAN	M-2.2	--	--	--	--	
VAV-2-xx TO VAV-7-xx	CEILING HUNG VAV TERMINAL UNITS	M-2.1B, M-2.2B	--	--	--	--	
						--	

NOTES:
PROVIDE SEISMIC CALCULATIONS AND DETAILS, SIGNED AND SEALED BY CALIFORNICA REGISTERED STRUCTURAL ENGINEER.
NO CUTTING OR DAMAGING OF EXISTING CONCRETE WAFFLE.

SHEET INDEX

M-0.1 MECHANICAL SYMBOL LIST & GENERAL NOTES
M-0.2 TITLE 24 - ENERGY COMPLIANCE FORMS
M-0.3 TITLE 24 - ENERGY COMPLIANCE FORMS
M-0.4 TITLE 24 - ENERGY COMPLIANCE FORMS
M-0.5 TITLE 24 - ENERGY COMPLIANCE FORMS

MD-1.1 SS3 LOWER LEVEL DEMO PLAN - MECHANICAL
MD-1.2 SS4 UPPER LEVEL DEMO PLAN - MECHANICAL
MD-1.3 ROOF DEMOLITION PLAN - MECHANICAL

M-2.1A SS3 LOWER LEVEL FLOOR PLAN - HVAC DUCTWORK
M-2.1B SS3 LOWER LVL FLR PLAN - HVAC REHEAT PIPING
M-2.2A SS4 UPPER LEVEL FLOOR PLAN - HVAC DUCTWORK
M-2.2B SS4 UPPER LVL FLR PLAN - HVAC REHEAT PIPING
M-2.3 ROOF PLAN - MECHANICAL

M-3.1 MECHANICAL DETAILS
M-3.2 MECHANICAL DETAILS
M-3.3 MECHANICAL DETAILS

M-4.1 MECHANICAL SCHEDULES
M-4.2 MECHANICAL SCHEDULES

M-5.1 HYDRONIC PIPING DIAGRAM
M-5.2 AIR FLOW DIAGRAM

M-6.1 MECHANICAL CONTROL DIAGRAM
M-6.2 MECHANICAL CONTROL DIAGRAM
M-6.3 MECHANICAL CONTROL DIAGRAM

tBP architecture planning interiors management
tBP/Architecture
1000 Burnett Avenue Suite 140
Concord, CA 94520
ph: 925.246.6419 fx: 925.246.6495
architect

INTERFACE ENGINEERING
consultant

name
address
city, state, zip
ph fx
agency

L-612 STUDENT SERVICES CENTER REMODEL
COLLEGE COMPLEX
BID DOCUMENTS

LOS MEDANOS COLLEGE
2700 EAST LELAND DRIVE
PITTSBURG, CA 94565

owner

tBP project number : 20610.00
file name: 0106M01.dwg
drawn by: GE checked by: BC
date: JULY 31, 2012

Rev:	date:	description:

drawing title:
MECHANICAL SYMBOL LIST & GENERAL NOTES

drawing no.:
M-0.1
drawing of

ENVELOPE MANDATORY MEASURES: NONRESIDENTIAL — ENV-MM

Project Name: LMCC L-612 Student Services Center Remodel — Date 09/30/2011

DESCRIPTION

Building Envelope Measures:

§118(a):	Installed insulating material shall have been certified by the manufacturer to comply with the California Quality Standards for insulating material, Title 20 Chapter 4, Article 3.
§118(c):	All insulating Materials shall be installed in compliance with the flame spread rating and smoke density requirements of Sections 2602 and 707 of Title 24, Part 2.
§118(f):	The opaque portions of framed demising walls in nonresidential buildings shall have insulation with an installed R-value of no less than R-13 between framing members.
§117(a):	All Exterior Joints and openings in the building that are observable sources of air leakage shall be caulked, gasketed, weatherstripped or otherwise sealed.
§116(a) 1:	Manufactured fenestration products and exterior doors shall have air infiltration rates not exceeding 0.3 cfm/ft.² of window area, 0.3 cfm/ft.² of door area for residential doors, 0.3 cfm/ft.² of door area for nonresidential single doors (swinging and sliding), and 1.0 cfm/ft.² for nonresidential double doors (swinging).
§116(a) 2:	Fenestration U-factor shall be rated in accordance with NFRC 100, or the applicable default U-factor.
§116(a) 3:	Fenestration SHGC shall be rated in accordance with NFRC 200, or NFRC 100 for site-built fenestration, or the applicable default SHGC.
§116(b):	Site Constructed Doors, Windows and Skylights shall be caulked between the unit and the building, and shall be weatherstripped (except for unframed glass doors and fire doors).

PERFORMANCE CERTIFICATE OF COMPLIANCE (Part 2 of 3) — PERF-1

Project Name: LMCC L-612 Student Service Center Remodel — Date: 30-Sep-2011

ANNUAL TDV ENERGY USE SUMMARY (TDV-kBtu/sqft-yr)

ENERGY COMPONENT	Standard Design	Proposed Design	Compliance Margin
Space Heating	10.18	9.84	0.34
Space Cooling	71.53	63.00	8.52
Indoor Fans	108.79	58.85	49.94
Heat Rejection	0.00	3.91	-3.91
Pumps	1.84	14.79	-12.96
Domestic Hot Water	8.73	8.13	0.59
Lighting	67.87	41.20	26.67
Receptacle	69.74	69.74	0.00
Process	0.00	0.00	0.00
Exterior Usage	0.00	0.00	0.00
TOTALS:	338.66	269.46	69.21

BUILDING COMPLIES

GENERAL INFORMATION

Building Orientation	North	Conditioned Floor Area	37,124
Number of Stories	2	Unconditioned Floor Area	-402
Number of Systems	10		

	Conditioned	Unconditioned	Plenum
Number of Zones	76	10	0

	Orientation	Gross Area	Glazing Area	Glazing Ratio
Front Elevation	North	4,256 sqft	1,450 sqft	0.341
Left Elevation	East	3,042 sqft	1,259 sqft	0.414
Rear Elevation	South	4,217 sqft	537 sqft	0.127
Right Elevation	West	2,854 sqft	883 sqft	0.309
Total		14,369 sqft	3,919 sqft	0.273
Roof		19,500 sqft	1,088 sqft	0.056

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ENVELOPE COMPLIANCE SUMMARY Performance (part 1 of 2) — ENV-1C

Project Name: LMCC L-612 Student Service Center Remodel — Date: 30-Sep-2011

OPAQUE SURFACES

#	Surface Type	Appendix JA4 Reference	Area	U-Factor	Az.	Tilt	Status	Location (Space)
49	Roof	4.2.6-A7, R24.0 Rigid	1,319	0.038	180°	0°	NEW	M08
50	Roof	4.2.6-A7, R24.0 Rigid	273	0.038	180°	0°	NEW	M09
51	Roof	4.2.6-A7, R24.0 Rigid	759	0.038	180°	0°	NEW	M10
52	Above Grade Wall	4.3.3-A6, R5.0 Rigid	352	0.094	270°	90°	NEW	M11
53	Above Grade Wall	4.3.3-A6, R5.0 Rigid	160	0.094	0°	90°	NEW	M11
54	Roof	4.2.6-A7, R24.0 Rigid	508	0.038	270°	0°	NEW	M11
55	Above Grade Wall	4.3.3-A6, R5.0 Rigid	11	0.094	0°	90°	NEW	M13
56	Roof	4.2.6-A7, R24.0 Rigid	118	0.038	0°	0°	NEW	M13
57	Roof	4.2.6-A7, R24.0 Rigid	557	0.038	180°	0°	NEW	M14
58	Above Grade Wall	4.3.3-A6, R5.0 Rigid	15	0.094	0°	90°	NEW	M15
59	Roof	4.2.6-A7, R24.0 Rigid	137	0.038	0°	0°	NEW	M15
60	Above Grade Wall	4.3.3-A6, R5.0 Rigid	6	0.094	0°	90°	NEW	M16
61	Roof	4.2.6-A7, R24.0 Rigid	423	0.038	0°	0°	NEW	M16
62	Roof	4.2.6-A7, R24.0 Rigid	185	0.038	180°	0°	NEW	M17
63	Above Grade Wall	4.3.3-A6, R5.0 Rigid	7	0.094	0°	90°	NEW	M18
64	Roof	4.2.6-A7, R24.0 Rigid	136	0.038	0°	0°	NEW	M18
65	Above Grade Wall	4.3.3-A6, R5.0 Rigid	255	0.094	0°	90°	NEW	M21
66	Above Grade Wall	4.3.3-A6, R5.0 Rigid	83	0.094	270°	90°	NEW	M21
67	Roof	4.2.6-A7, R24.0 Rigid	344	0.038	180°	0°	NEW	M21
68	Above Grade Wall	4.3.3-A6, R5.0 Rigid	54	0.094	270°	90°	NEW	M22
69	Above Grade Wall	4.3.3-A6, R5.0 Rigid	161	0.094	0°	90°	NEW	M22
70	Above Grade Wall	4.3.3-A6, R5.0 Rigid	168	0.094	0°	90°	NEW	M22
71	Roof	4.2.6-A7, R24.0 Rigid	534	0.038	270°	0°	NEW	M22
72	Roof	4.2.6-A7, R24.0 Rigid	705	0.038	180°	0°	NEW	M23
73	Roof	4.2.6-A7, R24.0 Rigid	243	0.038	180°	0°	NEW	M24
74	Roof	4.2.6-A7, R24.0 Rigid	196	0.038	180°	0°	NEW	M25
75	Roof	4.2.6-A7, R24.0 Rigid	376	0.038	180°	0°	NEW	M26
76	Above Grade Wall	4.3.3-A6, R5.0 Rigid	215	0.094	0°	90°	NEW	M27
77	Roof	4.2.6-A7, R24.0 Rigid	306	0.038	0°	0°	NEW	M27
78	Roof	4.2.6-A7, R24.0 Rigid	792	0.038	180°	0°	NEW	M28
79	Roof	4.2.6-A7, R24.0 Rigid	395	0.038	180°	0°	NEW	M29
80	Above Grade Wall	4.3.3-A6, R5.0 Rigid	410	0.094	180°	90°	NEW	M30
81	Roof	4.2.6-A7, R24.0 Rigid	829	0.038	180°	0°	NEW	M30
82	Roof	4.2.6-A7, R24.0 Rigid	166	0.038	180°	0°	NEW	M32
83	Above Grade Wall	4.3.3-A6, R5.0 Rigid	156	0.094	180°	90°	NEW	M33
84	Roof	4.2.6-A7, R24.0 Rigid	213	0.038	180°	0°	NEW	M33
85	Roof	4.2.6-A7, R24.0 Rigid	267	0.038	180°	0°	NEW	M34
86	Roof	4.2.6-A7, R24.0 Rigid	333	0.038	180°	0°	NEW	M35
87	Roof	4.2.6-A7, R24.0 Rigid	390	0.038	0°	0°	NEW	M36
88	Roof	4.2.6-A7, R24.0 Rigid	82	0.038	180°	0°	NEW	M37
89	Roof	4.2.6-A7, R24.0 Rigid	218	0.038	90°	0°	NEW	M38
90	Above Grade Wall	4.3.3-A6, R5.0 Rigid	17	0.094	90°	90°	NEW	M38
91	Above Grade Wall	4.3.3-A6, R5.0 Rigid	82	0.094	90°	90°	NEW	M39
92	Above Grade Wall	4.3.3-A6, R5.0 Rigid	376	0.094	180°	90°	NEW	M39
93	Roof	4.2.6-A7, R24.0 Rigid	244	0.038	90°	0°	NEW	M39
94	Roof	4.2.6-A7, R24.0 Rigid	479	0.038	180°	0°	NEW	M40
95	Roof	4.2.6-A7, R24.0 Rigid	245	0.038	90°	0°	NEW	M41
96	Above Grade Wall	4.3.3-A6, R5.0 Rigid	130	0.094	90°	90°	NEW	M41
97	Above Grade Wall	4.3.3-A6, R5.0 Rigid	85	0.094	90°	90°	NEW	M42

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ENVELOPE COMPLIANCE SUMMARY Performance (part 1 of 2) — ENV-1C

Project Name: LMCC L-612 Student Service Center Remodel — Date: 30-Sep-2011

VERTICAL FENESTRATION SURFACES WITH NFRC U-FACTORS

#	Fenestration Type	Area (ft²)	U-Factor	Azimuth	SHGC	Glazing Type	Location (Space)
33	Mfg Fixed, Mtl w/ Brk	59	0.390	270°	0.27	NFRC Props, ...6 Spc, w/Tint	M11
34	Mfg Fixed, Mtl w/ Brk	59	0.390	270°	0.27	NFRC Props, ...6 Spc, w/Tint	M11
35	Mfg Fixed, Mtl w/ Brk	97	0.450	0°	0.35	NFRC Props, ...6 Spc, w/Tint	M13
36	Mfg Fixed, Mtl w/ Brk	116	0.450	0°	0.35	NFRC Props, ...6 Spc, w/Tint	M15
37	Mfg Fixed, Mtl w/ Brk	72	0.450	0°	0.35	NFRC Props, ...6 Spc, w/Tint	M16
38	Mfg Fixed, Mtl w/ Brk	41	0.450	0°	0.35	NFRC Props, ...6 Spc, w/Tint	M18
39	Mfg Fixed, Mtl w/ Brk	47	0.390	0°	0.36	NFRC Props, ...6 Spc, w/Tint	M21
40	Mfg Fixed, Mtl w/ Brk	60	0.390	0°	0.36	NFRC Props, ...6 Spc, w/Tint	M21
41	Mfg Fixed, Mtl w/ Brk	59	0.390	0°	0.36	NFRC Props, ...6 Spc, w/Tint	M21
42	Mfg Fixed, Mtl w/ Brk	38	0.390	270°	0.38	NFRC Props, ...6 Spc, w/Tint	M21
43	Mfg Fixed, Mtl w/ Brk	91	0.390	0°	0.36	NFRC Props, ...6 Spc, w/Tint	M22
44	Mfg Fixed, Mtl w/ Brk	29	0.390	0°	0.38	NFRC Props, ...6 Spc, w/Tint	M22
45	Mfg Fixed, Mtl w/ Brk	119	0.390	0°	0.36	NFRC Props, ...6 Spc, w/Tint	M22
46	Mfg Fixed, Mtl w/ Brk	20	0.390	0°	0.36	NFRC Props, ...6 Spc, w/Tint	M27
47	Mfg Fixed, Mtl w/ Brk	46	0.390	0°	0.36	NFRC Props, ...6 Spc, w/Tint	M27
48	Mfg Fixed, Mtl w/ Brk	64	0.390	180°	0.36	NFRC Props, ...6 Spc, w/Tint	M33
49	Mfg Fixed, Mtl w/ Brk	325	0.390	90°	0.38	NFRC Props, ...6 Spc, w/Tint	M38
50	Mfg Fixed, Mtl w/ Brk	36	0.390	90°	0.38	NFRC Props, ...6 Spc, w/Tint	M39
51	Mfg Fixed, Mtl w/ Brk	99	0.390	90°	0.38	NFRC Props, ...6 Spc, w/Tint	M41
52	Mfg Fixed, Mtl w/ Brk	161	0.390	90°	0.38	NFRC Props, ...6 Spc, w/Tint	M42
53	Mfg Fixed, Mtl w/ Brk	240	0.390	90°	0.34	NFRC Props, ...6 Spc, w/Tint	M46

VERTICAL FENESTRATION EXTERIOR SHADING

(dimensions in feet)

Fen #	Exterior Shade Type	Window Height	Window Width	Overhang Depth	Overhang Width	Overhang LExt.	Overhang RExt.	Left Fin Depth	Left Fin Height	Left Fin TExt.	Left Fin BExt.	Right Fin Depth	Right Fin Height	Right Fin TExt.	Right Fin BExt.
1	T24 Default	5.0	6.0	-	-	-	-	-	-	-	-	-	-	-	-
2	T24 Default	8.0	4.5	-	-	-	-	-	-	-	-	-	-	-	-
3	T24 Default	5.0	4.0	-	-	-	-	-	-	-	-	-	-	-	-
4	T24 Default	5.0	7.2	-	-	-	-	-	-	-	-	-	-	-	-
5	T24 Default	5.0	7.2	-	-	-	-	-	-	-	-	-	-	-	-
6	T24 Default	5.0	9.2	-	-	-	-	-	-	-	-	-	-	-	-
7	T24 Default	5.0	4.0	-	-	-	-	-	-	-	-	-	-	-	-
8	T24 Default	5.0	11.0	-	-	-	-	-	-	-	-	-	-	-	-
9	T24 Default	5.0	11.0	-	-	-	-	-	-	-	-	-	-	-	-
10	T24 Default	5.0	11.0	-	-	-	-	-	-	-	-	-	-	-	-
11	T24 Default	8.0	4.5	-	-	-	-	-	-	-	-	-	-	-	-
12	T24 Default	7.0	6.0	-	-	-	-	-	-	-	-	-	-	-	-
13	T24 Default	9.5	25.0	-	-	-	-	-	-	-	-	-	-	-	-
14	T24 Default	9.5	11.0	-	-	-	-	-	-	-	-	-	-	-	-
15	T24 Default	5.0	8.0	-	-	-	-	-	-	-	-	-	-	-	-
16	T24 Default	5.0	4.0	-	-	-	-	-	-	-	-	-	-	-	-
17	T24 Default	5.2	5.4	-	-	-	-	-	-	-	-	-	-	-	-
18	T24 Default	8.0	21.0	-	-	-	-	-	-	-	-	-	-	-	-
19	Fixed Interior	16.0	10.0	-	-	-	-	-	-	-	-	-	-	-	-
20	Fixed Interior	16.0	10.0	-	-	-	-	-	-	-	-	-	-	-	-
21	T24 Default	5.0	8.0	-	-	-	-	-	-	-	-	-	-	-	-

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PERFORMANCE CERTIFICATE OF COMPLIANCE (Part 1 of 3) — PERF-1

Project Name: LMCC L-612 Student Service Center Remodel — Date: 30-Sep-2011

Project Address: 2700 East Leland Dr, Pittsburg, CA 94565

Enforcement Agency Use: Building Permit # — Checked by/Date

GENERAL INFORMATION

Date of Plans: — Building Conditioned Floor Area: 37,124 — Climate Zone: 12

BUILDING TYPE: ☒ NONRESIDENTIAL ☐ HIGH RISE RESIDENTIAL ☐ HOTEL/MOTEL GUEST

PHASE OF CONSTRUCTION: ☐ NEW CONSTRUCTION ☐ ADDITION ☒ ALTERATION

STATEMENT OF COMPLIANCE

This Certificate of Compliance lists the building features and performance specifications needed to comply with Title 24, Parts 1 and 6 of the State Building Code. This certificate applies only to a building using the performance compliance approach.

Documentation Author: Bo Xu — Signature: B. Xu — Date: 09/30/2011 — Telephone: 503-382-2754

The Principal Designers hereby certify that the proposed building design represented in the construction documents and modeled for this permit application are consistent with all other forms and worksheets, specifications, and other calculations submitted with this permit application. The proposed building as designed meets the energy efficiency requirements of the State Building Code, Title 24, Part 6.

ENV. LTG. MECH.

☐ ☐ ☐ 1. I hearby affirm that I am eligible under the provisions of Division 3 of theBusiness and Professions Code to sign this document as the person responsible for its preparation; and that I am licensed in the State of California as a civil engineer, mechanical engineer (envelope & mechanical only), or electrical engineer (lighting only) or I am a licensed architect.

☐ ☐ ☐ 2. I affirm that I am eligible under the provisions of Division 3 of the Business and Professions Code Section 5537.2 or 6737.3 to sign this document as the person responsible for its preparation; and that I am a licensed contractor performing this work.

☐ ☐ ☐ 3. I affirm that I am eligible under Division 3 of the Business and Professions Code to sign this document because it pertains to a structure or type of work described as exempt pursuant to Business and Professions Code Sections 5537, 5538, and 6737.1. (These sections of the Business and Professions Code are printed in full in the Nonresidential Manual.)

ENVELOPE COMPLIANCE

Indicate location on plans of Note Block for Mandatory Measures:

Required Forms: ENV-1C, ENV-3C — Telephone: 925 246 6419

Principle Designer Name: PHIL NEWSOM — Signature — Lic. No. C23270 — Date 09/30/2011

LIGHTING COMPLIANCE

Indicate location on plans of Note Block for Mandatory Measures:

Required Forms: LTG-1C, LTG-2C — Telephone: 415 489 7244

Principle Designer Name: Thomas Phuong, PE — Signature — Lic. No. E19293 — Date 09/30/2011

MECHANICAL COMPLIANCE

Indicate location on plans of Note Block for Mandatory Measures:

Required Forms: MECH-1C, MECH-2C, MECH-3C, MECH-5C — Telephone: 415 489 7241

Principle Designer Name: Hormoz Janssens, PE — Signature — Lic. No. O30802 — Date 09/30/2011

Run Initiation Time: 30-Sep-2011 @ 11:27:23 AM — Run Code: 1317407310

ENVELOPE COMPLIANCE SUMMARY Performance (part 1 of 2) — ENV-1C

Project Name: LMCC L-612 Student Service Center Remodel — Date: 30-Sep-2011

OPAQUE SURFACES

#	Surface Type	Appendix JA4 Reference	Area	U-Factor	Az.	Tilt	Status	Location (Space)
1	Above Grade Wall	4.3.3-A6, R5.0 Rigid	126	0.094	180°	90°	NEW	F01
2	Above Grade Wall	4.3.3-A6, R5.0 Rigid	122	0.094	352°	90°	NEW	F01
3	Above Grade Wall	4.3.3-A6, R5.0 Rigid	208	0.094	270°	90°	NEW	F01
4	Above Grade Wall	4.3.3-A6, R5.0 Rigid	431	0.094	180°	90°	NEW	F02
5	Above Grade Wall	4.3.3-A6, R5.0 Rigid	145	0.094	180°	90°	NEW	F03
6	Above Grade Wall	4.3.3-A6, R5.0 Rigid	35	0.094	271°	90°	NEW	F03
7	Above Grade Wall	4.3.3-A6, R5.0 Rigid	55	0.094	270°	90°	NEW	F03
8	Above Grade Wall	4.3.3-A6, R5.0 Rigid	163	0.094	180°	90°	NEW	F04
9	Above Grade Wall	4.3.3-A6, R5.0 Rigid	346	0.094	180°	90°	NEW	F06
10	Above Grade Wall	4.3.3-A6, R5.0 Rigid	82	0.094	180°	90°	NEW	F08
11	Above Grade Wall	4.3.3-A6, R5.0 Rigid	138	0.094	90°	90°	NEW	F09
12	Above Grade Wall	4.3.3-A6, R5.0 Rigid	199	0.094	180°	90°	NEW	F09
13	Above Grade Wall	4.3.3-A6, R5.0 Rigid	129	0.094	90°	90°	NEW	F10
14	Above Grade Wall	4.3.3-A6, R5.0 Rigid	149	0.094	270°	90°	NEW	F15
15	Above Grade Wall	4.3.3-A6, R5.0 Rigid	124	0.094	192°	90°	NEW	F17
16	Above Grade Wall	4.3.3-A6, R5.0 Rigid	50	0.094	270°	90°	NEW	F17
17	Above Grade Wall	4.3.3-A6, R5.0 Rigid	15	0.094	0°	90°	NEW	F19
18	Above Grade Wall	4.3.3-A6, R5.0 Rigid	348	0.094	0°	90°	NEW	F24
19	Above Grade Wall	4.3.3-A6, R5.0 Rigid	62	0.094	270°	90°	NEW	F24
20	Above Grade Wall	4.3.3-A6, R5.0 Rigid	56	0.094	270°	90°	NEW	F26
21	Roof	4.2.6-A7, R24.0 Rigid	289	0.038	180°	0°	NEW	F27
22	Roof	4.2.6-A7, R24.0 Rigid	440	0.038	180°	0°	NEW	F28
23	Above Grade Wall	4.3.3-A6, R5.0 Rigid	51	0.094	0°	90°	NEW	F29
24	Above Grade Wall	4.3.3-A6, R5.0 Rigid	40	0.094	270°	90°	NEW	F30
25	Above Grade Wall	4.3.3-A6, R5.0 Rigid	73	0.094	0°	90°	NEW	F30
26	Above Grade Wall	4.3.3-A6, R5.0 Rigid	101	0.094	0°	90°	NEW	F30
27	Above Grade Wall	4.3.3-A6, R5.0 Rigid	89	0.094	0°	90°	NEW	F31
28	Above Grade Wall	4.3.3-A6, R5.0 Rigid	110	0.094	0°	90°	NEW	F32
29	Above Grade Wall	4.3.3-A6, R5.0 Rigid	364	0.094	90°	90°	NEW	F34 Restroom
30	Above Grade Wall	4.3.3-A6, R5.0 Rigid	282	0.094	0°	90°	NEW	F34 Restroom
31	Above Grade Wall	4.3.3-A6, R5.0 Rigid	124	0.094	270°	90°	NEW	F34 Restroom
32	Above Grade Wall	4.3.3-A6, R5.0 Rigid	140	0.094	90°	90°	NEW	F38
33	Above Grade Wall	4.3.3-A6, R5.0 Rigid	192	0.094	0°	90°	NEW	F38
34	Above Grade Wall	4.3.3-A6, R5.0 Rigid	77	0.094	180°	90°	NEW	F38
35	Above Grade Wall	4.3.3-A6, R5.0 Rigid	123	0.094	90°	90°	NEW	F42
36	Above Grade Wall	4.3.3-A6, R5.0 Rigid	384	0.094	180°	90°	NEW	M01
37	Above Grade Wall	4.3.3-A6, R5.0 Rigid	86	0.094	270°	90°	NEW	M01
38	Roof	4.2.6-A7, R24.0 Rigid	402	0.038	180°	0°	NEW	M01
39	Above Grade Wall	4.3.3-A6, R5.0 Rigid	122	0.094	180°	90°	NEW	M02
40	Roof	4.2.6-A7, R24.0 Rigid	169	0.038	180°	0°	NEW	M02
41	Above Grade Wall	4.3.3-A6, R5.0 Rigid	74	0.094	270°	90°	NEW	M04
42	Above Grade Wall	4.3.3-A6, R5.0 Rigid	246	0.094	180°	90°	NEW	M04
43	Above Grade Wall	4.3.3-A6, R5.0 Rigid	36	0.094	180°	90°	NEW	M04
44	Roof	4.2.6-A7, R24.0 Rigid	891	0.038	270°	0°	NEW	M04
45	Above Grade Wall	4.3.3-A6, R5.0 Rigid	378	0.094	270°	90°	NEW	M05
46	Roof	4.2.6-A7, R24.0 Rigid	497	0.038	180°	0°	NEW	M05
47	Roof	4.2.6-A7, R24.0 Rigid	314	0.038	180°	0°	NEW	M06
48	Roof	4.2.6-A7, R24.0 Rigid	1,210	0.038	180°	0°	NEW	M07

Run Initiation Time: 30-Sep-2011 @ 11:27:23 AM — Run Code: 1317407310

ENVELOPE COMPLIANCE SUMMARY Performance (part 1 of 2) — ENV-1C

Project Name: LMCC L-612 Student Service Center Remodel — Date: 30-Sep-2011

OPAQUE SURFACES

#	Surface Type	Appendix JA4 Reference	Area	U-Factor	Az.	Tilt	Status	Location (Space)
98	Roof	4.2.6-A7, R24.0 Rigid	264	0.038	90°	0°	NEW	M42
99	Roof	4.2.6-A7, R24.0 Rigid	332	0.038	180°	0°	NEW	M43
100	Above Grade Wall	4.3.3-A6, R5.0 Rigid	491	0.094	90°	90°	NEW	M44
101	Above Grade Wall	4.3.3-A6, R5.0 Rigid	381	0.094	0°	90°	NEW	M44
102	Above Grade Wall	4.3.3-A6, R5.0 Rigid	167	0.094	270°	90°	NEW	M44
103	Roof	4.2.6-A7, R24.0 Rigid	902	0.038	90°	0°	NEW	M44
104	Roof	4.2.6-A7, R24.0 Rigid	469	0.038	90°	0°	NEW	M45
105	Above Grade Wall	4.3.3-A6, R5.0 Rigid	259	0.094	180°	90°	NEW	M46
106	Above Grade Wall	4.3.3-A6, R5.0 Rigid	84	0.094	90°	90°	NEW	M46
107	Above Grade Wall	4.3.3-A6, R5.0 Rigid	259	0.094	0°	90°	NEW	M46
108	Roof	4.2.6-A7, R24.0 Rigid	460	0.038	180°	0°	NEW	M46

VERTICAL FENESTRATION SURFACES WITH NFRC U-FACTORS

#	Fenestration Type	Area (ft²)	U-Factor	Azimuth	SHGC	Glazing Type	Location (Space)
1	Mfg Fixed, Mtl w/ Brk	30	0.390	180°	0.27	NFRC Props, ...6 Spc, w/Tint	F01
2	Mfg Fixed, Mtl w/ Brk	36	0.390	352°	0.27	NFRC Props, ...6 Spc, w/Tint	F01
3	Mfg Fixed, Mtl w/ Brk	20	0.390	270°	0.27	NFRC Props, ...6 Spc, w/Tint	F01
4	Mfg Fixed, Mtl w/ Brk	36	0.390	270°	0.27	NFRC Props, ...6 Spc, w/Tint	F01
5	Mfg Fixed, Mtl w/ Brk	36	0.390	270°	0.27	NFRC Props, ...6 Spc, w/Tint	F01
6	Mfg Fixed, Mtl w/ Brk	46	0.390	180°	0.36	NFRC Props, ...6 Spc, w/Tint	F08
7	Mfg Fixed, Mtl w/ Brk	20	0.390	180°	0.36	NFRC Props, ...6 Spc, w/Tint	F09
8	Mfg Fixed, Mtl w/ Brk	55	0.390	180°	0.36	NFRC Props, ...6 Spc, w/Tint	F09
9	Mfg Fixed, Mtl w/ Brk	55	0.390	90°	0.38	NFRC Props, ...6 Spc, w/Tint	F10
10	Mfg Fixed, Mtl w/ Brk	55	0.390	90°	0.38	NFRC Props, ...6 Spc, w/Tint	F10
11	Mfg Fixed, Mtl w/ Brk	36	0.390	192°	0.27	NFRC Props, ...6 Spc, w/Tint	F17
12	Mfg Fixed, Mtl w/ Brk	42	0.390	270°	0.27	NFRC Props, ...6 Spc, w/Tint	F17
13	Mfg Fixed, Mtl w/ Brk	238	0.450	0°	0.35	NFRC Props, ...6 Spc, w/Tint	F19
14	Mfg Fixed, Mtl w/ Brk	40	0.390	0°	0.36	NFRC Props, ...6 Spc, w/Tint	F24
15	Mfg Fixed, Mtl w/ Brk	20	0.390	0°	0.36	NFRC Props, ...6 Spc, w/Tint	F24
16	Mfg Fixed, Mtl w/ Brk	28	0.390	270°	0.38	NFRC Props, ...6 Spc, w/Tint	F24
17	Mfg Fixed, Mtl w/ Brk	168	0.390	270°	0.27	NFRC Props, ...6 Spc, w/Tint	F26
18	Mfg Fixed, Mtl w/ Brk	40	0.390	0°	0.36	NFRC Props, ...6 Spc, w/Tint	F30
19	Mfg Fixed, Mtl w/ Brk	20	0.390	0°	0.36	NFRC Props, ...6 Spc, w/Tint	F31
20	Mfg Fixed, Mtl w/ Brk	35	0.390	0°	0.36	NFRC Props, ...6 Spc, w/Tint	F32
21	Mfg Fixed, Mtl w/ Brk	15	0.390	0°	0.36	NFRC Props, ...6 Spc, w/Tint	F32
22	Mfg Fixed, Mtl w/ Brk	100	0.390	90°	0.34	NFRC Props, ...6 Spc, w/Tint	F38
23	Mfg Fixed, Mtl w/ Brk	188	0.450	90°	0.34	NFRC Props, ...6 Spc, w/Tint	F42
24	Mfg Fixed, Mtl w/ Brk	143	0.390	180°	0.27	NFRC Props, ...6 Spc, w/Tint	M01
25	Mfg Fixed, Mtl w/ Brk	53	0.390	270°	0.27	NFRC Props, ...6 Spc, w/Tint	M01
26	Mfg Fixed, Mtl w/ Brk	143	0.390	180°	0.27	NFRC Props, ...6 Spc, w/Tint	M04
27	Mfg Fixed, Mtl w/ Brk	59	0.390	270°	0.27	NFRC Props, ...6 Spc, w/Tint	M05
28	Mfg Fixed, Mtl w/ Brk	59	0.390	270°	0.27	NFRC Props, ...6 Spc, w/Tint	M05
29	Mfg Fixed, Mtl w/ Brk	59	0.390	270°	0.27	NFRC Props, ...6 Spc, w/Tint	M05
30	Mfg Fixed, Mtl w/ Brk	59	0.390	270°	0.27	NFRC Props, ...6 Spc, w/Tint	M05
31	Mfg Fixed, Mtl w/ Brk	52	0.390	270°	0.27	NFRC Props, ...6 Spc, w/Tint	M11
32	Mfg Fixed, Mtl w/ Brk	59	0.390	270°	0.27	NFRC Props, ...6 Spc, w/Tint	M11

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ENVELOPE COMPLIANCE SUMMARY Performance (part 1 of 2) — ENV-1C

Project Name: LMCC L-612 Student Service Center Remodel — Date: 30-Sep-2011

VERTICAL FENESTRATION EXTERIOR SHADING

(dimensions in feet)

Fen #	Exterior Shade Type	Window Height	Window Width	Overhang Depth	Overhang Width	Overhang LExt.	Overhang RExt.	Left Fin Depth	Left Fin Height	Left Fin TExt.	Left Fin BExt.	Right Fin Depth	Right Fin Height	Right Fin TExt.	Right Fin BExt.
22	T24 Default	5.0	4.0	-	-	-	-	-	-	-	-	-	-	-	-
23	T24 Default	5.0	7.0	-	-	-	-	-	-	-	-	-	-	-	-
24	T24 Default	5.0	3.0	-	-	-	-	-	-	-	-	-	-	-	-
25	T24 Default	5.0	20.0	-	-	-	-	-	-	-	-	-	-	-	-
26	T24 Default	8.0	23.5	9.4	23.5	0.0	0.0	-	-	-	-	-	-	-	-
27	T24 Default	6.5	22.0	-	-	-	-	-	-	-	-	-	-	-	-
28	T24 Default	6.5	8.2	-	-	-	-	-	-	-	-	-	-	-	-
29	T24 Default	6.5	22.0	-	-	-	-	-	-	-	-	-	-	-	-
30	T24 Default	6.5	9.0	-	-	-	-	-	-	-	-	-	-	-	-
31	T24 Default	6.5	9.0	-	-	-	-	-	-	-	-	-	-	-	-
32	T24 Default	6.5	9.0	-	-	-	-	-	-	-	-	-	-	-	-
33	T24 Default	6.5	9.0	-	-	-	-	-	-	-	-	-	-	-	-
34	Fixed Interior	8.0	12.0	-	-	-	-	-	-	-	-	-	-	-	-
35	Fixed Interior	8.0	12.0	-	-	-	-	-	-	-	-	-	-	-	-
36	T24 Default	6.5	8.0	-	-	-	-	-	-	-	-	-	-	-	-
37	T24 Default	6.5	9.0	-	-	-	-	-	-	-	-	-	-	-	-
38	T24 Default	6.5	9.0	-	-	-	-	-	-	-	-	-	-	-	-
39	T24 Default	6.5	9.0	-	-	-	-	-	-	-	-	-	-	-	-
40	T24 Default	12.5	8.5	-	-	-	-	-	-	-	-	-	-	-	-
41	T24 Default	12.5	7.8	-	-	-	-	-	-	-	-	-	-	-	-
42	T24 Default	12.5	9.3	-	-	-	-	-	-	-	-	-	-	-	-
43	T24 Default	12.5	5.8	-	-	-	-	-	-	-	-	-	-	-	-
44	T24 Default	12.5	3.3	-	-	-	-	-	-	-	-	-	-	-	-
45	T24 Default	6.5	7.3	-	-	-	-	-	-	-	-	-	-	-	-
46	T24 Default	6.5	9.3	-	-	-	-	-	-	-	-	-	-	-	-
47	T24 Default	6.5	9.0	-	-	-	-	-	-	-	-	-	-	-	-
48	T24 Default	5.2	7.3	-	-	-	-	-	-	-	-	-	-	-	-
49	T24 Default	7.0	13.0	-	-	-	-	-	-	-	-	-	-	-	-
50	T24 Default	6.5	4.5	-	-	-	-	-	-	-	-	-	-	-	-
51	T24 Default	7.0	17.0	-	-	-	-	-	-	-	-	-	-	-	-
52	Fixed Interior	8.0	12.0	-	-	-	-	-	-	-	-	-	-	-	-
53	Fixed Interior	8.0	12.0	-	-	-	-	-	-	-	-	-	-	-	-
54	T24 Default	6.5	3.0	-	-	-	-	-	-	-	-	-	-	-	-
55	T24 Default	6.5	7.0	-	-	-	-	-	-	-	-	-	-	-	-
56	T24 Default	7.0	9.2	-	-	-	-	-	-	-	-	-	-	-	-
57	Fixed Interior	12.0	16.0	-	-	-	-	-	-	-	-	-	-	-	-
58	Fixed Interior	16.0	12.0	-	-	-	-	-	-	-	-	-	-	-	-
59	T24 Default	13.0	25.0	-	-	-	-	-	-	-	-	-	-	-	-
60	T24 Default	9.0	4.0	-	-	-	-	-	-	-	-	-	-	-	-
61	T24 Default	9.0	11.0	-	-	-	-	-	-	-	-	-	-	-	-
62	T24 Default	9.0	17.9	-	-	-	-	-	-	-	-	-	-	-	-
63	T24 Default	12.0	20.0	-	-	-	-	-	-	-	-	-	-	-	-

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Date Signed: 7/25/12

consultant

FILE #7-C1

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
OFFICE OF REGULATION SERVICES
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DATE JUL 3 1 2012

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agency

L-612 STUDENT SERVICES CENTER REMODEL COLLEGE COMPLEX

BID DOCUMENTS

LOS MEDANOS COLLEGE
2700 EAST LELAND DRIVE
PITTSBURG, CA 94565

owner

tBP project number : 20610.00

file name: 0106M02.dwg

drawn by: HP checked by: BC

date: JULY 31, 2012

Rev. date: description:

drawing title:

TITLE 24 - ENERGY COMPLIANCE FORMS

drawing no.:

M-0.2

drawing of

ENVELOPE COMPLIANCE SUMMARY Performance (part 1 of 2) ENV-1C

Project Name: LMCC L-612 Student Service Center Remodel | Date: 30-Sep-2011

OVERHEAD FENESTRATION SURFACES WITH NFRC U-FACTORS

#	Fenestration Type	Area (ft²)	U-Factor	Azimuth	SHGC	Glazing Type	Location (Space)
1	Mlg Skylt, Mtl w/ Brk	160	0.400	180°	0.58	NFRC Props, ...6 Spc, w/Tint	F27
2	Mlg Skylt, Mtl w/ Brk	160	0.400	180°	0.58	NFRC Props, ...6 Spc, w/Tint	F28
3	Mlg Skylt, Mtl w/ Brk	96	0.400	180°	0.58	NFRC Props, ...6 Spc, w/Tint	M10
4	Mlg Skylt, Mtl w/ Brk	96	0.400	180°	0.58	NFRC Props, ...6 Spc, w/Tint	M10
5	Mlg Skylt, Mtl w/ Brk	96	0.400	180°	0.58	NFRC Props, ...6 Spc, w/Tint	M23
6	Mlg Skylt, Mtl w/ Brk	96	0.400	180°	0.58	NFRC Props, ...6 Spc, w/Tint	M23
7	Mlg Skylt, Mtl w/ Brk	192	0.400	0°	0.58	NFRC Props, ...6 Spc, w/Tint	M36
8	Mlg Skylt, Mtl w/ Brk	192	0.390	90°	0.57	NFRC Props, ...6 Spc, w/Tint	M38

OVERHEAD FENESTRATION EXTERIOR SHADING

(dimensions in feet)

Fen #	Exterior Shade Type	Window Height	Window Width	Overhang Depth	Overhang Width	Overhang LExt.	Overhang RExt.	Left Fin Depth	Left Fin Height	Left Fin TExt.	Left Fin BExt.	Right Fin Depth	Right Fin Height	Right Fin TExt.	Right Fin BExt.
1	T24 Default	5.0	6.0	-	-	-	-	-	-	-	-	-	-	-	-
2	T24 Default	8.0	4.5	-	-	-	-	-	-	-	-	-	-	-	-
3	T24 Default	5.0	4.0	-	-	-	-	-	-	-	-	-	-	-	-
4	T24 Default	5.0	7.2	-	-	-	-	-	-	-	-	-	-	-	-
5	T24 Default	5.0	7.2	-	-	-	-	-	-	-	-	-	-	-	-
6	T24 Default	5.0	9.2	-	-	-	-	-	-	-	-	-	-	-	-
7	T24 Default	5.0	4.0	-	-	-	-	-	-	-	-	-	-	-	-
8	T24 Default	5.0	11.0	-	-	-	-	-	-	-	-	-	-	-	-
9	T24 Default	5.0	11.0	-	-	-	-	-	-	-	-	-	-	-	-
10	T24 Default	5.0	11.0	-	-	-	-	-	-	-	-	-	-	-	-
11	T24 Default	8.0	4.5	-	-	-	-	-	-	-	-	-	-	-	-
12	T24 Default	7.0	6.0	-	-	-	-	-	-	-	-	-	-	-	-
13	T24 Default	9.5	25.0	-	-	-	-	-	-	-	-	-	-	-	-
14	T24 Default	9.5	11.0	-	-	-	-	-	-	-	-	-	-	-	-
15	T24 Default	5.0	8.0	-	-	-	-	-	-	-	-	-	-	-	-
16	T24 Default	5.0	4.0	-	-	-	-	-	-	-	-	-	-	-	-
17	T24 Default	5.2	5.4	-	-	-	-	-	-	-	-	-	-	-	-
18	T24 Default	8.0	21.0	-	-	-	-	-	-	-	-	-	-	-	-
19	Fixed Interior	16.0	10.0	-	-	-	-	-	-	-	-	-	-	-	-
20	Fixed Interior	16.0	10.0	-	-	-	-	-	-	-	-	-	-	-	-
21	T24 Default	5.0	8.0	-	-	-	-	-	-	-	-	-	-	-	-
22	T24 Default	5.0	4.0	-	-	-	-	-	-	-	-	-	-	-	-
23	T24 Default	5.0	7.0	-	-	-	-	-	-	-	-	-	-	-	-
24	T24 Default	5.0	3.0	-	-	-	-	-	-	-	-	-	-	-	-
25	T24 Default	5.0	20.0	-	-	-	-	-	-	-	-	-	-	-	-
26	T24 Default	8.0	23.5	9.4	23.5	0.0	0.0	-	-	-	-	-	-	-	-
27	T24 Default	6.5	22.0	-	-	-	-	-	-	-	-	-	-	-	-
28	T24 Default	6.5	8.2	-	-	-	-	-	-	-	-	-	-	-	-
29	T24 Default	6.5	22.0	-	-	-	-	-	-	-	-	-	-	-	-
30	T24 Default	6.5	9.0	-	-	-	-	-	-	-	-	-	-	-	-
31	T24 Default	6.5	9.0	-	-	-	-	-	-	-	-	-	-	-	-
32	T24 Default	6.5	9.0	-	-	-	-	-	-	-	-	-	-	-	-
33	T24 Default	6.5	9.0	-	-	-	-	-	-	-	-	-	-	-	-
34	Fixed Interior	8.0	12.0	-	-	-	-	-	-	-	-	-	-	-	-

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ENVELOPE COMPLIANCE SUMMARY Performance (part 2 of 2) ENV-1C

Project Name: LMCC L-612 Student Service Center Remodel | Date: 30-Sep-2011

Required Acceptance Tests:

Designer:

This form is to be used by the designer and attached to the plans. Listed below is the acceptance test for Envelope Fenestrations system. The designer is required to check the acceptance tests and list all the fenestration products that require an acceptance test. If all the site-built fenestration of a certain type requires a test, list the different fenestration products and the number of systems. The NA7 Section in the Appendix of the Nonresidential Reference Appendices Manual describes the test. Since this form will be part of the plans, completion of this section will allow the responsible party to budget for the scope of work appropriately.

Enforcement Agency:

Systems Acceptance. Before Occupancy Permit is granted for a newly constructed building or space or when ever new fenestration is installed in the building or space shall be certified as meeting the Acceptance Requirements. The ENV-2A form is not considered a complete form and is not to be accepted by the enforcement agency unless the boxes are checked and/or filled and signed. In addition, a Certificate of Acceptance forms shall be submitted to the enforcement agency that certifies plans, specifications, installation certificates, and operating and maintenance information meet the requirements of §10-103(b) of Title 24 Part 6. The field inspector must receive the properly filled out and signed forms before the building can receive final occupancy. A copy of the ENV-2A for each different fenestration product line must be provided to the owner of the building for their records.

FENESTRATION ACCEPTANCE TABLE

Test Description		ENV-2A	Test Performed By
Fenestration Products Name or ID Requiring Testing or Verification	Number of Like Products	Building Envelope Acceptance Test	

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MECHANICAL MANDATORY MEASURES: NONRESIDENTIAL MECH-MM

Project Name: LMCC L-612 Student Services Center Remodel | Date 09/30/2011

Equipment and System Efficiencies	
§111:	Any appliance for which there is a California standard established in the Appliance Efficiency Regulations will comply with the applicable standard.
§115(a):	Fan type central furnaces shall not have a pilot light.
§123:	Piping, except that conveying fluids at temperatures between 60 and 105 degrees Fahrenheit, or within HVAC equipment, shall be insulated in accordance with Standards Section 123.
§124:	Air handling duct systems shall be installed and insulated in compliance with Sections 601, 602, 603, 604, and 605 of the CMC Standards.
Controls	
§122(e):	Each space conditioning system shall be installed with one of the following:
1A.	Each space conditioning system serving building types such as offices and manufacturing facilities (and all others not explicitly exempt from the requirements of Section 112 (d)) shall be installed with an automatic time switch with an accessible manual override that allows operation of the system during off-hours for up to 4 hours. The time switch shall be capable of programming different schedules for weekdays and weekends and have program backup capabilities that prevent the loss of the device's program and time setting for at least 10 hours if power is interrupted; or
1B.	An occupancy sensor to control the operating period of the system; or
1C.	A 4-hour timer that can be manually operated to control the operating period of the system.
2.	Each space conditioning system shall be installed with controls that temporarily restart and temporarily operate the system as required to maintain a setback heating and/or a setup cooling thermostat setpoint.
§122(g):	Each space conditioning system serving multiple zones with a combined conditioned floor area more than 25,000 square feet shall be provided with isolation zones. Each zone: shall not exceed 25,000 square feet; shall be provided with isolation devices, such as valves or dampers that allow the supply of heating or cooling to be setback or shut off independently of other isolation areas; and shall be controlled by a time control device as described above.
§122(c):	Thermostats shall have numeric setpoints in degrees Fahrenheit (F) and adjustable setpoint stops accessible only to authorized personnel.
§122(b):	Heat pumps shall be installed with controls to prevent electric resistance supplementary heater operation when the heating load can be met by the heat pump alone
§122(a&b):	Each space conditioning system shall be controlled by an individual thermostat that responds to temperature within the zone. Where used to control heating, the control shall be adjustable down to 55 degrees F or lower. For cooling, the control shall be adjustable up to 85 degrees F or higher. Where used for both heating and cooling, the control shall be capable of providing a deadband of at least 5 degrees F within which the supply of heating and cooling is shut off or reduced to a minimum.
Ventilation	
§121(e):	Controls shall be provided to allow outside air dampers or devices to be operated at the ventilation rates as specified on these plans.
§122(f):	All gravity ventilating systems shall be provided with automatic or readily accessible manually operated dampers in all openings to the outside, except for combustion air openings.
§121(f):	Ventilation System Acceptance. Before an occupancy permit is granted for a newly constructed building or space, or a new ventilating system serving a building or space is operated for normal use, all ventilation systems serving the building or space shall be certified as meeting the Acceptance Requirements for Code Compliance
Service Water Heating Systems	
§113(c)	Installation
3.	Temperature controls for public lavatories. The controls shall limit the outlet Temperature to 110°F.
2.	Circulating service water-heating systems shall have a control capable of automatically turning off the circulating pump when hot water is not required.

EnergyPro 5.1 by EnergySoft *User Number: 4822* *RunCode: 2011-09-30T14:35:50* *ID:* *Page 3 of 3*

PERFORMANCE CERTIFICATE OF COMPLIANCE (Part 2 of 3) PERF-1

Project Name: LMCC L-612 Student Service Center Remodel | Date: 30-Sep-2011

ANNUAL TDV ENERGY USE SUMMARY (TDV-kBtu/sqft-yr)

ENERGY COMPONENT	Standard Design	Proposed Design	Compliance Margin
Space Heating	10.18	9.84	0.34
Space Cooling	71.53	63.00	8.52
Indoor Fans	108.79	58.85	49.94
Heat Rejection	0.00	3.91	-3.91
Pumps	1.84	14.79	-12.96
Domestic Hot Water	8.73	8.13	0.59
Lighting	67.87	41.20	26.67
Receptacle	69.74	69.74	0.00
Process	0.00	0.00	0.00
Exterior Usage	0.00	0.00	0.00
TOTALS:	338.66	269.46	69.21

BUILDING COMPLIES

GENERAL INFORMATION

Building Orientation	North	Conditioned Floor Area	37,124
Number of Stories	2	Unconditioned Floor Area	-402
Number of Systems	10		

	Conditioned	Unconditioned	Plenum
Number of Zones	76	10	0

	Orientation	Gross Area	Glazing Area	Glazing Ratio
Front Elevation	North	4,256 sqft	1,450 sqft	0.341
Left Elevation	East	3,042 sqft	1,259 sqft	0.414
Rear Elevation	South	4,217 sqft	537 sqft	0.127
Right Elevation	West	2,854 sqft	883 sqft	0.309
Total		14,369 sqft	3,919 sqft	0.273
Roof		19,500 sqft	1,088 sqft	0.056

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ENVELOPE COMPLIANCE SUMMARY Performance (part 1 of 2) ENV-1C

Project Name: LMCC L-612 Student Service Center Remodel | Date: 30-Sep-2011

OVERHEAD FENESTRATION EXTERIOR SHADING

(dimensions in feet)

Fen #	Exterior Shade Type	Window Height	Window Width	Overhang Depth	Overhang Width	Overhang LExt.	Overhang RExt.	Left Fin Depth	Left Fin Height	Left Fin TExt.	Left Fin BExt.	Right Fin Depth	Right Fin Height	Right Fin TExt.	Right Fin BExt.
35	Fixed Interior	8.0	12.0	-	-	-	-	-	-	-	-	-	-	-	-
36	T24 Default	6.5	8.0	-	-	-	-	-	-	-	-	-	-	-	-
37	T24 Default	6.5	9.0	-	-	-	-	-	-	-	-	-	-	-	-
38	T24 Default	6.5	9.0	-	-	-	-	-	-	-	-	-	-	-	-
39	T24 Default	6.5	9.0	-	-	-	-	-	-	-	-	-	-	-	-
40	T24 Default	12.5	8.5	-	-	-	-	-	-	-	-	-	-	-	-
41	T24 Default	12.5	7.8	-	-	-	-	-	-	-	-	-	-	-	-
42	T24 Default	12.5	9.3	-	-	-	-	-	-	-	-	-	-	-	-
43	T24 Default	12.5	5.8	-	-	-	-	-	-	-	-	-	-	-	-
44	T24 Default	12.5	3.3	-	-	-	-	-	-	-	-	-	-	-	-
45	T24 Default	6.5	7.3	-	-	-	-	-	-	-	-	-	-	-	-
46	T24 Default	6.5	9.3	-	-	-	-	-	-	-	-	-	-	-	-
47	T24 Default	6.5	9.0	-	-	-	-	-	-	-	-	-	-	-	-
48	T24 Default	5.2	7.3	-	-	-	-	-	-	-	-	-	-	-	-
49	T24 Default	7.0	13.0	-	-	-	-	-	-	-	-	-	-	-	-
50	T24 Default	6.5	4.5	-	-	-	-	-	-	-	-	-	-	-	-
51	T24 Default	7.0	17.0	-	-	-	-	-	-	-	-	-	-	-	-
52	Fixed Interior	8.0	12.0	-	-	-	-	-	-	-	-	-	-	-	-
53	Fixed Interior	8.0	12.0	-	-	-	-	-	-	-	-	-	-	-	-
54	T24 Default	6.5	3.0	-	-	-	-	-	-	-	-	-	-	-	-
55	T24 Default	6.5	7.0	-	-	-	-	-	-	-	-	-	-	-	-
56	T24 Default	7.0	9.2	-	-	-	-	-	-	-	-	-	-	-	-
57	Fixed Interior	12.0	16.0	-	-	-	-	-	-	-	-	-	-	-	-
58	Fixed Interior	16.0	12.0	-	-	-	-	-	-	-	-	-	-	-	-
59	T24 Default	13.0	25.0	-	-	-	-	-	-	-	-	-	-	-	-
60	T24 Default	9.0	4.0	-	-	-	-	-	-	-	-	-	-	-	-
61	T24 Default	9.0	11.0	-	-	-	-	-	-	-	-	-	-	-	-
62	T24 Default	9.0	17.9	-	-	-	-	-	-	-	-	-	-	-	-
63	T24 Default	12.0	20.0	-	-	-	-	-	-	-	-	-	-	-	-

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PERFORMANCE CERTIFICATE OF COMPLIANCE (Part 1 of 3) PERF-1

Project Name: LMCC L-612 Student Service Center Remodel | Date: 30-Sep-2011

Project Address: 2700 East Leland Dr, Pittsburg, CA 94565

Enforcement Agency Use: Building Permit # | Checked by/Date

GENERAL INFORMATION

Date of Plans	Building Conditioned Floor Area: 37,124	Climate Zone: 12	
BUILDING TYPE	☒ NONRESIDENTIAL	☐ HIGH RISE RESIDENTIAL	☐ HOTEL/MOTEL GUEST
PHASE OF CONSTRUCTION	☐ NEW CONSTRUCTION	☐ ADDITION	☒ ALTERATION

STATEMENT OF COMPLIANCE

This Certificate of Compliance lists the building features and performance specifications needed to comply with Title 24, Parts 1 and 6 of the State Building Code. This certificate applies only to a building using the performance compliance approach.

Documentation Author	Signature	Date	Telephone
Bo Xu	Bo Xu	09/30/2011	503-382-2754

The Principal Designers hereby certify that the proposed building design represented in the construction documents and modeled for this permit application are consistent with all other forms and worksheets, specifications, and other calculations submitted with this permit application. The proposed building as designed meets the energy efficiency requirements of the State Building Code, Title 24, Part 6.

ENV. LTG. MECH.

☐ ☐ ☐ 1. I hearby affirm that I am eligible under the provisions of Division 3 of theBusiness and Professions Code to sign this document as the person responsible for its preparation; and that I am licensed in the State of California as a civil engineer, mechanical engineer (envelope & mechanical only), or electrical engineer (lighting only) or I am a licensed architect.

☐ ☐ ☐ 2. I affirm that I am eligible under the provisions of Division 3 of the Business and Professions Code Section 5537.2 or 6737.3 to sign this document as the person responsible for its preparation; and that I am a licensed contractor performing this work.

☐ ☐ ☐ 3. I affirm that I am eligible under Division 3 of the Business and Professions Code to sign this document because it pertains to a structure or type of work described as exempt pursuant to Business and Professions Code Sections 5537, 5538, and 6737.1. (These sections of the Business and Professions Code are printed in full in the Nonresidential Manual.)

ENVELOPE COMPLIANCE

Indicate ocation on plans of Note Block for Mandatory Measures:

Required Forms: ENV-1C, ENV-3C | Telephone: 925 246 6419

Principle Designer Name: tBP / Phil Newsom | Signature | Lic. No. C22270 | Date: 09/30/2011

LIGHTING COMPLIANCE

Indicate ocation on plans of Note Block for Mandatory Measures:

Required Forms: LTG-1C, LTG-2C | Telephone: 415 489 7244

Principle Designer Name: Thomas Phuong, PE | Signature | Lic. No. E19293 | Date: 09/30/2011

MECHANICAL COMPLIANCE

Indicate ocation on plans of Note Block for Mandatory Measures:

Required Forms: MECH-1C, MECH-2C, MECH-3C, MECH-5C | Telephone: 415 489 7241

Principle Designer Name: Hormoz Janssens, PE | Signature | Lic. No. 030802 | Date: 09/30/2011

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MECHANICAL COMPLIANCE SUMMARY Performance MECH-1C

Project Name: LMCC L-612 Student Service Center Remodel | Date: 30-Sep-2011

Required Acceptance Tests:

Designer:

This form is to be used by the designer and attached to the plans. Listed below are all the acceptance tests for mechanical systems. The designer is required to check the applicable boxes by all acceptance tests that apply and list all equipment that requires an acceptance test. If all equipment of a certain type requires a test, list the equipment description and the number of systems. The NA number designates the Section in the Appendix of the Nonresidential Reference Appendices Manual that describes the test. Since this form will be part of the plans, completion of this section will allow the responsible party to budget for the scope of work appropriately.

Enforcement Agency:

Systems Acceptance. Before occupancy permit is granted for a newly constructed building or space, or a new space-conditioning system serving a building or space is operated for normal use, all control devices serving the building or space shall be certified as meeting the Acceptance Requirements for Code Compliance.
Systems Acceptance. Before occupancy permit is granted. All newly installed HVAC equipment must be tested using the Acceptance Requirements.
The MECH-1C form is not considered a completed form and is not to be accepted by the building department unless the correct boxes are checked. The equipment requiring testing, person performing the test (Example: HVAC installer, TAB contractor, controls contractor, PE in charge of project) and what Acceptance test must be conducted. The following checked-off forms are required for ALL newly installed and replaced equipment. In addition a Certificate of Acceptance forms shall be submitted to the building department that certifies plans, specifications, installation certificates, and operating and maintenance information meet the requirements of §10-103(b) and Title 24 Part 6. The building inspector must receive the properly filled out and signed forms before the building can receive final occupancy.

CENTRAL HEATING & COOLING SYSTEM ACCEPTANCE (Part 1)

Test Description		MECH-2A	MECH-3A	MECH-4A	MECH-5A	MECH-6A	MECH-7A	
Equipment Requiring Testing	# of units	Outdoor Ventilation for VAV & CAV	Constant Volume & Single-Zone Unitary	Air Distribution Ducts	Economizer Controls	Demand Control Ventilation DCV	Supply Fan VAV	Test Performed By
AHU-2	1	☐	☐	☐	☐	☐	☐	
AHU-3	1	☐	☐	☐	☐	☐	☐	
AHU-4	1	☐	☐	☐	☐	☐	☐	
AHU-5	1	☐	☐	☐	☐	☐	☐	
AHU-6	1	☐	☐	☐	☐	☐	☐	
AHU-7	1	☐	☐	☐	☐	☐	☐	
AC-1	1	☐	☐	☐	☐	☐	☐	
AC-3	1	☐	☐	☐	☐	☐	☐	
AC-2	1	☐	☐	☐	☐	☐	☐	
AC-4	1	☐	☐	☐	☐	☐	☐	

CENTRAL HEATING & COOLING SYSTEM ACCEPTANCE (Part 2)

Test Description		MECH-8A	MECH-11A	MECH-12A	MECH-13A	MECH-14A		
Equipment Requiring Testing	# of units	Valve Leakage Test	Automatic Demand Shed Control	Fault Detection & Diagnostics for DX Units	Automatic Fault Detection & Diagnostics for Air & Zone	Distributed Energy Storage DX AC Systems		Test Performed By
AHU-2	1	☐	☐	☐	☐	☐		
AHU-3	1	☐	☐	☐	☐	☐		
AHU-4	1	☐	☐	☐	☐	☐		
AHU-5	1	☐	☐	☐	☐	☐		
AHU-6	1	☐	☐	☐	☐	☐		
AHU-7	1	☐	☐	☐	☐	☐		

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tBP

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PROJECT 2009-0106
CONTACT Shawn Wilson

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FAX 415.489.7289
www.interfaceengineering.com

REGISTERED PROFESSIONAL ENGINEER HORMOZ L. JANSSENS No. 030802 MECHANICAL STATE OF CALIFORNIA

Date Signed: 7/25/12

consultant

FILE #7-C1

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
OFFICE OF REGULATION SERVICES
APPL 01-112272
AC FLS SS
DATE JUL 3 1 2012

name
address
city, state, zip
ph: fx:

agency

L-612 STUDENT SERVICES
CENTER REMODEL
COLLEGE COMPLEX

BID DOCUMENTS

LOS MEDANOS COLLEGE
2700 EAST LELAND DRIVE
PITTSBURG, CA 94565

owner

tBP project number : 20610.00

file name: 0106M03.dwg

drawn by: HP checked by: BC

date: JULY 31, 2012

Rev.	date:	description:

drawing title:
TITLE 24 - ENERGY COMPLIANCE FORMS

drawing no.:
M-0.3

drawing of

FILE: 0106M03.DWG -- M03 | EDIT: 5/9/2012 11:20 PM BY WILLIAMSB | PLOT: 7/25/2012 10:09 PM BY HAI PHAN

MECHANICAL COMPLIANCE SUMMARY Performance MECH-1C

Project Name: LMCC L-612 Student Service Center Remodel | Date: 30-Sep-2011

CENTRAL HEATING & COOLING SYSTEM ACCEPTANCE (Part 2)

Test Description		MECH-6A	MECH-11A	MECH-12A	MECH-13A	MECH-14A		
Equipment Requiring Testing	# of units	Valve Leakage Test	Automatic Demand Shed Control	Fault Detection & Diagnostics for DX Units	Automatic Fault Detection & Diagnostics for Air & Zone	Distributed Energy Storage DX AC Systems		Test Performed By
AC-1	1	☐	☐	☐	☐	☐		
AC-3	1	☐	☐	☐	☐	☐		
AC-2	1	☐	☐	☐	☐	☐		
AC-4	1	☐	☐	☐	☐	☐		

CHILLED WATER, HEATING HOT WATER & CONDENSER WATER CIRCULATION SYSTEMS ACCEPTANCE

Test Description		MECH-6A	MECH-9A	MECH-10A	MECH-11A	MECH-15A		
Equipment Requiring Testing	# of units	Valve Leakage Test	Supply Water Temperature Reset	Hydronic System Variable Flow Control	Automatic Demand Shed Control	Thermal Energy Storage (TES) Systems		Test Performed By
Chilled Water Loop		☐	☐	☐	☐	☐		
Hot Water Loop		☐	☐	☐	☐	☐		
DHW Plant 1 Loop (1)		☐	☐	☐	☐	☐		
Condenser Loop		☐	☐	☐	☐	☐		

PUMP ACCEPTANCE

Test Description		MECH-10A	MECH-11A	MECH-15A				
Equipment Requiring Testing	# of units	Hydronic System Variable Flow Control	Automatic Demand Shed Control	Thermal Energy Storage (TES) Systems				Test Performed By
CHW Loop Pump	1	☐	☐	☐				
HW Loop Pump	1	☐	☐	☐				
Pump 3	1	☐	☐	☐				

CHILLER ACCEPTANCE

Test Description		MECH-6A	MECH-9A	MECH-10A	MECH-11A	MECH-15A		
Equipment Requiring Testing	# of units	Valve Leakage Test	Supply Water Temperature Reset	Hydronic System Variable Flow Control	Automatic Demand Shed Control	Thermal Energy Storage (TES) Systems		Test Performed By
Chiller 1		☐	☐	☐	☐	☐		

BOILER ACCEPTANCE

Test Description		MECH-6A	MECH-9A	MECH-10A	MECH-11A	MECH-15A		
Equipment Requiring Testing	# of units	Valve Leakage Test	Supply Water Temperature Reset	Hydronic System Variable Flow Control	Automatic Demand Shed Control	Thermal Energy Storage (TES) Systems		Test Performed By
Boiler 1		☐	☐	☐	☐	☐		

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MECHANICAL COMPLIANCE SUMMARY Performance MECH-2C

Project Name: LMCC L-612 Student Service Center Remodel | Date: 30-Sep-2011

SYSTEM FEATURES

System Name	AHU-2	AHU-3	AHU-4	Note to Field
Time Control	S	S	S	
Setback Control	B	B	B	
Isolation Zones	1	1	1	
Heat Pump Thermostat?	Y	Y	Y	
Electric Heat?	N	N	N	
Fan Control	Any Fan w/ VSD	Any Fan w/ VSD	Any Fan w/ VSD	
VAV Minimum Position Control?	Yes	Yes	Yes	
Simulataneous Heat/Cool?	y	y	y	
Heating Supply Reset?	Yes	Yes	Yes	
Cooling Supply Reset?	Yes	Yes	Yes	
Ventilation	Air Balance	Air Balance	Air Balance	
Outdoor Damper Control?	A	A	A	
Economizer Type	OA Temperature	OA Temperature	OA Temperature	
Design O.A. CFM (Mech-3C, Column H)	1,429.711	1,417.835	1,314.130	
Heating Equipment Type	Hot Water	Hot Water	Hot Water	
Heating Equipment Efficiency	n/a	n/a	n/a	
Cooling Equipment Type	Ch Wtr Clg	Ch Wtr Clg	Ch Wtr Clg	
Cooling Equipment Efficiency	n/a	n/a	n/a	
Make and Model Number				
Heating Duct Location	On Roof	On Roof	On Roof	
Heating Duct R-Value	7.000	7.000	7.000	
Cooling Duct Location	On Roof	On Roof	On Roof	
Cooling Duct R-Value	7.000	7.000	7.000	
Duct Tape Allowed?	0	0	0	
Pipe Type (Supply, Return, Etc...)	-	-	-	
Pipe Insulation R-Value				

CODE TABLES: Enter code from table below into columns above.

Heat Pump Thermostat?	Y: Yes N: No
Electric Heat?	
VAV Minimum Position Control?	
Simulataneous Heat/Cool?	
Heat and Cool Supply Reset?	
Outdoor Damper Control?	
High Efficiency?	
Duct Tape Allowed?	
Pipe Insulation Required?	

Time Control	Setback Control	Isolation Zones	Fan Control
S: Prog Switch O: Occupancy Sensor M: Manual Timer	H: Heating C: Cooling B: Both	Enter number of Isloation Zones	I: Inlet Vanes P: Variable Pitch V: VFD O: Other C: Curve

Ventilation	Outdoor Damper	Economizer	Design O.A. CFM
B: Air Balance C: Outside Air Cert. M: Out. Air Measure D: Demand Control N: Natural	A: Auto G: Gravity	A: Air W: Water N: Not Required	Enter Design Outdoor Air CFM. Note: This shall be no less than Column H on MECH-3C.

Run Initiation Time: 30-Sep-2011 @ 11:27:23 AM Run Code: 1317407310

MECHANICAL COMPLIANCE SUMMARY Performance MECH-2C

Project Name: LMCC L-612 Student Service Center Remodel | Date: 30-Sep-2011

SYSTEM FEATURES

System Name	AC-1	AC-3	AC-2	Note to Field
Time Control	S	S	S	
Setback Control	B	B	B	
Isolation Zones	1	1	1	
Heat Pump Thermostat?	Y	Y	Y	
Electric Heat?	N	N	N	
Fan Control	Constant Volume	Constant Volume	Constant Volume	
VAV Minimum Position Control?	No	No	No	
Simulataneous Heat/Cool?	n	n	n	
Heating Supply Reset?	No	No	No	
Cooling Supply Reset?	No	No	No	
Ventilation	Air Balance	Air Balance	Air Balance	
Outdoor Damper Control?	A	A	A	
Economizer Type	Fixed Fraction	Fixed Fraction	Fixed Fraction	
Design O.A. CFM (Mech-3C, Column H)	16.920	28.785	17.895	
Heating Equipment Type	Split Ht Pump	Split Ht Pump	Split Ht Pump	
Heating Equipment Efficiency	7.700 HSPF	7.700 HSPF	7.700 HSPF	
Cooling Equipment Type	Pkg DX Clg	Pkg DX Clg	Pkg DX Clg	
Cooling Equipment Efficiency	16.00 SEER	16.00 SEER	16.00 SEER	
Make and Model Number	MITSUBIS...AD-A24AA	MITSUBIS...SY-A24NA	MITSUBIS...SY-A24NA	
Heating Duct Location	On Roof	On Roof	On Roof	
Heating Duct R-Value	7.000	7.000	7.000	
Cooling Duct Location	On Roof	On Roof	On Roof	
Cooling Duct R-Value	7.000	7.000	7.000	
Duct Tape Allowed?	0	0	0	
Pipe Type (Supply, Return, Etc...)	-	-	-	
Pipe Insulation R-Value				

CODE TABLES: Enter code from table below into columns above.

Heat Pump Thermostat?	Y: Yes N: No
Electric Heat?	
VAV Minimum Position Control?	
Simulataneous Heat/Cool?	
Heat and Cool Supply Reset?	
Outdoor Damper Control?	
High Efficiency?	
Duct Tape Allowed?	
Pipe Insulation Required?	

Time Control	Setback Control	Isolation Zones	Fan Control
S: Prog Switch O: Occupancy Sensor M: Manual Timer	H: Heating C: Cooling B: Both	Enter number of Isloation Zones	I: Inlet Vanes P: Variable Pitch V: VFD O: Other C: Curve

Ventilation	Outdoor Damper	Economizer	Design O.A. CFM
B: Air Balance C: Outside Air Cert. M: Out. Air Measure D: Demand Control N: Natural	A: Auto G: Gravity	A: Air W: Water N: Not Required	Enter Design Outdoor Air CFM. Note: This shall be no less than Column H on MECH-3C.

Run Initiation Time: 30-Sep-2011 @ 11:27:23 AM Run Code: 1317407310

MECHANICAL VENTILATION Performance MECH-3C

Project Name: LMCC L-612 Student Service Center Remodel | Date: 30-Sep-2011

MECHANICAL VENTILATION

A	B	C	D	E	F	G	H	I	J	K
	AREA BASIS			OCCUPANCY BASIS						
Zone Name	Cond Area (sf)	CFM per sf	Min. CFM (BxC)	No. of People	CFM Per Person	Min. CFM (ExF)	Req'd O.A. (Max. of D or G)	Design Outdoor Air CFM	VAV Min. CFM	Transfer Air CFM
ZF15	179	0.38	68	4	15.0	67	68	68	362.59	0
ZF17	436	0.15	65	2	15.0	33	65	65	319.95	0
ZF19	1,076	0.38	409	27	15.0	404	409	409	1,131.95	0
ZF21	183	0.15	27	1	15.0	14	27	27	159.92	0
ZF23	438	0.15	66	2	15.0	33	66	66	327.07	0
ZF24	428	0.15	64	2	15.0	32	64	64	333.04	0
ZF25	560	0.38	213	14	15.0	210	213	213	464.97	0
ZM09	273	0.15	41	1	15.0	20	41	41	132.29	0
ZM10	951	0.15	143	5	15.0	71	143	143	1,122.95	0
ZM11	508	0.15	76	3	15.0	38	76	75	749.85	0
ZM13	118	0.15	18	1	15.0	9	18	18	295.79	0
ZM14	557	0.15	84	3	15.0	42	84	84	214.89	0
ZM15	137	0.15	21	1	15.0	10	21	21	128.61	0
ZM16	423	0.15	63	2	15.0	32	63	63	336.88	0
ZM18	136	0.15	20	1	15.0	10	20	20	77.12	0
ZM21	344	0.15	52	2	15.0	26	52	52	389.31	0
ZF29	1,359	0.15	204	7	15.0	102	204	204	523.81	0
ZF30	264	0.15	40	1	15.0	20	40	40	181.83	0
ZF31	157	0.15	24	1	15.0	12	24	24	79.29	0
ZF32	419	0.15	63	2	15.0	31	63	63	194.10	0
ZF33	278	0.50	139	9	15.0	140	140	139	237.13	1
ZF39	251	0.50	125	8	15.0	126	126	125	209.33	1
ZM22	534	0.15	80	3	15.0	40	80	80	442.47	0
ZM23	897	0.15	135	4	15.0	67	135	135	1,045.33	0
ZM24	243	0.15	37	1	15.0	18	37	37	97.89	0
ZM25	196	0.15	29	1	15.0	15	29	29	49.43	0
ZM26	376	0.15	56	2	15.0	28	56	56	150.71	0
ZM27	306	0.15	46	2	15.0	23	46	45	193.02	0
ZM43	332	0.50	166	11	15.0	167	167	166	311.65	1
ZM44	902	0.15	135	5	15.0	68	135	135	411.23	0
ZM45	469	0.15	70	2	15.0	35	70	70	134.77	0
ZM46	460	0.15	69	2	15.0	34	69	69	554.85	0
ZF04	210	0.50	105	7	15.0	106	106	105	212.74	1
ZF06	441	0.50	220	15	15.0	221	221	220	549.99	1
ZF08	176	0.15	26	1	15.0	13	26	25	281.48	0
ZF09	377	0.15	57	2	15.0	28	57	57	336.02	0
ZF10	242	0.15	36	1	15.0	18	36	36	322.58	0
ZF11	440	0.15	66	2	15.0	33	66	65	160.76	0

C — Minimum ventilation rate per Section 121, Table 121-A.

E — Base on expected number of occupants or at least 50% of CBC occupant density for egress purposes.

I — Must be greater that or equal to H, or use Transfer Air. Design outdoor air includes ventilation from supply air system & exhaust fans which oeerate at design conditions.

K — Must be greater than or equal to (H-I), and, for VAV, greater than or equal to (H-J).

Run Initiation Time: 30-Sep-2011 @ 11:27:23 AM Run Code: 1317407310

MECHANICAL COMPLIANCE SUMMARY Performance MECH-1C

Project Name: LMCC L-612 Student Service Center Remodel | Date: 30-Sep-2011

COOLING TOWER & FLUID COOLER ACCEPTANCE

Test Description		MECH-6A	MECH-9A	MECH-10A	MECH-11A	MECH-15A		
Equipment Requiring Testing	# of units	Valve Leakage Test	Supply Water Temperature Reset	Hydronic System Variable Flow Control	Automatic Demand Shed Control	Thermal Energy Storage (TES) Systems		Test Performed By
CT		☐	☐	☐	☐	☐		

Run Initiation Time: 30-Sep-2011 @ 11:27:23 AM Run Code: 1317407310

MECHANICAL COMPLIANCE SUMMARY Performance MECH-2C

Project Name: LMCC L-612 Student Service Center Remodel | Date: 30-Sep-2011

SYSTEM FEATURES

System Name	AHU-5	AHU-6	AHU-7	Note to Field
Time Control	S	S	S	
Setback Control	B	B	B	
Isolation Zones	1	1	1	
Heat Pump Thermostat?	Y	Y	Y	
Electric Heat?	N	N	N	
Fan Control	Any Fan w/ VSD	Any Fan w/ VSD	Any Fan w/ VSD	
VAV Minimum Position Control?	Yes	Yes	Yes	
Simulataneous Heat/Cool?	y	y	y	
Heating Supply Reset?	Yes	Yes	Yes	
Cooling Supply Reset?	Yes	Yes	Yes	
Ventilation	Air Balance	Air Balance	Air Balance	
Outdoor Damper Control?	A	A	A	
Economizer Type	OA Temperature	OA Temperature	OA Temperature	
Design O.A. CFM (Mech-3C, Column H)	1,263.765	1,147.855	1,192.100	
Heating Equipment Type	Hot Water	Hot Water	Hot Water	
Heating Equipment Efficiency	n/a	n/a	n/a	
Cooling Equipment Type	Ch Wtr Clg	Ch Wtr Clg	Ch Wtr Clg	
Cooling Equipment Efficiency	n/a	n/a	n/a	
Make and Model Number				
Heating Duct Location	On Roof	On Roof	On Roof	
Heating Duct R-Value	7.000	7.000	7.000	
Cooling Duct Location	On Roof	On Roof	On Roof	
Cooling Duct R-Value	7.000	7.000	7.000	
Duct Tape Allowed?	0	0	0	
Pipe Type (Supply, Return, Etc...)	-	-	-	
Pipe Insulation R-Value				

CODE TABLES: Enter code from table below into columns above.

Heat Pump Thermostat?	Y: Yes N: No
Electric Heat?	
VAV Minimum Position Control?	
Simulataneous Heat/Cool?	
Heat and Cool Supply Reset?	
Outdoor Damper Control?	
High Efficiency?	
Duct Tape Allowed?	
Pipe Insulation Required?	

Time Control	Setback Control	Isolation Zones	Fan Control
S: Prog Switch O: Occupancy Sensor M: Manual Timer	H: Heating C: Cooling B: Both	Enter number of Isloation Zones	I: Inlet Vanes P: Variable Pitch V: VFD O: Other C: Curve

Ventilation	Outdoor Damper	Economizer	Design O.A. CFM
B: Air Balance C: Outside Air Cert. M: Out. Air Measure D: Demand Control N: Natural	A: Auto G: Gravity	A: Air W: Water N: Not Required	Enter Design Outdoor Air CFM. Note: This shall be no less than Column H on MECH-3C.

Run Initiation Time: 30-Sep-2011 @ 11:27:23 AM Run Code: 1317407310

MECHANICAL COMPLIANCE SUMMARY Performance MECH-2C

Project Name: LMCC L-612 Student Service Center Remodel | Date: 30-Sep-2011

SYSTEM FEATURES

System Name	AC-4	Note to Field
Time Control	S	
Setback Control	B	
Isolation Zones	1	
Heat Pump Thermostat?	Y	
Electric Heat?	N	
Fan Control	Constant Volume	
VAV Minimum Position Control?	No	
Simulataneous Heat/Cool?	n	
Heating Supply Reset?	No	
Cooling Supply Reset?	No	
Ventilation	Air Balance	
Outdoor Damper Control?	A	
Economizer Type	Fixed Fraction	
Design O.A. CFM (Mech-3C, Column H)	124.350	
Heating Equipment Type	Split Ht Pump	
Heating Equipment Efficiency	7.700 HSPF	
Cooling Equipment Type	Pkg DX Clg	
Cooling Equipment Efficiency	16.00 SEER	
Make and Model Number	MITSUBIS...SY-A24NA	
Heating Duct Location	On Roof	
Heating Duct R-Value	7.000	
Cooling Duct Location	On Roof	
Cooling Duct R-Value	7.000	
Duct Tape Allowed?	0	
Pipe Type (Supply, Return, Etc...)	-	
Pipe Insulation R-Value		

CODE TABLES: Enter code from table below into columns above.

Heat Pump Thermostat?	Y: Yes N: No
Electric Heat?	
VAV Minimum Position Control?	
Simulataneous Heat/Cool?	
Heat and Cool Supply Reset?	
Outdoor Damper Control?	
High Efficiency?	
Duct Tape Allowed?	
Pipe Insulation Required?	

Time Control	Setback Control	Isolation Zones	Fan Control
S: Prog Switch O: Occupancy Sensor M: Manual Timer	H: Heating C: Cooling B: Both	Enter number of Isloation Zones	I: Inlet Vanes P: Variable Pitch V: VFD O: Other C: Curve

Ventilation	Outdoor Damper	Economizer	Design O.A. CFM
B: Air Balance C: Outside Air Cert. M: Out. Air Measure D: Demand Control N: Natural	A: Auto G: Gravity	A: Air W: Water N: Not Required	Enter Design Outdoor Air CFM. Note: This shall be no less than Column H on MECH-3C.

NOTES TO FIELD - For Building Department Use Only

Run Initiation Time: 30-Sep-2011 @ 11:27:23 AM Run Code: 1317407310

MECHANICAL VENTILATION Performance MECH-3C

Project Name: LMCC L-612 Student Service Center Remodel | Date: 30-Sep-2011

MECHANICAL VENTILATION

A	B	C	D	E	F	G	H	I	J	K
	AREA BASIS			OCCUPANCY BASIS						
Zone Name	Cond Area (sf)	CFM per sf	Min. CFM (BxC)	No. of People	CFM Per Person	Min. CFM (ExF)	Req'd O.A. (Max. of D or G)	Design Outdoor Air CFM	VAV Min. CFM	Transfer Air CFM
ZF12	1,044	0.15	157	5	15.0	78	157	157	356.99	0
ZF13	587	0.15	88	3	15.0	44	88	88	200.57	0
ZM29	395	0.25	99	7	15.0	98	99	99	195.31	0
ZM32	166	0.15	25	1	15.0	12	25	25	180.97	0
ZM33	213	0.15	32	1	15.0	16	32	32	389.02	0
ZM34	267	0.15	40	1	15.0	20	40	40	105.74	0
ZM35	333	0.50	166	11	15.0	167	167	166	292.29	1
ZM37	82	0.15	12	0	15.0	6	12	12	14.18	0
ZM39	244	0.15	37	1	15.0	18	37	37	218.50	0
ZM40	479	0.15	72	2	15.0	36	72	72	180.51	0
ZM41	245	0.15	37	1	15.0	18	37	37	286.04	0
ZM42	264	0.15	40	1	15.0	20	40	40	385.09	0
ZF01	485	0.15	73	2	15.0	36	73	73	457.06	0
ZF02	336	0.15	50	2	15.0	25	50	50	219.29	0
ZF05	1,633	0.15	245	8	15.0	122	245	245	572.42	0
ZM01	402	0.50	201	13	15.0	202	202	201	759.84	1
ZM02	169	0.15	25	1	15.0	13	25	25	191.84	0
ZM04	891	0.38	339	22	15.0	334	339	339	970.14	0
ZM05	497	0.15	75	2	15.0	37	75	75	652.29	0
ZM06	314	0.15	47	2	15.0	24	47	47	129.95	0
ZM07	1,210	0.15	181	6	15.0	91	181	181	482.55	0
ZM17	185	0.15	28	1	15.0	14	28	28	43.55	0
ZF26	645	0.15	97	3	15.0	48	97	97	324.49	0
ZF27	1,566	0.25	392	26	15.0	388	392	392	1,319.65	0
ZM08	1,319	0.50	660	44	15.0	663	663	660	1,331.82	3
ZF28	1,002	0.15	150	5	15.0	75	150	150	808.74	0
ZF34	943	0.15	141	5	15.0	71	141	141	346.59	0
ZF35	212	0.15	32	1	15.0	16	32	32	73.16	0
ZF38	271	0.15	41	1	15.0	20	41	41	539.36	0
ZF41	815	0.15	122	4	15.0	61	122	122	232.15	0
ZF42	798	0.15	120	4	15.0	60	120	120	523.79	0
ZM28	792	0.50	396	27	15.0	398	398	396	837.83	2
ZM36	582	0.15	87	3	15.0	44	87	87	766.09	0
ZM38	410	0.25	102	7	15.0	101	102	102	1,103.09	0
ZF40	113	0.15	17	0	15.0	3	17	17	- n/a -	0
ZF03	192	0.15	29	0	15.0	4	29	29	- n/a -	0
ZF18	119	0.15	18	0	15.0	3	18	18	- n/a -	0

C — Minimum ventilation rate per Section 121, Table 121-A.

E — Base on expected number of occupants or at least 50% of CBC occupant density for egress purposes.

I — Must be greater that or equal to H, or use Transfer Air. Design outdoor air includes ventilation from supply air system & exhaust fans which oeerate at design conditions.

K — Must be greater than or equal to (H-I), and, for VAV, greater than or equal to (H-J).

Run Initiation Time: 30-Sep-2011 @ 11:27:23 AM Run Code: 1317407310

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planning
interiors
management

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REGISTERED PROFESSIONAL ENGINEER HORMOZ JANSSENS No. 030802 Exp. 12-31-2012 MECHANICAL STATE OF CALIFORNIA
Date Signed: 7/25/12
consultant

FILE #7-C1
IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
OFFICE OF REGULATION SERVICES
APPL 01-112272
AC FLS SS
DATE JUL 3 1 2012

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city, state, zip
ph: fx:
agency

L-612 STUDENT SERVICES CENTER REMODEL COLLEGE COMPLEX

BID DOCUMENTS

LOS MEDANOS COLLEGE
2700 EAST LELAND DRIVE
PITTSBURG, CA 94565
owner

tBP project number: 20610.00
file name: 0106M04.dwg
drawn by: HP checked by: BC
date: JULY 31, 2012

Rev.	date:	description:

drawing title:
TITLE 24 - ENERGY COMPLIANCE FORMS

drawing no.:
M-0.4
drawing of

FILE: 0106M04.DWG – M04 | EDIT: 5/9/2012 11:20 PM BY WILLIAMSB | PLOT: 7/25/2012 10:08 PM BY HAI PHAN

MECHANICAL VENTILATION Performance — MECH-3C

Project Name: LMCC L-612 Student Service Center Remodel — Date: 30-Sep-2011

MECHANICAL VENTILATION

A	B	C	D	E	F	G	H	I	J	K
	AREA BASIS			OCCUPANCY BASIS						
Zone Name	Cond Area (sf)	CFM per sf	Min. CFM (BxC)	No. of People	CFM Per Person	Min. CFM (ExF)	Req'd O.A. (Max. of D or G)	Design Outdoor Air CFM	VAV Min. CFM	Transfer Air CFM
ZM30	829	0.15	124	1	15.0	19	124	124	- n/a -	0

C Minimum ventilation rate per Section 121, Table 121-A.

E Base on expected number of occupants or at least 50% of CBC occupant density for egress purposes.

I Must be greater that or equal to H, or use Transfer Air. Design outdoor air includes ventilation from supply air system & exhaust fans which operate at design conditions.

K Must be greater than or equal to (H-I), and, for VAV, greater than or equal to (H-J).

Run Initiation Time: 30-Sep-2011 @ 11:27:23 AM — Run Code: 1317407310

MECHANICAL EQUIPMENT DETAILS Performance (Part 1 of 2) — MECH-5C

Project Name: LMCC L-612 Student Service Center Remodel — Date: 30-Sep-2011

CENTRAL FAN SUMMARY

	SUPPLY FAN						RETURN FAN					
System Name	Description	Qty.	CFM	BHP	Motor Eff	Drive Eff	Description	Qty.	CFM	BHP	Motor Eff	Drive Eff
AHU-2	Any Fan w/ VSD	1	5,900	6.04	0.90	1.00	Any Fan w/ VSD	1	3,658	1.53	0.87	1.00
AHU-3	Any Fan w/ VSD	2	6,600	1.51	0.90	1.00	Any Fan w/ VSD	1	4,092	2.52	0.90	1.00
AHU-4	Any Fan w/ VSD	2	5,200	1.74	0.92	1.00	Any Fan w/ VSD	1	3,240	2.56	0.90	1.00
AHU-5	Any Fan w/ VSD	2	4,400	1.86	0.92	1.00	Any Fan w/ VSD	1	2,728	2.32	0.90	1.00
AHU-6	Any Fan w/ VSD	1	4,600	6.10	0.90	1.00	Any Fan w/ VSD	1	2,852	1.72	0.87	1.00
AHU-7	Any Fan w/ VSD	1	5,100	6.10	0.90	1.00	Any Fan w/ VSD	1	3,162	1.72	0.87	1.00
AC-1	Constant Volume	1	671	0.16	0.82	1.00	n/a					
AC-3	Constant Volume	1	568	0.18	0.82	1.00	n/a					
AC-2	Constant Volume	1	568	0.18	0.80	1.00	n/a					
AC-4	Constant Volume	1	568	0.18	0.80	1.00	n/a					

Run Initiation Time: 30-Sep-2011 @ 11:27:23 AM — Run Code: 1317407310

MECHANICAL EQUIPMENT DETAILS Performance (Part 2 of 2) — MECH-5C

Project Name: LMCC L-612 Student Service Center Remodel — Date: 30-Sep-2011

VAV SUMMARY

	VAV				
Zone Name	System Type	Qty.	Min. CFM Ratio	Reheat Type	Reheat Delta-T
ZM41	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZM42	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZF01	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZF02	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZF05	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZM01	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZM02	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZM04	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZM05	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZM06	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZM07	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZM17	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZF26	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZF27	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZM08	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZF28	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZF34	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZF35	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZF38	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZF41	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZF42	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZM28	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZM36	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZM38	Variable Air Volume	1	0.30	Hot Water Loop	30.0

EXHAUST FAN SUMMARY

	EXHAUST FAN					
Zone Name	Description	Qty.	CFM	BHP	Motor Eff.	Drive Eff.
ZM44	Cycling		1,050.0	0.15	0.82	1.00
ZF34	Cycling		1,050.0	0.15	0.82	1.00
ZM30	Cycling		568.0	0.15	0.82	1.00

Run Initiation Time: 30-Sep-2011 @ 11:27:23 AM — Run Code: 1317407310

MECHANICAL EQUIPMENT DETAILS Performance (Part 1 of 2) — MECH-5C

Project Name: LMCC L-612 Student Service Center Remodel — Date: 30-Sep-2011

CIRCULATION LOOP SUMMARY

		CIRCULATION LOOP PUMPS					
Name	Description	Qty.	GPM	BHP	Motor Eff.	Drive Eff.	Pump Control
Chilled Water Loop	Chilled Water	1	222	3.8	0.90	1.00	var spd
Hot Water Loop	Hot Water	1	138	2.2	0.88	1.00	var spd
DHW Plan...oop (1)	Nonres DHW Loop	0	n/a	0.0	n/a	n/a	n/a
Condenser Loop	Condenser Water	1	326	7.3	0.92	1.00	var spd

CHILLER SUMMARY

						CHILLER PUMPS					
Name	Circulation Loop	Description	Qty.	Eff. (COP)	Total Tons	Qty.	GPM	BHP	Motor Eff.	Drive Eff.	Pump Control
Chiller 1	Chilled Water Loop	Screw	1	4.45	111	0	n/a	n/a	n/a	n/a	n/a

COOLING TOWER SUMMARY

						COOLING TOWER PUMPS					
Name	Circulation Loop	Description	Qty.	Eff. (EIR)	Total Tons	Qty.	GPM	BHP	Motor Eff.	Drive Eff.	Pump Control
CT	Condenser Loop	Open Tower	1	0.010	135	0	n/a	n/a	n/a	n/a	n/a

BOILER SUMMARY

						BOILER PUMPS					
Name	Circulation Loop	Description	Qty.	Efficiency	Tot Inp (kBtu/h)	Qty.	GPM	BHP	Motor Eff.	Drive Eff.	Pump Control
Boiler 1	Hot Water Loop	HW Boiler		0.90 EtMax	1380	0	n/a	n/a	n/a	n/a	n/a

DOMESTIC WATER HEATER SUMMARY

								Tank Insulation	
Name	Circulation Loop	Description	Qty.	Rtd Input (kBtu/h)	Volume (Gals.)	E.F. or Rec. Eff.	Stdby or Pilot	Int. R-Val	Ext. R-Val
DHW Plan... Htr (1)	DHW Plan...oop (1)	Indirect Fired	1	102	30.0	0.80% Et	0.00%	0.00	12.00

CENTRAL SYSTEM RATINGS

				HEATING			COOLING			
System Name	Circulation Loop	Description	Qty.	Output (kBtu/h)	Aux. kW	Efficiency	Output (kBtu/h)	EER	SEER	Economizer Type
AHU-2	CHW & HW Loops	Variable Air Volume	1	149	-	n/a	175	n/a	n/a	OA Te...ture
AHU-3	CHW & HW Loops	Variable Air Volume	1	186	-	n/a	192	n/a	n/a	OA Te...ture
AHU-4	CHW & HW Loops	Variable Air Volume	1	184	-	n/a	212	n/a	n/a	OA Te...ture
AHU-5	CHW & HW Loops	Variable Air Volume	1	210	-	n/a	226	n/a	n/a	OA Te...ture
AHU-6	CHW & HW Loops	Variable Air Volume	1	151	-	n/a	172	n/a	n/a	OA Te...ture
AHU-7	CHW & HW Loops	Variable Air Volume	1	151	-	n/a	172	n/a	n/a	OA Te...ture
AC-1	- none -	Pkgd Single Zone	1	0	-	7.70 HSPF	24	n/a	16.00	Fixed ...ction
AC-3	- none -	Pkgd Single Zone	1	1	-	7.70 HSPF	22	n/a	16.00	Fixed ...ction
AC-2	- none -	Pkgd Single Zone	1	8	-	7.70 HSPF	22	n/a	16.00	Fixed ...ction
AC-4	- none -	Pkgd Single Zone	1	15	-	7.70 HSPF	22	n/a	16.00	Fixed ...ction

Run Initiation Time: 30-Sep-2011 @ 11:27:23 AM — Run Code: 1317407310

MECHANICAL EQUIPMENT DETAILS Performance (Part 2 of 2) — MECH-5C

Project Name: LMCC L-612 Student Service Center Remodel — Date: 30-Sep-2011

VAV SUMMARY

	VAV				
Zone Name	System Type	Qty.	Min. CFM Ratio	Reheat Type	Reheat Delta-T
ZF15	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZF17	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZF19	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZF21	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZF23	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZF24	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZF25	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZM09	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZM10	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZM11	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZM13	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZM14	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZM15	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZM16	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZM18	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZM21	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZF29	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZF30	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZF31	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZF32	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZF33	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZF39	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZM22	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZM23	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZM24	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZM25	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZM26	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZM27	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZM43	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZM44	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZM45	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZM46	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZF04	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZF06	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZF08	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZF09	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZF10	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZF11	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZF12	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZF13	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZM29	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZM32	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZM33	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZM34	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZM35	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZM37	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZM39	Variable Air Volume	1	0.30	Hot Water Loop	30.0
ZM40	Variable Air Volume	1	0.30	Hot Water Loop	30.0

Run Initiation Time: 30-Sep-2011 @ 11:27:23 AM — Run Code: 1317407310

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DATE JUL 3 1 2012

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L-612 STUDENT SERVICES CENTER REMODEL COLLEGE COMPLEX
BID DOCUMENTS

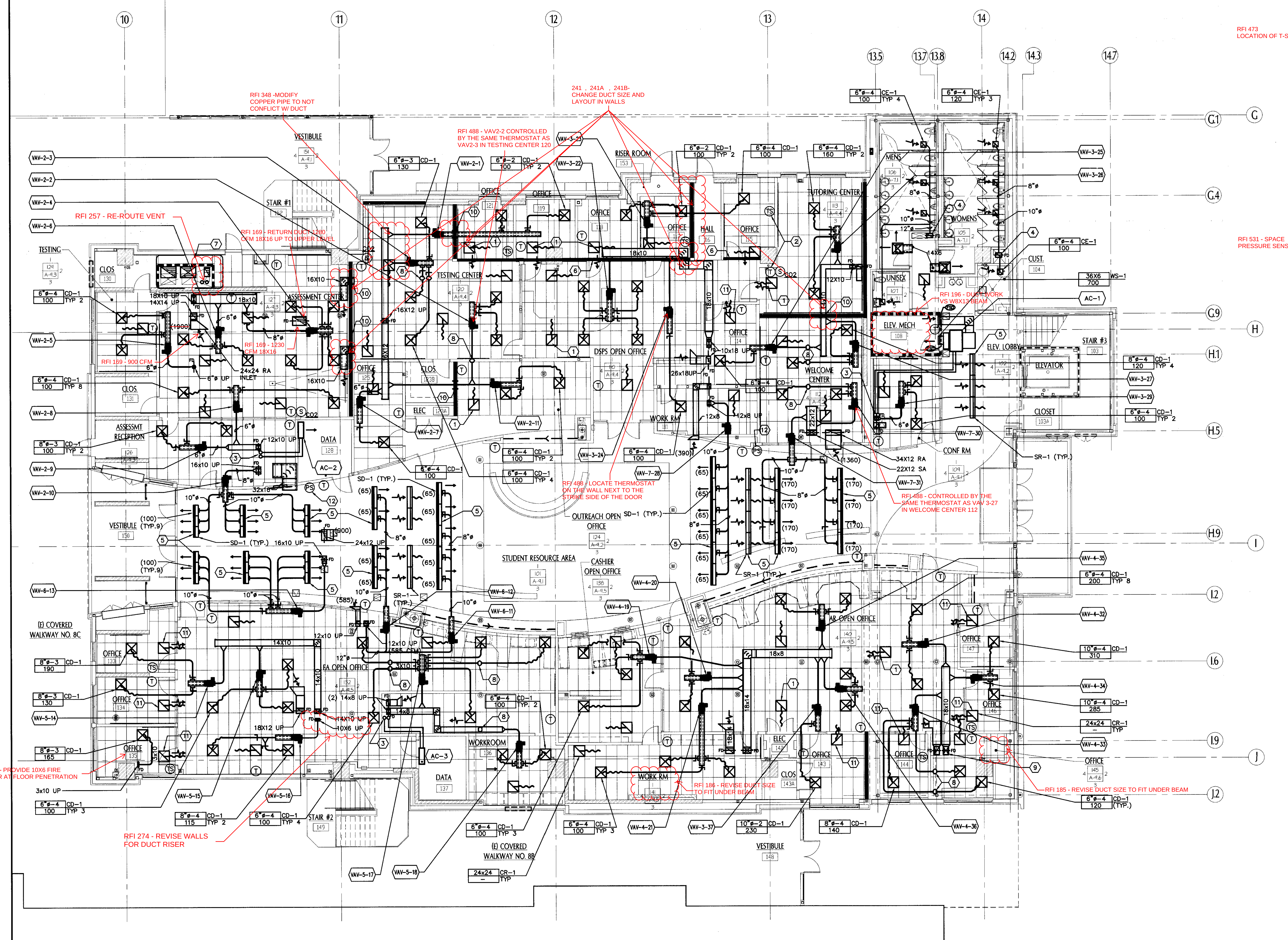
LOS MEDANOS COLLEGE
2700 EAST LELAND DRIVE
PITTSBURG, CA 94565
owner

tBP project number : 20610.00
file name: 0106M05.dwg
drawn by: HP checked by: BC
date: JULY 31, 2012

Rev.	date:	description:

drawing title:
TITLE 24 - ENERGY COMPLIANCE FORMS

drawing no.:
M-0.5
drawing of



1 SS3 LOWER LEVEL FLOOR PLAN - HVAC DUCTWORK

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

GENERAL SHEET NOTES

A. SEE ARCHITECTURAL INTERIOR ELEVATION PLAN FOR EXACT LOCATIONS OF ALL THERMOSTAT.

B. LOCATE ALL VAV BOXES SUCH THAT THEY CAN BE ACCESSIBLE FROM DROP-IN CEILING TO VAV'S CONTROLLER AND VALVES.

C. LOCATE ALL VAV BOXES AWAY FROM RECESSED LIGHTING FIXTURES & T-BAR HANGERS.

D. COORDINATION DOCUMENTS FOR ALL DIVISION 15 AND 16 TRADES SHALL BE SUBMITTED AND SIGNED OFF BY ALL TRADES. NO SHOP DRAWINGS SHALL BE REVIEWED BY AOR AND ENGINEERS UNLESS COORDINATION DOCUMENTS ARE SIGNED OFF.

E. REFER TO VAV CONTROL DIAGRAM ON SHEET M-6.2 FOR VAV ZONES ADDRESSES FOR THERMOSTAT.

F. REFER TO VAV SCHEDULE ON SHEET M-4.2 FOR VAV DUCT INLET SIZES.

SHEET KEYNOTES

1 CEILING RETURN GRILLE WITH MINIMUM 5' OF ACOUSTICAL FLEX DUCT IN RETURN PLENUM. (TYPICAL)

RFI 473
LOCATION OF T-STAT

2 REFER TO ARCH INTERIOR ELEVATION FOR EXACT THERMOSTAT LOCATION. (TYPICAL ALL)

3 REFRIGERANT PIPE RISERS UP TO CONDENSER ON ROOF.

4 14X10 EXHAUST DUCT UP. REFER TO PLUMBING DRAWINGS FOR HVAC CONDENSATE LINES.

5 DIFFUSER LENGTHS ARE TO MATCH SLOT LIGHT LENGTHS AS SHOWN. REFER TO SHEET M-4.1 FOR DIFFUSER SCHEDULE. (TYPICAL)

6 PROVIDE 3" HIGH CONTINUOUS SLOT OPENING IN FULL HEIGHT WALL ABOVE CEILING FOR RETURN AIR. SEE ARCHITECTURAL RCP DRAWING FOR ADDITIONAL INFORMATION.

7 SUPPLY, RETURN, EXHAUST DUCT & HEATING PIPE RISERS ARE PART OF PHASE II SCOPES.

8 PROVIDE 3X10 DUCT TRANSITION TO GO UNDERNEATH BELOW BEAM. (TYPICAL)

9 PROVIDE DUCT TRANSITION.

10 S/A DUCT THROUGH SHEAR WALL. REFER TO DETAIL #17/S5.3.

ASI 01

11 PROVIDE ACOUSTIC FLEX DUCT TRANSFER PLENUM SPACE AT ALL PRIVATE OFFICES (TYPICAL) DETAIL #10/M3.1.

12 LOCATE BUILDING PRESSURE SENSOR AS SPECIFIED PER M-6.1.

RFI 531 - SPACE PRESSURE SENSOR

Space pressure sensor locations as indicated on sheet M2.1A.
- Utilize the sensor location on the west side of the building to control AHU 1, 2, 5, & 6.
- Utilize the sensor location on the east side of the building to control AHU 3, 4, & 7.

RFI 626 - AIRFLOW DISCREPANCIES (ROOM 231, VAV 2-2, VAV 2-32, VAV2-11, VAV 4-32, VAV 5-4)

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L-612 STUDENT SERVICES CENTER REMODEL COLLEGE COMPLEX

BID DOCUMENTS

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2700 EAST LELAND DRIVE
PITTSBURG, CA 94565

owner

tBP project number : 20610.00

file name: 0108M21.dwg

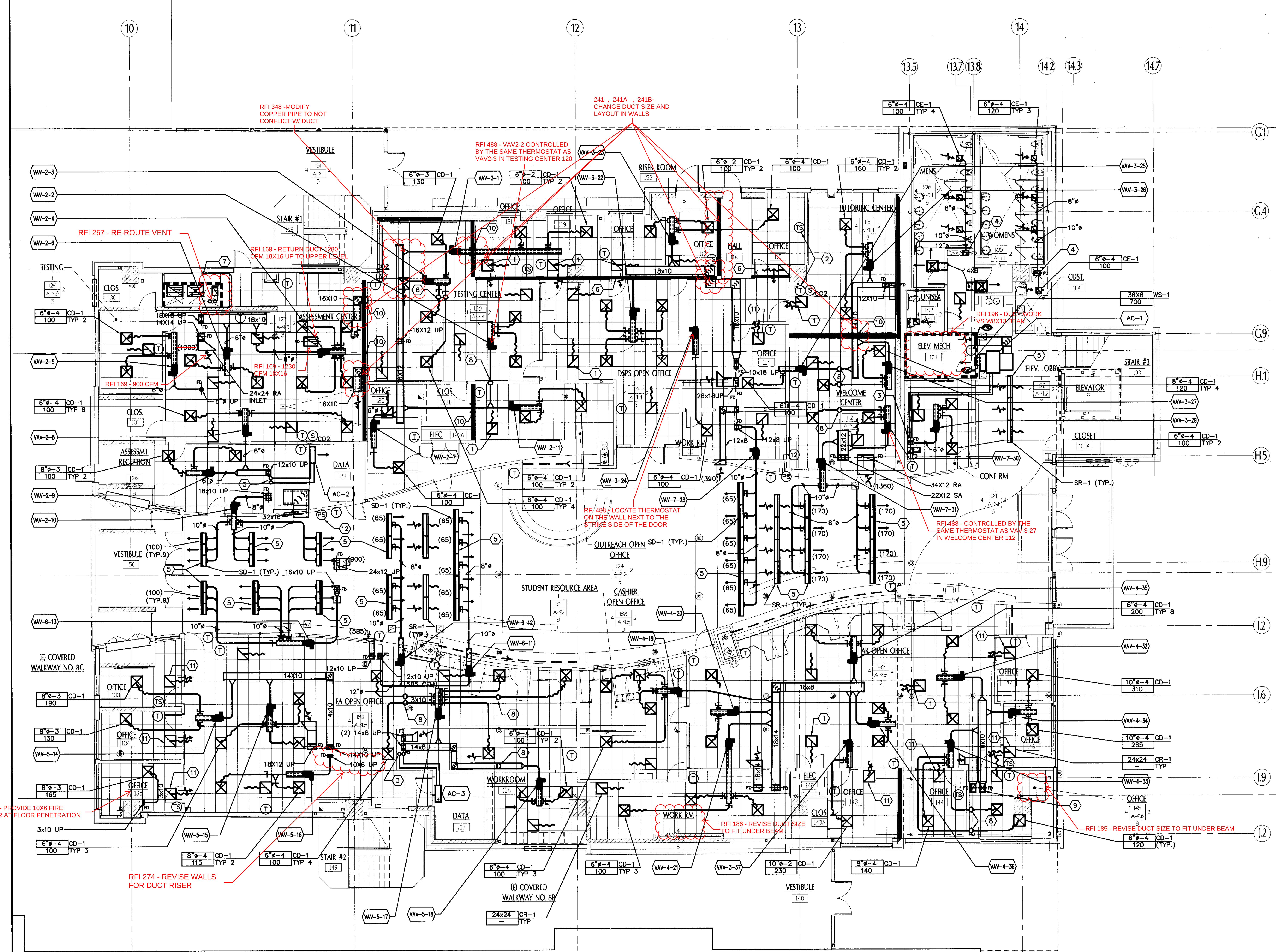
drawn by: GE checked by: BC

date: JULY 31, 2012

Rev:	date:	description:

drawing title:
SS3 LOWER LEVEL FLOOR PLAN- HVAC DUCTWORK

drawing no.:
M-2.1A
drawing of



1 SS3 LOWER LEVEL FLOOR PLAN - HVAC DUCTWORK

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

GENERAL SHEET NOTES

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F. REFER TO VAV SCHEDULE ON SHEET M-4.2 FOR VAV DUCT INLET SIZES.

SHEET KEYNOTES

1 CEILING RETURN GRILLE WITH MINIMUM 5' OF ACOUSTICAL FLEX DUCT IN RETURN PLENUM. (TYPICAL)

RFI 473
LOCATION OF T-STAT

2 REFER TO ARCH INTERIOR ELEVATION FOR EXACT THERMOSTAT LOCATION. (TYPICAL ALL)

3 REFRIGERANT PIPE RISERS UP TO CONDENSER ON ROOF.

4 14X10 EXHAUST DUCT UP. REFER TO PLUMBING DRAWINGS FOR HVAC CONDENSATE LINES.

5 DIFFUSER LENGTHS ARE TO MATCH SLOT LIGHT LENGTHS AS SHOWN. REFER TO SHEET M-4.1 FOR DIFFUSER SCHEDULE. (TYPICAL)

6 PROVIDE 3" HIGH CONTINUOUS SLOT OPENING IN FULL HEIGHT WALL ABOVE CEILING FOR RETURN AIR. SEE ARCHITECTURAL RCP DRAWING FOR ADDITIONAL INFORMATION.

7 SUPPLY, RETURN, EXHAUST DUCT & HEATING PIPE RISERS ARE PART OF PHASE II SCOPES.

8 PROVIDE 3X10 DUCT TRANSITION TO GO UNDERNEATH BELOW BEAM. (TYPICAL)

9 PROVIDE DUCT TRANSITION.

10 S/A DUCT THROUGH SHEAR WALL. REFER TO DETAIL #17/S5.3.

ASI 01

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RFI 531 - SPACE PRESSURE SENSOR

Space pressure sensor locations as indicated on sheet M2.1A.
- Utilize the sensor location on the west side of the building to control AHU 1, 2, 5, & 6.
- Utilize the sensor location on the east side of the building to control AHU 3, 4, & 7.

RFI 626 - AIRFLOW DISCREPANCIES (ROOM 231, VAV 2-2, VAV 2-32, VAV2-11, VAV 4-32, VAV 5-4)

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L-612 STUDENT SERVICES CENTER REMODEL
COLLEGE COMPLEX
BID DOCUMENTS

LOS MEDANOS COLLEGE
2700 EAST LELAND DRIVE
PITTSBURG, CA 94565

owner

tBP project number : 20610.00

file name: 0108M21.dwg

drawn by: GE checked by: BC

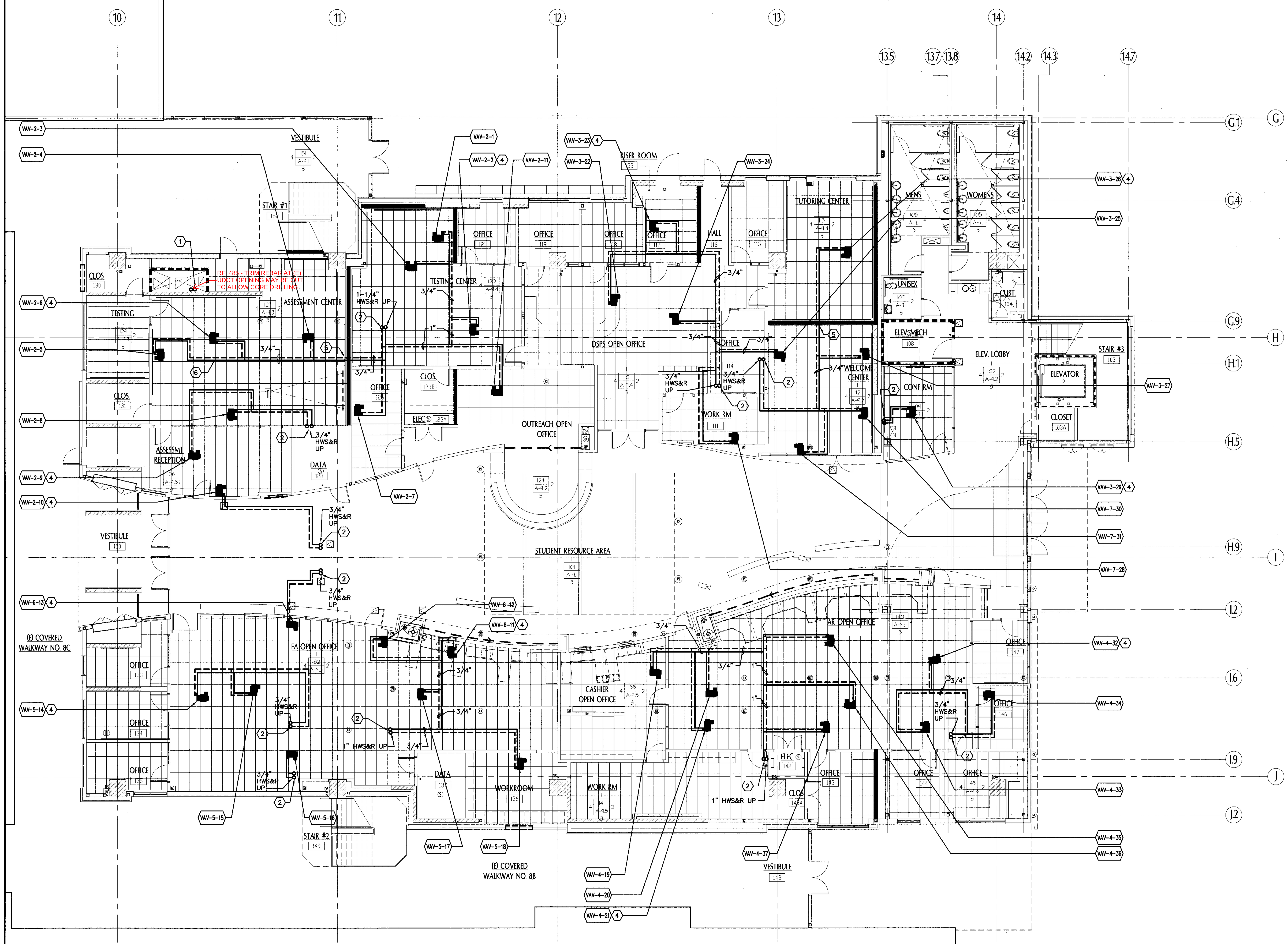
date: JULY 31, 2012

Rev.	date:	description:

drawing title:
SS3 LOWER LEVEL FLOOR PLAN- HVAC DUCTWORK

drawing no:
M-2.1A

drawing of



1 SS3 LOWER LEVEL FLOOR PLAN - HVAC REHEAT PIPING

0 4' 8' 16'

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

GENERAL SHEET NOTES

A. SEE ARCHITECTURAL INTERIOR ELEVATION PLAN FOR EXACT LOCATIONS OF ALL THERMOSTAT.

B. LOCATE ALL VAV BOXES SUCH THAT THEY CAN BE ACCESSIBLE FROM DROP-IN CEILING TO VAV'S CONTROLLER AND VALVES.

C. LOCATE ALL VAV BOXES AWAY FROM RECESSED LIGHTING FIXTURES & T-BAR HANGERS.

D. COORDINATION DOCUMENTS FOR ALL DIVISION 15 AND 16 TRADES SHALL BE SUBMITTED AND SIGNED OFF BY ALL TRADES. NO SHOP DRAWINGS SHALL BE REVIEWED BY AOR AND ENGINEERS UNLESS COORDINATION DOCUMENTS ARE SIGNED OFF.

SHEET KEYNOTES

1 2"HWS/HWR HYDRONIC RISERS SERVING 2ND FLOOR (PHASE I).

2 HYDRONIC PIPING DOWN FROM UPPER LEVEL.

3 NOT USED.

4 REHEAT COIL CONNECTION KIT WITH 3-WAY VALVE.

5 HYDRONIC PIPING THROUGH SHEAR WALL. REFER TO DETAIL #17/S5.3.

6 MINIMUM ALLOWABLE FOR END RUNS PIPING IS TO BE SIZED AT 3/4" (TYPICAL).

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L-612 STUDENT SERVICES CENTER REMODEL COLLEGE COMPLEX

BID DOCUMENTS

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tBP project number : 20610.00

file name: 0106M21B.dwg

drawn by: GE checked by: BC

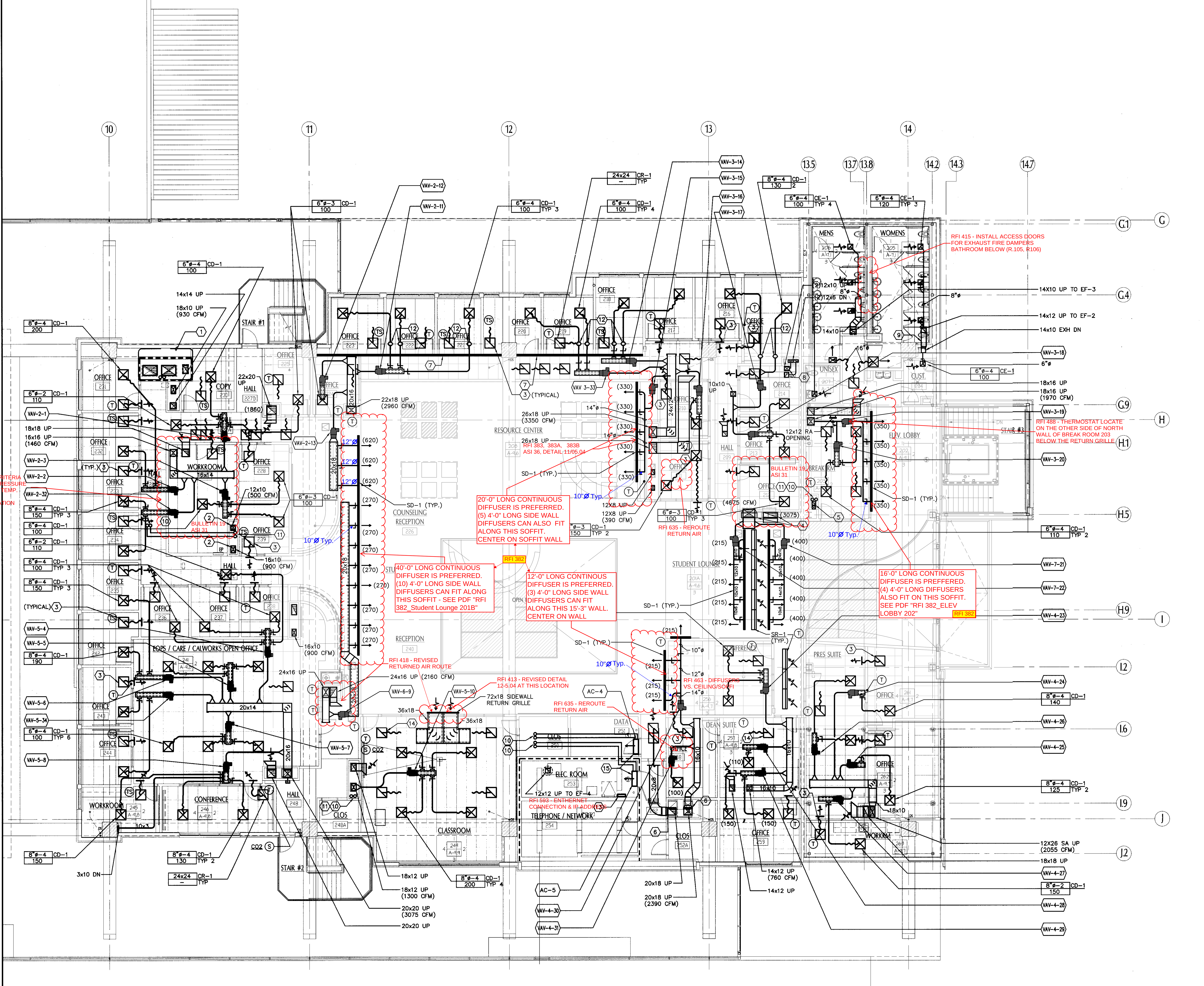
date: JULY 31, 2012

Rev.	date:	description:

drawing title:
SS3 LOWER LVL FLR PLAN - HVAC REHEAT PIPING

drawing no.:
M-2.1B

drawing of



1 SS4 UPPER LEVEL FLOOR PLAN - HVAC DUCTWORK

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

GENERAL SHEET NOTES

A. SEE ARCHITECTURAL INTERIOR ELEVATION PLAN FOR EXACT LOCATIONS OF ALL THERMOSTAT.

B. LOCATE ALL VAV BOXES SUCH THAT THEY CAN BE ACCESSIBLE FROM DROP-IN CEILING TO VAV'S CONTROLLER AND VALVES.

C. LOCATE ALL VAV BOXES AWAY FROM RECESSED LIGHTING FIXTURES & T-BAR HANGERS.

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E. REFER TO VAV CONTROL DIAGRAM ON SHEET M-6.2 FOR VAV ZONES ADDRESSES FOR THERMOSTAT.

F. REFER TO VAV SCHEDULE ON SHEET M-4.2 FOR VAV DUCT INLET SIZES.

SHEET KEYNOTES

1 (N)SUPPLY, RETURN, EXHAUST, HYDRONIC PIPE RISERS SERVING COLLEGE COMPLEX LEVEL CC2. SEE DIVISION 1 SECTION 01015 PROJECT PHASING.

2 SUPPLY DUCT DOWN TO LOWER LEVEL.

ASI#01

3 PROVIDE ACOUSTICAL FLEX DUCT TRANSFER TO PLENUM SPACE AT ALL PRIVATE OFFICES. (TYPICAL) DETAIL #10/M3.1.

4 PROVIDE TRANSITION FOR DUCTS TO GET INTO AIRSHAFT TO LOWER FLOOR. 28x20 SA & RA DUCTS FROM ROOF. 34x12 SA & RA DOWN INSIDE SHAFT.

5 8x8 SA & RA DUCT RISERS IN SHAFT.

6 PROVIDE TRANSITION FOR DUCTS TO GET INTO AIRSHAFT TO LOWER FLOOR. 20x18 SA & RA DUCTS FROM ROOF. 18x14 SA & RA DOWN INSIDE SHAFT.

7 PROVIDE 3" HIGH CONTINUOUS SLOT OPENING IN FULL HEIGHT WALL ABOVE CEILING FOR RETURN AIR. SEE ARCHITECTURAL RCP DRAWING FOR ADDITIONAL INFORMATION.

8 PROVIDE TRANSITION FOR DUCTS TO GET INTO AIRSHAFT TO LOWER FLOOR. 12x10 SA & RA DUCTS FROM ROOF. 12x6 SA & RA DOWN INSIDE SHAFT.

9 PROVIDE TRANSITION FOR DUCT TO GET INTO AIRSHAFT TO LOWER FLOOR. 14x12 EA DUCT FROM ROOF. 14x10 EA DOWN INSIDE SHAFT.

10 REFRIGERANT LINE SET UP TO CONDENSING UNIT ON ROOF.

11 REFRIGERANT LINE SET DOWN TO LOWER LEVEL.

12 PROVIDE 3x10 DUCT TRANSITION TO GO BELOW BEAM. (TYPICAL)

13 BAS INFINET CONTROL PANEL. DIVISION 16 TO PROVIDE 120V POWER TO PANEL.

14 CEILING RETURN GRILLE WITH MINIMUM 5' OF ACOUSTICAL FLEX DUCT IN RETURN PLENUM. (TYPICAL FOR ALL ROOMS)

15 REFER TO PLUMBING DRAWINGS FOR HVAC CONDENSATE LINES.

16 DIFFUSER LENGTHS ARE TO MATCH SLOT LIGHT LENGTHS AS SHOWN. REFER TO SHEET M-4.1 FOR DIFFUSER SCHEDULE. (TYPICAL)

RFI 626 - AIRFLOW DISCREPANCIES (ROOM 231, VAV 2-2, VAV 2-32, VAV2-11, VAV 4-32, VAV 5-4)

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L-612 STUDENT SERVICES CENTER REMODEL COLLEGE COMPLEX

BID DOCUMENTS

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tBP project number : 20670.00

file name: 0106M22A.dwg

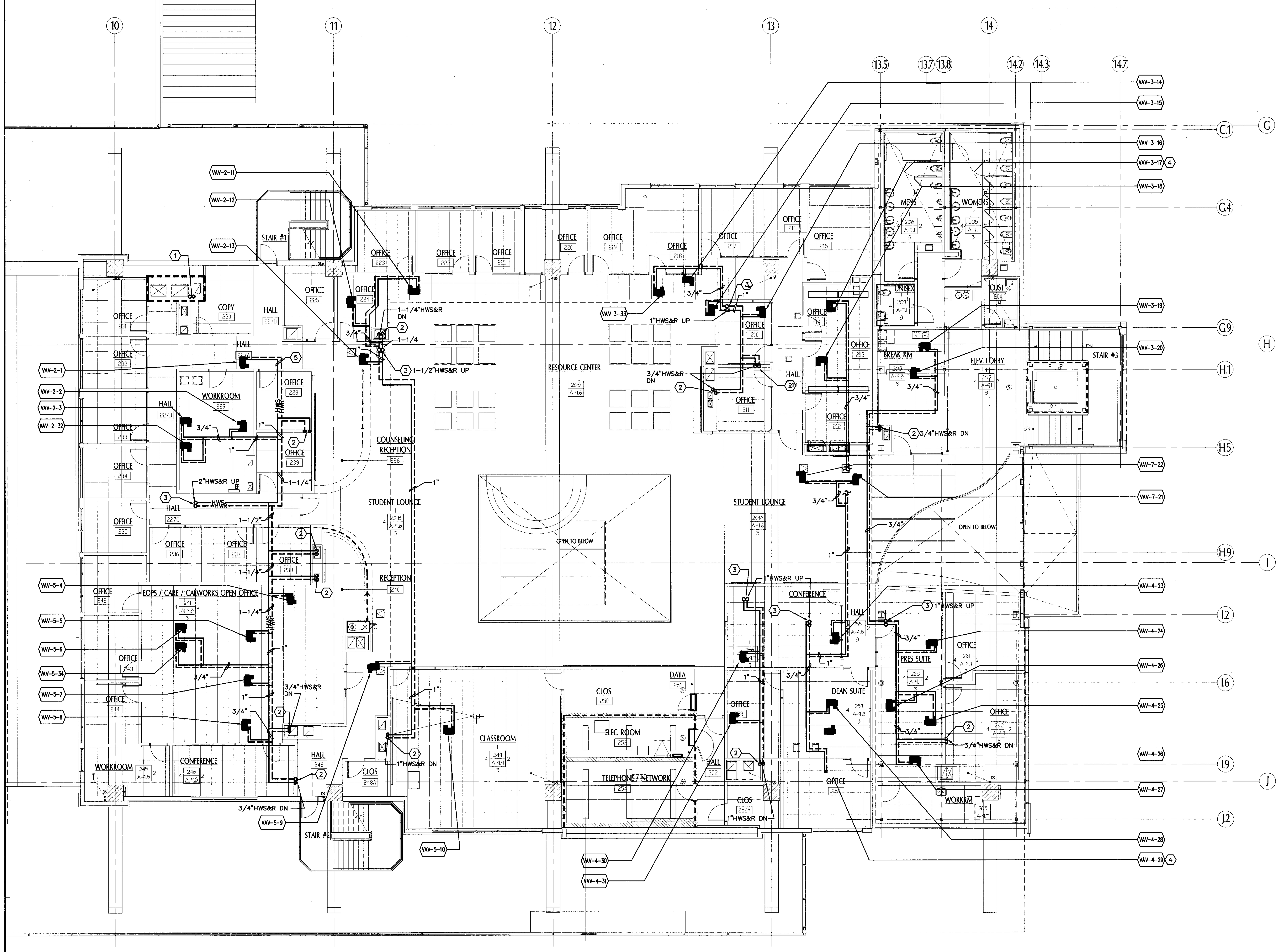
drawn by: GE checked by: BC

date: JULY 31, 2012

Rev:	date:	description:

drawing title:
SS4 UPPER LEVEL FLOOR PLAN- HVAC DUCTWORK

drawing no.:
M-2.2A
drawing of



1 SS4 UPPER LEVEL FLOOR PLAN - HVAC REHEAT PIPING

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

GENERAL SHEET NOTES

A. SEE ARCHITECTURAL INTERIOR ELEVATION PLAN FOR EXACT LOCATIONS OF ALL THERMOSTAT.

B. LOCATE ALL VAV BOXES SUCH THAT THEY CAN BE ACCESSIBLE FROM DROP-IN CEILING TO VAV'S CONTROLLER AND VALVES.

C. LOCATE ALL VAV BOXES AWAY FROM RECESSED LIGHTING FIXTURES & T-BAR HANGERS.

D. COORDINATION DOCUMENTS FOR ALL DIVISION 15 AND 16 TRADES SHALL BE SUBMITTED AND SIGNED OFF BY ALL TRADES. NO SHOP DRAWINGS SHALL BE REVIEWED BY AOR AND ENGINEERS UNLESS COORDINATION DOCUMENTS ARE SIGNED OFF.

SHEET KEYNOTES

1 2"HWS/HWR HYDRONIC RISERS SERVING COLLEGE COMPLEX CC2 LEVEL FLOOR (PHASE II)

2 HYDRONIC PIPING DOWN TO SS 3 LOWER LEVEL.

3 HYDRONIC PIPING DOWN FROM ROOF.

4 REHEAT COIL CONNECTION KIT WITH 3-WAY VALVE.

5 MINIMUM ALLOWABLE FOR END RUNS PIPING IS TO BE SIZED AT 3/4" (TYPICAL).

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L-612 STUDENT SERVICES CENTER REMODEL COLLEGE COMPLEX

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owner

tBP project number : 20610.00

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Rev:	date:	description:

drawing title:

SS4 UPPER LVL FLR PLAN - HVAC REHEAT PIPING

drawing no.:

M-2.2B

drawing of

GENERAL SHEET NOTES

A. CONTRACTOR SHALL COORDINATE DUCT DETECTOR REQUIREMENTS BETWEEN MECHANICAL, ELECTRICAL AND FIRE ALARM DRAWINGS AND SPECIFICATIONS.

SHEET KEYNOTES

1 PROVIDE STEP LADDER OVER PIPING, SEE ARCHITECTURAL DETAIL # 1/701. (TYPICAL)

2 HEATING WATER SUPPLY/RETURN DOWN THROUGH ROOF. PROVIDE SEISMIC PIPE LOOP IN PIPING BETWEEN HIGH ROOF AND NEW ADDITION. A1

3 SUPPLY/RETURN DUCT DN TO SS4 UPPER LEVEL CEILING.

4 SUPPLY/RETURN DUCT DN TO SS3 LOWER CEILING. MAXIMUM 30X30 THROUGH EXISTING CONCRETE WAFFLE STRUCTURE.

5 SUPPLY/RETURN DUCT DN TO CC2 SECOND FLOOR CEILING. MAXIMUM 30X30 THROUGH EXISTING CONCRETE WAFFLE STRUCTURE. A2

6 INSTALL ISOLATION VALVES DURING BUILDING OFF HOUR. SCHEDULE VALVES INSTALLATION WITH LMC FACILITY MANAGER. (PHASE II)

7 PROVIDE NEMA 3R ENCLOSURE FOR PUMP CONTROLS & VFD MOUNT ON EXISTING CONCRETE WALL. A2

8 NOT USED.

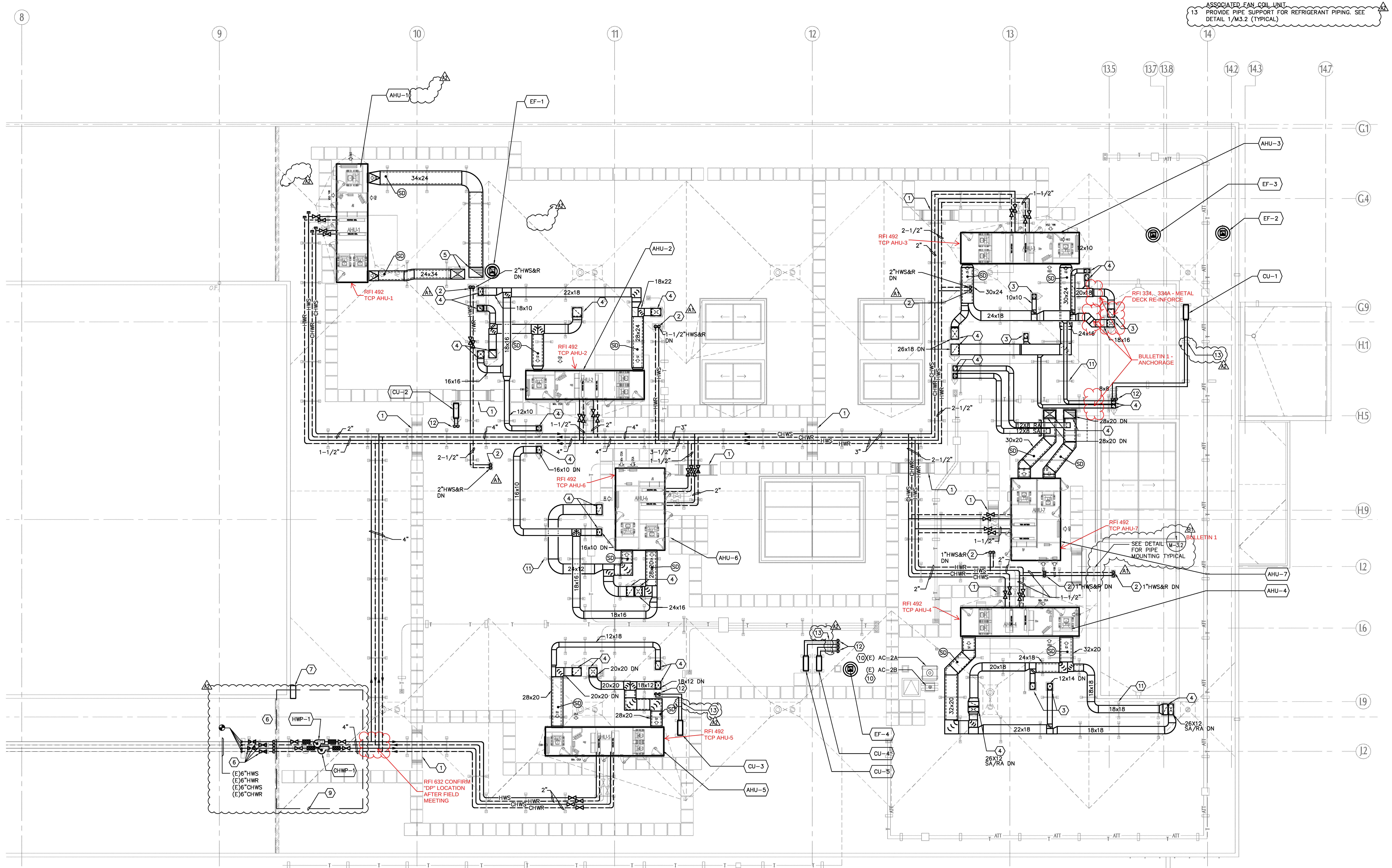
9 PROVIDE CHILLER & HEATING WATER PUMPS, ISOLATION VALVES AND ALL ASSOCIATED HYDRONIC COMPONENTS FOR A COMPLETE BOOSTER PUMP SYSTEM.

10 (E) AC UNITS TO REMAIN AND KEEP OPERATIONAL DURING CONSTRUCTION.

11 PROVIDE DUCT SUPPORTS. SEE DETAIL 4/M-3.2 (TYPICAL)

12 REFRIGERANT LINE SET DOWN THROUGH ROOF TO ASSOCIATED FAN COIL UNIT. A2

13 PROVIDE PIPE SUPPORT FOR REFRIGERANT PIPING. SEE DETAIL 1/M3.2 (TYPICAL)



1 ROOF FLOOR PLAN - MECHANICAL

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

FILE: 0106M23.DWG – M23 | EDIT: 10/10/2012 4:14 PM BY WILLIAMSB | PLOT: 10/10/2012 4:17 PM BY WILLIAMS BARRIENTOS

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agency

FILE #7-C1
APPL 01-112272

L-612 STUDENT SERVICES CENTER REMODEL COLLEGE COMPLEX

BID DOCUMENTS

LOS MEDANOS COLLEGE
2700 EAST LELAND DRIVE
PITTSBURG, CA 94565

owner

tBP project number : 20670.00

file name: 0106M23.dwg

drawn by: GE checked by: BC

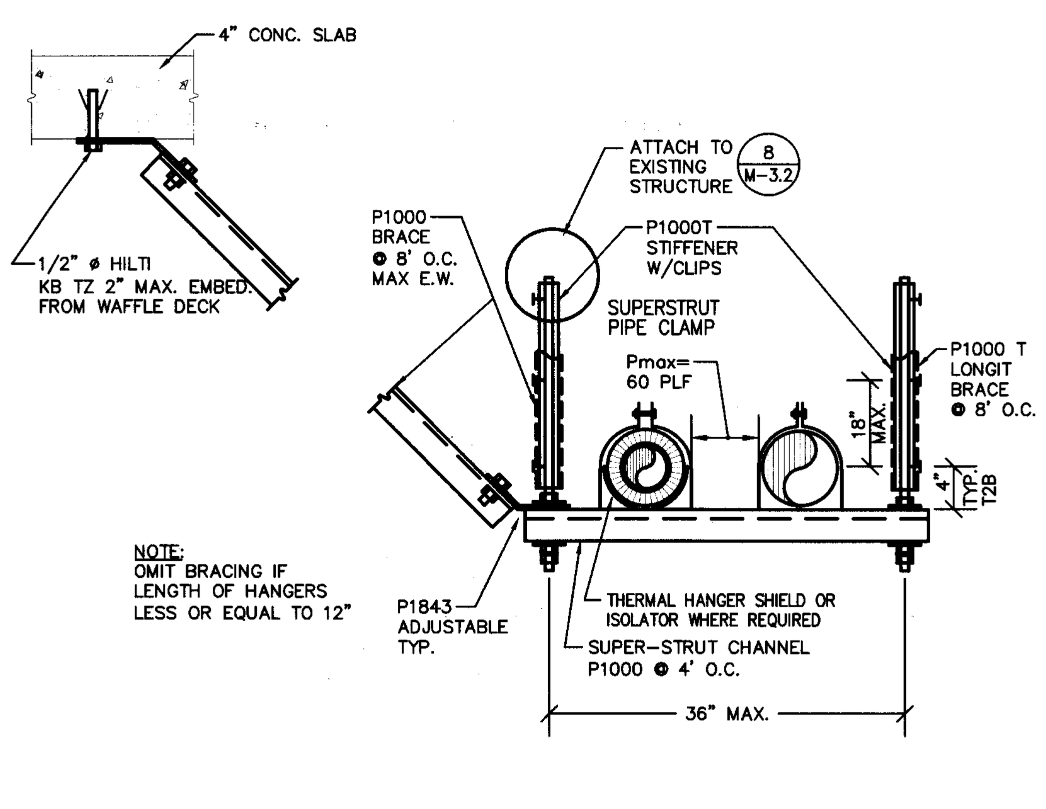
date: **JULY 31, 2012**

Rev:	date:	description:
A1	9/21/12	ADDENDUM #1
A2	10/10/12	ADDENDUM #2

drawing title:
ROOF FLOOR PLAN - MECHANICAL

drawing no.:
M-2.3

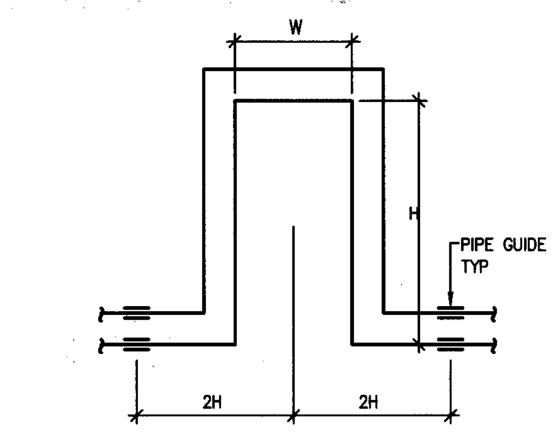
drawing of



NOTE:
OMIT BRACING IF LENGTH OF HANGERS LESS OR EQUAL TO 12"

PER OPA-0349

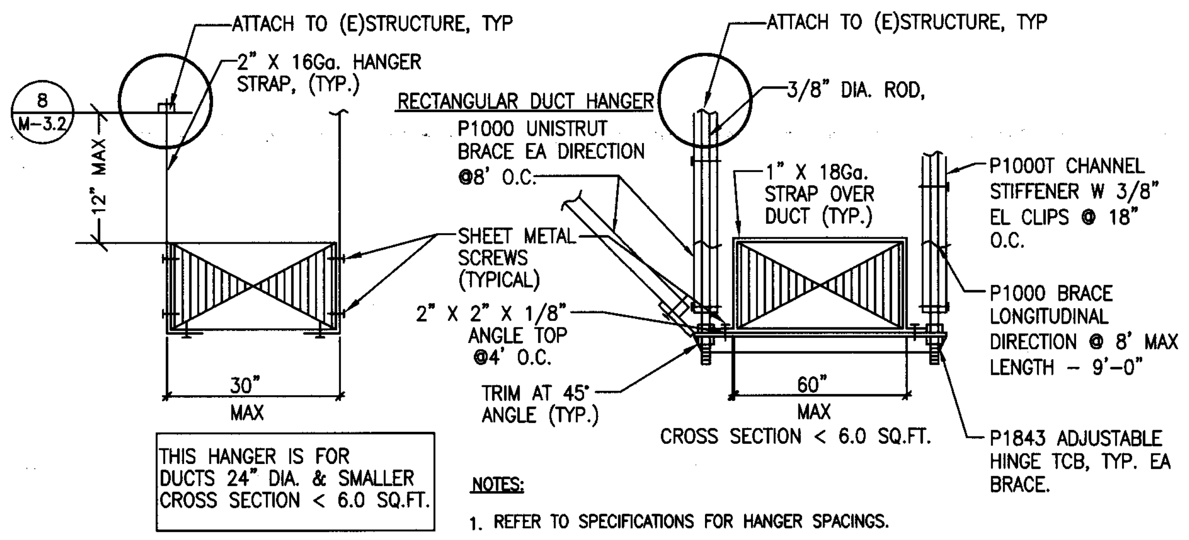
1 TRAPEZE PIPE HANGER DETAIL
NO SCALE



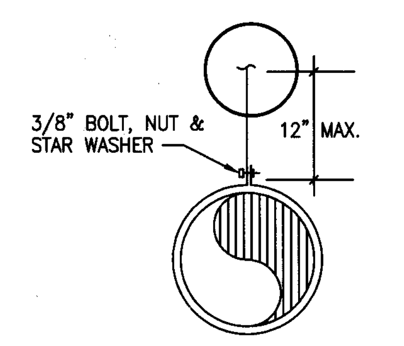
PIPE SIZE	W-MIN	H-MIN
4"	48"	96"
2-1/2" TO 3"	42"	84"
1-1/4" TO 2"	36"	72"
1" & LESS	24"	48"

BASED ON STEEL PIPE ANCHOR TO ANCHOR 6" EXPANSION

4 PIPE THERMAL EXPANSION LOOP DETAIL
NO SCALE



THIS HANGER IS FOR DUCTS 24" DIA. & SMALLER CROSS SECTION < 6.0 SQ.FT.

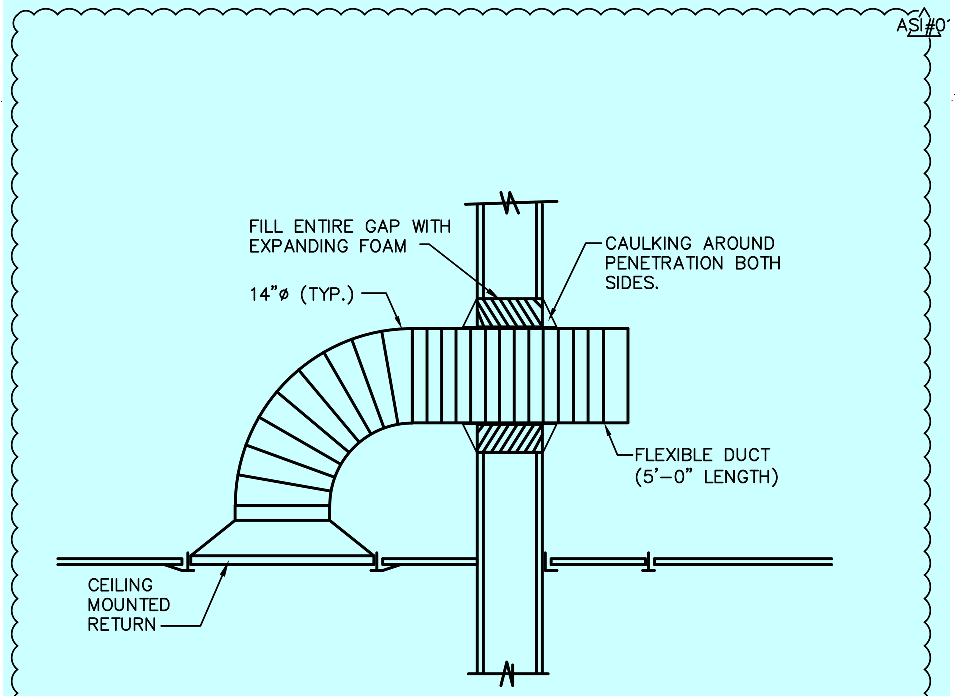


NOTES:

1. REFER TO SPECIFICATIONS FOR HANGER SPACINGS.
2. ATTACHMENTS TO OVERHEAD STRUCTURE SHALL BE MADE IN ACCORDANCE WITH STRUCTURAL ENGINEERS REQUIREMENTS AND WEIGHT LIMITATIONS. ALL ATTACHMENT METHODS TO STRUCTURE SHALL BE SUBMITTED TO ARCHITECT AND STRUCTURAL ENGINEER FOR REVIEW.
3. PROVIDE SWAY & SEISMIC BRACING PER ISAT SEISMIC GUIDELINES AND THE LATEST EDITION OF CALIFORNIA BUILDING CODE. CONTRACTOR SHALL INDICATE LOCATIONS OF SEISMIC BRACING ON THE SHOP DRAWING SUBMITTALS.
4. HANGER MATERIAL SUPPORTING FLEXIBLE DUCT SHALL IN NO CASE BE LESS THAN 1 1/2 INCHES WIDE. FLEXIBLE DUCT SHALL BE SUPPORTED PER MANUFACTURER'S RECOMMENDED MATERIALS, BUT AT NO GREATER DISTANCE THAN 4 FEET MAX. PERMISSIBLE SAG IS MAX. 1/2 INCHES PER FOOT OF SPACING BETWEEN SUPPORTS.
5. HANGER STRAP/ROD SECURE TO STRUCTURE AS REQ'D SEE DETAIL #8/M-3.2

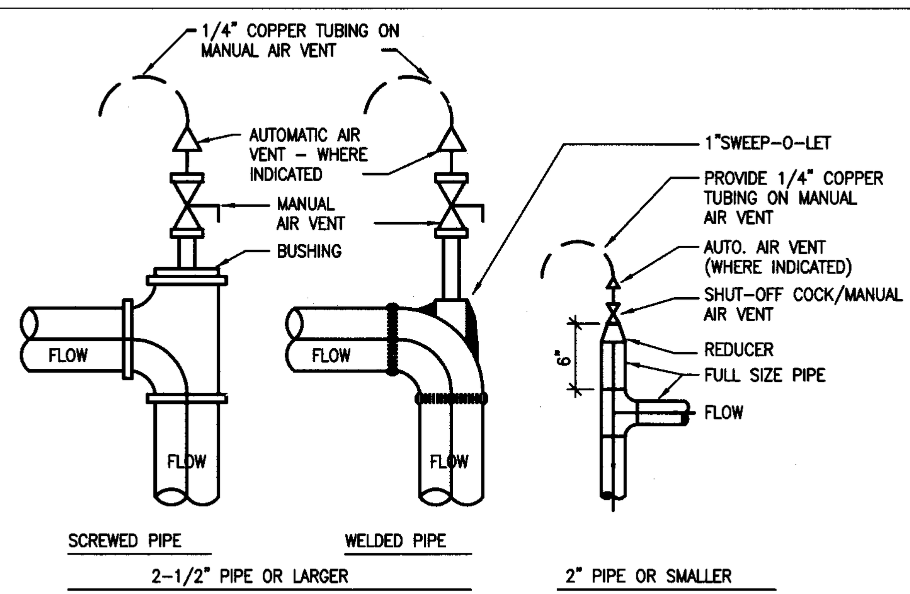
7 CONCEALED DUCT HANGER DETAIL
NO SCALE

ASI #01



ASI #01

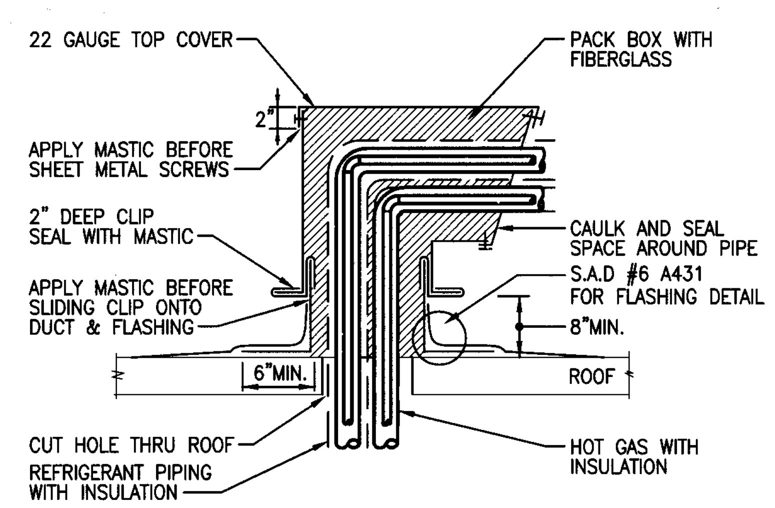
10 FLEXIBLE DUCT PENETRATION DETAIL
NO SCALE



NOTES:

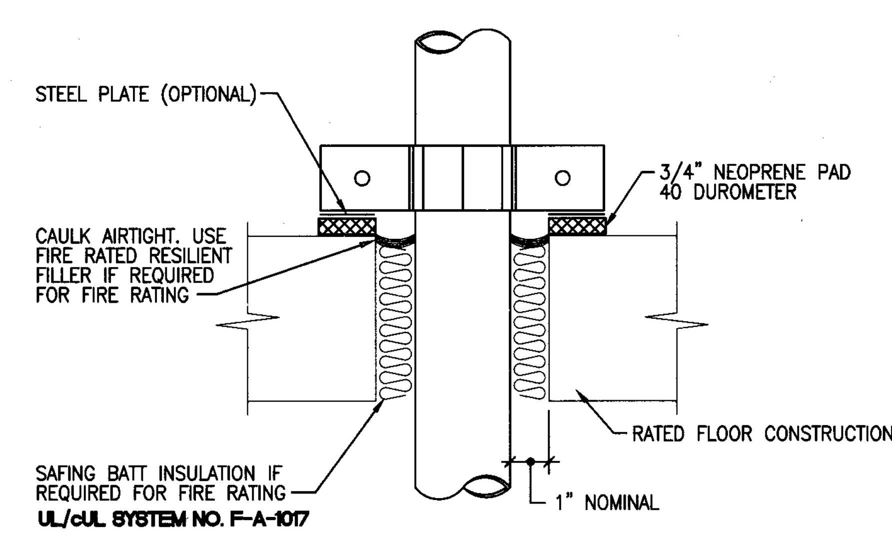
1. PROVIDE MANUAL AIR VENTS AT ALL PIPING HIGH POINTS & AT POINTS IN THE SYSTEM WHERE AIR CAN GET TRAPPED.
2. LOCATE AIR VENTS IN ELBOWS AS INDICATED ABOVE. WATER FLOW SHOULD ALWAYS BE HORRIZONTAL TOWARD THE ELBOW & THEN VERTICALLY DOWN.
3. PROVIDE A 1/4" MINIMUM TUBE ON THE DISCHARGE OF BOTH MANUAL & AUTOMATIC VENTS. TERMINATE TUBING WHERE ACCESSABLE FOR VENTING INTO A CAN OR AT NEAREST AIR GAP WASTE.
4. ALL AIR VENTS SHALL BE ACCESSABLE. PROVIDE ACCESS DOOR AS NECESSARY.
5. PROVIDE AUTOMATIC AIR VENTS WHERE VENTS WHERE INDICATED AND/OR SPECIFIED. PROVIDE AT LEAST TWO AIR VENTS IN EACH PIPING SYSTEM.

2 AIR VENT DETAIL
NO SCALE



NOTE: 1. PAINT ALL EXPOSED SHEET METAL PARTS WITH WEATHER RESISTANT PAINT. (COLOR PER M&O)
2. PAINT ALL EXPOSED REFRIGERANT PIPING INSULATION ON ROOF.

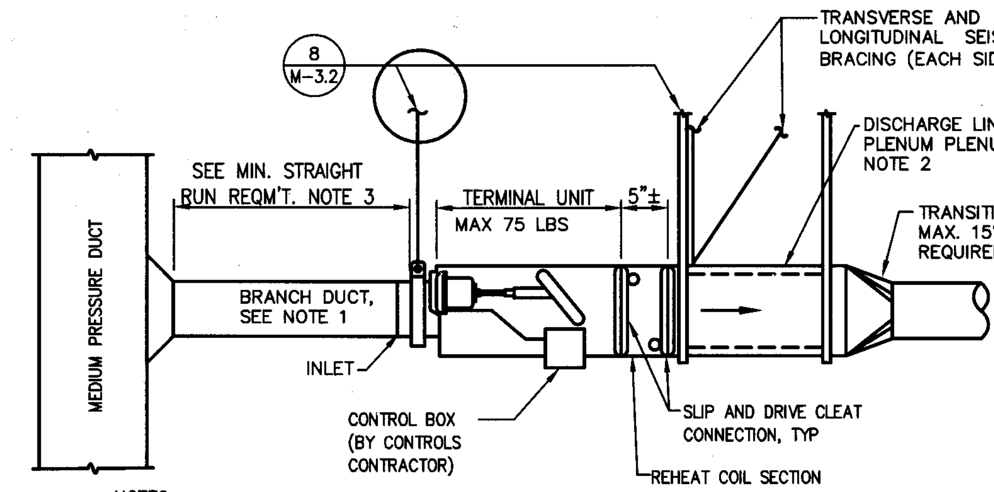
5 REFRIGERANT PIPING PENETRATION DETAIL
NO SCALE



NOTE: IF PIPE IS SUSPENDED FROM OR DIRECTLY ATTACHED TO STRUCTURE OR OTHER BUILDING ELEMENTS, USE 1/2" THICK, 40-DUROMETER NEOPRENE AS SLEEVE BETWEEN PIPE AND PIPE COLLAR.

8 PIPE ISOLATION AT FLOOR PENETRATION
NO SCALE

HANGER SUPPORTS SECURED TO STRUCTURE ABOVE PER ISAT STANDARDS AND GUIDELINES FOR SEISMIC RESTRAINTS

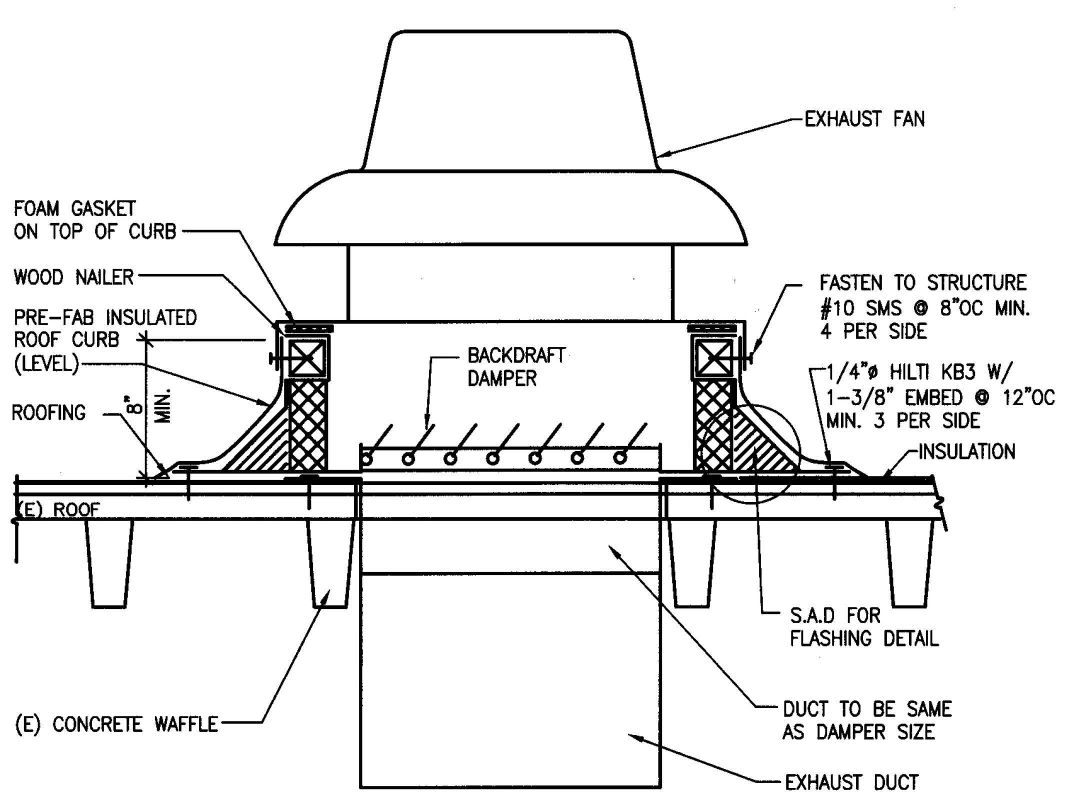


NOTES:

1. BRANCH DUCT SIZE TO MATCH UNIT INLET CONNECTION. FOR BRANCH DUCTS OVER SIX FEET IN LENGTH, INCREASE BRANCH DUCT ONE SIZE AND PROVIDE TRANSITION IMMEDIATELY UPSTREAM OF MINIMUM STRAIGHT DUCT RUN.
2. MINIMUM 4'-0" LONG LINED PLENUM EQUAL TO TERMINAL BOX OUTLET SIZE.
3. MINIMUM STRAIGHT DUCT RUN:
4. CONTRACTOR TO VERIFY ORIENTATION OF VAV BOXES TO ALLOW FOR MAINTENANCE ACCESS.

DUCT DIA (IN)	MIN STRAIGHT RUN (IN)
6	24
8	32
10	40
12	48
14-16	60

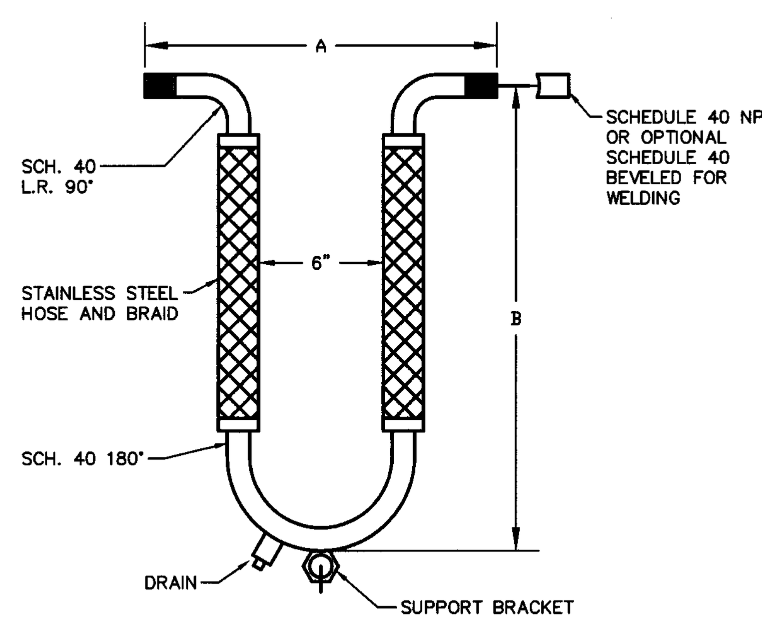
11 TERMINAL UNIT INSTALLATION DETAIL
NO SCALE



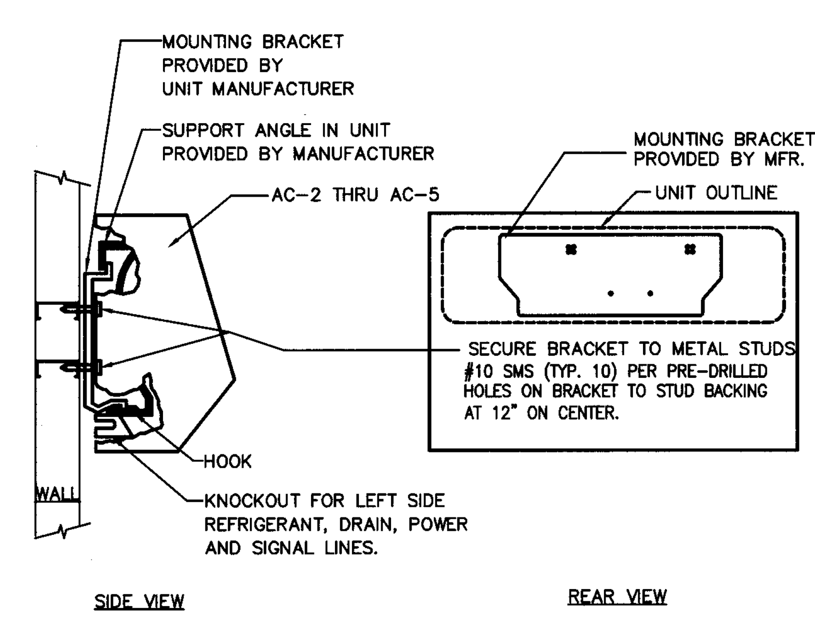
NOTE: SEE ARCH. AND STRUCT. DWGS FOR ROOF PENETRATION, FLASHING & ROOFING DETAILS.

3 EXHAUST FAN MOUNTING DETAIL
NO SCALE SHOWN AT EXISTING ROOF

Qty.	Size	A Weld/Thread	B	Movement * Seismic All Directions	Movement * Axial	Max. Working Pressure (psi)	Support Bracket	Note
	1/2"	15"	18'	4"	+/-4"	150	1/2"	
	3/4"	15-1/4"	20"	4"	+/-4"	150	1/2"	
	1"	16"	22"	4"	+/-4"	150	5/8"	
	1-1/4"	16-3/4"	22"	4"	+/-4"	150	5/8"	
	1-1/2"	17-1/2"	23"	4"	+/-4"	150	5/8"	
	2"	20"	25"	4"	+/-4"	150	5/8"	



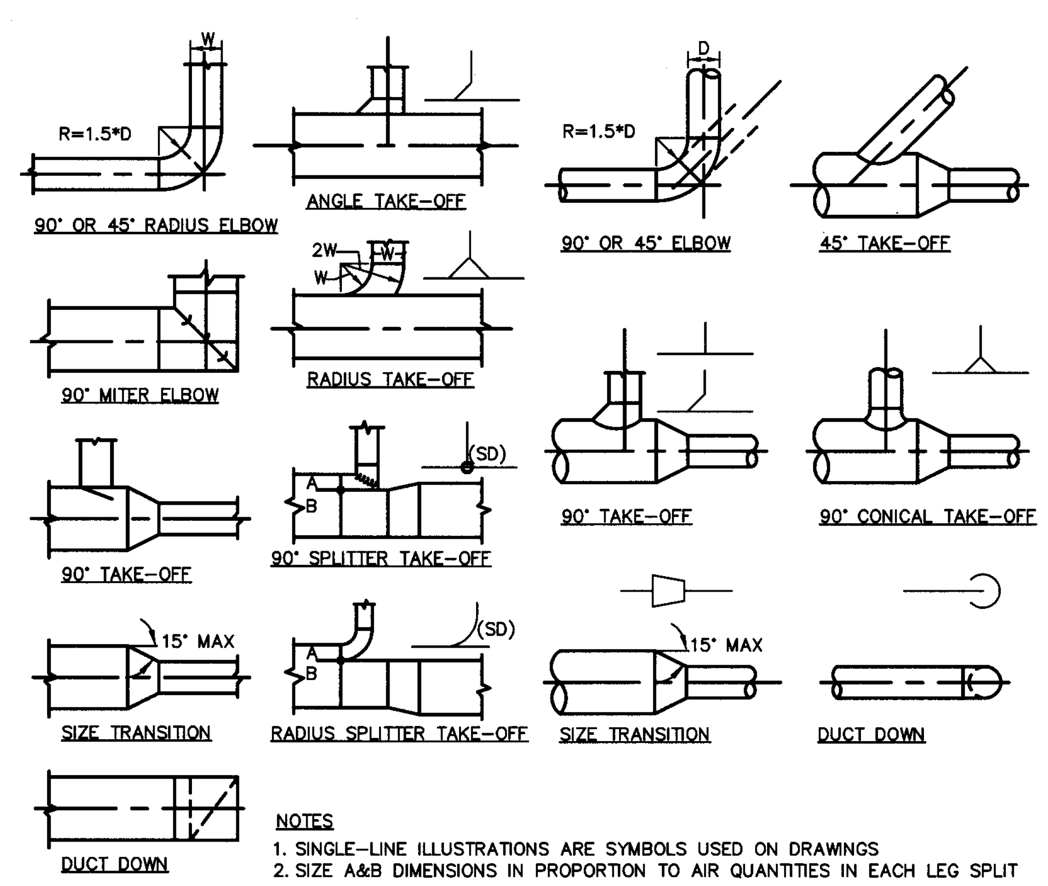
6 FLEXIBLE THERMAL EXPANSION LOOP
NO SCALE



NOTE:

1. FOR DRAIN CONNECTION, REFER TO PLUMBING DRAWINGS.
2. REFER TO MFR. INSTALLATION MANUAL FOR UNIT MOUNTING INSTRUCTION
3. UNIT OPERATING WEIGHT = 46 LBS.

9 WALL MOUNTED FAN COIL DETAIL
NO SCALE



NOTES
1. SINGLE-LINE ILLUSTRATIONS ARE SYMBOLS USED ON DRAWINGS
2. SIZE A&B DIMENSIONS IN PROPORTION TO AIR QUANTITIES IN EACH LEG SPLIT

12 DUCT BRANCHING DETAIL
NO SCALE

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FILE #A-C1
IDENTIFICATION STAMP DIV. OF THE STATE ARCHITECT OFFICE OF REGULATION SERVICES
APPL 01-112272
DATE JUL 3 1 2012

L-612 STUDENT SERVICES CENTER REMODEL COLLEGE COMPLEX
BID DOCUMENTS

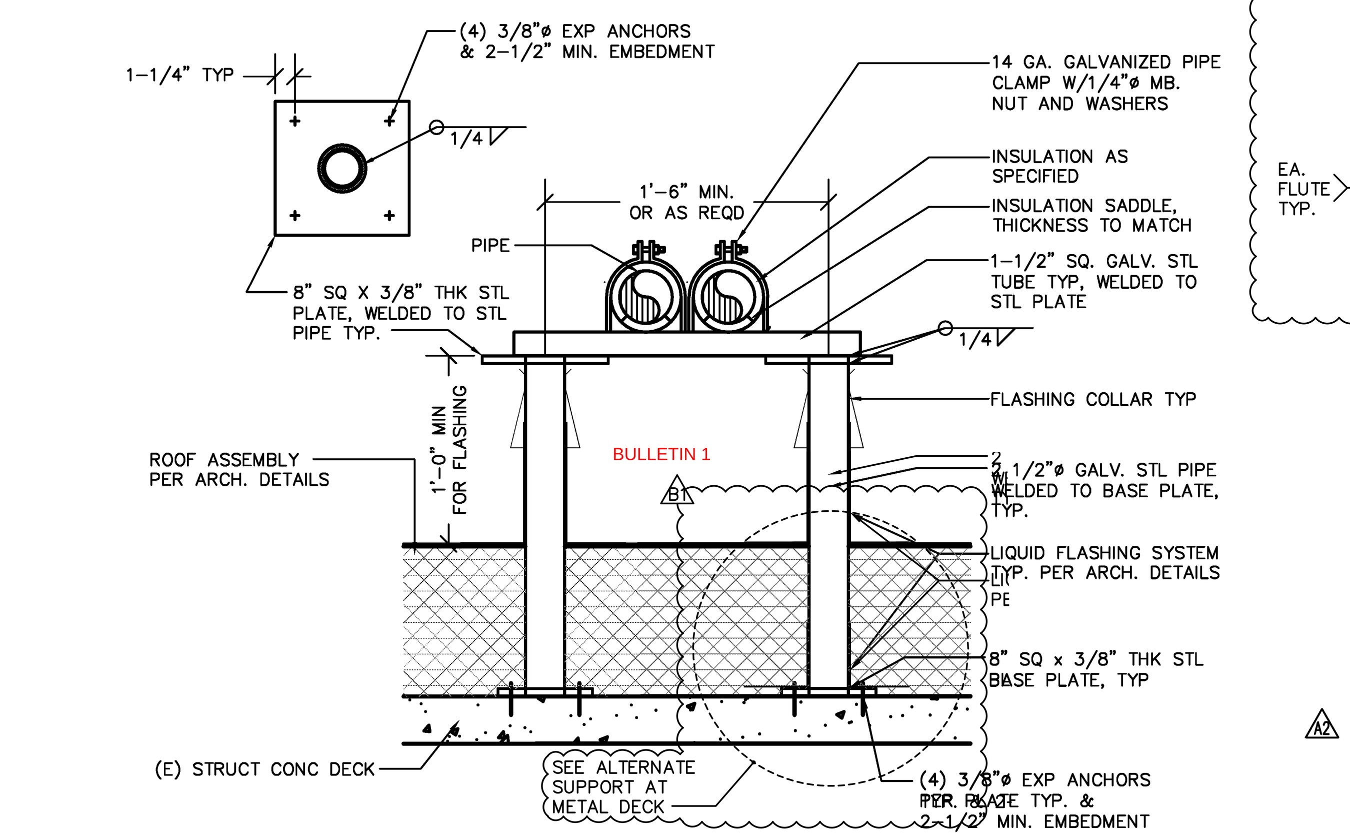
LOS MEDANOS COLLEGE
2700 EAST LELAND DRIVE
PITTSBURG, CA 94565

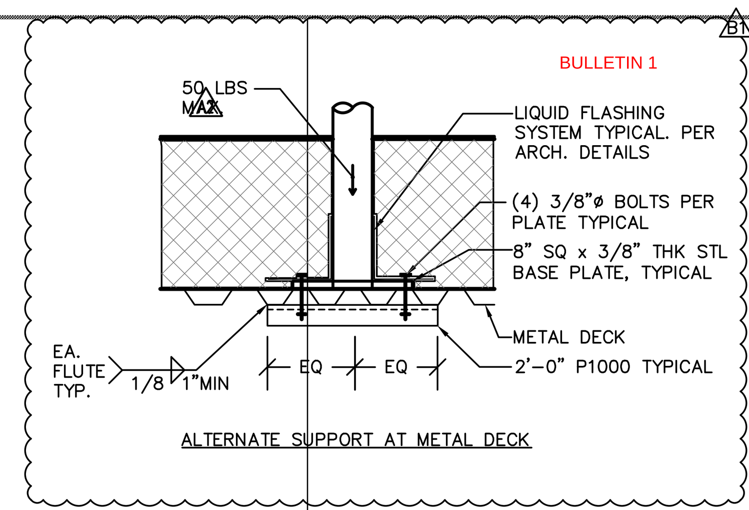
owner

tBP project number: 20670.00
file name: 0106M31.dwg
drawn by: GE checked by: BC
date: JULY 31, 2012
Rev. date: description:

drawing title:
MECHANICAL DETAILS

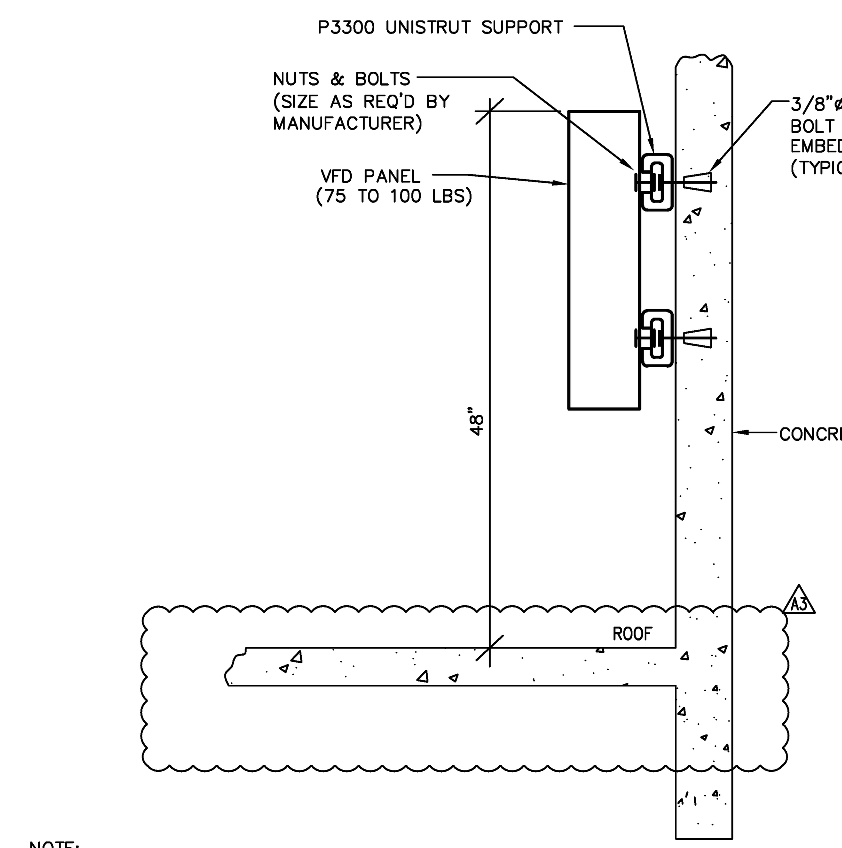
drawing no:
M-3.1
drawing of





1 REFRIGERANT PIPE SUPPORT ON ROOF DETAIL

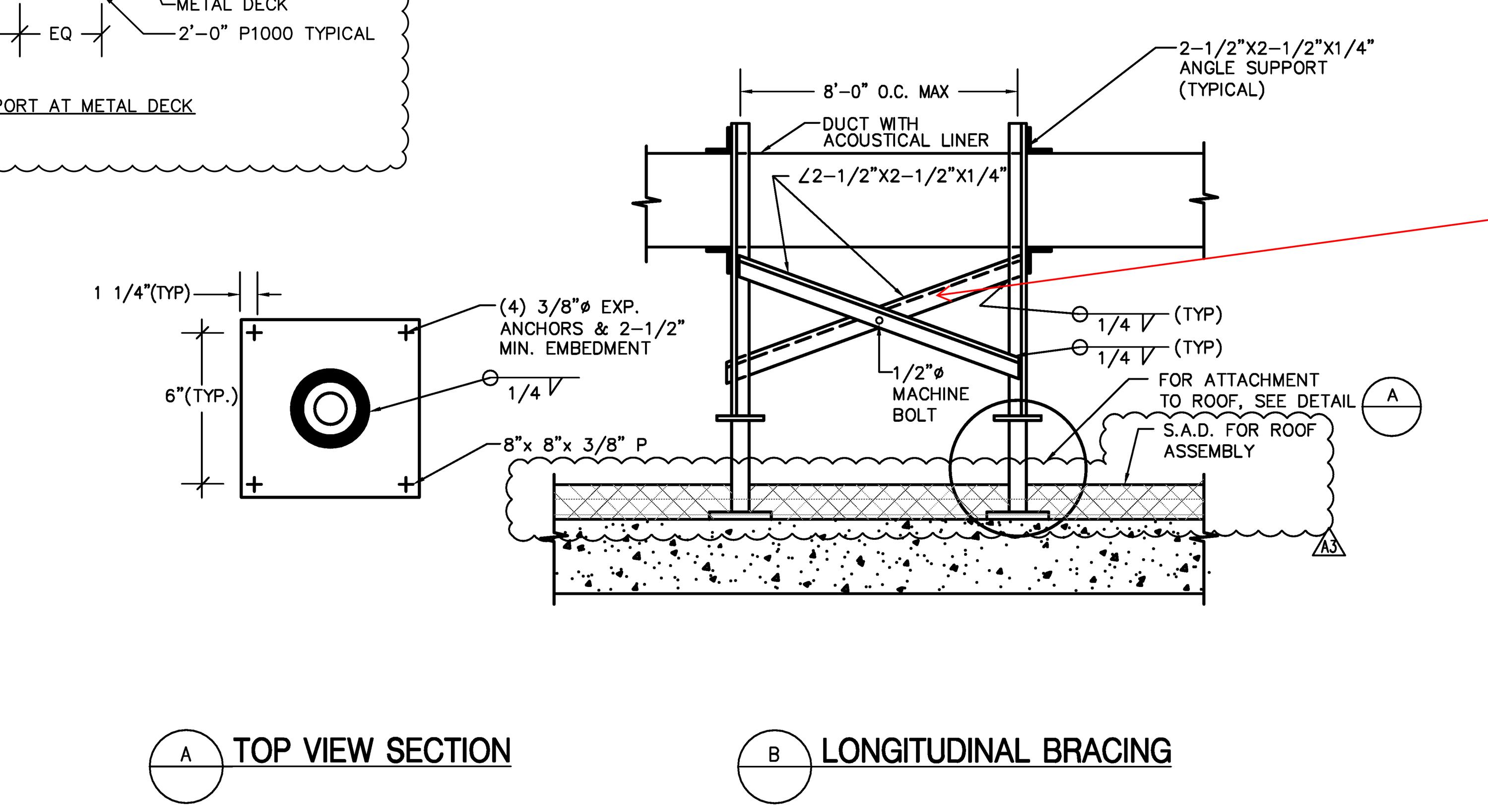
NO SCALE

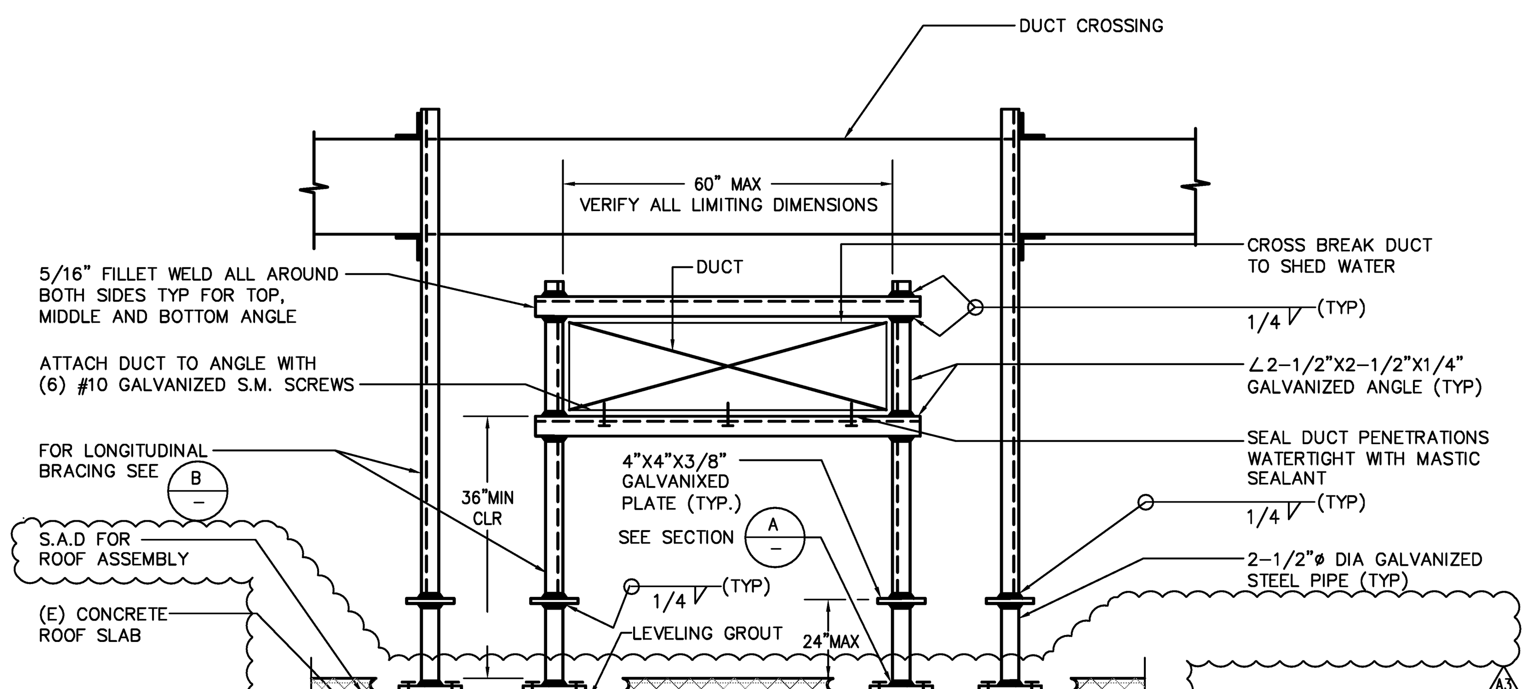


NOTE:
1. FOR COMPLETE INSTALLATION PROCEDURE, REFER TO MANUFACTURER'S RECOMMENDATION.

2 WALL MOUNTED VFD DETAIL

NO SCALE



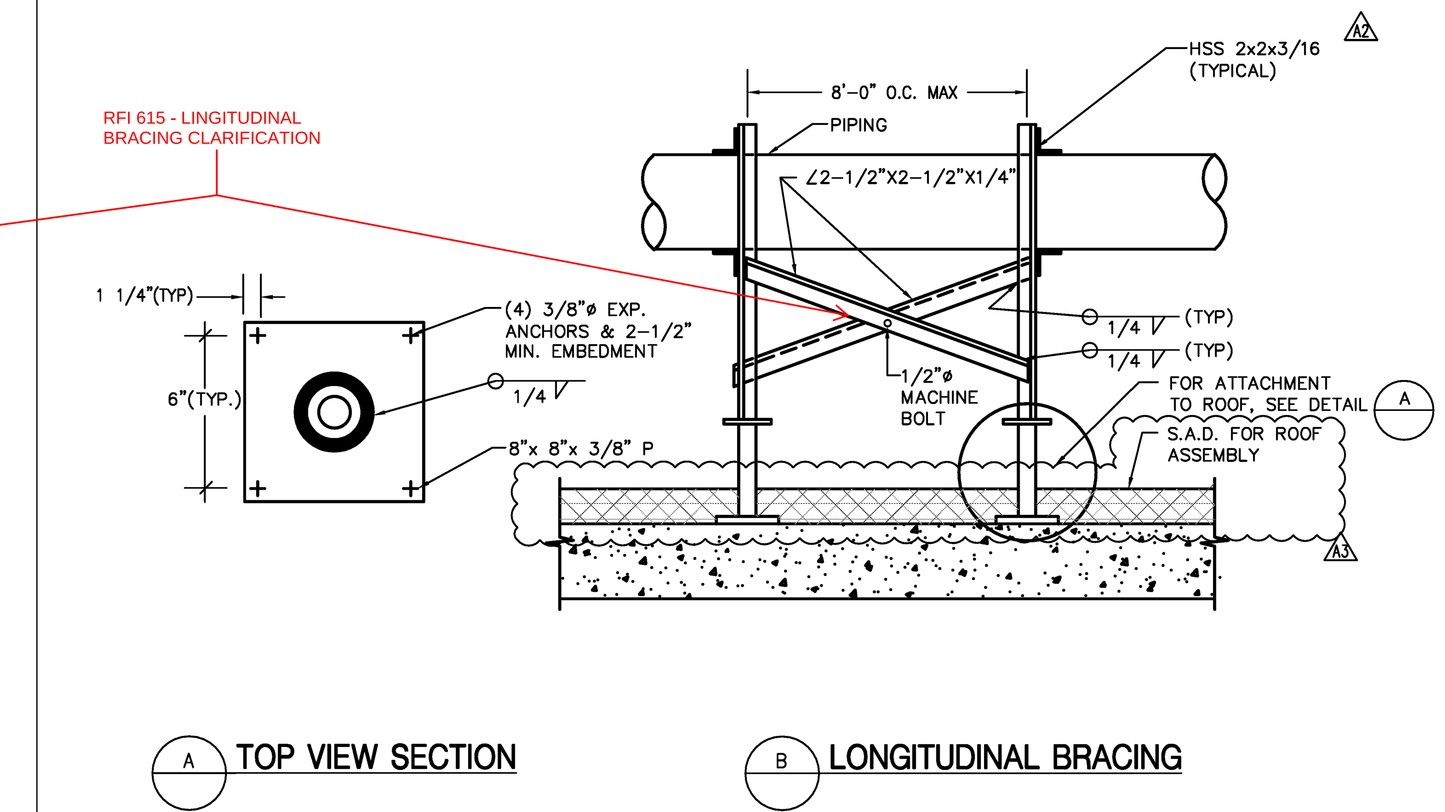


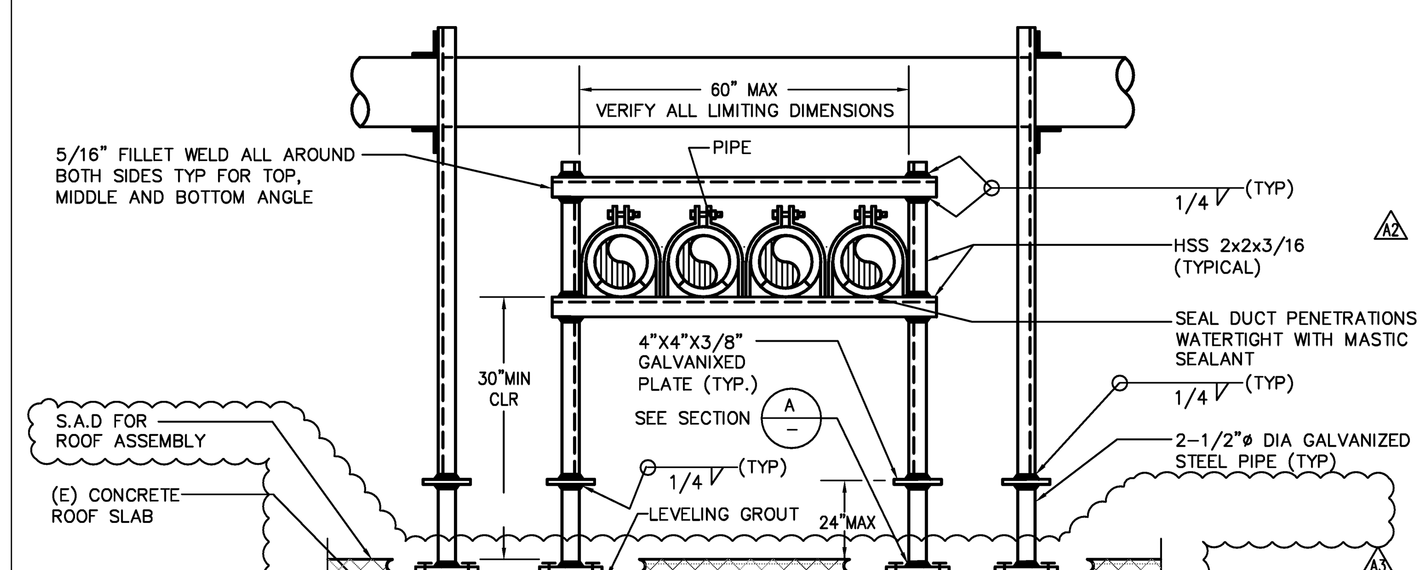
NOTES:
1. SUPPORT SPACING ON ROOF AT 6'-0" O.C. MAX, AT ALL OFFSETS, CHANGES IN DIRECTION, PRIOR TO ROOF PENETRATION AND WHERE SHOWN ON DRAWINGS.
2. COMPLETE SUPPORT ASSEMBLY SHALL BE HOT GALVANIZED AFTER FABRICATION.
3. COLD GALVANIZE ALL WELDED JOINTS.
4. CONTRACTOR SHALL SUBMIT SHOP DRAWING ON ANY SUBSTITUTIONS OF DUCT SUPPORT.
5. SEE ARCH DET. 17/7.01 FOR FLASHING REQUIREMENTS.
6. COORDINATE THE BOTTOM OF DUCT SUPPORT AT CROSSOVERS WITH HYDRONIC PIPING.

4 DUCT SUPPORT ON ROOF DETAIL

NO SCALE

RFI 615 - LINGITUDINAL BRACING CLARIFICATION

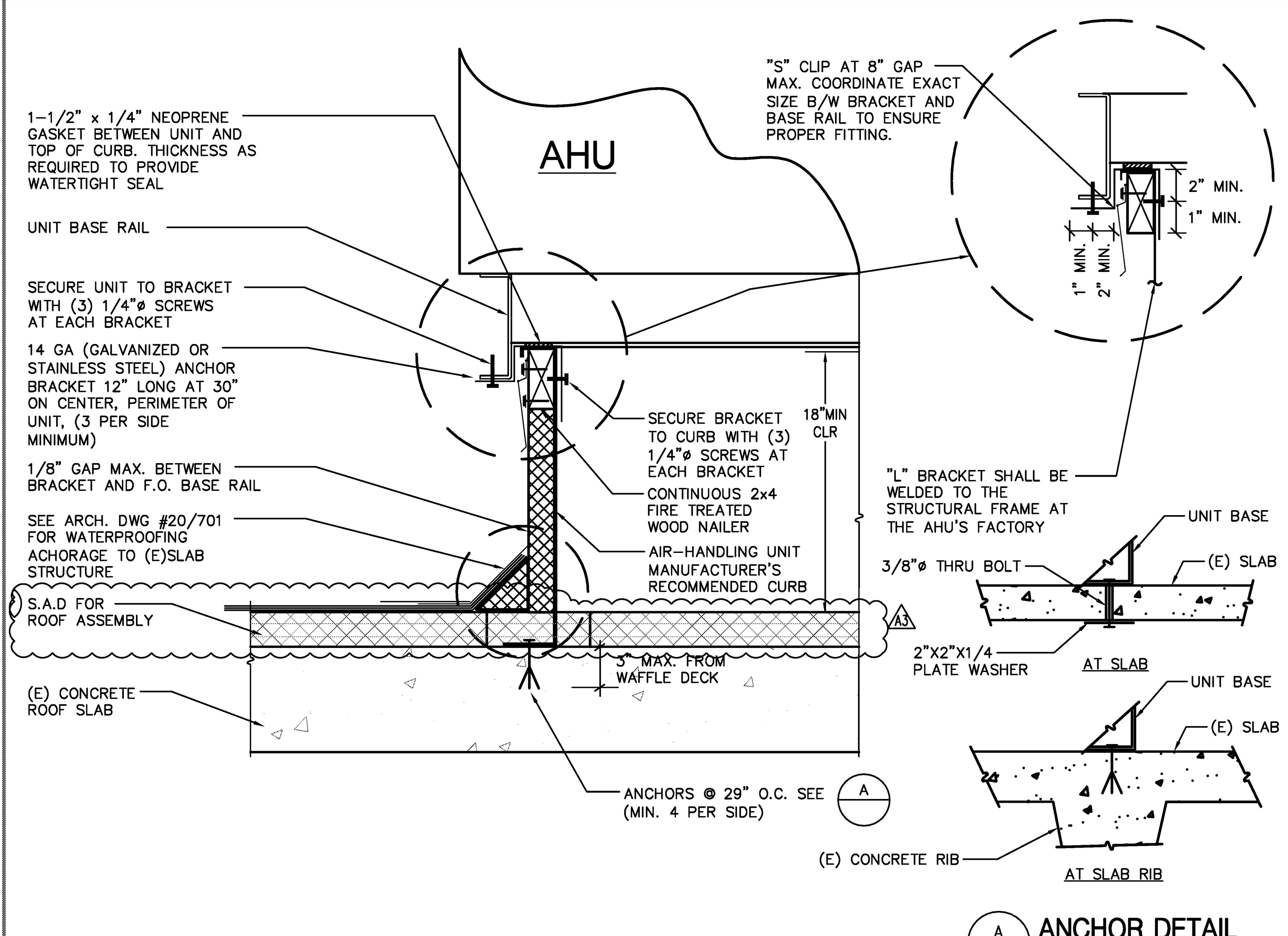




NOTES:
1. SUPPORT SPACING ON ROOF AT 6'-0" O.C. MAX, AT ALL OFFSETS, CHANGES IN DIRECTION, PRIOR TO ROOF PENETRATION AND WHERE SHOWN ON DRAWINGS.
2. COMPLETE SUPPORT ASSEMBLY SHALL BE HOT GALVANIZED AFTER FABRICATION.
3. COLD GALVANIZE ALL WELDED JOINTS.
4. CONTRACTOR SHALL SUBMIT SHOP DRAWING ON ANY SUBSTITUTIONS OF DUCT SUPPORT.
5. SEE ARCH DET. 17/7.01 FOR FLASHING REQUIREMENTS.
6. COORDINATE THE BOTTOM OF DUCT SUPPORT AT CROSSOVERS WITH HYDRONIC PIPING.

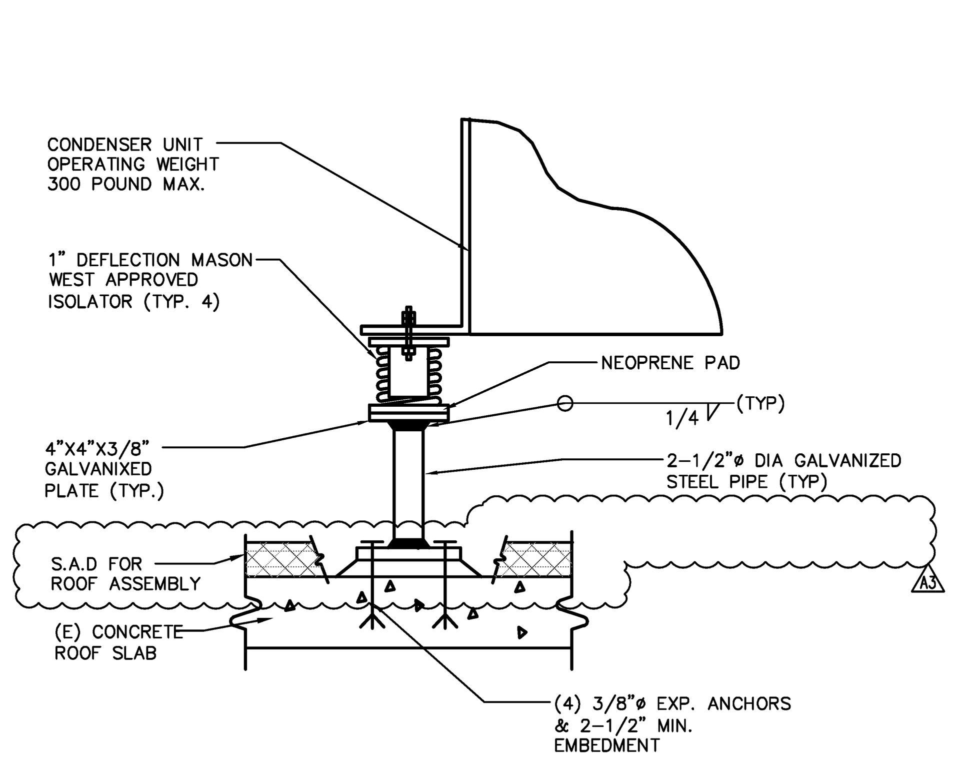
6 PIPE SUPPORT ON ROOF DETAIL

NO SCALE



3 AHU SUPPORT CURB DETAIL

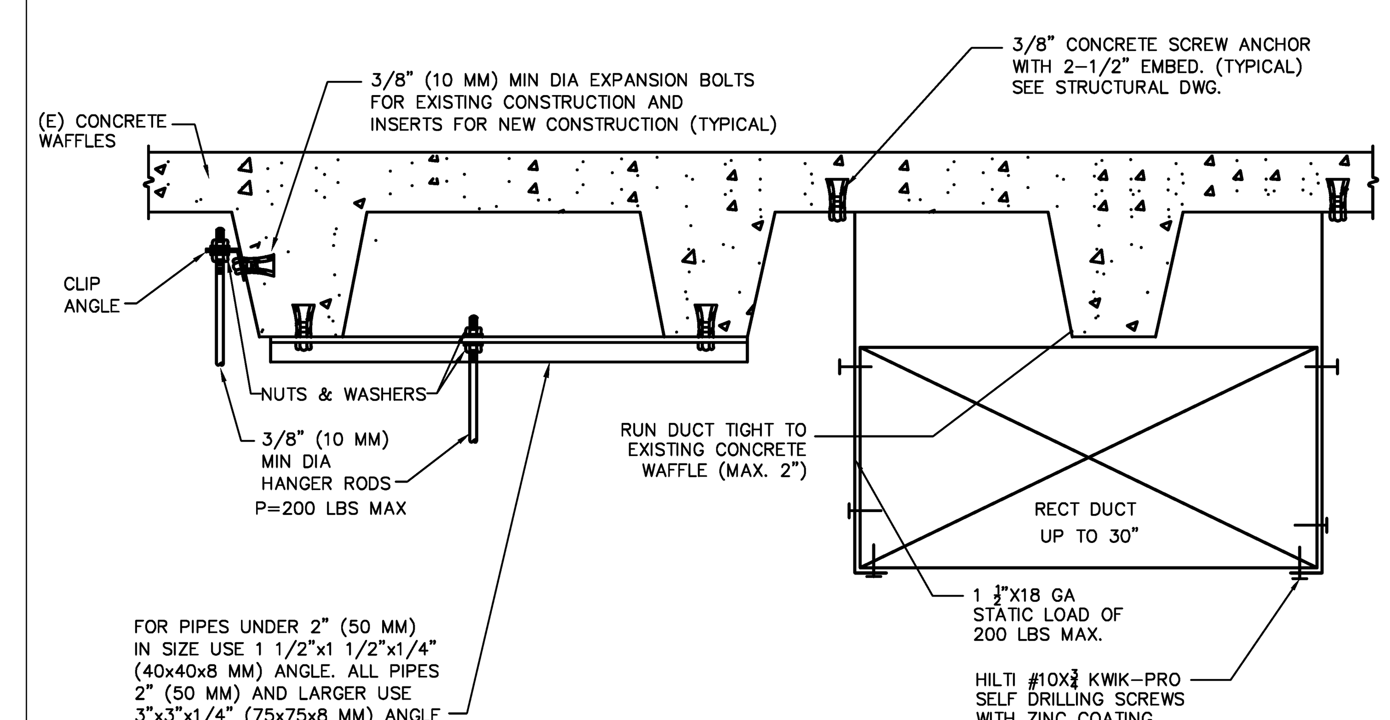
NO SCALE



RFI 288 - IT IS ACCEPTABLE TO USE THIS DETAIL FOR THE SPLIT SYSTEM FOR THE MPOE AND 4-TON UNIT ON SUPPORT STANCHIONS

5 CONDENSING UNIT MOUNTING DETAIL

NO SCALE CU-1 & CU-2



NOTES:
1. BOTTOM OF DUCT ELEVATION MAX IS 8'-4" A.F.F. AT SS3 WHERE CEILINGS ARE 7'-11" A.F.F.
2. BOTTOM OF DUCT ELEVATION MAX IS 10'-2" A.F.F. AT SS4 WHERE CEILINGS ARE 9'-0" A.F.F.

7 ATTACHMENT TO (E) CONCRETE WAFFLE DETAIL

NO SCALE

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FILE #7-C1
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city, state, zip
ph: fx:
agency

L-612 STUDENT SERVICES CENTER REMODEL COLLEGE COMPLEX

BID DOCUMENTS

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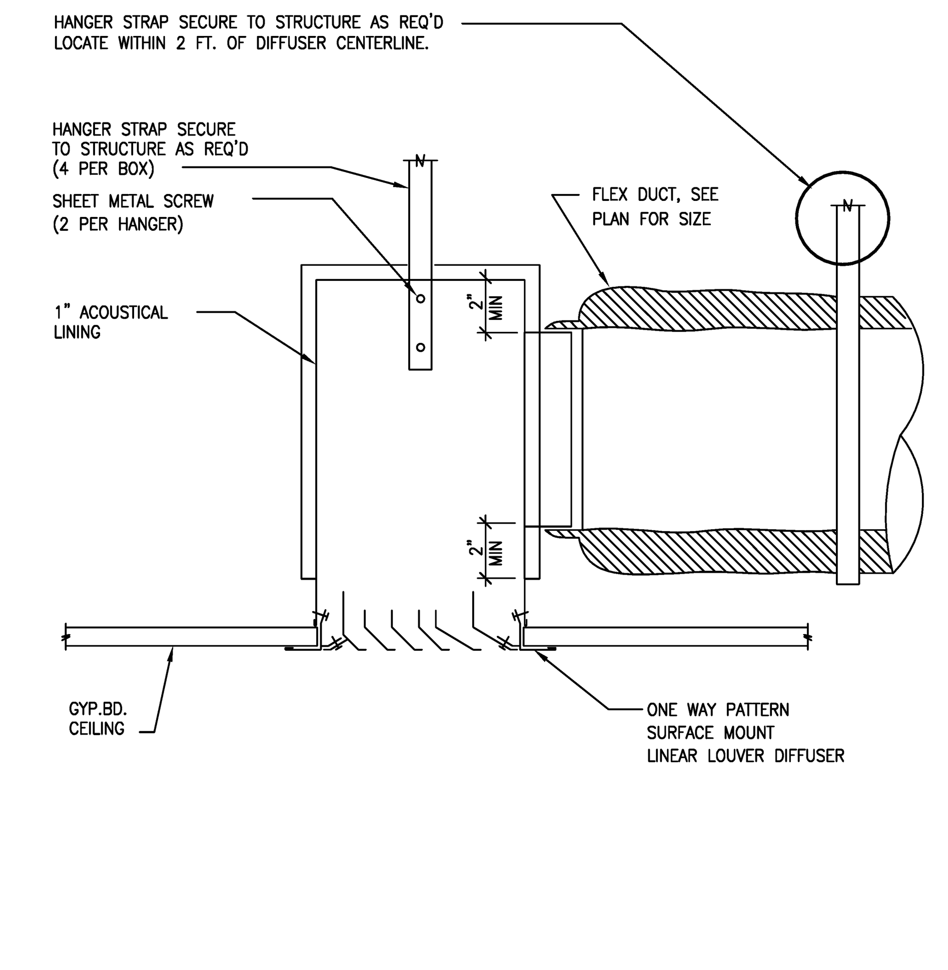
owner

tBP project number :	2061.00
file name:	0106M32.dwg
drawn by: GE	checked by: BC
date:	JULY 31, 2012

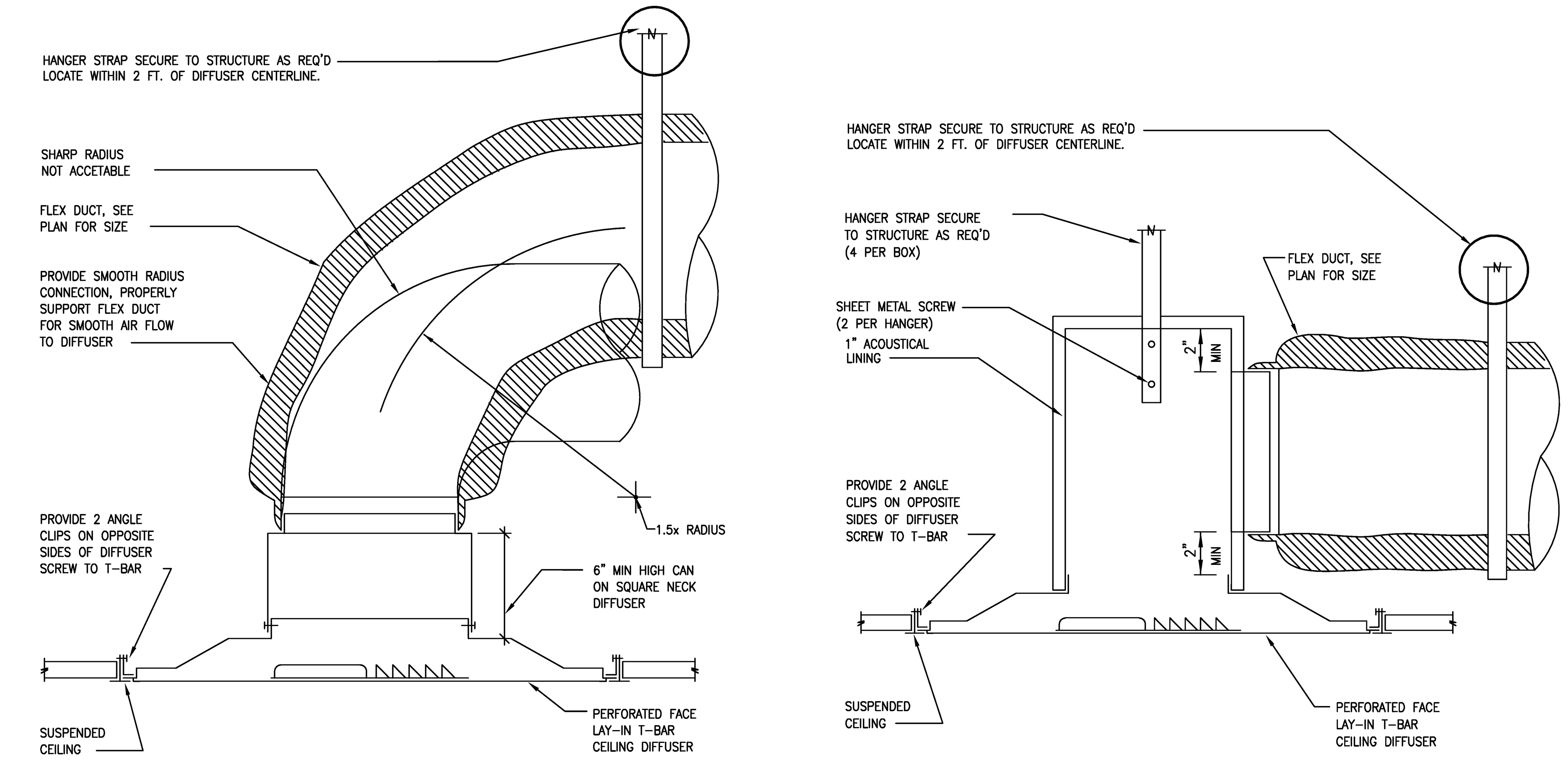
Rev.	date:	description:
2	10/10/12	ADDENDUM #2
3	10/24/12	ADDENDUM #3

drawing title:
MECHANICAL DETAILS

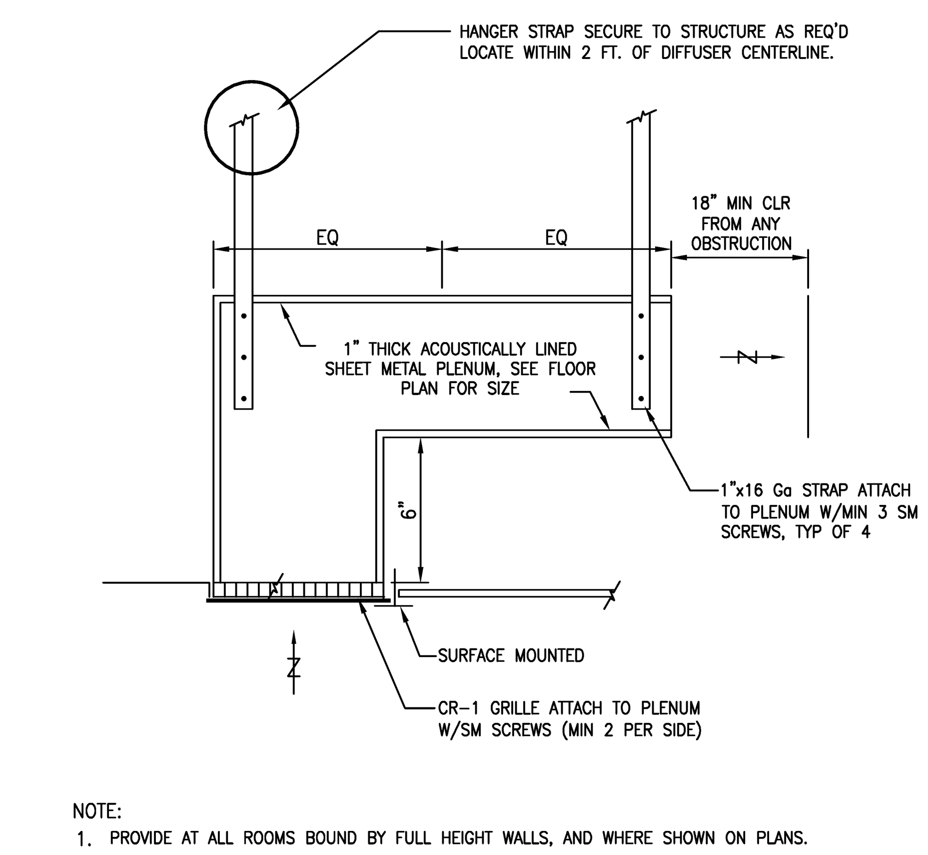
drawing no:
M-3.2
drawing of



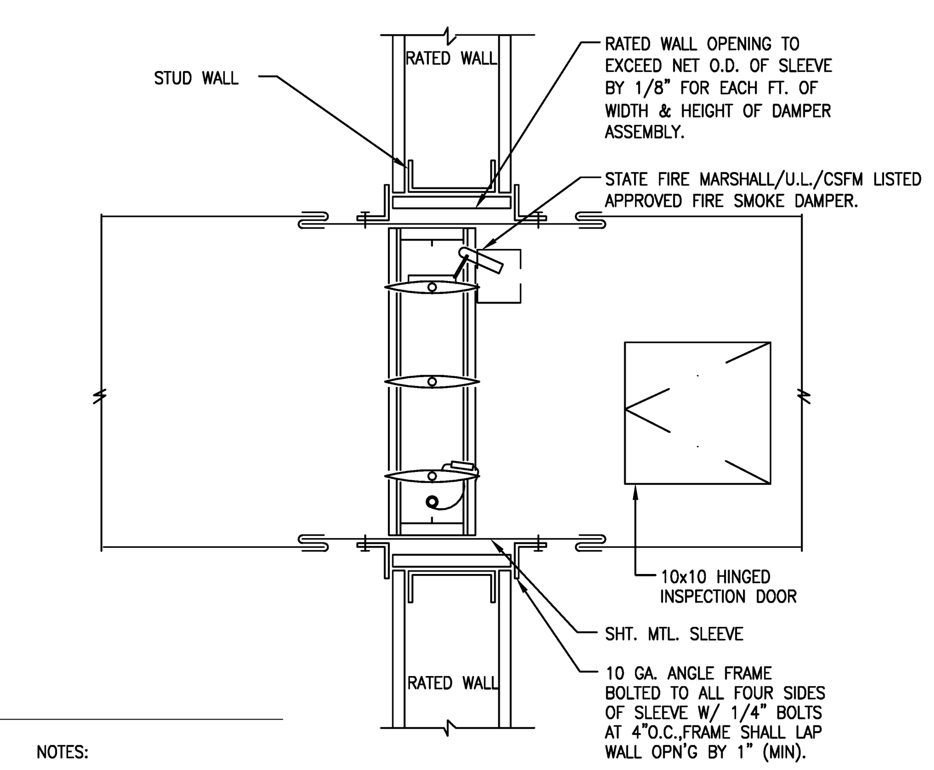
1 LINEAR DIFFUSER CONNECTION DETAIL
NO SCALE



2 CEILING DIFFUSER CONNECTION DETAIL
NO SCALE

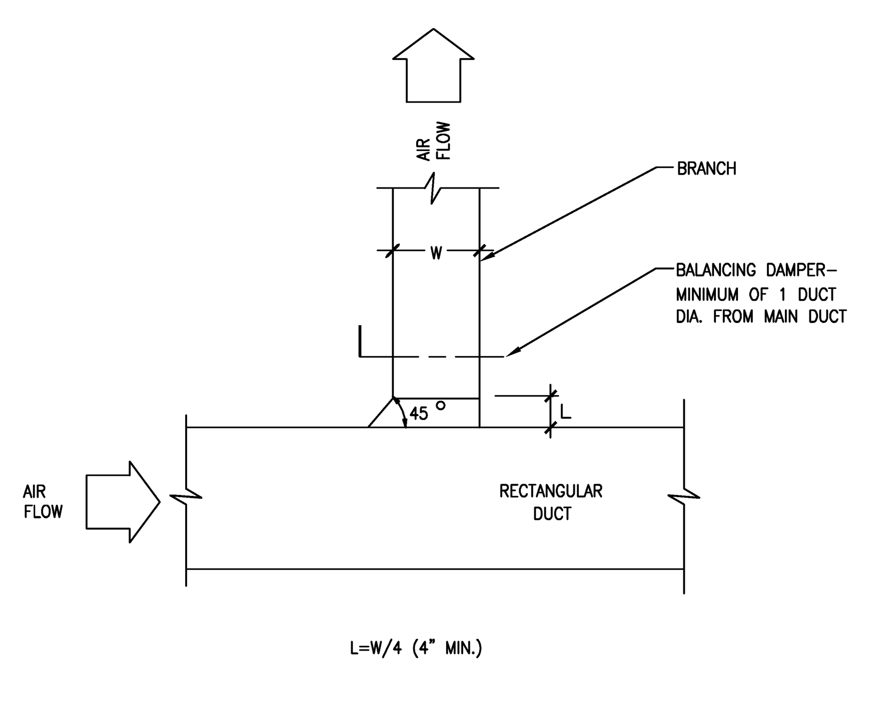


3 ACOUSTIC TRANSFER AIR BOOT DETAIL
NO SCALE



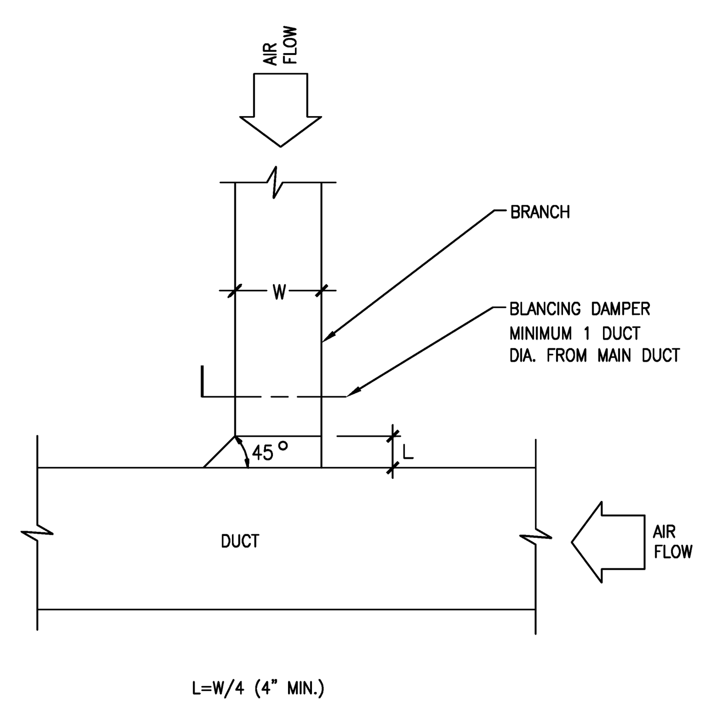
NOTES:
1. USE "UNITED DUCT SEALER" OR EQUAL WHERE DUCTS CONNECT TO SLEEVE. DUCT SEALER MUST MEET RULE #1168 LOW V.O.C LIMITS PER LEED REQUIRMENT.
2. IF ROUND DUCT, PROVIDE WELDED ROUND DUCT COLLAR ON BOTH SIDES. SIMILAR TO HIGH VELOCITY FIRE DAMPER. OPENING SIZE = DUCT SIZE + 1".

4 FIRE SMOKE DAMPER DETAIL
NO SCALE VERTICAL INSTALLATION

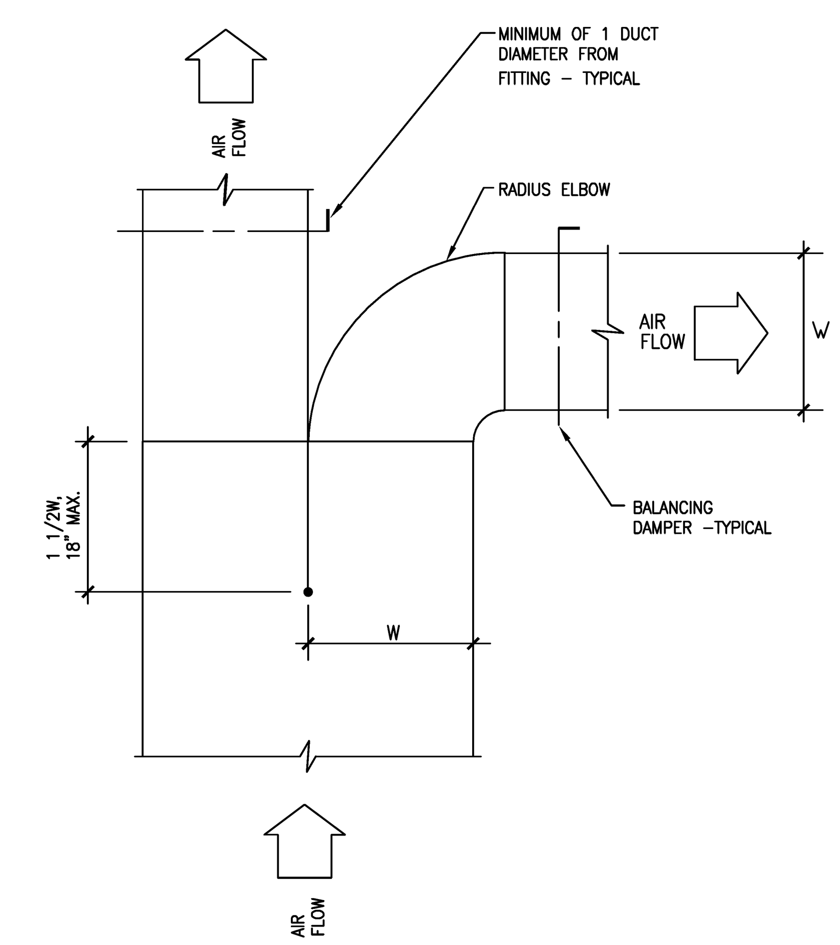


NOTE: 1. SHALL BE USED ON ALL DUCTS DOWNSTREAM OF VAV VOLUME BOXES

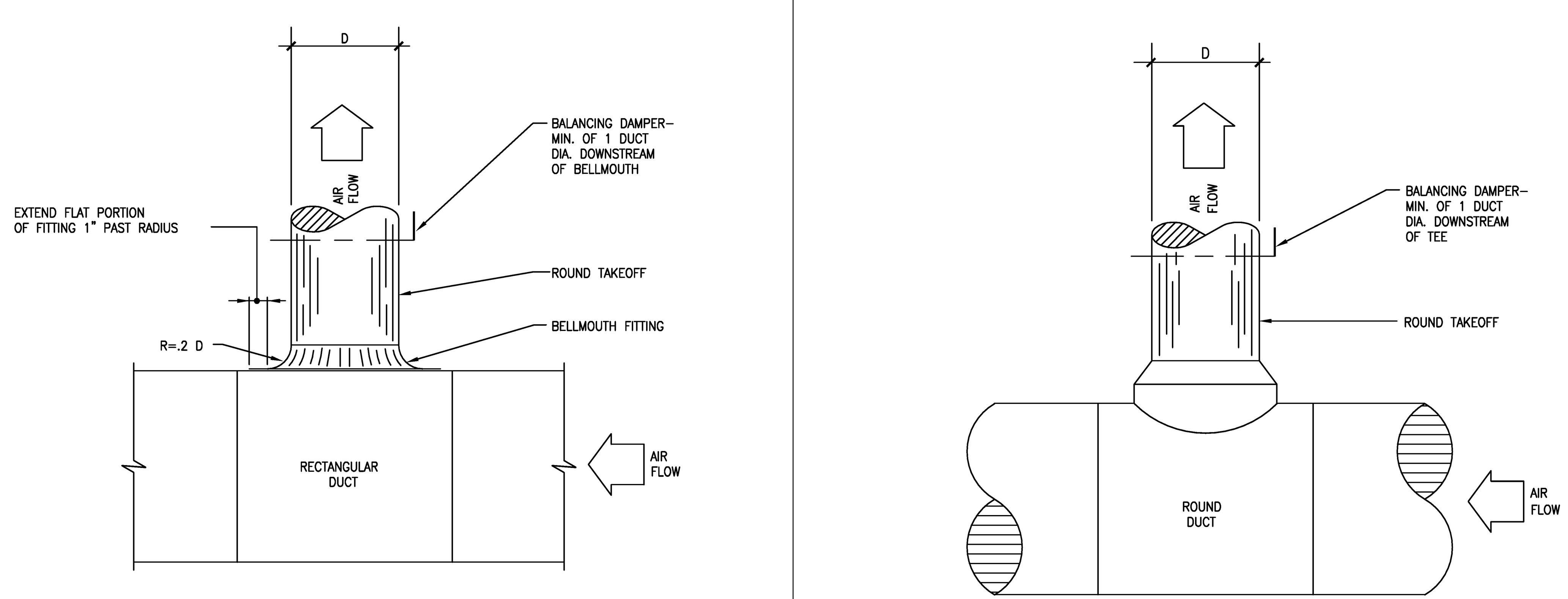
5 RECTANGULAR SUPPLY BRANCH DETAIL
NO SCALE



6 RECTANGULAR EXHAUST BRANCH DETAIL
NO SCALE



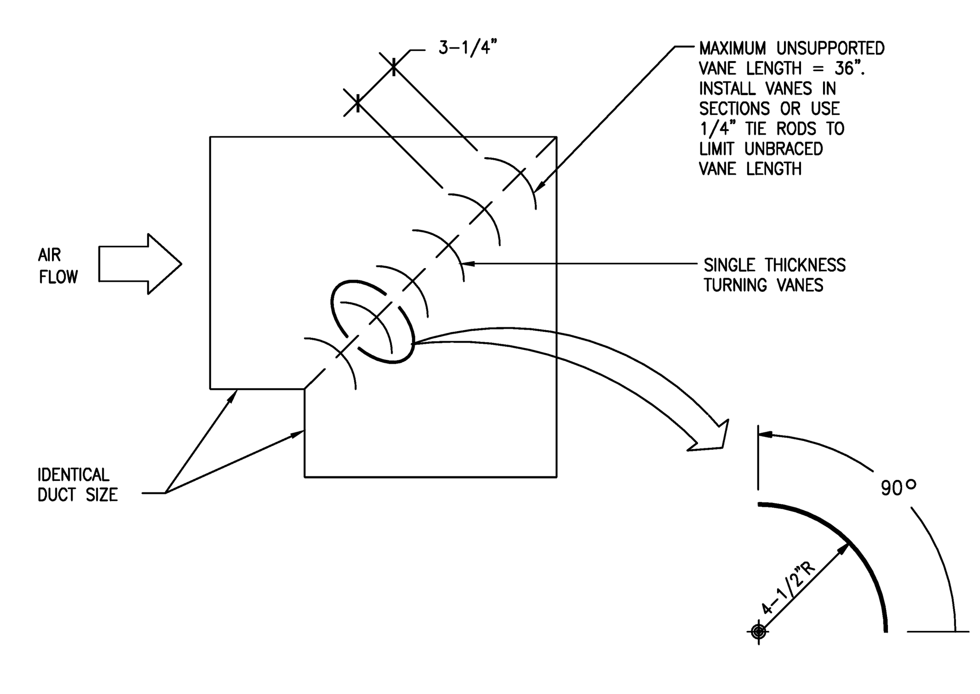
7 DUCT SPLIT DETAIL
NO SCALE



NOTE: 1. SHALL BE USED ON ALL DUCTS UPSTREAM OF CONSTANT VOLUME BOXES

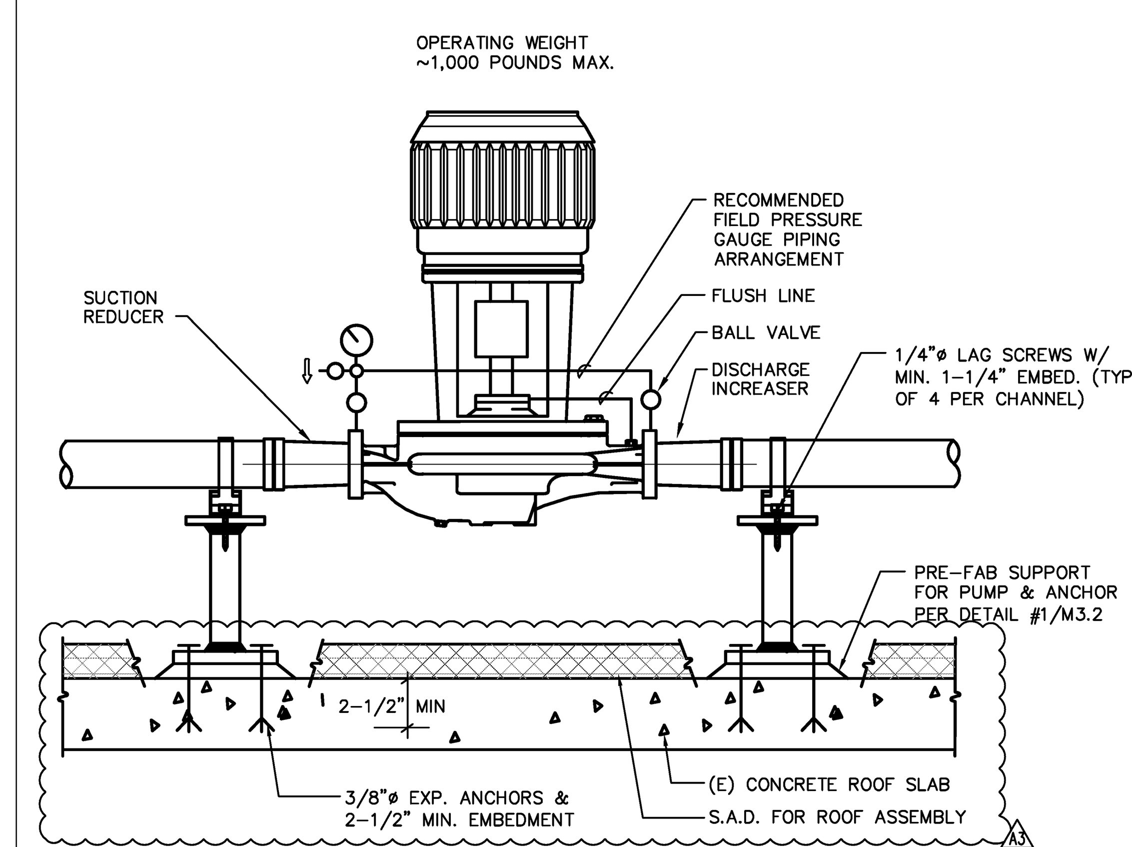
NOTE: 1. SHALL BE USED ON ALL DUCTS UPSTREAM OF TERMINAL UNITS

8 ROUND DUCT TAPPING DETAIL
NO SCALE



NOTE: REFER TO SMACNA FOR DUCTS ON NON-IDENTICAL SIZES.

9 MITER ELBOW DETAIL
NO SCALE



10 VERTICAL IN-LINE PUMP SUPPORT DETAIL
NO SCALE

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consultant

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L-612 STUDENT SERVICES CENTER REMODEL COLLEGE COMPLEX
BID DOCUMENTS
LOS MEDANOS COLLEGE
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PITTSBURG, CA 94565
owner

tBP project number : 2067.00
file name: 0106M33.dwg
drawn by: GE checked by: BC
date: JULY 31, 2012

Rev.	date:	description:
3	10/24/12	ADDENDUM #3

drawing title:
MECHANICAL DETAILS

drawing no.:
M-3.3
drawing of

UPDATE AHU SCHEDULE (ADD#1, MR-3)

UPDATE AHU SCHEDULE (ADD#1, MR-3)

AIR HANDLING UNIT SCHEDULE

SYMBOL	MFR.	SERVING / LOCATION	SUPPLY FAN TYPE/CLASS	SUPPLY FAN TOTAL CFM	SUPPLY FAN MIN. OSA CFM	SUPPLY FAN T.S.P./ E.S.P. (IN. WG)	SUPPLY FAN BHP	SUPPLY FAN HP	SUPPLY FAN FRPM	RETURN FAN TYPE/CLASS	RETURN FAN CFM	RETURN FAN T.S.P./ E.S.P. (IN. WG)	RETURN FAN BHP	RETURN FAN HP	RETURN FAN FRPM
AHU-1	ENERGY LABS	2ND FLOOR (PHASE I) – ROOF	ARR #4 / CLII	7000	2660	4.024/ 2.0	6.68	(2) 5	1136	ARR #4 / CLII	4340	1.75/ 1.0	1.84	3	1467
AHU-2	ENERGY LABS	NW SS3 & SS4 QUAD – ROOF	ARR #4 / CLII	5900	1500	4.271 / 2.0	6.04	7.5	1372	ARR #4 / CLII	4400	1.75/ 1.0	1.92	3	1372
AHU-3	ENERGY LABS	NE SS3 & SS4 QUAD – ROOF	ARR #4 / CLII	6600	1600	4.15 / 2.0	6.59	(2) 5	1286	ARR #4 / CLII	5000	1.75/ 1.0	2.32	3	1650
AHU-4	ENERGY LABS	SE SS3 & SS4 QUAD – ROOF	ARR #4 / CLII	5200	1400	3.91 / 1.75	6.94	(2) 5	1264	ARR #4 / CLII	3800	1.75/ 1.0	1.58	2	1662
AHU-5	ENERGY LABS	SW SS3 & SS4 QUAD – ROOF	ARR #4 / CLII	4400	1400	4.0/ 1.75	7.43	(2) 5	1131	ARR #4 / CLII	3000	1.75/ 1.0	1.33	2	1878
AHU-6	ENERGY LABS	WEST ENTRY SS3 & SS4 – ROOF	ARR #4 / CLII	4600	1200	4.10 / 1.75	6.1	7.5	1000	ARR #4 / CLII	3400	1.75/ 1.0	1.62	2	1000
AHU-7	ENERGY LABS	EAST ENTRY SS3 & SS4 – ROOF	ARR #4 / CLII	5100	1200	4.10 / 1.75	6.1	7.5	1000	ARR #4 / CLII	3900	1.75/ 1.0	1.63	2	1000

SYMBOL	CHILLED WATER COIL CAPACITY TOTAL/SEN. (MBH)	GPM	ROWS FPI	EWT (°F)	LWT (°F)	EDB (°F)	EWB (°F)	LDB (°F)	LWB (°F)	FACE VEL (FPM)	APD (H2O)	WPD (H2O)	MIN. BRANCH SIZE (IN)
AHU-1	243/231	48.6	4 – 11	45	55	82.1	63.1	51.5	50.8	339	0.31	8.4	2"
AHU-2	152/152	30.8	4 – 7	45	55	79.1	62.1	55.3	53	340	0.18	4.15	1-1/2"
AHU-3	202/193	40.3	4 – 10	45	55	78.8	61.9	51.7	51	319	0.26	6.05	2"
AHU-4	163/157	32.7	4 – 11	45	55	79.5	62.2	51.6	51	318	0.28	4.5	1-1/2"
AHU-5	146/138	29.2	4 – 10	45	55	80.6	62.6	51.5	50.8	287	0.22	6.12	1-1/2"
AHU-6	145/138	29.1	4 – 10	45	55	79.3	62.2	51.6	51	300	0.24	6.05	1-1/2"
AHU-7	172/166	34.3	5 – 9	45	55	77.8	61.5	51.8	50.9	333	0.35	6.58	1-1/2"

SYMBOL	HEATING WATER COIL MIN. CAP. (MBH)	GPM	ROWS FPI	EWT (°F)	LWT (°F)	EAT (°F)	LAT (°F)	FACE VEL (FPM)	APD (H2O)	WPD (H2O)	MIN. BRANCH PIPE SIZE (IN)
AHU-1	207	20.7	1 – 7	160	140	55.6	83	339	0.04	2.04	1-1/4"
AHU-2	153.0	15.4	1 – 6	160	140	60.3	84.4	340	0.04	2.22	1-1/4"
AHU-3	166	16.7	1 – 6	160	140	60.8	84.2	319	0.04	1.4	1-1/4"
AHU-4	139	13.9	1 – 6	160	140	59.8	84.6	318	0.04	2.34	1"
AHU-5	129	12.9	1 – 6	160	140	57.9	85.1	287	0.03	4.22	1"
AHU-6	129	12.9	1 – 6	160	140	60.1	86.1	300	0.03	4.22	1"
AHU-7	136	13.5	1 – 6	160	140	61.1	85.7	333	0.04	4.57	1"

SYMBOL	PRE-FILTER EFF MERV	PRE-FILTER MAX VEL (FPM)	PRE-FILTER INITIAL P.D. IN.WG.	PRE-FILTER FINAL P.D. IN.WG.	FINAL-FILTER EFF MERV	FINAL-FILTER MAX VEL (FPM)	FINAL-FILTER INITIAL P.D. IN.WG.	FINAL-FILTER FINAL P.D. IN.WG.	ELECTRICAL MCA	ELECTRICAL MOCP	ELECTRICAL V/Ø/HZ	EMERG. POWER (Y/N)	UNIT DIM. (LxWxH)	WET OPER. WEIGHT (LBS)	REMARKS
AHU-1	8	400	0.115	1.0	13	400	0.25	1.5	21.9	30	460/3/60	N	288x76x63	8150	1,2,3,4,5,6,7,8
AHU-2	8	400	0.115	1.0	13	400	0.25	1.5	18.6	25	460/3/60	N	288x70x63	7080	1,2,3,4,5,6,7,8
AHU-3	8	400	0.115	1.0	13	400	0.25	1.5	21.9	30	460/3/60	N	288x76x63	7800	1,2,3,4,5,6,7,8
AHU-4	8	400	0.115	1.0	13	400	0.25	1.5	20.5	30	460/3/60	N	288x70x63	8330	1,2,3,4,5,6,7,8
AHU-5	8	400	0.115	1.0	13	400	0.25	1.5	20.5	30	460/3/60	N	288x70x61	8000	1,2,3,4,5,6,7,8
AHU-6	8	400	0.115	1.0	13	400	0.25	1.5	17.2	25	460/3/60	N	267x66x42	7910	1,2,3,4,5,6,7,8
AHU-7	8	400	0.115	1.0	13	400	0.25	1.5	17.2	25	460/3/60	N	199x120x63	7910	1,2,3,4,5,6,7,8

REMARKS:

1. PROVIDE VARIABLE FREQUENCY DRIVES. DISCONNECT BY DIV. 26.
2. PROVIDE FANS WITH INTERNAL VIRATION ISOLATORS, MINIMUM 2" DEFLECTION.
3. COORDINATE WITH CONTROL DIAGRAMS.
4. STAINLESS STEEL DRAIN PANS, COPPER COILS, ALUMINUM FINS.
5. COORDINATE ACCESS SIDE OF UNIT WITH FLOOR PLANS.
6. PROVIDE MODULATING ECONOMIZER CAPABILITY 0 – 100% OUTSIDE AIR. PROVIDE HOT WIRE ANEMOMETER TYPE AIRFLOW MEASURING STATION FOR OUTSIDE AIR.
7. PROVIDE DUCT SMOKE DETECTOR FOR CODE REQUIRED FAN SHUTDOWN.
8. PROVIDE SEPARATE 120V FOR LIGHTS AND CONTROLS.
9. HEATING CAPACITIES, FLOW, AND CONNECTION SIZES INDICATE OCCUPIED MODE. COORDINATE WITH CONTROL DRAWINGS.
10. PROVIDE WITH FACTORY ROOF CURB.

FIRE/SMOKE DAMPER - AND VOLUME DAMPER SCHEDULE

MARK	MFR	MODEL	SLEEVE	U.L. RATING	MAX WEIGHT (LBS)	REMARKS
FSD-1	RUSKIN	FSD-60-FA FSD-60	17"	UL555/555S	10	1 2 3 4 5 7 8 (COMBINATION FIRE SMOKE DAMPER) (PROVIDE IN SUPPLY, RETURN, AT DUCTS PENETRATING 2-HR RATED PARTITIONS)
FSD-2	TITUS	PAS-FR	N/A	UL555/555S	10	FIRE RATED DIFFUSER AT RATED CEILING
LOUVER	RUSKIN	ELF375DXH	–	–	10	EXTRUDED ALUMINUM, DRAINABLE STATIONARY LOUVER WITH BIRD & INSECT SCREEN. MINIMUM 50% FREE AREA. FOR USE AS MAKEUP AIR TO STORAGE 912B

NOTES:

1. 212 °F FUSIBLE LINKAGE
2. SMOKE LEAKAGE CLASS ii, 1-1/2 HR. DAMPER
3. 120V ACTUATOR (POWER BY DIV. 16); PROVIDE END SWITCH
4. SMOKE DETECTOR SHALL BE PROVIDED, POWERED & WIRED BY DIVISION 16; INSTALLED BY DIVISION 15.
5. TIE-IN TO BUILDING LIFE SAFETY SYTEM BY DIV. 16.
6. PROVIDE IN MEDIUM PRESSURE DUCTWORK. (UPSTREAM OF TERMINAL UNIT)
7. PROVIDE IN LOW PRESSURE DUCTWORK. (DOWNSTREAM OF TERMINAL UNIT)
8. PROVIDE FRONT ACCESS FIRE SMOKE DAMPER FOR RETURN AIR DUCT AT 2-HR WALL

SPLIT AC/CU UNIT SCHEDULE (COOLING ONLY)

SYMBOL	LOCATION/AREA SERVED	ASSOC CU	BASIS OF DESIGN	TOTAL AIRFLOW (CFM)	COOLING TOTAL (MBH)	COOLING SENSIBLE (MBH)	EAT (DB/WB)	SEER	HSPF	SOUND DBA	MCA	ELECTRICAL VOLT	PH	Hz	WT. (LBS)	DIM (WxDxH)	REMARKS
AC-1	ELEV MACH 108	CU-1	MITSUBISHI – PEAD-A24AA	671	24.0	20.0	78/65	16.0	10.0	37	2.6	208/230	1	60	73	44X29X10	1, 2, 3, 4, 5, 7. 9, 10, 11
CU-1	ON ROOF		MITSUBISHI – PUY-A24NHA3	1,940	24.0	20.0	95	16.0		48	18.0	208/230	1	60	165	38X14X38	3, 4, 5, 6, 8, 11
AC-2	DATA 128	CU-2	MITSUBISHI – PKA-A24KA4	700	24.0	20.0	78/65	17.0	10.0	45	1.0	208/230	1	60	46	46x12x15	1, 2, 3, 4, 5, 7,10, 11
CU-2	ON ROOF		MITSUBISHI – PUY-A24NHA4	1,940	24.0	20.0	95	17.0		48	18.0	208/230	1	60	165	38x14x38	3, 4, 5, 6, 8, 11
AC-3	DATA 137	CU-3	MITSUBISHI – PKA-A24KA4	700	24.0	20.0	78/65	17.0	10.0	45	1.0	208/230	1	60	46	46x12x15	1, 2, 3, 4, 5, 7, 10, 11
CU-3	ON ROOF		MITSUBISHI – PUY-A24NHA4	1,940	24.0	20.0	95	17.0		48	18.0	208/230	1	60	165	38x14x38	3, 4, 5, 6, 8, 11
AC-4	DATA 251	CU-4	MITSUBISHI – PKA-A24KA4	700	24.0	20.0	78/65	17.0	10.0	45	1.0	208/230	1	60	46	46x12x15	1, 2, 3, 4, 5, 7, 10, 11
CU-4	ON ROOF		MITSUBISHI – PUY-A24NHA4	1,940	24.0	20.0	95	17.0		48	18.0	208/230	1	60	165	38x14x38	3, 4, 5, 6, 8, 11
AC-5	ELEC ROOM 253	CU-5	MITSUBISHI – PKA-A24KA4	700	24.0	20.0	78/65	17.0	10.0	45	1.0	208/230	1	60	46	46x12x15	1, 2, 3, 4, 5, 7, 10, 11
CU-5	ON ROOF		MITSUBISHI – PUY-A24NHA4	1,940	24.0	20.0	95	17.0		48	18.0	208/230	1	60	165	38x14x38	3, 4, 5, 6, 8, 11

NOTES:

1. PROVIDE UNIT WITH WALL MOUNTED BRACKET
2. PROVIDE CONDENSATE DRAIN TO APPROVED RECEPTOR WITH 1" AIR GAP.
3. DISCONNECT BY DIV 16.
4. COORDINATE POWER AND CONTROL WIRING REQUIREMENT PER MANUFACTURER.
5. SIZE REFRIGERANT PIPING PER MFR.'S RECOMMENDATIONS.
6. PROVIDE SLEEPERS FOR CONDENSER ON ROOF. RFI 233 - FOLLOW 2/M-6.2
7. PROVIDE CN51 CONNECTOR (PAC-725AD) FOR INTERFACE TO BMS.
8. PROVIDE COMMON DOGHOUSE FOR REFRIGERANT PIPING PENETRATION & WATERPROOFING
9. PROVIDE CEILING MOUNTED FANCOIL WITH ISOLATORS (1-INCH DEFLECTION), DUCTED TO ELEVATOR EQUIPMENT ROOM.
10. PROVIDE SECONDARY DRAIN PAN & OVERFLOW FOR ALL UNITS THAT ARE CONCEALED BY A CEILING OR SOME OTHER MEANS.
11. PROVIDE WITH OPTIONAL CONDENSATE PUMP.

EXHAUST FAN SCHEDULE

SYMBOL	AREA SERVED	TYPE	DRIVE	AIR FLOW (CFM)	T.S.P. (IN.H2O)	FAN RPM	SOUND (SONES)	MAX. WT. (LBS)	ELECTRICAL VOLT/PH	BHP	NOMINAL SIZE HP	BASIS OF DESIGN	REMARKS
EF-1	RESTROOM	ROOF MOUNTED	BELT	700	0.50	1,003	6.8	61	120/1	0.12	0.25	GREENHECK CUBE-121-4	1, 2, 3, 4, 5
EF-2	WOMEN'S RESTROOM	ROOF MOUNTED	BELT	900	0.75	1,244	9.7	61	120/1	0.21	0.25	GREENHECK CUBE-121-4	1, 2, 3, 4, 5
EF-3	MEN'S RESTROOM	ROOF MOUNTED	BELT	800	0.75	1.208	9.0	61	120/1	0.19	0.25	GREENHECK CUBE-121-4	1, 2, 3, 4, 5
EF-4	ELECTRICAL 253	ROOF MOUNTED	BELT	750	0.50	1,022	6.9	61	120/1	0.12	0.25	GREENHECK CUBE-121-4	1, 2, 3, 4, 6

NOTE:

1. PROVIDE BACKDRAFT DAMPER.
2. PROVIDE ROOFCURB.
3. COORDINATE CONTROL REQUIREMENTS WITH CONTROL DIAGRAMS AND SEQUENCES.
4. AMCA CERTIFIED FOR AIRFLOW AND SOUND.
5. 24 HOURS CONTINOUS OPERATION.
6. PROVIDE THERMOSTAT FAN CONTROLLER. SET FAN TO START AND RUN AT 85 F DEGREE

DIFFUSER, GRILLE AND REGISTER SCHEDULE

MARK	MFR	MODEL	SIZE	NECK	FINISH	SERVICE	BORDER	MATERIAL	MAX WEIGHT (LBS)	REMARKS
CD-1	TITUS	PAS	24"x24"	SEE FLOOR PLANS	WHITE	CEILING DIFFUSER	COORD. W/ RCP	STEEL	10	1 2 4 5 8
CR-1	TITUS	PAR	24"x24"	SEE FLOOR PLANS	WHITE	CEILING RETURN	COORD. W/ RCP	STEEL	10	1 2 4 5
CE-1	TITUS	PAR	12X12	SEE FLOOR PLANS	WHITE	CEILING EXHAUST	COORD. W/ RCP	STEEL	10	1 2 4 5
WS-1	TITUS	301 RL	PER SIZE	SEE FLOOR PLANS	WHITE	WALL SUPPLY	COORD. W/ ARCH	STEEL	10	3 4 5
WR-1	TITUS	350 RL	PER SIZE	SEE FLOOR PLANS	WHITE	WALL RETURN	COORD. W/ ARCH	STEEL	10	3 4 5
TG-1	TITUS	301 RL	PER SIZE	SEE FLOOR PLANS	WHITE	TRANSFER GRILLE	COORD. W/ ARCH	STEEL	10	3 4 5
SD-1	TITUS	TBD-80	(4) 1" SLOT	SEE FLOOR PLANS	WHITE	SLOT DIFFUSER	COORD. W/ RCP	STEEL	10	6 10
SR-1	TITUS	TBR-80	(4) 1" SLOT	SEE FLOOR PLANS	WHITE	SLOT RETURN	COORD. W/ RCP	STEEL	10	7 10
CD-T	THERMA-FUSER	TF-HC	24"x24" FACE	SEE FLOOR PLANS	WHITE	SUPPLY	COORD. W/ RCP	STEEL	10	9

RFI 397 - CHANGE TO "TITUS ML"

NOTE:

1. COORDINATE EXACT LOCATION WITH LIGHTS, SPRINKLER HEADS, AND ARCH. RCP.
2. USE BORDER TYPE 2 FOR SURFACE MOUNT IN HARD CEILINGS, BORDER TYPE 3 FOR LAY-IN.
3. COORDINATE WITH WALL ELEVATIONS
4. SEE FLOOR PLANS FOR NECK & GRILLE SIZES.
5. PROVIDE REMOTE CONTROL RODS FOR VOLUME DAMPERS ABOVE INACCESSIBLE CEILING.
6. 4' LONG AT DIRECTOR'S OFFICE, 2' AT ALL OTHER OFFICES
7. 4' LONG AT DIRECTOR'S OFFICE, 2' AT ALL OTHER OFFICES
8. USE TYPE PAS-FR FOR DIFFUSER AT FIRE RATED CEILING.
9. PROVIDE WALL ADJUSTER AND MOUNT IT NEAR LIGHT SWITCH, SEE FLOOR PLAN FOR LOCATION
10. PROVIDE YOUNG REGULATOR MODEL 270-275 REMOTE CONTROL KIT. MOUNT DAMPER OPERATOR WITH THE DIFFUSER PLENUM.

CHILLED + HEATING WATER BOOSTER PUMP SCHEDULE

SYMBOL	SERVING	TYPE	PUMP SIZE	IMPELLER SIZE	FLOW RATE (GPM)	HEAD (FT.H2O)	ELECTRICAL RPM	VOLT/PH	BHP	HP	EFFICIENCY	OPERATING WEIGHT (LBS)	BASIS OF DESIGN	REMARKS
CHWP-1	AHU-1 THROUGH AHU-7	END-SUCTION	2-1/2BB	8.25"	282	55	1,750	460/3	5.36	7.5	73.1%	350	BELL & GOSSETT 1510	1, 2, 3, 4, 5, 7
HWP-1	AHU-1 THROUGH AHU-7	END-SUCTION	2-1/2AB	7.0"	179	45	1,750	460/3	3.23	5.0	74.9%	250	BELL & GOSSETT 1510	1, 2, 3, 4, 5, 7

NOTES:

1. PROVIDE PREMIUM EFFICIENCY MOTOR
2. TOTALLY ENCLOSED FAN COOLED (TEFC) MOTOR
3. PROVIDE VFD IN NEMA3 ENCLOSURE NEXT TO AHU-5
4. PUMPS ARE HORIZONTAL INLINE SERIES 80
5. PROVIDE HOUSE KEEPING PAD AND PUMP MOUTING FRAME
6. PROVIDE PUMP SUCTION AND OUTLET DIFFUSER
7. PROVIDE PUMP FLEX CONNECTOR, ISOLATION VALVES, INLET/OUTLET GAUGE.

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FILE #7-C1
APPL 01-112272
JUL 31 2012

L-612 STUDENT SERVICES CENTER REMODEL COLLEGE COMPLEX

BID DOCUMENTS

LOS MEDANOS COLLEGE
2700 EAST LELAND DRIVE
PITTSBURG, CA 94565

owner

tBP project number : 20610.00

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MECHANICAL SCHEDULES

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FILE: 0106M41.DWG -- M41 | EDIT: 7/25/2012 5:11 PM BY ALLENL | PLOT: 7/25/2012 10:01 PM BY HAI PHAN

SINGLE DUCT VAV TERMINAL UNIT WITH HOT WATER HEAT SCHEDULE (3RD FLOOR LEVEL)

SYMBOL	MODEL	SIZE INLET (DIA)	SIZE OUTLET (WxH)	CFM MAX	CFM MIN	STATIC PRESSURE INLET	STATIC PRESSURE DOWN	STATIC PRESSURE MIN	NC LEVELS RAD.	NC LEVELS DISCH.	HOT WATER HEATING COIL CFM	MBH	EAT	LAT	Apd	GPM	EWT	LWT	WPd	ROWS	CONTROL VALVE TYPE 2 OR 3 WAY	CONTROL VALVE SIZE Cv	MINIMUM BRANCH PIPE SIZE (IN.)	REMARKS
VAV-2-1	DESV	6	12x8	200	80	1.00	0.30	0.15	22	20	80	3.5	55.0	95.0	0.14	0.5	160	140	0.3	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-2-3	DESV	6	12x8	330	80	1.00	0.30	0.15	22	20	100	4.3	55.0	95.0	0.14	0.5	160	140	0.3	2-RH	3-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-2-2	DESV	6	12x8	200	80	1.00	0.30	0.21	22	20	80	3.5	55.0	95.0	0.20	0.5	160	140	0.8	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-2-4	DESV	6	12x8	400	80	1.00	0.30	0.15	22	20	120	5.2	55.0	95.0	0.14	0.5	160	140	0.3	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-2-5	DESV	6	12x8	200	80	1.00	0.30	0.15	22	20	80	3.5	55.0	95.0	0.14	0.5	160	140	0.3	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-2-6	DESV	6	12x8	200	80	1.00	0.30	0.21	22	20	80	3.5	55.0	95.0	0.20	0.5	160	140	0.8	2-RH	3-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-2-7	DESV	4	12x8	100	50	1.00	0.30	0.09	24	23	50	2.2	55.0	95.0	0.03	0.5	160	140	0.1	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-2-8	DESV	6	12x8	200	80	1.00	0.30	0.21	22	20	80	3.5	55.0	95.0	0.20	0.5	160	140	0.8	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-2-9	DESV	6	12x8	200	80	1.00	0.30	0.21	22	20	80	3.5	55.0	95.0	0.20	0.5	160	140	0.8	2-RH	3-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-2-10	DESV	10	14x12.5	900	230	1.00	0.30	0.21	22	20	270	11.7	55.0	95.0	0.20	0.5	160	140	0.8	2-RH	3-WAY	0.25	3/4"	SEE NOTES BELOW
VA-2-11	DESV	6	12x8	200	80	1.00	0.30	0.16	20	19	80	3.5	55.0	95.0	0.14	0.5	160	140	0.2	2-RH	3-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-6-11	DESV	6	12x8	325	80	1.00	0.30	0.17	22	20	100	4.3	55.0	95.0	0.16	0.5	160	140	0.3	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-6-12	DESV	6	12x8	260	80	1.00	0.30	0.17	22	20	80	3.5	55.0	95.0	0.16	0.5	160	140	0.3	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-6-13	DESV	10	14x12.5	900	230	1.00	0.30	0.21	22	20	270	11.7	55.0	95.0	0.20	0.5	160	140	0.8	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-5-14	DESV	6	12x8	320	80	1.00	0.30	0.20	21	15	100	4.3	55.0	95.0	0.13	0.5	160	140	0.2	2-RH	3-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-5-15	DESV	6	12x8	300	90	1.00	0.30	0.21	22	20	90	3.9	55.0	95.0	0.20	0.5	160	140	0.8	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-5-16	DESV	6	12x8	230	80	1.00	0.30	0.20	21	15	80	3.5	55.0	95.0	0.13	0.5	160	140	0.2	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-5-17	DESV	8	12x10	500	150	1.00	0.30	0.21	22	20	150	6.5	55.0	95.0	0.20	0.5	160	140	0.8	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-5-18	DESV	6	12x8	200	80	1.00	0.30	0.20	21	15	80	3.5	55.0	95.0	0.13	0.5	160	140	0.2	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-4-19	DESV	6	12x8	300	80	1.00	0.30	0.14	21	15	90	3.9	55.0	95.0	0.13	0.5	160	140	0.2	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-4-20	DESV	6	12x8	200	80	1.00	0.30	0.17	22	20	80	3.5	55.0	95.0	0.16	0.5	160	140	0.3	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-4-21	DESV	6	12x8	300	80	1.00	0.30	0.20	21	15	90	3.9	55.0	95.0	0.13	0.5	160	140	0.2	2-RH	3-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-3-22	DESV	6	12x8	400	150	1.00	0.30	0.14	21	15	150	6.5	55.0	95.0	0.13	0.5	160	140	0.2	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-3-23	DESV	6	12x8	300	80	1.00	0.30	0.13	20	18	90	3.9	55.0	95.0	0.12	0.5	160	140	0.1	2-RH	3-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-3-24	DESV	4	12x8	100	50	1.00	0.30	0.17	22	20	50	2.2	55.0	95.0	0.16	0.5	160	140	0.3	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-3-25	DESV	4	12x8	100	50	1.00	0.30	0.17	22	20	50	2.2	55.0	95.0	0.16	0.5	160	140	0.3	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-3-26	DESV	6	12x8	320	80	1.00	0.30	0.14	20	18	100	4.3	55.0	95.0	0.12	0.5	160	140	0.1	2-RH	3-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-3-27	DESV	6	12x8	240	80	1.00	0.30	0.22	22	18	80	3.5	55.0	95.0	0.11	0.5	160	140	0.1	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-7-28	DESV	6	12x8	390	140	1.00	0.30	0.19	21	17	140	6.1	55.0	95.0	0.09	0.5	160	140	0.1	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-3-29	DESV	6	12x8	200	80	1.00	0.30	0.13	20	18	80	3.5	55.0	95.0	0.12	0.5	160	140	0.1	2-RH	3-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-7-30	DESV	6	12x8	240	80	1.00	0.30	0.16	20	19	80	3.5	55.0	95.0	0.14	0.5	160	140	0.2	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-7-31	DESV	12	16x15	1360	470	1.00	0.30	0.13	20	18	470	20.4	55.0	95.0	0.12	1.0	160	140	0.1	2-RH	2-WAY	0.50	3/4"	SEE NOTES BELOW
VAV-4-32	DESV	6	12x8	200	80	1.00	0.30	0.16	20	19	80	3.5	55.0	95.0	0.14	0.5	160	140	0.2	2-RH	3-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-4-33	DESV	6	12x8	380	80	1.00	0.30	0.22	22	18	120	5.2	55.0	95.0	0.11	0.5	160	140	0.1	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-4-34	DESV	8	12x10	595	150	1.00	0.30	0.19	21	17	180	7.8	55.0	95.0	0.09	0.5	160	140	0.1	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-4-35	DESV	6	12x8	200	80	1.00	0.30	0.13	20	18	80	3.5	55.0	95.0	0.12	0.5	160	140	0.1	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-4-36	DESV	6	12x8	200	80	1.00	0.30	0.16	20	19	80	3.5	55.0	95.0	0.14	0.5	160	140	0.2	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-4-37	DESV	6	12x8	230	80	1.00	0.30	0.16	20	19	80	3.5	55.0	95.0	0.14	0.5	160	140	0.2	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW

19.5

NOTES:
1. ALL BOXES SHALL BE PROVIDED WITH HIGH CFM CONTROL.
2. ALL BOXES SHALL BE PRESSURE INDEPENDENT AND COMPLETE WITH CENTER AVERAGING AIRFLOW SENSOR.
3. SEISMIC BRACE UNIT PER SMACMA GUIDELINES.
4. COIL CONNECTION AND CONTROL BOX SHALL BE ON OPPOSITE SIDE.
5. CONTROL VALVES TO BE FIELD INSTALLED AS REQUIRED. (2-WAY & 3-WAY)
6. ALL TERMINAL BOXES SHALL HAVE MINIMUM 1 INCH INSULATION CONFORMING TO UL181 AND NFPA90A.
7. ALL PERFORMANCE SHALL BE ARI CERTIFIED.
8. ROOM NC LEVEL SHOWN INCLUDES ATTENUATION TRANSFER FUNCTIONS OBTAINED FROM TABLES IN ARI STANDARD 885.
9. SOUND DATA SHALL BE OBTAINED FROM TESTS CONDUCTED IN ACCORDANCE WITH ARI STANDARD 880-98.
10. 120V POWER TO CONTROL TRANSFORMER BY DIVISION 16 WITH TOGGLE SWITCH TO ISOLATE POWER TO 24V. 24V DDC CONTROL WIRING BY "ANDOVER" CONTROL CONTRACTOR.

SINGLE DUCT VAV TERMINAL UNIT WITH HOT WATER HEAT SCHEDULE (SS4 LEVEL)

SYMBOL	MODEL	SIZE INLET (DIA)	SIZE OUTLET (WxH)	CFM MAX	CFM MIN	STATIC PRESSURE INLET	STATIC PRESSURE DOWN	STATIC PRESSURE MIN	NC LEVELS RAD.	NC LEVELS DISCH.	HOT WATER HEATING COIL CFM	MBH	EAT	LAT	Apd	GPM	EWT	LWT	WPd	ROWS	CONTROL VALVE TYPE 2 OR 3 WAY	CONTROL VALVE SIZE Cv	MINIMUM BRANCH PIPE SIZE (IN.)	REMARKS
VAV-2-1	DESV	6	12x8	310	100	1.00	0.30	0.11	16	15	100	4.3	55.0	95.0	0.05	0.5	160	140	0.1	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-2-2	DESV	6	12x8	200	80	1.00	0.30	0.19	21	17	80	3.5	55.0	95.0	0.09	0.5	160	140	0.1	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-2-3	DESV	6	12x8	300	80	1.00	0.30	0.25	22	20	90	3.9	55.0	95.0	0.12	0.5	160	140	0.1	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-5-4	DESV	6	12x8	300	80	1.00	0.30	0.15	22	20	90	3.9	55.0	95.0	0.14	0.5	160	140	0.3	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-5-5	DESV	6	12x8	300	90	1.00	0.30	0.15	22	20	90	3.9	55.0	95.0	0.14	0.5	160	140	0.3	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-5-6	DESV	6	12x8	340	80	1.00	0.30	0.18	21	19	110	4.8	55.0	95.0	0.09	0.5	160	140	0.2	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-5-7	DESV	6	12x8	300	90	1.00	0.30	0.09	24	23	90	3.9	55.0	95.0	0.03	0.5	160	140	0.1	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-5-8	DESV	8	12x10	575	150	1.00	0.30	0.19	23	20	180	7.8	55.0	95.0	0.18	0.5	160	140	0.4	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-6-9	DESV	14	20x18	2160	450	1.00	0.30	0.14	18	16	650	28.2	55.0	95.0	0.07	1.5	160	140	0.1	2-RH	2-WAY	0.75	3/4"	SEE NOTES BELOW
VAV-5-10	DESV	10	14x12.5	800	230	1.00	0.30	0.31	24	21	240	10.4	55.0	95.0	0.14	0.5	160	140	0.1	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-2-11	DESV	6	12x8	200	80	1.00	0.30	0.11	19	18	80	3.5	55.0	95.0	0.10	0.5	160	140	0.1	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-2-12	DESV	4	12x8	100	50	1.00	0.30	0.15	21	15	50	2.2	55.0	95.0	0.12	0.5	160	140	0.2	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-2-13	DESV	14	20x18	1860	450	1.00	0.30	0.14	29	27	560	24.3	55.0	95.0	0.04	1.0	160	140	0.1	2-RH	2-WAY	0.50	3/4"	SEE NOTES BELOW
VAV-3-14	DESV	6	12x8	200	80	1.00	0.30	0.16	18	16	80	3.5	55.0	95.0	0.07	0.5	160	140	0.1	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-3-15	DESV	14	20x18	1650	450	1.00	0.30	0.20	29	27	500	21.7	55.0	95.0	0.19	1.0	160	140	0.2	2-RH	2-WAY	0.50	3/4"	SEE NOTES BELOW
VAV-3-16	DESV	6	12x8	300	80	1.00	0.30	0.20	21	15	90	3.9	55.0	95.0	0.13	0.5	160	140	0.2	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-3-17	DESV	6	12x8	260	80	1.00	0.30	0.20	29	27	80	3.5	55.0	95.0	0.19	0.5	160	140	0.2	2-RH	3-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-3-18	DESV	6	12x8	300	80	1.00	0.30	0.20	21	15	90	3.9	55.0	95.0	0.13	0.5	160	140	0.2	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-3-19	DESV	14	20x18	1750	450	1.00	0.30	0.14	21	15	530	23.0	55.0	95.0	0.13	1.0	160	140	0.2	2-RH	2-WAY	0.50	3/4"	SEE NOTES BELOW
VAV-3-20	DESV	6	12x8	220	80	1.00	0.30	0.20	29	27	80	3.5	55.0	95.0	0.19	0.5	160	140	0.2	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-7-21	DESV	14	20x18	2000	450	1.00	0.30	0.20	21	15	600	26.0	55.0	95.0	0.13	1.0	160	140	0.2	2-RH	2-WAY	0.50	3/4"	SEE NOTES BELOW
VAV-7-22	DESV	10	14x12.5	1075	230	1.00	0.30	0.14	21	15	330	14.3	55.0	95.0	0.13	1.0	160	140	0.2	2-RH	2-WAY	0.50	3/4"	SEE NOTES BELOW
VAV-4-23	DESV	6	12x8	350	80	1.00	0.30	0.13	20	18	110	4.8	55.0	95.0	0.12	0.5	160	140	0.1	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-4-24	DESV	4	12x8	140	50	1.00	0.30	0.17	22	20	50	2.2	55.0	95.0	0.16	0.5	160	140	0.3	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-4-25	DESV	4	12x8	125	50	1.00	0.30	0.19	23	20	50	2.2	55.0	95.0	0.18	0.5	160	140	0.4	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-4-26	DESV	6	12x8	400	80	1.00	0.30	0.14	20	18	120	5.2	55.0	95.0	0.12	0.5	160	140	0.1	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-4-27	DESV	4	12x8	150	50	1.00	0.30	0.22	22	18	50	2.2	55.0	96.0	0.11	0.5	160	140	0.1	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-4-28	DESV	4	12x8	110	50	1.00	0.30	0.19	21	17	50	2.2	55.0	98.0	0.09	0.5	160	140	0.1	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-4-29	DESV	6	12x8	300	80	1.00	0.30	0.13	20	18	90	3.9	55.0	95.0	0.12	0.5	160	140	0.1	2-RH	3-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-4-30	DESV	10	14x12.5	860	230	1.00	0.30	0.16	20	19	260	11.3	55.0	95.0	0.14	0.5	160	140	0.2	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-4-31	DESV	4	12x8	100	50	1.00	0.30	0.14	29	27	50	2.2	55.0	95.0	0.04	0.5	160	140	0.1	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-2-32	DESV	8	12x10	450	150	1.00	0.30	0.18	21	19	150	6.5	55.0	95.0	0.09	0.5	160	140	0.1	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-3-33	DESV	6	12x8	200	80	1.00	0.30	0.16	18	16	80	3.5	55.0	95.0	0.07	0.5	160	140	0.1	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW
VAV-5-34	DESV	6	12x8	380	80	1.00	0.30	0.19	21	17	120	5.2	55.0	95.0	0.09	0.5	160	140	0.1	2-RH	2-WAY	0.25	3/4"	SEE NOTES BELOW

19.0

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FILE #7-C1
IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
OFFICE OF REGULATION SERVICES
APPL 01-112272
DATE JUL 3 1 2012

L-612 STUDENT SERVICES CENTER REMODEL COLLEGE COMPLEX

BID DOCUMENTS

LOS MEDANOS COLLEGE
2700 EAST LELAND DRIVE
PITTSBURG, CA 94565

owner

tBP project number: 20670.00

file name: 0106M42.dwg

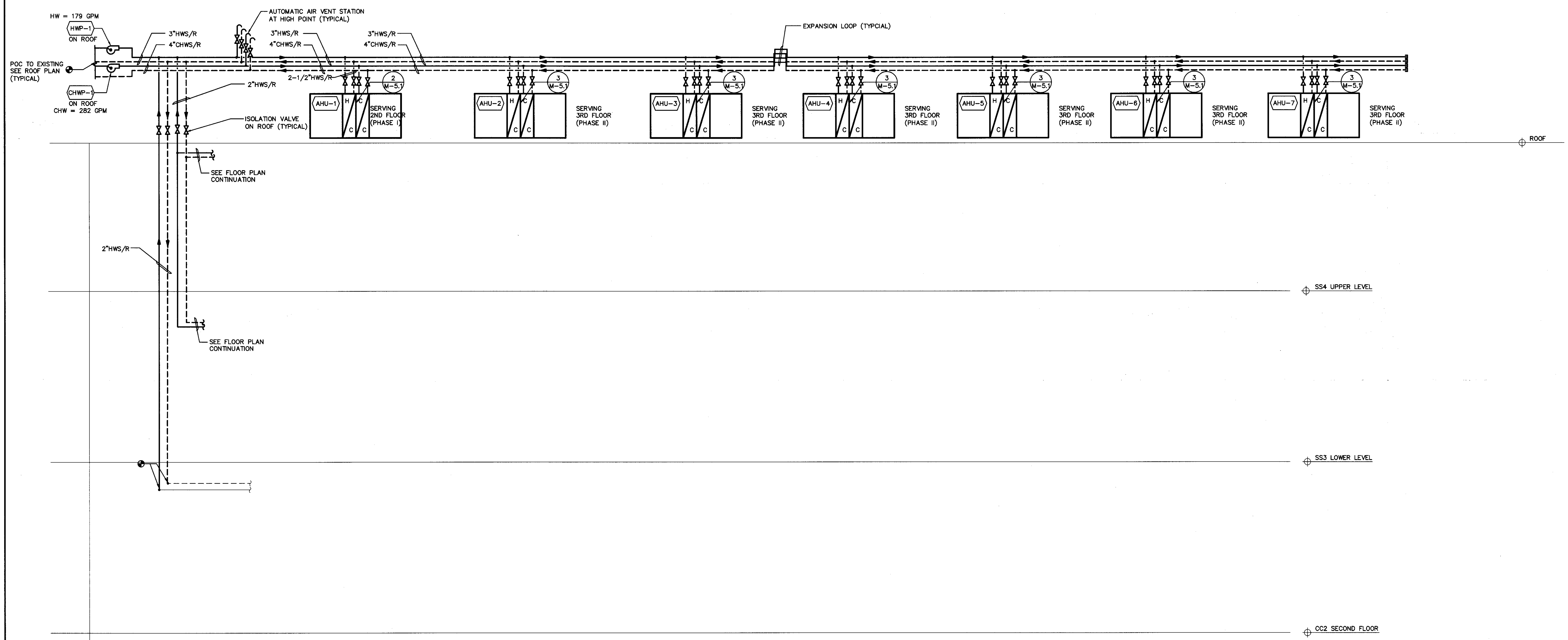
drawn by: GE checked by: BG

date: JULY 31, 2012

Rev. date: description:

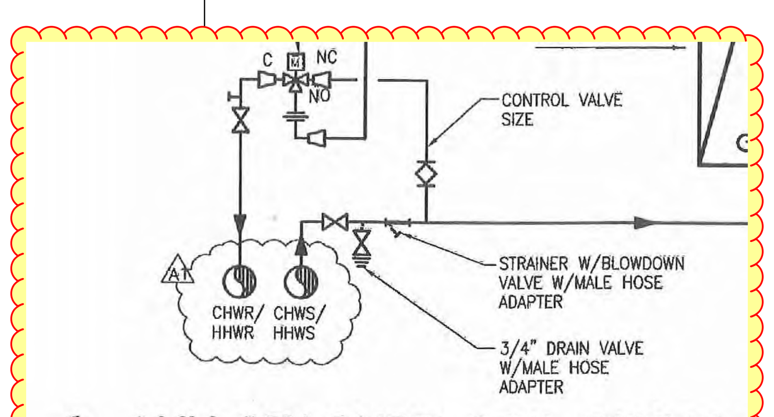
drawing title:
MECHANICAL SCHEDULES

drawing no:
M-4.2
drawing of



1 CHILLED WATER AND HEATING HOT WATER FLOW DIAGRAM

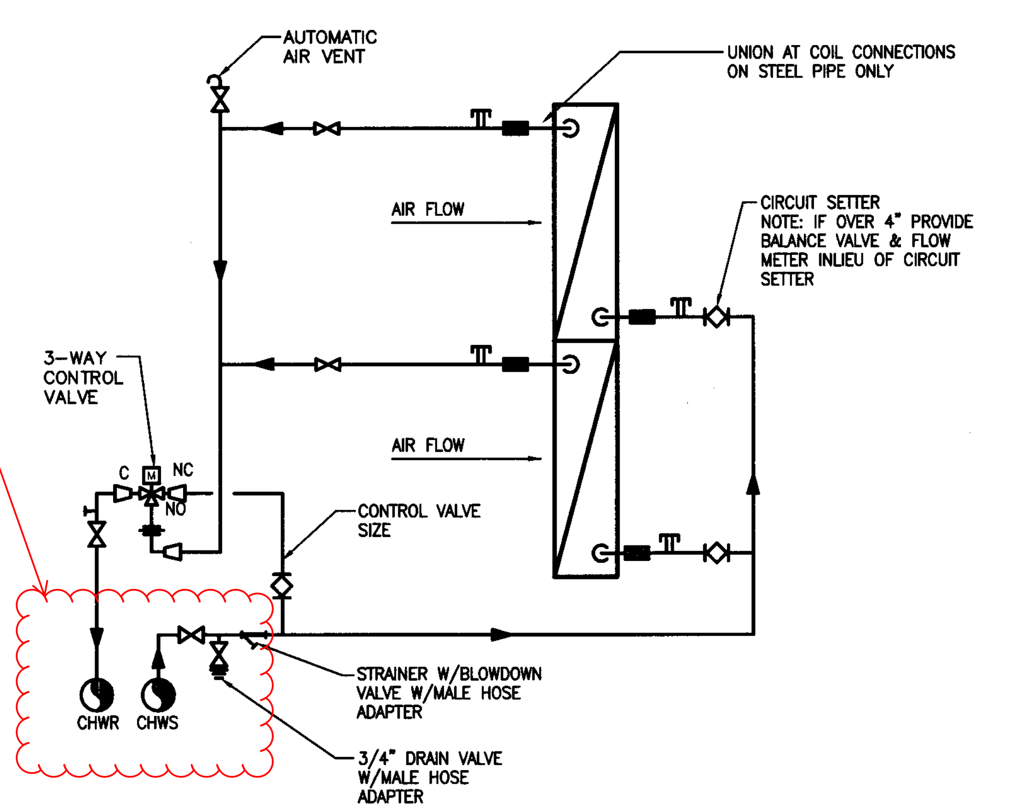
NO SCALE



2 AHU STACKED COIL PIPING

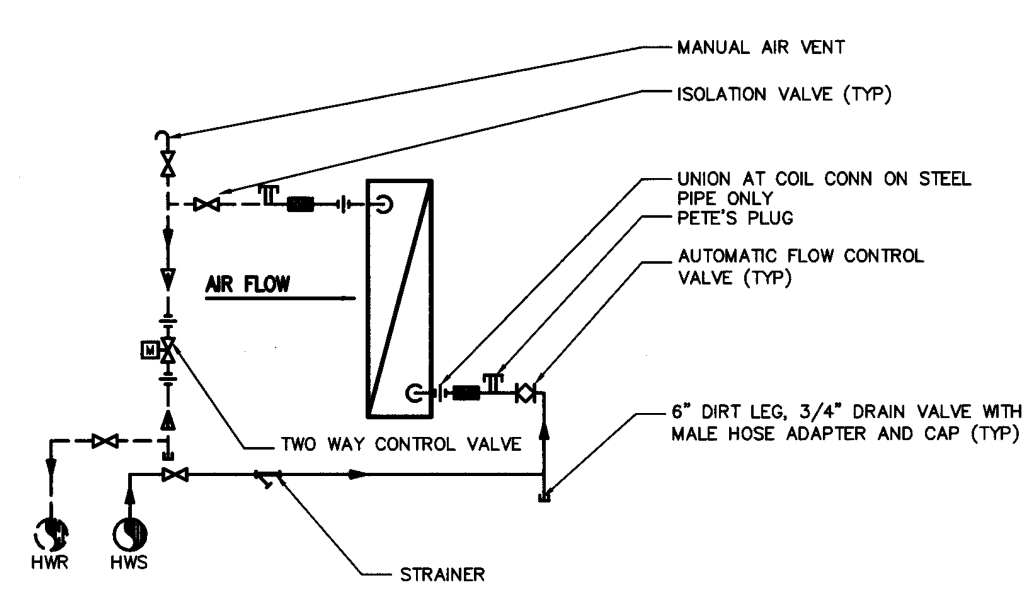
NO SCALE

UPDATED DETAIL (ADD#1, MR-4)



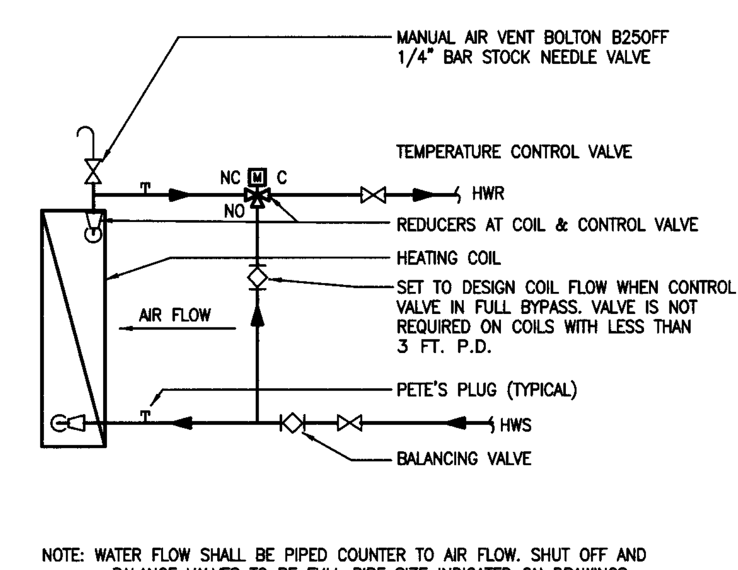
2 AHU STACKED COIL PIPING DIAGRAM (3-WAY)

NO SCALE



3 VAV COIL PIPNG DIAGRAM (2-WAY)

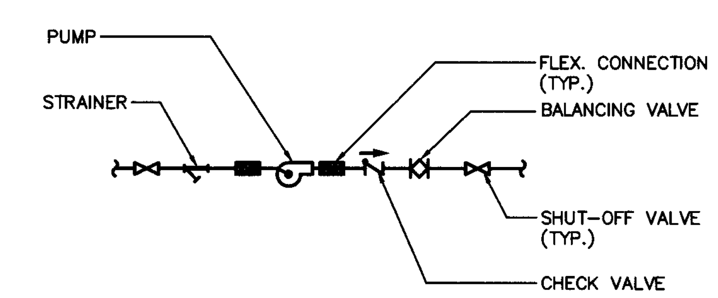
NO SCALE



NOTE: WATER FLOW SHALL BE PIPED COUNTER TO AIR FLOW. SHUT OFF AND BALANCE VALVES TO BE FULL PIPE SIZE INDICATED ON DRAWINGS.

4 VAV COIL PIPNG DIAGRAM (3-WAY)

NO SCALE



5 TYPICAL PUMP PIPE FIT-UP DIAGRAM

NO SCALE

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L-612 STUDENT SERVICES CENTER REMODEL COLLEGE COMPLEX

BID DOCUMENTS

LOS MEDANOS COLLEGE
2700 EAST LELAND DRIVE
PITTSBURG, CA 94565

owner

tBP project number : 20670.00

file name: 0106M51.dwg

drawn by: GE checked by: BC

date: JULY 31, 2012

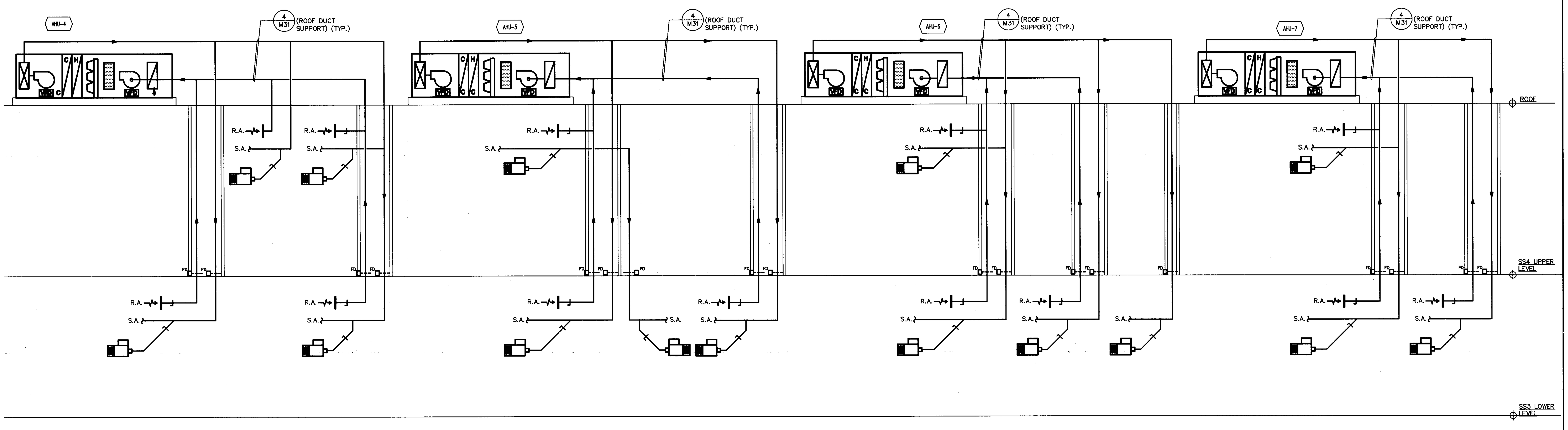
Rev:	date:	description:

drawing title:
HYDRONIC PIPING DIAGRAM

drawing no:
M-5.1

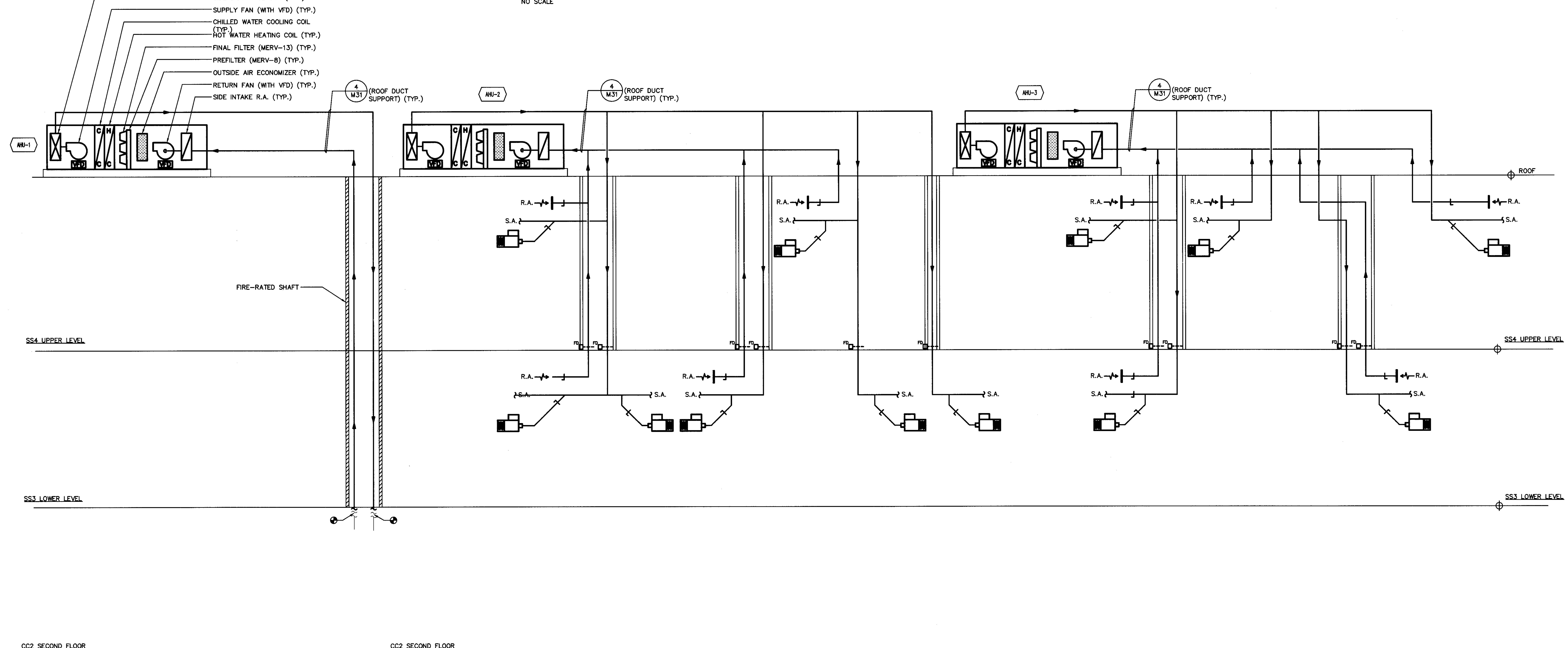
drawing of

FILE: 0106M51.DWG -- M51 | EDIT: 7/24/2012 3:51 PM BY ALLENL | PLOT: 7/25/2012 10:01 PM BY HAI PHAN



1 AIR FLOW DIAGRAM (STUDENT SERVICES CENTER)

NO SCALE



2 AIR FLOW DIAGRAM (STUDENT SERVICES CENTER)

NO SCALE

FILE: 0106M52.DWG - M52 | EDIT: 7/25/2012 7:38 PM BY SHAWNW | PLOT: 7/25/2012 10:00 PM BY HAI PHAN

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JUL 3 1 2012

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city, state, zip
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L-612 STUDENT SERVICES CENTER REMODEL COLLEGE COMPLEX

BID DOCUMENTS

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2700 EAST LELAND DRIVE
PITTSBURG, CA 94565

owner

tBP project number: 20610.00

file name: 0106M52.dwg

drawn by: GE checked by: BC

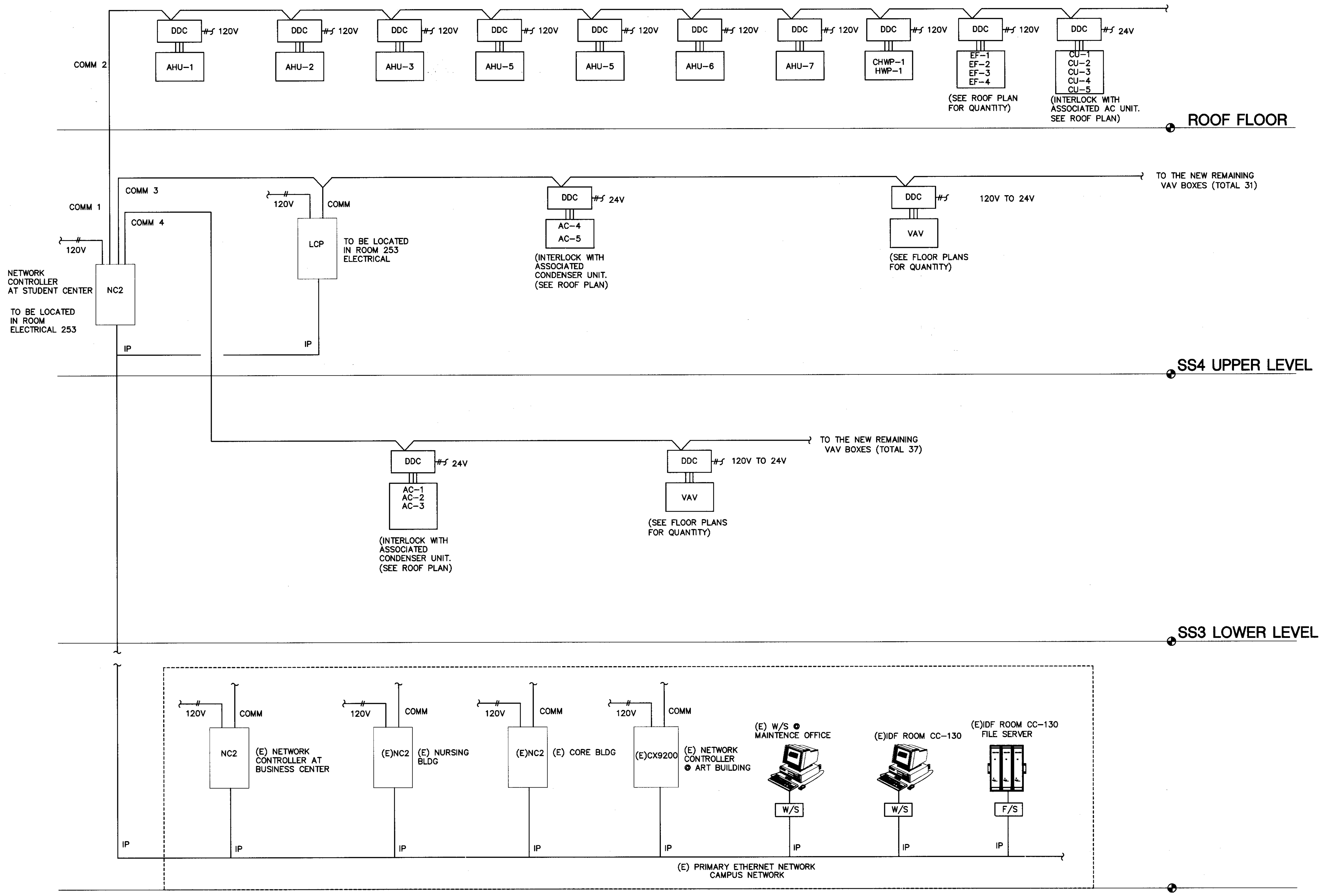
date: JULY 31, 2012

Rev. date: description:

drawing title:
AIR FLOW DIAGRAM

drawing no:
M-5.2

drawing of



1 DDC CONTROL ARCHITECTURE

NO SCALE

CAMPUS NETWORK (ANDOVER INFINET FAMILY)

CONTROL SHEET NOTES

DURING DEMO:

1 REMOVE EXISTING ANDOVER SXC 920 AND RETURN TO COLLEGE DISTRICT PERSONNEL FOR SALVAGING.

2 CAP OFF INFINET TO MAINTAIN NETWORK INTEGRITY

DURING INSTALL:

1 RUN INFINET TO NEW VAV CONTROLLERS FROM NEW NC2 NETWORK CONTROLLER.

2 KEEP CONTROL NETWORK UP AT ALL TIMES.

1. SMOKE DETECTOR SUPPLIED BY DIVISION 16
2. SMOKE DETECTOR INSTALLED BY DIVISION 15
3. SMOKE DETECTOR POWERED BY DIVISION 16
4. SMOKE DETECTOR CONTACTS TO BE HARD WIRED THROUGH BOTH SA & RA DRIVES BY CONTROLS CONTRACTOR

EBTRON AIR FLOW MONITORING STATIONS (AFMS) ARE FACTORY SUPPLIED AND INSTALLED AT MIN. OSA, RETURN AIR, SUPPLY AIR LOCATIONS. TO BE WIRED BY CONTROL CONTRACTOR

EACH FAN ARRAY SUPPLY/ RETURN FAN TO HAVE IT'S OWN VFD.

CONTROL DIAGRAM SYMBOLS LIST

ABBREVIATIONS

AFMS	AIR FLOW MEASURING STATION
AI	ANALOG INPUT
AO	ANALOG OUTPUT
BMS	BUILDING MANAGEMENT SYSTEM
CO2	CARBON DIOXIDE
CT	ELECTRIC CURRENT TRANSMITTER
DDC	DIRECT DIGITAL CONTROL
DI	DIGITAL INPUT
DO	DIGITAL OUTPUT
DP	PRESSURE SENSOR
EA	EXHAUST AIR
EF	EXHAUST FAN
HS	HIGH STATIC
HWR	HEATING HOT WATER RETURN
HWS	HOT WATER SUPPLY
M	MOTORIZED
MAU	MAKE UP AIR UNIT
M/S	STARTER
MD	MOTORIZED DAMPER
OA	OUTSIDE AIR
P	PRESSURE SENSOR
PPM	PART PER MILLION
RA	RETURN AIR
RF	FAN
SA	SUPPLY AIR
SF	SUPPLY FAN OR SQUARE FOOT
SD	SMOKE DETECTOR
T	TEMPERATURE SENSOR
TPI	THIRD PARTY INTERFACE
VFD	VARIABLE FREQUENCY DRIVE
XFMER	120V TO 24V TRANSFORMER

SYMBOLS

AI	ANALOG INPUT
A0	ANALOG OUTPUT
CT	ELECTRIC CURRENT TRANSMITTER
DDC	DIRECT DIGITAL CONTROL
DI	DIGITAL INPUT
D0	DIGITAL OUTPUT
DP DP	DIFFERENTIAL PRESSURE SENSOR
HS	HIGH STATIC
M/S	MOTOR STARTER
MD	MOTORIZED DAMPER
P	PRESSURE SENSOR
SD	SMOKE DETECTOR
T	TEMPERATURE SENSOR
TPI	THIRD PARTY INTERFACE (BACNET)
VFD	VARIABLE FREQUENCY DRIVE

NOTES:

A. PROVIDE THIRD PARTY INTERFACES, WHERE NOT PROVIDED BY MFR.

B. ALL CONTROL WIRING TO BE FURNISHED AND INSTALLED PER DIV. 15 & 16 SPECIFICATIONS. PLENUM RATED CABLE ABOVE REMOVABLE TILE CEILING, RACEWAY ABOVE HARD LID CEILINGS.

C. PROVIDE 24V POWER TO ALL CONTROL DEVICES. PROVIDE 120V POWER TO 24V TRANSFORMER FOR LOW VOLTAGE CONTROL POWER.

D. DIVISION 16 TO PROVIDE 120V POWER FOR ALL AIRFLOW MEASURING STATIONS AND BUILDING MANAGEMENT CONTROL SYSTEM INCLUDING ALL PANELS. FOLLOW DIV. 16 SPECIFICATIONS FOR PRODUCT AND INSTALLATION RELATED TO 120V POWER DISTRIBUTION, COORDINATE CIRCUITS DESIRED WITH ELECTRICAL.

E. PROVIDE DEVICES/PROGRAMMING OF BMS SYSTEM FOR OWNER OVERRIDE OF CONTROLLED SYSTEM.

F. MISCELLANEOUS POINTS: INTEGRATE BUILDING LIGHTING CONTROLS (SEE ELECTRICAL).

G. COLLEGE TO PROVIDE ALL TELECOMMUNICATIONS INFRASTRUCTURE REQUIRED FOR PROPER OPERATION OF SYSTEM AND COMMUNICATION TO DISTRICT CENTRAL AUTOMATION SYSTEMS. STATIC IP BMS NETWORK CONNECTION FOR NEW NETWORK CONTROLLER IN ELECTRICAL ROOM 253.

H. CONTROL DIAGRAMS, SEQUENCES, AND SPECIFICATIONS ARE PERFORMANCE BASED. PROVIDE FINAL SEQUENCES, POINTS LIST, TRENDING LIST, AND ARCHITECTURAL RISER DIAGRAMS (SEE SPECIFICATIONS).

CONTROLS CONTRACTOR TO COORDINATE SEQUENCES AND POINTS WITH SELECTED EQUIPMENT AT BID TIME.

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L-612 STUDENT SERVICES CENTER REMODEL COLLEGE COMPLEX

BID DOCUMENTS

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owner

tBP project number: 20610.00
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MECHANICAL CONTROL DIAGRAM

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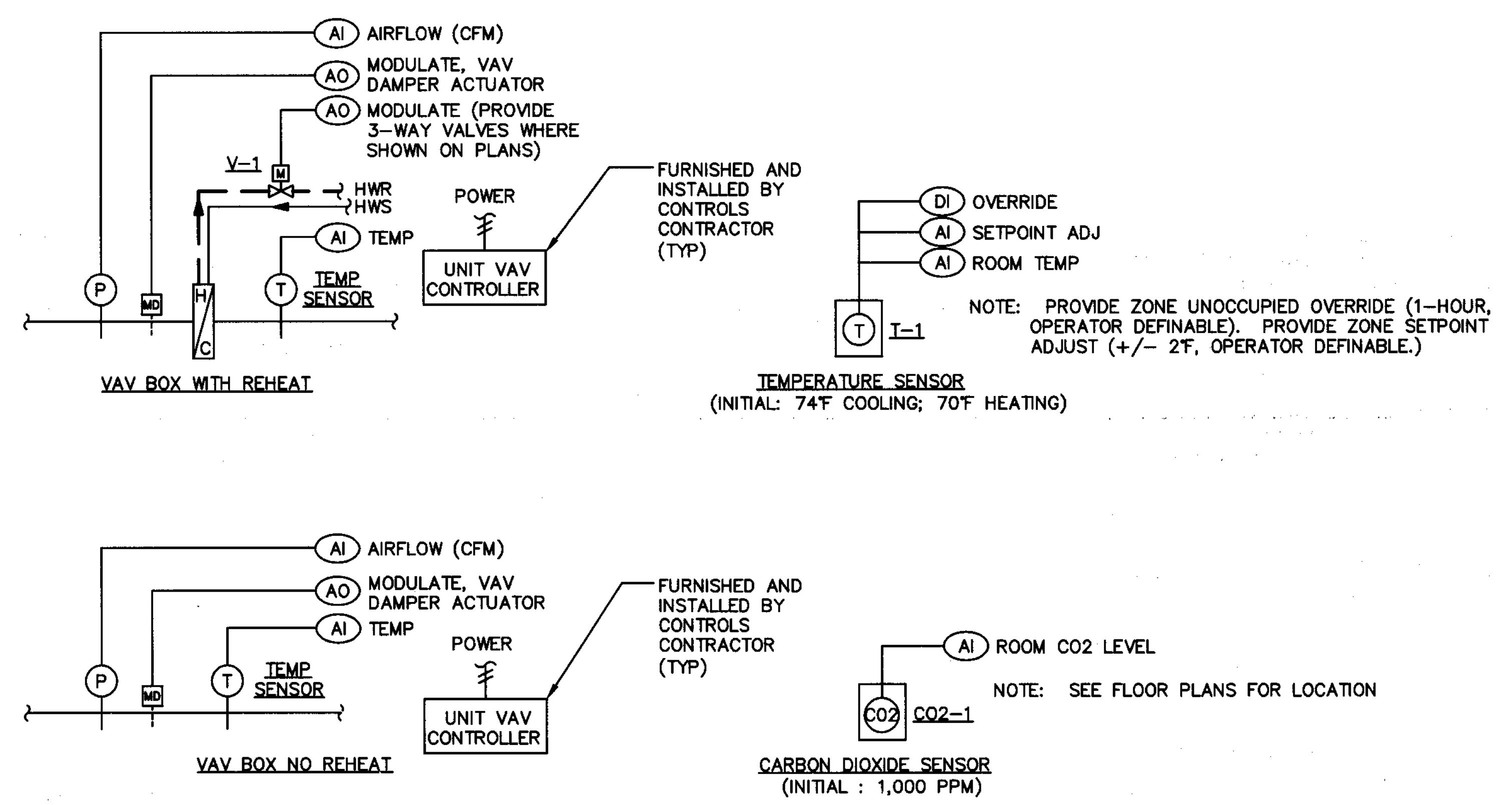
drawing of



SEQUENCE OF OPERATION:

RUN CONDITIONS:
THE TERMINAL UNIT CONTROLLER SHALL TAKE AN INPUT FROM THE ROOM TEMPERATURE SENSOR TO MODULATE THE VAV DAMPER ACTUATOR TO MAINTAIN THE SPACE ROOM TEMPERATURE.
PROVIDE ROOM TEMPERATURE SENSOR AT LOCATIONS AS INDICATED ON THE MECHANICAL FLOOR PLAN. FOR ZONES WITH MULTIPLE ROOM TEMPERATURE SENSORS, ONE SENSOR WILL BE THE MASTER ZONE SENSOR (OPERATOR DEFINABLE) FOR CONTROLLING THE VAV TERMINAL UNIT. AN ALARM WILL BE SENT IF THE ROOM TEMPERATURE AT ONE OF THE SECONDARY ROOM TEMPERATURE SENSORS IS FOUR (4) DEGREES (OPERATOR DEFINABLE) ABOVE OR BELOW THE MASTER ZONE SETPOINT.

OCCUPIED COOLING:
ONCE THE ZONE TEMPERATURE INCREASES ABOVE THE COOLING SETPOINT BY TWO (2) DEGREES (OPERATOR DEFINABLE) THE TERMINAL UNIT WILL GO INTO COOLING MODE, PRIMARY CFM SETPOINT WILL CHANGE TO THE MINIMUM FLOW INDICATED IN THE VAV TERMINAL UNIT SCHEDULE. IF SPACE TEMPERATURE DOES NOT MEET SETPOINT, INCREMENTALLY MODULATE AIRFLOW UPWARDS UNTIL TERMINAL UNIT REACHES MAXIMUM FLOW. A TWO (2) DEGREE BELOW SETPOINT DEADBAND WILL BE UTILIZED TO MINIMIZE CYCLING (OPERATOR DEFINABLE).

OCCUPIED HEATING:
ONCE THE ZONE TEMPERATURE DROPS BELOW THE HEATING SETPOINT BY TWO (2) DEGREES (OPERATOR DEFINABLE) THE TERMINAL UNIT WILL GO INTO THE HEATING MODE, PRIMARY CFM SETPOINT WILL CHANGE TO THE HEATING FLOW INDICATED IN THE VAV TERMINAL UNIT SCHEDULE. THE HEATING HOT WATER VALVE (V-1) WILL MODULATE TO MAINTAIN SPACE SETPOINT TEMPERATURE (OPERATOR DEFINABLE). IF SPACE TEMPERATURE DOES NOT MEET SETPOINT AND/ OR IF DISCHARGE TEMPERATURE IS ABOVE 100° F, INCREMENTALLY MODULATE AIRFLOW UPWARDS UNTIL TERMINAL UNIT REACHES MAXIMUM FLOW. A TWO (2) DEGREE ABOVE SETPOINT DEADBAND WILL BE UTILIZED TO MINIMIZE CYCLING (OPERATOR DEFINABLE).

MORNING WARM-UP:
DURING MORNING-WARM-UP, OPEN ALL VALVES (V-1) AND SET VAV TERMINAL UNIT TO MAXIMUM HEATING SETPOINT. IF AIR SYSTEM UNIT SERVING TERMINAL UNIT IS STILL IN HEATING AND ZONE HAS MET MORNING WARM-UP SET-POINT (70°F, OPERATOR DEFINABLE), MODULATE TERMINAL UNIT AIRFLOW TO MAINTAIN SETPOINT. UPON COMPLETION OF AIR SYSTEM MORNING WARM-UP SEQUENCE, RETURN TO OCCUPIED MODE.

DEMAND BASED VENTILATION:
IN ROOMS WITH CO2 SENSORS (CO2-1), SEE FLOOR PLANS FOR LOCATION, WHEN THE COOLING SETPOINT IS MET, THE CO2 SENSOR SHALL ALLOW THE TERMINAL UNIT TO REDUCE ITS AIRFLOW DOWN TO MINIMUM FLOW INDICATED IN THE VAV TERMINAL UNIT SCHEDULE. DOCUMENT THIS MINIMUM FLOW DURING BALANCING. CO2 LEVELS ARE TO BE MAINTAINED AT ALL TIMES. UPON SPIKE IN CO2 LEVELS, (INCREASE OVER SETPOINT BY MORE THAN 100 PPM WITHIN A ONE MINUTE INTERVAL, OPERATOR DEFINABLE), ALLOW ADEQUATE TIME FOR CO2 LEVELS TO STABILIZE PRIOR TO INCREASING PRIMARY AIRFLOW (THREE MINUTES, OPERATOR DEFINABLE). INCREMENTALLY MODULATE AIR FLOW UPWARDS UNTIL TERMINAL UNIT REACHES MAXIMUM FLOW AS INDICATED IN THE VAV TERMINAL UNIT SCHEDULE. USE PROPORTIONAL ONLY CONTROLS FOR DEMAND BASE CONTROL.

TRENDING:
AS A MINIMUM TREND THE FOLLOWING POINTS: SPACE TEMPERATURE, SPACE CO2, SUPPLY TEMPERATURE, AIRFLOW SUPPLY.

LOAD SHEDDING:
UPON BAS INPUT FOR LOAD SHEDDING, RESET ROOM TEMPERATURE SETPOINTS UPWARDS TWO (2) DEGREES F (OPERATOR DEFINABLE - COOLING) OR DOWNWARDS TWO (2) DEGREES F (OPERATOR DEFINABLE - HEATING).

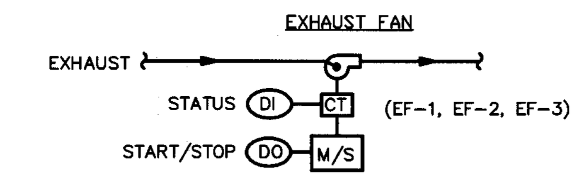
DUCT STATIC RE-SET:
MONITOR VAV TERMINAL UNIT AIRFLOW AND DAMPER ACTUATOR POSITION FOR USE IN AIR SYSTEM DUCT STATIC RESET STRATEGIES.

UNOCCUPIED MODE T-1: SET TO TITLE 24 SET-BACK TEMPERATURE; V-1 CLOSED. DAMPER CLOSED.

ALARMS :SEND AN ALARM IF VALVE (V-1) IS COMMANDED OPEN/CLOSE BUT DISCHARGE TEMPERATURE DOES NOT INDICATE CHANGE IN TEMPERATURE. SEND AN ALARM FOR HIGH DISCHARGE TEMPERATURE (GREATER THAN 105°F, OPERATOR DEFINABLE). SEND AN ALARM FOR LOW DISCHARGE AIR TEMPERATURE (LESS THAN 50°F, OPERATOR DEFINABLE).

1 VAV BOX CONTROL DIAGRAM

NO SCALE



SEQUENCE OF OPERATION:

EXHAUST FAN - ON/OFF

RUN CONDITIONS - SCHEDULED:
THE FAN SHALL RUN ACCORDING TO A USER DEFINABLE SCHEDULE.

FAN:
THE FAN SHALL HAVE AN OPERATOR DEFINABLE MINIMUM RUNTIME.

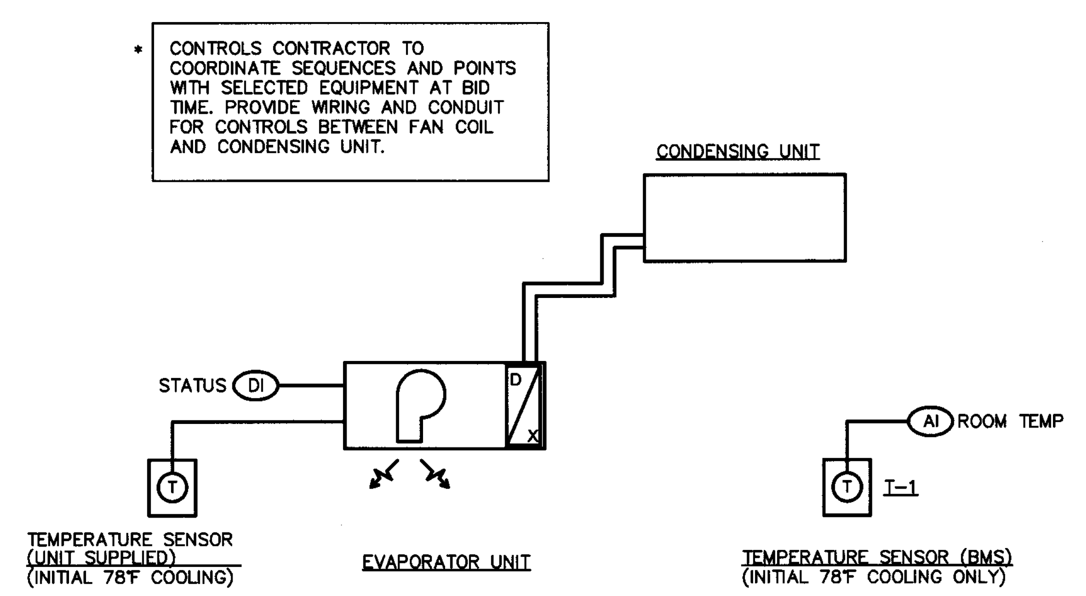
FAN STATUS
THE CONTROLLER SHALL MONITOR THE FAN STATUS.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

* FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
* FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
* FAN RUNTIME EXCEEDED: FAN STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT (OPERATOR DEFINABLE).

3 GENERAL EXHAUST FAN CONTROL DIAGRAM

NO SCALE



SEQUENCE OF OPERATION:

SPLIT SYSTEM: (AC-1, CU-1, AC-2, CU-2, AC-3, CU-3, AC-4, CU-4, AC-5, CU-5)

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 78 DEGREES F (OPERATOR DEFINABLE) COOLING SETPOINT.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

* HIGH ZONE TEMP: IF THE ZONE TEMPERATURE FROM THE BMS TEMP. SENSOR IS GREATER THAN THE COOLING SETPOINT BY A USER DEFINABLE AMOUNT (ADJ.).
* LOW ZONE TEMP: IF THE ZONE TEMPERATURE FROM THE BMS TEMP. SENSOR IS LESS THAN THE HEATING SETPOINT BY A USER DEFINABLE AMOUNT (ADJ.).

FAN:
THE FAN SHALL RUN THROUGH THE UNIT CONTROLLER ANYTIME THE UNIT IS COMMANDED TO RUN, UNLESS SHUTDOWN ON SAFETIES.

COOLING - 1 COMPRESSOR STAGE:
THE UNIT CONTROLLER SHALL MEASURE THE ZONE TEMPERATURE AND CYCLE THE COMPRESSOR TO MAINTAIN ITS SETPOINT THROUGH ITS OWN CONTROLLER. TO PREVENT SHORT CYCLING, THE STAGE SHALL HAVE AN OPERATOR DEFINABLE MINIMUM RUNTIME. THE COMPRESSOR SHALL RUN SUBJECT TO ITS OWN INTERNAL SAFETIES AND CONTROLS.

THE COOLING SHALL BE ENABLED WHENEVER:

* THE ZONE TEMPERATURE IS ABOVE THE COOLING SETPOINT.
* AND THE FAN IS ON.

FAN STATUS
THE BMS CONTROLLER SHALL MONITOR THE FAN (OR EVAPORATOR) STATUS.

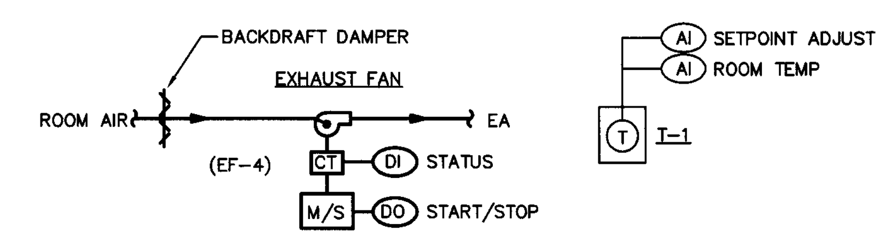
ALARMS SHALL BE PROVIDED AS FOLLOWS:

* FAN FAILURE: COMMANDED ON (BASED ON BMS TEMP. SETPOINT), BUT THE STATUS IS OFF.
* FAN IN HAND: COMMANDED OFF (BASED ON BMS TEMP. SETPOINT), BUT THE STATUS IS ON.

2 SPLIT SYSTEM CONTROL DIAGRAM

NO SCALE

RFI 233 - CONFIRM 2/M-6.2 SHOULD BE FOLLOW



SEQUENCE OF OPERATION:

RUN CONDITIONS - CONTINUOUS
THE UNIT SHALL BE CONTINUOUSLY ENABLED TO MAINTAIN A ZONE TEMPERATURE COOLING SETPOINT OF 78°F (ADJ.) WITH A 2°F DEADBAND (ADJ.).

ALARMS SHALL BE PROVIDED AS FOLLOWS:

* HIGH ZONE TEMP: IF THE ZONE TEMPERATURE IS GREATER THAN THE COOLING SETPOINT BY A USER DEFINABLE AMOUNT (ADJ.).

FAN:
THE FAN SHALL RUN ANYTIME THE ZONE TEMPERATURE RISES ABOVE COOLING SETPOINT BY 2°F (ADJ.) OR MORE, UNLESS SHUTDOWN ON SAFETIES.

FAN STATUS
THE CONTROLLER SHALL MONITOR THE FAN STATUS.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

* FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
* FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
* FAN RUNTIME EXCEEDED: FAN STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT (ADJ.).

4 EXHAUST FAN COOLING

NO SCALE

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OFFICE OF REGULATION SERVICES
APPL 01-112272
AC FLS SS
DATE JUL 3 1 2012

L-612 STUDENT SERVICES CENTER REMODEL COLLEGE COMPLEX
BID DOCUMENTS

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owner

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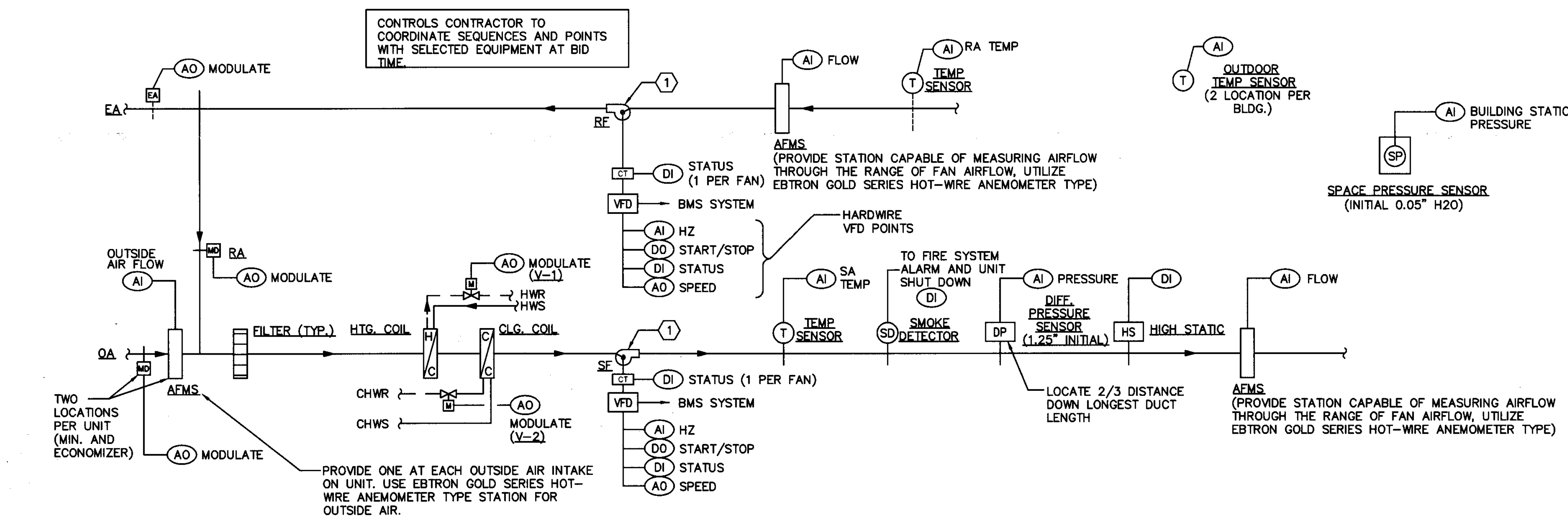
FILE: 0106M61, M62, M63.DWG -- M62 | EDIT: 7/25/2012 7:22 PM BY SHAWNW | PLOT: 7/25/2012 10:00 PM BY HAI PHAN

NOTE:

1. QTY. OF FANS DIFFERS PER AIR HANDLER (AHU). SEE AHU SCHEDULES FOR NUMBER OF FANS. POINTS SHOWN ARE PER FAN.

RFI 184 - CONFIRM 3-WAY ALVES FOR CHW AND HHW COIL PIPES AS SHOWN ON DETAIL 1/M-5.1



VARIABLE AIR VOLUME – AHU

RUN CONDITIONS – SCHEDULED:
THE UNIT SHALL RUN BASED UPON AN OPERATOR ADJUSTABLE SCHEDULE.

HIGH STATIC SHUTDOWN:
THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING A HIGH STATIC SHUTDOWN SIGNAL.

SUPPLY AIR SMOKE DETECTION:
THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING A SUPPLY AIR SMOKE DETECTOR STATUS.

UNIT OPTIMAL START:
THE UNIT SHALL START PRIOR TO SCHEDULED OCCUPANCY BASED ON THE TIME NECESSARY FOR THE ZONES TO REACH THEIR OCCUPIED SETPOINTS. THE START TIME SHALL AUTOMATICALLY ADJUST BASED ON CHANGES IN OUTSIDE AIR TEMPERATURE AND ZONE TEMPERATURES.

SCHEDULE TITLE 24 PRE–OCCUPANCY PURGE AND VENTILATION FOR 1–HOUR PRIOR TO MORNING WARM–UP OR COOL–DOWN.

UPON COMPLETION OF TITLE 24 PRE–OCCUPANCY PURGE AND VENTILATION, CLOSE OA DAMPERS (100%), OPEN RA DAMPER (100%), AND CLOSE EXHAUST DAMPER (100%), THEN START MORNING WARM–UP/COOL–DOWN. PROVIDE ECONOMIZER CONTROL FOR MORNING COOL–DOWN PER ECONOMIZER SEQUENCE. PROVIDE MORNING WARM–UP HEATING PER HEATING COIL SEQUENCE.

DEMAND LIMITING – SETPOINT ADJUST:
* THE SUPPLY AIR TEMPERATURE SETPOINT SHALL RELAX BY 2°F (OPERATOR DEFINABLE) FOR EACH DEMAND THRESHOLD EXCEEDED.
* THE SETPOINTS IN THE ZONES SUPPLIED BY THIS UNIT SHALL BE RELAXED AS SPECIFIED IN THE SEQUENCE OF OPERATIONS FOR THE ZONES. THIS SHALL IN TURN RELAX THE UNIT'S SUPPLY AIR TEMPERATURE SETPOINT BY A USER DEFINABLE AMOUNT.

ALL SETPOINTS SHALL AUTOMATICALLY RETURN TO THEIR PREVIOUS SETTINGS WHEN THE FACILITY POWER CONSUMPTION DROPS BELOW THE THRESHOLDS.

SUPPLY FAN(S):
THE SUPPLY FAN SHALL RUN ANYTIME THE UNIT IS COMMANDED TO RUN, UNLESS SHUTDOWN ON SAFETIES. TO PREVENT SHORT CYCLING, THE SUPPLY FAN SHALL HAVE AN OPERATOR DEFINABLE MINIMUM RUNTIME.
IF ANY INDIVIDUAL AIR HANDLER FAN FAILS AS DETECTED BY A RESPECTIVE CURRENT SENSOR AT EACH FAN WALL FAN, A FAN ALARM WILL BE GENERATED AT THE WORKSTATION ALARM BAR AND GRAPHIC.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
* SUPPLY FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
* SUPPLY FAN IN HAND: COMMAND OFF, BUT THE STATUS IS ON.
* SUPPLY FAN RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDS AN OPERATOR DEFINABLE LIMIT.

SUPPLY AIR DUCT STATIC PRESSURE CONTROL:
THE CONTROLLER SHALL MEASURE DUCT STATIC PRESSURE AND MODULATE THE SUPPLY FAN VFD SPEED TO MAINTAIN A DUCT STATIC PRESSURE SETPOINT. THE SPEED SHALL NOT DROP BELOW 25% (OPERATOR DEFINABLE). THE STATIC PRESSURE SETPOINT SHALL BE RESET BASED ON ZONE COOLING REQUIREMENTS.
* THE INITIAL DUCT STATIC PRESSURE SETPOINT SHALL BE 1.25IN H2O (OPERATOR DEFINABLE).
* AS AIRFLOW REQUEST INCREASES, THE SETPOINT SHALL INCREMENTALLY RESET UP TO A MAXIMUM OF 2.0IN H2O (OPERATOR DEFINABLE).
* AS AIRFLOW REQUEST DECREASES, THE SETPOINT SHALL INCREMENTALLY RESET DOWN TO A MINIMUM OF 0.5IN H2O (OPERATOR DEFINABLE).

ONE AIRFLOW REQUEST IS DEFINED AS ANY VAV BOX WITH A DAMPER POSITION GREATER THAN 90% (OPERATOR DEFINABLE) SETPOINT CHANGE EVALUATION INTERVAL SET TO 5 MINUTES (OPERATOR DEFINABLE) SETPOINT CHANGE INCREMENT SET TO 0.05" WG (OPERATOR DEFINABLE).

ALARM SHALL BE PROVIDED AS FOLLOWS:
* HIGH SUPPLY AIR STATIC PRESSURE: IF THE SUPPLY AIR STATIC PRESSURE IS 25% (OPERATOR DEFINABLE) GREATER THAN SETPOINT.
* LOW SUPPLY AIR STATIC PRESSURE: IF THE SUPPLY AIR STATIC PRESSURE IS 25% (OPERATOR DEFINABLE) LESS THAN SETPOINT.
* SUPPLY FAN VFD FAULT.

RETURN FAN(S):
THE RETURN FAN SHALL RUN WHENEVER THE SUPPLY FAN RUNS.
IF ANY INDIVIDUAL AIR HANDLER FAN FAILS AS DETECTED BY A RESPECTIVE CURRENT SENSOR AT EACH FAN WALL FAN, A FAN ALARM WILL BE GENERATED AT THE WORKSTATION ALARM BAR AND GRAPHIC.

ALARM SHALL BE PROVIDED AS FOLLOWS:
* RETURN FAN FAILURE: COMMAND ON, BUT THE STATUS IS OFF.
* RETURN FAN IN HAND: COMMAND OFF, BUT THE STATUS IS ON.
* RETURN FAN RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT (OPERATOR DEFINABLE).
* RETURN FAN VFD FAULT.

BUILDING STATIC PRESSURE CONTROL:
THE CONTROLLER SHALL MEASURE BUILDING STATIC PRESSURE AND MODULATE THE RETURN FAN VFD SPEED TO MAINTAIN A BUILDING STATIC PRESSURE SETPOINT OF 0.05IN H2O (OPERATOR DEFINABLE). THE RETURN FAN VFD SPEED SHALL NOT DROP BELOW 20% (OPERATOR DEFINABLE).

ALARMS SHALL BE PROVIDED AS FOLLOWS:
* HIGH BUILDING STATIC PRESSURE: IF THE BUILDING AIR STATIC PRESSURE IN 25% (OPERATOR DEFINABLE) GREATER THAN SETPOINT.
* LOW BUILDING STATIC PRESSURE: IF THE BUILDING AIR STATIC PRESSURE IS 25% (OPERATOR DEFINABLE) LESS THAN SETPOINT.

HEATING COIL VALVE (PRE–HEATING):
THE CONTROLLER SHALL MEASURE THE MIXED AIR TEMPERATURE AND MODULATE THE UNIT'S HEATING COIL VALVE (V–1) TO MAINTAIN SUPPLY AIR TEMPERATURE.

THE HEATING SHALL BE ENABLED WHENEVER:
* OUTSIDE AIR TEMPERATURE IS LESS THAN 60°F (OPERATOR DEFINABLE).
* AND THE ECONOMIZER (IF PRESENT) IS DISABLED.
* AND THE SUPPLY FAN STATUS IS ON.

THE HEATING COIL VALVE (V–1) SHALL MODULATE TO MAINTAIN SUPPLY AIR TEMPERATURE SETPOINT 5°F (OPERATION DEFINABLE) ABOVE SUPPLY AIR TEMPERATURE SETPOINT WHENEVER:
* ALL TERMINAL UNITS ARE IN HEATING.

FREEZE PROTECTION:
DURING UNIT OPERATION THE HEATING COIL WILL PROVIDE FREEZE PROTECTION WHILE MAINTAINING SUPPLY AIR SETPOINT. SHOULD THE SUPPLY AIR TEMPERATURE DROP BELOW 32 DEGREES, A FREEZE ALARM SHALL BE INDICATED, THE AHU WILL SHUTDOWN, VALVES OPENED AND PUMPS TURNED ON. DURING OFF HOURS, AN OUTSIDE AIR TEMPERATURE BELOW 32 DEGREES WILL TURN PUMPS ON AND OPEN VALVES.

SUPPLY AIR TEMPERATURE SETPOINT – OPTIMIZED:
THE CONTROLLER SHALL MONITOR THE SUPPLY AIR TEMPERATURE AND SHALL MAINTAIN A SUPPLY AIR TEMPERATURE SETPOINT RESET BASED ON ZONE COOLING AND HEATING REQUIREMENTS

THE SUPPLY AIR TEMPERATURE SETPOINT SHALL BE RESET FOR COOLING BASED ON ZONE COOLING REQUIREMENTS AS FOLLOWS:
* THE INITIAL SUPPLY AIR TEMPERATURE SETPOINT SHALL BE 60°F (OPERATOR DEFINABLE).
* AS COOLING DEMAND INCREASES, THE SETPOINT SHALL INCREMENTALLY RESET DOWN TO A MINIMUM OF 53°F (OPERATOR DEFINABLE).
* AS COOLING DEMAND DECREASES, THE SETPOINT SHALL INCREMENTALLY RESET UP TO A MAXIMUM OF 70°F (OPERATOR DEFINABLE).
* DURING MORNING COOL–DOWN PROVIDE SUPPLY AIR TEMPERATURE AT 55°F (OPERATOR DEFINABLE) UNTIL SPACE TEMPERATURE IN ALL ZONES REACH 74°F (OPERATOR DEFINABLE).

COOLING DEMAND IS DEFINED AS ANY VAV BOX WITH AN AIR FLOW SETPOINT EQUAL TO OR GREATER THAN 90% (OPERATOR DEFINABLE) SETPOINT CHANGE EVALUATION INTERVAL SET INITIALLY TO 5 MINUTES (OPERATOR DEFINABLE) SETPOINT CHANGE INCREMENT SET TO 1.0 DEGREE (OPERATOR DEFINABLE) OPERATOR TO HAVE CAPABILITY TO REMOVE ROGUE ZONES FROM RESET CALCULATION.

COOLING MODULATION:
THE CONTROLLER SHALL MEASURE THE SUPPLY AIR TEMPERATURE AND MODULATE CHILLED WATER VALVE (V–2) TO MAINTAIN ITS COOLING SETPOINT.

THE COOLING SHALL BE ENABLED WHENEVER:
* OUTSIDE AIR TEMPERATURE IS GREATER THAN 58°F (OPERATOR DEFINABLE).
* AND THE ECONOMIZER (IF PRESENT) IS NOT CAPABLE OF MEETING COOLING DEMAND BY ITSELF.
* AND THE SUPPLY FAN STATUS IS ON.
* AND THE HEATING (IF PRESENT) IS NOT ACTIVE.

MORNING COOL–DOWN SEQUENCE SHALL BE ENABLED WHENEVER:
* THE BUILDING IS IN MORNING COOL–DOWN BASED ON UNIT OPTIMAL START SEQUENCE.
* OR THE BUILDING TEMPERATURE GETS UP TO 80°F (OPERATOR DEFINABLE).

ALARMS SHALL BE PROVIDED AS FOLLOWS:
* HIGH SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS 5°F (OPERATOR DEFINABLE) GREATER THAN SETPOINT.
* LOW SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS 5°F (OPERATOR DEFINABLE) LOWER THAN SETPOINT.

HEATING COIL VALVE (MORNING WARM–UP):
THE CONTROLLER SHALL OPEN HEATING COIL VALVE (V–1) TO ITS MAXIMUM FLOW (AS SCHEDULED) UNTIL SPACE TEMPERATURE IS 70°F (OPERATOR DEFINABLE), AT WHICH TIME THE SYSTEM WILL RETURN TO OCCUPIED MODE.

THIS HEATING SEQUENCE SHALL BE ENABLED WHENEVER:
* THE BUILDING IS IN MORNING WARM–UP BASED ON UNIT OPTIMAL START OF SEQUENCE.
* OR BUILDING TEMPERATURES GET DOWN TO 55°F (OPERATOR DEFINABLE).
* AND THE SUPPLY FAN STATUS IS ON.
* AND THE COOLING (IF PRESENT) IS NOT ACTIVE.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
* LOW SUPPLY AIR TEMP: IF HEATING COIL VALVE (V–1) IS COMMANDED OPEN BUT THERE IS NO CHANGE IN SUPPLY AIR TEMPERATURE.

ECONOMIZER:
THE CONTROLLER SHALL MEASURE THE MIXED AIR TEMPERATURE AND MODULATE THE ECONOMIZER DAMPERS (OUTSIDE AIR, RETURN AIR, EXHAUST AIR) IN SEQUENCE TO MAINTAIN A SETPOINT 2°F (OPERATOR DEFINABLE) LESS THAN THE SUPPLY AIR TEMPERATURE SETPOINT. THE OUTSIDE AIR DAMPERS SHALL MAINTAIN A MINIMUM ADJUSTABLE POSITION EQUAL TO UNIT SCHEDULED MINIMUM VENTILATION WHENEVER OCCUPIED.

THE ECONOMIZER SHALL BE ENABLED WHENEVER:
* THE OUTSIDE AIR TEMPERATURE (DRY BULB) IS LESS THAN THE RETURN AIR TEMPERATURE (DRY BULB) BY 2°F (OPERATOR DEFINABLE).
* AND THE SUPPLY FAN STATUS IS ON.

THE ECONOMIZER SHALL CLOSE WHENEVER:
* WHEN THE OUTSIDE AIR TEMPERATURE (DRY BULB) IS HIGHER THAN 2°F (OPERATOR DEFINABLE) LESS THAN RETURN AIR TEMPERATURE.
* OR ON LOSS OF SUPPLY FAN STATUS.

ALL DAMPERS SHALL CLOSE WHEN THE UNIT IS OFF. IF OPTIMAL START UP IS AVAILABLE THE MIXED AIR DAMPER SHALL OPERATE AS DESCRIBED IN THE OCCUPIED MODE EXCEPT THAT THE OUTSIDE AIR DAMPER SHALL MODULATE TO FULLY CLOSED.

MINIMUM OUTSIDE AIR VENTILATION:
WHEN IN THE OCCUPIED MODE, THE CONTROLLER SHALL MEASURE THE OUTSIDE AIRFLOW AND

MODULATE THE OUTSIDE AIR DAMPERS TO MAINTAIN THE PROPER MINIMUM OUTSIDE AIR VENTILATION, OVERRIDING NORMAL DAMPER CONTROL. ON DROPPING OUTSIDE AIRFLOW, THE CONTROLLER SHALL MODULATE THE OUTSIDE AIR DAMPERS OPEN TO MAINTAIN THE OUTSIDE AIRFLOW SETPOINT (OPERATOR DEFINABLE). WHERE THE STANDARD PACKAGE UNIT OUTSIDE AIRFLOW MEASURING STATION CANNOT RECORD AIRFLOWS SCHEDULED, PROVIDE HOT WIRE ANEMOMETER TYPE STATION.

MIXED AIR TEMPERATURE:
THE CONTROLLER SHALL MONITOR THE MIXED AIR TEMPERATURE AND USE AS REQUIRED FOR ECONOMIZER CONTROL (IF PRESENT) OR PREHEATING CONTROL (IF PRESENT).

ALARMS SHALL BE PROVIDED AS FOLLOWS:
* HIGH MIXED AIR TEMP: IF THE MIXED AIR TEMPERATURE IS GREATER THAN 90°F (OPERATOR DEFINABLE).
* LOW MIXED AIR TEMP: IF THE MIXED AIR TEMPERATURE IS LESS THAN 45°F (OPERATOR DEFINABLE).

RETURN AIR TEMPERATURE:
THE CONTROLLER SHALL MONITOR THE RETURN AIR TEMPERATURE AND USE AS REQUIRED FOR SETPOINT CONTROL OR ECONOMIZER CONTROL (IF PRESENT).

ALARMS SHALL BE PROVIDED AS FOLLOWS:
* HIGH RETURN AIR TEMP: IF THE RETURN AIR TEMPERATURE IS GREATER THAN 90°F (OPERATOR DEFINABLE).
* LOW RETURN AIR TEMP: IF THE RETURN AIR TEMPERATURE IS LESS THAN 45°F (OPERATOR DEFINABLE).

SUPPLY AIR TEMPERATURE:
THE CONTROLLER SHALL MONITOR THE SUPPLY AIR TEMPERATURE.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
* HIGH SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS GREATER THAN 100°F (OPERATOR DEFINABLE)
* LOW SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS LESS THAN 50°F (OPERATOR DEFINABLE).

UNOCCUPIED MODE T–1: SET TO TITLE 24 SET–BACK TEMPERATURE; VALVES CLOSED. ALL MOTORIZED CONTROL DAMPERS CLOSED.

1 AHU-1 THROUGH AHU-7 CONTROL DIAGRAM (WITH VFD & BLDG STATIC)

NO SCALE

SEQUENCE OF OPERATION:

CHILLED WATER SYSTEM RUN CONDITIONS:
THE CHILLED WATER SYSTEM SHALL BE ENABLED TO RUN WHENEVER:
* A DEFINABLE NUMBER OF ZONES OR COOLING COILS NEED COOLING, MINIMUM ONE (OPERATOR DEFINABLE) CONTRACTOR TO MEASURE MINIMUM PUMP FLOW TO PREVENT DEAD HEAD CONDITION.
* AND OUTSIDE AIR TEMPERATURE IS HIGHER THAN 60°F (OPERATOR DEFINABLE).
* AND CAMPUS CHILLER PLANT IS ENABLED.

TO PREVENT SHORT CYCLING, THE PUMPING SYSTEM SHALL RUN FOR AND BE OFF FOR MINIMUM ADJUSTABLE TIMES (BOTH OPERATOR DEFINABLE), UNLESS SHUTDOWN ON SAFETIES OR OUTSIDE AIR CONDITIONS.

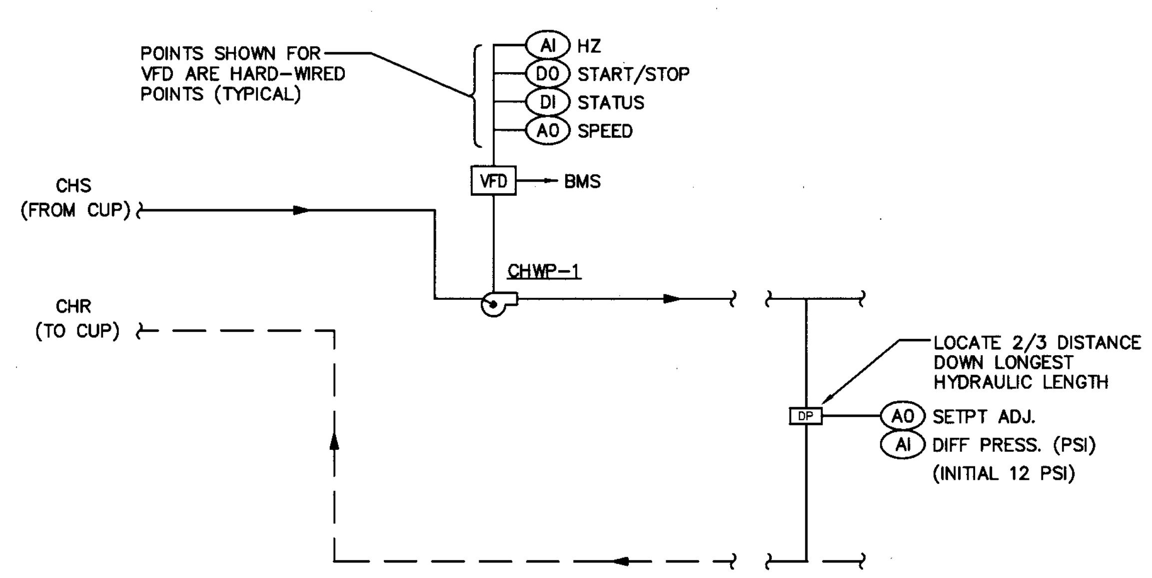
CHILLED WATER PUMP ALARMS:
ALARMS SHALL BE PROVIDED AS FOLLOWS:
* CHILLED WATER PUMP 1
  - FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
  - RUNNING IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
  - RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT.
  - VFD FAULT.

CHILLED WATER DIFFERENTIAL PRESSURE CONTROL:
THE CONTROLLER SHALL MEASURE CHILLED WATER DIFFERENTIAL PRESSURE AND MODULATE THE CHILLED WATER PUMP VFD TO MAINTAIN ITS CHILLED WATER DIFFERENTIAL PRESSURE SETPOINT.

THE FOLLOWING SETPOINTS ARE RECOMMENDED VALUES. ALL SETPOINTS SHALL BE FIELD ADJUSTED DURING THE COMMISSIONING PERIOD TO MEET THE REQUIREMENTS OF ACTUAL FIELD CONDITIONS.

THE CONTROLLER SHALL MODULATE CHILLED WATER PUMP SPEED TO MAINTAIN A CHILLED WATER DIFFERENTIAL PRESSURE OF 12 PSI (OPERATOR DEFINABLE). THE VFD MINIMUM SPEED SHALL NOT DROP BELOW 20% (ADJ.).

ALARMS SHALL BE PROVIDED AS FOLLOWS:
* HIGH CHILLED WATER DIFFERENTIAL PRESSURE: IF 30% (OPERATOR DEFINABLE) GREATER THAN SETPOINT.
* LOW CHILLED WATER DIFFERENTIAL PRESSURE: IF 30% (OPERATOR DEFINABLE) LESS THAN SETPOINT.



2 CHILLED WATER PUMP CONTROL (CHWP-1)

NO SCALE

SEQUENCE OF OPERATION:

HEATING SYSTEM RUN CONDITIONS:
THE HEATING SYSTEM SHALL BE ENABLED TO RUN WHENEVER:
* A DEFINABLE NUMBER OF ZONES OR HOT WATER COILS NEED HEATING DURING THEIR RESPECTIVE SCHEDULED OCCUPIED RUN TIMES, MINIMUM TWO (OPERATOR DEFINABLE) CONTRACTOR TO MEASURE MINIMUM PUMP FLOW TO PREVENT DEAD HEAD CONDITION.
* AND OUTSIDE AIR TEMPERATURE IS LESS THAN 65°F (OPERATOR DEFINABLE).
* AND CAMPUS CENTRAL HEATING PLAN IS ENABLED.

TO PREVENT SHORT CYCLING, THE PUMPING SYSTEM SHALL RUN FOR AND BE OFF FOR MINIMUM ADJUSTABLE TIMES (BOTH OPERATOR DEFINABLE), UNLESS SHUTDOWN ON SAFETIES OR OUTSIDE AIR CONDITIONS.

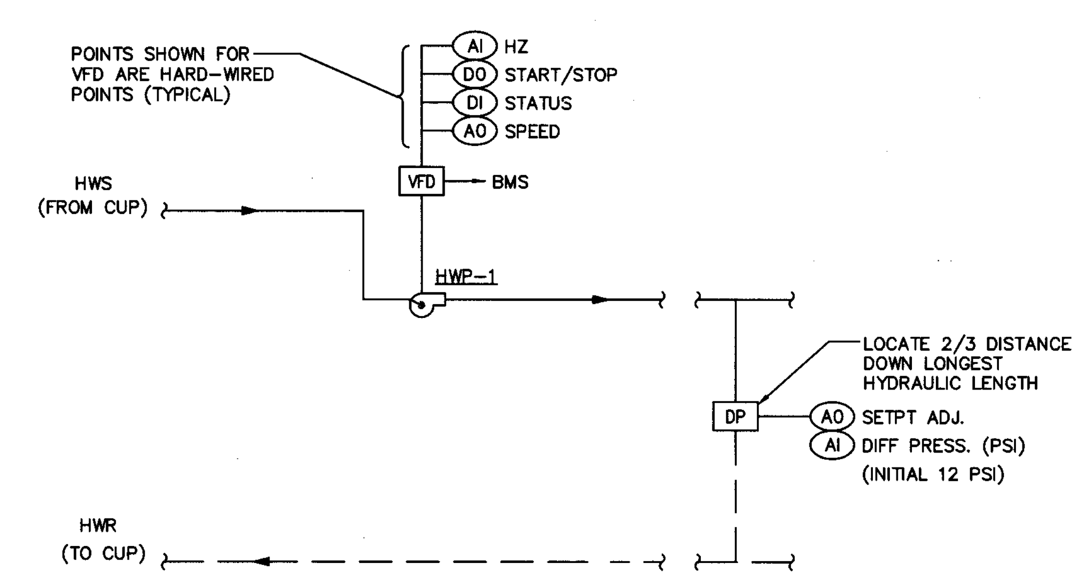
HOT WATER PUMP ALARMS:
ALARMS SHALL BE PROVIDED AS FOLLOWS:
* HOT WATER PUMP 1
  - FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
  - RUNNING IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
  - RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT.
  - VFD FAULT.

HOT WATER DIFFERENTIAL PRESSURE CONTROL:
THE CONTROLLER SHALL MEASURE HOT WATER DIFFERENTIAL PRESSURE AND MODULATE THE HOT WATER PUMP VFD TO MAINTAIN ITS HOT WATER DIFFERENTIAL PRESSURE SETPOINT.

THE FOLLOWING SETPOINTS ARE RECOMMENDED VALUES. ALL SETPOINTS SHALL BE FIELD ADJUSTED DURING THE COMMISSIONING PERIOD TO MEET THE REQUIREMENTS OF ACTUAL FIELD CONDITIONS.

THE CONTROLLER SHALL MODULATE HOT WATER PUMP SPEED TO MAINTAIN A HOT WATER DIFFERENTIAL PRESSURE OF 12 PSI (OPERATOR DEFINABLE). THE VFD MINIMUM SPEED SHALL NOT DROP BELOW 20% (ADJ.).

ALARMS SHALL BE PROVIDED AS FOLLOWS:
* HIGH HOT WATER DIFFERENTIAL PRESSURE: IF 30% (OPERATOR DEFINABLE) GREATER THAN SETPOINT.
* LOW HOT WATER DIFFERENTIAL PRESSURE: IF 30% (OPERATOR DEFINABLE) LESS THAN SETPOINT.



3 HOT WATER PUMP CONTROL (HWP-1)

NO SCALE

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