MECHANICAL SYMBOLS LIST

AC-1 / TXF-1	EQUIPMENT SYMBOL
XX / X	RISER SYMBOL

AIR DEVICES

	CEILING DIFFUSER SUPPLY
	CEILING DIFFUSER RETURN
	SIDEWALL/DUCT MOUNTED GRILLE–SUPPLY
	SIDEWALL/DUCT MOUNTED GRILLE–RETURN
	DOOR UNDERCUT

DUCT ACCESSORIES

GD	GRAVITY DAMPER
	FIRE SMOKE DAMPER
	FIRE DAMPER
M	MOTORIZED DAMPER W/ ACCESS DOOR
VD VD	VOLUME DAMPER W/ ACCESS DOOR

HVAC PIPING

CP	NEW CONDENSATE PIPING
REF	NEW REFRIGERANT PIPING
	FLUID FLOW DIRECTION
	PIPE TURNING DOWN
	PIPE GOING UP

CONTROLS AND SENSORS

T	THERMOSTAT
T_S	TEMPERATURE SENSOR

DUCTWORK

	AIR DUCT W/ 1.5" ACOUSTICAL LINING
	FLEXIBLE DUCT
FC FC	FLEXIBLE CONNECTION
24X12	RECTANGULAR DUCT (WIDTH X DEPTH)
ø12	ROUND DUCT (DIAMETER)
	ROUND DUCT CROSS SECTION
	SUPPLY AIR RECTANGULAR DUCT CROSS SECTION
	RETURN AIR RECTANGULAR DUCT CROSS SECTION

FIELD VERIFY ALL CONDITIONS

- DESIGN DRAWINGS ARE SCHEMATIC. THIS CONTRACTOR SHALL VISIT THE SITE PRIOR TO BIDDING OR AWARD OF CONTRACT TO INSPECT EXISTING FIELD CONDITIONS. THIS CONTRACT SHALL INCLUDE ALL LABOR AND MATERIALS NECESSARY FOR FIELD MODIFICATIONS DUE TO EXISTING CONDITIONS.
- THE CONTRACTOR SHALL CONTACT THE ARCHITECT, ENGINEER OR OWNER PRIOR TO BIDDING FOR INTERPRETATIONS AND CLARIFICATIONS OF THE DESIGN AND INCLUDE IN HIS BID ALL COSTS TO MEET THE DESIGN INTENT. CLARIFICATIONS MADE BY THE ARCHITECT, ENGINEER OR OWNER AFTER BIDDING WILL BE FINAL AND SHALL BE IMPLEMENTED AT CONTRACTORS COST.
- BIDDING CONTRACTORS SHALL HAVE A WORKING KNOWLEDGE OF LOCAL CODES AND ORDINANCES AND SHALL INCLUDE IN THEIR BIDS THE COSTS FOR ALL WORK INSTALLED IN STRICT ACCORDANCE WITH GOVERNING CODES, THE PLANS AND SPECIFICATIONS NOT WITHSTANDING. THE CONTRACTOR SHALL ALERT ARCHITECT, ENGINEER OR OWNER OF ANY APPARENT DISCREPANCIES BETWEEN GOVERNING CODES AND DESIGN INTENT.

MECHANICAL DRAWING LIST

M0.1	MECHANICAL SYMBOLS, ABBREVIATIONS AND GENERAL NOTES
M0.2	MECHANICAL NOTES & SPECIFICATIONS (1 OF 2)
M0.3	MECHANICAL SPECIFICATIONS (2 OF 2)
M1.1	MECHANICAL FLOOR PLAN AND DETAILS

MECHANICAL ABBREVIATIONS

AC	AIR CONDITIONER
ACCU	AIR CONDITIONER CONDENSING UNIT
AFF	ABOVE FINISHED FLOOR
AL	ACOUSTIC LINING
CFM	CUBIC FEET OF AIR PER MINUTE
COP	COEFFICIENT OF PERFORMANCE
CP	CONDENSATE PUMP
DN	DOWN
EER	ENERGY EFFICIENCY RATIO
EF	EXHUAST FAN
FC	FLEXIBLE CONNECTION
HSPF	HEATING SEASONAL PERFORMANCE FACTOR
IEER	INTEGRATED ENERGY EFFICIENCY RATIO
MD	MOTORIZED DAMPER
REF	REFRIGERANT PIPING
SEER	SEASONAL ENERGY EFFICIENCY RATIO
EF	EXHAUST FAN
OAI	OUTSIDE AIR INTAKE
KXF	KITCHEN EXHAUST FAN
GXF	GENERAL EXHAUST FAN
VAV	VARIABLE AIR VOLUME
WMS	WIRE MESH SCREEN

CHANDLER, ARIZONA BUILDING DEPARTMENT NOTES

ALL WORK SHALL COMPLY WITH APPLICABLE SECTIONS OF 2021–IBC AND RULES AND REGULATIONS OF THE DEPARTMENT OF BUILDINGS TO DATE.

1. THE CONTRACTOR SHALL ENGAGE THE SERVICES OF A PROFESSIONAL ENGINEER TO PROVIDE THE REQUIRED SPECIAL INSPECTIONS AND TESTS.
2. TESTS WILL BE CONDUCTED UNDER DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT OR OTHER PERSON HAVING NOT LESS THAN FIVE (5) YEARS EXPERIENCE SUPERVISING THE INSTALLATION OF SUCH MECHANICAL SYSTEMS. THE TESTS WILL SHOW COMPLIANCE WITH 2021 INTERNATIONAL BUILDING CODE REQUIREMENTS AS OUTLINES IN SECTION.
3. 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.
4. TESTS OF MECHANICAL SYSTEMS SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 2021 IMC 107 AND THE FOLLOWING SECTIONS OF THE 2021 IMC:
   A. MECHANICAL VENTILATION – SECTION 403.
5. THE FOLLOWING WORK ITEMS, COMPONENTS, MATERIALS, CAPACITIES, ETC. SHALL COMPLY WITH THE REFERENCED CODE OR STANDARD:
   A. DUCT CONSTRUCTION AND INSTALLATION– 2021 IMC 603
6. MINIMUM TEMPERATURE TO BE MAINTAINED IN OCCUPIED SPACES DURING HEATING SEASON: 68 DEG. FAHRENHEIT.
7. VENTILATION FOR ALL AREA SHALL COMPLY WITH 2021 IMC 401.
8. 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 2021 IMC 403.3
9. REFER TO ARCHITECTURAL DRAWINGS FOR REQUIRED FIRE–RATED WALL AND SMOKE WALL CONSTRUCTION AND LOCATION.
10. 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 EITHER BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.
11. ALL HEATING AND COOLING LOADS CALCULATED PER ASHRAE/ACCA 183.
12. SMOKE DETECTOR SHALL MEET UL268A.
13. SMOKE DETECTION SYSTEMS SHALL BE INSTALLED AND SEQUENCED TO FOLLOW CONTROLS OPERATIONS WITH THE REQUIREMENTS OF SECTION 606, 2021 INTERNATIONAL MECHANICAL CODE TO CLOSE DAMPERS AND AUTOMATICALLY STOP THE FAN.

GENERAL NOTES

1. CONTRACTOR SHALL SURVEY THE AREA OF THIS WORK BEFORE SUBMITTING A BID AND SHALL BE RESPONSIBLE FOR NOTIFYING THE ARCHITECT OF ANY CONDITIONS WHICH WOULD PREVENT THE INSTALLATION OF THE WORK AS SHOWN ON DRAWINGS.
2. ALL APPLICABLE CODES, LAWS AND REGULATIONS GOVERNING OR RELATING TO ANY PORTION OF THIS WORK ARE HEREBY INCORPORATED INTO AND MADE A PART OF THESE SPECIFICATIONS, AND THEIR PROVISIONS SHALL BE CARRIED OUT BY THE CONTRACTOR WHO SHALL INFORM THE OWNER, PRIOR TO SUBMITTING A PROPOSAL, OF ANY WORK OR MATERIALS WHICH VIOLATE ANY OF THE ABOVE LAWS AND REGULATIONS. ANY WORK DONE BY THE CONTRACTOR CAUSING SUCH VIOLATION SHALL BE CORRECTED BY THE CONTRACTOR.
3. BEFORE PROCEEDING WITH ANY WORK IN OCCUPIED OR USED AREAS, THE CONTRACTOR SHALL APPLY TO OWNER FOR PERMISSION TO ENTER SUCH AREAS. THE CONTRACTOR IS OBLIGED TO PERFORM HIS WORK ONLY AT THE TIMES DESIGNATED BY OWNER. THERE WILL BE NO ADDITIONAL COMPENSATION FOR THE WORK PERFORMED AFTER HOURS OR ON OFF–DAYS WITHOUT PRIOR WRITTEN APPROVAL.
4. THE WORK IN THE BUILDING SHALL BE DONE WHEN AND AS DIRECTED, AND IN A MANNER SATISFACTORY TO THE OWNER. THE WORK SHALL BE PERFORMED SO AS TO CAUSE THE LEAST POSSIBLE INCONVENIENCE AND DISTURBANCE TO THE PRESENT OCCUPANTS.
5. THE CONTRACTOR'S PROPOSAL FOR ALL WORK SHALL BE PREDICATED ON THE PERFORMANCE OF THE WORK DURING REGULAR WORKING HOURS. WHEN SO DIRECTED, HOWEVER, THE CONTRACTOR SHALL INSTALL WORK IN OVERTIME AND THE ADDITIONAL COST TO BE CHARGED THEREFORE SHALL BE ONLY THE "PREMIUM" PORTION OF THE WAGES PAID.
6. CONTRACTOR SHALL ASCERTAIN THE APPROPRIATE METHOD FOR BRINGING THE UNITS INTO AND THROUGH THE BUILDING TO POSITION UNIT IN LOCATION SHOWN ON THE PLANS. WHERE NECESSARY, EQUIPMENT SHALL BE SHIPPED FROM MANUFACTURER IN SECTIONS OF SIZE SUITABLE FOR MOVING THROUGH RESTRICTIVE SPACES. COORDINATE WITH BUILDING OWNER APPROPRIATE TIMES OF DAY SUCH EQUIPMENT MAY BE MOVED THROUGH ALL AREAS.
7. REMOVAL AND RELOCATION OF CERTAIN EXISTING WORK WILL BE NECESSARY FOR THE PERFORMANCE OF THE GENERAL WORK. ALL EXISTING CONDITIONS CANNOT BE COMPLETELY DETAILED ON THE DRAWINGS. THE CONTRACTOR SHALL SURVEY THE SITE AND INCLUDE ALL CHANGES IN MAKING UP THE WORK PROPOSAL.
8. DISCONNECT, REMOVE AND/OR RELOCATE EXISTING MATERIAL, EQUIPMENT AND OTHER WORK AS NOTED OR REQUIRED FOR PROPER INSTALLATION OF NEW SYSTEM.
9. CONNECT NEW WORK TO EXISTING WORK IN NEAT AND APPROVED MANNER. RESTORE EXISTING WORK DISTURBED WHILE INSTALLING NEW WORK TO ACCEPTABLE CONDITION AS DETERMINED BY ARCHITECT.
10. PLAN INSTALLATION OF NEW WORK AND CONNECTIONS TO EXISTING WORK TO INSURE MINIMUM INTERFERENCE WITH REGULAR OPERATION OF EXISTING FACILITIES. ALL SYSTEM SHUTDOWNS AFFECTING OTHER AREAS SHALL BE COORDINATED WITH BUILDING OWNER. INSTALL ISOLATION VALVES AT POINT OF CONNECTION TO THE EXISTING PIPING. PROVIDE TEMPORARY DUCT CAPS AND/OR CONNECTIONS TO MINIMIZE SHUTDOWN TIME.
11. SUPPORT ALL DUCTWORK AND PIPING FROM BUILDING STRUCTURE AND/OR FRAMING IN AN APPROVED MANNER. WHERE OVERHEAD CONSTRUCTION DOES NOT PERMIT FASTENING OR SUPPORTS FOR EQUIPMENT, FURNISH ADDITIONAL FRAMING. INSERTS SHALL BE STEEL, SLOTTED TYPE AND FACTORY PAINTED. SINGLE ROD SHALL BE SIMILAR TO GRINNELL FIG. 281. MULTI–ROD SHALL BE SIMILAR TO FEE & MASON SERIES 9000 WITH END CAPS AND CLOSURE STRIPS. MAXIMUM LOADING INCLUDING PIPES, DUCTWORK CONTENTS AND COVERING SHALL NOT EXCEED 75% OF RATED INSERT CAPABILITY. WHEN SUPPORTING FROM BUILDING USE BEAM CLAMPS IN APPROVED MANNER.
12. PROVIDE ALL NECESSARY FLASHING AND COUNTER FLASHING TO MAINTAIN THE WATERPROOFING INTEGRITY OF THIS BUILDING AS REQUIRED BY THE INSTALLATION OR REMOVAL OF PIPES, DUCTS, LOUVERS, CONDUIT, AND EQUIPMENT. PROVIDE EQUIPMENT CURBS AND DUNNAGE STEEL AS REQUIRED.
13. SEAL OPENINGS AROUND DUCTS AND PIPING THROUGH PARTITIONS, WALLS AND FLOORS (NOT IN SHAFTS) WITH MINERAL WOOL OR OTHER NONCOMBUSTIBLE MATERIAL (FIBERGLASS INSULATION IS NOT ACCEPTABLE).
14. WHERE PENETRATIONS THROUGH FIRE RATED WALLS ARE NOT FIRE PROOFED THIS CONTRACTOR SHALL BE RESPONSIBLE TO SEAL SAME TO MAINTAIN THE RATED INTEGRITY.
15. INSTALL WORK SO AS TO BE READILY ACCESSIBLE FOR OPERATION, MAINTENANCE AND REPAIR. MINOR DEVIATIONS FROM DRAWINGS MAY BE MADE TO ACCOMPLISH THIS, BUT CHANGES WHICH INVOLVE EXTRA COST SHALL NOT BE MADE WITHOUT APPROVAL.
16. ACCESS DOORS ARE REQUIRED FOR ALL BUILDING SERVICE VALVES THAT RUN THROUGH THE SPACE, AND ACCESS DOOR SHALL HAVE THE EQUAL RATED CAPACITY (1HR, 2HR, ETC.) AS WALL. COORDINATE ALL LOCATIONS OF ACCESS DOORS WITH THE ARCHITECT.
17. REMOVABLE ACCESS TILE AND/OR ACCESS DOOR ARE REQUIRED IN HUNG CEILINGS, SHAFTS AND WALLS FOR ALL VOLUME AND FIRE DAMPERS, AUTOMATIC DAMPERS AND ALL OTHER MECHANICAL EQUIPMENT AND DEVICES. HVAC CONTRACTOR TO FURNISH ACCESS LOCATION REQUIREMENTS TO GENERAL CONTRACTOR. ACCESS TILE IDENTIFICATION: PROVIDE BUTTONS, TABS, AND MARKERS TO IDENTIFY LOCATION OF CONCEALED VALVES, DAMPERS AND EQUIPMENT.
18. THE CONTRACTOR SHALL KEEP ALL EQUIPMENT AND MATERIALS, AND ALL PARTS OF THE BUILDING, EXTERIOR SPACES AND ADJACENT STREETS, SIDEWALKS AND PAVEMENTS, FREE FROM MATERIAL AND DEBRIS RESULTING FROM THE EXECUTION OF THIS WORK. EXCESS MATERIALS WILL NOT BE PERMITTED TO ACCUMULATE EITHER ON THE INTERIOR OR THE EXTERIOR.
19. UNLESS OTHERWISE SPECIFICALLY SPECIFIED, INCLUDE ALL CUTTING AND PATCHING OF EXISTING FLOORS, WALLS, PARTITIONS AND OTHER MATERIALS IN THE EXISTING BUILDING. THE CONTRACTOR SHALL RESTORE THESE AREAS TO ORIGINAL CONDITION.
20. MATERIALS AND WORKMANSHIP, UNLESS OTHERWISE NOTED, SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
21. ALL EQUIPMENT SHALL BE PROVIDED WITH ONE YEAR WARRANTY PARTS AND LABOR AND FIVE YEARS ON COMPRESSORS. WARRANTY PERIOD BEGINS UPON PROJECT ACCEPTANCE
22. ALL MATERIAL AND EQUIPMENT TO BE NEW UNLESS OTHERWISE NOTED AND SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
23. THE CONTRACTOR SHALL BE RESPONSIBLE FOR HIS WORK WITH ITS COMPLETION AND FINAL ACCEPTANCE AND SHALL REPLACE ANY OF THE SAME WHICH MAY BE DAMAGED, LOST, OR STOLEN WITHOUT ADDITIONAL COST TO THE OWNER.
24. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE FAILURE OF ANY DUCTWORK SYSTEM OR EQUIPMENT TO FUNCTION PROPERLY UPON COMPLETION OF HIS WORK UPON SAID SYSTEM OR EQUIPMENT.
25. SUBMIT SHOP DRAWING OF ALL WORK WHICH MUST BE APPROVED BY THE ARCHITECT AND ENGINEER BEFORE WORK COMMENCES.
26. ALL MATERIAL AND EQUIPMENT TO BE NEW UNLESS OTHERWISE NOTED AND SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
27. SUBMISSION OF A PROPOSAL SHALL BE CONSTRUED AS EVIDENCE THAT A CAREFUL EXAMINATION OF THE PORTIONS OF THE EXISTING BUILDING, EQUIPMENT, ETC., WHICH AFFECT THIS WORK, AND THE ACCESS TO SUCH SPACES, HAS BEEN MADE AND THAT THE CONTRACTOR IS FAMILIAR WITH EXISTING CONDITIONS AND DIFFICULTIES THAT WILL AFFECT THE EXECUTION OF THE WORK. LATER CLAIMS SHALL NOT BE MADE FOR LABOR, EQUIPMENT OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN DURING SUCH AN EXAMINATION. THE ON–SITE INSPECTION SHALL VERIFY EXISTING DUCTWORK, PIPING (SIZES, CLEARANCES, ETC) AND CONDITIONS.
28. INSURANCE: IN ACCORDANCE WITH BUILDING REQUIREMENTS THE CONTRACTOR SHALL INCLUDE A HOLD HARMLESS CLAUSE FOR OWNER AND ENGINEER.
29. THE FINAL ACCEPTANCE WILL BE MADE AFTER THE CONTRACTOR HAS ADJUSTED HIS EQUIPMENT, BALANCED THE VARIOUS SYSTEMS, DEMONSTRATED THAT IT FULFILLS THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS AND HAS FURNISHED ALL THE REQUIRED CERTIFICATES OF INSPECTION AND APPROVAL.
30. SPECIFICATIONS ARE OF SIMPLIFIED FORM AND INCLUDE INCOMPLETE SENTENCES. WORDS OR PHRASES SUCH AS "THE CONTRACTOR SHALL," "SHALL BE," "FURNISH," "PROVIDE," "A," "THE," AND "ALL" HAVE BEEN OMITTED FOR BREVITY.
31. WHERE A CONFLICT EXISTS BETWEEN THE DRAWINGS, THE SPECIFICATIONS OR ANY OTHER CONSTRUCTION DOCUMENT, THE ONE WITH THE MOST STRINGENT REQUIREMENT(S) SHALL APPLY.

DEFINITIONS:

1) "PROVIDE": TO SUPPLY, INSTALL AND CONNECT UP COMPLETE AND READY FOR SAFE AND REGULAR OPERATION THE PARTICULAR WORK REFERRED TO UNLESS SPECIFICALLY OTHERWISE NOTED.
2) "INSTALL": TO ERECT, MOUNT AND CONNECT COMPLETE WITH RELATED ACCESSORIES.
3) "FURNISH" OR "SUPPLY": TO PURCHASE, PROCURE, ACQUIRE AND DELIVER COMPLETE WITH RELATED ACCESSORIES.

NOTE TO CONTRACTOR

1. THE WORK UNDER CONTRACT INCLUDES ALL LABOR, MATERIALS AND APPLIANCES NECESSARY FOR THE FURNISHING, INSTALLING AND TESTING, COMPLETE AND READY FOR SAFE OPERATION OF THE SYSTEMS AS DESCRIBED IN THE SPECIFICATIONS, FLOOR PLAN(S) DESIGN, DETAIL DRAWINGS, NOTES, RFI'S, ETC. FOR THIS PROJECT. WORK SHALL BE INSTALLED IN A NEAT, WORKMANLIKE MANNER.
2. THE CONTRACTOR SHALL GIVE NECESSARY NOTICE, FILE DRAWINGS AND SPECIFICATIONS WITH THE DEPARTMENT HAVING JURISDICTION, OBTAIN PERMITS OR LICENSES NECESSARY TO CARRY OUT THIS WORK AND PAY ALL FEES THEREFORE. THE CONTRACTOR SHALL ARRANGE FOR INSPECTION AND TESTS OF ANY OR ALL PARTS OF THE WORK IF SO REQUIRED BY AUTHORITIES AND PAY ALL CHARGES FOR SAME. THE CONTRACTOR SHALL PAY ALL COSTS FOR, AND FURNISH TO THE OWNER BEFORE FINAL BILLING, ALL CERTIFICATES NECESSARY AS EVIDENCE THAT THE WORK INSTALLED CONFORMS WITH ALL REGULATIONS WHERE THEY APPLY TO THIS WORK.
3. THE CONTRACTOR SHALL FURNISH A WRITTEN GUARANTEE TO REPLACE OR REPAIR PROMPTLY AND ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED FOR ANY WORKMANSHIP AND EQUIPMENT IN WHICH DEFECTS DEVELOP WITHIN ONE YEAR FROM THE DATE OF FINAL CERTIFICATE FOR PAYMENT AND/OR FROM DATE OR ACTUAL USE OF EQUIPMENT OR OCCUPANCY OF SPACES, BY OWNER, INCLUDED UNDER THE VARIOUS PARTS OF THE WORK, WHICHEVER DATE IS EARLIER. THIS WORK SHALL BE DONE AS DIRECTED BY THE OWNER. THIS GUARANTEE SHALL ALSO PROVIDE THAT WHERE DEFECTS OCCUR, THE CONTRACTOR WILL ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED IN REPAIRING AND REPLACING WORK OF OTHER TRADES AFFECTED BY DEFECTS, REPAIRS OR REPLACEMENTS IN EQUIPMENT SUPPLIED BY THE CONTRACTOR.

EQUIPMENT/DEVICE COORDINATION NOTES:

1) GENERAL CONTRACTOR TO CONFIRM FINAL EQUIPMENT SPECIFICATIONS FOR OWNER AND G.C. PROVIDE EQUIPMENT AND COMPARE ALL ELECTRICAL, PLUMBING, AND MECHANICAL REQUIREMENTS TO EQUIPMENT SHOWN ON THESE DRAWINGS. G.C. TO NOTIFY ARCHITECT AND ENGINEERS OF ANY DISCREPANCIES PRIOR TO ORDERING OR INSTALLING ELECTRICAL, PLUMBING, OR MECHANICAL INFRASTRUCTURE.

C403.4.1 THERMOSTATIC CONTROLS

THE SUPPLY OF HEATING AND COOLING ENERGY TO EACH ZONE SHALL BE CONTROLLED BY INDIVIDUAL THERMOSTATIC CONTROLS CAPABLE OF RESPONDING TO TEMPERATURE WITHIN THE ZONE. WHERE HUMIDIFICATION OR DEHUMIDIFICATION OR BOTH IS PROVIDED, NOT FEWER THAN ONE HUMIDITY CONTROL DEVICE SHALL BE PROVIDED FOR EACH HUMIDITY CONTROL SYSTEM.

C403.4.1.2 DEADBAND

WHERE USED TO CONTROL BOTH HEATING AND COOLING, ZONE THERMOSTATIC CONTROLS SHALL BE CONFIGURED TO PROVIDE A TEMPERATURE RANGE OR DEADBAND OF NOT LESS THAN 5°F (2.8°C) WITHIN WHICH THE SUPPLY OF HEATING AND COOLING ENERGY TO THE ZONE IS SHUT OFF OR REDUCED TO A MINIMUM.

C403.4.1.3 SETPOINT OVERLAP RESTRICTION

WHERE A ZONE HAS A SEPARATE HEATING AND A SEPARATE COOLING THERMOSTATIC CONTROL LOCATED WITHIN THE ZONE, A LIMIT SWITCH, MECHANICAL STOP OR DIRECT DIGITAL CONTROL SYSTEM WITH SOFTWARE PROGRAMMING SHALL BE CONFIGURED TO PREVENT THE HEATING SETPOINT FROM EXCEEDING THE COOLING SETPOINT AND TO MAINTAIN A DEADBAND IN ACCORDANCE WITH SECTION C403.4.1.2.

C403.4.2 OFF–HOUR CONTROLS

EACH ZONE SHALL BE PROVIDED WITH THERMOSTATIC SETBACK CONTROLS THAT ARE CONTROLLED BY EITHER AN AUTOMATIC TIME CLOCK OR PROGRAMMABLE CONTROL SYSTEM.

C403.4.2.1 THERMOSTATIC SETBACK

THERMOSTATIC SETBACK CONTROLS SHALL BE CONFIGURED TO SET BACK OR TEMPORARILY OPERATE THE SYSTEM TO MAINTAIN ZONE TEMPERATURES DOWN TO 55°F (13°C) OR UP TO 85°F (29°C).

C403.4.2.2 AUTOMATIC SETBACK AND SHUTDOWN

AUTOMATIC TIME CLOCK OR PROGRAMMABLE CONTROLS SHALL BE CAPABLE OF STARTING AND STOPPING THE SYSTEM FOR SEVEN DIFFERENT DAILY SCHEDULES PER WEEK AND RETAINING THEIR PROGRAMMING AND TIME SETTING DURING A LOSS OF POWER FOR NOT FEWER THAN 10 HOURS. ADDITIONALLY, THE CONTROLS SHALL HAVE A MANUAL OVERRIDE THAT ALLOWS TEMPORARY OPERATION OF THE SYSTEM FOR UP TO 2 HOURS; A MANUALLY OPERATED TIMER CONFIGURED TO OPERATE THE SYSTEM FOR UP TO 2 HOURS; OR AN OCCUPANCY SENSOR.

C403.4.2.3 AUTOMATIC START AND STOP

AUTOMATIC START AND STOP CONTROLS SHALL BE PROVIDED FOR EACH HVAC SYSTEM. THE AUTOMATIC START CONTROLS SHALL BE CONFIGURED TO AUTOMATICALLY ADJUST THE DAILY START TIME OF THE HVAC SYSTEM IN ORDER TO BRING EACH SPACE TO THE DESIRED OCCUPIED TEMPERATURE IMMEDIATELY PRIOR TO SCHEDULED OCCUPANCY. AUTOMATIC STOP CONTROLS SHALL BE PROVIDED FOR EACH HVAC SYSTEM WITH DIRECT DIGITAL CONTROL OF INDIVIDUAL ZONES. THE AUTOMATIC STOP CONTROLS SHALL BE CONFIGURED TO REDUCE THE HVAC SYSTEM'S HEATING TEMPERATURE SETPOINT AND INCREASE THE COOLING TEMPERATURE SETPOINT BY NOT LESS THAN 2°F (–16.6°C) BEFORE SCHEDULED UNOCCUPIED PERIODS BASED ON THE THERMAL LAG AND ACCEPTABLE DRIFT IN SPACE TEMPERATURE THAT IS WITHIN COMFORT LIMITS.

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Sheet Issue & Revision Log

It is the clients responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or clients subcontractors proceeding with the work. The client will be responsible for any defects in construction if these procedures are not followed.

MECHANICAL SYMBOLS, ABBREVIATIONS AND GENERAL NOTES

M0.1

GENERAL HVAC NOTES

GENERAL:

1. PROVIDE ALL MATERIAL AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE AND OPERABLE MECHANICAL SYSTEMS AS INDICATED ON THE DRAWINGS, AS SPECIFIED AND AS REQUIRED BY CODE.

2. CONTRACT DOCUMENT DRAWINGS FOR MECHANICAL WORK (HVAC, PLUMBING, AND FIRE PROTECTION) ARE DIAGRAMMATIC AND ARE INTENDED TO CONVEY SCOPE AND GENERAL ARRANGEMENT ONLY.

3. THE LOCATIONS OF ALL ITEMS SHOWN ON THE DRAWINGS OR CALLED FOR IN THE SPECIFICATIONS THAT ARE NOT FIXED BY DIMENSIONS ARE APPROXIMATE ONLY. THE EXACT LOCATIONS NECESSARY TO SECURE THE BEST CONDITIONS AND RESULTS MUST BE DETERMINED BY THE PROJECT SITE CONDITIONS AND SHALL HAVE THE APPROVAL OF THE ENGINEER BEFORE BEING INSTALLED. DO NOT SCALE DRAWINGS.

4. WHEN MECHANICAL WORK (HVAC, PLUMBING, SHEET METAL, FIRE PROTECTION, ETC.) IS SUBCONTRACTED, IT SHALL BE THE MECHANICAL CONTRACTOR'S RESPONSIBILITY TO COORDINATE SUBCONTRACTORS AND THE ASSOCIATED CONTRACTS. WHEN DISCREPANCIES ARISE PERTAINING TO WHICH CONTRACTOR PROVIDES A PARTICULAR ITEM OF THE MECHANICAL CONTRACT OR WHICH CONTRACTOR PROVIDES FINAL CONNECTIONS FOR A PARTICULAR ITEM OF THE MECHANICAL CONTRACT, IT SHALL BE BROUGHT TO THE ATTENTION OF THE MECHANICAL CONTRACTOR, WHOSE DECISION SHALL BE FINAL.

5. COORDINATE CONSTRUCTION OF ALL MECHANICAL WORK WITH ARCHITECTURAL, STRUCTURAL, CIVIL, ELECTRICAL WORK, ETC., SHOWN ON OTHER CONTRACT DOCUMENT DRAWINGS.

6. INSTALL ALL MECHANICAL EQUIPMENT AND APPURTENANCES IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, CONTRACT DOCUMENTS, AND APPLICABLE CODES AND REGULATIONS.

7. WHERE TWO OR MORE ITEMS OF THE SAME TYPE OF EQUIPMENT ARE REQUIRED, THE PRODUCT OF ONE MANUFACTURER SHALL BE USED.

8. COORDINATE ALL EQUIPMENT CONNECTIONS WITH MANUFACTURERS' CERTIFIED DRAWINGS. COORDINATE AND PROVIDE ALL DUCT AND PIPING TRANSITIONS REQUIRED FOR FINAL EQUIPMENT CONNECTIONS TO FURNISHED EQUIPMENT. FIELD VERIFY AND COORDINATE ALL DUCT AND PIPING DIMENSIONS BEFORE FABRICATION.

9. ALL CONTROL WIRE AND CONDUIT SHALL COMPLY WITH THE NATIONAL ELECTRIC CODE AND ELECTRICAL DIVISION OF THE SPECIFICATION.

10. PROVIDE VIBRATION ISOLATION FOR ALL MECHANICAL EQUIPMENT TO PREVENT TRANSMISSION OF VIBRATION TO BUILDING STRUCTURE.

11. LOCATE ALL TEMPERATURE, AND FLOW MEASURING DEVICES IN ACCESSIBLE LOCATIONS WITH THE STRAIGHT SECTION OF PIPE OR DUCT UP– AND DOWNSTREAM AS RECOMMENDED BY THE MANUFACTURER FOR GOOD ACCURACY.

12. WHERE BEAMS ARE INDICATED TO BE PENETRATED WITH DUCTWORK OR PIPING, COORDINATE DUCTWORK AND PIPING LAYOUT WITH BEAM OPENING SIZE AND OPENING LOCATIONS. COORDINATION SHALL BE DONE PRIOR TO THE FABRICATION OF DUCTWORK, CUTTING OF PIPING, OR FABRICATION OF BEAMS.

13. ALL MISCELLANEOUS STEEL REQUIRED TO ENSURE PROPER INSTALLATION AND AS SHOWN IN THE DETAILS FOR DUCTWORK, AND EQUIPMENT (UNLESS OTHERWISE NOTED) SHALL BE FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR.

14. PROVIDE ACCESS PANELS FOR INSTALLATION IN WALLS AND CEILINGS, WHERE REQUIRED, TO SERVICE DAMPERS, VALVES, SMOKE DETECTORS, AND OTHER CONCEALED MECHANICAL EQUIPMENT. ACCESS PANELS SHALL BE TURNED OVER TO THE GENERAL CONTRACTOR FOR INSTALLATION. ACCESS PANELS SHALL HAVE THE EQUAL RATED CAPACITY (1HR, 2HR, ETC.) AS WALL.

15. MECHANICAL EQUIPMENT, DUCTWORK, AND PIPING SHALL NOT BE SUPPORTED FROM A METAL DECK.

16. ALL EQUIPMENT, PIPING, DUCTWORK, ETC., SHALL BE SUPPORTED AS DETAILED, SPECIFIED AND REQUIRED TO PROVIDE A VIBRATION–FREE INSTALLATION.

17. ALL DUCTWORK, PIPING, AND EQUIPMENT SUPPORTED FROM STRUCTURAL STEEL SHALL BE COORDINATED WITH THE GENERAL CONTRACTOR. ALL ATTACHMENTS TO STEEL BAR JOISTS, TRUSSES, OR JOIST GIRDERS SHALL BE AT PANEL POINTS. PROVIDE BEAM CLAMPS MEETING MSS STANDARDS. WELDING TO STRUCTURAL MEMBERS SHALL NOT BE PERMITTED. THE USE OF C–CLAMPS SHALL NOT BE PERMITTED.

18. LOCATIONS AND SIZES OF ALL FLOOR, WALL, AND ROOF OPENINGS SHALL BE COORDINATED WITH ALL OTHER TRADES INVOLVED.

19. ALL OPENINGS IN FIRE WALLS DUE TO DUCTWORK, PIPING, CONDUIT, ETC., SHALL BE FIRE STOPPED WITH A PRODUCT SIMILAR TO 3M OR APPROVED EQUAL.

20. ALL AIR CONDITIONING CONDENSATE DRAIN LINES FROM EACH AIR HANDLING UNIT SHALL BE PIPED FULL SIZE OF THE UNIT DRAIN OUTLET, WITH "P" TRAP, AND PIPED TO THE NEAREST DRAIN. SEE THE DETAILS SHOWN IN THE DRAWINGS OR THE CONTRACT SPECIFICATIONS FOR THE DEPTH OF THE AIR CONDITIONING CONDENSATE TRAP.

21. REFER TO TYPICAL DETAILS FOR DUCTWORK, PIPING, AND EQUIPMENT INSTALLATION.

22. ALL TESTS SHALL BE COMPLETED BEFORE ANY MECHANICAL EQUIPMENT OR PIPING INSULATION IS APPLIED.

23. TESTING, ADJUSTING, AND BALANCING AGENCY SHALL BE A MEMBER OF THE ASSOCIATED AIR BALANCE COUNCIL (AABC) OR THE NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB). TESTING, ADJUSTING, AND BALANCING SHALL BE PERFORMED IN ACCORDANCE WITH THE AABC STANDARDS.

HVAC DUCTWORK – SHEET METAL

1. CERTAIN ITEMS SUCH AS RISES AND DROPS IN DUCTWORK,ACCESS DOORS, VOLUME DAMPERS, ETC., ARE INDICATED ON THE CONTRACT DOCUMENT DRAWINGS FOR CLARITY FOR A SPECIFIC LOCATION REQUIREMENT AND SHALL NOT BE INTERPRETED AS THE EXTENT OF THE REQUIREMENTS FOR THESE ITEMS.

2. CONTRACTOR TO CHECK AND CORRECT ANY AND ALL DEFICIENCIES IN EXISTING DUCTS. ALL NEW DUCTWORK WILL COMPLY WITH THE LATEST SMACNA GUIDELINES AND CONFORM WITH REQUIREMENTS OF THE LATEST HANDBOOKS PUBLISHED BY ASHRAE.

3. PROVIDE VOLUME DAMPER AT EACH TAP TO MAIN DUCT AND WHERE NECESSARY TO PROPERLY BALANCE SYSTEM.

4. SUPPLY AND RETURN DUCTWORK 20' FROM ALL AC UNITS SHALL BE LINED WITH 1.5" ACOUSTICAL LINING.

5. RE–INSULATE ALL DUCTWORK AND PIPING IN WHICH INSULATION HAS BEEN REMOVED OR DAMAGED WITH INSULATION EQUAL TO THE EXISTING INSULATION.

6. CONTRACTOR SHALL SUPPLY AND INSTALL ALL NECESSARY SUPPLY DIFFUSERS AND RETURN AIR REGISTERS WHERE INDICATED ON THE DRAWING. COORDINATE LOCATION OF DIFFUSERS AND REGISTERS WITH REFLECTED CEILING PLAN.

7. IN CORRIDORS WHERE CEILING SPEAKERS AND AIR DIFFUSERS ARE INDICATED BETWEEN THE SAME LIGHT FIXTURES, INSTALL BOTH DEVICES AT THE QUARTER POINTS BETWEEN THE FIXTURES.

8. ALL DUCTWORK SHALL CLEAR DOORS AND WINDOWS.

9. ALL DUCTWORK DIMENSIONS, AS SHOWN ON THE DRAWINGS, ARE INTERNAL CLEAR DIMENSIONS AND DUCT SIZE SHALL BE INCREASED TO COMPENSATE FOR DUCT LINING THICKNESS.

10. PROVIDE ALL 90–DEGREE SQUARE ELBOWS WITH DOUBLE RADIUS TURNING VANES UNLESS OTHERWISE INDICATED. ELBOWS IN DISHWASHER, KITCHEN, AND LAUNRY EXHAUSTS SHALL BE OF UN–VANED SMOOTH RADIUS CONSTRUCTION WITH A RADIUS EQUAL TO 1–1/2 TIMES THE WIDTH OF THE DUCT. PROVIDE ACCESS DOORS UPSTREAM OF ALL ELBOWS WITH TURNING VANES.

11. COORDINATE DIFFUSER, REGISTER, AND GRILLE LOCATIONS WITH ARCHITECTURAL REFLECTED CEILING PLANS, LIGHTING, AND OTHER CEILING ITEMS AND MAKE MINOR DUCT MODIFICATIONS TO SUIT.

12. ALL AIR HANDLING UNITS SHALL OPERATE WITHOUT MOISTURE CARRYOVER.

13. LOCATE ALL MECHANICAL EQUIPMENT FOR UNOBSTRUCTED ACCESS TO UNIT ACCESS PANELS, CONTROLS, AND VALVING.

14. PROVIDE FLEXIBLE CONNECTIONS IN ALL DUCTWORK SYSTEMS (SUPPLY, RETURN, AND EXHAUST) CONNECTED TO AIR HANDLING UNITS, FANS, AND OTHER EQUIPMENT THAT REQUIRE VIBRATION ISOLATION. FLEXIBLE CONNECTIONS SHALL BE PROVIDED AT THE POINT OF CONNECTION TO THE EQUIPMENT UNLESS OTHERWISE INDICATED.

15. UNLESS OTHERWISE NOTED, ALL DUCTWORK IS OVERHEAD, TIGHT TO THE UNDERSIDE OF THE STRUCTURE, WITH SPACE FOR INSULATION IF NEEDED.

16. RUNS OF FLEXIBLE DUCT SHALL NOT EXCEED 5 FT.

17. ALL DUCTWORK SHALL BE COORDINATED WITH ALL TRADES INVOLVED. OFFSETS IN DUCTS, INCLUDING DIVIDED DUCTS AND TRANSITIONS AROUND OBSTRUCTIONS, SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.

18. PROVIDE ACCESS DOORS IN DUCTWORK TO PROVIDE ACCESS FOR ALL SMOKE DETECTORS, FIRE DAMPERS, SMOKE DAMPERS, VOLUME DAMPERS, COILS, AND OTHER ITEMS LOCATED IN THE DUCTWORK THAT REQUIRE SERVICE AND/OR INSPECTION.

19. PROVIDE ACCESS DOORS IN DUCTWORK FOR THE OPERATION, ADJUSTMENT, AND MAINTENANCE OF ALL FANS, VALVES, AND MECHANICAL EQUIPMENT.

20. ALL DUCTS SHALL BE GROUNDED ACROSS FLEXIBLE CONNECTIONS WITH FLEXIBLE COPPER GROUNDING STRAPS. GROUNDING STRAPS SHALL BE BOLTED OR SOLDERED TO BOTH THE EQUIPMENT AND THE DUCT.

21. SMOKE DETECTORS SHALL BE FURNISHED AND WIRED BY THE ELECTRICAL CONTRACTOR. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR MOUNTING THE SMOKE DETECTOR IN DUCTWORK AS SHOWN ON THE DRAWINGS AND IN ACCORDANCE WITH THE MANUFACTURER'S PRINTED INSTRUCTIONS.

22. SEE SPECIFICATIONS FOR DUCTWORK GAUGES, BRACING, HANGERS, AND OTHER REQUIREMENTS.

23. EXTERIOR LOUVERS ARE INDICATED FOR SIZE, GENERAL LOCATION AND PERFORMANCE ONLY. DETAILED LOUVER DESCRIPTIONS ARE PROVIDED IN THE ARCHITECTURAL SPECIFICATIONS.

PIPING

1. PROVIDE ALL MATERIALS AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE AND OPERABLE PIPING SYSTEMS AS INDICATED ON THE DRAWINGS AND AS SPECIFIED AND REQUIRED BY CODE.

2. ELEVATIONS AS SHOWN ON THE DRAWINGS ARE TO THE BOTTOM OF ALL PRESSURE PIPING AND TO THE INVERT OF ALL GRAVITY PIPING UNLESS OTHERWISE NOTED.

3. UNLESS OTHERWISE NOTED, ALL PIPING IS OVERHEAD, TIGHT TO THE UNDERSIDE OF THE STRUCTURE OR SLAB, WITH SPACE FOR INSULATION IF REQUIRED.

4. INSTALL PIPING SO ALL VALVES, STRAINERS, UNIONS, TRAPS, FLANGES, AND OTHER APPURTENANCES REQUIRING ACCESS ARE ACCESSIBLE.

5. ALL VALVES SHALL BE INSTALLED SO THAT THE VALVE REMAINS IN SERVICE WHEN EQUIPMENT OR PIPING ON THE EQUIPMENT SIDE OF THE VALVE IS REMOVED.

6. ALL VALVES (EXCEPT CONTROL VALVES) AND STRAINERS SHALL BE THE FULL SIZE OF THE PIPE BEFORE REDUCING IN SIZE TO MAKE CONNECTIONS TO EQUIPMENT AND CONTROLS.

7. INSTALL ALL PIPING WITHOUT FORCING OR SPRINGING.

8. ALL PIPING SHALL CLEAR DOORS AND WINDOWS.

9. ALL VALVES SHALL BE ADJUSTED FOR SMOOTH AND EASY OPERATION.

10. ALL PIPING SHALL BE COORDINATED WITH ALL TRADES INVOLVED. OFFSETS IN PIPING AROUND OBSTRUCTIONS SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.

11. SLOPED REFRIGERANT PIPING 1% IN THE DIRECTION OF OIL RETURN. LIQUID LINES MAY BE INSTALLED LEVEL.

12. INSTALL HORIZONTAL REFRIGERANT HOT GAS DISCHARGE PIPING WITH 1/2" PER 10 FT. DOWNWARD SLOPE AWAY FROM THE COMPRESSOR.

13. INSTALL HORIZONTAL REFRIGERANT SUCTION LINES WITH 1/2" PER 10 FT. DOWNWARD SLOPE TO THE COMPRESSOR, WITH NO LONG TRAPS OR DEAD ENDS THAT MAY CAUSE OIL TO SEPARATE FROM THE SUCTION GAS AND RETURN TO THE COMPRESSOR IN DAMAGING SLUGS.

14. PROVIDE LINE SIZE LIQUID INDICATORS IN THE MAIN LIQUID LINE LEAVING THE CONDENSER OR RECEIVER. INSTALL MOISTURE–LIQUID INDICATORS IN LIQUID LINES BETWEEN FILTER DRYERS AND THERMOSTATIC EXPANSION VALVES, AND IN LIQUID LINE TO RECEIVER.

15. PROVIDE A LINE SIZE STRAINER UPSTREAM OF EACH AUTOMATIC VALVE. PROVIDE A SHUT–OFF VALVE ON EACH SIDE OF A STRAINER.

16. PROVIDE PERMANENT FILTER DRYERS IN LOW–TEMPERATURE SYSTEMS AND SYSTEMS USING HERMETIC COMPRESSORS.

17. PROVIDE REPLACEABLE CARTRIDGE FILTER DRYERS WITH A THREE–VALVE BYPASS ASSEMBLY FOR SOLENOID VALVES, ADJACENT TO RECEIVERS.

18. PROVIDE REFRIGERANT CHARGING VALVE CONNECTIONS IN THE LIQUID LINE BETWEEN THE RECEIVER SHUTOFF VALVE AND THE EXPANSION VALVE.

SPECIFICATIONS

SECTION 0001 – NOTICE TO BIDDERS

1.1 BIDDERS REPRESENTATIONS

A. THE BIDDER BY MAKING A BID REPRESENTS THAT:

THE BIDDER HAS READ AND UNDERSTANDS THE BIDDING DOCUMENTS, TO THE EXTENT THAT SUCH DOCUMENTATION RELATES TO THE WORK FOR WHICH THE BID IS SUBMITTED, AND FOR OTHER PORTIONS OF THE PROJECT, IF ANY, BEING BID CONCURRENTLY OR PRESENTLY UNDER CONSTRUCTION.

B. THE BID IS MADE IN COMPLIANCE WITH THE BIDDING DOCUMENTS.

C. THE SPECIFICATIONS AND DRAWINGS ARE INTENDED TO SERVE JOINTLY AS A BASIS FOR THE BIDDER TO SUBMIT A CONTRACT PRICE FOR THE MATERIAL AND LABOR.

D. SHOULD CONFLICTS OR DISCREPANCIES OCCUR WITHIN THE BIDDING DOCUMENTS, THE ITEM OR ITEMS IN DISPUTE THAT REPRESENT THE GREATER COST SHALL PREVAIL IN THE FINAL BID.

E. THE BID IS BASED UPON THE MATERIALS, EQUIPMENT AND SYSTEMS REQUIRED BY THE BIDDING DOCUMENTS WITHOUT EXCEPTION.

1.2 EXISTING CONDITIONS AND COORDINATION

A. THE BIDDER HAS VISITED THE SITE, BECOME FAMILIAR WITH LOCAL CONDITIONS UNDER WHICH THE WORK IS TO BE PERFORMED AND HAS CORRELATED THE BIDDER'S PERSONAL OBSERVATIONS WITH THE REQUIREMENTS OF THE PROPOSED BIDDING DOCUMENTS.

B. THE BIDDER SHALL PROPOSE COORDINATION OF WORK SUCH THAT CONFLICTS WITH OTHER TRADES AND SPACE ALLOCATIONS ARE AVOIDED.

1.3 RESPONSIBILITIES

A. THE BIDDER UNDERSTANDS THAT ANY CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR THE TIMELY COMPLETION AND ACCEPTANCE OF THEIR WORK AND THAT ANY ITEMS DAMAGED, LOST OR STOLEN DURING TIME OF CONSTRUCTION SHALL BE REPAIRED OR REPLACED WITHOUT ANY ADDITIONAL COST TO THE OWNER.

B. THE BIDDER UNDERSTANDS THAT ANY PROPOSED WORK IN OCCUPIED TENANT SPACES SHALL BE PERFORMED DURING TIMES OF NON–TENANT OCCUPANCY OR AS SCHEDULED OR DIRECTED BY THE BUILDING MANAGER.

C. THE BIDDER UNDERSTANDS THAT ANY PROPOSED SHUT–DOWN OF EXISTING SYSTEMS DURING CONSTRUCTION SHALL BE PRE–ARRANGED WITH THE BUILDING MANAGER AND THAT SUCH SHUT–DOWNS ARE TO BE KEPT TO A MINIMUM.

END OF SECTION 0001

SECTION 0101 – QUALITY OF WORK

1.1 WORKMANSHIP

A. ALL WORK SHALL BE FREE FROM DEFECTS IN MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE.

B. ALL DEFECTS WHICH DEVELOP OR ARE DISCOVERED WITHIN THIS PERIOD SHALL BE REPAIRED BY THE CONTRACTOR TO THE SATISFACTION OF THE ARCHITECT OR BUILDING MANAGER AT NO ADDITIONAL COST TO THE OWNER.

C. UPON COMPLETION OF THE WORK THE CONTRACTOR SHALL REMOVE FROM THE SITE, ALL TOOLS, DEMOLISHED APPLIANCES AND ANY SURPLUS MATERIAL.

1.2 CODE COMPLIANCE

A. ALL WORK SHALL MEET ALL STATE AND LOCAL CODES HAVING JURISDICTION.

END OF SECTION 0101

SECTION 0101 – QUALITY OF WORK

1.1 WORKMANSHIP

A. ALL WORK SHALL BE FREE FROM DEFECTS IN MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE.

B. ALL DEFECTS WHICH DEVELOP OR ARE DISCOVERED WITHIN THIS PERIOD SHALL BE REPAIRED BY THE CONTRACTOR TO THE SATISFACTION OF THE ARCHITECT OR BUILDING MANAGER AT NO ADDITIONAL COST TO THE OWNER.

C. UPON COMPLETION OF THE WORK THE CONTRACTOR SHALL REMOVE FROM THE SITE, ALL TOOLS, DEMOLISHED APPLIANCES AND ANY SURPLUS MATERIAL.

1.2 CODE COMPLIANCE

A. ALL WORK SHALL MEET ALL STATE AND LOCAL CODES HAVING JURISDICTION.

END OF SECTION 0101

SECTION 0102 –REQUIRED DOCUMENTS

1.1 SHOP DRAWINGS

A. A SET OF PRINTS FOR ANY MECHANICAL WORK INCLUDING BUT NOT LIMITED TO, DUCTWORK AND PIPING LAYOUT SHALL BE SUBMITTED FOR APPROVAL TO THE ENGINEER PRIOR TO CONSTRUCTION OR PURCHASE OF MATERIALS.

1.2 SUBMITTALS

A. EQUIPMENT SUBMITTALS OF ALL PROPOSED MECHANICAL AND ANCILLARY EQUIPMENT INCLUDING ALL ACCESSORIES SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW. ALL PERTINENT MODELS, SIZES, ACCESSORIES AND CHOICES SHALL BE CLEARLY CHECKED, PRINTED OR OTHERWISE INDICATED ON THE SUBMITTALS.

1.3 RECORD DRAWINGS

A. UPON COMPLETION OF THE WORK, A RECORD DRAWING SHALL BE SUBMITTED TO THE OWNER DEPICTING ALL SUBSEQUENT CHANGES, ADDITIONS AND OR CORRECTIONS TO THE CONTRACT DRAWINGS AND OR CONTRACT SCOPE MADE DURING CONSTRUCTION. THIS DRAWING SHALL REPRESENT A COMPLETE RECORD OF THE WORK INSTALLED.

1.4 EQUIPMENT OPERATING INSTRUCTIONS

A. ON COMPLETION AND ACCEPTANCE OF WORK, THIS CONTRACTOR SHALL FURNISH WRITTEN INSTRUCTIONS,EQUIPMENT MANUALS AND DEMONSTRATE TO THE OWNER THE PROPER OPERATION AND MAINTENANCE OF ALL EQUIPMENT AND APPARATUS FURNISHED UNDER THIS CONTRACT.

B. THESE INSTRUCTIONS SHALL BE TYPED ON 8–1/2 IN. X 11 IN. PAPER AND BOUND IN THREE–RING BINDERS WITH CLEAR ACETATE COVERS. THE CONTRACTOR SHALL GIVE THREE COPIES OF THE INSTRUCTIONS TO THE OWNER AND ONE ELECTRONIC COPY TO THE ENGINEER.

C. THE INSTRUCTION BOOKLET SHALL BE ORGANIZED IN SECTIONS, WITH ONE SECTION PER SYSTEM. THE COVER OF THE INSTRUCTION BOOKLET SHALL BEAR THE NAME, ADDRESS AND PHONE NUMBER OF THE PROJECT, ARCHITECT, ENGINEER, MECHANICAL CONTRACTOR AND SUBCONTRACTORS.

END OF SECTION 0102

SECTION 078413–PENETRATION FIRE–STOPPING

1.1 QUALITY ASSURANCE

A. INSTALLER QUALIFICATIONS: AN FM GLOBAL–APPROVED FIRE–STOP CONTRACTOR OR A UL–QUALIFIED FIRE–STOP CONTRACTOR.

B. FIRE–TEST–RESPONSE CHARACTERISTICS: UL, INTERTEK ETL SEMKO OR FM GLOBAL

1.2 PENETRATION FIRESTOPPING

A. PENETRATIONS IN FIRE–RESISTANCE–RATED WALLS: F–RATINGS PER ASTM E 814 OR UL 1479.

B. PENETRATIONS IN HORIZONTAL ASSEMBLIES: F– AND T–RATINGS PER ASTM E 814 OR UL 1479:

C. PENETRATIONS IN SMOKE BARRIERS: L–RATINGS PER UL 1479.

D. W–RATINGS: PER UL 1479.

1.3 INSTALLATION

A. IDENTIFICATION: PREPRINTED METAL OR PLASTIC LABELS.

1.4 FIELD QUALITY CONTROL

A. INSPECTION OF INSTALLED FIRE–STOPPING: BY OWNER–ENGAGED AGENCY ACCORDING TO ASTM E 2174.

1.5 THROUGH–PENETRATION FIRESTOP SYSTEM SCHEDULE

WHERE UL–CLASSIFIED SYSTEMS ARE INDICATED, THEY REFER TO SYSTEM NUMBERS IN UL'S "FIRE RESISTANCE DIRECTORY" UNDER PRODUCT CATEGORY XHEZ.

FOR THE FOLLOWING SYSTEMS:

METALLIC AND NON–METALLIC PIPES, CONDUIT, OR TUBING, ELECTRICAL CABLES, CABLE TRAYS WITH ELECTRIC CABLES, MISCELLANEOUS ELECTRICAL PENETRANTS, INSULATED PIPES, GROUPINGS OF PENETRANTS, USE ON OR MORE THE FOLLOWING MATERIALS:

a. LATEX SEALANT
b. SILICONE SEALANT
c. INTUMESCENT PUTTY
d. MORTAR
h. SILICONE FOAM
i. PILLOWS/BAGS
j. INTUMESCENT WRAP STRIPS
k. INTUMESCENT COMPOSITE SHEET

1.6 MANUFACTURERS

1. HILTI CONSTRUCTION CHEMICAL, INC
2. TREMCO INC.
3. 3M FIRE PROTECTION PRODUCTS

END OF SECTION 078413

SECTION 230529 – HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

1.1 PERFORMANCE REQUIREMENTS

A. DELEGATED DESIGN: DESIGN TRAPEZE PIPE HANGERS AND EQUIPMENT SUPPORTS, INCLUDING COMPREHENSIVE ENGINEERING ANALYSIS BY A QUALIFIED PROFESSIONAL ENGINEER, USING PERFORMANCE REQUIREMENTS AND DESIGN CRITERIA INDICATED.

B. STRUCTURAL PERFORMANCE: HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT SHALL WITHSTAND THE EFFECTS OF GRAVITY LOADS AND STRESSES WITHIN LIMITS AND UNDER CONDITIONS INDICATED ACCORDING TO ASCE/SEI 7.

1. DESIGN SUPPORTS FOR MULTIPLE PIPES CAPABLE OF SUPPORTING COMBINED WEIGHT OF SUPPORTED SYSTEMS, SYSTEM CONTENTS, AND TEST WATER.
2. DESIGN EQUIPMENT SUPPORTS CAPABLE OF SUPPORTING COMBINED OPERATING WEIGHT OF SUPPORTED EQUIPMENT AND CONNECTED SYSTEMS.
3. DESIGN SEISMIC–RESTRAINT HANGERS AND SUPPORTS FOR PIPING AND EQUIPMENT AND OBTAIN APPROVAL FROM AUTHORITIES HAVING JURISDICTION.

1.2 SUBMITTALS

A. SHOP DRAWINGS: SIGNED AND SEALED BY A PROFESSIONAL ENGINEER

1.3 QUALITY ASSURANCE

A. AWS D1.1/D1.1M, "STRUCTURAL WELDING CODE – STEEL."

1.4 COMPONENTS

A. METAL PIPE HANGERS AND SUPPORTS: CARBON OR STAINLESS STEEL

B. TRAPEZE PIPE HANGERS: CARBON OR STAINLESS STEEL

C. FIBERGLASS PIPE HANGERS: –CLEVIS, CENTURY COMPOSITES, COOPER B–LINE

D. METAL FRAMING SYSTEMS: MFMA MANUFACTURER

E. FIBERGLASS STRUT SYSTEMS: COOPER B–LINE

F. THERMAL–HANGER SHIELD INSERTS:

G. FASTENER SYSTEMS: POWDER–ACTUATED FASTENERS OR MECHANICAL–EXPANSION ANCHORS

H. PIPE STANDS: COMPACT, LOW TYPE, SINGLE PIPE, HIGH TYPE, SINGLE PIPE, HIGH TYPE, MULTIPLE PIPES, CURB–MOUNTED TYPE

I. EQUIPMENT SUPPORTS.

END OF SECTION 230529

SECTION 230548 – VIBRATION CONTROLS FOR HVAC PIPING AND EQUIPMENT

PART 1 – GENERAL

1.1 COMPONENTS

A. VIBRATION ISOLATORS:

1. ISOLATOR PADS: NEOPRENE, RUBBER, HERMETICALLY AND/OR SEALED COMPRESSED FIBERGLASS
2. MOUNTS: DOUBLE–DEFLECTION TYPE.
3. RESTRAINED MOUNTS: ALL DIRECTIONAL MOUNTINGS WITH SEISMIC RESTRAINT; CAST–DUCTILE–IRON HOUSING.
4. SPRING ISOLATORS: FREESTANDING, LATERALLY STABLE, OPEN–SPRING TYPE.
5. RESTRAINED SPRING ISOLATORS: FREESTANDING, STEEL, OPEN–SPRING TYPE WITH SEISMIC RESTRAINT.
6. HOUSED SPRING MOUNTS: DUCTILE–IRON OR STEEL HOUSING, WITH INTEGRAL, VERTICALLY ADJUSTABLE SEISMIC SNUBBERS.
7. ELASTOMERIC HANGERS: DOUBLE–DEFLECTION TYPE.
8. SPRING HANGERS: COMBINATION COIL–SPRING AND ELASTOMERIC–INSERT HANGERS WITH SPRING AND INSERT IN COMPRESSION.
9. SPRING HANGERS WITH VERTICAL–LIMIT STOP: COMBINATION COIL–SPRING AND ELASTOMERIC–INSERT HANGERS WITH SPRING AND INSERT IN COMPRESSION AND WITH VERTICAL–LIMIT STOP.
10. PIPE RISER RESILIENT SUPPORT: ALL–DIRECTIONAL, ACOUSTICAL PIPE ANCHOR.
11. RESILIENT PIPE GUIDES.

B. AIR–MOUNTING SYSTEMS:

1. AIR MOUNTS: FREESTANDING, SINGLE OR MULTIPLE, COMPRESSED–AIR BELLOWS.
2. RESTRAINED AIR MOUNTS: HOUSED COMPRESSED–AIR BELLOWS.

C. RESTRAINED VIBRATION ISOLATION ROOF–CURB RAILS: FACTORY–ASSEMBLED, FULLY ENCLOSED, INSULATED, AIR– AND WATERTIGHT CURB RAIL; WITH SPRING ISOLATORS MOUNTED ON ELASTOMERIC ISOLATION PADS, AND SNUBBER BUSHINGS.

D. VIBRATION ISOLATION EQUIPMENT BASES:

1. STEEL BASE: FACTORY–FABRICATED, WELDED, STRUCTURAL–STEEL BASES AND RAILS.
2. INERTIA BASE: FACTORY–FABRICATED, WELDED, STRUCTURAL–STEEL BASES AND RAILS READY FOR FIELD–APPLIED, CAST–IN–PLACE CONCRETE

1.2 FIELD QUALITY CONTROL

A. TESTING: BY EITHER: OWNER–ENGAGED AGENCY, CONTRACTOR–ENGAGED AGENCY, OR CONTRACTOR.

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Sheet Issue & Revision Log

MECHANICAL NOTES & SPECIFICATIONS (1 OF 2)

M0.2

PART–2 PRODUCTS

1.1 VIBRATION ISOLATORS & SEISMIC–RESTRAINT DEVICES
A. AVAILABLE MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, MANUFACTURERS OFFERING PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:

B. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:

1. ACE MOUNTINGS CO., INC.
2. AMBER/BOOTH COMPANY, INC.
3. CALIFORNIA DYNAMICS CORPORATION.
4. HILTI, INC.
5. ISOLATION TECHNOLOGY, INC.
6. KINETICS NOISE CONTROL.
7. LOOS & CO.; CABLEWARE DIVISION.
8. MASON INDUSTRIES.
9. TOLCO INCORPORATED; A BRAND OF NIBCO INC.
10. UNISTRUT; TYCO INTERNATIONAL, LTD.

END OF SECTION 230548

SECTION 230593 – TESTING, ADJUSTING, AND BALANCING FOR HVAC

1.1 SUMMARY
A. TESTING, ADJUSTING, AND BALANCING FOR THE FOLLOWING:

1. AIR SYSTEMS: VARIABLE–VOLUME SYSTEMS.

1.2 QUALITY ASSURANCE
A. THE CONTRACTOR SHALL PROCURE THE SERVICES OF A TESTING, ADJUSTING AND BALANCING (TAB) SPECIALIST WHO SPECIALIZES IN HEATING, VENTILATION AND AIR CONDITIONING SYSTEMS. THE TAB AGENT SHALL HAVE THE FOLLOWING QUALIFICATIONS: AABC, NEBB OR TABB CERTIFIED.

1.3 EXECUTION
A. THE TAB SPECIALIST SHALL PERFORM FLOW MEASUREMENTS OF ALL EXISTING AIR AND HYDRONIC SYSTEMS THAT ARE TO REMAIN OR TO BE INCORPORATED INTO NEW WORK PRIOR TO THE STARTING OF WORK IN THE PROJECT SCOPE. A REPORT OF THESE MEASUREMENTS, INDICATING ANY AND ALL DEFICIENCIES SHALL BE SUBMITTED FOR OWNER REVIEW.

B. THE TAB SPECIALIST SHALL PERFORM FLOW MEASUREMENTS OF ALL NEW AIR AND HYDRONIC SYSTEMS AS LISTED ABOVE IN THE PROJECT SCOPE. A REPORT OF THESE MEASUREMENTS, INDICATING ANY AND ALL DEFICIENCIES SHALL BE SUBMITTED FOR OWNER REVIEW.

C. THE REPORT SHALL INDICATE A SCHEMATIC DIAGRAM INDICATING LOCATIONS OF ALL EQUIPMENT TESTED AND MEASUREMENT LOCATIONS.

D. PRIOR TO FINAL INSPECTION OF THE WORK, THE TAB SPECIALIST SHALL BALANCE ALL SYSTEMS AS INDICATED ABOVE TO THE REQUIREMENTS OF THE DESIGN.

E. THE CONTRACTOR SHALL HAVE FURNISH AND INSTALL ALL ADDITIONAL BALANCING EQUIPMENT, PRESSURE TAPS, GAUGES AND OTHER EQUIPMENT AS REQUIRED FOR A PROPERLY BALANCED SYSTEM AT NO ADDITIONAL COST TO THE OWNER. SUCH ADDITIONAL EQUIPMENT SHALL ADHERE IN STRICT ACCORDANCE WITH THE RESPECTIVE EQUIPMENT MANUFACTURER'S RECOMMENDATIONS.

F. THE CONTRACTOR SHALL HAVE THE TESTING AND BALANCING SPECIALIST COORDINATE ALL WORK OF THIS S3ECTION WITH THE BUILDING MANAGER. BALANCING WORK SHALL NOT CONFLICT WITH OTHER WORK SO AS TO MAINTAIN COMPLETION WITHIN THE SPECIFIED TIME.

G. ALL INSTRUMENTS USED FOR TAB SHALL BE MAINTAINED IN GOOD WORKING CONDITION AND ACCURATELY CALIBRATED.

H. TOLERANCES: PLUS OR MINUS 5 PERCENT OF DESIGN VALUES.

I. INSPECTIONS: RANDOM CHECKS BY OWNER OR ARCHITECT TO VERIFY FINAL TESTING, ADJUSTING, AND BALANCING REPORT.

J. ADDITIONAL TESTS: RANDOM TESTS WITHIN 90 DAYS OF COMPLETING TAB TO VERIFY BALANCE CONDITIONS AND SEASONAL TESTS.

END OF SECTION 230593

SECTION 230713 – DUCT INSULATION

1.1 QUALITY ASSURANCE

SURFACE–BURNING CHARACTERISTICS: ALL INSULATION SHALL HAVE COMPOSITE (INSULATION JACKET OR FACING AND ADHESIVE USED TO ADHERE THE FACING OR JACKET TO THE INSULATION) A FLAME–SPREAD INDEX OF 25, AND SMOKE–DEVELOPED INDEX OF 50 FOR INSULATION INSTALLED INDOOR, 75, AND SMOKE–DEVELOPED INDEX OF 150 FOR INSULATION INSTALLED OUTDOORS; ACCORDING TO ASTME 84.

1.2 FIELD QUALITY CONTROL
A. FIELD INSPECTIONS: BY OWNER–ENGAGED AGENCY.

1.3 INDOOR DUCT AND PLENUM INSULATION SCHEDULE;
A. CONCEALED, RECTANGULAR, ROUND AND FLAT–OVAL, SUPPLY–RETURN, OUTDOOR–AND EXHAUST–AIR DUCT AND AIR PLENUM INSULATION:

B. FLEXIBLE ELASTOMERIC, MINERAL–FIBER BLANKET,

MINERAL–FIBER BOARD OR POLYOLEFIN WITH MINIMUM INSTALLED THERMAL RESISTANCE AS FOLLOWS:
UNCONDITIONED SPACES WITHIN BUILDING: R–6
WITHIN BUILDING ENVELOPE ASSEMBLY: R–8
OUTSIDE OF BUILDING: R–8

1.4 ITEMS NOT INSULATED:

1. FIBROUS–GLASS DUCTS.
2. METAL DUCTS WITH DUCT LINER OR SUFFICIENT THICKNESS TO COMPLY WITH ENERGY CODE ANDASHRAE/IESNA 90.1.
3. FACTORY–INSILATED FLEXIBLE DUCTS.
4. FACTORY–INSULATED PLENUMS AND CASINGS.
5. FLEXIBLE CONNECTORS.
6. VIBRATION–CONTROL DEVICES.
7. 'FACTORY–INSULATED ACCESS PANELS AND DOORS.
8. DUCTS THAT HAVE INTERNAL ACOUSTICAL LINING.

1.5 PRODUCTS
A. THE FOLLOWING INSULATION MANUFACTURERS WILL BE ACCEPTABLE:

1. JOHNS–MANVILLE
2. OWENS–CORNING

1.6 ACOUSTICAL TREATMENT

1. WHERE SHOWN ON THE DRAWINGS, LOW PRESSURE DUCTWORK SHALL BE LINED WITH 1.5" THICK R–6 AS MANUFACTURED BY DUCTMATE, 1–1/2 POUND MINIMUM DENSITY, NEOPRENE COATED, FLEXIBLE FIBERGLASS DUCT LINER. LINING SHALL COMPLY WITH NFPA 90A AND SHALL HAVE A FLAME SPREAD CLASSIFICATION OF NOT MORE THAN 25 AND A SMOKE DEVELOPED RATING NOT MORE THAN 50. DUCT SIZES WHERE LINING IS INDICATED ON PLANS ARE MINIMUM INSIDE CLEAR DIMENSIONS REQUIRED,

END OF SECTION 230713

SECTION 233113 – METAL DUCTS

1.1 CONSTRUCTION
A. EACH DUCT SYSTEM SHALL BE CONSTRUCTED FOR THE SPECIFIC SMACNA DUCT PRESSURE CLASSIFICATIONS SHOWN ON THE CONTRACT DRAWINGS. WHERE NO PRESSURE CLASSES ARE SPECIFIED BY THE DESIGNER, THE SMACNA 2–1/2 INCH WG PRESSURE CLASS IS THE BASIS OF COMPLIANCE WITH THESE STANDARDS, REGARDLESS OF THE VELOCITY IN THE DUCT.

B. ALL DUCTWORK SHALL BE CONSTRUCTED TO SMACNA 2" WG DESIGN AND NOT LESS THAN THE FOLLOWING STANDARDS:

1. DUCTWORK SHALL BE TRANSVERSELY JOINTED BY CONNECTING SEAMS OF COMPANION ANGLES, FORMED FROM 1–1/2"X1–1/2"X1/8" GALVANIZED ANGLES, TACK–WELDED OR RIVETED TO THE DUCT. THE ANGLE FRAME SHALL BE CONTINUOUSLY FLANGED UP INTO UPRIGHT OF ANGLE AND EACH CORNER SHALL BE FILLED IN AND GROUND SMOOTH. JOINTS SHALL BE GASKETED WITH 1/8" THICK REINFORCED GASKET, OVERLAPPED AT CORNERS, GASKET SIMILAR TO 3M–1202 OR APPROVED EQUAL.
2. RECTANGULAR FITTINGS AND ALL TRANSITION PIECES FROM RECTANGULAR TO ROUND SHALL BE NO. 16 GAUGE ALL WELDED CONSTRUCTION.
3. HORIZONTAL DUCTS SHALL BE SUPPORTED ON NOT MORE THAN 6' CENTERS. VERTICAL RISERS SHALL BE SUPPORTED AT EACH FLOOR.
4. LONGITUDINAL SEAMS FOR RECTANGULAR DUCTWORK SHALL BE PITTSBURGH LOCK SEAMS WITH SEALING COMPOUND, EQUAL TO BENJAMIN FOSTER NO. 30–03 INSERTED INTO SEAM. ALL SEAMS SHALL BE BRUSHED WITH NO. 30–02 AND COVERED WITH APPROVED SEALING TAPE.
5. RECTANGULAR DUCTWORK 18 GAUGE AND HEAVIER, FILLER RODS SHALL BE IN ACCORDANCE WITH SPECIFICATIONS FOR IRON AND STEEL GAS WELDING RODS, ASTM 215; AWG A5.2.
6. ALL FITTINGS SUCH AS ELBOWS, TEES, ETC., SHALL BE NO. 20 GAUGE ZINC COATED STEEL. ELBOWS SHALL BE OF FIVE (5) PIECE WELDED AIRTIGHT CONSTRUCTION.

C. WHERE LATEST EDITION OF SMACNA DOES NOT CLEARLY STATE GAUGES AND/OR STIFFENERS TO BE USED OR, WHERE SMACNA STANDARDS REQUIRE INTERPRETATION, THE FOLLOWING MINIMUM METAL GAUGES AND BRACING SHALL BE USED:

USG	MAX. SIDE INCHES BRACING	TRANSVERSE JOINTS AND
22	UP TO 12	S SLIP, DRIVE SLIP, ONE INCH POCKET LOCK ON 8 FOOT CENTERS
22	13 TO 24	1"X1"X1/8" ANGLES ON 4 FOOT CENTERS
20	25 TO 35	1"X1"X1/8" ANGLES ON 2 FOOT CENTERS

D. PROVIDE TAPPING IN DUCTS FOR THERMOMETERS WHERE SPECIFIED. IN ADDITION, PROVIDE AN AIRTIGHT PLUGGED TAPPING LOCATED AS FOLLOWS:

1. UPSTREAM OF EACH REHEAT COIL AND VAV BOX.
2. DOWNSTREAM OF EACH REHEAT COIL AND VAV BOX.

E. FLAT OVAL OR ROUND DUCTWORK MAY BE PROVIDED IN LIEU RECTANGULAR DUCTWORK WITH THE REINFORCEMENT FOR FLAT SIDES SAME AS SPECIFIED FOR THE RECTANGULAR DUCTWORK, AND AS PER SMACNA FLAT OVAL DUCT CONSTRUCTION STANDARDS SHOWN IN FIG. 3–6 AND AS SHOWN IN FIG. 3–1 AND 3–2 FOR ROUND DUCTWORK.

F. ALL DUCTWORK SHALL BE SEALED TO CLASS "A" AND LEAK TESTED TO MEAT SMACNA CLASS 6 FOR RECTANGULAR AND CLASS 3 FOR ROUND DUCTS.

1.2 MATERIALS
A. SINGLE–WALL RECTANGULAR DUCTS AND FITTINGS.

B. SINGLE–WALL ROUND AND FLAT–OVAL DUCTS AND FITTINGS.

C. SHEET METAL MATERIALS:

1. GALVANIZED SHEET STEEL.
2. STAINLESS–STEEL SHEETS.
3. ALUMINUM SHEETS.
4. FACTORY–APPLIED ANTI–MICROBIAL COATING.

D. DUCT LINER:

1. FIBROUS GLASS, TYPE I, FLEXIBLE.
   a. WITH ANTI–MICROBIAL EROSION–RESISTANT COATING.
2. FLEXIBLE ELASTOMERIC.
3. NATURAL FIBER.

E. SEALANT MATERIALS:

1. TWO–PART TAPE SEALING SYSTEM.
2. WATER–BASED JOINT AND SEAM SEALANT.
3. SOLVENT–BASED JOINT AND SEAM SEALANT.
4. FLANGED JOINT SEALANT.
5. FLANGE GASKETS.
6. ROUND DUCT JOINT O–RING SEALS.

1.3 DUCT CLEANING
A. CLEAN EXISTING DUCT SYSTEM(S) BEFORE TESTING, ADJUSTING, AND BALANCING.

B. CLEAN THE FOLLOWING ITEMS:

1. AIR OUTLETS AND INLETS.
2. SUPPLY, RETURN, AND EXHAUST FANS.
3. AIR–HANDLING UNITS.
4. COILS AND RELATED COMPONENTS.
5. RETURN–AIR DUCTS, DAMPERS, ACTUATORS, AND TURNING VANES.
6. SUPPLY–AIR DUCTS, DAMPERS, ACTUATORS, AND TURNING VANES.
7. DEDICATED EXHAUST AND VENTILATION COMPONENTS AND MAKEUP AIR SYSTEMS.

1.4 DUCT SCHEDULE
A. ALL DUCTS SHALL BE GALVANIZED STEEL EXCEPT AS FOLLOWS:

8. MOIST ENVIRONMENT DUCT MATERIAL: ALUMINUM.

END OF SECTION 233113

SECTION 233713 – DIFFUSERS, REGISTERS, AND GRILLES

1.1 PRODUCTS
A. DIFFUSERS, REGISTERS AND GRILLES SHALL BE FURNISHED AND INSTALLED FOR CAPACITIES AND IN LOCATIONS INDICATED ON DRAWINGS. ALL REGISTERS AND DIFFUSERS SHALL BE PRIME COATED STEEL OR EXTRUDED ALUMINUM FINISHED UNLESS OTHERWISE NOTED IN BAKED WHITE ENAMEL.

B. MANUFACTURERS: TITUS

1. SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCT BY ONE OF THE FOLLOWING:

a. CARNES.
b. HART & COOLEY INC.
c. KRUEGER.
d. METALAIRE, INC.
e. NAILOR INDUSTRIES INC.

C. ALL DIFFUSERS SHALL HAVE CONTROLLING/EQUALIZING GRID AND OPPOSED BLADE DAMPER UNLESS OTHERWISE NOTED.

D. ALL DUCTED RETURN REGISTERS SHALL HAVE AN OPPOSED BLADE DAMPER UNLESS OTHERWISE NOTED.

END OF SECTION 233713

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It is the clients responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or clients subcontractors proceeding with the work. The client will be responsible for any defects in construction if these procedures are not followed.

MECHANICAL SPECIFICATIONS (2 OF 2)

M0.3

1. EXISTING TOILET EXHAUST SYSTEM TO REMAIN AS IS. REFURBISH OR CLEAN TOILET EXHAUST GRILLE TO LOOK LIKE NEW CONDITION. REPLACE WITH SAME MODEL IF REQUIRED.
2. RELOCATE EXISTING SUPPLY AIR DIFFUSER AS SHOWN ON PLAN. CONNECT TO EXISTING DUCTWORK AT SITE. REFURBISH OR CLEAN DIFFUSER TO LOOK LIKE NEW CONDITION BEFORE INSATLLATION. REPLACE WITH SAME MODEL IF REQUIRED. CONTRACTOR TO FIELD VERIFY.
3. EXISTING VAV BOX WITH ITS ACCESSORIES TO REMAIN AS IS. CONTRACTOR TO VERIFY THE WORKING CONDITION OF THE VAV SYSTEM. REPAIR, REFURBISH AND CLEAN THE EXISTING VAV BOX AS NEEDED TO LOOK LIKE NEW CONDITION. BALANCE THE AIRFLOW AS SHOWN ON PLAN.
4. RELOCATE EXISTING RETURN AIR GRILLE AS SHOWN ON PLAN. . REFURBISH OR CLEAN RETURN GRILLES TO LOOK LIKE NEW CONDITION BEFORE INSTALLATION. REPLACE WITH SAME MODEL IF REQUIRED. CONTRACTOR TO FIELD VERIFY.
5. EXISTING DUCTING TO REMAIN AS IS.
6. EXISTING TRANSFER AIR GRILLE ABOVE CEILING TO REMAIN AS IS.
7. EXISTING CEILING EXHAUST FAN WITH ITS ACCESSORIES TO REMAIN AS IS. RELOCATE AS SHOWN ON PLAN. CONTRACTOR TO VERIFY IN FIELD THE WORKING CONDITION OF FAN. REPAIR OR REPLACE AS NEEDED WITH SAME KIND. CONNECT TO EXISTING EXHAUST DUCTWORK AT SITE.
8. EXISTING TEMPERATURE SENSOR TO REMAIN AS IS. CONTRACTOR TO FIELD VERIFY THE WORKING CONDITION. REPAIR OR REPLACE AS NEEDED.

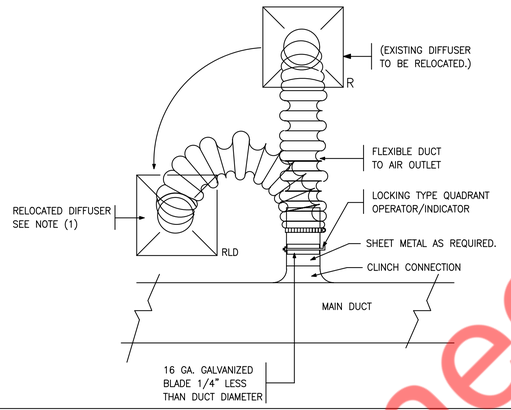
MECHANICAL PLAN KEY NOTES

SCALE: NTS | 3

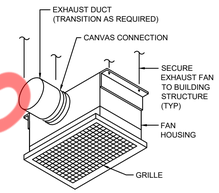
1. CONTRACTOR TO REVIEW BUILDING RULES AND REGULATION PRIOR TO START OF WORK. ANY DISCREPANCIES WITH MATERIAL OR REQUIREMENTS MUST COMPLY WITH THE BUILDING RULES AND REGULATIONS.
2. CONTRACTOR TO COORDINATE AT SITE FOR BEFORE INSTALLATION OF NEW DUCT AND PIPE WORKS. PROVIDE NECESSARY OFFSET AND SUPPORTS FOR PROPER INSTALLATION OF THE SYSTEM.
3. COORDINATE ALL FINAL LOCATION OF PROPOSED DUCTWORK/DIFFUSER/GRILLES WITH ARCHITECT.
4. FOR SUPPLY AND RETURN AIR DUCTS PROVIDE R-8 ACOUSTICAL LINING UPTO 10' OF DUCT RUN FROM AC UNITS. PROVIDE R-8 THERMAL INSULATION AFTER 10' OF DUCT FROM AC UNITS. FOR OUTSIDE AIR DUCT PROVIDE R-12 THERMAL INSULATION.
5. CONTRACTOR TO BALANCE THE AIRFLOW AT EACH DIFFUSER AS SHWON ON PLAN.

GENERAL NOTES

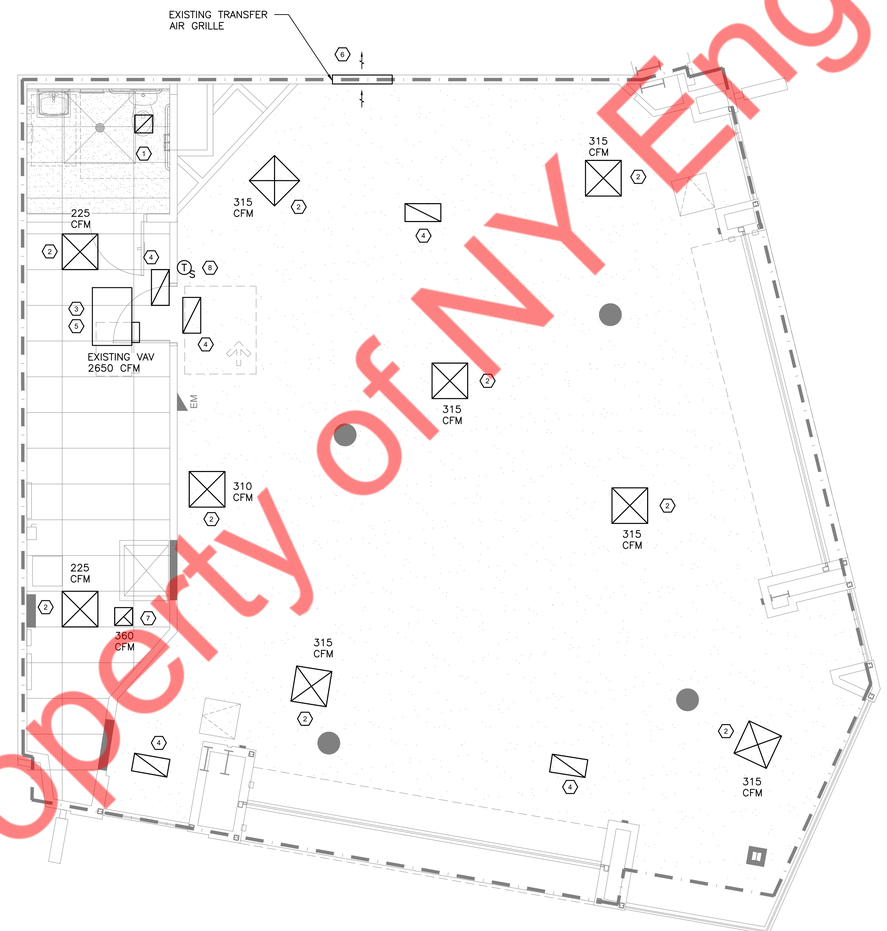
SCALE: NTS | 2



1 / M1.1 RELOCATED DIFFUSER DETAIL
N.T.S



2 / M1.1 CEILING EXHAUST FAN DETAIL
N.T.S



EXISTING 2ND FLOOR MECHANICAL PLAN

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

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MECHANICAL FLOOR PLAN AND DETAILS

M1.1

ELECTRICAL SYMBOLS LIST

LIGHTING

	FLUORESCENT LIGHTING FIXTURE AND OUTLET BOX. HALF SHADED FIXTURE OR "EM" INDICATES FIXTURES WITH INTEGRAL BATTERY PACK FOR EMERGENCY SERVICE, U.O.N.
	LUMINAIRE TYPE : INDICATE BY LIPPERCASE LETTER SEE LIGHTING EXTURE SCHEDULE.
	CIRCUIT NUMBER : INDICATED BY NUMBER
	SWITCHING INDICATED BY LOWER CASE LETTERS.
EM	DENOTES LUMINAIRE ON EMERGENCY CIRCUIT.
NL	DENOTES FIXTURES DESIGNATED AS NIGHTLIGHT, WIRED TO 24 HOURS UNSWITCHED CIRCUIT.
	CEILING/WALL MOUNTED SELF POWERED EXIT LIGHT FIXTURE WITH DIRECTIONALARROWS AS INDICATED. SHADED AREA DENOTES FACE(S). ISOLITE ELITE SERIES LED EXIT SIGN
	EMERGENCY BATTERY UNIT WITH ATTACHED EMERGENCY FIXTURES AND OUTLET BOX.

SWITCHES AND CONTROLS

$a,b,c,d	20A SP LV DIMMER SWITCH U.O.N.
$	SWITCH FOR ROLLING GATE.
$OS	WALL MOUNTED OCCUPANCY SENSOR

WIRING SYSTEMS

3 UP–	POWER OR LIGHTING CIRCUITRY HOMERUN WITH PANELBOARD DESIGNATION. NUMBER WHERE USED INDICATES CIRCUIT NUMBER. IT SHALL CONSISTS OF 1#12 Ø, 1#12 N. & 1#12 G. IN 3/4"C, UNLESS OTHERWISE NOTED.
3,5 UP–	POWER OR LIGHTING CIRCUITRY HOMERUN WITH PANELBOARD DESIGNATION. NUMBER WHERE USED INDICATES CIRCUIT NUMBER. IT SHALL CONSISTS OF 2#12 Ø, 2#12 N. & 2#12 G. IN 3/4"C, UNLESS OTHERWISE NOTED.
3,5,7 UP–	POWER OR LIGHTING CIRCUITRY HOMERUN WITH PANELBOARD DESIGNATION. NUMBER WHERE USED INDICATES CIRCUIT NUMBER. IT SHALL CONSISTS OF 3#12 Ø, 3#12 N. & 3#12 G. IN 3/4"C, UNLESS OTHERWISE NOTED.

ELECTRICAL DRAWING LIST

E1.0	ELECTRICAL SYMBOL LIST, ABBREVIATIONS & GENERAL NOTES
E2.0	ELECTRICAL PLANS
E3.0	ELECTRICAL RISER DIAGRAM AND PANEL SCHEDULE

PANEL BOARD AND SWITCH BOARD NOTES

1. PROVIDE NAMEPLATE IDENTIFICATION TO BE MOUNTED ABOVE DOOR AND CIRCUIT DIRECTORY HOLDER FRAMED WITH PLASTIC COVER MOUNTED BEHIND THE DOOR. ADHESIVE TYPE PLASTIC ENVELOPE ATTACHED BEHIND THE DOOR IS NOT AN ACCEPTABLE TYPE OF DIRECTORY CARD HOLDER.
2. BUILDING STEEL, UFER, COLD WATER PIPE, AND DRIVEN GROUNDING ROD BONDING TO BE UTILIZED FOR COMPLETE GROUNDING ELECTRODE SYSTEM & SUPPLEMENTS PER CEC 250, GROUNDING. THE BONDING TO BUILDING NATURAL GAS PIPING MAY BE REQUIRED BY THE AHJ.
3. CONTRACTOR TO VERIFY ALL EXISTING CIRCUITS FOR EXISTING AREAS THAT ARE TO REMAIN AND IDENTIFY IN PANEL & IN AS–BUILT. E.C. SHALL MAINTAIN CIRCUIT CONTINUITY OF THESE CIRCUITS SERVE AREAS THAT ARE TO REMAIN.
4. NEW BREAKERS TO BE INSTALLED IN EXISTING PANEL ARE TO MATCH THE EXISTING PANEL BOARD MFG. AND AIC RATING AS INDICATED OR AS REQUIRED PER AIC RATING FROM THE UTILITY COMPANY.
5. CONTRACTOR SHALL EXTEND THE CONDUIT AND INCOMING FEEDER OF THE EXISTING PANELS UPTO NEW LOCATION OF THE PANEL AS SHOWN ON THE PLAN IN COORDINATION WITH ARCHITECT/OWNER.
6. CONTRACTOR SHALL PROVIDE ALL REQUIRED MATERIAL, WIRING, CABLES, CONDUITS AND DEVICES IN ORDER TO WORK ELECTRICAL SYSTEM PROPERLY AS PER DESIGN INTEND.
7. E.C. SHALL VERIFY THE OPERABLE CONDITION OF ALL DEVICES, BREAKERS AND CONNECTIONS INSIDE THE PANEL. REPLACE IF FOUND INOPERABLE. BASE BID ACCORDINGLY.
8. CONTRACTOR SHALL PROVIDE ALL THE BRANCH BREAKERS, SHUNT BREAKER & GFI BREAKERS AS PER EQUIPMENT REQUIREMENTS IN COORDINATION WITH THE EQUIPMENT SUPPLIER/OWNER IN FIELD. BASE BID ACCORDINGLY.

POWER AND TELECOMMUNICATION

J	JUNCTION BOX WITH BLANK COVER PLATE
	DUPLEX CONVENIENCE RECEPTACLE, +18" AFF OR AS NOTED.
CL	DUPLEX CONVENIENCE RECEPTACLE - 20A-1P, 125V, NEMA 5-20R MOUNTED FLUSH IN CELING.
	DOUBLE DUPLEX RECEPTACLE - 20A-1P, 125V, NEMA 5-20R.
	TELEPHONE/DATA OUTLET, 4"SQUARE OUTLET BOX WITH SINGLE GANG COLLAR AND BLANK PLATE. PROVIDE 3/4" E.C., U.O.N., UP TO HUNG CEILING AND TERMINATE WITH 90° ELBOW, BUSHING AND DRAG WIRE.

MOTORS AND CONTROLS

M	EXHAUST FAN WITH JUNCTION BOX AND MOTOR SWITCH.
	NON–FUSED DISCONNECT. AMPERAGE AS NOTED.
A	30A/240V NON FUSED DISCONNECT SWITCH
B	60A/240V NON FUSED DISCONNECT SWITCH
M	MANUAL MOTOR SWITCH

ANNOTATION

+24"	INDICATES MOUNTING HEIGHT, CENTER LINE TO FINISHED FLOOR.
X	KEYED NOTE REFERENCE
1 E/2–1	DETAIL REFERENCE: DETAIL NUMBER INDICATED ON TOP; DRAWING NUMBER INDICATED ON BOTTOM

POWER DISTRIBUTION

	MAJOR ELECTRICAL COMPONENT OR DEVICE. VOLTAGE AND AMPERAGE AS NOTED.
	DISTRIBUTION PANELBOARD, 208Y/120V-SURFACE OR FLUSH MOUNTED.

ELECTRICAL ABBREVIATIONS

A	AMPERES	EA	EACH
A/C, AC	AIR CONDITIONING UNIT	EC	EMPTY CONDUIT/ ELECTRICAL CONTRACTOR
AF	AMPERE FRAME/AMP FUSE	EF	EXHAUST FAN
AFF	ABOVE FINISHED FLOOR	EM	EMERGENCY
AS	AMP SWITCH	EMT	ELECTRICAL METALLIC TUBING
AIC	AMPS INTERRUPTING CAPACITY	EQUIP	EQUIPMENT
AT	AMP TRIP	ER	EXISTING TO BE RELOCATED
ATS	AUTOMATIC TRANSFER SWITCH	ETR	EXISTING TO REMAIN
AUTO	AUTOMATIC	EWF	ELECTRIFIED WORKSTATION FURNITURE
AWG	AMERICAN WIRE GAUGE	EWH	ELECTRIC WATER HEATER
C	CONDUIT	FA	FIRE ALARM
C/B,CB	CIRCUIT BREAKER	FBO	FURNISHED BY OTHERS, INSTALLED & WIRED BY EC
CKT	CIRCUIT	FDR	FEEDER
CLG	CEILING	FIBO	FURNISHED & INSTALLED BY OTHERS, WIRED BY EC
COMM	COMMUNICATION	FIXT	FIXTURE
CT	CURRENT TRANSFORMER	FL	FLOOR
CU	COPPER	FLUOR	FLUORESCENT
°C	DEGREE CELSIUS	G	GROUND
°F	DEGREE FAHRENHEIT	GFI	GROUND FAULT INTERRUPTER
DIA	DIAMETER	GP	GENERAL PURPOSE
DISC	DISCONNECT	HC	HUNG CEILING
DN	DOWN	HP	HORSEPOWER
DP	DISTRIBUTION PANEL	HWH	HOW WATER HEATER
DWH	DOMESTIC WATER HEATER	HZ	HERTZ
DWG	DRAWING	IC	INTERRUPTING CAPACITY
JB	JUNCTION BOX	PP	POWER PANEL
KCMIL	ONE THOUSAND CIRCULAR MILS	PVC	POLYVINYL CHLORIDE
KV	KILOVOLT	PWR	POWER
KVA	KILOVOLT–AMPERES	R	REMOVE
KW	KILOWATTS	RE	RELOCATED EXISTING
LP	LIGHTING PANEL	REC	RECEPTACLE
LTG	LIGHTING	RGS	RIGID GALVANIZED STEEL
MAX	MAXIMUM	RR	REMOVE & RELOCATE
MC	MOTOR CONTROLLER	SECT	SECTION
MCB	MAIN CIRCUIT BREAKER	SPDT	SINGLE POLE DOUBLE THROW
MER	MECHANICAL EQUIPMENT ROOM	SPST	SINGLE POLE SINGLE THROW
MIN	MINIMUM	SPEC	SPECIFICATION
MLO	MAIN LUGS ONLY	SW	SWITCH
MTD	MOUNTED	SWBD	SWITCHBOARD
MTS	MANUAL TRANSFER SWITCH	SYM	SYMMETRICAL
N	NEUTRAL	SYS	SYSTEMS
NE	NEW DEVICE TO REPLACE EXISTING	TELE	TELEPHONE
NIC	NOT IN CONTRACT	TEMP	TEMPERATURE
NL	NIGHT LIGHT	TXF	TOILET EXHAUST FAN
NTS	NOT TO SCALE	TYP	TYPICAL
OC	ON CENTER	UON	UNLESS OTHERWISE NOTED
P	POLES	V	VOLT/VOLTAGE
PB	PULLBOX	VA	VOLT AMPERE
PC	PERSONAL COMPUTER	VAV	VARIABLE AIR VOLUME
ø	PHASE	VFD	VARIABLE FREQUENCY DRIVE
PNL	PANEL	VP	VAPORPROOF
W	WATT	WP	WEATHER PROOF
W	WIRE	XFMR	TRANSFORMER
WH	WALL HEATER	ZRT	ZONE REGISTER TERMINALS
E	EXISTING	IG	ISOLATED GROUND

GENERAL NOTES

(APPLY TO ALL "E" DRAWINGS)

1. ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH THE CURRENT VERSION OF THE LOCAL ELECTRICAL CODE, CURRENT NEC, LOCAL JURISDICTION REQUIREMENTS, AND ALL GOVERNING LOCAL CODES, LAWS, AND REGULATIONS.
2. CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH ALL EXISTING CONDITIONS THAT MAY AFFECT THE WORK. NO ADDITIONAL COMPENSATION WILL BE CONSIDERED FOR FAILURE TO DO SO.
3. CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS, TEST REPORTS, AND CERTIFICATIONS FOR TEMPORARY AND FINAL CERTIFICATE OF OCCUPANCY.
4. FIRE STOP ALL PENETRATIONS OF FIRE RATED CONSTRUCTION IN A CODE APPROVED MANNER IN ORDER TO MAINTAIN FIRE RATING. ALL PENETRATIONS SHALL BE SLEEVED AND SEALED WATERTIGHT.
5. SECURE ALL SUPPORTS TO BUILDING STRUCTURE UTILIZING TOGGLE BOLTS (HOLLOW MASONRY), EXPANSION SHIELDS OR INSERTS (CONCRETE AND BRICK), MACHINE SCREWS (METAL), BEAM CLAMPS (FRAMEWORK), WOOD SCREWS (WOOD) OR PAN THRU STRAPS (METAL DECK). NAILS, RAW PLUGS AND WOOD PLUGS ARE NOT PERMITTED. WHERE REQUIRED BY STRUCTURE, PROVIDE THRU BOLTS AND FISH PLATES. SUPPORT HORIZONTAL RUNS OF METALLIC RACEWAYS NOT MORE THAN 10 FT APART. SUPPORT RACEWAY RISERS AT EACH FLOOR LEVEL. RUN EXPOSED RACEWAYS PARALLEL WITH OR AT RIGHT ANGLES TO WALLS.
6. LEAVE WIRES WITH SUFFICIENT SLACK TO PERMIT MAKING FINAL CONNECTIONS. RACEWAYS OVER 10 FT LONG IN WHICH WIRING IS NOT INSTALLED: FURNISH FISH WIRE.
7. VERIFY LOCATIONS OF OUTLETS AND SWITCHES IN FINISHED ROOMS WITH ARCHITECTURAL DRAWINGS OF INTERIOR DETAILS AND FINISH. IN CENTERING OUTLETS AND LOCATING BOXES AND OUTLETS, ALLOW FOR OVERHEAD PIPES, DUCTS AND MECHANICAL EQUIPMENT, EQUIPMENT, VARIATIONS IN FIREPROOFING AND PLASTERING, WINDOW AND DOOR TRIM, PANELING, HUNG CEILINGS AND THE LIKE. CORRECT ANY INACCURACY RESULTING FROM FAILURE TO DO SO WITHOUT EXPENSE TO OWNER.
8. CONTRACTOR SHALL PROVIDE A WARRANTY ON ALL MATERIALS, EQUIPMENT, AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE OR AS PER CONTRACT WITH OWNER/ARCHITECT.
9. ALL UNUSED MATERIALS AND DEBRIS SHALL BE LEGALLY REMOVED AND DISPOSED OF AWAY FROM THE PREMISES ON A DAILY BASIS.
10. CONTRACTOR SHALL PATCH, PAINT, AND RESTORE EXISTING SURFACES DAMAGED DURING THE COURSE OF THIS CONSTRUCTION TO PRE–EXISTING CONDITIONS OR BETTER.
11. MINIMUM SIZE OF CONDUIT SHALL BE ¾", AND TYPE SHALL BE ELECTRICAL METALLIC TUBING (EMT), UNLESS OTHERWISE NOTED. PROVIDE NYLON DRAG LINE AND CONDUIT CAP FOR ALL EMPTY CONDUITS.
12. CONNECT CONDUIT TO MOTOR CONDUIT TERMINAL BOXES WITH FLEXIBLE CONDUIT (MINIMUM 18 IN. LENGTH AND 50% SLACK). DO NOT TERMINATE IN OR FASTEN RACEWAYS TO MOTOR FOUNDATION.
13. PULL AND JUNCTION BOXES WHERE INDICATED ON THE DRAWINGS, SHALL BE CONSIDERED SHOWN AT THEIR APPROXIMATE LOCATION. THE CONTRACTOR SHALL LOCATE THEM AS FIELD CONDITIONS DICTATE. ADDITIONAL PULL AND JUNCTION BOXES NOT SHOWN ON DRAWINGS SHALL BE PROVIDED WHERE REQUIRED BY APPLICABLE CODE PROVISIONS OR WHERE CALLED FOR BY FIELD CONDITIONS. PULL AND JUNCTION BOXES SHALL BE SURFACE TYPE IN UNFINISHED AREAS AND INSTALLED CONCEALED IN FINISHED AREAS, AND ALL COVERS TO PULL & JUNCTION BOXES SHALL BE READILY ACCESSIBLE.
14. SUPPORT PANEL, JUNCTION AND PULL BOXES INDEPENDENTLY TO BUILDING STRUCTURE WITH NO WEIGHT BEARING ON RACEWAYS.
15. FOR EXACT LOCATION AND MOUNTING HEIGHT OF LIGHTING FIXTURES AND SWITCH/RECEPTACLE OUTLETS, REFER TO ARCHITECTURAL REFLECTED CEILING AND POWER PLANS.
16. ALL ELECTRICAL ACCESSORIES AND EQUIPMENT INSTALLED OUTSIDE OR EXPOSED TO WEATHER SHALL HAVE NEMA 3R ENCLOSURES AND SHALL BE TIGHTLY GASKETED FOR A COMPLETE RAINTIGHT INSTALLATION. ALL BUILDING EXTERIOR MOUNTED RECEPTACLES SHALL BE GFCI RATED AND MOUNTED IN WEATHERPROOF ENCLOSURE.
17. ALL ACCESS PANEL LOCATIONS SHALL BE REVIEWED BY ARCHITECT PRIOR TO INSTALLATION.
18. ELECTRICAL CONTRACTOR SHALL COORDINATE THE LOCATION AND INSTALLATION OF NEW WORK WITH THE GENERAL CONTRACTOR AND OTHER ASSOCIATED TRADES IN A TIMELY MANNER. THE CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING ALL DIMENSIONS AND CONDITIONS PRIOR TO CONSTRUCTION. REFER TO ALL GENERAL, MECHANICAL, AND ELECTRICAL, DRAWINGS AND SPECIFICATIONS FOR THIS PROJECT.
19. ALL CONDUITS AND EQUIPMENT TO BE CONCEAL ED IN FINISHED SPACES UNLESS OTHERWISE NOTED. CONDUITS SHALL BE ENCASED IN THE CONCRETE FLOOR SLAB.
20. ALL EQUIPMENT AND MATERIALS INSTALLED IN PLENUM CEILINGS SHALL BE APPROVED FOR THAT APPLICATION.
21. OUTLET BOXES AND JUNCTION BOXES ON OPPOSITE SIDES OF FIRE–RATED WALLS SHALL BE SEPARATED BY A HORIZONTAL DISTANCE OF NOT LESS THAN 24 INCHES, UNLESS FIRE–RATED BOXES OR PUTTY PADS ARE UTILIZED.
22. COORDINATE ALL FLOOR PENETRATIONS WITH THE STRUCTURAL AND ARCHITECTURAL DRAWINGS. CONFIRM PENETRATION LOCATIONS WITH THE ENGINEER AND OWNER BEFORE INSTALLATION.
23. COORDINATE THE MOUNTING HEIGHT AND LOCATION OF RACEWAYS, COMMUNICATIONS OUTLETS, AND RECEPTACLES WITH THE ARCHITECTURAL CASEWORK DRAWINGS AND DETAILS. COORDINATE LOCATIONS OF LIGHT FIXTURES, SWITCHES, AND RELATED DEVICES WITH THE ARCHITECTURAL DRAWINGS AND DETAILS.
24. REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATIONS OF ALL LUMINARIES AND SWITCHES, AND FOR ALL FINISHED CEILING HEIGHTS.
25. REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATIONS OF ALL ELECTRICAL DEVICES, AND FOR FINAL CEILING AND WALL HEIGHTS AND LAYOUTS.
26. LIGHTING FIXTURES PROVIDED WITH EMERGENCY BATTERY PACKS AND INDICATED WITH SWITCH CONTROL SHALL BE WIRED WITH BATTERY CHARGING/SENSING CIRCUIT WIRED AHEAD OF SWITCH CONTROL.
27. NUMBER(S) SHOWN AT RECEPTACLES, JUNCTION BOXES AND EQUIPMENT INDICATES CIRCUIT NUMBERS IN PANEL BOARD. PROVIDE WIRE AND CONDUIT TO INTERCONNECT EQUIPMENT AND DEVICES WITH SAME CIRCUIT NUMBERS AND RUN TO PANEL BOARD.
28. ELECTRICAL DRAWINGS, SPECIFICATIONS, AND GENERAL NOTES DESCRIBE THE INTENDED SCOPE OF WORK DOCUMENTS SHALL BE USED FOR THE PURPOSE OF BIDDING, BUILDING DEPARTMENT REVIEW, AND THE SECURING OF NECESSARY CONSTRUCTION PERMITS ONLY. CONTRACTOR SHALL PROVIDE CONSTRUCTION DRAWINGS AND OBTAIN WRITTEN APPROVAL FROM ALL AUTHORITIES HAVING JURISDICTION (AHJ) AND UTILITY COMPANIES PRIOR TO THE START OF AFFECTED WORK. ELECTRICAL INSTALLATION SHALL COMPLY WITH CALIFORNIA ELECTRICAL CODE (LATEST VERSION) ADAPTED BY THE JURISDICTION AND ANY LOCAL SUPPLEMENTS.
29. CONTRACTOR SHALL PROVIDE CONSTRUCTION AND SHOP DRAWINGS BASED ON THESE DRAWINGS, SPECIFICATIONS, AND ADDITIONAL DESIGN CRITERIA FURNISHED BY OWNER AND SUBMIT TO ARCHITECT. CONTRACTOR SHALL SUBMIT ALL DEFERRED APPROVAL CONSTRUCTION DRAWINGS TO ALL GOVERNMENTAL AGENCIES AND UTILITY COMPANIES HAVING JURISDICTION INCLUDING POLICE AND FIRE DEPARTMENTS FOR THEIR REVIEW AND APPROVAL OF DRAWINGS FOR CONSTRUCTION.
30. CONTRACTOR'S BID SHALL NOT BE LIMITED TO THE WORK SHOWN ON PLANS AND SPECIFICATIONS. ALL PREMIUM OVERTIME COSTS, UTILITY CHARGES, COSTS FOR TEMPORARY UTILITY SERVICES, ALTERATION, DEMOLITION, AND EXTENSION WORKS, PLAN CHECK/INSPECTION FEES, MISCELLANEOUS CONTINGENCY COSTS, ETC., SHALL BE INCLUDED IN BID. (THE CONTINGENCY COST SHALL NOT BE LESS THAN 25% OF THE OVERALL ELECTRICAL BID. CONTRACTOR SHALL IDENTIFY THE CONTINGENCY AMOUNT IN THE BID DOCUMENT.)
31. ALL NEW EQUIPMENTS SHALL BE FURNISHED AND INSTALLED BY CONTRACTOR ,UNLESS OTHERWISE NOTED. IF CONTRACTOR PROPOSES TO SUBSTITUTE SPECIFIED EQUIPMENT, HE SHALL SUBMIT HIS REQUEST IN WRITING TO THE OWNER AND ENGINEER FOR CONSIDERATION PRIOR TO THE ALL SUBSTITUTIONS MUST BE REVIEWED BY THE ENGINEER. SUCH REVIEWS SHALL NOT RELIEVE THE CONTRACTOR FROM COMPLYING WITH DRAWING REQUIREMENTS AND SPECIFICATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE AT HIS OWN EXPENSE FOR ANY CHANGES RESULTING FROM HIS PROPOSED SUBSTITUTIONS WHICH AFFECT OTHER PARTS OF HIS WORK OR THE WORK OF OTHER CONTRACTORS. CONTRACTOR SHALL RELOCATE AND RECONNECT THE EXISTING EQUIPMENTS, DEVICES, BEING REUSED IN COORDINATION WITH ARCHITECT/OWNER.
32. ELECTRICAL DRAWINGS, CONDUIT RUNS, WIRING, AND ELECTRICAL INFORMATION ARE DIAGRAMMATIC ONLY. DO NOT SCALE THE ELECTRICAL DRAWINGS TO DETERMINE THE LOCATION OF EQUIPMENT OR OUTLETS. ALL RECEPTACLE AND OUTLET MOUNTING HEIGHTS AND EXACT LOCATIONS SHALL BE COORDINATED WITH ARCHITECTURAL DRAWING ELEVATIONS PRIOR TO ROUGH–IN WORK.
33. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN FOR EXACT LOCATION OF ALL LIGHTING FIXTURES, CEILING MOUNTED OUTLETS, AND EQUIPMENT. PORTIONS OF CEILING SYSTEMS MAY BE INACCESSIBLE. CONTRACTOR SHALL STRATEGICALLY LOCATE ACCESS BOXES, ETC., WHICH SHALL BE READILY ACCESSIBLE IN COMPLIANCE WITH CEC ARTICLE 100. ALL LIGHTING FIXTURE WIRING,BALLASTS, J–BOXES, ETC., SHALL BE ACCESSIBLE FROM FIXTURE OPENINGS. PROVIDE AN ADDITIONAL JUNCTION BOX (SIZE AS REQUIRED) WHERE THE NUMBER OF CONDUCTORS EXCEEDS THE MAXIMUM ALLOWED FOR A GIVEN JUNCTION POINT OR OUTLET.
34. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE TYPES OF CEILING SYSTEMS AND TO FURNISH APPROVED LIGHTING FIXTURES OF THE REQUIRED TYPE FOR MOUNTING IN CEILINGS. FIXTURES SHALL BE COMPLETED WITH NECESSARY MOUNTING HARDWARE AND ACCESSORIES. FIXTURES LOCATED IN DAMP OR WET LOCATIONS SHALL BE LABELED FOR USE IN SUCH LOCATIONS.
35. SEAL ALL PENETRATIONS THROUGH FIRE RATED WALLS, CEILINGS, FLOORS, ETC., TO MAINTAIN FIRE WORK FURNISH AND INSTALL FIRE RATED ENCLOSURES FOR ALL EQUIPMENT PENETRATING INTO FIRE RATED ENVELOPES, SPACES, ETC. ALL RECESSED LIGHTING FIXTURES, PANEL BOARDS, SWITCHES, ETC.MOUNTED IN FIRE RATED STRUCTURES SHALL BE ENCLOSED WITH AN APPROVED ENCLOSURE CARRYING THE SAME FIRE RATING AS THAT OF THE STRUCTURE.
36. ALL WIRING AND ELECTRICAL EQUIPMENT INSTALLED FOR MECHANICAL AND PLUMBING EQUIPMENT SHALL BE IN ACCORDANCE WITH DIVISION 15 AND ASSOCIATED DRAWINGS. CONTRACTOR SHALL OBTAIN THE REQUIRED MECHANICAL AND PLUMBING DRAWINGS AND PROVIDE ALL EQUIPMENT, RACEWAYS, WIRING, ETC., AS INDICATED THEREON.
37. ALL FINAL CONNECTIONS TO OWNER FURNISHED EQUIPMENT SHALL BE MADE BY THE CONTRACTOR UNLESS OTHERWISE NOTED. VERIFY ELECTRICAL CHARACTERISTICS AND U.L. LISTINGS PRIOR TO CONNECTION. CONTRACTOR SHALL VERIFY THE LOAD INPUT VOLTAGE OF ALL EQUIPMENT PRIOR TO INSTALLATION. ACCEPTING ANY EQUIPMENT RESULTING IN LOAD INCREASE SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
38. ELECTRICAL OUTLETS ON OPPOSITE SIDES OF FIRE RATED WALLS AND PARTITIONS MUST BE SEPARATED BY A DISTANCE OF 24 IN. HORIZONTALLY, IN ACCORDANCE WITH C.B.C. SEC. 714.3.2. EXCEPTION 1.1. OPENINGS IN FIRE RATED WALLS GREATER THAN 16 SQ. IN. MUST BE FIRE STOPPED.
39. ALL CONDUCTORS AND CURRENT CARRYING DEVICES SHALL BE COPPER DUAL RATED THHN/THWN 600 VOLT 75°C MINIMUM INSULATION UNLESS OTHERWISE NOTED. USE PROPER TEMPERATURE RATING OF CONDUCTORS BASED ON THE AMBIENT AIR OR SOIL TEMPERATURE WHERE CONDUCTORS ARE BEING WORK HIGHER AMPACITY CONDUCTORS AND LARGER RACEWAYS SHALL BE PROVIDED TO OFFSET THE AMPACITY CORRECTION FACTORS AS INDICATED IN NEC TABLE 310 AND ELSEWHERE IN CODE. ALL BUSSING SHALL BE COPPER. NMC CABLE MAY BE USED WITHIN THE DWELLING TYPE OCCUPANCY PER NEC 334.10 IF APPROVED BY AHJ.
40. DO ALL DRILLING, CUTTING, CHANNELING AS REQUIRED TO ELECTRICAL WORK AND AS INDICATED OR SPECIFIED HEREIN. ALL HOLES, CURBS, ETC., IN FLOORS, CEILINGS, AND WALLS SHALL BE PATCHED, UNLESS OTHERWISE NOTED. PAINT ALL EXPOSED ELECTRICAL RACEWAYS, CABINETS, ENCLOSURES, AND FITTINGS TO MATCH COLOR OF ADJACENT SURFACES IN FINISHED AREAS.
41. EMERGENCY LIGHTING AND EXIT SIGNS SHALL BE PROVIDED PER C.B.C. AND SHALL BE DESIGNED TO PROVIDE REQUIRED FOOTCANDLES AND LUMENS. PROVIDE ADDITIONAL EMERGENCY ILLUMINATION AS REQUIRED BY INSPECTION AUTHORITIES HAVING JURISDICTION.
42. ALL ELECTRICAL EQUIPMENT SHALL BE BRACED OR ANCHORED TO RESIST A HORIZONTAL FORCE ACTING IN ANY DIRECTION USING THE SMACNA CRITERIA.
43. BRANCH CONTROL CIRCUITRY AND WIRE COUNTS MAY NOT BE INDICATED ON PLANS. CONTRACTOR IS RESPONSIBLE FOR COMPLETING BRANCH CIRCUIT WIRING IN ACCORDANCE WITH PLAN NOTES AND AS PERMITTED BY AHJ. CONTRACTOR SHALL SUBMIT AS–BUILT DRAWINGS AS PART OF RECORD TO ARCHITECT AND AUTHORITY HAVING JURISDICTION (AHJ).
44. ALL EXISTING UTILITIES OR STRUCTURES REPORTED BY THE OWNER OR OTHERS AND THOSE SHOWN ON THESE DRAWINGS ARE INDICATED WITH THEIR APPROXIMATE LOCATION AND EXTENT. BY ACCEPTING THESE PLANS OR PROCEEDING WITH IMPROVEMENTS THE CONTRACTOR IS REQUIRED TO TAKE DUE PRECAUTIONARY MEASURES TO PROTECT THE UTILITIES OR STRUCTURES SHOWN AND ANY OTHER UTILITIES OR STRUCTURES FOUND AT THE SITE. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE OWNERS OF THE UTILITIES OR STRUCTURES CONCERNED BEFORE STARTING WORK.
45. COORDINATE ALL PHASES OF CONSTRUCTION AND OBTAIN APPROVAL OF WORK SCHEDULE, SHUTDOWN, CUTOVER, OVERTIME WORK, ETC. WITH BUILDING ENGINEER OR OWNER. PROVIDE TEMPORARY SERVICE, STANDBY GENERATOR, 24 HOURS FIRE WATCH, ETC. AS REQUIRED TO MAINTAIN UNINTERRUPTED FACILITY OPERATION DURING CONSTRUCTION WORK.
46. THE CONTRACTOR AGREES THAT, IN ACCORDANCE WITH GENERAL CONSTRUCTION PRACTICES, THE CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT AT ALL TIMES. CONTRACTOR FURTHER AGREES TO DEFEND, INDEMNIFY, AND HOLD OWNER AND ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH PERFORMANCE OF WORK ON THIS PROJECT.

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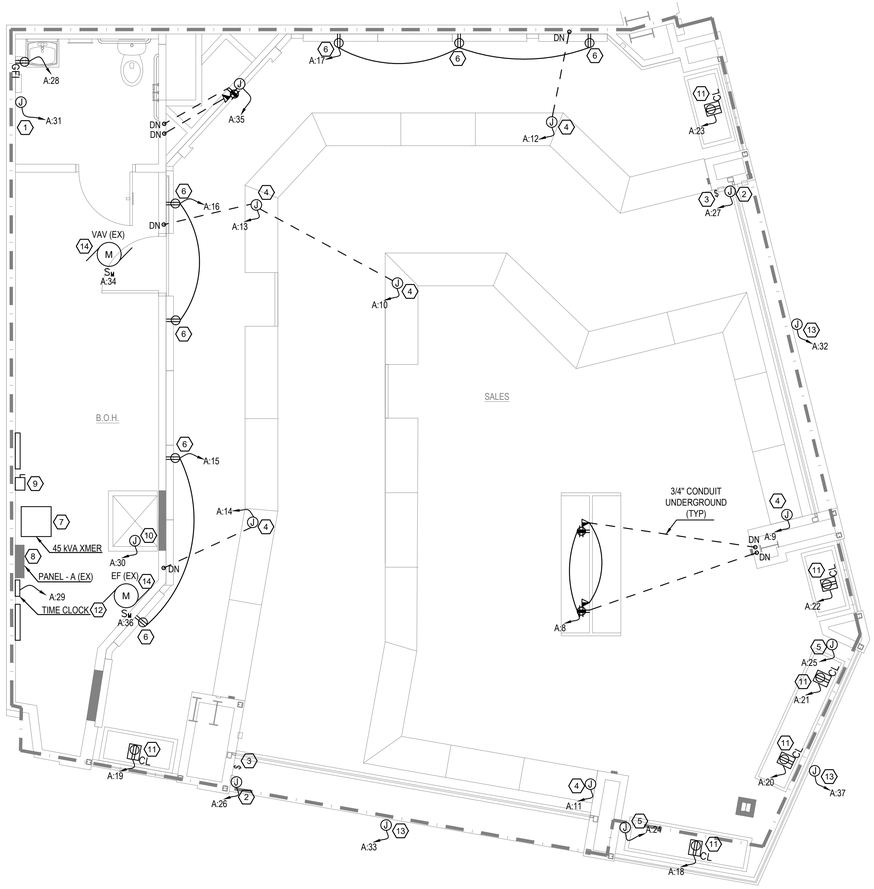
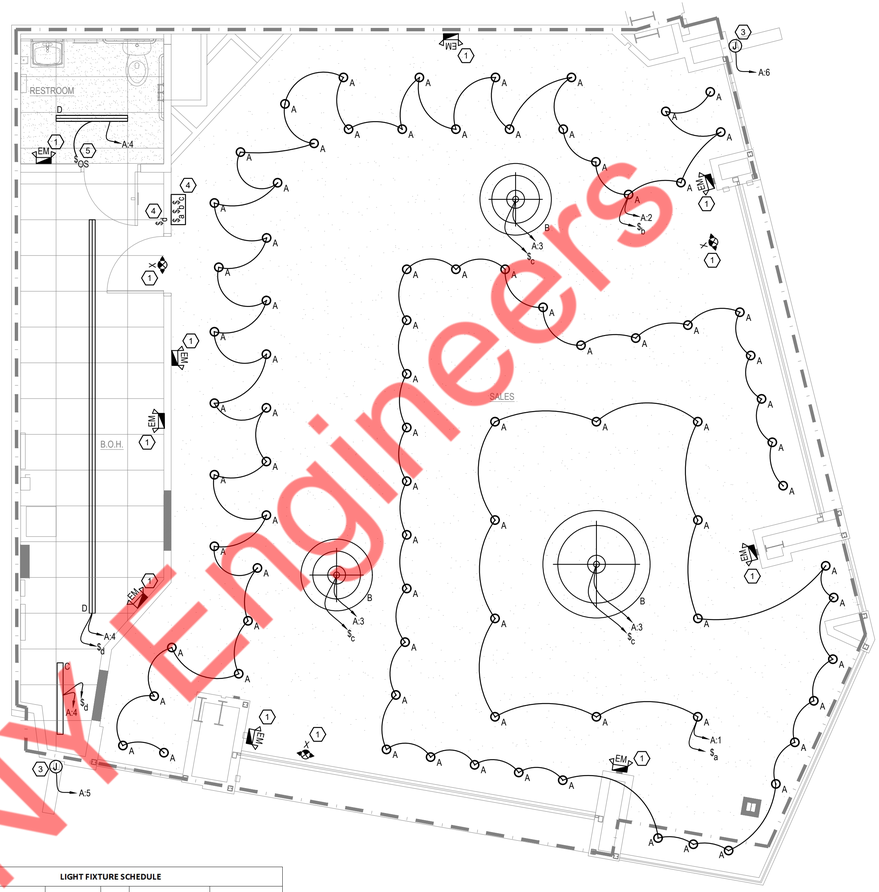
Sheet Issue & Revision Log

ELECTRICAL SYMBOL LIST, ABBREVIATIONS & GENERAL NOTES

E1.0





POWER PLAN GENERAL NOTES:

1. SEE ARCHITECTURAL ELEVATIONS FOR PLACEMENT AND MOUNTING OF DEVICES.
2. E.C. TO PROVIDE LABEL ON EACH OUTLET AND DISCONNECT MEANS INDICATING THE POWER SOURCE PANEL AND CIRCUIT NUMBER.
3. VERIFY ALL FUSE SIZES AND TYPES WITH THE AIR CONDITIONING EQUIPMENT MANUFACTURER PRIOR TO INSTALLATION.
4. REVIEW THE MECHANICAL PLANS FOR ALL THE HVAC EQUIPMENT CONTROL REQUIREMENTS AND SCOPE OF WORK PRIOR TO BIDDING AND INCLUDE ALL COSTS IN BID.
5. VERIFY CONNECTION POINTS OF ALL HVAC EQUIPMENT PRIOR TO INSTALLATION. PROVIDE CONTROL VOLTAGE CONNECTION TO DUCT MTD. SMOKE DETECTOR AS REQUIRED BY MECHANICAL DRAWING.
6. SEE MECHANICAL DRAWINGS FOR EXACT LOCATIONS OF MECHANICAL EQUIPMENT AND THERMOSTATS. PROVIDE RACEWAY SYSTEM FOR ALL CONTROL WIRING AS REQUIRED BY DETAIL ON MECHANICAL DRAWING.
7. ANY NEW WIRING TO BE COPPER AND RUN IN CONDUIT, INCLUDING LOW VOLTAGE

POWER PLAN KEYED NOTES:

1. PROVIDE JUNCTION BOX WITH 30A/1P MOTOR RATED SWITCH FOR WATER HEATER.
2. EXISTING JUNCTION BOX WITH 20A/1P MOTOR RATED SWITCH FOR CONNECTION TO THE ROLLING GATE SHALL REMAIN. E.C. SHALL VERIFY OPERABLE CONDITION IN FIELD. REPLACE IF FOUND IN-OPERABLE. RELOCATE TO THE LOCATION AS INDICATED. BASE BID ACCORDINGLY.
3. EXISTING SWITCH FOR GRILL CONTROL SHALL REMAIN. E.C. SHALL VERIFY OPERABLE CONDITION IN FIELD. REPLACE IF FOUND IN-OPERABLE. RELOCATE TO THE LOCATION AS INDICATED. BASE BID ACCORDINGLY.
4. PROVIDE JUNCTION BOX FOR CONNECTION TO SHOWCASE JEWELRY CABINET. E.C. TO VERIFY EXACT LOCATION AND INSTALLATION REQUIREMENT PRIOR TO ROUGH-IN.
5. PROVIDE JUNCTION BOX FOR CONNECTION TO WINDOW DISPLAY CASES. E.C. TO VERIFY EXACT LOCATION AND INSTALLATION REQUIREMENT PRIOR TO ROUGH-IN.
6. PROVIDE RECEPTACLE FOR CONNECTION TO WALL DISPLAY CASES. VERIFY EXACT LOCATION AND INSTALLATION REQUIREMENT PRIOR TO ROUGH-IN.
7. EXISTING 480/277V PRI. TO 208/120V SEC., 45 kVA, 3PH TRANSFORMER. E.C. SHALL VERIFY OPERABLE CONDITION IN FIELD. REPLACE IF FOUND IN-OPERABLE. BASE BID ACCORDINGLY.
8. EXISTING 150A (M.L.O.), 208/120V, 3PH, 4W ELECTRICAL PANEL-A FOR PROJECT SPACE. E.C. SHALL VERIFY OPERABLE CONDITION IN FIELD. REPLACE IF FOUND IN-OPERABLE. BASE BID ACCORDINGLY.
9. EXISTING 60A, 480V, 3 PH, 4W ELECTRICAL DISCONNECT FOR THE PROJECT SPACE. SHALL VERIFY OPERABLE CONDITION IN FIELD. REPLACE IF FOUND IN-OPERABLE. BASE BID ACCORDINGLY.
10. PROVIDE JUNCTION BOX FOR CONNECTION TO SAFE. E.C. TO VERIFY EXACT LOCATION AND INSTALLATION REQUIREMENT PRIOR TO ROUGH-IN.
11. PROVIDE SHOW WINDOW RECEPTACLES COMPLYING WITH NEC 210.62.
12. PROVIDE TIME CLOCK AS PER DETAILS ON SHEET E2.
13. JUNCTION BOX FOR STOREFRONT SIGNAGE. E.C. SHALL VERIFY EXACT LOCATION IN FIELD WITH ARCHITECT. VERIFY EXACT POWER AND MOUNTING REQUIREMENTS WITH ARCHITECT/ SIGNAGE VENDOR. PROVIDE ELECTRICAL CONNECTIONS ACCORDINGLY.
14. EXISTING MECHANICAL EQUIPMENT TO REMAIN. E.C. SHALL VERIFY THE LOCATION AND EXISTING ELECTRICAL CONNECTIONS. REPLACE THE CONNECTIONS IN COORDINATION WITH MECHANICAL CONTRACTOR, IF FOUND IN-OPERABLE. BASE BID ACCORDINGLY.

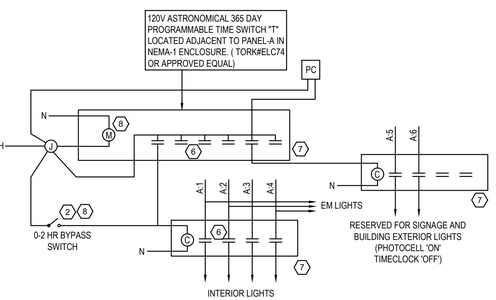
N

POWER PLAN | SCALE: 1/4"=1'-0" | 2

LIGHT FIXTURE SCHEDULE

TAG	QTY	FIXTURE	MANUFACTURER	WATTS	MODEL/PART #	NOTES
A	82	6" RECESSED LED	GOTHAM	25	EV06-50/-25-AR-ND-LSS-MVOLT-GZ10-TRW-90CRI	OR APPROVED EQUAL
B	3	CUSTOM PENDANT W/ 120W MAX	CUSTOM	120	CUSTOM	VERIFY WITH ARCH. FOR SPEC.
C	1	1X4 RECESSED LED	LITHONIA	26	SBL LED	OR APPROVED EQUAL
D	27	LINEAR LED	LITHONIA	20	MNSL LED	OR APPROVED EQUAL
X	2	EXIT SIGN W/ 90 MIN BATTERY BACKUP	LITHONIA	5	EDGR W I G EL	OR APPROVED EQUAL
EM	9	EMERGENCY SIGN W/ 90 MIN BATTERY BACKUP	LITHONIA	5	EML2	OR APPROVED EQUAL

NOTE :
1. VERRIFY WITH OWNER OR ARCHITECT BEFORE PURCHASING THE LIGHTING FIXTURE.
2. LIGHTING ABOVE FOOD OR UTENSILS SHALL BE SHATTERPROOF.



LIGHTING CONTROL DETAIL

LIGHTING PLAN GENERAL NOTES:

1. PROVIDE 6' OF FLEX METAL WIRES FROM J-BOX ABOVE EACH FIXTURE TO EACH LIGHTING FIXTURE.
2. PROVIDE 90 MINUTES BATTERY BACKUP FOR EXIT SIGN. PROVIDE LOW LEVEL EXIT SIGN AS REQUIRED
3. FIXTURE SHALL HAVE MINIMUM 60 LUMENS/WATT EFFICIENCY, AND BALLAST AND LAMP SHALL BE ENERGY SAVING TYPE U.O.N.
4. VERIFY WITH OWNER OR ARCHITECT FOR NIGHT LIGHT REQUIREMENT.
5. LIGHTING SWITCH TO BE 36"-48" A.F.F. U.O.N.
6. LIGHTING FIXTURES ABOVE FOOD PREPARE AREA TO BE SHATTERPROOF AND WASHABLE.
7. EMERGENCY LIGHT TO BE WITH 90 MINUTE BATTERY BACKUP OR UNIT MOUNTED EMERGENCY INVERTER. PROVIDE UNSWITCHED HOT WIRE AS NOTED.

LIGHTING PLAN KEYED NOTES:

1. WIRE ALL EMERGENCY AND EXIT LIGHT TO THE NEAREST CIRCUIT AHEAD OF ALL CONTROLS & SWITCHING FOR CONTINUOUS OPERATION.
2. 0-2 HR BY-PASS TIME SWITCH (TORK#LC115M SERIES) LOCATED AT DESK. VERIFY EXACT LOCATION WITH ARCHITECT/OWNER PRIOR TO ROUGH-IN.
3. E.C. SHALL PROVIDE JUNCTION BOX AND DISCONNECT FOR BLADE SIGNAGE. EXTERIOR SIGNAGE SHALL BE ROUTED VIA LIGHTING CONTROL DEVICE.
4. E.C. SHALL PROVIDE DIMMER SWITCHES FOR PROJECT SPACE. COORDINATE EXACT LOCATION WITH ARCHITECT/OWNER.
5. WALL MOUNTED OCCUPANCY SENSOR EQUAL TO WATTSTOPPER WS-250. SET OFF TIME TO 15 MINUTES. SET DIP SWITCH TO AUTOMATIC ON.
6. ELECTRICALLY HELD, REMOTE CONTROL LIGHTING CONTACTOR WITH QUANTITY OF POLES AS INDICATED. PROVIDE 120V COIL AND MOUNT IN RELAY CABINET. ASCO#917 SERIES OR SQUARE D #8903 SERIES, TYPICAL, U.N.O.
7. PROVIDE A WALL MOUNTED, NEMA 1 RELAY CABINET, SIZE AS REQUIRED, WITH HINGED AND LOCK DOOR. MOUNT THE CABINET ABOVE PANEL. ALL LIGHTING CONTACTORS AND RELAYS DESCRIBED HEREIN SHALL MOUNT IN THIS CABINET. CONFIRM CABINET DIMENSION WITH RELAY SUPPLIER PRIOR TO PRICING.
8. ASTRONOMICAL TIME CLOCK AND OVERRIDE SWITCH CONTROL CIRCUIT MUST BE ON THE SAME DEDICATED CIRCUIT.

N

LIGHTING PLAN | SCALE: 1/4"=1'-0" | 1

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Sheet Issue & Revision Log

It is the clients responsibility prior to or during construction to notify the architect in writing of any perceived errors or omissions in the plans and specifications of which a contractor thoroughly knowledgeable with the building codes and methods of construction should reasonably be aware. Written instructions addressing such perceived errors or omissions shall be received from the architect prior to the client or clients subcontractors proceeding with the work. The client will be responsible for any defects in construction if these procedures are not followed.

ELECTRICAL PLANS

E2.0

PANEL:	A (EXISTING)										MOUNTING:	SURFACE
208Y/120	VOLTS,	3	PHASE,	4	WIRE						PANEL LOCATION:	B.O.H.
MAIN CB:	NA	MLO:	150A	BUS:	225A	MIN,					FED FROM:	TRANSFORMER-A

CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD	LOAD TYPE	LOAD (KVA)	MINIMUM BRANCH CIRCUIT	PER PHASE (KVA) A	B	C	MINIMUM BRANCH CIRCUIT	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD	TRIP AMPS	CKT NO.
1	20	SALES AREA LIGHTING	L	1.10	2#12, #12G, 3/4"C	2.05			2#12, #12G, 3/4"C	0.95	L	SALES AREA LIGHTING	20	2
3	20	SALES AREA LIGHTING	L	0.36	2#12, #12G, 3/4"C		0.91		2#12, #12G, 3/4"C	0.55	L	B.O.H. LIGHTING	20	4
5	20	BLADE SIGNAGE	L	1.00	2#12, #12G, 3/4"C			2.00	2#12, #12G, 3/4"C	1.00	L	BLADE SIGNAGE	20	6
7	20	SPARE				0.90			2#12, #12G, 3/4"C	0.90	R	POS RECEPTACLES	20	8
9	20	SHOWCASE CABINET	R	1.50	2#12, #12G, 3/4"C		3.00		2#12, #12G, 3/4"C	1.50	R	SHOWCASE CABINET	20	10
11	20	SHOWCASE CABINET	R	1.50	2#12, #12G, 3/4"C			3.00	2#12, #12G, 3/4"C	1.50	R	SHOWCASE CABINET	20	12
13	20	SHOWCASE CABINET	R	1.50	2#12, #12G, 3/4"C	3.00			2#12, #12G, 3/4"C	1.50	R	SHOWCASE CABINET	20	14
15	20	LIGHT BOX CABINET	R	1.50	2#12, #12G, 3/4"C		3.00		2#12, #12G, 3/4"C	1.50	L	LIGHT BOX CABINET	20	16
17	20	LIGHT BOX CABINET	R	1.50	2#12, #12G, 3/4"C			3.15	2#12, #12G, 3/4"C	1.65	R	SHOW WINDOW RECEPTACLE	20	18
19	20	SHOW WINDOW RECEPTACLE	R	0.95	2#12, #12G, 3/4"C	2.15			2#12, #12G, 3/4"C	1.20	R	SHOW WINDOW RECEPTACLE	20	20
21	20	SHOW WINDOW RECEPTACLE	R	1.20	2#12, #12G, 3/4"C		2.20		2#12, #12G, 3/4"C	1.00	R	SHOW WINDOW RECEPTACLE	20	22
23	20	SHOW WINDOW RECEPTACLE	R	0.95	2#12, #12G, 3/4"C			2.45	2#12, #12G, 3/4"C	1.50	L	WINDOW DISPLAY CASE	20	24
25	20	WINDOW DISPLAY CASE	L	1.50	2#12, #12G, 3/4"C	2.70			2#12, #12G, 3/4"C	1.20	M	ROLLING GATE	20	26
27	20	ROLLING GATE	M	1.50	2#12, #12G, 3/4"C		1.68		2#12, #12G, 3/4"C	0.18	R	RESTROOM RECEPTACLE	20	28
29	20	TIME CLOCK	R	0.10	2#12, #12G, 3/4"C			0.60	2#12, #12G, 3/4"C	0.50	E	SAFE	20	30
31	30	WATER HEATER	O	2.00	2#10, #10G, 3/4"C	3.20			2#12, #12G, 3/4"C	1.20	L	EXTERIOR SIGNAGE	20	32
33	20	EXTERIOR SIGNAGE	L	1.20	2#12, #12G, 3/4"C		1.30		2#12, #12G, 3/4"C	0.10	M	VAV (EX)	20	34
35	20	DIGITAL SCREEN	L	1.20	2#12, #12G, 3/4"C			1.40	2#12, #12G, 3/4"C	0.20	M	EF (EX)	20	36
37	20	EXTERIOR SIGNAGE	L	1.20	2#12, #12G, 3/4"C	1.20						SPARE	20	38
39	20	SPARE					0.00					SPARE	20	40
41	20	SPARE						0.00				SPARE	20	42
					TOTAL CONNECTED LOAD (KVA)	15.20	12.09	12.60						

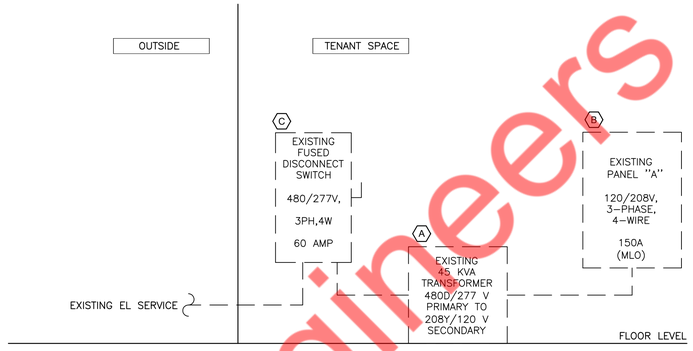
LOAD CLASSIFICATION		CONNECTED LOAD (KVA)	DEMAND FACTOR	DEMAND LOAD (KVA)
LIGHTING	L	14.26	125%	17.82
TOTAL RECEPTACLE LOAD	R	20.13		
RECEPTACLE UPTO 10KVA	R	10.00	100%	10.00
RECEPTACLE OVER 10KVA	R	10.13	50%	5.07
HVAC	H	0.00	100%	0.00
MOTOR	M	3.00	125%	3.75
LARGEST MOTOR	LM	0.00	100%	0.00
KITCHEN/EQUIPMENTS	E	0.50	65%	0.33
REFRIGERATION	C	0.00	100%	0.00
OTHER/MISCILLANEOUS	O	2.00	100%	2.00

PANEL TOTAL LOAD	
TOTAL CONNECTED LOAD	39.89 KVA
TOTAL DEMAND LOAD	38.96 KVA
TOTAL CONNECTED CURRENT	110.84 AMP
TOTAL DEMAND CURRENT	108.27 AMP

PANEL SCHEDULE GENERAL NOTES

1. ALL CIRCUITING SHOWN IS FOR REFERENCE PURPOSE ONLY. INFORM ENGINEER FOR ANY DISCREPANCIES BEFORE PURCHASE OF ANY EQUIPMENTS/WIRES OR DEVICES.
2. ELECTRICAL CONTRACTOR TO VERIFY THE EXACT PANEL SIZES AND INCOMING FEEDER SIZE.
3. E.C. SHALL COORDINATE WITH MECHANICAL AND PLUMBING CONTRACTOR/EQUIPMENT MANUFACTURER FORE EXACT ELECTRICAL REQUIREMENTS FOR CABLE AND BREAKERS AND ACCORDINGLY PROVIDE THE ELECTRICAL BREAKER AND CABLES IN FIELD. BASE BID ACCORDINGLY.
4. REFER TO ARCHITECTURAL SHEET FOR EQUIPMENT PLAN & SCHEDULE. E.C. SHALL VERIFY THE BREAKER, CABLE, ELECTRICAL LOAD, PLUG, RECEPTACLES AND CONDUIT REQUIREMENT /SIZES/RATINGS FOR ALL ELECTRICAL EQUIPMENTS WITH EQUIPMENT SUPPLIER/ MANUFACTURER AND PROVIDE THE ELECTRICAL CONNECTION PER MANUFACTURER RECOMMENDATIONS /REQUIREMENTS. BASE BID ACCORDINGLY.
5. CONTRACTOR SHALL PROVIDE THE GFI BREAKER AS CODE REQUIREMENTS AND AS MENTIONED ON POWER PLAN.

ELECTRICAL PANEL SCHEDULE | SCALE: N.T.S. | 2



RISER DIAGRAM KEYED WORK NOTES

(A) EXISTING 45KVA, 480/277V, EPH DELTA PRIMARY AND 120/208V, 3PH STAR SECONDARY STEP-DOWN TRANSFORMER FOR THE PROJECT SPACE SHALL REMAIN. E.C. SHALL VERIFY OPERABLE CONDITION IN FIELD. REPLACE IF FOUND IN-OPERABLE. BASE BID ACCORDINGLY.

(B) EXISTING 150A (MLO), 120/208V, 3PH, 4W ELECTRICAL PANEL "A" SHALL REMAIN. VERIFY OPERABLE CONDITION IN FIELD. REPLACE IF FOUND IN-OPERABLE. BASE BID ACCORDINGLY.

(C) EXISTING 60A, 480/277V, 3PH, 4W FUSED DISCONNECT FOR THE PROJECT SPACE. E.C. SHALL COORDINATE EXACT LOCATION WITH OWNER/LANDLORD.

ELECTRICAL GENERAL NOTES

1. ABOVE RISER DIAGRAM IS FOR REFERENCE PURPOSE ONLY. E.C TO VERIFY EXACT POWER DISTRIBUTION IN FIELD WITH UTILITY.
2. E.C. SHALL VERIFY THE INCOMING SERVICE AMPERAGE, VOLTAGE, NUMBER OF PHASES, WIRE SIZE AND DISTRIBUTION IN FIELD.
3. E.C. TO COORDINATE FAULT CURRENT (ISC) RATING WITH UTILITY COMPANY AND AHJ PRIOR TO COMMENCING ANY WORK.
4. E.C. SHALL VERIFY THE EXACT POWER DISTRIBUTION & INCOMING CONNECTION TO ALL PANELS IN FIELD. INFORM ENGINEER FOR ANY DISCREPANCY FOUND.

ELECTRICAL RISER DIAGRAM | SCALE: N.T.S. | 1

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ELECTRICAL RISER DIAGRAM & PANEL SCHEDULE

E3.0