MECHANICAL SYMBOLS LIST

AC–1 / TXF–1	EQUIPMENT SYMBOL
XX / X	RISER SYMBOL
AIR DEVICES	
	CEILING DIFFUSER SUPPLY
	CEILING DIFFUSER RETURN
DUCT ACCESSORIES	
BD	BACKDRAFT DAMPER
	FIRE DAMPER W / ACCESS DOOR
M	MOTORIZED DAMPER
VD VD	VOLUME DAMPER
	DUCT HEATER
HVAC PIPING	
CP	NEW CONDENSATE PIPING
REF	NEW REFRIGERANT PIPING
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

MECHANICAL ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLER UNIT
AL	ACOUSTIC LINING
CDS	CEILING DIFFUSER SUPPLY
CDR	CEILING DIFFUSER RETURN
CFM	CUBIC FEET OF AIR PER MINUTE
CP	CONDENSATE PUMP
CD	CONDENSATE DRAIN PIPE
DN	DOWN
DX	DRYER EXHAUST RISER
EDH	ELECTRIC DUCT HEATER
EER	ENERGY EFFICIENCY RATIO
EUH	ELECTRIC UNIT HEATER
EG	EXHAUST GRILLE
FD/AD	FIRE DAMPER W/ACCESS DOOR
OAI	OUTSIDE AIR INTAKE RISER
OAF	OUTSIDE AIR INTAKE FAN
MD	MOTORIZED DAMPER
JXF	JANITOR EXHAUST FAN
REF	REFRIGERANT PIPING
RG	RETURN GRILLE
SG	SUPPLY GRILLE
TR	TRANSFER DUCT
TX	TOILET EXHAUST RISER
TXF	TOILET EXHAUST FAN
VD	VOLUME DAMPER
W.M.S.	WIRE MESH SCREEN
U.O.N.	UNLESS OTHERWISE NOTED

PENNSYLVANIA BUILDING DEPARTMENT NOTES

ALL WORK SHALL COMPLY WITH APPLICABLE SECTIONS OF INTERNATIONAL BUILDING CODE 2015, AND ALL AMENDMENTS AND RULES AND REGULATIONS OF THE DEPARTMENT OF BUILDINGS.

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 2015 BUILDING CODE REQUIREMENTS AS OUTLINES IN SECTION [BC 1704].
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 MC 102.
5. THE FOLLOWING WORK ITEMS, COMPONENTS, MATERIALS, CAPACITIES, ETC. SHALL COMPLY WITH THE REFERENCED CODE OR STANDARD:
   A. STANDARDS OF HEATING – MC 309.1
   B. DUCT CONSTRUCTION AND INSTALLATION– MC 603
   C. AIR INTAKES, EXHAUSTS AND RELIEFS – MC 401.5
   D. AIR FILTERS – MC 605
   E. MANUAL AND AUTOMATIC FIRE AND SMOKE CONTROLS FOR AIR DISTRIBUTION SYSTEMS – MC 513
6. MINIMUM TEMPERATURE TO BE MAINTAINED IN OCCUPIED SPACES DURING HEATING SEASON: 68 DEG. FAHRENHEIT.
7. VENTILATION FOR ALL AREA SHALL COMPLY WITH MC 401.
8. ALL FIRE DAMPERS SHALL BE ACCEPTED FOR USE BY PHILADELPHIA DEPARTMENT OF BUILDINGS. FIRE DAMPERS SHALL BE MANUFACTURED AND INSTALLED IN ACCORDANCE WITH UL 555, STANDARDS FOR FIRE DAMPERS AND CEILING DAMPERS.
9. COMBINATION FIRE/SMOKE DAMPERS AND SMOKE DAMPERS SHALL BE ACCEPTED FOR USE BY PHILADELPHIA DEPARTMENT OF BUILDINGS AND SHALL BE MANUFACTURED AND INSTALLED IN ACCORDANCE WITH UL 555S.
10. FIRE DAMPERS, SMOKE DAMPERS, COMBINATION FIRE/SMOKE DAMPERS LOCATED WITHIN THE AIR DISTRIBUTION AND SMOKE CONTROL SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION MC 607.
11. REFER TO ARCHITECTURAL DRAWINGS FOR REQUIRED FIRE–RATED WALL AND SMOKE WALL CONSTRUCTION AND LOCATION.
12. 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.
13. SMOKE DETECTOR SHALL MEET UL268A.
14. MECHANICAL SYSTEMS SHALL BE COMMISSIONED PER 2015 IECC C403.2.2, C408.2.1, C408.2.5.2. FINAL COMMISSIONING REPORT SHALL BE DUE WITHIN 90 DAYS OF RECEIPT OF CERTIFICATE OF OCCUPANCY.
15. ALL HEATING AND COOLING LOADS CALCULATED PER ASHRAE/ACCA 183.
16. COMMISSIONING PLAN SHALL BE DEVELOPED BY A LICENSED DESIGN PROFESSIONAL, MECHANICAL ENGINEER OR APPROVED AGENCY.
17. 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 IECC 2015 C408.2.4.

MECHANICAL DRAWING LIST

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 POSITIONS 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. DUCTWORK AND PIPING IS SHOWN DIAGRAMMATICALLY AND DOES NOT SHOW ALL OFFSETS, DROPS AND RISES OF RUNS. THE CONTRACTOR SHALL MAKE ALLOWANCE IN PRICING FOR ROUTING OF DUCTWORK AND PIPING TO AVOID OBSTRUCTIONS. EXACT LOCATIONS ARE SUBJECT TO APPROVAL OF ARCHITECT. COORDINATION WITH THE EXISTING SERVICES, INCLUDING THOSE OF OTHER TRADES IS REQUIRED.
8. 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.
9. DISCONNECT, REMOVE AND/OR RELOCATE EXISTING MATERIAL, EQUIPMENT AND OTHER WORK AS NOTED OR REQUIRED FOR PROPER INSTALLATION OF NEW SYSTEM.
10. 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.
11. 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.
12. 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.
13. 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.
14. 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).
15. WHERE PENETRATIONS THROUGH FIRE RATED WALLS ARE NOT FIRE PROOFED THIS CONTRACTOR SHALL BE RESPONSIBLE TO SEAL SAME TO MAINTAIN THE RATED INTEGRITY.
16. 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.
17. 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.
18. 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.
19. 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.
20. 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.
21. MATERIALS AND WORKMANSHIP, UNLESS OTHERWISE NOTED, SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
22. ALL EQUIPMENT SHALL BE PROVIDED WITH ONE YEAR WARRANTY PARTS AND LABOR AND FIVE YEARS ON COMPRESSORS. WARRANTY PERIOD BEGINS UPON PROJECT ACCEPTANCE
23. ALL MATERIAL AND EQUIPMENT TO BE NEW UNLESS OTHERWISE NOTED AND SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
24. 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.
25. 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.
26. SUBMIT SHOP DRAWING OF ALL WORK WHICH MUST BE APPROVED BY THE ARCHITECT AND ENGINEER BEFORE WORK COMMENCES.
27. ALL MATERIAL AND EQUIPMENT TO BE NEW UNLESS OTHERWISE NOTED AND SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
28. 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.
29. INSURANCE: IN ACCORDANCE WITH BUILDING REQUIREMENTS THE CONTRACTOR SHALL INCLUDE A HOLD HARMLESS CLAUSE FOR OWNER AND ENGINEER.
30. 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.
31. 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.
32. 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.

SCOPE OF WORK

SCOPE OF WORK

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.

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

PROJECT:
GOODBLEND READING

PROJECT NUMBER: 21242

goodblend MEDICAL MARIJUANA

Parallel

STAMP:

ISSUE:	DATE:
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MECHANICAL GENERAL NOTES, SYMBOLS LIST & ABBREVIATIONS

DRAWING NUMBER:
M0.1

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. UNLESS OTHERWISE SHOWN, LOCATE ALL ROOM THERMOSTATS 4'-0" (CENTER LINE) ABOVE THE FINISHED FLOOR. NOTIFY THE ENGINEER OF ANY ROOMS WHERE THE PRECEDING LOCATION CANNOT BE MAINTAINED OR WHERE THERE IS A QUESTION ON LOCATION.

9. ALL DUCTWORK SHALL CLEAR DOORS AND WINDOWS.

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

11. PROVIDE ALL 90-DEGREE SQUARE ELBOWS WITH DOUBLE RADIUS TURNING VANES UNLESS OTHERWISE INDICATED. ELBOWS IN DISHWASHER, KITCHEN, AND LAUNDRY 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.

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

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

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

15. 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.

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

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

18. 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.

19. 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.

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

21. 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.

22. 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.

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

24. 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 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 230517 – SLEEVES AND SLEEVE SEALS FOR HVAC PIPING

1.1 SLEEVE-SEAL SYSTEMS

A. FIELD-ASSEMBLED, MODULAR SEALING-ELEMENT UNIT FOR FILLING ANNULAR SPACE BETWEEN PIPING AND SLEEVE.

1. SEALING ELEMENTS: EPDM RUBBER OR NBR.
2. PRESSURE PLATES: CARBON STEEL, PLASTIC, STAINLESS STEEL.
3. CONNECTING BOLTS AND NUTS: CARBON STEEL WITH CORROSION-RESISTANT COATING, STAINLESS STEEL.

B. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, AVAILABLE MANUFACTURERS OFFERING PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:

1. ADVANCE PRODUCTS & SYSTEMS, INC.
2. CALPICO, INC.
3. METRAFLEX COMPANY (THE).
4. PIPELINE SEAL AND INSULATOR, INC.
5. PROCO PRODUCTS, INC.

1.2 SLEEVE-SEAL FITTINGS

A. MANUFACTURED PLASTIC, SLEEVE-TYPE, PLASTIC OR RUBBER WATER-STOP ASSEMBLY MADE FOR IMBEDDING IN CONCRETE SLAB OR WALL.

1.3 GROUT

A. NON-SHRINK, FACTORY PACKAGED.

1.4 SLEEVE AND SLEEVE-SEAL SCHEDULE

A. USE SLEEVES AND SLEEVE SEALS FOR THE FOLLOWING PIPING-PENETRATION APPLICATIONS:

1. INTERIOR PARTITIONS:
   a. PIPING SMALLER THAN NPS 6 (DN 150): GALVANIZED-STEEL-PIPE SLEEVES; PVC-PIPE SLEEVES.
   b. PIPING NPS 6 (DN 150) AND LARGER: GALVANIZED-STEEL-SHEET SLEEVES.

END OF SECTION 230517

SECTION 230518 – ESCUTCHEONS FOR HVAC PIPING

PART 2 – PRODUCTS

2.1 ESCUTCHEONS

A. ONE-PIECE, CAST-BRASS TYPE: WITH POLISHED, CHROME-PLATED AND ROUGH-BRASS FINISH AND SETSCREW FASTENER.

B. ONE-PIECE, DEEP-PATTERN TYPE: DEEP-DRAWN, BOX-SHAPED BRASS WITH CHROME-PLATED FINISH AND SPRING-CLIP FASTENERS.

C. ONE-PIECE, STAMPED-STEEL TYPE: WITH CHROME-PLATED FINISH AND SPRING-CLIP FASTENERS.

2.2 FLOOR PLATES

A. ONE-PIECE FLOOR PLATES: CAST-IRON FLANGE WITH HOLES FOR FASTENERS.

PART 3 – EXECUTION

3.1 INSTALLATION

A. INSTALL ESCUTCHEONS FOR PIPING PENETRATIONS OF WALLS, CEILINGS, AND FINISHED FLOORS.

B. INSTALL ESCUTCHEONS WITH ID TO CLOSELY FIT AROUND PIPE, TUBE, AND INSULATION OF PIPING AND WITH OD THAT COMPLETELY COVERS OPENING.

1. ESCUTCHEONS FOR NEW PIPING:
   a. PIPING WITH FITTING OR SLEEVE PROTRUDING FROM WALL: ONE-PIECE, DEEP-PATTERN TYPE.
   b. INSULATED PIPING: ONE-PIECE, STAMPED-STEEL TYPE.
   c. BARE PIPING AT WALL AND FLOOR PENETRATIONS IN FINISHED SPACES: ONE-PIECE, CAST-BRASS TYPE WITH POLISHED, CHROME-PLATED FINISH OR STAMPED-STEEL TYPE.
   d. BARE PIPING AT CEILING PENETRATIONS IN FINISHED SPACES: ONE-PIECE, CAST-BRASS TYPE WITH POLISHED, CHROME-PLATED FINISH OR STAMPED-STEEL TYPE.

3.2 FIELD QUALITY CONTROL

A. REPLACE BROKEN AND DAMAGED ESCUTCHEONS AND FLOOR PLATES USING NEW MATERIALS.

END OF SECTION 230518

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 AND 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.

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

PROJECT:
GOODBLEND READING

PROJECT NUMBER: 21242

goodblend MEDICAL MARIJUANA

Parallel

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SECTION 230593 – TESTING, ADJUSTING, AND BALANCING FOR HVAC

1.1 SUMMARY

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

1. AIR SYSTEMS: CONSTANT–VOLUME SYSTEMS.
2. MOTORS.
3. CONDENSING UNITS.

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–6
OUTSIDE OF BUILDING:	R–12

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	TRANSVERSE JOINTS AND BRACING
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

PIPING INSULATION

A. INSULATE ALL PIPING IN ACCORDANCE WITH INSULATION SCHEDULE EXCEPT AS OTHERWISE NOTED.

INSULATION SCHEDULE – PIPING

SERVICE	SIZE	THICKNESS	MATERIAL FINISH
REFRIGERANT PIPING		1.5"	P–6
CONDENSER DRAIN PIPING (IF RUNNING THROUGH EXTERIOR WALL)		1.0"	P–6

B. PIPING, VALVES AND FITTINGS TO BE INSULATED:

1) LOW TEMPERATURE PIPING SYSTEMS – 0 TO 55 DEG F INCLUDING:
   a. CHILLED WATER SUPPLY AND RETURN.
   b. CONDENSER WATER SUPPLY AND RETURN.
   c. CONDENSATE DRAIN PIPING.

2) LOW TEMPERATURE PIPING SYSTEMS – 0 TO 55 DEG F INCLUDING:
   a. GLYCOL WATER SUPPLY AND RETURN.

3) LOW TEMPERATURE HOT PIPING SYSTEMS – 100 TO 200 DEG F INCLUDING:
   a. LOW TEMPERATURE HOT WATER SUPPLY AND RETURN.
   b. PUMPED CONDENSATE DISCHARGE.

4) PROTECTIVE COVERINGS SHALL BE INSTALLED ON AREAS OF INSULATION THAT ARE EXPOSED TO WEATHER OR SUBJECT TO MECHANICAL DAMAGE. THE PROTECTIVE COVERING SHALL BE:

   a. ARMA–CHEK SILVER" MULTI–LAYER LAMINATE OF ALUMINUM, COATED WITH A UV PROTECTIVE FILM AND BACKED WITH A FLEXIBLE PVC FILM. THE MATERIAL SHOULD BE ADHERED WITH ARMAFLEX 520 ADHESIVE OR EQUIVALENT, AND ALL JOINS AND SEAMS SECURED WITH "ARMA–CHEK SILVER TAPE". INSTALLATION SHALL BE IN ALL CASES TO THE MANUFACTURER'S RECOMMENDATIONS.

   OR

   b. HIGH DENSITY RUBBER CLADDING OF THE "ARMA–CHECK R" TYPE BONDED USING AN APPROPRIATE FULL CONTACT ADHESIVE WITH A MINIMUM 50 MM OVERLAP AT ALL BUTT JOINTS AND LONGITUDINAL SEAMS. A WEATHER–PROOF MASTIC SEALANT SHALL BE APPLIED OVER ALL SEAMS AND JOINTS. ALL MATERIAL SHALL BE OVERLAPPED AND STAGGERED IN SUCH A WAY AS TO ENSURE A WATERSHED IS ALWAYS PROVIDED. INSTALLATION SHALL BE IN ALL CASES TO THE MANUFACTURER'S RECOMMENDATIONS. ALL EXCESS ADHESIVE VISIBLE ON THE SURFACE OF THE COMPLETED ASSEMBLY SHALL BE REMOVED USING AN APPROPRIATE CLEANING MATERIAL.

   OR

   c. METAL CLADDING, COMPRISED OF COATED SHEET METAL, WITH ALL EXTERNAL JOINTS AND FIXING MADE WEATHER–PROOF WITH SILICONE SEALANT.

C. MATERIAL:

1) TYPE P–1: MINIMUM 4 LB DENSITY MOLDED FIBERGLASS, MAXIMUM 0.24 K–FACTOR AT 75 DEG F MEAN TEMPERATURE WITH FACTORY–APPLIED FIRE–RETARDANT FOIL–SKRIM–KRAFT FACING. ALL SERVICE JACKET. SIMILAR TO OWENS–CORNING 650 ASJ.

2) TYPE P–3: MINIMUM 4 LB DENSITY MOLDED FIBERGLASS FITTING, MAXIMUM 0.23 K–FACTOR AT 75 DEG F MEAN TEMPERATURE SIMILAR TO EPOLUX HAMFAB MOLDED FITTINGS.

3) TYPE P–4: MINIMUM 1 LB DENSITY FIBERGLASS FITTING INSERTS, MAXIMUM 0.27 K–FACTOR AT 75 DEG F MEAN TEMPERATURE SIMILAR TO MANVILLE HI–LO TEMP INSULATION INSERTS.

4) TYPE P–6: MINIMUM 6 LB MOLDED FOAMED PLASTIC. MAXIMUM 0.27 K–FACTOR AT 75 DEG F MEAN TEMPERATURE. MAXIMUM 0.17 PERMEANCE. SIMILAR TO ARMSTRONG ARMAFLEX II.

D. FINISH:

1) TYPE F–1: FITTING COVER, MOLDED WHITE PVC JACKET, UL CLASS 1, MAXIMUM PERMEANCE 0.05 SIMILAR TO MANVILLE ZESTRON.

2) TYPE F–2: WHITE VAPOR BARRIER COATING WITH 10X10 OR 20X20 MESH WHITE GLASS, POLYESTER OR NYLON CLOTH REINFORCING MEMBRANE, MINIMUM 31 MIL DRY FILM THICKNESS, SIMILAR TO FOSTER TITE–FIT, UL LABEL.

3) TYPE F–4: ALUMINUM JACKETING WITH MINIMUM 0.016 IN. WALL THICKNESS AND LONGITUDINAL JOINTS WITH LOCK SEAMS.

4) TYPE F–6: WHITE FINISHING AND INSULATING CEMENT APPLIED OVER HEXAGONAL WIRE MESH. CEMENT SIMILAR TO KEENE SUPERSLICK.

E. INSTALLATION:

3) BEFORE APPLYING INSULATION ALL PRESSURE AND LEAK TESTS SHALL BE COMPLETED AND APPROVED.

4) ALL INSULATION SHALL BE BUTTED FIRMLY TOGETHER. PROVIDE 2 IN. LAMP STRIPS AT ALL SEAMS SECURED WITH ADHESIVE. USE VAPOR BARRIER TAPE AND VAPORSEAL ADHESIVE WHERE REQUIRED. STAPLES NOT PERMITTED. REFRIGERANT PIPING INSULATION SHALL HAVE MITERED FITTINGS.

5) ALL INSULATION AND VAPOR BARRIERS SHALL BE CONTINUOUS PASSING THROUGH SLEEVES, HANGERS, ETC., OR OTHER OPENINGS. PROVIDE SADDLES OR SHIELDS FOR PROTECTION AT ALL HANGINGS.

6) INSULATION FOR STRAINERS OR OTHER FITTINGS OR ACCESSORIES REQUIRING SERVICING OR INSPECTION SHALL HAVE INSULATION REMOVABLE AND REPLACEABLE WITHOUT DAMAGE.

THERMOSTATIC CONTROLS:

A. GENERAL:

THE SUPPLY OF HEATING AND COOLING ENERGY TO EACH ZONE SHALL BE INDIVIDUALLY CONTROLLED BY THERMOSTATIC CONTROLS RESPONDING TO TEMPERATURE WITHIN THE ZONE. FOR THE PURPOSES OF SECTION 6.4.3.1, A DWELLING UNIT SHALL BE PERMITTED TO BE CONSIDERED A SINGLE ZONE.

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.

C. SETBACK CONTROLS:

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).

D. 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.

E. HEAT PUMP SUPPLEMENTARY HEAT :

HEAT PUMPS HAVING SUPPLEMENTARY ELECTRIC RESISTANCE HEAT SHALL HAVE CONTROLS THAT, EXCEPT DURING DEFROST, PREVENT SUPPLEMENTARY HEAT OPERATION WHERE THE HEAT PUMP CAN PROVIDE THE HEATING LOAD.

SEQUENCE OF OPERATIONS

1) FANS: TURNED ON OR OFF THROUGH ON–OFF SWITCH AND SHALL OPERATE CONTINUOUSLY. WHERE THERE ARE DAMPERS (MOTORIZED OR FSD) IN THE DUCTWORK SYSTEM SERVED BY THE FAN, THEY SHALL BE INTERLOCKED WITH THE FAN TO OPEN WHEN THE FAN IS OPERATING ONLY. IF FSD IS INSTALLED IN THE SYSTEM, THE FAN SHALL SHUT DOWN WHENEVER THE FSD CLOSES ON AN ALARM CONDITION.

   a. TRANSFER FANS: FANS SHALL BE CONTROLLED BY A LOCAL WALL MOUNTED SWITCH.

   b. OUTSIDE AIR FANS: FANS SHALL BE INTERCONNECTED WITH AC UNITS SERVED. FANS SHALL RUN WHENEVER EITHER BUILDING AIR HANDLER IS OPERATIONAL.

   c. OUTSIDE AIR FANS SHALL BE INTERCONNECTED TO THEIR RESPECTIVE OUTSIDE AIR MOTORIZED DAMPER SO THAT THE DAMPER OPENS WHENEVER THE OA FAN IS OPERATING. OA FAN SHALL START RUNNING AFTER DAMPER IS PROOFED OPEN.

2) AC UNITS: UNIT SHALL BE STARTED AND STOPPED BY WALL MOUNTED PROGRAMMABLE THERMOSTAT. DURING "ON" MODE UNIT THERMOSTAT SHALL ENERGIZE COMPRESSOR(S) AND SUPPLY FAN TO MAINTAIN ROOM SET POINT OF 75°F ADJUSTABLE; WHEN ROOM TEMPERATURE DROPS BELOW SET POINT COMPRESSOR(S) SHALL DE–ENERGIZE AND FAN SHALL REMAIN ON.

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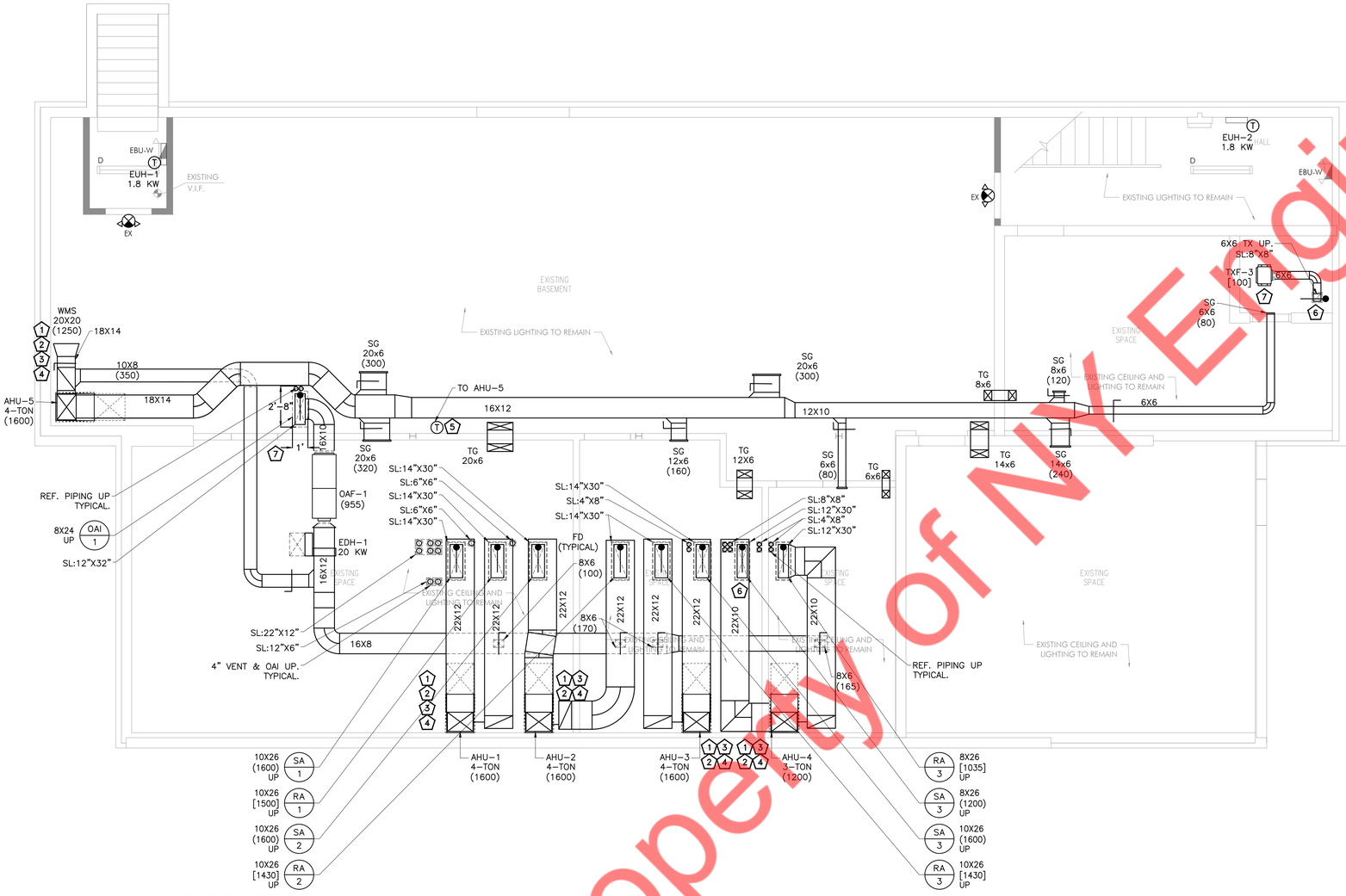

BASEMENT FLOOR MECHANICAL PLAN

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

MECHANICAL GENERAL NOTES

A. CONTRACTOR SHALL BALANCE EACH AIR DIFFUSER WITH THE CFM SHOWN PLAN.
B. DUCTWORK SHOWN ON PLAN ARE SCHEMATIC ONLY. CONTRACTOR SHALL COORDINATE WITH OTHER TRADES FOR DUCTWORK ROUTING. OFFSET AND RUN PIPING, DUCTWORK INSIDE THE STRUCTURE IF REQUIRED. PROVIDE ANY EXTRA DUCTWORK, FITTINGS, INSULATIONS AND OTHER ACCESSORIES IN ORDER TO COMPLETE THE INSTALLATION.
C. COORDINATE LOCATIONS AND SIZES OF WALL & SLAB OPENINGS WITH OWNER AND STRUCTURE ENGINEERS.
D. EQUIPMENT SIZES, DIMENSIONS AND REQUIRED CONNECTIONS SHALL BE VERIFIED WITH THE ACTUAL EQUIPMENT SELECTED VENDOR DRAWINGS BEFORE FABRICATION OF DUCTWORK, PIPING ETC.
E. DUCT SIZES SHOWN ON PLANS ARE CLEAR INSIDE AIR STREAM DIMENSIONS.
F. CONTRACTOR SHALL COORDINATE ALL ELECTRICAL REQUIREMENTS FOR ALL HVAC BASED ON ACTUAL EQUIPMENT SELECTED PRIOR TO INSTALLATION.
G. CONTRACTOR SHALL COORDINATE EQUIPMENT WEIGHTS AND SUPPORTS BASED ON ACTUAL EQUIPMENT SELECTED.
H. ALL CONCEALED DUCTWORK SHALL BE INSULATED METAL RECTANGULAR AND CIRCULAR DUCT SHALL BE INSULATED INTERNALLY UNLESS OTHERWISE ALLOWED IN WRITING BY THE ENGINEER OF RECORD. COORDINATE FINAL FINISH WITH ARCHITECT.
I. COORDINATE WITH ALL TRADES FOR MATERIALS IN RATED AND PLENUM SPACES.
J. ALL EXHAUST FANS SCHEDULED TO BE AUTOMATICALLY CONTROLLED BY MECHANICAL AIR HANDLERS SHALL BE CONNECTED BY MEANS OF AN AUXILIARY RELAY. PROVIDE AUXILIARY RELAY AS NEEDED.
K. ALL SOURCE OF MECHANICAL INTAKE SHALL MAINTAIN 10 LINEAR FEET SEPARATION BETWEEN ANY SOURCE OF EXHAUST. CONTRACTOR IS RESPONSIBLE TO ADJUST DUCT LENGTH AS NEEDED.
L. PROVIDE R-12 INSULATION WITH 2" THICKNESS FOR ALL OUTDOOR AIR INTAKE DUCTS & VENTS.
M. PROVIDE R-6 INSULATION WITH 1.5" THICKNESS FOR ALL SUPPLY AND RETURN.
N. MD TO INTERLOCK WITH RESPECTIVE INDOOR UNITS.
O. COORDINATE FINAL LOCATION OF EQUIPMENT WITH STRUCTURAL DRAWINGS.
P. CONTRACTOR SHALL DEMOLISH ALL EXISTING HVAC SYSTEMS INCLUDING FURNACE, DUCTWORK AND ALL ASSOCIATED ACCESSORIES.
Q. BEFORE STARTING DEMOLITION, PROVIDE NECESSARY PROTECTIVE DEVICES WHERE REQUIRED AND IN STRICT ACCORDANCE WITH OSHA AND ICRA REGULATIONS.
R. TAKE NECESSARY PRECAUTIONS TO PREVENT DUST AND DIRT MIGRATING TO OCCUPIED AREAS OF THE BUILDING. THIS INCLUDES BLANKING OFF ANY RETURN AIR GRILLES/ DUCTS IN THE WORK AREA. PROVIDE TEMPORARY EXHAUST FANS, DUCTED DIRECTLY TO OUTDOORS, TO MAINTAIN NEGATIVE PRESSURE WITHIN THE WORK AREA.
S. KEEP ALL ADJOINING AREAS ADJACENT TO THE WORK AREAS CLEAN AND FREE OF DEBRIS.
T. CONTRACTOR TO DEMOLISH ALL EXISTING HVAC SYSTEM WITH ALL ACCESSORIES. ALL DEMOLISHED MATERIALS SHALL BE REMOVED AND DISPOSED OF OFF SITE.
U. REPAIR/ REPLACE EXISTING EQUIPMENT/ MATERIALS NOT SCHEDULED OR NOTED TO BE DEMOLISHED BUT BECOME DAMAGED DURING THE PROGRESS OF THE WORK. MAKE ANY AND ALL SUCH REPAIRS, REPLACEMENTS, MODIFICATIONS TO RESTORE THE DAMAGED ITEMS TO THEIR ORIGINAL CONDITIONS AT THE TIME OF DAMAGE, TO THE SATISFACTION OF AND AT NO ADDITIONAL COST TO THE OWNER.
V. MECHANICAL CONTRACTOR TO COORDINATE ALL DUCT WORK, CROSSINGS, OVERLAPPING AND PENETRATIONS WITH SITE CONDITIONS AND AS PER EXISTING JOIST LAYOUT AND SKYLIGHT IN FIELD. MODIFY DUCT WORK WHEREVER REQUIRED.
W. DEMOLISH ALL EXISTING HVAC SYSTEM WITH ALL ACCESSORIES.

KEY NOTES:

1. CONNECT CD TO NEAREST PLUMBING DRAIN W/ AIR GAP FITTING. PROVIDE SECONDARY CONDENSATE PUMP AND DRIP PAN UNDER AC UNIT WITH WATER LEAKAGE SENSOR AND ALARM TO SHUT THE UNIT.
2. PROVIDE REMOTE TEMP SENSOR MOUNTED IN RETURN DUCT AND WIRE BACK TO T-STAT IN CHECK-IN ROOM.
3. EXTEND FULL SIZE SUPPLY & RETURN DUCTWORK TO SPACE. EXTEND AS SHOWN. ACOUSTICALLY LINE THE FIRST 10'-0" OF BOTH SUPPLY AND RETURN MAIN DUCTS.
4. PROVIDE 4" COMBUSTION AIR INTAKE AND VENT. PROVIDE VENTILATION TERMINATION KIT AT THE TERMINATION. INSTALL AS PER MANUFACTURERS RECOMMENDATION.
5. LOCATION OF DIGITAL THERMOSTAT CONTROL. INSTALL AND WIRE NEW 7-DAY PROGRAMMABLE THERMOSTAT FOR AHUs. COORDINATE EXACT LOCATION WITH ARCHITECT AND OWNER PRIOR TO ROUGH-IN. PROVIDE LOCKABLE COVER.
6. MECHANICAL CONTRACTOR TO COORDINATE ALL DUCT WORK PENETRATIONS WITH SITE CONDITIONS IN FIELD. ARCHITECT TO PROVIDE ENCLOSURE.
7. PROVIDE TIME CLOCK FOR ALL CEILING MOUNTED EXHAUST FANS. FAN SHALL BE SUSPENDED FROM STRUCTURE ABOVE. VERIFY EXACT LOCATION OF STRUCTURAL MEMBERS PRIOR TO INSTALLATION.

EQUIVALENT LENGTH FOR GAS FURNACE			
Sr. No.	Unit	Euivalent Length (ft)	Maximum Equivalent Length Each (ft)
		Outside Air Intake/vent	Outside Air Intake/VENT
1	AHU-1	220	265
2	AHU-2	230	265
3	AHU-3	230	265
4	AHU-4	233	265
5	AHU-5	220	265

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BASEMENT FLOOR MECHANICAL PLAN

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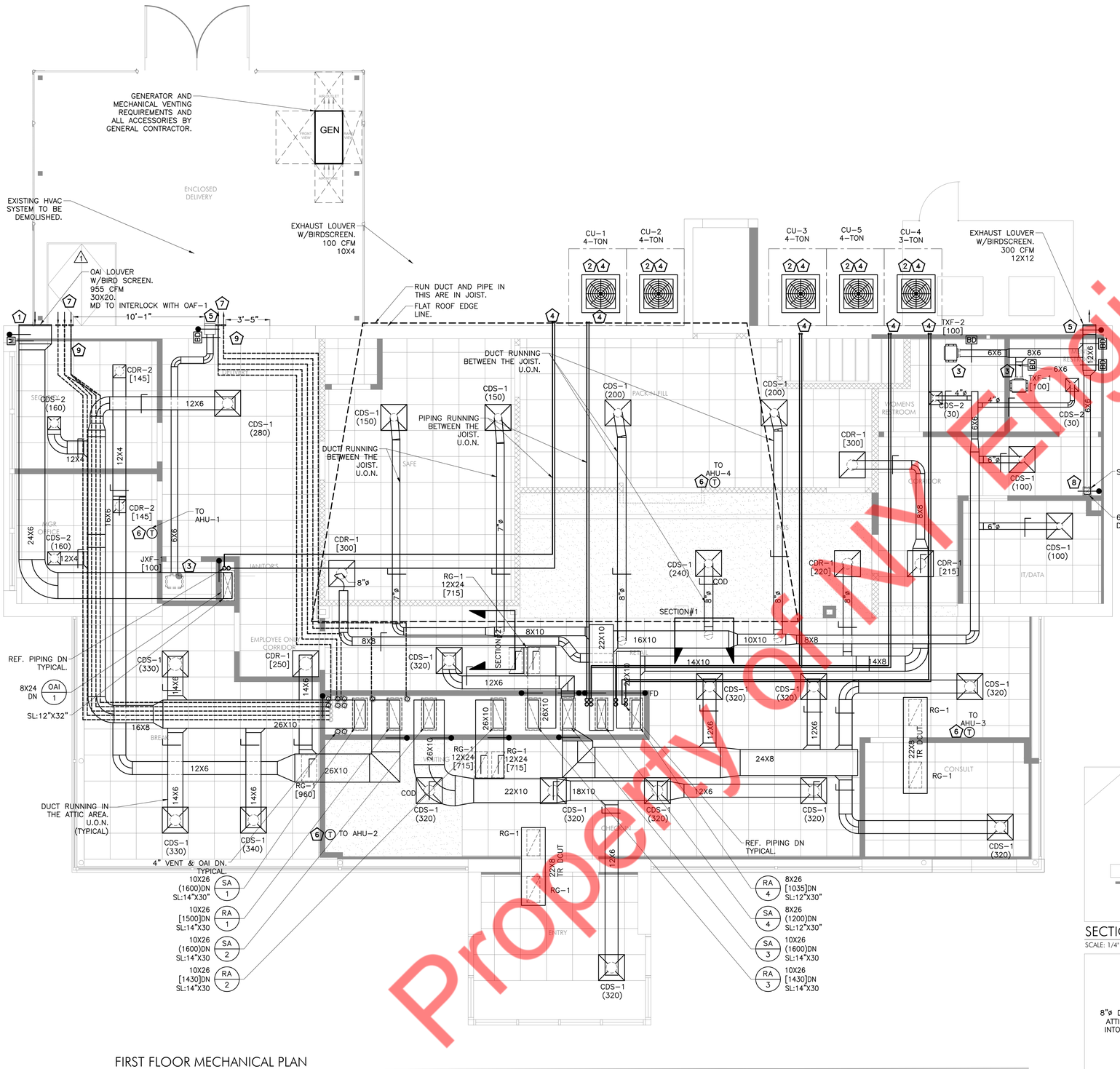


FIRST FLOOR MECHANICAL PLAN

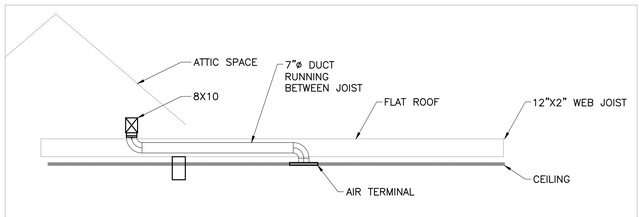
SCALE: 1/4" = 1'-0"

MECHANICAL GENERAL NOTES

A. CONTRACTOR SHALL BALANCE EACH AIR DIFFUSER WITH THE CFM SHOWN PLAN.
B. DUCTWORK SHOWN ON PLAN ARE SCHEMATIC ONLY. CONTRACTOR SHALL COORDINATE WITH OTHER TRADES FOR DUCTWORK ROUTING. OFFSET AND RUN PIPING, DUCTWORK INSIDE THE STRUCTURE IF REQUIRED. PROVIDE ANY EXTRA DUCTWORK, FITTINGS, INSULATIONS AND OTHER ACCESSORIES IN ORDER TO COMPLETE THE INSTALLATION.
C. COORDINATE LOCATIONS AND SIZES OF WALL & SLAB OPENINGS WITH OWNER AND STRUCTURE ENGINEERS.
D. EQUIPMENT SIZES, DIMENSIONS AND REQUIRED CONNECTIONS SHALL BE VERIFIED WITH THE ACTUAL EQUIPMENT SELECTED VENDOR DRAWINGS BEFORE FABRICATION OF DUCTWORK, PIPING ETC.
E. DUCT SIZES SHOWN ON PLANS ARE CLEAR INSIDE AIR STREAM DIMENSIONS.
F. CONTRACTOR SHALL COORDINATE ALL ELECTRICAL REQUIREMENTS FOR ALL HVAC BASED ON ACTUAL EQUIPMENT SELECTED PRIOR TO INSTALLATION.
G. CONTRACTOR SHALL COORDINATE EQUIPMENT WEIGHTS AND SUPPORTS BASED ON ACTUAL EQUIPMENT SELECTED.
H. ALL CONCEALED DUCTWORK SHALL BE INSULATED METAL RECTANGULAR AND CIRCULAR DUCT SHALL BE INSULATED INTERNALLY UNLESS OTHERWISE ALLOWED IN WRITING BY THE ENGINEER OF RECORD. COORDINATE FINAL FINISH WITH ARCHITECT.
I. COORDINATE WITH ALL TRADES FOR MATERIALS IN RATED AND PLENUM SPACES.
J. ALL EXHAUST FANS SCHEDULED TO BE AUTOMATICALLY CONTROLLED BY MECHANICAL AIR HANDLERS SHALL BE CONNECTED BY MEANS OF AN AUXILIARY RELAY. PROVIDE AUXILIARY RELAY AS NEEDED.
K. ALL SOURCE OF MECHANICAL INTAKE SHALL MAINTAIN 10 LINEAR FEET SEPARATION BETWEEN ANY SOURCE OF EXHAUST. CONTRACTOR IS RESPONSIBLE TO ADJUST DUCT LENGTH AS NEEDED.
L. PROVIDE R-12 INSULATION WITH 2" THICKNESS FOR ALL OUTDOOR AIR INTAKE DUCTS & VENTS.
M. PROVIDE R-6 INSULATION WITH 1.5" THICKNESS FOR ALL SUPPLY AND RETURN.
N. MD TO INTERLOCK WITH RESPECTIVE INDOOR UNITS.
O. COORDINATE FINAL LOCATION OF EQUIPMENT WITH STRUCTURAL DRAWINGS.
P. CONTRACTOR SHALL DEMOLISH ALL EXISTING HVAC SYSTEMS INCLUDING FURNACE, DUCTWORK AND ALL ASSOCIATED ACCESSORIES.
Q. BEFORE STARTING DEMOLITION, PROVIDE NECESSARY PROTECTIVE DEVICES WHERE REQUIRED AND IN STRICT ACCORDANCE WITH OSHA AND ICRA REGULATIONS.
R. TAKE NECESSARY PRECAUTIONS TO PREVENT DUST AND DIRT MIGRATING TO OCCUPIED AREAS OF THE BUILDING. THIS INCLUDES BLANKING OFF ANY RETURN AIR GRILLES/ DUCTS IN THE WORK AREA. PROVIDE TEMPORARY EXHAUST FANS, DUCTED DIRECTLY TO OUTDOORS, TO MAINTAIN NEGATIVE PRESSURE WITHIN THE WORK AREA.
S. KEEP ALL ADJOINING AREAS ADJACENT TO THE WORK AREAS CLEAN AND FREE OF DEBRIS.
T. CONTRACTOR TO DEMOLISH ALL EXISTING HVAC SYSTEM WITH ALL ACCESSORIES. ALL DEMOLISHED MATERIALS SHALL BE REMOVED AND DISPOSED OF OFF SITE.
U. REPAIR/ REPLACE EXISTING EQUIPMENT/ MATERIALS NOT SCHEDULED OR NOTED TO BE DEMOLISHED BUT BECOME DAMAGED DURING THE PROGRESS OF THE WORK. MAKE ANY AND ALL SUCH REPAIRS, REPLACEMENTS, MODIFICATIONS TO RESTORE THE DAMAGED ITEMS TO THEIR ORIGINAL CONDITIONS AT THE TIME OF DAMAGE, TO THE SATISFACTION OF AND AT NO ADDITIONAL COST TO THE OWNER.
V. PROVIDE WEATHER PROOF COATING FOR ALL EXTERIOR PIPING INSULATION.
W. MECHANICAL CONTRACTOR TO COORDINATE ALL DUCT WORK, CROSSINGS, OVERLAPPING AND PENETRATIONS WITH SITE CONDITIONS AND AS PER EXISTING JOIST LAYOUT AND SKYLIGHT IN FIELD. MODIFY DUCT WORK WHEREVER REQUIRED.
W. DEMOLISH ALL EXISTING HVAC SYSTEM WITH ALL ACCESSORIES.
X. COORDINATE WITH ARCHITECT FOR CEILING REQUIREMENTS.
Y. PROVIDE FIRE OR FIRE+SMOKE DAMPER WHEREVER DUCTS ARE CROSSING FIRE/SMOKE RATED WALLS/ BARRIERS. COORDINATE WITH ARCHITECTURAL DRAWING FOR FIRE RATING OF THE WALLS.
Z. MECHANICAL CONTRACTOR TO COORDINATE ALL DUCT WORK PENETRATIONS WITH SITE CONDITIONS IN FIELD. MODIFY DUCT PENETRATIONS WHEREVER REQUIRED. ARCHITECT TO PROVIDE ENCLOSURE.
AA. PROVIDE VOLUME DAMPER AT EACH TAPPING. PROVIDE CORD OPERATED DAMPER IN AN INACCESSIBLE CEILING.
AB. ALL DUCTS SHOWN ON THIS PLAN ARE RUNNING IN THE ATTIC. U.O.N. CONTRACTOR TO FIELD VERIFY SPACE IN THE ATTIC AND INFORM ENGINEER IF ANY DISCREPANCY.

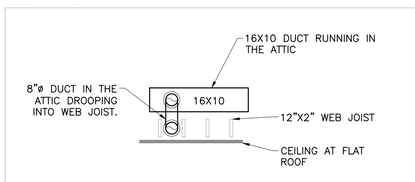
KEY NOTES:

1. OUTSIDE AIR INTAKE DUCT THROUGH SIDE WALL WITH LOUVER. MAINTAIN A MINIMUM OF 10'-0" FROM ALL EXHAUST.
2. INSTALL OUTDOOR CONDENSING UNITS OUTSIDE WITH ALL REQUIRED ACCESSORIES. COORDINATE EXACT LOCATION IN FIELD. PROVIDE 4" CONCRETE PAD.
3. PROVIDE TIME CLOCK FOR ALL CEILING MOUNTED EXHAUST FANS. FAN SHALL BE SUSPENDED FROM STRUCTURE ABOVE. VERIFY EXACT LOCATION OF STRUCTURAL MEMBERS PRIOR TO INSTALLATION.
4. INSTALL REFRIGERANT PIPING BETWEEN INDOOR AND OUTDOOR UNIT AS PER MANUFACTURES RECOMMENDATIONS COORDINATE WITH MANUFACTURERS FOR SIZES. PROVIDE PIPING INSULATION AS PER 2015 IECC.
5. EXHAUST DUCT THROUGH SIDE WALL WITH LOUVER. MAINTAIN A MINIMUM OF 10'-0" FROM ALL OUTSIDE AR INTAKES.
6. LOCATION OF DIGITAL THERMOSTAT CONTROL. INSTALL AND WIRE NEW 7-DAY PROGRAMMABLE THERMOSTAT FOR AHUs. COORDINATE EXACT LOCATION WITH ARCHITECT AND OWNER PRIOR TO ROUGH-IN. PROVIDE LOCKABLE COVER.
7. PROVIDE WALL CAP OR VENTILATION TERMINATION KIT. INSTALL 4"ø VENTS AND COMBUSTION AIR INTAKE TO AHU'S AS PER MANUFACTURES RECOMMENDATIONS.
8. ARCHITECT TO PROVIDE THE ENCLOSURE AROUND DUCT.
9. VENT AND COMBUSTION INTAKE WALL CAPS ONE ABOVE ONE.



SECTION#1

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



SECTION#2

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

PROJECT: GOODBLEND READING

PROJECT NUMBER: 21242

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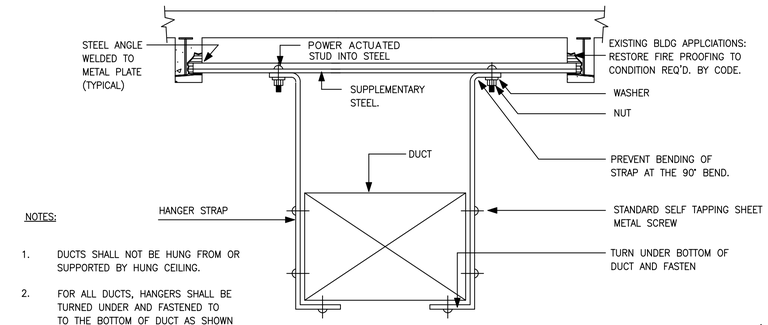
DRAWING SCALE: 1/4"-1'-0"

DRAWN BY-NYE | CHECKED BY-NYE

DRAWING TITLE: FIRST FLOOR MECHANICAL PLAN

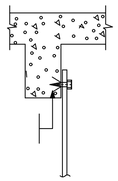
DRAWING NUMBER: M1.1

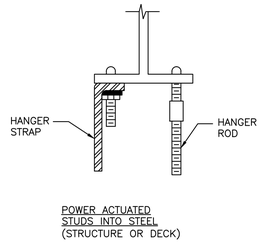


NOTES:

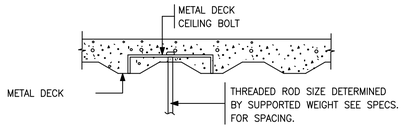
1. DUCTS SHALL NOT BE HUNG FROM OR SUPPORTED BY HUNG CEILING.
2. FOR ALL DUCTS, HANGERS SHALL BE TURNED UNDER AND FASTENED TO TO THE BOTTOM OF DUCT AS SHOWN ABOVE.
3. FRICTION OR CADDY CLIP ATTACHMENT TO STRUCTURE IS NOT PERMITTED.

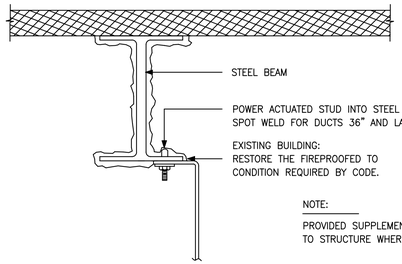
DUCT HANGER SCHEDULE		
DUCT CROSS SECTIONAL AREA	STRAP HANGER SIZE	MAX, SPACING
UNDER 2 SQ FT.	1" X 1/16"	6"-0" O.C.
2 TO 4 SQ FT.	1" X 1/8"	8"-0" O.C.
4 TO 8 SQ FT.	1" X 1/8"	6"-0" O.C.
OVER 8 SQ FT.	1" X 1/8"	4'-0" O.C.



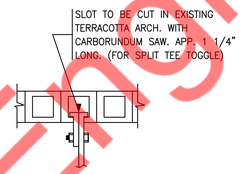


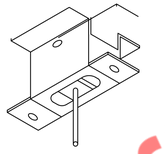
POWER ACTUATED STUDS INTO STEEL (STRUCTURE OR DECK)



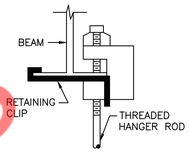


NOTE:
PROVIDED SUPPLEMENTARY ATTACHMENT TO STRUCTURE WHERE REQUIRED.

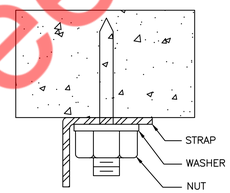




MANUFACTURED CONCRETE INSERT

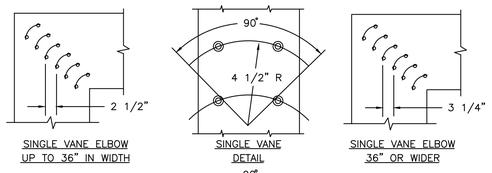


"C" CLAMP W/LOCK NUT



FLAT BAR CONCRETE INSERT

1 M5.0 DUCT HANGING DETAILS
N.T.S



SINGLE VANE ELBOW UP TO 36" IN WIDTH
SINGLE VANE DETAIL
SINGLE VANE ELBOW 36" OR WIDER
SMALL DOUBLE VANE DETAIL
SMALL DOUBLE VANE SQUARE ELBOW UP TO 36" IN WIDTH
SMALL DOUBLE VANE RUNNER DETAIL
LARGE DOUBLE VANE DETAIL
LARGE DOUBLE VANE RUNNER DETAIL
LARGE DOUBLE VANE SQUARE ELBOW 36" OR WIDER

2 M5.0 LOW VELOCITY DUCTWORK ELBOWS
N.T.S

NOTES:
DUCTS TO BE ACOUSTICALLY LINED SHALL BE DESIGNATED BY THE SYMBOL IN FIG. "C" TO THE EXTENT OF LINING. THICKNESS SHALL BE AS SPECIFIED.
DUCTS LINED WITH ACOUSTICAL MATERIAL SHOULD BE FASTENED WITH CLIPS, ADHESIVE, OR PINS

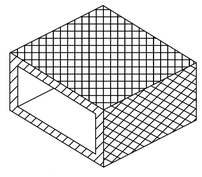


FIG. A

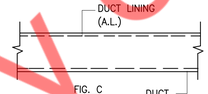


FIG. C

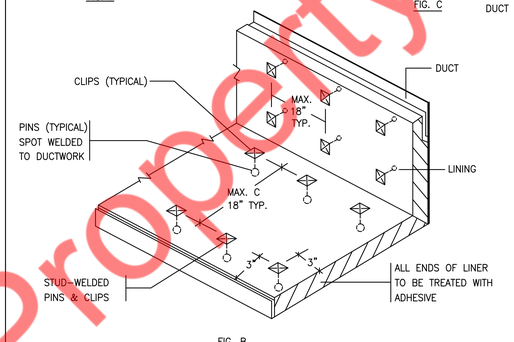
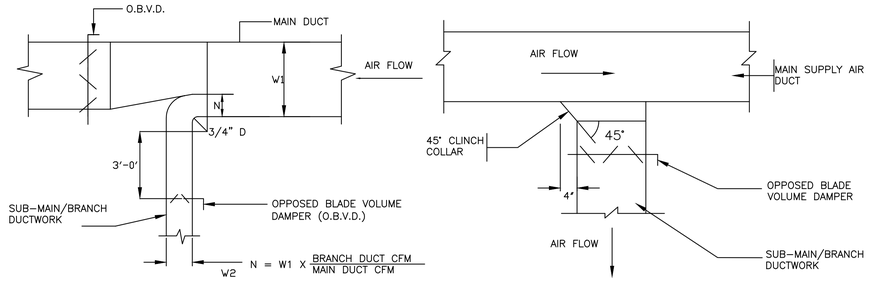
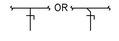


FIG. B

3 M5.0 ACOUSTICAL TREATMENT DUCT LINING
N.T.S



NOTE:
FURNISH THIS TYPE CONNECTION WHEN SINGLE LINE DUCTWORK IS INDICATED AS THIS



4 M5.0 SUPPLY AIR DUCTWORK SUB-MAIN/BRANCH DUCT CONNECTION
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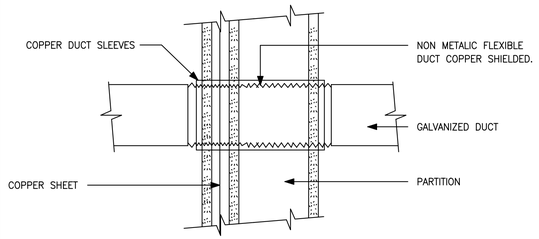
DRAWING SCALE: N.T.S.

DRAWN BY: NYE | CHECKED BY: NYE

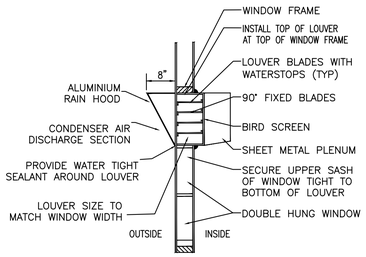
DRAWING TITLE: MECHANICAL DETAILS (1 OF 3)

DRAWING NUMBER: M5.0

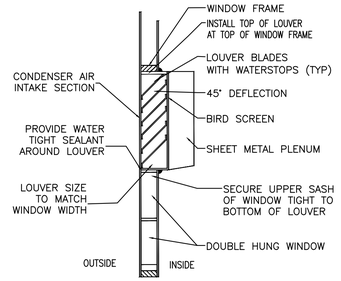


NOTES :
1. FOR WALL STRUCTURE – SEE ARCH. DWG.S.
2. COPPER DUCT SLEEVE AND COPPER SHIELDED PARTITION SHALL BE SOLIDLY CONNECTED EACH OTHER.

1 / M5.1 WALL PENETRATION DETAIL
N.T.S

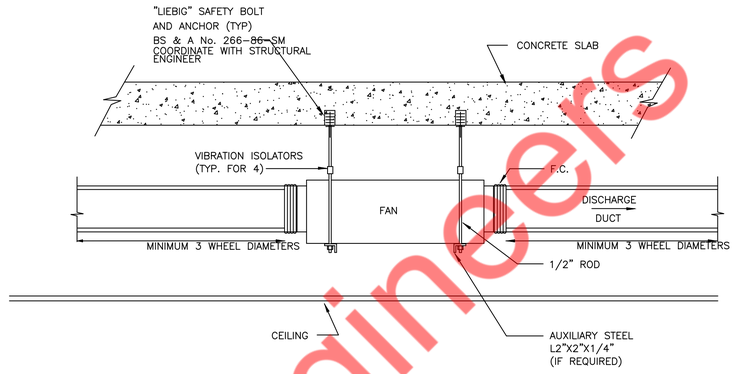


DISCHARGE LOUVER



INTAKE LOUVER

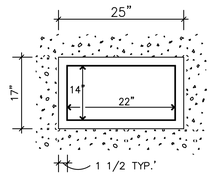
2 / M5.1 LOUVER DETAIL
N.T.S



NOTE:
1. DUCT LENGTH TO BE MINIMUM THREE WHEEL DIAMETER ON DISCHARGE AND INLET.

3 / M5.1 INLINE FAN SUPPORT DETAIL
N.T.S

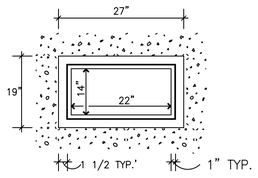
UNLINED DUCT



22X14 DUCT (SHEETMETAL)
25X17 SLAB OPENING

* SLAB OPENING = DUCT DIMENSION + 3"
* IF SPACE IS LIMITED, CAN BE DUCT DIMENSION + 1"
IF INSULATION IS NOT REQUIRED (CHECK WITH ENGINEER)

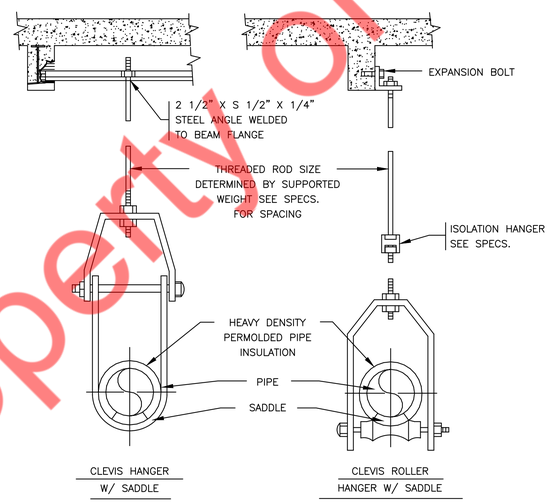
LINED DUCT



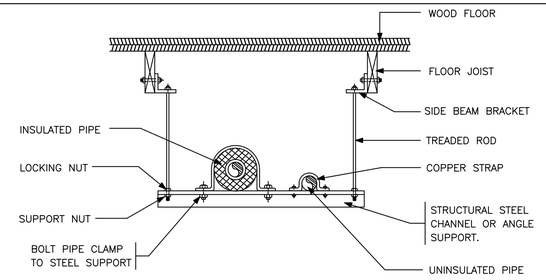
22X14 REQUIRED FREE AIRFLOW
24X16 DUCT (SHEETMETAL)
27X19 SLAB OPENING

* SLAB OPENING = FREE AIRFLOW DIMENSION + 5"
* IF SPACE IS LIMITED, CAN BE FREE AIRFLOW DIMENSION + 3"

4 / M5.1 DUCT SIZE/SLAB OPENING CONVENTION
N.T.S



5 / M5.1 PIPE HANGING DETAIL
N.T.S



TYPICAL TRAPEZE HANGER SUPPORT

PIPE HANGER ROD AND SPACING SCHEDULE												
NOMINAL PIPE OR TUBE SIZE – INCHES	5/8	3/4	7/8	1	1 1/2	2	2 1/2	–	–	–	–	–
HANGER ROD SIZES INCHES	3/8	3/8	3/8	3/8	3/8	3/8	3/8	–	–	–	–	–
MAX. SPACING BETWEEN PIPE SUPPORTS – FEET	–	6	–	7	9	10	11	–	–	–	–	–
MAX. SPACING BETWEEN CU. TUBE SUPPORTS–FT.	6	6	6	6	8	9	10	–	–	–	–	–

NOTES : TRAPEZE HANGER SPACING SHALL BE BASED ON SPACING OF SMALLEST PIPE ON TRAPEZE. TRAPEZE SHALL BE DESIGNED WITH A FACTOR OF SAFETY OF 5 FOR CENTER OF SPAN CONCENTRATED LOAD.

6 / M5.1 METHOD OF HANGING REFRIGERANT PIPING
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MECHANICAL DETAILS (2 OF 3)

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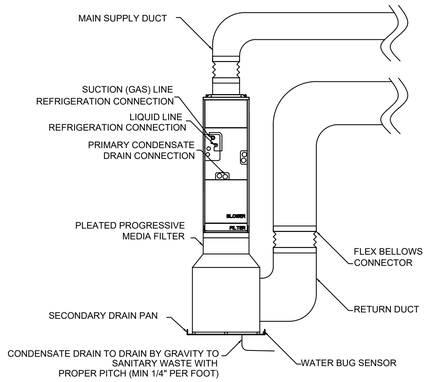
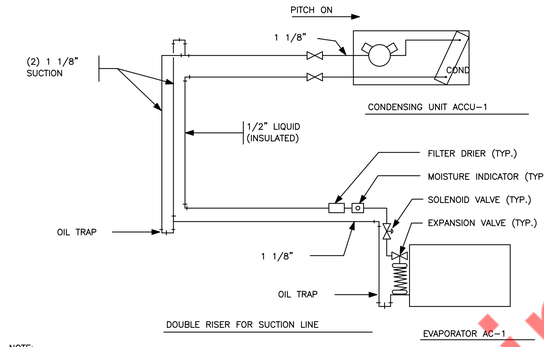


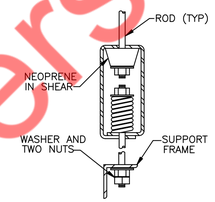
1 / M5.2 AIR HANDELLER DETAIL
N.T.S



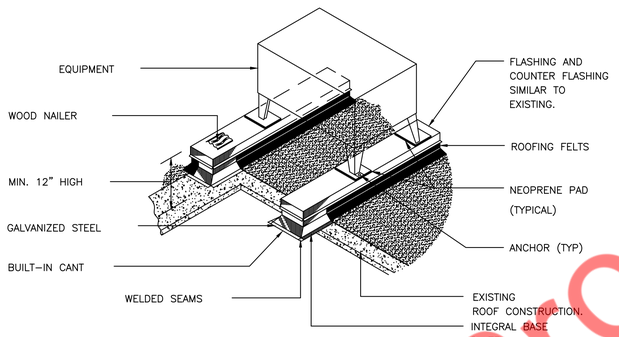
NOTE:

THE HORIZONTAL DIMENSION OF OIL TRAPS TO BE AS SHORT AS POSSIBLE.

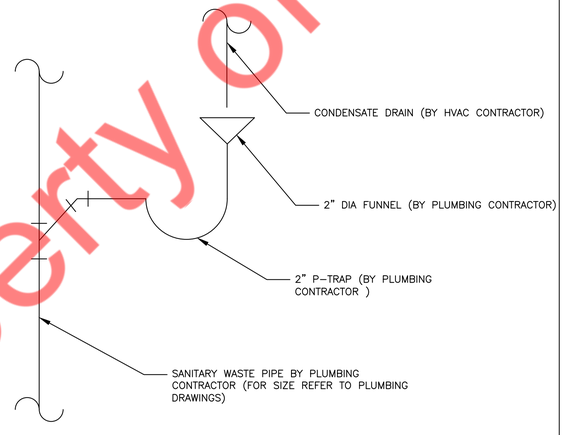
2 / M5.2 REFRIGERANT PIPING SCHEMATIC
N.T.S



3 / M5.2 VIBRATION ISOLATOR DETAIL
N.T.S



4 / M5.2 CONDENSING UNIT MOUNTING DETAIL
N.T.S



5 / M5.2 FUNNEL DRAIN INSTALLATION DETAIL
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DRAWING TITLE:
MECHANICAL DETAILS (3 OF 3)

DRAWING NUMBER:
M5.2

AIR HANDLING UNIT (INDOOR) SCHEDULE

MAKE : HEIL

TAG	AREA SERVED	TYPE	CAP TON	TOTAL COOLING CAP. (MBH)	NOMINAL HEATING CAP. (MBH)		SUPPLY AIRFLOW (CFM)	OUTSIDE AIRFLOW (CFM)	ELECTRICAL DATA			DIMENSIONS (H X W X D) (IN.)	REFRIGERANT PIPE SIZE (IN.)		WEIGHT (LBS.)	AFUE (%)	MODEL NO. (FURNACE/INDOOR COIL)
					INPUT	OUTPUT			PH/VOLT/HZ	MCA (A)	MOCP (A)		LIQ.	SUCTION			
AHU-1	SEE PLAN	MULTI-POSITION	4	48	100	98	1600	100	1/115/60	18.4	20.00	35 X 21 X 29-1/2	3/8"	7/8"	179	97	G97CMN1002122A/ENM4X48L21A1
AHU-2	SEE PLAN	MULTI-POSITION	4	48	100	98	1600	170	1/115/60	18.4	20.00	35 X 21 X 29-1/2	3/8"	7/8"	179	97	G97CMN1002122A/ENM4X48L21A1
AHU-3	SEE PLAN	MULTI-POSITION	4	48	100	98	1600	170	1/115/60	18.4	20.00	35 X 21 X 29-1/2	3/8"	7/8"	179	97	G97CMN1002122A/ENM4X48L21A1
AHU-4	SEE PLAN	MULTI-POSITION	3	36	80	78	1200	165	1/115/60	18.4	20.00	35 X 21 X 29-1/2	3/8"	3/4"	169	97	G97CMN0802120A/ENM4X37L21A1
AHU-5	SEE PLAN	MULTI-POSITION	4	48	100	98	1600	350	1/115/60	18.4	20.00	35 X 21 X 29-1/2	3/8"	7/8"	179	97	G97CMN1002122A/ENM4X48L21A1

NOTES :-

1) SUPPLY AIR CFM BASED ON HIGH SPEED. PROVIDE VARIABLE AIRFLOW ADJUSTMENT CONTROL FOR ALL UNITS.
2) REFRIGERANT R410A SHALL BE PROVIDED.
3) PROVIDE ALL ASSOCIATED ACCESSORIES.
4) ALL REFRIGERANT PIPING TO BE SIZED PER MANUFACTURERS RECOMMENDATIONS.
5) SEE FLOOR PLAN FOR QUANTITIES.
6) CONTRACTOR SHALL PROVIDE A LONG LINE SET FOR REFRIGERANT PIPING IN THE EVENT THAT TOTAL REFRIGERANT LENGTH EXCEEDS THE MANUFACTURER'S STANDARD RECOMMENDED LENGTH.
7) PROVIDE DISCONNECT SWITCH & NON-POWERED GFI OUTLET.
8) HINGED ACCESS PANELS AND EXTERNAL GAUGE PORTS/PRESSURE RESETS.
9) PROVIDE DRAIN PAN WITH WATER LEAK DETECTOR.

AIR COOLED CONDENSING OUTDOOR UNIT SCHEDULE

MAKE :- HEIL

TAG	CAP. (TON)	MAX. COOLING CAP. (MBH)	COMPRESSOR TYPE	UNIT DIMENSIONS IN.(HXWXL)	WEIGHT (LBS)	PIPING DIAMETER (IN.)		ELECTRICAL			SOUND RATING (dBA)	SEER	MODEL
						LIQ.	GAS	PH./V/Hz	MCA (A)	MCB (A)			
CU-1	4	48	VARIABLE SPEED ROTARY	43-11/16 X35 X35	249	3/8"	1-1/8"	1/208-230/60	26	40	74	19.0	HVA949GKA
CU-2	4	48	VARIABLE SPEED ROTARY	43-11/16 X35 X35	249	3/8"	1-1/8"	1/208-230/60	26	40	74	19.0	HVA949GKA
CU-3	4	48	VARIABLE SPEED ROTARY	43-11/16 X35 X35	249	3/8"	1-1/8"	1/208-230/60	26	40	74	19.0	HVA949GKA
CU-4	3	36	VARIABLE SPEED ROTARY	38-15/16 X31-3/16X31-3/16	205	3/8"	1-1/8"	1/208-230/60	26	40	68	19.0	HVA937GKA
CU-5	4	48	VARIABLE SPEED ROTARY	43-11/16 X35 X35	249	3/8"	1-1/8"	1/208-230/60	26	40	74	19.0	HVA949GKA

NOTES :-

1. UNIT SHALL HAVE TEN YEAR EXTENDED WARRANTY FOR COMPRESSORS/PARTS.
2. PROVIDE LOW AMBIENT CONTROL FOR CONDENSING UNIT OPERATION DOWN TO -4°F.
3. PROVIDE COMPRESSOR CYCLE PROTECTOR.
4. STEEL RAILS FOR CONDENSER MOUNTING TO BE PROVIDED BY MECH. CONTRACTOR .
5. OUTDOOR REFRIGERANT LINESET TO BE WRAPPED IN UV RESISTANT, FIRE RATED, AND ANTI-MICROBIAL INSULATION PROTECTION BASED ON AIREX-FLEX GUARD OR EQUAL.
6. REFFRIGERANT LINESET PENETRATION THROUGH BUILDING EXTERIOR SEALED BY AIREX TITAN FS OR SS MODEL SERIES DEPENDING UPON WALL CONSTRUCTION.
7. OUDOOR CONDENSING UNITS TO BE LOCATED WITH PROPER CLEARANCES AND MUST PREVENT RE-CIRCULATION OF AIR. COORDINATE WITH MANUFACTURER AND ARCHITECT.
8. PROVIDE COMPRESSOR SOUND BLANKET OPTION TO ALL CONDENSING UNITS.

AIR BALANCE

UNIT	AREA SERVED	SUPPLY AIR	OUTSIDE AIR	RETURN AIR	EXHAUST AIR
AHU-1	SEE PLAN	1600	170	1430	0 CFM
AHU-2	SEE PLAN	1600	170	1430	0 CFM
AHU-3	SEE PLAN	1600	100	1500	0 CFM
AHU-4	SEE PLAN	1200	165	1035	0 CFM
AHU-5	SEE PLAN	1600	350	1250	0 CFM
TXF-1	RESTROOMS	-	-	-	100 CFM
TXF-2	RESTROOMS	-	-	-	100 CFM
TXF-3	RESTROOMS	-	-	-	100 CFM
JXF-1	JANITOR	-	-	-	100 CFM
	TOTAL:	7600 CFM	955 CFM	6645 CFM	400 CFM
	BUILDING PRESSURE:			555 CFM	**POSITIVE**

MECHANICAL AIR TERMINAL DEVICES SCHEDULE

TAG	SIZE (IN.)	DESCRIPTION	CONSTRUCTION	BASIS OF DESIGN		NOTES
				MANUFACTURER	MODEL	
CDS-1	24X24	LOUVERED FACE SUPPLY AIR DIFFUSER	ALUMINUM	TITUS	OMNI	ALL
CDS-2	12X12	LOUVERED FACE SUPPLY AIR DIFFUSER	ALUMINUM	TITUS	OMNI	ALL
CDR-1	24X24	LOUVERED FACE RETURN AIR DIFFUSER	ALUMINUM	TITUS	OMNI	ALL
SG	SEE PLAN	SUPPLY GRILLE	ALUMINUM	TITUS	300FL	1,3,4
RG	SEE PLAN	RETURN GRILLE	ALUMINUM	TITUS	350FL	1,3,4

1. PAINT ALL SURFACES VISIBLE THROUGH FACE OF RETURN AIR GRILLE FLAT BLACK. THIS SHALL INCLUDE PIPING, CONDUIT, DUCTWORK AND STRUCTURAL MEMBERS.
2. PROVIDE FRAME FOR MOUNTING AIR DEVICE IN LAY-IN GRID CEILING UNLESS REFLECTED CEILING PLAN INDICATES HARD CEILING. IN AREAS WITH HARD CEILINGS, PROVIDE FRAMES FOR SURFACE
3. UNLESS OTHERWISE NOTED, BRANCH DUCTS SERVING AIR DEVICES SHALL BE SAME SIZE AS NECK OF AIR DEVICE.
4. AIR DEIVCE SHALL BE OF GALVANIZED FINISH WHEN INSTALLED ON EXPOSED DUCTWORK.

NECK SIZES

Up To 100 Cfm - 6" DIA
101 To 225 Cfm - 8" DIA
226 To 375 Cfm - 10" DIA
376 To 600 Cfm - 12" DIA
601 To 900 Cfm - 14" DIA
901 To 1100 Cfm - 15" DIA

VENTILATION CALCULATION TABLE

ROOM NAME	AREA (SQ.FT.)	NUMBER OF PEOPLE/1000 SQ.FT. AS PER IMC 2015	NUMBER OF PEOPLE AS PER IMC 2015	NUMBER OF CHAIRS	FINAL PEOPLE NO.	MIN OUTSIDE AIR AS PER IMC 2015		REQ. OSA (CFM)	PROVIDED OSA (CFM)	EXHAUST AIRFLOW RATE (CFM/FITXTURE OR CFM/SQ.FT.)	TOTAL EXHUAST
						CFM/PEOPLE	CFM/SQ.FT				
WAITING	124	10	2	0	2	5	0.06	17		0	
CHEK IN	127	10	2	0	2	5	0.06	18		0	
ENTRY	143	10	2	0	2	5	0.06	19		0	
CONSULT	114	5	1	4	4	5	0.06	27		0	
RETAIL	669	40	27	0	27	7.5	0.06	243		0	
IT/DATA	86	0	0	0	0	0	0.12	10		0	
BREAK	309	40	13	4	4	5	0.06	39		0	
POS	193	15	3	0	3	7.5	0.12	46		0	
WOMEN'S RR	51	0	0	0	0	0	0	0		100	
MEN'S RR	53	0	0	0	0	0	0	0		100	
PACK IN FILL	257	15	4	0	2	7.5	0.12	46		0	
SAFE	218	0	0	0	0	0	0.12	26		0	
DELIVERY	147	0	0	0	2	0	0.12	18		0	
SECURITY	108	5	1	1	1	5	0.06	11		0	
MGR OFFICE	109	5	1	1	1	5	0.06	12		0	
EMPLOYEE CORRIDOR	112	0	0	0	0	0	0.06	7		0	
CORRIDOR	147	0	0	0	0	0	0.06	9		0	
FUTURE BUILD	158	40	7	0	0	7.5	0.06	9		0	
STORAGE /UTILITY-00	231	0	0	0	0	0	0.12	28		0	
STORAGE /UTILITY-01	1243	0	0	0	0	0	0.12	149		0	
STORAGE /UTILITY-02	422	0	0	0	0	0	0.12	51		0	
STORAGE /UTILITY-03	131	0	0	0	0	0	0.12	16		0	
STORAGE /UTILITY-04	216	0	0	0	0	0	0.12	26		0	
STORAGE /UTILITY-05	538	0	0	0	0	0	0.12	65		0	
JANITOR	17	0	0	0	0	0	0	0		100	
RESTROOM	30	0	0	0	0	0	0	0		100	
TOTAL	**5953**								**955**		**400**

955

400

FANS SCHEDULE

MAKE:GREENHECK

UNIT TAG	TYPE	SERVICE	LOCATION	MODEL	DESIGN CFM	ESP (IN. W.G)	ELEC (V/HZ/PH.)	FAN SPEED (RPM)	FLA (AMPS)	DBA	WEIGHT (LBS)	REMARKS
OAF-1	INLINE	FRESH AIR	SEE PLAN	BDF-80	955	0.60	115/60/1	1231	7.2	59	72	CONTINOUS OPERATION
TXF-1	CEILING	EXHAUST AIR	SEE PLAN	SP-A390	100	0.5	115/60/1	1209	1.5	45	24	CONTINOUS OPERATION
TXF-2	CEILING	EXHAUST AIR	SEE PLAN	SP-A390	100	0.5	115/60/1	1209	1.5	45	24	CONTINOUS OPERATION
TXF-3	CEILING	EXHAUST AIR	SEE PLAN	SP-A390	100	0.5	115/60/1	1209	1.5	45	24	CONTINOUS OPERATION
JXF-1	CEILING	EXHAUST AIR	SEE PLAN	SP-A390	100	0.5	115/60/1	1209	1.5	45	24	CONTINOUS OPERATION

NOTES FOR FANS:

1) PROVIDE WALL SWITCH WHEREVER SHOWN ON PLANS AND COORDINATE HEIGHT WITH THE OWNER AND ARCHITECT.
2) ALL DIRECT DRIVE FANS SHALL BE FURNISHED MUST BE SPEED CONTROLLABLE.
3) FAN SPEED SHALL BE EASILY FIELD ADJUSTABLE.
4) FAN SHALL BE MOUNTED W/SUPPORT FRAMING BY OTHERS AS PER MANUFACTURER RECOMMENDATIONS.
5) PROVIDE MOTOR STARTERS, DISCONNECTS WITH NEMA-3R. ALL EQUIPMENT NORMAL POWER WIRING BY ELECTRICAL CONTRACTOR. COORDINATE POWER REQUIREMENTS.
6) PROVIDE RUBBER IN SHEAR ISOLATION AND ALL-THREAD HANGING RODS FOR INLINE FANS.
7) COORDINATE WITH ARCH./G.C. ACCESS DOORS FOR SERVICING ALL FANS WITHIN CEILINGS.
8) PROVIDE MERV 8 FILTER FOR OAF FANS.
9) PROVIDE ALL ACCESSORIES TO MOUNT FANS OUTDOORS (IF REQUIRED).

ELECTRIC DUCT HEATER SCHEDULE

MAKE:GREENHECK

UNIT ID	LOCATION	DUCT HEATER DIMENSIONS (IN)			QTY.	ELECTRICAL DATA					MODEL	HEATER TYPE
		W	H	D		KW	V	PH	Hz	Amps		
EDH-1	SEE PLAN	14	12	5	1	20	230	3	60	37.65	IDHB	SLIP IN

NOTES:

1) INSTALL ELECTRIC DUCT HEATER AS PER MANUFACTUR'S RECOMMENADATION. HEATER MUST BE RATED FOR OUTDOOR USE.
2) PROVIDE T-STAT AND WIRE TO DUCT HEATER.
3) PROVIDE DISCONNECT SWTICH, VAPOR BARRIER, DUST TIGHT BOX AND FAN INTERLOCK SWITCH.
4) PROVIDE DUCT HEATER WITH SCR CONTROL.

ELECTRIC UNIT HEATERS SCHEDULE

UNIT TAG	SERVING	TYPE	AIRFLOW (CFM)	KW	BTU/HR	ELECTRIC DATA	AMPS	QTY (NOS)	DIMENSIONS (WXHXD)	MODEL NO.	MAKE
EUH-1	SEE PLAN	FAN FORCED WALL HEATERS	100	1.8	6142	120/1/60	15	SEE PLAN	15-13/16"X19-1/4"X6"	SSARWH1802	BERKO
EUH-2	SEE PLAN	FAN FORCED WALL HEATERS	100	1.8	6142	120/1/60	15	SEE PLAN	15-13/16"X19-1/4"X6"	SSARWH1802	BERKO

NOTES FOR HEATER

1) PROVIDE DISCONNECTION SWITCH.
2) "HEATER ON" PILOT LIGHT.
3) THREE-POSITION SELECTOR SWITCH (HEATER-STANDBY-FAN)
4) BUILT-IN THERMOSTAT 40F TO 85 F RANGE.
5) ALL UNIT HEATERS SHALL BE INSTALLED IN ACCORDANCE WITH THE LISTING AND MANUFACTURER'S INSTALLATION INSTRUCTIONS.

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DRAWING TITLE: MECHANICAL SCHEDULES

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ELECTRICAL SYMBOLS LIST

LIGHTING

	LIGHTING FIXTURE AND OUTLET BOX. HALF SHADED FIXTURE OR "EM" INDICATES FIXTURES WITH INTEGRAL BATTERY PACK FOR EMERGENCY SERVICE, U.O.N.
A 2 a	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

SWITCHES AND CONTROLS

$3 a	20A 3–WAY TOGGLE SWITCH U.O.N. "a" DENOTES LIGHTING FIXTURE CONTROLLED
OS A	CEILING OCCUPANCY SENSOR, NUMBER INDICATES TYPE; SEE OCCUPANCY SENSOR SCHEDULE. 'A' LETTER REFERES TO WIRING DIAGRAM.
PC	WALL MOUNTED PHOTOCELL MOUNTED IN NEMA 3R ENCLOSURE.
$OS a	WALL OCCUPANCY SENSOR, NUMBER INDICATES TYPE.

ELECTRICAL DRAWING LIST

E0.1	ELECTRICAL SYMBOL LIST, ABBREVIATIONS & GENERAL NOTES
E0.2	ELECTRICAL SPECIFICATIONS SHEET 1 OF 2
E0.3	ELECTRICAL SPECIFICATIONS SHEET 2 OF 2
E1.0	BASEMENT FLOOR LIGHTING PLAN
E1.1	FIRST FLOOR LIGHTING PLAN
E2.0	BASEMENT FLOOR POWER PLAN
E2.1	FIRST FLOOR POWER PLAN
E3.0	BASEMENT FLOOR SECURITY PLAN
E3.1	FIRST FLOOR SECURITY PLAN
E4.0	PANEL SCHEDULE AND RISER DIAGRAM

POWER AND TELECOMMUNICATION

J	JUNCTION BOX WITH BLANK COVER PLATE, CEILING MOUNTED..
	DUPLEX CONVENIENCE RECEPTACLE, +12" AFF OR AS NOTED.
	DOUBLE DUPLEX RECEPTACLE – 20A–1P, 125V, NEMA 5–20R.
	TELEPHONE/DATA OUTLET, 4"SQUARE OUTLET BOX WITH SINGLE GANG COLLAR AND BLANK PLATE. RUN (2) COMPOSITE CABLES FROM EACH OUTLET TO NID BOX.
X	DATA OUTLET – (X) PORT, +18" AFF, TEL / DATA OUTLET TO BE RUN (2) COMPOSITE CABLES FROM EACH OUTLET TO NID BOX
AP	WIRELESS ACCESS POINT
A	SIMPLEX RECEPTACLE, +18" AFF OR AS NOTED. SUFFIXE DENOTES FOLLOWING: A– NEMA 5–15R B– NEMA L5–30R C– NEMA 14–30R D– NEMA 14–50R

MOTORS AND CONTROLS

M SW	AC INDOOR UNIT MOTOR AS NOTED WITH LIQUID TIGHT FLEXIBLE CONNECTION WITH JUNCTION BOX AND MOTOR SWITCH.
M WP	AC OUTDOOR UNIT MOTOR AS NOTED WITH CONTROLLER AND DISCONNECT SWITCH WITH WEATHER PROOF.
	NON FUSED DISCONNECT SWITCH AMPERAGE, AND NUMBER OF POLES AS NOTED.
A	30A/240V NON FUSED DISCONNECT SWITCH
B	60A/240V NON FUSED DISCONNECT SWITCH
C	100A/240V NON FUSED DISCONNECT SWITCH
D	200A/240V NON FUSED DISCONNECT SWITCH
E	400A/240V NON FUSED DISCONNECT SWITCH
MD	MOTORIZED DAMPER.
FSD	FIRE SMOKE DAMPER
$T	THERMAL OVERLOAD SWITCH AT MOTOR. PROVIDE THERMAL ELEMENTS AS PER MOTOR RATING.
$M	MANUAL MOTOR SWITCH
1.5 kW	ELECTRICAL HEATER, NUMBER DENOTES HEATER RATING
M M	DUPLEX PUMP. NUMBER INDICATES HP RATING OF PUMP.

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

	POWER PANELBOARD, 208Y/120V–SURFACE MOUNTED.

ELECTRICAL ABBREVIATIONS

A	AMPERES	EA	EACH
A/C, AC	AIR CONDITIONING UNIT	EM	EMERGENCY
AF	AMPERE FRAME/AMP FUSE	EMT	ELECTRICAL METALLIC TUBING
AFF	ABOVE FINISHED FLOOR	EQUIP	EQUIPMENT
AS	AMP SWITCH	ER	EXISTING TO BE RELOCATED
AIC	AMPS INTERRUPTING CAPACITY	FA	FIRE ALARM
AT	AMP TRIP	E	EXISTING
ATS	AUTOMATIC TRANSFER SWITCH	FL	FLOOR
AUTO	AUTOMATIC	G	GROUND
AWG	AMERICAN WIRE GAUGE	GFI	GROUND FAULT INTERRUPTER
C	CONDUIT	GP	GENERAL PURPOSE
C/B,CB	CIRCUIT BREAKER	HP	HORSEPOWER
CKT	CIRCUIT	HWH	HOW WATER HEATER
CLG	CEILING	HZ	HERTZ
COMM	COMMUNICATION	IC	INTERRUPTING CAPACITY
CT	CURRENT TRANSFORMER	PP	POWER PANEL
CU	COPPER	PWR	POWER
DIA	DIAMETER	R	REMOVE
DISC	DISCONNECT	RE	RELOCATED EXISTING
DN	DOWN	REC	RECEPTACLE
DP	DISTRIBUTION PANEL	RGS	RIGID GALVANIZED STEEL
DWG	DRAWING	RR	REMOVE & RELOCATE
JB	JUNCTION BOX	SECT	SECTION
KCMIL	ONE THOUSAND CIRCULAR MILS	SPDT	SINGLE POLE DOUBLE THROW
KV	KILOVOLT	SPST	SINGLE POLE SINGLE THROW
KVA	KILOVOLT–AMPERES	SPEC	SPECIFICATION
KW	KILOWATTS	SW	SWITCH
LTG	LIGHTING	SWBD	SWITCHBOARD
MAX	MAXIMUM	SYM	SYMMETRICAL
MC	MOTOR CONTROLLER	SYS	SYSTEMS
MCB	MAIN CIRCUIT BREAKER	TELE	TELEPHONE
MLO	MAIN LUGS ONLY	TEMP	TEMPERATURE
MTD	MOUNTED	TXF	TOILET EXHAUST FAN
MTS	MANUAL TRANSFER SWITCH	TYP	TYPICAL
N	NEUTRAL	UON	UNLESS OTHERWISE NOTED
NIC	NOT IN CONTRACT	V	VOLT/VOLTAGE
NTS	NOT TO SCALE	VA	VOLT AMPERE
PNL	PANEL	WP	WEATHER PROOF
W	WATT	ø	PHASE
RH	RANGE HOOD	DW	DISHWASHER
WA	WASHER	REF	REFRIGERATOR
DR	DRYER	MW	MICROWAVE

GENERAL NOTES

1. ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH THE CURRENT VERSION OF THE LOCAL ELECTRICAL CODE, 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, RAWL 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. 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.
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 PROVDED 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 CANCEALED IN FINISHED AREAS, AND ALL COVERS TO PULL & JUNCTION BOXES SHALL BE READILY ACCESSIBLE.
14. SUPPORT PANEL, JUNCTION AND PULLBOXES 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 CONCEALED 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 PANELBOARD. PROVIDE WIRE AND CONDUIT TO INTERCONNECT EQUIPMENT AND DEVICES WITH SAME CIRCUIT NUMBERS AND RUN TO PANELBOARD.

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DRAWING TITLE:
ELECTRICAL SYMBOL LIST,ABBREVIATIONS & GENERAL NOTES

DRAWING NUMBER:
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ELECTRICAL SPECIFICATIONS

1. GENERAL:

A. THE "GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION," AIA DOCUMENT A201, LATEST EDITION, AND THESE SPECIFICATIONS AS APPLICABLE ARE PART OF THIS CONTRACT.

B. DRAWING ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS AND WORK. CONDUIT ROUTING IS SHOWN DIAGRAMMATICALLY AND DOES NOT SHOW ALL OFFSETS, DROPS AND RISES OF RUNS. THE CONTRACTOR SHALL ALLOW IN HIS PRICE FOR ROUTING OF CONDUIT TO AVOID OBSTRUCTIONS. COORDINATION WITH EXISTING SERVICES, INCLUDING THOSE OF OTHER TRADES, IS REQUIRED, MAINTAIN HEADROOM AND SPACE CONDITIONS.

C. BIDDERS, BEFORE SUBMITTING PROPOSALS, SHALL VISIT AND CAREFULLY EXAMINE THE AREA AFFECTED BY THIS WORK TO FAMILIARIZE THEMSELVES WITH THE EXISTING CONDITIONS AND THE DIFFICULTIES THAT WILL ATTEND THE EXECUTION OF THIS WORK. SUBMISSION OF A PROPOSAL WILL BE CONSTRUED AS EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE, AND LATER CLAIMS WILL NOT BE RECOGNIZED FOR EXTRA LABOR, EQUIPMENT, OR MATERIALS, REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN HAD SUCH AN EXAMINATION BEEN MADE.

D. INSTALL WORK SO AS TO BE READILY ACCESSIBLE FOROPERATION,MAINTANANCE AND REPAIR, MINOR DEVIATIONS FROM DRAWING MAY BE MADE TO ACCOMPLISH THIS, BUT CHANGES WHICH INVOLVE EXTRA COST SHALL NOT BE MADE WITHOUT APPROVAL.

E. REMOVAL AND RELOCATION OF CERTAIN EXISTING WORK MAY 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 AND CHARGES IN MAKING UP THE WORK PROPOSAL.

F. CONNECTIONS TO EXISTING WORK: INSTALL NEW WORK AND CONNECT TO EXISTING WORK WITH MINIMUM INTERFERENCE TO EXISTING FACILITIES. TEMPORARY SHUTDOWNS OF EXISTING SERVICES SHALL BE PERFORMED AT NO ADDITIONAL CHARGES. AT TIMES NOT TO INTERFERE WITH NORMAL OPERATION OF EXISTING FACILITIES AND ONLY WITH WRITTEN CONSENT OF OWNER. ALARM AND EMERGENCY SYSTEMS SHALL NOT BE INTERRUPTED. MAINTAIN CONTINUOUS OPERATION OF EXISTING FACILITIES AS REQUIRED WITH NECESSARY TEMPORARY CONNECTIONS BETWEEN NEW AND EXISTING WORK. CONNECT NEW WORK TO EXISTING WORK IN NEAT AND ACCEPTABLE MANNER. RESTORE EXISTING DISTURBED WORK TO ORIGINAL CONDITION, INCLUDING MAINTENANCE OF WIRING CONTINUITY AS REQUIRED.

G. DISCONNECT, REMOVE AND/OR RELOCATE EXISTING MATERIAL, EQUIPMENT AND OTHER WORK AS NOTED OR REQUIRED FOR PROPER INSTALLATION OF NEW WORK.

H. 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.

I. SEAL OPENINGS THROUGH PARTITIONS, WALLS AND FLOORS WITH MINERAL WOOL OR OTHER NONCOMBUSTIBLE MATERIAL, UNLESS OTHERWISE NOTED.

J. PROVIDE ALL NECESSARY FLASHING AND COUNTER FLASHING TO MAINTAIN THE WATERPROOFING INTEGRITY OF THE BUILDING AS REQUIRED BY THE INSTALLATION OR REMOVAL OF CONDUIT AND EQUIPMENT, PROVIDE EQUIPMENT CURBS AS REQUIRED.

K. ALL EXISTING MATERIAL, EQUIPMENT AND CONSTRUCTION DEBRIS TO BE REMOVED UNDER THIS CONTRACT SHALL BECOME THE PROPERTY OF THE CONTRACTOR WITH THE EXCEPTION OF SPECIFIC EQUIPMENT ND APPARATUS REQUESTED BY THE BUILDING REPRESENTATIVE, ARCHITECT OR AS NOTED TO BE RELOCATED ON THE DRAWINGS. REMOVED EQUIPMENT SHALL BE PROPERLY DISPOSED OF BY THIS CONTRACTOR.

L. 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 DURING OVERTIME HOURS AND THE ADDITIONAL COST TO BE CHARGED THEREFORE SHALL BE ONLY THE "PREMIUM" PORTION OF THE WAGES PAID.

M. UNLESS OTHERWISE SPECIFICALLY NOTED OR 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.

N. ALL MATERIAL AND EQUIPMENT SHALL BE NEW UNLESS OTHERWISE NOTED AND SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.

O. INSURANCE: PROVIDE IN ACCORDANCE WITH OWNER/BUILDING REQUIREMENTS AND SHALL INCLUDE A HOLD HARMLESS CLAUSE FOR OWNER AND ENGINEER.

P. THE FINAL ACCEPTANCE SHALL BE MADE AFTER THE CONTRACTOR HAS ADJUSTED HIS EQUIPMENT, TESTED THE VARIOUS SYSTEMS, DEMONSTRATED THAT IT FULFILLS THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS AND HAS FURNISHED ALL THE REQUIRED CERTIFICATED OF INSPECTION AND APPROVAL.

2. GENERAL PROVISIONS FOR ELECTRICAL WORK:

A. DEFINITIONS:

1) "PROVIDE": TO FURNISH, 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.

4) "WORK": LABOR, MATERIALS, EQUIPMENT, APPARATUS, CONTROLS, ACCESSORIES AND OTHER ITEMS REQUIRED FOR PROPER AND COMPLETE INSTALLATION.

5) "WIRING": RACEWAY. FITTINGS, WIRE, BOXES, AND RELATED ITEMS.

6) "CONCEALED": EMBEDDED IN MASONRY OR OTHER CONSTRUCTION, INSTALLED IN FURRED SPACES, WITHIN DOUBLE PARTITIONS OR HUNG CEILINGS, IN TRENCHES, IN CRAWL SPACES, OR IN ENCLOSURES.

7) "EXPOSED": NOT INSTALLED UNDERGROUND OR "CONCEALED" AS DEFINED ABOVE.

8) "SIMILAR" OR "EQUAL": EQUAL IN MATERIALS, WEIGHT, SIZE, DESIGN AND EFFICIENCY OF SPECIFIED PRODUCT.

B. TEMPORARY LIGHT AND POWER: PROVIDE TEMPORARY LIGHT AND POWER SYSTEMS AT EARLIEST POSSIBLE DATE WITHIN THE CONSTRUCTION AREAS FOR THE REQUIREMENTS OF ALL TRADES AS HEREIN DESCRIBED. EXTEND SYSTEMS TO NEW CONSTRUCTION AS SOON AS PHYSICALLY POSSIBLE. MAINTAIN SYSTEM DURING WORKING OWNER. PROVIDE ALL REQUIRED MAINTENANCE, INCLUDING LAMPS AND SOCKETS.

C. QUALITY ASSURANCE

1) QUALITY OF MATERIALS: ALL EQUIPMENT SHALL BE NEW SPECIFICATION GRADE, FREE FROM DEFECTS AND LISTED BY APPROVED TESTING AGENCY AND BEARING THEIR LABEL MATERIALS AND EQUIPMENT OF SIMILAR APPLICATION SHALL BE OF SAME MANUFACTURER, EXCEPT AS NOTED.

2) GUARANTEE: ALL MATERIALS AND WORKMANSHIP SHALL BE GUARANTEED AS DEFINED IN PARAGRAPH 2.C.

3) CURRENT CHARACTERISTICS:

a. SERVICE: 120/240 VOLT, 3 PHASE, 4 WIRE, 60 HERTZ WITH GROUNDED NEUTRAL.

b. DISTRIBUTION: 120/240 VOLT, 3 PHASE, 4 WIRE, 60 HERTZ WITH GROUNDED NEUTRAL.

4) HEIGHTS OF OUTLETS:

a. FROM FINISHED FLOOR TO CENTERLINE OF OUTLETS FOR:

– RECEPTACLES AND TELEPHONES: 1 FT–6 IN.

– WALL SWITCHES: 4 FT–0 IN.

– WALL FIXTURES: 7 FT–0 IN.

– MOTOR CONTROLLERS: 5 FT–0 IN.

– CLOCKS: 7 FT 6 IN

b. EXCEPTIONS: AT JUNCTION OF DIFFERENT WALL FINISH MATERIALS, ON MOLDING OR BREAK IN WALL SURFACE, IN VIOLATION OF CODE, OR AS NOTED OR DIRECTED.

D. PRODUCT DELIVERY, STORAGE AND HANDLING

1) MOVING OF EQUIPMENT: WHERE NECESSARY, SHIP IN CARTED SECTIONS OF SIZE TO PERMIT PASSING THROUGH AVAILABLE SPACES.

2) ACCESSIBILITY: FOR OPERATION, MAINTENANCE AND REPAIR, MINOR DEVIATIONS SHALL BE PERMITTED, CHANGES OF MAGNITUDE OR INVOLVING EXTRA COST ARE NOT PERMISSIBLE WITHOUT REVIEW. GROUP CONCEALED ELECTRICAL EQUIPMENT REQUIRING ACCESS WITH EQUIPMENT FREELY ACCESSIBLE THROUGH ACCESS DOORS.

E. MATERIALS

1) NAMEPLATES: PROVIDE BLACK LAMICOID SHEET WITH 3/4 IN. WHITE LETTERING, FASTENED WITH EPOXY CEMENT FOR EACH DISCONNECT SWITCH, CIRCUIT BREAKER, PANEL, CABINET, TRANSFORMER, ENCLOSURE, MOTOR CONTROLLER AND THE LIKE. NAMEPLATES SHALL DESCRIBE THE NAME AND NUMBER OF EACH COMPONENT.

2) CABLE TAGS: TAG EACH CONDUCTOR PASSING THROUGH SPLICE OR PULLBOX WITH A WHITE LINEN TAG, INDICATING POINT OF ORIGIN AND TERMINATION OF THE CIRCUIT.

3) INSERTS AND SUPPORTS:

a. INSERTS: STEEL, SLOTTED TYPE, FACTORY PAINTED.

– SINGLE ROD: SIMILAR TO GRINNELL FIG. 281.

– MULTI–ROD: SIMILAR TO FEE AND MASON SERIES 9000 WITH END CAPS AND CLOSURE STRIPS.

– CLIP FORM NAILS FLUSH WITH INSERTS.

– MAXIMUM LOADING 75 PERCENT OF RATING.

b. SUPPORTS FROM BUILDING CONSTRUCTION: INSERTS, BEAM CLAMPS, STEEL FISHPLATES (IN CONCRETE FILL ONLY), CANTILEVER BRACKETS OR OTHER MEANS. SUBMIT FOR REVIEW.

c. GROUPED LINES AND SERVICES: TRAPEZE HANGERS OF BOLTED ANGLES OR CHANNELS.

d. WHERE BUILDING CONSTRUCTION IS INADEQUATE: PROVIDE ADDITIONAL FRAMING. SUBMIT FOR REVIEW.

F. PAINT SHALL BE THE BEST GRADE FOR ITS PURPOSE. DELIVER IN ORIGINAL SEALED CONTAINERS AND APPLY IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. COLORS SHALL BE AS SELECTED BY ARCHITECT OR ENGINEER. UTILIZE GALVANIZED IRON PRIMER ON PANEL AND PULL BOXES, AFTER FABRICATION. UTILIZE HOT DIPPED GALVANIZED OR DIPPED IN ZINC BASED PRIMER FOR: OUTLET BOXES, JUNCTION BOXES, CONDUIT HANGERS, RODS, INSERTS AND SUPPORTS. ZINC BASED PRIMER WITH FINISH TO MATCH SURROUNDINGS SHALL BE USED FOR MARRED SURFACES OF STEEL EQUIPMENT AND RACEWAYS. A FIELD–APPLIED ZINC BASED PRIME COAT SHALL BE UTILIZED FOR STEEL OR IRONWORK.

G. BRUSH AND CLEAN WORK PRIOR TO CONCEALING, PAINTING AND ACCEPTANCE. PAINTED EXPOSED WORK SOILED OR DAMAGED; CLEAN AND REPAIR TO MATCH ADJOINING WORK, BEFORE FINAL ACCEPTANCE. REMOVE DEBRIS FROM INSIDE AND OUTSIDE OF MATERIAL AND EQUIPMENT.

H. FINAL LOCATIONS AND MOUNTING ORIENTATIONS OF ALL SWITCHES, RECEPTACLES AND LIGHT FIXTURES SHALL BE VERIFIED WITH ARCHITECT.

I. ALL ACCESS DOOR LOCATIONS SHALL BE REVIEWED BY ARCHITECT PRIOR TO INSTALLATION.

3. SCOPE OF WORK:

A. SCOPE OF WORK SHALL CONSIST OF PROVIDING LABOR, MATERIALS, EQUIPMENT, SERVICES AND FEES NECESSARY FOR COMPLETE AND SAFE INSTALLATION IN CONFORMING WITH THE NATIONAL ELECTRICAL CODE (NEC) WITH AMENDMENTS, AND ALL OTHER APPLICABLE INDUSTRY, NATIONAL AND LOCAL CODES AND AUTHORITIES HAVING JURISDICTION, AS INDICATED ON DRAWINGS AND HEREIN SPECIFIED.

B. ALL DRAWINGS, PLANS, DETAILS, SPECIFICATIONS AND SPECIFICATION ADDENDA ARE MADE PART OF THIS CONTRACT AND SHALL APPLY TO ALL WORK UNDER THE CONTRACT UNLESS OTHERWISE AMENDED, MODIFIED, SUPPLIED OR SPECIFIED HEREIN.

C. 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 PROVIDED THAT WHERE DEFECTS OCCUR, THE CONTRACTOR WILL ASSUME RESPONSIBILITY OF OTHER TRADES AFFECTED BY DEFECTS, REPAIRS OR REPLACEMENTS IN EQUIPMENT SUPPLIED BY THE CONTRACTOR

D. THE CONTRACTOR SHALL GIVE NECESSARY NOTICE, FILE DRAWINGS AND SPECIFICATIONS WITH ALL DEPARTMENTS HAVING JURISDICTION, 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.

E. CONTRACTOR SHALL PERFORM ALL CONTROLLED INSPECTIONS IN ACCORDANCE WITH THE STATE BUILDING CODE. SECURE ALL REQUIRED PERMITS AND APPROVALS AND TRANSMIT SAME TO OWNER. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL FEES.

F. AREAS WITH NO ELECTRICAL WORK SHALL REMAIN AS IS. CONTRACTOR SHALL MAINTAIN CONTINUITY OF ALL ELECTRICAL SYSTEMS TO ALL AREAS NOT COVERED BY THIS RENOVATION AND SHALL PROVIDE 48 HOUR NOTICE TO LANDLORD OF ANY PLANNED POWER INTERRUPTIONS OR SIGNAL SYSTEM OUTAGES.

4. SHOP DRAWINGS

A. PRIOR TO THE INSTALLATION OF ANY WORK AND PROCUREMENT OF EQUIPMENT, CONTRACTOR SHALL PROVIDE COMPLETE SETS OF COORDINATED SHOP DRAWINGS OF ALL NEW AND EXISTING EQUIPMENT, INDICATING CAPACITY, DIMENSIONS AND SEQUENCE OF OPERATION FOR WRITTEN APPROVAL BY THE ARCHITECT AND ENGINEER.

B. INDICATE ON EACH SHOP DRAWINGS SUBMITTED:

1) PROJECT NAME AND LOCATION

2) NAME OF ARCHITECT AND ENGINEER

3) ITEM IDENTIFICATION

4) APPROVAL STAMP OF PRIME CONTRACTOR

C. SUBMISSIONS:

1) SUBMISSIONS 11 IN. X 17 IN. OR SMALLER: IF THE SUBMISSION IS A CATALOG CUT, THEN THE CONTRACTOR SHALL SUBMIT ONE ORIGINAL AND TWO COPIES. OTHERWISE, HE SHALL SUBMIT THREE COPIES. THE ARCHITECT WILL FORWARD THE ORIGINAL AND ONE COPY (TWO COPIES WHEN NO ORIGINAL IS RECEIVED) TO THE ENGINEER. ALL CATALOG CUTS SHALL BE COMPLETE.

2) SUBMISSIONS LARGER THAN 11 IN. X 17 IN.: SUBMIT TWO PRINTS AND ONE PAPER SEPIA TO THE ARCHITECT. THE ARCHITECT WILL FORWARD ONE PRINT AND THE PAPER SEPIA TO THE ENGINEER.

D. SUBMIT SHOP DRAWINGS FOR THE FOLLOWING:

1) SAFETY/DISCONNECT SWITCHES

2) FUSES

3) CIRCUIT BREAKERS

4) PANELBOARDS/LOADCENTER (INCLUDING DIMENSIONS, SCHEDULES, AND CATALOG CUTS).

5) RACEWAYS

6) WIRE AND CABLE

7) WALL SWITCHES

8) INSERTION RECEPTACLES

9) MOMENTARY CONTACT SWITCHES

10) TIME SWITCHES

11) LIGHTING FIXTURES.

E. ASSIST AND PROVIDE ALL NECESSARY INFORMATION, DIAGRAMS, SKETCHES, ETC. TO THE HVAC CONTRACTOR, FOR THE PREPARATION OF COORDINATED SHOP DRAWINGS INDICATING ROUTING OF FEEDERS, CONTROL CONDUITS, RECESSED FIXTURES AND ADJACENT NEARBY PIPING AND DUCTWORK WHERE APPLICABLE, CERTIFIED BY ALL TRADES THAT COORDINATION HAS BEEN ESTABLISHED. SUBMIT FOUR(4) BOOKBOUND OPERATING AND SERVICE MANUALS WHICH SHALL INCLUDE COPIES OF ALL SHOP DRAWING. PROVIDE SHOP DRAWINGS FOR PANELS, FIXTURES, WIRING DEVICES, CONDUIT, CABLE, DISCONNECT SWITCH, RELAYS, CONTRACTORS, AND OTHER SYSTEMS AS DIRECTED BY THE ENGINEER.

5. AS–BUILT DRAWINGS AND EQUIPMENT OPERATIONAL INSTRUCTIONS

A. UPON COMPLETION AND ACCEPTANCE OF WORK, CONTRACTOR SHALL FURNISH WRITTEN INSTRUCTIONS AND 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. CONTRACTOR SHALL GIVE THREE COPIES OF THE INSTRUCTIONS TO THE OWNER AND ONE COPY TO THE ENGINEER.

C. THE INSTRUCTION BOOKLET SHALL BEAR THE NAME, ADDRESS AND TELEPHONE NUMBER OF THE PROJECT, ARCHITECT AND ENGINEER.

D. REPRODUCIBLE "AS–BUILT" DRAWINGS SHALL BE PROVIDED INDICATING THE AS INSTALLED CONDITIONS OF THE WORK. "AS–BUILT" DRAWINGS SHALL BE PROVIDED TO THE ARCHITECT AFTER COMPLETION OF THE INSTALLATION.

6. LOW–VOLTAGE DISTRIBUTION EQUIPMENT:

A. PROVIDE COMPLETE EQUIPMENT INCLUDING: SWITCHES, FUSES, CIRCUIT BREAKERS, PANELS AND TRANSFORMERS.

B. ALL EQUIPMENT SHALL CONFORM TO NEMA, ANSI AND IEEE STANDARDS.

C. DISCONNECT SWITCHES SHALL BE FUSED OR NONFUSED AS NOTED. VOLTAGE SHALL BE AS REQUIRED. SWITCHES SHALL BE HEAVY DUTY, EXCEPT AS NOTED, AND HORSEPOWER RATED FOR MOTOR LOADS. TOGGLE TYPE SWITCHES SHALL BE NONFUSED, LOAD BREAK, HAVING MAXIMUM RATINGS OF 20 AMP AT 600 VOLTS AND 30 AMP AT 240 VOLTS. TWO–POLE SWITCHES SHALL BE SIMILAR TO HART AND HEGEMAN NO. 6808F. THREE–POLE SWITCHES SHALL BE SIMILAR TO HART AND HEGEMAN NO. 7810F. KNIFE–BLADE TYPE SWITCHES SHALL BE LOAD BREAK, QUICK–MAKE– QUICK–BREAK, UL CLASS R UP TO 600 AMP. MAXIMUM RATING EXCEPT AS NOTED SHALL BE 800 AMP. ARC QUENCHERS SHALL BE PROVIDED. SWITCHES SHALL BE SIMILAR TO GENERAL ELECTRIC QMR. ALL SWITCH ENCLOSURES SHALL BE DEAD FRONT, NEMA TYPE 1, EXCEPT AS NOTED.

7. FUSES:

A. CIRCUITS 0 TO 600 AMPERES SHALL BE PROTECTED BY FUSES SIMILAR TO CURRENT LIMITING BUSSMAN LOW–PEAK DUAL–ELEMENT TIME–DELAY LPN–RK (AMP)SP (250V) /LPS–RK (AMP)SP (600V) OR LPJ (AMP)SP (600V) (UL CLASS RK1 OR CLASS J), AND BE LISTED BY UL WITH AN INTERRUPTING RATING OF 300,000 AMPERES RMS SYMMETRICAL.

B. MOTOR CIRCUITS – ALL INDIVIDUAL MOTOR CIRCUITS WITH FULL LOAD AMPERE RATINGS (FLA) OF 480 AMPERES OR LESS SHALL BE PROTECTED BY FUSES SIMILAR TO CURRENT LIMITING BUSSMANN LOW–PEAK DUAL–ELEMENT TIME–DELAY LPN–RK (AMP)SP (250V) /LPS–RK (AMP)SP (600V) OR LPJ (AMP)SP (600V) (UL CLASS RK1 OR CLASS J), AND BE LISTED BY UL WITH AN INTERRUPTING RATING OF 300,000 AMPERES RMS SYMMETRICAL.

C. ALL FUSES SHALL BE PROVIDED BY SAME MANUFACTURER.

D. PROVIDE 1 SPACE MATCHING FUSE FOR EACH SET OF 3.

E. CIRCUIT BREAKERS: MOLDED CASE BREAKERS SHALL BE THERMAL–MAGNETIC, QUICK–MAKE–QUICK–BREAK, BOLT–ON TYPE, MANUALLY OPERATED WITH INSULATED TRIP–FREE HANDLE. MULTI–POLE TYPE BREAKERS SHALL CONTAIN INTERNAL TRIP BAR. TERMINALS SHALL BE SUITABLE FOR COPPER OR ALUMINUM CABLE. FURNISH AUXILIARY DEVICES WHERE REQUIRED FOR SHUNT–TRIPPING, OPEN A ND CLOSE MOTOR OPERATOR AND ALARM INDICATION. ENCLOSURES SHALL BE DEAD FRONT, NEMA TYPE 1, EXCEPT AS NOTED. FRAMES, IC AND INTERCHANGEABLE TRIPS SHALL BE AS FOLLOWS, UNLESS OTHERWISE NOTED:

1) 120 VOLTS, 100–AMP FRAME: 10,000 AMPS, 1 POLE.

2) 120/240 VOLTS, 225–AMP FRAME: 22,000 AMPS MINIMUM

8. DISTRIBUTION PANELBOARDS, SWITCH AND FUSE:

A. THREE PHASE, 3 OR 4 WIRE WITH COPPER BUS BARS. ALL THROUGH BUS SHALL BE INSULATED.

B. NEMA CLASS 1 CONSTRUCTION TO ACCOMMODATE FUSIBLE, INDIVIDUALLY ENCLOSED SWITCHES, FRONT REMOVABLE, SWITCH AND DOOR INTERLOCKS. COVERS TO BE PAD–LOCKABLE.

C. PANELBOARD SHALL BE CONSTRUCTED OF CODE–GAUGE STEEL, GRAY FINISH OVER RUST INHIBITOR, FOR SURFACE MOUNTING. BOX AND PANEL FRAME SHALL BE FLANGED AND REINFORCED FOR RIGID SUPPORT OF INTERIOR AND ACCURATE ALIGNMENT OF INTERIOR WITH FRONT. TRIMS TO BE FASTENED TO BACK BOX WITH SCREWS.

D. ALL BRANCH SWITCHES SHALL HAVE INDIVIDUAL ENGRAVED LAMICOID NAMEPLATES (BLACK WITH WHITE CORE).

E. DISTRIBUTION PANELBOARD CONSTRUCTION MINIMUM SHORT CIRCUIT RATING 25,000 AMPERES, REMS SYMMETRICAL FOR ALL 120/208V APPLICATIONS. APPLICATIONS.

F. DISCONNECTS

1) DISCONNECT SWITCHES SHALL CONFORM TO NEMA AND UL STANDARDS, AND SHALL BE HORSEPOWER RATED.

2) SWITCHING MECHANISM SHALL BE QUICK–MAKE, QUICK–BREAK, SINGLE THROW WITH EXTERNAL OPERATING HANDLE MECHANCIALLY INTERLOCKED WITH ENCLOSURE COVER TO PROVIDE ACCESS TO INTERIOR WHEN DISCONNECT IS IN OFF POSITION ONLY. PROVIDE MEANS TO LOCK OPERATING HANDLE IN THE OPEN AND CLOSED POSITION. DESIGNATE ON THE ENCLOSURE THE OPEN AND CLOSED POSITION OF THE OPERATING HANDLE.

3) SWITCHES SHALL BE OF THE DOUBLE STATIONARY CONTACT TYPE.

4) SWITCHES SHALL BE EQUIPPED WITH REJECTION TYPE FUSE HOLDERS, FUSIBLE AS SHOWN ON THE DRAWINGS; PROVIDE COMPLETE WITH FUSES AS SCHEDULED.

G. INSTALLATION

1) DISTRIBUTION PANELBOARD SHALL BE MOUNTED TO STRUCTURAL STEEL CHANNEL (KINDORF) WHICH SHALL BE BOLTED TO THE WALL USING EXPANSION ANCHORS FOR LARGE PANELS.

H. IDENTIFICATION

1) PROVIDE NAMEPLATE AT EACH SWITCH IDENTIFYING THE LOAD SERVED.

2) NAMEPLATES SHALL BE MOUNTED ON THE FRONT COVER SECURED WITH SELF–TAPPING SCREWS OR NUTS AND BOLTS. NAMEPLATES SHALL BE LAMINATED PHENOLIC, BLACK WITH A MINIMUM OF ¼" HIGH WHITE LETTERING.

I. DISTRIBUTION AND SUB–DISTRIBUTION PANELBOARDS SHALL BE A MINIMUM OF 30" WIDE AND 10" DEEP.

J. POWER PANELBOARDS SHALL BE SIMILAR TO GENERAL ELECTRIC TYPE "OMR", AS MANUFACTURED BY ATLAS SWITCH COMPANY, ELECTRIC SWITCHBOARD COMPANY OR APPROVED EQUAL.

K. PANELBOARD SHALL HAVE MAIN CIRCUIT BREAKER OR MAIN LUGS AS INDICATED ON THE DRAWINGS. QUANTITY, POLES AND TRIP RATINGS OF BRANCH CIRCUIT BREAKERS TO BE AS INDICATED ON DRAWINGS.

L. PANELBOARD SHALL HAVE ENGRAVED WHITE CORE, BLACK LAMACOID NAMEPLATE SCREWED ONTO PANE TRIM WITH DESIGNATION LISTED (PANELBOARD NAME, VOLTAGE, RATING OR MAINS IN AMPS).

B. MATERIALS

1) RACEWAYS:

a. RIGID STEEL CONDUIT: FULL–WEIGHT PIPE, GALVANIZED, THREADED.

b. ELECTROMETALLIC TUBING (EMT): THIN WALL PIPE, GALVANIZED, THREADLESS.

c. FLEXIBLE STEEL CONDUIT: CONTINUOUS SINGLE STRIP, GALVANIZED.

d. WIREWAYS: WIRE SHALL BE AS NOTED, MINIMUM NO. 16 GAUGE STEEL WITH GROUND CONTINUITY. FINISH SHALL BE BAKED ENAMEL. COVERS SHALL BE SCREW–ON.

e. SURFACE METAL RACEWAY: SIZE AS NOTED. BASE 0.04 IN., COVER 0.25 IN. MATERIAL SHALL BE STEEL. FINISH SHALL BE BAKED ENAMEL. COVERS SHALL BE SCREW–ON.

2) FITTINGS AND ACCESSORIES:

a. RIGID STEEL: NONSPLIT, THREADED, STEEL OR MALLEABLE IRON. ZINC DIE CAST NOT PERMITTED.

b. ELECTROMETALLIC TUBING: COMPRESSION TYPE. GALVANIZED RIGID STEEL ELBOWS, 2 IN. OR LARGER.

c. FLEXIBLE METALLIC CONDUIT: ANGLE WEDGE TYPE WITH INSULATED THROAT.

d. BUSHINGS: METALLIC INSULATED TYPE.

PROJECT:
GOODBLEND READING

PROJECT NUMBER: 21242

goodblend MEDICAL MARIJUANA

Parallel

STAMP:

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ELECTRICAL SPECIFICATION SHEET 1 OF 2

DRAWING NUMBER:
E0.2

ELECTRICAL SPECIFICATIONS (CONT.)

3) BOXES:

a. OUTLET BOXES: EXCEPT AS OTHERWISE REQUIRED BY CONSTRUCTION, DEVICES OR WIRING, BOXES SHALL BE STAMPED STEEL, 4 IN. SQUARE OR OCTAGON FOR FIXTURES. BOXES ABOVE CEILING SHALL BE 1–1/2 IN. DEEP. BOXES IN CEILING OR SLAB SHALL BE 3 IN. DEEP. BOXES IN WALL FOR FIXTURES SHALL BE 2–3/4 IN. DEEP. BOXES IN WALL FOR RECEPTACLES AND SWITCHES SHALL BE 1–1/2 IN. DEEP. FURNISH WITH RAISED COVERS AND FIXTURE STUDS WHERE REQUIRED. WITHOUT FIXTURE OR DEVICE: FURNISH BLANK COVER. OFFSET BACK–TO–BACK OUTLETS WITH MINIMUM 6 IN. SEPARATION.

b. JUNCTION AND PULL BOXES: GALVANIZED SHEET STEEL WITH SCREW–ON COVERS, EXCEPT AS NOTED. FURNISH WITH INSULATED SUPPORTS FOR CABLES. LOCATIONS SHALL BE AS NOTED OR REQUIRED AND ACCESSIBLE. PROVIDE BARRIERS IN NEW AND RENOVATED BOXES BETWEEN 120/208 VOLT AND 265/460 VOLT WIRING AND BETWEEN EMERGENCY AND NORMAL WIRING. FLOOR BOXES SHALL BE SUITABLE FOR CONDUIT AND DEVICES NOTED. RAISED OUTLETS SHALL BE HUBBELL #B2414 SERIES WITH ABOVE FLOOR FITTING. TELEPHONE: BUSHED HOLE. POWER: DUPLEX RECEPTACLE OR OTHER AS NOTED. INCREASE SIZE TO SUIT AS NECESSARY. FLUSH OUTLETS SHALL BE HUBBELL #B2414 SERIES WITH FLUSH FLOOR FITTING FOR TELEPHONE AND FLUSH DUAL FLAP COVER WITH DUPLEX RECEPTACLE FOR POWER AS NOTED. INCREASE SIZE TO SUIT AS NECESSARY.

C. PROVIDE RACEWAYS ONLY AS HEREIN SPECIFIED, EXCEPT AS NOTED. RACEWAYS SHALL BE RUN CONCEALED, EXCEPT AS NOTED.

PROVIDE RACEWAY SUPPORT UTILIZING CEILING TRAPEZE, STRAP HANGERS, OR WALL BRACKETS. PROVIDE U–BOLTS AT EACH FLOOR LEVEL OF RISER RACEWAYS AND CONNECTED TO ACCEPTABLE SUPPORTS. PROVIDE RISER CLAMPS AT EACH FLOOR LEVEL OF RISER RACEWAYS AND RESTING ON SLAB. FOR THROUGH–THE–FLOOR SYSTEMS, UTILIZE AN ASSEMBLY SIMILAR TO HUBBELL FIRE RATED POKE–THROUGH–FLOOR BOX SYSTEM. FOR ABOVE FLOOR FITTINGS TELEPHONE SHALL BE BUSHED HOLE AND POWER SHALL BE DUPLEX RECEPTACLE OR OTHER AS NOTED. PROVIDE SEPARATION BARRIER BETWEEN POWER AND TELEPHONE COMPARTMENTS. PROVIDE JUNCTION BOX ON UNDERSIDE OF FLOOR. PACK FITTING TO RESTORE FIRE RATING OF FLOOR.

SECURE ALL RACEWAYS TO SUPPORTS WITH PIPE STRAPS OR U–BOLTS. SPACING OF SUPPORTS SHALL BE A MINIMUM OF 10 FT ON CENTER FOR METALLIC RACEWAY AND AS REQUIRED FOR NONMETALLIC RACEWAY. SPACING SHALL BE 5 FT ON CENTER FOR WIREWAYS AND PER CODE AND AS NOTED FOR OTHERS. MOUNT SUPPORTS TO STRUCTURE MASONRY WITH TOGGLE BOLTS ON HOLLOW MASONRY, EXPANSION SHIELDS OR INSERTS IN CONCRETE AND BRICK, MACHINE SCREWS ON METAL, BEAM CLAMPS ON FRAMEWORK, WOOD SCREWS ON WOOD, AND PAN THROUGH STRAPS IN METAL DECK. NAILS, RAWL PLUGS OR WOOD PLUGS SHALL NOT BE PERMITTED. WHERE REQUIRED BY STRUCTURE, FURNISH THROUGH BOLTS AND FISHPLATES.

EXPOSED RACEWAYS SHALL BE RUN PARALLEL WITH OR AT RIGHT ANGLES TO WALLS. PROVIDE CLEARANCE WITH WATER, STEAM OR OTHER PIPING (MINIMUM 3 IN. SEPARATION FROM STEAM AND HOT WATER PIPES, EXCEPT 1 IN. FROM PIPE COVER AT CROSSINGS AND 18 IN. FOR PARALLEL RUNS). FOR HUNG CEILING OUTLETS, RUN IN HUNG CEILING AND CONNECT TO CEILING SUPPORT CHANNELS. IN MASONRY AND POURED CONCRETE, RUN VERTICALLY ONLY.

MAINTAIN GROUNDING CONTINUITY OF INTERRUPTED METALLIC RACEWAYS WITH GROUND CONDUCTOR, AND IN FLEXIBLE CONDUIT FOR FEEDERS AND MOTOR TERMINAL CONNECTIONS.

EMPTY RACEWAYS OVER 10 FT LONG: PROVIDE FISH OR PULL WIRE, GALVANIZED OR NYLON ROPE.

RIGID STEEL CONDUIT SHALL BE PERMITTED FOR FEEDERS AND BRANCH CIRCUITS. PAINT MALE THREADS OF FIELD–THREADED CONDUIT WITH GRAPHITE–BASE PIPE COMPOUND AND BUTT CONDUIT ENDS. TOUCH UP MARRED SURFACES AND FIELD–CUT THREADS, CRC–COLD GALVANIZED. EMT SHALL BE PERMITTED FOR BRANCH CIRCUITS ONLY, IN DRY LOCATIONS, DRY WALLS, HUNG CEILINGS, HOLLOW BLOCK WALLS AND FURRED SPACES. EMT SHALL NOT BE PERMITTED IN RAISED FLOORS. FLEXIBLE STEEL CONDUIT SHALL BE UTILIZED FOR SHORT CONNECTIONS WHERE RIGID CONDUIT IS IMPRACTICAL. FROM OUTLET BOX TO RECESSED LIGHTING FIXTURE: PROVIDE MINIMUM 4 FT AND MAXIMUM 6 FT LENGTHS. FOR FINAL CONNECTION TO MOTOR TERMINAL BOX, TRANSFORMER AND OTHER VIBRATING EQUIPMENT: PROVIDE WITH POLYVINYL SHEATHING AND GROUND CONDUCTOR. MINIMUM LENGTH: 18 IN. WITH SLACK. CONNECT GROUND CONDUCTOR TO ENCLOSURE OR RACEWAY AT EACH END. FOR EXPANSION JOINT CROSSINGS, CROSS AT RIGHT ANGLES AND ANCHOR ENDS.

CUT CONDUIT ENDS SQUARE. REAM SMOOTH. PAINT MALE THREADS OF FIELD THREADED RACEWAYS WITH GRAPHITE BASE PIPE COMPOUND. DRAW UP TIGHT WITH RACEWAY COUPLING.

ALL COUPLINGS SHALL BE COMPRESSION TYPE. NO SET SCREW FITTINGS.

EXPANSION FITTINGS SHALL BE INSTALLED AT RIGHT ANGLES WITH CLIP JOINT CENTERED IN EXPANSION JOINT. PROVIDE A LENGTH OF RUN IN ACCORDANCE MANUFACTURER'S RECOMMENDATIONS. PRESET FITTINGS SHALL ALLOW FOR TEMPERATURE VARIATION.

RACEWAYS PASSING THROUGH FIRE–RATED CONSTRUCTION: SEAL OPENING WITH FIRE SEALANT.

D. PROVIDE CABLE SUPPORTS IN ACCORDANCE WITH NATIONAL ELECTRIC CODE ARTICLE 300.19. CABLE SUPPORTS SHALL UTILIZE A ONE–PIECE PLUG WITH POZI–GRIP WEDGING PLUG AS MANUFACTURED BY OZ–GEDNEY. TYPE SF SHALL BE USED FOR ARMORED CABLE.

INSTALL CABLE SUPPORTS AT THE TOP OF A VERTICAL RISE AND PROVIDE INTERMEDIATE ADDITIONAL SUPPORTS AS REQUIRED TO LIMIT SUPPORTED CONDUCTOR LENGTHS TO NOT GREATER THAN THOSE SPECIFIED IN TABLE 300.19(A).

A. ERECT WALL AND SWITCH OUTLETS IN ADVANCE OF FURRING AND FIREPROOFING. OUTLET BOXES SHALL BE SET SQUARE AND TRUE WITH BUILDING FINISH. SECURE TO BUILDING STRUCTURE BY ADJUSTABLE STRAP IRON OR GROUT IN WITH MASONRY. VERIFY OUTLET LOCATIONS IN FINISHED SPACES WITH ARCHITECTURAL DRAWINGS OF INTERIOR DETAILS AND FINISHES. PROVIDE BARRIERS BETWEEN SWITCHES CONNECTED TO DIFFERENT PHASES FOR VOLTAGES EXCEEDING 150 VOLTS TO GROUND.

D. PANEL, JUNCTION AND PULL BOXES SHALL BE LOCATED CLEAR OF OTHER TRADES. CONCEAL JUNCTION AND PULL BOXES IN FINISHED SPACES. WHERE NECESSARY, REROUTE RACEWAYS OR MAKE OTHER ARRANGEMENTS FOR CONCEALMENT. BOXES SHALL BE ACCESSIBLE. SUPPORT BOXES FROM BUILDING STRUCTURE, INDEPENDENT OF CONDUIT. PROVIDE FLOOR–TO–CEILING CHANNELS FOR MOUNTING ON DRYWALL AND LIGHTWEIGHT CONSTRUCTION. OUTLET BOXES FOR FIXTURES RECESSED IN HUNG CEILINGS SHALL BE ACCESSIBLE THROUGH OPENING CREATED BY REMOVAL OF FIXTURE. SECURE TO BLACK IRON SUPPORT. MOTOR TERMINAL BOXES: COORDINATE WITH MOTOR BRANCH CIRCUIT CONDUIT AND WIRING; ADD BOX VOLUME WHERE REQUIRED.

E. FIRE SEALANTS: PROVIDE FOR RACEWAYS AND WIRE PASSING THROUGH FLOOR SLOTS, SLEEVES OR OPENINGS IN FIRE–PARTITIONS ROOMS.

F. PERFORM CONTINUITY TESTS OF RESISTANCE OF FEEDER CONDUITS FROM SERVICE TO POINT OF FINAL DISTRIBUTION USING 1 CONDUCTOR RETURN. MAXIMUM RESISTANCE SHALL BE 25 OHMS.

9. WIRE AND CABLE:

A. PROVIDE WIRE AND CABLE COMPLETE WITH ACCESSORIES. SIZE REFERENCE SHALL BE AWG EXCEPT AS NOTED.

B. CONDUCTORS SHALL BE COPPER, ASTM STANDARD SOLID (NO. 10 AND SMALLER) OR STRANDED (NO. 8 AND LARGER). GENERAL USE CABLING SHALL BE NO. 12 MINIMUM. AT 120 VOLTS AND OVER 100 FT CIRCUIT LENGTH PROVIDE NO. 10 MINIMUM. AT 265 VOLTS AND OVER 200 FT CIRCUIT LENGTH PROVIDE NO. 10 MINIMUM.

C. CONTROL AND ALARM CABLING, EXCEPT AS NOTED, SHALL BE NO. 14 MINIMUM. AT 120 VOLTS AND OVER 200 FT CIRCUIT LENGTH PROVIDE NO. 12 MINIMUM. OTHER VOLTAGES AND PHASES: ADJUST CABLE SIZING AS REQUIRED TO MAINTAIN VOLTAGE DROP. INCREASE RACEWAY SIZES FOR LARGER WIRE AS REQUIRED.

D. INSULATION SHALL BE RUBBER AND THERMOPLASTIC MEETING ASTM AND IPCEA STANDARDS. TYPE THW OR THWN SHALL BE UTILIZED FOR FEEDERS AND BRANCH CIRCUITS EXCEPT AS NOTED. TYPE SFF–2 SHALL BE UTILIZED FOR BRANCH CIRCUITS LOCATED IN WIRING CHANNELS OF CONTINUOUS FLUORESCENT FIXTURES AND IN AMBIENT TEMPERATURES OVER 90 DEG C. FOR UNGROUNDED ISOLATED BRANCH CIRCUITS PROVIDE CROSS–LINKED POLYETHYLENE INSULATION (TYPE XHHW).

E. ARMORED CABLE (BX) SHALL BE UTILIZED FOR BRANCH CIRCUITS IN DRY HOLLOW LOCATIONS, HUNG CEILINGS, AND BLOCK WALLS.

F. COLOR CODING SHALL BE AS FOLLOWS:

120/240 VOLT SYSTEM:
BLACK FOR A PHASE
RED FOR B PHASE
BLUE FOR C PHASE

1) NEUTRAL WIRE SHALL UTILIZE WHITE OUTER COVERING THROUGHOUT. EQUIPMENT GROUND WIRE SHALL UTILIZE GREEN OUTER COVERING THROUGHOUT.

WHERE COLOR–CODED CABLE IS NOT AVAILABLE, CERTIFY IN WRITING AND REQUEST PERMISSION TO OVERLAP CONDUCTORS WITH 6 IN. OF COLOR TAPING IN ACCESSIBLE LOCATIONS.

G. PROVIDE FLAMEPROOF LINEN OR FIBER TAGS IN ACCESSIBLE LOCATIONS. FOR FEEDERS INDICATE FEEDER NUMBER, SIZE, PHASE AND POINTS OF ORIGIN AND TERMINATIONS. FOR CONTROL AND ALARM WIRING INDICATE TYPE (CONTROL OR ALARM), SIZE OF WIRE, AND POINTS OF ORIGIN AND TERMINATIONS.

H. TERMINATIONS, SPLICES AND TAPS UNDER 600 VOLTS: COPPER CONDUCTORS NO. 10 AND SMALLER SHALL UTILIZE COMPRESSION–TYPE OF TWIST–ON SPRING–LOADED CONNECTORS AND CLEAR NYLON–INSULATED COVERING. COPPER CONDUCTORS NO. 8 AND LARGER SHALL UTILIZE MECHANICAL BOLTED PRESSURE OR HYDRAULIC COMPRESSION TYPE USING MANUFACTURER'S RECOMMENDED TOOLING. CABLE LUGS AND CONNECTORS SHALL UTILIZE COMPRESSION TYPE OF SAME METAL AS CONDUCTOR. PROVIDE TO MATCH CABLE, WITH MARKING INDICATING SIZE AND TYPE. COPPER LUG CONNECTIONS TO BUS BARS: USE ANTISEIZE COMPOUND ON TANG.

I. NOT MORE THAN 3 LIGHTING OR CONVENIENCE OUTLET CIRCUITS SHALL BE INSTALLED IN ONE CONDUIT UNLESS OTHERWISE INDICATED. PULL NO THERMOPLASTIC WIRES AT TEMPERATURES LOWER THAN 32 DEG F. PROVIDE SEPARATE RACEWAYS FOR CONDUCTORS OF 120/240 VOLT SYSTEMS, EXCEPT 460 VOLT MOTOR BRANCH CIRCUIT WIRING AND RELATED 120 VOLT CONTROL WIRING. THERMOPLASTIC WIRES SHALL NOT BE INSTALLED IN COMPUTER AREA RAISED FLOORS.

J. LEAVE WIRES WITH SUFFICIENT SLACK TO PERMIT MAKING FINAL CONNECTIONS.

K. PERFORM CONTINUITY AND INSULATION TESTS. MEGGER TEST 100 PERCENT OF FEEDERS, 10 PERCENT OF BRANCH CIRCUITS AND ALL MOTOR BRANCH CIRCUITS OVER 25 HP.

PERFORM TESTS PRIOR TO CONNECTING EQUIPMENT AND IN PRESENCE OF AUTHORIZED REPRESENTATIVES. SUBMIT WRITTEN REPORT OF RESULTS. CORRECT OR REPLACE CABLE TESTING BELOW MANUFACTURER'S STANDARDS.

11. WIRING DEVICES:

A. WIRING DEVICES SHALL BE SPECIFICATION GRADE UNLESS OTHERWISE SPECIFIED. ALL DEVICES SHALL BE FLUSH MOUNTED, UNLESS OTHERWISE NOTED. PROVIDE COMPLETE MATERIAL AND ACCESSORIES AS NOTED.

B. LOCAL WALL SWITCHES SHALL BE ROCKER TYPE, QUIET OPERATING, RATED 20 AMP, 120/277 VOLT, AC. SIMILAR TO LEVITON DECORA SERIES A5621 (SINGLE POLE), A5623 (3–WAY) AND A5624 (4–WAY).

C. STRAIGHT BLADE RECEPTACLES SHALL BE COMMERCIAL SPECIFICATION GRADE DUPLEX CONVENIENCE 125 VOLTS, 2 POLE, 3 WIRE, U GROUND SLOT, DECORA SERIES BY LEVITON. GROUNDED, EXCEPT AS NOTED.

1) SINGLE GANG, RECESSED, DUPLEX RECEPTACLE: TAMPER RESISTANT, 2–POLE, 3–WIRE GROUNDING, 15A, 125V, NEMA 5–20R; LEVITON 689 SERIES (COLOR AS SPECIFIED BY ARCHITECT).
2) USB CHARGER/ DUPLEX TAMPER–RESISTANT RECEPTACLE: TAMPER RESISTANT,

D. INSERTION RECEPTACLES SHALL BE DUPLEX RECEPTACLE CONVENIENCE 125 VOLTS, 2 POLE, 3 WIRE, U GROUND SLOT. GROUNDED, EXCEPT AS NOTED.

1) HEALTH CARE FACILITIES:

a) DUPLEX, 20 AMP, 125 VOLTS, 2 POLE, 3 WIRE, U GROUND SLOT: SIMILAR TO HUBBELL NO. 8300.

b) SINGLE, 20 AMP, 125 VOLT, 2 POLE, 3 WIRE, U GROUND SLOT: SIMILAR TO HUBBELL NO. 8310.

E. DEVICE PLATES: SEE ARCHITECT FOR TYPE. FOR RECEPTACLES WITH OTHER THAN 120 VOLT, INSCRIBED VOLTAGE AVAILABLE.

F. COLORS: COORDINATE COLORS WITH ARCHITECT.

G. MOUNTING ORIENTATION OF RECEPTACLES (HORIZONTAL OR VERTICAL): COORDINATE WITH ARCHITECT.

12. LIGHTING FIXTURES:

A. FIXTURES TO BE AS SPECIFIED BY ARCHITECT AND SHALL BE COMPLETELY FACTORY ASSEMBLED, WIRED AND EQUIPPED WITH ALL NECESSARY SOCKETS, BALLASTS, SUPPORTING HARDWARE AND ACCESSORIES. REFER TO DRAWINGS FOR INDIVIDUAL FIXTURE DESCRIPTIONS.

B. FIXTURE CATALOG NUMBERS USED TO ILLUSTRATE EQUIPMENT TYPE DO NOT NECESSARILY DENOTE REQUIRED MOUNTING EQUIPMENT OR ACCESSORIES. PROVIDE ACCESSORIES TO SUIT.

C. BALLAST: CLASS P, HIGH POWER FACTOR, LOWEST AVAILABLE NEMA RATED NOISE LEVEL, ET1 AND CBM APPROVED. ENERGY SAVING TYPE. TRIGGER START FOR 24–INCH LAMPS AND RAPID START FOR 48–INCH. TWO LAMP BALLASTS; NO THREE LAMP BALLASTS. BALLASTS SHALL BE ADVANCE MAGNETEK, UNIVERSAL OR EQUAL.

D. LED DRIVERS SHALL BE ELECTRONIC TYPE, LABELED AS COMPLIANT WITH RADIO FREQUENCY INTERFERENCE (RFI) REQUIREMENTS OF FCC TITLE 47, PART 15 AND COMPLY WITH NEMA SSL 1 "ELECTRONIC DRIVERS FOR LED DEVICES, ARRAYS OR SYSTEMS". LED DRIVERS SHALL HAVE A SOUND RATING OF "A", HAVE A MINIMUM EFFICIENCY OF 85% AND BE RATED FOR A THD OF LESS THAN 20% AT ALL INPUT VOLTAGES.

E. DIMMABLE LED DRIVERS SHALL BE CAPABLE OF DIMMING WITHOUT LED STROBING OR FLICKER ACROSS THEIR FULL DIMMING RANGE. PROVIDE TYPE OF LED DRIVER AS PER LIGHTING FIXTURE SCHEDULE, DIMMABLE LED DRIVERS SHALL BE 0–10V WHERE NOT INDICATED.

F. CONTINUOUS ROW, TWO LAMP STRIP FIXTURES SHALL BE STAGGERED TYPE.

G. FLUORESCENT LIGHTING FIXTURES, INCLUDING GENERAL CONSTRUCTION, LAMPS AND BALLASTS SHALL CONFORM TO THE ENERGY EFFICIENCY REQUIREMENTS OF CONSOLIDATED EDISON CO. AND QUALITY FOR A UTILITY REBATE TO OWNER UNDER CON EDISON'S ENLIGHTENED ENERGY LIGHTING REBATE PROGRAM. CONTRACTOR SHALL COORDINATE REBATE PROGRAM WITH CON EDISON AND ARRANGE FOR CON EDISON TO PERFORM A SURVEY TO INVENTORY ALL EXISTING FIXTURES PRIOR TO DEMOLITION.

H. EXIT SIGNS SHALL BE PRECISION DIE–CAST ALUMINUM HOUSING WITH LASER–FORMED ACRYLIC LEGEND. EXIT SIGNS SHALL COMPLY WITH UL 924 AND BE MEA APPROVED FOR USE IN CITY. AC POWERED WITH PREMIUM LONG–LIFE NICKEL CADMIUM BATTERY WITH STANDARD UL LISTED 3–HOUR RUN TIME. PROVIDE WITH INTEGRAL AUTOMATIC CHARGER IN A SELF CONTAINED POWER PACK. LED INDICATOR WITH PUSH TO TEST SWITCH.

13. TELEPHONE CONDUIT SYSTEM:

A. PROVIDE COMPLETE SYSTEM OF: RACEWAYS AND ACCESSORIES, OUTLET BOXES, SLEEVES AND FISHWIRES.

B. EQUIPMENT SHALL CONFORM TO REQUIREMENTS OF TELEPHONE COMPANY.

C. OUTLETS SHALL BE:

1) WALL: 4 IN. SQUARE WITH BUSHED COVER PLATE.

D. PROVIDE FISHWIRES, IN RACEWAYS OVER 10 FT LONG.

E. CONDUIT SHALL BE 3/4 IN. MINIMUM. FURNISH EMPTY CONDUIT FROM OUTLET BOX TO BUSHED END THRU WALL 6" BELOW THE PLASTER CEILING.

F. FACE RACEWAYS IN ROOMS SHALL HUBBELL HBL500, HBL750 OR HBL2000 SERIES OR AS ACCEPTABLE.

14. GROUNDING AND BONDING:

A. PROVIDE GROUNDING SYSTEM IN ACCORDANCE WITH (NATIONAL ELECTRICAL CODE WITH AMENDMENTS), AND THESE SPECIFICATIONS. THE WIRING SYSTEM SHALL BE INSTALLED AS REQUIRED TO PROVIDE A CONTINUOUSLY GROUNDED SYSTEM. WHERE FLEXIBLE CONDUIT IS USED FOR PART OF A CONDUIT RUN, EXCEPT LIGHTING BRANCH CIRCUITS, AN INSULATED GROUNDING CONDUCTOR SHALL BE PROVIDED IN THE CONDUIT AND CONNECTED TO GROUNDING BUSHINGS AT EACH END OF THE RUN.

B. USE EXOTHERMIC WELDING PROCESS FOR INACCESSIBLE CONNECTIONS.

C. EXTEND EXISTING SYSTEM GROUND TO INCLUDE ALL THE ELECTRICAL EQUIPMENT IN THE SCOPE OF WORK.

D. WHERE FLEXIBLE METALLIC CONDUIT IS USED AN INTERNAL BONDING CONDUCTOR SHALL BE INSTALLED.

E. IN ADDITION, FURNISH A SEPARATE INSULATED GREEN EQUIPMENT GROUND CONDUCTOR WHERE INDICATED ON DRAWINGS AND FOR THE FOLLOWING BRANCH CIRCUITS:
1) CIRCUITS SERVING ANY WALL BOX DIMMER.

2) CIRCUITS SERVING ANY ISOLATED GROUND RECEPTACLES. TERMINATE GROUND DIRECTLY AT AN EQUIPMENT GROUNDING CONDUCTOR TERMINAL OF THE SOURCE AT THE SOURCE , OR AS OTHER WISE NOTED ON DRAWINGS.

3) CIRCUITS SERVING ANY DUPLEX OR SIMPLEX COMPUTER RECEPTACLES

4) ANY CIRCUIT SERVED VIA AN ISOLATION TRANSFORMER OR COMPUTER POWER DISTRIBUTION UNIT.

15. PANELBOARDS:

A. PANELBOARDS SHALL BE OF THE DEAD FRONT TYPE MANUFACTURED IN CODE GAUGE AND SIZE BOXES FOR MOUNTING AS INDICATED ON PLANS COMPLETE WITH TRIM, DOORS AND LOCKS. ALL LOCKS SHALL BE KEYED ALIKE.

B. CIRCUIT BREAKERS SHALL BE OF THE BOLT–ON THERMAL MAGNETIC MOLDED CASE TYPE, AND SHALL HAVE THE TRIP RATINGS AND NUMBER OF POLES SHOWN IN SCHEDULES ON THE CONTRACT DRAWINGS. FOR BLANK (SPACE) COMPARTMENTS, PROVIDE FULL RATED BUS. MINIMUM GUTTER SPACES SHALL BE 5–3/4". SIDES, TOP AND BOTTOM, INCREASE FOR THROUGH FEEDERS. PROVIDE 25% COPPER GROUND BUS AND 100% COPPER NEUTRAL BUS AND INCREASE NEUTRAL BUS INDICATED.

C. LOCKING TABS SHALL BE PROVIDED ON ALL CIRCUIT BREAKERS SERVING EMERGENCY LIGHTING, FIRE ALARM SYSTEM, SECURITY SYSTEMS AND OTHER EMERGENCY OR CRITICAL EQUIPMENT AND AS NOTED ON THE CONTRACT DRAWINGS. A TOTAL OF 5 SPARE LOCKING TABS SHALL BE FURNISHED TO THE OWNER.

D. BUSES SHALL BE HARD DRAWN COPPER OF 98 PERCENT CONDUCTIVITY AND SHALL HAVE CROSS SECTIONAL AREAS LARGE ENOUGH TO LIMIT THE TEMPERATURE RISE, WHEN CARRYING FULL LOAD, TO 35 DEGREES C. ABOVE AN AMBIENT INSIDE THE ENCLOSURE OF 55 DEGREES C. AS DEFINED IN IEEE STANDARD RULES. MAIN BUS CAPACITY SHALL BE AS SHOWN ON THE CONTRACT DRAWINGS.

E. ENCLOSURES SHALL BE SURFACE OR FLUSH AS INDICATED. TRIMS SHALL BE SECURED TO PANEL WITH MACHINE SCREWS. COVERS SHALL BE HINGED DOOR–IN–DOOR CONSTRUCTION WITH CYLINDER LOCKS AND CATCHES. LOCKS MUST BE COMPATIBLE WITH BUILDING STANDARD KEY SYSTEM AND WHEN NONE EXISTS, THEY SHALL BE SIMILAR TO A YALE NO. 911 KEY.

F. DISTRIBUTION AND SUB–DISTRIBUTION PANELBOARD SHALL BE A MINIMUM OF 30" WIDE AND 10" DEEP.

G. ALL STANDARD PANELBOARDS SHALL BE A MINIMUM OF 20" WIDE AND 5 3/4" DEEP.

H. FURNISH ALL PANELBOARDS WITH FEED–THRU LUGS UNLESS OTHERWISE INDICATED ON THE DRAWINGS.

I. ALL NEW PANELBOARDS SHALL BE PROVIDED WITH AN ENGRAVED WHITE CORE LAMACOID NAMEPLATE, WITH 3/4 IN. WHITE LETTERING ON A BLACK BACKGROUND, WITH DESIGNATION LISTED (PANELBOARD NAME), FASTENED WITH EPOXY CEMENT OR OVAL HEAD CHROME PLATED MACHINE SCREWS.

J. THE CIRCUIT DIRECTORY SHALL BE TYPEWRITTEN AND PROVIDED INSIDE EACH PANEL DOOR TO INDICATE EQUIPMENT AND/OR AREA SERVED. DIRECTORY HOLDER SHALL BE METAL FRAME WITH CLEAR PLASTIC, TRANSPARENT COVER. THE TYPEWRITTEN LIST INDICATING CIRCUIT NUMBERS, OUTLETS SUPPLIED AND THEIR LOCATIONS SHALL BE PROVIDED.

K. TIE–BARS SHALL NOT BE USED TO CREATE MULTI–POLE CIRCUITS. MAXIMUM 42 CIRCUITS ALLOWED.

L. ONLY ONE WIRE SHALL BE INSTALLED UNDER EACH CIRCUIT BREAKER LUG.

M. SHORT CIRCUIT RATING OF PANELBOARDS SHALL NOT BE LESS THAN AS INDICATED ON THE CONTRACT DRAWINGS OR SPECIFIED HEREIN. WHERE NOT INDICATED OR SPECIFIED THE MINIMUM SHORT CIRCUIT RATING SHALL BE EQUAL TO THE INTERRUPTING CAPACITY OF THE LOWEST RATED CIRCUIT BREAKER IN THE PANELBOARD, BUT IN NO CASE LESS THAN 10,000 AMPERES R.M.S. SYMMETRICAL FOR 208Y/120 VOLT SYSTEM AND 14,000 AMPERES R.M.S. SYMMETRICAL FOR 480Y/277 VOLT SYSTEM. SERIES RATED PANELBOARDS SHALL BE USED TO ACHIEVE REQUIRED SHORT CIRCUIT RATINGS.

N. FOR ALL EXISTING PANELBOARDS, CONTRACTOR SHALL PROVIDE NEW CIRCUIT BREAKERS TO REPLACE EXISTING AS REQUIRED AS INDICATED ON DRAWINGS.

16. INTERCOM CONDUIT SYSTEM:

A. PROVIDE COMPLETE SYSTEM OF: RACEWAYS AND ACCESSORIES, OUTLET BOXES, SLEEVES AND FISHWIRES.

B. EQUIPMENT SHALL CONFORM TO REQUIREMENTS OF INTERCOM MANUFACTURER.

C. OUTLETS SHALL BE:

1)WALL: 4 IN. SQUARE WITH SINGLE GANG COVER PLATE.

D. PROVIDE FISHWIRES, IN RACEWAYS OVER 10 FT LONG.

E. CONDUIT SHALL BE 3/4 IN. MINIMUM. FURNISH EMPTY CONDUIT FROM EACH APARTMENT TO MAIN INTERCOM CONTROLLER AT ENTRANCE.

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PROJECT NUMBER: 21242

goodblend MEDICAL MARIJUANA

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DRAWING SCALE:

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DRAWING TITLE:
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ELECTRICAL LIGHTING PLAN GENERAL NOTES

1. E.C. TO COORDINATE WITH ARCHITECT/OWNER FOR FINAL SELECTION OF LIGHTING FIXTURE, MOUNTING DETAILS AND FINISHES.
2. EXISTING LIGHTING FIXTURES AND EXISTING LIGHTING CONTROL IN THE BASEMENT AREA TO REMAIN. E.C. TO FIELD VERIFY OPERABLE CONDITION OF EXISTING LIGHTING FIXTURES AND EXISTING LIGHTING CONTROL IN BASEMENT AREA. REPLACE IF FOUND INOPERABLE. BASE BID ACCORDINGLY.
3. E.C. TO REROUTE THE EXISTING LIGHTING CIRCUITS IN THE BASEMENT AREA TO NEW PANEL "A". INFORM ENGINEER FOR ANY DISCREPANCY FOUND.

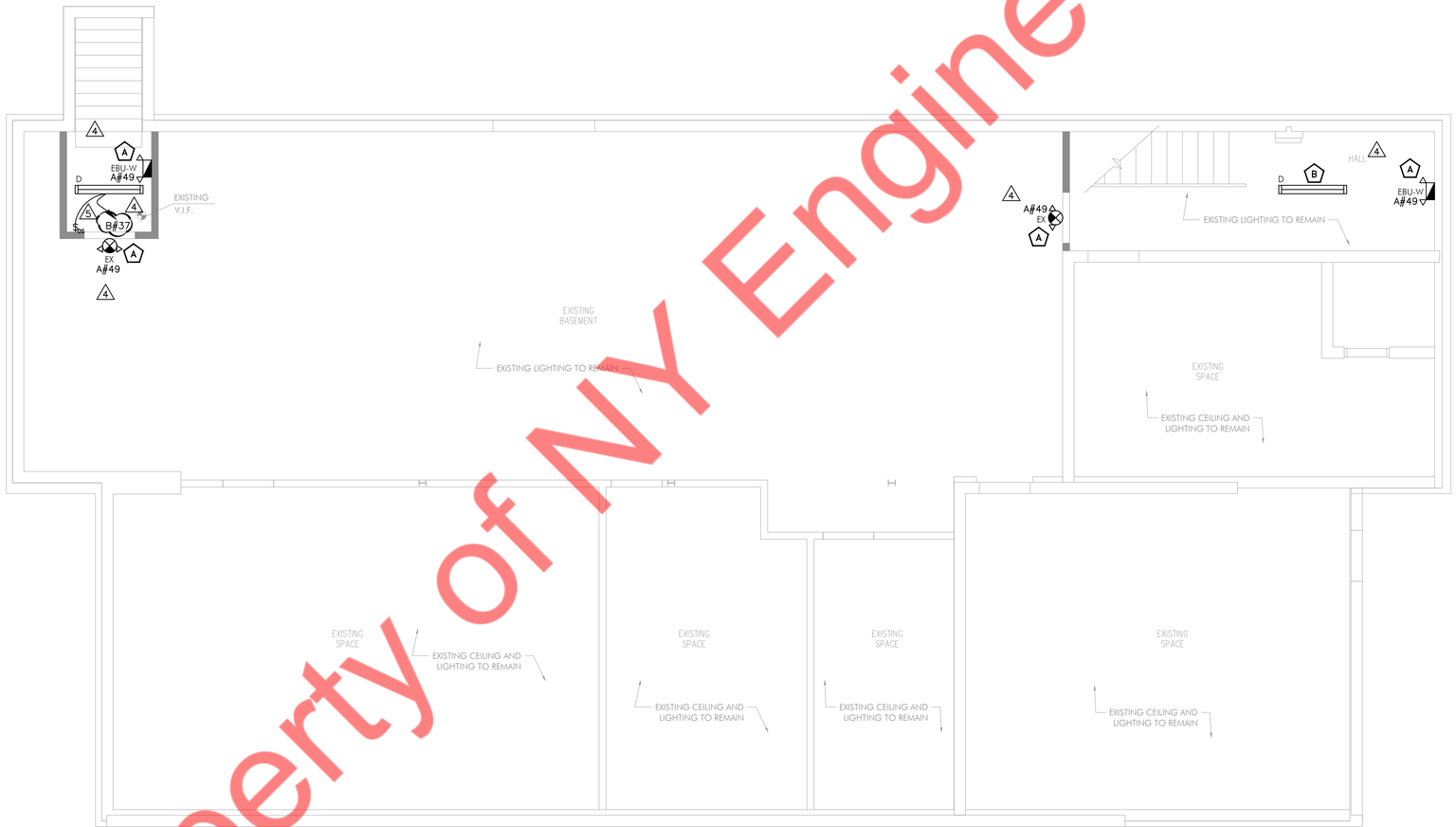
ELECTRICAL LIGHTING PLAN KEYED WORK NOTES

(A) CONNECT EMERGENCY/EXIT LIGHTING FIXTURES TO THE CIRCUIT NUMBER SHOWN AHEAD OF ALL SWITCHING AND CONTROLS.

(B) E.C. TO VERIFY THE OPERATING CONDITION OF EXISTING LIGHT FIXTURE AND LIGHTING CONTROL IN FIELD. REPLACE IF INOPERABLE. BASE BID ACCORDINGLY.

LIGHT FIXTURE SCHEDULE:

SYMBOL	TYPE	DESCRIPTION	WATTAGE	QUANTITY
	D	4'-0" SUSPENDED LED LINEAR LIGHT FIXTURE TBD MOUNTING HEIGHT: MATCH EXISTING	TBD	1
	EX	LED EXIT LIGHT WITH BATTERY BACKUP (4)	3	2
	EBU-W	EMERGENCY LIGHT FIXTURE WITH BATTERY BACKUP	2	2 (4)



BASEMENT FLOOR LIGHTING PLAN

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

PROJECT:
GOODBLEND READING

PROJECT NUMBER: 21242

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BASEMENT FLOOR LIGHTING PLAN

DRAWING NUMBER:
E1.0

ELECTRICAL LIGHTING PLAN GENERAL NOTES

1. E.C. TO COORDINATE WITH ARCHITECT/OWNER FOR FINAL SELECTION OF LIGHTING FIXTURE, MOUNTING DETAILS AND FINISHES.

ELECTRICAL LIGHTING PLAN KEYED WORK NOTES

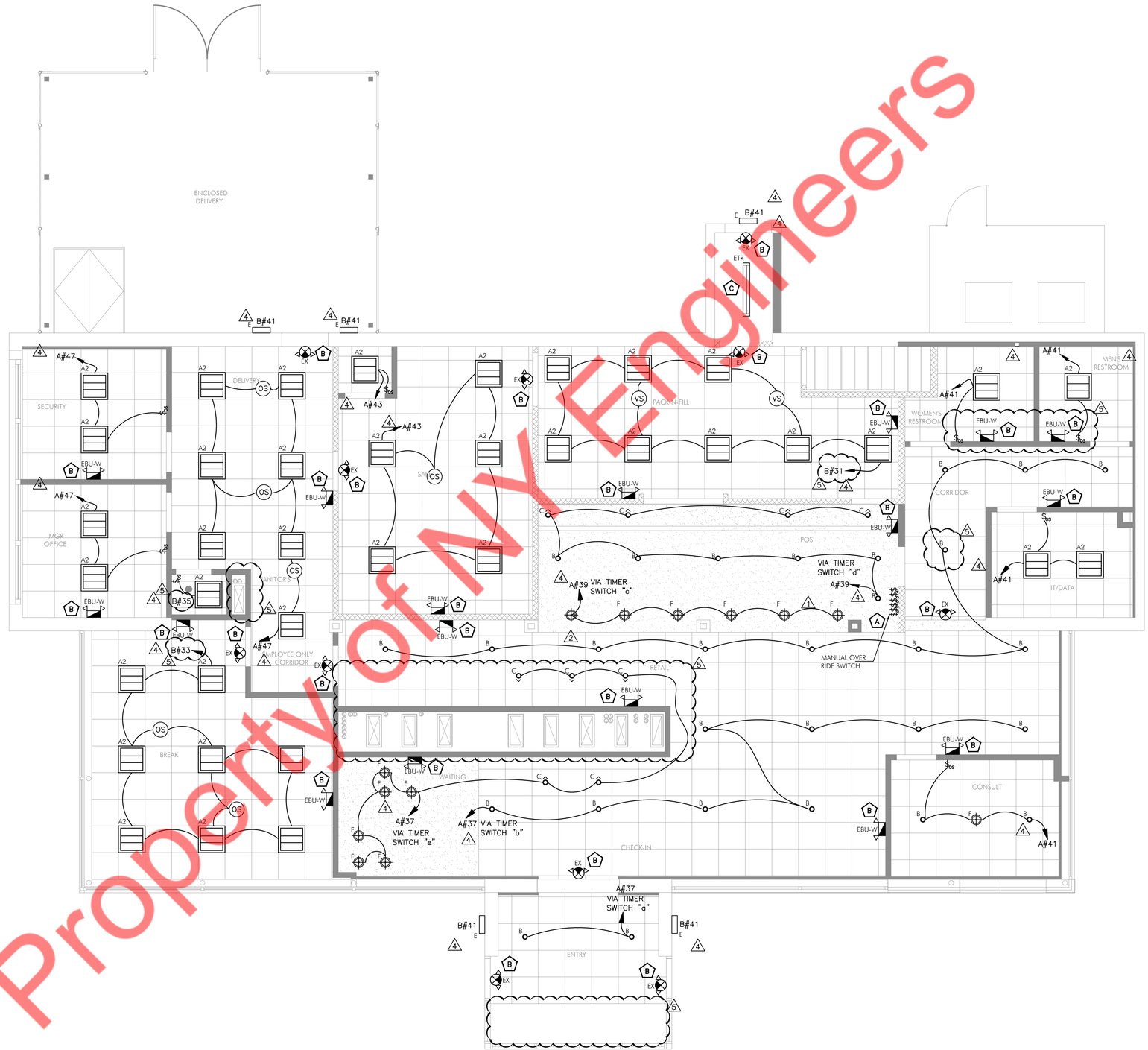
(A) PROVIDE MANUAL OVERRIDE SWITCH FOR AFTER HOURS CONTROL OF LIGHT FIXTURES ON LIGHTING CONTROL PANEL.

(B) CONNECT ALL EMERGENCY, EGRESS AND NIGHT LIGHT FIXTURES TO THE NEAREST LIGHTING BRANCH CIRCUIT AHEAD OF ALL SWITCHING AND CONTROLS.

(C) E.C. TO VERIFY THE OPERATING CONDITION OF EXISTING LIGHT FIXTURE AND LIGHTING CONTROL IN FIELD. REPLACE IF INOPERABLE. BASE BID ACCORDINGLY.

LIGHT FIXTURE SCHEDULE:

SYMBOL	TYPE	DESCRIPTION	WATTAGE	QUANTITY
	A2	2X2 LED TROFFER DAY-BRITE CFI BY SIGNIFY 2FXP38B835-2-DS-UNB-DIM MOUNTING HEIGHT: 9'-6" AFF	33	38
	B	4.5" LED DOWNLIGHT HE WILLIAMS 4DR-TL-L10/835-QS-DIM1-UNV-OW-OF- CS-N-F1 MOUNTING HEIGHT: 9'-6"	9	29 (5)
	C	4.5" LED WALL WASHER HE WILLIAMS 4ARL20 835 DIM UNV/ OWOFCSMWT N F1 MOUNTING HEIGHT: 9'-6"	20	9
	E	EXTERIOR LED WALL PACK WILLIAMS VOLTAIRE VWPV-L30-TFT-BLK -CGL-DIM-UNV MOUNTING HEIGHT: TBD	36	(4) 3
	F	PENDENT LIGHT FIXTURES WICKER-GLOBE-PENDANT-W3879	30	12
	ETR	FUORESCENT TUBE LIGHT	TBD	1
	EBU-W	EMERGENCY LIGHT FIXTURE WITH BATTERY BACKUP	2	17
	EX	(4) LED EXIT LIGHT WITH BATTERY BACKUP	3	(4) 10



FIRST FLOOR LIGHTING PLAN

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

PROJECT:
GOODBLEND READING

PROJECT NUMBER: 21242

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FIRST FLOOR LIGHTING PLAN

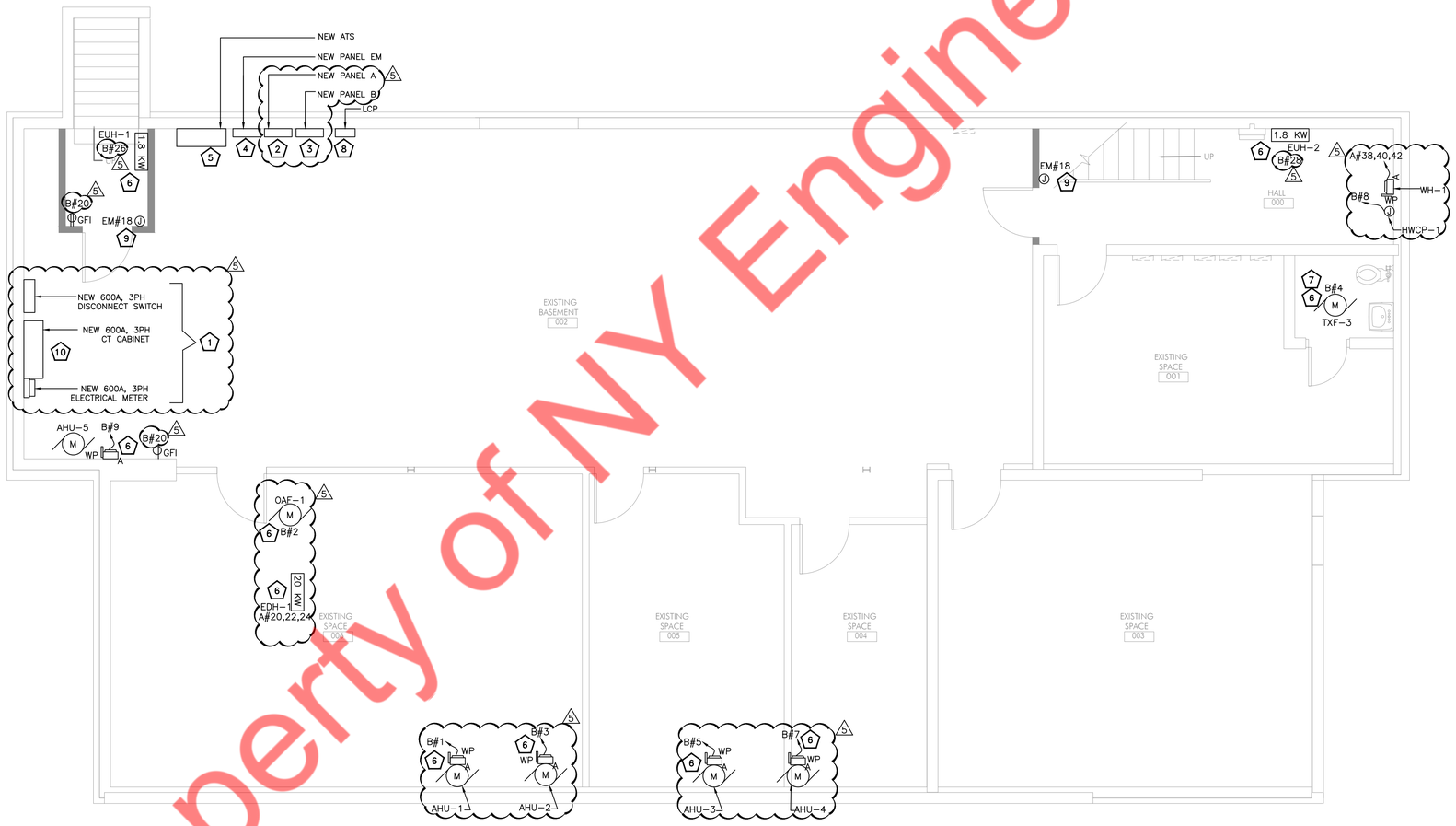
DRAWING NUMBER:
E1.1

ELECTRICAL POWER PLAN GENERAL NOTES

1. ALL THE EXISTING RECEPTACLES IN THE BASEMENT AREA SHALL REMAIN. E.C. TO VERIFY THE OPERABLE CONDITION OF EXISTING RECEPTACLE IN FIELD. REPLACE IF FOUND INOPERABLE. BASE BID ACCORDINGLY.
2. E.C. TO REROUTE THE EXISTING CIRCUIT OF RECEPTACLES IN THE BASEMENT AREA TO NEW PANEL "A".
3. REFER TO RISER DIAGRAM ON ELECTRICAL SHEET E4.0 FOR THE ELECTRICAL POWER DISTRIBUTION AND EXACT RATING OF ELECTRICAL PANELS.

ELECTRICAL POWER PLAN KEYED WORK NOTES

1. NEW ELECTRICAL METER, DISCONNECT SWITCH AND CT CABINET FOR THE PROJECT SPACE. E.C SHALL COORDINATE WITH OWNER/UTILITY FOR THE EXACT LOCATION IN FIELD.
2. NEW 600A, 120/240V, 3–PHASE ELECTRICAL PANEL "A" FOR THE PROJECT SPACE. E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR EXACT LOCATION OF PANEL "A" IN FIELD.
3. NEW 150A, 120/240V, 3–PHASE ELECTRICAL PANEL "B" FOR THE PROJECT SPACE. E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR EXACT LOCATION OF PANEL "B" IN FIELD.
4. NEW 70A, 120/240V, 1–PHASE ELECTRICAL PANEL "EM" FOR THE PROJECT SPACE. E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR EXACT LOCATION OF PANEL "EM" IN FIELD.
5. NEW 70A, 120/240V, 1–PHASE ATS FOR THE PROJECT SPACE. E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR EXACT LOCATION OF ATS IN FIELD.
6. ELECTRICAL CONTRACTOR SHALL COORDINATE DISCONNECT AND FUSE REQUIREMENT FOR MECHANICAL UNIT WITH MECHANICAL CONTRACTOR AND EQUIPMENT MANUFACTURER FOR FINAL SELECTION PRIOR TO ROUGH–IN.
7. EXHAUST FANS SHALL BE CIRCUITED AND CONTROLLED ALONG WITH THE LIGHT FIXTURES IN THE SAME ROOM.
8. NEW LIGHTING CONTACTOR PANEL. E.C. TO COORDINATE WITH ARCHITECT/OWNER FOR LOCATION IN FIELD.
9. JUNCTION BOX FOR CARD READER.
10. E.C. SHALL DEMOLISH THE EXISTING 200A 3PH DISCONNECT SWITCH, 200A 3PH ELECTRICAL METER, WIREWAY & 400A 1PH DISCONNECT SWITCH AND PROVIDE NEW ELECTRICAL METER, CT CABINET AND DISCONNECT SWITCH AS SPECIFIED.



BASEMENT FLOOR ELECTRICAL POWER PLAN

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

PROJECT:
GOODBLEND READING

PROJECT NUMBER: 21242

goodblend MEDICAL MARIJUANA

Parallel

STAMP:

ISSUE:	DATE:
ISSUE FOR PERMIT	02.25.2022
BULLETIN 1	03.18.2022
BULLETIN 2	04.28.2022
FIELD COORDINATION	08.03.2022
BULLETIN 3	08.26.2022
FIELD COORDINATION	09.30.2022

DRAWING SCALE:

DRAWN BY:NYE | CHECKED BY:NYE

DRAWING TITLE:
BASEMENT FLOOR ELECTRICAL POWER PLAN

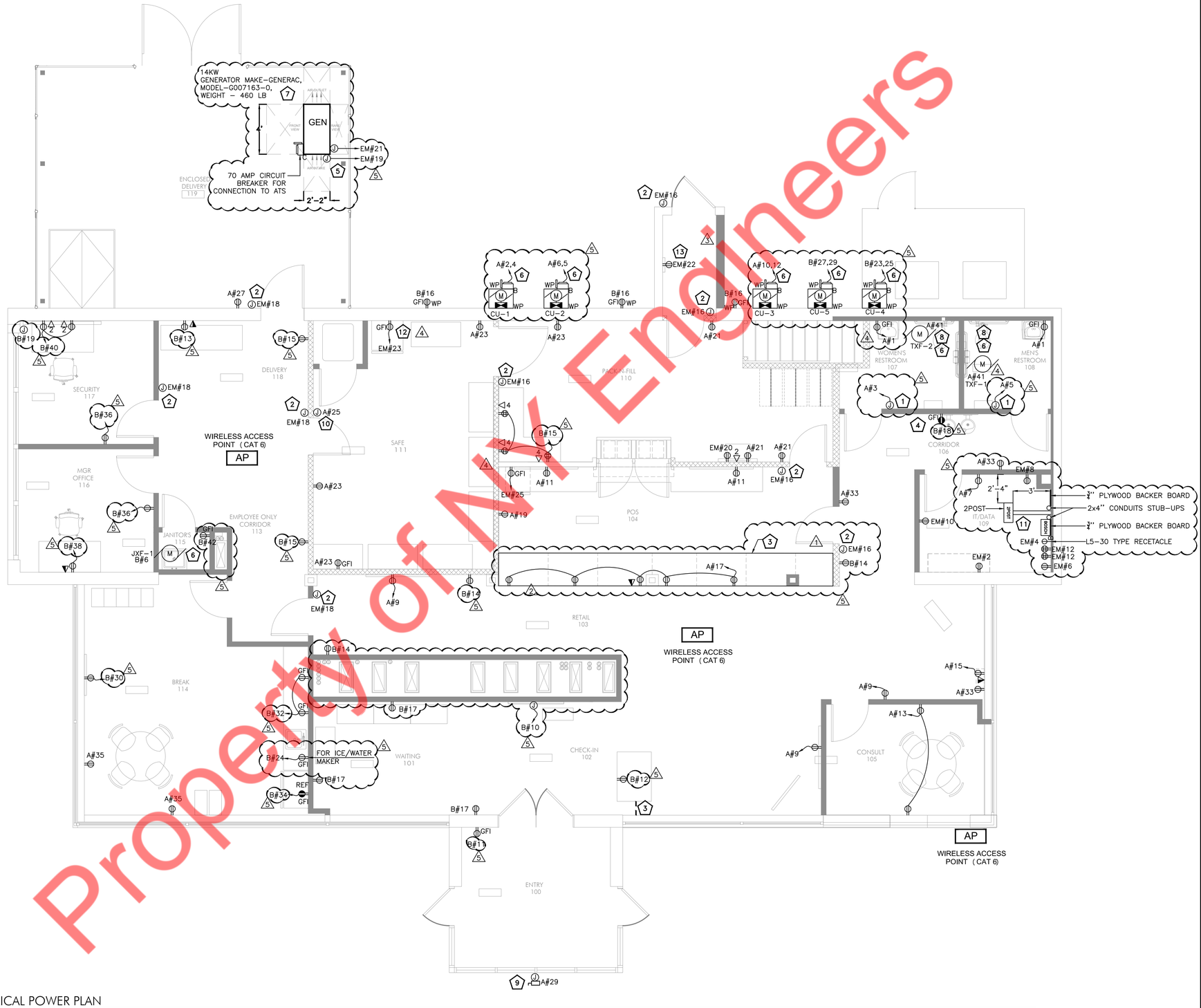
DRAWING NUMBER:
E2.0

ELECTRICAL POWER PLAN GENERAL NOTES

1. E.C. SHALL COORDINATE RECEPTACLES MOUNTING HEIGHT WITH ARCHITECT/OWNER PRIOR TO ROUGH-IN.

ELECTRICAL POWER PLAN KEYED WORK NOTES

1. J-BOX FOR HAND DRYERS. VERIFY EXACT LOCATIONS AND ELECTRICAL REQUIREMENT IN FIELD PRIOR TO COMMENCING ANY WORK.
2. JUNCTION BOX FOR CARD READER.
3. PROVIDE CONDUIT TRENCHED FROM NEAREST WALL TO MILLWORK. RECEPTACLES LOCATED IN MILLWORK SHALL BE POWERED FROM JUNCTION BOXES, STUBBING UP TO EACH DEVICES. COORDINATE RECEPTACLE INSTALLATION AND MOUNTING HEIGHTS WITH MILLWORK VENDOR PRIOR TO ROUGH-IN.
4. PROVIDE POWER TO ELECTRIC WATER COOLER. COORDINATE EXACT REQUIREMENTS WITH PLUMBING CONTRACTOR.
5. PROVIDE POWER FOR GENERATOR BLOCK HEATER AND BATTERY CHARGER.
6. ELECTRICAL CONTRACTOR SHALL COORDINATE DISCONNECT AND FUSE REQUIREMENT FOR MECHANICAL UNIT WITH MECHANICAL CONTRACTOR AND EQUIPMENT MANUFACTURER FOR FINAL SELECTION PRIOR TO ROUGH-IN.
7. PROPOSED 14 KW GENERATOR LOCATION. E.C. TO COORDINATE THE EXACT LOCATION OF GENERATOR WITH ARCHITECT/OWNER IN FIELD AND ACCORDINGLY PROVIDE THE ELECTRICAL CABLE FROM GENERATOR TO ATS.
8. EXHAUST FANS SHALL BE CIRCUITED AND CONTROLLED ALONG WITH THE LIGHT FIXTURES IN THE SAME ROOM.
9. PROVIDE A 30AMP DISCONNECT SWITCH WITH LOCK-OFF CAPABILITY FOR STOREFRONT SIGN. VERIFY EXACT LOCATION AND ELECTRICAL REQUIREMENTS CONNECTION TO STOREFRONT SIGN. VERIFY EXACT LOCATION OF POWER FEED AND PUNCH-THRU WITH SIGNAGE CONTRACTOR TO ENSURE NO EXCESSIVE CONDUIT IS RUN NEITHER INSIDE NOT OUTSIDE. TIE CIRCUIT INTO LIGHTING CONTROL SYSTEM FOR CONTROLS.
10. JUNCTION BOX FOR SMART SAFE. E.C. TO COORDINATE WITH EQUIPMENT MANUFACTURER FOR EXACT POWER AND DATA REQUIREMENTS.
11. E.C. TO PROVIDE TWO 4" CONDUIT STUB UPS, 3/4" PLYWOOD BACKER-BOARD AND LADDER CONNECTING 2POST. E.C. TO PROVIDE DEDICATED L5-30P RECEPTACLE AND GROUND BAR FOR IT ROOM.
12. RECEPTACLE FOR THE REACH IN REFRIGERATOR. E.C. SHALL COORDINATE WITH OWNER FOR THE FINAL SELECTION OF REACH IN REFRIGERATOR AND ELECTRICAL REQUIREMENT IN FIELD.
13. E.C. SHALL INSTALL RECEPTACLE FOR WALL MOUNTED TIME CLOCK @ 10" AFF.



FIRST FLOOR ELECTRICAL POWER PLAN

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

PROJECT:
GOODBLEND READING

PROJECT NUMBER: 21242

goodblend MEDICAL MARIJUANA

Parallel

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FIELD COORDINATION	09.30.2022

DRAWING SCALE:

DRAWN BY:NYE | CHECKED BY:NYE

DRAWING TITLE:
FIRST FLOOR ELECTRICAL POWER PLAN

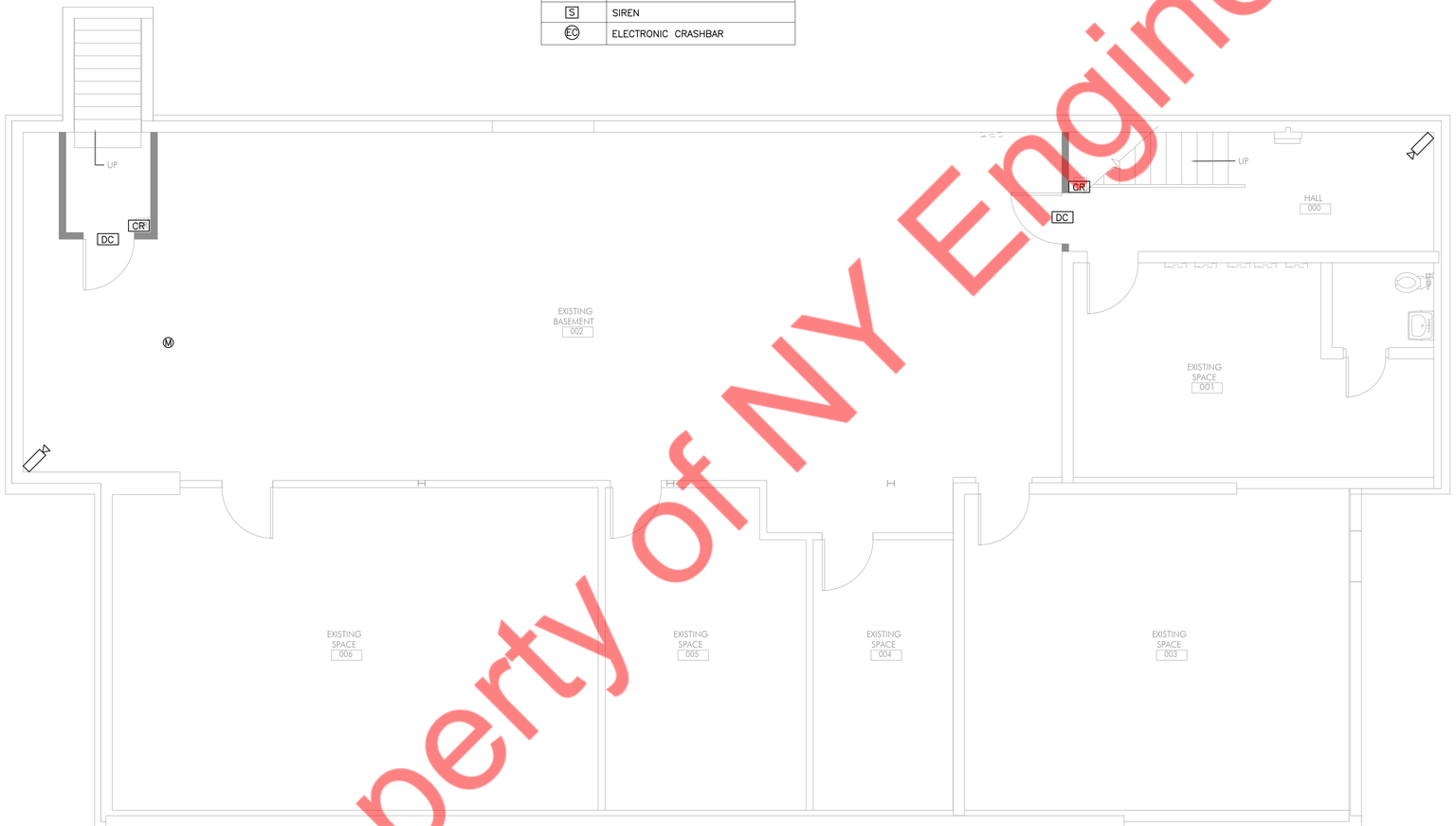
DRAWING NUMBER:
E2.1

LEGEND	
	180 DEGREE CCTV CAMERA
	360 DEGREE CCTV CAMERA
GB	GLASS BREAK SENSOR
CR	CARD READER
DC	DOOR CONTACT
SSCP	SECURITY SYSTEM ALARM CONTROL PANEL
Ⓜ	CEILING MOUNTED MOTION DETECTOR
Ⓟ	PANIC BUTTON
ES	ELECTRONIC STRIKE
S	SIREN
EC	ELECTRONIC CRASHBAR

SECURITY PLAN GENERAL NOTES:

A. SECURITY PLAN IS FOR REFERENCE ONLY. G.C. TO COORDINATE WITH OWNER AND OWNER'S SECURITY VENDOR PRIOR TO CONSTRUCTION FOR EXACT LOCATIONS AND SPECIFICATIONS OF LV DEVICES.

B. ALL EXTERNAL MOUNTED CAMERAS TO BE PROVIDED WITH WEATHER PROOF PROTECTION.



BASEMENT FLOOR SECURITY PLAN

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

PROJECT:
GOODBLEND READING

PROJECT NUMBER: 21242

goodblend MEDICAL MARIJUANA

Parallel

STAMP:

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ISSUE FOR PERMIT	02.25.2022
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FIELD COORDINATION	08.03.2022
BULLETIN 3	08.26.2022
FIELD COORDINATION	09.30.2022

DRAWING SCALE:

DRAWN BY:NYE | CHECKED BY:NYE

DRAWING TITLE:
BASEMENT FLOOR SECURITY PLAN

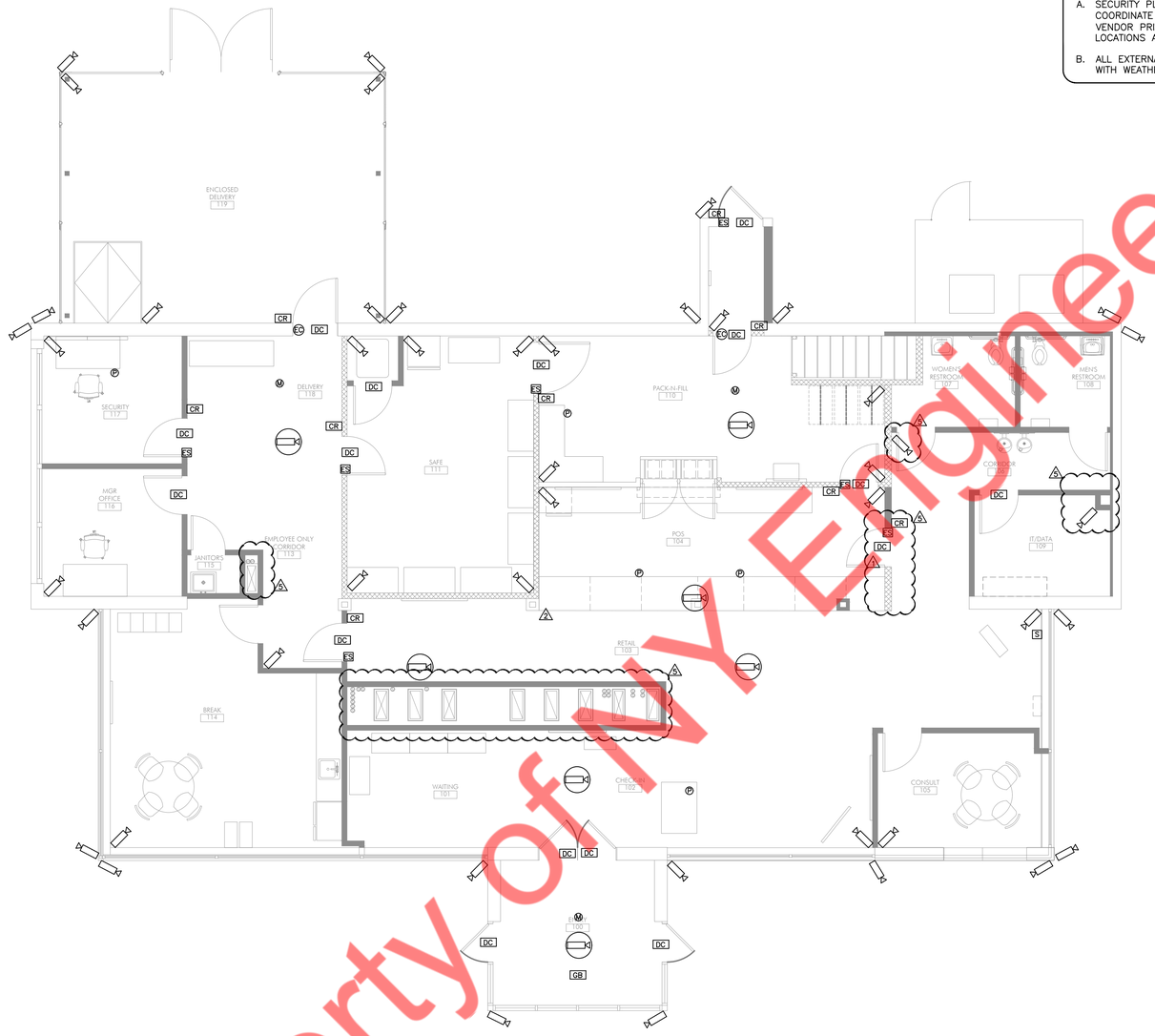
DRAWING NUMBER:
E3.0

SECURITY PLAN GENERAL NOTES:

A. SECURITY PLAN IS FOR REFERENCE ONLY. G.C. TO COORDINATE WITH OWNER AND OWNER'S SECURITY VENDOR PRIOR TO CONSTRUCTION FOR EXACT LOCATIONS AND SPECIFICATIONS OF LV DEVICES.

B. ALL EXTERNAL MOUNTED CAMERAS TO BE PROVIDED WITH WEATHER PROOF PROTECTION.

LEGEND	
	180 DEGREE CCTV CAMERA
	360 DEGREE CCTV CAMERA
GB	GLASS BREAK SENSOR
CR	CARD READER
DC	DOOR CONTACT
SSCP	SECURITY SYSTEM ALARM CONTROL PANEL
M	CEILING MOUNTED MOTION DETECTOR
P	PANIC BUTTON
ES	ELECTRONIC STRIKE
S	SIREN
EC	ELECTRONIC CRASHBAR



FIRST FLOOR SECURITY PLAN

SCALE: 3/16" = 1'-0"

PROJECT:
GOODBLEND READING

PROJECT NUMBER: 21242

goodblend MEDICAL MARIJUANA

Parallel

STAMP:

ISSUE:	DATE:
ISSUE FOR PERMIT	02.25.2022
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BULLETIN 2	04.28.2022
FIELD COORDINATION	08.03.2022
BULLETIN 3	08.26.2022
FIELD COORDINATION	09.30.2022

DRAWING SCALE:

DRAWN BY:NYE | CHECKED BY:NYE

DRAWING TITLE:
FIRST FLOOR SECURITY PLAN

DRAWING NUMBER:
E3.1

PANEL: A (NEW) — **MOUNTING:** SURFACE

120/240 VOLTS, **3** PHASE, **4** WIRE — **PANEL LOCATION:** BASEMENT

MAIN CB: 600 A — **MLO:** NA — **BUS:** 600 A MIN, — **FED FROM:** 600A SERVICE DISCONNECT

NOTE:

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	RESTROOM MEN'S/WOMEN'S RECEPTACLE	R	0.36	2#12, #12G, 3/4"C	3.06			2#8, #10G, 3/4"C	2.70	H	CU-1	2P-40A	2
3	20	HAND DRYER -REST ROOM	O	1.00	2#12, #12G, 3/4"C		3.70			2.70	H			4
5	20	HAND DRYER -REST ROOM	O	1.00	2#12, #12G, 3/4"C			3.70	2#8, #10G, 3/4"C	2.70	H	CU-2	2P-40A	6
7	20	RECEPTACLE - IT/DATA	R	0.18	2#12, #12G, 3/4"C	2.88				2.70	H			8
9	20	RETAIL RECEPTACLE - MARKETING TV	R	0.18	2#12, #12G, 3/4"C		2.88		2#8, #10G, 3/4"C	2.70	H	CU-3	2P-40A	10
11	20	POS AREA RECEPTACLE- MARKETING TV	R	0.36	2#12, #12G, 3/4"C			3.06		2.70	H			12
13	20	CONSULT RECEPTACLE	R	0.36	2#12, #12G, 3/4"C	12.40				12.04	O			14
15	20	ATM RECEPTACLE	R	0.18	2#12, #12G, 3/4"C		12.22		4#1/0, #6G, 1-1/2"C.	12.04	O	PANEL B	3P-150A	16
17	20	POS AREA RECEPTACLE- GTG	R	0.90	2#12, #12G, 3/4"C			12.94		12.04	O			18
19	20	POS AREA RECEPTACLE- GENERAL USE	R	0.54	2#12, #12G, 3/4"C	5.76				5.22	O			20
21	20	PACK AND FILL AREA RECEPTACLE	R	1.08	2#12, #12G, 3/4"C		6.30		3#8, #10G, 3/4"C.	5.22	O	EDH-1	3P-50A	22
23	20	SAFE AREA RECEPTACLE- GENERAL USE	R	0.36	2#12, #12G, 3/4"C			5.58		5.22	O			24
25	20	SAFE AREA RECEPTACLE	R	0.18	2#12, #12G, 3/4"C	0.18						SPARE	20	26
27	20	ENCLOSED DELIVERY AREA RECEPTACLE	R	0.18	2#12, #12G, 3/4"C		0.18					SPARE	20	28
29	20	JB FOR ENTRY LOGO	O	0.50	2#12, #12G, 3/4"C			0.50				SPARE	20	30
31	20	RECEPTACLE - FUTURE BUILD	R	0.36	2#12, #12G, 3/4"C	0.36						SPARE	20	32
33	20	RECEPTACLE CONVENIENCE	R	0.54	2#12, #12G, 3/4"C		5.06		2#4, #8G, 1"C	4.52	O	PANEL EM VIA ATS	2P-70A	34
35	20	RECEPTACLE CONVENIENCE	R	0.36	2#12, #12G, 3/4"C			4.88		4.52	O			36
37	20	LTG-WAITING, CHECKIN, RETAIL,CORRIDOR	L	0.24	2#12, #12G, 3/4"C	3.24				3.00	O			38
39	20	LTG-POS	L	0.13	2#12, #12G, 3/4"C		3.13		3#10, #10G, 3/4"C	3.00	O	WATER HEATER (WH-1)	3P-30A	40
41	20	LTG- CONSULT,IT/DATA,REST ROOMS, TXF-1,TXF-2	L	0.20	2#12, #12G, 3/4"C			3.20		3.00	O			42
		TOTAL CONNECTED LOAD (KVA)				**27.89**	**33.48**	**33.86**						

PANEL: B (NEW) — **MOUNTING:** SURFACE

120/240 VOLTS, **3** PHASE, **4** WIRE — **PANEL LOCATION:** BASEMENT

MAIN CB: NA — **MLO:** 150A — **BUS:** 150 A MIN, — **FED FROM:** PANEL A

NOTE:

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	AHU-1	H	2.12	2#12, #12G, 3/4"C	2.98			2#12, #12G, 3/4"C	0.86	M	OAF-1	20	2
3	20	AHU-2	H	2.12	2#12, #12G, 3/4"C		2.30		2#12, #12G, 3/4"C	0.18	M	TXF-3	20	4
5	20	AHU-3	H	2.12	2#12, #12G, 3/4"C			2.30	2#12, #12G, 3/4"C	0.18	M	JXF-1	20	6
7	20	AHU-4	H	2.12	2#12, #12G, 3/4"C	2.64			2#12, #12G, 3/4"C	0.53	M	CIRCULATION PUMP (HWCP-1)	20	8
9	20	AHU-5	H	2.12	2#12, #12G, 3/4"C		2.66		2#12, #12G, 3/4"C	0.54	R	WAITING AREA JB - GOODBLEND LOGO	20	10
11	20	RECEPTACLE - ENTRY	R	0.18	2#12, #12G, 3/4"C			0.54	2#12, #12G, 3/4"C	0.36	R	CHECK IN AREA RECEPTACLE - DESK	20	12
13	20	DELIVERY AREA RECEPTACLE - DESK	R	0.18	2#12, #12G, 3/4"C	0.90			2#12, #12G, 3/4"C	0.72	R	RETAIL/CORRIDOOR AREA RECEPTACLE - GENERAL	20	14
15	20	DELIVERY AREA RECEPTACLE - GENERAL USE	R	0.36	2#12, #12G, 3/4"C		0.90		2#12, #12G, 3/4"C	0.18	R	RETAIL RECEPTACLE - EXTERIOR	20	16
17	20	WAITING AREA RECEPTACLE - GENERAL USE	R	0.54	2#12, #12G, 3/4"C			1.62	2#12, #12G, 3/4"C	1.08	R	CORRIDOOR AREA RECEPTACLE - WATER COOLER	20	18
19	20	MOTORIZED DAMPER	M	0.20	2#12, #12G, 3/4"C	0.56			2#12, #12G, 3/4"C	0.36	R	BASEMENT- SERVICE RECEPTACLE	20	20
21	20	SPARE					0.00					SPARE	20	22
23	2P-40A	CU-4	H	2.70	2#8, #10G, 3/4"C			3.11	2#12, #12G, 3/4"C	0.40	E	ICE/WATER MAKER MACHINE	20	24
25			H	2.70		4.50			2#12, #12G, 3/4"C	1.80	O	EUH-1	20	26
27	2P-40A	CU-5	H	2.70	2#8, #10G, 3/4"C		4.50		2#12, #12G, 3/4"C	1.80	O	EUH-2	20	28
29			H	2.70				2.88	2#12, #12G, 3/4"C	0.18	R	BREAK ROOM RECEPTACLE- TEAM SCREEN	20	30
31	20	LTG-PACK-N-FILL, SAFE, FUTURE BUILD	L	0.46	2#12, #12G, 3/4"C	1.00			2#12, #12G, 3/4"C	0.54	R	BREAK ROOM RECEPTACLE- PANTRY	20	32
33	20	LTG-BREAK ROOM	L	0.26	2#12, #12G, 3/4"C		0.44		2#12, #12G, 3/4"C	0.18	R	BREAK ROOM RECEPTACLE- REF.	20	34
35	20	LTG-SECURITY,MGR OFFICE, DELIVERY	L	0.40	2#12, #12G, 3/4"C			0.76	2#12, #12G, 3/4"C	0.36	R	SECURITY & MGR ROOM RECEPTACLE	20	36
37	20	BASEMENT STAIRCASE NEW LTG , EXIT SIGN	L	0.10	2#12, #12G, 3/4"C	0.28			2#12, #12G, 3/4"C	0.18	R	MGR ROOM RECEPTACLE	20	38
39	20	FUTURE PROVISION FOR BASEMENT LIGHTING	L	0.50	2#12, #12G, 3/4"C		0.86		2#12, #12G, 3/4"C	0.36	R	SECURITY ROOM RECEPTACLE - TV'S	20	40
41	20	LTG- EXTERIOR	L	0.10	2#12, #12G, 3/4"C			0.28	2#12, #12G, 3/4"C	0.18	R	JANITOR ROOM RECEPTACLE	20	42
		TOTAL CONNECTED LOAD (KVA)				**12.87**	**11.66**	**11.48**						

PANEL: EM (NEW) — **MOUNTING:** SURFACE

120/240 VOLTS, **1** PHASE, **3** WIRE — **PANEL LOCATION:** BASEMENT

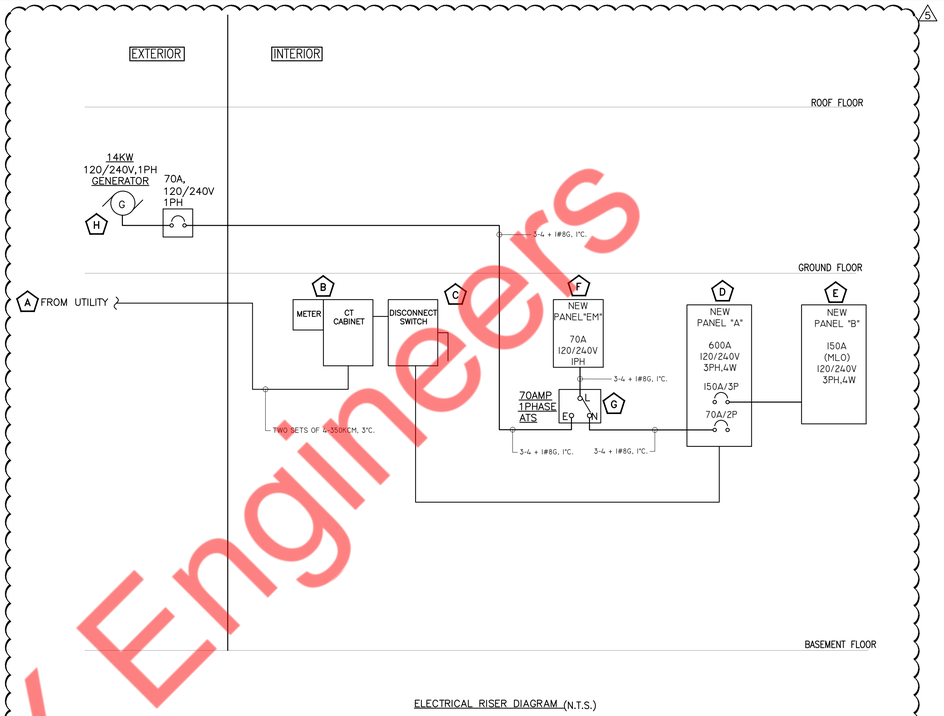
MAIN CB: 70 A — **MLO:** NA — **BUS:** 125A MIN, — **FED FROM:** ATS

NOTE:

CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD	LOAD TYPE	LOAD (KVA)	MINIMUM BRANCH CIRCUIT	PER PHASE (KVA) A	C	MINIMUM BRANCH CIRCUIT	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD	TRIP AMPS	CKT NO.
1	20	SPARE				0.36		2#12, #12G, 3/4"C	0.36	O	SECURITY SYSTEM	20	2
3	20	SPARE					1.50	2#10, #10G, 3/4"C	1.50	O	SPECIAL RECEPTACL L5-30	30	4
5	20	SPARE				0.60		2#12, #12G, 3/4"C	0.60	O	SECURITY SYSTEM DVR	20	6
7	20	SPARE					0.36	2#12, #12G, 3/4"C	0.36	O	SECURITY SYSTEM DVR	20	8
9	20	SPARE				0.36		2#12, #12G, 3/4"C	0.36	O	SECURITY SYSTEM DVR	20	10
11	20	SPARE					0.80	2#12, #12G, 3/4"C	0.80	O	RECEPTACLE-IT/DATA ROOM	20	12
13	20	SPARE				1.50		2#12, #12G, 3/4"C	1.50	O	MISCELLANEOUS LOAD OF SECURITY SYSTEM	20	14
15	20	SPARE					0.50	2#12, #12G, 3/4"C	0.50	O	JUNCTION BOX FOR CARD READER	20	16
17	20	SPARE				0.60		2#12, #12G, 3/4"C	0.60	O	JUNCTION BOX FOR CARD READER	20	18
19	20	GENERATOR BATTERY CHARGER	O	1.00	2#12, #12G, 3/4"C		1.36	2#12, #12G, 3/4"C	0.36	R	SECURITY MONITOR RECEPTACLE	20	20
21	20	GENERATOR JACKET HEATER	O	0.50	2#12, #12G, 3/4"C	0.68		2#12, #12G, 3/4"C	0.18	R	WALL MOUNTED TIME CLOCK RECEPTACLE	20	22
23	20	REACH IN REFRIGERATOR	E	0.52	2#12, #12G, 3/4"C		0.52				SPARE	20	24
25	20	UNDERCOUNTER FRIDGE SUMMIT AL57G	E	0.12	2#12, #12G, 3/4"C	0.12					SPARE	20	26
27	20	SPARE					0.00				SPARE	20	28
29	20	SPARE				0.00					SPARE	20	30
		TOTAL CONNECTED LOAD (KVA)				**4.22**	**5.04**						

PANEL SCHEDULE GENERAL NOTES:

A. E.C. TO REROUTE THE ALL EXISTING LIGHTING AND RECEPTACLE CIRCUITS IN THE BASEMENTS TO SPARE CIRCUITS SHOWN IN NEW PANEL A".



ELECTRICAL RISER DIAGRAM (N.T.S.)

ELECTRICAL RISER DIAGRAM KEY NOTES

A. NEW 600 AMPS, 120/240V, 3-PHASE, 4 WIRE INCOMING SERVICE FOR THE SPACE. E.C. SHALL COORDINATE WITH OWNER/UTILITY FOR EXACT LOCATION IN FIELD.

B. NEW 600 AMPS, 120/240V, 3-PHASE, 4 WIRE ELECTRICAL METER AND CT CABINET FOR THE SPACE. E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR THE EXACT LOCATION IN FIELD.

C. NEW 600 AMPS, 120/240V, 3-PHASE, 4 WIRE DISCONNECT SWITCH FOR THE SPACE. E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR THE EXACT LOCATION IN FIELD.

D. NEW 600 AMPS, 120/240V, 3-PHASE, 4 WIRE ELECTRICAL PANEL "A" FOR THE SPACE. E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR EXACT LOCATION IN FIELD.

E. NEW 150 AMPS, 120/240V, 3-PHASE, 4 WIRE ELECTRICAL PANEL "B" FOR THE SPACE. E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR EXACT LOCATION IN FIELD.

F. NEW 70 AMPS, 120/240V, 1-PHASE EMERGENCY ELECTRICAL PANEL "EM". E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR EXACT LOCATION IN FIELD.

G. NEW 70 AMPS, 120/240V, 1-PHASE ATS. E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR EXACT LOCATION IN FIELD.

H. NEW 14 KW, 120/240V, 1-PHASE, GENERATOR FOR THE SPACE. E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR EXACT LOCATION OF THE GENERATOR IN FIELD. (GENERATOR MAKE-GENERAC, MODEL-G007223-0, DIMENSIONS (LXWXH) (48" x 25" x 29").

ELECTRICAL RISER DIAGRAM GENERAL NOTES

1. ELECTRICAL RISER DIAGRAM SHOWN IS FOR REFERENCE PURPOSE ONLY. E.C TO VERIFY THE RATING, LOCATION AND EXACT POWER DISTRIBUTION IN FIELD. INFORM ENGINEER FOR ANY DISCREPANCY FOUND BEFORE COMMENCING ANY WORK.
2. E.C. SHALL FIELD VERIFY INCOMING SERVICE AMPERAGE, WIRE SIZING AND DISTRIBUTION.
3. ELECTRICAL CONTRACTOR TO COORDINATE FAULT CURRENT (Isc) RATING WITH UTILITY COMPANY AND AHJ PRIOR TO COMMENCING ANY WORK.
4. E.C. TO FIELD VERIFY THE OPERABLE CONDITION OF ALL THE EXISTING EQUIPMENTS TO BE REUSED. REPLACE IF FOUND INOPERABLE. BASE BID ACCORDINGLY.
5. E.C. SHALL DEMOLISH THE EXISTING 200A 3PH DISCONNECT SWITCH, 200A 3PH ELECTRICAL METER, WIRE WAY, 400A 1PH METER & 400A 1PH DISCONNECT SWITCH. PROVIDE NEW ELECTRICAL METER, CT CABINET AND DISCONNECT SWITCH AS SPECIFIED.

PROJECT: GOODBLEND READING

PROJECT NUMBER: 21242

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PLUMBING SYMBOLS LIST

SAN	SANITARY WASTE
SAN	SANITARY SEWER (UNDERFLOOR)
EX.SAN	EXISTING SANITARY SEWER
EX.SAN	EXISITNG SANITARY SEWER (UNDERFLOOR)
	VENT PIPING
CW	COLD WATER
EX.CW	EXISTING COLD WATER
HW	HOT WATER
HWR	HOT WATER RETURN
G	GAS PIPING
EX.G	EXISTING GAS PIPING
	CHECK VALVE
	FLOOR DRAIN
	P-TRAP
	PIPE UP OR DOWN
	PIPE UP
	UNION
	SHUT-OFF VALVE IN RISER
	CAP ON END OF PIPE
	CLEANOUT
	SOLENOID VALVE
	POINT OF NEW CONNECTION

PLUMBING ABBREVIATIONS

CO-1	CLEANOUT
CODP	CLEAN OUT DECK PLATE
CW	COLD WATER
HW	HOT WATER
HWR	HOT WATER RETURN
SAN	SANITARY
V	VENT
W	WASTE
LAV-1	LAVATORY
WC-1	WATER CLOSET
TYP.	TYPICAL
DN	DOWN
EXIST	EXISTING
G	GAS
AFF	ABOVE FINISH FLOOR
FD-1	FLOOR DRAIN
SQ. FT.	SQUARE FEET
HWCP	HOT WATER RE-CIRCULATION PUMP
WH	HOT WATER HEATER
SV	SHUT OFF VALVE

BUILDING DEPARTMENT PLUMBING NOTES

1. ALL PLUMBING SYSTEMS (SANITARY, WASTE, VENT, GAS, WATER, STORM) AND ASSOCIATED EQUIPMENT SHALL BE INSTALLED, OPERATED AND MAINTAINED IN ACCORDANCE WITH THE REQUIREMENTS OF THE 2015 INTERNATIONAL PLUMBING CODE (IPC).
2. INSTALLATION OF UNDERGROUND PIPING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION PC 702.2
3. PROTECTION OF PIPING AND PLUMBING SYSTEM COMPONENTS AS PER SECTION PC 305.
4. TRENCHING, EXCAVATION AND BACKFILL AS PER SECTION PC 306.
5. RODENT PROOFING AS PER PC 304
6. MATERIALS USED IN PLUMBING SYSTEMS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION PC 303, PC 605, PC 702, PC 902.
7. EQUIPMENT CONNECTIONS AND JOINING OF PIPING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF CHAPTERS 4, 5, 6, 7 AND 9.
8. DEEP SEAL TRAPS FOR FLOOR DRAINS SHALL BE PROVIDED AS PER PC 1002, AND CLEAN-OUTS SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION PC 708
9. BUILDING HOUSE TRAPS SHALL BE PROVIDED AS PER SECTION PC 1002.
10. DRAINAGE PIPE CLEANOUTS AS PER SECTION PC 708.
11. VERTICAL AND HORIZONTAL PIPING SHALL BE SUPPORTED IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION PC 308
12. WATER SUPPLY SYSTEMS SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE REQUIREMENTS OF CHAPTER 6 SECTION PC 601-603, 604, 606, 607, 608, 610
13. THE SANITARY DRAINAGE SYSTEM SHALL BE SIZED AND INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF CHAPTER 7 SECTION PC 701, 704, 705, 706, 707, 708, 710, 711.
14. VENT PIPING FOR THE SANITARY DRAINAGE SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF CHAPTER 9 SECTIONS PC 901 THROUGH PC 912 THROUGH PC 917
15. GAS PIPING INSTALLATION SHALL IN IN ACCORDANCE WITH 2015 INTERNATIONAL FUEL GAS CODE CHAPTER 4.
16. INSPECTION AND TESTING OF PLUMBING AND GAS PIPING SYSTEMS SHALL BE IN ACCORDANCE WITH SECTION 107 OF 2015 INTERNATIONAL PLUMBING CODE AND SECTION 107 OF 2015 INTERNATIONAL FUEL GAS CODE.

PLUMBING DRAWING LIST

CODE COMPLIANCE

ALL WORK AND MATERIAL SHALL BE PERFORMED AND INSTALLED IN COMPLIANCE WITH THE FOLLOWING CODES AS ADOPTED AND AMENDED BY THE INSPECTING AUTHORITY. NOTHING IN THESE DRAWINGS IS TO BE CONSTRUCTED TO PERMIT WORK NOT CONFORMING TO THESE CODES OR OTHERS APPLICABLE TO THESE PROJECT:

a. INTERNATIONAL BUILDING CODE 2015

b. INTERNATIONAL MECHANICAL CODE 2015

c. INTERNATIONAL PLUMBING CODE 2015

d. INTERNATIONAL FUEL GAS CODE, 20015

e. INTERNATIONAL ENERGY CONSERVATION CODE 2015

f. NATIONAL ELECTRIC CODE 2014

PLUMBING SPECIFICATIONS:

1. BASIC PLUMBING REQUIREMENTS, MATERIALS AND METHODS

1.01 SCOPE

A. PROVIDE ALL MATERIAL, TOOLS, SUPERVISION AND LABOR INCLUDING ALL MISCELLANEOUS AND INCIDENTAL ITEMS REQUIRED FOR COMPLETE AND OPERABLE PLUMBING INSTALLATIONS AS SHOWN OR DESCRIBED ON THE DRAWINGS AND IN THESE SPECIFICATIONS.

B. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL NEW CONDITIONS AND MATERIALS WITHIN THE CONSTRUCTION AREA. ANY DAMAGE CAUSED BY THE CONTRACTOR SHALL BE REPAIRED TO THE OWNER'S SATISFACTION.

C. OBTAIN ALL PERMITS, PAY ALL PERMIT FEES AND SCHEDULE ALL REQUIRED INSPECTIONS. COPIES OF ALL PERMITS AND INSPECTION CERTIFICATES SHALL BE FORWARDED TO THE OWNER FOR RECORD.

D. THE GENERAL CONDITIONS OF THE CONTRACT AND ALL DIVISION 1 REQUIREMENTS APPLY TO THE WORK OF THIS SECTION.

E. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO SUBMITTING BID TO DETERMINE CONDITIONS AND THE EXTENT OF THE WORK. BY COMMENCING WORK, THE CONTRACTOR ACKNOWLEDGES HIS CONFIRMATION OF ALL CONDITIONS AS ACCEPTABLE WITH REFERENCE TO HIS CONTRACT, SCOPE OF WORK AND BID PRICE SUCH THAT NO ADDITIONAL COMPENSATION SHALL BE FORTHCOMING FOR UNFORESEEN EXISTING CONDITIONS.

F. IN ALL AREAS SUBJECT TO FREEZING CONDITIONS, THE CONTRACTOR SHALL PROVIDE FREEZE PROTECTION FOR ALL DOMESTIC WATER PIPING INSTALLED UNDER HIS CONTRACT.

G. ALL ELECTRICAL REQUIREMENTS SHALL BE COORDINATED WITH THE CONTRACTOR FOR ELECTRICAL WORK. THIS CONTRACTOR IS RESPONSIBLE FOR ALL LOW VOLTAGE WIRING FOR EQUIPMENT INSTALLED UNDER HIS CONTRACT. THE CONTRACTOR FOR ELECTRICAL WORK IS RESPONSIBLE FOR LINE VOLTAGE POWER WIRING ONLY.

H. COLOR AND FINISH SELECTIONS FOR ALL MATERIALS, INCLUDING PAINTING OF PIPING, SHALL BE AS DIRECTED AND/OR APPROVED BY THE ARCHITECT.

I. MINOR DETAILS NOT SHOWN OR SPECIFIED, BUT NECESSARY FOR THE PROPER AND ACCEPTABLE CONSTRUCTION, INSTALLATION OR OPERATION OF ANY PART OF THE WORK AS DETERMINED BY THE ENGINEER SHALL BE INCLUDED AS IF SPECIFIED OR INDICATED ON THE DRAWINGS.

J. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL REQUIREMENTS FOR THE INSTALLATION, CONNECTION, EXTENSION OR MODIFICATION TO ALL UTILITY SERVICES WITH RESPECTIVE PROVIDERS INCLUDING PAYMENT OF ALL ASSOCIATED FEES.

K. THE CONTRACTOR IS RESPONSIBLE FOR ALL PAINTING ASSOCIATED WITH CUTTING AND PATCHING. ALL PAINTING IN AREAS WITH COMPLETE FINISH RENOVATIONS SHALL BE PROVIDED BY THE GENERAL CONTRACTOR.

1.02 SUBMITTALS

A. SUBMITTAL REQUIREMENTS SHALL BE COORDINATED WITH THE ARCHITECT AND AUTHORITIES HAVING JURISDICTION. UNLESS OTHERWISE DIRECTED, CONTRACTOR SHALL PROVIDE SUBMITTALS AS LISTED BELOW.

1. PIPE AND FITTINGS
2. VALVES
3. HANGERS AND SUPPORTS
4. PLUMBING PIPING LAYOUT
5. TESTS
6. PLUMBING FIXTURES
7. WATER HEATERS & ACCESSORIES
8. FLOOR DRAINS
9. MIXING VALVES
10. HOSE BIBB
11. BACKFLOW PREVENTER
12. ALL SCHEDULED PLUMBING EQUIPMENT

B. SUBMITTALS FROM SUPPLIERS OR MANUFACTURERS WHICH DO NOT BEAR THE STAMP OF THE SUBMITTING CONTRACTOR INDICATING THAT THE CONTRACTOR HAS REVIEWED THE SUBMITTAL FOR CONFORMANCE WITH THE PROJECT REQUIREMENTS WILL BE RETURNED REJECTED.

C. THE ENGINEER'S REVIEW OF SUBMITTALS IS A COURTESY WHICH DOES NOT RELIEVE THE CONTRACTOR FROM CONFORMING WITH THE CONSTRUCTION DOCUMENTS, REGARDLESS OF THE ACTION INDICATED BY THE SHOP DRAWINGS STAMP.

D. REVIEW OF SHOP DRAWINGS BY THE ENGINEER SHALL BE LIMITED TO THE INITIAL REVIEW, AND A SECOND REVIEW OF ANY REQUIRED RESUBMITTED DATA. IF THE ENGINEER IS REQUIRED TO REVIEW SHOP DRAWINGS FOR A THIRD (OR MORE) SUBMISSION OF THE SAME ITEM, THE CONTRACTOR SHALL BE LIABLE FOR COMPENSATING THE ENGINEER FOR THESE SUBSEQUENT REVIEWS AS PER THE ENGINEER'S CURRENT HOURLY RATE SCHEDULE.

E. SUBMIT PROOF OF APPROVAL AND/OR CONFIRMATION OF SATISFACTORY TEST RESULTS TO THE OWNER AND THE ARCHITECT.

F. SUBMIT TO THE OWNER'S MAINTENANCE PERSONNEL OPERATION AND MAINTENANCE DATA FOR ALL SYSTEM COMPONENTS, SERVICING REQUIREMENTS, INSPECTION DATA, REPLACEMENT PART NUMBERS AND AVAILABILITY AND CONTACT INFORMATION FOR SERVICE/SUPPLY COMPANY.

G. FOR ALL BELOW GRADE PIPING WHERE ACTUAL INSTALLATION DEVIATES FROM CONSTRUCTION DRAWINGS, THE CONTRACTOR SHALL PROVIDE AS-BUILT DRAWINGS INDICATING BELOW GRADE PIPE LOCATIONS DIMENSIONED TO NEAREST COLUMN LINES.

H. RECORD AS-BUILT DRAWINGS SHALL BE SUPPLIED TO THE OWNER/TENANT AFTER COMPLETION OF THE WORK SHOWING ANY ALTERATIONS, ADDITIONS AND/OR DELETIONS TO THE SYSTEM(S) INSTALLED.

1.03 SUBSTITUTIONS

A. ALL EQUIPMENT SHALL BE PRODUCTS OF THE SPECIFIED MANUFACTURER OR MANUFACTURERS. ALL BIDS SHALL BE BASED ON THE SPECIFIED MANUFACTURER OR MANUFACTURER'S EQUIPMENT. FOR SUBSTITUTIONS OF OTHER MANUFACTURER'S EQUIPMENT TO BE CONSIDERED, THE SUBSTITUTION MUST BE INDICATED PRIOR TO BIDDING WITH THE REASON FOR THE PROPOSED SUBSTITUTION IDENTIFIED, AND THE PROPOSED CREDIT TO THE OWNER INDICATED. THE ENGINEER SHALL DETERMINE THE ACCEPTABILITY OF ANY PROPOSED SUBSTITUTIONS.

B. THE CONTRACTOR ASSUMES ALL RESPONSIBILITY FOR COORDINATING THE WORK OF OTHER TRADES WHICH MAY BE AFFECTED BY SUBSTITUTIONS, INCLUDING ALL RELATED COSTS.

1.04 DEFINITIONS

A. FURNISH: TO PURCHASE, PROCURE, ACQUIRE AND DELIVER, COMPLETE WITH RELATED ACCESSORIES.

B. INSTALL: TO ERECT, MOUNT AND CONNECT, COMPLETE WITH RELATED ACCESSORIES.

C. PROVIDE: TO FURNISH AND INSTALL.

D. PLUMBING CONTRACTOR, THE CONTRACTOR, THIS CONTRACTOR: THE CONTRACTOR FOR PLUMBING WORK WHICH IS SPECIFIED HEREIN AND SHOWN ON THESE DRAWINGS.

E. REFER TO THE NATIONAL STANDARD PLUMBING CODE FOR ADDITIONAL DEFINITIONS.

1.05 DRAWINGS

A. THE DRAWINGS ARE DIAGRAMMATIC AND ARE INTENDED TO ILLUSTRATE THE GENERAL ARRANGEMENT AND ROUTING OF PIPING AND GENERAL LOCATIONS OF EQUIPMENT. PRECISE LOCATIONS OF EQUIPMENT, RISERS AND STACKS, AND ROUTING AND ELEVATION OF ALL PIPING SYSTEMS SHALL BE COORDINATED IN THE FIELD WITH THE ARCHITECT, ARCHITECTURAL DRAWINGS, THE WORK OF OTHER TRADES, EXISTING AND NEW BUILDING CONDITIONS AND/OR THE PREFERENCES OF THE OWNER/TENANT AS CONSTRUCTION PROCEEDS. ALL PIPING SHALL BE INSTALLED CONCEALED IN FINISHED SPACES, UNLESS NOTED OTHERWISE.

B. PROVIDE ALL NECESSARY INCIDENTAL MATERIALS AND ACCESSORIES REQUIRED TO MAKE THE WORK COMPLETE IN ALL RESPECTS, EVEN IF NOT PARTICULARLY SHOWN OR SPECIFIED.

C. REFER TO PLUMBING EQUIPMENT/FIXTURE SCHEDULE ON THE DRAWINGS FOR ALL FIXTURE AND EQUIPMENT SPECIFICATIONS.

D. REFER TO FIXTURE CONNECTION SIZE SCHEDULE FOR ALL FIXTURE ROUGHING SIZE REQUIREMENTS.

E. VERIFY ALL INDICATED CONDITIONS BEFORE STARTING WORK AND REPORT ANY DISCREPANCIES. THE DRAWINGS REFLECT CONDITIONS WHICH CAN BE REASONABLY INTERPRETED FROM THE EXISTING VISIBLE CONDITIONS OR FROM DRAWINGS AND INFORMATION FURNISHED BY THE OWNER.

F. LOCATE ALL FIXTURES AND EQUIPMENT AS PER THE FINAL ARCHITECTURAL DRAWINGS.

1.06 PRODUCTS

A. SANITARY AND VENT PIPING:

1. ABOVE GRADE PIPING SHALL BE HUBLESS CAST IRON PIPE WITH STAINLESS STEEL COUPLINGS AND ELASTOMERIC GASKETS WITH A MINIMUM NO. OF BANDS PER COUPLING AS PER CISPI 310-12.
2. SLOPE OF DRAINAGE SYSTEM SHALL BE 1/8" PER FOOT OF RUN FOR PIPE OVER 3" (I.D.) AND 1/4" PER FOOT OF RUN FOR PIPE 3" AND SMALLER (I.D.). VENT PIPING SHALL BE PITCHED TO DRAIN.
3. PVC OR OTHER COMBUSTIBLE PLASTIC PIPING SHALL NOT BE INSTALLED IN CEILING PLENUM SPACES.
4. ALL CAST IRON SOIL PIPE AND FITTINGS SHALL BE MARKED WITH THE COLLECTIVE TRADEMARK OF THE CAST IRON SOIL PIPE INSTITUTE (CISPI) AND BE LISTED BY NSF INTERNATIONAL.

B. DOMESTIC WATER PIPING:

1. ABOVE GRADE WATER PIPING SHALL BE TYPE 'L' HARD-DRAWN COPPER TUBE.
2. FITTINGS IN DOMESTIC WATER PIPING SHALL BE WROUGHT COPPER OR CAST BRASS.
3. JOINTS SHALL BE MADE WITH LEAD-FREE SOLDER.
4. THE ENTIRE DOMESTIC WATER DISTRIBUTION SYSTEM SHALL BE INSULATED INCLUDING ALL VALVES, FITTINGS, ETC.
5. COMPLY WITH NSF 61 FOR MATERIALS FOR WATER-SERVICE PIPING AND SPECIALTIES FOR DOMESTIC WATER.
6. ALL DOMESTIC WATER PIPING ABOVE GRADE SHALL BE FIRE-RETARDANT, FACTORY-APPLIED JACKET. PROVIDE COLD WATER PIPING WITH FACTORY-APPLIED VAPOR BARRIER. INSULATION REQUIREMENT SHOULD COMPLY WITH 2015 INTERNATIONAL ENERGY CONSERVATION CODE SECTION C403.2.10. REFER BELOW TABLE.

FLUID OPERATING TEMPERATURE RANGE AND USAGE (°F)	MINIMUM PIPE INSULATION THICKNESS: INSULATION CONDUCTIVITY		NOMINAL PIPE OR TUBE SIZE (INCHES)				
	CONDUCTIVITY BTU·IN./(H·FT2·°F)	MEAN RATING TEMPERATURE, °F	<1	1 to < 1½	1½ to < 4	4 to < 8	<8
105-140	0.21-0.28	100	1.0	1.0	1.5	1.5	1.5
40-60	0.21-0.27	75	0.5	0.5	1.0	1.0	1.0

7. WATER DISTRIBUTION SYSTEM AS PER INTERNATIONAL ENERGY CONSERVATION CODE 2015 C404.7, HAVING ONE OR MORE RECIRCULATION PUMPS THAT PUMP WATER FROM A HEATED-WATER SUPPLY PIPE BACK TO THE HEATED WATER SOURCE THROUGH A COLD-WATER SUPPLY PIPE SHALL BE A DEMAND RECIRCULATION WATER SYSTEM. PUMPS SHALL HAVE CONTROLS THAT COMPLY WITH BOTH OF THE FOLLOWING:
   a. THE CONTROL SHALL START THE PUMP UPON RECEIVING A SIGNAL FROM THE ACTION OF A USER OF A FIXTURE OR APPLIANCE, SENSING THE PRESENCE OF A USER OF A FIXTURE OR SENSING THE FLOW OF HOT OR TEMPERED WATER TO A FIXTURE FITTING OR APPLIANCE.
   b. THE CONTROL SHALL LIMIT THE TEMPERATURE OF THE WATER ENTERING THE COLD-WATER PIPING TO 104°F (40°C).
8. AS PER INTERNATIONAL ENERGY CONSERVATION CODE 2015 C404.6.1 HEATED - WATER CIRCULATION SYSTEMS SHALL BE PROVIDED WITH A CIRCULATION PUMP. THE SYSTEM RETURN PIPE SHALL BE A DEDICATED RETURN PIPE OR A COLD WATER SUPPLY PIPE. CONTROLS FOR CIRCULATING HOT WATER SYSTEM PUMPS SHALL START THE PUMP BASED ON THE IDENTIFICATION OF A DEMAND FOR HOT WATER WITHIN THE OCCUPANCY. THE CONTROLS SHALL AUTOMATICALLY TURN OFF THE PUMP WHEN THE WATER IN THE CIRCULATION LOOP IS AT THE DESIRED TEMPERATURE AND WHEN THERE IS NO DEMAND FOR HOT WATER.
9. AS PER INTERNATIONAL ENERGY CONSERVATION CODE 2015 C404.6.3 THE CONTROLS ON PUMPS THAT CIRCULATE WATER BETWEEN A WATER HEATER AND A HEATED-WATER STORAGE TANK SHALL LIMIT OPERATION OF THE PUMP FROM HEATING CYCLE STARTUP TO NOT GREATER THAN 5 MINUTES AFTER THE END OF THE CYCLE.
10. HEATED WATER SUPPLY PIPING SHALL BE IN ACCORDANCE WITH INTERNATIONAL ENERGY CONSERVATION CODE 2015 SECTION C404.5.1 OR C404.5.2. THE FLOW RATE THROUGH 1/4-INCH PIPING SHALL BE NOT GREATER THAN 0.5 GPM. THE FLOW RATE THROUGH 5/16-INCH PIPING SHALL BE NOT GREATER THAN 1 GPM. THE FLOW RATE THROUGH 3/8-INCH PIPING SHALL BE NOT GREATER THAN 1.5 GPM. HW SYSTEM PIPING IS DESIGNED AS PER MAXIMUM ALLOWED PIPE LENGTH METHOD AS PER IECC 2015 C404.5.1. THE HW PIPE LENGTH FROM THE NEAREST SOURCE OF HEATED WATER TO THE TERMINATION OF THE FIXTURE SUPPLY PIPE SHALL BE AS PER FOLLOWING TABLE.

NOMINAL PIPE SIZE (INCHES)	MAXIMUM PIPING LENGTH (FEET)	
	PUBLIC LAV	OTHER FIXTURES
½"	2'	43'
¾"	0.5'	21'
1"	0.5'	13'
1¼"	0.5'	8'
1½"	0.5'	6'
2" OR LARGER	0.5'	4'

11. SEAL ALL JOINTS BETWEEN SEGMENTS OF INSULATION.
12. PROVIDE SHIELDS BETWEEN HANGERS AND INSULATION.
13. AS PER IECC 2015 C404.3 WATER HEATING EQUIPMENT NOT SUPPLIED WITH INTEGRAL HEAT TRAPS AND SERVING NON CIRCULATING SYTEMS SHALL BE PROVIDED WITH HEAT TRAPS ON THE SUPPLY AND DISCHARGE PIPING ASSOCIATED WITH THE EQUIPMENT.

C. PRESS JOINERY SYSTEM:

a. FITTINGS ½" - 4":

1. WHERE APPROVED BY THE LOCAL JURISDICTION, THE VIEGA PRO PRESS OR SIMILAR SYSTEM MAY BE USED AT THE CONTRACTOR'S OPTION FOR THE FOLLOWING BUILDING SERVICES PIPING -20°F TO +250°F UP TO 200 PSI:
   - HOT AND COLD DOMESTIC WATER; FITTINGS AND VALVES SHALL BE NSF-61 APPROVED.
   - POTABLE WATER; FITTINGS AND VALVES SHALL BE NSF-61 APPROVED.
   - HOT WATER HEATING SERVICE

ALL FITTINGS SHALL BE THIRD-PARTY CERTIFIED TO NSF/ANSI 61 ANNEX G. THE PRESS FITTINGS CONNECTIONS SHALL BE COMPATIBLE WITH SEAMLESS K, L OR M COPPER TUBE MADE TO ASTM B 88. FITTINGS SHALL HAVE A MAXIMUM NON-SHOCK WORKING PRESSURE OF 200 PSI BETWEEN THE TEMPERATURES OF -20°F AND +250°F. ELASTOMERIC SEALS WITH LEAK DETECTION DESIGN SHALL BE MADE OF EPDM MATERIAL AND THE FITTINGS SHALL BE MANUFACTURED WITH AN INBOARD BEAD DESIGN. VIEGA PRESS FITTINGS MEET ALL PERFORMANCE REQUIREMENTS OF ASME B16.22 AND B16.18ALL FITTINGS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS AND ACCORDING TO LOCAL PLUMBING AND MECHANICAL CODES. THE PRESS-TO-CONNECT JOINT SHALL BE MADE WITH PRESSING TOOLS AND JAW SETS RECOMMENDED AND AUTHORIZED BY VIEGA. ALL FITTINGS, VALVES AND TOOLS SHALL BE PROVIDED BY SAME MANUFACTURER.

b. VALVES 2" AND SMALLER: BALL VALVES: (ON/OFF, ISOLATION OR THROTTLING)

1. BALL VALVES (STAINLESS STEEL BALL AND STEM) WITH MALE OR FEMALE PRESS-TO-CONNECT ENDS SHALL BE RATED AT 200 PSI CWP TO +250°F MAXIMUM. VIEGO PRO OR SIMILAR LEAD FREE VALVES SHALL BE MANUFACTURED IN ACCORDANCE WITH MSS SP-110 AND CONSTRUCTED OF DEZINCIFICATION-RESISTANT (DZR) BRONZE BODIES AND END PIECES AND SHALL BE MADE FROM A HIGH QUALITY LEAD FREE PERFORMANCE BRONZE ALLOY PER ASTM B 584 ALLOY C87850. NO BRASS CONTAINING MORE THAN 15% ZINC SHALL BE APPROVED. VALVE SHALL HAVE REINFORCED TEFLON SEATS, BLOW-OUT PROOF STEM, SOLID STAINLESS STEEL BALL AND STEM. NO HOLLOW CHROME PLATED BALLS ACCEPTED. ALL VALVES SHALL BE FULL PORT. ALL ELASTOMERIC SEALS SHALL HAVE LEAK DETECTION DESIGN.
   - WHERE PIPING IS TO BE INSULATED, BALL VALVES SHALL BE EQUIPPED WITH 2" EXTENDED HANDLES OF NON-THERMAL CONDUCTIVE MATERIAL. HANDLE TO HAVE EXTENDED SLEEVE INCORPORATING AN INSULATION PLUG TO PROVIDE A VAPOR BARRIER AND ALLOW VALVE OPERATION WITHOUT DISTURBING THE INSULATION, AND A MEMORY STOP, WHICH CAN BE SET AFTER INSTALLATION.

c. CHECK VALVES: (BACKFLOW PREVENTION)

1. VALVES WITH PRESS-TO-CONNECT ENDS SHALL BE RATED TO 200 PSI CWP AT +250°F MAXIMUM. VIEGO PRO OR SIMILAR LEAD FREE VALVES SHALL BE MANUFACTURED IN ACCORDANCE WITH MSS SP-80 AND CONSTRUCTED OF DEZINCIFICATION-RESISTANT (DZR) BRONZE BODY & CAP SHALL BE MADE FROM A HIGH QUALITY LEAD FREE PERFORMANCE BRONZE ALLOY PER ASTM B 584 ALLOY C87850. DISC SHALL BE TFE TEFLON. ALL ELASTOMERIC SEALS SHALL HAVE LEAK DETECTION DESIGN.

d. BUTTERFLY VALVES 2-1/2" - 4", (ON/OFF, ISOLATION OR THROTTLING)

1. BUTTERFLY VALVES WITH FEMALE LEAD FREE PRESS-TO-CONNECT ENDS SHALL BE RATED AT 200 PSI. CWP TO +250°F MAXIMUM. VALVES SHALL BE MANUFACTURED IN ACCORDANCE WITH MSS SP-67 AND CONSTRUCTED OF A DUCTILE-IRON BODY, FOR BUBBLE-TIGHT SHUTOFF, EXTENDED-NECK FOR INSULATION, DISC AND LINING SUITABLE FOR POTABLE WATER, VALVES SHALL BE SUITABLE FOR BI-DIRECTIONAL DEAD END SERVICE AT FULL RATED PRESSURE, ONE-PIECE TYPE 416 STAINLESS-STEEL STEM, COPPER BUSHING, FASTENERS AND PINS SHALL NOT BE USED TO ATTACH STEM TO DISC, NO PINS OR FASTENERS IN WATERWAY, ALUMINUM-BRONZE DISC, AND MOLDED-IN EPDM SEAT (LINER). ALL ELASTOMERIC SEALS SHALL HAVE LEAK DETECTION DESIGN.

D. ELECTRIC WATER HEATER

1. TANKS SHALL 40 GALLONS CAPACITY AND SHALL HAVE 150 PSI. WORKING PRESSURE AND BE EQUIPPED WITH EXTRUDED HIGH DENSITY ANODE.
2. ALL INTERNAL SURFACES OF THE HEATER(S) EXPOSED TO WATER SHALL BE GLASS-LINED WITH AN ALKALINE BORO SILICATE COMPOSITION THAT HAS BEEN FUSED-TO-STEEL BY FIRING AT A TEMPERATURE RANGE OF 1400°F TO 1600°F.
3. ELECTRIC HEATING ELEMENTS SHALL BE LOW WATT DENSITY GOLDENROD 1" SCREW-IN TYPE.
4. EACH ELEMENT SHALL BE CONTROLLED BY AN INDIVIDUALLY MOUNTED THERMOSTAT AND HIGH TEMPERATURE CUT-OFF SWITCH. ALL INTERNAL CIRCUITS SHALL BE FUSED. THE OUTER JACKET SHALL BE OF BAKED ENAMEL FINISH AND SHALL BE PROVIDED WITH FULL SIZE CONTROL COMPARTMENT FOR PERFORMANCE OF SERVICE AND MAINTENANCE THROUGH HINGED FRONT PANEL AND SHALL ENCLOSE THE TANK WITH FOAM INSULATION. ELECTRICAL JUNCTION BOX WITH HEAVY DUTY TERMINAL BLOCK SHALL BE PROVIDED. THE DRAIN VALVE SHALL BE LOCATED IN THE FRONT FOR EASE OF SERVICING.

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E. GAS PIPING:

1. ALL GAS PIPING WORK SHALL COMPLY WITH INTERNATIONAL FUEL GAS CODE, 2015 AND LOCAL UTILITY GAS REQUIREMENTS.

2. FURNISH AND INSTALL ALL NECESSARY GAS PIPING TO ALL EQUIPMENT REQUIRING GAS SUPPLY INCLUDING RECONNECTION TO EXISTING ACTIVE GAS BURNING EQUIPMENT

3. PROVIDE A LUBRICATED GAS VALVE AT ALL CONNECTIONS TO EQUIPMENT.

4. ALL GAS PIPING AND INSTALLATION SHALL BE IN ACCORDANCE WITH RULES AND REGULATIONS OF LOCAL UTILITY GAS COMPANY AND OTHER AUTHORITIES HAVING JURISDICTION.

5. PROVIDE ADEQUATE SUPPORT FOR ALL PIPING.

6. GAS PIPING SHALL BE STEEL SCHEDULE 40 THREADED PIPE CONFORMING TO ANSI B36.10, 10M. AND ASTM A 106.

7. FITTINGS SHALL BE MALLEABLE IRON.

8. PIPING NDERGROUND ENEATH BUILDING SHALL COMPLY WITH INTERNATIONAL FUEL GAS CODE, 2015.

F. HANGERS AND SUPPORTS:

1. HANGERS SHALL BE STANDARD STEEL, MALLEABLE OR WROUGHT IRON, AS MANUFACTURED BY GRINNELL OR APPROVED EQUAL, SUITABLE FOR THE TYPE OF CONSTRUCTION. PIPING SHALL NOT BE HUNG FROM OTHER PIPE.

2. SECTIONS OF INDIVIDUAL PIPE RUNS SHALL BE SUPPORTED BY CLEVIS HANGERS.

3. ALL EQUIPMENT SHALL BE PROVIDED WITH APPROVED SUPPORTS..

4. SUPPORTS SHALL BE PROVIDED IN STRICT ACCORDANCE WITH THE RECOMMENDATIONS OF THE PIPING MANUFACTURER.

G. VALVES:

1. PROVIDE GATE VALVES, BUTTERFLY OR BALL VALVES FOR SHUT–OFF DUTY ON MAIN AND BRANCH SUPPLY LINES. FOR ALL PIPE RUNS 2" AND SMALLER, PROVIDE BALL FOR ALL PIPE RUNS LARGER THAN 2" AND SMALLER THAN 4", PROVIDE GATE VALVES. PIPING 4" AND LARGER, PROVIDE BUTTERFLY VALVES FOR SHUT–OFF DUTY.

2. ALL FIXTURES WITH THE EXCEPTION O FLUSHOMETER–EQUIPPED WATER CLOSETS AND URINALS SHALL HAVE STOP VALVES TO CONTROL SUPPLY TO THE FIXTURE. WHERE SUPPLIES ARE EXPOSED PROVIDE CHROME–PLATED STOPS WITH CHROME–PLATED ESCUTCHEONS ON PIPING PENETRATIONS.

3. ALL PLUMBING FIXTURES AND EQUIPMENT TO HAVE SHUT–OFF VALVES ON SUPPLY LINES.

4. ALL BRANCH LINES TO HAVE SHUT–OFF VALVES.

5. ALL VALVES SHALL BE ACCESSIBLE. PROVIDE ACCESS DOORS WHERE REQUIRED FOR VALVE ACCESS.

6. PROVIDE GLOBE VALVES FOR THROTTLING/BALANCING OF THE HOT WATER CIRCULATING SYSTEM.

H. SLEEVES AND ESCUTCHEONS:

1. SLEEVES THROUGH STRUCTURAL CONCRETE MEMBERS AND SLEEVES FOR WALLS BELOW GRADE AND FLOORS ON GRADE SHALL BE STANDARD WEIGHT GALVANIZED SCHEDULE 40 STEEL PIPE. SLEEVES THROUGH OTHER THAN STRUCTURAL COMPONENTS OF THE BUILDING SHALL BE 20 GAGE GALVANIZED SHEET METAL WITH LOCK SEAM JOINTS. USG THERMAFIBER SAFING INSULATION SHALL BE INSTALLED BETWEEN PIPE AND SLEEVE.

2. PIPE ESCUTCHEON PLATES SHALL BE INSTALLED WHERE EXPOSED PIPING PASSES THROUGH WALLS, CEILINGS, AND FLOORS AND SHALL BE MINIMUM 20 GAGE STEEL. PROVIDE CHROME PLATED ESCUTCHEON PLATES IN FINISHED AREAS.

I. DRAINAGE ACCESSORIES

1. GENERAL:
   a. INSTALL THE WORK OF THIS SECTION IN ACCORDANCE WITH THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS, UNLESS OTHERWISE SPECIFIED.

   b. SECURE EXTERNAL COMPONENTS IN PLACE WITH VANDAL RESISTANT FASTENERS OR DEVICES WHICH CANNOT BE REMOVED WITHOUT SPECIAL TOOLS.

J. DEVICES:

   a. CLEANOUT & CLEANOUT PLUG

- THREADED PIPE FITTING OR CAST IRON FERRULE WITH GAS TIGHT CLEANOUT PLUG

- PLUG SHOULD BE CAST BRASS OR BRONZE, WITH THREADED END, AND RAISED OR COUNTERSUNK HEAD.

- LUBRICATE THREADS OF CLEANOUT PLUG WITH ANTI–SEIZE LUBRICANT BEFORE FINAL INSTALLATION.

   b. CLEANOUT WALL PLATE

- IT SHOULD BE ROUND, STAINLESS STEEL OR POLISHED CHROME PLATED BRONZE COVER PLATE WITH STAINLESS STEEL VANDAL RESISTANT FASTENER TO SECURE TO CLEANOUT PLUG.

   c. CLEANOUT DECK PLATE

- IT SHOULD BE STANDARD DUTY FLOOR CLEANOUT FITTING WITH COATED CAST IRON BODY; ROUND, POLISHED NICKEL BRONZE SCORIATED TOP SECURED TO CLEANOUT PLUG WITH STAINLESS STEEL VANDAL RESISTANT FASTENER; THREADED HEIGHT ADJUSTMENT, CAST IRON HEAD, GAS TIGHT CLEANOUT PLUG, AND CONNECTION TO MATCH PIPING OPTION SELECTED.

- GRILLE FREE AREA SHOULD BE AT LEAST EQUAL TO CROSS–SECTION AREA OF PIPE TO WHICH CONNECTION MADE AND MADE OF POLISHED NICKEL BRONZE, WITH REMOVABLE GRATE, EITHER PERFORATED OR BAR TYPE. GRATE ATTACHED TO GRILLE BODY WITH VANDAL RESISTANT FASTENER.

K. INSTALL PIPING TO CONSERVE BUILDING SPACE. DO NOT INTERFERE WITH USE OF BUILDING SPACE AND THE WORK OF OTHER TRADES. ALL PIPING RUN IN CEILING SHALL BE INSTALLED TIGHT TO THE STRUCTURE ABOVE.

L. INSTALL PIPING TO ALLOW FOR EXPANSION AND CONTRACTION WITHOUT STRESSING PIPE, JOINTS OR CONNECTED EQUIPMENT. PROVIDE PIPE ANCHORS, GUIDES AND EXPANSION JOINTS OR LOOPS IN ALL HOT WATER AND HOT WATER CIRCULATING MAIN SUPPLY PIPING AND SEGMENTS OF SUCH PIPE THAT EXCEED 30'–0" IN LENGTH.

M. IN ALL AREAS WITH FINISHED SURFACES, SYSTEM PIPING AND COMPONENTS SHALL BE CONCEALED ABOVE OR WITHIN FINISHED SURFACES.

N. REDUCTIONS IN PIPE SIZES SHALL BE MADE WITH ONE–PIECE REDUCING FITTINGS. BUSHINGS ARE NOT ACCEPTABLE. USE FLANGED FITTINGS AT THE BASE OF RISERS.

O. VENT PENETRATIONS THROUGH THE ROOF SHALL BE FLASHED.

P. IF WATER PRESSURE EXCEEDS 80 PSI, A WATER PRESSURE REDUCING VALVE SHALL BE INSTALLED IN WATER PIPING AT CONNECTION TO MAIN.

Q. PROVIDE DIELECTRIC FITTINGS BETWEEN DISSIMILAR METALS.

R. PIPE BACKFLOW PREVENTER DRAINS TO FLOOR DRAIN OR OTHER APPROVED INDIRECT WASTE SOURCE.

S. PROVIDE ACCESS DOORS/PANELS FOR SERVICE AND ACCESS TO ALL VALVES AND OTHER SYSTEM COMPONENTS ENCLOSED IN WALLS AND CEILINGS. ACCESS DOORS SHALL BE FURNISHED BY THIS CONTRACTOR, INSTALLED BY THE GENERAL CONTRACTOR.

T. ALL FIXTURES REQUIRING VACUUM BREAKERS SHALL BE EQUIPPED WITH INTEGRAL VACUUM BREAKERS.

U. ANY PENETRATIONS THROUGH FIRE RATED PARTITIONS, FLOORS, OR CEILINGS SHALL BE STEEL SLEEVED AND SEALED WITH 3M BRAND UL RATED FIRE BARRIER CAULK OR APPROVED EQUAL.

V. WHEN THE WATER PIPING SYSTEM IS COMPLETE, THOROUGHLY FLUSH ALL DIRT, SEDIMENT, SOLDER, ETC., OUT OF THE SYSTEM, REMOVING ALL STRAINERS, VALVE STEM SEATS, ETC., REQUIRED TO ACCOMPLISH THE FLUSHING.

W. AT ALL INDIRECT WASTE DRAINS, MAINTAIN AIR GAP AS REQUIRED BY CODE.

X. CONNECT GAS PIPING TO ALL GAS–FIRED EQUIPMENT WITH GAS COCK, DIRT LEG AND UNION.

Y. FOR ALL GAS–FIRED EQUIPMENT, VERIFY INPUT RATING AND PRESSURE REQUIREMENTS. PROVIDE GAS PRESSURE REGULATORS VENTED TO THE BUILDING EXTERIOR ON GAS SUPPLY TO ALL EQUIPMENT REQUIRING LOWER THAN LINE GAS PRESSURE.

Z. INSTALL SLEEVES FOR ALL PIPES WHICH PASS THROUGH WALLS, FLOORS, AND CEILINGS. WHERE PIPES ARE TO BE INSULATED, THE SLEEVE SHALL BE LARGE ENOUGH TO ACCOMMODATE INSULATION. SLEEVES SHALL BE FLUSH WITH FINISHED SURFACES AT BOTH ENDS. ON FINISHED SURFACES IN EXPOSED AREAS PROVIDE ESCUTCHEONS COMPATIBLE WITH FINISH.

AA. PROVIDE WATER HAMMER ARRESTERS ON SUPPLY PIPING TO ALL FLUSHOMETER VALVES AND QUICK–CLOSING VALVES.

AB. UNLESS OTHERWISE INDICATED, TRAPS SEALS AT ALL FLOOR DRAINS SHALL BE MAINTAINED BY AN APPROVED TRAP PRIMING DEVICE.

AC. MAINTAIN ALL REQUIRED AND RECOMMENDED CLEARANCES FOR ALL PLUMBING SYSTEM COMPONENTS AND EQUIPMENT.

AD. MAINTAIN MINIMUM 10'–0" CLEARANCE BETWEEN ALL PLUMBING V.T.R.S AND ALL OUTDOOR AIR INTAKES. OFFSET VENT STACKS AND STACK VENTS IF AND AS REQUIRED BELOW ROOF TO MAINTAIN SUCH CLEARANCE WHETHER OR NOT SUCH OFFSET IS INDICATED ON THE DRAWINGS. PROVIDE ALL REQUIRED SEISMIC SUPPORTS.

2. INSTALLATION

2.01 GENERAL

A. ALL WORK WHICH REQUIRES DISRUPTION OF THE ROOFING SHALL BE DONE BY A CONTRACTOR CERTIFIED BY THE ROOFING MANUFACTURER AS REQUIRED TO MAINTAIN ANY EXISTING ROOF WARRANTIES.

B. EXTERIOR INSTALLATIONS TO BE WEATHER PROOF IN ALL RESPECTS.

C. EXTERIOR MATERIALS AND EQUIPMENT SHALL BE PAINTED TO PREVENT CORROSION, COLOR PER ARCHITECT.

D. COORDINATE THE PLUMBING WORK WITH ALL OTHER AFFECTED WORK AND THE CONSTRUCTION SCHEDULE.

E. REAM PIPE AND TUBE ENDS. REMOVE BURRS. BEVEL PLAIN AND FERROUS END PIPE.

F. REMOVE SCALE AND FOREIGN MATERIAL, FROM INSIDE AND OUTSIDE, BEFORE ASSEMBLY.

G. PREPARE PIPING CONNECTIONS TO EQUIPMENT WITH FLANGES AND UNIONS.

H. COORDINATION WITH THE WORK OF OTHER TRADES IS REQUIRED. PROVIDE OFFSETS IN PIPING SYSTEMS OR MINOR DEVIATIONS TO THE INDICATED PIPE ROUTING IN ORDER TO COORDINATE THE PLUMBING WORK WITH THE WORK OF ALL OTHER TRADES AND THE GENERAL BUILDING CONDITIONS.

I. NO DOMESTIC WATER PIPING SHALL BE INSTALLED IN UNHEATED SPACES.

J. PRIOR TO DISCONNECTING AND CONNECTING NEW WORK TO EXISTING SYSTEMS, THE PLUMBING CONTRACTOR SHALL NOTIFY THE PROPERTY MANAGER AND OFFER A PROPOSED SCHEDULE OF WORK. ESB WILL AUTHORIZE CONNECTIONS AND COORDINATE NECESSARY SHUT DOWNS AND DRAIN DOWNS AS REQUIRED. SHUT DOWNS AND DRAIN DOWNS MAY BE PERFORMED BY THE PLUMBING CONTRACTOR ONLY AFTER RECEIVING ESB AUTHORIZATION, AND SHOULD BE PERFORMED UNDER SUPERVISION OF ESB PERSONNEL. THREE (3) DAYS ADVANCE NOTICE TO THE PROPERTY MANAGER IS REQUIRED.

K. THE PLUMBING CONTRACTOR IS ADVISED THAT DUE TO THE NATURE OF THE OPERATIONS AND TENANT REQUIREMENTS, CONNECTIONS TO EXISTING SYSTEMS MAY HAVE TO BE MADE AFTER REGULAR WORKING HOURS. THE PROPERTY MANAGER WILL ADVISE THE PLUMBING CONTRACTOR OF THE TIME CONSTRAINTS UPON RECEIPT AND APPROVAL OF THE PLUMBING CONTRACTOR'S REQUEST FOR SHUT DOWN AND CONNECTION TO EXISTING SYSTEMS.

L. WHEN CONNECTING TO EXISTING STACKS AND RISERS, PROVISION IS TO BE MADE FOR FUTURE CONNECTIONS BY PROVIDING CAPPED AND VALVED OUTLETS ON DOMESTIC WATER RISERS AND PLUGGED OUTLETS ON THE SANITARY AND VENT STACKS.

2.02 ABOVE GRADE

A. INSTALL PLUMBING PIPING IN ACCORDANCE WITH RECOGNIZED INDUSTRY PRACTICES TO ENSURE THAT PIPING COMPLIES WITH REQUIREMENTS AND SERVES INTENDED PURPOSES.

B. ROUTE PIPING IN AN ORDERLY MANNER, PLUMB AND PARALLEL TO BUILDING STRUCTURE. MAINTAIN GRADIENT. SLOPE PIPING AND ARRANGE SYSTEMS TO DRAIN. IN DOMESTIC WATER SYSTEMS, PROVIDE DRAIN VALVES AT MAIN SHUT–OFF VALVES AND ALL LOW POINTS IN PIPING.

C. USE EXISTING CONNECTIONS AT MAINS WHERE AVAILABLE FOR NEW BRANCH PIPING. LOCATE ALL RISERS AND PIPING BEFORE CONSTRUCTION COMMENCES AND TAKE CARE NOT TO DAMAGE SAME. ANY DAMAGE OCCURRING TO THE EXISTING PIPING WILL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

2.03 INSULATION (PIPE AND FITTINGS)

A.PIPING

COVER ALL HOT WATER AND HOT WATER RECIRCULATION PIPE WITH 1" THICK FOR PIPE SIZE UP TO 1¼" AND 1½" THICK FOR PIPE SIZE UP TO 1½" AND GREATER WITH MANVILLE MICRO–LOK AP–T PLUS FIBERGLASS INSULATION. FITTINGS AND VALVES SHALL BE INSULATED. INSTALL ALL INSULATION AS PER MANUFACTURERS RECOMMENDATIONS. ALL INSULATION MATERIAL SHALL COMPLY WITH 2015 INTERNATIONAL BUILDING CODE REQUIREMENT OF A FLAME SPREAD RATING NOT TO EXCEED 25 AND A SMOKE DEVELOPED RATING NOT TO EXCEED 50. ALL PIPE INSULATION SHALL COMPLY WITH 2015 INTERNATIONAL ENERGY CONSERVATION CODE.

3. TESTING

A. AT THE COMPLETION OF THE PLUMBING WORK, COMPLETELY TEST THE ENTIRE INSTALLATION OF ALL SYSTEMS FOR PROPER OPERATION AND COMPLIANCE WITH APPLICABLE CODES AND LOCAL REQUIREMENTS. CORRECT ALL DEFICIENCIES FOUND.

B. TESTING OF THE INSTALLED SYSTEMS SHALL BE MADE BY THE CONTRACTOR IN THE PRESENCE OF A REPRESENTATIVE OF THE OWNER.

C. THE CONTRACTOR SHALL NOT COVER UP OR PERMANENTLY CONCEAL PIPING, DEVICES OR ANY PORTION OF NEWLY CONSTRUCTED PLUMBING SYSTEM(S) UNTIL SUCH SYSTEM, OR PORTION OF THE SYSTEM, HAS BEEN TESTED IN THE PRESENCE OF A REPRESENTATIVE OF THE OWNER AND INSPECTED BY THE LOCAL INSPECTOR AND APPROVED IN WRITING, EXCEPT PIPING PASSING THROUGH FLOORS, WALLS, PARTITIONS, OR BEAMS, FOR DISTANCES EQUAL TO THE THICKNESS OF SUCH FLOOR, WALL, PARTITION OR BEAM.

D. THIS CONTRACTOR SHALL NOTIFY THE VARIOUS DEPARTMENTS, BUREAUS AND INDIVIDUALS AT LEAST TWO WEEKS IN ADVANCE OF THE TIME THAT THE TESTS ARE TO BE CONDUCTED.

E. ALL DEFECTIVE PARTS SHALL BE REPLACED OR CORRECTED BY THIS CONTRACTOR AND AN EXTRA TEST OR TESTS SHALL BE MADE UNTIL THE OPERATION IS SATISFACTORY. ALL ARRANGEMENTS AND EXPENSES NECESSARY TO CONDUCT ALL TESTS REQUIRED BY THESE SPECIFICATIONS AND THE VARIOUS AGENCIES HAVING JURISDICTION OVER THE WORK INSTALLED UNDER THIS CONTRACT SHALL BE MADE BY THIS CONTRACTOR. NO EXTRA COMPENSATION WILL BE ALLOWED FOR THESE TESTS, THE COST THEREOF BEING INCLUDED IN THE LUMP SUM BID FOR THIS CONTRACT.

F. WHERE ANY EVIDENCE OF STOPPAGE IS FOUND IN PIPING OR EQUIPMENT, THIS CONTRACTOR SHALL DISCONNECT, CLEAN, REPAIR AND RECONNECT ALL OBSTRUCTED PIPING OR EQUIPMENT AND SHALL ALSO PAY FOR ALL NECESSARY CUTTING AND REPAIRS TO ADJOINING WORK.

G. ALL PIPING AND EQUIPMENT SHALL BE THOROUGHLY CLEANED INSIDE AND OUT, OF DIRT, CUTTINGS, OILS AND OTHER FOREIGN SUBSTANCES AND SHALL BE LEFT CLEAN.

H. ALL REQUIRED TESTS SHALL BE WITNESSED BY LOCAL AUTHORITIES AND THE OWNER'S REPRESENTATIVE.

I. ALL EQUIPMENT WILL BE FACTORY TESTED.

J. CONTRACTOR SHALL IDENTIFY TO THE OWNER'S REPRESENTATIVE ANY LEAKS OR DAMAGE THAT OCCURS AS A RESULT OF SYSTEM TESTING. CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO LIMIT ANY POTENTIAL DAMAGE. CORRECTIVE ACTION REQUIRED AS A RESULT OF TESTING SHALL BE PERFORMED IMMEDIATELY AND AT THE CONTRACTOR'S EXPENSE.

K. REPORT IN WRITING TO AUTHORITIES HAVING JURISDICTION, THE ARCHITECT AND THE OWNER THE RESULTS OF ALL TESTING.

L. TESTING REQUIREMENTS
   a. TEST ALL DOMESTIC WATER PIPING HYDROSTATICALLY TO 125 PSIG.
   b. HYDROSTATIC TEST PRESSURES SHALL REMAIN CONSTANT WITH NO VARIATION FOR 120 MINUTES.
   c. TESTS SHALL BE WITNESSED BY THE BUILDING ENGINEER.
   d. THE PLUMBING CONTRACTOR WILL BE HELD RESPONSIBLE FOR ALL DAMAGE DUE TO TEST FAILURES AND LEAKAGE IN THE TEST AREA AND ADJACENT TENANT OR ESB SPACES.

M. REFILL ENTIRE POTABLE HOT AND COLD WATER SUPPLY SYSTEM WITH CHLORINE SOLUTION (HTH OLIN CHEMICAL CORP.) AT A STRENGTH TO MEET STANDARDS OF THE DEPARTMENT OF HEALTH, AND FOR A PERIOD OF RETENTION AS STIPULATED.

N. THOROUGHLY FLUSH PIPING SYSTEM WITH FRESH WATER IMMEDIATELY PRIOR TO FINAL ACCEPTANCE.

O. INSPECTION & TESTING SHALL BE AS PER 2015 INTERNATIONAL PLUMBING CODE SECTION 107.

4. WARRANTY

A. EQUIPMENT, MATERIALS AND WORKMANSHIP FURNISHED UNDER THIS CONTRACT SHALL BE GUARANTEED BY THE CONTRACTOR FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE OF THE WORK BY THE OWNER. THE CONTRACTOR SHALL KEEP THE WORK IN GOOD REPAIR FOR ONE YEAR AFTER THE DATE OF FINAL APPROVAL. THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, PROMPTLY CORRECT AND REPAIR ANY AND ALL BREAKS, FAILURES OR WEAR DUE TO FAULTY MATERIALS, WORKMANSHIP OR EQUIPMENT. ALL SETTLEMENTS OF SURFACES THAT MAY OCCUR WITHIN THAT PERIOD SHALL ALSO BE PROMPTLY REPAIRED.

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FIELD COORDINATION	08.03.2022
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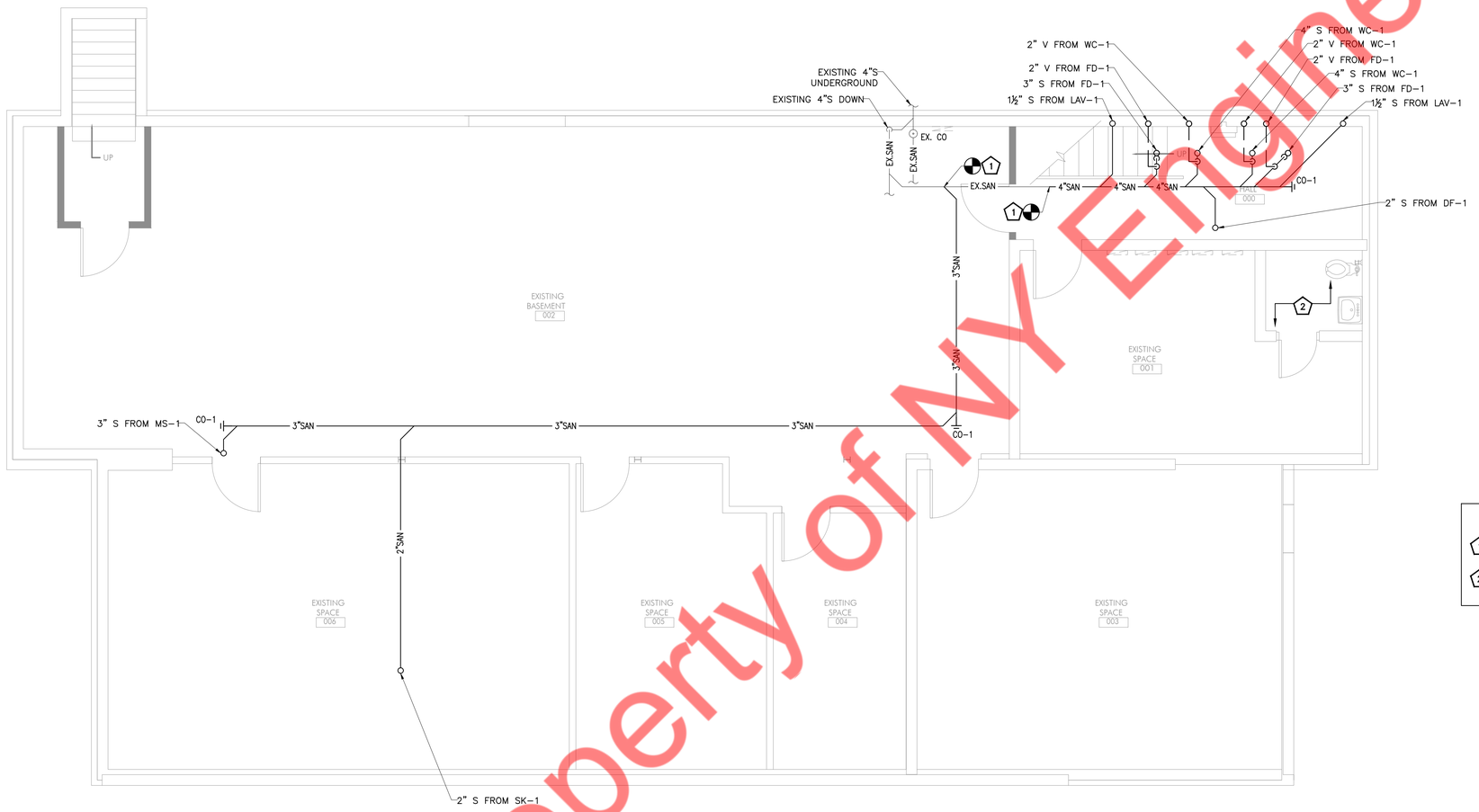
FIELD COORDINATION	09.30.2022

DRAWING SCALE:

DRAWN BY:NYE | CHECKED BY:NYE

DRAWING TITLE:
PLUMBING SYMBOLS, NOTES AND SPECIFICATIONS (2 OF 2)

DRAWING NUMBER:
P0.2



BASEMENT PLUMBING SANITARY PLAN

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

SANITARY PLAN KEYED NOTES:

1. CONNECT NEW SANITARY WASTE PIPING TO EXISTING SANITARY WASTE PIPING. CONTRACTOR TO FIELD VERIFY SIZE, LOCATION, ROUTING AND INVERT ON SITE.
2. EXISTING SANITARY FIXTURES WITH ALL EXISTING SANITARY AND VENT PIPING TO REMAIN. CONTRACTOR TO FIELD VERIFY EXISTING CONDITION AND REPLACE IF REQUIRED.

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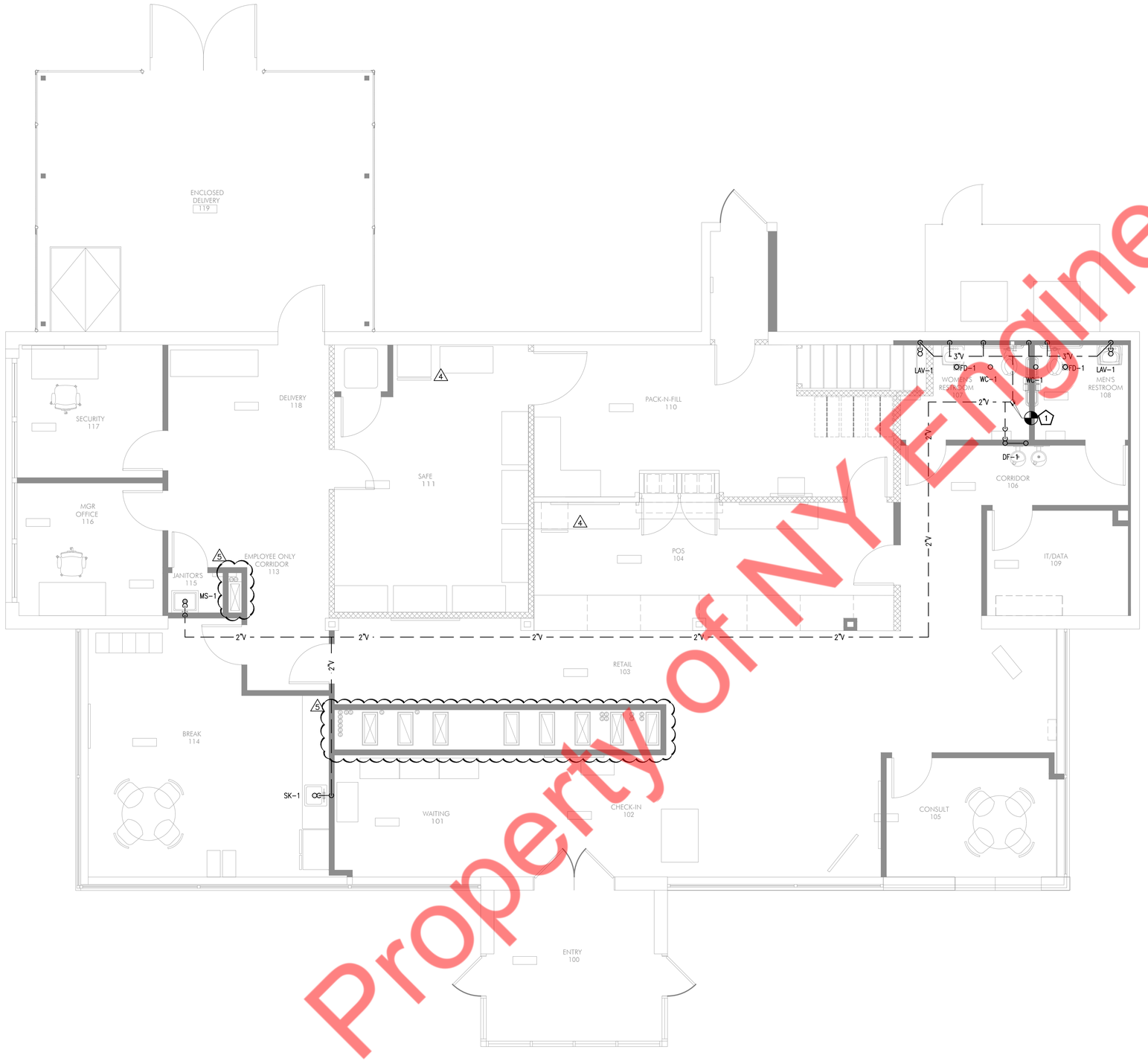

FIRST FLOOR PLUMBING SANITARY PLAN

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

SANITARY PLAN KEYED NOTES:

1. CONNECT NEW 3" VENT PIPING TO EXISTING V.T.R. CONTRACTOR TO FIELD VERIFY SIZE, LOCATION, ROUTING.

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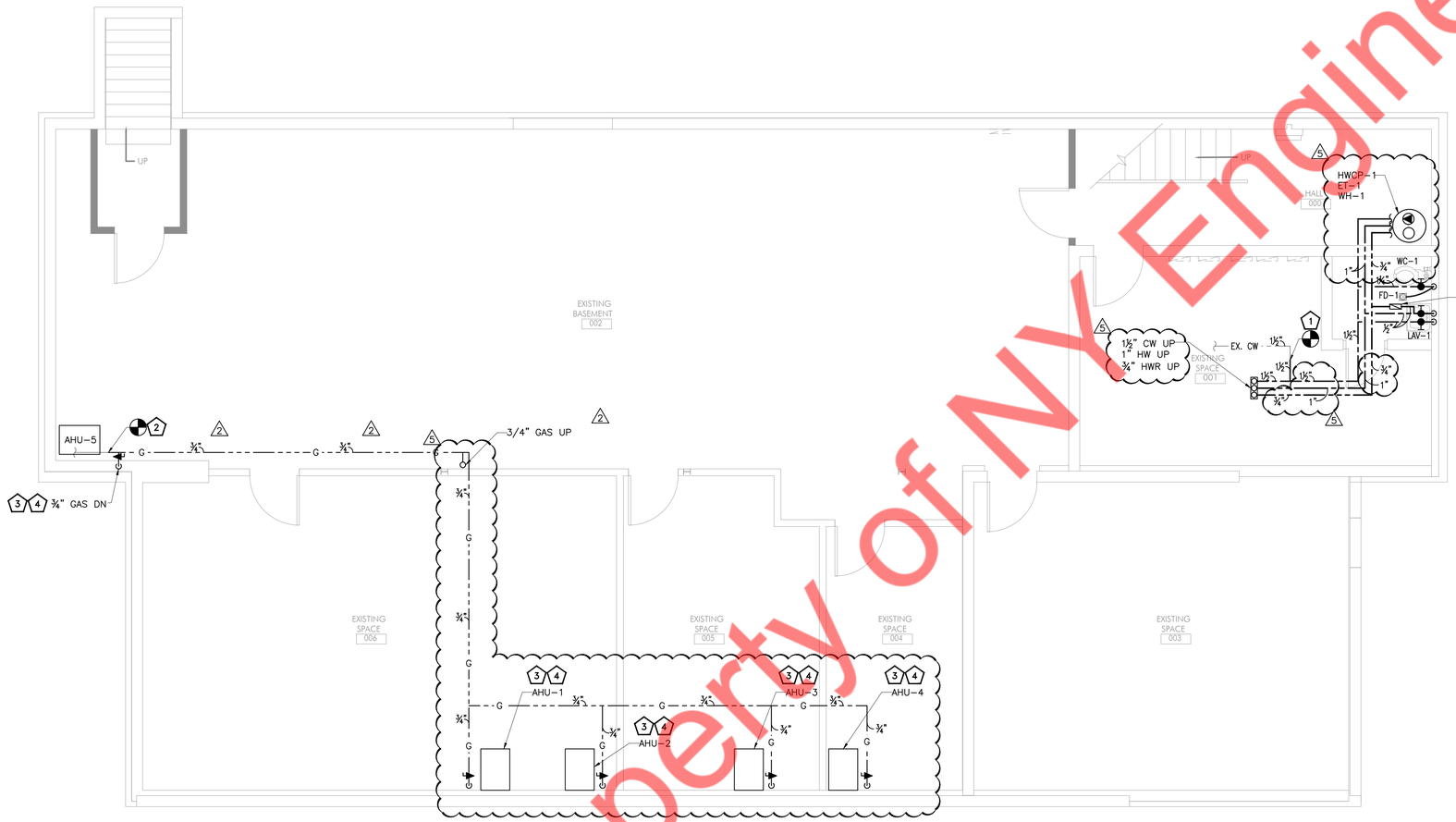

WATER AND GAS PLAN KEYED NOTES:

1. CONNECT NEW 1½" COLD WATER PIPING TO EXISTING 1½" COLD WATER PIPING. CONTRACTOR TO FIELD VERIFY SIZE, LOCATION, ROUTING. CONTRACTOR TO FIELD VERIFY WATER METER AND BACKFLOW PREVENTER REQUIREMENT WITH LANDLORD PRIOR TO BID.
2. CONNECT NEW 1" GAS PIPING TO EXISTING 1½" GAS PIPING. CONTRACTOR TO FIELD VERIFY SIZE, LOCATION, ROUTING AND AVAILABLE GAS PRESSURE AND METER CAPACITY AND UPGRADE IF REQUIRED.
3. CONTRACTOR TO FIELD VERIFY EXISTING AVAILABLE GAS PRESSURE AND MAKE SURE TO PROVIDE ADEQUATE INLET PRESSURE REQUIRED FOR MECHANICAL EQUIPMENTS AND GENERATOR TO OPERATE SATISFACTORILY.
4. PROVIDE PRESSURE REGULATOR AND GAS SHUT–OFF VALVE AT AN ACCESSIBLE LOCATION.

BASEMENT PLUMBING WATER AND GAS PLAN

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

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DRAWING TITLE:
BASEMENT PLUMBING WATER AND GAS PLAN

DRAWING NUMBER:
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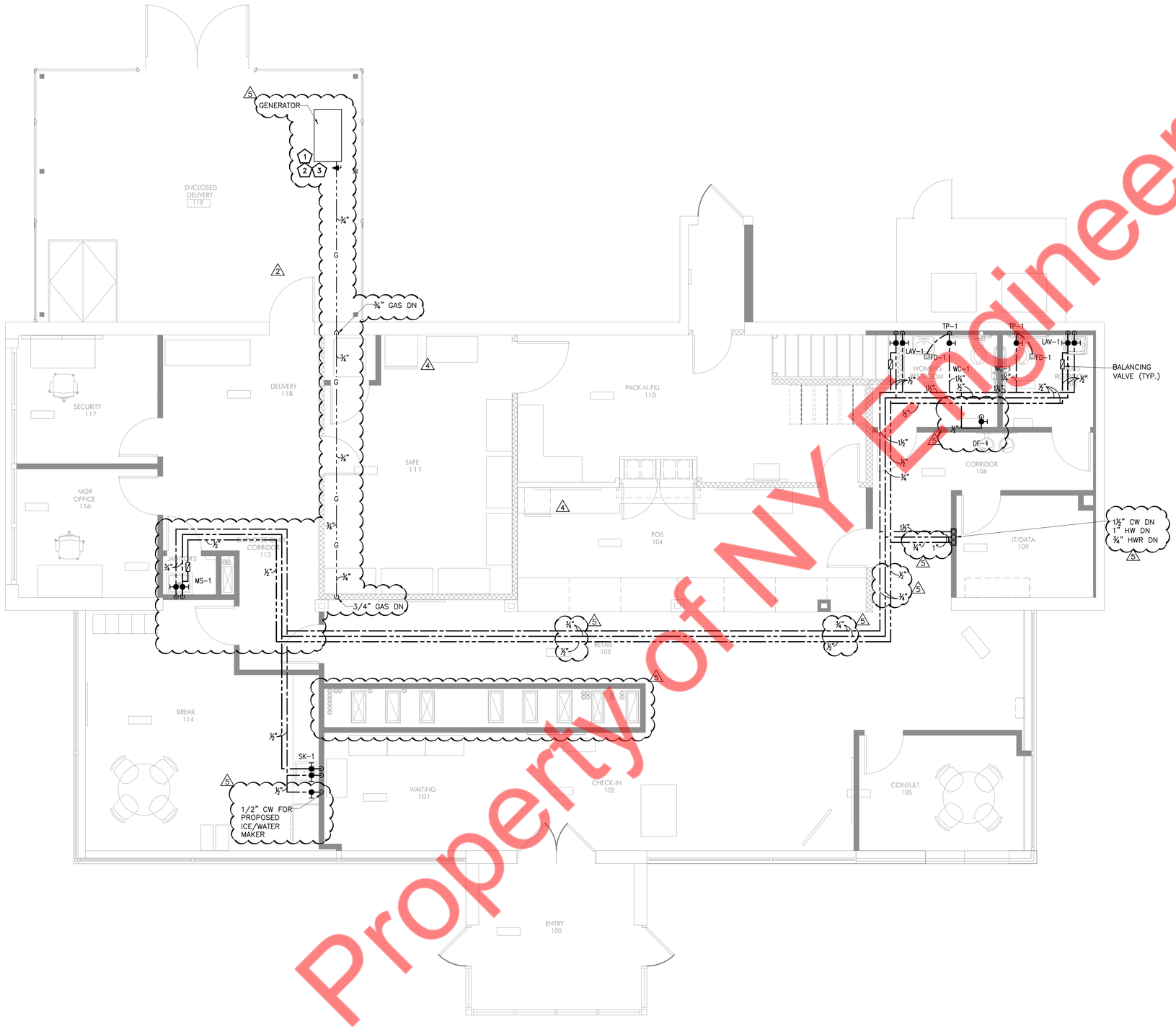

WATER AND GAS PLAN KEYED NOTES:

1. ROUTE NEW GAS PIPING TO GRADE MOUNTED GENERATOR. COORDINATE WITH ELECTRICAL WORK AND PROVIDE GAS CONNECTION AS PER MANUFACTURER'S INSTRUCTIONS. PROVIDE GRADE MOUNTED PEDESTAL PIPING TO SUPPORT PIPING ABOVE GRADE.
2. CONTRACTOR TO FIELD VERIFY EXISTING AVAILABLE GAS PRESSURE AND MAKE SURE TO PROVIDE ADEQUATE INLET PRESSURE REQUIRED FOR MECHANICAL EQUIPMENTS AND GENERATOR TO OPERATE SATISFACTORILY.
3. PROVIDE PRESSURE REGULATOR AND GAS SHUT-OFF VALVE AT AN ACCESSIBLE LOCATION.

FIRST FLOOR PLUMBING WATER AND GAS PLAN

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

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FIRST FLOOR PLUMBING WATER AND GAS PLAN

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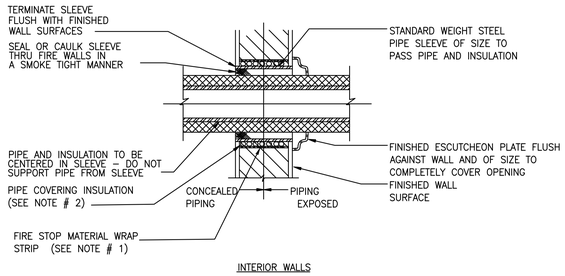
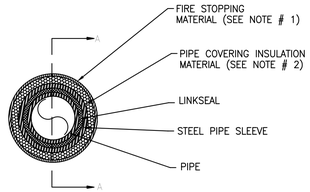
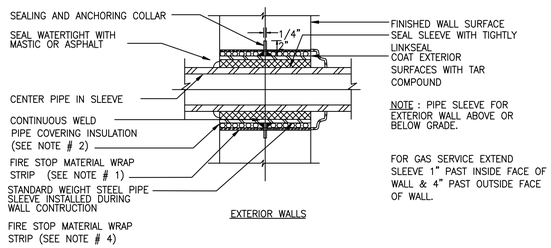




PIPE SLEEVE VIEW



NOTES:

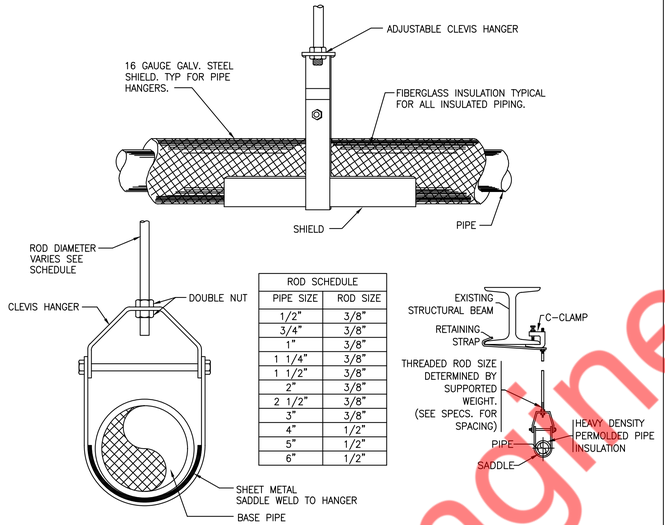
1. FIRESTOP MATERIAL WRAP STRIP SHALL BE ¼" THICK INTUMESCENT ELASTOMERIC MATERIAL FACED ON ONE SIDE WITH ALUMINUM FOIL SUPPLIED IN 2 IN. WIDE STRIPS AND WRAP AROUND THE PIPE AS PER UL MATERIAL LISTED3M COMPANY FS–195+ OR FILL CAVITY WITH CAULK OR SEALANT MIN. ¼" DIA. CONTINUOUS BEAD APPLIED TO THE WRAP STRIP/WALL INTERFACE AND TO THE EXPOSED OF THE WRAP STRIP LAYER APPROX. 3/4" FROM WALL SURFACE. AS PER UL LISTED 3M COMPANY CP25WB+, IC 15WB+, FIRE DAM 150+CAULK.
2. PIPE COVERING INSULATION SHALL BE 2" THICK HOLLOW CYLINDRICAL HEAVY DENSITY GLASS FIBER UNITS JACKETED ON THE OUTSIDE WITH AN ALL SERVICE JACKETED. AS PER UL CLASSIFICATION AND MARKING WITH A FLAME SPREAD INDEX OF 25 OR LESS AND A SMOKE DEVELOPED INDEX OF 50 OR LESS MAY BE USED.

NOTE : PIPE SLEEVE FOR EXTERIOR WALL ABOVE OR BELOW GRADE.

FOR GAS SERVICE EXTEND SLEEVE 1" PAST INSIDE FACE OF WALL & 4" PAST OUTSIDE FACE OF WALL.

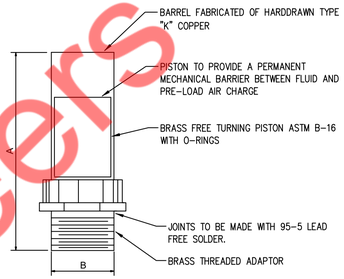
PIPE SLEEVE THRU WALL SECTION

1 / P5.1 PIPE SLEEVE THRU WALL SECTION N.T.S



ROD SCHEDULE	
PIPE SIZE	ROD SIZE
1/2"	3/8"
3/4"	3/8"
1"	3/8"
1 1/4"	3/8"
1 1/2"	3/8"
2"	3/8"
2 1/2"	3/8"
3"	3/8"
4"	1/2"
5"	1/2"
6"	1/2"

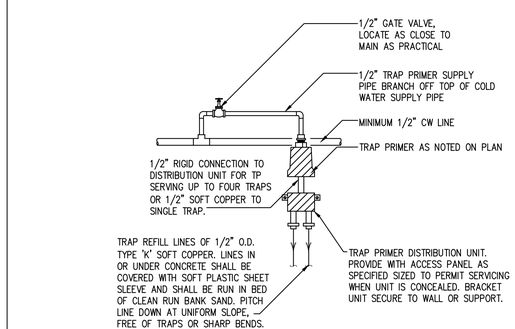
2 / P5.1 HANGER DETAIL N.T.S



PIPE SIZE	P.D.I. SYMBOL	FIXTURE UNIT RATINGS	A SIZE	B SIZE
1/2"	A	1 – 11	5"	1/2"
3/4"	B	12 – 32	5"	3/4"
1"	C	33 – 60	7"	1"
1–1/4"	D	61 – 113	7"	1–1/4"
1–1/2"	E	114 – 154	9"	1–1/2"
2"	F	155 – 330	9"	2"

NOTE: LOCATE ONE FOR EACH BANK OF FLUSHOMETER FIXTURES AT LAST FIXTURE PROVIDE A STAINLESS STEEL ACCESS DOOR FOR EACH SUFFICIENT IN SIZE TO ALLOW REPLACEMENT OF ARRESTOR AT A FUTURE DATE.

3 / P5.1 WATER HAMMER ARRESTOR DETAILS N.T.S



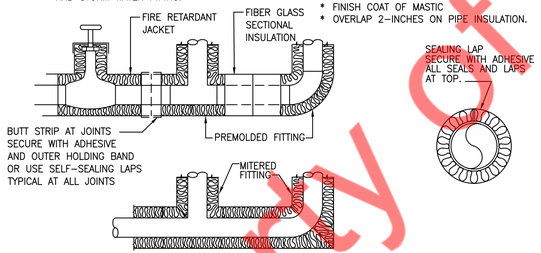
4 / P5.1 TRAP PRIMER DETAIL N.T.S

CONCEALED VALVES AND FITTINGS

* WRAP WITH 1–INCH THICK, 1–POUND DENSITY TO REQUIRED PIPE INSULATION THICKNESS
* SECURE WITH WIRE OR TAPE.
* VAPOR SEAL COLD WATER, CHILLED WATER AND STORM WATER PIPING.

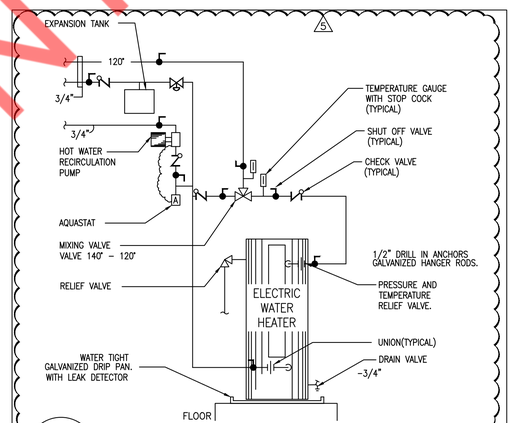
CONCEALED VALVES AND FITTINGS

* PREMOLDED FIBER GLASS OR RADIAL MITERED PIPE INSULATION
* SKIM COAT OF INSULATION CEMENT
* COAT OF MASTIC
* WRAP WITH FIBER GLASS REINFORCING CLOTH.
* FINISH COAT OF MASTIC
* OVERLAP 2–INCHES ON PIPE INSULATION.

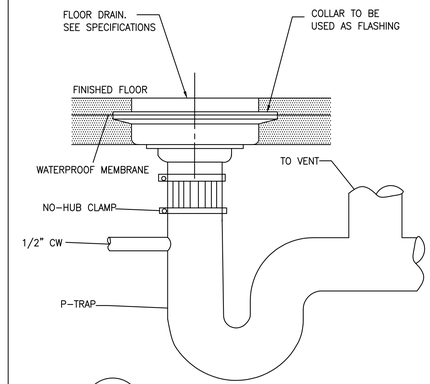


INSULATION OF PIPING, VALVES AND FITTINGS FOR EXPOSED AND CONCEALED LOCATIONS

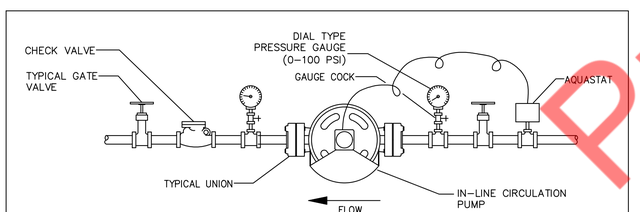
5 / P5.1 N.T.S



6 / P5.1 HOT WATER HEATER INSTALLATION DETAIL N.T.S



7 / P5.1 FLOOR DRAIN DETAIL N.T.S



8 / P5.1 INLINE RECIRCULATION PUMP DETAIL N.T.S

PROJECT: GOODBLEND READING

PROJECT NUMBER: 21242

goodblend MEDICAL MARIJUANA

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DRAWN BY:NYE | CHECKED BY:NYE

DRAWING TITLE: PLUMBING DETAILS

DRAWING NUMBER: P5.0

PLUMBING FIXTURE SCHEDULE

LEGEND	PLUMBING FIXTURE	CONNECTION SIZE – INCHES						REMARKS
		TRAP	SOIL/WASTE	VENT	COLD WATER	HOT WATER	THERMOSTATIC MIXING VALVE	
WC–1	WATER CLOSET	–	4"	2"	1¼"	–	–	FLUSH VALVE
LAV–1	LAVATORY	2"	2"	2"	½"	½"	PROVIDE	P–TRAP
MS–1	MOP SINK	3"	3"	2"	¾"	¾"	–	P–TRAP
SK–1	BREAKRDOOM SINK	2"	2"	2"	½"	½"	PROVIDE	P–TRAP
DF–1	DRINKING FOUNTAIN	2"	2"	1½"	½"	–	PROVIDE	P–TRAP
TP–1	TRAP PRIMER	–	–	–	½"	–	PROVIDE	P–TRAP
FD–1	FLOOR DRAIN	3"	3"	2"	–	–	–	P–TRAP

NOTE: CONTRACTOR TO COORDINATE WITH ARCHITECTURAL DRAWINGS FOR ALL PLUMBING FIXTURES SPECIFICATIONS AND MOUNTING HEIGHT INSTALLATION.

HOT WATER HEATER

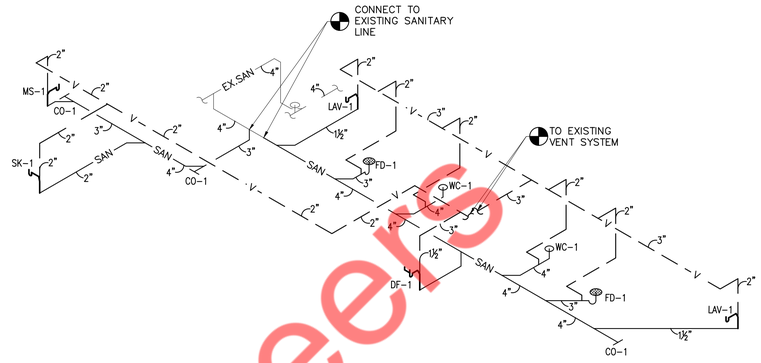
TAG No.	NO. OF ELEMENTS	FIXTURES SERVING	STORAGE GALONS	RECOVERY CAP. (GPM @ RISE)	TYPE	ELECTRICAL				MANUFACTURER & MODEL NO.	REMARKS
						VOLTS	PHASE	HERTZ	INPUT KW		
WH–1	2	BREAKROOM SINK, LAVATORY, MOP SINK.	40	36 GPH @ 100°F	ELECTRIC WATER HEATER (SIMULTANEOUS OPERATION)	240	3	60	9	A.O.SMITH DEL–40 (DURA–POWER)	–DIMENSIONS 24"DIA X 32.25"H –HEATERS SHALL HAVE 150PSI WORKING PRESSURE.

RECIRCULATING PUMP SCHEDULE

MARK	SERVICE	GPM	TOTAL HEAD FT.	MOTOR HP	MANUFACTURER & REMARKS
HWCP–1	HW RECIRCULATION	2	10	0.115	GRUNDFOS UPS 15–18 BUC5 W/AQUASTAT + TIMER

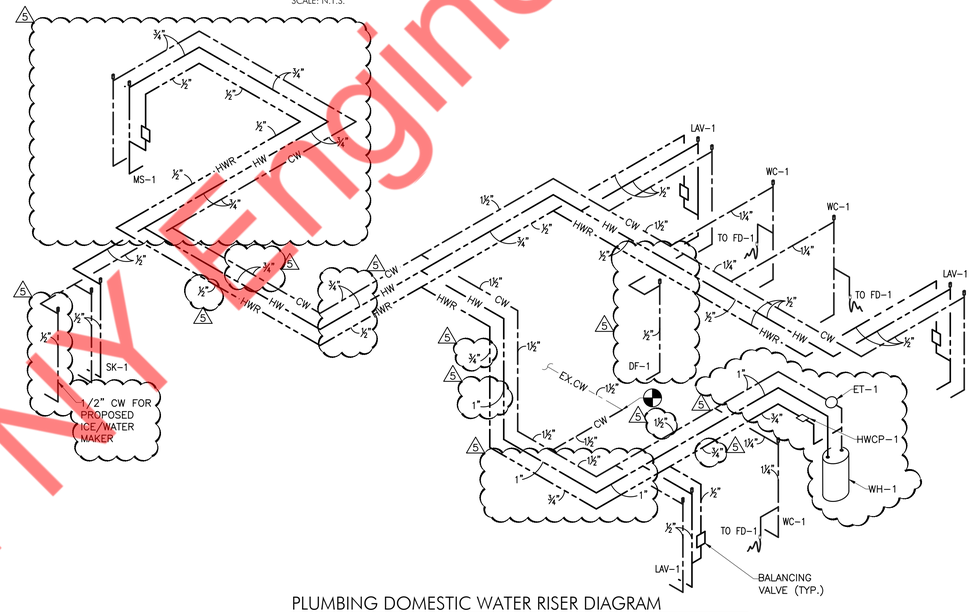
EXPANSION TANK SCHEDULE

ITEM	QUANTITY	LOCATION	SERVICE	GALLONS	MANUFACTURER & MODEL NO.	WEIGHT(LBS)	DIMENSION
EXPANSION TANK (ET–1)	1	REFER PLANS	HOT WATER	2	THERM–X–TROL ST–5	5	DIMENSIONS– 13"(H)x8"(DIA.)



PLUMBING SANITARY RISER DIAGRAM

SCALE: N.T.S.



PLUMBING DOMESTIC WATER RISER DIAGRAM

SCALE: N.T.S.

NATURAL GAS PIPING SYSTEM

PROVIDE A COMPLETE GAS PIPING SYSTEM TO SERVE GAS EQUIPMENT FURNISHED BY OTHERS, AS NOTED ON THE DRAWINGS. PROVIDE EITHER THREADED STEEL OR MALLEABLE IRON PIPE WITH MALLEABLE FITTINGS OR WELDED STEEL. PROVIDE ALL UNIONS, SHUT–OFF VALVES AND DIRT LEGS REQUIRED BY NFPA–54 AND GOVERNING LOCAL CODES AND AT EACH GAS APPLIANCE CONNECTION. PROVIDE ALL TESTS, METERS, INSPECTIONS, HANGERS AND EQUIPMENT CONNECTIONS REQUIRED FOR A COMPLETE AND OPERATING SYSTEM.

NOTES:

1. GAS PIPING TO BE SCHEDULE 40 STEEL PIPE W/125 CAST IRON SCREWID FITTINGS
2. GAS SYSTEM TO BE INSTALLED BY QUALIFIED LICENSED CONTRACTOR.
3. VERIFY ALL EQUIPMENT BTUS'S PRIOR TO INSTALLATION. ADJUST PIPE SIZE ACCORDING INTERNATIONAL FUEL GAS CODE, 2015, TABLE 402.4(5) (2)

MAXIMUM EQUIVALENT LENGTH OF PIPE= 140FT.

GAS PIPE SIZING PER IFGC 2015, TABLE 402.4(5)

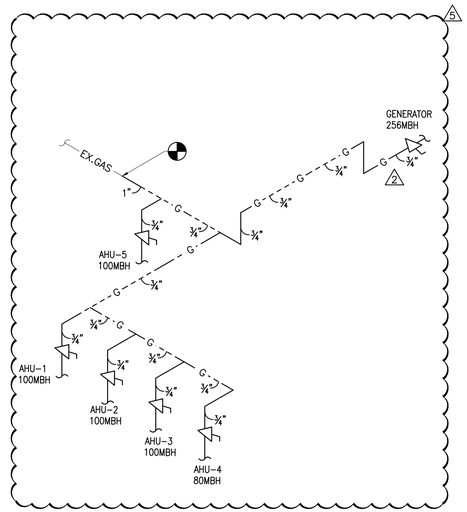
GAS INLET PRESSURE= 2 PSI.

PRESSURE DROP= 1 PSI.

SPECIFIC GRAVITY= 0.60

GAS SCHEDULE

ITEM	QTY.	DESCRIPTION	SIZE	MBH
–	1	AHU–1	3/4"	100
–	1	AHU–2	3/4"	100
–	1	AHU–3	3/4"	100
–	1	AHU–4	3/4"	80
–	1	AHU–5	3/4"	100
–	1	GENERATOR	3/4"	256 (5)
TOTAL LOAD				736



PLUMBING GAS RISER DIAGRAM

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DRAWING TITLE: PLUMBING SCHEDULES & RISER DIAGRAMS

DRAWING NUMBER: P6.0

BUILDING DATA

PROJECT DESCRIPTION		BUILDING OCCUPANCY				BUILDING DESCRIPTION						FIRE ALARM SYSTEM FEATURES	
	NEW BUILDING		ASSEMBLY GROUP A (A1,A2,A3,A4 AND A5)		RESIDENTIAL GROUP R (R1,R2 AND R3)	2	TOTAL NUMBER OF LEVELS		ATRIUM		STAIR PRESSURIZATION	X	NON-VOICE EVACUATION
	FIRE ALARM SYSTEM UPGRADE		BUSINESS GROUP B		STORAGE GROUP S (S1 AND S2)	1	ABOVE GROUND LEVELS	FIRST	FIRE DEPARTMENT ACCESS		POST FIRE SMOKE PURGE		VOICE EVACUATION
	LIFE SAFETY SYSTEM UPGRADE		EDUCATIONAL GROUP E		UTILITY AND MISCELLANEOUS GROUP U	1	BELOW GROUND LEVELS		FULLY SPRINKLERED	X	GENERATOR		PARTIAL/SELECTIVE EVACUATION
X	RENOVATION		FACTORY INDUSTRIAL GROUP F (F1 AND F2)		OTHER:	0	NUMBER OF ELEVATOR BANKS		PARTIALLY SPRINKLERED		FIRE PUMP		GENERAL EVACUATION
	EMERGENCY REPAIR		HIGH-HAZARD GROUP H (H1,H2,H3,H4 AND H5)			2	NUMBER OF EGRESS STAIRS	X	NON-SPRINKLERED		OTHER:		DIGITAL ALARM COMMUNICATOR
	TENANT ADDITION		INSTITUTIONAL GROUP I (I1,I2 AND I3)			X	LOW RISE BUILDING		PRE-ACTION SPRINKLER		OTHER:		PRE-SIGNAL SYSTEM
	OTHER:	X	MERCANTILE GROUP M				HIGH RISE BUILDING						FIRE FIGHTER'S TELEPHONE SYSTEM

SYSTEM INPUTS / INITIATING DEVICES	SYSTEM OUTPUTS / INDICATING/CONTROLLED DEVICES	CONTROL UNIT ANNUNCIATION				NOTIFICATION						REQUIRED FIRE SAFETY CONTROL						
		A: ACTIVATE COMMON ALARM SIGNAL INDICATOR ON LCD OF FIRE ALARM CONTROL PANEL & OUTLYING ANNUNCIATORS	B: ACTIVATE COMMON TROUBLE SIGNAL INDICATOR ON LCD OF FIRE ALARM CONTROL PANEL & OUTLYING ANNUNCIATORS.	C: SOUND INTERNAL BUZZER AT FIRE ALARM CONTROL PANEL & OUTLYING ANNUNCIATORS.	D: TEXT MESSAGE DISPLAY DEVICE TYPE & LOCATION OF TROUBLE/ALARM/SUPERVISORY SIGNAL ON FIRE ALARM CONTROL PANEL & OUTLYING ANNUNCIATORS.	E: ACTIVATE EVACUATION SIGNAL THROUGH LOUDSPEAKERS AND FLASH STROBES ON ALARM FLOOR, FLOOR ABOVE, & FLOOR BELOW.	F: TRANSMIT "MANUAL" ALARM SIGNAL TO FIRE DEPARTMENT VIA AN APPROVED CENTRAL STATION MONITORING COMPANY.	G: TRANSMIT "SMOKE/HEAT" ALARM SIGNAL TO FIRE DEPARTMENT VIA AN APPROVED CENTRAL STATION MONITORING COMPANY.	H: TRANSMIT "TROUBLE" ALARM SIGNAL TO FIRE DEPARTMENT VIA AN APPROVED CENTRAL STATION MONITORING COMPANY.	I: DURING PERIODS WHEN NOT USED BY THE PUBLIC AS AN ASSEMBLY OCCUPANCY, SOUND STANDARD ALARM SIGNAL AND FLASH VISIBLE SIGNALS(STROBES) THROUGHOUT THE COVERED AREA.	J: DURING PERIODS WHEN USED BY THE PUBLIC AS AN ASSEMBLY OCCUPANCY, VISUAL ALARM SIGNALS SHALL BE MADE FACP LIVE VOICE ANNOUNCEMENTS UTILIZING FA SPEAKERS FOR THE PURPOSE OF COMMUNICATING INSTRUCTIONS AND/OR DIRECTING ACTIONS TO BE TAKEN, PER BC 907.2.1	K: INITIATE THE AUTOMATIC FIRE MODE CONDITIONS FOR FAN (AC UNIT)OPERATION. PROCEED AC UNIT SHUTDOWN SEQUENCE.	L: INITIATE THE AUTOMATIC FIRE MODE CONDITIONS FOR FIRE SMOKE DAMPER OPERATION. PROCEED FIRE SMOKE DAMPER SHUTDOWN SEQUENCE.	M: RELEASE ALL ELECTRICALLY HELD OPEN FIRE & SMOKE DOORS.	N: RELEASE/ OPEN ASSOCIATED SMOKE VENTS (AREA DETECTOR ONLY)	O: RELEASE FIRE STAIR SMOKE VENT	P: RELEASE ALL ELECTRIC STRIKES ON STAIRWAY RE-ENTRY DOORS & ALL OTHER DOORS IN BUILDING IN THE PATHS OF EGRESS TO THE EXIT STAIRWAYS.	
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	
1	MANUAL PULL STATION	●		●	●	●	●			●	●			●			●	1
2	AREA SMOKE DETECTOR	●		●	●	●		●		●	●	●	●	●	●	●	●	2
3	HEAT DETECTOR	●		●	●	●		●				●	●	●			●	3
4	ALARM ACTIVATION OF OTHER SUBSYSTEM	●		●	●	●		●				●	●	●				4
5	TROUBLE ACTIVATION OF OTHER SUBSYSTEM		●	●	●				●									5
6	FIRE DRILL KEY SWITCH																	6
7	FIRE ALARM AC POWER FAILURE		●	●	●				●									7
8	FIRE ALARM SYSTEM LOW BATTERY		●	●	●				●									8
9	OPEN CIRCUIT		●	●	●				●									9
10	GROUND CIRCUIT		●	●	●				●									10
11	NOTIFICATION APPLIANCE CIRCUIT SHORT		●	●	●				●									11

FIRE ALARM SYMBOL LIST

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
F	STROBE LIGHT DEVICE, WALL MOUNTED (80" AFF)	F	FIRE ALARM MANUAL PULL STATION, WALL MOUNTED (48" AFF)
H	WALL MOUNTED HORN/STROBE COMBINATION DEVICE (80" AFF)	MM	MONITOR MODULE
F	WALL MOUNTED SPEAKER ONLY DEVICE (80" AFF)	CST	CENTRAL STATION TRANSMITTER
S	CEILING MOUNTED AREA SMOKE DETECTOR	FSD	FIRE SMOKE DAMPER, REFER TO MECH. PLANS FOR FURTHER INFORMATION.
H	CEILING MOUNTED HEAT DETECTOR	R	FIRE ALARM RELAY
FACP	FIRE ALARM CONTROL PANEL	CR	CARD READER (BY OTHERS)
CM	ADDRESSABLE CONTROL MODULE	DH	MAGNETIC DOOR HOLDER DEVICE
T	SIGNAL TRANSFORMER (PRI: 120V, SEC: 24V)	——	SOLID THICK LINE INDICATES NEW DEVICE OR WIRING
FCS	FIRE COMMAND STATION	——	DOTTED LINE INDICATES EXISTING DEVICE OR WIRING

ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR
C	CONDUIT
DGP	DATA GATHERING PANEL
E	EXISTING
EL	EXISTING TO BE LOWERED
ELV	ELEVATOR LOBBY
EMT	ELECTRIC METALLIC TUBING
ER	EXISTING TO BE RELOCATED
FA	FIRE ALARM
FCS	FIRE COMMAND STATION
FDS	FUSED DISCONNECT SWITCH
G	GROUND
HC	HUNG CEILING
NE	NEW TO REPLACE EXISTING
NTS	NOT TO SCALE
R	REMOVE
RCU	REMOTE COMPUTER UNIT
RE	RELOCATED EXISTING
RGS	RIGID GALVANIZED STEEL
RP	RELOCATED POSITION
UON	UNLESS OTHERWISE NOTED
W	WIRE

FIRE ALARM NOTES:

1. ALL EQUIPMENT AND WIRING INDICATED ON THESE PLANS IS NEW (U.O.N.).
2. PROVIDE WIRING AS REQUIRED BETWEEN ALL DEVICES AND EQUIPMENT AS REQUIRED TO PERFORM FIRE ALARM SYSTEM FUNCTIONS.
3. WIRING FOR FIRE ALARM DEVICES IN FINISHED SPACES WITHOUT HUNG CEILING SHALL BE INSTALLED IN EMT CONDUIT.
4. ALL STROBES AND HORN/STROBES SHALL BE FLUSH WALL MOUNTED FINISH BY ARCHITECT, APPROVED FOR USE IN PA.
5. ALL DUCT SMOKE DETECTORS INSTALLED IN HUNG CEILING AREA AND IN OUT OF SIGHT AREA SHALL HAVE REMOTELY INSTALLED STATUS INDICATOR LAMPS. COORDINATE EXACT LOCATION WITH ARCHITECT AND GENERAL CONTRACTOR.
6. FOR WALL MOUNTED F.A. DEVICES PROVIDE 3/4" CONDUIT TERMINATED IN NEAREST ACCESSIBLE CEILING.
7. WIRING FOR FIRE ALARM DEVICES IN UNFINISHED SPACES SHALL BE INSTALLED IN RGS CONDUIT UP TO 8'-0" AFF AND THEN IN EMT CONDUIT ABOVE 8'-0" AFF.
8. FOR LOCATIONS AND QUANTITIES OF DEVICES REFER TO FIRE ALARM FLOOR PLANS. WHERE THERE ARE DISCREPANCIES BETWEEN THE PLANS AND THE RISER DIAGRAM, THE GREATER QUANTITY SHALL BE USED.
9. CONTRACTOR SHALL VERIFY ALL WIRING WITH FIRE ALARM VENDOR AND OBTAIN WIRING DIAGRAMS BEFORE PROCEEDING WITH THE START OF ANY WORK.
10. ALL WIRING SHALL BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE AND LOCAL CODES.
11. PROVIDE FAN SHUT DOWN CAPABILITY FOR FANS WITH A RATING LARGER THAN 2,000 CFM. SHUT DOWN SHALL BE ACCOMPLISHED BY ONE OR MORE OUTPUT CONTROL POINTS FROM THE FIRE ALARM SYSTEM TO RELAYS FOR SHUTDOWN. PROVIDE CONTROL AND MONITORING FOR ALL RELAYS. PROVIDE POWER, CONTROL RELAYS, MONITORING AND WIRING FOR ALL FIRE/SMOKE DAMPERS.
12. DUCT DETECTORS SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR ALONG WITH FURNISHING OF THE SAMPLING TUBES. DUCTWORK MODIFICATIONS AND INSTALLATION OF SAMPLING TUBES SHALL BE BY THE MECHANICAL CONTRACTOR. FOR FANS RATED LARGER THAN 2,000 CFM PROVIDE DUCT DETECTORS IN SUPPLY AND RETURN DUCTWORK.
13. PROVIDE ALL REQUIRED EXPANSION PANELS, PC BOARDS, POWER SUPPLIES, BATTERIES, FUSE CUTOUTS AND BRANCH CIRCUITS, ETC, FOR A COMPLETE AND OPERATIONAL FIRE ALARM SYSTEM.
14. STROBES AND HORNS SHALL BE WIRED ON ALTERNATING A-B CIRCUITING IN ALL AREAS, AS INDICATED ON THE RISER DIAGRAM.
15. CONTRACTOR SHALL PERFORM ALL PA BUILDING DEPT. FILINGS AND OBTAIN ALL APPROVALS. CONTRACTOR SHALL OBTAIN ALL REQUIRED SIGNED & SEALED PA BUILDING DEPT. FORMS AND ALL REQUIRED SETS OF DRAWINGS FROM ENGINEER OF RECORD AND BUILDING DEPT. EXPEDITOR.
16. UPON COMPLETION OF INSTALLATION THE SYSTEM SHALL BE 100% PRE-TESTED BY THE FIRE ALARM VENDOR AND THE LICENSED ELECTRICAL CONTRACTOR PRIOR TO FIRE DEPARTMENT INSPECTION.
17. CONTRACTOR SHALL SUBMIT TO THE ENGINEER A MARKUP OF FA DRAWINGS INDICATING "AS-BUILT" CONDITIONS FOR ENGINEER'S REFERENCE. IN PREPARING "AS-BUILT" DRAWINGS FOR FILING, CONTRACTOR SHALL SIGN "AS-BUILT" STATING A FUNCTIONAL TEST HAS BEEN CONDUCTED OF THE FIRE ALARM SYSTEM AND THE SYSTEM OPERATES AS DESIGNED AND IN ACCORDANCE WITH THE INPUT/OUTPUT PROGRAMMING MATRIX/ AS REQUIRED BY LOCAL FIRE CODES.

DRAWINGS LIST

TYPE OF DESIGN

INSTALLATION OF MANUAL, AUTOMATIC SMOKE/HEAT DETECTION ALARM SYSTEM.

PROJECT:
GOODBLEND READING

PROJECT NUMBER: 21242

goodblend MEDICAL MARIJUANA

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DRAWING TITLE:
BUILDING DATA, NOTES, LEGEND & I/O MATRIX

DRAWING NUMBER:
FA0.1

FIRE ALARM SYSTEM

A. DESCRIPTION:

1. THE ELECTRICAL CONTRACTOR SHALL FURNISH, INSTALL AND PLACE IN OPERATING CONDITION, A COMPLETE FIRE ALARM SYSTEM AS SPECIFIED IN THIS SECTION, TO INCLUDE THE FURNISHING OF ALL LABOR, EQUIPMENT, MATERIALS AND THE PERFORMANCE OF ALL OPERATIONS ASSOCIATED WITH THE INSTALLATION OF THE FIRE ALARM SYSTEM, AS SHOWN ON THE CONTRACT DRAWINGS AND HEREIN SPECIFIED.

2. THE COMPLETE SYSTEM INSTALLATION SHALL BE IN ACCORDANCE WITH THE APPLICABLE SECTIONS OF THE NATIONAL FIRE SAFETY CODE, THE (ADA) AMERICAN DISABILITIES ACT, THE NATIONAL ELECTRICAL CODE, REQUIREMENTS, AND ALL THE REQUIREMENTS OF THE LOCAL FIRE DEPARTMENT.

3. THE REQUIREMENTS OF THE GENERAL CONDITIONS AND THE SUPPLEMENTARY CONDITIONS OF THE CONTRACT DOCUMENTS SHALL APPLY TO ALL WORK SPECIFIED IN THIS SECTION.

4. THE WORK COVERED UNDER THIS SECTION OF THE CONTRACT SPECIFICATIONS SHALL BE COORDINATED WITH ALL OTHER WORK SPECIFIED IN THE OTHER SECTIONS OF THE CONTRACT SPECIFICATIONS.

5. THE FIRE ALARM SYSTEM DESCRIBED HEREIN AND AS SHOWN ON THE PLANS; SHALL BE WIRED, CONNECTED, TESTED AND LEFT IN FIRST CLASS OPERATING CONDITION. THE ELECTRICAL CONTRACTOR SHALL PROVIDE THE PROPER CONTROL EQUIPMENT, CONTROL INTERFACE ANNUNCIATORS, ALARM INITIATING DEVICES, ALARM NOTIFICATION APPLIANCES, WIRING, TERMINATIONS, ELECTRICAL BOXES, AND ALL OTHER NECESSARY MATERIALS FOR A COMPLETE OPERATING SYSTEM.

6. THE FIRE ALARM SYSTEM SHALL BE A MICROPROCESSOR – BASED SYSTEM ALLOWING FOR EDITING OF THE SOFTWARE PROGRAM FOR CHANGES IN SYSTEM OPERATION. THE SYSTEM SHALL BE CAPABLE OF ON–SITE PROGRAMMING TO ACCOMMODATE SYSTEM CHANGES AND/OR SYSTEM EXPANSIONS. ALL SOFTWARE OPERATIONS SHALL BE STORED IN NON–VOLATILE, FLASH PROM MEMORY. LOSS OF THE SYSTEM'S PRIMARY AND/OR SECONDARY POWER SOURCES SHALL NOT RESULT IN A LOSS OF THE SYSTEM SOFTWARE PROGRAMS. FIELD PROGRAMMING SHALL NOT BE LOST IN THE EVENT OF MAIN AND/OR BATTERY POWER LOSS.

7. FULL FLEXIBILITY FOR SELECTIVE INPUT–OUTPUT CONTROL FUNCTIONS BASED ON ANDING, ORING, NOTING, TIMING, AND SPECIAL CODED OPERATIONS SHALL ALSO BE INCORPORATED IN THE RESIDENT SOFTWARE PROGRAM OF THE SYSTEM.

B. SYSTEM OPERATION

1. THE SYSTEM OPERATION SUBSEQUENT TO THE ACTIVATION OF ANY MANUAL OR AUTOMATIC ALARM INITIATING DEVICE SHALL BE AS FOLLOWS:

   A. ALL AUDIBLE VISUAL ALARM INDICATING APPLIANCES SHALL SOUND AT THE NEW FIRE ALARM PANEL AND AT THE REMOTE ANNUNCIATOR UNTIL SILENCED BY THE ALARM SILENCE SWITCH.

   B. THE ALARM SHALL BE DISPLAYED ON AN 80–CHARACTER LCD DISPLAY. THE TOP LINE OF 40 CHARACTERS SHALL BE THE POINT LABEL, AND THE SECOND LINE SHALL BE THE DEVICE TYPE IDENTIFIER. THE SYSTEM ALARM LED SHALL FLASH ON THE CONTROL PANEL UNTIL THE ALARM HAS BEEN ACKNOWLEDGED. ONCE ACKNOWLEDGED, THIS SAME LED SHALL LATCH ON. A SUBSEQUENT ALARM RECEIVED FROM ANOTHER ZONE SHALL FLASH THE SYSTEM ALARM LED ON THE CONTROL PANEL. THE LCD DISPLAY SHALL SHOW THE NEW ALARM INFORMATION, AT THE CONTROL PANEL.

   C. TRANSMIT A SIGNAL FROM THE CONTROL PANEL VIA AN RS232 SERIAL PORT, TO PRINT THE SYSTEM STATUS CHANGES ON THE REMOTE SYSTEM PRINTER.

   D. ACTIVATE THE MUNICIPAL CONNECTION VIA THE RADIO MASTER BOX.

   E. ACTIVATE CONTROL RELAYS LOCATED WITHIN AN EXTERNAL CONTROL CABINET LOCATED NEXT TO THE FIRE ALARM CONTROL PANEL SPECIFIED. IN ADDITION TO BUILDING EVACUATION THE FOLLOWING AUXILIARY CONTROL AND INTERFACE FUNCTIONS SHALL BE PROVIDED BY THE SPECIFIED SYSTEM.

      1. SELECTIVE AUTOMATIC HVAC FAN SHUTDOWN AND MANUAL (HOA) OVERRIDE.
      2. RELEASE OF MAGNETIC DOOR HOLDER.
      3. CAPTURE AN ALTERNATE FLOOR RECALL OF SPECIFIED ELEVATORS.

C. SYSTEM SUPERVISION:

1. THE SYSTEM SHALL BE PROVIDED WITH STYLE 6 (SLC) ADDRESSABLE DEVICE COMMUNICATION CIRCUITS, STYLE D (IDC) INITIATING DEVICE CIRCUITS AND (STYLE Z) NOTIFICATION APPLIANCE CIRCUITS. ALL SYSTEM FAULTS SHALL BE INDICATED AND DISPLAYED AT THE CONTROL PANEL.

2. THE SYSTEM SHALL BE PROVIDED WITH A STANDBY BATTERY SET OR SETS, WITH SUFFICIENT CAPACITY TO OPERATE THE ENTIRE SYSTEM UPON LOSS OF NORMAL OPERATING POWER, FOR A TIME PERIOD OF (60) HOURS IN SUPERVISORY MODE, WITH (15) MINUTES OF ALARM AT THE END OF THE (60) HOUR TIME PERIOD.
THE STANDBY BATTERY SET SHALL BE CHARGED, LOAD TESTED AND MONITORED FOR EITHER A DISCONNECTED OR LOW BATTERY STATUS CONDITION BY THE SYSTEM. ANY FAULT DETECTED WITH THE STANDBY BATTERIES SHALL BE INDICATED AND DISPLAYED AT THE CONTROL PANEL.

D. FIRE ALARM CONTROL PANEL

1. CONTROL PANEL SHALL HAVE SOLID STATE, MICROPROCESSOR BASED ELECTRONICS USING SURFACE MOUNT TECHNOLOGY. THROUGH–PUT TECHNOLOGY WILL NOT BE ALLOWED. IT SHALL DISPLAY ONLY THOSE PRIMARY CONTROLS AND DISPLAYS ESSENTIAL TO OPERATION DURING A FIRE ALARM CONDITION. KEYBOARDS OR KEYPADS SHALL NOT BE REQUIRED TO OPERATE THE SYSTEM DURING THE FIRE ALARM CONDITIONS. THE UNIT SHALL HAVE 9 AMP POWER SUPPLY MINIMUM.

2. A LOCAL AUDIBLE DEVICE SHALL SOUND DURING ALARM, TROUBLE OR SUPERVISORY CONDITIONS. THIS AUDIBLE DEVICE SHALL SOUND DIFFERENTLY DURING EACH CONDITION TO DISTINGUISH ONE CONDITION FROM ANOTHER WITHOUT HAVING A VIEW THE PANEL. THIS AUDIBLE DEVICE SHALL ALSO SOUND DURING EACH KEY PRESS TO PROVIDE AN AUDIBLE FEEDBACK TO ENSURE THAT THE KEY HAS BEEN PRESSED PROPERLY.

3. THE FOLLOWING PRIMARY CRYSTAL DISPLAYS:

   A. INDIVIDUAL RED SYSTEM ALARM LED
   B. INDIVIDUAL YELLOW SUPERVISORY SERVICE LED
   C. INDIVIDUAL YELLOW TROUBLE LED
   D. GREEN "POWER ON" LED
   E. ALARM ACKNOWLEDGE KEY
   F. TROUBLE ACKNOWLEDGE KEY
   G. ALARM SILENCE KEY
   H. SYSTEM RESET KEY

4. PRIMARY, KEYS, LED'S AND LCD DISPLAY.

5. THE CONTROL PANEL SHALL HAVE A 2–LINE X 40 CHARACTER LIQUID CRYSTAL DISPLAY WHICH SHALL BE BACK LIGHTED FOR ENHANCED READABILITY. SO AS TO CONSERVE BATTERY STANDBY, POWER IT SHALL NOT BE LIT DURING AN AC POWER FAILURE, UNLESS AN ALARM CONDITION OCCURS OR THERE IS KEYPAD ACTIVITY.

6. THE DISPLAY SHALL SUPPORT BOTH UPPER AND LOWER CASE LETTERS. LOWER CASE LETTERS SHALL BE USED FOR SHORT TITLES AND PROMPTING THE USER. UPPERCASE LETTERS SHALL BE USED FOR SYSTEM STATUS INFORMATION. A CURSOR SHALL BE VISIBLE WHEN ENTERING INFORMATION. SYSTEMS USING UPPERCASE LETTERS ONLY WILL NOT OFFER CLEAR DISTINCTION BETWEEN ALARMS AND PROGRAMMING AND ARE NOT ACCEPTABLE.

7. ANY SUPPLEMENTAL NOTIFICATION CONTROL PANELS SHALL BE CAPABLE OF OPERATING ALL CONNECTED NOTIFICATION APPLIANCE DEVICES THROUGHOUT THE BUILDING, AND 25 % SPARE CAPACITY FOR VISUAL AND THE HORN CIRCUITS. THEY SHALL HAVE AT A MINIMUM 12 AMPS OF AVAILABLE NAC POWER.

E. ISOLATE MODULES

1. PROVIDE FIELD MOUNTED ISOLATE MODULES FOR EVERY 20 DEVICES TO PROTECT CIRCUIT INTEGRITY IN THE EVENT OF A WIRING FAULT & ENSURE STYLE 6 WIRING CONVENTIONS.

F. RESET SYSTEM

1. THE SYSTEM RESET BUTTON SHALL BE USED TO RETURN THE SYSTEM TO ITS NORMAL STATE AFTER AND ALARM CONDITION HAS BEEN REMEDIED. THE LCD DISPLAY SHALL STEP THE USER THROUGH THE RESET PROCESS WITH SIMPLE ENGLISH LANGUAGE MESSAGES. MESSAGE "SYSTEM RESET IN PROGRESS" WILL FIRST BE DISPLAYED, FOLLOWED BY THE MESSAGE "SYSTEM RESET COMPLETED," AND FINALLY "SYSTEM IS NORMAL," SHOULD ALL ALARM CONDITIONS BE CLEARED. IN ORDER TO MAINTAIN CONSISTENCY WITH OTHER EXISTING PANELS, NO DEVIATION FROM THESE MESSAGES CAN BE ACCEPTED.

2. SHOULD AN ALARM CONDITION CONTINUE TO EXIST, THE MESSAGE "SYSTEM RESET IN PROGRESS" WILL BE FOLLOWED BY THE MESSAGE "SYSTEM RESET ABORTED," AND THE SYSTEM WILL REMAIN IN AN ABNORMAL STATE. SYSTEM CONTROL RELAYS SHALL NOT RESET. THE SONALERT AND THE ALARM LED WILL BE ON. THE DISPLAY WILL INDICATE THE TOTAL NUMBER OF ALARMS AND TROUBLES PRESENT IN THE SYSTEM, ALONG WITH A PROMPT TO USE THE ACK KEYS TO REVIEW THE POINTS. THESE POINTS WILL NOT REQUIRE ACKNOWLEDGMENT IF THEY WERE PREVIOUSLY ACKNOWLEDGED.

G. H.O.A. SWITCHTES

1. PROVIDE KEY PAD POSITION SWITCH AS SHOWN ON CONTRACT DRAWINGS.

H. SILENT WALKTEST WITH HISTORY LOGGING

1. THE SYSTEM SHALL BE CAPABLE OF BEING TESTED BY ONE PERSON, WHILE IN THE TESTING MODE, THE ALARM ACTIVATION OF AN INITIATING DEVICE CIRCUIT SHALL BE SILENTLY LOGGED AS AN ALARM CONDITION IN THE HISTORICAL DATA FILE. THE PANEL SHALL AUTOMATICALLY RESET ITSELF AFTER LOGGING OF THE ALARM. THE SYSTEM SHALL SIGNAL THE DEVICE ZONE NUMBER THROUGH THE BUILDING AUDIBLE UNITS, FOR IMMEDIATE VERIFICATION BY THE TEST TECHNICIAN. DUE TO THE CRITICAL NATURE OF THE TEST PROCEDURES, NO DEVIATION FROM THIS SECTION CAN BE ACCEPTED.

I. LED SUPERVISION

1. ALL SLAVE MODULE LEDS SHALL BE SUPERVISED FOR BURNOUT OR DISARRANGEMENT. SHOULD A PROBLEM OCCUR, THE LCD SHALL DISPLAY THE MODULE AND LED LOCATION NUMBERS TO FACILITATE LOCATION OF THE LED. DUE TO THE CRITICAL NATURE OF THE PANEL LCD FUNCTIONS, NO DEVIATION FROM THIS REQUIREMENT CAN BE ACCEPTED.

J. SYSTEM TROUBLE REMINDER

1. SHOULD A TROUBLE CONDITION BE PRESENT WITHIN THE SYSTEM AND THE AUDIBLE TROUBLE SIGNAL SILENCED, THE TROUBLE SIGNAL SHALL RESOUND AT PREPROGRAMMED TIME INTERVALS TO ACT AS REMINDER THAT THE FIRE ALARM SYSTEM IS NOT 100% OPERATIONAL. BOTH THE TIME INTERVAL AND THE TROUBLE REMINDER SIGNALS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE BUILDING CODE AND NFPA 72 AS REFERENCED.

K. MULTIPLE ADDRESSABLE PERIPHERAL NETWORK

1. PROVIDE ADDRESSABLE CIRCUITS FOR COMMUNICATION WITH ADDRESSABLE DEVICES. SYSTEM SHALL HAVE AN INDEPENDENT ISOLATED ADDRESSABLE LOOPS, UP TO 318 ADDRESSABLE DEVICES.

2. THE SYSTEM MUST PROVIDE COMMUNICATION WITH INITIATING AND CONTROL DEVICES INDIVIDUALLY. ALL OF THESE DEVICES WILL BE INDIVIDUALLY ANNUNCIATED AT THE CONTROL PANEL.

3. ANNUNCIATION SHALL INCLUDE THE FOLLOWING CONDITIONS FOR EACH POINT.

   A. ALARM
   B. TROUBLE
   C. OPEN
   D. SHORT
   E. DEVICE MISSING/FAILED

4. ALL ADDRESSABLE DEVICES SHALL HAVE THE CAPABILITY OF BEING DISABLED OR ENABLED INDIVIDUALLY.

5. UP TO 318 ADDRESSABLE DEVICES ON A CLASS A CIRCUIT. SYSTEMS THAT REQUIRE FACTORY RE–PROGRAMMING TO ADD OR DELETE SERVICES ARE UNACCEPTABLE.

6. IDENTIFICATION OF ADDRESSABLE DEVICES.

L. PHOTOELECTRIC DETECTOR HEAD

1. PROVIDE PHOTOELECTRIC TYPE DETECTORS. WHERE INDICATED OR REQUIRED. THEY SHALL BE A PLUG–IN UNIT WHICH MOUNTS TO A TWISTLOCK BASE, AND SHALL BE UL APPROVED.

2. THE DETECTORS SHALL BE OF THE SOLID STATE PHOTOELECTRIC TYPE AND SHALL CONTAIN NO RADIOACTIVE MATERIAL. THEY WILL USE A REFRACTED INFRARED LED LIGHT SOURCE AND BE SEALED AGAINST REAR AIR FLOW ENTRY.

3. THE DETECTOR SHALL FIT INTO A BASE THAT IS COMMON WITH BOTH THE HEAT DETECTOR AND IONIZATION TYPE DETECTOR AND SHALL BE COMPATIBLE WITH OTHER ADDRESSABLE DETECTORS, ADDRESSABLE MANUAL STATIONS, AND ADDRESSABLE ZONE ADAPTER MODULES ON THE SAME CIRCUIT. DEVICE ADDRESSES SHALL BE CONTAINED IN THE BASE OF THE DETECTOR. THOSE SYSTEMS WHICH PROVIDE ADDRESSING IN THE HEAD, SHALL PROVIDE AN ADDRESSABLE MONITOR MODULE AND A CONVENTIONAL DETECTOR ASSEMBLY TO ALLOW THE OWNER TO REPLACE A DETECTOR HEAD WITHOUT THE NEED OF VERIFYING DETECTOR ADDRESS.

4. THERE SHALL BE NO LIMIT TO THE NUMBER OF DETECTORS OR ZONE ADAPTER MODULES WHICH MAY BE ACTIVATED OR "IN ALARM" SIMULTANEOUSLY.

5. DUE TO THE REQUIREMENT FOR IMMEDIATE CHANGE OUT OF DETECTOR HEADS ADDRESS SETTING SWITCHES, JUMPERS ETC., MAY BE PROVIDED IN THE HEAD OR BEHIND THE DETECTOR BASE. DETECTORS WHICH USE DIP SWITCHES ARE NOT ACCEPTABLE.

6. PROVIDE A DUCT HOUSING WITH SENSOR, WITH RELAY. THE RELAY SHALL BE SOFTWARE PROGRAMMABLE TO ALLOW THE UNIT IN WHICH THE DETECTOR IS MOUNTED IN TO BE SHUT DOWN, OR ANY OTHER DEVICE TO BE CONTROLLED BY THIS PROGRAMMABLE RELAY. THE RELAY MAY BE A SEPARATE UNIT FROM THE DUCT HOUSING TO ALLOW FOR TROUBLESHOOTING AND DISCONNECTS.

7. PROVIDE SAMPLING TUBE AS REQUIRED FOR UNIT SIZE.

8. PROVIDE A REMOTE TEST UNIT FOR EACH DUCT SMOKE DETECTOR WITH LED ALARM INDICATOR AND TEST KEY SWITCH.

M. LCD ANNUNCIATOR

1. PROVIDE A VGA COLOR TOUCH SCREEN LCD ANNUNCIATOR AND STATIC GRAPHIC PLOT PLAN AS SHOWN ON THE CONTRACT DRAWINGS. SUBMIT A LAYOUT OF THIS UNIT TO THE ENGINEER FOR APPROVAL.

2. PROVIDE CITY CONNECTIONS TO THE LOCAL FIRE DEPARTMENT.

N. ADDRESSABLE THERMAL DETECTOR HEAD

1. PROVIDE THERMAL DETECTOR HEADS WHERE INDICATED OR REQUIRED.

2. THERMAL DETECTOR HEADS MUST BE UL LISTED. SHALL BE A COMBINATION RATE–OF–USE AND FIXED TEMPERATURE (135 F) TYPE, AUTOMATICALLY RESTORABLE.

3. PROVIDE REMOTE LED ALARM INDICATORS, AS INDICATED ON PLANS.

O. ADDRESSABLE PULL STATIONS

1. PROVIDE ADDRESSABLE PULL STATIONS WHICH CONTAIN ELECTRONICS THAT COMMUNICATE THE STATION'S STATUS (ALARM, NORMAL) TO THE CONTROL PANEL OVER ONE TWISTED PAIR. THE ADDRESS WILL SET ON THE STATION. THEY WILL BE MANUFACTURED FROM HIGH IMPACT RED LEXAN. STATION WILL MECHANICALLY LATCH UPON OPERATION AND REMAIN SO UNTIL MANUALLY RESET BY OPENING WITH A KEY COMMON TO ALL SYSTEM LOCKS. PULL STATIONS WILL BE DOUBLE ACTION AND AS IDENTIFIED BY A SCHEDULE ON THE PRINTS.

2. THE FRONT OF THE STATION IS TO BE HINGED TO A BACKPLATE ASSEMBLY AND MUST BE OPENED WITH A KEY TO RESET THE STATION. THE KEY SHALL BE COMMON WITH THE CONTROL PANELS. STATIONS WHICH USE ALLEN WRENCHES OR SPECIAL TOOLS TO RESET WILL NOT BE ACCEPTED. THE STATION SHALL CONSIST OF HIGH IMPACT LEXAN PLASTIC, RED IN COLOR.

3. THE ADDRESSABLE MANUAL STATION SHALL BE CAPABLE OF FIELD PROGRAMMING OF ITS "ADDRESSABLE" LOCATION ON AN ADDRESSABLE INITIATING CIRCUIT.

4. THERE SHALL BE NO LIMIT TO THE NUMBER OF STATIONS, DETECTORS OR ZONE ADAPTER MODULES, WHICH MAY BE ACTIVATED OR "IN ALARM" SIMULTANEOUSLY.

5. THE ADDRESSABLE MANUAL STATION SHALL BE UNDERWRITER'S LABORATORIES INC. LISTED.

6. PROVIDE PROTECTIVE COVERS, EQUAL TO STOPPER II, WHERE REQUIRED BY THE AHJ.

P. ZONE ADAPTER MODULES

1. ZONE ADAPTER MODULES SHALL BE USED FOR MONITORING OF WATERFLOW, VALVE TAMPER, HALON CONTROL PANELS, NON–ADDRESSABLE DETECTORS, AND FOR CONTROL OF EVACUATION INDICATING APPLIANCES AND AHU SYSTEMS.

2. AN ADDRESSABLE INTERFACE MODULE SHALL BE PROVIDED FOR INTERFACING NORMALLY OPEN DIRECT CONTACT DEVICES TO AN ADDRESSABLE INITIATING CIRCUIT.

3. ADDRESSABLE MODULES WILL BE CAPABLE OF MOUNTING IN A STANDARD ELECTRIC OUTLET BOX. ZAMS WILL INCLUDE COVER PLATES TO ALLOW SURFACE OR FLUSH MOUNTING. ZAMS WILL RECEIVE THEIR 24 VDC POWER FROM A SEPARATE TWO WIRE PAIR RUNNING FROM AN APPROPRIATE POWER.

4. THERE SHALL BE TWO TYPES OF DEVICES:
   TYPE 1: MONITOR MODULE
   TYPE 2: CONTROL MODULE

5. ADDRESSABLE DEVICE SUPERVISION.

   A. ALL DEVICES SHALL BE SUPERVISED FOR TROUBLE CONDITION. THE SYSTEM CONTROL PANEL WILL BE CAPABLE OF DISPLAYING THE TYPE OF TROUBLE CONDITION (OPEN, SHORT, DEVICE MISSING/FAILED). SHOULD A DEVICE FAIL, IT WILL NOT HINDER THE OPERATION OF OTHER DEVICES.

Q. MINI–HORNS

1. 'H' LETTERING MINI HORN WHERE INDICATED ON CONTRACT DRAWINGS.THE UNIT SHALL MOUNT TO A SINGLE, DEEP GANG BOX.

R. STROBE LIGHT

1. PROVIDE A MULTI–CANDELA STROBE APPLIANCE.

S. MAGNETIC DOOR HOLDERS

1. PROVIDE SEMI–FLUSH WALL MOUNTED, 120 V.A.C AND 24 V.D.C. WITH LONG CATCH PLATE.

T. BATTERIES AND BATTERY CABINET

1. PROVIDE MAINTENANCE – FREE BATTERIES.

U. RELAY MODULE

1. PROVIDE ADDRESSABLE RELAY TO PROVIDE SUPERVISED CONTROL OF AUXILIARY CIRCUITS (AHU's, DOOR HOLDER's, ETC) VIA SLC ADDRESSABLE LOOP. RELAY SHALL PROVIDE SUPERVISED OUTLET FOR 3AMPS @ 30VDC OR 0.5AMPS AT 120VAC. WHERE CURRENT EXCEEDS LIMITATIONS PROVIDE ISOLATION RELAY RATED FOR REQUIRED LOAD.

V. INSTALLATION FIRE ALARM WIRING

1. ALL FIRE ALARM WIRING SHALL CONFORM TO THE APPLICABLE STATE AND LOCAL FIRE SAFETY CODES.

2. WIRING SHOWN ON DRAWINGS IS FOR ESTIMATING PURPOSED ONLY. THE FINAL WIRING REQUIREMENTS SHALL BE PER THE EQUIPMENT MANUFACTURER'S WIRING DIAGRAMS AND NO INCREASE IN CONTRACT PRICE WILL BE ALLOWED FOR ANY ADDITIONAL WIRES THAT MAY BE SHOWN ON THE MANUFACTURER'S DRAWINGS.

3. DETAILED ONE–LINE SCHEMATIC WIRING DIAGRAMS OF EACH SPECIFIED DEVICE BETWEEN ALL SYSTEMS. THESE CONNECTION DRAWINGS ARE TO INDICATE ROUTING OF CONDUCTORS VIA THE FLOOR TERMINAL BOXES.

W. SHUTDOWNS OF ANY EXISTING SYSTEMS

1. THIS CONTRACTOR SHALL COORDINATE ALL REQUIRED SHUTDOWNS OF THE EXISTING FIRE ALARM SYSTEM DURING THE DURATION OF THIS CONTRACT. ALL SYSTEM SHALL BE COORDINATED WITH THE OWNER AND THE FIRE DEPARTMENT. THE FIRE ALARM SYSTEMS SHALL BE RETURNED TO A NORMAL MODE OF OPERATION BY THE END OF EACH WORKDAY. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL COSTS INCURRED FOR A FIRE WATCH IF THE SYSTEM IS NOT OPERATIONAL AT THE END OF A WORKDAY.

X. PROGRAMMING OF SYSTEM

1. THIS CONTRACTOR SHALL BE RESPONSIBLE TO OBTAIN APPROVED ZONE AND DEVICE CUSTOM LABELS, THAT WILL BE PROGRAMMED INTO THE SYSTEM FOR ZONE AND DEVICE IDENTIFICATION PURPOSES. THE SUBJECT CUSTOM LABELS SHALL BE APPROVED BY OWNERS REPRESENTATIVE AND THE FIRE DEPT. BEFORE THEY ARE PROGRAMMED INTO THE SYSTEM.

Y. TRAINING:

1. THE ELECTRICAL CONTRACTOR AND SYSTEM MANUFACTURER SHALL PROVIDE A MINIMUM OF ONE (1) ON–SITE TRAINING SESSIONS FOR THE OWNER'S REPRESENTATIVES. EACH SESSION SHALL BE A MINIMUM OF 1 HOUR.

2. DUE TO THE CRITICAL NATURE OF PROPER SYSTEM OPERATION, TRAINING MUST BE CONDUCTED BY PERSONNEL IN THE DIRECT EMPLOY OF THE MANUFACTURER OF THE FIRE ALARM CONTROL PANEL. A THIRD PARTY INSTRUCTOR IS NOT ACCEPTABLE.

AA. WARRANTY:

1. THE CONTRACTOR SHALL WARRANT THE COMPLETE FIRE ALARM SYSTEM WIRING AND EQUIPMENT TO BE FREE FROM INHERENT MECHANICAL AND ELECTRICAL DEFECTS FOR A PERIOD OF (3) THREE YEARS FROM THE DATE OF THE COMPLETED AND CERTIFIED TEST OR FROM THE DATE OF FIRST BENEFICIAL USE.

2. THE EQUIPMENT MANUFACTURE SHALL MAKE AVAILABLE TO THE OWNER A MAINTENANCE CONTRACT PROPOSAL TO PROVIDE A MINIMUM OF TWO (2) INSPECTIONS AND TEST PER YEAR IN COMPLIANCE WITH NFPA–72H GUIDELINES.

BB. SUBMITTALS

1. PROVIDE COMPLETE SETS OF DOCUMENTATION TO INCLUDE THE FOLLOWING:

   A. A COMPLETE POINT TO POINT RISER DIAGRAM OF THE FIRE ALARM SYSTEM SHOWING ALL DEVICES AND EQUIPMENT AND SIZE, TYPE AND NUMBERS OF ALL CONDUCTORS.

   B. BATTERY STANDBY AND POWER SUPPLY CALCULATIONS SHOWING TOTAL POWER REQUIRED TO MEET THE SPECIFIED SYSTEM REQUIREMENTS INCLUDING SPARE CAPACITY ALLOWANCES. CALCULATIONS SHALL INCLUDE A COMPLETE LIST OF CURRENT REQUIREMENTS DURING NORMAL, SUPERVISORY, TROUBLE AND ALARM CONDITIONS. CALCULATIONS SHALL ALSO DEMONSTRATE PROPER CONSIDERATION OF CURRENT REQUIREMENTS, WIRE SIZE, WIRE LENGTH AND VOLTAGE DROP CHARACTERISTICS.

   C. MANUFACTURER'S ORIGINAL CATALOG DATA SHEETS SHALL BE SUPPLIED FOR ALL OF THE EQUIPMENT TO BE SUPPLIED. ALL EQUIPMENT SHALL BE SUBJECT TO APPROVAL BY THE ENGINEER AND NO EQUIPMENT SHALL BE ORDERED WITHOUT PRIOR APPROVAL.

   D. LARGE SCALE DRAWINGS OF THE MAIN CONTROL PANEL AND EACH REMOTE PANEL DEPICTING OVERALL MECHANICAL DIMENSIONS, LAYOUT INCLUDING FUTURE ALLOWANCES, AND FIELD WIRING IN FULL DETAIL.

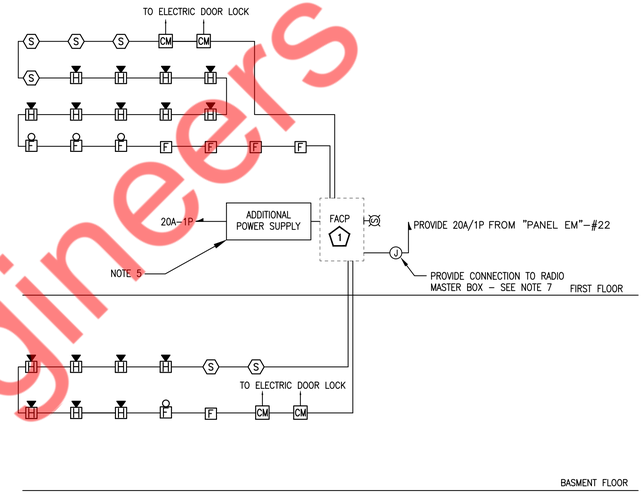
   E. DOCUMENTATION OF THE SUPPLIER'S QUALIFICATIONS INDICATING YEARS IN BUSINESS SERVICE POLICIES, WARRANTY DEFINITIONS, AND A LIST OF SIMILAR INSTALLATIONS IN THE LOCAL MUNICIPALITY.

   F. PROVIDE A COMPLETE DETAILED DESCRIPTION OF THE SYSTEM OPERATION.

   G. ADDRESSES FOR ALL FIELD DEVICES SHALL BE SHOWN ON FLOOR PLANS SUPPLIED WITH THIS SUBMITTAL.

CC. DOCUMENTATION:

1. AT THE COMPLETION OF THE PROJECT A COMPLETE SET OF OPERATING/MAINTENANCE MANUALS, THE FIRE ALARM SUBMITTAL BOOK, POINT–TO–POINT WIRING DIAGRAMS, A TERMINAL STRIP CABINET CONNECTION POINT DIAGRAM FOR EACH TERMINAL CABINET, A COMPLETE POINT ADDRESS LISTING BY DEVICE, AND A FINAL TEST REPORT SHALL BE GIVEN TO THE OWNER.



BUILDING FIRE ALARM RISER

N.T.S.

KEYED

1 FIRE ALARM CONTROL PANEL. CONTRACTOR SHALL COORDINATE WITH ARCHITECT/ OWNER FOR PROPER INSTALLATION.

FIRE ALARM RISER NOTES:

1. REFER TO FLOOR PLAN FOR EXACT QUANTITIES AND LOCATIONS OF ALL DEVICES.
2. THE FIRE ALARM SYSTEM SHALL CONFORM WITH THE REQUIREMENTS OF THE FIRE SAFETY CODE AND THE CITY OF READING FIRE DEPARTMENT. SHOP DRAWINGS SHALL BE SUBMITTED TO THE FIRE DEPARTMENT FOR APPROVAL.
3. PROVIDE A NEW ADDRESSABLE FIRE ALARM SYSTEM AS MANUFACTURED BY FCI OR APPROVED EQUAL. THE PANEL SHALL BE E3 SERIES. ALL DEVICES SHALL BE NEW AND MANUFACTURED BY GAMEWELL/FCI OR APPROVED EQUAL. ALL FIRE ALARM WIRING SHALL BE CLASS A PER FCI OR APPROVED EQUAL RECOMMENDATIONS AND SHALL BE INSTALLED IN MINIMUM 3/4" EMT CONDUIT.
4. ALL FIRE ALARM WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITIONS OF NFPA, STATE, AND LOCAL BUILDING CODES AND THE AMERICANS WITH DISABILITIES ACT (ADA).
5. PROVIDE REMOTE BOOSTER POWER SUPPLY PANELS AS REQUIRED.
6. PROVIDE FAULT ISOLATION MODULES ON THE SIGNAL LINE CIRCUIT TO PROTECT THE SYSTEM FROM LINE TO LINE FAULTS. MODULES SHALL BE PROVIDED AS REQUIRED, WITH A MINIMUM OF (1) MODULE PER EVERY 25 DEVICES.
7. PROVIDE NEW RADIO MASTER BOX IN ACCORDANCE WITH THE FIRE DEPARTMENT REQUIREMENTS. PROVIDE ANTENNA AND LOCATE AS DIRECTED BY THE FIRE DEPARTMENT. COORDINATE EXISTING FIRE COMMUNICATION CONNECTIONS IN THE FIELD.
8. DOOR LOCKS ARE SHOWN FOR REFERENCE PUPROSE ONLY. SHOULD COORDINATE IN SITE WITH OWNER/ARCHITECT.

FIRE ALARM GENERAL NOTES & RISER DIAGRAM | SCALE 1/8" = 1'-0" | 1

PROJECT: GOODBLEND READING

PROJECT NUMBER: 21242

goodblend MEDICAL MARIJUANA

Parallel

STAMP:

ISSUE:	DATE:
FIELD COORDINATION	09.30.2022

DRAWING SCALE:

DRAWN BY-NYE | CHECKED BY-NYE

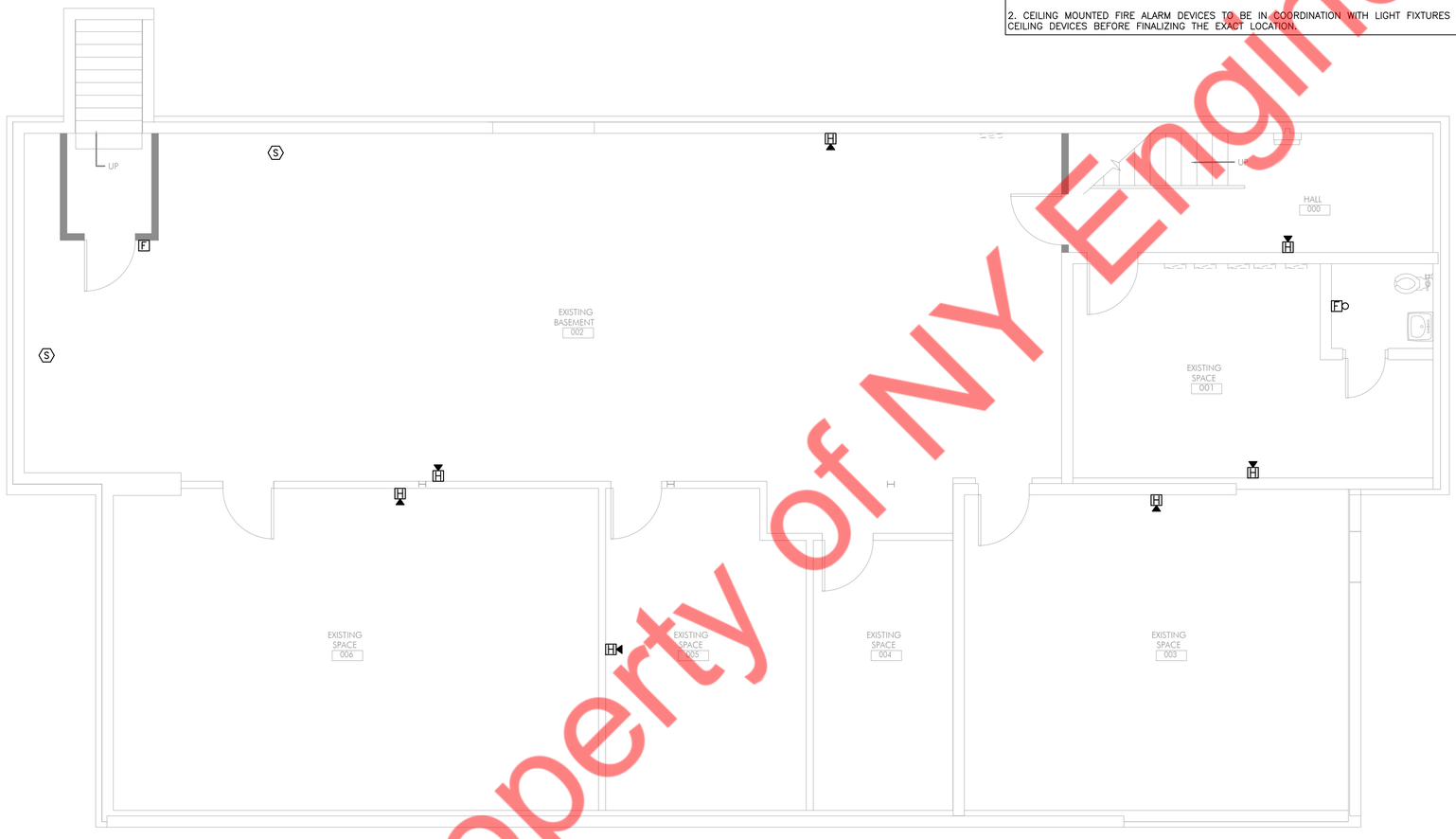
DRAWING TITLE: FIRE ALARM GENERAL NOTES & RISER DIAGRAM

DRAWING NUMBER: FA0.2

FIRE ALARM GENERAL NOTES

1. ALL FIRE ALARM DEVICES SHALL BE COORDINATED WITH OWNER/ARCHITECT.

2. CEILING MOUNTED FIRE ALARM DEVICES TO BE IN COORDINATION WITH LIGHT FIXTURES AND ANY OTHER CEILING DEVICES BEFORE FINALIZING THE EXACT LOCATION.



BASEMENT FLOOR FIRE ALARM PLAN | SCALE 1/4" = 1'-0" | 1

PROJECT:
GOODBLEND READING

PROJECT NUMBER: 21242

goodblend MEDICAL MARIJUANA

Parallel

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ISSUE:	DATE:
FIELD COORDINATION	09.30.2022

DRAWING SCALE:

DRAWN BY:NYE | CHECKED BY:NYE

DRAWING TITLE:
BASEMENT FLOOR
FIRE ALARM PLAN

DRAWING NUMBER:
FA1.0

FIRE ALARM GENERAL NOTES

1. ALL FIRE ALARM DEVICES SHALL BE COORDINATED WITH OWNER/ARCHITECT.

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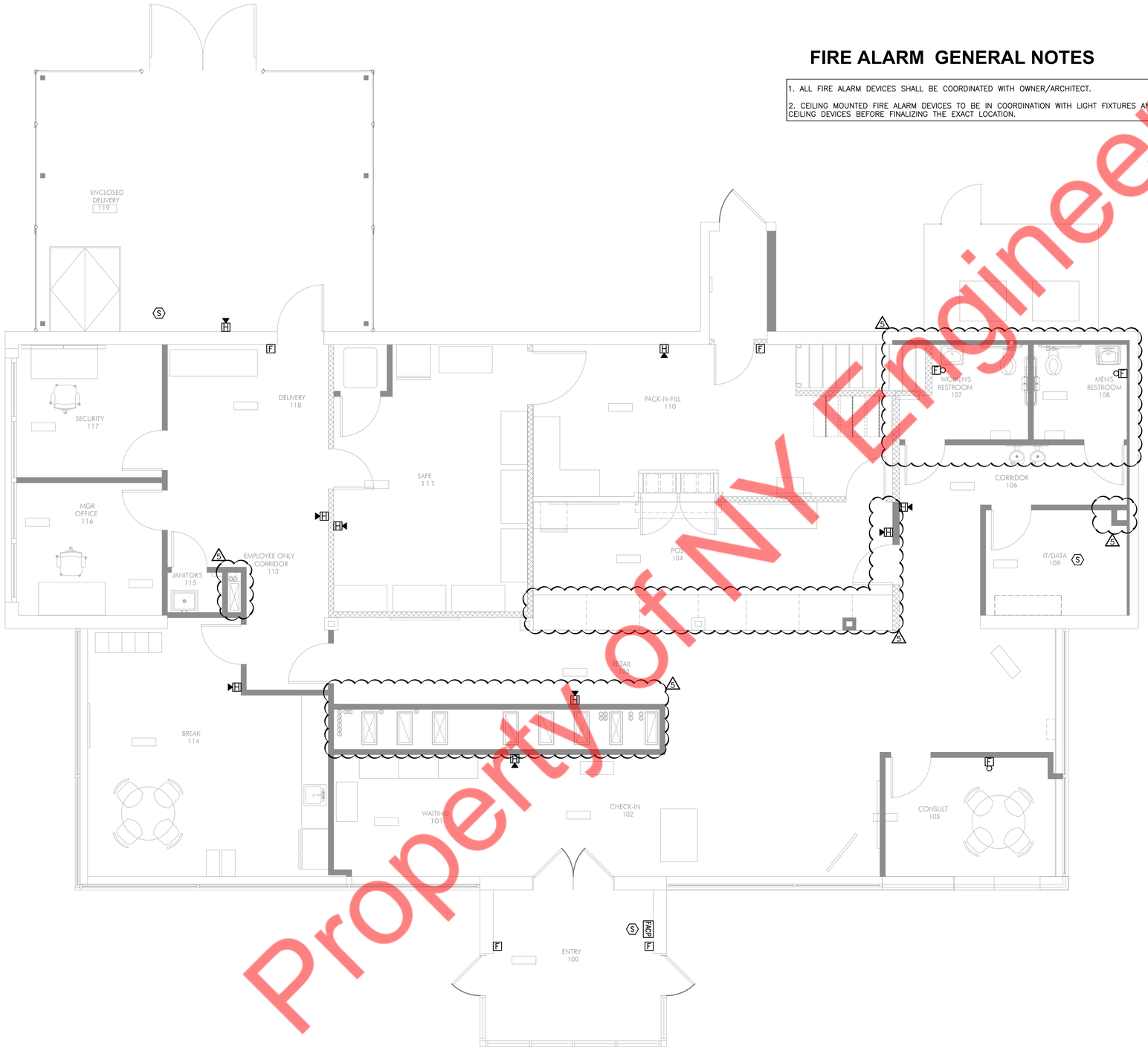

PROJECT:
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PROJECT NUMBER: 21242

goodblend MEDICAL MARIJUANA

Parallel

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ISSUE:	DATE:
FIELD COORDINATION	09.30.2022

DRAWING SCALE:

DRAWN BY:NYE | CHECKED BY:NYE

DRAWING TITLE:
FIRST FLOOR
FIRE ALARM PLAN

DRAWING NUMBER:
FA1.1

FIRST FLOOR FIRE ALARM PLAN | SCALE 1/4" = 1'-0" | 1