WHITE PAPER

SWEATHOUZ

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DESIGNED & CONCEPTUALIZED BY

NY-ENGINEERS

OVERVIEW OF CHALLENGE IN THE PROJECT

SweatHouz was planning to open a new healthcare centre at Seattle, Washington in an existing commercial building. The building had a shared hot and cold water connection from an existing water source heat pump unit with capped condenser water connection. The commercial building had its own electric supply and water supply shared with multiple occupants.

We had a multiple challenge while designing this project-

1. Fulfil owner's requirement to utilize the existing heat pump unit connection and existing utility services to minimize the cost in our design.
2. Maintain temperature of the sauna rooms and making sure operations of other existing tenants are not affected
3. Reduce the energy consumption by designing MEP systems effectively.

YOUR ONE STOP SHOP FOR ALL MEP DESIGN NEEDS

OUR CUSTOM SOLUTION

Our team of experts performed the load calculation to understand and verify required heating and cooling load. We designed the HVAC system by accommodating new load to exiting. For sauna rooms to maintain the required temperature, we designed a separate exhaust system. New water and electrical power requirements was calculated and accommodated in the existing services to meet local and SweatHouz's standards.

By successfully designing this complicated project, we managed to utilize existing water and electric utilities to save the cost for an owner. The entire franchise was designed within 2 weeks in an affordable cost.

Area - 1450 Sq. Ft.
Services Used - Mechanical, Electrical, Plumbing

SCOPE OF WORK

USE EXISTING 4 TON WATER SOURCE HEAT PUMP UNITS. PROVIDE MODIFICATIONS TO DUCT AS SHOWN AND PROVIDE NEW DUCTWORK WHERE NECESSARY AND PROVIDE NECESSARY ACCESSORIES FOR COMPLETE HVAC SYSTEMS.

PROVIDE 1 EXHAUST FANS FOR SHOWER ROOMS. 1

COORDINATE WITH GC ANY ADDITIONAL REFRIGERATION WORK REQUIRED AND PLUMBING CONTRACTOR PROVIDING CONDENSATE LINES FOR MECHANICAL EQUIPMENTS.

EXISTING CONTIDITONS NOTES

STOP AND READ

THE CONTRACTOR AND SUB-CONTRACTORS **SHALL NOT INITIATE ANY WORK UNTIL EXISTING FIELD CONDITIONS ARE PROPERLY VERIFIED**. THIS SHALL HOLD TRUE FOR FIRST GENERATION AND 2ND GENERATION SPACES. WHEN DEMOLITION IS REQUIRED, THAT WILL BE PERMITTED TO EXPOSE CONDITIONS. THESE VERIFICATIONS SHALL INCLUDE BUT NOT LIMITED TO: DIMENSIONS BOTH HORIZONTALLY AND VERTICAL, ELECTRICAL SERVICE /PANELS LOCATION AND VOLTS/PHASE, LOCATION/QTY OF ROOF MOUNTED HVAC EQUIPMENT, CONFIRM THAT INTERIOR HVAC HUNG UNITS HAVE PROPER SUPPORT CONNECTIONS FOR EXISTING STRUCTURE, FIRE SPRINKLER MAIN RUNS, TOILET ROOM DIMENSIONS, DOOR SWING FOR DOORS TO REMAIN AND ETC. IF NOT VERIFIED AND DISCOVERED AT A LATER TIME, THE CONTRACTOR SHALL REIMBURSE THE ARCHITECT FOR THE REDESIGN FEE. THIS DOES NOT INCLUDE HIDDEN WORK I.E. PITCH OF SANITARY LINES, ACTUAL CONDITIONS OF EXISTING HVAC EQUIPMENT, STRUCTURAL COLUMNS/BEARING WALLS OR CONDITIONS OF GREASE INTERCEPTORS AND ETC.

GENERAL NOTES

A. CONTRACTORS AND SUB-CONTRACTORS SHALL CAREFULLY REVIEW THE CONSTRUCTION DOCUMENTS. INFORMATION REGARDING THE COMPLETE WORK IS DISPERSED THROUGHOUT THE DOCUMENT SET AND CANNOT BE ACCURATELY DETERMINED WITHOUT REFERENCE TO THE COMPLETE DOCUMENT SET. PAY SPECIAL ATTENTION TO THE RESPONSIBILITY SCHEDULE. WORK DESIGNATED ON SCHEDULE SHALL BE CONSIDERED INCLUDED IN YOUR SCOPE OF WORK AND CONTRACT AMOUNT.

B. CONTRACTOR TO VERIFY THAT ALL EQUIPMENT SHOWN AS EXISTING MATCHES THE DESCRIPTIONS AND SPECIFICATIONS SHOWN ON DRAWINGS AND SCHEDULES. IF DIFFERENT NOTIFY ARCHITECT/ENGINEER BEFORE BIDDING, ORDERING, OR PROCEEDING WITH WORK.

C. DRAWINGS/DETAILS ARE TO BE CONSIDERED DIAGRAMMATIC, NOT NECESSARILY SHOWING IN DETAIL OR TO SCALE ALL MINOR ITEMS. UNLESS SPECIFIC DIMENSIONS ARE SHOWN, THE STRUCTURAL, ARCHITECTURAL AND SITE CONDITIONS SHALL GOVERN EXACT LOCATIONS. CONTRACTOR SHALL FOLLOW DRAWINGS IN LAYING OUT WORK, AND CHECK/COORDINATE DRAWINGS OF ALL TRADES.

D. COORDINATE WITH THE WORK OF OTHERS SECTIONS, EQUIPMENT FURNISHED BY OTHERS, REQUIREMENTS OF THE OWNER, AND WITH THE CONSTRAINTS OF THE EXISTING CONDITIONS OF THE PROJECT SITE. PROVIDE DUCT RISES AND DRIPS AS REQUIRED FOR FIELD INSTALLATION AND TRADE COORDINATION. NOTIFY ARCHITECT OF ANY DISCREPANCIES BEFORE STARTING WORK.

E. DRAWINGS FOR HVAC WORK ARE DIAGRAMMATIC, SHOWING THE GENERAL LOCATION, TYPE, LAYOUT, AND EQUIPMENT REQUIRED. THE DRAWINGS SHALL NOT BE SCALED FOR EXACT MEASUREMENT. REFER TO MANUFACTURER'S STANDARD INSTALLATION DRAWINGS FOR EQUIPMENT CONNECTIONS AND INSTALLATION REQUIREMENTS. PROVIDE DUCTWORK, CONNECTIONS, ACCESSORIES, OFFSETS, AND MATERIALS NECESSARY FOR A COMPLETE SYSTEM.

F. ALL WORK SHALL COMPLY WITH STATE AND LOCAL CODE REQUIREMENTS AS APPROVED AND AMENDED BY THE GOVERNING CITY. PURCHASE ALL PERMITS ASSOCIATED WITH THE WORK. OBTAIN ALL INSPECTIONS REQUIRED BY CODE.

G. USE OF COMBUSTIBLE MATERIALS IS NOT ALLOWED IN THE RETURN AIR PLENUM. MATERIALS USED IN THE PLENUM SHALL HAVE FLAME SPREAD RATING NOT TO EXCEED 25, AND SMOKE DEVELOPED RATING NOT TO EXCEED 50 WHEN TESTED IN ACCORDANCE WITH ASTM E 84. ALL EXPOSED WIRING IN THE PLENUM SHALL BE PLENUM RATED.

H. VERIFY LOCATION OF PERMISSIBLE NEW STRUCTURAL ROOF PENETRATIONS AND ADAPT THE REQUIRED DUCTS ACCORDINGLY. THE OPENINGS MUST BE LOCATED USING A REBAR LOCATOR, TRYING TO LEAVE A TRANSVERSE BAR WITHIN 4" FROM THE OPENING. LOCATE OPENINGS AT MID-DISTANCE BETWEEN THE STEMS OF THE DOUBLE TEE AND LONGITUDINAL REINFORCEMENT SHALL NEVER BE CUT. CALL THE ARCHITECT'S OFFICE IN CASE OF UNEXPECTED DIFFICULTIES.

I. ALL A/C AND FRESH AIR ROUND EXPOSED DUCTS WILL BE SPIRAL GALVANIZED AND READY FOR PAINTING. ALL RECTANGULAR DUCTS OVER CEILINGS MAY BE FIBER DUCTS. ALL SG SUPPLY GRILLS WILL BE DOUBLE DEFLECTION WITH VOLUME CONTROLS.

J. G.C. SHALL CONTRACT LANDLORD-APPROVED ROOFING CONTRACTOR TO FLASH AND SEAL ALL ROOF PENETRATIONS TO MAINTAIN ROOFING WARRANTY.

K. IF APPLICABLE CONTRACTOR TO PROVIDE SHOP DRAWINGS FOR KITCHEN VENTILATION SYSTEM INCLUDING TYPE 1 HOOD AND FOR THE WALK-IN COOLER & FREEZER.

L. REQUIRED INSURANCE SHALL BE PROVIDED BY THE PLUMBING CONTRACTOR FOR PROTECTION AGAINST PUBLIC LIABILITY AND PROPERTY DAMAGE FOR THE DURATION OF THE WORK.

M. CONSTRUCTION "AS BUILT" DRAWINGS AND DOCUMENTS SHALL BE PROVIDED TO THE OWNER WITHIN 30 DAYS AFTER THE DATE OF ACCEPTANCE.

N. OPERATION MANUALS AND MAINTENANCE MANUALS SHALL BE PROVIDED TO THE BUILDING OWNER.

MECHANICAL SYMBOLS

- EXHAUST FAN
- EXHAUST FAN WITH LIGHT
- ROOF MOUNTED EXHAUST FAN OUTLET
- SUPPLY OR OUTSIDE AIR DUCT
- (SD) DUCT SMOKE DETECTOR
- RETURN OR EXHAUST AIR DUCT
- (T) PROGRAMMABLE THERMOSTAT
- INSULATED RIGID DUCTWORK
- (RS) REMOTE SENSOR
- DUCT TRANSITION
- Ø ROUND DUCT DIAMETER
- MANUAL VOLUME DAMPER
- CFM CUBIC FEET/ MINUTE
- S/A SUPPLY AIR
- SUPPLY DIFFUSER REFER TO DIFFUSER SCHEDULE FOR SPECIFICATIONS
- R/A RETURN AIR
- SG SUPPLY GRILLE
- CD CONDENSATE PIPING
- RETURN DIFFUSER REFER TO DIFFUSER SCHEDULE FOR SPECIFICATIONS

NOTE: THIS PROJECT MAY NOT USE EVERY SYMBOL OR DEVICE APPEARING ON THIS LEGEND.

MECHANICAL PLAN NOTES

A. USE EXISTING (2) 4 TONS WATER SOURCE HEAT PUMP UNITS. PROVIDE MODIFICATIONS TO DUCT SYSTEM AS SHOWN. PROVIDE FLEXIBLE CONNECTORS ON SUPPLY AND RETURN AIR DUCT CONNECTIONS. INSTALL FIRE DAMPERS IN ANY FIRE WALLS AND BETWEEN FLOORS. TRANSITION TO DUCT SIZES SHOWN. PROVIDE DUCTWORK AND AIR DISTRIBUTION DEVICES AS INDICATED ON THE PLAN. EXISTING DUCTWORK MAY BE REUSED WHERE POSSIBLE. REFER TO A/C UNIT SCHEDULE FOR ADDITIONAL REQUIREMENTS. 1

B. FOR SYSTEM OVER 2,000 CFM PROVIDE 120V CHECK FOR DUCT MOUNTED AIR SMOKE DETECTORS AND THAT MEET THE REQUIREMENTS OF U.L. 268A, INTERLOCKED TO SHUTDOWN A/C UNIT UPON DETECTION OF SMOKE. IF NECESSARY PROVIDE SMOKE DETECTOR WITH AN ANNUNCIATOR, ALARM AND POWER L.E.D.'S FOR VISIBLE AND AUDIBLE ALARM SIGNAL, AND VISIBLE TROUBLE SIGNAL. MOUNT ANNUNCIATOR ON ROOM SIDE OF CEILING.

C. ALL DUCTS WILL BE FIBERBOARD OR MINIMUM 26 GAUGE SHEET METAL WITH EXTERNAL DUCT WRAP INSULATION. ALL DUCTS TO BE MANUFACTURED AND INSTALLED ACCORDING TO ASHRAE AND SMACNA METAL DUCT CONSTRUCTION STANDARD, LATEST EDITION. ALL MATERIALS WILL CONFORM TO NFPA 90A.

D. THERMOSTATS SHALL BE 7-DAY PROGRAMMABLE TYPE. MOUNT THERMOSTAT 48" A.F.F. COORDINATE LOCATION OF THERMOSTAT. 1

E. ALL INTERIOR AIR DUCTS WITH INSULATION SHALL HAVE A MINIMUM OF THICKNESS OF 1.5", R-6 INSULATION. EXTERIOR AIR DUCTS TO HAVE R-8 INSULATION. OUTSIDE AIR DUCTS TO HAVE R-7 INSULATION ACCORDING TO S.E.C.2015-C403.2.8

F. ALL SEAMS, JOINTS, ETC WILL BE SEALED TO MAKE AIR DUCT AIRTIGHT. PRESSURE SENSITIVE MATERIALS AND OTHERS APPROVED BY LATEST SMACNA. SEALING MATERIALS WILL BE USED.

G. ALL EVAPORATOR UNITS SHALL HAVE A FLOAT SWITCH TO CONTROL OVERFLOW THAT WILL AUTOMATICALLY SHUT DOWN THE A/C SYSTEM. THE DEVICE SHALL BE ATTACHED TO THE SECONDARY DRAIN OUTLET ON THE UNIT.

H. ALL NEW A/C CONDENSATE DRAINS WILL BE PVC FULL DIAMETER OF OUTLET AND WILL TERMINATE IN THE NEAREST ROOF DRAIN OR INDIRECT WASTE.

I. ALL EQUIPMENT AND MATERIALS WILL BE INSTALLED ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS AND ACCORDING TO THE BEST PRACTICE.

J. TESTING AND BALANCING SHALL BE DONE IN ACCORDANCE WITH SBC-E.C.C.SECTION C408.2.2. BALANCING PROCEDURES SHALL BE IN ACCORDANCE WITH THE NATIONAL ENVIRONMENTAL BALANCING BUREAU (N.E.B.B.), THE ASSOCIATED AIR BALANCE COUNCIL (A.A.B.C) NATIONAL STANDARDS OR EQUIVALENT PROCEDURES.

K. HANGER ATTACHMENTS TO THE STEEL STRUCTURE WILL BE RATED POWDER ACTUATED FASTENERS, "C" CLAMPS, WELDED STUDS, CLAMP HANGERS, JOIST CLAMPS OR OTHER METHODS RECOMMENDED BY SMACNA'S "METAL AND FLEXIBLE STANDARDS", CHAPTER 4, AND WILL HAVE A MINIMUM SAFETY MARGIN OF 4:1.

L. DUCTS, CURBS, FANS AND CONTROLS TO BE SUPPLIED AND INSTALLED BY HOOD CONTRACTOR ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS, THE SBC, NEC AND NFPA 96.

M. ALL HVAC CONTROLS AND CONTROL WIRING SHALL BE PROVIDED BY THE MECHANICAL CONTRACTOR.

N. HVAC SYSTEM TO BE TIED INTO MALL ENERGY MANAGEMENT SYSTEM AT TENANTS COST.

THERMOSTATIC CONTROLS

A. GENERAL:
THE SUPPLY OF HEATING AND COOLING ENERGY TO EACH ZONE SHALL BE INDIVIDUALLY CONTROLLED BY THERMOSTATIC CONTROLS RESPONDING TO TEMPERATURE.

B. DEAD BAND:
WHERE USED TO CONTROL BOTH HEATING AND COOLING, ZONE THERMOSTATIC CONTROLS SHALL BE CAPABLE OF PROVIDING A TEMPERATURE RANGE OR DEAD BAND OF AT LEAST 5°F WITHIN WHICH THE SUPPLY OF HEATING AND COOLING ENERGY TO THE ZONE IS SHUT OFF OR REDUCED TO A MINIMUM.
EXCEPTIONS:THERMOSTATS THAT REQUIRE MANUAL CHANGEOVER BETWEEN HEATING AND COOLING MODES.

C. SETBACK CONTROLS:
HEATING SYSTEMS LOCATED IN CLIMATE ZONES 2-8 SHALL BE EQUIPPED WITH CONTROLS THAT HAVE THE CAPABILITY TO AUTOMATICALLY RESTART AND TEMPORARILY OPERATE THE SYSTEM AS REQUIRED TO MAINTAIN ZONE TEMPERATURES ABOVE A HEATING SETPOINT ADJUSTABLE DOWN TO 55°F OR LOWER. COOLING SYSTEMS LOCATED IN CLIMATE ZONES 1B, 2B, AND 3B SHALL BE EQUIPPED WITH CONTROLS THAT HAVE THE CAPABILITY TO AUTOMATICALLY RESTART AND TEMPORARILY OPERATE THE SYSTEM AS REQUIRED TO MAINTAIN ZONE TEMPERATURES BELOW A COOLING SETPOINT ADJUSTABLE UP TO 90°F OR HIGHER OR TO PREVENT HIGH SPACE HUMIDITY LEVELS.

D. AUTOMATIC SHUTDOWN:
HVAC SYSTEMS SHALL BE EQUIPPED WITH AT LEAST ONE OF THE FOLLOWING: CONTROLS THAT CAN START AND STOP THE SYSTEM UNDER DIFFERENT TIME SCHEDULES FOR SEVEN DIFFERENT DAY-TYPES PER WEEK, ARE CAPABLE OF RETAINING PROGRAMMING AND TIME SETTING DURING LOSS OF POWER FOR A PERIOD OF AT LEAST TEN HOURS, AND INCLUDE AN ACCESSIBLE MANUAL OVERRIDE, OR EQUIVALENT FUNCTION, THAT ALLOWS TEMPORARY OPERATION OF THE SYSTEM FOR UP TO TWO HOURS.

E. SETPOINT OVERLAP RESTRICTION:
WHERE HEATING AND COOLING TO A ZONE ARE CONTROLLED BY SEPARATE ZONE THERMOSTATIC CONTROLS LOCATED WITHIN THE ZONE, MEANS (SUCH AS LIMIT SWITCHES, MECHANICAL STOPS, OR, FOR DDC SYSTEMS, SOFTWARE PROGRAMMING) SHALL BE PROVIDED TO PREVENT THE HEATING SETPOINT FROM EXCEEDING THE COOLING SETPOINT MINUS ANY APPLICABLE PROPORTIONAL BAND.

SEATTLE BUILDING DEPARTMENT NOTES

ALL WORK SHALL COMPLY WITH APPLICABLE SECTIONS OF 2015 SEATTLE BUILDING CODE, BASE CODE IBC 2015 AND RULES AND REGULATIONS OF THE DEPARTMENT OF BUILDINGS TO DATE.

1. THE CONTRACTOR SHALL ENGAGE THE THE SERVICES OF A PROFESSIONAL ENGINEER TO PROVIDE THE REQUIRED SPECIAL INSPECTIONS AND TESTS.
2. THE LICENSED PROFESSIONAL ENGINEER, ARCHITECT OR OTHER PERSON HAVING NOT LESS THAN FIVE (5) YEARS EXPERIENCE SUPERVISING THE INSTALLATION OF SUCH MECHANICAL SYSTEMS AND CONDUCTING SUCH TESTS WILL FILE DOCUMENTATION AND REPORTS OF TESTS THAT THE SYSTEM COMPLIES WITH THE CONSTRUCTION DOCUMENTS AND APPLICABLE LAWS.
3. TESTS OF MECHANICAL SYSTEMS SHALL BE PERFORMED IN ACCORDANCE WITH THE FOLLOWING SECTIONS OF THE 2015 SEATTLE MECHANICAL CODE, BASE CODE IMC 2015:
   A. VENTILATION SYSTEM SERVING COMMERCIAL COOKING APPLIANCES - MC 506
   B. REFRIGERATION SYSTEMS - MC 1108
4. THE FOLLOWING WORK ITEMS, COMPONENTS, MATERIALS, CAPACITIES, ETC. SHALL COMPLY WITH THE REFERENCED CODE OR STANDARD:
   A. DUCT CONSTRUCTION AND INSTALLATION-2015 SEATTLE MECHANICAL CODE, BASE CODE IMC 2015 SECTION 603
   B. AIR INTAKES, EXHAUSTS AND RELIEF - 2015 SEATTLE MECHANICAL CODE, BASE CODE IMC 2015 SECTION 401
5. MINIMUM TEMPERATURE TO BE MAINTAINED IN OCCUPIED SPACES DURING HEATING SEASON: 68 DEG. FAHRENHEIT.
6. VENTILATION FOR ALL AREA SHALL COMPLY WITH 2015 SEATTLE MECHANICAL CODE, BASE CODE IMC 2015 SECTION 401.
7. A STATEMENT SHALL BE FILED BY THE OWNER OR TENANT IN POSSESSION THAT THE VENTILATION SYSTEM WILL BE KEPT IN CONTINUOUS OPERATION AT ALL TIMES DURING THE NORMAL OCCUPANCY OF THE STRUCTURE AS REQUIRED BY 2015 SEATTLE MECHANICAL CODE, BASE CODE IMC 2015 CHAPTER 4 SECTION 403.3.
8. REFER TO ARCHITECTURAL DRAWINGS FOR REQUIRED FIRE-RATED WALL AND SMOKE WALL CONSTRUCTION AND LOCATION.
9. THESE PLANS ARE APPROVED ONLY FOR THE WORK INDICATED ON THE APPLICATION SPECIFICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON OR TO BE CONSIDERED AS BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.
10. MECHANICAL SYSTEMS SHALL BE COMMISSIONED PER 2015 SEATTLE ENERGY CODE, BASE CODE IECC 2015 C403.2.2, C408.2.1, C408.2.5 FINAL COMMISSIONING REPORT SHALL BE DUE WITHIN 90 DAYS OF RECEIPT OF CERTIFICATE OF OCCUPANCY.
11. A COMMISSIONING PLAN SHALL BE DEVELOPED BY A LICENSED DESIGN PROFESSIONAL, MECHANICAL ENGINEER OR APPROVED AGENCY.
12. A PRELIMINARY REPORT OF COMMISSIONING TEST PROCEDURES AND RESULTS SHALL BE COMPLETED AND CERTIFIED BY THE LICENSED DESIGN PROFESSIONAL, ELECTRICAL ENGINEER, MECHANICAL ENGINEER OR APPROVED AGENCY AND PROVIDED TO THE BUILDING OWNER OR OWNER'S AUTHORIZED AGENT AS PER 2015 SEATTLE ENERGY CODE, BASE CODE IECC 2015, C408.2.4.
13. A WRITTEN REPORT DESCRIBING THE ACTIVITIES AND MEASUREMENTS COMPLETED IN ACCORDANCE WITH SECTION 2015 SEATTLE ENERGY CODE, BASE CODE IECC 2015, C408.2.1.
14. ALL HEATING AND COOLING LOADS CALCULATED PER ASHRAE/ACCA 183.
15. SMOKE DETECTOR SHALL MEET UL268A.

DIFFUSER SCHEDULE

MANUFACTURER	TITUS	TITUS	TITUS
DESIGNATION	A	B	C
MODEL	TDC-AA	250-AA (2/3 WAY)	350RL
TYPE	SUPPLY	SUPPLY	RETURN/EXHAUST
LOCATION	DROP CEILINGS	BATHROOMS	CEILING
CFM	AS SHOWN	AS SHOWN	
FACE SIZE	24" X 24"	12" X 12"	AS SHOWN
NECK SIZE	TO MATCH DUCT	TO MATCH DUCT	TO MATCH DUCT
FRAME TYPE	LAY IN	FLANGED	LAY IN
FINISH	FIELD PAINTED	FIELD PAINTED	FIELD PAINTED
NOISE CRITERIA	<30	<30	<30
ACCESSORIES	VOLUME DAMPER	VOLUME DAMPER	

FAN SCHEDULE

DESIGNATION	BEF-1	EF-1	EF-2
STATUS	EXISTING	NEW	NEW
QUANTITY	1	1	1
MANUFACTURER	GREENHECK	GREENHECK	GREENHECK
MODEL	SP-B110	CSP-A1300	CSP-A1050
CFM	75 @ 0.2" SP	825 @ 0.7" SP	675 @ 0.7" SP
WATTS	-	800	700
AMPS	-	7.1	5.0
VOLTAGE	115/1/60	115/1/60	115/1/60
CONTROLLER	-	-	-
WEIGHT (lbs.)	EXISTING	56.0	59.0

1

WATER SOURCE HEAT PUMP SCHEDULE

DESIGNATION	WSHP-1	WSHP-2
STATUS	EXISTING	EXISTING
QUANTITY	1	1
MANUFACTURER	VERSATEC	VERSATEC
MODEL	UBH048	UBH048
TONNAGE	4	4
TOTAL BTU's/HR	45,400	45,400
SENSIBLE BTU's/HR	34,500	34,500
CFM	1,600	1,600
OUTDOOR AIR	750	750
EER	14	14
HEATING BTU'S/HR	50,700	50,700
COP	EXISTING	EXISTING
FAN HP	0.80	0.80
GPM	9	9
VOLTAGE	208/1/60	208/1/60
MCA	27.2	27.2
MOCP	35	35
RLA/FLA	-	-
ACCESSORIES	EXISTING	EXISTING
WEIGHT (lbs)	EXISTING	EXISTING

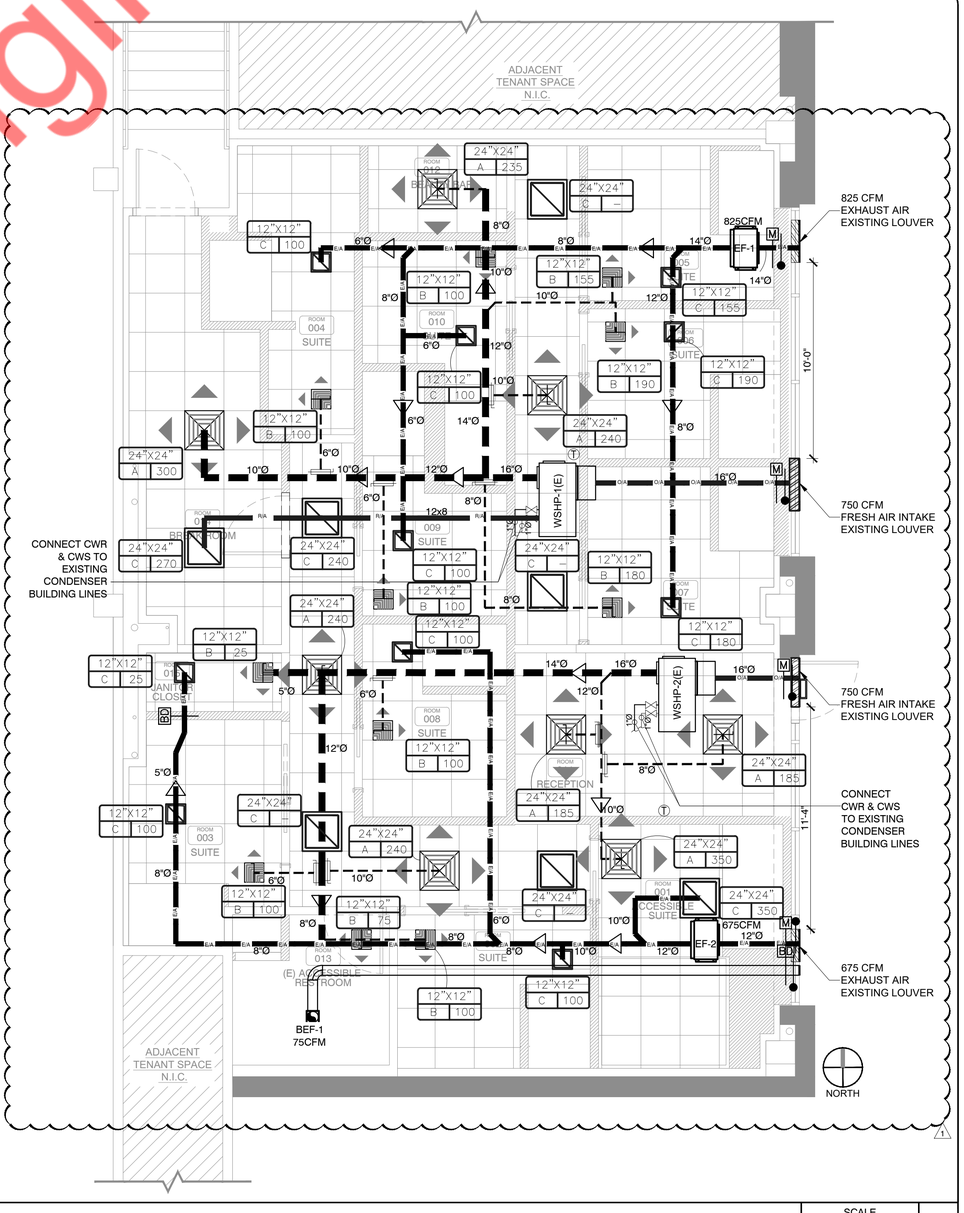
OCCUPANCY CALCULATIONS PER SBC MECH TABLE 403.3

RECEPTION	120 SQ. FT. @	30 PEOPLE/1,000 SQ. FT.	4 PEOPLE
SAUNA SUITES	793 SQ. FT. @	1 PERSON / SUITE	10 PEOPLE
MAXIMUM OCCUPANCY AS DETERMINED			14 PEOPLE

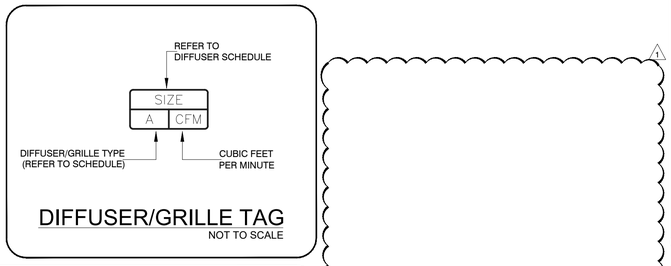
OUTDOOR AIR CALCULATIONS PER SBC - MECH TABLE 403.3

FRESH AIR REQUIRED				
RECEPTION	118 SQ. FT. @	0.06 CFM/SQ. FT =	7	CFM
	4 PEOPLE @	5 CFM/PP =	20	CFM
OUTSIDE AIR REQUIRED			27	CFM
EXHAUST REQUIRED				
SAUNA SUITES	793 SQ. FT. @	0.25 CFM/SQ. FT. =	198	CFM
	10 SHOWER @	20 CFM/PER SHOWER*	200	CFM
O/A REQUIRED			398	CFM
OA TO WSHP #1			750	CFM
OA TO WSHP #2			750	CFM
TOTAL O/A			1,500	CFM
AIR BALANCE				
OUTDOOR AIR			1500	CFM
EF-1 @825 CFM			-825	CFM
EF-2 @675 CFM			-675	CFM
BUILDING PRESSURE			0	CFM

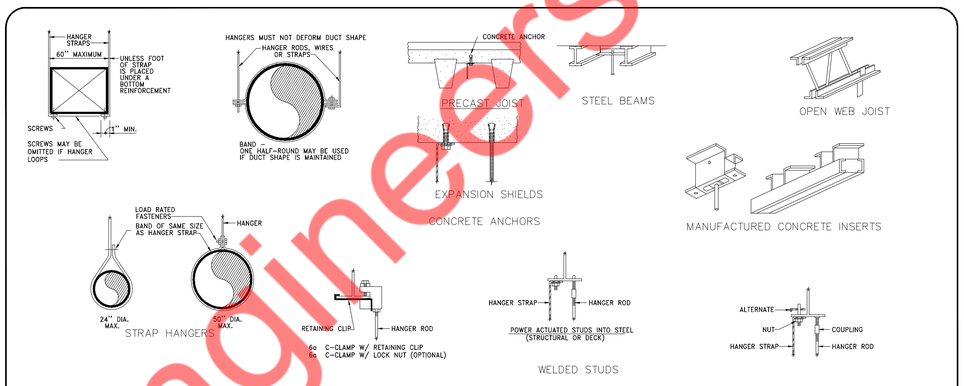
1



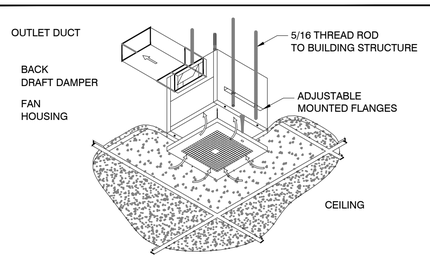
HVAC PLAN | SCALE 1/4" = 1'-0" | 1



DIFFUSER/GRILLE TAG
NOT TO SCALE

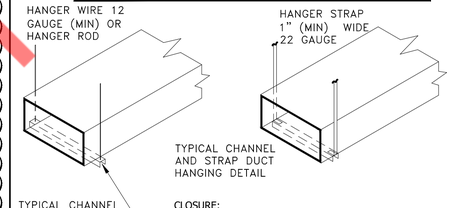


UPPER & LOWER ATTACHMENTS & DEVICES
NOT TO SCALE



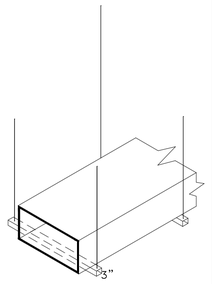
CEILING EXHAUST FAN DETAIL
NOT TO SCALE

CHANNEL SELECTION		
DUCT WIDTH	MIN. CHANNEL GUAGE	MIN. CHANNEL PROFILE
LESS THAN 18"	22	3"x 2"
LESS THAN 30"	18	3"x 2"



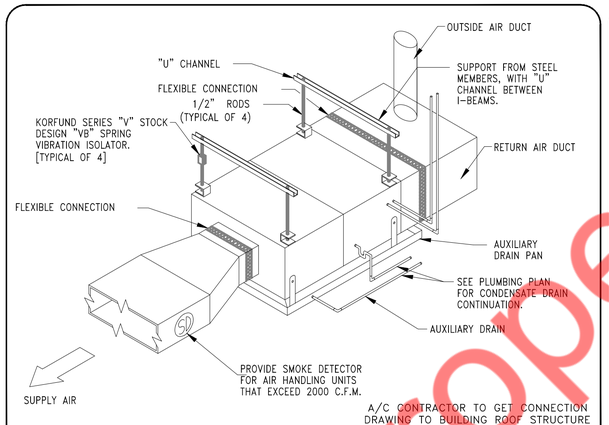
CLOSURE:
-PRESSURE SENSITIVE ALUMINUM FOIL TAPES LSITED UNDER UL 181A,
PART I (P)
- HEAT ACTIVATED ALUMINUM FOIL/SCRIM TAPES LISTED UNDER UL 181A, PART II (H)
- MASTIC AND GLASS FABRIC TAPE CLOSURE SYSTEMS LISTED UNDER UL 181A, PART III (M)

DUCT SIZE,IN.	MAXIMUM HANGER SPACING
① WIDTH 48" OR GREATER	4'-0"
② LESS THEN 48"W X 12"H	6'-0"
③ WIDTH BETWEEN 24" & 48" & HEIGHT OVER 24"	6'-0"
④ WIDTH BETWEEN 24" & 48" & HEIGHT BETWEEN 12" & 24"	8'-0"
⑤ WIDTH LESS THAN 24" & HEIGHT GREATER THAN 12"	8'-0"
DUCT REINFORCING PER SMACNA REQUIRED	

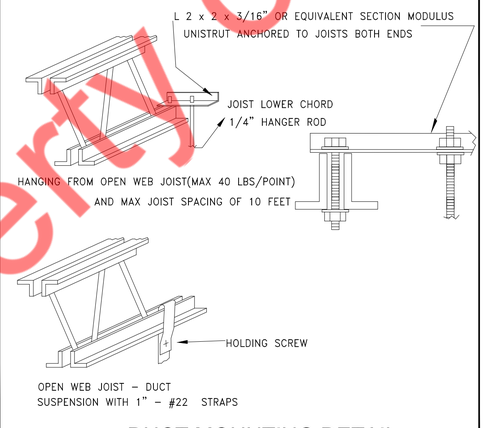


HANGER SPACING AND EXTENSION 3" WIDE CHANNELS

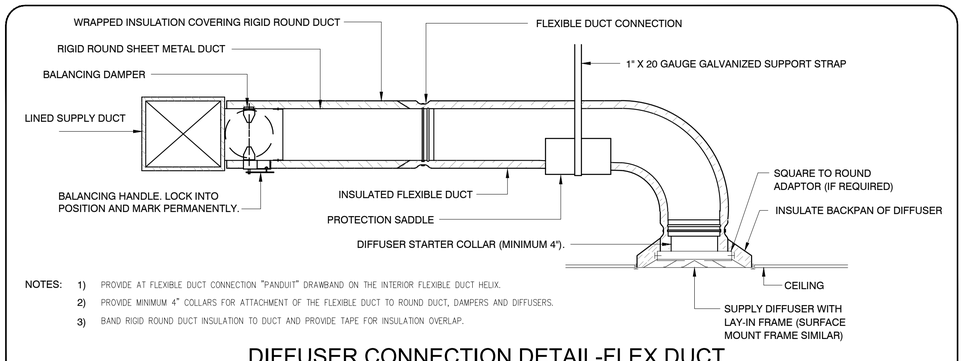
DUCT SUPPORTS
NOT TO SCALE



AIR HANDLING UNIT MOUNT
NOT TO SCALE



DUCT MOUNTING DETAIL
NOT TO SCALE



NOTES:
1) PROVIDE AT FLEXIBLE DUCT CONNECTION "PANDUIT" DRAWBAND ON THE INTERIOR FLEXIBLE DUCT HELIX.
2) PROVIDE MINIMUM 4" COLLARS FOR ATTACHMENT OF THE FLEXIBLE DUCT TO ROUND DUCT, DAMPERS AND DIFFUSERS.
3) BAND RIGID ROUND DUCT INSULATION TO DUCT AND PROVIDE TAPE FOR INSULATION OVERLAP.

DIFFUSER CONNECTION DETAIL-FLEX DUCT
NOT TO SCALE