

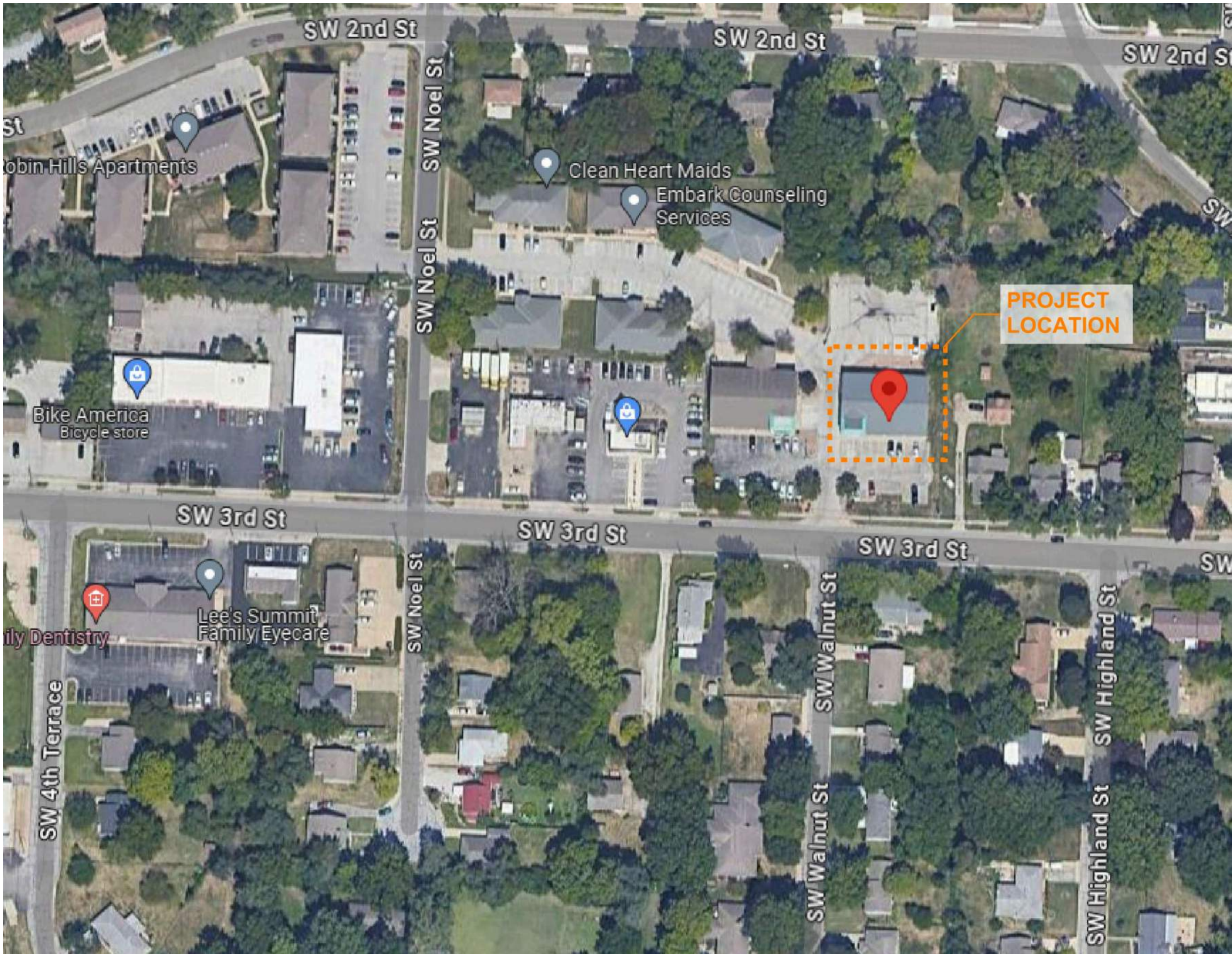
# SereniTea Boutique

500 SW 3RD ST. UNIT A  
LEE'S SUMMIT, MO 64063

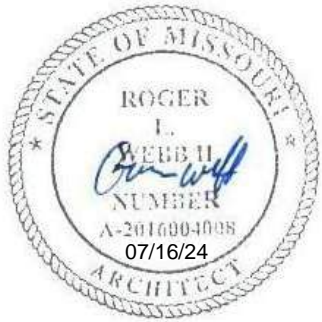
## PERMIT DOCUMENTS

16 JULY 2024

COLLINS WEBB #: 24036



GENERAL	
SHEET NUMBER	SHEET NAME
CS	COVER SHEET
G001	GENERAL INFORMATION
G002	ACCESSIBILITY GUIDELINES
G003	LIFE SAFETY PLAN, WALL TYPES, AND PROJECT INFORMATION
G500	GENERAL PROJECT SPECIFICATIONS
G501	GENERAL PROJECT SPECIFICATIONS
ARCHITECTURAL	
SHEET NUMBER	SHEET NAME
A101	PLANS, SECTIONS, AND ELEVATIONS
MEP	
SHEET NUMBER	SHEET NAME
M101	MECHANICAL NOTES, SYMBOLS & ABBREVIATIONS
M201	MECHANICAL PLAN
M301	MECHANICAL SPECIFICATIONS
E101	ELECTRICAL NOTES, SYMBOLS & ABBREVIATIONS
E201	ELECTRICAL POWER PLAN
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P201	PLUMBING WASTE AND VENT PLAN
P202	PLUMBING WATER PLAN
P301	PLUMBING SPECIFICATIONS



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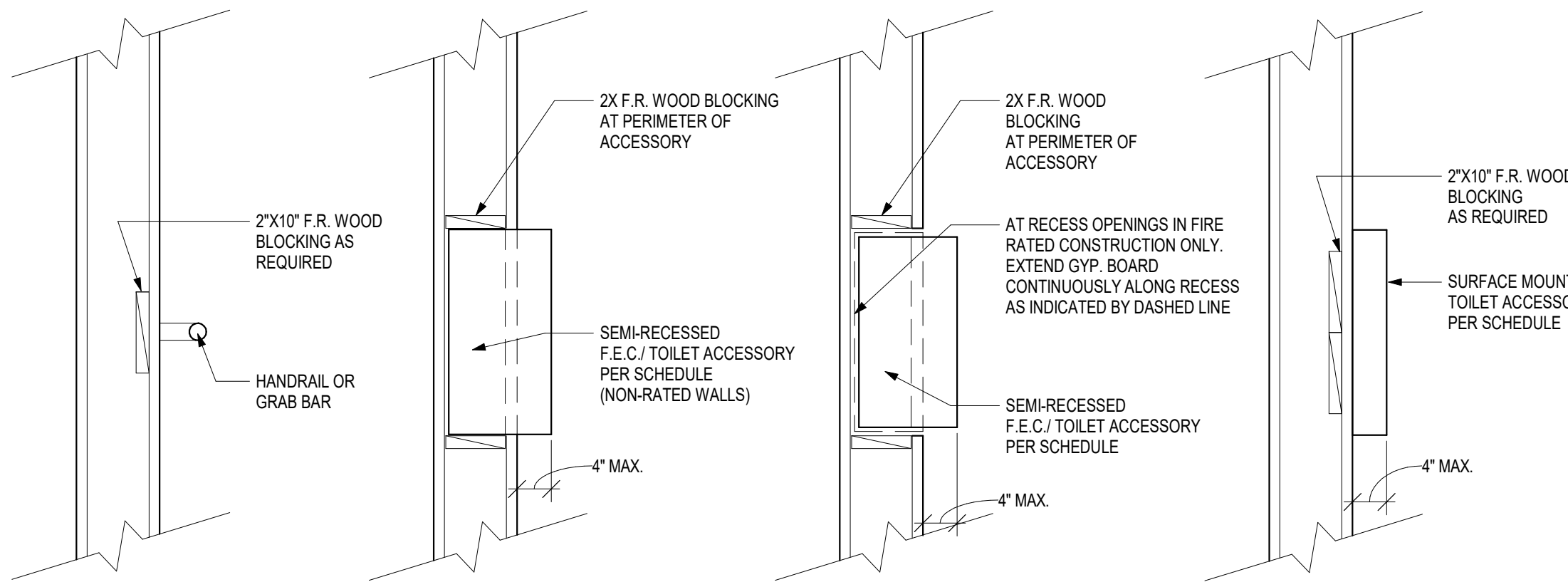




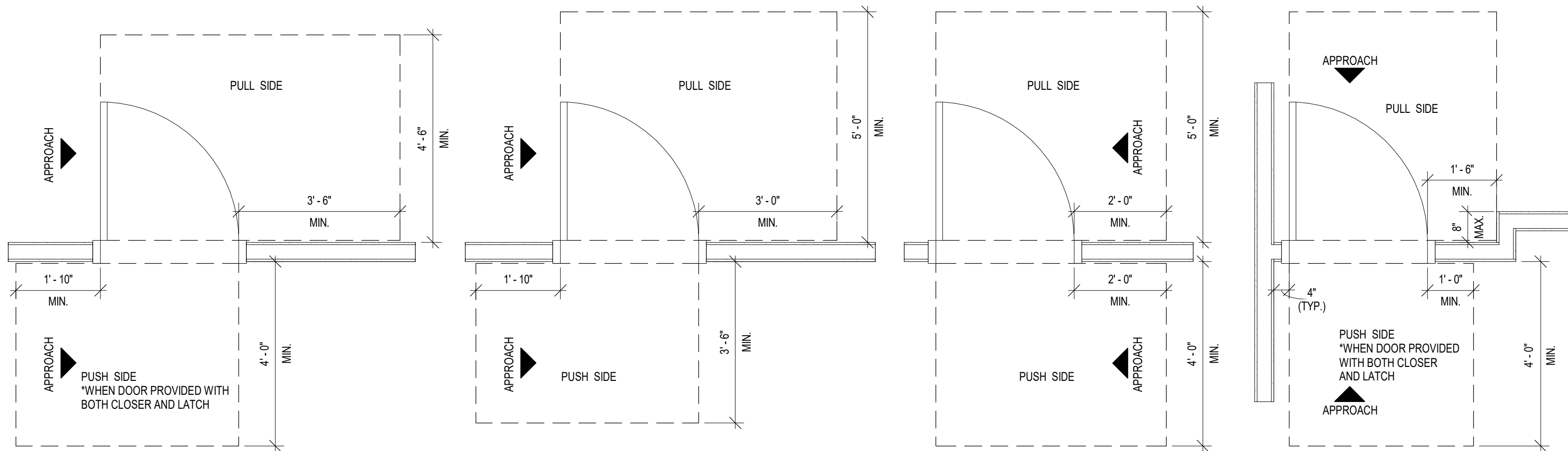
**A11** TYP. MOUNTING HEIGHTS  
1/4" = 1'-0"

MISCELLANEOUS ACCESSORY TYPICAL MOUNTING HEIGHTS														TOILET ACCESSORY TYPICAL MOUNTING HEIGHTS									
FINISH FLOOR														FINISH FLOOR									
ACCESSORY TYPE														ACCESSORY TYPE									
COMMENTS														COMMENTS									
MISCELLANEOUS ACCESSORY TYPICAL MOUNTING HEIGHTS														PLUMBING FIXTURE TYPICAL MOUNTING HEIGHTS									
FINISH FLOOR														FINISH FLOOR									
ACCESSORY TYPE														ACCESSORY TYPE									
COMMENTS														COMMENTS									
GRAB BAR TYPICAL MOUNTING HEIGHTS & TOILET ACCESSORY PLANS														GRAB BAR TYPICAL MOUNTING HEIGHTS & TOILET ACCESSORY PLANS									
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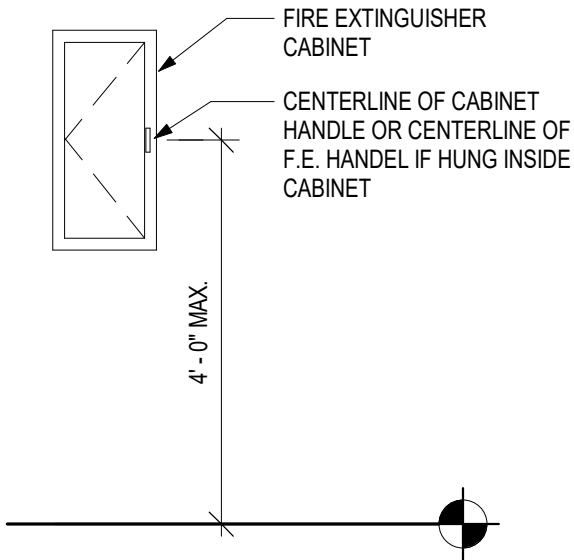
**F11** TYP. BLOCKING DETAILS  
3/4" = 1'-0"



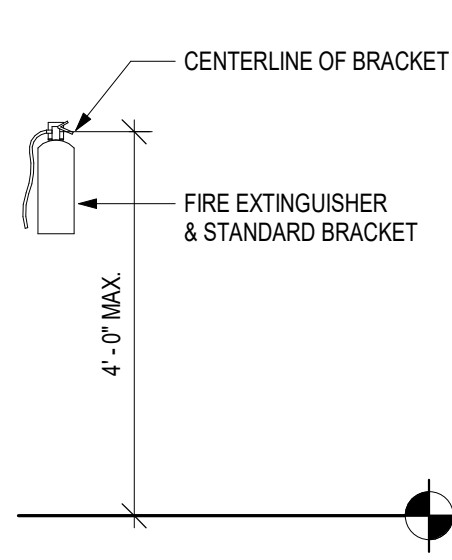
**F7** TYP. DOOR APPROACH CLEARANCES  
1/2" = 1'-0"



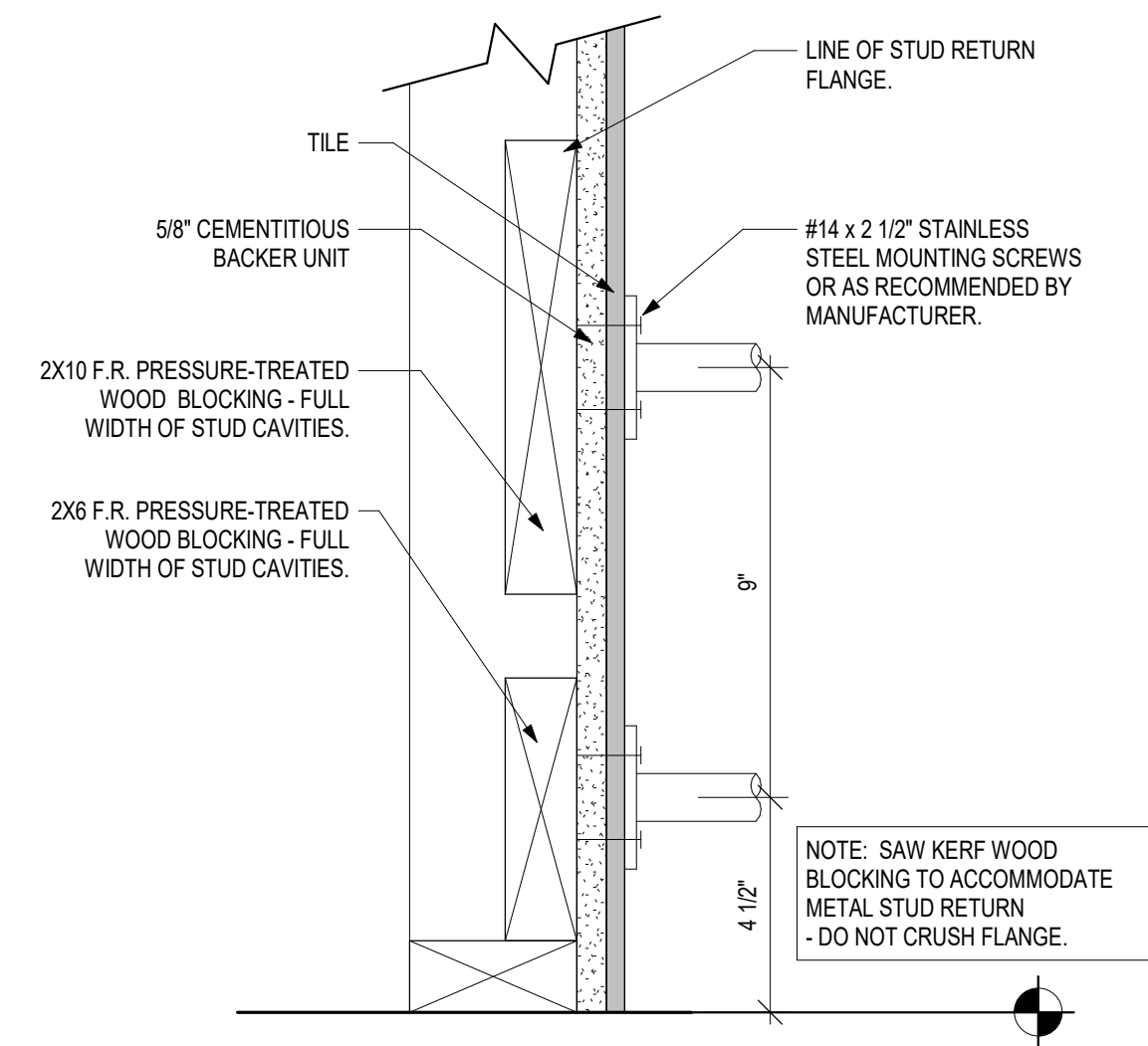
**H7** FE CABINET  
1/2" = 1'-0"



**H4** FIRE EXTINGUISHER  
1/2" = 1'-0"



**H3** BLOCKING SECTION  
3" = 1'-0"



**GENERAL NOTES:**  
**ACCESSIBILITY GUIDELINES**

- NOTE: ALL DIMENSIONS ARE MEASURED FROM FLOOR, UNLESS NOTED OR SHOWN OTHERWISE.
- ADA UNOBSTRUCTED REACH RANGES: ADA FORWARD REACH = 48" MAX. & 15" MIN. ADA SIDE REACH = 48" MAX. & 15" MIN.
- DOOR HARDWARE (TO CENTER OF HARDWARE): STANDARD MOUNTING HEIGHTS: PUSH PLATES = 42". PULL HANDLES = 42". KNOBS/LEVERS = 40". PANIC EXIT = 40". CENTERLINE OF BAR, KICKPLATES: WIDTH = DOOR WIDTH MINUS 2". CENTER, HEIGHT = 16" FROM B.O. DOOR. THRESHOLDS: STANDARD = 12" MAX. AT EXIT, SLIDING DOORS = 34" MAX. ADA HARDWARE = 34" MIN. TO 48" MAX.
- DRINKING FOUNTAINS & EWC'S (TO SPOUT): STANDARD = 40" TYP. 42" MAX. ADA = 38" MAX. (27" MIN. CLEARANCE SPACE) COUNTERTOPS (TO SINK RM/ COUNTERTOP): ADA = 28" MIN. TO 34" MAX.
- WATER CLOSETS (TO TOP OF SEAT): STANDARD = 14" TO 15". ADA (TO TOP OF SEAT) = 17" TO 19". ADA FLUSH CONTROLS = 44" MAX.
- URINALS (TO RIM): STANDARD = 24" MAX. ADA = 17" MAX. ADA FLUSH CONTROLS = 44" MAX.
- LAVATORIES (TO SINK RM/ COUNTERTOP): STANDARD = 36" MAX. ADA = 34" MAX. (27" MIN. CLEARANCE SPACE) MIRRORS (TO B.O. REFLECTIVE SURFACE): STANDARD = VARIES. ADA = 40" MAX.
- GRAB BARS: ADA (TO TOP OF BAR): WATER CLOSETS = 33" MIN. TO 36" MAX. SHOWERS = 33" MIN. TO 36" MAX. (FROM B.O. SHOWER). BATHTUBS: TOP BAR = 33" MIN. TO 36" MAX. BOT. BAR = 7" ABOVE T.O. TUB.
- SHOWER HEADS (FROM FLOOR TO HEAD): STANDARD = 72" TO 84". ADA = SPRAY UNIT W/ HOSE 60" LONG MIN. ADA = FIXED SHOWER HEAD = 48" AFF.
- SHOWER CONTROLS (TO CONTROL AREA): STANDARD = 48" MAX. (TO TOP). ADA = 38" MIN. TO 48" MAX.
- SHOWER ROD (FROM FLOOR TO C.L.): STANDARD = 78" MAX. TOILET ROOM PARTITIONS: TOILETS = 12" TO BOT. & 70" TO TOP. URINALS = 18" TO BOT. & 40" TO TOP.
- TOILET PAPER DISPENSERS (TO C.L. OF OUTLET): STANDARD = 24". ADA = 18" MIN. TO 24" MAX.
- WALL MOUNTED SOAP DISPENSERS (TO C.L. OF PUSH BUTTON): STANDARD = 48". ADA = VARIES. RE-OBSTRUCTED AND UNOBSTRUCTED REACH RANGES: ADA SIDE REACH = 48" MAX. ABOVE SINK IN COUNTER.
- PAPER TOWEL DISPENSER/ WASTE RECEPTACLE (TO TOWEL SLOT): STANDARD = 40" MAX. ADA FORWARD REACH = 48" MAX. & 15" MIN. ADA SIDE REACH = 48" MAX. & 15" MIN.
- WARM AIR HAND DRYER (TO PUSH SWITCH): STANDARD = 44" MAX. ADA FORWARD REACH = 48" MAX. & 15" MIN. ADA SIDE REACH = 48" MAX. & 15" MIN.
- SANITARY NAPKIN DISPENSER (TO C.L. OF COIN SLOT): STANDARD = 40" MAX. ADA FORWARD REACH = 48" MAX. & 15" MIN. ADA SIDE REACH = 48" MAX. & 15" MIN.
- SANITARY NAPKIN DISPOSAL (TO TOP OF UNIT): STANDARD = 28" MAX. ADA = 18" MIN. TO 24" MAX. (TO OPNG.)
- TOILET SEAT COVER DISPENSERS (TO OPNG.): STANDARD = 40" MAX. ADA FORWARD REACH = 48" MAX. & 15" MIN. ADA SIDE REACH = 48" MAX. & 15" MIN.
- SHelves: ADA = 48" MAX.
- COAT COATS: STANDARD = 68". ADA = 48" MAX.
- CHALKBOARDS, TACKBOARDS & MARKERBOARDS: STANDARD = 32" TO 38" (TO B.O. BOARD OR CHALKTRAY). STANDARD = 80" (RECOMMENDED) TO T.O. BOARD.
- THERMOSTATS & CONTROL DEVICES (TO TOP): ADA FORWARD REACH = 48" MAX. ADA SIDE REACH = 48" MAX.
- CONVENIENCE RECEPTACLES - ELECTRICAL/ TELEPHONE/ DATA (TO C.L.): STANDARD = 18". ADA = 15" MIN.
- EXIT LIGHTS - WALL MOUNTED: 2" MIN. BELOW CEILING. 2" MIN. ABOVE DOOR FRAME. EQUAL SPACE FROM CEILING TO TOP OF FRAME.
- FIRE EXTINGUISHERS (TO TOP, U.N.O.): GROSS WGT. 40 LBS. OR LESS = 80" MAX. GROSS WGT. MORE THAN 40 LBS. = 42" MAX. ADA = 40" MAX. (B.O. CABINET).
- FIRE ALARM PULL STATIONS (TO LEVER): STANDARD = 48" MAX. ADA FORWARD REACH = 48" MAX. ADA SIDE REACH = 48" MAX.
- SMOKE AND/OR HEAT DETECTORS: STANDARD = CEILING HEIGHT.
- HORN SPEAKER/ VISUAL SIGNALS: STANDARD = 80" AFF. OR 6" BELOW CEILING - WHICHEVER IS LOWER.
- ROOM SIGNAGE (TO C.L.): STANDARD = 60" HIGH AFF. & WITHIN 18" OF LATCH SIDE OF DOOR.











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**SPECIFICATIONS - PRODUCT & INSTALLATION GENERAL REQUIREMENTS**

**DIVISION 9 - FINISHES (CONT.)**

**PART 3 EXECUTION (99 9900 HIGH PERFORMANCE COATINGS CONT.)**

- 3.1 MANUFACTURER'S INSTRUCTIONS.
- 3.2 EXAMINATION.
- A. SITE VERIFICATION OF CONDITIONS: VERIFY THAT SUBSTRATE CONDITIONS ARE SUITABLE FOR INSTALLATION OF THE FLOORING SURFACE SYSTEM.
- B. DO NOT PROCEED WITH INSTALLATION UNTIL UNSUITABLE CONDITIONS ARE CORRECTED.
- 3.3 SURFACE PREPARATION.
- A. DEGREASING: IT IS VERY IMPORTANT WHEN USING A DEGREASER THAT THE CLEAN-UP IS ABSOLUTELY THOROUGH AND COMPLETE AND THAT NO DISSOLVED RESIDUE, FAT, OILS, GREASE, DUST, ETC. IS LEFT ON THE SURFACE. THIS IS FURTHER ACHIEVED BY REPEATING RINSES OF WATER.
2. EEO-800 ECO-ETCH PRO ETCH-A-CLEAN CONCENTRATE
1. EF-500 ECO-FAST 500 DEGREASER CONCENTRATE
- B. CONCRETE: THE CONCRETE SURFACE SHOULD BE HAND TROWELED OR WITH A BRUSH/BROOM FINISH TO ENSURE OPTIMUM POROSITY FOR ADHESION. OTHERWISE PROPER SURFACE PROFILING IS REQUIRED. NEW CONCRETE NEEDS AT LEAST 28 DAYS TO CURE PROPERLY. PRIOR TO PRIMER APPLICATION, UNLESS THE NEW CONCRETE IS DRY, ADHESION PROBLEMS WILL BE EXPERIENCED.
1. PROFILE AND CLEAN THE CONCRETE FOR MAXIMUM BONDING AND PENETRATION BY USING ECO ETCH PRO CONCENTRATE IN FULL STRENGTH OR 1:1. IF PERFORMING MECHANICAL ABRASION, BE SURE THE SURFACE TEXTURE DOES NOT ALTER EXPECTED RESULTS. VERY DENSE SURFACE STILL MAY REQUIRE AN ECO ETCH PRO APPLICATION TO OPEN THE PORES ADEQUATELY. TEST FOR OPTIMUM POROSITY PRIOR TO PROCEEDING. A CSP-1 TO CSP-3 SURFACE PROFILE IS REQUIRED DEPENDENT UPON SURFACE TEXTURE, FINISH, AND ENVIRONMENT.
2. CONCRETE SHOULD BE COMPLETELY CLEAN AND DRY. TEST FOR PROPER PH LEVELS AND MOISTURE VAPOR TRANSMISSION PER INDUSTRY STANDARDS FOR COATING APPLICATIONS.
3. PATCH ALL IMPERFECTIONS, CRACKS, ETC WITH CONCRETE PATCH FILLER AND FLEXIBLE JOINT FILLERS. DO NOT USE SILICONE PRODUCTS. THE PRODUCT WILL NOT ADHERE TO SILICONE.
4. PRIME WITH ET-6900 OR ET-7007 AS PER MANUFACTURER INSTRUCTIONS. WHEN PRIMER HAS PROPERLY CURED, PERFORM TEST PATCH TO ENSURE ADHESION.
- C. WOOD: INSPECT THOROUGHLY FOR EXCESSIVE MOISTURE AND TANNIN BLEED. ALL WOOD SPECIES MUST BE COMPLETELY DRY AND FREE FROM BLEED.
1. SAND WOOD IF NECESSARY TO REMOVE ALL BOND BREAKERS, LOOSE PARTICLES AND OTHER SURFACE CONTAMINANTS.
2. DEGREASE WITH SOY-IT DEGREASER TO REMOVE SURFACE OILS, GRIME. ENSURE THAT ALL RESIDUE AND DUST IS COMPLETELY REMOVED.
3. WOOD SHOULD BE COMPLETELY CLEAN AND DRY BEFORE APPLYING COATING MATERIALS.
- D. METAL: PRIME METALS WITH AN APPLICABLE STANDARD WATER-BASED RUST INHIBITING PRIMER TO INHIBIT RUST AND CORROSION PRIOR TO COATING APPLICATION. HIGH TRAFFIC AREAS WITH STEEL GRATES, DIAMOND PLATE RAMPS, ETC. SHOULD BE ACID WASHED AND/OR GRIND TO PROVIDE OPTIMUM PROFILE FOR COATING ADHESION PRIOR TO A PRIME COAT.
- 3.4 INSTALLATION.
- A. TYPES OF APPLICATIONS
1. ROLLER APPLICATION
- A. USE A 3/8" NAP ROLLER WHEN APPLYING THE PRIMER, FLOOR COATING, OR CLEAR COATING. USE A FOAM TEXTURED ROLLER WHEN APPLYING THE ECO-TUFF FLOOR COATING WITH RUBBER AGGREGATE. OTHER ROLLERS MAY NOT PICK UP AND SPREAD THE PRODUCT EVENLY. THE FOAM TEXTURED ROLLER MUST BE CAPABLE OF LIFTING THE RUBBER CRUMBS WITHIN THE PRODUCT TO THE SURFACE. ALL OTHER PRODUCTS ARE SUITABLE USE TRADITIONAL AND APPLICABLE SIZED NAP FOR THE INTENDED SUBSTRATE AND TEXTURE.
- B. SOAK ROLLER IN WATER - REMOVE EXCESS WATER PRIOR TO APPLICATION.
- C. POUR PRODUCT INTO PAINT TRAY OR HANG ROLLER GRID INTO A GALLON BUCKET. MAKE SURE TO COMPLETELY SATURATE ROLLER WITH PRODUCT. LEAVING NO BARE SPOTS ON ROLLER.
- D. APPLY THE PRIMER COAT AS A THIN COAT AND ALLOW TO DRY TO BE TACK FREE USUALLY WITHIN 1 HOUR AND NOT TO EXCEED 24 HOURS.
- E. RESATURATE ROLLER AFTER EACH PASS. MAKE 4-5 CONSECUTIVE PASSES IN THE SAME DIRECTION, WITH EACH PASS RIGHT NEXT TO THE OTHER. WHEN APPLYING, ROLL IN ONE DIRECTION FIRST, THEN ROLL IN THE OPPOSITE DIRECTION IN ORDER TO PROPERLY BLEND THE PRODUCT AND CREATE A UNIFORM SURFACE.
- F. ONCE AN AREA IS COVERED, RUN THE ROLLER VERY LIGHTLY OVER IT TO ENSURE EVEN DISTRIBUTION OF COLOR AND RUBBER CRUMB IF APPLICABLE.
- G. WHEN DRY TO THE TOUCH, APPLY 2ND COAT. IF INSTALLING NON SKID AGGREGATE, APPLY THE ECOTUFF FLOOR COATING WITHOUT AGGREGATE OR APPLY THE ECOTUFF CLEAR COAT AS THE FINISH COAT TO HELP ENCAPSULATE OR REGULATE THE FINAL TEXTURE. REPEAT IF A 3RD COAT IS DESIRED.
2. SPRAY APPLICATIONS
- A. MASK OFF AREAS AS NEEDED
1. WHEN SPRAY APPLYING ECO-TUFF FLOOR COATING WITH RUBBER AGGREGATE MIXED, USE A HOPPER TYPE GRACO BRAND "TEX-SPRAY COMPACT" OR EQUIVALENT.
2. WHEN SPRAY APPLYING ECO-TUFF CLEAR COATING USE A STANDARD AIRLESS WITH A # 12-415 TIP AS APPLICABLE TO THE FINISH AND MIL THICKNESS REQUIRED.
- B. ATTACH SPRAY GUN TO A COMPRESSOR AIRLINE GIVING PRESSURE OF AT LEAST 40 PSI.
- C. SPRAY ALL WATER OUT OF THE GUN TO PRIME.
- D. BEFORE STARTING THE JOB, SPRAY A FEW SHORT BURSTS AWAY FROM THE SURFACE TO TEST THAT EVERYTHING IS WORKING PROPERLY.
- E. HOLDING GUN APPROXIMATELY 12-24" AWAY FROM SURFACE. SPRAY AN EVEN, LIGHT COAT OVER THE ENTIRE SURFACE. DO NOT APPLY TOO THICK.
- F. KEEP SPRAY GUN AT A 90 DEGREE ANGLE TO THE SURFACE.
- G. IF USING THE HOPPER SPRAY GUN FOR THE NON-SKID COATING, IT SHOULD MAKE A SLIGHT "SPITTING" SOUND. THIS IS A CHARACTERISTIC OF THE GUNS AND IS NECESSARY FOR AN EVEN TEXTURE. THE PRODUCT WILL SELF-LEVEL TO A CERTAIN EXTEND, BUT DO NOT ALLOW TO PUDDLE.
- H. WHEN SURFACE BECOMES TOUCH DRY, SPRAY SUBSEQUENT COATS.
- I. WHILE SPRAYING THE ECO-TUFF FLOOR COATING WITH RUBBER AGGREGATE, BE CAREFUL NOT TO BLOW RUBBER CRUMBS AWAY FROM THE AREA YOU ARE WORKING ON AS THIS CAN ACCUMULATE IN OTHER AREAS OF THE JOB THAT WILL PREVENT THE COATING FROM BONDING WITH THE SUBSTRATE.
- J. IF THE RUBBER CRUMB IS BOUNCING BACK AT YOU, LOWER THE PRESSURE OR HOLD GUN FURTHER FROM THE SURFACE. THE FURTHER AWAY FROM THE SURFACE YOU HOLD THE GUN, THE GREATER THE TEXTURE. THE CLOSER, THE FINER.
- K. REMOVE ANY OVER SPRAY IMMEDIATELY WITH CLOTH AND WATER.
- B. APPLICATION TEMPERATURE AND CURING TIME
1. UNDER NORMAL WORKING CONDITIONS, THE PRODUCT WILL BE DRY TO THE TOUCH WITHIN 1 HOUR AND CAN BE SUBJECTED TO LIGHT FOOT TRAFFIC WITHIN 24 HOURS. FULL CURING TIME ONLY AFFECTS THE AMOUNT OF TIME REQUIRED TO WAIT BEFORE SUBJECTING THE SURFACE TO CLEANING, HEAVY LOADS AND CHEMICAL EXPOSURE. SURFACE CAN BE SUBJECTED TO NORMAL LOADS WELL BEFORE THIS MINIMUM TIME REQUIREMENT.
2. THE COATING SHOULD NOT BE SUBJECTED TO CLEANING, HEAVY LOADS, OR CHEMICAL EXPOSURE UNTIL FULLY CURED AFTER 7 DAYS. LESS IN HOT-HUMID CONDITIONS, MORE IN COLD, DRY WEATHER. SUMMERSED APPLICATIONS SHOULD ALLOW A 7-14 DAYS. DRY TIMES IN THIS MANUAL ARE BASED ON A TEMPERATURE OF 77 DEGREES F AND 50% HUMIDITY. THE PRODUCT SHOULD NOT BE USED UNDER 40 DEGREES F. DO NOT ALLOW PRODUCT TO FREEZE.
3. DO NOT USE ANY SOLVENTS, SOLVENT BASED ALCOHOLS, THINNERS OR LACQUERS TO THIN PRODUCT.
- 3.5 PROTECTION: PROTECT THE INSTALLED SURFACE FROM DAMAGE RESULTING FROM SUBSEQUENT CONSTRUCTION ACTIVITY ON THE SITE.
- 3.6 STORAGE AND REPAIR.
- A. TO STORE PARTIALLY USED CANS, SEAL CAN WELL (AIRTIGHT) AND PLACE IN COOL, DRY PLACE. THE CONTENTS SHOULD BE USEABLE FOR AT LEAST 12 MONTHS.
- B. THE EVAPORATION OF THE WATER WITHIN THE PRODUCT WILL CAUSE THE PRODUCT TO CURE. IF SOME WATER CONTENT HAS EVAPORATED, RECONSTITUTION WITH CLEAN WATER MAY RESTORE PRODUCT VIABILITY IF THE CURING PROCESS WITHIN THE CAN IS NOT TOO ADVANCED.
- 3.7 REPAIRING: IN THE EVENT THAT THE PRODUCT IS DAMAGED, IF IT CAN EASILY BE REPAIRED OR OVER-COATED, DUE TO SELF-BONDING.
- A. REMOVE ALL DAMAGED PRODUCT. USE A SHARP KNIFE SUCH AS A UTILITY KNIFE TO MAKE A WELL-DEFINED AREA SUCH AS A SQUARE AND ELIMINATE UNEVEN EDGES.
- B. SAND AREA WITH 36 OR 40 GRIT SANDPAPER SO THAT THE NEW APPLICATION CAN GET A GOOD GRIP. SLIGHTLY BEVEL THE EDGES OF THE EXISTING PRODUCT SO THAT THE NEW PRODUCT CAN FILL IN THE CUTOUT AREA AND GO SLIGHTLY ONTO THE EXISTING.
- C. CLEAN AREA WITH WATER.
- D. TEST FOR ADHESION FIRST. BEFORE COMPLETING JOB, THEN APPLY THE PRODUCT TO THE AFFECTED AREA.
- 3.8 MAINTENANCE.
- A. MOST GENERAL NEUTRAL PH FLOOR CLEANERS HAVE BEEN TESTED AND WILL WORK WELL. WE RECOMMEND ECOFAST 500 DEGREASER CONCENTRATE.
- B. DO NOT USE CONCENTRATED BLEACH OR CAUSTICS.
- C. FOR BEST RESULTS ON THE ECO-TUFF FLOOR COATING WITH TEXTURED AGGREGATES, USE A STIFF BRISTLE DECK BRUSH TO AGITATE CLEANER ON THE SURFACE. RINSE THOROUGHLY TO REMOVE ALL RESIDUE. ALL OTHERS USE A WET/DRY MICROFIBER MOP.
- D. SURFACES CAN ALSO BE CLEANED WITH THE USE OF AUTOMATIC SCRUBBERS. THESE ARE MACHINES WHICH, IN ONE PASS, PUT DOWN THE WASHING SOLUTION, SCRUB THE FLOOR WITH A LIGHT PAD OR BRUSH ATTACHMENT AND EXTRACT THE DIRTY WATER. IT SHOULD BE POINTED OUT THAT THE PAD PRESSURE USED IN THE SCRUBBER MUST BE LIGHT AND NEED ONLY BE SUFFICIENT FOR THE PAD TO MAKE LIGHT CONTACT WITH THE FLOOR.
- E. HEAVY SCRUBBING WILL NEGATIVELY AFFECT THE COATED SURFACE OVER TIME.

**DIVISION 10 - SPECIALTIES**

**10 4400 - FIRE PROTECTION SPECIALTIES**

- A. REFERENCE CONSTRUCTION DRAWINGS FOR TYPE, SIZE AND LOCATIONS OF FIRE EXTINGUISHERS AND CABINETS.
- B. SUBMITTALS: PRODUCT DATA ONLY.
- C. FIELD CONDITIONS: DO NOT INSTALL EXTINGUISHERS WHEN AMBIENT TEMPERATURE MAY
- D. MANUFACTURERS:
1. FIRE EXTINGUISHERS:
- A. ANSUL, A TYCO BUSINESS: WWW.ANSUL.COM/.
- B. KIDDE, A UNIT OF UNITED TECHNOLOGIES CORP.: WWW.KIDDE.COM/.
- C. NYSTROM, INC.: WWW.NYSTROM.COM/.
- D. SUBSTITUTIONS: SEE SECTION 106000 - PRODUCT REQUIREMENTS.
2. FIRE EXTINGUISHER CABINETS AND ACCESSORIES:
- A. ACTVAX CONSTRUCTION PRODUCTS GROUP - JL INDUSTRIES: WWW.ACTVAXPCG.COM
- B. ANSUL, A TYCO BUSINESS: WWW.ANSUL.COM
- C. LARSENS MANUFACTURING CO.: WWW.LARSENSMFG.COM
- D. NYSTROM, INC.: WWW.NYSTROM.COM
- E. PYRO-CHEM, A TYCO BUSINESS: WWW.PYROCHEM.COM
- F. SUBSTITUTIONS: SEE SECTION 106000 - PRODUCT REQUIREMENTS
- E. FIRE EXTINGUISHERS - GENERAL: COMPLY WITH PRODUCT REQUIREMENTS OF NFPA 10 AND APPLICABLE CODES, WHICHEVER IS MORE STRINGENT.
2. MULTIPURPOSE DRY CHEMICAL TYPE FIRE EXTINGUISHERS: CARBON STEEL TANK, WITH PRESSURE GAUGE.
- A. CLASS: A-B-C TYPE.
- B. SIZE: 10 POUND (4.54 kg)
- C. FINISH: BAKED POLYESTER POWDER COAT, COLOR AS SELECTED
- D. TEMPERATURE RANGE: MINUS 40 DEGREES F TO 120 DEGREES F.
3. DRY CHEMICAL TYPE FIRE EXTINGUISHERS: STAINLESS STEEL TANK, WITH PRESSURE GAUGE.
- A. CLASS: K-TYPE
- B. SIZE: 2.5 POUND (1.13 kg)
- C. FINISH: POLISHED STAINLESS STEEL
- D. TEMPERATURE RANGE: MINUS 20 DEGREES F TO 120 DEGREES F.
- F. FIRE EXTINGUISHER CABINETS:
1. FIRE RATING: LISTED AND LABELED IN ACCORDANCE WITH ASTM E814 REQUIREMENTS FOR FIRE RESISTANCE REATING OF WALLS WHERE BEING INSTALLED.
2. CABINET CONSTRUCTION: NON-FIRE RATED.
3. FORMED STAINLESS STEEL SHEET 0.036 INCH THICK BARE METAL.
3. FIRE RATED CABINET CONSTRUCTION: ONE-HOUR FIRE RATED.
- A. STEEL: DOUBLE WALL OR OUTER ADN INNER BOXES WITH 5/8 INCH THICK FIRE BARRIER MATERIAL.
4. CABINET CONFIGURATION: RECESSED TYPE.
- A. SIZE TO ACCOMMODATE ACCESSORIES.
- B. TRIMLESS TYPE.
- C. PROVIDE CABINET ENCLOSURE WITH RIGHT ANGLE INSIDE CORNERS AND SEAMS, AND WITH FORMED PERIMETER TRIM AND DOOR STILES.
5. DOOR: 0.036 INCH METAL THICKNESS, REINFORCED FOR FLATNESS AND RIGIDITY WITH NYLON CATCH HINGE DOORS FOR 180 DEGREE OPENING WITH TWO BUTT HINGE.
6. DOOR GLAZING: ACRYLIC PLASTIC, CLEAR, 1/8 INCH THICK, FLAT SHAPE AND SET IN RESILIENT CHANNEL GLAZING GASKET.
7. CABINET MOUNTING HARDWARE: APPROPRIATE TO CABINET, WITH PRE-DRILLED HOLES FOR PLACEMENT OF ANCHORS.
8. FINISH OF CABINET EXTERIOR TRIM AND DOOR: NO. 4 - BRUSHED STAINLESS STEEL.
9. FINISH OF CABINET INTERIOR: WHITE COLORED ENAMEL.
- G. ACCESSORIES:
1. EXTINGUISHER BRACKETS: FORMED STEEL, CHROME-PLATED
- H. INSTALLATION:
1. INSTALL IN ACCORDANCE WITH MFG'S INSTRUCTIONS.
2. SECURE RIGIDLY IN PLACE.

**DIVISION 11 - EQUIPMENT**

**11 3000 - APPLIANCES**

- A. REFERENCE CONSTRUCTION DRAWINGS FOR QUANTITY, AND LOCATION OF APPLIANCES TO BE FURNISHED BY OWNER.

**DIVISION 12 - FURNISHINGS**

**12 3661 COUNTERTOPS**

- A. REFERENCE CONSTRUCTION DRAWINGS & SCHEDULES FOR TYPE, QUANTITY, AND LOCATIONS OF TOILET AND BATH ACCESSORIES.
- B. SUBMITTALS: INCLUDE PLANS, SECTIONS, DETAILS, AND ATTACHMENTS TO OTHER WORK.
1. PRODUCT DATA FOR EACH STONE, STONE ACCESSORY, AND MANUFACTURED PRODUCT.
2. STORAGE AND HANDLING REQUIREMENTS AND RECOMMENDATIONS.
3. SAMPLES: FOR EACH STONE TYPE INDICATED.
- C. FIELD CONDITIONS:
1. FIELD MEASUREMENTS: VERIFY DIMENSIONS OF CONSTRUCTION TO RECEIVE STONE COUNTERTOPS BY FIELD MEASUREMENTS BEFORE FABRICATION.
- D. PRODUCTS:
1. SOURCE LIMITATIONS FOR STONE: OBTAIN FROM A SINGLE SOURCE TO PROVIDE MATERIALS OF CONSISTENT QUALITY IN APPEARANCE AND PHYSICAL PROPERTIES.
- E. COUNTERTOPS:
1. QUALITY STANDARD: PREMIUM GRADE, IN ACCORDANCE WITH AWWA/MACW (AWS) OR AWWACW (NAAWS), UNLESS NOTED OTHERWISE.
2. QUALITY STANDARD: SEFA 3 FOR LABORATORY WORKSURFACES.
3. PLASTIC LAMINATE COUNTERTOPS: HIGH-PRESSURE DECORATIVE LAMINATE (HPDL) SHEET BONDED TO SUBSTRATE.
- A. LAMINATE SHEET: NEMA LD 3, GRADE HGS, 0.048 INCH NOMINAL THICKNESS.
- B. EXPOSED EDGE TREATMENT: AS NOTED. SUBSTRATE BUILT UP TO MINIMUM 1-1/4 INCH THICK, COVERED WITH MATCHING LAMINATE.
- C. BACK AND END SPLASHES: SAME MATERIAL, SAME CONSTRUCTION.
- D. FABRICATE IN ACCORDANCE WITH AWWA/MACW (AWS) OR AWWACW (NAAWS), SECTION 11 - COUNTERTOPS, CUSTOM GRADE.
- E. MANUFACTURERS:
- A. REFER TO FINISH LEGEND.
4. NATURAL QUARTZ AND RESIN COMPOSITE COUNTERTOPS: SHEET OR SLAB OF NATURAL QUARTZ AND PLASTIC RESIN OVER CONTINUOUS SUBSTRATE.
- A. FLAT SHEET THICKNESS: 1-1/4 INCH, MINIMUM.
- B. NATURAL QUARTZ AND RESIN COMPOSITE SHEETS, SLABS AND CASTINGS: COMPLYING WITH ISFA 3-41 AND NEMA LD 3, ORTHOPHTHALIC POLYESTER RESIN, MINERAL FILLER, AND PIGMENTS: HOMOGENEOUS, NON-POROUS AND CAPABLE OF BEING WORKED AND REPAIRED USING STANDARD WOODWORKING TOOLS; NO SURFACE COATING; COLOR AND PATTERN CONSISTENT THROUGHOUT THICKNESS.
- C. MANUFACTURERS:
- A. REFER TO FINISH LEGEND FOR SOLID SURFACE AND CORIAN QUARTZ DESCRIPTIONS, MANUFACTURERS, PRODUCT NUMBERS, COLORS, SIZES AND CONTACT INFORMATION.
- D. FACTORY FABRICATE COMPONENTS TO THE GREATEST EXTENT PRACTICAL IN SIZES AND SHAPES INDICATED; COMPLY WITH THE MAX DIMENSION STONE DESIGN MANUAL.
- E. FINISH ON EXPOSED SURFACES: POLISHED.
- F. COLOR AND PATTERN: AS INDICATED ON DRAWINGS.
5. CULTURED MARBLE AND RESIN COMPOSITE VANITY COUNTERTOP WITH INTEGRATED BOWL OVER CONTINUOUS SUBSTRATE.
- A. CULTURED MARBLE AND RESIN COMPOSITE SHEETS, SLABS AND CASTINGS: ORTHOPHTHALIC POLYESTER RESIN, MINERAL FILLER, AND PIGMENTS: HOMOGENEOUS, NON-POROUS AND CAPABLE OF BEING WORKED AND REPAIRED USING STANDARD WOODWORKING TOOLS; NO SURFACE COATING; COLOR AND PATTERN CONSISTENT THROUGHOUT THICKNESS.
- B. MANUFACTURERS:
- A. REFER TO FINISH LEGEND FOR DESCRIPTIONS, MANUFACTURERS, PRODUCT NUMBERS, COLORS, SIZES AND CONTACT INFORMATION.
- C. FINISH ON EXPOSED SURFACES: POLISHED.
- D. COLOR AND PATTERN: AS INDICATED ON DRAWINGS.
- F. INSTALLATION:
1. SECURELY ATTACH COUNTERTOPS TO CABINETS OR SUPPORTS USING CONCEALED FASTENERS. MAKE FLAT SURFACES LEVEL; SHIM WHERE REQUIRED.
2. ATTACH PLASTIC LAMINATE COUNTERTOPS USING SCREWS WITH MINIMUM PENETRATION INTO SUBSTRATE BOARD OF 5/8 INCH.
3. SEAL JOINT BETWEEN BACK/END SPLASHES AND VERTICAL SURFACES.
4. GENERAL: INSTALL COUNTERTOPS OVER PLYWOOD SUBTOPS WITH FULL SPREAD OF WATER CLEANABLE EPOXY ADHESIVE.
5. GENERAL: INSTALL COUNTERTOPS BY ADHERING TO SUPPORTS WITH WATER CLEANABLE EPOXY ADHESIVE.
6. SET STONE TO COMPLY WITH REQUIREMENTS INDICATED. SHIM AND ADJUST STONE TO LOCATIONS INDICATED, WITH UNIFORM JOINTS OF WIDTHS INDICATED AND WITH EDGES AND FACES ALIGNED ACCORDING TO ESTABLISHED RELATIONSHIPS.
7. SPACE JOINTS WITH 1/16" INCH GAP FOR FILLING WITH SEALANT. USE TEMPORARY SHIMS TO ENSURE UNIFORM SPACING. CLAMP UNITS TO TEMPORARY BRACING, SUPPORTS, OR EACH OTHER TO ENSURE THAT COUNTERTOPS ARE PROPERLY ALIGNED AND JOINTS ARE OF SPECIFIED WIDTH.
8. COMPLETE CUTOUTS NOT FINISHED IN SHOP. MASK AREAS OF COUNTERTOPS ADJACENT TO CUTOUTS TO PREVENT DAMAGE WHILE CUTTING. USE POWER SAWS WITH DIAMOND BLADES TO CUT STONE. MAKE CUTOUTS TO ACCURATELY FIT ITEMS TO BE INSTALLED, AND AT RIGHT ANGLES TO FINISHED SURFACES UNLESS BEVELING IS REQUIRED FOR CLEARANCE. EASE EDGES SLIGHTLY TO PREVENT SNIFFING.
9. INSTALL BACK/SPLASHES AND END SPLASHES BY ADHERING TO WALL WITH WATER- CLEANABLE EPOXY ADHESIVE. LEAVE 1/16" INCH GAP BETWEEN COUNTERTOP AND SPLASHES FOR FILLING WITH SEALANT. USE TEMPORARY SHIMS TO ENSURE UNIFORM SPACING.
10. GROUT JOINTS TO COMPLY WITH ANSI A108.10. REMOVE TEMPORARY SHIMS BEFORE GROUTING. TOOL GROUT UNIFORMLY AND SMOOTHLY WITH PLASTIC TOOL.
11. APPLY SEALANT TO JOINTS AND GAPS SPECIFIED FOR FILLING WITH SEALANT; COMPLY WITH SECTION 072900 "JOINT SEALANTS." REMOVE TEMPORARY SHIMS BEFORE APPLYING SEALANT.
12. ASSURE THAT SEAMS ARE SMOOTH LEVEL AND TIGHT. SEAMS SHALL BE FILLED ENTIRELY SO FLUSH WITH COUNTERTOP. POLISH SURFACE AT SEAM. ASSURE THAT FILLER IS NON-YELLOWING.
13. CLEANING: CLEAN COUNTERTOPS AS WORK PROGRESSES. REMOVE ADHESIVE, GROUT, MORTAR, AND SEALANT REMAERS IMMEDIATELY. CLEAN STONE COUNTERTOPS NO FEWER THAN SIX DAYS AFTER COMPLETION OF INSTALLATION, USING CLEAN WATER AND SOFT BRUSHES. DO NOT USE WIRE BRUSHES, ACID TYPE CLEANING AGENTS, CLEANING COMPOUNDS WITH CAUSTIC OR HARSH FILLERS, OR OTHER MATERIALS OR METHODS THAT COULD DAMAGE STONE.
14. SEALER APPLICATION: APPLY STONE SEALER TO COMPLY WITH STONE PRODUCERS AND SEALER MANUFACTURERS WRITTEN INSTRUCTIONS.



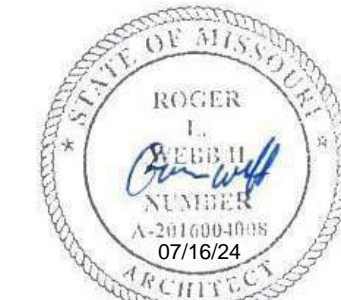
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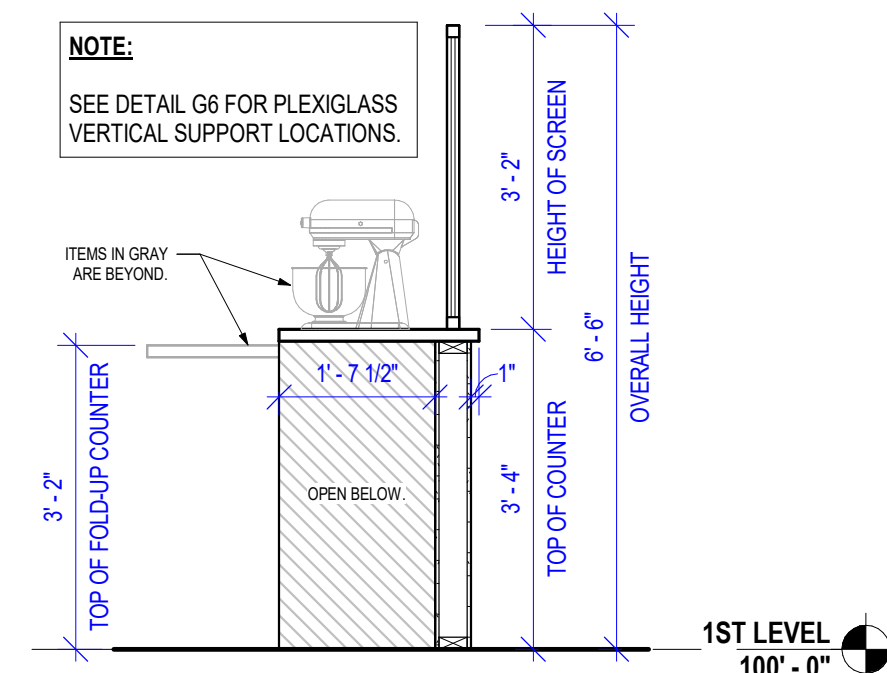
PROFESSIONAL SEAL

**G501**

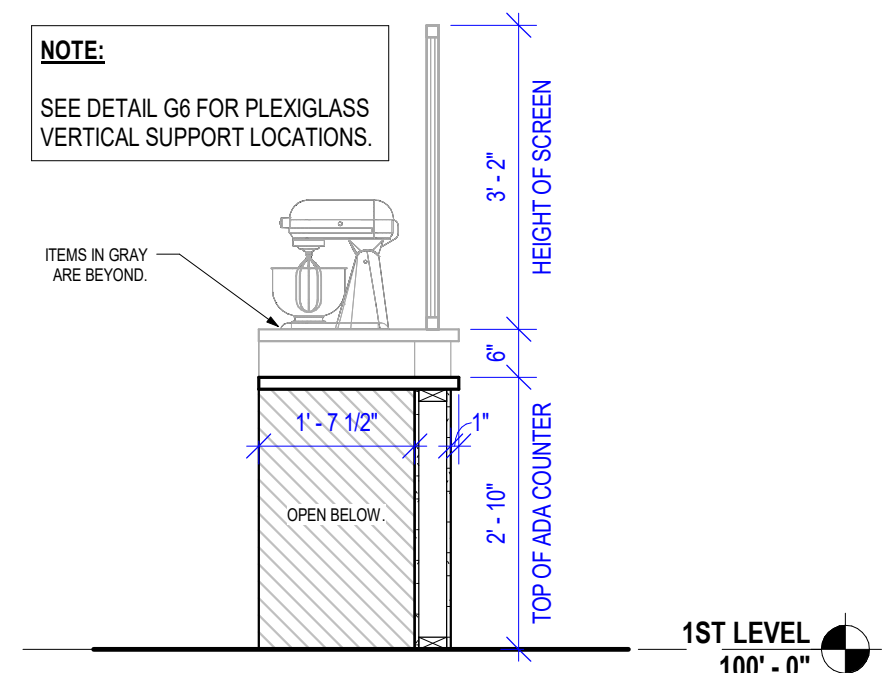
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**GENERAL PROJECT  
SPECIFICATIONS**

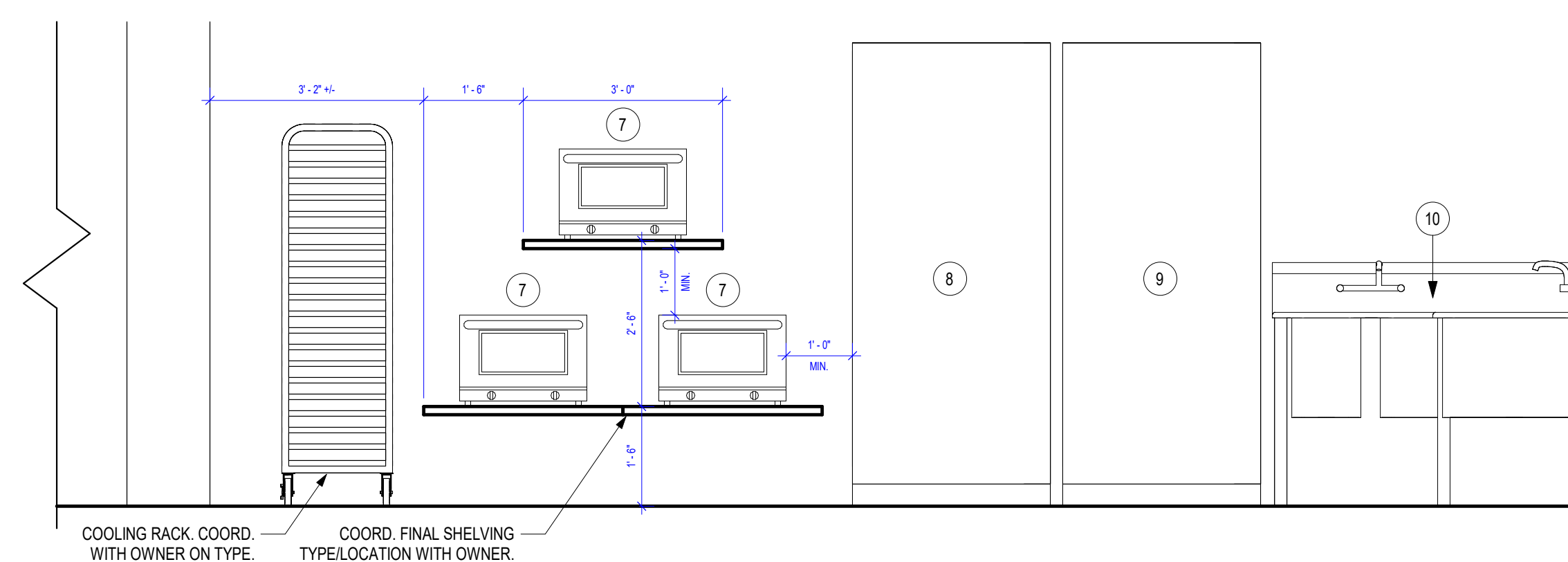




J12 SECTION - PREP COUNTER  
1/2" = 1'-0"



J10 SECTION - PREP COUNTER ADA  
1/2" = 1'-0"

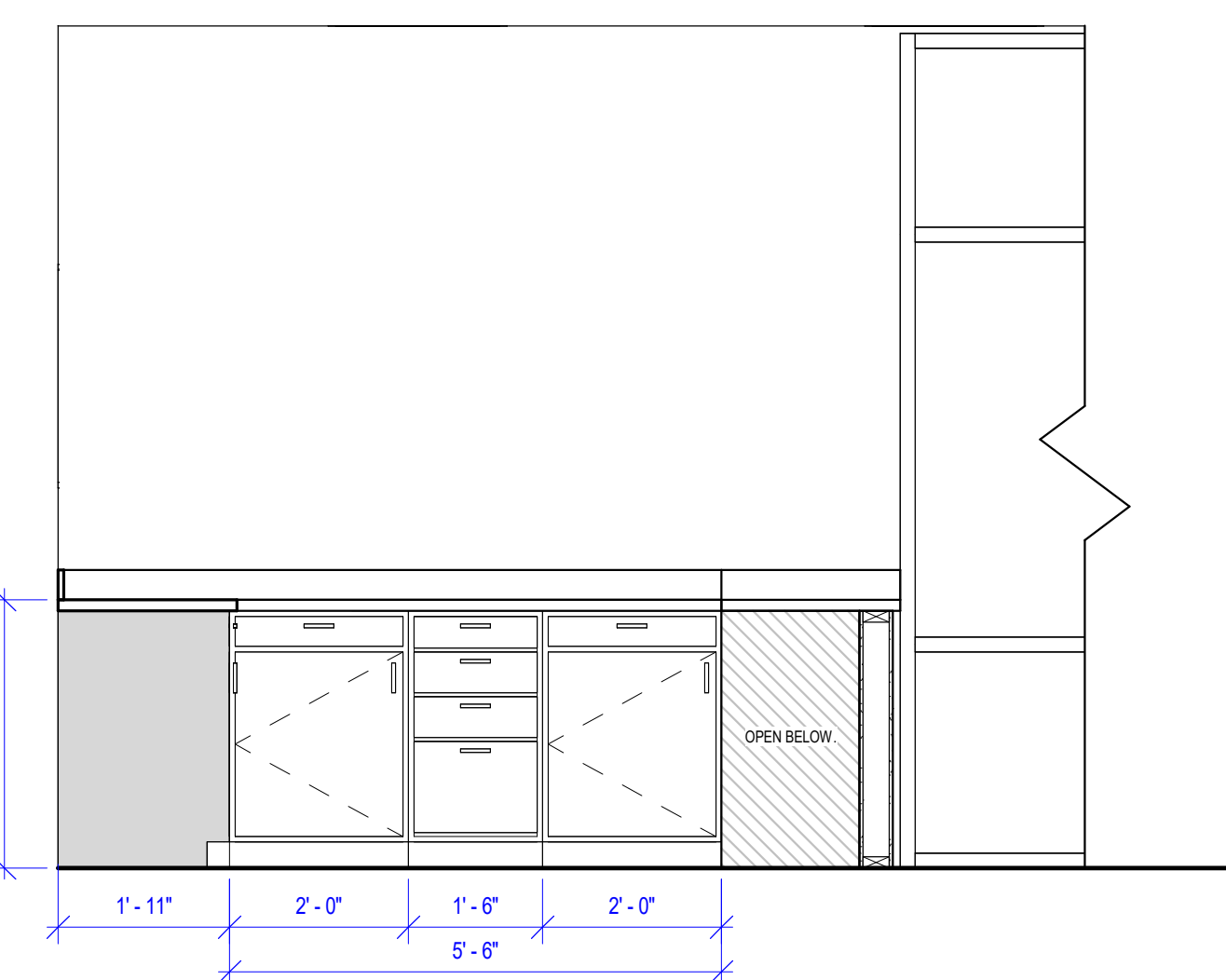


**J8** INTERIOR ELEVATION - PREP EQUIPMENT  
1/2" = 1'-0"

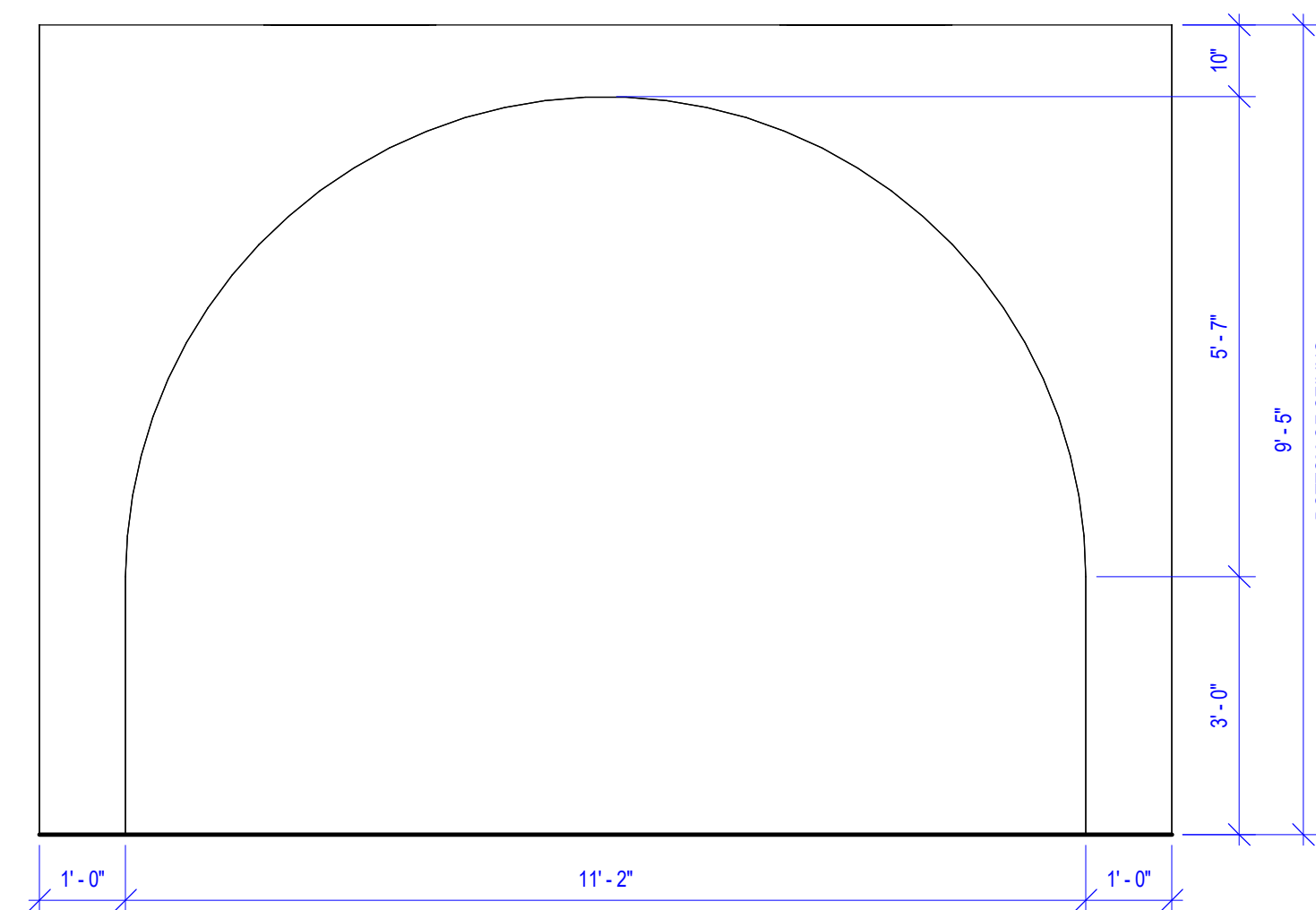
**EQUIPMENT SCHEDULE BASIS OF DESIGN:**

- 1. BUINI S300 0100 TICP-DV INFUSION SINGLE COFFEE AND TEA BREWER WITH ADJUSTABLE SHELF - DUAL VOLTAGE
- 2. MATCHING HOTD 210STD 0120353 GALLON HOT WATER DISPENSER WITH ON-DEMAND TEMPERATURE AND PUSH-BUTTON CONTROLS
- 3. FALCONING GULF BULK GRINDER
- 4. FALCONING UC-6B-714 11.91 GPM HOT COOLED UNDERCOUNTER BULLET ICE MACHINE - 96 LB. ITEM # 154UC6B714
- 5. AVANTO CEC-48-4C 48" BLACK REFRIGERATED COUNTERTOP BAKERY DISPLAY CASE WITH LED LIGHTING
- 6. AVANTO SELECTED REACH-IN COOLER
- 7. AVANTO CEC-18-1/2 18 1/2" HALF SIZE COUNTERTOP CONVECTION OVEN, 1.5 CU FT. - 120V, 1600W (3 UNITS)
- 8. OWNER SELECTED REFRIGERATOR
- 9. OWNER SELECTED FREEZER TYPE
- 10. SILESTON ST-16 16" GAINAGE STAINLESS STEEL 3-COMPARTMENT COMPARTMENT CORNER SINK WITH 2 DRABINBOARDS - 18" X 18" X 12" BOWLS
- 11. NOBLE WAREWASHING UL30 LOW TEMPERATURE UNDERCOUNTER DISHWASHER - 115V ITEM # 45GNOWNL30X
- 12. AVANTO SELECTED SINK TYPE
- 13. KITCHENADE DELUXE 4.5 QUART LT-LEAD STAND MIXER, MODEL #KSM57MT (3 UNITS)

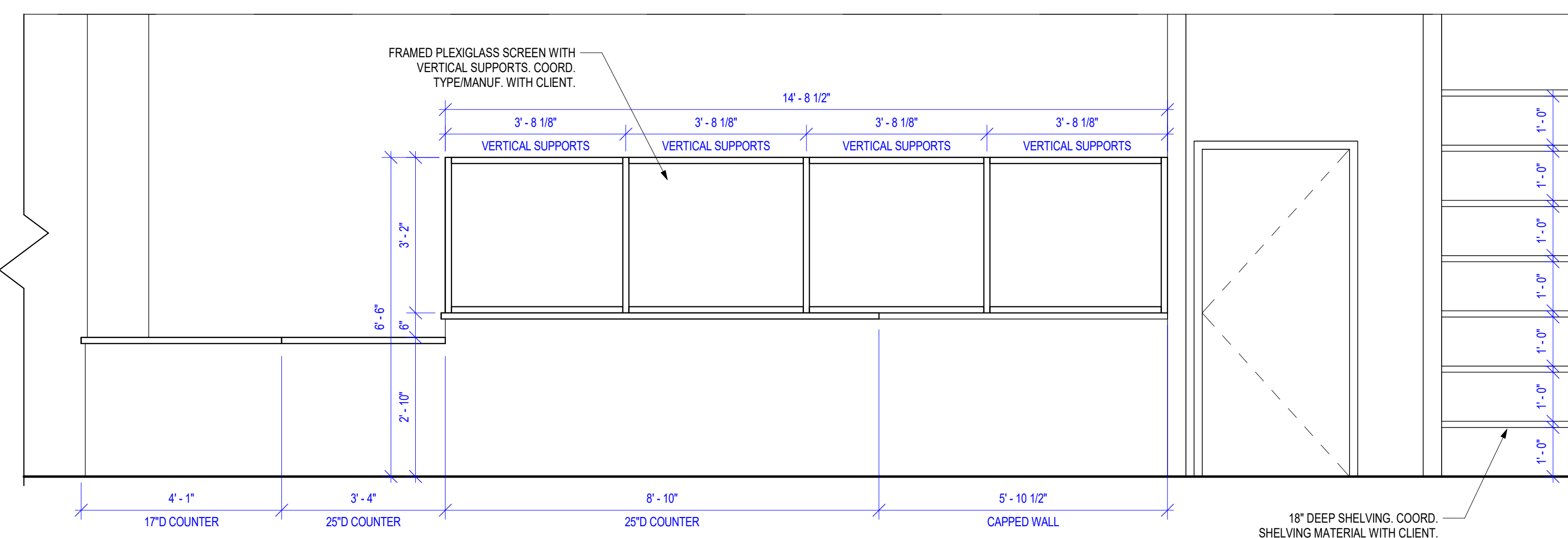
REFER TO MANUFACTURER'S MANUAL/SPEC SHEET FOR SPECIFIC GUIDELINES, AS THEY PROVIDE ADDITIONAL, DETAIL REGARDING INSTALLATION AND SPACING REQUIREMENTS. GO TO COORDINATE BOOKING FOR ANY WALL HUNG EQUIPMENT ITEMS.



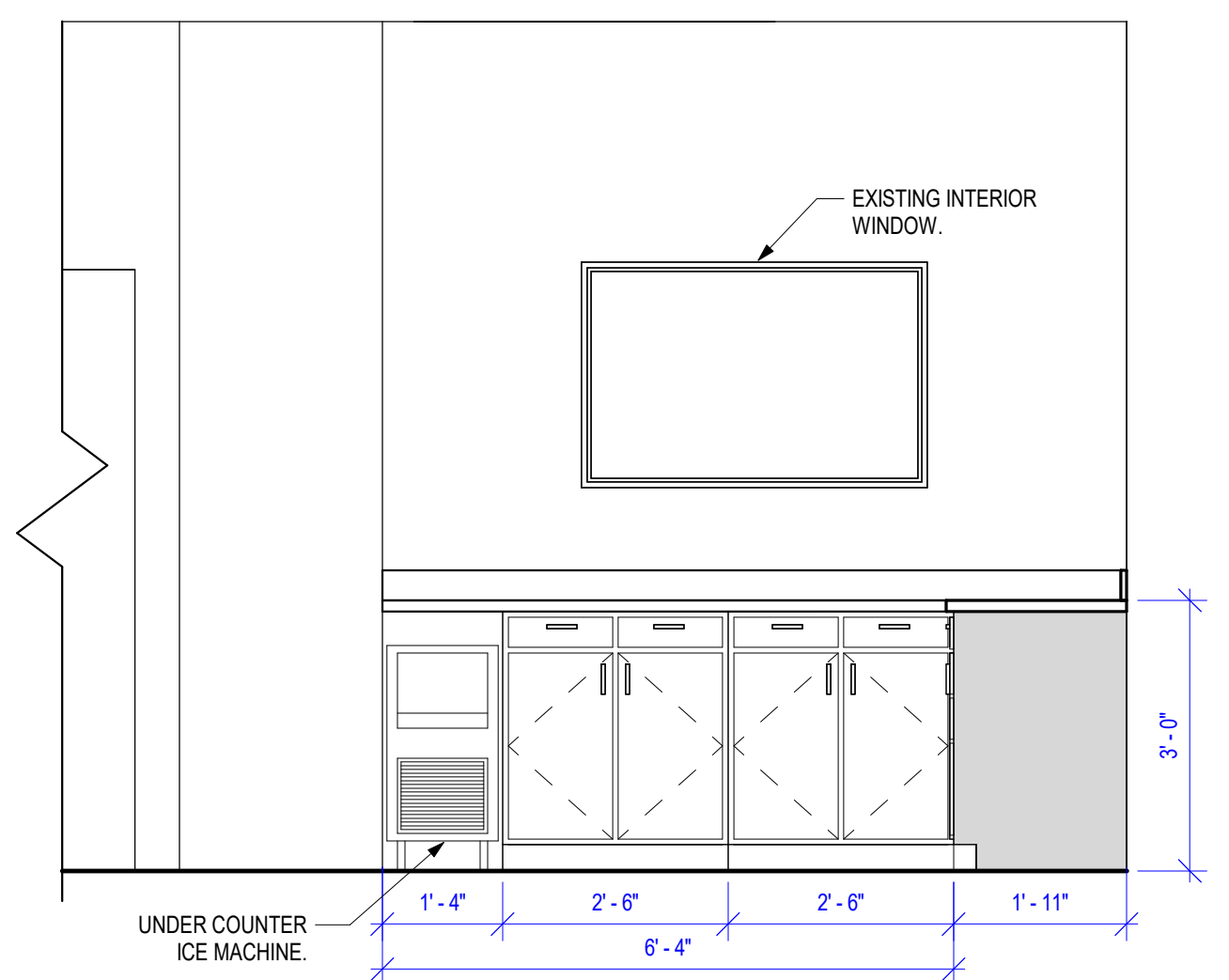
G12 INTERIOR ELEVATION - FRONT COUNTER - C  
1/2" = 1'-0"



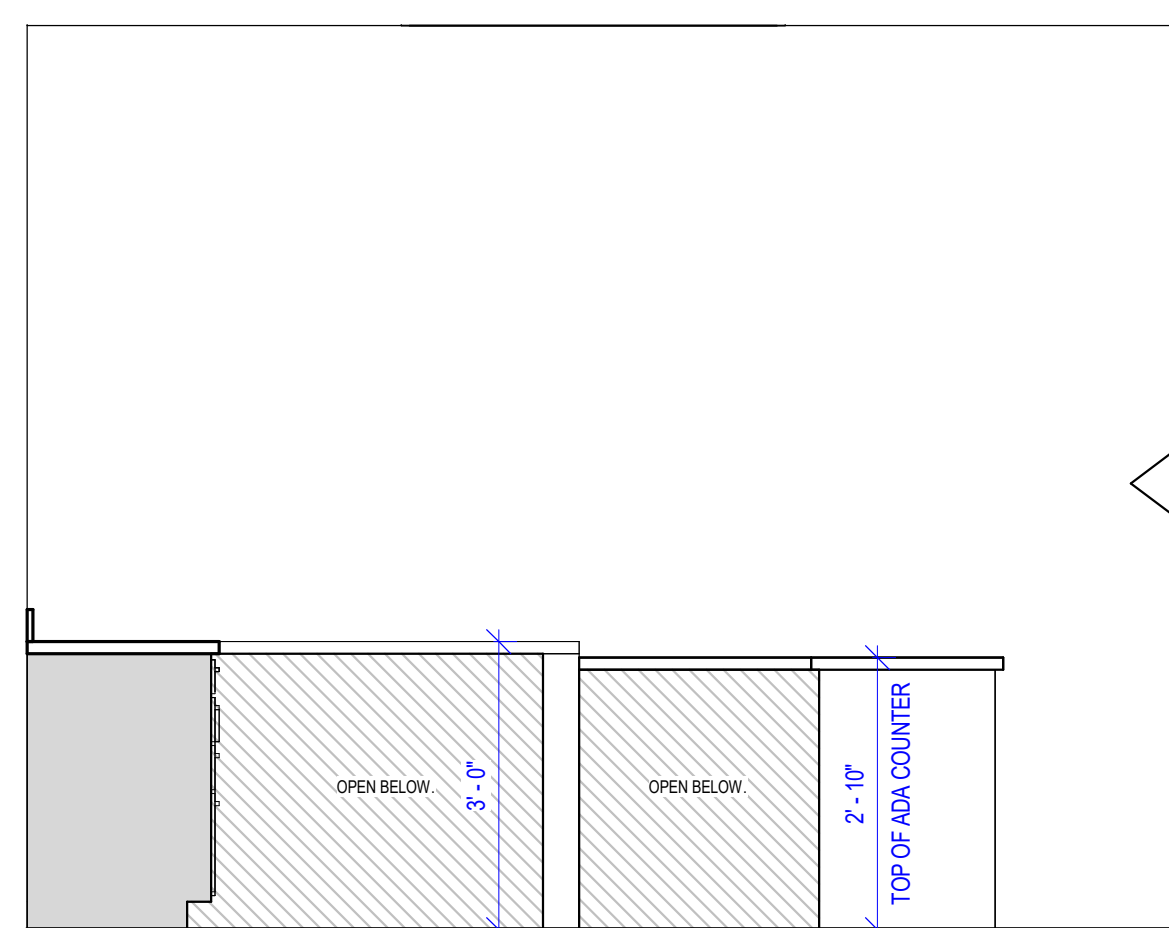
**G9** INTERIOR ELEVATION - BOOK NOOK  
1/2" = 1'-0"



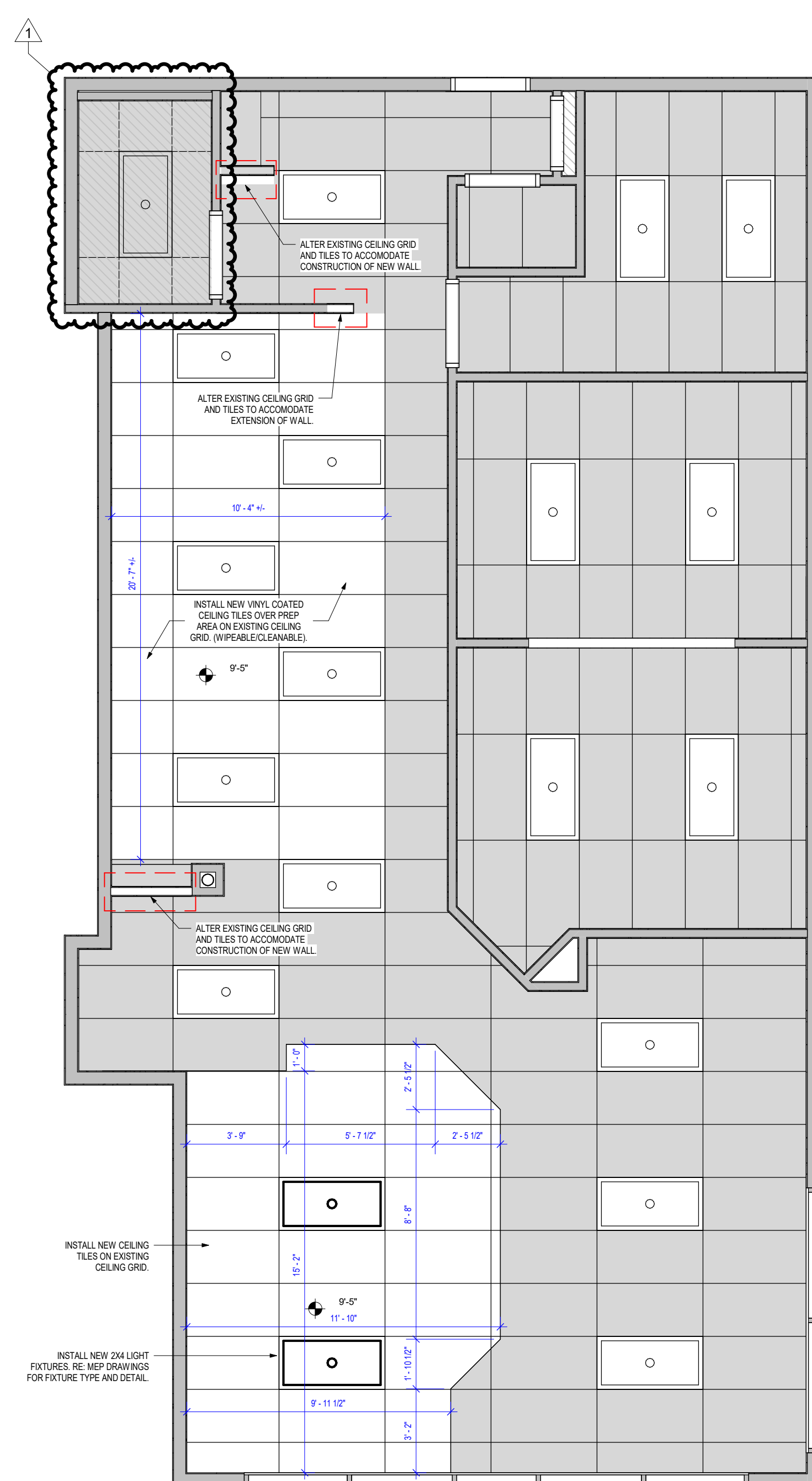
**G6** INTERIOR ELEVATION - PREP COUNTER  
1/2" = 1'-0"



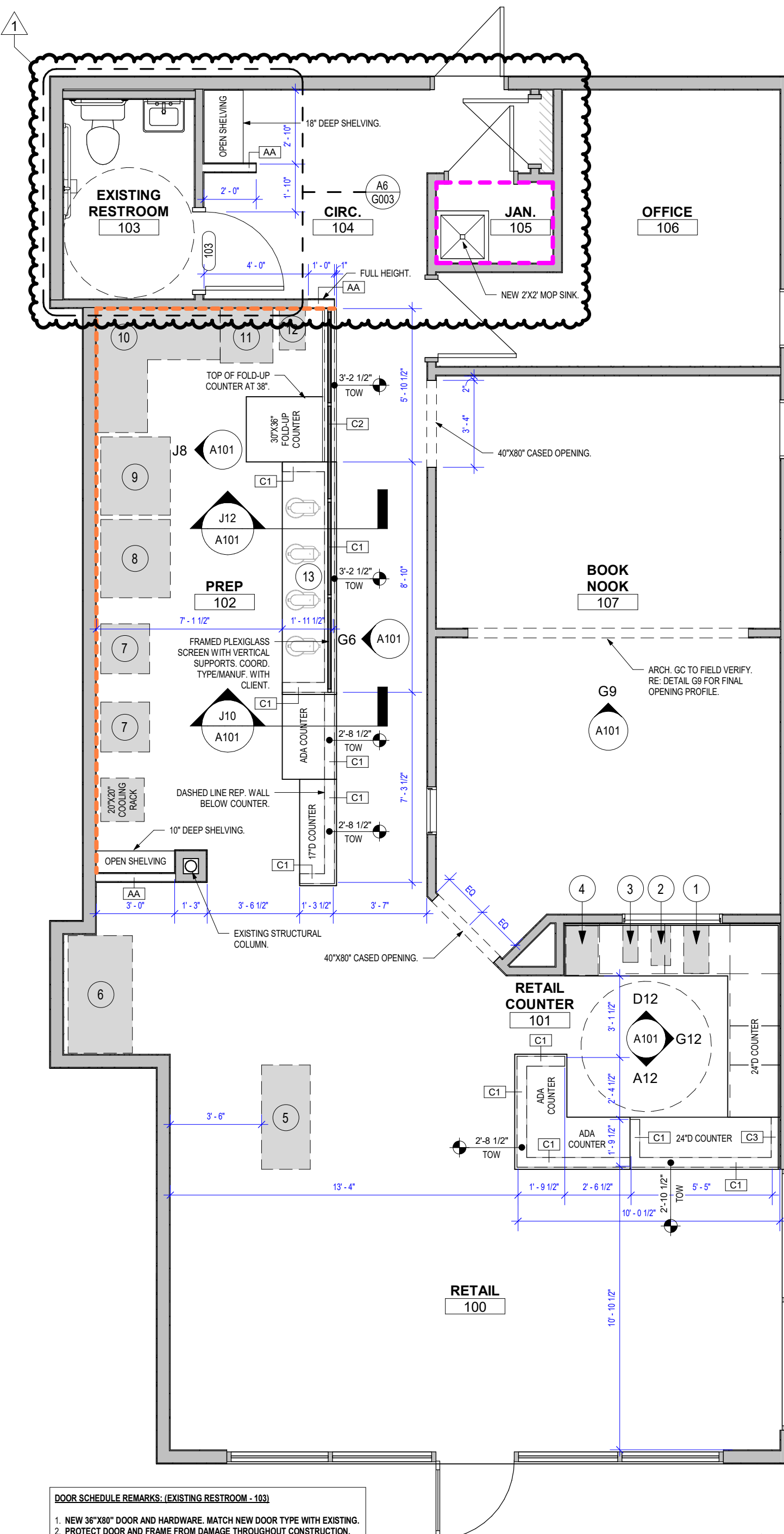
D12 INTERIOR ELEVATION - FRONT COUNTER - B  
1/2" = 1'-0"



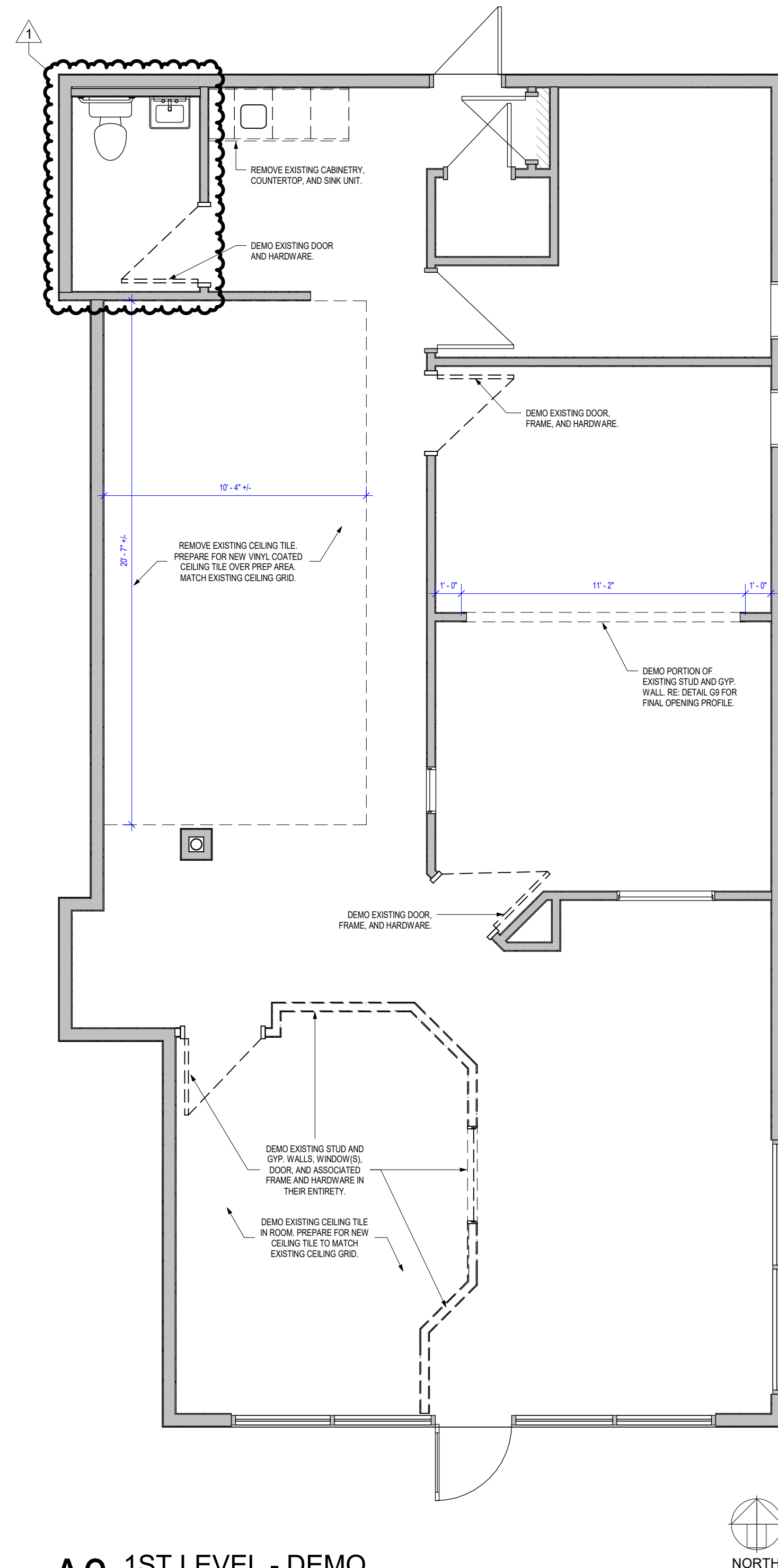
A12 INTERIOR ELEVATION - FRONT COUNTER - A  
1/2" = 1'-0"



**A9** 1ST LEVEL - REFLECTED CEILING PLAN  
1/4" = 1'-0"



A6  $\frac{1\text{ST LEVEL}}{1/4" = 1'-0"}$



A3 1ST LEVEL - DEMO  
1/4" = 1'-0"

- GENERAL NOTES:  
DEMOLITION PLANS**

1. RE SHEET #001 FOR ADDITIONAL GENERAL NOTES THAT ARE APPLICABLE.
2. CONTRACTOR TO VISIT PROJECT SITE AND BUILDING PROJECT TO OBTAIN ACCESS TO ALL AREAS TO BE DEMOLISHED.
3. BUILDING AND SITE TO REMAIN SECURE DURING DEMOLITION AND CONSTRUCTION.
4. CONTRACTOR TO OBTAIN ALL NECESSARY PERMITS, FUMES, FUMES, PIPING, HVAC UNITS, COLUMNS, ETC.
5. CONTRACTOR TO PROTECT EXISTING FINISHES ADJACENT TO DEMOLITION WORK.
6. CONTRACTOR TO PATCH AND REPAIR ALL WORK, ESPECIALLY WORK ADJACENT TO EXISTING AREAS, AS REQUIRED.
7. CONTRACTOR TO REPAIR ANY AREAS DAMAGED DURING DEMOLITION.
8. CONTRACTOR TO REPAIR ANY PUNCTURES OR TEARS TO THE VAPOR BARRIER AT THE EXTERIOR WALLS.
9. CONTRACTOR TO COORDINATE DEMOLITION OPENINGS WITH EXISTING AND REMAINING FLOOR SYSTEMS.
10. REMOVE EXISTING GYP BOARD OR PLASTER AS NECESSARY.
11. PROVIDE TO PROTECT NEW BLOCKING IN EXISTING WALLS FOR CASEWORK AND PARTITION SYSTEMS.
12. SPRINKLER HEADS TO REMAIN, PROTECT DURING DEMOLITION.
13. PROTECT EXISTING CONDITIONS AND MAINTAIN WEATHER TIGHTNESS FOR ALL OCCUPIED/UNOCCUPIED SPACES BOTH VERTICALLY AND HORIZONTALLY FOR THE ENTIRE DURATION THAT THE BUILDING IS EXPOSED TO THE ELEMENTS. DISCREPANCY BETWEEN EXISTING AND

- ## GENERAL NOTES: FLOOR PLANS


1. SEE GENERAL ARCHITECTURAL SHEETS FOR ADDITIONAL NOTES AND DETAILS THAT ARE APPLICABLE.
2. ARCHITECTURAL ELEVATION 10701
3. DIMENSIONED DRAWN ON PLAN ARE:
  - A. FACE OF STUD (FSD), FACE OF MASSORY (MOM), FACE OF CONCRETE WALL (FCW), AND COLUMB DRAIN LINES.
  - B. DIMENSIONS FOR DOOR OR WINDOW.
  - C. NET WALL THICKNESSES ARE ACTUAL DIMENSIONS AND NOT FINISHES. SEE GENERAL NOTES FOR FINISHES.
4. DOOR OPENINGS NOT LOCATED BY DIMENSION SHALL BE CENTERED IN WALL SHOWN OR LOCATED 4 INCHES FROM OTHER FINISHING SURFACE. DOOR SHALL BE 36" HIGH, ALWAYS ALLOWING A MINIMUM OF 18" FROM THE PULL SIDE (STRIKE SIDE) OF THE DOOR TO THE INTERSECTING WALL OR OTHER FINISHING SURFACE.
5. ALL DOORS WITHOUT A SPACE IDENTIFICATION NUMBER SHALL HAVE THE SAME FINISHES AS THE ADJOINING SPACES.
6. MAINTAIN AND PROTECT EXISTING EXPANSION JOINTS
7. PROTECT EXISTING STRUCTURE TO REMAIN FROM COLLAPSE TO MATCH EXISTING RATINGS AS REQUIRED ON THE SHELL PORTION OF PROJECT
8. ALL STRUCTURE TO BE FIRE-RETARDANT, INCLUDING BLOCKING AND PLYWOOD.
9. COORDINATE FINAL SELECTION OF EQUIPMENT TYPES WITH GC OR CLIENT
10. ALL COUNTERTOPS TO BE 25" DEEP, UNLESS OTHERWISE SPECIFIED. COORDINATE WITH GC OR CLIENT FOR COUNTERTOP MATERIAL/MANUFACTURE WITH GC OR CLIENT PRIOR TO INSTALLATION.
11. ALL CASE CLIENTS TO BE 20"
12. COORDINATE PLEXIGLASS TYPE/MANUE WITH GC OR CLIENT PRIOR TO INSTALLATION.
13. COORDINATE FLOORING TYPE/MANUE WITH CLIENT
14. RE: PLUMBING FOR LOCATION OF FLOOR DRAIN
15. COORDINATE WITH THE CLIENT ON FINAL PLAN, PART, TYPE, AND SPEC.

- GENERAL NOTES:**  
**REFLECTED CEILING PLANS**

1. RE: SHEET 3001 FOR ADDITIONAL GENERAL NOTES THAT ARE APPLICABLE
2. RE: DETAILS FOR ADDITIONAL CONDITIONS AND CEILING HEIGHT DETAIL SECTION
3. RE: ELECTRICAL SHEETS AND SPECIFICATIONS FOR DETAILED INFORMATION ON LIGHT FIXTURE SCHEDULE
4. RE: MECHANICAL SHEETS FOR DETAILED INFORMATION FOR DETAILED INFORMATION ON DIFFUSERS
5. RE: MECHANICAL SHEETS FOR LOCATIONS OF SOUND SILENCERS AND DUCTWORK
6. RE: MECHANICAL SHEETS FOR REFLECTED GLASS PLANS ARE TO THE FACE OF GYP BOARD (GLASS) AND COLUM GRASS (GLASS) COATED OR SHOWING VENEER
7. AREAS HIGHLIGHTED IN GREY ARE EXISTING CONDITIONS
8. ANY REPLACEMENT OF EXISTING LIGHT FIXTURES ARE TO BE IDENTICAL WITH EXISTING
9. ALL NEW LIGHT FIXTURES TO BE LED. COORDINATE WITH CLIENT AND ARCHITECT
10. ALL CEILING HEIGHTS TO BE AS F.F. UNLESS NOTED OTHERWISE
11. ALL CEILING HEIGHTS AS SHOWN ON PLANS AND DETAILS NOTING SLAB OR TILE FLOOR (FINISHED FLOOR) TO FINISH CEILING
12. CEILING TIE/BAR TO BE CENTERED IN THE ROOM, UNLESS NOTED OTHERWISE
13. RECESSED LIGHTING, SPEAKERS, SMOKE DETECTORS ETC AND PENDANT LIGHT FIXTURES, SHALL BE CENTERED IN CEILING, OR ON GYP BO. CEILING, UNLESS NOTED OTHERWISE
14. COORDINATE ALL CEILING UNMOUNTED LIGHT FIXTURES IN ROOMS WITH EXPOSED STRUCTURE
15. COORDINATE ALL CEILING UNMOUNTED EQUIPMENT WITH CASKWORK BELOW
16. PROVIDE CONFLICT BETWEEN ANY ABOVE-CEILING MECHANICAL / ELECTRICAL / PLUMBING WORK & THE SCHEDULED OR SHOWN CEILING HEIGHT. CONTACT THE ARCHITECT IMMEDIATELY
17. PROVIDE OVERALL CEILING COORDINATION DRAWING SHOWING ALL DEVICES DURING SHOP SUBMITTAL PROCESS
18. PROVIDE G.C. OR A.C. LIGHT CONTROL, WITH MILLWORK CONTRACTOR FOR LOCATION
19. ALL EGRESS DOORS TO HAVE AN INTERIOR SIGN, TYP. EXIT PATH TO HAVE EXIT SIGN AS REQUIRED BY CODE, TYP.
20. ELECTRICAL CONTRACTOR TO HAVE PRE-CONSTRUCTION MEETING WITH CLIENT PRIOR TO BEGINNING FOR FINAL LIGHT LOCATIONS
21. COORDINATE ALL FINAL LIGHT LOCATIONS WITH CLIENT

- GENERAL NOTES:  
INTERIOR ELEVATIONS**

1. RE: SHEET 0001 FOR ADDITIONAL GENERAL NOTES THAT ARE APPLICABLE.
2. HEIGHT 002 ACCESSIBILITY GUIDELINES FOR MOUNTING HEIGHTS OF FIXTURES AND ACCESSORIES.
3. COORDINATE SMALL PANELS TO 1/2" DIMENSIONS PER MILLWORK/CONCRETE FABRICATION & INSTALLATION.
4. CONTRACTOR SHALL PROVIDE & INSTALL GROMMETS AT 4" O.C. TO ALLOW WORK TO BE DONE IN OPEN SPACE. COORDINATE LOCATIONS DIRECTLY WITH ELECTRICAL DRAWINGS FOR OUTLET LOCATIONS. COLOR TO BE SELECTED BY CLIENT.
5. RE: EQUIPMENT DRAWINGS & SPECS. FOR EQUIPMENT ITEM SHOWN DASHED. PROVIDED BY EQUIP. CONSULTANT AND SUPPLIED BY OWNER. COORDINATE WITH OTHER TRADES WHEN NECESSARY.
6. ALL COUNTERTOPS TO BE 25" DEEP UNLESS OTHERWISE NOTED ON PLANS. COORDINATE COUNTERTOP TYPE/SPACED WITH ALL PARTS OF COUNTER INSTALLATION.
7. COORDINATE/FINALIZE ALL FIXTURE AND EQUIPMENT SELECTIONS WITH CLIENT OR GC PRIOR TO INSTALLATION.
8. COORDINATE/FINAL BIDDING PERMIT APPLICATIONS.
9. COORDINATE FINAL BASE CABINET TYPE/INSTALLATION WITH CLIENT. PRIOR TO INSTALLATION.
10. ALL PARTS TO BE 25" DEEP UNLESS OTHERWISE NOTED/DIMENSIONED ON PLANS. COORDINATE COUNTERTYPE/MATERIAL/MAINF. WITH GC OR CLIENT PRIOR TO INSTALL.
11. BASE CAB. BAINET TO BE 20"D.

WALL FINISH LEGEND	
	WALL PROTECTION (FRP) FULL HEIGHT
	WALL PROTECTION (FRP) 4' HEIGHT



MECHANICAL ABBREVIATIONS

ABBREVIATION		LONG FORM	
ABV	ABOVE		
AC OR ACU	AIR-CONDITIONING UNIT		
AHAP	AS HIGH AS POSSIBLE		
AHU	AIR-HANDLING UNIT		
AUTO	AUTOMATIC		
BLW	BELOW		
C	CHILLER		
CD	CONDENSATE		
CF	CABINET FAN		
CFM	CUBIC FEET PER MINUTE		
CH	CABINET HEATER		
CHP	CHILLED WATER PUMP		
CLNG OR CLG	CEILING		
CONC	CONCRETE		
CP OR CWP	CONDENSER WATER PUMP		
CS	CONDENSER WATER SUPPLY		
CR	CONDENSER WATER RETURN		
CRAC OR CACU	COMPUTER ROOM AIR-CONDITIONING UNIT		
CREF	CHILLER ROOM EXHAUST FAN		
CRU	CONDENSATE (STEAM) RETURN UNIT		
CT	CODING TOWER CELL		
CTU	CONDENSATE (STEAM) TRANSFER UNIT		
CU	CONDENSING UNIT		
DV	CONSTANT VOLUME TERMINAL BOX		
DEF	DISHWASER EXHAUST FAN		
DMPR	DAMPER		
DN	DOWN		
EA	EACH		
EBH	ELECTRIC BASEBOARD HEATER		
EDH	ELECTRIC DUCT-MOUNTED HEATER		
EF	EXHAUST FAN		
EG	EXHAUST GRILLE		
ER	EXHAUST REGISTER		
EUH	ELECTRIC UNIT HEATER		
EXH	EXHAUST		
FD	FIRE DAMPER		
FCU	FAN-COIL UNIT		
FF	FINAL FILTER		
FFCH	FORCED-FLOW CABINET HEATER		
FFU	FAN FILTER UNIT		
FP	FAN POWERED TERMINAL BOX		
GPM	GALLONS PER MINUTE		
HC	HEATING COIL		
HUM	HUMIDIFIER		
HWP OR HP	HEATING WATER PUMP		
HX	HEAT EXCHANGER		
KEF	KITCHEN (GREASE HOOD) EXHAUST FAN		
KW	KILOWATTS		
LD	LINEAR SUPPLY DIFFUSER		
MOT	MOTORIZED		
MTD	MOUNTED		
MUAF	MAKE-UP AIR FAN		
MUAHU	MAKE-UP AIR-HANDLING UNIT		
OA	OUTSIDE AIR		
OKF	OUTSIDE AIR FAN		
OPG OR OPNG	OPENING		

NOT ALL ABBREVIATIONS ON THIS LIST ARE NECESSARILY USED ON THIS PROJECT

MECHANICAL ABBREVIATIONS CONT.

ABBREVIATION		LONG FORM	
PF	PREFILTER		
PLNM	PLENUM		
RA	RETURN AIR		
RAF	RETURN AIR FAN		
RAG OR RG	RETURN AIR GRILLE		
RAR OR RR	RETURN AIR REGISTER		
RAS	RETURN AIR SILENCER		
RE	IN REFERENCE TO		
RTU	ROOFTOP UNIT		
SA	SUPPLY AIR		
SAP OR SF	SUPPLY AIR FAN		
SAG OR SG	SUPPLY AIR GRILLE		
SAR OR SR	SUPPLY AIR REGISTER		
SAS	SUPPLY AIR SILENCER		
SCHP	SECONDARY CHILLED WATER PUMP		
SD	SMOKE DAMPER OR DETECTOR		
SPCHP	SPECIAL PROCESS CHILLED WATER PUMP		
TA	THROW AWAY (FILTER TYPE)		
TDEF	TRUCK DOCK EXHAUST FAN		
TEF	TOILET EXHAUST FAN		
TRANS	TRANSITION OR TRANSFER		
TYP	TYPICAL		
UH	UNIT HEATER		
UNO	UNLESS NOTED OTHERWISE		
VF	VENTILATION FAN		
VFD	VARIABLE FREQUENCY DRIVE		
V-V	VARIABLE VOLUME TERMINAL BOX		
WI	WITH		
XFMR OR TMR	TRANSFORMER		
XT OR EX	EXPANSION TANK		

NOT ALL ABBREVIATIONS ON THIS LIST ARE NECESSARILY USED ON THIS PROJECT

DUCTWORK LEGEND

(REFER TO SPECIFICATIONS SECTIONS 15B15 AND 15B20 FOR ADDITIONAL INFORMATION)

SINGLE LINE	DESCRIPTION	DOUBLE LINE
	ROUND ELBOW DOWN	
	ROUND ELBOW UP	
	OFFSET TO CHANGE ELEVATION (AT 30° WHEN POSSIBLE. ARROW SLOPES ON, U.N.O.)	
	ROUND RADIUS ELBOW	
	90° STRAIGHT TEE	
	90° CONICAL TEE	
	45° LATERAL TAP	
	45° LATERAL CONICAL TEE	
	SIZE OR SHAPE TRANSITION	
	ROUND FLEXIBLE DUCT	
	RECTANGULAR ELBOW DOWN	
	RECTANGULAR ELBOW UP	
	OFFSET TO CHANGE ELEVATION (AT 30° WHERE POSSIBLE. ARROW SLOPES ON, U.N.O.)	
	RECTANGULAR RADIUS ELBOW	
	RECTANGULAR ELBOW WITH TURNING VANES	
	SPLIT BRANCH TAKE-OFF WITH SQUARE ELBOW & SPLITTER DAMPER	
	SPLIT BRANCH TAKE-OFF WITH RADIUS ELBOW & SPLITTER DAMPER	
	SPLIT BRANCH TAKE-OFF TEE WITH STATIONARY SPLITTER DAMPER	
	BRANCH TAKE-OFF WITH 45° LEAD IN TAP	
	INSULATED LINED DUCTWORK (U.N.O.)	
	SQUARE FACED CEILING DIFFUSER 4-WAY DIRECTIONAL THROW (U.N.O.)	
	ROUND FACED CEILING DIFFUSER	
	CEILING RETURN OR EXHAUST AIR GRILLE OR REGISTER	
	SIDEALL SUPPLY GRILLE OR REGISTER	
	SUPPLY DUCT RISER	
	RETURN, EXHAUST OR OUTSIDE AIR DUCT RISER	
	MANUAL BALANCING DAMPER	
	AUTOMATIC (MOTOR-OPERATED) DAMPER	
	FIRE DAMPER	
	GRAVITY BACKDRAFT DAMPER	
	COMBINATION FIRE AND SMOKE DAMPER WITH SMOKE DETECTOR	
	SMOKE DAMPER (AUTOMATIC) WITH SMOKE DETECTOR	
	DUCT MOUNTED SMOKE DETECTOR	

NOT ALL SYMBOLS ON THIS LIST ARE NECESSARILY USED ON THIS PROJECT

STANDARD MECHANICAL SYMBOLS

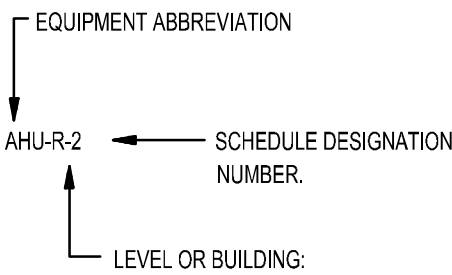
SYMBOL	DESCRIPTION
	GATE VALVE
	BALL VALVE
	GLOBE VALVE
	BUTTERFLY VALVE
	PLUG VALVE
	ANGLE VALVE
	CHECK VALVE
	AUTOMATIC CONTROL VALVE (STRAIGHT THROUGH)
	AUTOMATIC CONTROL VALVE (3-WAY)
	AUTOMATIC CONTROL VALVE (ANGLE)
	AUTOMATIC CONTROL VALVE (STRAIGHT THROUGH)
	SOLENOID VALVE
	PRESSURE REDUCING VALVE
	PRESSURE RELIEF VALVE
	GAUGE COCK
	PRESSURE GAUGE WITH GAUGE COCK
	THERMOMETER
	THERMOMETER WELL
	TEST PLUG
	FLOW METER
	TEMPERATURE SENSOR
	PRESSURE SENSOR
	DIFFERENTIAL PRESSURE SWITCH
	IMMERSION THERMOSTAT
	MANUAL AIR VENT
	AUTOMATIC AIR VENT
	FLOW SWITCH
	ORIFICE
	PIPE SLEEVE THRU WALL OR FLOOR
	EXPANSION JOINT
	FLEXIBLE PIPE JOINT
	PIPE GUIDE
	ANCHOR
	STRAINER (Y-TYPE)
	STRAINER (BASKET TYPE)
	UNION
	CONCENTRIC REDUCER
	ECCENTRIC REDUCER
	DIRECTION OF FLOW
	DIRECTION OF SLOPE
	THERMOSTAT
	HUMIDISTAT
	FAN SPEED CONTROLLER
	CONDENSER WATER SUPPLY
	CONDENSER WATER RETURN
	CONDENSATE DRAIN

NOT ALL SYMBOLS ON THIS LIST ARE NECESSARILY USED ON THIS PROJECT

OTHER SYMBOLS

SYMBOL	DESCRIPTION
	INDICATES CONNECTION TO EXISTING DUCT OR PIPE

GENERAL EQUIPMENT DESIGNATION KEY:



MECHANICAL GENERAL NOTES

- PRIOR TO SUBMITTING BID, VISIT THE SITE AND BECOME FULLY ACQUAINTED WITH THE EXISTING CONDITIONS OF THE PROJECT. REVIEW GENERAL NOTES, SPECIFICATIONS AND ALL OTHER DRAWINGS FOR ADDITIONAL REQUIREMENTS WHICH MAY NOT BE SPECIFICALLY CALLED OUT IN THIS PORTION OF THE CONSTRUCTION DOCUMENTS. NOTIFY ARCHITECT, ENGINEER AND/OR OWNER OF ANY CONFLICTS OR DISCREPANCIES PRIOR TO SUBMISSION OF BID.
- COORDINATE THE INSTALLATION OF MECHANICAL SYSTEMS WITH OTHER TRADES TO ENSURE A NEAT AND ORDERLY INSTALLATION. DUCTWORK AND PIPING SHALL BE ROUTED TO AVOID CONFLICTS WITH ELECTRICAL PANELS, LIGHTING FIXTURES, ETC.
- TAKE NECESSARY PRECAUTIONS TO AVOID DAMAGING EXISTING SURFACES AND EQUIPMENT TO REMAIN FOR NEW INSTALLATION DURING WORK. REPAIR ANY DAMAGE CAUSED DURING CONSTRUCTION AT NO COST TO THE OWNER.
- ALL MECHANICAL EQUIPMENT SHOWN ON THE MECHANICAL PLANS SHALL BE PROVIDED BY THE MECHANICAL CONTRACTOR UNLESS OTHERWISE NOTED.
- NEW MECHANICAL EQUIPMENT, DUCTWORK AND PIPING IS SHOWN AT APPROXIMATE LOCATIONS. FIELD MEASURE FINAL DUCTWORK AND PIPING LOCATIONS PRIOR TO FABRICATION AND SHALL MAKE ADJUSTMENTS AS REQUIRED TO FIT THE DUCTWORK AND PIPING WITHIN THE AVAILABLE SPACE. FIELD VERIFY FINAL LOCATIONS TO INSTALL EQUIPMENT IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS REGARDING SERVICE CLEARANCE AND PROPER AIRFLOW CLEARANCE AROUND EQUIPMENT.
- REFER TO ARCHITECTURAL DRAWINGS FOR ALL RELATED CONSTRUCTION DETAILS AS APPLICABLE TO THE HVAC SYSTEM. CHASE AND PENETRATIONS INTENDED FOR DUCTWORK AND PIPING SHALL BE VERIFIED WITH ARCHITECTURAL DRAWINGS PRIOR TO INSTALLATION.
- COORDINATE LOCATION OF ROOF PENETRATIONS WITH THE EXISTING CONDITIONS AND ARCHITECTURAL DRAWINGS.
- SEAL ALL PENETRATIONS THROUGH THE BUILDING COMPONENTS IN ACCORDANCE WITH THE CONSTRUCTION SPECIFICATIONS. FIREPROOF ALL PENETRATIONS THROUGH FIRE RATED COMPONENTS IN ACCORDANCE WITH U.L. REQUIREMENTS.
- COORDINATE THE EXACT MOUNTING SIZE AND FRAME TYPE OF DIFFUSERS, REGISTERS AND GRILLES WITH THE SUPPLIER TO MEET THE CEILING, WALL, AND DUCT INSTALLATION REQUIREMENTS.
- LOCATION OF CEILING DIFFUSERS, REGISTERS, AND GRILLES SHALL BE ADJUSTED AS REQUIRED TO ACCOMMODATE FINAL CEILING AND LIGHTING LOCATIONS.
- DUCTWORK CROSSING FIRE RATED WALL OR OTHER FIRE RATED ASSEMBLIES SHALL BE MINIMUM 26 GAUGE SHEET METAL.
- PROVIDE FIRE AND/OR FIRE-SMOKE DAMPERS IN DUCTWORK AT CEILINGS AND WALLS AS REQUIRED BY BUILDING CODE AUTHORITY HAVING JURISDICTION. FIRE AND FIRE-SMOKE DAMPERS SHALL CONFORM TO NFPA AS APPLICABLE.
- PROVIDE WALL AND/OR DUCT ACCESS PANELS OR DOORS FOR ACCESS TO ALL FIRE AND/OR FIRE-SMOKE DAMPERS. ACCESS PANEL OR DOOR SHALL BE MINIMUM SIZE OF 6"x6" AND SHALL BE INSTALLED WITH 1/2" OF DAMPER. PROVIDE A REMOVABLE DUCT SECTION WHERE DUCT SIZE IS TOO SMALL FOR A 6"x6" ACCESS DOOR.
- THERMOSTATS AND HUMIDISTATS SHALL BE LOCATED AND SET BY MECHANICAL CONTRACTOR AND WIRED IN CONDUIT BY ELECTRICAL CONTRACTOR. VERIFY EXACT LOCATIONS WITH ARCHITECT PRIOR TO INSTALLATION. MOUNTING HEIGHTS SHALL BE 48" AFF TO MEET ADA REQUIREMENTS UNLESS OTHERWISE NOTED ON PLANS.
- COORDINATE THE LOCATION AND ELEVATION OF WALL-MOUNTED DEVICES WITH ANY WALL MOUNTED ITEMS INDICATED ON THE ARCHITECTURAL DRAWINGS. CONTRACTOR WILL NOT BE REIMBURSED FOR RELOCATION OF ANY WALL-MOUNTED DEVICES CAUSED BY A LACK OF COORDINATION.
- ALL BRANCH DUCT CONNECTIONS AND TAKE-OFFS TO INDIVIDUAL DIFFUSERS, REGISTERS, AND GRILLES SHALL HAVE A PREFABRICATED 45 DEGREE, HIGH EFFICIENCY, RECTANGULAR AROUND BRANCH DUCT TAKE-OFF FITTING WITH MANUAL BALANCING DAMPER AND LOCKING QUADRANT.
- BRANCH DUCTWORK TO AIR OUTLETS SHALL BE SAME SIZE AS OUTLET NECK SIZE UNLESS OTHERWISE NOTED.
- RIGID DUCTWORK INSULATION: PROVIDE R-6 MINIMUM INSULATION WRAP ON ALL CONCEALED DUCTWORK. PROVIDE R-4 MINIMUM INTERNAL DUCT LINER ON ALL EXPOSED DUCTWORK. DUCT SIZES ON MECHANICAL PLANS INDICATE CLEAR INSIDE DIMENSIONS. SHEET METAL SIZES SHALL INCREASE ACCORDINGLY. PROVIDE R-12 MINIMUM INSULATION ON ALL DUCTWORK INSTALLED IN UNCONDITIONED SPACES. REFER TO SPECIFICATIONS FOR MORE INFORMATION.
- FLEXIBLE DUCT WORK SHALL BE THERMAFLEX TYPE MKE, FLEXMASTER TYPE SM, OR APPROVED EQUAL. SHALL BE LISTED UNDER 191 AS CLASS 1 AIR DUCT AND SHALL BE PROVIDED WITH INTEGRAL R-6 MINIMUM FIBERGLASS INSULATION. FLEXIBLE DUCTWORK SHALL NOT EXCEED 5'-0" IN LENGTH AND SHALL BE INSTALLED AND SUPPORT TO AVOID SHARP BENDS AND SAGGING.
- WALL MOUNTED DIFFUSERS AND GRILLES SHALL BE PROVIDED WITH SUITABLE MOUNTING FRAME TO MATCH WALL CONSTRUCTION. COORDINATE WITH ARCHITECTURAL DRAWINGS.

GENERAL MECHANICAL NOTES:

- REFER TO ARCHITECTURAL PLANS FOR RATED WALLS AND PARTITIONS. VERIFY FIRE AND/OR SMOKE DAMPER LOCATIONS AT DUCTS OR OPENINGS PENETRATING THESE WALLS.
- REFER TO ARCHITECTURAL PLANS FOR ROOM NAMES AND NUMBERS.
- REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATIONS OF CEILING DIFFUSERS, REGISTERS, AND GRILLES.
- VERIFY LOCATIONS OF THERMOSTATS WITH ARCHITECT AND OWNER PRIOR TO INSTALLATION.
- VERIFY LOCATIONS OF EXPOSED DUCTS WITH ARCHITECT PRIOR TO INSTALLATION.
- DUCT DIMENSIONS INDICATED ON PLANS ARE FREE AREA DIMENSIONS.
- SUPPLY AND RETURN AIR DUCT SHALL BE INTERNALLY LINED WHERE SPECIFIED.
- ALL LOUVER SIZES ON MECHANICAL PLANS ARE GIVEN IN FREE AREA REQUIRED. REFER TO ARCHITECTURAL PLANS FOR DIMENSIONS AND LOCATIONS.
- COORDINATE TERMINAL BOX AND BALANCING DAMPER LOCATIONS CAREFULLY TO INSURE PROPER AND ADEQUATE ACCESS TO FILTERS, MOTORS, CONTROL VALVES, CONTROL PANELS, ETC. PROVIDE ACCESS PANELS AS SPECIFIED WHERE REQUIRED TO ASSURE THIS ACCESS.
- CEILING PLENUM SPACE IS VERY TIGHT. WHERE REQUIRED, DUCTS OR PIPES SHALL BE ROUTED BETWEEN LIGHT FIXTURES AND UP AND OVER OTHER DUCTS OR PIPES USING THE SPACES BETWEEN STRUCTURAL JOISTS OR BEAMS WHERE APPLICABLE. CONTRACTOR SHALL BE RESPONSIBLE FOR CAREFULLY COORDINATING ALL TRADES. EXISTING UNKNOWN CONDITIONS MAY AFFECT EXACT DUCT OR PIPE ROUTING, OR EXISTING CONDITIONS MAY NEED TO BE MODIFIED TO ACCOMMODATE DUCTS AND PIPES.

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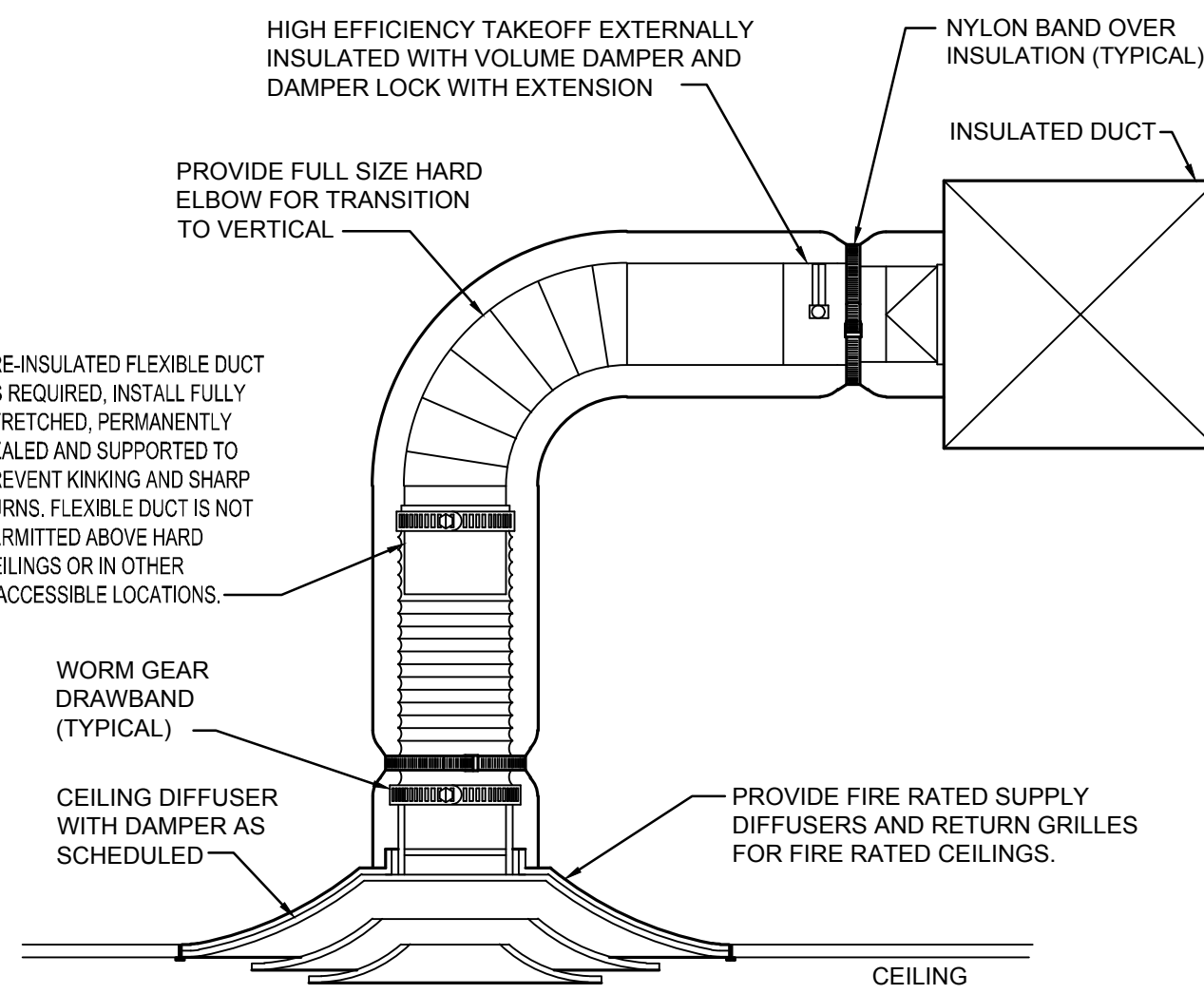
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MECHANICAL NOTES,  
SYMBOLS, AND ABBREVS.

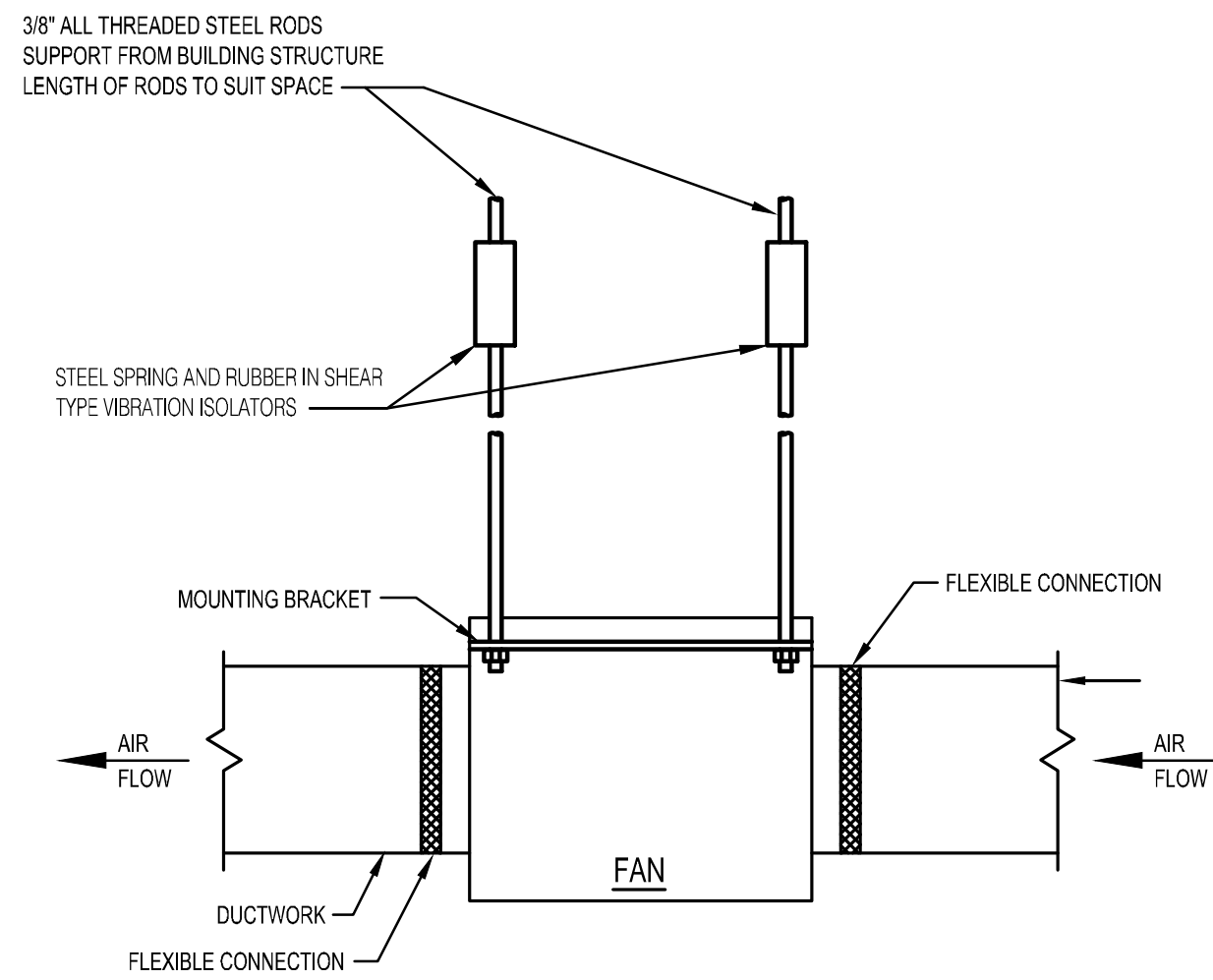


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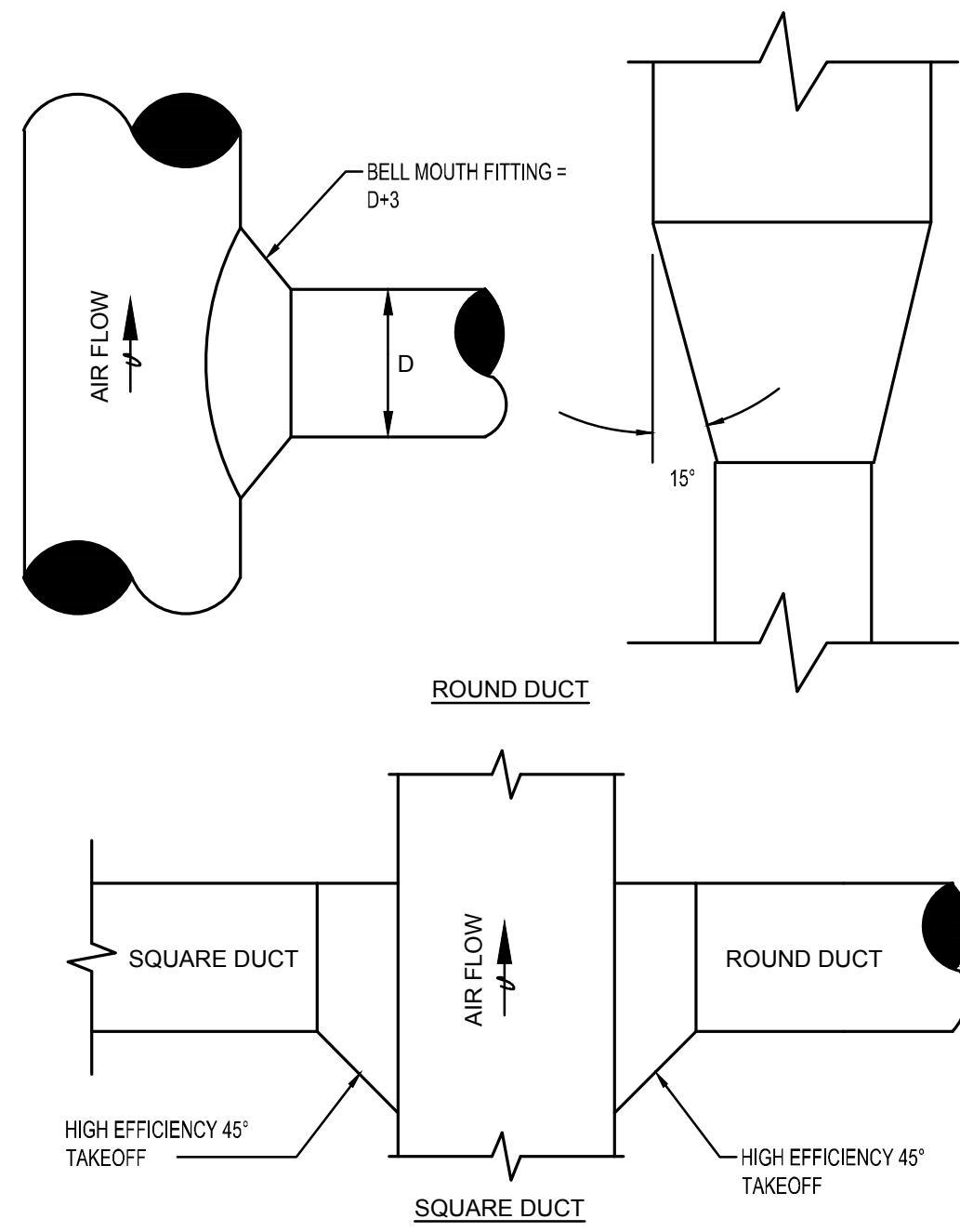




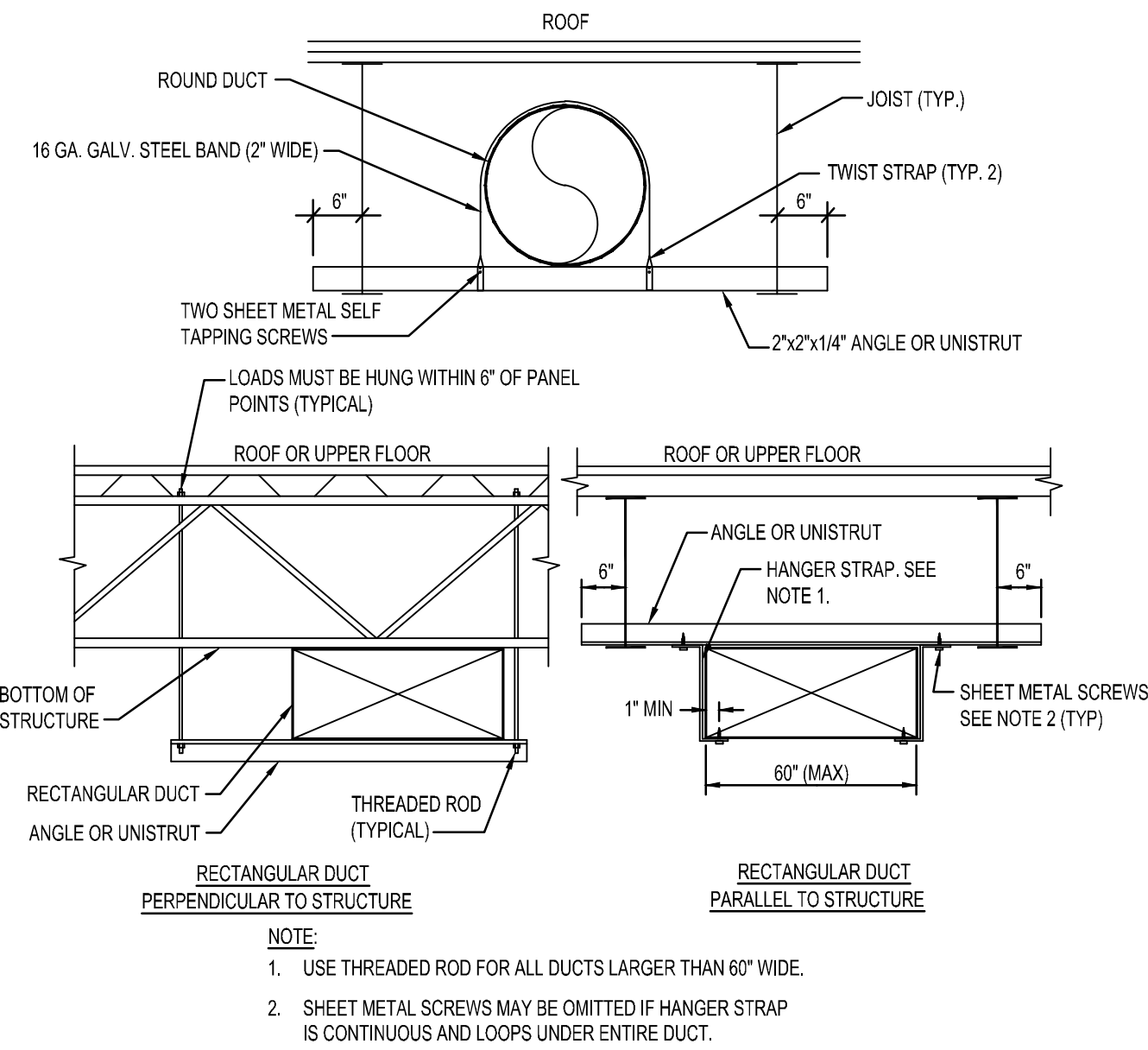
**3 LAY-IN CEILING DIFFUSER**  
NOT TO SCALE



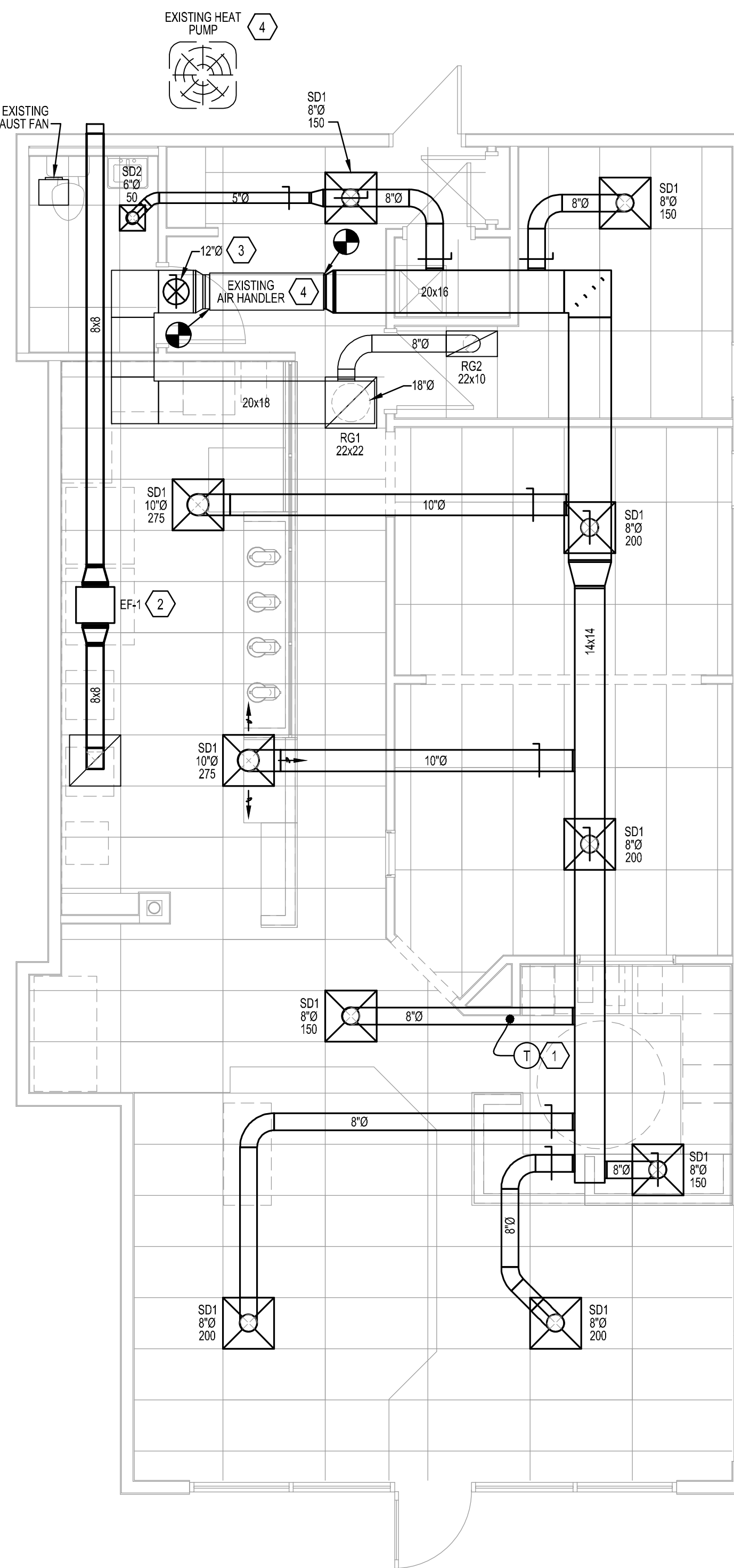
**4 INLINE EXHAUST FAN DETAIL**  
NOT TO SCALE



**2 DUCT TAKEOFFS AND FITTINGS**  
NOT TO SCALE



**3 DUCT HANGERS AND SUPPORTS**  
NOT TO SCALE



**1 MECHANICAL PLAN**  
SCALE: 1/4\"/>

GRILLE, REGISTER, AND DIFFUSER SCHEDULE						
MARK	MANUFACTURER	MODEL	FACE TYPE	MOUNTING LOCATION	FACE SIZE (IN)	NOTES
SD1	PRICE	SCD	SQUARE CONE	CEILING	24"x24"	1, 2, 3, 4, 5, 6, 7
SD2	PRICE	SCD	SQUARE CONE	CEILING	12"x12"	1, 2, 3, 4, 5, 6, 7
RG1	PRICE	80	EGGCRATE	CEILING	24"x24"	1, 3, 4, 6, 7
RG2	PRICE	80	EGGCRATE	CEILING	24"x12"	1, 3, 4, 6, 7
EG1	PRICE	PDDR	PERFORATED	CEILING	24"x24"	1, 3, 4, 6, 7

NOTES:

1 NECK SIZE SHOWN ON DRAWINGS.

2 4-WAY THROW PATTERN, UNLESS SHOWN OTHERWISE ON DRAWINGS (REFER TO FLOW ARROWS IF INDICATED ON DRAWINGS).

3 BAKED ENAMEL FINISH TO MATCH CEILING/WALL COLOR, COORDINATE WITH ARCHITECTURAL PLANS.

4 PROVIDE NECK FOR DUCT CONNECTION.

5 BRANCH DUCT SIZE SHALL BE SAME AS NECK SIZE UNLESS OTHERWISE SHOWN ON DRAWINGS.

6 FRAME TYPE TO MATCH CONSTRUCTION OF MOUNTING LOCATION, COORDINATE WITH ARCHITECTURAL PLANS.

7 PROVIDE WITH VOLUME DAMPER OPERABLE FROM FACE OF DIFFUSER/GRILLE IN HARD CEILINGS.

EXHAUST FAN SCHEDULE										
MARK	MANUFACTURER	MODEL	MOUNTING	VOLUME (CFM)	ESP (IN)	FAN RPM	DRIVE (BELT/DIRECT)	MOTOR HP	ELECTRICAL VOLTS/PH	WEIGHT (LBS)
EF-1	GREENHECK	SQ-90-VG	INLINE	300	0.5	1540	DIRECT	1/6	240/1/60	60

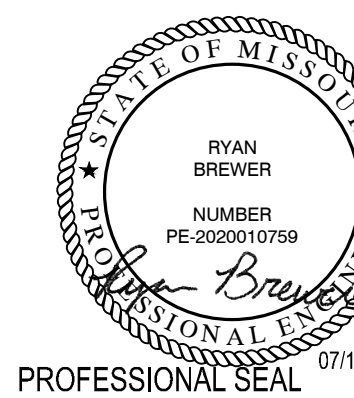
NOTES:  
1 PROVIDE WITH BACK DRAFT DAMPER, DISCONNECT, AND SPEED CONTROLLER FOR BALANCING. SUSPEND FROM STRUCTURE WITH ALL-THREAD RODS.  
2 FAN SHALL RUN CONTINUOUSLY DURING OPERATING HOURS.

- GENERAL NOTES**  
(NOT ALL NOTES APPLY)
- REFERENCE SHEET M1.01 FOR GENERAL NOTES, SYMBOLS, AND ABBREVIATIONS.
- KEYED NOTES:**
- RELOCATE EXISTING THERMOSTAT FOR EXISTING AIR HANDLER TO LOCATION INDICATED. MOUNT TOP OF THERMOSTAT AT MAXIMUM 48\"/>

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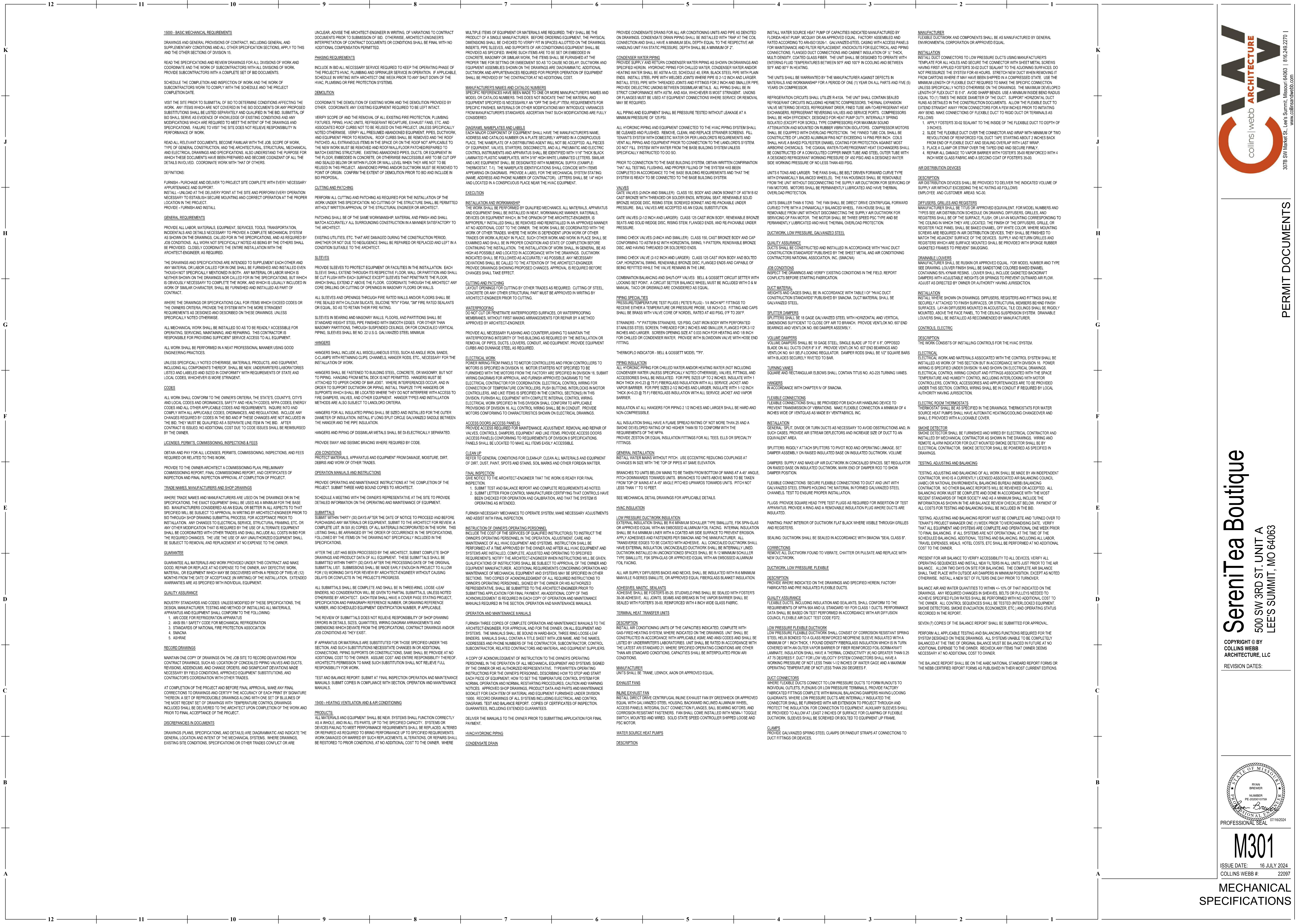
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MECHANICAL PLAN





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**MECHANICAL  
SPECIFICATIONS**

**15000 - BASIC MECHANICAL REQUIREMENTS**

DRAWINGS AND GENERAL PROVISIONS OF CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND ALL OTHER SPECIFICATION SECTIONS, APPLY TO THIS AND THE OTHER SECTIONS OF DIVISION 15.

READ THE SPECIFICATIONS AND REVIEW DRAWINGS FOR ALL DIVISIONS OF WORK AND COORDINATE AND THE WORK OF SUBCONTRACTORS WITH ALL DIVISIONS OF WORK. PROVIDE SUBCONTRACTORS WITH A COMPLETE SET OF BID DOCUMENTS.

SCHEDULE THE COMPLETION AND INSPECTION OF WORK AND THE WORK OF SUBCONTRACTORS TO COMPLY WITH THE SCHEDULE AND THE PROJECT COMPLETION DATE.

VISIT THE SITE PRIOR TO SUBMITTAL OF BID TO DETERMINE CONDITIONS AFFECTING THE WORK. ANY ITEMS WHICH ARE NOT COVERED IN THE BID REQUIREMENTS OR ANY PROPOSED SUBSTITUTIONS SHALL BE LISTED SEPARATELY AND QUALIFIED IN THE BID. SUBMITTAL OF BID SHALL SERVE AS EVIDENCE OF KNOWLEDGE OF EXISTING CONDITIONS AND ANY MODIFICATIONS WHICH ARE REQUIRED TO MEET THE INTENT OF THE DRAWINGS AND SPECIFICATIONS. FAILURE TO VISIT THE SITE DOES NOT RELIEVE RESPONSIBILITY IN PERFORMANCE OF WORK.

READ ALL RELEVANT CONDITIONS, BECOME FAMILIAR WITH THE JOB, SCOPE OF WORK, TYPE OF GENERAL CONSTRUCTION, AND THE ARCHITECTURAL, STRUCTURAL, MECHANICAL AND ELECTRICAL DRAWINGS AND SPECIFICATIONS, AND ALSO UNDERSTAND THE PURPOSE FOR WHICH THESE DOCUMENTS HAVE BEEN PREPARED AND BECOME AWARE OF ALL THE DETAILS INVOLVED. COORDINATE WORK WITH THAT OF OTHERS.

**DEFINITIONS:**

FURNISH - PURCHASE AND DELIVER TO PROJECT SITE COMPLETE WITH EVERY NECESSARY APPURTENANCE AND SUPPORT.  
INSTALL - UNLOAD AT THE DELIVERY POINT AT THE SITE AND PERFORM EVERY OPERATION NECESSARY TO ESTABLISH SECURE MOUNTING AND CORRECT OPERATION AT THE PROPER LOCATION IN THE PROJECT.  
PROVIDE - FURNISH AND INSTALL.

**GENERAL REQUIREMENTS**

PROVIDE ALL LABOR, MATERIALS, EQUIPMENT, SERVICES, TOOLS, TRANSPORTATION, INSTRUCTIONS AND DETAILS NECESSARY TO PROVIDE A COMPLETE MECHANICAL SYSTEM AS SHOWN ON THE DRAWINGS, CALLED FOR IN THE SPECIFICATIONS, AND AS REQUIRED BY ANY CONDITIONS. ALL WORK NOT SPECIFICALLY NOTED AS BEING BY THE OTHERS SHALL BE PROVIDED. CLOSELY COORDINATE THE ENTIRE INSTALLATION WITH THE ARCHITECT-ENGINEER, AS REQUIRED.

THE DRAWINGS AND SPECIFICATIONS ARE INTENDED TO SUPPLEMENT EACH OTHER AND ANY MATERIAL OR LABOR CALLED FOR IN ONE SHALL BE FURNISHED AND INSTALLED EVEN THOUGH NOT SPECIFICALLY MENTIONED IN BOTH. ANY MATERIAL OR LABOR WHICH IS NEITHER SHOWN ON THE DRAWINGS NOR CALLED FOR IN THE SPECIFICATIONS, BUT WHICH IS OBVIOUSLY NECESSARY TO COMPLETE THE WORK, AND WHICH IS USUALLY INCLUDED IN WORK OF SIMILAR CHARACTER, SHALL BE FURNISHED AND INSTALLED AS PART OF CONTRACT.

WHERE THE DRAWINGS OR SPECIFICATIONS CALL FOR ITEMS WHICH EXCEED CODES OR THE OWNERS CRITERIA, PROVIDE THE SYSTEM WITH THE MORE STRINGENT REQUIREMENTS AS DESIGNED AND DESCRIBED IN THESE DRAWINGS, UNLESS SPECIFICALLY NOTED OTHERWISE.

ALL MECHANICAL WORK SHALL BE INSTALLED SO AS TO BE READILY ACCESSIBLE FOR OPERATING, SERVICING, MAINTAINING, AND REPAIRING. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING SUFFICIENT SERVICE ACCESS TO ALL EQUIPMENT.

ALL WORK SHALL BE PERFORMED IN A NEAT PROFESSIONAL MANNER USING GOOD ENGINEERING PRACTICE.

UNLESS SPECIFICALLY NOTED OTHERWISE, MATERIALS, PRODUCTS, AND EQUIPMENT, INCLUDING ALL COMPONENTS THEREOF, SHALL BE NEW, UNDETERMINED LABORATORIES LISTED AND LABELED AND SIZED IN CONFORMITY WITH REQUIREMENTS OF STATE AND LOCAL CODES, WHICHEVER IS MORE STRINGENT.

**CODES**

ALL WORK SHALL CONFORM TO THE OWNERS CRITERIA, THE STATES, COUNTYS, CITIES AND LOCAL CODES AND ORDINANCES, SAFETY AND HEALTH CODES, NFPA CODES, ENERGY CODES AND ALL OTHER APPLICABLE CODES AND REQUIREMENTS. INQUIRE INTO AND COMPLY WITH ALL APPLICABLE CODES, ORDINANCES, AND REGULATIONS. INCLUDE ANY CHANGES REQUIRED BY CODES IN THE BID AND IF THESE CHANGES ARE NOT INCLUDED IN THE BID, THEY MUST BE QUALIFIED AS A SEPARATE LINE ITEM IN THE BID. AFTER CONTRACT IS ISSUED, NO ADDITIONAL COST DUE TO CODE ISSUES SHALL BE REIMBURSED BY THE OWNER.

**LICENSES, PERMITS, COMMISSIONING, INSPECTIONS & FEES**

OBTAIN AND PAY FOR ALL LICENSES, PERMITS, COMMISSIONING, INSPECTIONS, AND FEES REQUIRED OR RELATED TO THIS WORK.

PROVIDE TO THE OWNER/ARCHITECT A COMMISSIONING PLAN, PRELIMINARY COMMISSIONING REPORT, FINAL COMMISSIONING REPORT, AND CERTIFICATES OF INSPECTION AND FINAL INSPECTION APPROVAL AT COMPLETION OF PROJECT.

**TRADE NAMES, MANUFACTURERS AND SHOP DRAWINGS**

WHERE TRADE NAMES AND MANUFACTURERS ARE USED ON THE DRAWINGS OR IN THE SPECIFICATIONS, THE EXACT EQUIPMENT SHALL BE USED AS A MINIMUM FOR THE BASE BID. MANUFACTURERS CONSIDERED AS AN EQUAL OR BETTER IN ALL ASPECTS TO THAT SPECIFIED WILL BE SUBJECT TO APPROVAL BY THE ARCHITECT-ENGINEER PRIOR TO BID THROUGH SHOP DRAWING SUBMITTAL PROCESS. FOR ACCEPTANCE PRIOR TO INSTALLATION, ANY CHANGES TO ELECTRICAL SERVICE, STRUCTURAL FRAMING, ETC. OR ANY OTHER MODIFICATION THAT IS REQUIRED BY THE USE OF ALTERNATE EQUIPMENT SHALL BE COORDINATED WITH OTHER TRADES AND SHALL INCLUDE ALL COSTS IN BID FOR THE REQUIRED CHANGES. THE USE OF ANY UNAUTHORIZED EQUIPMENT SHALL BE SUBJECT TO REMOVAL AND REPLACEMENT AT NO EXPENSE TO THE OWNER.

**WARRANTY**

GUARANTEE ALL MATERIALS AND WORK PROVIDED UNDER THIS CONTRACT AND MAKE GOOD, REPAIR OR REPLACE AT NO EXPENSE TO THE OWNER, ANY DEFECTIVE WORK, MATERIAL, OR EQUIPMENT WHICH MAY BE DISCOVERED WITHIN A PERIOD OF TWELVE (12) MONTHS FROM THE DATE OF ACCEPTANCE (IN WRITING) OF THE INSTALLATION. EXTENDED WARRANTIES ARE AS SPECIFIED WITH INDIVIDUAL EQUIPMENT.

**QUALITY ASSURANCE**

INDUSTRY STANDARDS AND CODES, UNLESS MODIFIED BY THESE SPECIFICATIONS, THE DESIGN, MANUFACTURER, TESTING AND METHOD OF INSTALLING ALL MATERIALS, APPARATUS AND EQUIPMENT SHALL CONFORM TO THE FOLLOWING:

- ARI CODE FOR REFRIGERATION APPARATUS
- ANSI B3.1 SAFETY CODE FOR MECHANICAL REFRIGERATION
- STANDARDS OF NATIONAL FIRE PROTECTION ASSOCIATION
- SMACNA
- ASHRAE

**RECORD DRAWINGS**

MAINTAIN ONE COPY OF DRAWINGS ON THE JOB SITE TO RECORD DEVIATIONS FROM CONTRACT DRAWINGS, SUCH AS LOCATION OF CONCEALED PIPING VALVES AND DUCTS, REVISIONS, ADDENDUMS, AND CHANGE ORDERS, AND SIGNIFICANT DEVIATIONS MADE NECESSARY BY FIELD CONDITIONS, APPROVED EQUIPMENT SUBSTITUTIONS, AND CONTRACTORS COORDINATION WITH OTHER TRADES.

AT COMPLETION OF THE PROJECT AND BEFORE FINAL APPROVAL, MAKE ANY FINAL CORRECTIONS TO DRAWINGS AND CERTIFY THE ACCURACY OF EACH PRINT BY SIGNATURE THEREON. A SET OF REPRODUCIBLE DRAWINGS ALONG WITH ONE SET OF BLUELINES OF THE MOST RECENT SET OF DRAWINGS WITH TEMPERATURE CONTROL DRAWINGS INCLUDED SHALL BE DELIVERED TO THE ARCHITECT UPON COMPLETION OF THE WORK AND PRIOR TO FINAL ACCEPTANCE OF THE PROJECT.

**DISCREPANCIES IN DOCUMENTS**

DRAWINGS (PLANS, SPECIFICATIONS, AND DETAILS) ARE DIAGRAMMATIC AND INDICATE THE GENERAL LOCATION AND INTENT OF THE MECHANICAL SYSTEMS. WHERE DRAWINGS, EXISTING SITE CONDITIONS, SPECIFICATIONS OR OTHER TRADES CONFLICT OR ARE

UNCLEAR, ADVISE THE ARCHITECT-ENGINEER IN WRITING, OF VARIATIONS TO CONTRACT DOCUMENTS PRIOR TO SUBMISSION OF BID. OTHERWISE, ARCHITECT-ENGINEERS INTERPRETATION OF CONTRACT DOCUMENTS OR CONDITIONS SHALL BE FINAL WITH NO ADDITIONAL COMPENSATION PERMITTED.

**PHASING REQUIREMENTS**

INCLUDE IN BID ALL NECESSARY SERVICE REQUIRED TO KEEP THE OPERATING PHASE OF THE PROJECTS HVAC PLUMBING AND SPRINKLER SERVICE IN OPERATION. IF APPLICABLE SCHEDULE IN WRITING WITH ARCHITECT ONE WEEK PRIOR TO ANY SHUT DOWN OF THE HVAC, PLUMBING OR FIRE PROTECTION SYSTEMS.

**DEMOLITION**

COORDINATE THE DEMOLITION OF EXISTING WORK AND THE DEMOLITION PROVIDED BY OTHER. COORDINATE ANY EXISTING EQUIPMENT REQUIRED TO BE LEFT INTACT.

VERIFY SCOPE OF AND THE REMOVAL OF ALL EXISTING FIRE PROTECTION, PLUMBING FIXTURES, PIPING, HVAC UNITS, REFRIGERANT RECAPTURE, EXHAUST FANS, ETC. AND ASSOCIATED ROOF CURBS NOT TO BE REUSED ON THIS PROJECT, UNLESS SPECIFICALLY NOTED OTHERWISE. VERIFY ALL PRESUMED ABANDONED EQUIPMENT, PIPES, DUCTWORK AND EQUIPMENT PRIOR TO REMOVAL. ROOF CURBS SHALL BE REMOVED AND THE ROOF PATCHED. ALL EXTRANEOUS ITEMS IN THE SPACE OR ON THE ROOF NOT APPLICABLE TO THE NEW WORK MUST BE REMOVED AND ROOF/WALL/FLOOR PATCHED OR EQUIPMENT TO MATCH EXISTING STRUCTURE. EXISTING ABANDONED PIPES, DUCTS, OR EQUIPMENT IN THE FLOOR, EMBEDDED IN CONCRETE, OR OTHERWISE INACCESSIBLE ARE TO BE CUT OFF AND SEALED BELOW OR WITHIN FLOOR OR WALL LEVEL WHEN THEY ARE NOT TO BE REUSED IN THIS PROJECT. ABANDONED PIPING AND/OR DUCTWORK MUST BE REMOVED TO POINT OF ORIGIN. CONFIRM THE EXTENT OF DEMOLITION PRIOR TO BID AND INCLUDE IN BID PROPOSAL.

**CUTTING AND PATCHING**

PERFORM ALL CUTTING AND PATCHING AS REQUIRED FOR THE INSTALLATION OF THE WORK UNDER THIS SPECIFICATION. NO CUTTING OF THE STRUCTURE SHALL BE PERMITTED WITHOUT WRITTEN APPROVAL OF THE STRUCTURAL ARCHITECT OR ARCHITECT.

PATCHING SHALL BE OF THE SAME WORKMANSHIP, MATERIAL AND FINISH AND SHALL MATCH ACCURATELY ALL SURROUNDING CONSTRUCTION IN A MANNER SATISFACTORY TO THE ARCHITECT.

EXISTING UTILITIES, ETC. THAT ARE DAMAGED DURING THE CONSTRUCTION PERIOD, WHETHER OR NOT DUE TO NEGLIGENCE SHALL BE REPAIRED OR REPLACED AND LEFT IN THE SAME CONDITION AS BEFORE THE CONSTRUCTION.

**SLEEVES**

PROVIDE SLEEVES TO PROTECT EQUIPMENT OR FACILITIES IN THE INSTALLATION. EACH SLEEVE SHALL EXTEND THROUGH ITS RESPECTIVE FLOOR, WALL, OR PARTITION AND SHALL BE CUT FLUSH WITH EACH SURFACE EXCEPT SLEEVES THAT PENETRATE THE FLOOR, WHICH SHALL EXTEND 2" ABOVE THE FLOOR. COORDINATE THROUGH THE ARCHITECT ANY CORE DRILLING OR CUTTING OF DRILLINGS IN MASONRY FLOORS OR WALLS.

ALL SLEEVES AND OPENINGS THROUGH FIRE RATED WALLS AND/OR FLOORS SHALL BE FIRE SEALED WITH CALCIUM SILICATE, SILICONE PUTTY, "X" FIRE RATED SEALANTS OR EQUAL, SO AS TO RETAIN THEIR FIRE RATING.

SLEEVES IN BEARING AND MASONRY WALLS, FLOORS, AND PARTITIONS SHALL BE STANDARD WEIGHT STEEL PIPE FINISHED WITH SMOOTH EDGES. FOR OTHER THAN MASONRY PARTITIONS, THROUGH SUSPENDED CEILING, OR FOR CONCEALED VERTICAL PIPING, SLEEVES SHALL BE NO. 22 U.S.G. GALVANIZED STEEL MINIMUM.

**HANGERS**

HANGERS SHALL INCLUDE ALL MISCELLANEOUS STEEL, SUCH AS ANGLE IRON, BANDS, C-CAMPS WITH RETAINING PLUGS, CHANNELS, HANGER RODS, ETC., NECESSARY FOR THE INSTALLATION OF WORK.

HANGERS SHALL BE FASTENED TO BUILDING STEEL, CONCRETE, OR MASONRY BUT NOT TO PILING. HANGING FROM METAL DECK IS NOT PERMITTED. HANGERS MUST BE ATTACHED TO A CHORD MEMBER. WHERE INTERFERENCES OCCUR, HANGERS IN ORDER TO SUPPORT DUCTWORK OR PIPING, INSTALL TRAPEZOID TYPE HANGERS OR SUPPORTS WHICH SHALL BE LOCATED WHERE THEY DO NOT INTERFERE WITH ACCESS TO FIRE DAMPERS, VALVES, AND OTHER EQUIPMENT. HANGER TYPES AND INSTALLATION METHODS ARE ALSO SUBJECT TO LANDLORD CRITERIA.

HANGERS FOR ALL INSULATED PIPING SHALL BE SIZED AND INSTALLED FOR THE OUTER DAMPERS OF INSULATION. INSTALL PLONG BOLT OR RIGID BRACKET GALVANIZED SADDLE BETWEEN THE HANGER AND THE PIPE INSULATION.

HANGERS AND PIPING OF DISSIMILAR METALS SHALL BE DI-ELECTRICALLY SEPARATED.

PROVIDE SWAY AND SEISMIC BRACING WHERE REQUIRED BY CODE.

**JOB CONDITIONS**

PROTECT MATERIALS, APPARATUS AND EQUIPMENT FROM DAMAGE, MOISTURE, DIRT, DERRIS AND WORK OF OTHER TRADES.

**OPERATION MANUALS AND INSTRUCTIONS**

PROVIDE OPERATING AND MAINTENANCE INSTRUCTIONS AT THE COMPLETION OF THE PROJECT. SUBMIT THREE HARD BOUND COPIES TO ARCHITECT.

SCHEDULE A MEETING WITH THE OWNERS REPRESENTATIVE AT THE SITE TO PROVIDE DETAILED INFORMATION ON THE OPERATING AND MAINTENANCE OF EQUIPMENT.

**SUBMITTALS**

SUBMIT WITHIN THIRTY (30) DAYS AFTER THE DATE OF NOTICE TO PROCEED AND BEFORE PURCHASING ANY MATERIALS OR EQUIPMENT. SUBMIT TO THE ARCHITECT FOR REVIEW, A COMPLETE LIST, IN 8" (6) COPIES, OF ALL MATERIALS INCORPORATED IN THE WORK. THIS LISTING SHALL BE APPROVED BY THE ORDER OF OCCURRENCE IN THE SPECIFICATIONS, FOLLOWED BY THE ITEMS ON THE DRAWING NOT SPECIFICALLY INCLUDED IN THE SPECIFICATIONS.

AFTER THE LIST HAS BEEN PROCESSED BY THE ARCHITECT, SUBMIT COMPLETE SHOP DRAWINGS AND PRODUCT DATA OF ALL EQUIPMENT. THESE SUBMITTALS SHALL BE SUBMITTED WITHIN THIRTY (30) DAYS AFTER THE PROCESSING DATE OF THE ORIGINAL SUBMITTAL LIST. SUBMISSIONS SHALL BE MADE EARLY ENOUGH IN PROJECT TO ALLOW FOR (10) WORKING DAYS FOR REVIEW BY ARCHITECT-ENGINEER WITHOUT CAUSING DELAYS OR CONFLICTS IN THE PROJECTS PROGRESS.

ALL SUBMITTALS SHALL BE COMPLETE AND SHALL BE IN THREE-RING, LOOSE-LEAF BINDERS, NO CONSIDERATION WILL BE GIVEN TO PARTIAL SUBMITTALS. UNLESS NOTED OTHERWISE BY ARCHITECT, EACH ITEM SHALL HAVE A COVER PAGE STATING PROJECT, SPECIFICATION AND PARAGRAPH REFERENCE NUMBER, OR DRAWING REFERENCE NUMBER, AND SCHEDULED EQUIPMENT IDENTIFICATION NUMBER, IF APPLICABLE.

THE REVIEW OF SUBMITTALS DOES NOT RELIEVE RESPONSIBILITY OF SHOP DRAWING ERRORS IN DETAILS, SIZES, QUANTITIES, WRITING DIAGRAM ARRANGEMENTS AND DIMENSIONS WHICH DEVIATE FROM THE SPECIFICATIONS, CONTRACT DRAWINGS AND/OR JOB CONDITIONS AS THEY EXIST.

IF APPARATUS OR MATERIALS ARE SUBSTITUTED FOR THOSE SPECIFIED UNDER THIS SECTION, AND SUCH SUBSTITUTIONS NECESSITATE CHANGES IN OR ADDITIONAL CONNECTIONS, PIPING SUPPORTS OR CONSTRUCTIONS, SAME SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER. ASSUME COST AND ENTIRE RESPONSIBILITY THEREOF, ARCHITECT'S PERMISSION TO MAKE SUCH SUBSTITUTION SHALL NOT RELIEVE FULL RESPONSIBILITY FOR WORK.

TEST AND BALANCE REPORT: SUBMIT AT FINAL INSPECTION OPERATION AND MAINTENANCE MANUALS. SUBMIT COPIES IN COMPLIANCE WITH SECTION, OPERATION AND MAINTENANCE MANUALS.

**15000 - HEATING, VENTILATION AND AIR CONDITIONING**

**PRODUCTS:**

ALL MATERIALS AND EQUIPMENT SHALL BE NEW. SYSTEMS SHALL FUNCTION CORRECTLY AS A WHOLE, AND IN ALL ITS PARTS, UP TO THE SPECIFIED CAPACITY. SYSTEMS OR DEVICES FAILING TO MEET PERFORMANCE REQUIREMENTS SHALL BE REPLACED, ALTERED OR REPAIRED AS REQUIRED TO BRING PERFORMANCE UP TO SPECIFIED REQUIREMENTS. WORK DAMAGED OR MARRED BY SUCH REPLACEMENTS, ALTERATIONS, OR REPAIRS SHALL BE RESTORED TO PRIOR CONDITIONS, AT NO ADDITIONAL COST TO THE OWNER. WHERE

MULTIPLE ITEMS OF EQUIPMENT OR MATERIALS ARE REQUIRED, THEY SHALL BE THE PRODUCT OF A SINGLE MANUFACTURER. BEFORE ORDERING EQUIPMENT, THE PHYSICAL DIMENSIONS SHALL BE CHECKED TO VERIFY ALL SPACES ALLOTTED ON THE DRAWINGS. INSERTS, PIPE SLEEVES, AND SUPPORTS OF AIR CONDITIONING EQUIPMENT SHALL BE PROVIDED AS SPECIFIED. WHERE SUCH ITEMS ARE TO BE SET OR EMBEDDED IN CONCRETE, MASONRY OR SIMILAR MATERIALS, THE ITEMS SHALL BE FURNISHED AT THE PROPER TIME FOR SETTING OR EMBEDMENT SO AS TO CAUSE NO DELAY. DUCTWORK AND EQUIPMENT ASSEMBLIES SHOWN ON THE DRAWINGS ARE DIAGRAMMATIC. ADDITIONAL DUCTWORK AND APPURTENANCES REQUIRED FOR PROPER OPERATION OF EQUIPMENT SHALL BE PROVIDED BY THE CONTRACTOR AT NO ADDITIONAL COST.

MANUFACTURERS NAMES AND CATALOG NUMBERS  
SPECIFIC REFERENCES HAVE BEEN MADE TO ONE OR MORE MANUFACTURERS NAMES AND MODEL OR CATALOG NUMBERS. THIS DOES NOT INDICATE THAT THE MATERIAL AND EQUIPMENT SPECIFIED IS ESPECIALLY AN "OFF THE SHELF" ITEM. REQUIREMENTS FOR SPECIFIC MATERIALS, MATERIALS OR OTHER MODIFICATIONS MAY INTRODUCE VARIANCES FROM MANUFACTURERS STANDARDS. ASCERTAIN THAT SUCH MODIFICATIONS ARE FULLY CONSIDERED.

**DIAGRAMS, NAMEPLATES AND LABELS**

EACH MAJOR COMPONENT OF EQUIPMENT SHALL HAVE THE MANUFACTURERS NAME, ADDRESS AND CATALOG NUMBER ON A PLATE SPECIFICALLY AFFIXED IN A NEAT, EASY TO PATCHED, PLACE. THE NAMEPLATE OF A DISTRIBUTING AGENT WILL NOT BE ACCEPTED. ALL PIECES OF EQUIPMENT, VALVES, STARTERS, DISCONNECTS, AND ALL PNEUMATIC AND ELECTRIC CONTROL INSTRUMENTS AND APPARATUS SHALL BE IDENTIFIED WITH 1/16" THICK BLACK LAMINATED PLASTIC NAMEPLATES, WITH 5/16" HIGH WHITE LAMINATED LETTERS. SIMILAR AND LIKE EQUIPMENT SHALL BE DESIGNATED WITH NUMERICAL SUFFIX (EXAMPLE: THERMOSTAT 1-1). THE NAMEPLATE IDENTIFICATIONS SHALL CONCORD WITH ITEMS APPEARING ON DIAGRAMS. PROVIDE A LABEL FOR THE MECHANICAL SYSTEM STATING (NAME, ADDRESS AND PHONE NUMBER OF CONTRACTOR). LETTERS SHALL BE 1/4" HIGH AND LOCATED IN A CONSPICUOUS PLACE NEAR THE HVAC EQUIPMENT.

**EXECUTION**

**INSTALLATION AND WORKMANSHIP**

THE WORK SHALL BE PERFORMED BY QUALIFIED MECHANICS. ALL MATERIALS, APPARATUS AND EQUIPMENT SHALL BE INSTALLED IN NEAT, WORKMANLIKE MANNER. MATERIALS, DEVICES OR EQUIPMENT WHICH, IN THE OPINION OF THE ARCHITECT-ENGINEER, IS IMPROPERLY INSTALLED SHALL BE REMOVED AND REINSTALLED IN AN APPROVED MANNER AT NO ADDITIONAL COST TO THE OWNER. THE WORK SHALL BE COORDINATED WITH THE WORK OF OTHER TRADES, WHERE THE WORK IS DEPENDENT UPON WORK OF OTHER TRADES OR WORK ALREADY IN PLACE. SUCH OTHER WORK AND WORK IN PLACE SHALL BE EXAMINED AND SHALL BE IN PROPER CONDITION AND STATE OF COMPLETION BEFORE CONTINUING THE INSTALLATION. THE INSTALLATION OF WORK SHALL, IN GENERAL, BE AS HIGH AS POSSIBLE AND LOCATED IN CONFORMANCE WITH THE DRAWINGS. DUCTWORK INSTALLED SHALL BE FOLLOWED AS ACCURATELY AS POSSIBLE, ANY NECESSARY DEVIATIONS SHALL BE CALLED TO THE ATTENTION OF THE ARCHITECT-ENGINEER. BEFORE DRAWINGS SHOWING PROPOSED CHANGES, APPROVAL IS REQUIRED BEFORE CHANGES SHALL TAKE EFFECT.

**CUTTING AND PATCHING**

PIVOT OPENINGS FOR EXHAUST FANS OR OTHER EQUIPMENT SHALL BE CUT BY OTHER TRADES AS REQUIRED. CUTTING OF STEEL, CONCRETE OR ANY OTHER STRUCTURAL PART MUST BE APPROVED IN WRITING BY ARCHITECT-ENGINEER PRIOR TO CUTTING.

**WATERPROOFING**

DO NOT CUT OR PENETRATE WATERPROOFED SURFACES, OR WATERPROOFING MEMBRANES, WITHOUT FIRST MAKING ARRANGEMENTS FOR REPAIR BY A METHOD APPROVED BY ARCHITECT-ENGINEER.

PROVIDE ALL NECESSARY FLASHING AND COUNTERFLASHING TO MAINTAIN THE WATERPROOFING INTEGRITY OF THIS BUILDING AS REQUIRED BY THE INSTALLATION OR REMOVAL OF PIPES, DUCTS, LOUVERS, CONDUIT, AND EQUIPMENT. PROVIDE EQUIPMENT CURBS AND DUNNAGE STEEL, AS REQUIRED.

**ELECTRICAL WORK**

POWER WIRING FROM MOTORS TO MOTOR CONTROLLERS AND FROM CONTROLLERS TO ALL HYDRONIC PIPING FOR CHILLED WATER AND/OR HEATING WATER NOT INCLUDING CONDENSER WATER UNLESS SPECIFICALLY NOTED OTHERWISE, VALVES, FITTINGS, AND ACCESSORIES SHALL BE INSULATED. FOR PIPE SIZES UP TO 12 INCHES, INSULATE WITH 1 INCH THICK (K=23 @ 75 F) FIBERGLASS INSULATION WITH ALL SERVICE JACKET AND VAPOR BARRIER. FOR PIPE SIZES 2-12 INCHES AND LARGER, INSULATE WITH 1-1/2 INCH THICK (K=23 @ 75 F) FIBERGLASS INSULATION WITH ALL SERVICE JACKET AND VAPOR BARRIER. INSULATION AT ALL HANGERS FOR PIPING 2 1/2 INCHES AND LARGER SHALL BE HARD AND NON-COMPRESSIBLE.

**ACCESS DOORS (ACCESS PANELS)**

PROVIDE ACCESS REQUIRED FOR MAINTENANCE, ADJUSTMENT, REMOVAL AND REPAIR OF VALVES, CONTROLS, DAMPERS AND OTHER LIKE ITEMS. PROVIDE ACCESS DOORS (ACCESS PANELS) CONFORMING TO REQUIREMENTS OF DIVISION 8 SPECIFICATIONS. PANELS SHALL BE LOCATED TO MAKE ALL ITEMS EASILY ACCESSIBLE.

**CLEAN UP**

REFER TO GENERAL CONDITIONS FOR CLEAN-UP. CLEAN ALL MATERIALS AND EQUIPMENT OF DIRT, DUST, PAINT, SPOTS AND STAINS, SOIL MARKS AND OTHER FOREIGN MATTER.

**FINAL INSPECTION**

- GIVE NOTICE TO THE ARCHITECT-ENGINEER THAT THE WORK IS READY FOR FINAL ACCEPTANCE.
- SUBMIT TEST AND BALANCE REPORT AND COMPLETE REQUIREMENTS AS NOTED.
- SUBMIT LETTER FROM CONTROL MANUFACTURER CERTIFYING THAT CONTROLS HAVE BEEN CHECKED FOR OPERATION AND CALIBRATION, AND THAT THE SYSTEM IS OPERATING AS INTENDED.

FURNISH NECESSARY MECHANICS TO OPERATE SYSTEM, MAKE NECESSARY ADJUSTMENTS AND ASSIST WITH FINAL INSPECTION.

INSTRUCTION OF OWNERS OPERATING PERSONNEL  
INCLUDE THE COST OF THE SERVICES OF QUALIFIED INSTRUCTORS TO INSTRUCT THE OWNERS OPERATING PERSONNEL IN THE OPERATION, ADJUSTMENT, CARE AND MAINTENANCE OF ALL HVAC EQUIPMENT AND SYSTEMS. INSTRUCTION SHALL BE PERFORMED AT A TIME APPROVED BY THE OWNER AND AFTER ALL HVAC EQUIPMENT AND SYSTEMS ARE INSTALLED, COMPLETE, ADJUSTED AND OPERATING TO SPECIFIED REQUIREMENTS. NOTIFY THE ARCHITECT-ENGINEER WHEN INSTRUCTIONS WILL BE GIVEN. QUALIFICATIONS OF INSTRUCTORS SHALL BE SUBJECT TO APPROVAL OF THE OWNER AND EQUIPMENT MANUFACTURER. ADDITIONAL REQUIREMENTS CONCERNING OPERATION AND MAINTENANCE OF MECHANICAL EQUIPMENT AND SYSTEMS MAY BE SPECIFIED IN OTHER SECTIONS. TWO COPIES OF ACKNOWLEDGMENT OF ALL REQUIRED INSTRUCTIONS TO OWNERS OPERATING PERSONNEL, SIGNED BY THE OWNER OR HIS AUTHORIZED REPRESENTATIVE, SHALL BE SUBMITTED TO THE ARCHITECT-ENGINEER PRIOR TO SUBMITTING APPLICATION FOR FINAL PAYMENT. AN ADDITIONAL COPY OF THIS ACKNOWLEDGMENT IS REQUIRED IN EACH COPY OF OPERATION AND MAINTENANCE MANUALS REQUIRED IN THE SECTION, OPERATION AND MAINTENANCE MANUALS.

**OPERATION AND MAINTENANCE MANUALS**

FURNISH THREE COPIES OF COMPLETE OPERATION AND MAINTENANCE MANUALS TO THE ARCHITECT-ENGINEER, FOR APPROVAL AND FOR THE OWNER, ON ALL EQUIPMENT AND SYSTEMS. THE MANUALS SHALL BE BOUND IN HARD BACK, THREE RING LOOSE-LEAF BINDERS. MANUALS SHALL CONTAIN A TITLE SHEET WITH JOB NAME AND THE NAMES, ADDRESSES AND PHONE NUMBERS OF THE CONTRACTOR, SUBCONTRACTOR, CONTROL, SUBCONTRACTOR, RELATED CONTRACTORS AND MATERIAL AND EQUIPMENT SUPPLIERS.

A COPY OF ACKNOWLEDGMENT OF INSTRUCTION TO THE OWNERS OPERATING PERSONNEL IN THE OPERATION OF ALL MECHANICAL EQUIPMENT AND SYSTEMS, SIGNED BY THE OWNER OR HIS AUTHORIZED REPRESENTATIVE, TYPEWRITTEN OPERATING INSTRUCTIONS FOR THE OWNERS PERSONNEL, DESCRIBING HOW TO STOP AND START EACH PIECE OF EQUIPMENT, HOW TO TEST THE TEMPERATURE CONTROL SYSTEM FOR NORMAL OPERATION AND NORMAL RESTARTING PROCEDURES, CAUTION AND WARNING NOTICES, APPROVED SHOP DRAWINGS, PRODUCT DATA AND PARTS AND MATERIALS SOURCE LIST FOR EACH ITEM, MATERIAL AND EQUIPMENT, FURNISHED UNDER SHOP DRAWING, RECORD DRAWINGS OF ALL SYSTEMS INCLUDING ELECTRICAL AND CONTROL DIAGRAMS, TEST AND BALANCE REPORT, COPIES OF CERTIFICATES OF INSPECTION, GUARANTEES, INCLUDING EXTENDED GUARANTEES.

DELIVER THE MANUALS TO THE OWNER PRIOR TO SUBMITTING APPLICATION FOR FINAL PAYMENT.

**HYDROHYDRONIC PIPING**

**CONDENSATE DRAIN**

PROVIDE CONDENSATE DRAINS FOR ALL AIR CONDITIONING UNITS AND PIPE AS DENOTED ON DRAWINGS. CONDENSATE DRAIN PIPING SHALL BE INSTALLED WITH TRAP AT THE COIL. INTERIOR CONNECTIONS SHALL HAVE A MINIMUM SEAL DEPTH EQUAL TO THE RESPECTIVE AIR HANDLING UNIT FAN STATIC PRESSURE. DEPTH SHALL BE A MINIMUM OF 2".

**CONDENSER WATER PIPING**

PROVIDE SUPPLY AND RETURN CONDENSER WATER PIPING AS SHOWN ON DRAWINGS AND SPECIFIED HEREIN. HYDRONIC PIPING FOR CHILLED WATER, CONDENSER WATER AND/OR HEATING WATER SHALL BE ASTM A106, SCHEDULE 40, BLACK STEEL PIPE WITH FLARE ENDS. INSTALL STEEL PIPE WITH WELDED JOINTS AND FITTINGS FOR 2-1/2 INCH AND LARGER. INSTALL STEEL PIPE WITH THREADED JOINTS AND FITTINGS FOR 2 INCH AND SMALLER PIPE. PROVIDE ELECTRIC UNIONS BETWEEN DISSIMILAR METALS. ALL PIPING SHALL BE IN STRICT CONFORMANCE WITH ASTM AND AISA, WHICHEVER IS MOST STRINGENT. UNIONS OR FLANGES MUST BE USED AT EQUIPMENT CONNECTIONS WHERE SERVICE OR REMOVAL MAY BE REQUIRED.

ALL PIPING AND EQUIPMENT SHALL BE PRESSURE TESTED WITHOUT LEAKAGE AT A MINIMUM PRESSURE OF 125 PSI.

ALL HYDRONIC PIPING AND EQUIPMENT CONNECTED TO THE HVAC PIPING SYSTEM SHALL BE CLEANED AND FLUSHED. REMOVE, CLEAN, AND REPLACE STRAINER SCREENS. FILL TENANTS SYSTEM WITH DOMESTIC WATER OR PER LANDLORDS REQUIREMENTS AND VENT ALL PIPING AND EQUIPMENT PRIOR TO CONNECTION TO THE LANDLORDS SYSTEM UNLESS SPECIFICALLY INSTRUCTED TO DO SO.

PRIOR TO CONNECTION TO THE BASE BUILDING SYSTEM, OBTAIN WRITTEN CONFIRMATION THAT ALL TESTING, FLUSHING, AND PROPER FILLING OF THE SYSTEM HAS BEEN COMPLETED IN ACCORDANCE TO THE BASE BUILDING REQUIREMENTS AND THAT THE SYSTEM IS READY TO BE CONNECTED TO THE BASE BUILDING SYSTEM.

**VALVES**

GATE VALVES (2-INCH AND SMALLER); CLASS 150; BODY AND UNION BONNET OF ASTM B 62 CAST BRONZE WITH THREADED OR SOLDER ENDS. INTEGRAL SEAT, RENEWABLE SOFT BRONZE WEDGE DISC, RISING STEM, SCREWED BONNET AND RE-PACKABLE UNDER PRESSURE. BALL VALVES ARE ACCEPTED AS AN EQUAL SUBSTITUTION.

GATE VALVES 2-1/2 INCH AND LARGER; CLASS 125 CAST IRON BODY, RENEWABLE BRONZE SEATS AND SOFT WEDGE DISC, RISING STEM, FLANGED ENDS, AND RE-PACKABLE UNDER PRESSURE.

SWING CHECK VALVES (2-INCH AND SMALLER); CLASS 150; CAST BRONZE BODY AND CAP CONFORMING TO ASTM B 62 WITH HORIZONTAL SWING. Y-PATTERN, RENEWABLE BRONZE DISC, AND HAVING THREADED OR SOLDERED ENDS.

SWING CHECK VALVE (2-1/2 INCH AND LARGER); CLASS 125 CAST IRON BODY AND BOLTED CAP. REPTITIZED SWING, RENEWABLE BRONZE DISC, FLANGED ENDS AND CAPABLE OF BEING REVERTED WHILE THE VALVE REMAINS IN THE LINE.

COMBINING BALANCING AND SHUT-OFF VALVES. BELL & GOSSETT ORCUTT SETTER WITH LOCKING SET POINT. A SHORT-SETTER BALANCE WHEEL MUST BE INCLUDED WITH 0.8 M MANUAL, TACO OR BROADBENT ARE CONSIDERED AS EQUAL.

**PIPING SPECIALTIES**

PRESSURE/TEMPERATURE TEST PLUGS (PETE'S PLUGS) - 1/4 INCH NPT FITTINGS TO RECEIVE EITHER A TEMPERATURE OR PRESSURE PROBE, 18 INCH O.D. FITTING AND CAPS SHALL BE BRASS WITH VALVE CODE OF NOREL, RATED AT 400 PSIG, 0°F TO 200°F.

STRAINERS - "Y" PATTERN STRAINERS, 125 PSIG, CAST IRON BODY WITH PERFORATED STAINLESS STEEL SCREEN, THREADED FOR 2 INCHES AND SMALLER, FLANGED FOR 2-1/2 INCH THICK (K=23 @ 75 F) FIBERGLASS INSULATION WITH ALL SERVICE JACKET AND VAPOR BARRIER. FOR PIPE SIZES 2-12 INCHES AND LARGER, INSULATE WITH 1-1/2 INCH THICK (K=23 @ 75 F) FIBERGLASS INSULATION WITH ALL SERVICE JACKET AND VAPOR BARRIER.

THERMOFLUID INDICATOR - BELL & GOSSETT MODEL "TFF".

**PIPING INSULATION**

INSULATION FOR PIPING FOR CHILLED WATER AND/OR HEATING WATER NOT INCLUDING CONDENSER WATER UNLESS SPECIFICALLY NOTED OTHERWISE, VALVES, FITTINGS, AND ACCESSORIES SHALL BE INSULATED. FOR PIPE SIZES UP TO 12 INCHES, INSULATE WITH 1 INCH THICK (K=23 @ 75 F) FIBERGLASS INSULATION WITH ALL SERVICE JACKET AND VAPOR BARRIER. FOR PIPE SIZES 2-12 INCHES AND LARGER, INSULATE WITH 1-1/2 INCH THICK (K=23 @ 75 F) FIBERGLASS INSULATION WITH ALL SERVICE JACKET AND VAPOR BARRIER.

INSULATION AT ALL HANGERS FOR PIPING 2 1/2 INCHES AND LARGER SHALL BE HARD AND NON-COMPRESSIBLE.

ALL INSULATION SHALL HAVE A FLAME SPREAD RATING OF NOT MORE THAN 25 AND A SMOKE DEVELOPED RATING OF NO HIGHER THAN 50 TO CONFORM WITH THE REQUIREMENTS OF THE NFPA. PROVIDE ZESTON OR EQUAL INSULATION FITTINGS FOR ALL TEES, ELBS OR SPECIALTY FITTINGS.

**GENERAL INSTALLATION**

INSTALL WATER MAINS WITHOUT PITCH. USE ECCENTRIC REDUCING COUPLINGS AT CHANGES IN SIZE WITH THE TOP OF PIPES AT SAME ELEVATION.

BRANCHES TO UNITS BELOW MAINS TO BE TAKEN FROM BOTTOM OF MAINS AT A 45° ANGLE. PITCH DOWNWARDS TOWARDS UNITS. BRANCHES TO UNITS ABOVE MAINS TO BE TAKEN FROM TOP OF MAINS AT A 45° ANGLE, PITCHED UPWARDS TOWARDS UNITS. PITCH NOT LESS THAN 1" TO 10 FEET.

SEE MECHANICAL DETAIL DRAWINGS FOR APPLICABLE DETAILS.

**HVAC INSULATION**

**LOW PRESSURE FLEXIBLE DUCTWORK INSULATION**

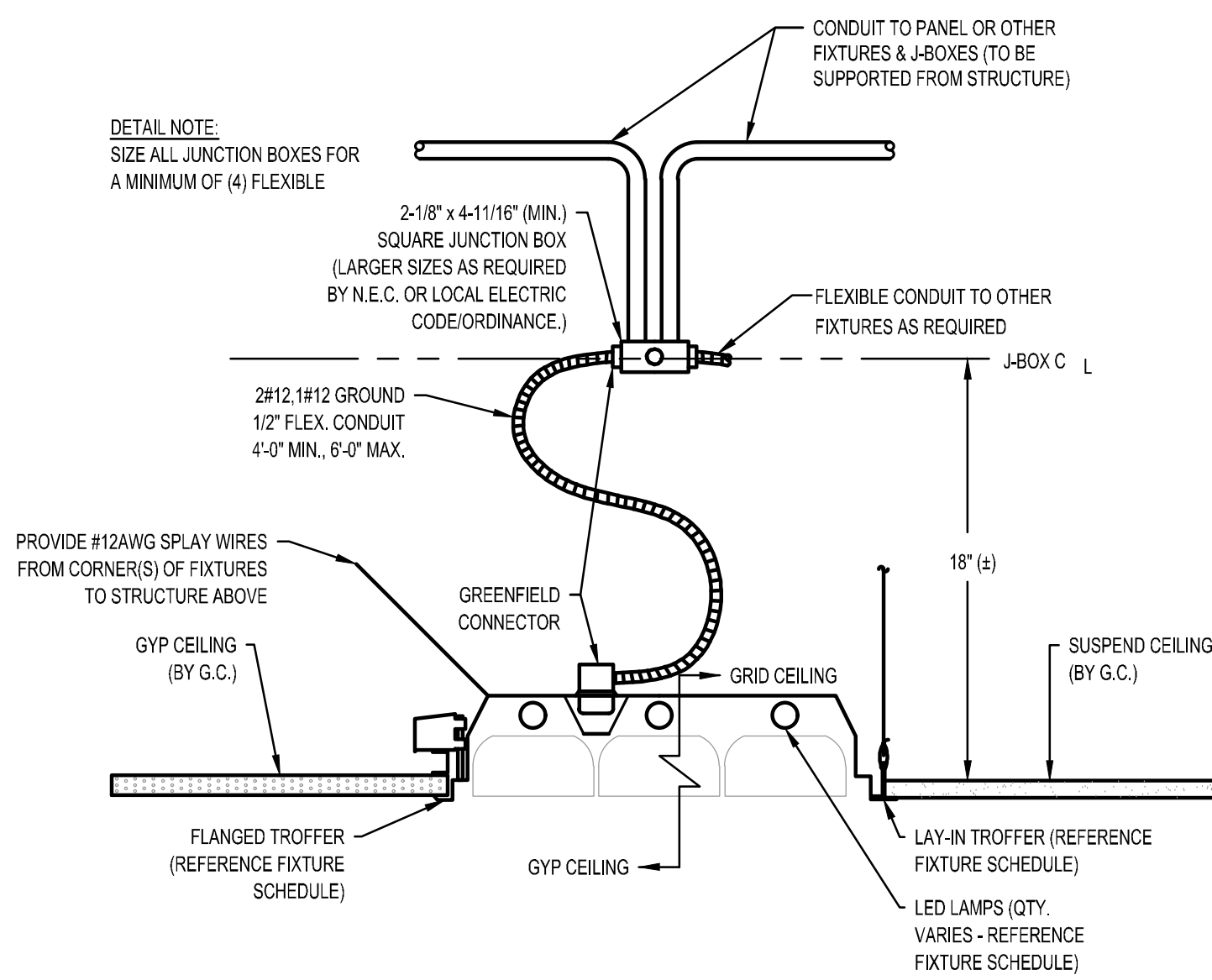
EXTERNAL INSULATION SHALL BE R-6 MINIMUM SCHULLER TYPE SMALLLITE, FSK SPIN-GLAS OR APPROVED EQUAL, WITH AN EMBOSSED ALUMINUM FOIL FACING. INTERNAL INSULATION SHALL BE R-6 MINIMUM LINER WITH A COATED AIR SIDE SURFACE TO PREVENT EROSION. APPLY ADHESIVES AND FASTENERS PER SMACNA AND THE MANUFACTURER. ALL TRANSVERSE EDGES TO BE COATED WITH ADHESIVE. ALL CONCEALED DUCTWORK SHALL HAVE EXTERNAL INSULATION. UNCONCEALED DUCTWORK SHALL BE INTERNALLY LINED. DUCTWORK INSTALLED IN UNCONDITIONED SPACES SHALL BE R-12 MINIMUM SCHULLER TYPE SMALLLITE, FSK SPIN-GLAS OR APPROVED EQUAL, WITH AN EMBOSSED ALUMINUM FOIL FACING.

ALL AIR SUPPLY DIFFUSERS BACKS AND NECKS, SHALL BE INSULATED WITH R-6 MINIMUM MANVILLE R-SERIES SMALLITE, OR APPROVED EQUAL, FIBERGLASS BLANKET INSULATION.

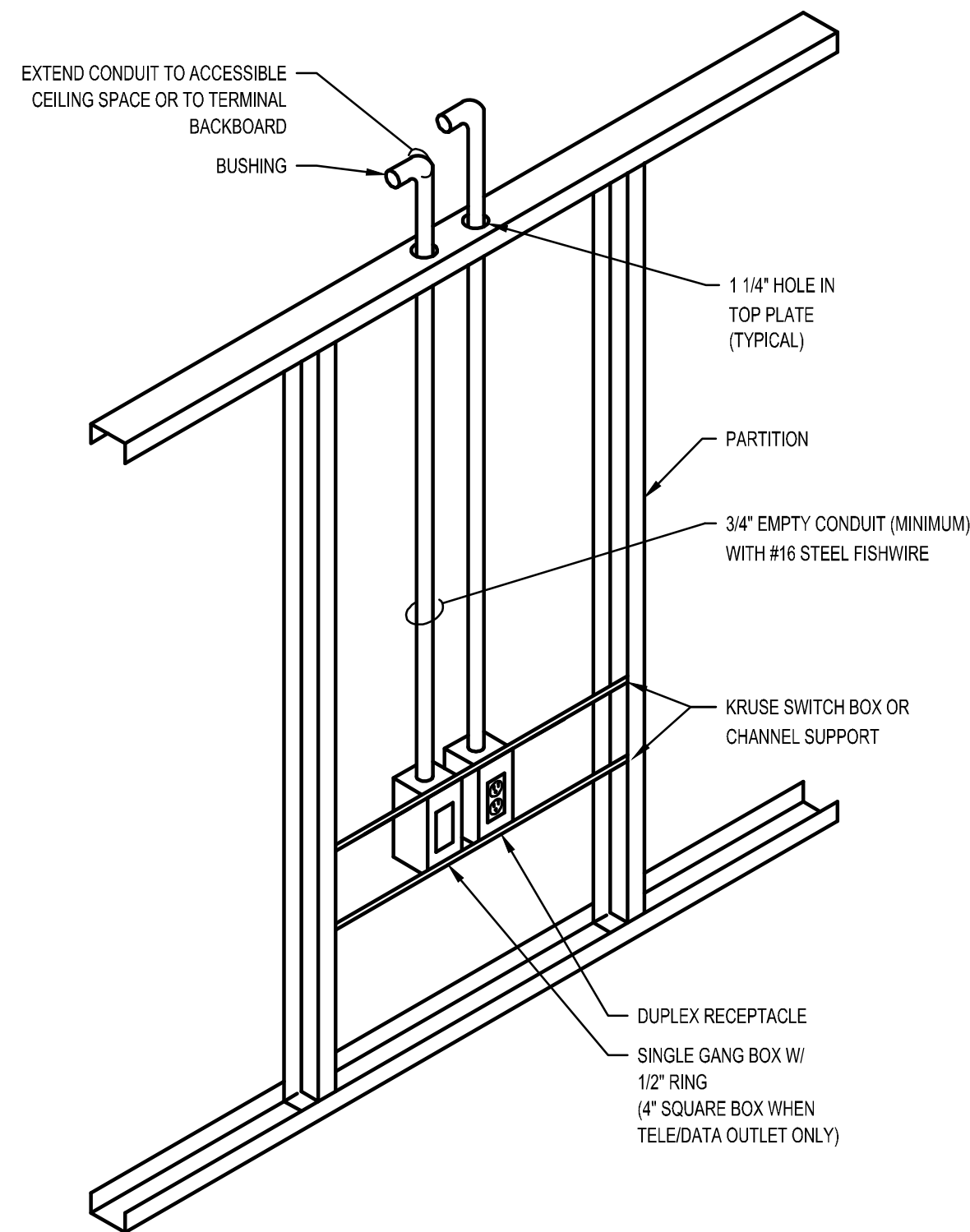
**ADHESIVES, MASTIC, SEALANTS**

ADHESIVE SHALL BE FOSTERS B5-20. STUDIED PWS SHALL BE SEALED WITH FOSTERS 30-S-8 ADHESIVE. ALL JOINTS, SEAMS AND BREAKS IN THE VAPOR BARRIER SHALL BE SEALED WITH FOSTERS 30-S-8, REINFORCED WITH 4 INCH WIDE GLASS FABRIC.





**1 TYPICAL RECESSED FIXTURE DETAIL**  
SCALE: NOT TO SCALE



**2 OUTLET IN HOLLOW PARTITION**  
SCALE: NOT TO SCALE

## ELECTRICAL ABBREVIATIONS

AC	ALTERNATING CURRENT
AHU	AIR HANDLING UNIT
A, OR AMPS	AMPERES
APC	ABOVE FINISH COUNTER
AFCI	ARC FAULT CIRCUIT INTERRUPTER
AFF	ABOVE FINISHED FLOOR
AIC	AMPERES INTERRUPTING CAPACITY
ATS	AUTOMATIC TRANSFER SWITCH
BTC	BRANCH TO CONNECTION POINT AND CONNECT EQUIPMENT
C	CONDUIT ("E.C." IS EMPTY CONDUIT)
CF	CEILING FAN
CM	COFFEE MAKER
CT	COOKTOP
D	DEDICATED CIRCUIT
DDO	DUPLEX CONVENIENCE OUTLET
DP	DISPOSAL
DW	DISHWASHER
DY	DRYER
EMT	ELECTRICAL METALLIC TUBING
EF	EXHAUST FAN
EWC	ELECTRIC WATER COOLER (WATER-COOLED DRINKING FOUNTAIN)
EX	EXISTING
FCU	FAN COIL UNIT
GFIC/FCI	GROUND FAULT CIRCUIT INTERRUPTER
GFI/P	GROUND FAULT INTERRUPTER PROTECTED
GRD	GROUND
H	HORIZONTAL MOUNT (RECEPTACLE)
HD	VENTILATION HOOD
HP	HORSEPOWER
HT	HEAT TRACE POWER (PROVIDE W/ 20A/1P GFI BREAKER)
HVAC	HEATING, VENTILATING, & AIR CONDITIONING
Hz	HERTZ
IG	ISOLATED GROUND (DUPLEX RECEPTS - NEMA 5-20RIG)
KCM	THOUSAND CIRCULAR MILLS
KVA	KILOVOLT-AMPERES (1000 VOLT-AMPERES)
KW	KILOWATTS (1000 WATTS)
MLO	MAIN LUGS ONLY
MCB	MAIN CIRCUIT BREAKER
MW	MICROWAVE (COORD MTG HT W/ ARCHITECT)
NIC	NOT IN CONTRACT
NEC	NATIONAL ELECTRICAL CODE
NF	NOT FUSED
OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
PNL	PANEL
PH OR Ø	PHASE
P	POLE
PVC	POLYVINYL CHLORIDE
RF	REFRIGERATOR
RG	RANGE
SPD	SURGE PROTECTIVE DEVICE
T	TAMPERPROOF RECEPTACLE
TTB	TELEPHONE TERMINAL BOARD
TV	TELEVISION RECEPTACLE
UC	UNDERCOUNTER REFRIGERATOR (OR ICE MACHINE)
UL	UNDERWRITERS LABORATORIES
U.N.O.	UNLESS NOTED OTHERWISE
V	VOLTS
VA	VOLT-AMPERES
VD	VENDING MACHINE (2P/4P)
VFD	VARIABLE FREQUENCY DRIVE
W	WATTS
WA	WASHER
WD	WARMING DRAWER
W/O	WALL OVEN
WP	WEATHERPROOF
WPWR	WEATHERPROOF/WEATHER RESISTANT
W/UNT	DISCONNECT IS SUPPLIED WITH THE UNIT

## GENERAL ELECTRICAL NOTES

1. COMPLETE INSTALLATION SHALL BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE, REQUIREMENTS OF THE AHJ AND ALL LOCAL & STATE CODES.
2. DO NOT SCALE FROM THESE DRAWINGS.
3. REFER TO ARCHITECTURAL DRAWINGS AND REFLECTED CEILING PLANS FOR EXACT LOCATIONS OF ALL LIGHTING FIXTURES AND ELECTRICAL DEVICES.
4. ALL EMPTY CONDUITS SHALL BE PROVIDED WITH PULL STRINGS AND BUSHINGS.
5. ALL JUNCTION BOXES SHALL HAVE A COVER.
6. COORDINATE EACH LIGHT FIXTURE INSTALLATION(S) W/ ACTUAL CEILING TO BE FURNISHED.
7. ALL BRANCH CIRCUITS WITHOUT A CONDUCTOR & CONDUIT INDICATED SHALL BE ROUTED TO A 20A-1P BREAKER W/ 2412, 1P/2EG, 34°C.
8. ALL BRANCH CIRCUIT CONDUCTORS SHALL NOT BE SMALLER THAN #12 AWG AND ALL CONDUIT SHALL NOT BE SMALLER THAN 3/4" UNLESS SPECIFICALLY NOTED OTHERWISE.
9. ALL CIRCUITS (LIGHTING AND POWER) SHALL BE PROVIDED WITH DEDICATED NEUTRALS UNLESS NOTED OTHERWISE. WHERE NEUTRALS ARE INDICATED TO BE SHARED, MULTIWIRE BRANCH CIRCUITS SHALL BE PROVIDED WITH 2P OR 3P BREAKERS AS REQUIRED PER NEC 210.4.
10. ALL CIRCUITS (LIGHTING AND POWER) SHALL BE PROVIDED WITH AN INSULATED EQUIPMENT GROUND CONDUCTOR SIZED IN ACCORDANCE WITH THE NEC. THE RACEWAY SHALL NOT BE USED AN EQUIPMENT GROUND.
11. ALL FIXTURES SHALL BE SUPPORTED FROM EACH CORNER (INDEPENDENT OF THE SUSPENDED CEILING) WITH 12 GAUGE WIRE CONNECTED TO STRUCTURAL SYSTEM OF BUILDING. THE INSTALLATION SHALL MEET OR EXCEED THE SEISMIC REQUIREMENTS OF LOCAL AND NATIONAL CODES.
12. ELECTRICAL DEVICE MOUNTING HEIGHTS, UNO:
  - PANELBOARDS 78" AFF TO TOP OF PANEL
  - SWITCHES 48" AFF TO TOP OF JUNCTION BOX
  - RECEPTACLES 18" AFF TO CENTER OF RECEPTACLE
  - TELEDATA OUTLETS 18" AFF TO CENTER OF RECEPTACLE
  - APARTMENT LOADCENTERS PER ANSI A11.1 REQUIREMENTS (VERIFY WITH LOCAL INSPECTOR)
13. ELECTRICAL EQUIPMENT (PANELBOARDS, TRANSFORMERS, DISTRIBUTION EQUIPMENT, ETC.) IS SHOWN TO SCALE ON THE FLOOR PLANS.
14. THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR PROVIDING EQUIPMENT THAT WILL FIT WITHIN THE SPACES SHOWN ON THE PLANS AND COMPLYING WITH ALL CODE REQUIRED CLEARANCES.
15. ELECTRICAL CONTRACTOR TO LABEL ALL DEVICES (RECEPTACLES, SWITCHES, PANELBOARDS, DISCONNECTS, ETC.) WITH CIRCUIT NUMBER AND PANELBOARD DESIGNATION. RECEPTACLES, SWITCHES, AND SIMILAR DEVICES TO HAVE PRE-PRINTED, SELF-ADHESIVE LABEL.
16. PANELBOARDS, DISCONNECT SWITCHES, AND SIMILAR DEVICES TO HAVE ENGRAVED, SELF-ADHESIVE, LAMINATED ACRYLIC LABEL (BLACK W/ WHITE LETTERING).
17. PROVIDE TYPE-WRITTEN PANELBOARD SCHEDULES FOR ALL ELECTRICAL PANELBOARDS.

## ELECTRICAL SYMBOLS

LIGHTING FIXTURES/DEVICES			POWER EQUIPMENT/DEVICES		
SYMBOL	DESCRIPTION	MOUNTING	SYMBOL	DESCRIPTION	MOUNTING
	DOWNLIGHT (LETTER INDICATES FIXTURE TYPE) REFER TO LIGHT FIXTURE SCHEDULE	CEILING		SWITCHBOARD OR DISTRIBUTION PANEL REFER TO PANEL SCHEDULES	
	DIRECTIONAL DOWNLIGHT (LETTER INDICATES FIXTURE TYPE) REFER TO LIGHT FIXTURE SCHEDULE	CEILING		DRY-TYPE TRANSFORMER REFER TO PLANS FOR KVA RATING	
	WALL MOUNTED LIGHT FIXTURE (LETTER INDICATES FIXTURE TYPE) REFER TO LIGHT FIXTURE SCHEDULE	WALL		120/208V, 30, 4W PANELBOARD REFER TO PANEL SCHEDULES	
	LINEAR LIGHT FIXTURE (LETTER INDICATES FIXTURE TYPE) REFER TO LIGHT FIXTURE SCHEDULE	CEILING OR SUSPENDED		277/480V, 30, 4W PANELBOARD REFER TO PANEL SCHEDULES	
	2x4 LIGHT FIXTURE (LETTER INDICATES FIXTURE TYPE) REFER TO LIGHT FIXTURE SCHEDULE	CEILING		JUNCTION BOX	WALL OR CEILING
	2x2 LIGHT FIXTURE (LETTER INDICATES FIXTURE TYPE) REFER TO LIGHT FIXTURE SCHEDULE	CEILING		FUSED SAFETY SWITCH (E.G. 30250 INDICATES A 30A, 3-POLE SWITCH WITH 20A FUSES)	
	HATCHING ON FIXTURE INDICATES FIXTURE TO HAVE EMERGENCY BACK-UP			NON-FUSED SAFETY SWITCH (E.G. 30NF3 INDICATES A 30A, 3-POLE SWITCH WITHOUT FUSES)	
	TWO HEAD EMERGENCY LIGHT FIXTURE (LETTER INDICATES FIXTURE TYPE) REFER TO LIGHT FIXTURE SCHEDULE	WALL OR CEILING		MOTOR RATED SWITCH	
	EMERGENCY EXIT SIGN. PROVIDE ARROW(S) AS INDICATED. SHADING INDICATES FACE (LETTER INDICATES FIXTURE TYPE) REFER TO LIGHT FIXTURE SCHEDULE	WALL OR CEILING		MOTOR	
	SINGLE POLE SWITCH 20A (120/277V)	WALL - 48" AFF		NEMA 5-20R SIMPLEX RECEPTACLE	WALL - 18" AFF
	THREE WAY SWITCH 20A (120/277V)	WALL - 48" AFF		NEMA 5-20R DUPLEX RECEPTACLE	WALL - 18" AFF
	FOUR WAY SWITCH 20A (120/277V)	WALL - 48" AFF		NEMA 5-20R DUPLEX RECEPTACLE MOUNTED ABOVE COUNTER	
	WALL BOX DIMMER SWITCH	WALL - 48" AFF		NEMA 5-20R QUAD-PLEX RECEPTACLE	WALL - 18" AFF
	CEILING OR WALL MOUNTED OCCUPANCY SENSOR (LETTER INDICATES SENSOR TYPE) REFER TO LIGHTING CONTROLS SCHEDULE	WALL OR CEILING		NEMA 5-20R SPLIT RECEPTACLE. TOP OUTLET WIRED HOT. BOTTOM OUTLET SWITCHED.	WALL - 18" AFF OR CEILING
	LOW VOLTAGE CONTROL STATION (LETTER INDICATES CONTROL STATION TYPE) REFER TO LIGHTING CONTROLS SCHEDULE	WALL - 48" AFF		SPECIAL PURPOSE RECEPTACLE REFER TO PLANS FOR NEMA CONFIGURATION	WALL - 18" AFF OR CEILING
	PHOTOCELL SENSOR (LETTER INDICATES SENSOR TYPE) REFER TO LIGHTING CONTROLS SCHEDULE	FIELD VERIFY		NEMA 5-20R - DUPLEX RECEPTACLE WITH USB PORTS SIMILAR TO HUBBELL FUSE20ACSW	WALL - 18" AFF
	POWERPACK (LETTER INDICATES POWERPACK TYPE) REFER TO LIGHTING CONTROLS SCHEDULE	ACCESSIBLE CEILING		NEMA 5-20R DUPLEX RECEPTACLE MOUNTED ON CEILING	CEILING - FLUSH
COMMUNICATION/LOW-VOLTAGE DEVICES				HUBBELL CF84 SERIES FLOOR BOX (OR EQUAL) WITH (2) DUPLEX RECEPTACLES AND DATA/COMMUNICATION CONNECTION CAPABILITY	FLOOR - FLUSH
	CARD READER (VERIFY EXACT REQUIREMENTS)			HUBBELL B24 SERIES FLOOR BOX (OR EQUAL) FOR POWER AND DATA CONNECTIONS TO PRE-WIRED FURNITURE. VERIFY EXACT CONNECTION WITH FURNITURE VENDOR.	FLOOR - FLUSH
	DATA, TELEPHONE, OR COMBO TELEDATA OUTLET PROVIDE PULLSTRING IN CONDUIT TO ACCESSIBLE CEILING	WALL - 18" AFF		HUBBELL S1PTF SERIES 4" POKE-THRU (OR EQUAL) WITH (2) DUPLEX RECEPTACLES AND DATA/COMMUNICATION CONNECTION CAPABILITY	FLOOR - FLUSH
	DATA, TELEPHONE, OR COMBO TELEDATA OUTLET PROVIDE PULLSTRING IN CONDUIT TO ACCESSIBLE CEILING	FLOOR OR CEILING		HUBBELL S1PTFF SERIES 4" POKE-THRU (OR EQUAL) FOR POWER AND DATA CONNECTIONS TO PRE-WIRED FURNITURE. VERIFY EXACT CONNECTION WITH FURNITURE VENDOR.	FLOOR - FLUSH
	TELEVISION OUTLET	WALL OR CEILING		HUBBELL S180 SERIES 6" POKE-THRU (OR EQUAL) WITH (2) DUPLEX RECEPTACLES AND DATA/COMMUNICATION AND AV CONNECTION CAPABILITY	FLOOR - FLUSH
	SPEAKER OUTLET	FIELD VERIFY		CONDUIT IN OR UNDER FLOOR/GRADE	
	TELEPHONE TERMINAL BOARD	WALL		CONDUCTOR HOME RUN - (H) HOT, (N) NEUTRAL, (G) EQUIPMENT GROUND, & ( ) ISOLATED GROUND	
	SECURITY CAMERA OUTLET	FIELD VERIFY		EQUIPMENT CONNECTION	
	PUSH BUTTON			CONDUIT IN CEILING OR WALL	

NOTE: NOT ALL SYMBOLS MAY BE USED.

1. IF MOUNTED ABOVE A COUNTER, DEVICE TO BE WALL MOUNTED 6" ABOVE FINISHED COUNTER OR 44" TO TOP OF JUNCTION BOX (WHICHEVER IS LOWER). IF NOT MOUNTED ABOVE A COUNTER, DEVICE TO BE WALL MOUNTED AT 48" AFF TO TOP OF JUNCTION BOX AS REQUIRED TO MEET ADA REQUIREMENTS. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATIONS/ELEVATIONS.

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REVISION DATES:



**E101**

ISSUE DATE: 16 JULY 2024  
COLLINS WEBB #: 22097

ELECTRICAL NOTES,  
SYMBOLS & ABBREVIATIONS



PERMIT DOCUMENTS



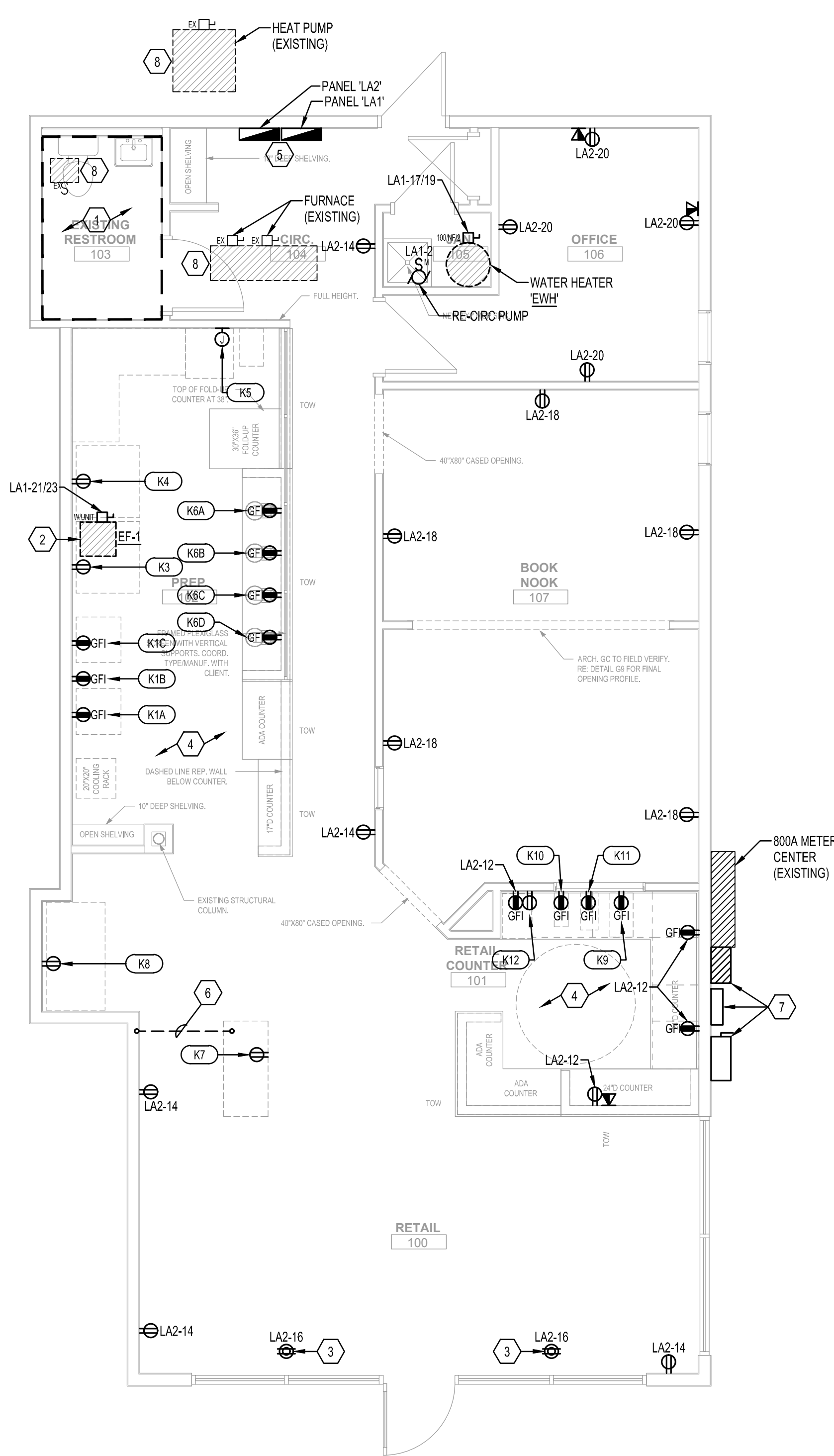
KITCHEN ELECTRICAL ROUGH-IN SCHEDULE										
ITEM TAG	DESCRIPTION	VOLT	PH.	LOAD KW	AMPS	CIRCUIT	MOUNTING		REMARKS	
							CONN.	RT HT		
K1A	COUNTERTOP OVEN	120	1	1.6		L1A-25	DOO	NOTE #1		
K1B	COUNTERTOP OVEN	120	1	1.6		L1A-27	DOO	NOTE #1		
K1C	COUNTERTOP OVEN	120	1	1.6		L1A-29	DOO	NOTE #1		
K3	DOUBLE DOOR REACH-IN REFRIGERATOR	120	1	0.46		L2A-15	DOO	NOTE #1		
K4	REACH-IN FREEZER	120	1	0.42		L2A-15	DOO	NOTE #1		
K5	LOW-TEMP DISHWASHER	120	1	13.2		L2A-17	JBOX	NOTE #1		
K5A	4.5 QUART STAND MIXER	120	1	0.3		L2A-19	DOO	NOTE #1		
K5B	4.5 QUART STAND MIXER	120	1	0.3		L2A-21	DOO	NOTE #1		
K5C	4.5 QUART STAND MIXER	120	1	0.3		L2A-23	DOO	NOTE #1		
K5D	4.5 QUART STAND MIXER	120	1	0.3		L2A-25	DOO	NOTE #1		
K7	BAKERY DISPLAY CASE	120	1	3.9		L2A-27	DOO	NOTE #1		
K8	REACH-IN COOLER	120	1	5.4		L2A-23	DOO	NOTE #1		
K9	TEA/COFFEE BREWER COMBO	120	1	1.4		L2A-24	DOO	NOTE #1		
K10	COFFEE GRINDER	120	1	7		L2A-26	DOO	NOTE #1		
K11	HOT WATER DISPENSER	120	1	17.5		L2A-28	DOO	NOTE #1		
K12	ICE MACHINE	120	1	6		L2A-29	DOO	NOTE #1		

### GENERAL KITCHEN EQUIPMENT NOTES

- #1 COORDINATE ALL EQUIPMENT CONNECTIONS WITH SUPPLIER EQUIPMENT AND VENDOR DRAWINGS PRIOR TO ROUGH-IN.
- #2 REFER TO ELECTRICAL PANEL SCHEDULES FOR WIRE SIZE & BREAKER SIZE OF EQUIPMENT CIRCUIT.
- #3 PROVIDE AND INSTALL RECEPTABLES, DISCONNECTS, AND ELECTRICAL CONNECTIONS AS REQUIRED FOR POWER, ALL ROUGH-INS AND FINAL CONNECTIONS SHALL BE IN ACCORDANCE WITH ALL APPLICABLE CODES & HEALTH DEPT.
- #4 PER NEC 210.8(b)(2), ALL SINGLE PHASE RECEPTABLES RATED 150V TO 1000V, 30 AMPS OR LESS AND THREE PHASE RECEPTABLES RATED 150V TO 480V OR LESS, 100 AMPS OR LESS SHALL BE PROVIDED WITH GFI PROTECTION. WHERE CIRCUIT IS NOT DEREGISTERED WITH GFI, ELECTRICAL CONTRACTOR SHALL PROVIDE A GFI TO THE BREAKER OR FALCLOS GFI DEVICE ADJACENT TO THE PANEL, SERVING THE EQUIPMENT.

### CONNECTION LEGEND


DOO - DUPLEX RECEPTABLE, SR - SIMPLEX RECEPTABLE, SPR - SPECIAL PURPOSE RECEPTABLE, JBOX - JUNCTION BOX, BTC - BRANCH TO CONNECTION, DISC - DISCONNECT SWITCH



# 1 ELECTRICAL POWER PLAN

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

- ## GENERAL NOTES
- (NOT ALL NOTES APPLY)
- REFERENCE SHEET E101 FOR GENERAL NOTES, SYMBOLS, AND ABBREVIATIONS.
- COORDINATE MOUNTING HEIGHTS AND LOCATIONS FOR ALL DEVICES WITH ARCHITECT AND/OR INTERIOR ELEVATIONS PRIOR TO ROUGH-IN.
- SUPPLIER AND MANUFACTURER.
- PHONE/DATA OUTLETS TO BE ABOVE ACCESSIBLE CEILING. VERIFY EXACT REQUIREMENTS WITH TELEPHONE EQUIPMENT SUPPLIER AND MANUFACTURER.
- CIRCUIT NUMBERS SHOWN ARE FOR REFERENCE ONLY. CONTRACTOR TO FIELD VERIFY EXISTING CONDITIONS. REMOVE EXCESS WIRING RESULTING FROM DEMOLITION.
- CONTRACTOR TO BE RESPONSIBLE TO RECONFIGURE OUTLETS LEFT ON INCOMPLETE CIRCUITS.
- WHERE POSSIBLE, RE-USE SPARE CIRCUITS RESULTING FROM DEMOLITION PRIOR TO PULLING NEW CIRCUITS FROM PANELBOARD.
- EXISTING CONDITIONS INDICATED IN THESE DOCUMENTS ARE BASED ON A CURSORY SITE REVIEW AND DO NOT REPRESENT A DETAILED INVESTIGATION OF DOCUMENTS. IT IS THE CONTRACTORS RESPONSIBILITY TO FULLY INVESTIGATE ALL EXISTING CONDITIONS AND NOTIFY THE ARCHITECT IMMEDIATELY OF ANY DISCREPANCIES TO THESE DOCUMENTS OR THE DESIGN INTENT.

- ## KEYED NOTES:
- 
- NO SCOPE IN THIS AREA. EXISTING RESTROOM AREA TO REMAIN. CONDUIT EXISTING CIRCUITING TO NEW PANELS AS REQUIRED.
- ROUTE EXHAUST FAN CIRCUIT THROUGH TIME CLOCK. CONTROL INFORMATION IS FOR EXHAUST FAN TO BE ON DURING BUSINESS HOURS. REFER TO DETAIL 2 (SHEET E301) FOR ADDITIONAL INFORMATION.
- PROVIDE RECEPTACLE(S) ABOVE SHOW WINDOW AS REQUIRED PER NEC 210.62.
- REMOVE ALL EQUIPMENT CONNECTIONS AND LOCATIONS WITH OWNER PRIOR TO ROUGH-IN.
- FIELD VERIFY EXACT LOCATION OF PANELS LA1 & LA2 WITH OWNER PRIOR TO ROUGH-IN. ENSURE ALL WORKING CLEARANCE MAINTAINED PER NEC 110.26.
- STUB (1") CONDUIT FROM MULLHORN TO NEAREST WALL AND UP INTO ACCESSIBLE CIELING FOR POWER TO BAKERY.
- DISPLAY CASES. FIELD VERIFY EXACT LOCATION PRIOR TO ROUGH-IN. PREPARE FLOORING AS REQUIRED.
- PROVIDE METER CENTER TAP BOX. 40A. 30A. SELF-CONTAINED METER AND 40A. FUSED DISCONNECT FOR ELECTRICAL FEED TO BAKERY. REFER TO SHEET E401 FOR ADDITIONAL INFORMATION.
- INTERCEPT AND EXTEND CIRCUIT FOR EXISTING EQUIPMENT TO REMAIN TO NEW PANEL(S) AS REQUIRED. FIELD VERIFY EXISTING BREAKER SIZE AND PROVIDE A NEW BREAKER IN THE NEW PANEL(S) TO MATCH.



# PERMIT DOCUMENTS

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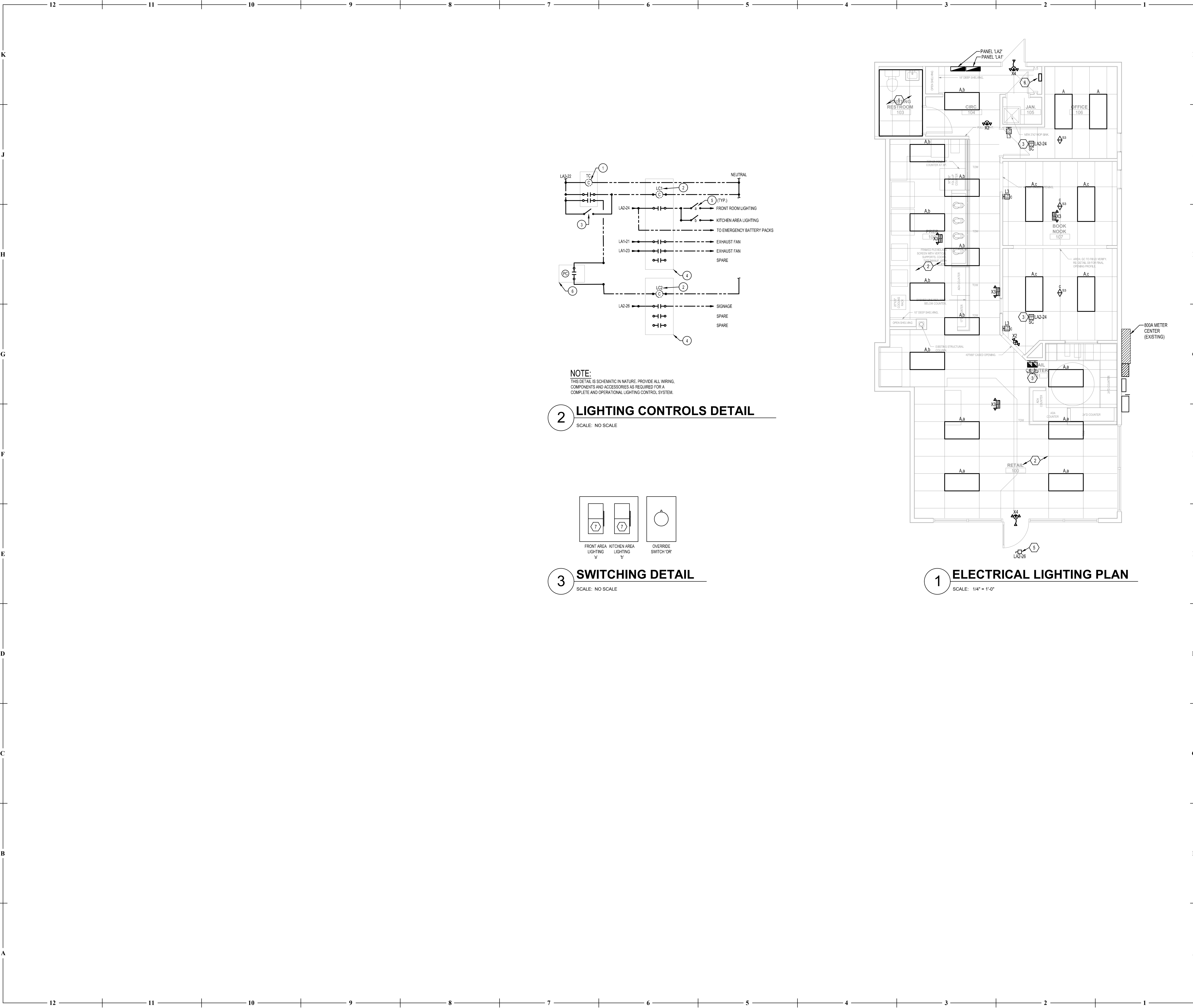


# E201

ISSUE DATE: 16 JULY 2024  
COLLINS WEBB #: 22097

# ELECTRICAL POWER PLAN





**GENERAL NOTES**  
(NOT ALL NOTES APPLY)

1. REFERENCE SHEET E101 FOR GENERAL NOTES, SYMBOLS, AND ABBREVIATIONS.
2. COORDINATE ALL MOUNTING HEIGHTS FOR ALL PUBLIC SPACE DEVICES WITH ARCHITECT AND/OR INTERIOR ELEVATIONS PRIOR TO ROUGH-IN.
3. CIRCUIT ALL EXIT SIGNS TO NEAREST EMERGENCY LIGHTING CIRCUIT (OR NEAREST LIGHTING CIRCUIT IF NO GENERATOR).
4. VERIFY ALL EXISTING BRANCH CIRCUITING. CONTRACTOR SHALL WIRE FIXTURES IN ACCORDANCE WITH SWITCHING INDICATED. CONNECTED LOAD ON 277V/20A CIRCUITS SHALL NOT EXCEED 4000W, 120V/20A CIRCUITS SHALL NOT EXCEED 1800W.
5. CIRCUIT NUMBERS ARE SHOWN FOR REFERENCE ONLY. CONTRACTOR TO FIELD VERIFY EXISTING CONDITIONS.
6. EXISTING CONDITIONS INDICATED IN THESE DOCUMENTS ARE BASED ON A CURSORY SITE REVIEW AND DO NOT REPRESENT A COMPLETE "AS-BUILT" SET OF DOCUMENTS. IT IS THE CONTRACTORS RESPONSIBILITY TO FULLY INVESTIGATE ALL EXISTING CONDITIONS AND NOTIFY THE ARCHITECT/ENGINEER OF ANY DISCREPANCIES TO THESE DOCUMENTS OR THE DESIGN INTENT.

**KEYED NOTES:**

1. NO SCOPE IN THIS AREA. EXISTING RESTROOM AREA TO REMAIN.
2. CONTROL INTENT FOR THIS AREA IS FOR FIXTURES TO TURN 'ON/OFF' ON A TIME-OF-DAY SCHEDULE WITH MANUAL OVERRIDE VIA THE WALL BOX DIMMER. VERIFY SCHEDULING WITH OWNER. REFER TO DETAIL 2 (THIS SHEET) FOR ADDITIONAL INFORMATION.
3. MANUAL OVERRIDE SWITCHES FOR FRONT ROOM/KITCHEN AREA. FIELD VERIFY EXACT LOCATION WITH OWNER PRIOR TO ROUGH-IN. REFER TO DETAIL 3 (THIS SHEET) FOR ADDITIONAL INFORMATION.
4. CONTROL INTENT FOR THIS AREA IS FOR FIXTURES TO BE MANUAL 'ON', 'AUTO' 'OFF' VIA OCCUPANCY SENSOR WITH MANUAL OVERRIDE VIA THE LOW-VOLTAGE CONTROL STATION.
5. PROVIDE NEMA 3R, LOCKABLE DISCONNECT SWITCH FOR EXTERIOR SIGNAGE. FIELD VERIFY EXACT LOCATION WITH OWNER/SIGN VENDOR PRIOR TO ROUGH-IN. CONTROL INTENT IS FOR SIGNAGE TO BE 'ON/OFF' VIA TIME-OF-DAY SCHEDULE. REFER TO DETAIL 2 (THIS SHEET) FOR ADDITIONAL INFORMATION.
6. TIME CLOCK AND CONTACTORS. REFER TO DETAIL 2 (THIS SHEET) FOR ADDITIONAL INFORMATION.
7. PROVIDE WALL BOX DIMMER SWITCH SIMILAR TO LUTRON DIVA SERIES FOR MANUAL OVERRIDE OF LIGHTING. VERIFY COMPATIBILITY OF DIMMER SWITCH WITH EACH FIXTURE TYPE PRIOR TO ORDERING.

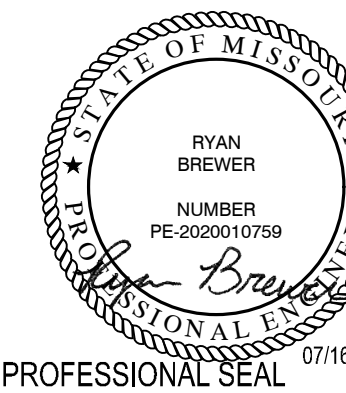
**LIGHTING CONTROL KEYED NOTES:**

1. PROVIDE TORK DIGITAL SERIES, MODEL DGLC200A-NC (2-CHANNEL) TIMECLOCK (OR EQUAL).
2. PROVIDE SQUARE D MODEL 8903 ELECTRICALLY HELD LIGHTING CONTACTORS (LC1 & LC2) WITH POLE QUANTITY AS REQUIRED.
3. PROVIDE PARAGON #SWP2H 2-HOUR SPRING WOUND OVERRIDE SWITCH (OR EQUAL).
4. PROVIDE NEMA 1 ENCLOSURE TO HOUSE ALL CONTACTORS INDICATED.
5. REMOTE MANUAL SWITCH. REFER TO SWITCHING DETAIL (THIS SHEET) FOR ADDITIONAL INFORMATION.
6. PROVIDE INTERMATIC #K4238C PHOTOCELL MOUNTED ON A WEATHERPROOF BOX. CONTROL INTENT OF EXTERIOR LIGHT FIXTURES IS FOR LIGHTS TO BE ON A TIME-OF-DAY SCHEDULE WITH PHOTOCELL OVERRIDE. PER 2021 IECC, LIGHTS SHALL NOT ENERGIZE 'ON' WHEN ENOUGH DAYLIGHT IS PRESENT.

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**ELECTRICAL LIGHTING PLAN**



PERMIT DOCUMENTS



K

J

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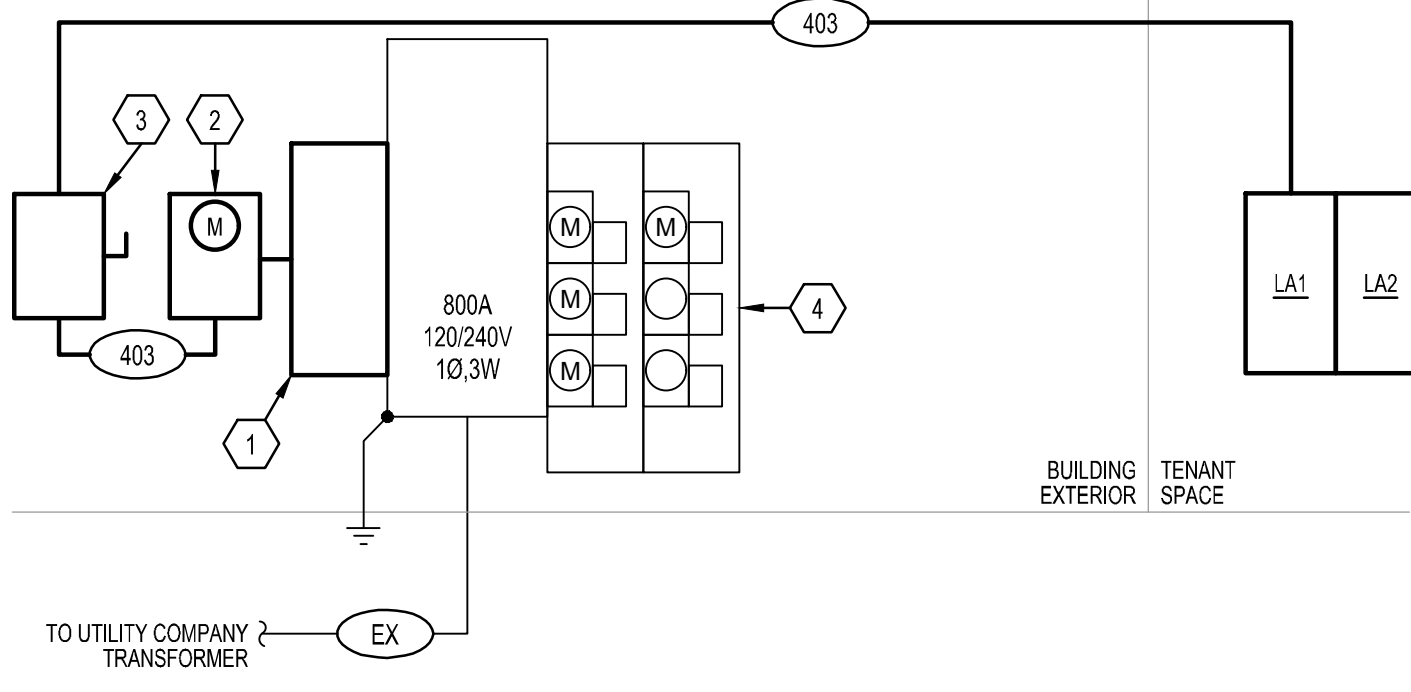
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VOLTAGE DROP CHART						
BRANCH CIRCUIT VOLTAGE DROP WIRING SCHEDULE FOR 1Ø CIRCUITS						
BRANCH CIRCUIT RATING (AMPS)	WIRE SIZE (AWG)	MAXIMUM LENGTH OF BRANCH CIRCUIT (FEET)				
		120V	208V	240V	277V	480V
20A	#12	50	90	110	125	200
	#10	80	150	175	200	350
	#8	140	230	280	320	550
	#6	215	375	430	500	870
30A	#10	50	100	110	130	225
	#8	80	160	180	210	360
	#6	135	250	280	325	560
	#4	220	400	450	525	910

NOTES:  
1. PROVIDE BRANCH CIRCUIT CONDUCTORS AS INDICATED IN THE TABLE ABOVE FOR ALL LIGHTING AND RECEPTACLE BRANCH CIRCUITS. WHERE BRANCH CIRCUITS SERVE DEDICATED EQUIPMENT, THE CONTRACTOR MAY PERFORM VOLTAGE DROP CALCULATIONS BASED ON ACTUAL EQUIPMENT CONNECTED LOAD AND PROVIDE CONDUCTORS APPROPRIATELY SIZED TO LIMIT VOLTAGE DROP TO A MAXIMUM OF 3%.  
2. CONDUCTOR SIZES ARE BASED ON SOLID COPPER CONDUCTORS FOR WIRES #6 AND LARGER, IN A SINGLE METAL CONDUIT.  
3. LIMITS FOR CONDUCTOR LENGTH SHOWN ARE BASED ON A MAXIMUM OF 3% VOLTAGE DROP TO COMPLY WITH THE NEC FOR CIRCUITS LOADED UP TO 80% OF THE BRANCH BREAKER RATING. FIELD VERIFY EXACT BRANCH CIRCUIT LENGTHS AND PROVIDE CONDUCTORS APPROPRIATELY SIZED TO LIMIT VOLTAGE DROP TO 3%.

FEEDER SCHEDULE				
THHN/THWN COPPER CONDUCTORS W/ EG CONDUCTOR XHHW ALUMINUM CONDUCTORS W/ EG CONDUCTOR				
CONDUCTORS & GROUND				AMPS
CODE	SETS	CONDUCTORS	RACEWAY	
EX		EXISTING CONDUCTORS TO REMAIN		
403	2	3#3/0,1#3G, (CU)	2"	400

NOTES:  
1. ALL CONDUCTORS AMPACITY BASED ON THE NEC TABLE 310-16 FOR CONDUCTORS W/ 75°C INSULATION.  
2. ALL RACEWAY SIZES (EMT/RMC/PVC 40) BASED ON THE NEC TABLE 4(CHAPTER 9), 40% FILL COLUMN.  
3. ELECTRICAL CONTRACTOR TO VERIFY ALL EQUIPMENT CONDUCTOR TERMINATION TEMPERATURE RATINGS (IE, 60°C OR 75°C), ADJUST CONDUCTOR AMPACITY AND CONDUIT SIZES ACCORDINGLY.  
4. VERIFY MAXIMUM NO. OF SETS OF SERVICE ENTRANCE CONDUCTORS ALLOWED W/ UTILITY CO.  
5. EQUIPMENT GROUNDING CONDUCTORS BASED ON 250.122. GROUND TO BE ADJUSTED PER 250.66 FOR SEPARATELY DERIVED SYSTEMS.  
6. ALUMINUM FEEDERS NOT TO BE USED ON TRANSFORMER SECONDARY CONDUCTORS.



NEC 220.87 CALCULATION FOR 120/240V, 1Ø SERVICE

PEAK DEMAND OVER LAST 12 MONTHS = 510VA  
DEMAND LOAD OF NEW ADDITION = 711.36VA  
51 x 1.25 + 57.8 = 121.36VA  
125.18VA @ 120/240V, 1Ø = 505.6 AMPS  
EXISTING SERVICE SIZE IS 800 AMPS AT 120/240V, 1Ø (PER SITE VISIT W/ EVERGY)  
THE EXISTING SERVICE SIZE IS ADEQUATE.

1 ELECTRICAL RISER DIAGRAM  
SCALE: NO SCALE

LIGHTING FIXTURE SCHEDULE							
FIXT. TYPE	DESCRIPTION & MANUFACTURER OPTIONS	NO.	LAMPS TYPE	FIXT. VOLT	TOTAL WATTS	FINISH	REMARKS/MOUNTING
A	2' x 4' Field Selectable LED Troffer M# LITHONIA #STAKS 2X4 AL06 SHW7	1	LED	UNV	40W	Standard	Recessed (Jay-In)
X2	Combination LED Exit Sign and Emergency Light Fixture, Universal Mount, Emergency Battery Pack. Provide Arrows as Indicated. M# EVENLITE #TCXCOM-R-U-W DUAL LITE #BVC-U-R-W	1	LED	UNV	2W		Wall/Ceiling/Pendant
X3	LED Emergency Light w/ (2) 2-Watt Adjustable LED Heads and Emergency Battery Backup M# EVENLITE #TCL-4-W DUAL LITE #V4D-02L	2	LED	UNV	5W	White	Surface (Wall/Ceiling)
X4	Combination LED Exit Sign and Emergency Light Fixture w/ Exterior Rated Remote Emergency Heads, Universal Mount, Emergency Battery Pack. Provide Arrows as Indicated. M# EVENLITE #TCXCOM-R-U-W-PRVLED2W DUAL LITE #BVC-U-R-W-DK WITH BVO-D-X	1	LED	UNV	5W		Wall/Ceiling/Pendant

NOTES:  
1. Circuit Emergency Battery Packs and Exit Signs to Local Lighting Circuit Ahead of Any Means of Control for Proper Operation.

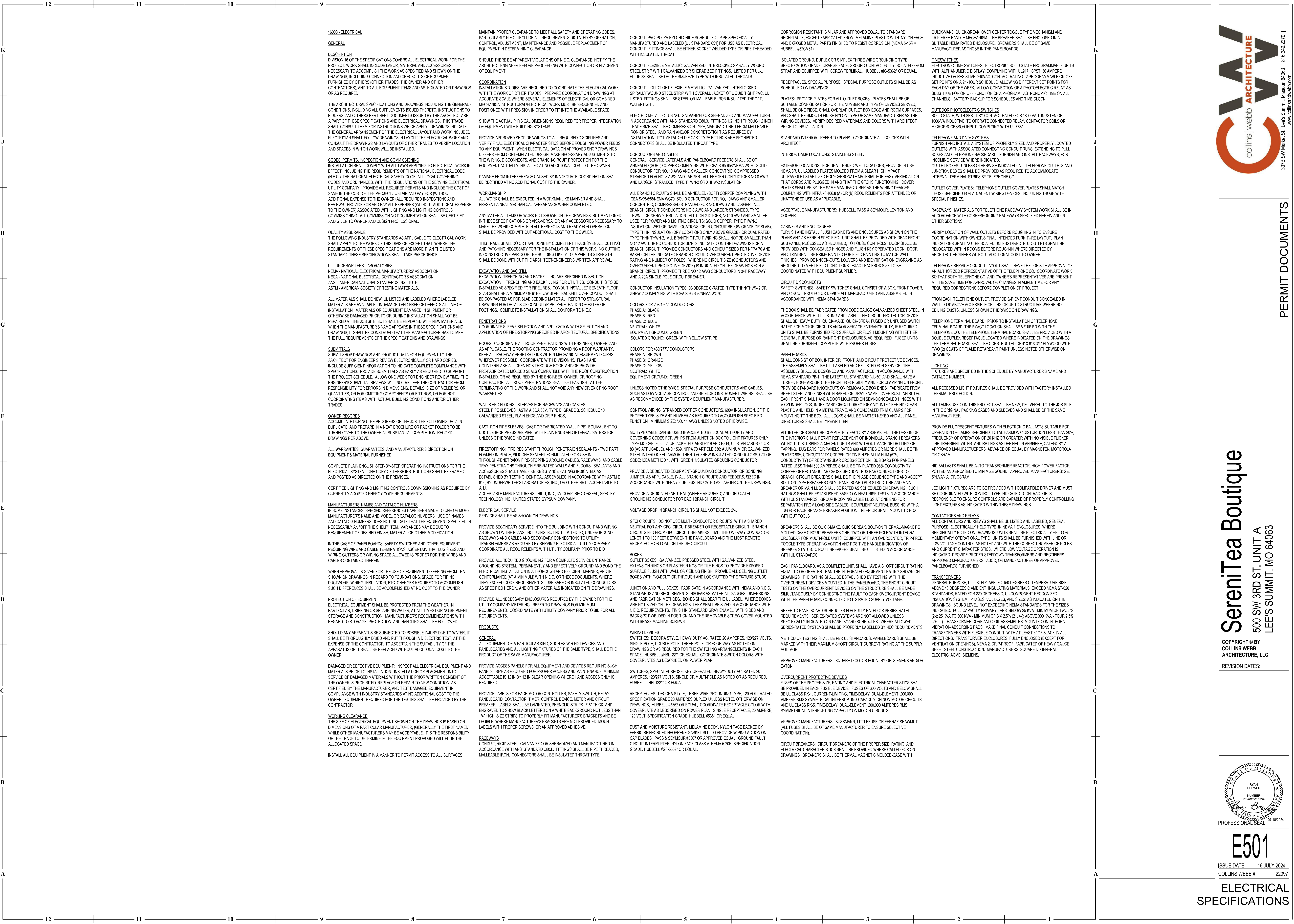
LIGHTING CONTROLS SCHEDULE					
FIXTURE TAG	MANUFACTURER	MODEL #	SETTINGS	DESCRIPTION	NOTES
SC	ACUITY BRANDS- nLIGHT	#PPI6 SERIES	REFER TO PLANS FOR CONTROL INTENT	ON/OFF ROOM SWITCH CONTROLLER LINE VOLTAGE - SINGLE RELAY	1,2,4
L3	ACUITY BRANDS- nLIGHT	#PODM	-	ON/OFF LOW VOLTAGE SWITCH WITH 1-CHANNEL CONTROL	1,6
S3	ACUITY BRANDS- nLIGHT	#CM0 SERIES	-	CEILING MOUNT OCCUPANCY SENSOR - SMALL MOTION LOW VOLTAGE	3
WIRE	-	-	-	CATS, CAT5E OR CAT 6 STANDARD OR SOLID. TERMINATED AS RJ45 TIA/EIA-568B	

NOTES:  
1. COORDINATE ALL MODEL NUMBERS WITH MANUFACTURER PRIOR TO ORDERING. PROVIDE DEVICES TO MEET CONTROL INTENT INDICATED ON THE DRAWINGS.  
2. PROVIDE 6'-0" OF EXCESS CONTROL WIRING, COILED AND TIED, BETWEEN CEILING MOUNTED OCCUPANCY SENSOR AND CORRESPONDING LOAD CONTROLLER.  
3. MODIFY LOCATIONS OF CEILING MOUNTED OCCUPANCY SENSORS AS REQUIRED SO THAT NO OCCUPANCY SENSORS IS WITHIN 4'-0" OF AN HVAC SUPPLY DIFFUSER.  
4. LOCATE DEVICE ABOVE CEILING OR AT STRUCTURE IN ACCESSIBLE LOCATION. LOCATIONS SHOWN ON DRAWINGS ARE SCHEMATIC. ADD ACCESS PANEL WITHIN CEILING IF NECESSARY. COORDINATE ACCESS PANEL LOCATION AND SPECIFICATION DIRECTLY WITH ARCHITECT.  
5. LOCATION SHOWN ON PLAN FOR REFERENCE ONLY. CONTRACTOR MAY RELOCATE BRIDGE PORTS FOR A MORE ECONOMIC LAYOUT IF DESIRED.  
6. PROVIDE DEVICES WITH DEFAULT MANUFACTURE MARKINGS ON BUTTONS.  
7. ROUTE RECEPTACLE CIRCUIT INDICATED ON PLAN AS "CONTROLLED RECEPTACLES" THROUGH PLUG LOAD CONTROLLER FOR AUTOMATIC ON/OFF CONTROL.  
8. OCCUPANCY SENSOR, ONE CONTROLLED CIRCUIT PER PLUG CONTROLLER.  
9. DEVICE TO BE INSTALLED IN SINGLE GANG BOX. COORDINATE TIME-OF-DAY SCHEDULES WITH OWNER FOR ZONES TO BE ON TIME-OF-DAY CONTROL.  
10. PENDANT MOUNT DEVICE TO 12" KNOCKOUT ON JUNCTION BOX AS REQUIRED.

PANEL LA1 (SECT.1)									
VOLTAGE PHASE: 240V 2W, 1Ø/1.5W BUS: 400A MAIN TYPE: MLO					AFCI VALUE: VERIFY ARC FAULTING: VERIFY MOUNTING: SURFACE (NEMA 1)				
ISOLATED GROUND BUS: NO SERVICE ENTRANCE RATED: NO					GROUNDING: 800 PER T250.132				
120	208	240	HEAT	COOL	120/240V	1Ø/1.5W	120/240V	1Ø/1.5W	120/240V
FURNACE (EXISTING)									
2	2	2	2	2	2	2	2	2	2
SPACE ONLY									
1	1	1	1	1	1	1	1	1	1
COND. UNIT (EXISTING)									
2	2	2	2	2	2	2	2	2	2
WATER HEATER (NEW)									
2	2	2	2	2	2	2	2	2	2
SPACE ONLY									
1	1	1	1	1	1	1	1	1	1
COUNTERTOP COIN									
2	2	2	2	2	2	2	2	2	2
COUNTERTOP COIN									
2	2	2	2	2	2	2	2	2	2
TOTAL									
188	188	188	188	188	188	188	188	188	188

NEC CODE REFERENCES:  
1. 100% OF LEFT TO RIGHT, 50% OF REMAINING  
2. 100% OF LEFT TO RIGHT, 50% OF REMAINING  
3. 100% OF LEFT TO RIGHT, 50% OF REMAINING  
4. 100% OF LEFT TO RIGHT, 50% OF REMAINING  
5. 100% OF LEFT TO RIGHT, 50% OF REMAINING  
6. 100% OF LEFT TO RIGHT, 50% OF REMAINING  
7. 100% OF LEFT TO RIGHT, 50% OF REMAINING  
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**16000 - ELECTRICAL**

**GENERAL**

**DESCRIPTION**

DIVISION 16 OF THE SPECIFICATIONS COVERS ALL ELECTRICAL WORK FOR THE PROJECT. WORK SHALL INCLUDE LABOR, MATERIAL, AND ACCESSORIES NECESSARY TO ACCOMPLISH THE WORK AS SPECIFIED AND SHOWN ON THE DRAWINGS, INCLUDING CONNECTION AND CHECKOUTS OF EQUIPMENT FURNISHED BY OTHERS (OTHER TRADES, THE OWNER AND OTHER CONTRACTORS), AND TO ALL EQUIPMENT ITEMS AND AS INDICATED ON DRAWINGS OR AS REQUIRED.

THE ARCHITECTURAL SPECIFICATIONS AND DRAWINGS INCLUDING THE GENERAL CONDITIONS, INCLUDING ALL SUPPLEMENTS ISSUED THEREIN, INSTRUCTIONS TO BIDDERS, AND OTHERS PERTINENT DOCUMENTS ISSUED BY THE ARCHITECT ARE A PART OF THESE SPECIFICATIONS AND ELECTRICAL DRAWINGS. THIS TRADE SHALL CONSULT THEM FOR INSTRUCTIONS WHICH APPLY. DRAWINGS INDICATE THE GENERAL ARRANGEMENT OF THE ELECTRICAL LAYOUT AND WORK INCLUDED. ELECTRICIAN SHALL FOLLOW DRAWINGS IN LAYOUT THE ELECTRICAL WORK AND CONSULT THE DRAWINGS AND LAYOUTS OF OTHER TRADES TO VERIFY LOCATION AND SPACES IN WHICH WORK WILL BE INSTALLED.

CODES, PERMITS, INSPECTION AND COMMISSIONING  
INSTALLATION SHALL COMPLY WITH ALL LAWS APPLYING TO ELECTRICAL WORK IN EFFECT, INCLUDING THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (N.E.C.), THE NATIONAL ELECTRICAL SAFETY CODE, ALL LOCAL GOVERNING CODES AND ORDINANCES, WITH THE REGULATIONS OF THE SERVING ELECTRICAL UTILITY COMPANY. PROVIDE ALL REQUIRED PERMITS AND INCLUDE THE COST OF SAME IN THE COST OF THE PROJECT. OBTAIN AND PAY FOR (WITHOUT ADDITIONAL EXPENSE TO THE OWNER) ALL REQUIRED INSPECTIONS AND REVIEWS. PROVIDE FOR AND PAY ALL EXPENSES (WITHOUT ADDITIONAL EXPENSE TO THE OWNER) ASSOCIATED WITH LIGHTING AND LIGHTING CONTROLS COMMISSIONING. ALL COMMISSIONING DOCUMENTATION SHALL BE CERTIFIED AND GIVEN TO OWNER AND DESIGN PROFESSIONAL.

**QUALITY ASSURANCE**

THE FOLLOWING INDUSTRY STANDARDS AS APPLICABLE TO ELECTRICAL WORK SHALL APPLY TO THE WORK OF THIS DIVISION EXCEPT THAT, WHERE THE REQUIREMENTS OF THESE SPECIFICATIONS ARE MORE THAN THE LISTED STANDARD, THESE SPECIFICATIONS SHALL TAKE PRECEDENCE.

UL - UNDERWRITERS' LABORATORIES  
NEMA - NATIONAL ELECTRICAL MANUFACTURERS' ASSOCIATION  
NECA - NATIONAL ELECTRICAL CONTRACTORS' ASSOCIATION  
ANSI - AMERICAN NATIONAL STANDARDS INSTITUTE  
ASTM - AMERICAN SOCIETY OF TESTING MATERIALS

ALL MATERIALS SHALL BE NEW, UL LISTED AND LABELED WHERE LABELED MATERIALS ARE AVAILABLE, UN Damaged AND FREE OF DEFECTS AT TIME OF INSTALLATION. MATERIALS OR EQUIPMENT DAMAGED IN SHIPMENT OR OTHERWISE DAMAGED PRIOR TO OR DURING INSTALLATION SHALL NOT BE REPAIRED AT THE JOB SITE, BUT SHALL BE REPLACED WITH NEW MATERIALS, WHEN THE MANUFACTURER'S NAME APPEARS IN THESE SPECIFICATIONS AND DRAWINGS, IT SHALL BE OF THE SAME TYPE, VARIATIONS IN MATERIAL TO MEET THE FULL REQUIREMENTS OF THE SPECIFICATIONS AND DRAWINGS.

**SUBMITTALS**

SUBMIT SHOP DRAWINGS AND PRODUCT DATA FOR EQUIPMENT TO THE ARCHITECT FOR ENGINEER'S REVIEW ELECTRONICALLY OR HARD COPIES. INCLUDE SUFFICIENT INFORMATION TO INDICATE COMPLETE COMPLIANCE WITH SPECIFICATIONS. PROVIDE SUBMITTALS AS EARLY AS REQUIRED TO SUPPORT THE PROJECT SCHEDULE. ALLOW ONE WEEK FOR ENGINEER REVIEW TIME. THE ENGINEER'S SUBMITTAL REVIEWS WILL NOT RELIEVE THE CONTRACTOR FROM RESPONSIBILITY FOR ERRORS IN DIMENSIONS, DETAILS, SIZE OF MEMBERS, OR QUANTITIES; OR FOR OMITTING COMPONENTS OR FITTINGS; OR FOR NOT COORDINATING ITEMS WITH ACTUAL BUILDING CONDITIONS AND/OR OTHER TRADES.

**OWNER RECORDS**

ACCUMULATE DURING THE PROGRESS OF THE JOB, THE FOLLOWING DATA IN DUPLICATE, AND PREPARE IN A NEAT BROCHURE OR PACKET FOLDER TO BE TURNED OVER TO THE OWNER AT SUBSTANTIAL COMPLETION: RECORD DRAWINGS PER ABOVE.

ALL WARRANTIES, GUARANTEES, AND MANUFACTURER'S DIRECTION ON EQUIPMENT & MATERIAL FURNISHED.

COMPLETE PLAIN ENGLISH STEP-BY-STEP OPERATING INSTRUCTIONS FOR THE ELECTRICAL SYSTEM. ONE COPY OF THESE INSTRUCTIONS SHALL BE FRAMED AND POSTED AS DIRECTED ON THE PREMISES.

CERTIFIED LIGHTING AND LIGHTING CONTROLS COMMISSIONING AS REQUIRED BY CURRENTLY ADOPTED ENERGY CODE REQUIREMENTS.

**MANUFACTURER'S NAMES AND CATALOG NUMBERS**  
IN SOME INSTANCES, SPECIFIC REFERENCES HAVE BEEN MADE TO ONE OR MORE MANUFACTURER'S NAME AND MODEL OR CATALOG NUMBERS. USE OF NAMES AND CATALOG NUMBERS DOES NOT INDICATE THAT THE EQUIPMENT SPECIFIED IS NECESSARILY AN "OFF THE SHELF" ITEM. VARIATIONS IN MATERIAL OR REQUIREMENT OF DESIRED FINISH, MATERIAL OR OTHER MODIFICATION.

IN THE CASE OF PANELBOARDS, SAFETY SWITCHES AND OTHER EQUIPMENT REQUIRING WIRE AND CABLE TERMINATIONS, ASCERTAIN THAT LUG SIZES AND WIRING GUTTERS OR WIRING SPACE ALLOWED IS PROPER FOR THE WIRES AND CABLES CONTAINED THEREIN.

WHEN APPROVAL IS GIVEN FOR THE USE OF EQUIPMENT DIFFERING FROM THAT SHOWN ON DRAWINGS IN REGARD TO FOUNDATIONS, SPACE FOR PIPING, DUCTWORK, WIRING, INSULATION, ETC. CHANGES REQUIRED TO ACCOMPLISH SUCH DIFFERENCES SHALL BE ACCOMPLISHED AT NO COST TO THE OWNER.

**PROTECTION OF EQUIPMENT**

ELECTRICAL EQUIPMENT SHALL BE PROTECTED FROM THE WEATHER, IN PARTICULAR, DRIPPING OR SPLASHING WATER, AT ALL TIMES DURING SHIPMENT, STORAGE AND CONSTRUCTION. MANUFACTURER'S RECOMMENDATIONS WITH REGARD TO STORAGE, PROTECTION, AND HANDLING SHALL BE FOLLOWED.

SHOULD ANY APPARATUS BE SUBJECTED TO POSSIBLE INJURY DUE TO WATER, IT SHALL BE THOROUGHLY DRIED AND PUT THROUGH A DIELECTRIC TEST, AT THE EXPENSE OF THE CONTRACTOR, TO ASCERTAIN THE SUITABILITY OF THE APPARATUS OR IT SHALL BE REPLACED WITHOUT ADDITIONAL COST TO THE OWNER.

DAMAGED OR DEFECTIVE EQUIPMENT: INSPECT ALL ELECTRICAL EQUIPMENT AND MATERIALS PRIOR TO INSTALLATION. INSTALLATION OR PLACEMENT INTO SERVICE OF DAMAGED MATERIALS WITHOUT THE PRIOR WRITTEN CONSENT OF THE OWNER IS PROHIBITED. REPLACE OR REPAIR TO NEW CONDITION, AS CERTIFIED BY THE MANUFACTURER, AND TEST DAMAGED EQUIPMENT IN COMPLIANCE WITH INDUSTRY STANDARDS AT NO ADDITIONAL COST TO THE OWNER. EQUIPMENT REQUIRED FOR THE TESTING SHALL BE PROVIDED BY THE CONTRACTOR.

**WORKING CLEARANCE**

THE SIZE OF ELECTRICAL EQUIPMENT SHOWN ON THE DRAWINGS IS BASED ON DIMENSIONS OF A PARTICULAR MANUFACTURER, (GENERALLY THE FIRST NAMED), WHILE OTHER MANUFACTURERS MAY BE ACCEPTABLE, IT IS THE RESPONSIBILITY OF THE TRADE TO DETERMINE IF THE EQUIPMENT PROPOSED WILL FIT IN THE ALLOCATED SPACE.

INSTALL ALL EQUIPMENT IN A MANNER TO PERMIT ACCESS TO ALL SURFACES.

MAINTAIN PROPER CLEARANCE TO MEET ALL SAFETY AND OPERATING CODES, PARTICULARLY N.E.C. INCLUDE ALL REQUIREMENTS DICTATED BY OPERATION, CONTROL, ADJUSTMENT, MAINTENANCE AND POSSIBLE REPLACEMENT OF EQUIPMENT IN DETERMINING CLEARANCE.

SHOULD THERE BE APPARENT VIOLATIONS OF N.E.C. CLEARANCE, NOTIFY THE ARCHITECT-ENGINEER BEFORE PROCEEDING WITH CONNECTION OR PLACEMENT OF EQUIPMENT.

**COORDINATION**

INSTALLATION STUDIES ARE REQUIRED TO COORDINATE THE ELECTRICAL WORK WITH THE WORK OF OTHER TRADES. PREPARE COORDINATION DRAWINGS AT ACCURATE SCALE WHERE SEVERAL ELEMENTS OF ELECTRICAL OR COMBINED MECHANICAL/STRUCTURAL/ELECTRICAL WORK MUST BE SEQUENCED AND POSITIONED WITH PRECISION IN ORDER TO FIT INTO THE AVAILABLE SPACE.

SHOW THE ACTUAL PHYSICAL DIMENSIONS REQUIRED FOR PROPER INTEGRATION OF EQUIPMENT WITH BUILDING SYSTEMS.

PROVIDE APPROVED SHOP DRAWINGS TO ALL REQUIRED DISCIPLINES AND VERIFY FINAL ELECTRICAL CHARACTERISTICS BEFORE ROUGHING POWER FEEDS TO ANY EQUIPMENT. WHEN ELECTRICAL DATA ON APPROVED SHOP DRAWINGS DIFFERS FROM CONTEMPLATED DESIGN, MAKE NECESSARY ADJUSTMENTS TO THE WIRING, DISCONNECTS, AND BRANCH-CIRCUIT PROTECTION FOR THE EQUIPMENT ACTUALLY INSTALLED AT NO ADDITIONAL COST TO THE OWNER.

DAMAGE FROM INTERFERENCE CAUSED BY INADEQUATE COORDINATION SHALL BE RECTIFIED AT NO ADDITIONAL COST TO THE OWNER.

**WORKMANSHIP**

ALL WORK SHALL BE EXECUTED IN A WORKMANLIKE MANNER AND SHALL PRESENT A NEAT MECHANICAL APPEARANCE WHEN COMPLETED.

ANY MATERIAL, ITEMS OR WORK NOT SHOWN ON THE DRAWINGS, BUT MENTIONED IN THESE SPECIFICATIONS OR VISA-VERSA, OR ANY ACCESSORIES NECESSARY TO MAKE THE WORK COMPLETE IN ALL RESPECTS AND READY FOR OPERATION SHALL BE PROVIDED WITHOUT ADDITIONAL COST TO THE OWNER.

THIS TRADE SHALL DO OR HAVE DONE BY COMPETENT TRADESMEN ALL CUTTING AND PATCHING NECESSARY FOR THE INSTALLATION OF THIS WORK. NO CUTTING IN CONSTRUCTIVE PARTS OF THE BUILDING LIKELY TO IMPAIR ITS STRENGTH SHALL BE DONE WITHOUT THE ARCHITECT-ENGINEER'S WRITTEN APPROVAL.

**EXCAVATION AND BACKFILL**

EXCAVATION, TRENCHING AND BACKFILLING ARE SPECIFIED IN SECTION EXCAVATION. TRENCHING AND BACKFILLING FOR UTILITIES. CONDUIT IS TO BE INSTALLED AS SPECIFIED FOR PIPELINES. CONDUIT INSTALLED BENEATH FLOOR SLAB SHALL BE A MINIMUM OF 6" BELOW SLAB. BACKFILL OVER CONDUIT SHALL BE COMPACTED AS FOR SLAB BEDDING MATERIAL. REFER TO STRUCTURAL DRAWINGS FOR DETAILS OF CONDUIT (PIPE) PENETRATION OF EXTERIOR FOOTINGS. COMPLETE INSTALLATION SHALL CONFORM TO N.E.C.

**PENETRATIONS**

COORDINATE SLEEVE SELECTION AND APPLICATION WITH SELECTION AND APPLICATION OF FIRE-STOPPING SPECIFIED IN ARCHITECTURAL SPECIFICATIONS.

ROOFS: COORDINATE ALL ROOF PENETRATIONS WITH ENGINEER, OWNER, AND AS APPLICABLE, THE ROOFING CONTRACTOR PROVIDING A ROOF WARRANTY. KEEP ALL RACKWAY PENETRATIONS WITHIN MECHANICAL EQUIPMENT CURBS WHEREVER POSSIBLE. COORDINATE WITH DIVISION 15, FLASH AND COUNTERFLASH ALL OPENINGS THROUGH ROOF, AND/OR PROVIDE PRE-FABRICATED MOLDED SEALS COMPATIBLE WITH THE ROOF CONSTRUCTION INSTALLED, OR AS REQUIRED BY THE ENGINEER, OWNER, OR ROOFING CONTRACTOR. ALL ROOF PENETRATIONS SHALL BE LEAKTIGHT AT THE TERMINATION OF THE WORK AND SHALL NOT VOID ANY NEW OR EXISTING ROOF WARRANTIES.

WALLS AND FLOORS - SLEEVES FOR RACEWAYS AND CABLES: STEEL PIPE SLEEVES: ASTM A 53A 3/4", TYPE E, GRADE B, SCHEDULE 40, GALVANIZED STEEL, PLAIN ENDS AND DRIP RINGS.

CAST IRON PIPE SLEEVES: CAST OR FABRICATED "WALL PIPE," EQUIVALENT TO DUCTILE-IRON PRESSURE PIPE, WITH PLAIN ENDS AND INTEGRAL WATERSTOP, UNLESS OTHERWISE INDICATED.

FIRESTOPPING: FIRE RESISTANT THROUGH PENETRATION SEALANTS - TWO PART, FOAMED-IN-PLACE, SILICONE SEALANT FORMULATED FOR USE IN THROUGH-PENETRATION FIRE-STOPPING AROUND CABLES, RACEWAYS, AND CABLE TRAY PENETRATIONS THROUGH FIRE-RATED WALLS AND FLOORS. SEALANTS AND ACCESSORIES SHALL HAVE FIRE-RESISTANCE RATINGS INDICATED, AS ESTABLISHED BY TESTING IDENTICAL ASSEMBLIES IN ACCORDANCE WITH ASTM E 814, BY UNDERWRITERS' LABORATORIES, INC., OR OTHER NRTL ACCEPTABLE TO AHJ. ACCEPTABLE MANUFACTURERS - HILTI, INC., 3M CORP. RETICOR SEAL, SPECIFY TECHNOLOGY INC., UNITED STATES GYPSUM COMPANY.

**ELECTRICAL SERVICE**

SERVICE SHALL BE AS SHOWN ON DRAWINGS.

PROVIDE SECONDARY SERVICE INTO THE BUILDING WITH CONDUIT AND WIRING AS SHOWN ON THE PLANS, INCLUDING, BUT NOT LIMITED TO, UNDERGROUND RACEWAYS AND CABLES AND SECONDARY CONNECTIONS TO UTILITY TRANSFORMERS AS REQUIRED BY SERVING ELECTRICAL UTILITY COMPANY. COORDINATE ALL REQUIREMENTS WITH UTILITY COMPANY PRIOR TO BID.

PROVIDE ALL REQUIRED GROUNDING FOR A COMPLETE SERVICE ENTRANCE GROUNDING SYSTEM. PERMANENTLY AND EFFECTIVELY GROUND AND BOND THE ELECTRICAL INSTALLATION IN A THOROUGH AND EFFICIENT MANNER, AND IN CONFORMANCE WITH A MINIMUM WITH N.E.C. OR THESE DOCUMENTS, WHERE THEY EXCEED CODE REQUIREMENTS. USE BARE OR INSULATED CONDUCTORS, AS SPECIFIED HEREIN, AND OTHER MATERIALS INDICATED ON THE DRAWINGS.

PROVIDE ALL NECESSARY ENCLOSURES REQUIRED BY THE OWNER FOR THE UTILITY COMPANY METERING. REFER TO DRAWINGS FOR MINIMUM REQUIREMENTS. COORDINATE WITH UTILITY COMPANY PRIOR TO BID FOR ALL REQUIREMENTS.

**PRODUCTS**

**GENERAL**

ALL EQUIPMENT OF A PARTICULAR KIND, SUCH AS WIRING DEVICES AND PANELBOARDS AND ALL LIGHTING FIXTURES OF THE SAME TYPE, SHALL BE THE PRODUCT OF THE SAME MANUFACTURER.

PROVIDE ACCESS PANELS FOR ALL EQUIPMENT AND DEVICES REQUIRING SUCH PANELS. SIZE AS REQUIRED FOR PROPER ACCESS AND MAINTENANCE, MINIMUM ACCEPTABLE IS 12 IN BY 12 IN CLEAR OPENING WHERE HAND ACCESS ONLY IS REQUIRED.

PROVIDE LABELS FOR EACH MOTOR CONTROLLER, SAFETY SWITCH, RELAY, PANELBOARD, CONTACTOR, TIMER, CONTROL DEVICE, METER AND CIRCUIT BREAKER. LABELS SHALL BE LAMINATED, PHENOLIC STRIPS 1/16" THICK, AND ENGRAVED TO SHOW BLACK LETTERS ON A WHITE BACKGROUND NOT LESS THAN 1/4" HIGH. SIZE STRIPS TO PROPERLY FIT MANUFACTURER'S BRACKETS AND BE LEGIBLE, WHERE MANUFACTURER'S BRACKETS ARE NOT PROVIDED, MOUNT LABELS WITH PROPER SCREWS, OR AN APPROVED ADHESIVE.

**RACEWAYS**

CONDUIT, RIGID STEEL, GALVANIZED OR SHERADIZED AND MANUFACTURED IN ACCORDANCE WITH ANSI STANDARD C80.1. FITTINGS SHALL BE PIPE THREADED, MALLEABLE IRON. CONNECTORS SHALL BE INSULATED THROAT TYPE.

CONDUIT, PVC, POLY VINYL CHLORIDE SCHEDULE 40 PIPE SPECIFICALLY MANUFACTURED AND LABELED UL STANDARD 651 FOR USE AS ELECTRICAL CONDUIT. FITTINGS SHALL BE EITHER SOCKET WELDED TYPE OR PIPE THREADED WITH INSULATED THROAT.

CONDUIT, FLEXIBLE METALLIC: GALVANIZED, INTERLOCKED SPIRALLY WOUND STEEL STRIP WITH GALVANIZED OR SHERADIZED FITTINGS. LISTED PER UL. FITTINGS SHALL BE OF THE SQUEEZE TYPE WITH INSULATED THROATS.

CONDUIT, LIQUIDTIGHT FLEXIBLE METALLIC: GALVANIZED, INTERLOCKED SPIRALLY WOUND STEEL STRIP WITH OVERLAP JACKET OF LIQUID TIGHT PVC, UL LISTED. FITTINGS SHALL BE STEEL OR MALLEABLE IRON INSULATED THROAT, WATER TIGHT.

ELECTRIC METALLIC TUBING: GALVANIZED OR SHERADIZED AND MANUFACTURED IN ACCORDANCE WITH ANSI STANDARD C80.3. FITTINGS 1/2 INCH THROUGH 2 INCH TRADE SIZE SHALL BE COMPRESSION TYPE, MANUFACTURED FROM GALVANIZED IRON OR STEEL, AND RAIN AND/OR CONCRETE-TIGHT AS REQUIRED BY INSTALLATION. POT METAL OR DIE CAST TYPE FITTINGS ARE PROHIBITED. CONNECTORS SHALL BE INSULATED THROAT TYPE.

**CONDUCTORS AND CABLES**

GENERAL: SERVICE LATERAL AND PANELBOARD FEEDERS SHALL BE OF ANNEALED (SOFT) COPPER COMPLYING WITH ICEA S-95-658/NEMA WC70. SOLID CONDUCTOR FOR NO. 10 AWG AND SMALLER, CONCENTRIC, COMPRESSED STRANDED FOR NO. 8 AWG AND LARGER. ALL FEEDER CONDUCTORS NO. 8 AWG AND LARGER: STRANDED, TYPE THWN-2 OR XHHW-2 INSULATION.

ALL BRANCH CIRCUITS SHALL BE ANNEALED (SOFT) COPPER COMPLYING WITH ICEA S-95-658/NEMA WC70. SOLID CONDUCTOR FOR NO. 10AWG AND SMALLER, CONCENTRIC, COMPRESSED STRANDED FOR NO. 8 AWG AND LARGER. ALL BRANCH CIRCUIT CONDUCTORS NO. 8 AWG AND LARGER, STRANDED, TYPE THWN-2 OR XHHW-2 INSULATION. ALL CONDUCTORS, NO. 10 AWG AND SMALLER, USED FOR POWER AND LIGHTING CIRCUITS: SOLID COPPER, TYPE THWN-2 INSULATION (WET OR DAMP LOCATIONS, OR IN CONDUIT BELOW GRADE OR SLAB), TYPE THHN INSULATION (DRY LOCATIONS ONLY ABOVE GRADE), OR DUAL RATED TYPE THHN/THWN-2. ALL BRANCH CIRCUIT WIRES SHALL NOT BE SMALLER THAN NO. 12 AWG. IF NO CONDUCTOR SIZE IS INDICATED ON THE DRAWINGS FOR A BRANCH CIRCUIT, PROVIDE CONDUCTORS AND CONDUIT SIZED PER NFPA 70 AND BASED ON THE INDICATED BRANCH CIRCUIT OVERCURRENT PROTECTIVE DEVICE RATING AND NUMBER OF POLES. WHERE NO CIRCUIT SIZE, CONDUCTORS AND OVERCURRENT PROTECTIVE DEVICES IS INDICATED ON THE DRAWINGS FOR A BRANCH CIRCUIT, PROVIDE THREE NO. 12 AWG CONDUCTORS IN 3/4" RACEWAY, AND A 20A SINGLE POLE CIRCUIT BREAKER.

CONDUCTOR INSULATION TYPES: 90-DEGREE C-RATED, TYPE THHN/THWN-2 OR XHHW-2 COMPLYING WITH ICEA S-95-658/NEMA WC70.

COLORS FOR 208/240V CONDUCTORS

PHASE A: BLACK  
PHASE B: RED  
PHASE C: BLUE  
NEUTRAL: WHITE  
EQUIPMENT GROUND: GREEN  
ISOLATED GROUND: GREEN WITH YELLOW STRIPE

COLORS FOR 480/277V CONDUCTORS

PHASE A: BROWN  
PHASE B: ORANGE  
PHASE C: YELLOW  
NEUTRAL: WHITE  
EQUIPMENT GROUND: GREEN

UNLESS NOTED OTHERWISE, SPECIAL PURPOSE CONDUCTORS AND CABLES, SUCH AS LOW VOLTAGE CONTROL AND SHIELDED INSTRUMENT WIRING, SHALL BE AS RECOMMENDED BY THE SYSTEM EQUIPMENT MANUFACTURER.

CONTROL WIRING: STRANDED COPPER CONDUCTORS, 600V INSULATION, OF THE PROPER TYPE, SIZE AND NUMBER AS REQUIRED TO ACCOMPLISH SPECIFIED FUNCTION. MINIMUM SIZE, NO. 14 AWG UNLESS NOTED OTHERWISE.

MC TYPE CABLE CAN BE USED IF ACCEPTED BY LOCAL AUTHORITY AND GOVERNING CODES FOR WHIPS FROM JUNCTION BOX TO LIGHT FIXTURES ONLY. TYPE MC CABLE, 600V, UNJACKETED; ANSI E119 AND E814, UL STANDARDS 44 OR 83 (AS APPLICABLE), AND 1569, NFPA 70 ARTICLE 330; ALUMINUM OR GALVANIZED STEEL, INTERLOCKED ARMOR, THIN-OR XHHW-INSULATED CONDUCTORS; COLOR CODE: ICEA METHOD 1, WITH GREEN INSULATED GROUNDING CONDUCTOR.

PROVIDE A DEDICATED EQUIPMENT-GROUNDING CONDUCTOR, OR BONDING JUNCTION, AS APPLICABLE, AND ALL BRANCH CIRCUITS AND FEEDERS, SIZED IN ACCORDANCE WITH NFPA 70, UNLESS INDICATED AS LARGER ON THE DRAWINGS.

PROVIDE A DEDICATED NEUTRAL (WHERE REQUIRED) AND DEDICATED GROUNDING CONDUCTOR FOR EACH BRANCH CIRCUIT.

VOLTAGE DROP IN BRANCH CIRCUITS SHALL NOT EXCEED 2%.

GFCI CIRCUITS: DO NOT USE MULTI-CONDUCTOR CIRCUITS, WITH A SHARED NEUTRAL, FOR ANY GFCI CIRCUIT BREAKER OR RECEPTACLE CIRCUIT. BRANCH CIRCUITS FEED FROM GFCI CIRCUIT BREAKERS, LIMIT THE ONE-WAY CONDUCTOR LENGTH TO 100 FEET BETWEEN THE PANELBOARD AND THE MOST REMOTE RECEPTACLE OR LOAD ON THE GFCI CIRCUIT.

**BOXES**

JUNCTION AND PULL BOXES: GALVANIZED PRESSED STEEL WITH GALVANIZED STEEL EXTENSION RINGS OR PLASTER RINGS OR TILE RINGS TO PROVIDE EXPOSED SURFACE FLUSH WITH WALL OR CEILING FINISH. PROVIDE ALL CEILING OUTLET BOXES WITH "NO-BOLT" OR THROUGH AND LOCKWATTED TYPE FIXTURE STUDS.

UNLESS NOTED OTHERWISE, BOXES SHALL BE IN ACCORDANCE WITH NEMA AND N.E.C. STANDARDS AND REQUIREMENTS INSOFAR AS MATERIAL, GAUGES, DIMENSIONS, AND FABRICATION METHODS. BOXES SHALL BEAR THE UL LABEL. WHERE BOXES ARE NOT SIZED ON THE DRAWINGS, THEY SHALL BE SIZED IN ACCORDANCE WITH N.E.C. REQUIREMENTS. FINISH IN STANDARD GRAY ENAMEL, WITH SIDES AND BACK SPOT-WELDED IN POSITION AND THE REMOVABLE SCREW COVER MOUNTED WITH BRASS MACHINE SCREWS.

**WIRING DEVICES**

SWITCHES: DECORA STYLE, HEAVY DUTY AC, RATED 20 AMPERES, 120/277 VOLTS, SINGLE-POLE, DOUBLE-POLE, THREE-POLE, OR FOUR-WAY AS NOTED ON DRAWINGS OR AS REQUIRED FOR THE SWITCHING ARRANGEMENTS IN EACH SPACE. HUBBELL #HBL122" OR EQUAL. COORDINATE SWITCH COLORS WITH COVERPLATES AS DESCRIBED ON POWER PLAN.

SWITCHES, SPECIAL PURPOSE: KEY OPERATED, HEAVY-DUTY AC, RATED 20 AMPERES, 120/277 VOLTS, SINGLE OR MULTI-POLE AS NOTED OR AS REQUIRED, HUBBELL #HBL122" OR EQUAL.

RECEPTACLES: DECORA STYLE, THREE WIRE GROUNDING TYPE, 120 VOLT RATED, SPECIFICATION GRADE 20 AMPERES DUPLEX UNLESS NOTED OTHERWISE ON DRAWINGS, HUBBELL #5882 OR EQUAL. COORDINATE RECEPTACLE COLOR WITH COVERPLATE AS DESCRIBED ON POWER PLAN. SINGLE RECEPTACLE, 20 AMPERE, 120 VOLT, SPECIFICATION GRADE, HUBBELL #5901 OR EQUAL.

DUST AND MOISTURE RESISTANT, MELAMINE BODY, NYLON FACE BACKED BY FABRIC REINFORCED NEOPRENE GASKET SLIT TO PROVIDE WIPING ACTION ON CAP BLADES. PASS & SEYMOUR #R307 OR APPROVED EQUAL. GROUND FAULT CIRCUIT INTERRUPTER, NYLON FACE, CLASS A, NEMA 5-20R, SPECIFICATION GRADE, HUBBELL #GF-5362" OR EQUAL.

CORROSION RESISTANT, SIMILAR AND APPROVED EQUAL TO STANDARD RECEPTACLE, EXCEPT FABRICATED FROM MELAMINE PLASTIC WITH NYLON FACE AND EXPOSED METAL PARTS FINISHED TO RESIST CORROSION. (NEMA 5-15R - HUBBELL #52CM1).

ISOLATED GROUND, DUPLEX OR SIMPLEX THREE WIRE GROUNDING TYPE, SPECIFICATION GRADE, ORANGE FACE, GROUND CONTACT FULLY ISOLATED FROM STRAP AND EQUIPPED WITH SCREW TERMINAL. HUBBELL #IG-5362" OR EQUAL.

RECEPTACLES, SPECIAL PURPOSE: SPECIAL PURPOSE OUTLETS SHALL BE AS SCHEDULED ON DRAWINGS.  
PLATES: PROVIDE PLATES FOR ALL OUTLET BOXES. PLATES SHALL BE OF SUITABLE CONFIGURATION FOR THE NUMBER AND TYPE OF DEVICES SERVED, SHALL BE ONE PIECE, SHALL OVERLAP OUTLET BOX EDGE AND ROOM SURFACES, AND SHALL BE SMOOTH SANISH NYLON TYPE OF SAME MANUFACTURER AS THE WIRING DEVICES. VERIFY DESIRED MATERIALS AND COLORS WITH ARCHITECT PRIOR TO INSTALLATION.

STANDARD INTERIOR: REFER TO PLANS - COORDINATE ALL COLORS WITH ARCHITECT

INTERIOR DAMP LOCATIONS: STAINLESS STEEL.

EXTERIOR LOCATIONS: FOR UNATTENDED WET LOCATIONS, PROVIDE IN-HOUSE NEMA 3R, UL LABELED PLATES MOLDED FROM A CLEAR HIGH IMPACT ULTRAVIOLET STABILIZED POLYCARBONATE MATERIAL FOR EASY VERIFICATION THAT CORDS ARE PLUGGED IN AND THAT THE GFCI IS FUNCTIONING. COVER PLATES SHALL BE BY THE SAME MANUFACTURER AS THE WIRING DEVICES, COMPLYING WITH NFPA 70 (A) OR (B) REQUIREMENTS FOR ATTENDED OR UNATTENDED USE AS APPLICABLE.

ACCEPTABLE MANUFACTURERS: HUBBELL, PASS & SEYMOUR, LEVITON AND COOPER.

**CABINETS AND ENCLOSURES**

FURNISH AND INSTALL FLUSH CABINETS AND ENCLOSURES AS SHOWN ON THE PLANS AND AS HEREIN SPECIFIED. UNIT SHALL BE PROVIDED WITH DEAD FRONT SUB PANEL, RECESSED AS REQUIRED, TO HOUSE CONTROLS. DOOR SHALL BE PROVIDED WITH CONCEALED HINGES AND FLUSH KEY OPERATED LOCK. DOOR AND TRIM SHALL BE PRIME PAINTED FOR FIELD PAINTING TO MATCH WALL FINISHES. PROVIDE KNOCK-OUTS, LOUVERS AND IDENTIFICATION ENGRAVING AS REQUIRED TO MEET FIELD CONDITIONS. EXACT BOXBOX SIZE TO BE COORDINATED WITH EQUIPMENT SUPPLIER.

**CIRCUIT DISCONNECTS**

SAFETY SWITCHES: SAFETY SWITCHES SHALL CONSIST OF A BOX, FRONT COVER, AND CIRCUIT PROTECTOR DEVICE ALL MANUFACTURED AND ASSEMBLED IN ACCORDANCE WITH NEMA STANDARDS

THE BOX SHALL BE FABRICATED FROM CODE GAUGE GALVANIZED SHEET STEEL IN ACCORDANCE WITH UL LISTING AND LABEL. THE CIRCUIT PROTECTOR DEVICE SHALL BE HEAVY DUTY, QUICKMAKE, QUICK-BREAK FUSED OR UNFUSED SWITCH RATED FOR MOTOR CIRCUITS AND/OR SERVICE ENTRANCE DUTY; IF REQUIRED, UNITS SHALL BE FURNISHED FOR SURFACE OR FLUSH MOUNTING WITH ETHICAL GENERAL PURPOSE OR RAIN TIGHT ENCLOSURES, AS REQUIRED. FUSED UNITS SHALL BE FURNISHED COMPLETE WITH PROPER FUSES.

**PANELBOARDS**

SHALL CONSIST OF BOX, INTERIOR, FRONT, AND CIRCUIT PROTECTIVE DEVICES. THE ASSEMBLY SHALL BE UL LISTED AND BE LISTED FOR SERVICE. THE ASSEMBLY SHALL BE DESIGNED AND MANUFACTURED IN ACCORDANCE WITH NEMA STANDARD PB-1, THE LATEST UL STANDARD (UL-50) AND SHALL HAVE A TURNED EDGE AROUND THE FRONT FOR RIGIDITY AND FOR CLAMPING ON FRONT. PROVIDE STANDARD KNOCKOUTS ON REMOVABLE BOX ENDS. FABRICATE FROM SHEET STEEL AND FINISH WITH BAKED ON GRAY ENAMEL OVER RUST INHIBITOR. EACH FRONT SHALL HAVE A DOOR MOUNTED ON SEMI-CONCEALED HINGES WITH A CYLINDER LOCK, INDEX CARD CIRCUIT DIRECTORY MOUNTED BEHIND CLEAR PLASTIC AND HELD IN A METAL FRAME, AND CONCEALED TRIM CLAMPS FOR MOUNTING TO THE BOX. ALL LOCKS SHALL BE MASTER KEYED AND ALL PANEL DIRECTORIES SHALL BE TYPEWRITTEN.

ALL INTERIORS SHALL BE COMPLETELY FACTORY ASSEMBLED. THE DESIGN OF THE INTERIOR SHALL PERMIT REPLACEMENT OF INDIVIDUAL BRANCH BREAKERS WITHOUT DISTURBING ADJACENT UNITS AND WITHOUT MACHINE DRILLING OR TAPPING. BUS BARS FOR PANELS RATED 600 AMPERES OR MORE SHALL BE TIN PLATED 98% CONDUCTIVITY COPPER OR TIN FINISH ALUMINUM 57% CONDUCTIVITY OF RECTANGULAR CROSS-SECTION. BUS BARS FOR PANELS RATED LESS THAN 600 AMPERES SHALL BE TIN PLATED 98% CONDUCTIVITY COPPER OR RECTANGULAR CROSS-SECTION. BUS BAR CONNECTIONS TO BRANCH CIRCUIT BREAKERS SHALL BE THE PHASE SEQUENCE TYPE AND ACCEPT BOLT ON TYPE BREAKERS ONLY. PANELBOARD BUS STRUCTURE AND MAIN BREAKER OR MAIN LUGS SHALL BE RATED AS SCHEDULED ON DRAWING. SUCH RATINGS SHALL BE ESTABLISHED BASED ON HEAT RISE TESTS IN ACCORDANCE WITH UL STANDARDS. GROUP INCOMING CABLE LUGS AT ONE END FOR SEPARATION FROM LOAD SIDE CABLES. EQUIPMENT NEUTRAL BUSSING WITH A LUG FOR EACH BRANCH BREAKER POSITION. INTERIOR SHALL MOUNT TO BOX WITHOUT TOOLS.

BREAKERS SHALL BE QUICKMAKE, QUICK-BREAK, BOLT-ON THERMAL-MAGNETIC MOLDED CASE CIRCUIT BREAKERS, ONE, TWO OR THREE POLE WITH INTEGRAL CROSSBAR FOR MULTIPOLE UNITS, EQUIPPED WITH AN OVERCURRENT, TRIP-FREE, TOGGLE-TYPE OPERATING ACTION AND POSITIVE HANDLE INDICATION OF BREAKER STATUS. CIRCUIT BREAKERS SHALL BE UL LISTED IN ACCORDANCE WITH UL STANDARDS.

EACH PANELBOARD, AS A COMPLETE UNIT, SHALL HAVE A SHORT CIRCUIT RATING EQUAL TO, OR GREATER THAN THE INTEGRATED EQUIPMENT RATING SHOWN ON DRAWINGS. THE RATING SHALL BE ESTABLISHED BY TESTING WITH THE OVERCURRENT DEVICES MOUNTED IN THE PANELBOARD. THE SHORT CIRCUIT TESTS ON THE OVERCURRENT DEVICES ON THE STRUCTURE SHALL BE MADE SIMULTANEOUSLY BY CONNECTING THE FAULT TO EACH OVERCURRENT DEVICE WITH THE PANELBOARD CONNECTED TO ITS RATED SUPPLY VOLTAGE.

REFER TO PANELBOARD SCHEDULES FOR FULLY RATED OR SERIES-RATED REQUIREMENTS. SERIES-RATED SYSTEMS ARE NOT ALLOWED UNLESS SPECIFICALLY INDICATED ON PANELBOARD SCHEDULES, WHERE ALLOWED, SERIES-RATED SYSTEMS SHALL BE PROPERLY LABELLED BY NEC REQUIREMENTS.

METHOD OF TESTING SHALL BE PER UL STANDARDS. PANELBOARDS SHALL BE MARKED WITH THEIR MAXIMUM SHORT CIRCUIT CURRENT RATING AT THE SUPPLY VOLTAGE.

APPROVED MANUFACTURERS: SQUARE-D CO. OR EQUAL, BY GE, SIEMENS AND/OR EATON.

**OVERCURRENT PROTECTIVE DEVICES**

FUSES OF THE PROPER SIZE, RATING AND ELECTRICAL CHARACTERISTICS SHALL BE PROVIDED IN EACH FUSIBLE DEVICE. FUSES OF 600 VOLTS AND BELOW SHALL BE UL CLASS RK-1, CURRENT-LIMITING, TIME-DELAY, DUAL-ELEMENT, 200,000 AMPERE RMS SYMMETRICAL INTERRUPTING CAPACITY ON NON-MOTOR CIRCUITS AND UL CLASS RK-5, TIME-DELAY, DUAL-ELEMENT, 200,000 AMPERES RMS SYMMETRICAL INTERRUPTING CAPACITY ON MOTOR CIRCUITS.

APPROVED MANUFACTURERS: BUSSMANN, LITTELFUSE, OR FERRAZ-SHAWMUT (ALL FUSES SHALL BE OF SAME MANUFACTURER TO ENSURE SELECTIVE COORDINATION).

CIRCUIT BREAKERS: CIRCUIT BREAKERS OF THE PROPER SIZE, RATING, AND ELECTRICAL CHARACTERISTICS SHALL BE PROVIDED WHERE CALLED FOR ON DRAWINGS. BREAKERS SHALL BE THERMAL-MAGNETIC MOLDED-CASE WITH

QUICK-MAKE, QUICK-BREAK, OVER CENTER TOGGLE TYPE MECHANISM AND TRIP-FREE HANDLE MECHANISM. THE BREAKER SHALL BE ENCLOSED IN A SUITABLE NEMA RATED ENCLOSURE. BREAKERS SHALL BE OF SAME MANUFACTURER AS THOSE IN THE PANELBOARDS.

**TIMESWITCHES**

ELECTRONIC TIME SWITCHES: ELECTRONIC, SOLID STATE PROGRAMMABLE UNITS WITH ALPHANUMERIC DISPLAY, COMPLYING WITH UL917. SPST, 30 AMPERE INDUCTIVE OR RESISTIVE, 240VAC, CONTACT RATING, 2 PROGRAMMABLE ON-OFF SET POINTS ON A 24-HOUR SCHEDULE, ALLOWING DIFFERENT SET POINTS FOR EACH DAY OF THE WEEK, ALLOW CONNECTION OF A PHOTOELECTRIC RELAY AS SUBSTITUTE FOR ON-OFF FUNCTION OF A PROGRAM. ASTRONOMIC TIME ON ALL CHANNELS. BATTERY BACKUP FOR SCHEDULES AND TIME CLOCK.

**OUTDOOR PHOTOELECTRIC SWITCHES**

SOLID STATE, WITH SPST DRY CONTACT RATED FOR 1800-VA TUNGSTEN OR 1000-VA INDUCTIVE, TO OPERATE CONNECTED RELAY, CONTACTOR COILS OR MICROPROCESSOR INPUT, COMPLYING WITH UL 773A.

**TELEPHONE AND DATA SYSTEMS**

FURNISH AND INSTALL A SYSTEM OF PROPERLY SIZED AND PROPERLY LOCATED OUTLETS WITH ASSOCIATED CONNECTING CONDUIT RUNS, EXTENDING TO PULL BOXES AND TELEPHONE BACKBOARD. FURNISH AND INSTALL RACEWAYS, FOR INCOMING SERVICE WHERE INDICATED.  
OUTLET BOXES: UNLESS OTHERWISE INDICATED, ALL TELEPHONE OUTLETS AND JUNCTION BOXES SHALL BE PROVIDED AS REQUIRED TO ACCOMMODATE INTERNAL TERMINAL STRIPS BY TELEPHONE CO.

OUTLET COVER PLATES: TELEPHONE OUTLET COVER PLATES SHALL MATCH THOSE SPECIFIED FOR ADJACENT WIRING DEVICES, INCLUDING THOSE WITH SPECIAL FINISHES.

RACEWAYS: MATERIALS FOR TELEPHONE RACEWAY SYSTEM WORK SHALL BE IN ACCORDANCE WITH CORRESPONDING RACEWAYS SPECIFIED HEREIN AND IN OTHER SECTIONS.

VERIFY LOCATION OF WALL OUTLETS BEFORE ROUGHING IN TO ENSURE COORDINATION WITH OWNER'S FINAL INTENDED FURNITURE LAYOUT. PLAN INDICATIONS SHALL NOT BE SCALED UNLESS DIRECTED BY ARCHITECT-ENGINEER WITHOUT ADDITIONAL COST TO OWNER.

TELEPHONE SERVICE CONDUIT LAYOUT SHALL HAVE THE JOB SITE APPROVAL OF AN AUTHORIZED REPRESENTATIVE OF THE TELEPHONE CO. COORDINATE WORK SO THAT BOTH TELEPHONE CO. AND OWNERS REPRESENTATIVES ARE PRESENT AT THE SAME TIME FOR APPROVAL OR CHANGES IN AMPLI TIME FOR ANY REQUIRED CORRECTIONS BEFORE COMPLETION OF PROJECT.

FROM EACH TELEPHONE OUTLET, PROVIDE 3/4" EMT CONDUIT CONCEALED IN WALL TO 6" ABOVE ACCESSIBLE CEILING OR UP TO STRUCTURE WHERE NO CEILING EXISTS, UNLESS SHOWN OTHERWISE ON DRAWINGS.

TELEPHONE TERMINAL BOARD: PRIOR TO INSTALLATION OF TELEPHONE TERMINAL BOARD, THE EXACT LOCATION SHALL BE VERIFIED WITH THE TELEPHONE CO. THE TELEPHONE TERMINAL BOARD SHALL BE PROVIDED WITH A DOUBLE DUPLEX RECEPTACLE LOCATED WHERE INDICATED ON THE DRAWINGS. THE TERMINAL BOARD SHALL BE CONSTRUCTED OF 4' X 8' X 3/4" PLYWOOD WITH TWO (2) COATS OF FLAME RETARDANT PAINT UNLESS NOTED OTHERWISE ON DRAWINGS.

**LIGHTING**

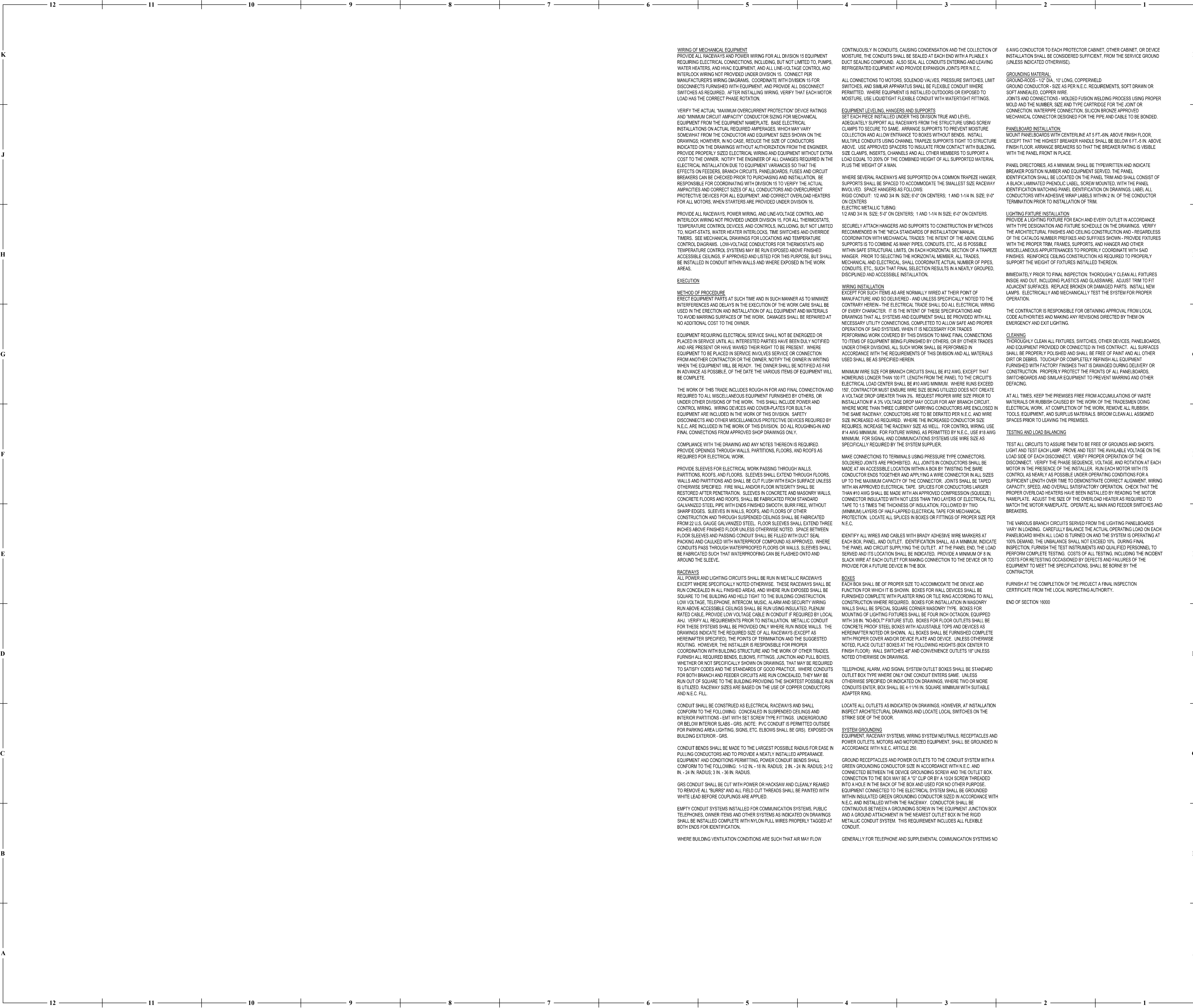
FIXTURES ARE SPECIFIED IN THE SCHEDULE BY MANUFACTURER'S NAME AND CATALOG NUMBER.

ALL RECESSED LIGHT FIXTURES SHALL BE PROVIDED WITH FACTORY INSTALLED THERMAL PROTECTION.

ALL LAMPS USED ON THIS PROJECT SHALL BE NEW, DELIVERED TO THE JOB SITE IN THE ORIGINAL PACKING CASES AND SLEEVES AND SHALL BE OF THE SAME MANUFACTURER.

PROVIDE FLUORESCENT FIXTURES WITH ELECTRONIC BALLASTS SUITABLE FOR OPERATION OF LAMPS SPECIFIED; TOTAL HARMONIC DISTORTION LESS THAN





**WIRING OF MECHANICAL EQUIPMENT**  
PROVIDE ALL RACEWAYS AND POWER WIRING FOR ALL DIVISION 15 EQUIPMENT REQUIRING ELECTRICAL CONNECTIONS, INCLUDING, BUT NOT LIMITED TO, PUMPS, WATER HEATERS, AND HVAC EQUIPMENT, AND ALL LINE-VOLTAGE CONTROL AND INTERLOCK WIRING NOT PROVIDED UNDER DIVISION 15. CONNECT PER MANUFACTURER'S WIRING DIAGRAMS. COORDINATE WITH DIVISION 15 FOR DISCONNECTS FURNISHED WITH EQUIPMENT, AND PROVIDE ALL DISCONNECT SWITCHES AS REQUIRED, AFTER INSTALLING WIRING, VERIFY THAT EACH MOTOR LOAD HAS THE CORRECT PHASE ROTATION.

VERIFY THE ACTUAL "MAXIMUM OVERCURRENT PROTECTION" DEVICE RATINGS AND "MINIMUM CIRCUIT AMPACITY" CONDUCTOR SIZING FOR MECHANICAL EQUIPMENT FROM THE EQUIPMENT NAMEPLATE. BASE ELECTRICAL INSTALLATIONS ON ACTUAL REQUIRED AMPERAGES, WHICH MAY VARY SOMEWHAT FROM THE CONDUCTOR AND EQUIPMENT SIZES SHOWN ON THE DRAWINGS; HOWEVER, IN NO CASE, REDUCE THE SIZE OF CONDUCTORS INDICATED ON THE DRAWINGS WITHOUT AUTHORIZATION FROM THE ENGINEER. PROVIDE PROPERLY SIZED ELECTRICAL WIRING AND EQUIPMENT WITHOUT EXTRA COST TO THE OWNER. NOTIFY THE ENGINEER OF ALL CHANGES REQUIRED IN THE ELECTRICAL INSTALLATION DUE TO EQUIPMENT VARIANCES SO THAT THE EFFECTS ON FEEDERS, BRANCH CIRCUITS, PANELBOARDS, FUSES AND CIRCUIT BREAKERS CAN BE CHECKED PRIOR TO PURCHASING AND INSTALLATION. BE RESPONSIBLE FOR COORDINATING WITH DIVISION 15 TO VERIFY THE ACTUAL AMPACITIES AND CORRECT SIZES OF ALL CONDUCTORS AND OVERCURRENT PROTECTIVE DEVICES FOR ALL EQUIPMENT, AND CORRECT OVERLOAD HEATERS FOR ALL MOTORS, WHEN STARTERS ARE PROVIDED UNDER DIVISION 16.

PROVIDE ALL RACEWAYS'S POWER WIRING, AND LINE-VOLTAGE CONTROL AND INTERLOCK WIRING NOT PROVIDED UNDER DIVISION 15, FOR ALL THERMOSTATS, TEMPERATURE CONTROL DEVICES, AND CONTROLS, INCLUDING, BUT NOT LIMITED TO, NIGHT-STATS, WATER HEATER INTERLOCKS, TIME SWITCHES AND OVERRIDE TIMERS. SEE MECHANICAL DRAWINGS FOR LOCATIONS AND TEMPERATURE CONTROL DIAGRAM. LOW-VOLTAGE CONDUCTORS FOR THERMOSTATS AND TEMPERATURE CONTROL SYSTEMS MAY BE RUN EXPOSED ABOVE FINISHED ACCESSIBLE CEILINGS, IF APPROVED AND LISTED FOR THIS PURPOSE, BUT SHALL BE INSTALLED IN CONDUIT WITHIN WALLS AND WHERE EXPOSED IN THE WORK AREAS.

**EXECUTION**

**METHOD OF PROCEDURE**  
ERECT EQUIPMENT PARTS AT SUCH TIME AND IN SUCH MANNER AS TO MINIMIZE INTERFERENCES AND DELAYS IN THE EXECUTION OF THE WORK CARE SHALL BE USED IN THE ERECTION AND INSTALLATION OF ALL EQUIPMENT AND MATERIALS TO AVOID MARRING SURFACES OF THE WORK. DAMAGES SHALL BE REPAIRED AT NO ADDITIONAL COST TO THE OWNER.

EQUIPMENT REQUIRING ELECTRICAL SERVICE SHALL NOT BE ENERGIZED OR PLACED IN SERVICE UNTIL ALL INTERESTED PARTIES HAVE BEEN DULY NOTIFIED AND ARE PRESENT OR HAVE WAIVED THEIR RIGHT TO BE PRESENT WHERE EQUIPMENT TO BE PLACED IN SERVICE INVOLVES SERVICE OR CONNECTION FROM ANOTHER CONTRACTOR OR THE OWNER, NOTIFY THE OWNER IN WRITING WHEN THE EQUIPMENT WILL BE READY. THE OWNER SHALL BE NOTIFIED AS FAR IN ADVANCE AS POSSIBLE, OF THE DATE THE VARIOUS ITEMS OF EQUIPMENT WILL BE COMPLETE.

THE WORK OF THIS TRADE INCLUDES ROUGH-IN FOR AND FINAL CONNECTION AND REQUIRED TO ALL MISCELLANEOUS EQUIPMENT FURNISHED BY OTHERS, OR UNDER OTHER DIVISIONS OF THE WORK. THIS SHALL INCLUDE POWER AND CONTROL WIRING. WIRING DEVICES AND COVER-PLATES FOR BUILT-IN EQUIPMENT ARE INCLUDED IN THE WORK OF THIS DIVISION. SAFETY DISCONNECTS AND OTHER MISCELLANEOUS PROTECTIVE DEVICES REQUIRED BY N.E.C., ARE INCLUDED IN THE WORK OF THIS DIVISION. DO ALL ROUGHING-IN AND FINAL CONNECTIONS FROM APPROVED SHOP DRAWINGS ONLY.

COMPLIANCE WITH THE DRAWING AND ANY NOTES THEREON IS REQUIRED. PROVIDE OPENINGS THROUGH WALLS, PARTITIONS, FLOORS, AND ROOFS AS REQUIRED FOR ELECTRICAL WORK.

PROVIDE SLEEVES FOR ELECTRICAL WORK PASSING THROUGH WALLS, PARTITIONS, ROOFS, AND FLOORS. SLEEVES SHALL EXTEND THROUGH FLOORS, WALLS AND PARTITIONS AND SHALL BE CUT FLUSH WITH EACH SURFACE, UNLESS OTHERWISE SPECIFIED. FIRE WALL AND/OR FLOOR INTEGRITY SHALL BE RESTORED AFTER PENETRATION. SLEEVES IN CONCRETE AND MASONRY WALLS, CONCRETE FLOORS AND ROOFS, SHALL BE FABRICATED FROM STANDARD GALVANIZED STEEL PIPE WITH ENDS FINISHED SMOOTH, BURR FREE, WITHOUT SHARP EDGES. SLEEVES IN WALLS, ROOFS, AND FLOORS OF OTHER CONSTRUCTION AND THROUGH SUSPENDED CEILINGS SHALL BE FABRICATED FROM 22 U.S. GAUGE GALVANIZED STEEL. FLOOR SLEEVES SHALL EXTEND THREE INCHES ABOVE FINISHED FLOOR UNLESS OTHERWISE NOTED. SPACE BETWEEN FLOOR SLEEVES AND PASSING CONDUIT SHALL BE FILLED WITH DUCT SEAL PACKING AND CAULKED WITH WATERPROOF COMPOUND AS APPROVED, WHERE CONDUITS PASS THROUGH WATERPROOFED FLOORS OR WALLS. SLEEVES SHALL BE FABRICATED SUCH THAT WATERPROOFING CAN BE FLASHED ONTO AND AROUND THE SLEEVE.

**RACEWAYS**  
ALL POWER AND LIGHTING CIRCUITS SHALL BE RUN IN METALLIC RACEWAYS EXCEPT WHERE SPECIFICALLY NOTED OTHERWISE. THESE RACEWAYS SHALL BE RUN CONCEALED IN ALL FINISHED AREAS, AND WHERE RUN EXPOSED SHALL BE SQUARE TO THE BUILDING AND HELD TIGHT TO THE BUILDING CONSTRUCTION. LOW VOLTAGE, TELEPHONE, INTERCOM, MUSIC, ALARM AND SECURITY WIRING RUN ABOVE ACCESSIBLE CEILINGS SHALL BE RUN USING INSULATED, PLENUM RATED CABLE, PROVIDE LOW VOLTAGE CABLE IN CONDUIT IF REQUIRED BY LOCAL A.U.I. VERIFY ALL REQUIREMENTS PRIOR TO INSTALLATION. METALLIC CONDUIT FOR THESE SYSTEMS SHALL BE PROVIDED ONLY WHERE RUN INSIDE WALLS. THE DRAWINGS INDICATE THE REQUIRED SIZE OF ALL RACEWAYS (EXCEPT AS HEREINAFTER SPECIFIED), THE POINTS OF TERMINATION AND THE SUGGESTED ROUTING. HOWEVER, THE INSTALLER IS RESPONSIBLE FOR PROPER COORDINATION WITH BUILDING STRUCTURE AND THE WORK OF OTHER TRADES. FURNISH ALL REQUIRED BENDS, ELBOWS, FITTINGS, JUNCTION AND PULL BOXES, WHETHER OR NOT SPECIFICALLY SHOWN ON DRAWINGS, THAT MAY BE REQUIRED TO SATISFY CODES AND THE STANDARDS OF GOOD PRACTICE. WHERE CONDUITS FOR BOTH BRANCH AND FEEDER CIRCUITS ARE RUN CONCEALED, THEY MAY BE RUN OUT OF SQUARE TO THE BUILDING PROVIDING THE SHORTEST POSSIBLE RUN IS UTILIZED. RACEWAY SIZES ARE BASED ON THE USE OF COPPER CONDUCTORS AND N.E.C. FILL.

CONDUIT SHALL BE CONSTRUED AS ELECTRICAL RACEWAYS AND SHALL CONFORM TO THE FOLLOWING: CONCEALED IN SUSPENDED CEILINGS AND INTERIOR PARTITIONS - EMT WITH SET SCREW TYPE FITTINGS. UNDERGROUND OR BELOW INTERIOR SUBS - GRS. (NOTE: PVC CONDUIT IS PERMITTED OUTSIDE FOR PARKING AREA LIGHTING, SIGNS, ETC. ELBOWS SHALL BE GRS). EXPOSED ON BUILDING EXTERIOR - GRS.

CONDUIT BENDS SHALL BE MADE TO THE LARGEST POSSIBLE RADIUS FOR EASE IN PULLING CONDUCTORS AND TO PROVIDE A NEATLY INSTALLED APPEARANCE. EQUIPMENT AND CONDITIONS PERMITTING, POWER CONDUIT BENDS SHALL CONFORM TO THE FOLLOWING: 1-1/2 IN. - 18 IN. RADIUS; 2 IN. - 24 IN. RADIUS; 2-1/2 IN. - 24 IN. RADIUS; 3 IN. - 36 IN. RADIUS.

GRS CONDUIT SHALL BE CUT WITH POWER OR HACKSAW AND CLEANLY REAMED TO REMOVE ALL "BURRS" AND ALL FIELD CUT THREADS SHALL BE PAINTED WITH WHITE LEAD BEFORE COUPLINGS ARE APPLIED.

EMPTY CONDUIT SYSTEMS INSTALLED FOR COMMUNICATION SYSTEMS, PUBLIC TELEPHONES, OWNER ITEMS AND OTHER SYSTEMS AS INDICATED ON DRAWINGS SHALL BE INSTALLED COMPLETE WITH NYLON PULL WIRES PROPERLY TAGGED AT BOTH ENDS FOR IDENTIFICATION.

WHERE BUILDING VENTILATION CONDITIONS ARE SUCH THAT AIR MAY FLOW

CONTINUOUSLY IN CONDUITS, CAUSING CONDENSATION AND THE COLLECTION OF MOISTURE, THE CONDUITS SHALL BE SEALED AT EACH END WITH A PLIABLE, NON-REFRIGERATED EQUIPMENT AND PROVIDE EXPANSION JOINTS PER N.E.C.

ALL CONNECTIONS TO MOTORS, SOLENOID VALVES, PRESSURE SWITCHES, LIMIT SWITCHES, AND SIMILAR APPARATUS SHALL BE FLEXIBLE CONDUIT WHERE PERMITTED. WHERE EQUIPMENT IS INSTALLED OUTDOORS OR EXPOSED TO MOISTURE, USE LIQUIDTIGHT FLEXIBLE CONDUIT WITH WATER TIGHT FITTINGS.

**EQUIPMENT LEVELING, HANGERS AND SUPPORTS**  
SET EACH PIECE INSTALLED UNDER THIS DIVISION TRUE AND LEVEL. ADEQUATELY SUPPORT ALL RACEWAYS FROM THE STRUCTURE USING SCREW CLAMPS TO SECURE TO SAME, ARRANGE SUPPORTS TO PREVENT MOISTURE COLLECTION AND ALLOW ENTRANCE TO BOXES WITHOUT BENDS. INSTALL MULTIPLE CONDUITS USING CHANNEL TRAPEZE SUPPORTS TIGHT TO STRUCTURE ABOVE. USE APPROVED SPACERS TO INSULATE FROM CONTACT WITH BUILDING. SIZE CLAMPS, INSERTS, CHANNELS AND ALL OTHER MEMBERS TO SUPPORT A LOAD EQUAL TO 200% OF THE COMBINED WEIGHT OF ALL SUPPORTED MATERIAL PLUS THE WEIGHT OF A MAN.

WHERE SEVERAL RACEWAYS ARE SUPPORTED ON A COMMON TRAPEZE HANGER, SUPPORTS SHALL BE SPACED TO ACCOMMODATE THE SMALLEST SIZE RACEWAY INVOLVED. SPACE HANGERS AS FOLLOWS:  
RIGID CONDUIT: 1/2 AND 3/4 IN. SIZE: 6'-0" ON CENTERS; 1 AND 1-1/4 IN. SIZE: 9'-0" ON CENTERS  
ELECTRIC METALLIC TUBING: 1/2 AND 3/4 IN. SIZE: 5'-0" ON CENTERS; 1 AND 1-1/4 IN. SIZE: 6'-0" ON CENTERS.

SECURELY ATTACH HANGERS AND SUPPORTS TO CONSTRUCTION BY METHODS RECOMMENDED IN THE "NECA STANDARDS OF INSTALLATION" MANUAL. COORDINATION WITH MECHANICAL TRADES: THE INTENT OF THE ABOVE CEILING SUPPORTS IS TO COMBINE AS MANY PIPES, CONDUITS, ETC. AS IS POSSIBLE WITHIN SAFE STRUCTURAL LIMITS. ON EACH HORIZONTAL SECTION OF A TRAPEZE HANGER, PRIOR TO SELECTING THE HORIZONTAL MEMBER, ALL TRADES, MECHANICAL AND ELECTRICAL, SHALL COORDINATE ACTUAL NUMBER OF PIPES, CONDUITS, ETC., SUCH THAT FINAL SELECTION RESULTS IN A NEATLY GROUPED, DISCIPLINED AND ACCESSIBLE INSTALLATION.

**WIRING INSTALLATION**  
EXCEPT FOR SUCH ITEMS AS ARE NORMALLY WIRED AT THEIR POINT OF MANUFACTURE AND SO DELIVERED - AND UNLESS SPECIFICALLY NOTED TO THE CONTRARY HEREIN - THE ELECTRICAL TRADE SHALL DO ALL ELECTRICAL WIRING OF EVERY CHARACTER. IT IS THE INTENT OF THESE SPECIFICATIONS AND DRAWINGS THAT ALL SYSTEMS AND EQUIPMENT SHALL BE PROVIDED WITH ALL NECESSARY UTILITY CONNECTIONS, COMPLETED TO ALLOW SAFE AND PROPER OPERATION OF SAID SYSTEMS, WHEN IT IS NECESSARY FOR TRADES PERFORMING WORK COVERED BY THIS DIVISION TO MAKE FINAL CONNECTIONS TO ITEMS OF EQUIPMENT BEING FURNISHED BY OTHERS, OR BY OTHER TRADES UNDER OTHER DIVISIONS. ALL SUCH WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THIS DIVISION AND ALL MATERIALS USED SHALL BE AS SPECIFIED HEREIN.

MINIMUM WIRE SIZE FOR BRANCH CIRCUITS SHALL BE #12 AWG, EXCEPT THAT MOTORS RUNS LONGER THAN 100 FT. LENGTH FROM THE PANEL TO THE CIRCUITS ELECTRICAL LOAD CENTER SHALL BE #10 AWG MINIMUM. WHERE RUNS EXCEED 150', CONTRACTOR MUST ENSURE WIRE SIZE BEING UTILIZED DOES NOT CREATE A VOLTAGE DROP GREATER THAN 3%. REQUEST PROPER WIRE SIZE PRIOR TO INSTALLATION IF A 3% VOLTAGE DROP MAY OCCUR ON ANY BRANCH CIRCUIT. WHERE MORE THAN THREE CURRENT CARRYING CONDUCTORS ARE ENCLOSED IN THE SAME RACEWAY, CONDUCTORS ARE TO BE DERATED PER N.E.C. AND WIRE SIZE INCREASED AS REQUIRED. WHERE THE INCREASED CONDUCTOR SIZE REQUIRES INCREASE THE RACEWAY SIZE AS WELL. FOR CONTROL WIRING, USE #14 AWG MINIMUM. FOR FIXTURE WIRING, AS PERMITTED BY N.E.C., USE #18 AWG MINIMUM. FOR SIGNAL AND COMMUNICATIONS SYSTEMS USE WIRE SIZE AS SPECIFICALLY REQUIRED BY THE SYSTEM SUPPLIER.

MAKE CONNECTIONS TO TERMINALS USING PRESSURE TYPE CONNECTORS. SOLDERED JOINTS ARE PROHIBITED. ALL JOINTS IN CONDUCTORS SHALL BE MADE AT AN ACCESSIBLE LOCATION WITHIN A BOX BY TWISTING THE BARE CONDUCTOR ENDS TOGETHER AND APPLYING A WIRE CONNECTOR IN ALL SIZES UP TO THE MAXIMUM CAPACITY OF THE CONNECTOR. JOINTS SHALL BE TAPED WITH AN APPROVED ELECTRICAL TAPE. SPLICES FOR CONDUCTORS LARGER THAN #10 AWG SHALL BE MADE WITH AN APPROVED COMPRESSION (SQUEEZE) CONNECTOR INSULATED WITH NOT LESS THAN TWO LAYERS OF ELECTRICAL FILL TAPE TO 1.5 TIMES THE THICKNESS OF INSULATION, FOLLOWED BY TWO (MINIMUM) LAYERS OF HALF-LAPPED ELECTRICAL TAPE FOR MECHANICAL PROTECTION. LOCATE ALL SPLICES IN BOXES OR FITTINGS OF PROPER SIZE PER N.E.C.

IDENTIFY ALL WIRES AND CABLES WITH BRADY ADHESIVE WIRE MARKERS AT EACH BOX, PANEL, AND OUTLET. IDENTIFICATION SHALL, AS A MINIMUM, INDICATE THE PANEL AND CIRCUIT SUPPLYING THE OUTLET. AT THE PANEL END, THE LOAD SERVED AND ITS LOCATION SHALL BE INDICATED. PROVIDE A MINIMUM OF 6 IN. SLACK WIRE AT EACH OUTLET FOR MAKING CONNECTION TO THE DEVICE OR TO PROVIDE FOR A FUTURE DEVICE IN THE BOX.

**BOXES**  
EACH BOX SHALL BE OF PROPER SIZE TO ACCOMMODATE THE DEVICE AND FUNCTION FOR WHICH IT IS SHOWN. BOXES FOR WALL DEVICES SHALL BE FURNISHED COMPLETE WITH PLASTER RING OR TILE RING ACCORDING TO WALL CONSTRUCTION WHERE REQUIRED. BOXES FOR INSTALLATION IN MASONRY WALLS SHALL BE SPECIAL SQUARE CORNER MASONRY TYPE. BOXES FOR MOUNTING OF LIGHTING FIXTURES SHALL BE FOUR INCH OCTAGON, EQUIPPED WITH 3/8 IN. "NO-BOLT" FIXTURE STUD. BOXES FOR FLOOR OUTLETS SHALL BE CONCRETE PROOF STEEL BOXES WITH ADJUSTABLE TOPS AND DEVICES AS HEREINAFTER NOTED OR SHOWN. ALL BOXES SHALL BE FURNISHED COMPLETE WITH PROPER COVER AND/OR DEVICE PLATE AND DEVICE. UNLESS OTHERWISE NOTED, PLACE OUTLET BOXES AT THE FOLLOWING HEIGHTS (BOX CENTER TO FINISH FLOOR): WALL SWITCHES 48" AND CONVENIENCE OUTLETS 18" UNLESS NOTED OTHERWISE ON DRAWINGS.

TELEPHONE, ALARM, AND SIGNAL SYSTEM OUTLET BOXES SHALL BE STANDARD OUTLET BOX TYPE WHERE ONLY ONE CONDUIT ENTERS SAME. UNLESS OTHERWISE SPECIFIED OR INDICATED ON DRAWINGS, WHERE TWO OR MORE CONDUITS ENTER, BOX SHALL BE 4-11/16 IN. SQUARE MINIMUM WITH SUITABLE ADAPTER RING.

LOCATE ALL OUTLETS AS INDICATED ON DRAWINGS; HOWEVER, AT INSTALLATION INSPECT ARCHITECTURAL DRAWINGS AND LOCATE LOCAL SWITCHES ON THE STRIKE SIDE OF THE DOOR.

**SYSTEM GROUNDING**  
EQUIPMENT, RACEWAY SYSTEMS, WIRING SYSTEM NEUTRALS, RECEPTACLES AND POWER OUTLETS, MOTORS AND MOTORIZED EQUIPMENT, SHALL BE GROUNDED IN ACCORDANCE WITH N.E.C. ARTICLE 250.

GROUND RECEPTACLES AND POWER OUTLETS TO THE CONDUIT SYSTEM WITH A GREEN GROUNDING CONDUCTOR SIZE IN ACCORDANCE WITH N.E.C. AND CONNECTED BETWEEN THE DEVICE GROUNDING SCREW AND THE OUTLET BOX CONNECTION TO THE BOX MAY BE A "C" CLIP OR BY A 1/204 SCREW THREADED INTO A HOLE IN THE BACK OF THE BOX AND USED FOR NO OTHER PURPOSE. EQUIPMENT CONNECTED TO THE ELECTRICAL SYSTEM SHALL BE GROUNDED WITHIN INSULATED GREEN GROUNDING CONDUCTOR SIZED IN ACCORDANCE WITH N.E.C. AND INSTALLED WITHIN THE RACEWAY. CONDUCTOR SHALL BE CONTINUOUS BETWEEN A GROUNDING SCREW IN THE EQUIPMENT JUNCTION BOX AND A GROUND ATTACHMENT IN THE NEAREST OUTLET BOX IN THE RIGID METALLIC CONDUIT SYSTEM. THIS REQUIREMENT INCLUDES ALL FLEXIBLE CONDUIT.

GENERALLY FOR TELEPHONE AND SUPPLEMENTAL COMMUNICATION SYSTEMS NO

6 AWG CONDUCTOR TO EACH PROTECTOR CABINET, OTHER CABINET, OR DEVICE INSTALLATION SHALL BE CONSIDERED SUFFICIENT, FROM THE SERVICE GROUND (UNLESS INDICATED OTHERWISE).

**GROUNDING MATERIAL**  
GROUND-RODS - 1/2" DIA., 10' LONG, COPPERWELD  
GROUND CONDUCTOR - SIZE AS PER N.E.C. REQUIREMENTS, SOFT DRAWN OR SOFT ANNEALED, COPPER WIRE.  
JOINTS AND CONNECTIONS - MOLDED FUSION WELDING PROCESS USING PROPER MOLD AND THE NUMBER, SIZE AND TYPE CARTRIDGE FOR THE JOINT OR CONNECTION. WATERPIPE CONNECTION, SILICON BRONZE APPROVED.  
MECHANICAL CONNECTOR DESIGNED FOR THE PIPE AND CABLE TO BE BONDED.

**PANELBOARD INSTALLATION**  
MOUNT PANELBOARDS WITH CENTERLINE AT 5 FT. -6IN. ABOVE FINISH FLOOR, EXCEPT THAT THE HIGHEST BREAKER HANDLE SHALL BE BELOW 6 FT. -5 IN. ABOVE FINISH FLOOR. ARRANGE BREAKERS SO THAT THE BREAKER RATING IS VISIBLE WITH THE PANEL FRONT IN PLACE.

PANEL DIRECTORIES, AS A MINIMUM, SHALL BE TYPEWRITTEN AND INDICATE BREAKER POSITION NUMBER AND EQUIPMENT SERVED. THE PANEL IDENTIFICATION SHALL BE LOCATED ON THE PANEL TRIM AND SHALL CONSIST OF A BLACK LAMINATED PHENOLIC LABEL, SCREW MOUNTED, WITH THE PANEL IDENTIFICATION MATCHING PANEL IDENTIFICATION ON DRAWINGS. LABEL ALL CONDUCTORS WITH ADHESIVE WRAP LABELS WITHIN 2 IN. OF THE CONDUCTOR TERMINATION PRIOR TO INSTALLATION OF TRIM.

**LIGHTING FIXTURE INSTALLATION**  
PROVIDE A LIGHTING FIXTURE FOR EACH AND EVERY OUTLET IN ACCORDANCE WITH TYPE DESIGNATION AND FIXTURE SCHEDULE ON THE DRAWINGS. VERIFY THE ARCHITECTURAL FINISHES AND CEILING CONSTRUCTION AND - REGARDLESS OF THE CATALOG NUMBER PREFIXES AND SUFFIXES SHOWN - PROVIDE FIXTURES WITH THE PROPER TRIM, FRAMES, SUPPORTS, AND HANGER AND OTHER MISCELLANEOUS APPURTENANCES TO PROPERLY COORDINATE WITH SAID FINISHES. REINFORCE CEILING CONSTRUCTION AS REQUIRED TO PROPERLY SUPPORT THE WEIGHT OF FIXTURES INSTALLED THEREON.

IMMEDIATELY PRIOR TO FINAL INSPECTION: THOROUGHLY CLEAN ALL FIXTURES INSIDE AND OUT, INCLUDING PLASTICS AND GLASSWARE. ADJUST TRIM TO FIT ADJACENT SURFACES. REPLACE BROKEN OR DAMAGED PARTS. INSTALL NEW LAMPS. ELECTRICALLY AND MECHANICALLY TEST THE SYSTEM FOR PROPER OPERATION.

THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING APPROVAL FROM LOCAL CODE AUTHORITIES AND MAKING ANY REVISIONS DIRECTED BY THEM ON EMERGENCY AND EXIT LIGHTINGS.

**CLEANING**  
THOROUGHLY CLEAN ALL FIXTURES, SWITCHES, OTHER DEVICES, PANELBOARDS, AND EQUIPMENT PROVIDED OR CONNECTED IN THIS CONTRACT. ALL SURFACES SHALL BE PROPERLY POLISHED AND SHALL BE FREE OF PAINT AND ALL OTHER DIRT OR DEBRIS. TOUCHUP OR COMPLETELY REFINISH ALL EQUIPMENT FURNISHED WITH FACTORY FINISHES THAT IS DAMAGED DURING DELIVERY OR CONSTRUCTION. PROPERLY PROTECT THE FRONTS OF ALL PANELBOARDS, SWITCHBOARDS AND SIMILAR EQUIPMENT TO PREVENT MARRING AND OTHER DEFACING.

AT ALL TIMES, KEEP THE PREMISES FREE FROM ACCUMULATIONS OF WASTE MATERIALS OR RUBBISH CAUSED BY THE WORK OF THE TRADESMEN DOING ELECTRICAL WORK. AT COMPLETION OF THE WORK, REMOVE ALL RUBBISH, TOOLS, EQUIPMENT, AND SURPLUS MATERIALS. BROOM CLEAN ALL ASSIGNED SPACES PRIOR TO LEAVING THE PREMISES.

**TESTING AND LOAD BALANCING**

TEST ALL CIRCUITS TO ASSURE THEM TO BE FREE OF GROUNDS AND SHORTS. LIGHT AND TEST EACH LAMP. PROVE AND TEST THE AVAILABLE VOLTAGE ON THE LOAD SIDE OF EACH DISCONNECT. VERIFY PROPER OPERATION OF THE DISCONNECT. VERIFY THE PHASE SEQUENCE, VOLTAGE, AND ROTATION AT EACH MOTOR IN THE PRESENCE OF THE INSTALLER. RUN EACH MOTOR WITH ITS CONTROL AS NEARLY AS POSSIBLE UNDER OPERATING CONDITIONS FOR A SUFFICIENT LENGTH OF TIME TO DEMONSTRATE CORRECT ALIGNMENT, WIRING CAPACITY, SPEED, AND OVERALL SATISFACTORY OPERATION. CHECK THAT THE PROPER OVERLOAD HEATERS HAVE BEEN INSTALLED BY READING THE MOTOR NAMEPLATE. ADJUST THE SIZE OF THE OVERLOAD HEATER AS REQUIRED TO MATCH THE MOTOR NAMEPLATE. OPERATE ALL MAIN AND FEEDER SWITCHES AND BREAKERS.

THE VARIOUS BRANCH CIRCUITS SERVED FROM THE LIGHTING PANELBOARDS VARY IN LOADING. CAREFULLY BALANCE THE ACTUAL OPERATING LOAD ON EACH PANELBOARD WHEN ALL LOAD IS TURNED ON AND THE SYSTEM IS OPERATING AT 100% DEMAND. THE UNBALANCE SHALL NOT EXCEED 10%. DURING FINAL INSPECTION, FURNISH THE TEST INSTRUMENTS AND QUALIFIED PERSONNEL TO PERFORM COMPLETE TESTING. COSTS OF ALL TESTING, INCLUDING THE INCIDENT COSTS FOR RETESTING OCCASIONED BY DEFECTS AND FAILURES OF THE EQUIPMENT TO MEET THE SPECIFICATIONS, SHALL BE BORNE BY THE CONTRACTOR.

FURNISH AT THE COMPLETION OF THE PROJECT A FINAL INSPECTION CERTIFICATE FROM THE LOCAL INSPECTING AUTHORITY.

END OF SECTION 16000

# SereniTea Boutique

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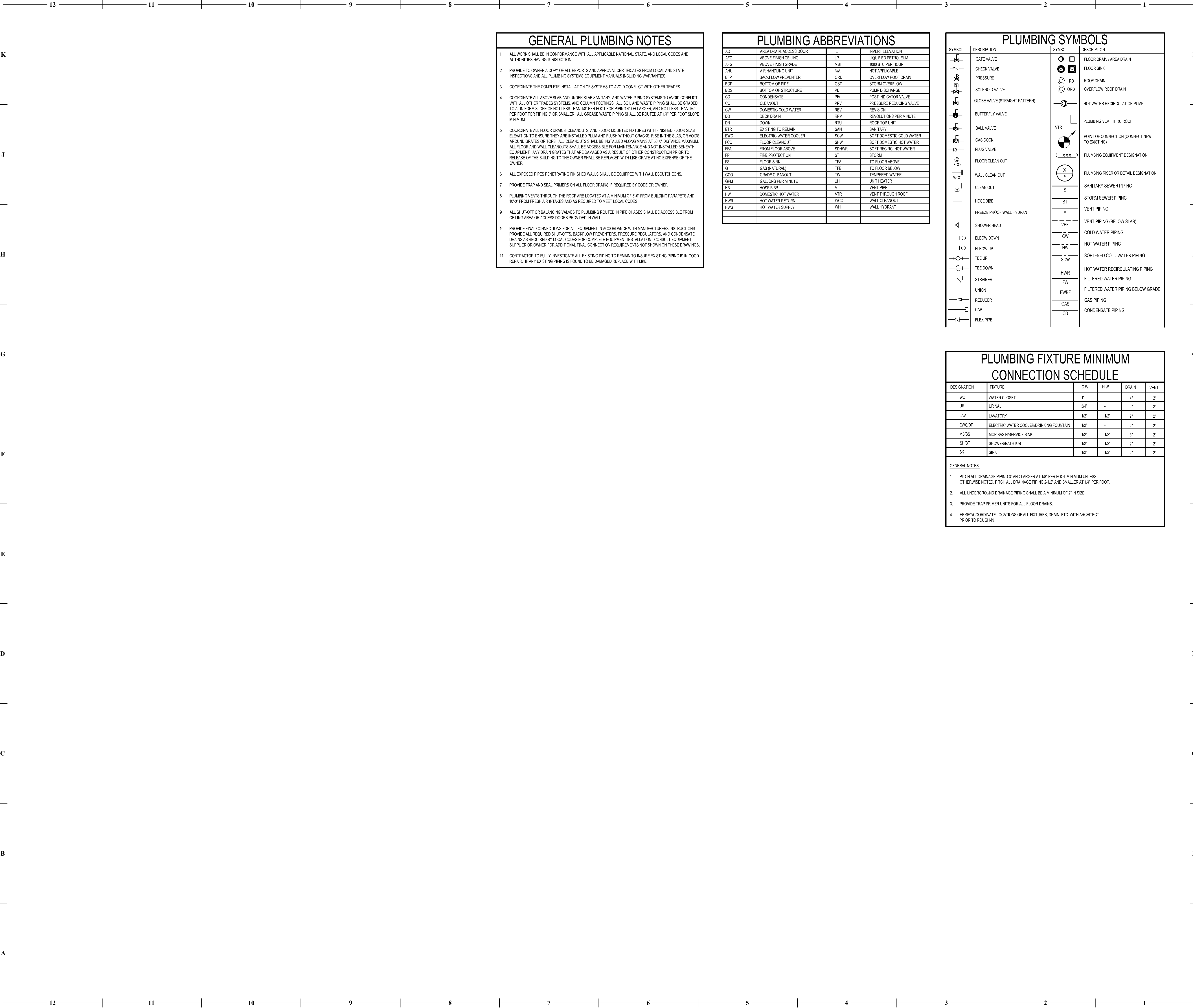
### ELECTRICAL SPECIFICATIONS



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GENERAL PLUMBING NOTES	
1.	ALL WORK SHALL BE IN CONFORMANCE WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AND AUTHORITIES HAVING JURISDICTION.
2.	PROVIDE TO OWNER A COPY OF ALL REPORTS AND APPROVAL CERTIFICATES FROM LOCAL AND STATE INSPECTIONS AND ALL PLUMBING SYSTEMS EQUIPMENT MANUALS INCLUDING WARRANTIES.
3.	COORDINATE THE COMPLETE INSTALLATION OF SYSTEMS TO AVOID CONFLICT WITH OTHER TRADES.
4.	COORDINATE ALL ABOVE SLAB AND UNDER SLAB SANITARY AND WATER PIPING SYSTEMS TO AVOID CONFLICT WITH ALL OTHER TRADES SYSTEMS, AND COLUMN FOOTINGS. ALL SOLID AND WASTE PIPING SHALL BE GRADED TO A UNIFORM SLOPE OF NOT LESS THAN 1/8" PER FOOT FOR PIPING 4" OR LARGER, AND NOT LESS THAN 1/4" PER FOOT FOR PIPING 3" OR SMALLER. ALL GREASE WASTE PIPING SHALL BE ROUTED AT 1/4" PER FOOT SLOPE MINIMUM.
5.	COORDINATE ALL FLOOR DRAINS, CLEANOUTS, AND FLOOR MOUNTED FIXTURES WITH FINISHED FLOOR SLAB ELEVATION TO ENSURE THEY ARE INSTALLED PLUMB AND FLUSH WITHOUT CRACKS, RISERS IN THE SLAB, OR VOIDS AROUND GRATES OR TOPS. ALL CLEANOUTS SHALL BE INSTALLED ALONG WALLS AT 50'-0" DISTANCE MAXIMUM. ALL FLOOR AND WALL CLEANOUTS SHALL BE ACCESSIBLE FOR MAINTENANCE AND NOT INSTALLED BENEATH EQUIPMENT. ANY DRAIN GRATES THAT ARE DAMAGED AS A RESULT OF OTHER CONSTRUCTION PRIOR TO RELEASE OF THE BUILDING TO THE OWNER SHALL BE REPLACED WITH LIKE GRATE AT NO EXPENSE OF THE OWNER.
6.	ALL EXPOSED PIPES PENETRATING FINISHED WALLS SHALL BE EQUIPPED WITH WALL ESCUTCHEONS.
7.	PROVIDE TRAP AND SEAL PRIMERS ON ALL FLOOR DRAINS IF REQUIRED BY CODE OR OWNER.
8.	PLUMBING VENTS THROUGH THE ROOF ARE LOCATED AT A MINIMUM OF 5'-0" FROM BUILDING PARAPETS AND 10'-0" FROM FRESH AIR INTAKES AND AS REQUIRED TO MEET LOCAL CODES.
9.	ALL SHUT-OFF OR BALANCING VALVES TO PLUMBING ROUTED IN PIPE CHASES SHALL BE ACCESSIBLE FROM CEILING AREA OR ACCESS DOORS PROVIDED IN WALL.
10.	PROVIDE FINAL CONNECTIONS FOR ALL EQUIPMENT IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS. PROVIDE ALL REQUIRED SHUT-OFFS, BACKFLOW PREVENTERS, PRESSURE REGULATORS, AND CONDENSATE DRAINS AS REQUIRED BY LOCAL CODES FOR COMPLETE EQUIPMENT INSTALLATION. CONSULT EQUIPMENT SUPPLIER OR OWNER FOR ADDITIONAL FINAL CONNECTION REQUIREMENTS NOT SHOWN ON THESE DRAWINGS.
11.	CONTRACTOR TO FULLY INVESTIGATE ALL EXISTING PIPING TO REMAIN TO INSURE EXISTING PIPING IS IN GOOD REPAIR. IF ANY EXISTING PIPING IS FOUND TO BE DAMAGED REPLACE WITH LIKE.

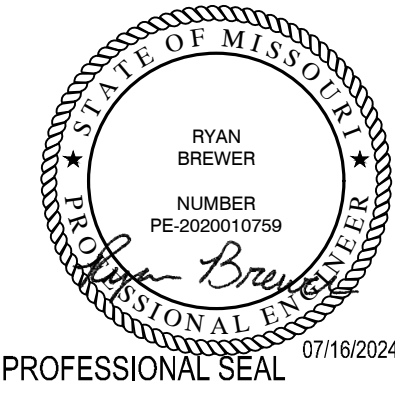
PLUMBING ABBREVIATIONS			
AD	AREA DRAIN, ACCESS DOOR	IE	INVERT ELEVATION
AFC	ABOVE FINISH CEILING	LP	LIQUIFIED PETROLEUM
AFG	ABOVE FINISH GRADE	MBH	1000 BTU PER HOUR
AHU	AIR HANDLING UNIT	NK	NOT APPLICABLE
BFP	BACKFLOW PREVENTER	ORD	OVERFLOW ROOF DRAIN
BOP	BOTTOM OF PIPE	OST	STORM OVERFLOW
BOS	BOTTOM OF STRUCTURE	PD	PUMP DISCHARGE
CD	CONDENSATE	PIV	POST INDICATOR VALVE
CO	CLEANOUT	PRV	PRESSURE REDUCING VALVE
CW	DOMESTIC COLD WATER	REV	REVISION
DD	DECK DRAIN	RPM	REVOLUTIONS PER MINUTE
DN	DOWN	RTU	ROOF TOP UNIT
ETR	EXISTING TO REMAIN	SAN	SANITARY
EWIC	ELECTRIC WATER COOLER	SCW	SOFT DOMESTIC COLD WATER
FCD	FLOOR CLEANOUT	SHW	SOFT DOMESTIC HOT WATER
FTA	FROM FLOOR ABOVE	SDHWR	SOFT RECIRC. HOT WATER
FP	FIRE PROTECTION	ST	STORM
FS	FLOOR SINK	TFA	TO FLOOR ABOVE
G	GAS (NATURAL)	TFB	TO FLOOR BELOW
GCD	GRADE CLEANOUT	TW	TEMPERED WATER
GPM	GALLONS PER MINUTE	UH	UNIT HEATER
HB	HOSE BIBB	V	VENT PIPE
HW	DOMESTIC HOT WATER	VTR	VENT THROUGH ROOF
HWR	HOT WATER RETURN	WCO	WALL CLEANOUT
HWS	HOT WATER SUPPLY	WH	WALL HYDRANT

PLUMBING SYMBOLS			
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	GATE VALVE		FLOOR DRAIN / AREA DRAIN
	CHECK VALVE		FLOOR SINK
	PRESSURE		ROOF DRAIN
	SOLENOID VALVE		OVERFLOW ROOF DRAIN
	GLOBE VALVE (STRAIGHT PATTERN)		HOT WATER RECIRCULATION PUMP
	BUTTERFLY VALVE		PLUMBING VENT THRU ROOF
	BALL VALVE		POINT OF CONNECTION (CONNECT NEW TO EXISTING)
	GAS COCK		PLUMBING EQUIPMENT DESIGNATION
	PLUG VALVE		PLUMBING RISER OR DETAIL DESIGNATION
	FLOOR CLEAN OUT		SANITARY SEWER PIPING
	WALL CLEAN OUT		STORM SEWER PIPING
	CLEAN OUT		VENT PIPING
	HOSE BIBB		VENT PIPING (BELOW SLAB)
	FREEZE PROOF WALL HYDRANT		COLD WATER PIPING
	SHOWER HEAD		HOT WATER PIPING
	ELBOW DOWN		SOFTENED COLD WATER PIPING
	ELBOW UP		HOT WATER RECIRCULATING PIPING
	TEE UP		FILTERED WATER PIPING
	TEE DOWN		FILTERED WATER PIPING BELOW GRADE
	STRAINER		GAS PIPING
	UNION		CONDENSATE PIPING
	REDUCER		
	CAP		
	FLEX PIPE		

PLUMBING FIXTURE MINIMUM CONNECTION SCHEDULE					
DESIGNATION	FIXTURE	C.W.	H.W.	DRAIN	VENT
WC	WATER CLOSET	1"	-	4"	2"
UR	URINAL	3/4"	-	2"	2"
LAV.	LAVATORY	1/2"	1/2"	2"	2"
EWIC/DF	ELECTRIC WATER COOLER/DRINKING FOUNTAIN	1/2"		2"	2"
MBSS	MOP BASIN/SERVICE SINK	1/2"	1/2"	3"	2"
SHBT	SHOWER/BATH TUB	1/2"	1/2"	2"	2"
SK	SINK	1/2"	1/2"	2"	2"
<b>GENERAL NOTES:</b> 1. PITCH ALL DRAINAGE PIPING 3" AND LARGER AT 1/8" PER FOOT MINIMUM UNLESS OTHERWISE NOTED. PITCH ALL DRAINAGE PIPING 2-1/2" AND SMALLER AT 1/4" PER FOOT. 2. ALL UNDERGROUND DRAINAGE PIPING SHALL BE A MINIMUM OF 2' IN SIZE. 3. PROVIDE TRAP PRIMER UNITS FOR ALL FLOOR DRAINS. 4. VERIFY/COORDINATE LOCATIONS OF ALL FIXTURES, DRAIN, ETC. WITH ARCHITECT PRIOR TO ROUGH-IN.					

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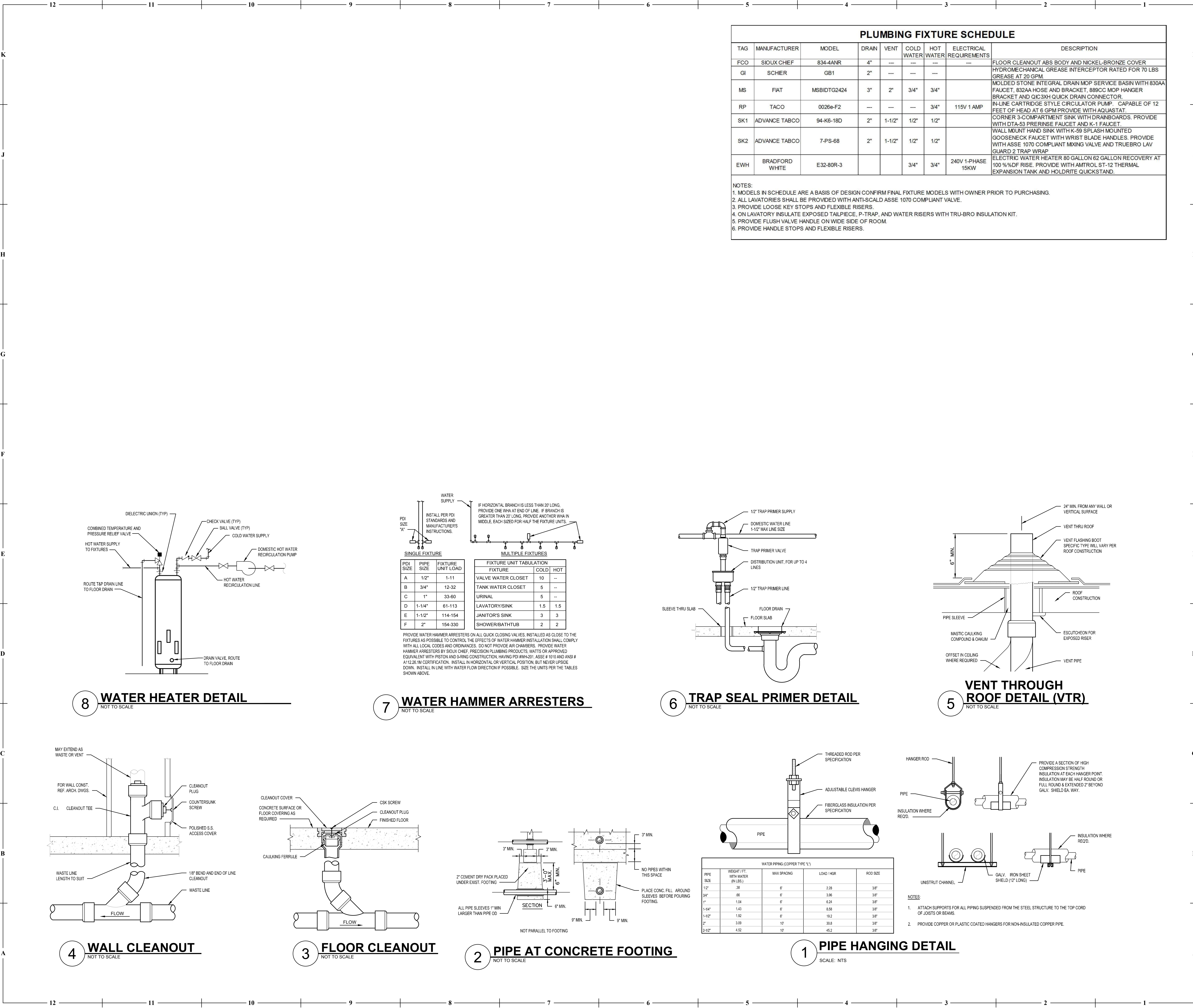
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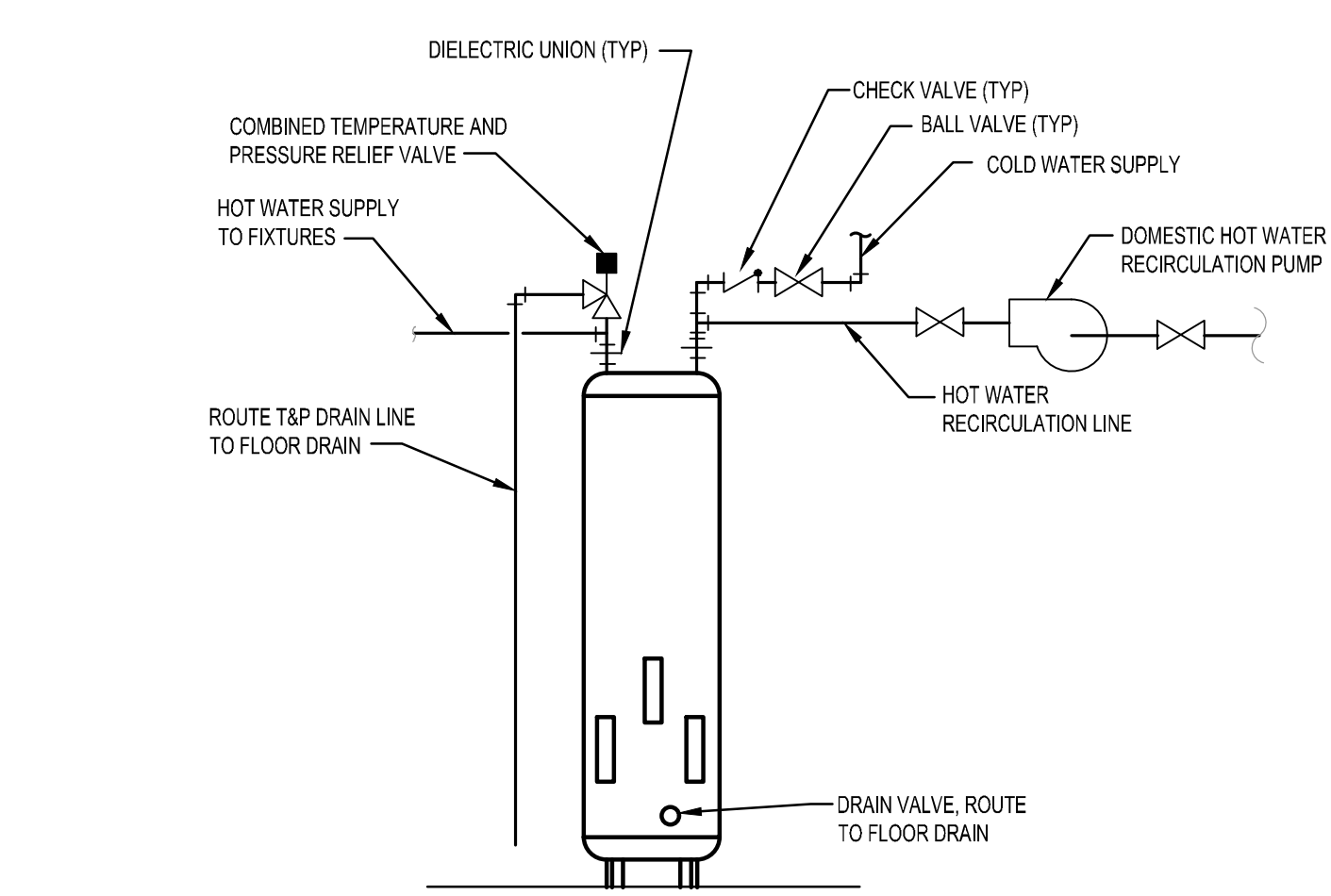
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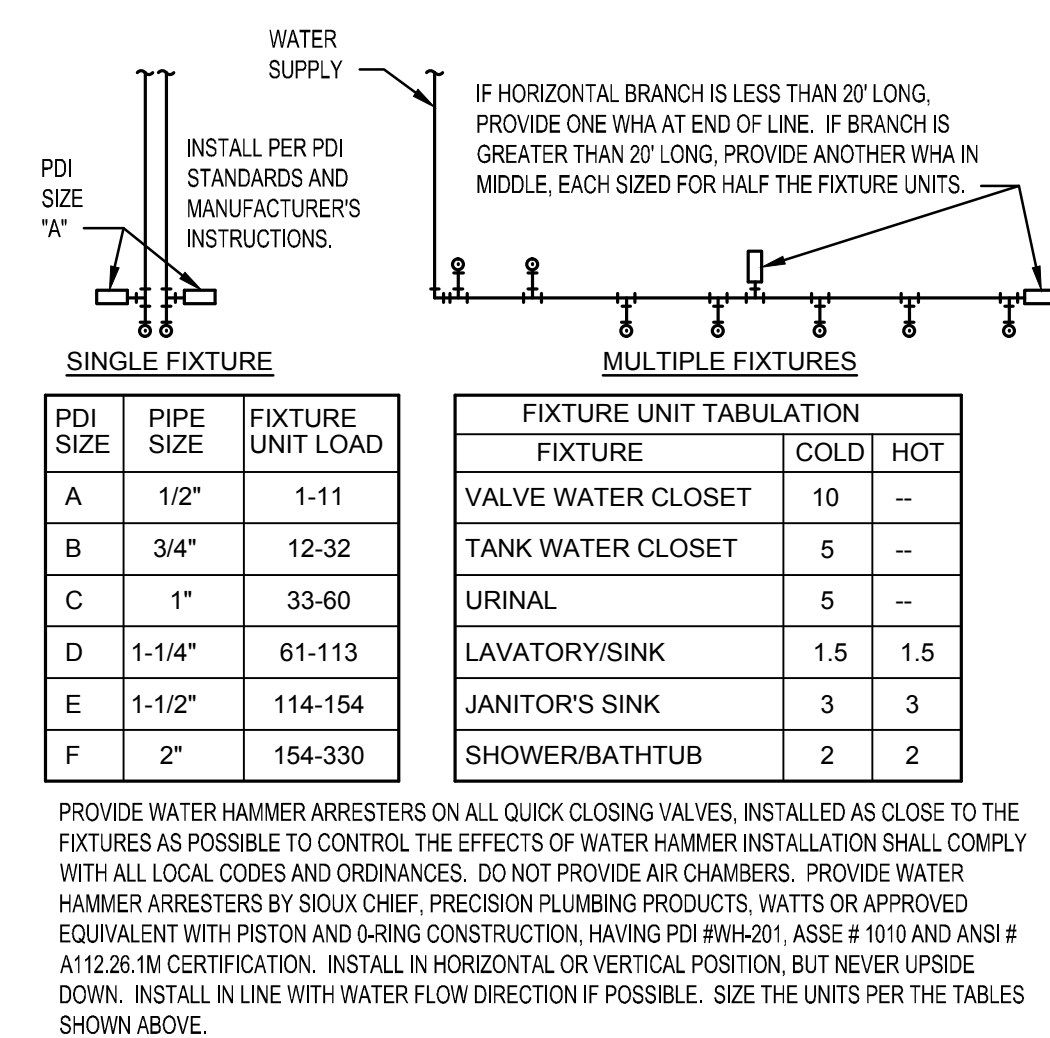




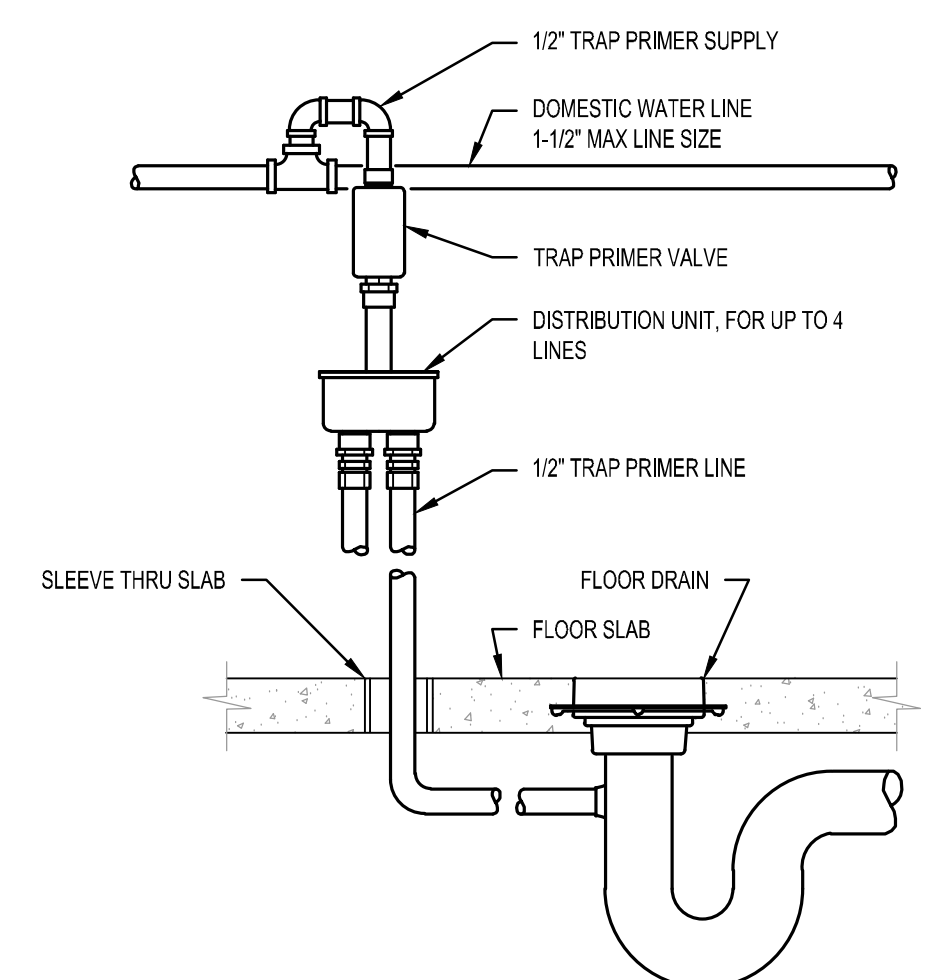
8 WATER HEATER DETAIL  
NOT TO SCALE



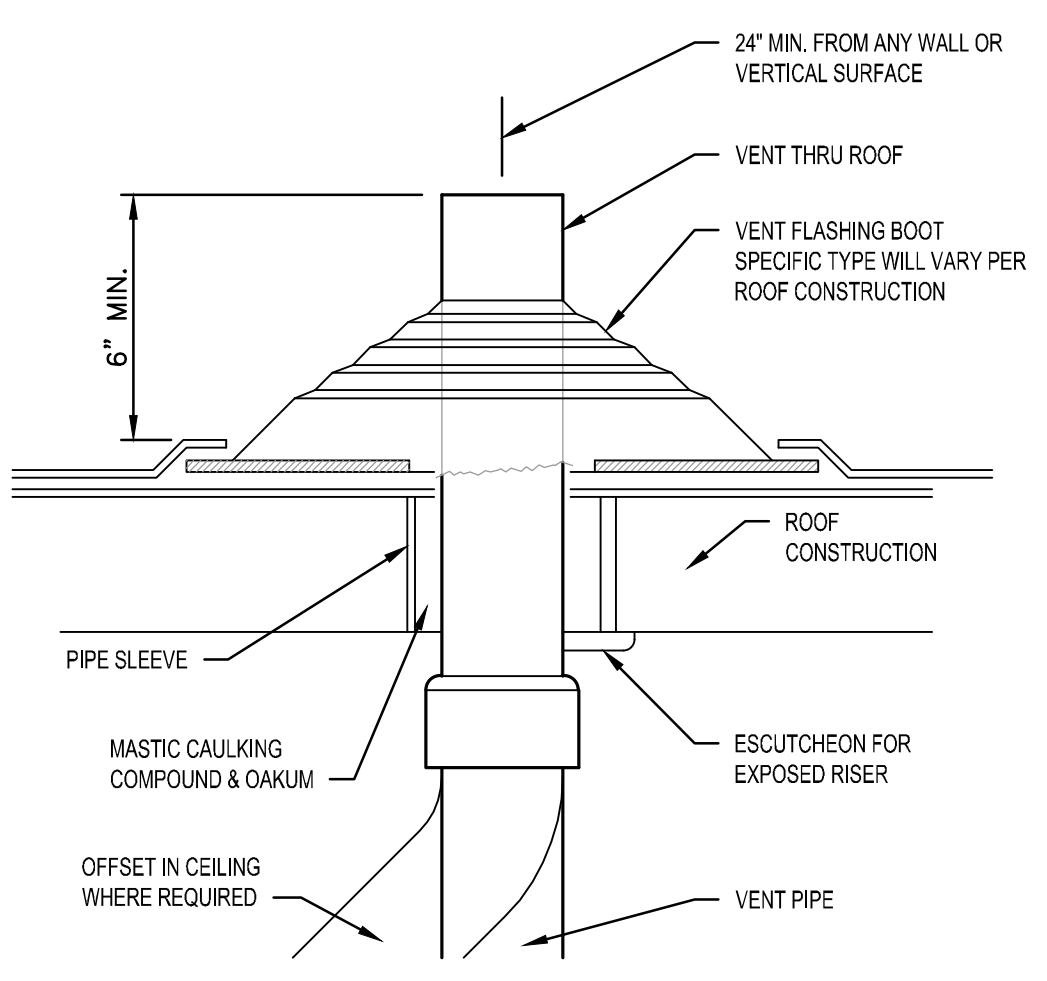
7 WATER HAMMER ARRESTERS  
NOT TO SCALE



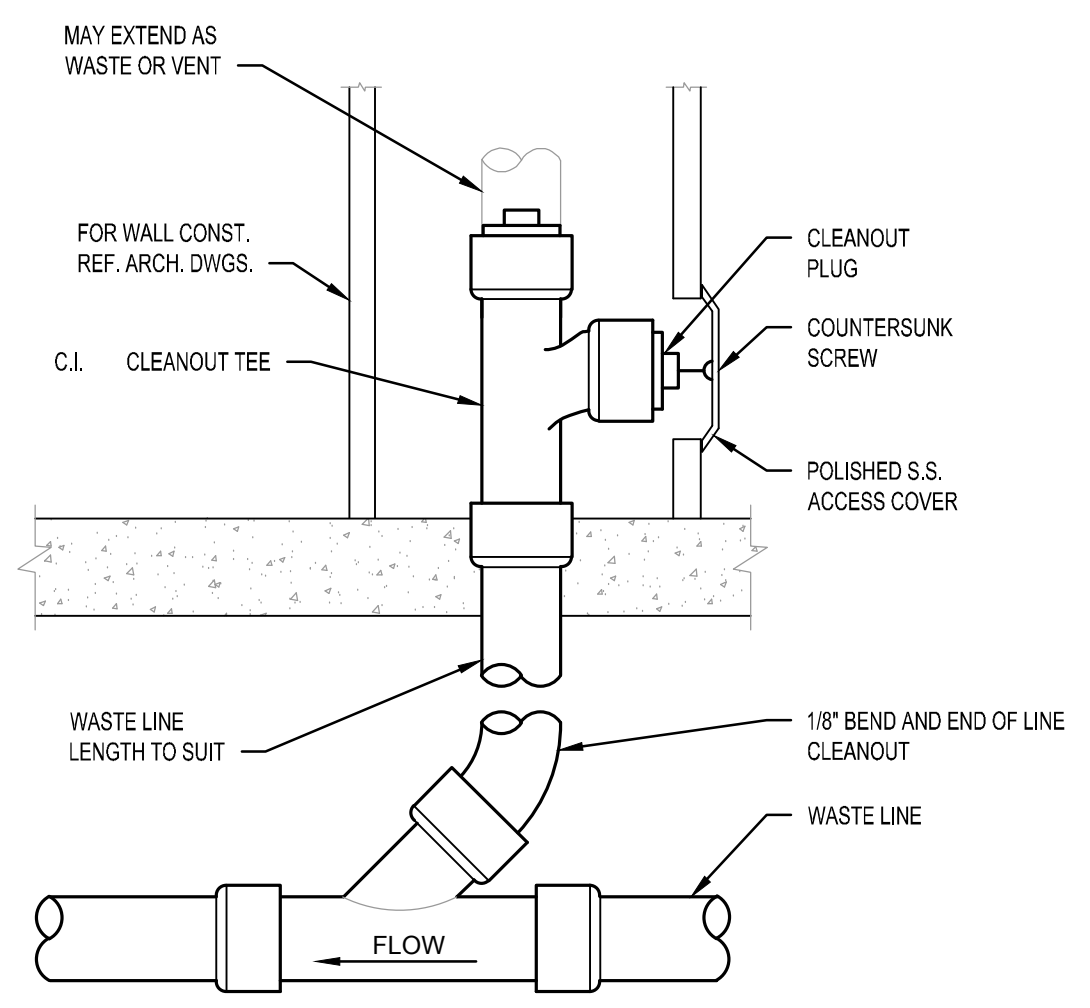
6 TRAP SEAL PRIMER DETAIL  
NOT TO SCALE



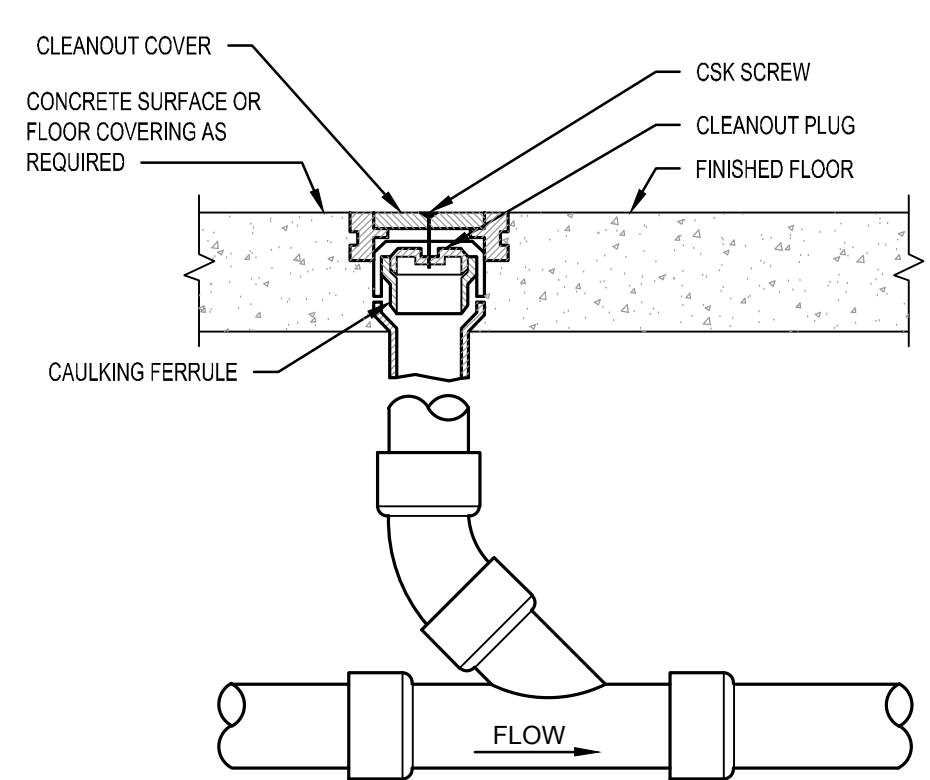
5 VENT THROUGH ROOF DETAIL (VTR)  
NOT TO SCALE



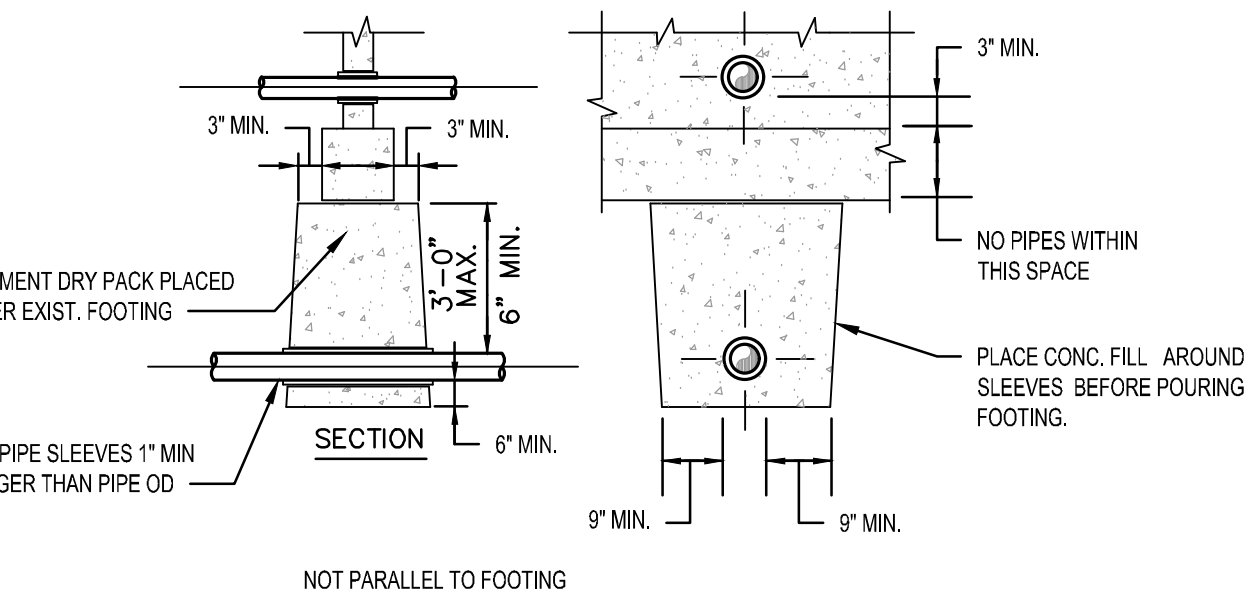
4 WALL CLEANOUT  
NOT TO SCALE



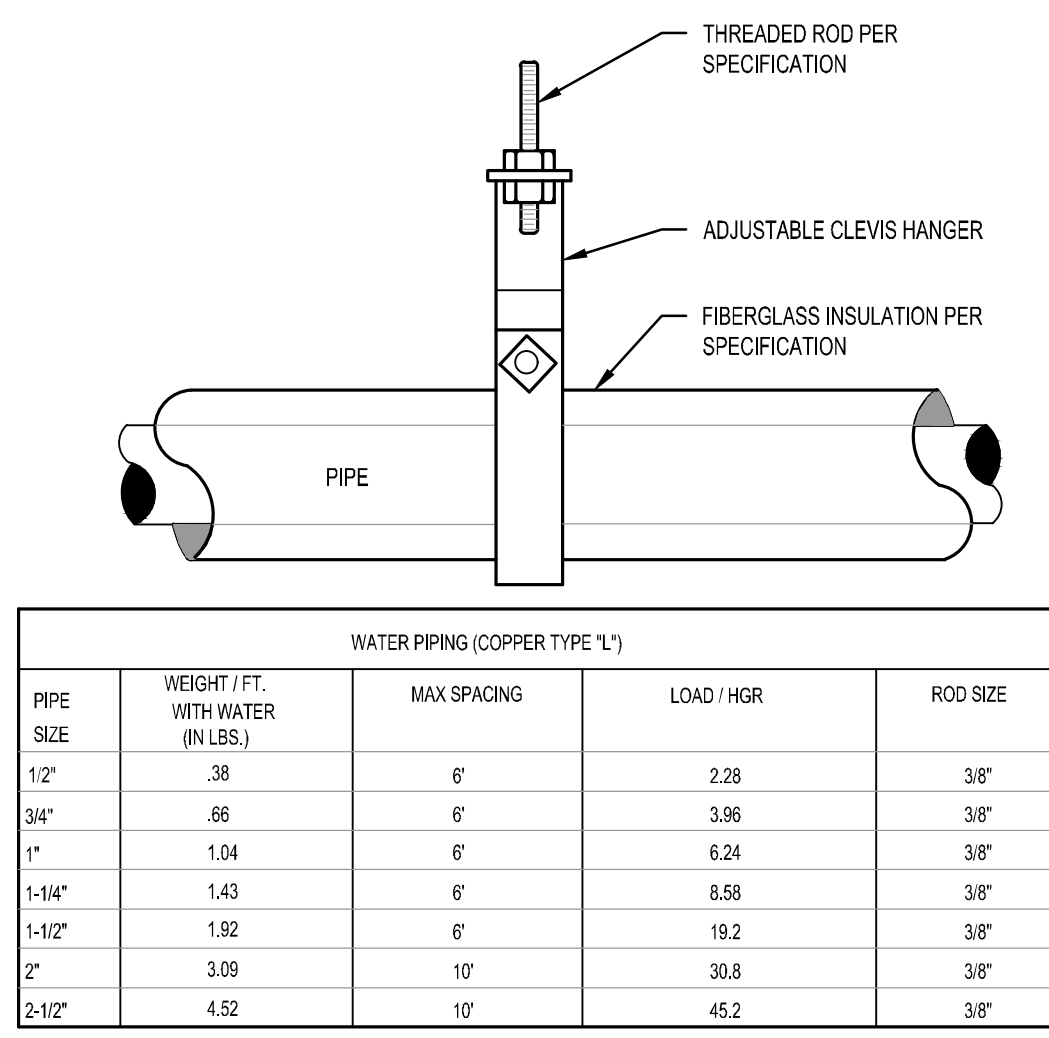
3 FLOOR CLEANOUT  
NOT TO SCALE



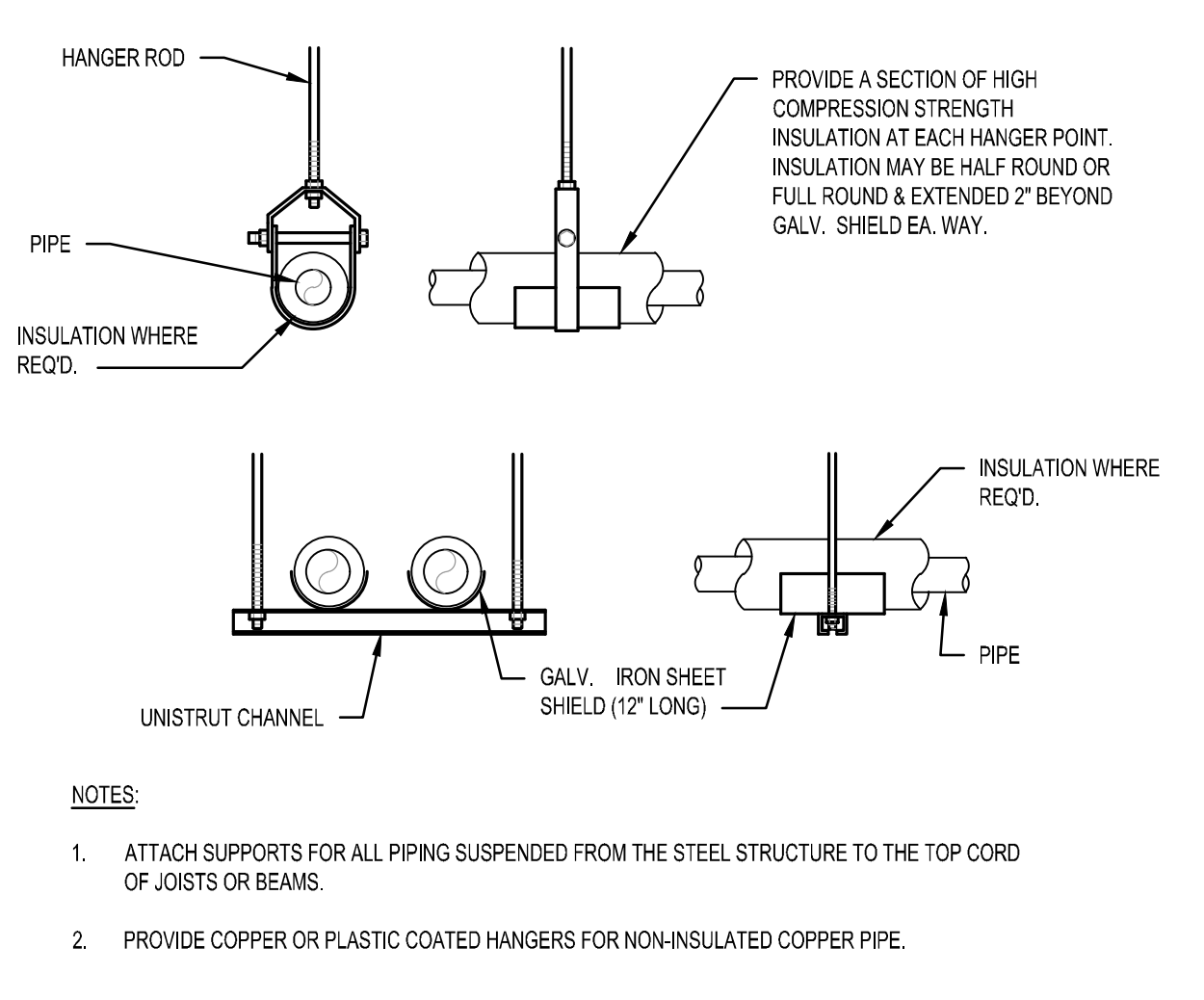
2 PIPE AT CONCRETE FOOTING  
NOT TO SCALE



1 PIPE HANGING DETAIL  
SCALE: NTS



WATER PIPING (COPPER TYPE 1/2)				
PIPE SIZE	WEIGHT / FT. WITH WATER (IN LBS.)	MAX SPACING	LOAD / HGR	ROD SIZE
1/2"	.28	6'	2.28	3/8"
3/4"	.66	6'	3.96	3/8"
1"	1.04	6'	6.24	3/8"
1-1/4"	1.43	6'	8.58	3/8"
1-1/2"	1.92	6'	19.2	3/8"
2"	3.09	10'	30.9	3/8"
2-1/2"	4.52	10'	45.2	3/8"



- NOTES:
- ATTACH SUPPORTS FOR ALL PIPING SUSPENDED FROM THE STEEL STRUCTURE TO THE TOP CORD OF JOISTS OR BEAMS.
  - PROVIDE COPPER OR PLASTIC COATED HANGERS FOR NON-INSULATED COPPER PIPE.

PLUMBING FIXTURE SCHEDULE									
TAG	MANUFACTURER	MODEL	DRAIN	VENT	COLD WATER	HOT WATER	ELECTRICAL REQUIREMENTS	DESCRIPTION	
FCO	SIoux CHIEF	834-4ANR	4"	---	---	---	---	FLOOR CLEANOUT ABS BODY AND NICKEL-BRONZE COVER	
GI	SCHIER	GB1	2"	---	---	---	---	HYDROMECHANICAL GREASE INTERCEPTOR RATED FOR 70 LBS GREASE AT 20 GPM	
MS	FIAT	MSBIDTG2424	3"	2"	3/4"	3/4"	---	MOLDED STONE INTEGRAL DRAIN MOP SERVICE BASIN WITH 830AA FAUCET, 832AA HOSE AND BRACKET, 889CC MOP HANGER BRACKET AND QIC3XH QUICK DRAIN CONNECTOR.	
RP	TACO	0026e-F2	---	---	---	3/4"	115V 1 AMP	IN-LINE CARTRIDGE STYLE CIRCULATOR PUMP CAPABLE OF 12 FEET OF HEAD AT 8 GPM PROVIDE WITH AQUASTAT.	
SK1	ADVANCE TABCO	94-K6-18D	2"	1-1/2"	1/2"	1/2"	---	CORNER 3-COMPARTMENT SINK WITH DRAINBOARDS. PROVIDE WITH DTA-53 PRERINSE FAUCET AND K-1 FAUCET.	
SK2	ADVANCE TABCO	7-PS-68	2"	1-1/2"	1/2"	1/2"	---	WALL MOUNT HAND SINK WITH K-59 SPLASH MOUNTED GOOSENECK FAUCET WITH WRIST BLADE HANDLES. PROVIDE WITH ASSE 1070 COMPLIANT MIXING VALVE AND TRUEBRO LAV GUARD 2 TRAP WRAP	
EWB	BRADFORD WHITE	E32-80R-3	---	---	3/4"	3/4"	240V 1-PHASE 15KW	ELECTRIC WATER HEATER 80 GALLON/82 GALLON RECOVERY AT 100 %%DF RISE. PROVIDE WITH AMTROL ST-12 THERMAL EXPANSION TANK AND HOLDRITE QUICKSTAND.	

NOTES:

- MODELS IN SCHEDULE ARE A BASIS OF DESIGN CONFIRM FINAL FIXTURE MODELS WITH OWNER PRIOR TO PURCHASING.
- ALL LAVATORIES SHALL BE PROVIDED WITH ANTI-SCALD ASSE 1070 COMPLIANT VALVE.
- PROVIDE LOOSE KEY STOPS AND FLEXIBLE RISERS.
- ON LAVATORY INSULATE EXPOSED TAILPIECE, P-TRAP, AND WATER RISERS WITH TRU-BRO INSULATION KIT.
- PROVIDE FLUSH VALVE HANDLE ON WIDE SIDE OF ROOM.
- PROVIDE HANDLE STOPS AND FLEXIBLE RISERS.

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REGISTERED PROFESSIONAL ENGINEER  
STATE OF MISSOURI  
NO. 0000010789  
07/16/2024

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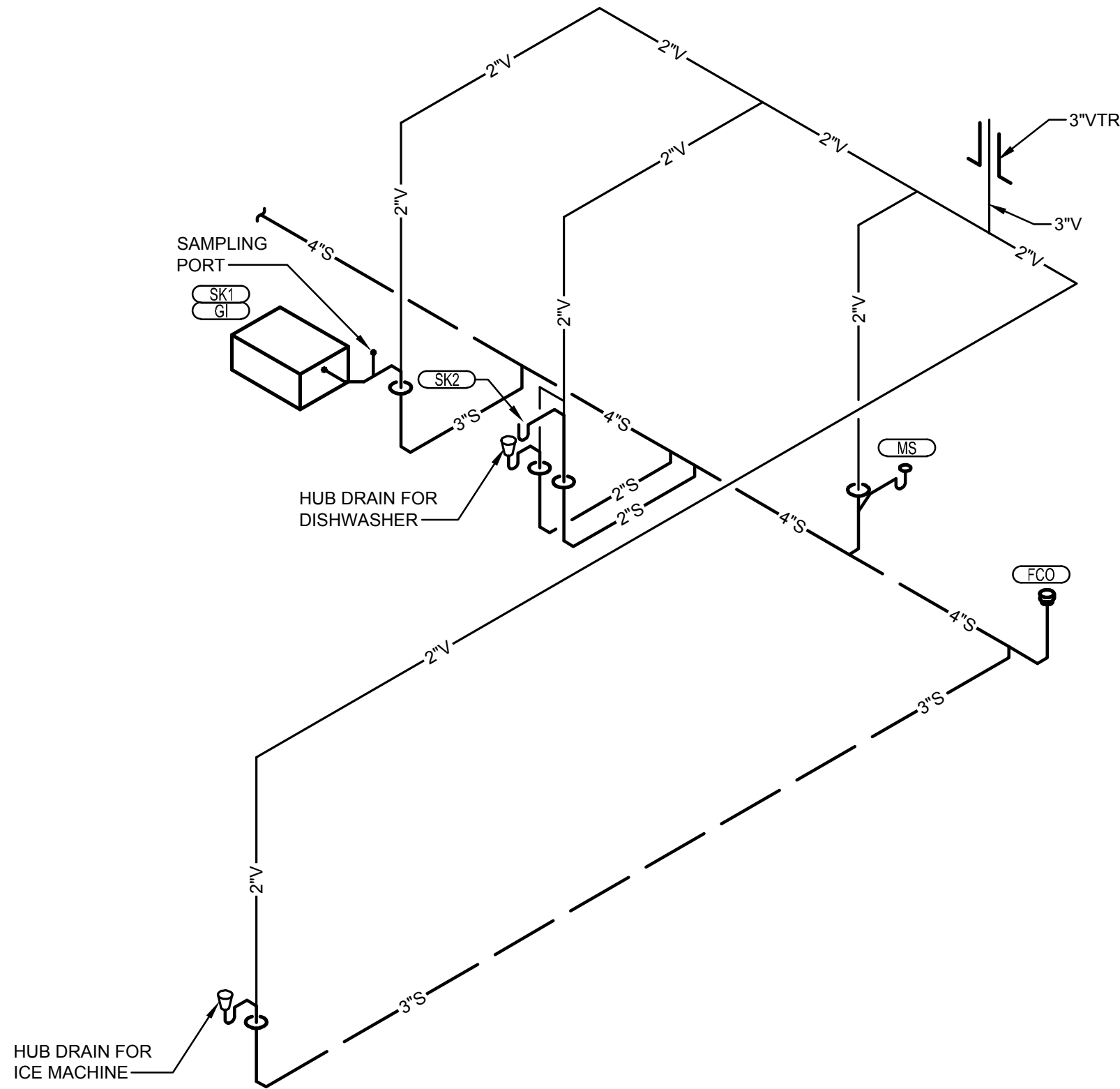
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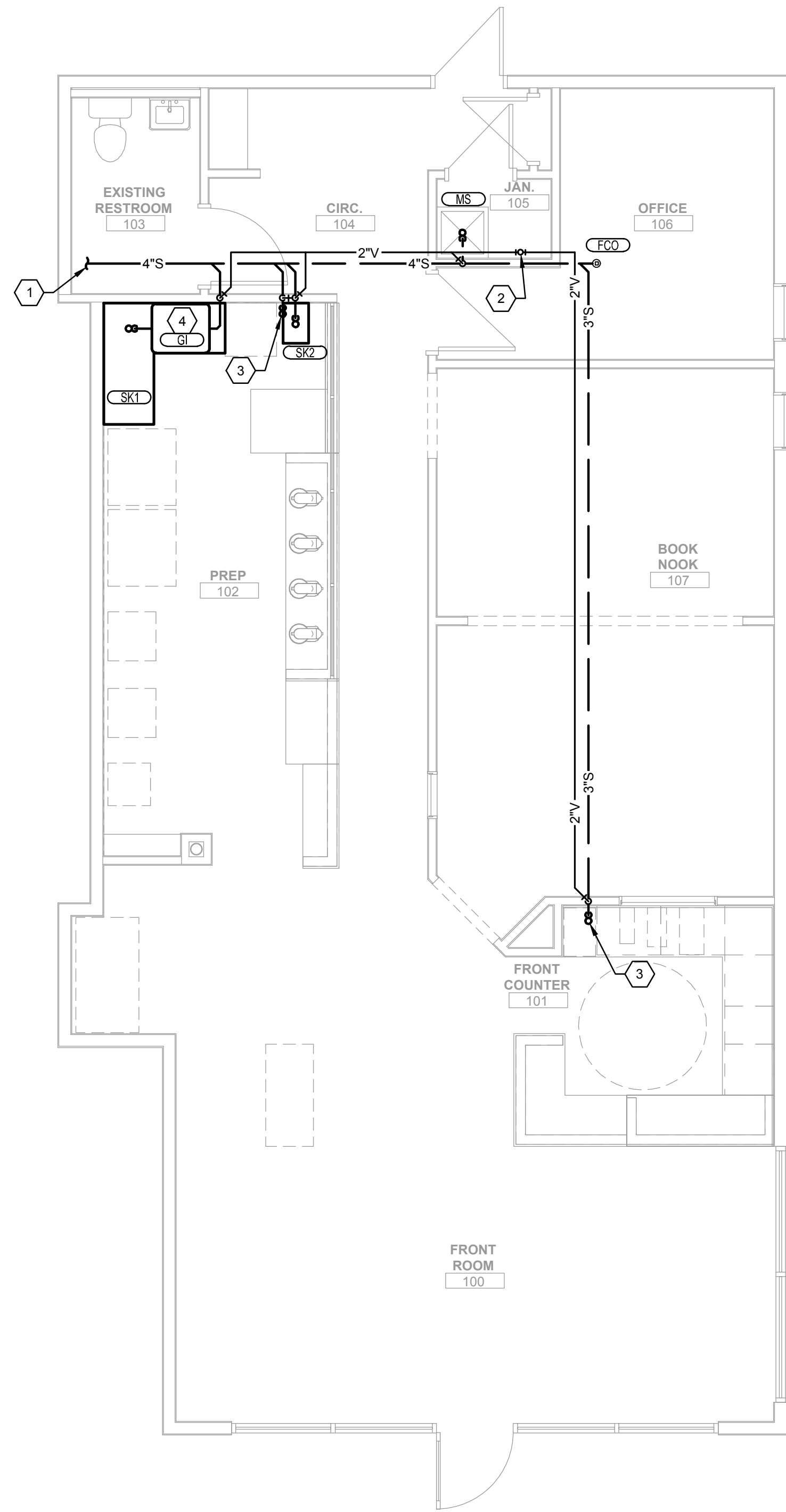
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PLUMBING DETAILS  
AND SCHEDULES





2 WASTE & VENT RISER



1 PLUMBING WASTE & VENT PLAN

GENERAL NOTES

- (NOT ALL NOTES APPLY)
1. REFERENCE SHEET P1.01 FOR GENERAL NOTES, SYMBOLS, AND ABBREVIATIONS.
  2. ALL WORK PERFORMED UNDER THIS CONTRACT SHALL BE IN CONFORMANCE WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES HAVING JURISDICTION AND INSPECTION.
  3. COORDINATE THE COMPLETE INSTALLATION OF SYSTEMS TO AVOID CONFLICT WITH OTHER TRADES.
  4. PROVIDE TO OWNER A COPY OF ALL REPORTS AND APPROVAL CERTIFICATES FROM LOCAL AND STATE INSPECTIONS AND ALL PLUMBING SYSTEMS EQUIPMENT MANUALS INCLUDING WARRANTIES.
  5. COORDINATE ALL ABOVE SLAB AND UNDER SLAB SANITARY, AND WATER PIPING SYSTEMS TO AVOID CONFLICT WITH ALL OTHER TRADES SYSTEMS, AND COLUMN FOOTINGS. ALL SOIL AND WASTE PIPING SHALL BE GRADED TO A UNIFORM SLOPE OF NOT LESS THAN 1/8" PER FOOT FOR PIPING 4" OR LARGER, AND NOT LESS THAN 1/4" PER FOOT FOR PIPING 3" OR SMALLER. COORDINATE FINAL INVERTS WITH EXISTING PIPING PRIOR TO ROUGH-IN OF UNDER SLAB INSTALLATION.
  6. COORDINATE ALL FLOOR DRAINS, CLEANOUTS, AND FLOOR MOUNTED FIXTURES WITH FINISHED FLOOR SLAB ELEVATION TO ENSURE THEY ARE INSTALLED PLUM AND FLUSH WITHOUT CRACKS, RISE IN THE SLAB, OR VOIDS AROUND GRATES OR TOPS. ALL CLEANOUTS SHALL BE INSTALLED ALONG MAINS AT 80'-4" DISTANCE MAXIMUM. ALL FLOOR AND WALL CLEANOUTS SHALL BE ACCESSIBLE FOR MAINTENANCE AND NOT INSTALLED BENEATH EQUIPMENT. ANY DRAIN GRATES THAT ARE DAMAGED AS A RESULT OF OTHER CONSTRUCTION PRIOR TO RELEASE OF THE BUILDING TO THE OWNER SHALL BE REPLACED WITH LIKE GRATE AT NO EXPENSE OF THE OWNER.
  7. PROVIDE TRAP AND SEAL PRIMERS ON ALL FLOOR DRAINS IF REQUIRED BY CODE OR OWNER.
  8. PLUMBING VENTS THROUGH THE ROOF ARE LOCATED AT A MINIMUM OF 5'-0" FROM BUILDING PARAPETS AND 10'-0" FROM FRESH AIR INTAKES AND AS REQUIRED TO MEET LOCAL CODES.
  9. ALL SHUT-OFF OR BALANCING VALVES TO PLUMBING ROUTED IN PIPE CHASES SHALL BE ACCESSIBLE FROM CEILING AREA OR ACCESS DOORS PROVIDED IN WALL.
  10. ALL EXPOSED PIPES PENETRATING FINISHED WALLS SHALL BE EQUIPPED WITH WALL ESCUTCHEONS.
  11. PROVIDE FINAL CONNECTIONS FOR ALL EQUIPMENT SPECIFIED IN PLUMBING FIXTURES AND EQUIPMENT SCHEDULES ON THESE CONSTRUCTION DOCUMENTS IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS. PROVIDE ALL REQUIRED SHUT-OFFS, BACKFLOW PREVENTERS, PRESSURE REGULATORS, AND CONDENSATE DRAINS INDICATED ON PLUMBING SCHEDULES AND AS REQUIRED BY LOCAL CODES FOR COMPLETE EQUIPMENT INSTALLATION. CONSULT EQUIPMENT SUPPLIER OR OWNER FOR ADDITIONAL FINAL CONNECTION REQUIREMENTS NOT SHOWN ON THESE DRAWINGS.

KEYED NOTES:

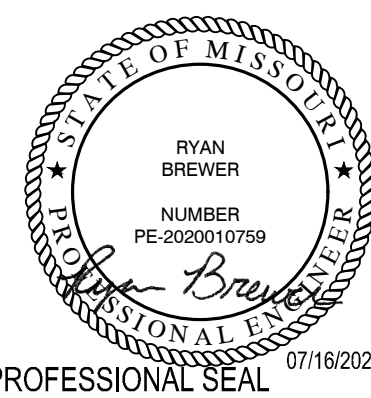
1. CONNECT NEW 4"S INTO EXISTING SANITARY. FIELD VERIFY EXACT CONNECTION POINT, LINE SIZE, MATERIAL AND AVAILABLE INVERT.
2. 3"V UP TO 3"VTR. COORDINATE FINAL LOCATION WITH ALL ROOF TOP EQUIPMENT AND OPENINGS. MAINTAIN A MINIMUM 10" FROM ALL FRESH AIR INTAKES AND 2' FROM ALL VERTICAL SURFACES.
3. INSTALL HUB DRAIN TIGHT TO WALL. TERMINATE DRAIN LINES OVER HUB DRAIN WITH AIR GAP PER CODE.
4. INSTALL SAMPLING PORT ON GREASE TRAP AS PER LOCAL CODES.

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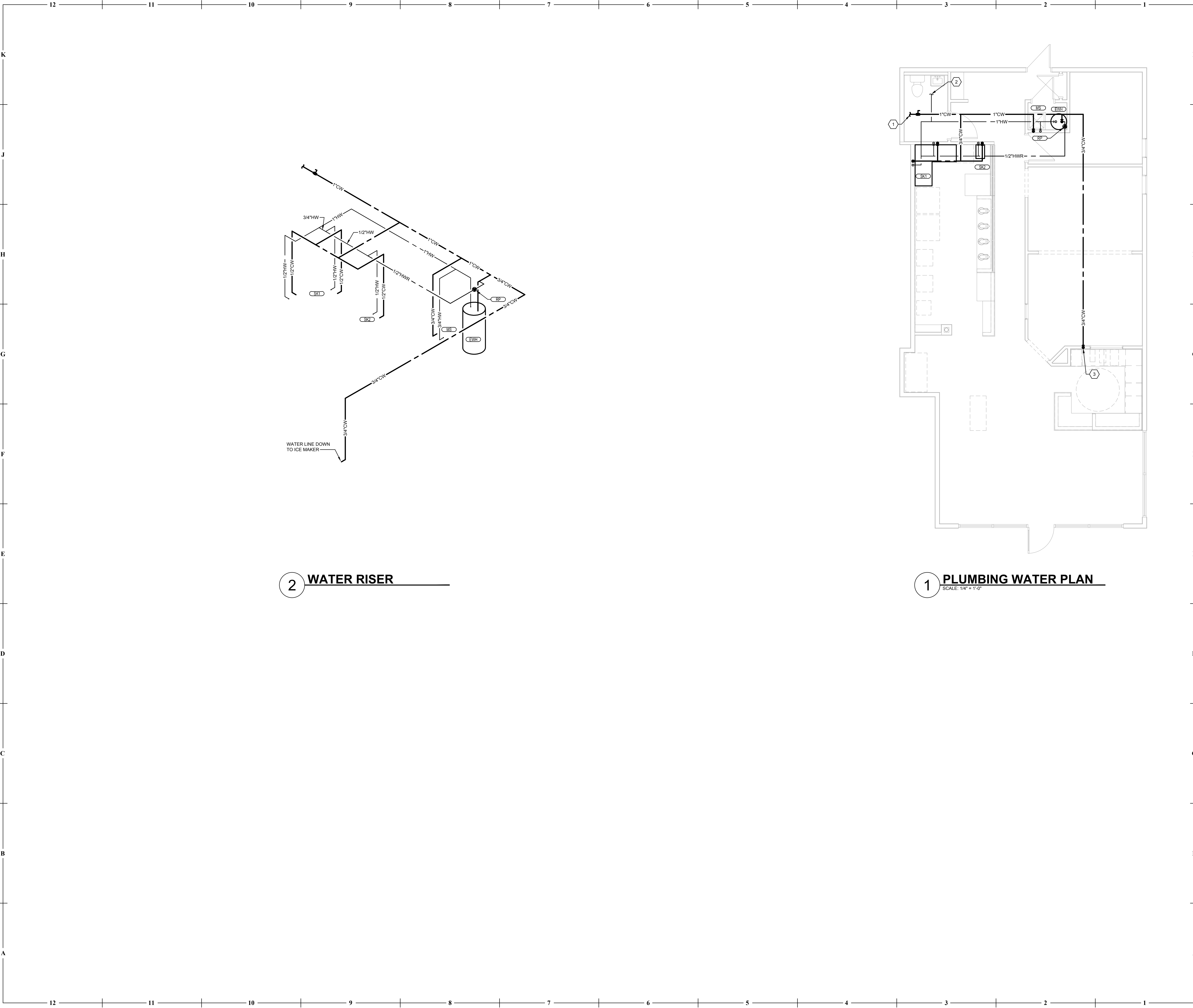
PLUMBING WASTE  
AND VENT PLAN



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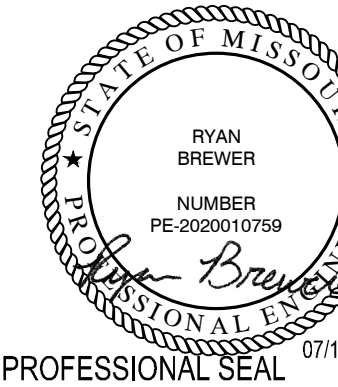
- GENERAL NOTES**  
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  3. COORDINATE THE COMPLETE INSTALLATION OF SYSTEMS TO AVOID CONFLICT WITH OTHER TRADES.
  4. PROVIDE TO OWNER A COPY OF ALL REPORTS AND APPROVAL CERTIFICATES FROM LOCAL AND STATE INSPECTIONS AND ALL PLUMBING SYSTEMS EQUIPMENT MANUALS INCLUDING WARRANTIES.
  5. COORDINATE ALL ABOVE SLAB AND UNDER SLAB SANITARY, AND WATER PIPING SYSTEMS TO AVOID CONFLICT WITH ALL OTHER TRADES SYSTEMS, AND COLUMN FOOTINGS. ALL SOIL AND WASTE PIPING SHALL BE GRADED TO A UNIFORM SLOPE OF NOT LESS THAN 1/8" PER FOOT FOR PIPING 4" OR LARGER, AND NOT LESS THAN 1/4" PER FOOT FOR PIPING 3" OR SMALLER. COORDINATE FINAL INVERTS WITH EXISTING PIPING PRIOR TO ROUGH-IN OF UNDER SLAB INSTALLATION.
  6. COORDINATE ALL FLOOR DRAINS, CLEANOUTS, AND FLOOR MOUNTED FIXTURES WITH FINISHED FLOOR SLAB ELEVATION TO ENSURE THEY ARE INSTALLED PLUMB AND FLUSH WITHOUT CRACKS, RISE IN THE SLAB, OR VOIDS AROUND GRATES OR TOPS. ALL CLEANOUTS SHALL BE INSTALLED ALONG MAINS AT 30'-0" DISTANCE MAXIMUM. ALL FLOOR AND WALL CLEANOUTS SHALL BE ACCESSIBLE FOR MAINTENANCE AND NOT INSTALLED BENEATH EQUIPMENT. ANY DRAIN GRATES THAT ARE DAMAGED AS A RESULT OF OTHER CONSTRUCTION PRIOR TO RELEASE OF THE BUILDING TO THE OWNER SHALL BE REPLACED WITH LIKE GRATE AT NO EXPENSE OF THE OWNER.
  7. PROVIDE TRAP AND SEAL PRIMERS ON ALL FLOOR DRAINS IF REQUIRED BY CODE OR OWNER.
  8. PLUMBING VENTS THROUGH THE ROOF ARE LOCATED AT A MINIMUM OF 5'-0" FROM BUILDING PARAPETS AND 10'-0" FROM FRESH AIR INTAKES AND AS REQUIRED TO MEET LOCAL CODES.
  9. ALL SHUT-OFF OR BALANCING VALVES TO PLUMBING ROUTED IN PIPE CHASES SHALL BE ACCESSIBLE FROM CEILING AREA OR ACCESS DOORS PROVIDED IN WALL.
  10. ALL EXPOSED PIPES PENETRATING FINISHED WALLS SHALL BE EQUIPPED WITH WALL ESCUTCHEONS.
  11. PROVIDE FINAL CONNECTIONS FOR ALL EQUIPMENT SPECIFIED IN PLUMBING FIXTURES AND EQUIPMENT SCHEDULES ON THESE CONSTRUCTION DOCUMENTS IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS. PROVIDE ALL REQUIRED SHUT-OFFS, BACKFLOW PREVENTERS, PRESSURE REGULATORS, AND CONDENSATE DRAINS INDICATED ON PLUMBING SCHEDULES AND AS REQUIRED BY LOCAL CODES FOR COMPLETE EQUIPMENT INSTALLATION. CONSULT EQUIPMENT SUPPLIER OR OWNER FOR ADDITIONAL FINAL CONNECTION REQUIREMENTS NOT SHOWN ON THESE DRAWINGS.

- KEYED NOTES:** ○
1. CONNECT NEW 1" CW INTO EXISTING LANDLORD PROVIDED COLD WATER LINE. FIELD VERIFY EXACT CONNECTION POINT, LINE SIZE, MATERIAL AND ROUTING.
  2. CONNECT NEW 1/2" HW INTO EXISTING LAVATORY. FIELD VERIFY EXACT CONNECTION POINT, LINE SIZE, MATERIAL AND ROUTING.
  3. ROUTE 3/4" CW DOWN IN WALL. ROUTE WATER PIPING TO ALL FIXTURES AS REQUIRED. INSTALL ALL VALVING AND BACKFLOW PREVENTION AS PER MANUFACTURER'S RECOMMENDATIONS AND LOCAL CODE. COORDINATE WITH OWNER FOR FINAL REQUIREMENTS AND LOCATIONS.

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**PLUMBING WATER  
PLAN**



PERMIT DOCUMENTS





15400 - PLUMBING WORK

DESCRIPTION  
ALL PLUMBING AND ASSOCIATED WORK IN DIVISION 15 IS GOVERNED BY THIS SECTION. PROVIDE LABOR AND MATERIALS NECESSARY TO PROVIDE THE WORK AS SHOWN ON THE DRAWINGS AND SPECIFIED HEREIN. REFER TO OTHER DIVISIONS FOR CONTINUATION OF EXTERIOR AND ALLIED WORK.

QUALITY ASSURANCE  
OBTAIN AND PAY FOR ALL PERMITS, INSPECTIONS AND CONNECTION FEES REQUIRED BY GOVERNING BODIES IN CONNECTION WITH THE WORK. DELIVER CERTIFICATES OF INSPECTION TO THE OWNER'S REPRESENTATIVE. ALL WORK SHALL COMPLY WITH GOVERNING CODES, ORDINANCES, AND REGULATIONS OF CITY, COUNTY AND STATE.

SUBMITTALS  
SHOP DRAWINGS: SUBMIT MATERIALS, PRODUCTS, EQUIPMENT AND SYSTEMS AS SPECIFIED UNDER EACH PLUMBING SECTION IN THIS DIVISION IN ACCORDANCE WITH THE GENERAL CONDITIONS. SHOW PIPE SIZES, LOCATION, SLOPES OF HORIZONTAL RUNS, FITTINGS, VALVES, METERS, GAGES AND CONNECTIONS.

PRODUCT DATA: SUBMIT ON MATERIALS, FIXTURES, AND EQUIPMENT UNLESS OTHERWISE SPECIFIED OR ACKNOWLEDGED IN WRITING.

SAMPLES: SUBMIT WHEN SPECIFIED OR REQUESTED.

RECORD DOCUMENTS  
REFER TO GENERAL CONDITIONS FOR REQUIREMENTS CONCERNING RECORD DOCUMENTS. ADDITIONAL REQUIREMENTS MAY BE SPECIFIED IN DIVISION 1, UNLESS SEPARS OF THE DRAWINGS ARE TO BE FURNISHED BY THE ARCHITECT-ENGINEER FOR PREPARATION OF RECORD DRAWINGS. FURNISH OWNER'S REPRESENTATIVE WITH TWO SETS OF ACCURATELY MARKED COPIES OF THE DRAWINGS, INSTEAD OF ONE SET AS REQUIRED BY THE GENERAL CONDITIONS, INDICATING ALL CHANGES FROM ORIGINAL DRAWINGS AS INSTALLED.

PRODUCT HANDLING  
PIPE, FIXTURES AND ACCESSORIES SHALL BE PROTECTED FROM DAMAGE IN SHIPMENT, HANDLING, STORAGE AND INSTALLATION. FROM MOISTURE, DIRT AND DEBRIS. PIPE, CLEANOUT AND FLOOR DRAIN OPENINGS SHALL BE TEMPORARILY PLUGGED WITH TEST PLUGS UNTIL FINAL CONNECTIONS ARE MADE.

GUARANTEE AND SERVICE  
REFER TO GENERAL CONDITIONS FOR GUARANTEE. WHERE EXTENDED GUARANTEES ARE CALLED FOR, FURNISH THREE COPIES TO BE INSERTED INTO OPERATION AND MAINTENANCE MANUALS.

GENERAL  
PLUMBING SYSTEMS SHALL BE PROVIDED COMPLETE. SHOULD A SYSTEM, OR ANY PART THEREOF, FAIL TO MEET PERFORMANCE REQUIREMENTS, NECESSARY REPLACEMENTS, ALTERATIONS OR REPAIRS, AS REQUIRED BY THE OWNER'S REPRESENTATIVE, SHALL BE MADE TO BRING PERFORMANCE UP TO SPECIFIED REQUIREMENTS AND ALL BUILDING CONSTRUCTION AND FINISHES DAMAGED OR MARKED BY SUCH REPLACEMENTS, ALTERATIONS OR REPAIRS SHALL BE RESTORED TO PRIOR CONDITION, AT NO ADDITIONAL COST TO THE OWNER.

WHERE MULTIPLE ITEMS OF EQUIPMENT OR MATERIALS ARE REQUIRED THEY SHALL BE THE PRODUCT OF A SINGLE MANUFACTURER.

INSERTS: PIPE SLEEVES, HANGERS, SUPPORTS, FIXTURES, TRIM DRAINS AND ANCHORAGE OF PLUMBING SHALL BE PROVIDED AS SPECIFIED HEREIN. WHERE SUCH ITEMS ARE TO BE SET OR EMBEDDED IN CONCRETE, MASONRY OR SIMILAR WORK, THE ITEMS SHALL BE FURNISHED AND LAYOUT MADE AT THE PROPER TIME FOR THE SETTING OR EMBEDMENT THEREOF SO AS TO CAUSE NO DELAY IN THE WORK.

MANUFACTURER'S NAMES AND CATALOG NUMBERS  
SPECIFIED REFERENCES HAVE BEEN MADE TO ONE OR MORE MANUFACTURERS' NAMES AND MODEL OR CATALOG NUMBERS. THIS DOES NOT NECESSARILY INDICATE THAT THE MATERIAL AND EQUIPMENT SPECIFIED IS AN "OFF THE SHELF" ITEM. REQUIREMENTS FOR SPECIFIC FINISHES, MATERIAL OR OTHER MODIFICATIONS MAY INTRODUCE VARIANCES FROM MANUFACTURERS' STANDARDS. MODIFICATIONS SHALL BE FULLY CONSIDERED.

CHARTS AND TAGS  
IN AREAS HAVING VALVES, PROVIDE SINGLE LINE DIAGRAMS FRAMED UNDER GLASS AND MOUNTED ON EQUIPMENT ROOM WALL. THE DIAGRAMS SHALL GIVE NAME, NUMBER DESIGNATION AND LOCATION OF VALVE.

VALVES SHALL BE IDENTIFIED WITH 1/16 INCH THICK WHITE LAMINATED PLASTIC NAMEPLATES WITH 3/16 INCH HIGH BLACK LAMINATED LETTERS. THE NAMEPLATE IDENTIFICATION SHALL COINCIDE WITH ITEMS APPEARING ON DIAGRAMS. ATTACH NAMEPLATES TO VALVES WITH NON-CORROSIVE CHAIN OR WIRE.

ACCESS DOORS  
PROVIDE ACCESS DOORS AS INDICATED AND SPECIFIED IN DRAWINGS

INSTALLATION AND WORKMANSHIP  
THE WORK SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. ANY MATERIAL, APPARATUS OR EQUIPMENT WHICH, IN THE OPINION OF THE OWNER'S REPRESENTATIVE, IS IMPROPERLY INSTALLED SHALL BE REMOVED AND REINSTALLED IN AN APPROVED MANNER AT NO ADDITIONAL COST TO THE OWNER.

THE LOCATION OF PLUMBING PIPING SHALL BE COORDINATED TO ENSURE THAT IT CLEARS OPENINGS AND STRUCTURAL MEMBERS. THAT PIPING INDICATED AS CONCEALED CAN BE PROPERLY CONCEALED IN WALLS OR PARTITIONS AND THAT IT DOES NOT INTERFERE WITH LIGHTS, DUCTWORK OR EQUIPMENT HAVING FIXED LOCATIONS. MAKE NECESSARY HORIZONTAL OR VERTICAL OFFSETS WITH PIPE FITTINGS TO INSTALL THE SYSTEM IN THE AVAILABLE SPACE, CONCEAL OR INSTALL TIGHT TO STRUCTURE (IF EXPOSED) UNLESS OTHERWISE NOTED.

PIPING SHALL BE EXPOSED IN FINISHED AREAS ONLY WHERE INDICATED OR WITH THE APPROVAL OF THE OWNER'S REPRESENTATIVE.

WHERE DRAIN OR WATER CONNECTIONS NECESSARY TO THE OPERATION OF FIXTURES OR EQUIPMENT ARE NOT SPECIFICALLY SHOWN ON DIAGRAMS, EXTEND NECESSARY BRANCHES TO THE CLOSEST INDICATED BRANCH OR MAIN, AT NO ADDITIONAL COST TO THE OWNER.

EACH FIXTURE, EQUIPMENT DRAIN OR FLOOR DRAIN SHALL BE SEPARATELY TRAPPED UNLESS OTHERWISE INDICATED OR SPECIFIED.

PLUMBING PIPING AND EQUIPMENT SHALL NOT BE FIELD PAINTED, OR PRIMED BEYOND THE DEGREE OF APPLICATION FROM THE FACTORY SOURCE, OR EXCEPT AS REQUIRED BY APPLICABLE CODES AND AUTHORITIES HAVING JURISDICTION.

WATERPROOFING  
DO NOT CUT OR PENETRATE WATERPROOFED SURFACES OR WATERPROOFING MEMBRANES WITHOUT FIRST MAKING ARRANGEMENTS FOR REPAIR BY A METHOD APPROVED BY THE OWNER'S REPRESENTATIVE.

ACCESS DOORS  
INSTALL AS REQUIRED FOR MAINTENANCE, ADJUSTMENT, REMOVAL AND REPAIR OF VALVES, EQUIPMENT AND LIKE ITEMS. DOORS SHALL BE CONVENIENTLY LOCATED AND OF SUFFICIENT SIZE.

PIPING PROVISIONS FOR FIXTURES AND EQUIPMENT SPECIFIED IN OTHER SECTIONS OR FURNISHED BY THE OWNER.  
ROUGH LOCATIONS SHALL BE DETERMINED FOR SERVICES. PROVIDE ALL

NECESSARY PLUMBING SERVICES, ACCESSIBLE VALVES ON PLUMBING BRANCHES AND MAKE ALL FINAL CONNECTIONS.

PLUMBING OPERATION AND MAINTENANCE MANUALS

DESCRIPTION  
FURNISH TWO COPIES OF COMPLETE OPERATION AND MAINTENANCE MANUALS TO THE OWNER'S REPRESENTATIVE, FOR APPROVAL AND FOR THE OWNER, ON PLUMBING EQUIPMENT AND SPECIALTIES. THE MANUAL SHALL BE BOUND IN HARD-BACK, THREE-RING LOOSE-LEAF BINDERS.

MANUAL CONTENTS  
TITLE SHEET WITH JOB NAME, AND THE NAMES, ADDRESSES AND PHONE NUMBERS OF THE CONTRACTOR, SUBCONTRACTOR, CONTROL, SUBCONTRACTOR, RELATED CONTRACTOR AND MATERIAL AND EQUIPMENT SUPPLIERS.

INDEX OF CONTENTS  
TYPEWRITTEN OPERATING INSTRUCTIONS FOR THE OWNER'S PERSONNEL DESCRIBING HOW TO OPERATE EACH PIECE OF EQUIPMENT, AND CAUTION AND WARNING NOTICES.

APPROVED SHOP DRAWINGS, PRODUCT DATA AND PARTS AND MAINTENANCE BOOKLET FOR EACH ITEM OF PLUMBING, EQUIPMENT SPECIFIED IN DIVISION 15.

COPIES OF CERTIFICATES OF INSPECTION, WHERE INSPECTION IS REQUIRED, GUARANTEES, INCLUDING EXTENDED GUARANTEES.

SUBMIT MEDICAL GAS CERTIFICATION REPORT TO OWNER AND LOCAL A.H.U.

DELIVERY  
DELIVER THE MANUALS TO THE OWNER'S REPRESENTATIVE PRIOR TO SUBMITTING APPLICATION FOR FINAL PAYMENT.

PLUMBING PIPING

DESCRIPTION  
FURNISH AND INSTALL PLUMBING PIPING WHERE SHOWN ON DRAWINGS AND AS SPECIFIED.

- PIPING MATERIALS  
OPTIONS:
1. CAST IRON HUBLESS SANITARY PIPE AND FITTINGS: CISPI STD. 301.
  2. CAST IRON SOIL PIPE AND FITTINGS, SERVICE WEIGHT: ASTM A 74.
  3. CAST IRON SOIL PIPE AND FITTINGS, EXTRA HEAVY WEIGHT: ASTM A 74.
  4. STEEL PIPE: ASTM A 53.
  5. MALLEABLE IRON FITTINGS, 150 LB.: ASTM A 197.
  6. PIPE THREADS: ANSI B2.1.
  7. NIPPLES, PIPE (THREADED): FED SPEC. WW-4-351.
  8. COPPER WATER TUBE: ASTM B 88.
  9. WROUGHT COPPER AND BRONZE SOLDER-JOINT PRESSURE FITTINGS: ANSI B16.29.
  10. WROUGHT COPPER AND WROUGHT COPPER ALLOY SOLDER-JOINT DRAINAGE FITTINGS: ANSI B16.29.
  11. CALKING LEAD, FED. SPEC. DD-C-40 (2).
  12. SHEET LEAD, FED. SPEC. DD-C-101.
  13. SHEET COPPER: ASTM B 152.
  14. NO-HUB STAINLESS STEEL COUPLING AND GASKETS: CISPI STD. S-301.
  15. WHERE ACCEPTABLE BY LOCAL AUTHORITY HAVING JURISDICTION SOLID WALL ABS PIPING MAY BE USED FOR WASTE PIPING.
  - 15.A PVC/ABS PIPING CANNOT BE USED IN RETURN AIR PLENUM APPLICATION.
  16. WHERE ACCEPTABLE BY LOCAL AUTHORITY HAVING JURISDICTION PEX PIPING CONFORMING TO ASTM F876 MAY BE USED FOR HOT AND COLD WATER PIPING.

- JOINTS AND CONNECTIONS  
OPTIONS:
1. CAST IRON, HUB AND SPIGOT: PACKED WITH OILKUM AND FINISHED WITH LEAD NOT LESS THAN 1 INCH DEEP, WELL CAULKED.
  2. CAST IRON, NO-HUB: NEOPRENE GASKET AND CORRUGATED 304 STAINLESS STEEL SHELDED IN CONJUNCTION WITH 4 STAINLESS STEEL CLAMPS FOR 4" AND SMALLER, 5 CLAMPS FOR 5" AND LARGER.
  3. BETWEEN LEAD AND BRASS: FERRULES OR SOLDERING NIPPLES WITH WIPE, JOINTS 3/8" THICK AND 3/4" EACH SIDE OF JOINTS.
  4. SCREWED JOINTS: AMERICAN NATIONAL STANDARD WITH PIPE FREE FROM CUTTING AND BURRS. THREE THREADS EXPOSED MAXIMUM.
  5. SOLDERED JOINTS: 95% TIN/ANTIMONY SOLDER. SLIP JOINTS: USE FOR PLUMBING TRAP SEALS ON INLET SIDE ONLY.
  6. BETWEEN COPPER AND FERROUS MATERIALS: INSULATING DIELECTRIC UNION.
  7. FLANGED JOINTS: FURNISH WITH COMPANION FLANGE AND CLOTH INSERTED RUBBER GASKET.
  8. FLANGED BOLTS: ASTM A 354, MINIMUM GRADE 80, ALLOY STEEL WITH HEX NUTS IN COMPLIANCE WITH ANSII B16.22 AND STANDARD ROLLED STEEL WASHERS.
  9. ASSEMBLY FOR HUBLESS PIPING: AS RECOMMENDED BY THE MANUFACTURER.
  10. CHANGES IN PIPE SIZE SHALL BE MADE WITH REDUCERS, INCREASES OR REDUCING FITTINGS. BUSHINGS WILL NOT BE PERMITTED.

INSTALLATION  
BEFORE INSTALLING PIPE IN ANY PART OF THE SYSTEM, THE PIPE SHALL BE CLEANED INSIDE AND MADE FREE OF OIL, DIRT, AND FOREIGN MATTER. PROPERLY ALIGN AND INSTALL IN NEAT ARRANGEMENT, TRUE TO THE LINES OF THE BUILDING. PITCH LINE AT A CONSTANT SLOPE FOR PROPER DRAINAGE.  
  
EXCEPT AS NOTED OTHERWISE ON DRAWINGS, PIPING SHALL BE HELD AS HIGH AS POSSIBLE. BETWEEN STRUCTURES AND THROUGH JOIST WEBBING, WITH DUE REGARD TO CONFLICTS WITH OTHER SYSTEMS AND THEIR REQUIREMENTS FOR SPACE.

PIPING, INCLUDING NO-HUB PIPING, SHALL BE INSTALLED STRAIGHT AND TRUE TO VERTICAL AND HORIZONTAL LINES. DEFLECTION SHALL NOT EXCEED ONE DEGREE, WHEN NECESSARY TO ACHIEVE THIS ALIGNMENT PROVIDE ADDITIONAL HANGERS OR BRACING.

APPLY LUBRICANT TO SCREW JOINT MALE THREADS.

METAL TO BE SOLDERED SHALL BE CLEANED AND FLUXED AS SUITABLE FOR THE SOLDER USED.

NOTHING OF COPPER TUBING OR PLASTIC PIPING FOR CONNECTIONS WILL NOT BE PERMITTED.

PLUMBING SPECIALTIES

PIPE SLEEVES  
SCHEDULE 40 BLACK STEEL, GALVANIZED 26 GAGE STEEL, PROVIDE FOR ALL PIPES THROUGH WALLS AND FLOORS.

ESCUTCHEONS  
PROVIDE FOR ALL PIPING THROUGH WALLS, FLOORS AND CEILING WERE PIPING IS EXPOSED TO VIEW IN FINISHED AREA. ESCUTCHEONS SHALL BE CHROMIUM PLATED, TWO PIECE, HINGED WITH SET SCREW.

UNIONS  
PROVIDE GROUND JOINT BRASS UNIONS OR FLANGES ON EACH PIPING CONNECTION TO EQUIPMENT.

PROVIDE DIELECTRIC UNIONS BETWEEN COPPER AND STEEL PIPING CONNECTION

TO EQUIPMENT.  
  
VACUUM BREAKERS  
SHALL CONFORM TO THE REQUIREMENTS OF THE REFERENCED PLUMBING CODE AND SHALL BE PROVIDED FOR HOSE BIBBS, FLUSHMETERS AND ANY FIXTURE OR EQUIPMENT WATER SUPPLY HAVING A THREADED OUTLET.

FLASHING  
VENT FLASHING SHALL COMPLY WITH ROOFING MANUFACTURER'S WRITTEN SPECIFICATIONS

CLEANOUTS  
CLEANOUTS ON NO-HUB PIPE SHALL BE STANDARD NO-HUB FITTINGS. CLEANOUTS ON CAST IRON HUB AND SPIGOT PIPING, SHALL BE CADMIUM PLATED. APPROVED MANUFACTURERS: ZURN, JOSAM OR JONSEPEC.

TRAP PRIMERS  
PROVIDE WHERE INDICATED ON DRAWINGS. PRECISION PRODUCTS WITH DISTRIBUTION UNIT OR APPROVED EQUAL.

- PIPE SLEEVES
1. EXTEND SLEEVE 1/4 INCH BEYOND FINISHED SURFACE.
  2. SET SLEEVE BEFORE POURING CONCRETE.
  3. PROVIDE CLEARANCE BETWEEN SLEEVE AND PIPE OR BETWEEN SLEEVE AND INSULATION TO ALLOW FOR PIPE MOVEMENT DUE TO EXPANSION AND CONTRACTION.
  4. INSULATION SHALL PASS CONTINUOUS THROUGH THE SLEEVE.
  5. CALK BETWEEN SLEEVE AND PIPE OR SLEEVE AND INSULATION. PREFABRICATED, PRE-INSULATED, "PIPE SHIELDS" WILL BE ACCEPTABLE FOR PIPES PASSING THROUGH FLOORS, EXTERIOR WALLS, FIRE WALLS AND FIRE RESISTIVE WALLS AND PARTITIONS.
  6. ESCUTCHEONS: FIT AROUND INSULATION WHERE PRESENT. PROVIDE DEEP ESCUTCHEON PLATES WHERE PIPE SLEEVES EXTEND ABOVE FLOORS.
  7. WATER HAMMER ARRESTERS: INSTALL WHERE SHOWN ON DRAWINGS.
  8. CLEANOUTS: INSTALL WHERE SHOWN ON DRAWINGS AND AT BASE OF ALL RISERS. PROVIDE ADDITIONAL CLEANOUTS WHERE REQUIRED BY LOCAL CODES AND FOR CONVENIENCE OF TESTING AND ERECTION AT CONTRACTOR'S OPTION.
  9. FRAMES AND COVERS SHALL BE FLUSH WITH ADJOINING ARCHITECTURAL FINISH.

PLUMBING VALVES

DESCRIPTION  
INSTALL IN ACCESSIBLE LOCATION.  
VALVES SHALL NOT BE INSTALLED WITH THE STEMS BELOW THE HORIZONTAL POSITION.

- VALVES, GATE, 125# UNION BONNET. RISING STEM 3 INCH OR SMALLER.
1. SCREWED: ITT GRINNELL #3080 OR APPROVED EQUAL.
  2. SOLDER JOINT: ITT GRINNELL #3080 SJ OR APPROVED EQUAL.

VALVES, BALL, MAY BE USED IN LIEU OF GATE VALVES UP TO 7" AND SMALLER NIBCO #7580. TWO PIECE BRONZE BODY, WITH SCREWED ENDS, CHROME PLATED BRONZE BALL WITH CONVENTIONAL PORT, 400 PSI, BLOW OUT PROOF STEM.

- VALVES, GLOBE 150# TEFLOX DISC, UNION BONNET 3 INCH OR SMALLER.
1. SCREWED: ITT GRINNELL #3240 OR APPROVED EQUAL.
  2. SOLDER JOINT: ITT GRINNELL #3240 SJ OR APPROVED EQUAL.

- VALVES, CHECK 125# REMOVABLE REGRINDABLE DISC. A. 3 INCH AND SMALLER, HORIZONTAL:
1. SCREWED: ITT GRINNELL #3300 OR APPROVED EQUAL.
  2. SOLDER JOINT: ITT GRINNELL #3300 SJ OR APPROVED EQUAL.

- 3 INCH AND SMALLER, VERTICAL:
1. FOR SCREWED AND SOLDER JOINT INSTALLATION, SAME AS SECTION A OR APPROVED EQUAL. PROVIDE ADAPTERS FOR SOLDER JOINT CONNECTION. 2.15 50# RISING A. SEE VARIATION SCHEDULE ON DRAWINGS. B. PLUS COCKS, 125# BRONZE COCKS. TWO (2) INCH AND SMALLER SHALL BE CRANE NO. 250 OR APPROVED EQUAL.

INSTALLATION  
INSTALL VALVES WHERE SHOWN ON DRAWINGS.

PLUMBING HANGERS AND SUPPORTS  
  
DESCRIPTION  
PROVIDE HANGERS FOR ALL PIPING NOT INDICATED BELOW GRADE. USE HANGERS CAPABLE OF ADJUSTMENT.

HANGERS AND SUPPORTS  
HANGERS FOR BLACK OR GALVANIZED STEEL PIPE SHALL BE GRINNELL, MODEL NO. 65 OR APPROVED EQUAL.

HANGERS FOR CAST IRON PIPE SHALL BE GRINNELL, MODEL NO. 280 OR APPROVED EQUAL.

HANGERS FOR COPPER TUBING SHALL BE GRINNELL, MODEL NO. 97 C OR APPROVED EQUAL.

TRAPEZE HANGERS OF A TYPE APPROVED BY THE OWNER'S REPRESENTATIVE MAY BE USED WHERE PIPES ARE DESIGNED TO RUN PARALLEL AT THE SAME ELEVATION.

PROVIDE ISOLATION HANGER WITH PROTECTIVE SHIELD, GRINNELL, MODEL NO. 300 103 OR APPROVED EQUAL. FOR ALL INSULATED PIPING, AT HANGER POINTS, PROVIDE 8 INCH LONG SECTION OF 1/2 INCH THICK CALCIUM SILICATE SECTIONAL PIPE INSULATION WITH FACTORY LONGITUDINAL LAP. SEAL BUTT JOINTS WITH INSULATING CEMENT.

STRAP HANGERS: NOT PERMITTED.

RISER CLAMPS: PROVIDE RISER CLAMPS FOR VERTICAL PIPING AT EACH LEVEL, GRINNELL, MODEL NO. 261

INSERTS: IN CONCRETE, GRINNELL, MODEL NO. 285 OR APPROVED EQUAL, HAVING ADJUSTMENT FROM 3/4 INCH THROUGH 1 1/4 INCH. IN METAL DECKS READHEAD SD1 OR APPROVED EQUAL. POWDER PROPELLED PERMITTED IN NEW CONSTRUCTION WHERE TYPE AND LOCATION ARE APPROVED PRIOR TO INSTALLATION. IN EXISTING CONSTRUCTION, START SLUGG NO. 6800 SERIES OR APPROVED EQUAL.

SIDE BEAM CLAMPS: PROVIDE WHEN SUPPORTING FROM STRUCTURAL STEEL MEMBERS, GRINNELL, MODEL 225 OR APPROVED EQUAL.

OTHER SUPPORTS, OBTAIN OWNER'S REPRESENTATIVE APPROVAL FOR OTHER METHODS OF SUPPORT.

SPACING OF HANGERS  
PROVIDE HANGER AT EACH CHANGE OF DIRECTION.

SPACE HANGERS AND SUPPORTS TO PREVENT SAGGING AND REDUCE STRAIN ON VALVES AND SPECIALTIES WITH SPACING NO GREATER AND ROD NO SMALLER THAN SHOWN ON THE FOLLOWING TABLE. HANGERS SHALL ALLOW FOR EXPANSION AND CONTRACTION.

FERROUS PIPING AND COPPER TUBING.	DIAMETER OF PIPE	MAXIMUM SPACING	ROD SIZE
	1/2" THROUGH 1-1/2"	6 FT.	3/8"
	2" THROUGH 3"	10 FT.	1/2"
	4" THROUGH 5"	12 FT.	5/8"
	6" AND LARGER	16 FT.	3/4" D.
CAST IRON PIPING:	DIAMETER OF PIPE	MAXIMUM SPACING	ROD SIZE
	2" AND 3"	EACH JOINT	3/8"
	4" AND 5"	EACH JOINT	1/2"
	6" AND 8"	EACH JOINT	1/2"
	10" THROUGH 15"	EACH JOINT	3/4"

(TWO HANGERS)

RISER CLAMPS  
INSTALL AT EACH LEVEL BELOW THE FLOOR. SUSPEND FROM TWO HANGER RODS AND INSERTS WHERE THE INSTALLATION OF ESCUTCHEON PLATES IS REQUIRED.

TESTING OF PLUMBING PIPING

DESCRIPTION  
CONDUCT ALL TESTS AFTER PIPING IS INSTALLED AND BEFORE PIPING IS CONCEALED OR COVERED.

PROVIDE ALL NECESSARY TEMPORARY PIPING CLOSURES.

PROVIDE ALL TESTING EQUIPMENT, MATERIALS AND SUPPLIES.

SYSTEMS SHALL REMAIN UNDER TEST FOR SUFFICIENT LENGTH OF TIME TO PROVE TIGHTNESS THEREOF AND FOR ADEQUATE OBSERVATION BY THE ARCHITECT-ENGINEER.

MATERIALS OTHER THAN THOSE SPECIFIED FOR JOINING WILL NOT BE PERMITTED IN THE PIPING SYSTEMS FOR THE PURPOSE OF STOPPING LEAKS.

ALL LEAKS DISCLOSED BY THE TESTING PROCEDURES SHALL BE REPAIRED AND TESTING REPEATED UNTIL THE SYSTEM IS PROVEN TIGHT.

TESTING REQUIREMENTS ARE MINIMUM AND ARE NOT INTENDED TO BE LIMITING WHERE ADDITIONAL TESTING METHODS ARE REQUIRED BY THE AUTHORITY HAVING JURISDICTION.

SUBMITTALS  
STERILIZATION: PROVIDE A DATED LETTER TO THE ARCHITECT-ENGINEERS REPRESENTATIVE STATING THAT PIPING SYSTEM HAS BEEN STERILIZED AND FLUSHED AS SPECIFIED.

PIPING TEST  
DOMESTIC HOT AND COLD WATER PIPING SHALL BE FILLED, THEN TESTED TO A HYDROSTATIC PRESSURE OF 150 PSIG. MAINTAIN TEST PRESSURE FOR A MINIMUM OF ONE HOUR.

SANITARY PIPING, PREVIOUS TO CONNECTION OF FIXTURES, SHALL BE FILLED WITH WATER TO THE TOP OF THE SYSTEM AND PROVEN TIGHT. WHEN TESTING THE SYSTEM BY SECTIONS THE MINIMUM HEIGHT OF THE WATER COLUMN SHALL BE 10 FEET. EXAMINE ALL JOINTS FOR LEAKS.

NEW FIRE STANDPIPE SYSTEM SHALL BE TESTED TO A HYDROSTATIC PRESSURE OF 200 PSIG. MAINTAIN TEST PRESSURE FOR A MINIMUM OF TWO HOURS.

GAS PIPING SHALL BE TESTED WITH NITROGEN TO 50 PSIG. PRESSURE SHALL BE MEASURED WITH A MANOMETER. MAINTAIN TEST PRESSURE FOR A MINIMUM OF 30 MINUTES.

STERILIZATION  
AFTER TESTS ARE COMPLETED ALL WATER SUPPLY SYSTEMS SHALL BE FILLED WITH A SOLUTION CONTAINING 100 PPM OF AVAILABLE CHLORINE AND ALLOWED TO STAND FOR A PERIOD TO TWO HOURS BEFORE BEING FLUSHED WITH CLEAN WATER.

PLUMBING, FIXTURES, TRIM AND DRAINS

MANUFACTURER  
MANUFACTURER SHALL BE AS SCHEDULED OR BY APPROVED EQUAL.

PIPING  
PIPING TO SERVICE FIXTURES AND EQUIPMENT AND EXPOSED TO VIEW IN FINISHED AREAS SHALL BE BRASS, CHROMIUM PLATED.

SUPPORTS  
PROVIDE ALL BRACKETS, PLATES, ANCHORS AND FASTENING DEVICES REQUIRED FOR ANCHORING THE FIXTURES RIGIDLY IN PLACE. RISERS TO SHOWER HEADS SHALL BE ANCHORED TO THE WALL CONSTRUCTION TO PREVENT MOVEMENT.

FIXTURES  
PROVIDE PLUMBING FIXTURES AS SCHEDULED ON DRAWINGS, AMERICAN STANDARD, KOHLER, ELIER OR APPROVED EQUAL.

PLUMBING DRAINS  
FURNISH WITH GEORGE FLANGE WHERE INSTALLED WITH PANS OR FLASHING, FURNISH CLAMPING RING.

ALL DRAINS SHALL BE OF THE SAME MANUFACTURER.

FURNISH FLOOR DRAINS WITH PRIMER CONNECTIONS WHERE INDICATED ON THE DRAWINGS. IN LIEU OF CAST-IN PRIMER CONNECTIONS ON THE DRAIN BODY, A TEE BETWEEN THE DRAIN BODY AND THE TRAP, TO RECEIVE THE PRIMER DISCHARGE WILL BE ACCEPTABLE.

PROVIDE FLOOR DRAINS WITH 4 INCH DEEP SEAL TRAPS.

PROVIDE ALL DRAINS AS SCHEDULED ON DRAWINGS OR APPROVED EQUAL.

INSTALLATION  
DRAIN SHALL BE INSTALLED WHERE SHOWN ON THE DRAWINGS, ACCESSIBLE AND LOCATED TO SUIT EQUIPMENT APPROVED FOR INSTALLATION. WHERE FLUSH VALVES ARE SPECIFIED WITH FIXTURES, THE SUPPLY TO THE VALVE IN EACH ROOM SHALL BE AT THE SAME HEIGHT FOR THE TYPE OF FIXTURE AND THE VALVE SHALL BE SET IN PLACE SO THAT THE CENTER LINE OF THE VALVE DISCHARGE IS DIRECTLY ABOVE THE CENTER LINE OF FIXTURE STUD. BENDING OF NIPPLE BETWEEN THE VALVE AND THE STUD TO ACHIEVE CONNECTION WILL NOT BE PERMITTED.

CHROME PLATED PIPING REQUIRING THE USE OF WRENCH SHALL BE PROTECTED FROM DAMAGE.

BOLT WATER CLOSET CARRIER TO FLOOR.

GAS PIPING

PIPING  
SHALL COMPLY WITH THE REQUIREMENTS OF NFPA NO. 54 AND THE LOCAL GAS COMPANY.

PIPE SHALL BE SCHEDULE 40 BLACK STEEL PIPE WITH MALLEABLE FITTINGS

INSTALLATION  
PIPING SHALL COMPLY WITH THE REQUIREMENTS OF NFPA NO. 54 AND THE LOCAL GAS COMPANY.

INSTALL GAS SHUT-OFF AND GAS MANIFOLDS AS INDICATED OR REQUIRED.

MEDICAL VACUUM

1. TYPE I HARD DRAWN COPPER TUBING, ASTM B419.
2. WROUGHT BRONZE SOLDERED FITTINGS.
3. JOINTS TO BE AINS A5.8, BCUP SILVER BRAZE (15% SILVER SOLDER).
4. PIPING SHALL BE CLEANED AND INSTALLED PER INSTALLATION OF MEDICAL GAS PIPING SECTION OF THIS SPECIFICATION.
5. PVC PLASTIC PIPE SHALL BE SCHEDULE 40 OR SCHEDULE 80, COMPLYING WITH ASTM D 1785 STANDARD SPECIFICATION FOR POLYVINYL CHLORIDE (PVC) PLASTIC PIPE SCHEDULES 40, 80 AND 120.
6. PVC PLASTIC FITTINGS SHALL BE SCHEDULE 40 OR 80 TO MATCH THE PIPING AND COMPLY WITH ASTM D 2466 STANDARD SPECIFICATION FOR POLYVINYL CHLORIDE (PVC) PLASTIC PIPE FITTINGS, SCHEDULE 40 OR ASTM D 2467 STANDARD SPECIFICATION FOR POLYVINYL CHLORIDE (PVC) PLASTIC PIPE FITTINGS, SCHEDULE 80.
7. PVC PLASTIC PIPING JOINTS SHALL BE SOLVENT-CEMENTED IN ACCORDANCE WITH ASTM D 2672 STANDARD SPECIFICATION FOR JOINTS FOR IPS PVC PIPE USING SOLVENT CEMENT.

OXYGEN

1. TYPE I HARD DRAWN COPPER TUBING PER ASTM B419.
2. WROUGHT BRONZE SOLDERED FITTINGS.
3. JOINTS TO BE AINS A5.8, BCUP SILVER BRAZE (15% SILVER SOLDER).
4. PIPING SHALL BE CLEANED AND INSTALLED IN ACCORDANCE WITH INSTALLATION OF MEDICAL GAS PIPING SECTION OF THIS SPECIFICATION.

NITROUS OXIDE

1. TYPE I HARD DRAWN COPPER TUBING PER ASTM B419.
2. WROUGHT BRONZE SOLDERED FITTINGS.
3. JOINTS TO BE AINS A5.8, BCUP SILVER BRAZE (15% SILVER SOLDER).
4. PIPING SHALL BE CLEANED AND INSTALLED IN ACCORDANCE WITH INSTALLATION OF MEDICAL GAS PIPING SECTION OF THIS SPECIFICATION.

DOMESTIC HOT AND COLD WATER

DESCRIPTION  
THE WORK INCLUDES FURNISHING AND INSTALLING HOT AND COLD WATER PIPING AS SHOWN ON THE DRAWINGS AND SPECIFIED HEREIN.

PIPING  
HOT AND COLD WATER PIPING SHALL BE COPPER WATER TUBE HARD TEMPER, TYPE "L" WITH WROUGHT SOLDER FITTINGS ABOVE FLOOR AND SOFT TEMPER, TYPE "K" WITH WROUGHT SOLDER FITTINGS BELOW GRADE.

PEX, HIGH-DENSITY CROSS-LINKED POLYETHYLENE TUBING SHALL BE MANUFACTURED TO THE REQUIREMENTS OF ASTM F876 AND MEET THE STANDARD GAUGE HYDROSTATIC PRESSURE RATINGS FROM PLASTIC PIPE INSTITUTE IN ACCORDANCE WITH TR-403.

GATE VALVES  
SPECIFIED IN SECTION, PLUMBING VALVES.

INSTALLATION  
NOTHING OF PIPE FOR CONNECTION NOT PERMITTED.

WHERE POSSIBILITY OF BACKFLOW FROM THE DRAIN TO THE SUPPLY FITTING EXISTS, INSTALL VACUUM BREAKERS.

NOT MORE THAN ONE LAVATORY, SINK, OR SIMILAR FIXTURE SHALL BE SUPPLIED BY A 1/2 INCH BRANCH. LINEAR DIMENSIONS NOT TO EXCEED 5 FEET.

MAKE CONNECTION TO EQUIPMENT AND FIXTURES INDICATED ON THE DRAWINGS OR SPECIFIED HEREIN.

HOT WATER BRANCH CONNECTIONS TO DISTRIBUTION MAINS SHALL BE TOP TAKE-OFF, SWING JOINT TYPE.

ALL PIPING INSTALLED BELOW GROUND SHALL RECEIVE TWO COATS OF COPPERS NO. 30 OR APPROVED EQUAL.

PLUMBING INSULATION

DESCRIPTION  
INSULATION SHALL NOT BE INSTALLED UNTIL TESTING PROCEDURES HAVE BEEN COMPLETED WITH ALL SURFACES HAVE BEEN CLEANED AND FREE OF DIRT, GREASE AND COMPLETELY DRIED.

MATERIALS SHALL COMPLY WITH UL 723, FLAME SPREAD RATINGS, HOT SURFACE TEST PERFORMANCE, AND SMOKE DEVELOPED RATING.

SUBMITTALS  
SAMPLES AND MANUFACTURER'S PRODUCT DATA. SUBMIT SAMPLES OF INSULATION AND ADHESIVE AND PRODUCT DATA LISTING RECOMMENDATIONS FOR USE AND COMPLIANCE WITH NFPA 90.

INSULATION  
INSULATION FOR HOT AND COLD WATER PIPING, SHALL BE SECTIONAL GLASS FIBER AS MANUFACTURED BY OVENS CORNING FIBERGLASS TYPE ASJ/SJSL OR APPROVED EQUAL, WITH FACTORY APPLIED, ALL PURPOSE, FIRE RETARDANT JACKET.

INSULATION FOR EXPOSED HOT AND COLD WATER PIPING SHALL BE SECTIONAL GLASS FIBER AS MANUFACTURED BY OVENS CORNING FIBERGLASS TYPE ASJ/SJSL OR APPROVED EQUAL, WITH FACTORY APPLIED, .016 EMBOSSED ALUMINUM JACKET.

ADHESIVE SHALL BE BENJAMIN FOSTER 30-36, OR APPROVED EQUAL, WHITE INSULATION LAGGING ADHESIVE.

VAPOR BARRIER MASTIC SHALL BE BENJAMIN FOSTER NO. 82-07, WHITE, OR APPROVED EQUAL.

INSTALLATION  
HOT AND COLD WATER PIPING, SHALL BE INSULATED WITH 1/2 INCH THICK GLASS FIBER INSULATION HAVING A FACTORY APPLIED, ALL PURPOSE, FIRE RETARDANT JACKET WITH A MINIMUM R-4.0 PER INCH. CONCEALED AND EXPOSED PIPING SHALL HAVE THE INSULATION APPLIED WITH SIDE AND END JOINTS BUTTED TIGHTLY. SEAL JACKET LEGS AND BUTT JOINT STRIPS WITH ADHESIVE.

INSULATE FITTINGS FOR PIPING UP TO 3 INCHES IPS WITH MOLDED GLASS FIBER. INSULATE FITTINGS FOR PIPING LARGER THAN 3 INCHES WITH MOLDED FITTINGS OR SEGMENTED SECTIONS, WIRED IN PLACE TO THE SAME THICKNESS AS ADJACENT INSULATION. EXPOSED INSULATED PIPING AND FITTINGS SHALL BE JACKETED WITH 6 OUNCE CANVAS PIPING INCLUDING THE FITTING CHANGE FROM HORIZONTAL TO VERTICAL. CONCEALED AND EXPOSED PIPING SHALL HAVE THE INSULATION APPLIED WITH SIDE AND END JOINTS BUTTED TIGHTLY. SEAL OFF ENDS OF INSULATION WITH VAPOR BARRIER MASTIC AT EACH FITTING AND AT 21 FOOT INTERVALS ON CONTINUOUS RUNS.

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