

MECHANICAL GENERAL NOTES

1. **GENERAL**
 - A. THE GENERAL CONDITIONS OF THE GENERAL SPECIFICATIONS, AND ALL APPLICABLE INSTRUCTIONS TO BIDDERS SHALL BE PART OF THESE SPECIFICATIONS.
 - B. "PROVIDE" AS USED HEREIN MEANS TO FURNISH AND INSTALL COMPLETE.
 - C. "FURNISH" AS USED HEREIN MEANS TO PURCHASE AND DELIVER TO THE PROJECT SITE IN UNDAMAGED CONDITION, WHERE APPLICABLE, SUBMIT FOR REVIEW AND APPROVAL AND COORDINATE WITH THE MOST STRINGENT MATERIALS, EQUIPMENT, AND SCOPE OF WORK.
 - D. "INSTALL" AS USED HEREIN MEANS TO STORE AND PROTECT FROM DAMAGE, INSTALL PER MANUFACTURERS' WRITTEN INSTRUCTIONS, AND MAKE ALL CONNECTIONS COMPLETE.
 - E. THE TERM, "CONTRACTOR" AS USED HEREIN MEANS ANY CONTRACTOR OR SUBCONTRACTOR CONTRACTED TO PERFORM WORK INCLUDED IN AND DEFINED BY THIS SECTION.
 - F. MECHANICAL WORK SHALL BE PROVIDED IN STRICT COMPLIANCE WITH THE COLORADO AND CITY OF BOULDER, MECHANICAL CODE 2018, AND ALL APPLICABLE LOCAL ORDINANCES, STATE LAWS AND FEDERAL LAWS.
 2. **PRIOR TO BIDDING:**
 - A. THOROUGHLY REVIEW THE BID INSTRUCTIONS INCLUDING ALL CIVIL, ARCHITECTURAL, STRUCTURAL, AND MEP CONSTRUCTION DOCUMENTS, OBTAIN AND THOROUGHLY EXAMINE THE MANUFACTURERS' WRITTEN INSTALLATION INSTRUCTIONS, DETAILS, AND REQUIREMENTS FOR THE SCHEDULED AND SPECIFIED EQUIPMENT AND MATERIALS. FOR AMBIGUOUS, CONTRADICTORY, OR CONFLICTING ITEMS WITHIN THE CONSTRUCTION DOCUMENTS, THE CONTRACTOR SHALL REQUEST CLARIFICATION IN A WRITTEN "REQUEST FOR INFORMATION" (RFI). AT LEAST FIVE (5) WORKING DAYS PRIOR TO BID DATE, RE-RELATED WORK NOT CLARIFIED PRIOR TO BID SHALL BE PROVIDED PER THE ARCHITECT (ENGINEER) IN STRICT ACCORDANCE WITH THE MOST STRINGENT MATERIALS, EQUIPMENT, AND SCOPE OF WORK.
 - B. IF THE CONTRACTOR BELIEVES THE DRAWINGS AND SPECIFICATIONS CONFLICT WITH CODE REQUIREMENTS, IMMEDIATELY NOTIFY THE ARCHITECT (ENGINEER) IN WRITING.
 - C. NO ALLOWANCES WILL BE MADE DUE TO CONTRACTORS' UNFAMILIARITY WITH THE CONSTRUCTION DOCUMENTS OR FOR THE FAILURE OF THE CONTRACTOR TO OBTAIN CLARIFICATIONS PRIOR TO BID.
 - D. VISIT THE JOB SITE AND THOROUGHLY INVESTIGATE CONDITIONS. THE LACK OF SPECIFIC INFORMATION ON THE DRAWINGS SHALL NOT RELIEVE THE CONTRACTOR OF ANY RESPONSIBILITY.
 - E. PRIOR TO APPLICATION OF CODES CITED IN CONSTRUCTION DOCUMENTS, EXAMINE GOVERNING STATE AND LOCAL CODES, AND LOCAL REGULATIONS AND ORDINANCES, AND PROVIDE ALL EQUIPMENT AND INSTALLATION IN STRICT ACCORDANCE WITH SAME.
 - F. REFER TO CONSTRUCTION DOCUMENTS FOR SCHEDULED AND SPECIFIED MATERIALS AND EQUIPMENT. INSTALLATION SHALL BE IN STRICT ACCORDANCE WITH MANUFACTURERS' WRITTEN INSTRUCTIONS AND DETAILS.
 - G. ALL WORK SHALL BE COMPLETED IN STRICT ACCORDANCE WITH THE LANDLORD'S CONSTRUCTION CRITERIA AND TENANT/LANDLORD AGREEMENT. THIS CONTRACTOR SHALL EXAMINE THE LANDLORD CRITERIA AND TENANT/LANDLORD AGREEMENT AND THEY SHALL BE PART OF THESE SPECIFICATIONS. NO ALLOWANCES WILL BE MADE DUE TO CONTRACTORS' UNFAMILIARITY WITH THESE DOCUMENTS.
 3. **BIDDING**
 - A. SUBMISSION OF A BID ACKNOWLEDGES THAT THE CONTRACTOR HAS REVIEWED THE BID INSTRUCTIONS, HAS VISITED THE SITE, EXAMINED ALL CONSTRUCTION DOCUMENTS, AND AGREES TO ALL ITEMS AND CONDITIONS WITHIN THE CONSTRUCTION DOCUMENTS. THE CONTRACTORS' BID SHALL INCLUDE ALL MECHANICAL WORK IN THE CONSTRUCTION DOCUMENTS, INCLUDING MECHANICAL WORK RELATED TO EQUIPMENT FURNISHED/PROVIDED BY OTHERS.
 4. **PERMITS**
 - A. SECURE AND PAY FOR ALL PERMITS, LICENSES, AND INSPECTIONS REQUIRED BY THE AHJ FOR THIS WORK.
 5. **SUBSTITUTIONS**
 - A. MANUFACTURERS' EQUIPMENT, APPLIANCES, AND MATERIALS SCHEDULED, NOTED, AND SPECIFIED IN THE CONSTRUCTION DOCUMENTS ARE THE DESIGN STANDARD. NO SUBSTITUTIONS WILL BE ALLOWED WITHOUT PRIOR WRITTEN APPROVAL BY THE ARCHITECT OR ENGINEER. IN BIDDING, CONTRACTOR SHALL NOT ASSUME ACCEPTANCE OF SUBSTITUTIONS. CONTRACTOR MUST STATE IN SUBSTITUTION REQUEST: "PROPOSED SUBSTITUTIONS ARE OF EQUAL OR HIGHER QUALITY, EFFICIENCY AND DEPENDABILITY COMPARED TO THE SPECIFIED EQUIPMENT AND MATERIAL. CONTRACTOR ASSUMES FULL RESPONSIBILITY FOR ADDITIONAL ENGINEERING COSTS AND COSTS TO OTHER CONTRACTORS DUE TO SUBSTITUTIONS." IF DEEMED NECESSARY BY THE ARCHITECT OR ENGINEER, SUBSTITUTIONS WHICH ARE NOT APPROVED OR NOT EQUAL TO DESIGN STANDARD SHALL BE REMOVED, AND THE SCHEDULED, NOTED, AND SPECIFIED EQUIPMENT AND MATERIALS SHALL BE INSTALLED AT CONTRACTORS' EXPENSE. SUBMITTING CONTRACTOR ASSUMES FULL RESPONSIBILITY FOR ADDITIONAL ENGINEERING COSTS AND COSTS TO OTHER CONTRACTORS DUE TO SUBSTITUTIONS.
 6. **UTILITIES**
 - A. THE UTILITY INFORMATION NOTED AND SPECIFIED IN THE CONSTRUCTION DOCUMENTS ARE THE DESIGN STANDARD AND AS ACCURATE AS COULD BE SECURED BUT IS NOT GUARANTEED. PRIOR TO INSTALLING ANY UTILITY-RELATED WORK, THIS CONTRACTOR SHALL CONTACT THE LOCAL UTILITY - IN WRITING - TO COORDINATE AND CONFIRM THE SERVICE AND CONNECTION REQUIREMENTS WITH THE CONSTRUCTION DOCUMENTS. THE CONTRACTOR SHALL REQUEST THE UTILITY SERVICE AND CONNECTION IN AMPLE TIME TO MEET THE CONSTRUCTION SCHEDULE. ANY DISCREPANCIES BETWEEN THE CONSTRUCTION DOCUMENTS AND THE ACTUAL UTILITY SERVICE CONNECTION SHALL BE SUBMITTED WITHOUT DELAY TO THE ARCHITECT (ENGINEER) IN WRITING AS A "REQUEST FOR INFORMATION" (RFI). RFI-SUBJECT UTILITY WORK MUST BE RESOLVED WITH THE ARCHITECT (ENGINEER) PRIOR TO INSTALLATION. THE CONTRACTOR ASSUMES FULL RESPONSIBILITY AND ALL COSTS FOR WORK NOT COORDINATED WITH THE UTILITY AND NOT SUBMITTED TO THE ARCHITECT (ENGINEER) FOR RESOLUTION.
 7. **SCHEDULING**
 - A. ALL PERFORMANCE OF CONSTRUCTION SHALL BE AS REQUIRED BY THE PACE OF THE GENERAL CONSTRUCTION, AS SCHEDULED BY THE GC. PROVIDE COMPLETE INFORMATION AND FULL COOPERATION WITH OTHER CONTRACTORS AND TRADES, AS REQUIRED FOR THE TIMELY COMPLETION AND COORDINATION OF THE COMPLETE PROJECT.
 - B. PROVIDE ALL TESTS AND INSPECTIONS COORDINATED BY AHJ.
 - C. PROVIDE A SIGNED CERTIFICATE OF INSPECTION AT THE PROJECT COMPLETION.
 8. **SCOPE**
 - A. PROVIDE PERMIT(S), INSPECTIONS, FINAL CERTIFICATE(S) OF INSPECTION BY AHJ, PERMIT AND INSPECTION FEES, AND ALL MATERIALS, EQUIPMENT, RIGGING, AND LABOR NECESSARY FOR A COMPLETE AND OPERATING HVAC SYSTEM.
 - B. STRUCTURAL ENGINEERING FOR THE SUPPORT AND MOUNTING OF THE SCHEDULED AND SPECIFIED MATERIALS AND EQUIPMENT IS THE RESPONSIBILITY OF OTHERS. THE MECHANICAL CONSTRUCTION DOCUMENT DO NOT INCLUDE STRUCTURAL ENGINEERING FOR SUPPORT OF MECHANICAL EQUIPMENT, APPLIANCES, OR SYSTEMS.
 - C. THROUGHOUT CONSTRUCTION, THIS CONTRACTOR'S WORK SHALL INCLUDE ONGOING COORDINATION OF THIS WORK WITH THE CONSTRUCTION DOCUMENTS, THE WORK OF ALL OTHER TRADES, AND WITH UTILITY SERVICE(S) AND UTILITY CONNECTION(S), FOR AMBIGUOUS, CONTRADICTORY, OR CONFLICTING ITEMS WITHIN THE CONSTRUCTION DOCUMENTS, INCLUDING BUT NOT LIMITED TO THE ACTUAL UTILITY SERVICE AND CONNECTION REQUIREMENTS. THE CONTRACTOR SHALL REQUEST CLARIFICATION IN A WRITTEN "REQUEST FOR INFORMATION" (RFI). RFI SHALL BE ISSUED WITHOUT DELAY AND PRIOR TO PROCEEDING WITH ANY RFI-SUBJECT WORK. RFI NOT CLARIFIED PRIOR TO BID SHALL BE PROVIDED PER THE ARCHITECT (ENGINEER) IN STRICT ACCORDANCE WITH THE MOST STRINGENT MATERIALS, EQUIPMENT, AND SCOPE OF WORK. AT NO ADDITIONAL COST TO THE OWNER.
 - D. PROVIDE HOISTING FOR ALL MATERIALS AND EQUIPMENT FURNISHED AND/OR INSTALLED, IN ACCORDANCE WITH ALL CITY, STATE AND FEDERAL RULES AND REGULATIONS.
 - E. INSTALL ALL WORK AND EQUIPMENT RIGID, DEAD LEVEL, PLUMB, AND TRUE-TO-LINE, UNLESS NOTED OTHERWISE, SUPPORT AND MOUNTING OF EQUIPMENT, DUCT, PIPING, ETC., ARE THIS CONTRACTOR'S MEANS AND METHODS. THE CONTRACTOR SHALL UNDERSTAND THE SPECIFIED AND SCHEDULED EQUIPMENT AND MATERIALS AND MEANS AND METHODS OF INSTALLATION. THIS CONTRACTOR SHALL PROVIDE ALL ACCESSORIES REQUIRED FOR PROPER SUPPORT WHETHER SHOWN ON THE DRAWINGS OR NOT. IF SUPPORTS ARE REQUIRED, CONTRACTOR SHALL SUBMIT DRAWINGS TO THE ARCHITECT FOR APPROVAL.
 - F. PROVIDE ACCESSORY MOUNTING HARDWARE INCLUDING BUT NOT LIMITED TO STRUCTURAL STEEL, STRUT SYSTEMS, ALL THROAT RODS, AND BRACES, AS REQUIRED TO MOUNT EQUIPMENT. PROVIDE STEEL BRACE SHAPES AND FRAMES TO SUPPORT EQUIPMENT WHERE NEEDED. ALL SYSTEMS SHALL BE SUPPORTED INDEPENDENT OF AND ISOLATED FROM EQUIPMENT VIBRATION.
 - G. PRODUCTS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS' PRINTED INSTALLATION AND MAINTENANCE LITERATURE. COMPONENTS REQUIRING PERIODIC MAINTENANCE OR ADJUSTMENTS SHALL BE INSTALLED AS TO PERMIT ACCESS WITHOUT DAMAGE TO STRUCTURE, FINISHES, OR OTHER EQUIPMENT.
 - H. PROVIDE ALL LABOR, EQUIPMENT AND MATERIAL REQUIRED FOR THE REINSTALLATION AND RE-SUPPORT OF EXISTING SERVICES (DUCTWORK, ELECTRICAL CONDUIT, PIPING, EXISTING EQUIPMENT, ETC.) DISTURBED BY THE INSTALLATION OF WORK UNDER THIS CONTRACT, INCLUDING THE WORK OF OTHER TRADES.
 - I. DEMOLITION: REFER TO THE ARCHITECTURAL DRAWINGS FOR THE GENERAL SCOPE OF DEMOLITION. THIS CONTRACTOR SHALL DISCONNECT AND CAREFULLY REMOVE ALL EXISTING HVAC EQUIPMENT LOCATED IN DEMOLISHED AREAS INCLUDING FLOOR, PLenums, CEILINGs, WALLS, AND FLOORs. U.N.O., DISCONNECT AND REMOVE EXISTING HVAC SYSTEMS COMPLETE, INCLUDING EQUIPMENT, CURBS, DUCTS, INSULATION, AIR DEVICES, AND PIPING LOCATED IN THESE AREAS. ALL HVAC SYSTEM COMPONENTS INCLUDING AIR TERMINAL UNITS, FANS, MOTORS, CONTROL DEVICES AND SENSORS, DAMPERS, ACTUATORS, HANGERS, RESTRAINTS, MOUNTING HARDWARE, ETC., SHALL BE REMOVED AND LEGALLY DISPOSED OF BY THIS CONTRACTOR.
 - J. UNLESS NOTED OTHERWISE, ABANDONMENT IN PLACE (AIP) IS NOT ACCEPTABLE. UNLESS EQUIPMENT, DUCT, PIPING, AND OTHER COMPONENTS WITHIN OR SERVING THIS SPACE MUST BE COMPLETELY REMOVED TO POINT OF ORIGIN, ENDS OF SYSTEMS BEYOND GENERAL SCOPE OF DEMOLITION MAY BE ABANDONED ONLY WITH WRITTEN APPROVAL OF THE ARCHITECT (ENGINEER), WHERE THESE ABANDONED EXIST TERMINATE, TRIM CLEANLY AND PROPERLY CAP OR SEAL IN AN APPROVED MANNER, LEAVING TERMINATION SAFE AND SECURE BEHIND NEW FINISHES. MAINTAIN SYSTEM CONTINUITY TO HVAC SYSTEMS SERVING AREAS BEYOND GENERAL DEMOLITION, AS NEEDED. THIS INCLUDES BUT IS NOT LIMITED TO REMOVAL, MODIFICATION AND/OR REINSTALLATION OF EQUIPMENT, AS NEEDED, COMPLETION OF THIS PROJECT SHALL INCLUDE RETURNING THESE ADJACENT AREAS TO FULLY FUNCTIONING OPERATION.
 - K. CONTRACTOR SHALL PROVIDE DAILY CLEAN-UP, REMOVAL AND LEGAL DISPOSAL OF
 - ALL RUBBISH GENERATED BY THIS WORK.
 - A. AS-BUILT DRAWINGS: DURING CONSTRUCTION, AS WORK PROCEEDS, MAINTAIN AS-BUILT MARKINGS OF ACTUAL INSTALLATION AT CONSTRUCTION COMPLETION AND PRIOR TO TURN-OVER TO OWNER. PROVIDE FINAL MARK-UPS IN PDF AND DWG FORMAT TO ARCHITECT AND ENGINEER.
 - M. PROVIDE FINAL CONNECTIONS TO EQUIPMENT FURNISHED/PROVIDED BY OTHERS, AS NOTED IN CONSTRUCTION DOCUMENTS.
 - N. DO NOT ROUTE ANY PIPING OR DUCTWORK ABOVE ELECTRICAL PANELS.
 - O. UNLESS NOTED OTHERWISE, ALL DUCT AND PIPE SHALL BE RUN PARALLEL TO OR AT RIGHT ANGLES TO WALLS, BEAMS OR COLUMNS. PIPE SHALL BE RUN AS DIRECT AS POSSIBLE - AVOID UNNECESSARY OFFSETS AND MAXIMIZE HEADROOM.
 - P. PRIOR TO ORDERING EQUIPMENT, THIS CONTRACTOR SHALL PROVIDE FINAL COORDINATION OF ELECTRICAL POWER REQUIREMENTS WITH THE ELECTRICAL CONTRACTOR.
 - Q. CONTRACTOR SHALL MAINTAIN ACTIVITIES WITHIN AREA APPROVED BY OWNER OR GC. CONTRACTOR'S ACTIVITIES SHALL NOT INTERFERE WITH THE OWNER'S OPERATIONS, EXCEPT AS APPROVED BY THE ARCHITECT (ENGINEER).
 - R. EXCEPT THOSE COORDINATED AND APPROVED BY THE G.C., CONTINUITY OF ALL BUILDING SERVICES AND UTILITIES SERVING BUILDING FACILITIES SHALL BE MAINTAINED UNINTERRUPTED AT NO ADDITIONAL COST. PROVIDE ALL NECESSARY CROSS CONNECTIONS AND TEMPORARY CONNECTIONS REQUIRED TO PERFORM THE CONSTRUCTION, AS DETERMINED BY THE G.C., AND NEEDED TO MAINTAIN CONTINUITY OF THE BUILDING SERVICE(S). THIS CONTRACTOR SHALL SCHEDULE WORK SUCH THAT ANY AND ALL CONNECTIONS, AND/OR REARRANGEMENT OF EXISTING EQUIPMENT, PIPING, ETC., SHALL ASSURE FULL RESUMPTION OF SERVICE(S) AT THE G.C.'S DESIGNATED TIME.
 9. **CODE REQUIREMENTS**
 - A. ALL WORK SHALL COMPLY WITH THE CONSTRUCTION DOCUMENTS OR, AS A DIRECTED BY THE ARCHITECT (ENGINEER), AND SHALL BE PERFORMED IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, ORDINANCES, AND REGULATIONS OF THE AHJ, WHETHER OR NOT SHOWN ON THE DRAWINGS. THE CONTRACTOR SHALL COMPLY WITH PROVISIONS OF ALL APPLICABLE CODES AND SHALL ENSURE THE WORK COMPLIES WITH ALL LOCAL, STATE AND FEDERAL CODES, TRADE STANDARDS AND MANUFACTURERS' RECOMMENDATIONS. IF CONTRACTOR BELIEVES THE DRAWINGS AND/OR SPECIFICATIONS CONFLICT WITH CODE REQUIREMENTS, IMMEDIATELY NOTIFY THE G.C. IN WRITING. DO NOT INSTALL WORK NOT COMPLYING WITH CODE REQUIREMENTS. IN CASE OF CONFLICT BETWEEN THE CONSTRUCTION DOCUMENTS AND THE CODES AND ORDINANCES, THE HIGHEST STANDARD SHALL APPLY. AS A MINIMUM STANDARD, CONTRACTOR SHALL SATISFY CODE REQUIREMENTS. ALL MODIFICATIONS REQUIRED BY AHJ SHALL BE MADE BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER. BEFORE COMMENCING WORK NOT SHOWN IN THE CONSTRUCTION DOCUMENTS, THE CONTRACTOR SHALL VERIFY COMPLIANCE WITH CODES. CONTRACTOR SHALL NOTIFY ARCHITECT (ENGINEER).
 10. **CUTTING & PATCHING**
 - A. CORE-DRILL OR SAW-CUT EXISTING FLOORS, WALLS, ROOF, ETC., AS A. REQUIRED FOR EQUIPMENT, PIPE, OR DUCTWORK. PRIOR TO CUTTING, PERFORM NON-DESTRUCTIVE TESTING TO VERIFY LOCATION OF PIPING, CONDUIT, AND STRUCTURAL COMPONENTS. NOTIFY ARCHITECT (ENGINEER) OF ANY DISCREPANCIES. PATCH SURROUNDING AREA FLUSH WITH ADJACENT SURFACE AND READY TO RECEIVE FINISH. PATCH AND REPAIR ROOF TO MATCH EXISTING ROOFING.
 11. **FIRE STOPPING**
 - A. PROVIDE FIRE STOPPING FOR PENETRATIONS OF DUCT, PIPING, AND A. OTHER MECHANICAL EQUIPMENT THROUGH FIRE-RATED VERTICAL BARRIERS (WALLS AND PARTITIONS), HORIZONTAL BARRIERS (FLOOR/CEILING ASSEMBLIES), AND VERTICAL SERVICE SHAFT WALLS AND PARTITIONS. WHERE THIS WORK IS BEING PERFORMED UNDER A GC, PRIOR TO INSTALLATION, THIS CONTRACTOR SHALL COORDINATE FIRESTOPPING WITH GC. FIRESTOP SYSTEM INSTALLATION MUST MEET REQUIREMENTS OF ASTM E 814 OR UL 1479 TESTED ASSEMBLIES THAT PROVIDE A FIRE RATING EQUAL TO OR GREATER THAN THAT OF CONSTRUCTION BEING PENETRATED. INSTALL IN STRICT ACCORDANCE WITH UL FIRE RESISTANCE DIRECTORY, AHJ, AND MANUFACTURERS' SPECIFIED REQUIREMENTS. ONLY TESTED DUCT SYSTEMS SHALL BE USED. IF EQUIPMENT SHALL BE USED, REFER TO ARCHITECTURAL DRAWINGS FOR ASSEMBLY RATING.
 12. **MATERIALS AND WORKMANSHIP**
 - A. ALL MANUFACTURED MATERIALS, AND EQUIPMENT SHALL BE NEW U.N.O., FREE OF DEFECTS, AND INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURERS' WRITTEN INSTRUCTIONS AND DETAILS, AND INDEPENDENTLY TESTED AND LABELED BY A NATIONALLY RECOGNIZED TESTING LABORATORY - UNDERWRITERS' LABORATORY (UL) OR EQUIVALENT. LIKE MATERIALS USED SHALL BE OF THE SAME MANUFACTURE AND QUALITY U.N.O.
 - B. ALL MATERIALS WITHIN PLENUMS SHALL BE NONCOMBUSTIBLE OR SHALL HAVE A FLAME SPREAD INDEX OF NOT MORE THAN 25 AND A SMOKE DEVELOPED INDEX OF NOT MORE THAN 50 WHEN TESTED IN ACCORDANCE WITH ASTM E84 OR UL 723. ALL MATERIALS INSTALLED IN PLENUM SPACES SHALL BE LISTED AND LABELED FOR SUCH APPLICATION.
 - C. ALL WORK SHALL BE SUPERVISED BY THE INSTALLING CONTRACTOR'S COMPETENT AND SKILLED FOREMAN. ALL WORK SHALL BE PERFORMED BY COMPETENT AND SKILLED WORKERS, WITH ALL TRADE AND MANUFACTURER REQUIRED TRAINING, AND EXECUTED IN A NEAT AND WORKMANLIKE MANNER. ALL WORK SHALL BE IN STRICT ACCORDANCE WITH THE BEST QUALITY STANDARDS OF THE TRADE AND IN CONFORMANCE WITH ALL FEDERAL, STATE, AND LOCAL CODES AND STANDARDS, INCLUDING APPLICABLE OSHA REGULATIONS. PROPERLY PROTECT WORK DURING CONSTRUCTION. PRIOR TO CONSTRUCTION COMPLETION, THOROUGHLY CLEAN WORK AND REMOVE ALL DEBRIS FROM THE PREMISES.
 13. **PROTECTION OF WORK AND PROPERTY**
 - A. PROTECT ALL WORK FROM DAMAGE AND PROTECT THE OWNER'S PROPERTY FROM DIRT, DAMAGE, OR LOSS ARISING FROM CONTRACTOR WORK.
 - B. COMPLY WITH OSHA REQUIREMENTS AND TAKE ALL NECESSARY PRECAUTIONS FOR EMPLOYEE SAFETY.
 - C. PROTECT ALL OPEN PIPING, DUCT, AND EQUIPMENT, EXISTING AND NEW FROM CONSTRUCTION DIRT AND DUST, COVER, CAP, OR PLUG OPEN ENDS OF PIPING AND DUCT. KEEP EQUIPMENT CLOSED OR COVER AND SEAL EQUIPMENT OPENINGS. ANY MECHANICAL SYSTEMS, NEW AND/OR EXISTING OPERATED DURING CONSTRUCTION SHALL BE PROTECTED BY COVERING EACH RETURN AIR DUCT OPENING WITH MERV 8 FILTERS AND INSTALLING MERV 8 FILTER(S) IN EQUIPMENT FILTER RACK. PRIOR TO TESTING AND BALANCING, REMOVE FILTERS FROM FILTER RACKS AND INSTALL NEW MERV 8 FILTERS.
 - D. AT COMPLETION OF WORK, PRIOR TO EQUIPMENT START-UP, REMOVE COVERS, CAPS, OR PLUGS ON DUCT AND PIPING.
 14. **DAMAGE BY LEAKS**
 - A. THIS CONTRACTOR IS SOLELY RESPONSIBLE FOR ALL DAMAGES TO THE PROPERTY (GROUNDS, WALKS, ROADS, BUILDING COMPONENTS, FINISHES, PIPING SYSTEMS, ELECTRICAL SYSTEMS, HVAC SYSTEMS, AND THEIR EQUIPMENT AND CONTENT) CAUSED BY LEAKS IN THE SYSTEMS BEING INSTALLED OR HAVING BEEN INSTALLED AS PART OF THIS WORK. ALL REPAIRS WILL BE MADE AT THIS CONTRACTOR'S EXPENSE.
 15. **DRAWINGS AND SPECIFICATIONS**
 - A. DRAWINGS ARE DIAGRAMMATIC AND INTENDED TO SHOW GENERAL LOCATIONS OF DUCTS, PIPES, AND EQUIPMENT AND THE METHODS OF CONNECTING AND CONTROL. THE DRAWINGS SHALL BE FOLLOWED AS CLOSELY AS ACTUAL BUILDING CONDITIONS AND THE WORK OF OTHER TRADES PERMIT. THE DRAWINGS ARE NOT INTENDED TO SHOW EVERY CONNECTION IN DETAIL OR ALL OFFSETS, TRANSITIONS, OR FITTINGS REQUIRED FOR A COMPLETE SYSTEM NOR IS IT IMPLIED THAT ALL CONFLICTS BETWEEN BUILDING ELEMENTS AND/OR OTHER TRADES ARE INDICATED. DO NOT SCALE DRAWINGS. EXAMINE FIELD CONDITIONS AND SEE ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR EXACT LOCATION OF DOORS, WINDOWS, LIGHTS, ETC.
 - B. THE DRAWINGS AND SPECIFICATIONS ARE MUTUALLY COMPLEMENTARY, AND ANY WORK REQUIRED BY ONE BUT NOT BY THE OTHER SHALL BE REQUIRED BY BOTH.
 - C. PRIOR TO INSTALLING EQUIPMENT, DUCT, OR PIPE COORDINATE PROPOSED LOCATIONS WITH EACH TRADE/DISCIPLINE AND GC. EXAMINE EACH DISCIPLINE DRAWINGS FOR CONSTRUCTION DETAILS, CEILING HEIGHTS, REQUIREMENTS, CLEARANCES, AND SPACE CONSTRAINTS. PROVIDE SYSTEMS INSTALLATION BASED ON THIS EXAMINATION AND COORDINATION. IMMEDIATELY REPORT INSTALLATION CONFLICTS IN WRITINGS TO THE GC. RESOLVE ALL CONFLICTS WITH GC AND OTHER TRADES PRIOR TO PROCEEDING. IF THE INSTALLING CONTRACTOR IS FULLY RESPONSIBLE FOR CORRECT INTERPRETATION AND APPLICATION OF ALL SIZES AND DIMENSIONS.
 - D. SIGNIFICANT DEVIATIONS OR CHANGES FROM THE DRAWINGS, WHICH ARE REQUIRED TO ACCOMPLISH THE INTENT OF THE CONTRACT DOCUMENTS MUST BE REVIEWED AND APPROVED BY THE ARCHITECT (ENGINEER) BEFORE PROCEEDING. IF THE CONTRACTOR BELIEVES CHANGES TO THE CONTRACT DRAWINGS ARE NECESSARY, SHOP DRAWINGS WITH WRITTEN DESCRIPTIONS OF THE PROPOSED CHANGES SHALL BE SUBMITTED TO THE ARCHITECT (ENGINEER) FOR APPROVAL.
 - E. ALL PIPE, DUCTS, VENTS, ETC., EXTENDING THROUGH WALLS AND ROOF SHALL BE FLASHED WATERPROOF. PROVIDE ALL FLASHING FOR PIPE AND DUCTWORK PENETRATING BUILDING ENVELOPE. PROVIDE DUCT AND/OR PIPE SLEEVES AT WALL PENETRATIONS. SEAL ANNULAR SPACE WEATHER TIGHT.
 16. **CONTROLS**
 - A. PROVIDE COMPLETE EQUIPMENT CONTROLS, INCLUSIVE OF ALL COMPONENTS, VOLTAGES, PROGRAMMING, WIRING, ETC. FOR COMPLETE AND OPERATIONAL SYSTEMS. MOUNT THERMOSTATS AND SWITCHES 4'-0" ABOVE FINISHED FLOOR. MOUNT OTHER SENSORS (HUMIDITY, CO2, CO, NOX, ETC.) PER MANUFACTURERS' IOM. PRIOR TO MOUNTING, COORDINATE THERMOSTAT LOCATIONS) WITH SUNLIGHT, EXHAUSTURE AND EQUIPMENT. DO NOT MOUNT THERMOSTATS IN DIRECT SUNLIGHT, IN DISCHARGE OR EQUIPMENT, ON WALLS WITH INTERNAL HEAT SOURCES (DUCT OR OR ON EXTERIOR WALLS; IF EXTERIOR WALL MOUNTING IS NECESSARY, PROVIDE INSULATED MOUNTING BASE WHERE THERMOSTAT LOCATION IS SUBJECT TO DAMAGE, PROVIDE LOCKABLE HIGH-IMPACT GUARD.
 17. **PIPING**
 - A. IN FINISHED AREAS, ALL PIPING SHALL BE CONCEALED UNLESS NOTED OTHERWISE.
 - B. SEE PIPE SCHEDULE FOR PIPE MATERIALS AND PIPE INSULATION.
 - C. DO NOT INSTALL PVC PIPING IN PLENUM AREAS.
 - D. MANNERS OF PIPE TO MATCH WITH OTHER BUILDING STANDARDS.
 - E. PROVIDE PIPE LABELS AND FLOW DIRECTION PER BUILDING OR FACILITY'S STANDARD OR AS SCHEDULED. ORIENT ALL MARKERS SO AS TO BE VISIBLE FROM FLOOR LEVEL. AT A MINIMUM PIPE LABELS AND FLOW DIRECTION MARKERS SHALL BE LOCATED:
 - AT LEAST ONCE IN EACH ROOM
 - AT EQUIPMENT CONNECTIONS
 - AT ACCESS DOORS
 - ON ALL ACCESSIBLE PIPE A MAXIMUM OF 25' BETWEEN MARKERS.
 - F. BRANCH TAKE-OFFS SHALL BE MADE WITH SWING CONNECTIONS AS REQUIRED TO AVOID STRESS AT THESE POINTS.
 - G. DO NOT INSTALL ANY PIPING ABOVE ELECTRICAL PANELS AND/OR TRANSFORMERS.
 - H. INSTALL AND SIZE REFRIGERANT PIPE IN STRICT ACCORDANCE WITH MANUFACTURERS' IOM. DO NOT INSTALL REFRIGERANT PIPE ABOVE FINISHED FLOORS.
 - I. BELOW GROUND, REFRIGERANT PIPE INSTALLED ON BUILDING EXTERIOR SHALL BE ROUTED TO MINIMIZE EXTERIOR EXPOSURE. INSULATE REFRIGERANT PIPE PER MANUFACTURERS' IOM. INSULATE INSULATION EXPOSED TO AMBIENT CONDITIONS WITH A CONTINUOUS 30 MIL PVC JACKET.
 - J. ROUTE PIPE THROUGH ROOF WITH ALUMINUM PIPE HOOD, PATE CURB MODEL "PHA-2" WITH 14" TALL MODEL "PC-2" CURB. SEAL PIPE THROUGH CURB WEATHER-TIGHT.
 - K. ON HYDRONIC PIPING, PROVIDE MANUAL AIR VENTS AT ALL HIGH POINTS TO ALLOW BLEEDING OF AIR FROM THE SYSTEM, AND BALL VALVES WITH HOSE END DRAIN FITTINGS AT ALL LOW POINTS TO ALLOW DRAINING THE SYSTEM.
 - L. PRIOR TO INSTALLING EQUIPMENT/APPLIANCES, CAREFULLY CONSIDER FALL REQUIREMENTS OF CONDENSATE DRAIN PIPE. PROVIDE MINIMUM 1/8" FOOT SLOPE. EXTEND CONDENSATE DRAIN PIPE TO AN APPROVED RECEPTOR AND TERMINATE VIA AN INDIRECT CONNECTION.
 - M. ALL HOLES REQUIRED THROUGH EXISTING FLOORS AND MASONRY WALLS SHALL BE CORE DRILLED.
18. **DUCT MOUNTED SMOKE DETECTORS**
 - A. DUCT MOUNTED SMOKE DETECTORS SHALL BE PROVIDED BY E.C. AND UPON DETECTING SMOKE, SHALL SHUT DOWN PROTECTED AIR SYSTEM.
19. **SHOP DRAWINGS**
 - A. SUBMIT SHOP DRAWINGS ON SCHEDULED AND NOTED EQUIPMENT AND MATERIALS. PRIOR TO SUBMITTAL, EACH SHOP DRAWING SHALL BE REVIEWED BY THE CONTRACTOR TO ASSURE THAT THE PROPOSED EQUIPMENT IS CLEARLY MARKED, HIGHLIGHTED, AND NOTED. ALL DIMENSIONS, QUANTITIES, CONNECTIONS, CAPACITIES AND ACCESSORIES SHALL BE CLEARLY SHOWN. THE CONTRACTOR SHALL WITH THE CONTRACT DOCUMENTS, AND SHALL BE MARKED OR STAMPED TO CONFIRM THAT SUCH REVIEW WAS MADE AND COMPLIANCE WAS CONFIRMED. SHOP DRAWING SUBMITTED WITHOUT BEING MARKED, HIGHLIGHTED, AND NOTED WILL BE REJECTED BY THE ARCHITECT (ENGINEER).
 - B. PROVIDE ADEQUATE TIME FOR SUBMITTAL REVIEW AND CORRECTIONS. IF ANY, T PREVENT CONSTRUCTION DELAY. DO NOT PERFORM ANY PORTION OF WORK WHICH REQUIRES APPROVED SUBMITTALS UNTIL THE RESPECTIVE SUBMITTALS HAVE BEEN APPROVED BY THE ENGINEER.
 - C. REVIEW OF SHOP DRAWINGS BY THE OWNER, OWNER'S AGENT, ARCHITECT, OR ENGINEER IS FOR GENERAL COMPLIANCE WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR COMPLYING WITH ALL EQUIPMENT AND CONTRACT DOCUMENTS AND FOR PERFORMANCE OF ALL EQUIPMENT AND MATERIALS PURCHASED, FOR QUANTITIES, PROPER FIT, AND OTHER DIMENSIONAL REQUIREMENTS.
20. **DUCTWORK**
 - A. REFER TO KEVED NOTES FOR CLARIFICATION OF DUCT DIMENSIONS. PROVIDE ALL DUCTWORK IN STRICT ACCORDANCE WITH THE SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE", LATEST EDITION. U.N.O. ALL RIGID DUCTWORK SHALL BE GALVANIZED SHEET METAL. ALL EXPOSED DUCTWORK SHALL HAVE A MINIMUM FINISH PHOSPHATIZED FINISH. PRIOR TO PAINT ADHESION, EXPOSED RIGID DUCT SHALL BE SPIRAL SEAM TYPE. NO FIBERGLASS DUCTBOARD WILL BE ALLOWED.
 - B. PROVIDE TURNING VANES AT ALL CHANGES IN DIRECTION.
 - C. UNLESS NOTED OTHERWISE, EACH DUCTED AIR DEVICE SHALL BE PROVIDED WITH A VOLUME DAMPER. VOLUME DAMPERS SHALL BE INSTALLED ON THE PLANS OR PROVIDE A VOLUME DAMPER AT EACH BRANCH DUCT SERVING AN AIR DEVICE AND/OR AS SHOWN, DETAILED, AND SPECIFIED. WHERE A DUCT MOUNTED VOLUME DAMPER WOULD BE INACCESSIBLE, PROVIDE A VOLUME DAMPER IN THE AIR DEVICE GRILLE NECK OR A DAMPER WITH REMOTE CABLE CONTROL. PROVIDE EACH ROUND BRANCH DUCT TAKE-OFF FROM MAIN DUCT WITH SPIN-IN FITTING AND VOLUME BALANCING DAMPER. VOLUME DAMPERS SHALL BE YOUNG REGULATOR MODEL 502R LOCKING QUADRANT VOLUME DAMPER WITH 2" HANDLE STAND-OFF FOR INSULATION THICKNESS. WHERE BRANCH TAKE-OFF IS INACCESSIBLE FOR BALANCING, PROVIDE BALANCING DAMPER IN GRILLE NECK OR BOWDEN "270-275" REMOTE CABLE CONTROL. ALL FLEXIBLE DUCT SHALL BE THERMAX FLEX TYPE MAKE, MAXIMUM 5'-0" FLEXDUCT SHALL BE INSTALLED. I ALL ACCESSIBLE ONLY FULLY STRETCHED OUT AND WITHOUT SAGS OR KINKS. CONNECTIONS TO FITTINGS AND AIR DEVICES SHALL BE MADE WITH TWO BAND KLOCKS. BAND CLAMP THE INNER LINER TIGHT TO FITTING OR AIR DEVICE, THEN THE INSULATION AND VAPOK-PROOF JACKET SHALL BE CLAMPED TIGHT. FLEX DUCT INSTALLATION AREA/NO ACCESSIBLE CEILING IS INACCESSIBLE.
21. **DUCT SEALING**
 - A. IN ALL CONDITIONS AREAS, SEAL ALL LONGITUDINAL AND TRANSVERSE JOINTS WITH A NON-HARDENING, NON-MIGRATING MASTIC OR LIQUID ELASTIC SEALANT, WITH VOC CONTENT NO GREATER THAN 250G/L AND RECOMMENDED BY THE MANUFACTURER FOR SEALING SHEET METAL, SEAL ALL JOINTS, SPIN-IN FITTINGS, AND FASTENING SCREWS WITH HANCOCK SYSTEM LEAKAGE SHALL NOT EXCEED .5% OF DESIGN FLOW. DUCT TAPE IS NOT ALLOWED.
22. **DUCT INSULATION**
 1. ALL NEW SUPPLY AND RETURN AIR DUCTWORK WITHIN 10' OF HVAC UNIT SHALL BE ACoustically LINED. DUCT SIZES SHOWN ON THE DRAWING ARE INTERNAL FREE AREA SIZES WITH INTERNAL RADIUS. RADIUS OF 1-INCH. DUCT LINED WITH JOHNS MANVILLE "PERMACOTE UNACOUSTIC" (R VALUE = 6) AND SHALL BE APPLIED TO THE DUCTWORK WITH FIRE RESISTIVE ADHESIVES AND CADMIUM OR COPPER PLATED MECHANICAL FASTENERS.
 2. ALL OUTSIDE AIR AND UNEXPOSED DUCTWORK WITHIN BUILDING, EXCEPT WHERE ACoustically LINED, SHALL HAVE 2-INCH FIBERGLASS DUCT WRAP INSULATION WITH FSK FACING EQUIVALENT TO JOHNS MANVILLE "MICROGLITE XG 75" (INSTALLED "R VALUE" = 6).
 3. MINIMUM INSULATION REQUIREMENTS AS PER IECC 2018:

	SUPPLY	RETURN
UNCONDITIONED SPACES :	R-6	R-6
INDIRECTLY CONDITIONED SPACE:	R-12	R-12
EXTERIOR :	R-12	R-12
 4. LEADING EDGES OF DUCT INSULATION SHALL BE OVERLAPPED BY ADJOINING INSULATION AT LEAST 6 INCHES MINIMUM AND THEN SEALED WITH FOIL VAPOUR BARRIER ADHESIVE AND DUCT MASTIC. THAT NO FIBERGLASS INSULATION IS VISIBLE.
 5. INSULATION ON EXISTING PIPING OR DUCTS THAT BECOMES WET, DAMAGED, DISTURBED OR GETS REMOVED SHALL BE REPLACED.
 6. INSTALL INSULATION PRODUCTS IN ACCORDANCE WITH MANUFACTURERS' WRITTEN INSTRUCTIONS AND IN ACCORDANCE WITH RECOGNIZED INDUSTRY PRACTICES. INSULATION MUST COMPLY WITH NFPA 90A.
 7. ALL INSULATION SHALL HAVE A FLAME SPREAD RATING OF NOT MORE THAN 25 AND A SMOKE DEVELOPED INDEX OF NOT MORE THAN 50 WHEN TESTED IN ACCORDANCE WITH ASTM TEST: C411 OR AS REQUIRED BY LOCAL CODES.
 8. EXTERIOR SUPPLY AND RETURN DUCT INSULATION:

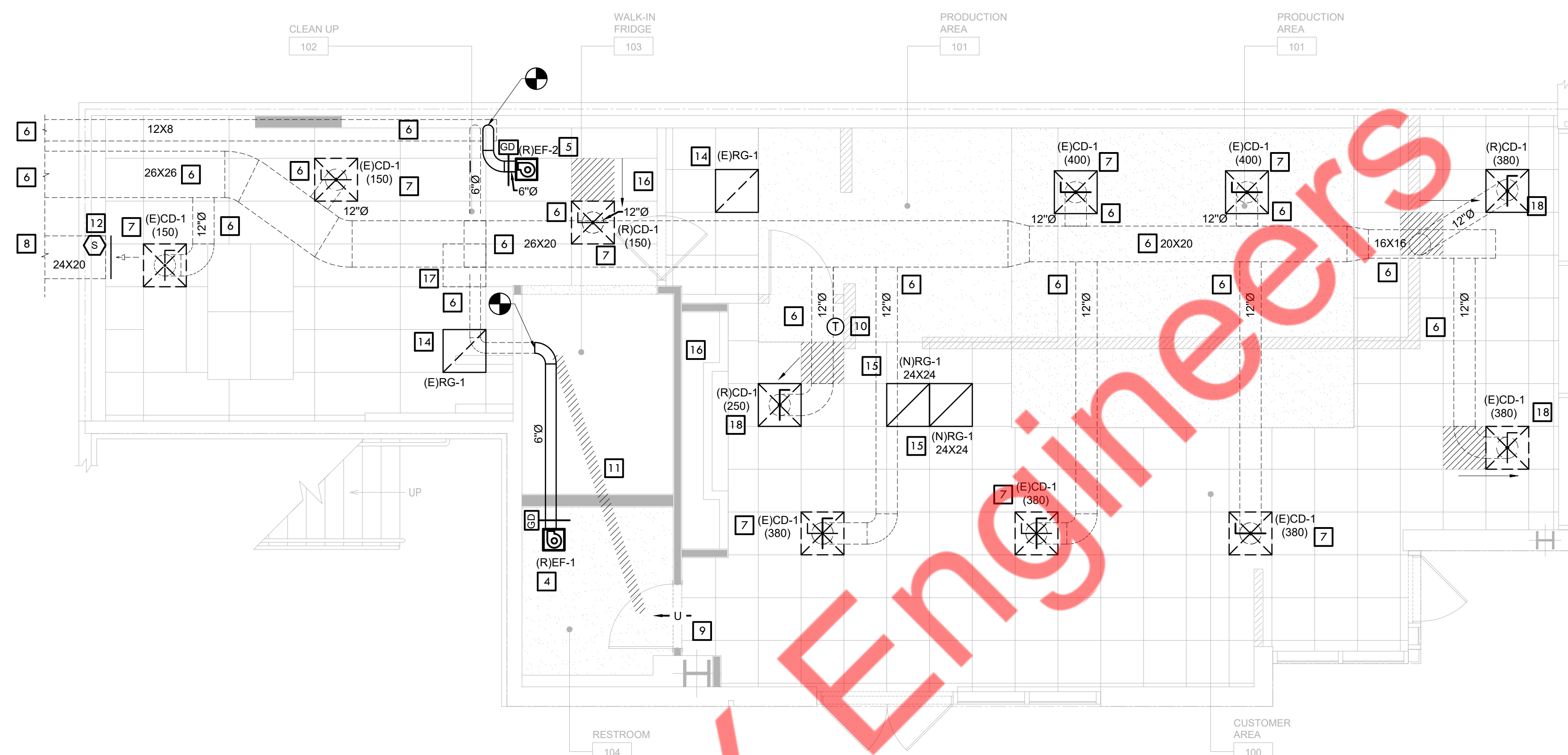
	SUPPLY	RETURN
A. SERVICE: RECTANGULAR, SUPPLY-AIR AND RETURN-AIR DUCTS.		
A.1. MATERIAL: INSULATION BOARD, 6 PSF MINIMUM AND PLAIN FACING.		
A.2. THICKNESS: 2 INCHES.		
A.3. NUMBER OF LAYERS: TWO.		
A.4. TOTAL THICKNESS: 4" .		
A.5. VAPOK RETARDER REQUIRED: YES.		
B. INORGANIC GLASS FIBERS PREFORMED AND BONDED BY THERMOSETTING RESIN. MUST COMPLY WITH ASTM C 612, TYPE 1A & 1B. KNAUF INSULATION OR APPROVED EQUIVALENT.		
9. APPLY INSULATION AS FOLLOWS:

A. APPLY TWO-LAYER INSULATION WITH JOINTS TIGHTLY BUTTED AND STAGGERED AT LEAST 3 INCHES. SECURE LAYERS WITH ADHESIVE, MECHANICAL FASTENERS OR BANDING. FASTENERS SHALL BE LOCATED A MAXIMUM OF 3" FROM EACH EDGE AND NO GREATER THAN 12" APART.		
B. ON EXPOSED APPLICATIONS, FINISH INSULATION WITH A SKIM COAT OF MINERAL-FIBER, HYDRAULIC-SETTING CEMENT TO SURFACE OF INSTALLED INSULATION. WHEN DRY, APPLY FLOOD COAT OF LAGGING ADHESIVE AND PRESS ON ONE LAYER OF GLASS CLOTH OR TAPE. OVERLAP EDGES AT LEAST 1 INCH (25 MM). APPLY FINISH COAT OF LAGGING ADHESIVE OVER GLASS CLOTH OR TAPE. THEN THE FINISH COAT TO ACHIEVE SMOOTH FINISH. OUTDOOR JACKET: POLYGLAD PRODUCTS, INC. ALUMAGUARD 60" OR MFM BUILDING PRODUCTS CORP. FLEXGLAD 400"		
23. **EQUIPMENT**
 - A. INSTALL ALL EQUIPMENT AND MATERIALS IN STRICT ACCORDANCE WITH MANUFACTURERS' INSTALLATION AND OPERATIONS MANUAL AND IN STRICT ACCORDANCE WITH ALL LOCAL CODES AND REGULATIONS.
 - B. U.N.O. PROVIDE ALL MOTORIZED EQUIPMENT WITH VIBRATION ISOLATION MOUNTING AND FLEXIBLE DUCT AND FLEXIBLE PIPE CONNECTIONS.
 - C. LABEL ALL EQUIPMENT WITH ID TAGS. LETTERING SHALL BE 1" HIGH BLACK ON WHITE BACKGROUND. ID TAGS IN PLENUM SPACES SHALL BE PLENUM EQUIPMENT NOT PLENUM MOUNTED. SHALL BE LABELED WITH ENGRAVED PHENOLIC RESIN. MANNERS OF PIPE TO MATCH WITH OTHER BUILDING STANDARDS. SHALL BE 1" HIGH BLACK ON WHITE BACKGROUND. ALL EQUIPMENT, DUCT, PIPE, ETC. MOUNTED FROM BOLTED CONNECTIONS SHALL HAVE DOUBLE NUTS AT ATTACHMENT TO STRUCTURE AND HANGER, NO EXCEPTIONS.
24. **FIRE AND FIRE-SMOKE DAMPERS**
 - A. PROVIDE FIRE DAMPERS AND/OR FIRE SMOKE DAMPERS AT DUCT PENETRATIONS OF RATED ASSEMBLIES AND AS REQUIRED BY AHJ. REFER TO ARCHITECTURAL

THERMOSTATIC CONTROLS:

- A. GENERAL:
 - I. THE SUPPLY OF HEATING AND COOLING ENERGY TO EACH ZONE SHALL BE CONTROLLED BY INDIVIDUAL THERMOSTATIC CONTROLS CAPABLE OF RESPONDING TO TEMPERATURE WITHIN THE ZONE, WHERE HUMIDIFICATION OR DEHUMIDIFICATION OR BOTH IS PROVIDED, NOT FEWER THAN ONE HUMIDITY CONTROL DEVICE SHALL BE PROVIDED FOR EACH HUMIDITY CONTROL SYSTEM.
 - EXCEPTION:
 1. INDEPENDENT PERIMETER SYSTEMS THAT ARE DESIGNED TO OFFSET ONLY BUILDING ENVELOPE HEAT LOSSES, GAINS OR BOTH SERVING ONE OR MORE PERIMETER ZONES ALSO SERVED BY AN INTERIOR SYSTEM PROVIDED THAT BOTH OF THE FOLLOWING CONDITIONS ARE MET:
 1. THE PERIMETER SYSTEM INCLUDES NOT FEWER THAN ONE THERMOSTATIC CONTROL FOR EACH BUILDING EXPOSURE HAVING FACTORY RATED WALLS FACING ONLY ONE ORIENTATION (WITHIN ± 45 DEGREES) (0.8 RAD) FOR MORE THAN 50 CONTIGUOUS FEET (15 240 MM).
 2. THE PERIMETER SYSTEM HEATING AND COOLING SUPPLY IS CONTROLLED BY THERMOSTATS LOCATED WITHIN THE ZONES SERVED BY THE SYSTEM.
 2. DEAD BAND:
 - WHERE USED TO CONTROL BOTH HEATING AND COOLING, ZONE THERMOSTATIC CONTROLS SHALL BE CONFIGURED TO PROVIDE A TEMPERATURE RANGE OR DEAD BAND OF NOT LESS THAN 5°F (2.8°C) WITHIN WHICH THE SUPPLY OF HEATING AND COOLING ENERGY TO THE ZONE IS SHUT OFF OR REDUCED TO A MINIMUM.
 - EXCEPTIONS:
 1. THERMOSTATS REQUIRING MANUAL CHANGEOVER BETWEEN HEATING AND COOLING MODES.
 2. OCCUPANCIES OR APPLICATIONS REQUIRING PRECISION IN INDOOR TEMPERATURE CONTROL AS APPROVED BY THE CODE OFFICIAL.
 - C. OFF-HOUR CONTROLS
 - I. EACH ZONE SHALL BE PROVIDED WITH THERMOSTATIC SETBACK CONTROLS THAT ARE CONTROLLED BY EITHER AN AUTOMATIC TIME CLOCK OR PROGRAMMABLE CONTROL SYSTEM.
 - EXCEPTIONS:
 1. ZONES THAT WILL BE OPERATED CONTINUOUSLY.
 2. ZONES WITH A FULL HVAC LOAD DEMAND NOT EXCEEDING 6,800 BTU/H (2 kW) AND HAVING A MANUAL SHUTOFF SWITCH LOCATED WITH READY ACCESS.
 - D. THERMOSTATIC SETBACK:
 - I. 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).
 - II. AUTOMATIC SETBACK AND SHUTDOWN:
 - A. AUTOMATIC SETBACK AND SHUTDOWN CONTROLS SHALL BE CAPABLE OF 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.
 - F. SETPOINT OVERLAP RESTRICTION:
 - WHERE A ZONE HAS A SEPARATE HEATING AND A SEPARATE COOLING THERMOSTATIC CONTROL LOCATED WITHIN THE ZONE, A LIMIT SWITCH SHALL STOP OR DIRECT DIGITAL CONTROL SYSTEM WITH SOFTWARE PROGRAMMING SHALL BE CONFIGURED TO PREVENT THE HEATING SETPOINT FROM EXCEEDING THE COOLING SETPOINT AND TO MAINTAIN A DEADBAND IN ACCORDANCE WITH SECTION DEADBAND.
 - G. AUTOMATIC START:
 - I. AUTOMATIC START CONTROLS SHALL BE PROVIDED FOR EACH HVAC SYSTEM. THE CONTROLS SHALL BE CONFIGURED TO AUTOMATICALLY ADJUST THE DAILY START TIME OF THE HVAC SYSTEM IN ORDER TO BRING EACH SPACE TO THE DESIRED OCCUPIED TEMPERATURE IMMEDIATELY PRIOR TO SCHEDULED OCCUPANCY.

ALL PENETRATIONS OF FIRE RATED CONSTRUCTION MUST BE RENEWED PER MANUFACTURER'S DETAILS OF THE SEALANT. THE DETAILS SHALL MEET OR EXCEED RATINGS OF CONSTRUCTION BEING PENETRATED. PENETRATION DETAILS SHALL BE EXACTLY AS TESTED BY AN APPROVED TESTING LABORATORY OR AGENCY AND SHALL INCLUDE THEIR SYSTEM NUMBERS.



NOTE:
SYMBOL LIST SHOWN IS FOR GENERAL REFERENCE ONLY. THE PRESENCE OF A
SYMBOL DOES NOT IMPLY ITS USE ON THIS PROJECT. REFER TO DRAWINGS FOR
SPECIFIC SYMBOLS USED.

2 SCHEDULES

ELECTRICAL SPECIFICATIONS

SUMMARY		ARCHITECT/ENGINEER WILL REVIEW SHOP DRAWINGS ONLY FOR CONFORMANCE WITH DESIGN CONCEPT OF THE PROJECT. REVIEW BY ARCHITECT/ENGINEER SHALL NOT BE CONSTRUCTED.	
GENERAL	GENERAL AND SUPPLEMENTARY CONDITIONS WITHIN THE SPECIFICATIONS ARE HEREBY INCORPORATED AND BECOME PART OF THESE SPECIFICATIONS AND AS SUCH SHALL BE APPLICABLE TO THE WORK OF THE ELECTRICAL CONTRACT.		
	PRIOR TO SUBMISSION OF A BID PROPOSAL, THE CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH ALL EXISTING CONDITIONS AND LIMITATIONS THAT IMPACT THE WORK OF THIS CONTRACT. NO ADDITIONAL COSTS TO THE OWNER SHALL BE PERMITTED FOR CHANGES TO THE WORK AS A RESULT OF THE CONTRACTOR'S FAILURE TO VISIT THE SITE PRIOR TO BIDDING AND IDENTIFY ITEMS THAT WERE ABLE TO BE VERIFIED DURING A SITE VISIT PRIOR TO THE SUBMISSION OF A BID PROPOSAL.		
	CONTRACTOR SHALL SUBMIT SHOP DRAWINGS, EQUIPMENT, RIGGING, AND MISCELLANEOUS ITEMS AS REQUIRED FOR A COMPLETE, OPERATIONAL, FUNCTIONAL, AND CODE COMPLIANT ELECTRICAL INSTALLATION AS SHOWN ON THE DRAWINGS AND AS SPECIFIED IN THESE SPECIFICATIONS.		
LANDLORDS REQUIREMENTS			
A.	ALL WORK OF THIS CONTRACT SHALL BE COMPLETED IN STRICT ACCORDANCE WITH THE REQUIREMENTS OF THE LANDLORD'S WORK LETTER, LANDLORDS CONSTRUCTION CRITERIA AND/OR THE TENANT/LANDLORD AGREEMENT. THIS CONTRACTOR SHALL EXAMINE THESE DOCUMENTS PRIOR TO THE SUBMISSION OF A BID PROPOSAL.	B.	THE CONTRACTOR SHALL PERFORM NO PORTION OF THE WORK REQUIRING SUBMITTAL AND REVIEW OF SHOP DRAWINGS, PRODUCT DATA, SAMPLES OR SIMILAR SUBMITTALS UNTIL THE RESPECTIVE SUBMITTALS HAS BEEN APPROVED BY THE ENGINEER.
ELECTRICAL COORDINATION DRAWINGS			
A.	PREPARE ELECTRICAL COORDINATION DRAWINGS AS REQUIRED BY THE WORK AND AS DIRECTED BY THE GENERAL CONTRACTOR.	B.	MEET WITH REPRESENTATIVES OF THE OTHER DISCIPLINES/TRADES TO COORDINATE THE ELECTRICAL WORK WITH THE WORK OF EACH DISCIPLINE AND TO OBTAIN INFORMATION REGARDING THEIR WORK THAT IS TO BE INDICATED ON THE COORDINATION DRAWINGS.
POWER SYSTEM STUDIES - GENERAL			
A.	PROVIDE COMPUTER-BASED, POWER SYSTEM STUDIES THAT INCLUDES: A SHORT CIRCUIT STUDY TO DETERMINE THE MINIMUM INTERRUPTING CAPACITY OF CIRCUIT PROTECTIVE DEVICES.	B.	SHOULD THE CONTRACTOR WISH TO SUBMIT AN ALTERNATE PRODUCT TO THE MANUFACTURERS NAMES THESE SPECIFICATIONS OR ON THE DRAWINGS FOR ANY EQUIPMENT, THE CONTRACTOR SHALL SUBMIT A VOLUNTARY ALTERNATIVE A MINIMUM OF SEVEN (7) CALENDAR DAYS PRIOR TO BID, STATING THE MANUFACTURER'S NAME, MODEL NUMBER, WRITTEN, DETAIL PRODUCT DATA.
B.	WORK PERFORMED OR CONSTRUCTED WITH UNAPPROVED EQUALS IS AT CONTRACTOR'S RISK AND ANY REQUIRED CORRECTION OF WORK INCORPORATING UNAPPROVED EQUALS SHALL BE AT CONTRACTOR'S SOLE COST AND EXPENSE.	C.	SOFTWARE DEVELOPERS: SUBJECT TO COMPLIANCE WITH SPECIFIED REQUIREMENTS, PERFORM STUDIES UTILIZING SOFTWARE PRODUCTS BY ONE OF THE FOLLOWING: 1. EASY POWER 2. POWER ANALYSIS CORPORATION 3. SCAM SYSTEMS ANALYSIS
C.	NO SUBSTITUTIONS PERMITTED FOR LIGHTING FIXTURES.	D.	ALL STUDIES SHALL BE BASED ON THE DEVICE CHARACTERISTICS OF ACTUAL EXISTING COMPONENTS AND THE NEW COMPONENTS BEING INSTALLED.
QUALITY ASSURANCE			
A.	ALL MATERIALS AND EQUIPMENT SHALL BE NEW.	E.	PROVIDE ALL FIELD LABOR AS REQUIRED TO OBTAIN ALL DATA NECESSARY TO CONDUCT THE STUDIES SPECIFIED HEREIN.
B.	PROVIDE A CERTIFICATE OF INSPECTION BY THE AUTHORITY HAVING JURISDICTION, PERMIT AND INSPECTION FEES AND ALL MATERIALS, EQUIPMENT AND LABOR AS REQUIRED FOR A COMPLETE, FUNCTIONAL, FULLY OPERATIONAL AND CODE COMPLIANT ELECTRICAL SYSTEM.	F.	SUBMIT STUDIES FOR REVIEW BEFORE SUBMITTING THE SYSTEM AND INFORMATION SUBMITTALS. SUBMIT STUDY REPORT FOR REVIEW PRIOR TO RECEIVING FINAL APPROVAL OF THE OVERCURRENT PROTECTIVE DEVICE AND DISTRIBUTION EQUIPMENT.
C.	THIS CONTRACTOR SHALL PROVIDE ALL MATERIALS, LABOR AND ACCESSORIES FOR THE ORDERING AND MANUFACTURING OF OVERCURRENT PROTECTIVE DEVICES AND POWER DISTRIBUTION EQUIPMENT, THE CONTRACTOR SHALL SUBMIT A VOLUNTARY ALTERNATIVE A MINIMUM OF SEVEN (7) CALENDAR DAYS PRIOR TO BID, STATING THE MANUFACTURER'S NAME, MODEL NUMBER, WRITTEN, DETAIL PRODUCT DATA.	G.	WHERE FORMAL COMPLETION OF STUDIES WILL CAUSE A DELAY IN THE ORDERING AND MANUFACTURING OF OVERCURRENT PROTECTIVE DEVICES AND POWER DISTRIBUTION EQUIPMENT, THE CONTRACTOR SHALL SUBMIT A VOLUNTARY ALTERNATIVE A MINIMUM OF SEVEN (7) CALENDAR DAYS PRIOR TO BID, STATING THE MANUFACTURER'S NAME, MODEL NUMBER, WRITTEN, DETAIL PRODUCT DATA.
D.	EC SHALL VERIFY THE VOLTAGE AND AMPERAGE REQUIREMENTS OF ALL EQUIPMENT DELIVERED TO THE SITE PRIOR TO CONNECTION. EC SHALL NOTIFY THE OWNER OF ANY DIFFERENCES.	H.	BEGIN SHORT-CIRCUIT CURRENT ANALYSIS AT THE SERVICE, EXTENDING DOWN TO THE SYSTEM OVERCURRENT PROTECTIVE DEVICES AS FOLLOWS: 1. TO NORMAL SYSTEM VOLTAGE LOAD BUSES WHERE FAULT CURRENT IS 10 KA OR LESS.
E.	REQUIREMENTS OF REGULATORY AGENCIES	SHORT CIRCUIT STUDY	
F.	REQUIREMENTS OF REGULATORY AGENCIES	A. PROVIDE A COMPUTER-BASED, SHORT CIRCUIT STUDY TO DETERMINE THE MINIMUM INTERRUPTING CAPACITY OF CIRCUIT PROTECTIVE DEVICES.	
G.	REQUIREMENTS OF REGULATORY AGENCIES	B. FOR NEW EQUIPMENT, USE CHARACTERISTICS SUBMITTED UNDER THE PROVISIONS OF ACTION SUBMITTALS AND INFORMATION SUBMITTALS FOR THIS PROJECT.	
H.	REQUIREMENTS OF REGULATORY AGENCIES	C. FOR EXISTING RELOCATED EQUIPMENT AND EXISTING EQUIPMENT THAT IS EXISTING TO REMAIN, OBTAIN REQUIRED ELECTRICAL DISTRIBUTION SYSTEM DATA BY FIELD INVESTIGATION AND SURVEYS, CONDUCTED BY QUALIFIED TECHNICIANS AND ENGINEERS.	
I.	REQUIREMENTS OF REGULATORY AGENCIES	D. GATHER AND TABULATE ALL REQUIRED DATA TO SUPPORT THE SHORT-CIRCUIT STUDY, COMPLY WITH RECOMMENDATIONS IN IEEE 551 AS NOTED TO THE AMOUNT OF DETAIL THAT IS REQUIRED TO BE ACQUIRED IN THE FIELD.	
J.	REQUIREMENTS OF REGULATORY AGENCIES	E. BEGIN SHORT-CIRCUIT CURRENT ANALYSIS AT THE SERVICE, EXTENDING DOWN TO THE SYSTEM OVERCURRENT PROTECTIVE DEVICES AS FOLLOWS: 1. TO NORMAL SYSTEM VOLTAGE LOAD BUSES WHERE FAULT CURRENT IS 10 KA OR LESS.	
ARC FLASH HAZARD STUDY			
A.	THE ELECTRICAL DRAWINGS (DRAWINGS) AND THE SPECIFICATIONS SHALL TOGETHER FORM A SET OF CONTRACT DOCUMENTS FOR THE ELECTRICAL WORK. NEITHER THE DRAWINGS OR THE SPECIFICATIONS SHALL BE COMPLETE WITHOUT THE OTHER. ANY ITEM SHOWN ONLY ON THE DRAWINGS OR SPECIFIED ONLY IN THE SPECIFICATIONS SHALL BE CONSIDERED AS IF SHOWN AND SPECIFIED IN BOTH.	B.	THE CONTRACTOR SHALL GATHER AND TABULATE ALL REQUIRED INPUT DATA TO SUPPORT STUDY, COMPLY WITH RECOMMENDATIONS IN IEEE 1584 AND NFPA 70E AS TO THE AMOUNT OF DETAIL THAT IS REQUIRED TO BE ACQUIRED IN THE FIELD.
C.	FOR NEW EQUIPMENT, USE CHARACTERISTICS SUBMITTED UNDER THE PROVISIONS OF ACTION SUBMITTALS AND INFORMATION SUBMITTALS FOR THIS PROJECT.	C.	FOR EXISTING RELOCATED EQUIPMENT AND EXISTING EQUIPMENT THAT IS EXISTING TO REMAIN, OBTAIN REQUIRED ELECTRICAL DISTRIBUTION SYSTEM DATA BY FIELD INVESTIGATION AND SURVEYS, CONDUCTED BY QUALIFIED TECHNICIANS AND ENGINEERS.
D.	GATHER AND TABULATE ALL REQUIRED DATA TO SUPPORT THE SHORT-CIRCUIT STUDY, COMPLY WITH RECOMMENDATIONS IN IEEE 551 AS NOTED TO THE AMOUNT OF DETAIL THAT IS REQUIRED TO BE ACQUIRED IN THE FIELD.	D.	GATHER AND TABULATE ALL REQUIRED DATA TO SUPPORT THE SHORT-CIRCUIT STUDY, COMPLY WITH RECOMMENDATIONS IN IEEE 551 AS NOTED TO THE AMOUNT OF DETAIL THAT IS REQUIRED TO BE ACQUIRED IN THE FIELD.
E.	BEGIN SHORT-CIRCUIT CURRENT ANALYSIS AT THE SERVICE, EXTENDING DOWN TO THE SYSTEM OVERCURRENT PROTECTIVE DEVICES AS FOLLOWS: 1. TO NORMAL SYSTEM VOLTAGE LOAD BUSES WHERE FAULT CURRENT IS 10 KA OR LESS.	E.	BEGIN SHORT-CIRCUIT CURRENT ANALYSIS AT THE SERVICE, EXTENDING DOWN TO THE SYSTEM OVERCURRENT PROTECTIVE DEVICES AS FOLLOWS: 1. TO NORMAL SYSTEM VOLTAGE LOAD BUSES WHERE FAULT CURRENT IS 10 KA OR LESS.
RECORD DOCUMENTS			
A.	DURING THE PROGRESS OF THE WORK, CONTRACTOR SHALL MAINTAIN A CURRENT (DAILY) AS-BUILT SET OF THE DRAWINGS AND SPECIFICATIONS, INDICATING THEREON ALL WORK INSTALLED AT VARIANCE WITH SUCH CONTRACT DOCUMENTS INCLUDING WITHOUT LIMITATION, WORK COVERED BY ADDENDA, FIELD WORK ORDERS, CHANGE ORDERS, AND ENGINEERS' CORRECTIONS.	B.	CONTRACTOR SHALL PROVIDE THE TENANT WITH THE FINAL AS-BUILT SET OF DRAWINGS AT THE COMPLETION OF THE WORK.
COORDINATION WITH LANDLORD AND UTILITY COMPANIES			
A.	PRIOR TO COMMENCEMENT OF WORK, CONTRACTOR SHALL COORDINATE THE WORK OF THIS CONTRACT WITH THE LANDLORD'S AUTHORIZED REPRESENTATIVE AND AUTHORIZED REPRESENTATIVES OF EACH SERVING UTILITY THAT WILL PROVIDE SERVICE TO THE SITE, INCLUDING BUT NOT NECESSARILY LIMITED TO, ELECTRIC, TELEPHONE AND CABLE/SATELLITE TV SERVICE PROVIDERS.	B.	CONTRACTOR SHALL MEET WITH AUTHORIZED REPRESENTATIVES OF THE LANDLORD AND EACH UTILITY TO DISCUSS LANDLORD UTILITY COMPANY SCOPE OF WORK, CONTRACTOR SCOPE OF WORK, POINT OF SERVICE PICK-UP DETAILS REGARDING SYSTEM INTERFACE, UTILITY COMPANY STANDARDS TO BE COMPLIED WITH, ETC.
COORDINATION WITH OTHER TRADES			
A.	ELECTRICAL WORK SHALL BE INSTALLED SO AS TO NOT CONFLICT WITH THE WORK OF OTHER TRADES.	B.	SET ALL SLEEVES AND CUT AND PATCH ALL MISCELLANEOUS HOLES NECESSARY FOR THE CONVENIENT AND PROPER INSTALLATION OF THE WORK.
C.	FINISHED SPACE - SPACES HAVING WALLS PAINTED OR FINISHED WITH WALL COVERING, LAY-ON OR DRYWALL CEILINGS, AND FINISHED FLOORING MATERIALS. EXAMPLES OF FINISHED SPACES INCLUDE, BUT ARE NOT NECESSARILY LIMITED TO, ALL SPACES IN A DWELLING UNIT, OFFICES, LOBBIES, CORRIDORS, TOILET ROOMS, ETC.	D.	UNFINISHED SPACES - SPACES WITH UNFINISHED WALLS AND FLOORS AND TYPICALLY ARE NOT EQUIPPED WITH A CEILING. EXAMPLES INCLUDE, BUT ARE NOT NECESSARILY LIMITED TO, MECHANICAL ROOMS, ETC.
E.	REMOVE - DETACH ITEMS FROM EXISTING CONSTRUCTION AND LEGALLY DISPOSE OF THEM OFF SITE UNLESS INDICATED OTHERWISE TO BE REMOVED AND SALVAGED OR REMOVED AND RE-INSTALLED.	F.	REMOVE AND RE-INSTALL - DETACH ITEMS FROM EXISTING CONSTRUCTION, PREPARE FOR RE-USE, RE-INSTALL, AND RECONNECT THEREON. WHERE INDICATED SUCH THAT THE RE-INSTALLED ITEM IS FULLY OPERATIONAL.
G.	EXISTING TO REMAIN - EXISTING ITEMS OF CONSTRUCTION THAT ARE NOT TO BE PERMANENTLY REMOVED AND THAT ARE NOT OTHERWISE INDICATED TO BE REMOVED, REMOVED AND SALVAGED OR REMOVED AND RE-INSTALLED.	SUBMITTALS	
A.	REVIEW OF THE SHOP DRAWINGS IS RENDERED AS A SERVICE ONLY AND SHALL NOT BE CONSIDERED AS A GUARANTEE OF MEASUREMENTS OR OF BUILDING CONDITIONS. NOR SHALL IT BE CONSTRUED AS RELIEVING THE CONTRACTORS OF BASIC RESPONSIBILITIES UNDER HIS CONTRACT.	TEMPORARY POWER	
THE CONTRACTOR SHALL PROVIDE ALL REQUIRED TEMPORARY		TEMPORARY	

CONSTRUCTION POWER AND LIGHTING TO ALLOW ALL CONTRACTORS AND SUB-CONTRACTORS TO PERFORM THE WORK OF THEIR CONTRACTS.

CONTRACTOR SHALL SUBMIT SHOP DRAWINGS, EQUIPMENT, RIGGING, AND MISCELLANEOUS ITEMS AS REQUIRED FOR A COMPLETE, OPERATIONAL, FUNCTIONAL, AND CODE COMPLIANT ELECTRICAL INSTALLATION AS SHOWN ON THE DRAWINGS AND AS SPECIFIED IN THESE SPECIFICATIONS.

CONTRACTOR SHALL SUBMIT SHOP DRAWINGS, EQUIPMENT, RIGGING, AND MISCELLANEOUS ITEMS AS REQUIRED FOR A COMPLETE, OPERATIONAL, FUNCTIONAL, AND CODE COMPLIANT ELECTRICAL INSTALLATION AS SHOWN ON THE DRAWINGS AND AS SPECIFIED IN THESE SPECIFICATIONS.

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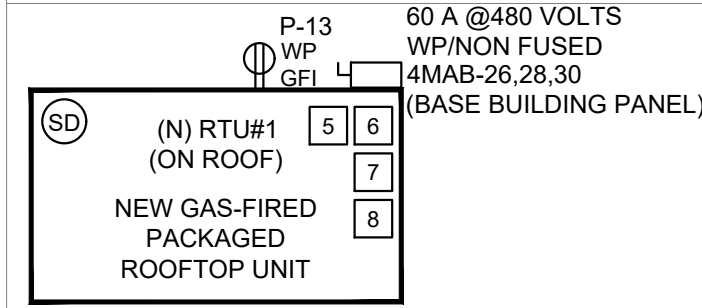
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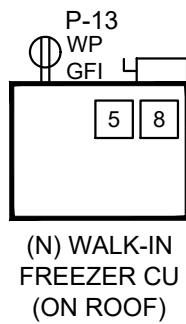
CON

LEGEND:
----- NEW
----- EXISTING

PACKAGED ROOF TOP UNIT & WALK-IN FREEZER CU ON THE TERRACE.
(EXACT LOCATION TO BE VERIFIED IN FIELD)



(N) 8-RELAY LIGHTING CONTROL PANEL WITH INTEGRAL ASTRONOMIC TIMECLOCK
(E) 400 AMP (MCB), 3 PH. 4W, 208Y/120V ELECTRICAL PANEL 'SB SEC-1'
(E) 400 AMP (MLO), 3 PH. 4W, 208Y/120V ELECTRICAL PANEL 'SB SEC-2'
(E) 150 AMP, 3 PH. 4W, 480Y/277V ELECTRICAL DISCONNECT SWITCH FOR TRANSFORMER
FOR HEAT TRACE PANEL
(E) TELE/DATA DEMARC



(E) 112.5 KVA CEILING SUSPENDED 480Y/277V TO 208Y/120V STEPDOWN TRANSFORMER

EXTERIOR (ACCESS STAIR LOBBY)

FOR WALK-IN FRIDGE LIGHTS

WALK-IN FRIDGE

100 A NON FUSED P-79, 81, 83

30 A NON FUSED P-16

(E) HOT WATER HEATER

FOR WIF EVAPORATOR

UP

RESTROOM

104

(R) EF-1 FOR HAND DRYER

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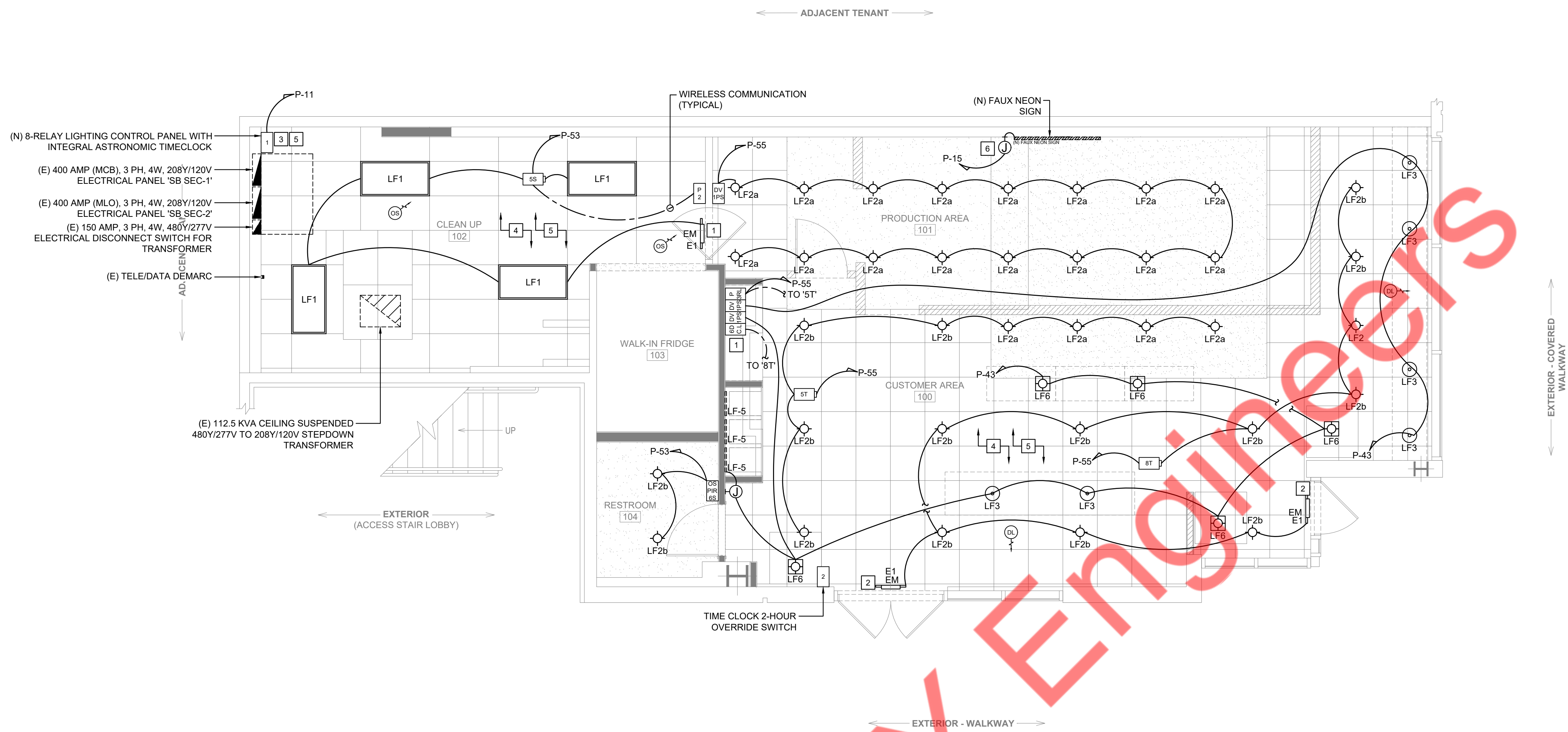
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LEGEND:
----- NEW
----- EXISTING



1 LIGHTING PLAN

LIGHT FIXTURE SCHEDULE

STYLE	TAG	MANUFACTURER	MODEL	DESCRIPTION	LAMP	WATTS	VOLTAGE	MOUNTING	REMARK
	LF1	HALCO	90520 (FPL-24-LS-CS-UNV)	2X4 FLAT PANEL, LUMEN SELECTABLE, CCT SELECTABLE, UNV 120-277V 0-10V DIMMABLE	LED	30-35 WATTS	120V	RECESSED	NEW LIGHTS TO MATCH EXISTING LIGHT FIXTURE
	LF2a	EIKO	CD6-PS208FCCT-UDIM-WH	6" ROUND FIXED RECESSED DOWNLIGHTING	LED	12 WATTS	120V	RECESSED	EXISTING CLOUD CEILING AT PRODUCTION AREA, CENTERED OR EQUALLY SPACED
	LF2b	LITHONIA	WF4LED 30K40K50K 90CRI MW	RECESSED LED LIGHT(SWITCHABLE WHITE COLOR TEMPERATURE)	LED	10.5 WATTS	120V	RECESSED	EXISTING DECK CEILING AT FRONT OF THE HOUSE, CENTERED OR EQUALLY SPACED
	LF3	KUZCO	ARCHIBALD 492316-BK/GD or CHROMA PD1712-BK	PENDANT LIGHT	LED	13 WATTS	120V	PENDANT	CUSTOMER AREA BAR COUNTER & CUSTOMER TABLE
	LF4	ALCON	ARCHIBALD 492316-BK/GD or CHROMA PD1712-BK	LINEAR RECESSED LED STRIP LIGHT	LED	3-12.2 WATTS/FT	120V	RECESSED	LOCATED AT BUILT-IN-SHELVING AS BACKLIGHTING INSTALLED PER SHELVING INSERTS
	LF5	ALCON LIGHTING	12100-10-PR	SHELVING LIGHT: RECESSED LED STRIP LIGHT	LED	3-12.2 WATTS/FT	120V	RECESSED	LOCATED AT BUILT-IN-SHELVING AS BACKLIGHTING INSTALLED PER SHELVING INSERTS
	LF6	LEVITON CONTECH	RDA4L230KC12D2M-WHT-P	ADJUSTABLE RECESSED MULTIPLES LIGHT	LED	14 WATTS	120V	RECESSED	CENTERED TO SPOT EACH FREE STANDING CRYSTAL
	E1	EXITRONIX	QCRS-U-WH	LED EXIT & EMERGENCY COMBO (MINIMUM 90-MINUTE EMERGENCY ILLUMINATION)	LED	>5 WATTS	120V	CEILING, END OR WALL MOUNTED	PLACED AT ALL EXIT DOORS. USE GREEN LETTERING
	E2	SIGNIFY	VLLU	LED EMERGENCY LIGHT (MINIMUM 90-MINUTE EMERGENCY ILLUMINATION)	LED	>5 WATTS	120V	CEILING, END OR WALL MOUNTED	3.6V, WHITE FINISH
	E3	MAG TECH	KD800R-RC-W-1	LED EXIT SIGN (MINIMUM 90-MINUTE EMERGENCY ILLUMINATION)	LED	>5 WATTS	120V	CEILING, END OR WALL MOUNTED	USE RED LETTERING

NOTE: ANY LIGHTING CONTROL SUBSTITUTIONS TO BE APPROVED BY SUNLIFE ORGANICS LTD.
(E) EXISTING, (R) RELOCATED, (NL) FIXTURE CONNECTED TO NIGHT LIGHT CIRCUIT, (EM) FIXTURE WITH EMERGENCY BATTERY BACK-UP.

LIGHTING CONTROL SCHEDULE

STYLE	TAG	MANUFACTURER	MODEL	DESCRIPTION	QUANTITY	REMARK
CONTROLS		LUTRON	CA-1PS-WH	120/277 V, 15 A DIVA SWITCH, SINGLE POLE	3	
		LUTRON	MS-OPS6M2-DV-WH	120/277 V, 6 A MAESTRO SWITCH WITH XCT, PIR OCCUPANCY AND VACANCY SENSOR, SINGLE-POLE/MULTI-LOCATION	1	
		LUTRON	PJ2-2B-GWH-L01	2 BUTTON WITH LIGHT ICON - PICO KEYPAD	1	
		LUTRON	PJ2-3BRL-GWH-L01	3 BUTTON WITH RAISE/LOWER AND LIGHT ICON - PICO KEYPAD	1	
		LUTRON	SS-1BI-GWH-E00	1-BUTTON LOW VOLTAGE 2-HOUR OVERRIDE SWITCH	1	
SENSORS		LUTRON	XPS8-FT	8-RELAY LIGHTING CONTROL PANEL WITH INTEGRAL ASTRONOMIC TIMECLOCK	1	
		LUTRON	LRF2-DCRB-WH	RADIO POWR SAVR WIRELESS CEILING MOUNT, DAYLIGHT SENSOR	2	
VIVE		LUTRON	LRF2-OCR2B-P-WH	RADIO POWR SAVR WIRELESS CEILING OCCUPANCY SENSOR	2	
		LUTRON	MRF2S-6CL-WH	MAESTRO WIRELESS DIMMER: SINGLE-POLE/MULTI-LOCATION, 120 V/150 W CFL/LED, 120 V/600 W INC.	1	
ACCESSORIES		LUTRON	RMJS-SR-DV-B	POWPAK 5 A RELAY MODULE WITH SOFTSWITCH	2	
		LUTRON	RMJS-ST-DV-B	POWPAK DIMMING MODULE WITH 0-10 V CONTROL		
		LUTRON	CW-1-WH	CLARO WALLPLATE		
		LUTRON	CW-4-WH	CLARO WALLPLATE 4-GANG		
		LUTRON	PICO-WBX-ADAPT	PICO WIRELESS CONTROL WALLBOX ADAPTER KIT		

NOTE: ANY LIGHTING CONTROL SUBSTITUTIONS TO BE APPROVED BY SUNLIFE ORGANICS LTD.

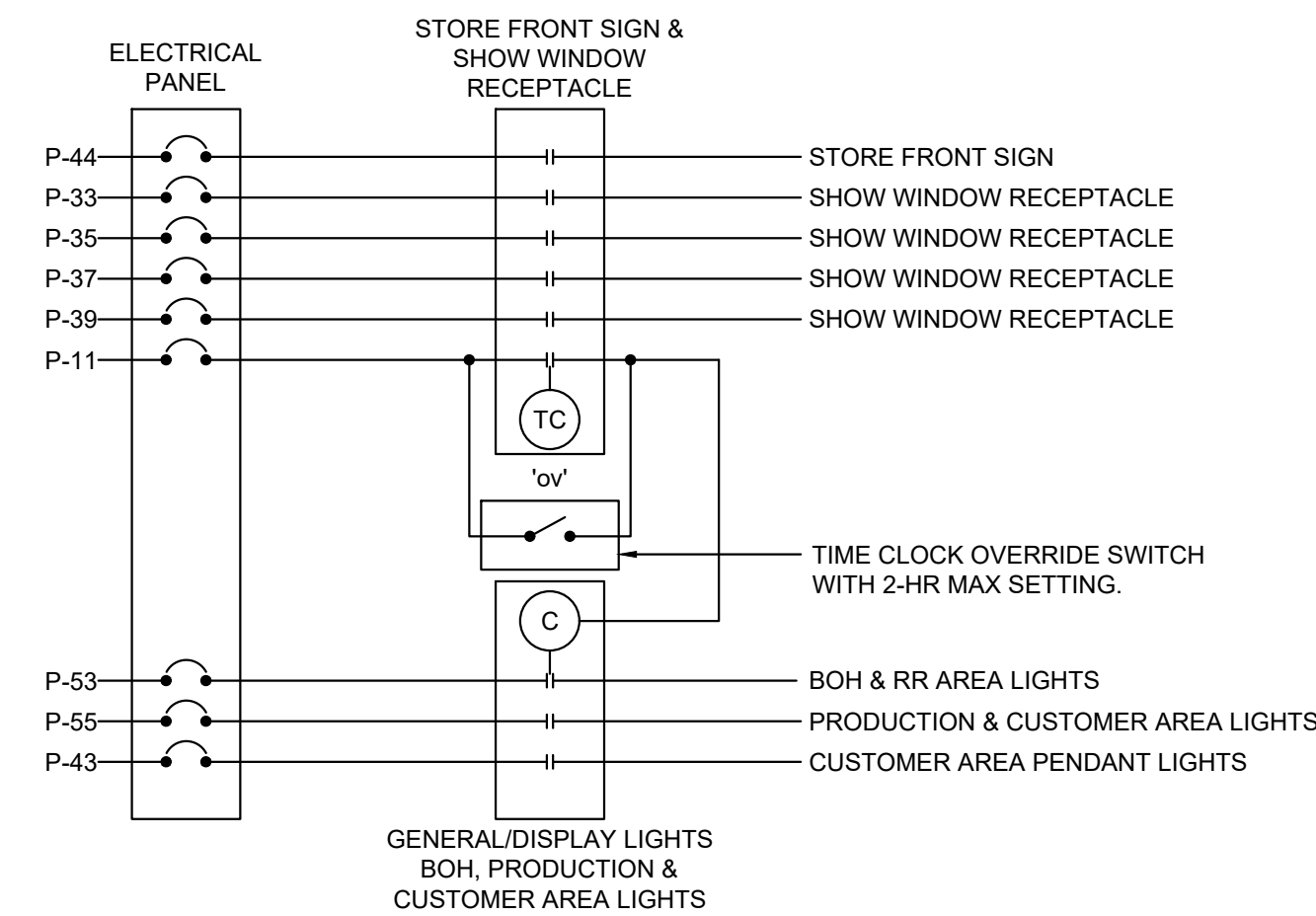
GENERAL NOTES

- ALL ELECTRICAL WORK SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE OR LOCAL CODE AND/OR OTHER AUTHORITIES HAVING JURISDICTION.
- THE CONTRACTOR SHALL VISIT THE PROJECT SITE, REVIEW EXISTING CONDITIONS AGAINST THE PLANS, AND FAMILIARIZE HIMSELF WITH THE WORK PRIOR TO BIDDING AND START OF WORK.
- SEE ARCHITECTURAL REFLECTED CEILING PLAN FOR EXACT LOCATION AND QUANTITY OF LIGHTING FIXTURES.
- EMERGENCY AND EXIT LIGHTS SHALL BE INSTALLED AND CIRCUITED PER LATEST NATIONAL ELECTRICAL CODE AND ALL LOCAL CODES. ALL EMERGENCY AND EXIT FIXTURES SHALL HAVE A MINIMUM 90-MINUTE BATTERY BACK-UP.
- ELECTRICAL CONTRACTOR SHALL MAKE ALL FINAL CONNECTIONS AS REQUIRED FOR A FULLY COMPLETE AND OPERABLE SYSTEM.
- ALL EQUIPMENT SHALL HAVE UL OR CSA LABELS.
- G.C. IS RESPONSIBLE FOR ALL FINAL CONNECTIONS, TERMINATIONS, AND COORDINATION IN ALL MILLWORK FIXTURES.
- ELECTRICAL CONTRACTOR'S BID SHALL INCLUDE INSTALLATION OF ALL LIGHT FIXTURES AND ASSOCIATED LAMPS. SOME FIXTURES REQUIRE ASSEMBLY, E.C. IS RESPONSIBLE TO ENSURE THE ADJUSTABILITY OF ALL DIRECTIONAL FIXTURES AFTER INSTALLATION AND SHALL AIM FIXTURES PER DIRECTION FROM OWNER. IF THE CEILING SYSTEMS ARE FIRE-RATED, E.C. SHALL CLOSELY COORDINATE RECESSED FIXTURE REQUIREMENT WITH OWNER AND SUPPLIER TO MAINTAIN THE FIRE RATING OF THE CEILING.
- G.C. SHALL PROVIDE TIME CLOCK PROGRAMMING TRAINING SESSION FOR THE STORE MANAGER AND AT LEAST ONE OTHER EMPLOYEE PRIOR TO PROJECT CLOSEOUT.
- ALL FIXTURES INSTALLED OUTDOORS SHALL BE RATED FOR DAMP/WET LOCATIONS AS REQUIRED. THE CONTRACTOR SHALL COORDINATE DAMP/WET LOCATION RATING PER NEC ARTICLE 410.10 (A) ALL INSTALLATIONS SHALL CONFORM TO NEC ARTICLE 410. ALL SUB ARTICLES. ALL FLUORESCENT FIXTURES THAT UTILIZE DOUBLE ENDED LAMPS AND CONTAIN BALLAST(S) THAT CAN BE SERVICED IN PLACE SHALL BE CODE COMPLIANT WITH N.E.C. 410.130(G).
- THE ELECTRICAL LIGHTING INSTALLATIONS SHALL CONFORM TO ALL STATE AND LOCAL SEISMIC AND CODE REQUIREMENTS REGARDING LIGHT FIXTURE SUPPORT. ALL ELECTRICAL METALLIC TUBING (EMT), RIGID NON-METALLIC CONDUITS, "SEAL TIGHT" TYPE CONDUITS AND ALL OTHER CONDUITS THAT DO NOT CONTAIN A CODE SIZED GROUND WIRE SHALL HAVE A CODE SIZED BOND WIRE INSTALLED WITH THE CIRCUIT CONDUCTORS.
- IF STORE IS AN OPEN DECK THEN ALL CAMERA AND SHOPPERTRAX LINES RUN THROUGH CONDUIT SO CAMERA/SHOPPERTRAX CAN BE SECURED AT THE PROPER HEIGHT.

KEY NOTES

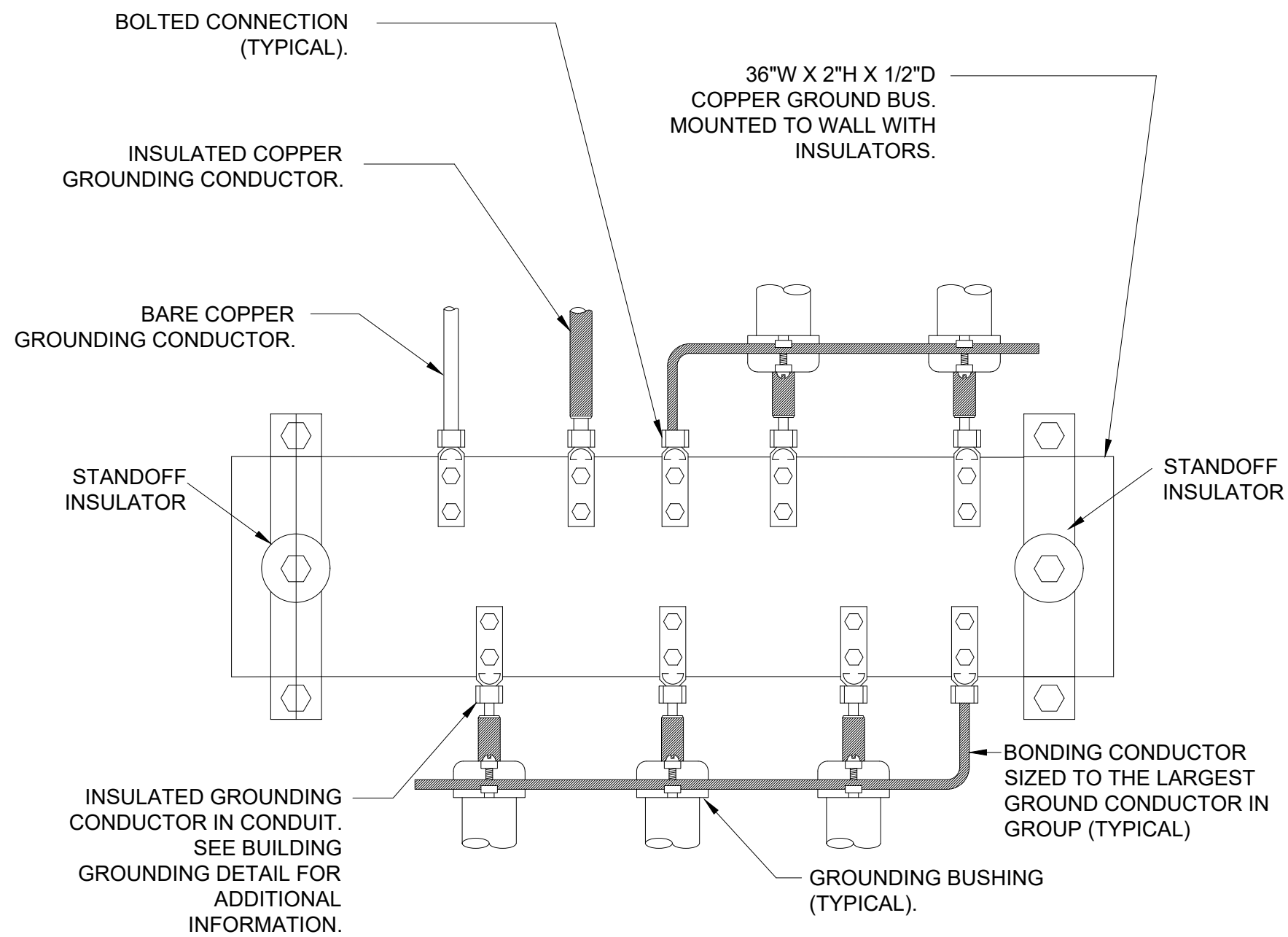
- NEW MASTER SWITCH BANK LOCATION. SEE DETAIL IN THIS SHEET FOR ADDITIONAL INFORMATION. VERIFY/CONFIRM LOCATION WITH OWNER PRIOR TO INSTALLATION AND ROUGH-IN.
- TIE NEW/EXISTING/RELOCATED NIGHT LIGHT, EXIT SIGN & EMERGENCY LIGHT WITH MINIMUM 90-MINUTES BATTERY BACK-UP TO AREA NEAREST LIGHTING BRANCH CIRCUIT AHEAD OF CONTROL/SWITCHING, OR TO BRANCH CIRCUIT AS SHOWN ON PLAN.
- TIME CLOCK FOR LIGHTING & STOREFRONT SIGN CONTROL. CONTRACTOR SHALL VERIFY THE EXACT LOCATION & OPERABLE CONDITION IN FIELD REUSE IF POSSIBLE. OTHERWISE PROVIDE NEW TIME CLOCK & LIGHTING CONTACTOR AS REQUIRED. REFER TO THE TIME CLOCK AND LIGHTING CONTACTOR DETAILS' ON TO SHEET E2.0. BASE BID ACCORDINGLY.
- CONTRACTOR SHALL COORDINATE FINAL LOCATION, QUANTITY OF LOW VOLTAGE DEVICES (i.e., SPEAKERS, SECURITY SYSTEM DEVICES & CAMERAS) WITH ARCHITECT/OWNER AND EXACT ELECTRICAL REQUIREMENTS WITH SYSTEM VENDOR PRIOR TO ROUGH PER THE SITE CONDITIONS.
- CONTRACTOR SHALL COORDINATE WITH LIGHTING SYSTEM VENDOR (i.e., LUTRON) FOR LIGHTING CONTROL PANEL AND CONTROL DEVICE'S EXACT ELECTRICAL REQUIREMENTS PRIOR TO ROUGH. BASE BID ACCORDINGLY. BASE BID ACCORDINGLY.
- G.C. TO COORDINATE EXACT LOCATION & POWER REQUIREMENT FOR THE FAUX NEON SIGN WITH BRAND STANDARD VENDOR PRIOR TO ROUGH-IN. PROVIDE CONCEALED ACCESSIBLE POWER FOR FAUX NEON SIGN. SIGN SUPPLIED BY BRAND STANDARD VENDOR, INSTALLED BY G.C.; CENTER VERTICALLY.

TIME CLOCK AND LIGHTING CONTACTOR DETAILS



TIME CLOCK SCHEDULE:

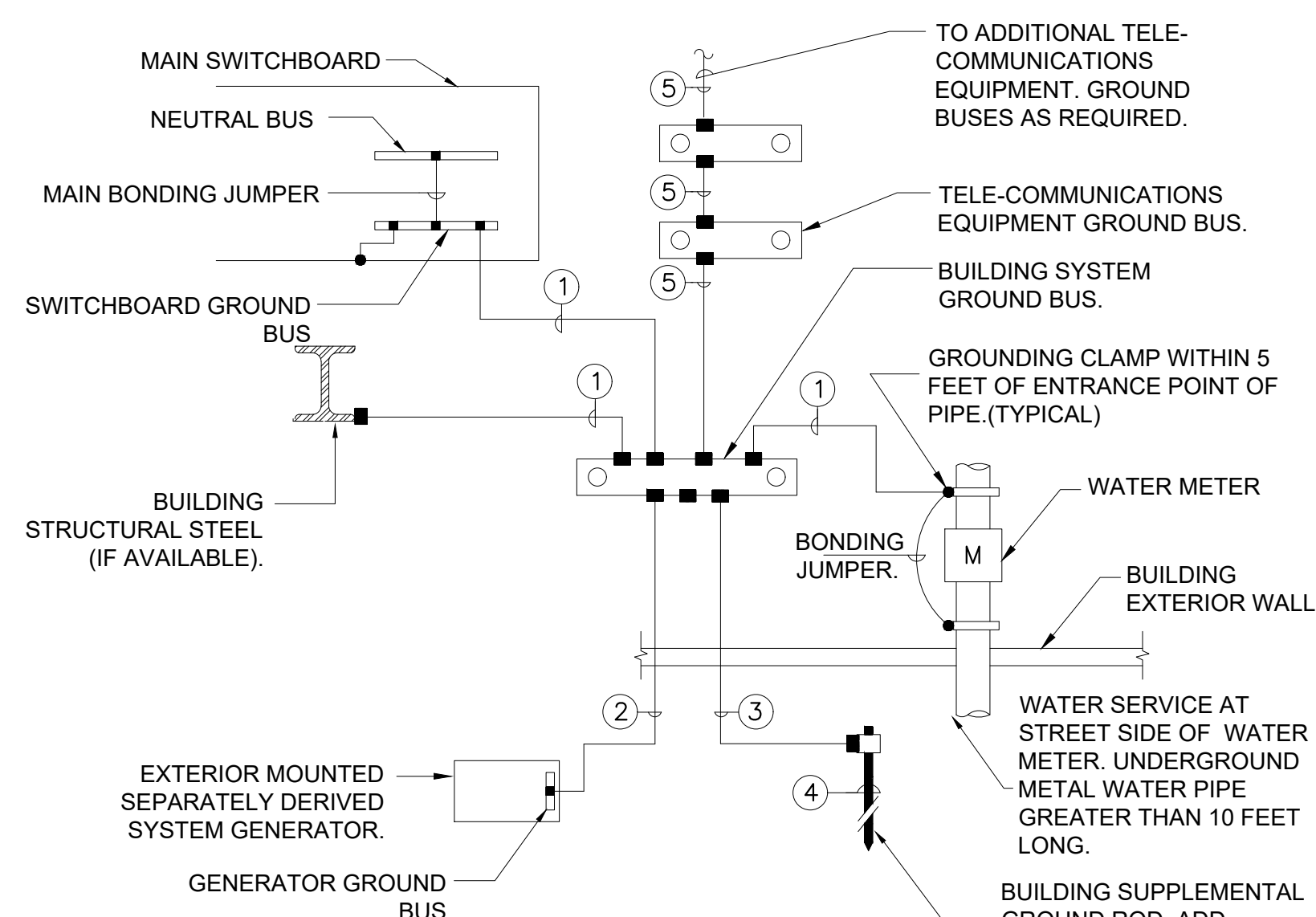
- CONTRACTOR TO SET TIME CLOCK SETTINGS AND VERIFY WITH OWNER:
- LIGHTING SHALL BE "ON" DAILY FROM 8:00AM TO 11:00PM.
 - DURING SET "OFF" TIME LIGHTING TO BE CONTROLLED BY A 2-HR MANUAL OVERRIDE SWITCH.
 - COORDINATE WITH LIGHTING SYSTEM VENDOR (i.e., LUTRON) FOR LIGHTING CONTROL PANEL AND CONTROL DEVICES EXACT ELECTRICAL REQUIREMENTS PRIOR TO ROUGH. BASE BID ACCORDINGLY.



NOTES:
1. REFER TO BUILDING
GROUNDING ELECTRODE
SYSTEM DETAIL FOR
EXACT CONFIGURATION.

1 BUILDING ELECTRICAL SYSTEMS GROUND BUS

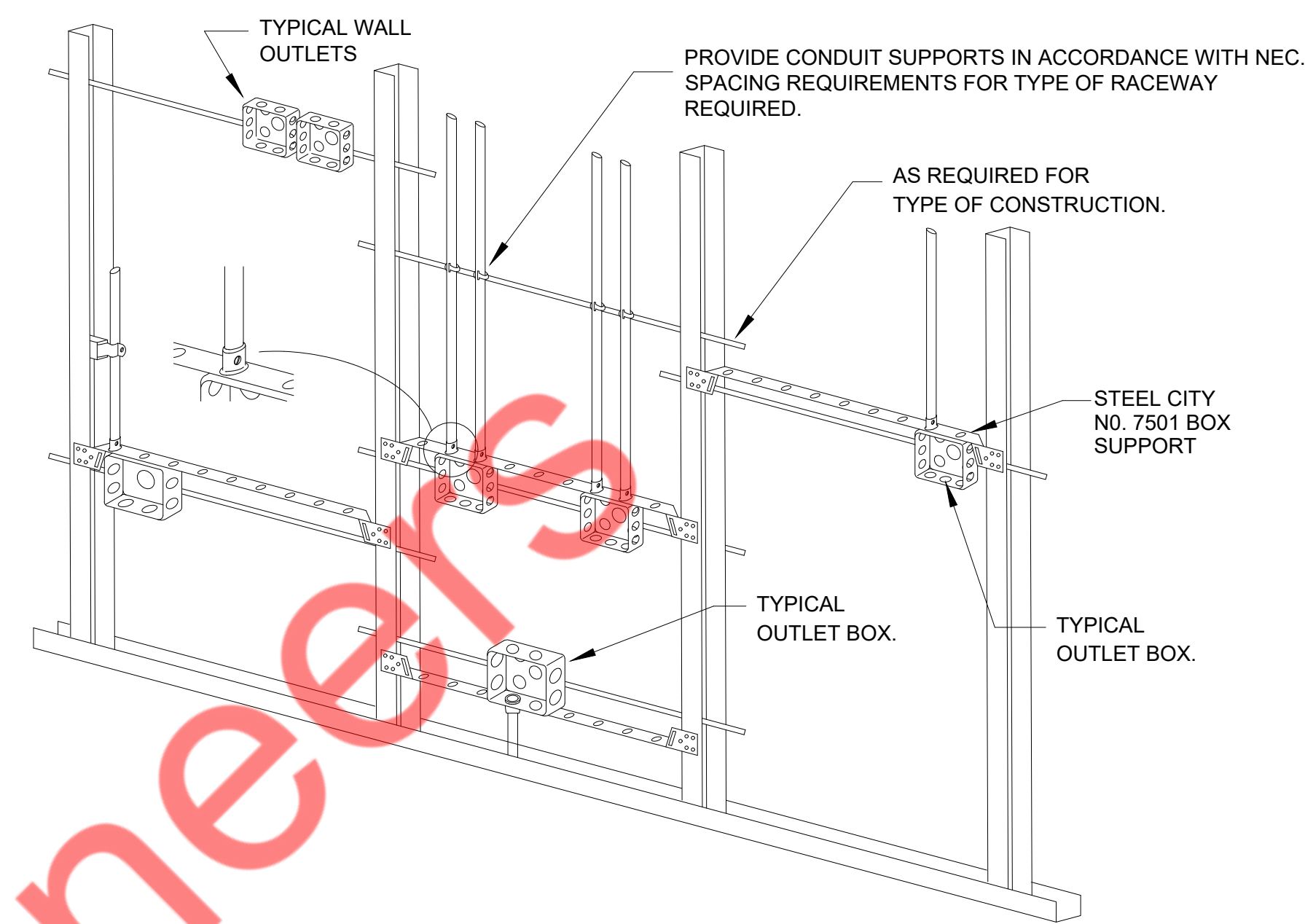
SCALE: NOT TO SCALE



- LEGEND:
- INDICATES BOLTED CONNECTION.
 - INDICATES EXOTHERMIC WELD CONNECTION, COMPATIBLE WITH MATERIALS BEING JOINED.
- ① INSULATED COPPER GROUNDING ELECTRODE CONDUCTOR IN CONDUIT SIZED AS PER NEC ARTICLE 250.66.
- ② INSULATED COPPER GROUNDING ELECTRODE CONDUCTOR ENCASED IN CONCRETE SIZED AS PER NEC ARTICLE 250.66.
- ③ #2 IN 3/4" AWG BARE COPPER GROUND CONDUCTOR.
- ④ 3/4" x 10'-0" LONG COPPER-CLAD GROUND ROD DRIVEN WITH TOP 12" BELOW GRADE.
- ⑤ #4/0 IN 1" INSULATED COPPER GROUND CONDUCTOR IN 30mm CONDUIT.

2 BUILDING GROUNDING ELECTRODE SYSTEM

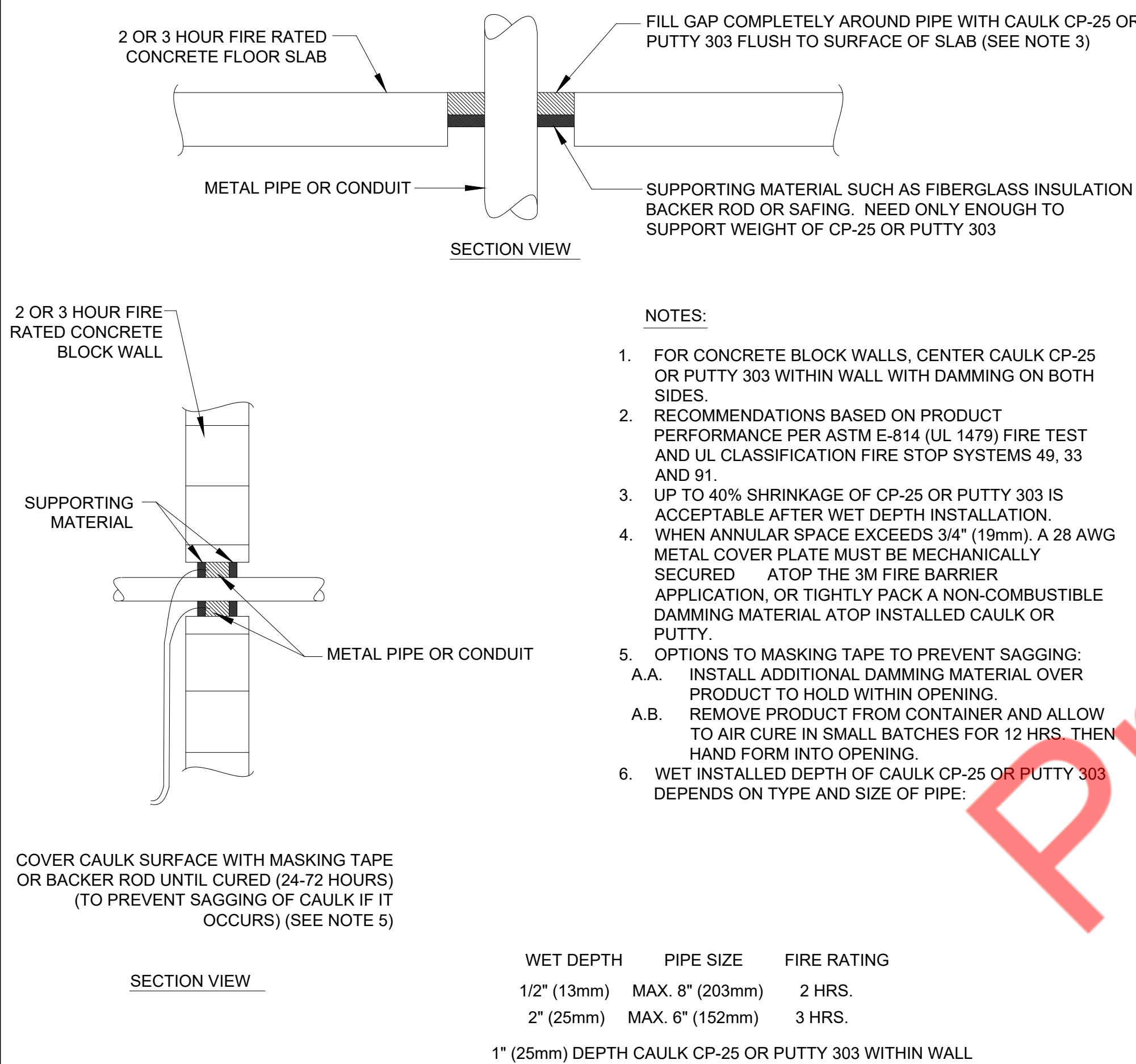
SCALE: NOT TO SCALE



- NOTES:
- ① TYPICAL FOR WOOD AND METAL STUD ROUGH-IN
- ② PLASTER RINGS NOT SHOWN
- ③ LOCATE ALL OUTLET BOXES IN ACCORDANCE WITH ARCHITECTURAL DRAWINGS, AND WITH ALL APPLICABLE SHOP DRAWINGS.
- ④ OUTLETS ON OPPOSITE SIDES OF WALLS OR PARTITIONS IN THE SAME STUD SPACE MUST BE SEPARATED BY A MIN. OF 24" HORIZONTAL DISTANCE.

3 TYPICAL ROUGH-IN REQUIREMENTS

SCALE: NOT TO SCALE

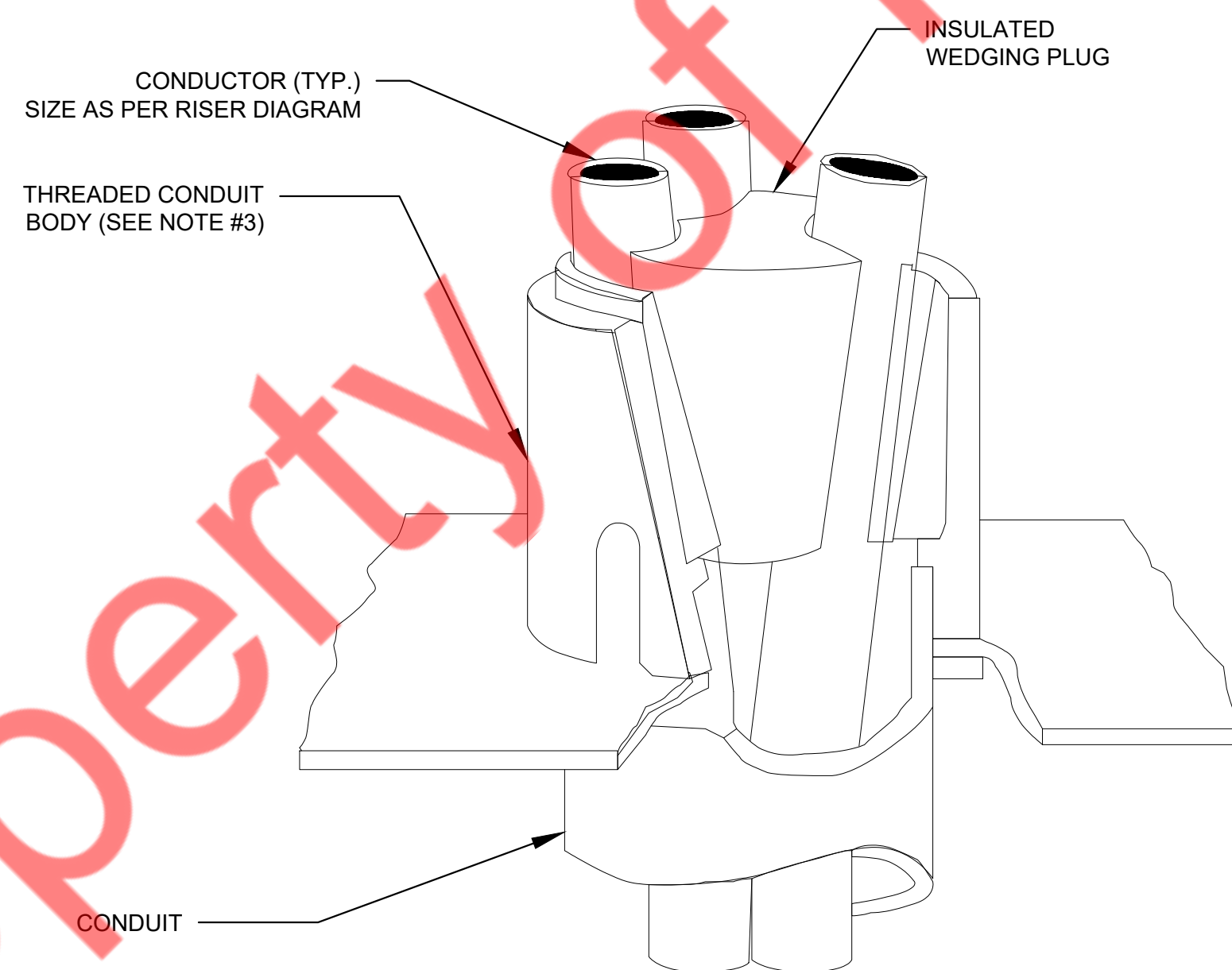


- NOTES:
1. FOR CONCRETE BLOCK WALLS, CENTER CAULK CP-25 OR PUTTY 303 WITHIN WALL WITH DAMMING ON BOTH SIDES.
2. RECOMMENDATIONS BASED ON PRODUCT PERFORMANCE PER ASTM E-814 (UL 1479) FIRE TEST AND UL CLASSIFICATION FIRE STOP SYSTEMS 49, 33 AND 91.
3. UP TO 40% SHRINKAGE OF CP-25 OR PUTTY 303 IS ACCEPTABLE AFTER WET DEPTH INSTALLATION.
4. WHEN ANNULAR SPACE EXCEEDS 3/4" (19mm), A 28 AWG METAL COVER PLATE MUST BE MECHANICALLY SECURED ATOP THE 3M FIRE BARRIER APPLICATION, OR TIGHTLY PACK A NON-COMBUSTIBLE DAMMING MATERIAL ATOP INSTALLED CAULK OR PUTTY.
5. OPTIONS TO MASKING TAPE TO PREVENT SAGGING:
- A.A. INSTALL ADDITIONAL DAMMING MATERIAL OVER PRODUCT TO HOLD WITHIN OPENING.
- A.B. REMOVE PRODUCT FROM CONTAINER AND ALLOW TO AIR CURE IN SMALL BATCHES FOR 12 HRS. THEN HAND FORM INTO OPENING.
6. WET INSTALLED DEPTH OF CAULK CP-25 OR PUTTY 303 DEPENDS ON TYPE AND SIZE OF PIPE:

WET DEPTH	PIPE SIZE	FIRE RATING
1/2" (13mm)	MAX. 8" (203mm)	2 HRS.
2" (25mm)	MAX. 6" (152mm)	3 HRS.
1" (25mm) DEPTH CAULK CP-25 OR PUTTY 303 WITHIN WALL		

4 FIRE STOP DETAIL

SCALE: NOT TO SCALE

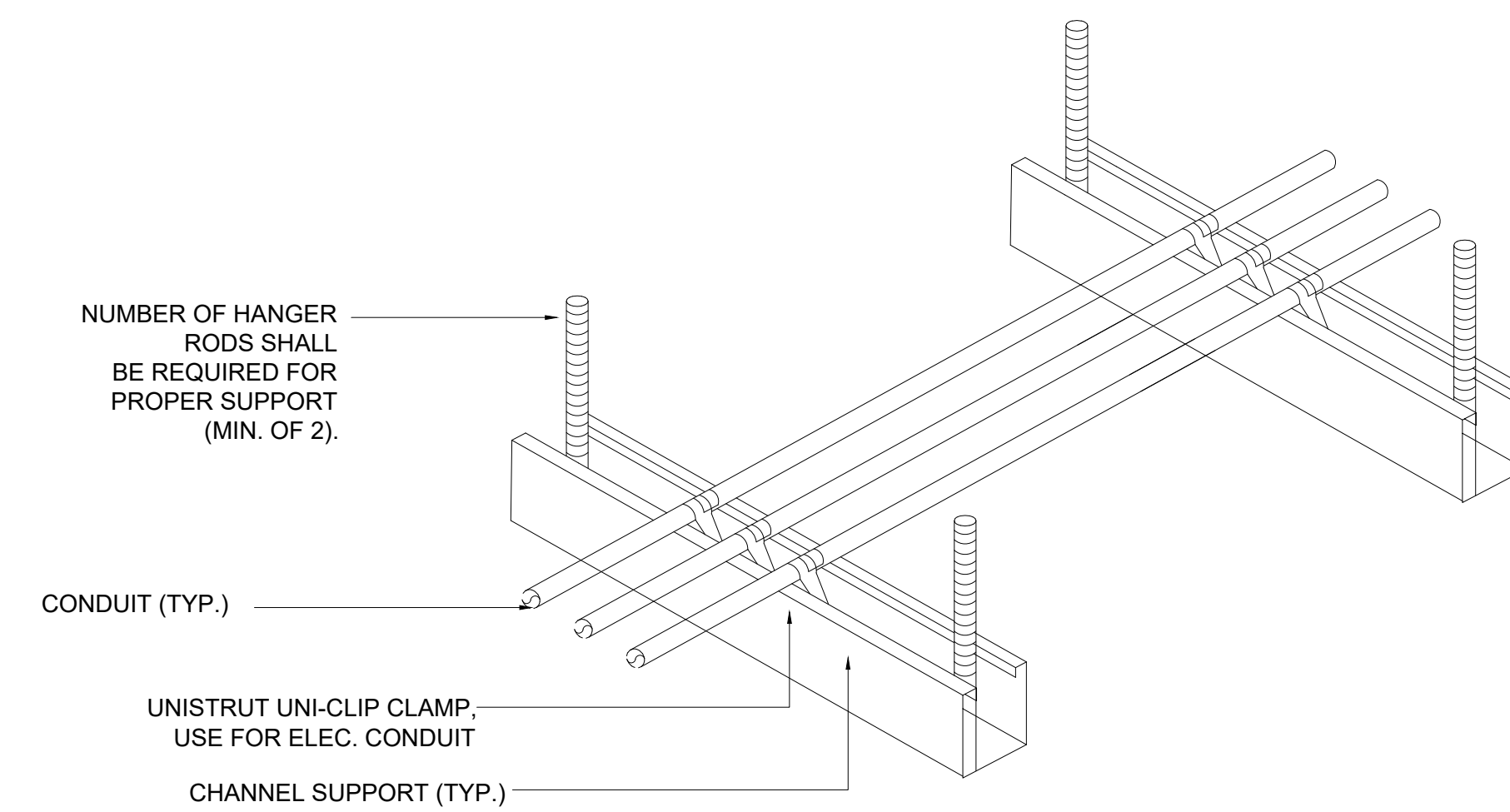


- NOTES:
1. ALL CONDUCTORS IN VERTICAL RACEWAYS SHALL BE SUPPORTED IN ACCORDANCE WITH ARTICLE 300.19 OF NEC. CABLE SUPPORTS SHALL BE LOCATED AT THE INTERVALS REQUIRED BY THE NEC.
2. CABLE SUPPORT SYSTEM SHALL BE AS MANUFACTURED BY O-Z GEDNEY WITH pOZI-GRIP "S-STYLE" WEDGING PLUG OR APPROVED EQUAL.
3. FOR THREADLESS CONDUIT (RIGID, IMC OR EMT), ATTACH CONDUIT BODY TO MALE THREADS OF A SET SCREW OR COMPRESSION CONNECT, AS PERMITTED BY SPECIFICATIONS.
4. PROVIDE PULL BOX AT EACH LOCATION OF CABLE SUPPORTS. PULL BOX SHALL BE SIZED AS PER CODE TO ACCOMMODATE ALL CONDUITS.

5 VERTICAL CABLE SUPPORT DETAIL

SCALE: NOT TO SCALE

NOTE:
THIS INFORMATION MAY NOT CONTAIN ALL DETAILS REQUIRED FOR CONSTRUCTION. APPROPRIATE MODIFICATION MAY BE REQUIRED TO ENSURE SUITABILITY OF THESE DRAWINGS FOR THE SPECIFIC APPLICATION. IT IS THE USER'S RESPONSIBILITY TO ENSURE INSTALLATION OF THE EQUIPMENT/SYSTEM IS IN ACCORDANCE WITH BUILDING/PROJECT SPECIFICATIONS, APPLICABLE CODES AND STANDARDS.



- NOTES:
1. ALL CONDUIT MAY BE COMBINED ON SAME SUPPORT CHANNEL WHERE PRACTICAL.
2. SUPPORT CHANNEL LENGTH SHALL NOT BE DETERMINED UNTIL ALL PIPING, CONDUIT, ETC. TO BE SUPPORTED IS COORDINATED.
3. SUPPORT CHANNEL SPACING SHALL BE NO MORE THAN 10'-0".
4. UNISTRUT AND CONDUIT INSTALLATION MAY BE REVERSED.

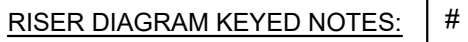
6 CONDUIT SUPPORT DETAIL

SCALE: NOT TO SCALE

RISER DIAGRAM NOTES:

- VERIFY THE FOLLOWING PRIOR TO BID/ PRICING:

- IF THE EXISTING SERVICE DISCONNECT AND FEEDERS ARE RATED FOR LESS THAN THE RATING SHOWN ON THIS RISER, NOTIFY THE PROJECT MANAGER AND ENGINEER IMMEDIATELY PRIOR TO SUBMITTING BID/ PRICING PACKAGE SO DRAWINGS CAN BE REVISED AND UPDATED ACCORDINGLY



1. ELECTRICAL CONTRACTOR SHALL COORDINATE EXACT LOCATION OF EXISTING DEMAND EMON METER OF PROJECT SPACE WITH BASE BUILDING /LANDLORD. OTHERWISE PROVIDE NEW DEMAND EMON METER AS REQUIRED. BASE BID ACCORDINGLY.

ELECTRICAL EQUIPMENT SCHEDULE															
ITEM NO.	QTY.	EQUIPMENT DISCRPTION	ELECTRICAL							CIRCUIT BREAKER & FUSES	WIRE	AFF (N)	MANUFACTURER	MODEL NUMBER	NOTES
			VOLTS	PHASE	AMPS	KW	HP	DIRECT	PLUG						
E01	1	CHEST FREEZER	115	1	8	0.92			-	20A/1P	2-12 + 1#12G, 3/4"C.	NELSO MFG.	BD8	1,2,3	
E02	1	COLD PAN	115	1	0.58	1/4	X	NEMA 5-15P	20A/1P	2-12 + 1#12G, 3/4"C.	RANDELL	9946SCN	1,2,3		
E03	2	DIPPER WELL	120	1	1	0.10		X	NEMA 5-15P	20A/1P	2-12 + 1#12G, 3/4"C.	SERVER	87770	1,2,3	
E04	6	BLENDER-THE QUIET ONE	120	1	15	1.50		-	20A/1P	2-12 + 1#12G, 3/4"C.	VITAMIX	36019	1,2,3		
E08	1	JUICE COOLER	120	1	15	1.00	X	NEMA 5-20P OR NEMA L5-20P	20A/1P	2-12 + 1#12G, 3/4"C.	REVEAL	NES320RSVV	1,2,3		
E09	1	JUICER	120	1	9	1.08	1/3		20A/1P	2-12 + 1#12G, 3/4"C.	ROBOT-COUPPE	J 100	1,2,4		
E10	1	SOUP WARMER	120	1	12.5	1.50	X	NEMA 5-15P	20A/1P	2-12 + 1#12G, 3/4"C.	AVANTCO	177WK15002X	1,2,4		
E11	1	ICE MACHINE	115	1	11	1.27		-	20A/1P	2-12 + 1#12G, 3/4"C.	ICE-O-MATIC	CM0430	1,2,3		
E16	1	REFRIGERATED SELF-SERVICE CASE	120	1	16	1.20	X	NEMA 5-20P OR NEMA L5-20P	20A/1P	2-12 + 1#12G, 3/4"C.	STRUCTURAL CONCEPTS		1,2,3		
E17	1	REFRIGERATED SELF-SERVICE UC CASE	120	1	10.8	0.98	X	NEMA 5-20P OR NEMA L5-20P	20A/1P	2-12 + 1#12G, 3/4"C.	STRUCTURAL CONCEPTS	C33R-UC	1,2,3		
E18A	1	2 DOOR FREEZER	115	1	6.3	0.75	2/3	X	NEMA 5-15P	20A/1P	2-12 + 1#12G, 3/4"C.	TURBO AIR	M3F47-2-N	1,2	
E18B	2	3 DOOR FREEZER	115	1	7.9	0.91	3/4	X	NEMA 5-15P	20A/1P	2-12 + 1#12G, 3/4"C.	TURBO AIR	M3F72-3-N	1,2	
E25	2	POS REGISTER	115	1	5	0.58		-	20A/1P	2-12 + 1#12G, 3/4"C.			1,2,3		
E29	1	UC FRIDGE	115	1	2	0.24	1/6	X	NEMA 5-15P	20A/1P	2-12 + 1#12G, 3/4"C.	BEVERAGE-AIR	UCR34HC	1,2,3	
E36	1	UC FREEZER	115	1	3.6	0.41	2/5	X	-	20A/1P	2-12 + 1#12G, 3/4"C.	EXCELLENCE INDUSTRIES	CTF-3HC	1,2,3	
E39	1	DROP IN COLD PAN	115	1	3.5	0.36	1/4	X	NEMA 5-15P	20A/1P	2-12 + 1#12G, 3/4"C.	RANDELL	RPC-2N	1,2,3	
E40	3	KITCHEN DISPLAY SCREENS	120	1	1		X	NEMA 5-15P	20A/1P	2-12 + 1#12G, 3/4"C.			1,2		
E41	1	ESPRESSO	208	1	13	2.80		X	NEMA 6-20P	20A/2P	2-12 + 1#12G, 3/4"C.	SIMONELLI	PRONTOTAR TOUCH	1,2,4	
E53	2	65 TY SUSPENDED	120	1				-	20A/1P	2-12 + 1#12G, 3/4"C.			1,2		
W1F	1	WALK-IN FRIDGE CONDENSER UNIT	208/230	1	15	3.10	X	-	20A/2P	2-12 + 1#12G, 3/4"C.			2		
W1F	1	WALK-IN FRIDGE EVAPORATOR	120	1	0.9	0.10	X	-	20A/1P	2-12 + 1#12G, 3/4"C.			2		

NOTES:

1 THE CONTRACTOR SHALL COORDINATE THE EXACT RECEPTACLE TYPE FOR EQUIPMENT WITH THE VENDOR/MANUFACTURER AND THE EXACT MOUNTING HEIGHT WITH THE ARCHITECT.

2 ALL EQUIPMENT SHALL BE PROVIDED WITH THE REQUIRED ROUGH-IN, MOPP, AND WIRE SIZE REQUIREMENTS. THE ELECTRICAL CONTRACTOR MUST COORDINATE WITH THE MANUFACTURER FOR THE EXACT TYPE OF ROUGH-INS AND WIRE SIZE FOR THE WORK COMMENCEMENT.

3 RECEPTACLES SHALL BE MOUNTED TO BELOW COUNTER HEIGHT.

4 RECEPTACLES SHALL BE MOUNTED TO ABOVE BACK SPLASH.

PANEL SCHEDULE GENERAL NOTES:

- THE MAXIMUM COMBINED VOLTAGE DROP ON BOTH INSTALLED FEEDER CONDUCTORS AND BRANCH CIRCUIT CONDUCTORS TO THE FARTHEST CONNECTED LOAD OR OUTLET SHALL NOT EXCEED 5 PERCENT.

ELECTRICAL PANEL SCHEDULE																		
PANELBOARD			SB SEC-1 (P)		VOLTAGE		120 / 208 V		PHASE		3		WIRE		4			
PANEL TYPE			MCB		MANS		400A / 208 V		BUS RATING		400A		AIC RATING		FIELD VERIFY			
NEBA TYPE ENCLOSURE			1		MOUNTING		SURFACE		OPTIONS				NOTE		EXISTING PANEL			
CKT.	EQT	CKT	DESCRIPTION		POLE	WIRE	BKR.	TOTAL	PHASE	TOTAL	BKR.	WIRE	POLE	DESCRIPTION		CKT	EQT	CKT.
NO.	TAG	TAG				SIZE	SIZE	WATTS		WATTS	SIZE	SIZE				TAG	TAG	NO.
1	(N)		E2S POS REGISTER		1	12	20	360	A	360	20	12	1	REC_GFI BACK ROOM ELECT		(N)		2
3	(N)		E2S POS REGISTER		1	12	20	360	B	1,500	20	12	1	INSTA HOT WATER				4
5			SPARE		2		50		C	500	20	12	1	EIS UC FREEZER		(N)		6
7									A	540	20	12	1	GENI GFI BOX		(N)		8
9	(N)		HAND DRYER		1	12	20	1,500	B	1,500	20	12	1	HEAT TRACE PANEL		(N)		10
11	(N)		LCPTIME CLOCK		1	12	20	500	C	1,550	20	12	2	WALK-IN FRIDGE CU		(N)		12
13	(N)		REC_WP/GFL RTU		1	12	20	180	A	1,550								14
15	(N)		FAUX NEON SIGN		1	12	20	1,200	B	55	20	12	1	WALK-IN FRIDGE EVAPORATOR		(N)		16
17									C	100	20	12	1	WALK-IN FRIDGE LIGHTS		(N)		18
19			SPARE		2		50		A		50		2	SPARE				20
21			SPARE		1	20			B									22
23			SPARE		1	20			C		50		2	SPARE				24
25			SPARE		1	20			A									26
27			SPARE		2		30		B		50		2	SPARE				28
29									C									30
31			SPARE		1	20			A		50		2	SPARE				32
33	(N)		REC_SHOW WINDOW		1	12	20	500	B									34
35	(N)		REC_SHOW WINDOW		1	12	20	500	C	500	20	12	1	(R) EF-1		(N)		36
37	(N)		REC_SHOW WINDOW		1	12	20	500	A	500	20	12	1	(R) EF-2		(N)		38
39	(N)		REC_SHOW WINDOW		1	12	20	500	B	180	20	12	1	REC_GFI RR		(N)		40
41	(N)		REC_GEN SEATING AREA		1	12	20	1,080	C					SPACE				42
ALL PHASES TO BE BALANCED TO WITHIN 7%																		
(E) EXISTING TO REMAIN																		
(N) NEW CIRCUIT																		
GFCI GROUND FAULT CURRENT INTERRUPTER																		
IG CIRCUITS WITH ISOLATED GROUND																		
TC CIRCUITS ON TIMECLOCK																		
EMS ROUTING TO THE EMS PANEL																		
C BREAKER LOCK																		
a,b,c SWITCHES CONTROLLING LIGHTS																		
TOTAL CONNECTED LOAD			16,015		WATTS		45		AHP'S									
TOTAL DEMAND LOAD			16,790		WATTS		47		AHP'S									

ELECTRICAL LOAD SUMMARY					
DESCRIPTION	NEC CONNECTED KW	VOLT	PHASE	NEC DEMAND FACTOR	NEC DEMAND KW
LIGHTING- 120V	2.8	120	1	1.25	3.5
INTERIOR SIGN	1.2	120	1	1.25	1.5
RECEPTACLES	9.2	120	1	>10KW=10+[0.5*(KW-10)]	9.2
STOREFRONT SIGN	1.2	120	1	1.25	1.5
S/W OUTLETS	2.0	120	1	1.25	2.5
EXH. FANS	1.0	208	1	1.00	1.0
REFRIGERATION EQUIPMENT	3.2	208	1	1.00	3.2
KITCHEN EQUIPMENT	25.4	208	1	0.65	16.5
HOT WATER HEATER	24.1	208	3	1.00	24.1
TOTALS	70.2				63.1

PANELBOARD		SB SEC-2 (P)		VOLTAGE		120 / 208 V		PHASE		3		WIRE		4			
PANEL TYPE		FEED THROUGH		MAINS		400A MCB		BUS RATING		400A		AIC RATING		FIELD VERIFY			
NEMA TYPE ENCLOSURE				1		MOUNTING		SURFACE		OPTIONS		NOTE		EXISTING PANEL			
CKT.	EQT	CKT	NO.	DESCRIPTION	NO.	WIRE	SIZE	WATTS	PHASE	TOTAL	BKR.	WIRE	SIZE	DESCRIPTION	CKT	EQT	CKT.
TAG	TAG	(N)	(N)		TAG	(N)	SIZE			WATTS	WIRE	(N)	SIZE		TAG	TAG	NO.
43	(N)	LIGHTING	PREP, DINNING		1	12	20	500	A	1,200	20	12	1	STOREFRONT SIGN	(N)		44
45	(N)	SPARE			1	12	20		B	800	20	12	1	E09 JUICER	(N)		46
47	(N)	SPARE			1	12	20		C	1,200	20	12	1	RCP-1	(N)		48
49	(E)	REC_DED. CAMERA SYSTEM		1	12	20	1,500	A	1,400	20	12	2		E41 ESPRESSO	(N)		50
51	(E)	REC_DED. SECURITY ALARM		1	12	20	1,500	B	1,400	20	12	2		E41 ESPRESSO	(N)		52
53	(N)	LIGHTING	RR/BOP		1	12	20	500	C	180	20	12	1	REC_GFI MOP SINK	(E)		54
55	(N)	LIGHTING	PREP, DINNING		1	12	20	1,200	A	30	2			SPARE			56
57	(N)	E01 CHEST FREEZER		1	12	20	920	B									58
59	(N)	E02 COLD PAN		1	12	20	575	C	1,500	20	12	1		E10 SOUP WARMER	(N)		60
61	(N)	E03 DIPPER WELL		1	12	20	100	A	1,275	20	12	1		E11 ICE MACHINE	(N)		62
63	(N)	E03 DIPPER WELL		1	12	20	100	B	980	20	12	1		E16_REF SELF-SERVICE CASE	(N)		64
65	(N)	E04 BLENDER- THE QUIET ONE		1	12	20	1,500	C	1,200	20	12	1		E17_REF SELF-SERVICE UC CASE	(N)		66
67	(N)	E04 BLENDER- THE QUIET ONE		1	12	20	1,500	A	950	20	12	1		E18A_2 DOOR FREEZER	(N)		68
69	(N)	E04 BLENDER- THE QUIET ONE		1	12	20	1,500	B	710	20	12	1		E18B_3 DOOR FREEZER	(N)		70
71	(N)	E04 BLENDER- THE QUIET ONE		1	12	20	1,500	C	20	1				SPARE			72
73	(N)	E04 BLENDER- THE QUIET ONE		1	12	20	1,500	A	910	20	12	1		W18B_3 DOOR FREEZER	(N)		74
75	(N)	E04 BLENDER- THE QUIET ONE		1	12	20	1,500	B	240	20	12	1		E29 UC FRIDGE	(N)		76
77	(N)	E08 JUICE COOLER		1	12	20	800	C	360	20	12	1		E39_DROP IN COLD PAN	(N)		78
79	(N)						7,500		720	20	12			E40 KITCHEN DISPLAY SCREENS	(N)		80
81	(E)	WATER HEATER		3	4	80	7,500	B	1,000	20	12	1		E53_65 TV SUSPENDED	(N)		82
83							7,500	C	15	1				SPARE			84

ALL PHASES TO BE BALANCED TO WITHIN 7%

A= 20,955 WATTS

B= 18,350 WATTS

C= 15,740 WATTS

(E) EXISTING TO REMAIN

(N) NEW CIRCUIT

GFCI GROUND FAULT CURRENT INTERRUPTER

IG CIRCUITS WITH ISOLATED GROUND

TC CIRCUITS ON TIMELOCK

EMS ROUTING TO THE EMS PANEL

TOTAL CONNECTED LOAD	54,145	WATTS	151	AMPS
TOTAL DEMAND LOAD	46,266	WATTS	129	AMPS

C BREAKER LOCK

a,b,c SWITCHES CONTROLLING LIGHTS

PLUMBING SPECIFICATIONS

1. GENERAL
THE "ARCHITECTURAL GENERAL CONDITIONS" GOVERN WORK UNDER THIS SECTION.

BEFORE SUBMITTING A PROPOSAL, THIS CONTRACTOR SHALL VISIT THE SITE OF THE WORK AND SHALL CAREFULLY EXAMINE THE DRAWINGS AND SPECIFICATIONS. IT IS EXPRESSLY UNDERSTOOD THAT THIS PROPOSAL IS BASED ON THE ABOVE REQUIREMENTS AND THAT IT COVERS EVERYTHING NECESSARY TO DO AND COMPLETE THE WORK.

2. INSPECTION AND COOPERATION
NO DEVIATION FROM THE DRAWINGS AND/OR SPECIFICATIONS WILL BE ALLOWED WITHOUT PRIOR WRITTEN APPROVAL OF ARCHITECT OR ENGINEER. THIS CONTRACTOR SHALL COOPERATE WITH THE OTHER CONTRACTORS TO ALLOW FOR THE INSTALLATION OF THEIR WORK AS WELL AS HIS OWN.

THIS CONTRACTOR SHALL BE RESPONSIBLE FOR HIS WORK FITTING IN PLACE WITHOUT CONFLICT WITH THE OTHER TRADES, WHERE PROPER PLANNING COULD AVOID INTERFERENCE.

3. CODES AND PERMITS
NOTHING IN THE DRAWINGS AND/OR SPECIFICATIONS SHALL BE INTERPRETED TO CONFLICT WITH ANY CITY OR PROVINCIAL LAW, REGULATION, CODE, ORDINANCE, RULING, OR FIRE UNDERWRITER'S REQUIREMENT APPLICABLE TO THIS CLASS OF WORK.

SHOULD THE DRAWINGS AND/OR SPECIFICATIONS CONFLICT WITH SUCH LAWS OR ORDINANCES, THE CONFLICTING PORTION OF THE WORK SHALL BE INSTALLED STRICTLY IN ACCORDANCE WITH SUCH LAWS AND ORDINANCES WITHOUT EXTRA COST.

THIS CONTRACTOR SHALL SECURE AND PAY FOR ALL NECESSARY PERMITS AND INSPECTIONS REQUIRED FOR THIS INSTALLATION OF HIS WORK.

4. ACCURACY OF DATA
THE INFORMATION GIVEN HEREIN AND ON THE DRAWINGS IS AS EXACT AS COULD BE SECURED, BUT ITS EXTREME ACCURACY IS NOT GUARANTEED. THIS CONTRACTOR SHALL EXAMINE THE LOCATIONS AND VERIFY ALL MEASUREMENTS, DISTANCES, ELEVATIONS AND EXISTING PIPE SIZES BEFORE STARTING THE WORK AS ALL PIPING SYSTEMS SHOWN ON THE DRAWINGS ARE DIAGRAMMATIC ONLY.

THIS CONTRACTOR SHALL PROVIDE ALL NECESSARY OFFSETS, RAISED AND DROPS IN PIPING AND DUCTWORK AS REQUIRED BY BUILDING CONDITIONS AT NO ADDITIONAL COST.

MECHANICAL DRAWINGS SHALL NOT BE USED FOR GENERAL CONSTRUCTION DIMENSIONS OR FOR TYPE OF MATERIAL USED, FOR EXACT BUILDING LAYOUT, DIMENSIONS AND BUILDING MATERIAL USED, THIS CONTRACTOR SHALL REFER TO THE ARCHITECTURAL DRAWINGS.

5. SHOP DRAWINGS
SHOP OR INSTALLATION DRAWINGS, FOUNDATION PLANS, EQUIPMENT OR APPARATUS DRAWINGS SHALL BE FURNISHED BY THIS CONTRACTOR. THESE DRAWINGS SHALL BE CLEARLY MARKED INDICATING WHICH ITEMS ARE TO BE SUPPLIED AND SHALL STATE CAPACITIES, SIZES AND GENERAL DESCRIPTION OF ALL EQUIPMENT, ANY CHANGES FROM THE SPECIFIED ITEMS SHALL BE NOTED ON THE SUBMITTALS.

SHOP DRAWINGS OF SPECIAL APPARATUS OR EQUIPMENT WHICH IS TO BE FABRICATED INDIVIDUALLY FOR THIS PROJECT AND IS NOT DESCRIBED BY STANDARD MANUFACTURER'S DRAWINGS OR BULLETINS SHALL BE SUBMITTED FOR PROCESSING BEFORE FABRICATION.

THESE DRAWINGS SHALL BE SUBMITTED IN A TIMELY MANNER.

IT SHALL BE THIS CONTRACTORS RESPONSIBILITY TO MAINTAIN LIAISON WITH ALL PARTIES CONCERNED WITH THE MATERIAL SUBMITTED. THIS CONTRACTOR SHALL NOT PURCHASE ANY EQUIPMENT UNTIL SHOP DRAWINGS HAVE BEEN PROCESSED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY FEES ACCRUED FROM THE RETURN OF FIXTURES PURCHASED PRIOR TO THE REVIEW OF SHOP DRAWINGS AND THAT ARE NOT APPROVED.

THIS CONTRACTOR SHALL SUBMIT NO DRAWINGS WITHOUT NOTATION INDICATING DATE OF CONTRACTORS REVIEW AND SIGNATURE OF CHECK FOR CONTRACTOR TOGETHER WITH CONTRACTORS NAME AND PROJECT IDENTIFICATION.

ARCHITECT'S PROCESSING WILL NOT CONSTITUTE A COMPLETE CHECK BUT WILL INDICATE ONLY THAT GENERAL METHOD OF CONSTRUCTION AND DETAILING IS SATISFACTORY.

ARCHITECT'S PROCESSING WILL NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR ERRORS SINCE THIS CONTRACTOR IS SOLELY RESPONSIBLE FOR DIMENSIONS AND DESIGNS OF ADEQUATE CONNECTIONS, DETAILS AND SATISFACTORY CONSTRUCTION OF ALL WORK, AS WELL AS FURNISHING MATERIALS AND WORKMANSHIP REQUIRED BY DRAWINGS AND SPECIFICATIONS WHICH MAY NOT BE INDICATED ON THE SUBMITTALS WHEN APPROVED.

CORRECTIONS OR COMMENTS MADE ON THE SHOP DRAWINGS DURING ENGINEER REVIEW DO NOT RELIEVE THE CONTRACTOR FROM COMPLIANCE WITH THE REQUIREMENTS OF THE PLANS AND SPECIFICATIONS. REVIEW OF A SPECIFIC ITEM SHALL NOT INCLUDE REVIEW OF AN ASSEMBLY OF WHICH THE ITEM IS A COMPONENT. THE CONTRACTOR IS RESPONSIBLE FOR EQUIPMENT VOLTAGES AND DIMENSIONS TO BE CONFIRMED AND CORRELATED WITH ALL DISCIPLINES PRIOR TO PURCHASE. INFORMATION THAT PERTAINS SOLELY TO THE FABRICATION PROCESSES OR TO THE MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES OF CONSTRUCTION; COORDINATION OF THE WORK WITH THAT OF ALL OTHER TRADES AND PERFORMING ALL WORK IN A SAFE AND SATISFACTORY MANNER.

6. SUBSTITUTIONS OF EQUIPMENT OR MATERIAL

THE BRAND NAMES OF EQUIPMENT OR MATERIALS SPECIFIED HEREIN SHALL ESTABLISH QUALITY, CAPACITY, TYPE AND DIMENSIONS TO BE INCLUDED IN THE BASE BID.

APPROVAL OF SUBSTITUTED ITEMS WILL BE BASED ON ABILITY AND CAPACITY TO PERFORM FUNCTION SERVED, QUALITY AND AVAILABILITY OF PARTS AND SERVICE, QUALITY OF EQUIPMENT, DELIVERY SCHEDULE, ETC. THE ARCHITECT SHALL REVIEW ALL SUCH REQUESTS BUT RESERVES THE SOLE RIGHT OF JUDGEMENT TO APPROVE OR REJECT THE PROPOSED SUBSTITUTION.

ACCEPTANCE OR REJECTION OF PROPOSED SUBSTITUTIONS SHALL NOT CAUSE ADDITIONAL COST. ANY CHANGES OF PIPING, DUCTWORK, ELECTRICAL CONTROLS OR INSTALLATION REQUIRED BECAUSE OF THE SUBSTITUTION OR EQUIPMENT SHALL BE PAID FOR BY THIS CONTRACTOR PROPOSING THE SUBSTITUTION.

7. ERECTION OF APPARATUS

ALL WORK SHALL BE DONE UNDER THE PERSONAL SUPERVISION OF THIS CONTRACTOR WHO SHALL PROVIDE A COMPETENT FOREMAN TO LAY OUT ALL WORK. ALL WORK SHALL BE LAID OUT WITH DUE REGARD FOR THE SPACE REQUIREMENTS OF THE OTHER CONTRACTORS. THIS CONTRACTOR SHALL REPORT ANY CONFLICTS OR DIFFICULTIES IN REGARD TO THE INSTALLATION IMMEDIATELY.

WHERE CROWDED LOCATIONS EXIST OR WHERE THERE IS A POSSIBILITY OF CONFLICT BETWEEN TRADES, THIS CONTRACTOR SHALL MAKE COMPOSITE DRAWINGS SHOWING THE EXACT LOCATIONS OF PIPES, DUCT, CONDUIT AND EQUIPMENT. DRAWINGS SHALL BE BASED ON FIELD MEASUREMENTS AND AFTER CONSULTATION AND AGREEMENT BETWEEN THE TRADES, SHALL BE APPROVED BY ARCHITECT AND ENGINEER BEFORE INSTALLATION OF THE WORK.

EQUIPMENT OF A TYPE TO REQUIRE REPLACEMENT, SERVICING, ADJUSTING OR MAINTENANCE SHALL BE LOCATED TO ALLOW EASY ACCESS AND SPACE FOR REMOVAL OF INTERNAL ASSEMBLIES, IT REQUIRED.

8. EXCAVATION AND BACKFILL

THIS CONTRACTOR SHALL DO ALL EXCAVATION REQUIRED TO INSTALL PIPES AND EQUIPMENT SHOWN ON THE PLANS OR REQUIRED FOR PROPER OPERATION. EXCESS EXCAVATION BELOW THE REQUIRED LEVEL SHALL BE BACKFILLED WITH EARTH AND THOROUGHLY TAMPED. UTILITIES SERVICES LINES SHALL BE INSPECTED AND APPROVED BY THE PROPER INSPECTION AUTHORITY BEFORE BACKFILLING.

INSTALL PLASTIC PIPE AND FITTINGS IN STRICT ACCORDANCE WITH THE INSTALLATION RECOMMENDATIONS OF THE PIPE AND FITTINGS MANUFACTURER, APPENDIX X1 OF ASTM D2285 (STORAGE AND INSTALLATION PROCEDURES FOR PLASTIC DRAIN, WASTE, AND VENT PIPING) AND FOR BURIED PIPE ASTM D2321 (STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY-FLOW APPLICATIONS). SUCH INSTRUCTIONS SHALL INCLUDE BUT ARE NOT LIMITED TO CUTTING, SOLVENT CEMENTING AND PRIMING, JOINTS, CONNECTIONS, TRANSITIONS, ALIGNMENT AND GRADE, TRENCHING, BEDDING, BACKFILL AND COMPACTION, SUPPORTS AND SPACING AND ALLOWANCE FOR THERMAL EXPANSION.

CAST IRON PIPING TRENCHING SHALL BE IN ACCORDANCE TO THE CAST IRON SOIL PIPE AND FITTINGS HANDBOOK ISSUED BY THE CAST IRON SOIL PIPE INSTITUTE.

THE BOTTOM OF TRENCHES SHALL BE TAMPED HARD AN GRADED TO SECURE THE REQUIRED FALL. ROCK, WHERE ENCOUNTERED SHALL BE EXCAVATED TO A DEPTH OF SIX INCHES (6") BELOW THE BOTTOM OF THE PIPE, AND BEFORE THE PIPE IS LAID, THE SPACE BETWEEN BOTTOM PIPE AND ROCK SURFACE SHALL BE FILLED WITH GRAVEL. IF TRENCHES ARE DEEPER THAN BOTTOM OF FLOORING OR CLOSER THAN THREE FEET (3') TO FOOTING THEY MUST BE FILLED WITH COHESIVE SOIL, AND COMPACTED TO 95% OF MAXIMUM DENSITY, STANDARD PROCTOR, ASTM D- 698. ALL OTHER EXCAVATIONS UNDER FLOOR SLABS COMPACTED TO 95% STANDARD PROCTOR.

WHEN EXCESS DIRT HAS BEEN REMOVED, THE TRENCH SHALL BE BROUGHT TO THE REQUIRED LEVEL WITH SAND AND GRAVEL FIRMLY COMPACTED.

TRENCHES AND EXCAVATION SHALL BE BACKFILLED IN 6" LAYERS OF EARTH, FREE FROM CLDS, AND STONES THOROUGHLY TAMPED TO A DEPTH OF 12" ABOVE THE PIPE. AFTER THAT DEPTH HAS BEEN REACHED, BACKFILLING SHALL BE DONE IN 12" LAYERS, THOROUGHLY TAMPED.

THIS CONTRACTOR SHALL BE RESPONSIBLE FOR ANY REPAIRS TO ANY DAMAGES OR SAGS TO THE PIPING SYSTEMS THAT OCCUR FROM THE IMPROPER EXCAVATION AND BACKFILL METHODS.

9. EQUIPMENT SUPPORTS

ANY STRUCTURAL STEEL MEMBERS REQUIRED TO ADAPT THE EQUIPMENT AND PIPING AS FURNISHED BY THIS CONTRACTOR, TO THE BUILDING STEEL OR STRUCTURE, SHALL BE INCLUDED IN THE BID OF THE CONTRACTOR FURNISHING THE EQUIPMENT OR PIPING. HANGING OF ALL EQUIPMENT AND REQUIRED SUPPORTING STEEL AND BRACING SHALL BE FURNISHED BY THE CONTRACTOR WHO SUPPLIES THE EQUIPMENT.

10. CUTTING AND PATCHING

THIS CONTRACTOR SHALL INCLUDE ALL CUTTING, PATCHING AND PAINTING OF PATCHED AREAS REQUIRED FOR AND RESULTING FROM THE INSTALLATION OF ALL OF THIS CONTRACTOR'S WORK, EXCEPT WHERE NOTED OTHERWISE.

ALL OPENINGS AROUND PIPE PENETRATIONS THROUGH SMOKE OR FIRE-RATED FLOORS, CEILINGS OR WALLS SHALL BE SEALED AIRTIGHT WITH MATERIAL HAVING A RATING EQUAL TO THE MATERIAL OF THE WALL, CEILING AND/OR FLOOR PENETRATED.

ALL PATCHING SHALL BE NEATLY FINISHED TO THE SATISFACTION OF THE ARCHITECT.

11. ACCESS PANELS

THIS CONTRACTOR SHALL LOCATE AND FURNISH FOR INSTALLATION BY THE GENERAL CONTRACTOR, ALL ACCESS PANELS AS REQUIRED FOR ACCESS TO VALVES, AND THE PROPER SERVICING OF EQUIPMENT AND LINES INSTALLED UNDER THE CONTRACT.

ALL PANELS SHALL BE MILCOR, STYLE "M" FOR MASONRY, "A" FOR ACOUSTICAL TILE AND "K" FOR PLASTER, EXCEPT FOR FIRE-RATED UL 1-1/2 HOUR AND "B" LABEL ACCESS PANELS SHALL BE FURNISHED IN FIRE-RATED WALLS AND CEILINGS AS INDICATED ON THE DRAWINGS. ACCESS DOORS SHALL BE 12" X 12" MINIMUM SIZE FOR VALVES.

12. DIELECTRIC UNIONS

FOR THE PREVENTION OF ELECTROLYTIC CORROSION AT CONNECTIONS BETWEEN PIPE OF DISSIMILAR METALS OR BETWEEN PIPE AND EQUIPMENT CONNECTIONS OF DISSIMILAR METALS, PROVIDE DIELECTRIC UNIONS OR FLANGES.

13. MOTORS, STARTERS AND DISCONNECTS

UNLESS SPECIFIED TO BE FURNISHED WITH EQUIPMENT, ALL MOTOR STARTERS AND DISCONNECT SWITCHES SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR.

14. JOINTS AND FITTINGS

THREADS ON SCREWED PIPE SHALL BE STANDARD, CLEAN BUTT AND TAPERED. PIPE SHALL BE REAMED OF BURRS AND KEPT CLEAN OF SCALE, DIRT AND SHAVINGS. TREADS SHALL BE MADE WITH FLAKED GRAPHITE AND LUBRICATING OIL OR APPROVED PIPE COMPOUND ON THE MALE THREAD ONLY.

COPPER-TO-STEEL AND COPPER-TO-BRASS JOINTS SHALL BE MADE WITH SILVER SOLDER. ALL OTHER COPPER-TO-COPPER JOINTS ABOVE GROUND SHALL BE MADE WITH LEAD FREE SOLDER. COPPER PIPE SHALL BE CUT SQUARE, BURRS REMOVED AND CARE SHALL BE GIVEN TO KEEP THE LINES FREE OF DIRT AND MOISTURE. ALL TUBING AND FITTINGS SHALL BE THOROUGHLY CLEANED.

WELDED PIPE SHALL HAVE BUTT WELDED SINGLE "V" TYPE JOINTS FOR WHICH PIPE HAS BEEN BELTED TO 45 DEGREES. WELD SHALL BE ONE-FOURTH GREATER THICKNESS THAN THE PIPE. CONNECTIONS TO EQUIPMENT, ACCESSORIES, ETC. SHALL BE MADE BY MEANS OF FLANGES AND/OR ADAPTERS.

UNIONS SHALL BE PROVIDED AT EACH SCREWED VALVE AND UNIONS OR FLANGES AT EACH EQUIPMENT CONNECTION.

15. EXPANSION JOINTS

FURNISH AND INSTALL FLEXONICS EXPANSION JOINTS IN PIPING SYSTEM WHERE SHOWN OR NECESSARY FOR EXPANSION AND CONTRACTION.

EXPANSION JOINTS IN PIPE 4" AND GREATER SHALL BE THE PACKLESS TYPE WITH STAINLESS STEEL BELLOWS AND HAVE WELDED OR FLANGED END. JOINTS SHALL HAVE TRAVERSE AS INDICATED ON THE PLANS. EXPANSION JOINTS SHALL BE OF THE CONTROLLED FLEXING TYPE.

EXPANSION JOINTS IN COPPER PIPE UNDER 4" IN SIZE SHALL BE OF THE COMPENSATOR TYPE CONSTRUCTED OF TWO-PLY STAINLESS STEEL BELLOWS AND CARBON STEEL SHROUDS AND END FITTINGS, INTERNAL GUIDES AND ANTI-TORQUE DEVICES.

EXPANSION JOINTS IN STEEL PIPE UNDER 4" IN SIZE SHALL BE OF THE COMPENSATOR TYPE CONSTRUCTED OF TWO-PLY STAINLESS STEEL ELBOWS AND CARBON STEEL SHROUDS AND END FITTINGS, INTERNAL GUIDES AND ANTI-TORQUE DEVICES.

PROVIDE GUIDES ON EACH SIDE OF EXPANSION JOINT, AT 4 PIPE DIAMETERS, 14 PIPE DIAMETERS, AND A THIRD GUIDE AS RECOMMENDED BY THE MANUFACTURER.

16. PIPE FLEXIBLE CONNECTIONS

FLEXIBLE PIPE CONNECTIONS SHALL BE RESISTOFLEX #R8904 OR APPROVED EQUAL FLEXIBLE CONNECTIONS MADE FROM TEFLON.

PROVIDE FOR MOVEMENT IN PIPING BY USE OF SWING JOINTS AT CONNECTION OF ALL BRANCHES TO MAINS AND RISERS. ALL BRANCHES FROM MAINS AND RISERS SHALL HAVE 1/4" CLEARANCE BETWEEN PIPE INSULATION AND SLEEVE TO PERMIT PIPE MOVEMENT.

17. VALVES

THIS CONTRACTOR SHALL FURNISH AND INSTALL ALL VALVES OF ONE MANUFACTURER, FIGURE, NUMBER AND TYPE THROUGHOUT THE ENTIRE INSTALLATION OF THE WORK, UNLESS OTHERWISE SPECIFIED. THE FOLLOWING NUMBERS ARE FROM THE CRANE CATALOG. EQUAL VALVES OF REPUTABLE MANUFACTURERS, SUCH AS HAMMOND, NIBCO-SOFT AND/OR JENKINS WILL BE CONSIDERED EQUIVALENT.

ALL VALVES SHALL BE BUILT FOR A MINIMUM OF 125 PSIG WORKING PRESSURE.

ISOLATION VALVES SHALL BE PROVIDED ON ALL INDIVIDUAL FIXTURES AND FIXTURE GROUPS.

CHECK VALVES 2-1/2" AND SMALLER SHALL BE #36 (SCREWED ENDS) OR #1342 (SOLDER-JOINT ENDS) SWING-TYPE WITH BRONZE BODY AND BRONZE TRIM.

BUTTERFLY VALVES 2" AND LARGER SHALL BE #12F, IRON BODY, CAST-IRON WAFER W/LOCK LEVER.

BALL VALVE UP TO 3" IN SIZE SHALL BE APOLLO SERIES #70 BRONZE VALVE WITH CHROME-PLATED BALL AND TEFLON SEAT.

GAS LINE COCKS UP TO 4" SHALL BE #320, 1/2 PSI FOR INDOOR APPLIANCE CONNECTIONS SHALL CONFORM TO ANSI Z21.15 AND CSA 9.1, 5 PSI FOR INDOOR SHUTOFF SHALL CONFORM TO CGA 91-002 AND ASME B16.44

HOSE END VALVES SHALL BE #438 GATE VALVES WITH HOSE END NIPPLES.

18. PIPE SLEEVES AND COLLARS

THIS CONTRACTOR SHALL LAY OUT ALL HIS WORK AND SET SLEEVES IN NEW CONSTRUCTION AS CONCRETE FORMS AND WALL ARE ERECTED SO AS TO BE ABLE TO INSTALL HIS WORK WITHOUT CUTTING OR BREAKING OF FLOORS OR WALLS. ALL SLEEVES FOR INSULATED PIPING SHALL BE LARGE ENOUGH TO ALLOW INSULATION TO PASS THROUGH SLEEVE.

ALL SLEEVES PASSING THROUGH FLOORS WHICH ARE WATERPROOFED SHALL BE COPPER TUBING SLEEVES EXTENDING 1" ABOVE FINISHED FLOOR. ALL OTHER SLEEVES SHALL BE 24 GAUGE GALVANIZED PIPES AND SLEEVES TO BE THOROUGHLY PACKED WITH WATERPROOF SEALANT AND THE REMAINING SPACE FILLED WITH MASTIC AND MUST BE WATERTIGHT.

ALL SLEEVES PASSING THROUGH INNER WALLS SHALL BE STANDARD PIPE THIMBLES EQUAL TO THE THICKNESS OF THE WALL.

SPACES BETWEEN PIPES AND SLEEVES THROUGH OUTSIDE WALLS, ABOVE GRADE, SHALL BE CAULKED WITH CAULKING COMPOUND; THOSE BELOW GRADE SHALL BE MADE WATERTIGHT.

SPACE AROUND ALL PIPING THROUGH FIRE OR SMOKE RATED PARTITIONS OR FLOORS SHALL BE SEALED AIRTIGHT WITH MATERIALS OR EQUIPMENT AS SPECIFIED UNDER FIRESTOPPING.

ALL PIPE PENETRATIONS OF SLABS ON GRADE SHALL BE WRAPPED WITH #15 BUILDING FELTS OR FOAM WRAP.

19. HANGERS

- PIPE HANGER AND SUPPORT PRODUCTS INSTALLATION
- VERTICAL PIPING, MSS TYPE 8 OR 42 CLAMPS.
- INDIVIDUAL STRAIGHT, HORIZONTAL PIPING RUNS, 100 FEET AND LESS, MSS TYPE 1, ADJUSTABLE, STEEL, CLEVIS HANGERS, LONGER THAN 100 FEET, MSS TYPE 43, ADJUSTABLE ROLLER HANGERS, LONGER THAN 100 FEET IF INDICATED, MSS TYPE 49, SPRING CUSHION ROLLS.
- MULTIPLE, STRAIGHT, HORIZONTAL PIPING RUNS 100 FEET OR LONGER, MSS TYPE 44, PIPE ROLLS, SUPPORT PIPE ROLLS ON TRAPEZE.
- BASE OF VERTICAL PIPING, MSS TYPE 52, SPRING HANGERS.

- SUPPORT VERTICAL PIPING AND TUBING AT BASE AND AT EACH FLOOR.
- ROD DIAMETER MAY BE REDUCED ONE SIZE FOR DOUBLE-ROD HANGERS, TO A MINIMUM OF 3/8 INCH.
- INSTALL HANGERS FOR ALL PIPING PER MSS SP-69, MANUFACTURERS MANUALS AND AS PER HANGER SUPPORT DETAIL ON DRAWINGS.
- INSTALL SUPPORTS FOR VERTICAL COPPER TUBING EVERY 10 FEET.
- INSTALL SUPPORTS FOR VERTICAL STEEL PIPING EVERY 15 FEET.
- SUPPORT PIPING AND TUBING NOT LISTED IN THIS ARTICLE, ACCORDING TO MSS SP-69 AND MANUFACTURER'S WRITTEN INSTRUCTIONS.

20. DAMAGE BY LEAKS

THIS CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGES TO THE GROUNDS, WALKS, ROADS, ALL BUILDING COMPONENTS AND FINISHES, PIPING SYSTEMS, ELECTRICAL SYSTEMS AND THEIR EQUIPMENT AND CONTENT, CAUSED BY LEAKS IN THE PIPING SYSTEMS BEING INSTALLED OR HAVING BEEN INSTALLED HEREIN. ALL REPAIRS WILL BE MADE AT THIS CONTRACTOR'S EXPENSE.

21. PIPE MARKERS

FURNISH AND INSTALL, BRADY #B-350 THIN FILM OR APPROVED EQUAL PIPE MARKERS. MARKERS SHALL BE 1-1/8" HIGH FOR PIPES 3" AND UNDER AND 2-1/4" HIGH FOR PIPES OVER 3". MARKERS SHALL INDICATE TYPE OF SERVICE AND DIRECTION OF FLOW.

PIPE MARKERS SHALL BE LOCATED:

- AT EQUIPMENT CONNECTIONS - AT ACCESS DOORS
- AT BRANCH MAINS
- ON ALL ACCESSIBLE PIPE A MAXIMUM OF 75' BETWEEN MARKERS.
- AT ALL PENETRATIONS ON EITHER SIDE OF PENETRATION

22. FLOOR, WALL AND CEILING PLATES

PIPES PASSING THROUGH FLOORS AND FINISHED CEILINGS, FITTED WITH CHROME- PLATED PLATES OR ESCUTCHEONS LARGE ENOUGH TO COMPLETELY CLOSE OPENING AROUND PIPE OR PIPE COVERING AND FLOOR SUPPORT IN THE CASE OF VERTICAL PIPING, SECURELY HELD IN PLACE, CAULK WATERTIGHT AROUND PIPE IN UNFINISHED ROOMS.

23. FIRE STOPPING

THE PENETRATIONS OF FIRE AND/OR SMOKE RATED WALLS OR FLOORS SHALL BE PROTECTED BY A UL APPROVED MATERIAL TO RETAIN THE INTEGRITY OF THE TIME-RATED CONSTRUCTION BY MAINTAINING AS EFFECTIVE BARRIER AGAINST THE SPREAD OF FLAME, SMOKE AND GASES. IT SHALL BE USED IN ALL DUCT CABLE, CONDUIT AND PIPING PENETRATIONS THROUGH FLOOR SLABS AND TIME-RATED WALLS, AND/OR FLOORS. THE RATING OF THE FIRESTOPPING SHALL EQUAL THE RATING OF THE TIME-RATED ASSEMBLY.

FIRESTOPPING MATERIAL SHALL BE 3M FIRE BARRIER SEALING SYSTEM OF APPROVED EQUAL. FIRESTOPPING MATERIAL SHALL CONSTITUTE ONE OR MORE OF THE FOLLOWING PRODUCTS:

- CAULK: CP-25
- PUTTY #303
- WRAP/STRIP: FS195
- COMPOSITE SHEET: CS195
- ANCHORAGE, FASTENINGS, AND SYSTEMS: 7900 SERIES

INSTALLATION OF FIRESTOPPING SHALL BE INSTALLED IN ACCORDANCE WITH AND IN STRICT CONFORMITY WITH MANUFACTURER'S PRINTED INSTRUCTIONS AS TO SURFACE PREPARATION, INSTALLATION AND QUALITY CONTROL. AREAS OF WORK SHALL REMAIN ACCESSIBLE UNTIL INSPECTION AND APPROVAL BY THE APPLICABLE CODE AUTHORITIES.

ON INSULATED PIPES, THE FIRE-RATING CLASSIFICATION SHALL NOT REQUIRE REMOVAL OF THE INSULATION.

QUALITY ASSURANCE:
SUBMIT MANUFACTURER'S PRODUCT DATA, LETTER OF CERTIFICATION OR CERTIFIED LABORATORY TEST REPORT THAT THE MATERIAL OR COMBINATION OF MATERIALS MEET THE REQUIREMENTS SPECIFIED IN ASTM E814 AND ARE SO CLASSIFIED IN U.S. BUILDING MATERIALS DIRECTORY. MATERIALS SHALL MEET AND BE ACCEPTABLE FOR USE BY ALL MODEL BUILDING CODES. MATERIALS SHALL MEET THE REQUIREMENTS OF NFPM61- LIFE SAFETY CODE AND NFPA 70 NATIONAL ELECTRICAL CODE.

SUBMITTALS:
SUBMIT SHOP DRAWINGS, PRODUCT DATA, CERTIFICATES AND MANUFACTURER'S INSTALLATION INSTRUCTIONS. SUBMIT MANUFACTURER'S PRODUCT DATA FOR ALL MATERIALS AND PREFABRICATED DEVICES, PROVIDING DESCRIPTIONS SUFFICIENT FOR IDENTIFICATION AT THE JOB SITE. INCLUDE MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION.

SUBMIT SHOP DRAWINGS SHOWING PROPOSED MATERIAL, REINFORCEMENT, ANCHORAGE, FASTENINGS, AND METHOD OF INSTALLATION. CONSTRUCTION DETAILS SHALL ACCURATELY REFLECT ACTUAL JOB CONDITIONS.

24. CLEANUP AND ADJUSTMENT

ALL PARTS WORK LEFT CLEAN; EQUIPMENT, FIXTURES, VALVES, PIPES AND FITTINGS CLEANED OF GREASE AND METAL CUTTINGS; ANY DISCOLORATION OR OTHER DAMAGE TO PORTIONS OF BUILDING, ITS FINISH OR FURNISHING DUE TO THIS CONTRACTORS FAILURE TO PROPERLY CLEAN INTERIOR OF PIPING, REPAIRED AT THIS CONTRACTOR'S EXPENSE. ALL AUTOMATIC CONTROL DEVICES ADJUSTED FOR PROPER OPERATION. SURPLUS MATERIALS AND ANY RUBBISH REMOVED AS IT ACCUMULATES. ALL EQUIPMENT LEFT IN SAFE, PROPER OPERATING CONDITION.

DAMAGE TO ANY PORTIONS MUST BE REPAIRED OF THE PART REPLACED BY THIS CONTRACTOR AND ALL PARTS LEFT WITHOUT DENTS, SCRATCHES, THROUGH THE FINISH PAINT, LOOSE PLASTER, STAINS OR OTHER BLEMISHES.

25. PIPE TESTING AND START-UP

ALL PIPING TO BE TESTED IN ACCORDANCE WITH THE FOLLOWING:

- WATER - 100 PSI WATER PRESSURE
- ALL TESTING MUST HOLD FOR AT LEAST 24 HOURS WITHOUT LOSS OF PRESSURE OR VACUUM. ALL CONCEALED PIPING SHALL BE TESTED IN THE PRESENCE OF THE OWNER'S REPRESENTATIVE PRIOR TO COVERING. BEFORE STARTING ANY SYSTEM, ALL EQUIPMENT SHALL BE LUBRICATED PER MANUFACTURERS REQUIREMENTS BY THIS CONTRACTOR. TEST ENTIRE BUILDING SYSTEMS UNDER FULL LOAD CONDITIONS FOR A PERIOD OF NOT LESS THAN ONE (1) WEEK DURING WHICH TIME THE OPERATING PERSONNEL SHALL BE FULLY INSTRUCTED IN THE OPERATION AND MAINTENANCE OF THE PLANT. AFTER THE START-UP OR OPERATION, THIS CONTRACTOR IS TO FURNISH WHATEVER ADDITIONAL SERVICE IS REQUIRED TO RECALIBRATE AND RESET CONTROLS, VALVES, BALANCING COCKS, ETC. TO ENSURE PROPER OPERATION OF THIS SYSTEM.

26. TESTING AND BALANCING

THIS CONTRACTOR SHALL AT THE TIME OF INSTALLATION ENSURE THAT ALL DEVICES TO COMPLETE TESTING AND BALANCING AS DIRECTED HEREIN ARE FURNISHED AND INSTALLED DURING FABRICATION AND INSTALLATION OF WORK. THIS WORK SHALL BE PERFORMED PRIOR TO THE OCCUPANCY OF THE BUILDING AND WITH AMPLE TIME TO MAKE ANY NECESSARY REPAIRS OR CHANGES TO ACHIEVE A PROPERLY OPERATING SYSTEM.

27. SEISMIC RESTRAINTS ON MECHANICAL EQUIPMENT

ALL PLUMBING EQUIPMENT SHALL BE PROVIDED WITH SEISMIC RESTRAINING SERVICES AS REQUIRED BY LOCAL BUILDING CODES. CONTRACTOR SHALL HAVE LOCAL BUILDING OFFICE REVIEW EACH PIECE OF EQUIPMENT WHEN INSTALLED AND THE CONTRACTOR SHALL INSTALL ALL REQUIRED TIE DOWN, ANCHORS, STRAPS OR OTHER DEVICES REQUIRED.

28. GUARANTEE

THIS CONTRACTOR SHALL GUARANTEE ALL EQUIPMENT, MATERIALS, AND LABOR FURNISHED UNDER THIS CONTRACT TO BE FREE FROM DEFECTS FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF COMPLETION. FOR LETTERS OF GUARANTEE, REPAIR OR REPLACE ANY EQUIPMENT OR MATERIAL WHICH IS DEFECTIVE OR IMPROPERLY INSTALLED. IN ADDITION, THIS CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR ANY DAMAGE TO THE BUILDINGS AND ITS CONTENTS OR OTHER EQUIPMENT, CAUSED BY DEFECTS OR IMPROPER INSTALLATION OF EQUIPMENT OR MATERIALS INSTALLED UNDER THIS SECTION OF THE SPECIFICATIONS.

29. TEMPORARY WATER

TEMPORARY WATER SERVICE (IF REQUIRED) TO THE BUILDING SHALL BE PROVIDED BY THIS CONTRACTOR TO THE BUILDING FOR CONSTRUCTION PURPOSES. THIS CONTRACTOR TO MAINTAIN WATER SERVICE AS REQUIRED DURING CONSTRUCTION.

30. DOMESTIC WATER SERVICE

THIS CONTRACTOR SHALL COORDINATE EXACT AVAILABLE DELIVERY PRESSURE AND PROVIDE ALTERNATE FEE FOR A PRESSURE BOOSTING SYSTEM IF PRESSURE IS LESS THAN REQUIRED PRESSURE. PROVIDE PRESSURE REDUCING VALVE WITH STRAINER IN SERVICE LINE IF REQUIRED BY LOCAL CODES OR REQUIREMENTS IS ABOVE 80 PSI.

JOINTS SHALL BE CLEANED AND DEBURRED AS RECOMMENDED BY THE MANUFACTURER AND FEDERAL, STATE, AND LOCAL CODES AND PRESS FITTINGS ARE AN ACCEPTABLE IF ALLOWED BY LOCAL AHA. WHERE PRESS FITTINGS ARE NOT ALLOWED SOLDERED AS LISTED ABOVE, FLUX SHALL BE NON-CORROSIVE. VICTALULIC GROUDED COUPLINGS ARE ACCEPTABLE ALTERNATE IF ALLOWED BY LOCAL AHA.

ABOVE GRADE - WHERE FITTINGS ARE SOLDERED BOTH FITTINGS AND TUBING SHALL BE CLEANED AS DESCRIBED ABOVE. UNDER NO CIRCUMSTANCES SHALL DISSIMILAR METALS COME INTO DIRECT CONTACT WITH COPPER TUBING, E.G., ON TRAPEZE.

BELOW GRADE, OR FLOOR SLAB ON EARTH OR STONE FILL - HIGH TEMPERATURE, SOLDER, 1200 DEG. F. OR GREATER MELTING POINT.

NOTE: WATER PIPE TO BE PROPERLY SECURED AND ALIGNED SO AS NOT TO EXERT VERTICAL OR HORIZONTAL STRESSES ON THE SEATING OF THE MATING (MALE AND FEMALE) SURFACES OF THE UNIONS.

MATERIALS - UNDERGROUND: TYPE "K" COPPER TUBE, SOFT TEMPER MATERIALS - ABOVEGROUND: TYPE "L" COPPER TUBE, HARD DRAWN, ALTERNATE MATERIALS - PEX-A PIPING IS AN ACCEPTABLE ALTERNATE IF NOT INSTALLED IN A PLENUM AND APPROVED BY LOCAL CODE OFFICIALS. VIEGA PROGRESS COPPER 1/2-INCH THROUGH 4-INCH WITH EPDM SEALING ELEMENT AND/OR VIEGA, PROGRESS 3/4 OR 3/6 STAINLESS 1/2-INCH THROUGH 4-INCH WITH EPDM OR FKM SEALING ELEMENT IS ACCEPTABLE IF ALLOWED BY LOCAL CODE.

31. STERILIZATION OF DOMESTIC WATER SYSTEM

THE ENTIRE DOMESTIC WATER DISTRIBUTION SYSTEM SHALL BE FLUSHED CLEAR OF ANY DEBRIS AND THOROUGHLY STERILIZED WITH A SOLUTION CONTAINING NOT LESS THAN 100 PARTS PER MILLION OF AVAILABLE CHLORINE. THE SOLUTION SHALL REMAIN IN THE SYSTEM FOR TWO (2) HOURS DURING WHICH TIME ALL VALVES AND FACETS SHALL BE OPENED AND CLOSED SEVERAL TIMES. AFTER STERILIZATION, THE SOLUTION SHALL BE FLUSHED FROM THE SYSTEM WITH CLEAN WATER UNTIL THE RESIDUE CHLORINE CONTENT IS NOT GREATER THAN THE CHLORINE LEVEL OF THE AVAILABLE WATER SUPPLY.

STERILIZATION SHALL BE PERFORMED PRIOR TO TURNOVER TO OCCUPANT AS TO NOT ALLOW FOR THE WATER SYSTEM TO REMAIN STAGNANT FOR LONGER THAN 24 HOURS.

THIS CONTRACTOR SHALL HAVE THE WATER TESTED AND APPROVED BY THE HEALTH DEPARTMENT.

32. SANITARY SEWERS

THIS CONTRACTOR SHALL CONNECT SANITARY SEWER AS INDICATED ON THE DRAWINGS. VERIFY DIRECTION OF FLOW PRIOR TO ANY ROUGH-IN WORK.

EACH PIPE SHALL BE LAID TO THE LINE AND GRADE INDICATED ON THE PLANS AND SUCH A MANNER AS TO FORM A CLOSE CONCENTRIC JOINT WITH THE ADJOINING PIPE AND TO PRESENT OFFSETS IN FLOW LINE. ALL PIPE SHALL BE LAID WITH THE BELLS UPHILL.

THE SUB-GRADES SHALL BE KEPT FREE FROM WATER WHILE PIPES ARE BEING LAID. ALL PIPE SHALL BE LAID WITH ENDS ABUTTING AND TRUE TO LINE AND GRADE. THEY SHALL BE FITTED AND MATCHED SO THAT THEY WILL FORM A SEWER WITH A SMOOTH AND UNIFORM INVERT.

EACH JOINT SHALL BE CLEANED AS IT IS LAID AND ALL BELLS SHALL BE CLEANED BEFORE PIPES ARE JOINED.

PVC SEWER PIPE MAY BE USED IN LIEU OF THAT SPECIFIED ABOVE IF ALLOWED BY LOCAL CODES.

ABS AND FOAM CORE PVC ARE NOT ACCEPTABLE MATERIALS.

SDR 35 IS NOT ACCEPTABLE FOR UNDER BUILDING USE.

33. WASTE, SOIL, DRAIN AND VENT PIPING

THE DRAINS, SOIL WASTE AND VENT PIPE AND FITTINGS INCLUDING EXTENSIONS TO SEWERS SHALL BE OF THE SIZES INDICATED ON THE DRAWINGS. PIPE AND FITTINGS TO BE, CYLINDRICAL AND FREE FROM CRACKS OR OTHER DEFECTS.

ALL TRENCHES TO BE DUG WITH GRADUAL FALL, THE PIPING TO BE STRAIGHT AND FREE FROM ANY SAGS.

THE ARRANGEMENT OF THE SYSTEM SHALL BE AS SHOWN ON THE DRAWINGS AND AS DIRECT AS POSSIBLE, AVOIDING ALL UNNECESSARY OFFSETS. THE STACKS SHALL BE FIRMLY SECURED IN POSITION WITH WROUGHT IRON CLAMPS AT EACH FLOOR.

ALL CHANGES IN DIRECTION OF SOIL OR WASTE PIPE SHALL BE MADE BY MEANS OF "Y" BRANCHES AND 1/8 BENDS. NINETY DEGREE SHORT TURN FITTINGS WILL NOT BE PERMITTED EXCEPT TO INDIVIDUAL FIXTURE CONNECTIONS OR WHERE THE FLOW IS FROM THE HORIZONTAL TO THE VERTICAL.

SANITARY CLEANOUTS ARE TO BE PROVIDED AT EVERY TURN GREATER THAN 45° AT INTERVALS OF NO GREATER THAN 50' AT ANY STACK ROUTING BELOW GRADE. NOT ALL CLEANOUTS LOCATIONS MAY BE SHOWN ON THE DRAWING.

ALL TRAP SCREWS MUST BE OF FULL SIZE OF PIPE UP TO 4" AND 4" FOR ALL OVER THIS SIZE. CONNECTIONS BETWEEN OUTLETS OF FIXTURES AND SOIL OR WASTE PIPE SHALL BE MADE WITH "Y" BRANCHES TO "Y" BRANCHES WHEREVER POSSIBLE. ALL HORIZONTAL SOIL-WASTE AND VENT PIPE SHALL BE GRADED TOWARD OUTLETS AND PIPE NOT BURIED SHALL BE INSTALLED ABOVE THE CEILING OR CLOSE AS POSSIBLE TO THE CONSTRUCTION ABOVE WHERE THERE IS NO CEILING.

THE STACKS SHALL BE EXTENDED THROUGH ROOF OF BUILDING TO POINTS NOT LESS THAN 12" ABOVE ROOF. EXTENSIONS THROUGH ROOF SHALL BE MADE WATER-TIGHT BY MEANS OF A LEAD FLASHING OF FOUR POINTS SHIRL LEAD SPREAD OVER A DISTANCE OF NOT LESS THAN TWELVE INCHES (12") AROUND PIPE. THIMBLE TO BE SOLDERED TO BASE AND EXTENDED OVER AND TURNED DOWN INTO END OF PIPE IN AN APPROVED MANNER.

ALL CLEANOUTS IN FLOORS TO BE JOSAM #8360 OR EQUAL ADJUSTABLE CLEANOUTS WITH BODY OF PIPING MATERIAL, CAST BRASS, SCRATCHED COVER WITH LETTERS C.O. CAST IN TOP AND CONCEALED PLUG.

CLEANOUTS SHALL BE INSTALLED IN BASE OF EACH STACK. CONCEALED CLEANOUTS SHALL HAVE JOSAM #8600 OR EQUAL, CAST BRASS CHROMIUM PLATED FLAT ACCESS COVER PLATES.

PLUMBING SYMBOL LIST	
-----	VENT PIPING
--- EX.V ---	EXISTING VENT PIPING
--- SAN ---	WASTE PIPE ABOVE GROUND
--- G.SAN ---	GREASE WASTE ABOVE GROUND
--- EX.SAN ---	EXISTING WASTE PIPE ABOVE GROUND
-----	COLD WATER PIPING
-----	HOT WATER PIPING
-----	HOT WATER RETURN PIPING
-----	FILTER WATER PIPING
-----	EXISTING COLD WATER PIPING
-----	P-TRAP
-----	PIPE UP
-----	PIPE DROP
-----	PIPE CAP
-----	CONTROL VALVE
-----	FLOOR DRAIN / HUB DRAIN
-----	BACKFLOW PREVENTER
-----	POINT OF CONNECTION
-----	CLEANOUT
-----	BALANCING VALVE
-----	FLOOR SINK

PLUMBING ABBREVIATIONS	
SAN	SANITARY
V	VENT
GSAN	GREASE SANITARY
FFD	FUNNEL FLOOR DRAIN
HD	HUB DRAIN
EX	EXISTING
FD	FLOOR DRAIN
CW	COLD WATER
HW	HOT WATER
HWR	HOT WATER RETURN
TYP.	TYPICAL
DN	DOWN
AFF	ABOVE FINISH FLOOR
BFP	BACK FLOW PREVENTER
M	WATER METER
PRV	PRESSURE REDUCING VALVE
UNGD	UNDERGROUND
HS	HAND SINK
FS	FLOOR SINK
FW	FILTERED WATER
CO	CLEANOUT
WH	WATER HEATER
RCP-1	RECIRCULATION PUMP
ET	EXPANSION TANK
VIF	VERIFY IN FIELD
E	EXISTING

KITCHEN EQUIPMENT SCHEDULE						
ITEM NUMBER	DESCRIPTION	MFR	MODEL	FURNISH	INST	DIRECT /INDIRECT
E01	FREEZER	NELSON MFG	BD8	GC	GC	INDIRECT
E02	LIQUID DROP-IN	RANDALL	9946SCN	GC	GC	INDIRECT
E05	ICE BIN	JOHN BOOS	D-30-IBL (CUSTOM)	GC	GC	INDIRECT
E06	DUMP SINK	JOHN BOOS	PB-DISINK201612-X	GC	GC	INDIRECT
E06.1	DUMP SINK FILTERED WATER SPIGOT	LIKUAN	NCP8883CP	GC	GC	INDIRECT
E06.2	BLENDER RINSER	BLENTEC	JRE-610	GC	GC	INDIRECT
E06.3	DUMP SINK SPRAYER FAUCET	WATERLOO	1.15 GPM LOW PROFILE WALL-MOUNTED PRE-RINSE FAUCET WITH 8" CENTER AND 6" ADD ON FAUCET	GC	GC	
E07	DROP-IN SINK	ADVANCE TABCO	TBD	GC		INDIRECT
E07.1	DROP-IN SINK FAUCET	FISHER	53740	GC	GC	
E11	ICE MACHINE	ICE-O-MATIC	CM0430HA	GC	GC	INDIRECT
E12	3-COMPARTMENT SINK	GSW	SE18183D20	GC	GC	INDIRECT
E12.1	3-COMPARTMENT SINK FAUCET COMBO	FISHER	68128 STAINLESS STEEL 8" BACKSPASH SPRING STYLE PRE-RINSE UNIT WITH ULTRA SPRAY VALVE, ADD ON FAUCET AND 12" SWING SPOUT, LEVER HANDLE	GC	GC	
E13	PREP TABLE W/ BUILT IN SINK	GSW	WT-PS3060L	GC	GC	INDIRECT
E13.1	PREP SINK FAUCET	FISHER	53775	GC	GC	
EX.MS	EXISTING MOP SINK	E	E	GC	GC	DIRECT
E20	URN TROUGHS (DRIP TRAY)	JOHN BOOS	URN48	GC	GC	
E21	DROP IN BAR DRIP TRAY	KROWNE METAL	KR-D24 (CUSTOM)	GC	GC	DIRECT
E33	HAND SINK	GSW	HS-0810S	GC	GC	DIRECT
E41	ESPRESSO MACHINE	NUOVA SIMONELLI PRONTOBAR TOUCH 2-STEP SUPER AUTOMATIC ESPRESSO MACHINE	ITEM # 238PT2 MFR # MPROTFTCAP21000003	GC	GC	INDIRECT
ALL FIXTURE MAY BE SUBSTITUTED WITH APPROVED EQUAL. CONTACT OWNER/ARCHITECT FOR APPROVAL						

EXISTING WATER HEATER SCHEDULE						
MARK	MFR	MODEL	STORAGE	RECOVERY	ELECTRICAL DATA	REMARK
EX-WH	STATE	SSE30A	30	100 GPH @ 90°F	24KW	EXISTING TO REMAIN

PLUMBING FIXTURE SCHEDULE						
MARK	FIXTURE	SAN.	VENT	C.W.	H.W.	REMARKS
FS-1	FLOOR SINK - HALF GRATE	3"	2"	-	-	J.R. SMITH 3060Y-12, CAST IRON FLANGED, ROUND RECEPTOR WITH SEEPAGE OPENINGS, ACID RESISTANT COATED INTERIOR, NB HALF GRATE, INTERIOR DOME STRAINER
EX-FS	EXISTING FLOOR SINK	E	E	-	-	EXISTING TO REMAIN
FD-1	FLOOR DRAIN	3"	2"	-	-	J.R. SMITH 2010Y, CAST IRON FLANGED, ROUND.
RCP-1	CIRCULATION PUMP	-	-	3/4"	-	BELL AND GOSSETT NBF-33, ALL BRONZE BODY, 125 WATTS, 120 VOLT WITH TC-1 AUTOMATIC TIMER KIT. WHEN INSTANTANEOUS WATER IS SPECIFIED, REFER TO MANUFACTURER FOR WIRING. PROVIDE AS NEAR TO WATER HEATER AS FEASIBLE. LOCATIONS SHOWN ARE DIAGRAMMATIC. PROVIDE NEW IF NOT EXISTING.
TMV	THERMOSTATIC MIXING VAVLE POINT OF USE	-	-	1/2"	1/2"	ACORN ST-70 SET TO 110°F. PROVIDE TO LAVATORY AND HAND SINK
WC-1	WATER CLOSET	4"	2"	1"	-	KOHLER K-4325-0. ADA COMPLIANT ELONGATED BOWL WITH WALL CARRIER.
LV-1	LAVATORY	2"	2"	1/2"	1/2"	KOHLER K-2007-0. WALL HUNG WITH CONCEALED ARM, FLOOR PEDESTAL CARRIER, ADA COMPLIANT. PROVIDE WITH KOHLER K-13466 FAUCET.
HD-1	HUB DRAIN	3"	2"	-	-	ZURN MODEL 325-AH. INDIRECT WASTE FUNNEL WITH INTEGRAL BACKWATER VALVE.

POTABLE WATER BACKFLOW SCHEDULE			
TYPE OF EQUIPMENT ON SYSTEM	METHOD OF CROSS CONNECTION CONTROL	MANUFACTURE AND MODEL NUMBER	REMARKS
ESPRESSO MACHINE	DUAL CHECK VALVE BACKFLOW PREVENTER	WATTS SD-3	ASSE 1022 APPROVED LEAD FREE
ICE MACHINE	DUAL CHECK VALVE BACKFLOW PREVENTER	WATTS LF9D	ASSE 1012 APPROVED LEAD FREE
WATER SERVICE RPZ	E	E	EXISTING TO REMAIN
1. CONTRACTOR SHALL PROVIDE INDIVIDUAL BACKFLOW PREVENTERS FOR EACH PIECE OF EQUIPMENT IF REQUIRED 2. EACH BACKFLOW PREVENTER MUST HAVE TESTING PORTS. 3. BRONZE BODIED BACKFLOW PREVENTERS ARE PERMISSABLE IF ALLOWED BY LOCAL CODES.			

PIPE MATERIAL SCHEDULE	
PIPES	MATERIALS
WASTE AND VENT	- ABOVE GROUND: PVC SCH. 40, CAST IRON - HUB TYPE WITH NEOPRENE JOINTS - WITH STAINLESS STEEL CONNECTORS WHEN PVC IS NOT ALLOWED PER LOCAL CODE. -SLOPE OF DRAINAGE SYSTEM SHALL BE 1/8" PER FOOT OF RUN FOR PIPE OVER 3" AND 1/4" PER FOOT OF RUN FOR PIPE 3" AND SMALLER. -PVC OR OTHER COMBUSTIBLE PLASTIC PIPING SHALL NOT BE INSTALLED IN CEILING PLENUM SPACES. -WHERE THE DRAINAGE PIPING IS UPSTREAM OF GREASE TRAP, THE SLOPE OF THE PIPING SHALL BE NOT LESS THAN 1/4" PER FOOT.
WATER PIPING	A. UNDERGROUND: TYPE "K" COPPER TUBE, SOFT TEMPER B. ABOVEGROUND: TYPE "L" COPPER TUBE, HARD DRAWN. C. INSULATION: INSULATION FOR HOT AND COLD WATER PIPING SHALL BE AS PER BOULDER 2020 ENERGY CONSERVATION CODE (IECC 2018) PEX PIPE SHALL BE USED FOR ALL FILTERED AND R.O. WATER LINES

GENERAL NOTES	
1. VERIFY ALL PIPING IS GRADED AS PER CODE AND INSTALLED AS CALLED FOR IN DRAWINGS AND REQUIRED FOR PROPER OPERATION.	10. PLUMBING CONTRACTOR TO FURNISH AND INSTALL ALL MATERIAL AND PIPING REQUIRED FROM ROUGH-IN LOCATION TO EQUIPMENT CONNECTION LOCATIONS, BOTH SUPPLY AND WASTE (DIRECT & INDIRECT)
2. PROVIDE WALL PLATES, STOPS, SUPPLIES, TRAPS AND DRAIN OUTLETS FOR ALL KITCHEN EQUIPMENT AND MISCELLANEOUS EQUIPMENT.	11. ALL HORIZONTAL LINES AS EXTENDED AND CONNECTED TO EQUIPMENT SHALL BE RUN AT HIGHEST POSSIBLE ELEVATION AND NOT LESS THAT 6 INCHES ABOVE FINISHED FLOOR SURFACE TO PROVIDE CLEARANCE FOR CLEANING AT ALL SUCH LOCATIONS
3. CONNECT ALL EQUIPMENT AND FIXTURES SUPPLIES BY OTHERS.	12. PLUMBING CONTRACTOR TO INSTALL FAUCETS, AND WASTE ON ALL SINKS AND MAKE FINAL CONNECTIONS.
4. ALL HOT WATER PIPING SHALL BE FIBERGLASS INSULATED.	13. ALL INTERIOR PIPING FOR GREASE WASTE SYSTEM SHALL BE PCV, SOLVENT WELDED IF LOCAL CODE PERMIT.
5. PROVIDE NAIL GUARDS AS REQUIRED.	14. WHEN PERMITTED BY CODE AND THE OWNER, CONTRACTOR MAY USE PEX AS ALTERNATE SYSTEM FOR POTABLE WATER SYSTEMS
6. ALL WORK TO BE DONE IN ACCORDANCE WITH ALL LOCAL CODES AND REQUIREMENTS.	
7. VERIFY EXACT SIZE AND LOCATION OF ALL EXISTING UTILITIES PRIOR TO BID AND START OF WORK.	
8. ALL EXPOSED PIPING FOR DESIGNATED DISABLED ACCESS FIXTURES SHALL BE COVERED OR OTHERWISE WRAPPED IN ACCORDANCE WITH A.D.A. REQUIREMENTS AND LOCAL AUTHORITY.	
9. ALTERNATE MATERIAL NOT IDENTIFIED IN DRAWINGS BUT APPROVED BY LOCAL AUTHORITY SHALL BE SUBMITTED TO ARCHITECT AND PLUMBING ENGINEER FOR REVIEW PRIOR TO INSTALLATION.	

TABLE TO CALCULATE WATER FIXTURE UNITS

PLUMBING FIXTURE	QTY.	WSFU	TOTAL WSFU
3 COMPARTMENT SINK	1	4	4
PREP SINK	1	4	4
MOP SINK	1	3	3
WATER CLOSET	1	10	10
HAND SINK	1	0.7	0.7
LAVATORY	1	2	2
ICE MACHINE	1	0.25	0.25
DUMP SINK	1	1.4	1.4
DROP-IN SINK	1	1.4	1.4
ESPRESSO MACHINE	1	0.25	0.25
BLENDER RINSER	1	0.25	0.25
TOTAL WATER FIXTURE UNITS			27.25
GPM WATER CLOSET FLUSH VALVE			42
WATER SERVICE - TYPE L COPPER			1-1/2"
COLD WATER PIPE SIZING AS PER IPC 2018			

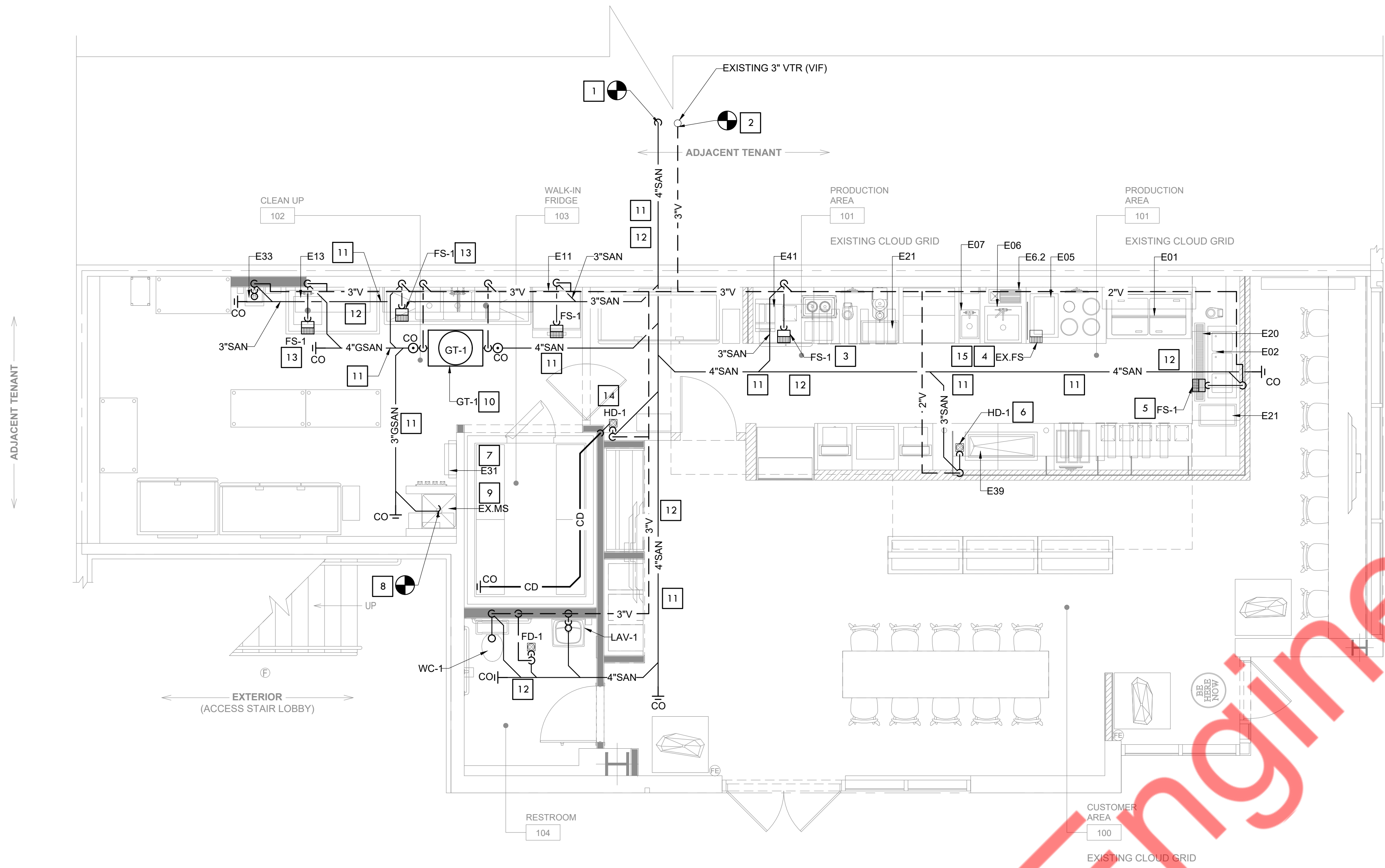
TABLE TO CALCULATE TOTAL DRAINAGE FIXTURES UNITS

PLUMBING FIXTURE	TRAP SIZE	DRAINAGE FIXTURE UNITS	NUMBER OF FIXTURES	TOTAL DFU
FLOOR DRAINS (FD-1) (EMERGENCY)	3"	0	1	0
WATER CLOSET	4"	6	1	6
FLOOR SINK (FS-1 & EX-FS)	3"	5	6	30
LAVATORY	1-1/2"	2	1	2
HAND SINK	1-1/2"	2	1	2
MOP SINK	3"	5	1	5
HUB DRAIN (HD-1)	3"	5	2	10
TOTAL DRAINAGE FIXTURE UNITS				55

ELECTRIC HEAT TRACING CABLE SCHEDULE FOR SANITARY DRAINAGE PIPING								
MAKE	MODEL	ELECTRICAL DATA				DISCIPLINE	FLOOR (AREA)	REMARK
		VOLTAGE	APPROX LENGTH (FT.)	WATTS/FT	AMPS			
RAYCHEM	5XL1-CR	120	200	4.5 W/FT	20	PLUMBING	REFER PLAN	-PROVIDE CONNECTION KITS AND ACCESSORIES, SPLICES, POWER CONNECTIONS, TEE KITS CROSS CONNECTIONS, TAPE, ETC., -PROVIDE AN AMBIENT THERMOSTAT SENSING RTD-200 BY RAYCHEM -PROVIDE ONE CONTROLLER ACS-30 FOR ALL DATA ELECTRIC CIRCUITS. -PROVIDE MAX. FIVE(5) CIRCUITS PER PANEL ACS-PCM2-S
NOTES: 1. PROVIDE CLEARANCES AS PER MANUFACTURER RECOMMENDATIONS.								

GREASE INTERCEPTOR CALCULATIONS				Quote: DCBB9FX8	
Reference No. 76080				Project Name: Sunlife	
Step 1: Flow rate to grease interceptor					
Fixture flow rate: (cu in / 231) = gal x 0.75 / 2 min = 2 min flow rate					
NAME	TYPE	DIMENSIONS	QTY	CU IN	FLOW RATE
3 Compartment Sink	3 Compartment Sink	18" x 18" x 12" (3)	1	11,664	18.94 GPM
Floor Sink	Floor Sink	N/A	4	N/A	0 GPM
Mop Basin	Mop Basin	20" x 20" x 10"	1	4,000	6.49 GPM
Pre-Rinse Sink One Bowl	Pre-Rinse Sink One Bowl	16" x 20" x 14"	1	4,480	7.27 GPM
Total				32.7 GPM	
Step 2: Grease Production					
Number of Seats x 4 turns per seat x Grease Production Value x Days between pump-out = Grease output					
Number of seats in facility: 25					
Grease production value: 0.005 lbs per serving (Bar - Drinks Only: Low / No flatware)					
Days between pump-outs: 90 days					
25 x 4 x 0.005 x 90 = 45 lbs of FOG					
SCHIER MODEL		Description: GREASE INTERCEPTOR 35 GPM / 50 GPM, 4" FPT CONNECTIONS W/ 3" AND 4" PLAIN END ADAPTERS, PEDESTRIAN RATED POLYPROPYLENE COVER			
GB2		Dimensions: Length: 35", Width: 23", Height: 13.75" Flow Rate/Grease Capacity: 35 GPM / 130 lbs Liquid Capacity: 20 gal			

GREASE TRAP SCHEDULE					
ITEM	SERVICE	FLOW CAPACITY (GPM)	GREASE CAPACITY (LBS)	LIQUID CAPACITY (GALLON)	MANUFACTURER AND MODEL
GT-1: GREASE TRAP	KITCHEN WASTE	50	127	20	SCHIER GB2
NOTE: CONTRACTOR TO PROVIDE ALL REQUIRED ACCESSORIES FOR SATISFACTORY WORKING OF GREASE TRAP AS PER SITE CONDITIONS.					



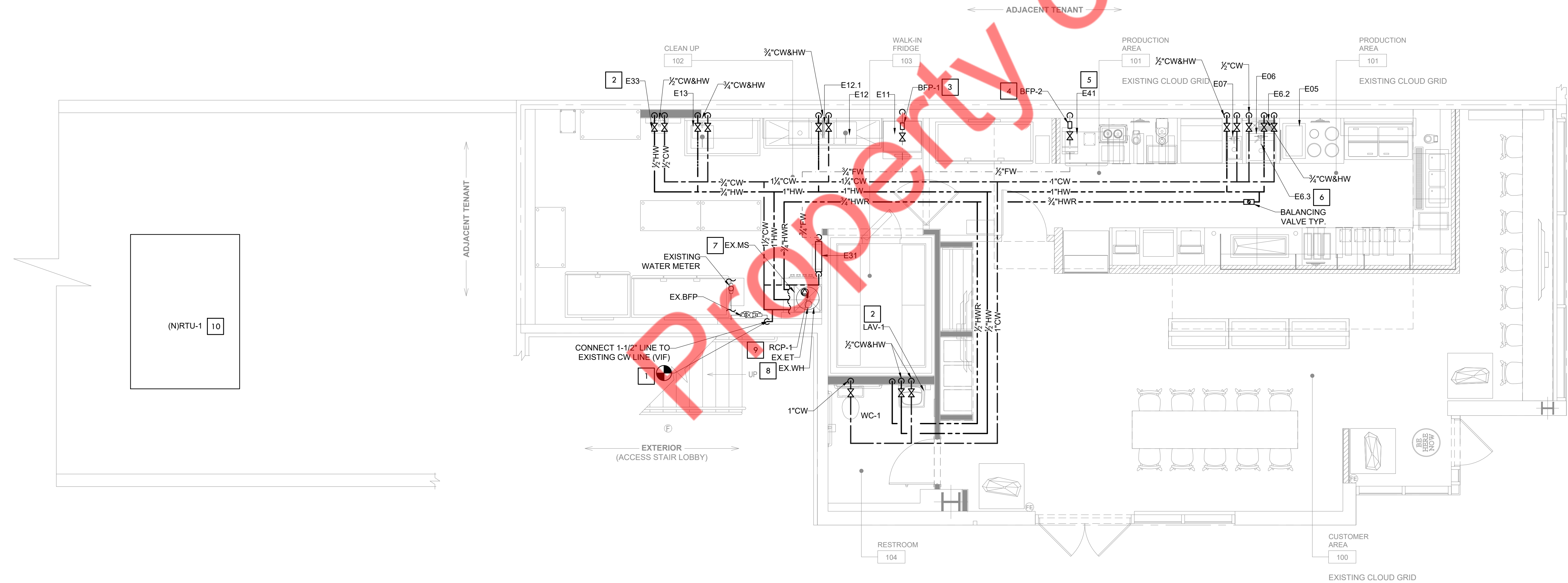
GENERAL NOTES:

- SANITARY SEWER PIPING SHOWN ON DRAWINGS IS DIAGRAMMATIC AND MAY DIFFER SLIGHTLY FROM ACTUAL FIELD CONDITIONS. PLUMBING CONTRACTOR (PC) SHALL COORDINATE WITH EXISTING FIELD CONDITIONS VIA A SANITARY VIDEO SURVEY/SCOPE TO DETERMINE THE EXACT SIZE, LOCATION, INVERT ELEVATIONS AT THE PROPOSED CONNECTIONS TO EXISTING PLUMBING SERVICES PRIOR TO BID/CONSTRUCTION. IF ACTUAL FIELD FINDINGS VARY SIGNIFICANTLY FROM THOSE AS INDICATED ON PLANS, PC SHALL NOTIFY GENERAL CONTRACTOR (GC) IMMEDIATELY PRIOR TO STARTING ANY WORK. THE OWNER SHALL NOT BE RESPONSIBLE FOR ADDITIONAL COSTS INCURRED BY FAILED COORDINATION AFTER CONSTRUCTION HAS BEGUN. PC SHALL BE RESPONSIBLE FOR UTILIZING A REPUTABLE UTILITY LOCATING SERVICE PRIOR TO ANY EXCAVATION.
- CONTRACTOR TO FIELD VERIFY FEASIBILITY OF SLAB PENETRATION AS PER STRUCTURAL REQUIREMENTS.
- ANY UNUSED PLUMBING EQUIPMENT, PIPING, ETC. WITHIN OR SERVING THE PREMISES MUST BE COMPLETELY REMOVED TO POINT OF ORIGIN AND CAPPED. DO NOT ABANDON IN PLACE.
- REFER RISER DIAGRAM FOR ALL PIPE SIZES.
- CLEAN OUT TO BE ACCESSIBLE BY ACCESS PANEL BY G.C.
- FLOOR SINK: INSTALLED FLUSH WITH FINISHED FLOOR.

SANITARY AND VENT KEYED NOTES:

- EXTEND AND CONNECT NEW 4" SANITARY PIPING TO THE EXISTING SANITARY LINE. CONTRACTOR SHALL VERIFY THE EXISTING MAIN PIPE SIZE, ROUTING, INVERT, DIRECTION OF FLOW & TIE-IN CONNECTION PRIOR TO BID.
- CONNECT NEW 3" VENT LINE TO EXISTING VTR. CONTRACTOR TO FIELD VERIFY AVAILABILITY OF EXISTING VTR AND ITS SIZE AND LOCATION PROVIDE NEW VTR IF REQUIRED.
- ROUTE INDIRECT WASTE FROM ESPRESSO MACHINE AND DROP-IN TO FLOOR SINK WITH APPROVED AIR GAP. COORDINATE WITH ELECTRICAL PLANS AND CONTRACTOR BEFORE INSTALLATION. KEEP CLEAR OF ALL ELECTRICAL WIRING UNDERNEATH COUNTER.
- ROUTE INDIRECT WASTE FROM DROP-IN SINK, DUMP SINK, BLENDER RINSE AND ICE BIN TO EXISTING FLOOR SINK WITH APPROVED AIR GAP.
- ROUTE INDIRECT WASTE FROM DROP-IN BAR, DROP-IN COLD PAN, FREEZER AND URN TROUGH TO FLOOR SINK WITH APPROVED AIR GAP.
- ROUTE INDIRECT WASTE FROM DROP-IN COLD PAN TO HUB DRAIN WITH FUNNEL WITH APPROVED AIR GAP.
- ROUTE INDIRECT WASTE FROM WATER FILTER TO MOP SINK WITH APPROVED AIR GAP.
- DISCONNECT EXISTING SANITARY LINE AND RE-CONNECT TO NEW GREASE SANITARY LINE. CONTRACTOR TO FIELD VERIFY EXISTING SANITARY ROUTE, LOCATION AND INVERT.
- EXISTING MOP SINK WITH EXISTING SANITARY P-TRAP, VENT LINE AND ASSOCIATED ACCESSORIES AND FITTINGS TO REMAIN. CONTRACTOR TO FIELD VERIFY EXISTING CONDITION OF PIPING, REPLACE IF REQUIRED.
- GT-1: GREASE TRAP SCHIER GB-2 OR EQUIVALENT. GREASE 127 LBS @350 GPM. INSTALL GREASE TRAP (BELOW FLOOR/CEILING) AS PER MANUFACTURER'S RECOMMENDATION AND LOCAL GUIDELINES. CONTRACTOR TO FIELD VERIFY GREASE TRAP LOCATION AS PER SITE CONDITION. FREEZING CONDITION PRIOR TO BID AND COORDINATE WITH ARCHITECT/LANDLORD/STRUCTURE FOR FINAL GREASE TRAP LOCATION. BASE BID ACCORDINGLY. NOTIFY ENGINEER IF ANY DISCREPANCIES.
- ALL SANITARY PIPING RUNNING AT BELOW FLOOR CEILING.
- CONTRACTOR TO FIELD VERIFY REQUIREMENT OF HEAT TRACE PRIOR TO BID. PROVIDE HEAT TRACING FOR ALL EXPOSED SANITARY PIPING IF REQUIRED. REFER TO HEAT TRACE SCHEDULE FOR MORE DETAILS.
- ROUTE INDIRECT WASTE FROM 3-COMPARTMENT SINK AND PREP SINK TO ADJACENT FLOOR SINK WITH APPROVED AIR GAP.
- 3/4" PVC CONDENSATE DRAIN TO BE HELD TIGHT TO INSIDE COOLER WALL, TO SLOPE AT A 1/4" PER FOOT, TO DROP INSIDE COOLER AND EXIT COOLER AT 12" A.F.F. TO HUB DRAIN PROVIDE WITH 2" APPROVED AIR GAP.
- EXISTING FLOOR SINK WITH EXISTING SANITARY, VENT LINE AND ASSOCIATED ACCESSORIES AND FITTINGS TO REMAIN. CONTRACTOR TO FIELD VERIFY EXISTING CONDITION OF PIPING, REPLACE IF REQUIRED.

1 SCALE 1/4" = 1' - 0" PLUMBING SANITARY AND VENT PLAN



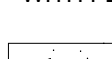
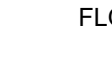
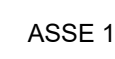
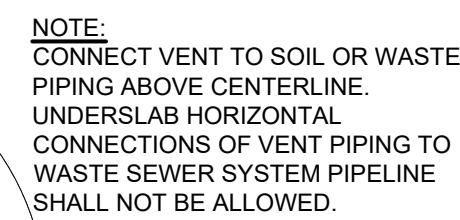
GENERAL NOTES:

- CONTRACTOR SHALL VERIFY EXISTING WATER PRESSURE IN FIELD PRIOR TO ANY WORK AND PIPING ROUGH IN.
- PRIOR TO WORK VERIFY INCOMING WATER QUALITY TO SPACE. WHEN INCOMING WATER IS ABOVE 3.5 GRAINS PER GALLON (60 PARTS PER MILLION) SCALE BUILD-UP WILL FORM INSIDE THE PLUMBING SYSTEM CAUSING DAMAGE TO SYSTEM COMPONENTS AND COPPER PIPE. TO AVOID DAMAGE DUE TO SCALE BUILD-UP, EITHER A WATER SOFTENER OR ANTI-SCALE DEVICE SHOULD BE INSTALLED AT POINT-OF-ENTRY. APPLICATIONS WHERE THERE IS A CONCERN FOR WATER SPOTS ON GLASS SHOWER DOORS, GLASS DISHES, VEHICLES IN CARWASHES, ETC., AND/OR THE EFFECTS OF HARD WATER ON HUMAN SKIN, A WATER SOFTENER SHOULD BE USED INSTEAD OF AN ANTI-SCALE DEVICE. ANTI-SCALE DEVICES REDUCE THE FORMATION OF SCALE IN A PLUMBING SYSTEM BUT DO NOT REMOVE THE CALCIUM AND MAGNESIUM FROM THE WATER, WHICH WILL REMAIN ONCE THE WATER HAS EVAPORATE LEAVING WATER SPOTS AND/OR DRYING OUT HUMAN SKIN. WATER SOFTENERS REMOVE CALCIUM AND MAGNESIUM FROM THE WATER BUT REQUIRE ROUTINE REFILLING OF SALT LEVELS IN THE BRINE TANK.
- ALL FIXTURES, EQUIPMENT, PIPING, AND MATERIALS SHALL BE LISTED.
- ALL PLUMBING FIXTURES SHALL MEET THE FLOW REQUIREMENTS SPECIFIED IN THE LOS ANGELES PLUMBING CODE.
- ALL FAUCETS IN PUBLIC RESTROOMS SHALL BE SELF CLOSING OR SELF CLOSING METERING FAUCETS.
- WATER PIPES AND FITTINGS WITH A LEAD CONTENT WHICH EXCEEDS 0.25% SHALL BE PROHIBITED IN SYSTEMS CONVEYING POTABLE WATER.
- PUBLIC LAVATORIES SHALL HAVE CONTROLS TO LIMIT THE WATER TEMPERATURE TO 110 DEGREES FAHRENHEIT.
- CONTRACTOR TO FIELD VERIFY FEASIBILITY OF SLAB PENETRATION AS PER STRUCTURAL REQUIREMENT.
- PROVIDE TRAP PRIMER FOR FLOOR DRAIN.
- REFER RISER DIAGRAM FOR ALL PIPE SIZES.
- COPPER PIPE SHALL BE USED FOR ALL WATER PIPING EXCEPT FILTERED AND R.O. WATER PIPING. TYPE "L" HARD DRAWN COPPER SHALL BE USED FOR PIPE NOT SET UNDER CONCRETE. TYPE "K" SOFT COPPER SHALL BE USED FOR PIPING UNDER CONCRETE. FITTINGS SHALL BE WROUGHT COPPER THROUGHOUT. LARR #5482) PEX PIPE SHALL BE USED FOR ALL FILTERED AND R.O. WATER LINES. "UPONOR" PEX PIPE AND FITTINGS ASTM F 876/877 AND PEX-A FITTINGS ASTM F1960, MULTI-PORT TEES, MANIFOLDS AND TRANSITION FITTINGS AS REQUIRED. INSTALLATION SHALL BE AS PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.

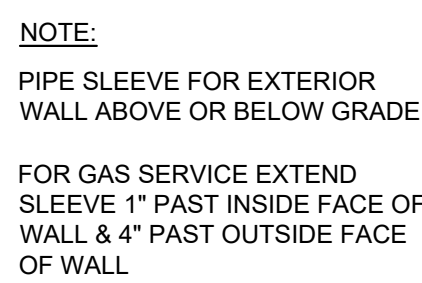
WATER AND GAS KEYED NOTES:

- CONNECT NEW 1/2" CW LINE WITH EXISTING BFP AND WATER METER TO EXISTING COLD WATER LINE IN THE SPACE. CONTRACTOR TO FIELD VERIFY EXISTING PIPE SIZE, UPGRADE IF REQUIRED.
- PROVIDE ASSE 1070 APPROVED THERMOSTATIC MIXING VALVE (TMV) TO LAVATORY AND HAND SINK. SET AT MAXIMUM 110° F.
- PROVIDE ASSE 1012 APPROVED WATTS LF90 OR EQUIVALENT BACKFLOW PREVENTER TO ICE MACHINE AT ACCESSIBLE LOCATION.
- PROVIDE ASSE 1022 APPROVED WATTS SD-3 OR EQUIVALENT BACKFLOW PREVENTER TO ESPRESSO MACHINE AT ACCESSIBLE LOCATION.
- INSTALL ACCESSIBLE 1/2" FILTERED WATER SUPPLY TO ESPRESSO MACHINE.
- PROVIDE 1/2" COLD WATER SUPPLY LINE TO SPRAYER.
- EXISTING MOP SINK WITH EXISTING WATER PIPING, AND ASSOCIATED ACCESSORIES AND FITTINGS TO REMAIN. CONTRACTOR TO FIELD VERIFY EXISTING CONDITION OF PIPING, REPLACE IF REQUIRED.
- EXISTING WATER HEATER WITH EXPANSION TANK, EXISTING WATER PIPING, AND ASSOCIATED ACCESSORIES AND FITTINGS TO REMAIN. CONNECT EXISTING WATER HEATER TO NEW WATER PIPING AS SHOWN ON THE PLAN. CONTRACTOR TO FIELD VERIFY EXISTING CONDITION OF PIPING, REPLACE IF REQUIRED.
- CONTRACTOR TO FIELD VERIFY AVAILABILITY OF EXISTING RE-CIRCULATION PUMP PRIOR TO BID. PROVIDE NEW (RCP-1) AS SHOWN ON THE PLAN IF IT IS NOT EXIST. BASE BID ACCORDINGLY.
- EXISTING RTU REPLACE WITH NEW (NRTU-1). REFER TO MECHANICAL DRAWING FOR MORE DETAIL. CONTRACTOR TO FIELD VERIFY EXISTING GAS PIPING IS IN GOOD CONDITION. REPLACE GAS PIPING IF REQUIRED. BASE BID ACCORDINGLY.

2 SCALE 1/4" = 1' - 0" WATER SUPPLY AND GAS PLAN



1	SCALE	VENT PIPING INSTLLATION	2	SCALE	MIXING VALVE DETAILS	3	SCALE	FLOOR DRAIN WITH TRAP PRIMER	4	SCALE	FLOOR SINK DETAILS
	N.T.S.			N.T.S.			N.T.S.				



SIN

PROVIDE WATER HAMMER ARRESTERS BY SIOUX CHIEF, PRECISION PLUMBING PRODUCTS, WATTS OR APPROVED EQUAL WITH PISTON AND O-RING CONSTRUCTION HAVING PDI #WH-201, ASSE #1010 AND ANSI #A112.26.1M CERTIFICATION. INSTALL IN HORIZONTAL OR VERTICAL POSITION, BUT NEVER UPSIDE DOWN. INSTALL INLINE WITH WATER FLOW DIRECTION IF POSSIBLE. SIZE UNITS PER TABLES ABOVE.

COMMENTS:

1. EACH CHEMICAL DISPENSER MUST HAVE A DEDICATED WATER SUPPLY, LOCATED WITHIN 4 FEET OF THE DISPENSER, IT MUST PROVIDE TEMPERED WATER (ADJUSTABLE FROM 60-120F) WITH A FLOW RATE OF 4 GPM AT 40 PSID DYNAMIC/FLOW PRESSURE (35 PSID MIN). HOT AND COLD WATER SUPPLY LINES MUST HAVE CHECK VALVES TO PREVENT HOT/COLD WATER CROSSOVER. THE TEMPERING VALVE DOES NOT INCLUDE IT, IT MUST INCLUDE A SHUTOFF VALVE TERMINATING IN A 3" GARDEN HOSE MALE FITTING.

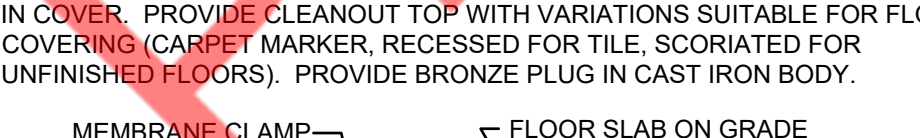
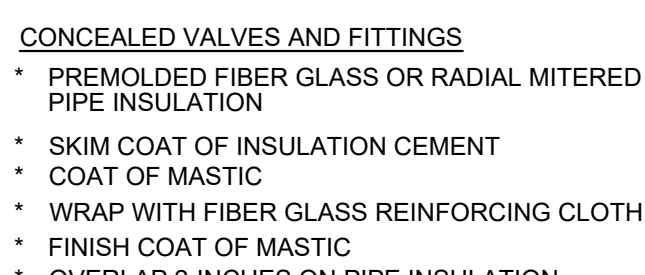
2. THE DEDICATED WATER SUPPLY SHOULD NOT HAVE ANY BACKFLOW PREVENTION (E.G. NO ATMOSPHERIC VACUUM BREAKER, ETC.), UNLESS REQUIRED BY THE LOCAL PLUMBING CODE OR UTILITIES. CHEMICAL DISPENSER INCLUDES AN INTEGRAL BACKFLOW PREVENTOR ASSE 1055 OR ASSE 10313

5	SCALE	PIPE SLEEVE THROUGH WALL SECTION	6	SCALE	WATER HAMMER ARRESTOR	7	SCALE	CHEMICAL SYSTEM AT MOP SINK
	N.T.S.			N.T.S.			N.T.S.	

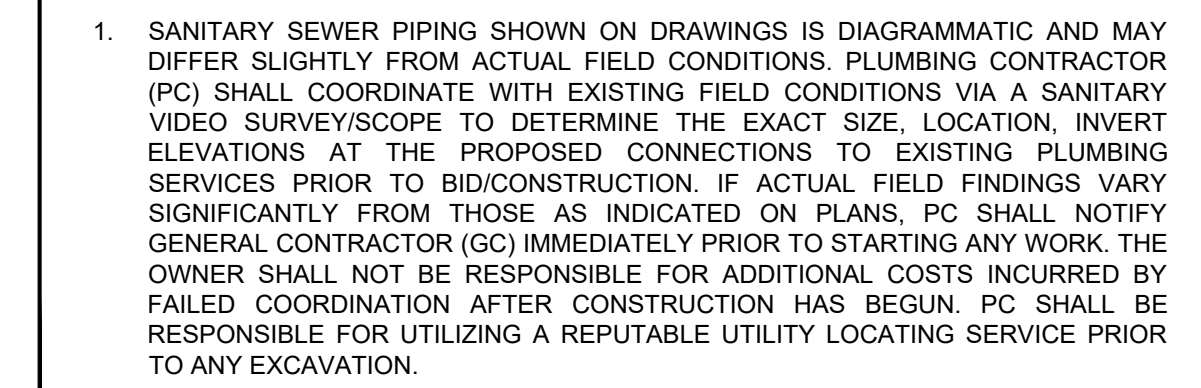


ROUTE DRAIN LINE TO WALL. ROUTE VENT UP, AND GREASE SANITARY DOWN AS SHOWN ON PLANS. ARRANGEMENT SHOWN IS SCHEMATIC. ADJUST TO SUIT FIELD CONDITIONS OR MEET LOCAL CODE REQUIREMENTS

8	SCALE	WALL CLEAN OUT DETAIL	9	SCALE	3-COMPARTMENT SINK DETAILS		<table><tr><td>5"</td><td>1/2"</td></tr><tr><td>6"</td><td>1/2"</td></tr></table>	5"	1/2"	6"	1/2"
	5"			1/2"							
6"	1/2"										
N.T.S.	N.T.S.										

ROD SCHEDULE

10	SCALE	PIPE INSULATION DETAILS	11	SCALE	FLOOR CLEAN OUT DETAIL	12	SCALE	HANGER DETAILS
	N.T.S.			N.T.S.			N.T.S.	



2	SCALE	DOMESTIC WATER ISOMETRIC DIAGRAM
	NTS	