



BUILDING CODE INFORMATION

APPLICABLE CODES

2015 INTERNATIONAL BUILDING CODE W/ LOCAL AMENDMENTS
2015 IECC, IPC, IMC, IFC, IFGC, ALL W/ LOCAL AMENDMENTS
2014 NATIONAL ELECTRIC CODE W/ LOCAL AMENDMENTS
2009 ICC A117.1

DEFERRED SUBMITTALS

FIRE ALARM SYSTEM

SHOP DRAWINGS INDICATING COMPLIANCE WITH ALL CODES MUST BE SUBMITTED TO AND APPROVED BY THE BUILDING CODE OFFICIAL PRIOR TO EQUIPMENT INSTALLATION OR THE START OF SYSTEM.

GENERAL BUILDING INFORMATION

311.3 USE GROUP: S-2 - LOW-HAZARD STORAGE
601 CONSTRUCTION TYPE: 5B, NON-SPRINKLERED

CHAPTER 5 HEIGHT AND BUILDING AREA

| | ALLOWABLE | ACTUAL |
|--|-----------|----------|
| 504.3 BUILDING HEIGHT | 40 FEET | 19 FEET |
| 504.4 NO. OF STORIES ABOVE GRADE | 2 | 1 |
| 506.2 BUILDING AREA (W/O UT INCREASES) | 13,500 SF | 6,960 SF |

FIRE AND SMOKE PROTECTION REQUIREMENTS

| | | |
|----------|--|----------|
| 601 | FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS) FOR CONSTRUCTION TYPE 5B: | |
| | PRIMARY STRUCTURAL FRAME | 0 HOUR |
| | BEARING WALLS - EXTERIOR | 0 HOUR |
| | BEARING WALLS - INTERIOR | 0 HOUR |
| | NONBEARING WALLS - EXTERIOR | 0 HOUR |
| | NONBEARING WALLS - INTERIOR | 0 HOUR |
| | FLOOR CONSTRUCTION | 0 HOUR |
| | ROOF CONSTRUCTION | 0 HOUR |
| 903.2.10 | AUTOMATIC SPRINKLER SYSTEM NOT REQUIRED SINCE AREA < 12,000 SF | |
| 906 | PORTABLE FIRE EXTINGUISHERS 1 PER MAX. 11,250 SF AND 75 FT TRAVEL (SEE PLAN FOR LOCATIONS - EACH F.E. TO BE 10 LB. CAPACITY, UL 4A-80BC RATED) | |
| 907 | FIRE ALARM SYSTEM | INCLUDED |

MEANS OF EGRESS REQUIREMENTS

| | |
|----------|---|
| 1004 | FOR OCCUPANT LOADS SEE LIFE SAFETY PLAN - OCCUPANT LOADS INDICATED ARE FOR EXITING PURPOSES ONLY AND ARE NOT TO BE USED FOR ACTUAL BUILDING CAPACITY. - ROOM SQUARE FOOTAGE SHOWN IS GROSS U.N.O. |
| 1005.3 | EGRESS WIDTH FOR BUILDING W/OUT SPRINKLER SYSTEM: - EGRESS STAIRWAYS = 0.3 INCHES PER OCCUPANT - OTHER EGRESS COMPONENTS = 0.2 INCHES PER OCCUPANT |
| 1006.2.1 | COMMON PATH OF TRAVEL FOR S-2 OCCUPANCY W/OUT SPRINKLER SYSTEM AND <31 OCCUPANTS = 100 FEET (COMPLIES) |
| 1006.3.1 | MINIMUM NUMBER OF EXITS OR ACCESS TO EXITS PER STORY = 2 (2 PROVIDED) |
| 1017.2 | MAXIMUM EXIT ACCESS TRAVEL DISTANCE FOR S-2 OCCUPANCY W/OUT SPRINKLER SYSTEM = 300 FEET (COMPLIES - SEE PLAN FOR ACTUAL) |
| 1020.1 | CORRIDOR FIRE RATING W/OUT SPRINKLER SYSTEM = 1 HOUR (N/A) |

ENERGY CONSERVATION (2015 IECC)

| | | |
|--------------|----------------------------------|---|
| C301.1 | CLIMATE ZONE: | 3A-MOIST (SHELBY COUNTY, TN) |
| C402.1.3 & 4 | BUILDING ENVELOPE: | |
| | METAL BUILDING ROOF | REQUIRED: R-19 + R-11 LS (W/ THERMAL SPACER BLOCK) / PROVIDED: R-30 W/ R-5 SPACER BLOCK |
| | METAL BUILDING WALLS ABOVE GRADE | U-0.079 (R-12.66) / R-13 |
| | UNHEATED SLAB | NR / R-10 FOR 24" BELOW |
| | SWINGING DOORS | U-0.61 (R-1.64) |
| | NON-SWINGING DOORS | U-0.21 (R-4.75) |

PLUMBING FIXTURE CALCULATIONS (2015 IBC TABLE 2902.1)

2902.2.2 BASED ON OWNER'S OCCUPANT LOAD OF 15 OR FEWER, SEPARATE TOILET FACILITIES FOR EACH SEX ARE NOT REQUIRED

WATER CLOSETS (1 PER 100)
1 REQUIRED 1 WATER CLOSET & 1 URINAL PROVIDED

LAVATORIES (1 PER 100)
1 REQUIRED 1 PROVIDED

DRINKING FOUNTAIN
1 PER 1000 (2 MIN. PER 1109.5.1) 2 PROVIDED (HI / LO)

SERVICE SINK
1 REQUIRED 1 PROVIDED

LIFE SAFETY PLAN EXITING LEGEND

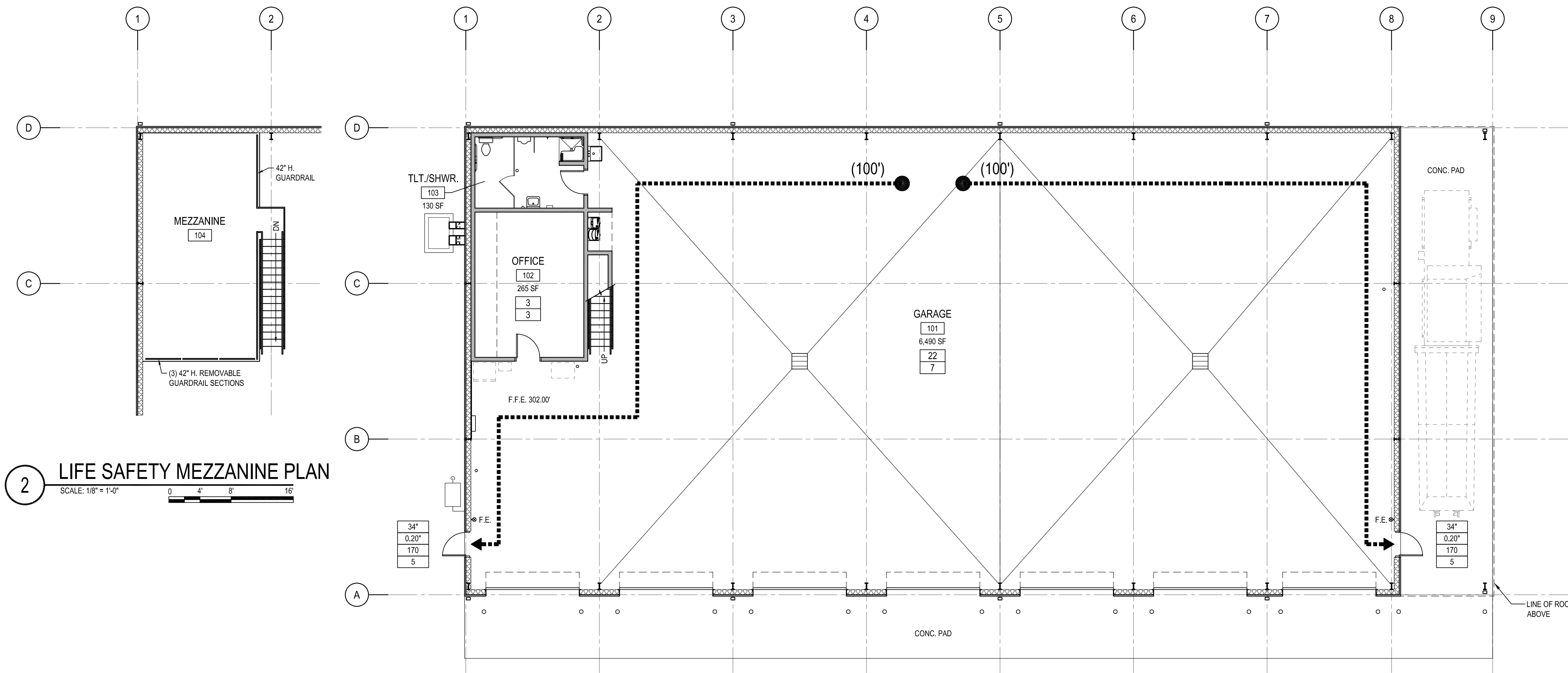
OCCUPANT LOAD
 X ALLOWABLE OCCUPANTS (PER IBC TABLE 1004.1.2)
 X ACTUAL OWNER ANTICIPATED OCCUPANTS (FOR PLUMBING FIXTURE COUNT)

CAPACITY
 34" CLEAR WIDTH OF DOOR OPENING OR STAIR IN INCHES
 0.20" EGRESS WIDTH PER OCCUPANT (STAIRS 0.30", OTHER 0.20")
 170 ALLOWABLE OCCUPANT LOAD
 85 ACTUAL OCCUPANT LOAD

(XX) EGRESS STARTING POINT, PATH OF TRAVEL, AND ACTUAL DISTANCE
 F.E. INDICATES WALL MOUNTED FIRE EXTINGUISHER

FOR CODE REVIEW ONLY

SHEET NO. **A-001**



1 LIFE SAFETY FLOOR PLAN
SCALE: 1/8" = 1'-0"
PROJECT NORTH

2 LIFE SAFETY MEZZANINE PLAN
SCALE: 1/8" = 1'-0"

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PROJECT NO: 81079-04
ISSUED DATE: 7/31/20
DRAWN BY: ALH
CHECKED BY: ALH

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SHEET TITLE:

LIFE SAFETY PLAN AND CODE INFORMATION

DOOR SCHEDULE

| DOOR NO | ROOM NAME | DOOR | | | FRAME | | DETAILS | | | FIRE RATING | GLZ | HDW | SIGN TYPE | FOOTNOTE |
|--|---------------|------|-------|--------|--------|--------|---------|-------|------|-------------|-----|-----|-----------|----------|
| | | TYPE | MATL. | W | H | THK | TYPE | MATL. | HEAD | | | | | |
| 101A | GARAGE | F | HM | 3'-0" | 7'-0" | 1 1/2" | F1 | HM | H1 | J1 | S1 | | | 12A |
| 101B, 101C, 101D, 101E, 101F, 101G, 101H | GARAGE | OHCD | STL | 12'-0" | 14'-0" | 2" | | STL | H2 | J2 | S2 | | | 1, 2 |
| 101J | GARAGE | F | HM | 3'-0" | 7'-0" | 1 1/2" | F1 | HM | H1 | J1 | S1 | | | 12A |
| 102A | OFFICE | HG | HM | 3'-0" | 7'-0" | 1 1/2" | F1 | HM | H3 | J3 | | | GL1 | 2 |
| 103A | TOILET/SHOWER | F | HM | 3'-0" | 7'-0" | 1 1/2" | F1 | HM | H3 | J3 | | | | 2, 3M |

GENERAL NOTES:
 A. ALL EXTERIOR DOORS TO BE INSULATED.
 B. PAINT ALL NEW HOLLOW METAL DOORS AND FRAMES.
 C. ALL NEW FRAMES TO HAVE SILENCERS.
 D. PROVIDE MASTER KEYING PER OWNER'S DIRECTION.
 E. LEVER HANDLE OR PUSH PLATE ACTIVATION HARDWARE TO BE INSTALLED ON ALL NEW DOORS. NEW HARDWARE MUST BE EASILY OPERATED WITH ONE HAND AND NOT REQUIRE TIGHT GRASPING, PINCHING, OR TWISTING OF THE WRIST TO OPERATE.
 F. COORDINATE HEADROOM REQUIREMENTS WITH PRE-ENGINEERED BUILDING MANUFACTURER.

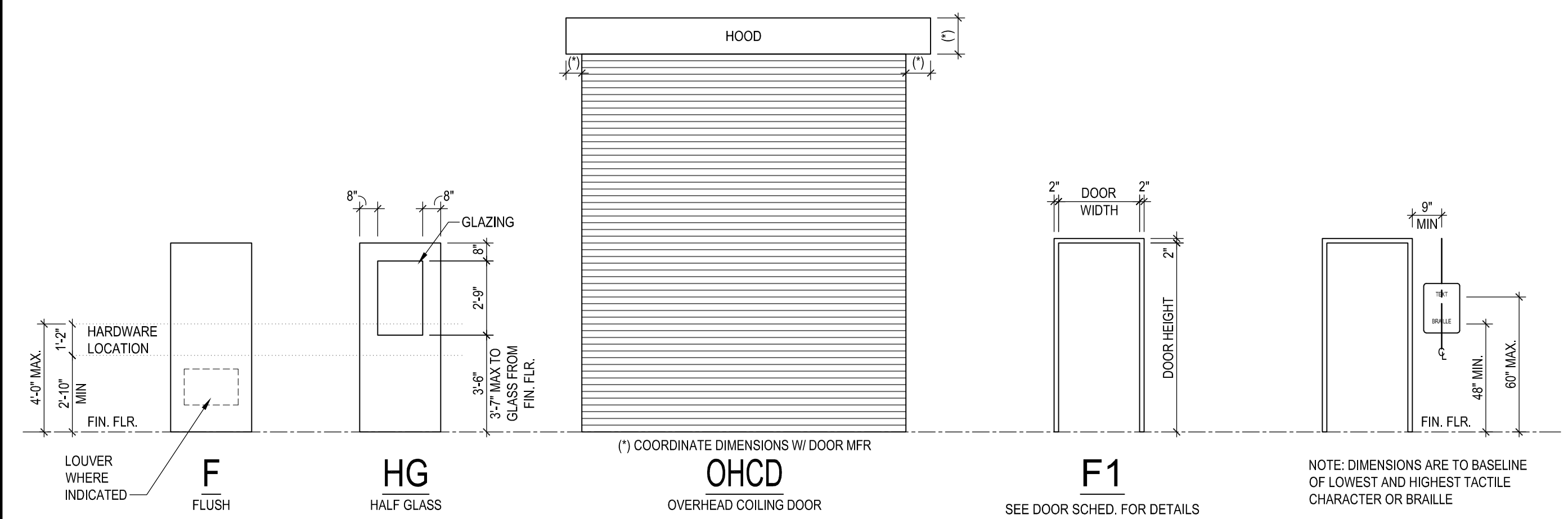
ABBREVIATIONS:
 EX EXISTING
 GLZ GLAZING
 HM HOLLOW METAL
 HR HOUR
 MATL MATERIAL
 SIM SIMILAR
 STL STEEL

DOOR HARDWARE SET #1:
 3 EA. HINGES
 1 EA. EXIT DEVICE W/ KEYED LEVER AT ENTRY SIDE
 1 EA. DOOR CLOSER
 1 EA. 8" X 34" S/STL. KICK PLATE
 1 EA. THRESHOLD
 3 EA. SILENCER

DOOR HARDWARE SET #2:
 3 EA. HINGES
 1 EA. LEVER LOCKSET (CLASSROOM FUNCTION)
 1 EA. DOOR CLOSER
 1 EA. 8" X 34" S/STL. KICK PLATE
 1 EA. WALL OR FLOOR STOP
 3 EA. SILENCER

FOOTNOTES:
 1. INSULATED DOOR ASSEMBLY
 2. MANUALLY OPERATED
 3. 16" H. X 24" W. LOUVER

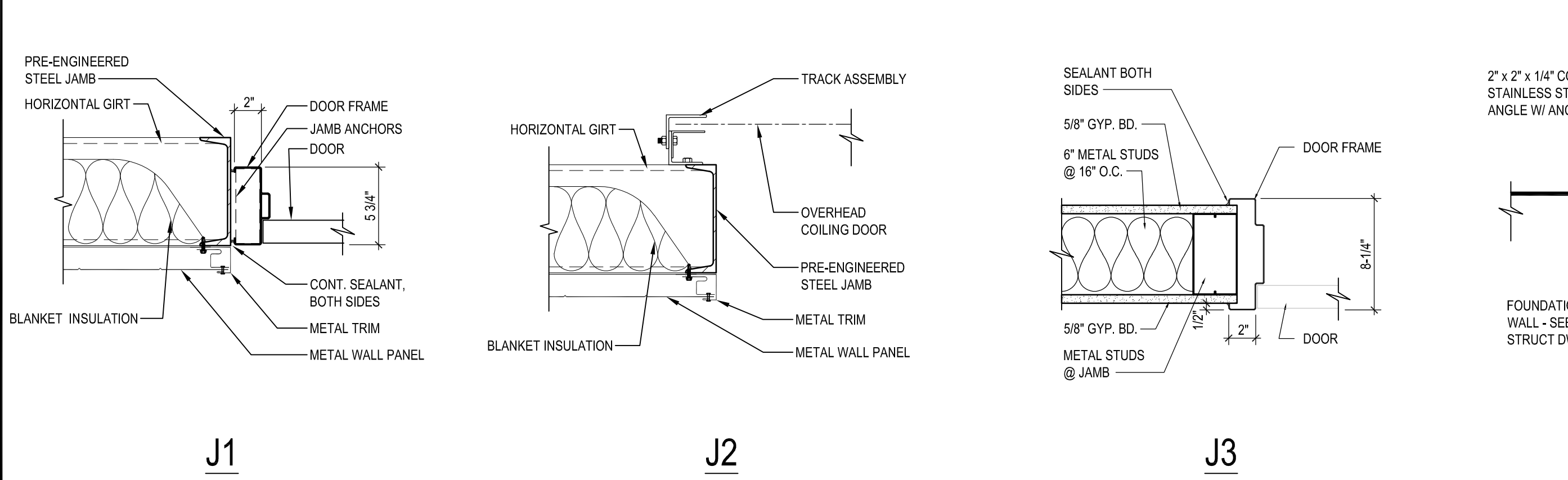
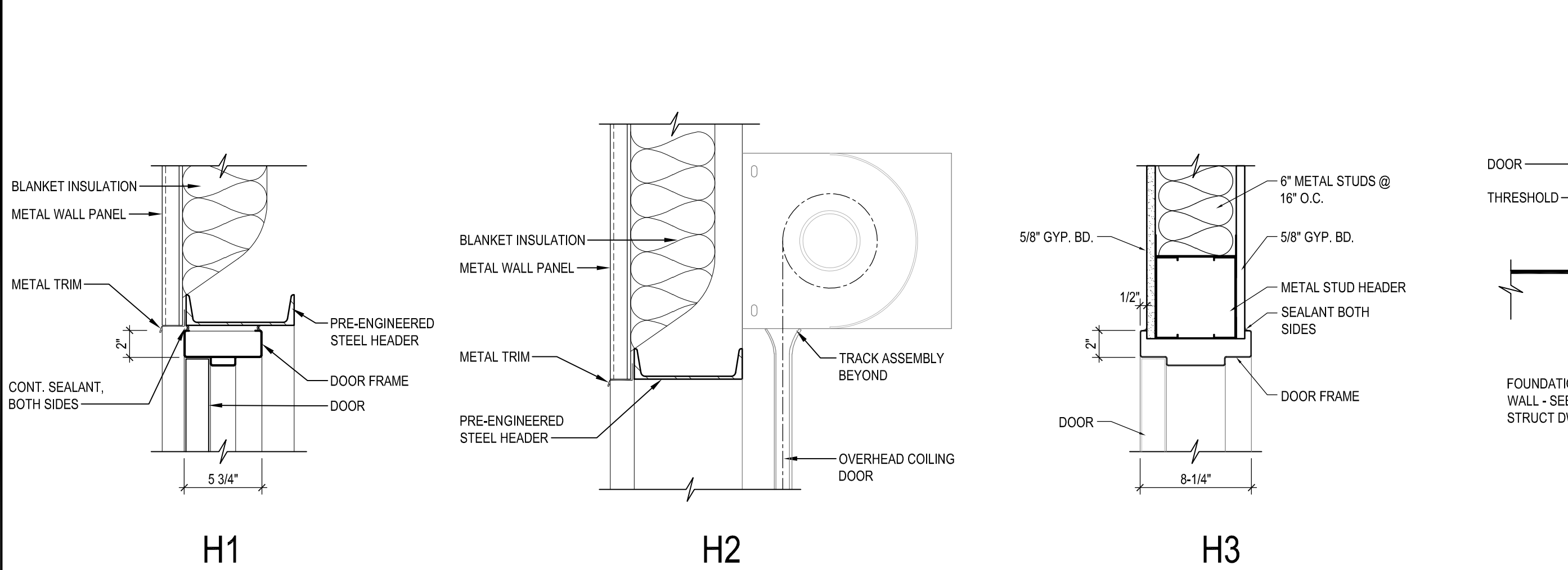
GLAZING TYPES:
 GL1 1/4" TEMPERED CLEAR GLASS



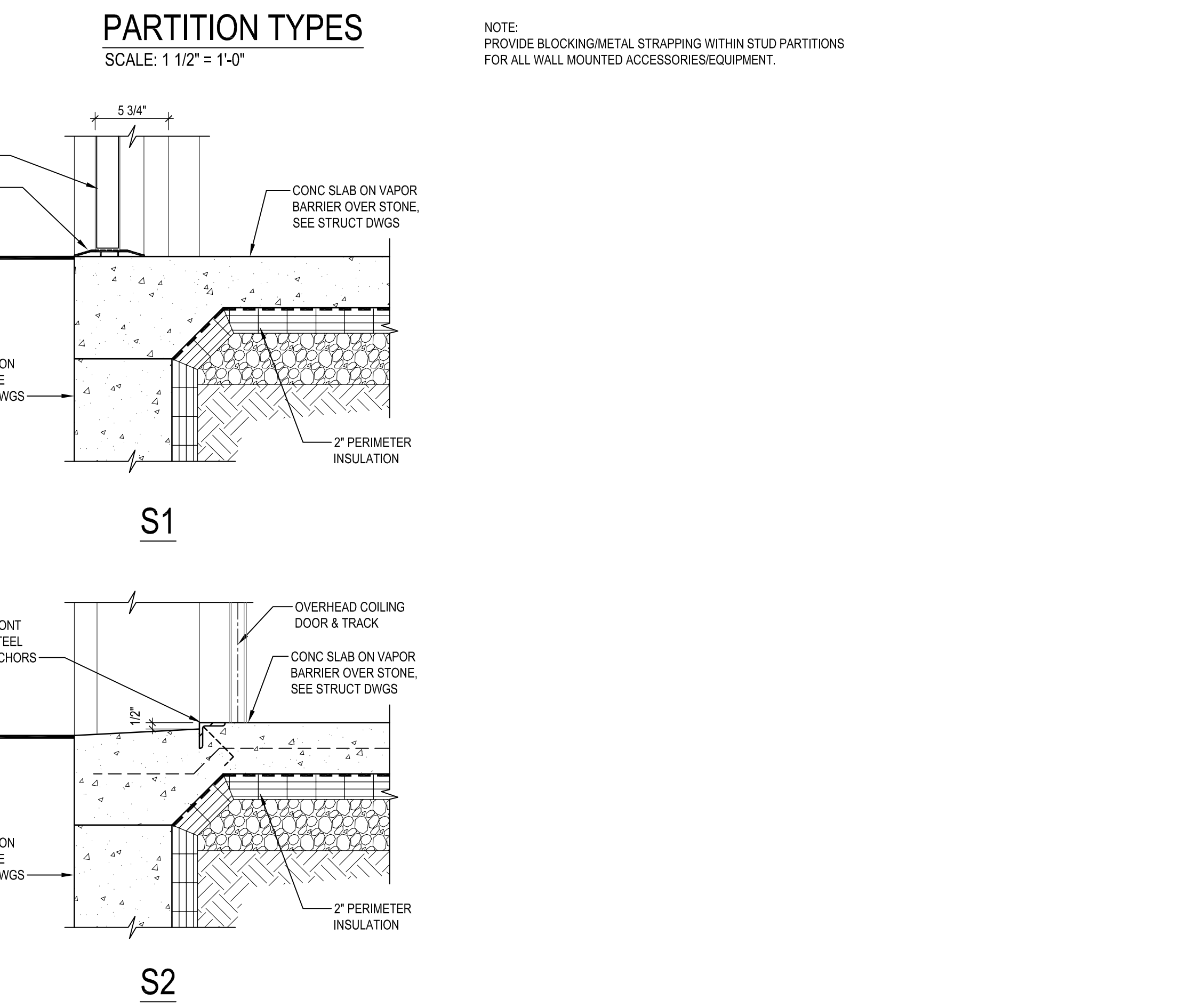
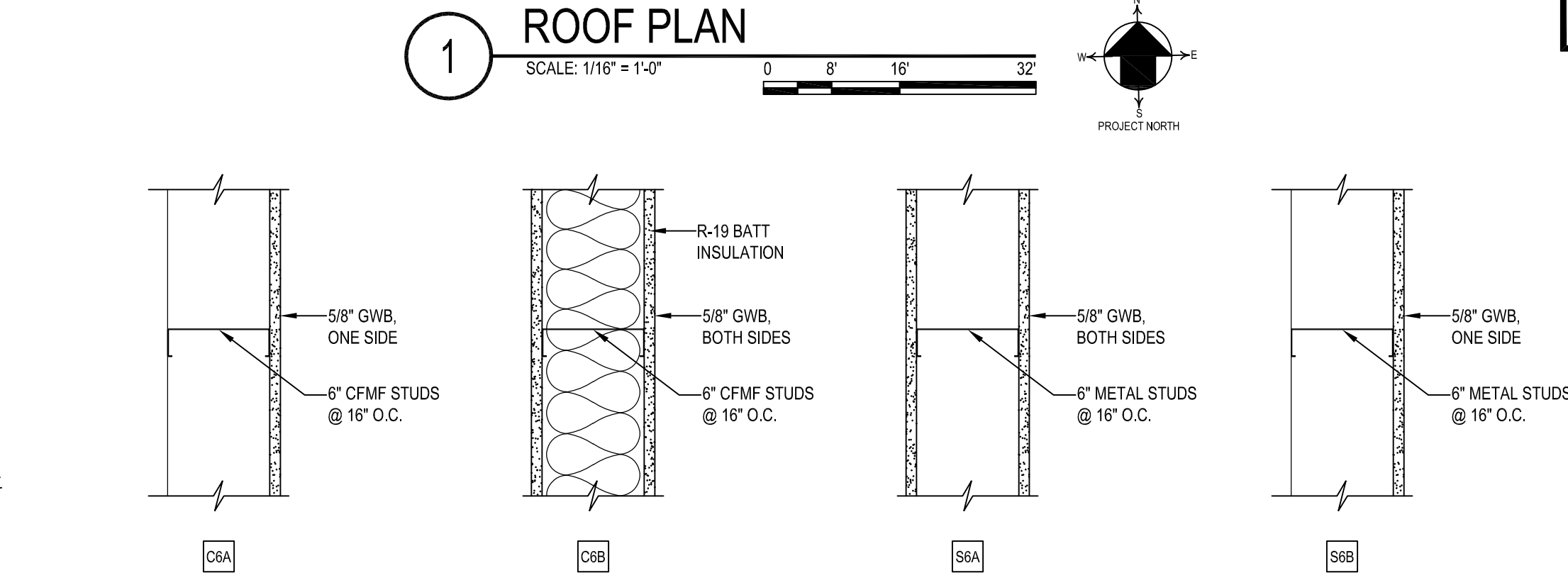
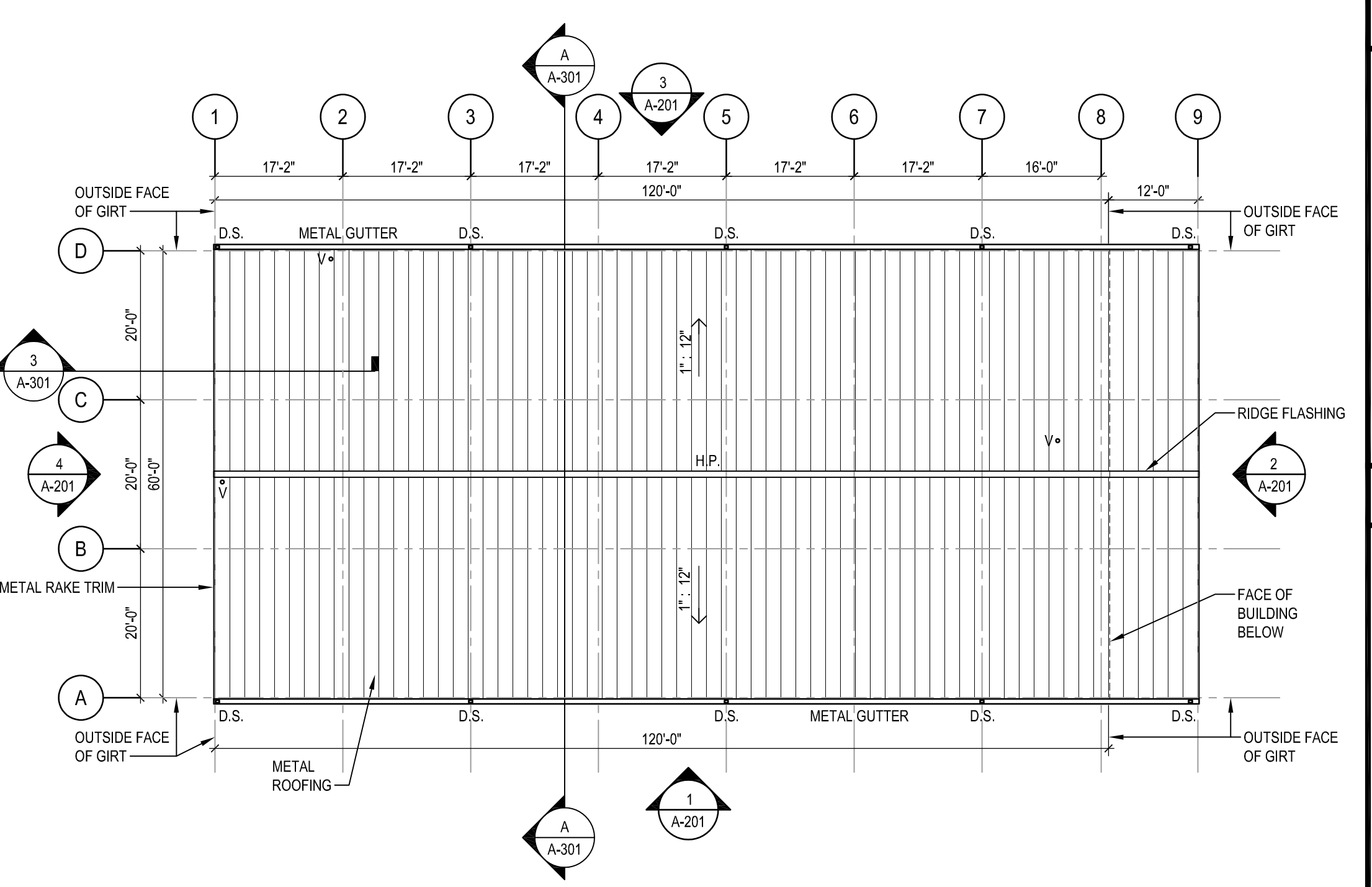
DOOR TYPES
 SCALE: 1/4" = 1'-0"
 CONC SLAB

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

SIGNAGE AT DOOR
 SCALE: 1/4" = 1'-0"



DOOR / FRAME DETAILS
 SCALE: 1 1/2" = 1'-0"



ROOF PLAN
 SCALE: 1/16" = 1'-0"

ROOF PLAN GENERAL NOTES

- DO NOT SCALE DRAWINGS. THE CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND CONDITIONS PRIOR TO THE START OF WORK.
- OWNER TO CONFIRM FINISH COLOR FOR METAL ROOF PANELS, WALL PANELS, TRIM, GUTTERS, AND DOWNSPOUTS.
- ALL METAL ROOF AND WALL PANELS, TRIM, GUTTERS, AND DOWNSPOUTS ARE BY THE PRE-ENGINEERED BUILDING MANUFACTURER.
- ALL DOWNSPOUTS TO SPILL TO GRADE AND BE PROVIDED WITH SPLASH BLOCK.
- CONTRACTOR SHALL VERIFY EXACT SIZE, LOCATION AND QUANTITY OF ALL HVAC, PLUMBING AND ELECTRICAL EQUIPMENT AND PENETRATIONS, AND PROVIDE FLASHING AS PER THE ROOFING MANUFACTURER'S RECOMMENDATIONS AND REQUIREMENTS.
- ROOFING MATERIALS AND ACCESSORIES SHALL BE INSTALLED AS PER MANUFACTURERS RECOMMENDATIONS AND REQUIREMENTS.

ROOF PLAN LEGEND

- - ROOF TOP EQUIPMENT FOR HVAC, PLUMBING AND/OR ELECTRICAL. SEE MEP DRAWINGS FOR ADDITIONAL INFORMATION
- ↘ - DIRECTION OF STRUCTURAL ROOF SLOPE (DOWN)
- ↘ - DIRECTION OF TAPERED INSULATION ROOF SLOPE (DOWN)
- - VENT PIPE
- H.P. - HIGH POINT OF ROOF
- D.S. □ - DOWNSPOUT



MAINTENANCE BUILDING
 10001 US HIGHWAY 70
 LAKELAND, TN 38002
 SHELBY COUNTY
 CITY OF LAKELAND
 10001 US HIGHWAY 70
 LAKELAND, TN 38002



| REVISIONS | MARK | ISSUED DATE | DESCRIPTION |
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PROJECT NO: 81079-04
 ISSUED DATE: 7/31/20
 DRAWN BY: ALH
 CHECKED BY: ALH
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 SHEET TITLE: ROOF PLAN, DOOR SCHEDULE, AND DETAILS
 SHEET NO: A-102

FOR CODE REVIEW ONLY

HEATING, VENTILATION AND AIR CONDITIONING

| ABBREVIATIONS | AIR DEVICES AND COMPONENTS | PIPING SPECIALTIES | PIPING DESIGNATIONS | HVAC GENERAL NOTES | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>A</td><td>ABOVE</td></tr> <tr><td>ACU</td><td>AIR CONDITIONING UNIT</td></tr> <tr><td>AFF</td><td>ABOVE FINISHED FLOOR</td></tr> <tr><td>AFG</td><td>ABOVE FINISHED GRADE</td></tr> <tr><td>AHU</td><td>AIR HANDLING UNIT</td></tr> <tr><td>AMP</td><td>AMPERES</td></tr> <tr><td>APPROX</td><td>APPROXIMATE</td></tr> <tr><td>ARCH</td><td>ARCHITECTURAL</td></tr> <tr><td>ASME</td><td>AMERICAN SOCIETY OF MECH ENG</td></tr> <tr><td>ATC</td><td>AUTOMATIC TEMPERATURE CONTROL</td></tr> <tr><td>AUTO</td><td>AUTOMATIC</td></tr> <tr><td>B</td><td>BACK DRAFT DAMPER</td></tr> <tr><td>BE</td><td>BOTTOM ELEVATION</td></tr> <tr><td>BFG</td><td>BELOW FINISHED GRADE</td></tr> <tr><td>BJ</td><td>BETWEEN JOISTS</td></tr> <tr><td>BLDG</td><td>BUILDING</td></tr> <tr><td>BLW</td><td>BELOW</td></tr> <tr><td>BOD</td><td>BOTTOM OF DUCT</td></tr> <tr><td>BOT</td><td>BOTTOM</td></tr> <tr><td>BTU</td><td>BRITISH THERMAL UNIT</td></tr> <tr><td>C</td><td>CONNECTOR</td></tr> <tr><td>CFM</td><td>CUBIC FEET PER MINUTE</td></tr> <tr><td>CLG</td><td>CEILING</td></tr> <tr><td>CO</td><td>CLEANOUT</td></tr> <tr><td>COD</td><td>CENTER OF DUCT</td></tr> <tr><td>CONC</td><td>CONCRETE</td></tr> <tr><td>COND</td><td>CONDENSATE/CONDENSING</td></tr> <tr><td>CONN</td><td>CONNECT/CONNECTION</td></tr> <tr><td>CONST</td><td>CONSTRUCT/CONSTRUCTION</td></tr> <tr><td>COORD</td><td>COORDINATE</td></tr> <tr><td>CR</td><td>STEAM CONDENSATE RETURN</td></tr> <tr><td>CRACU</td><td>COMPUTER ROOM ACU</td></tr> <tr><td>CU</td><td>CONDENSING UNIT</td></tr> <tr><td>CUH</td><td>CABINET UNIT HEATER</td></tr> <tr><td>CV</td><td>CHECK VALVE</td></tr> <tr><td>CW</td><td>COLD WATER</td></tr> <tr><td>CWR</td><td>CHILLED WATER RETURN</td></tr> <tr><td>CWS</td><td>CHILLED WATER SUPPLY</td></tr> <tr><td>D</td><td>DRY BULB</td></tr> <tr><td>DEG</td><td>DEGREE</td></tr> <tr><td>DEPT</td><td>DEPARTMENT</td></tr> <tr><td>DIA</td><td>DIAMETER</td></tr> <tr><td>DISC</td><td>DISCONNECT</td></tr> <tr><td>DN</td><td>DOWN</td></tr> <tr><td>DR</td><td>DRAIN</td></tr> <tr><td>DR</td><td>DUCT RISER</td></tr> <tr><td>DS</td><td>DUCT SILENCER</td></tr> <tr><td>DSSU</td><td>DUCTLESS SPLIT SYSTEM UNIT</td></tr> <tr><td>DWG</td><td>DRAWING</td></tr> <tr><td>E</td><td>EXHAUST AIR</td></tr> <tr><td>EAT</td><td>ENTERING AIR TEMPERATURE</td></tr> <tr><td>EC</td><td>ELECTRICAL CONTRACTOR</td></tr> <tr><td>EDB</td><td>ENTERING DRY BULB TEMPERATURE</td></tr> <tr><td>EF</td><td>EXHAUST FAN</td></tr> <tr><td>EL</td><td>ELEVATION</td></tr> <tr><td>ELEC</td><td>ELECTRIC(AL)</td></tr> <tr><td>EMER</td><td>EMERGENCY</td></tr> <tr><td>ENCL</td><td>ENCLOSURE</td></tr> <tr><td>EQUIP</td><td>EQUIPMENT</td></tr> <tr><td>ERU</td><td>ENERGY RECOVERY UNIT</td></tr> <tr><td>ESP</td><td>EXTERNAL STATIC PRESSURE</td></tr> <tr><td>ETR</td><td>EXISTING TO REMAIN</td></tr> <tr><td>EWB</td><td>ENTERING WET BULB TEMPERATURE</td></tr> <tr><td>EWT</td><td>ENTERING WATER TEMPERATURE</td></tr> <tr><td>EXH</td><td>EXHAUST/EXHAUSTER</td></tr> <tr><td>EXIST</td><td>EXISTING</td></tr> <tr><td>EXP</td><td>EXPOSED</td></tr> <tr><td>F</td><td>FAHRENHEIT</td></tr> <tr><td>FD</td><td>FIRE DAMPER</td></tr> <tr><td>FLA</td><td>FULL LOAD AMPERES</td></tr> <tr><td>FLEX</td><td>FLEXIBLE</td></tr> <tr><td>FLR</td><td>FLOOR</td></tr> <tr><td>FPM</td><td>FEET PER MINUTE</td></tr> <tr><td>FT</td><td>FOOT/FEET</td></tr> <tr><td>FT HD</td><td>FEET OF HEAD</td></tr> <tr><td>FUT</td><td>FUTURE</td></tr> <tr><td>G</td><td>GROUND</td></tr> <tr><td>GA</td><td>GAUGE/GAGE</td></tr> <tr><td>GAL</td><td>GALLON</td></tr> <tr><td>GALV</td><td>GALVANIC or GALVANIZED</td></tr> <tr><td>GC</td><td>GENERAL CONTRACTOR</td></tr> <tr><td>GEN</td><td>GENERAL</td></tr> <tr><td>GPH</td><td>GALLONS PER HOUR</td></tr> <tr><td>GPM</td><td>GALLONS PER MINUTE</td></tr> <tr><td>GR</td><td>GRILLE</td></tr> <tr><td>GRD</td><td>GRADE</td></tr> <tr><td>H</td><td>HIGH</td></tr> <tr><td>HC</td><td>HEATING (HVAC) CONTRACTOR</td></tr> <tr><td>HDAG</td><td>HEAVY DUTY ARCHITECTURAL GRILLE</td></tr> <tr><td>HGB</td><td>HOT GAS BYPASS</td></tr> <tr><td>HORIZ</td><td>HORIZONTAL</td></tr> <tr><td>HP</td><td>HORSE POWER</td></tr> <tr><td>HPC</td><td>HIGH PRESSURE CONDENSATE</td></tr> <tr><td>HPS</td><td>HIGH PRESSURE STEAM</td></tr> <tr><td>HR</td><td>HOUR</td></tr> <tr><td>HSTAT</td><td>HUMIDISTAT</td></tr> <tr><td>HT</td><td>HEIGHT</td></tr> <tr><td>HTG</td><td>HEATING</td></tr> <tr><td>HWR</td><td>HOT WATER RETURN</td></tr> <tr><td>HWS</td><td>HOT WATER SUPPLY</td></tr> <tr><td>Hz</td><td>HERTZ (FREQUENCY)</td></tr> <tr><td>I</td><td>INSIDE DIAMETER</td></tr> <tr><td>ID</td><td>INSIDE DIAMETER</td></tr> <tr><td>IN OR "</td><td>INCH</td></tr> <tr><td>INT</td><td>INTERIOR</td></tr> <tr><td>INV</td><td>INVERT(ER)</td></tr> <tr><td>ISP</td><td>INTERNAL STATIC PRESSURE</td></tr> <tr><td>IWG</td><td>INCH WATER GAUGE</td></tr> <tr><td>K</td><td>KILOWATT</td></tr> <tr><td>KWH</td><td>KILOWATT HOURS</td></tr> <tr><td>L</td><td>LEAVING AIR TEMPERATURE</td></tr> <tr><td>LAT</td><td>LEAVING AIR TEMPERATURE</td></tr> <tr><td>LB or LBS</td><td>POUND(S)</td></tr> <tr><td>LDB</td><td>LEAVING DRY BULB TEMPERATURE</td></tr> <tr><td>LF</td><td>LINEAR FEET</td></tr> <tr><td>LPC</td><td>LOW PRESSURE CONDENSATE</td></tr> <tr><td>LPS</td><td>LOW PRESSURE STEAM</td></tr> <tr><td>LWB</td><td>LEAVING WET BULB TEMPERATURE</td></tr> <tr><td>LWC</td><td>LOW WATER CUT-OFF</td></tr> <tr><td>LWT</td><td>LEAVING WATER TEMPERATURE</td></tr> <tr><td>M</td><td>MAKE-UP AIR UNIT</td></tr> <tr><td>MAU</td><td>MAKE-UP AIR UNIT</td></tr> <tr><td>MAX</td><td>MAXIMUM</td></tr> <tr><td>MBH</td><td>THOUSAND BTU PER HOUR</td></tr> <tr><td>MC</td><td>MECHANICAL CONTRACTOR</td></tr> <tr><td>MCA</td><td>MINIMUM CIRCUIT AMPACITY</td></tr> <tr><td>MECH</td><td>MECHANICAL</td></tr> <tr><td>MFR</td><td>MANUFACTURER</td></tr> <tr><td>MH</td><td>MANHOLE</td></tr> <tr><td>MIN</td><td>MINIMUM</td></tr> <tr><td>MOD</td><td>MOTOR OPERATED DAMPER (ATC)</td></tr> <tr><td>MPC</td><td>MEDIUM PRESSURE CONDENSATE</td></tr> <tr><td>MPS</td><td>MEDIUM PRESSURE STEAM</td></tr> <tr><td>MTD</td><td>MOUNTED</td></tr> <tr><td>MTG</td><td>MOUNTING</td></tr> <tr><td>MZ</td><td>MULTIZONE</td></tr> <tr><td>N</td><td>NOT APPLICABLE</td></tr> <tr><td>N/A</td><td>NOT APPLICABLE</td></tr> <tr><td>NC</td><td>NOISE CRITERIA</td></tr> <tr><td>NC or N/C</td><td>NORMALLY CLOSED</td></tr> <tr><td>NE or N/E</td><td>NORMAL/EMERGENCY POWER</td></tr> <tr><td>NOT IN CONTRACT</td><td>NOT IN CONTRACT</td></tr> <tr><td>NO</td><td>NUMBER</td></tr> <tr><td>NO or N/O</td><td>NORMALLY OPEN</td></tr> <tr><td>NTS</td><td>NOT TO SCALE</td></tr> <tr><td>O</td><td>OUTSIDE AIR</td></tr> <tr><td>O/A</td><td>OUTSIDE AIR INTAKE</td></tr> <tr><td>DC</td><td>ON CENTER</td></tr> <tr><td>OPNG</td><td>OPENING</td></tr> <tr><td>P</td><td>PLUMBING CONTRACTOR</td></tr> <tr><td>PC</td><td>PLUMBING CONTRACTOR</td></tr> <tr><td>PD</td><td>PRESSURE DROP</td></tr> <tr><td>PH</td><td>PHASE</td></tr> <tr><td>PLBG</td><td>PLUMBING</td></tr> <tr><td>PR</td><td>PIPE RISER</td></tr> <tr><td>PRESS</td><td>PRESSURE</td></tr> <tr><td>PRV</td><td>PRESSURE REDUCING VALVE/PRESSURE RELIEF VENT</td></tr> <tr><td>PSI</td><td>POUNDS PER SQUARE INCH</td></tr> <tr><td>PTIR</td><td>PRESSURE TEMPERATURE RELIEF</td></tr> <tr><td>R</td><td>RADIATION</td></tr> <tr><td>RD</td><td>ROUND</td></tr> <tr><td>REG</td><td>REGISTER</td></tr> <tr><td>REL</td><td>RELIEF AIR</td></tr> <tr><td>RF</td><td>ROOF</td></tr> <tr><td>RLA</td><td>RATED LOAD AMPERES</td></tr> <tr><td>ROOM</td><td>ROOM</td></tr> <tr><td>RPM</td><td>REVOLUTIONS PER MINUTE</td></tr> <tr><td>RTU</td><td>ROOF TOP UNIT</td></tr> <tr><td>RV</td><td>RELIEF VALVE</td></tr> <tr><td>S</td><td>STUB & CAP</td></tr> <tr><td>S&C</td><td>STUB & CAP</td></tr> <tr><td>SAN</td><td>SANITARY</td></tr> <tr><td>SHT</td><td>SHEET</td></tr> <tr><td>SP</td><td>STATIC PRESSURE</td></tr> <tr><td>SPEC</td><td>SPECIFICATIONS</td></tr> <tr><td>SQ</td><td>SQUARE</td></tr> <tr><td>STD</td><td>STANDARD</td></tr> <tr><td>STL</td><td>STEEL</td></tr> <tr><td>STOR</td><td>STORAGE</td></tr> <tr><td>SUSP</td><td>SUSPEND/SUSPENDED</td></tr> <tr><td>SW</td><td>SWITCH</td></tr> <tr><td>T</td><td>TRANSFER DUCT</td></tr> <tr><td>TDH</td><td>TOTAL DYNAMIC HEAD</td></tr> <tr><td>TE</td><td>TOP ELEVATION</td></tr> <tr><td>TEMP</td><td>TEMPERATURE</td></tr> <tr><td>THRU</td><td>THROUGH</td></tr> <tr><td>TJ</td><td>THROUGH JOISTS</td></tr> <tr><td>TSP</td><td>TOTAL STATIC PRESSURE</td></tr> <tr><td>TSTAT</td><td>THERMOSTAT</td></tr> <tr><td>TYP</td><td>TYPICAL</td></tr> <tr><td>U</td><td>UNDER ELECTRICAL</td></tr> <tr><td>UE</td><td>UNDER ELECTRICAL</td></tr> <tr><td>UG</td><td>UNDER GENERAL</td></tr> <tr><td>UH</td><td>UNIT HEATER, UNDER HVAC</td></tr> <tr><td>UNO</td><td>UNLESS NOTED OTHERWISE</td></tr> <tr><td>UP</td><td>UNDER PLUMBING</td></tr> <tr><td>UV</td><td>UNIT VENTILATOR</td></tr> <tr><td>V</td><td>VARIABLE AIR VOLUME</td></tr> <tr><td>VAV</td><td>VARIABLE AIR VOLUME</td></tr> <tr><td>VD</td><td>VOLUME DAMPER (MANUAL)</td></tr> <tr><td>VFD</td><td>VARIABLE FREQUENCY DRIVE</td></tr> <tr><td>VI</td><td>VIBRATION ISOLATOR</td></tr> <tr><td>VR</td><td>VENT RISER</td></tr> <tr><td>VTR</td><td>VENT THROUGH ROOF</td></tr> <tr><td>W</td><td>WATT</td></tr> <tr><td>W</td><td>WATT</td></tr> <tr><td>W/</td><td>WITH</td></tr> <tr><td>W/O</td><td>WITHOUT</td></tr> <tr><td>WB</td><td>WET BULB</td></tr> <tr><td>WG</td><td>WATER GAUGE</td></tr> <tr><td>WL</td><td>WEATHER LOUVER</td></tr> <tr><td>WP</td><td>WEATHERPROOF</td></tr> <tr><td>WPD</td><td>WATER PRESSURE DROP</td></tr> <tr><td>WT</td><td>WEIGHT</td></tr> <tr><td>WTD</td><td>WATER TEMPERATURE DROP</td></tr> <tr><td>WTR</td><td>WATER TEMPERATURE RISE</td></tr> <tr><td>X</td><td>TRANSFORMER</td></tr> <tr><td>XFMR</td><td>TRANSFORMER</td></tr> </table> | A | ABOVE | ACU | AIR CONDITIONING UNIT | AFF | ABOVE FINISHED FLOOR | AFG | ABOVE FINISHED GRADE | AHU | AIR HANDLING UNIT | AMP | AMPERES | APPROX | APPROXIMATE | ARCH | ARCHITECTURAL | ASME | AMERICAN SOCIETY OF MECH ENG | ATC | AUTOMATIC TEMPERATURE CONTROL | AUTO | AUTOMATIC | B | BACK DRAFT DAMPER | BE | BOTTOM ELEVATION | BFG | BELOW FINISHED GRADE | BJ | BETWEEN JOISTS | BLDG | BUILDING | BLW | BELOW | BOD | BOTTOM OF DUCT | BOT | BOTTOM | BTU | BRITISH THERMAL UNIT | C | CONNECTOR | CFM | CUBIC FEET PER MINUTE | CLG | CEILING | CO | CLEANOUT | COD | CENTER OF DUCT | CONC | CONCRETE | COND | CONDENSATE/CONDENSING | CONN | CONNECT/CONNECTION | CONST | CONSTRUCT/CONSTRUCTION | COORD | COORDINATE | CR | STEAM CONDENSATE RETURN | CRACU | COMPUTER ROOM ACU | CU | CONDENSING UNIT | CUH | CABINET UNIT HEATER | CV | CHECK VALVE | CW | COLD WATER | CWR | CHILLED WATER RETURN | CWS | CHILLED WATER SUPPLY | D | DRY BULB | DEG | DEGREE | DEPT | DEPARTMENT | DIA | DIAMETER | DISC | DISCONNECT | DN | DOWN | DR | DRAIN | DR | DUCT RISER | DS | DUCT SILENCER | DSSU | DUCTLESS SPLIT SYSTEM UNIT | DWG | DRAWING | E | EXHAUST AIR | EAT | ENTERING AIR TEMPERATURE | EC | ELECTRICAL CONTRACTOR | EDB | ENTERING DRY BULB TEMPERATURE | EF | EXHAUST FAN | EL | ELEVATION | ELEC | ELECTRIC(AL) | EMER | EMERGENCY | ENCL | ENCLOSURE | EQUIP | EQUIPMENT | ERU | ENERGY RECOVERY UNIT | ESP | EXTERNAL STATIC PRESSURE | ETR | EXISTING TO REMAIN | EWB | ENTERING WET BULB TEMPERATURE | EWT | ENTERING WATER TEMPERATURE | EXH | EXHAUST/EXHAUSTER | EXIST | EXISTING | EXP | EXPOSED | F | FAHRENHEIT | FD | FIRE DAMPER | FLA | FULL LOAD AMPERES | FLEX | FLEXIBLE | FLR | FLOOR | FPM | FEET PER MINUTE | FT | FOOT/FEET | FT HD | FEET OF HEAD | FUT | FUTURE | G | GROUND | GA | GAUGE/GAGE | GAL | GALLON | GALV | GALVANIC or GALVANIZED | GC | GENERAL CONTRACTOR | GEN | GENERAL | GPH | GALLONS PER HOUR | GPM | GALLONS PER MINUTE | GR | GRILLE | GRD | GRADE | H | HIGH | HC | HEATING (HVAC) CONTRACTOR | HDAG | HEAVY DUTY ARCHITECTURAL GRILLE | HGB | HOT GAS BYPASS | HORIZ | HORIZONTAL | HP | HORSE POWER | HPC | HIGH PRESSURE CONDENSATE | HPS | HIGH PRESSURE STEAM | HR | HOUR | HSTAT | HUMIDISTAT | HT | HEIGHT | HTG | HEATING | HWR | HOT WATER RETURN | HWS | HOT WATER SUPPLY | Hz | HERTZ (FREQUENCY) | I | INSIDE DIAMETER | ID | INSIDE DIAMETER | IN OR " | INCH | INT | INTERIOR | INV | INVERT(ER) | ISP | INTERNAL STATIC PRESSURE | IWG | INCH WATER GAUGE | K | KILOWATT | KWH | KILOWATT HOURS | L | LEAVING AIR TEMPERATURE | LAT | LEAVING AIR TEMPERATURE | LB or LBS | POUND(S) | LDB | LEAVING DRY BULB TEMPERATURE | LF | LINEAR FEET | LPC | LOW PRESSURE CONDENSATE | LPS | LOW PRESSURE STEAM | LWB | LEAVING WET BULB TEMPERATURE | LWC | LOW WATER CUT-OFF | LWT | LEAVING WATER TEMPERATURE | M | MAKE-UP AIR UNIT | MAU | MAKE-UP AIR UNIT | MAX | MAXIMUM | MBH | THOUSAND BTU PER HOUR | MC | MECHANICAL CONTRACTOR | MCA | MINIMUM CIRCUIT AMPACITY | MECH | MECHANICAL | MFR | MANUFACTURER | MH | MANHOLE | MIN | MINIMUM | MOD | MOTOR OPERATED DAMPER (ATC) | MPC | MEDIUM PRESSURE CONDENSATE | MPS | MEDIUM PRESSURE STEAM | MTD | MOUNTED | MTG | MOUNTING | MZ | MULTIZONE | N | NOT APPLICABLE | N/A | NOT APPLICABLE | NC | NOISE CRITERIA | NC or N/C | NORMALLY CLOSED | NE or N/E | NORMAL/EMERGENCY POWER | NOT IN CONTRACT | NOT IN CONTRACT | NO | NUMBER | NO or N/O | NORMALLY OPEN | NTS | NOT TO SCALE | O | OUTSIDE AIR | O/A | OUTSIDE AIR INTAKE | DC | ON CENTER | OPNG | OPENING | P | PLUMBING CONTRACTOR | PC | PLUMBING CONTRACTOR | PD | PRESSURE DROP | PH | PHASE | PLBG | PLUMBING | PR | PIPE RISER | PRESS | PRESSURE | PRV | PRESSURE REDUCING VALVE/PRESSURE RELIEF VENT | PSI | POUNDS PER SQUARE INCH | PTIR | PRESSURE TEMPERATURE RELIEF | R | RADIATION | RD | ROUND | REG | REGISTER | REL | RELIEF AIR | RF | ROOF | RLA | RATED LOAD AMPERES | ROOM | ROOM | RPM | REVOLUTIONS PER MINUTE | RTU | ROOF TOP UNIT | RV | RELIEF VALVE | S | STUB & CAP | S&C | STUB & CAP | SAN | SANITARY | SHT | SHEET | SP | STATIC PRESSURE | SPEC | SPECIFICATIONS | SQ | SQUARE | STD | STANDARD | STL | STEEL | STOR | STORAGE | SUSP | SUSPEND/SUSPENDED | SW | SWITCH | T | TRANSFER DUCT | TDH | TOTAL DYNAMIC HEAD | TE | TOP ELEVATION | TEMP | TEMPERATURE | THRU | THROUGH | TJ | THROUGH JOISTS | TSP | TOTAL STATIC PRESSURE | TSTAT | THERMOSTAT | TYP | TYPICAL | U | UNDER ELECTRICAL | UE | UNDER ELECTRICAL | UG | UNDER GENERAL | UH | UNIT HEATER, UNDER HVAC | UNO | UNLESS NOTED OTHERWISE | UP | UNDER PLUMBING | UV | UNIT VENTILATOR | V | VARIABLE AIR VOLUME | VAV | VARIABLE AIR VOLUME | VD | VOLUME DAMPER (MANUAL) | VFD | VARIABLE FREQUENCY DRIVE | VI | VIBRATION ISOLATOR | VR | VENT RISER | VTR | VENT THROUGH ROOF | W | WATT | W | WATT | W/ | WITH | W/O | WITHOUT | WB | WET BULB | WG | WATER GAUGE | WL | WEATHER LOUVER | WP | WEATHERPROOF | WPD | WATER PRESSURE DROP | WT | WEIGHT | WTD | WATER TEMPERATURE DROP | WTR | WATER TEMPERATURE RISE | X | TRANSFORMER | XFMR | TRANSFORMER | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th colspan="2">SINGLE LINE</th><th colspan="2">DOUBLE LINE</th></tr> <tr><td></td><td>SUPPLY/OUTSIDE AIR DUCT</td><td></td><td>RETURN/RELIEF AIR DUCT</td></tr> <tr><td></td><td>EXHAUST AIR DUCT</td><td></td><td>SUPPLY/OUTSIDE AIR DUCT ELBOW (UP AND DOWN)</td></tr> <tr><td></td><td>RETURN/RELIEF DUCT BELOW (UP AND DOWN)</td><td></td><td>EXHAUST DUCT BELOW (UP AND DOWN)</td></tr> <tr><td></td><td>RECTANGULAR OR SQUARE DUCT (SIZE IN INCHES)</td><td></td><td>ROUND DUCT (SIZE IN INCHES)</td></tr> <tr><td></td><td>FLAT OVAL DUCT (SIZE IN INCHES)</td><td></td><td>ROUND OR FLAT OVAL DUCT (UP)</td></tr> <tr><td></td><td>ROUND OR FLAT OVAL DUCT (DOWN)</td><td></td><td>MITERED ELBOW W/ TURNING VANES</td></tr> <tr><td></td><td>RADIUS ELBOW</td><td></td><td>TRANSITION-CONCENTRIC</td></tr> <tr><td></td><td>TRANSITION-ECCENTRIC</td><td></td><td>MANUAL VOLUME DAMPER</td></tr> <tr><td></td><td>INCLINED RISE(R) OR DROP(D) ARROW IN DIRECTION OF AIR FLOW</td><td></td><td>RECTANGULAR BRANCH TAKE OFF</td></tr> <tr><td></td><td>ROUND BRANCH TAKE OFF</td><td></td><td>DUCT-MOUNTED REHEAT COIL</td></tr> <tr><td></td><td>FLEXIBLE DUCT</td><td></td><td>FLEXIBLE CONNECTION</td></tr> <tr><td></td><td>DUCT SILENCER</td><td></td><td>DUCT ACCESS DOORS</td></tr> <tr><td></td><td>SUPPLY DIFFUSER</td><td></td><td>RETURN REGISTER/GRILLE</td></tr> <tr><td></td><td>EXHAUST REGISTER/GRILLE</td><td></td><td>FIRE DAMPER (HORIZONTAL/ VERTICAL)</td></tr> <tr><td></td><td>SMOKE DAMPER</td><td></td><td>BACK DRAFT DAMPER</td></tr> <tr><td></td><td>DUCT MOUNTED SMOKE DETECTOR</td><td></td><td>DUCT MOUNTED HUMIDIFIER</td></tr> <tr><td></td><td>DUCT MOUNTED PRESSURE SENSOR</td><td></td><td>HVAC CONTROLS</td></tr> </table> | SINGLE LINE | | DOUBLE LINE | | | SUPPLY/OUTSIDE AIR DUCT | | RETURN/RELIEF AIR DUCT | | EXHAUST AIR DUCT | | SUPPLY/OUTSIDE AIR DUCT ELBOW (UP AND DOWN) | | RETURN/RELIEF DUCT BELOW (UP AND DOWN) | | EXHAUST DUCT BELOW (UP AND DOWN) | | RECTANGULAR OR SQUARE DUCT (SIZE IN INCHES) | | ROUND DUCT (SIZE IN INCHES) | | FLAT OVAL DUCT (SIZE IN INCHES) | | ROUND OR FLAT OVAL DUCT (UP) | | ROUND OR FLAT OVAL DUCT (DOWN) | | MITERED ELBOW W/ TURNING VANES | | RADIUS ELBOW | | TRANSITION-CONCENTRIC | | TRANSITION-ECCENTRIC | | MANUAL VOLUME DAMPER | | INCLINED RISE(R) OR DROP(D) ARROW IN DIRECTION OF AIR FLOW | | RECTANGULAR BRANCH TAKE OFF | | ROUND BRANCH TAKE OFF | | DUCT-MOUNTED REHEAT COIL | | FLEXIBLE DUCT | | FLEXIBLE CONNECTION | | DUCT SILENCER | | DUCT ACCESS DOORS | | SUPPLY DIFFUSER | | RETURN REGISTER/GRILLE | | EXHAUST REGISTER/GRILLE | | FIRE DAMPER (HORIZONTAL/ VERTICAL) | | SMOKE DAMPER | | BACK DRAFT DAMPER | | DUCT MOUNTED SMOKE DETECTOR | | DUCT MOUNTED HUMIDIFIER | | DUCT MOUNTED PRESSURE SENSOR | | HVAC CONTROLS | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td></td><td>PIPE ANCHOR</td></tr> <tr><td></td><td>STUB AND CAP</td></tr> <tr><td></td><td>PIPE DROP</td></tr> <tr><td></td><td>PIPE RISE</td></tr> <tr><td></td><td>PIPE TEE OFF BOTTOM</td></tr> <tr><td></td><td>REDUCER</td></tr> <tr><td></td><td>UNION</td></tr> <tr><td></td><td>PRESSURE/ TEMPERATURE TEST FITTING</td></tr> <tr><td></td><td>ALIGNMENT GUIDE</td></tr> <tr><td></td><td>EXPANSION JOINT W/ ALIGNMENT GUIDES</td></tr> <tr><td></td><td>FLEXIBLE CONNECTOR</td></tr> <tr><td></td><td>EXPANSION COMPENSATOR</td></tr> <tr><td></td><td>STRAINER W/HOSE END BLOW OFF VALVE</td></tr> <tr><td></td><td>STRAINER</td></tr> <tr><td></td><td>PUMP</td></tr> <tr><td></td><td>STEAM TRAP</td></tr> <tr><td></td><td>AUTOMATIC AIR VENT</td></tr> <tr><td></td><td>MANUAL AIR VENT</td></tr> <tr><td></td><td>TWO WAY ATC VALVE</td></tr> <tr><td></td><td>THREE WAY ATC VALVE</td></tr> <tr><td></td><td>BALANCING VALVE</td></tr> <tr><td></td><td>BALL VALVE</td></tr> <tr><td></td><td>BUTTERFLY VALVE</td></tr> <tr><td></td><td>CHECK VALVE</td></tr> <tr><td></td><td>DRAIN VALVE</td></tr> <tr><td></td><td>SHUT OFF VALVE</td></tr> <tr><td></td><td>NEEDLE VALVE</td></tr> <tr><td></td><td>PLUG VALVE</td></tr> <tr><td></td><td>PRESSURE REDUCING VALVE</td></tr> <tr><td></td><td>PRESSURE REGULATOR VALVE</td></tr> <tr><td></td><td>PRESSURE RELIEF VALVE</td></tr> <tr><td></td><td>SAFETY RELIEF VALVE</td></tr> <tr><td></td><td>SOLENOID VALVE</td></tr> <tr><td></td><td>STOP CHECK VALVE</td></tr> <tr><td></td><td>THROTTLE VALVE</td></tr> <tr><td></td><td>BACKFLOW PREVENTER</td></tr> <tr><td></td><td>HOT WATER TEMPER VALVE</td></tr> <tr><td></td><td>THERMOMETER</td></tr> <tr><td></td><td>PRESSURE GAUGE W/NEEDLE VALVE & SNUBBER (WATER, AIR, GAS)</td></tr> <tr><td></td><td>PRESSURE GAUGE WITH SIPHON</td></tr> <tr><td></td><td>OS & Y W/ TAMPER SWITCH & FLOW INDICATOR</td></tr> <tr><td></td><td>PRESSURE SENSOR</td></tr> <tr><td></td><td>OS & Y SUPERVISORY SWITCH</td></tr> <tr><td></td><td>FLOW DETECTOR SWITCH</td></tr> </table> | | PIPE ANCHOR | | STUB AND CAP | | PIPE DROP | | PIPE RISE | | PIPE TEE OFF BOTTOM | | REDUCER | | UNION | | PRESSURE/ TEMPERATURE TEST FITTING | | ALIGNMENT GUIDE | | EXPANSION JOINT W/ ALIGNMENT GUIDES | | FLEXIBLE CONNECTOR | | EXPANSION COMPENSATOR | | STRAINER W/HOSE END BLOW OFF VALVE | | STRAINER | | PUMP | | STEAM TRAP | | AUTOMATIC AIR VENT | | MANUAL AIR VENT | | TWO WAY ATC VALVE | | THREE WAY ATC VALVE | | BALANCING VALVE | | BALL VALVE | | BUTTERFLY VALVE | | CHECK VALVE | | DRAIN VALVE | | SHUT OFF VALVE | | NEEDLE VALVE | | PLUG VALVE | | PRESSURE REDUCING VALVE | | PRESSURE REGULATOR VALVE | | PRESSURE RELIEF VALVE | | SAFETY RELIEF VALVE | | SOLENOID VALVE | | STOP CHECK VALVE | | THROTTLE VALVE | | BACKFLOW PREVENTER | | HOT WATER TEMPER VALVE | | THERMOMETER | | PRESSURE GAUGE W/NEEDLE VALVE & SNUBBER (WATER, AIR, GAS) | | PRESSURE GAUGE WITH SIPHON | | OS & Y W/ TAMPER SWITCH & FLOW INDICATOR | | PRESSURE SENSOR | | OS & Y SUPERVISORY SWITCH | | FLOW DETECTOR SWITCH | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th colspan="2">PIPING DESIGNATIONS</th></tr> <tr><td></td><td>CHILLED WATER SUPPLY</td></tr> <tr><td></td><td>CHILLED WATER RETURN</td></tr> <tr><td></td><td>WATER LOOP SUPPLY</td></tr> <tr><td></td><td>WATER LOOP RETURN</td></tr> <tr><td></td><td>HOT WATER SUPPLY (LOW TEMPERATURE)</td></tr> <tr><td></td><td>HOT WATER RETURN (LOW TEMPERATURE)</td></tr> <tr><td></td><td>MEDIUM TEMPERATURE HOT WATER SUPPLY</td></tr> <tr><td></td><td>MEDIUM TEMPERATURE HOT WATER RETURN</td></tr> <tr><td></td><td>HIGH TEMPERATURE WATER SUPPLY</td></tr> <tr><td></td><td>HIGH TEMPERATURE WATER RETURN</td></tr> <tr><td></td><td>CONDENSATE DRAIN</td></tr> <tr><td></td><td>NATURAL GAS, LOW PRESSURE</td></tr> <tr><td></td><td>GAS VENT</td></tr> <tr><td></td><td>STEAM</td></tr> <tr><td></td><td>STEAM CONDENSATE SUPPLY</td></tr> <tr><td></td><td>STEAM CONDENSATE RETURN</td></tr> <tr><td></td><td>LOW PRESSURE STEAM SUPPLY</td></tr> <tr><td></td><td>LOW PRESSURE STEAM RETURN</td></tr> <tr><td></td><td>MEDIUM PRESSURE STEAM SUPPLY</td></tr> <tr><td></td><td>MEDIUM PRESSURE STEAM RETURN</td></tr> <tr><td></td><td>HIGH PRESSURE STEAM SUPPLY</td></tr> <tr><td></td><td>HIGH PRESSURE STEAM RETURN</td></tr> <tr><td></td><td>LOW PRESSURE CONDENSATE</td></tr> <tr><td></td><td>MEDIUM PRESSURE CONDENSATE</td></tr> <tr><td></td><td>HIGH PRESSURE CONDENSATE</td></tr> <tr><td></td><td>BOILER BLOW DOWN</td></tr> <tr><td></td><td>PUMPED CONDENSATE</td></tr> <tr><td></td><td>VACUUM PUMP DISCHARGE</td></tr> <tr><td></td><td>MAKEUP WATER</td></tr> <tr><td></td><td>ATMOSPHERIC VENT (STEAM OR HW)</td></tr> <tr><td></td><td>FUEL OIL DISCHARGE</td></tr> <tr><td></td><td>FUEL OIL GAUGE</td></tr> <tr><td></td><td>FUEL OIL SUPPLY</td></tr> <tr><td></td><td>FUEL OIL RETURN</td></tr> <tr><td></td><td>FUEL OIL VENT</td></tr> <tr><td></td><td>COMPRESSED AIR</td></tr> <tr><td></td><td>REFRIGERANT DISCHARGE</td></tr> <tr><td></td><td>REFRIGERANT SUCTION</td></tr> <tr><td></td><td>REFRIGERANT LIQUID</td></tr> <tr><td></td><td>FILL LINE</td></tr> <tr><td></td><td>HUMIDIFICATION LINE</td></tr> <tr><td></td><td>VACUUM (AIR)</td></tr> <tr><td></td><td>WET VACUUM CLEANING</td></tr> <tr><td></td><td>DRY VACUUM CLEANING</td></tr> <tr><td></td><td>MEDICAL VACUUM</td></tr> <tr><td></td><td>SURGICAL VACUUM</td></tr> <tr><td></td><td>LABORATORY VACUUM</td></tr> <tr><td></td><td>HOT/CHILLED WATER SUPPLY</td></tr> <tr><td></td><td>HOT/CHILLED WATER RETURN</td></tr> </table> | PIPING DESIGNATIONS | | | CHILLED WATER SUPPLY | | CHILLED WATER RETURN | | WATER LOOP SUPPLY | | WATER LOOP RETURN | | HOT WATER SUPPLY (LOW TEMPERATURE) | | HOT WATER RETURN (LOW TEMPERATURE) | | MEDIUM TEMPERATURE HOT WATER SUPPLY | | MEDIUM TEMPERATURE HOT WATER RETURN | | HIGH TEMPERATURE WATER SUPPLY | | HIGH TEMPERATURE WATER RETURN | | CONDENSATE DRAIN | | NATURAL GAS, LOW PRESSURE | | GAS VENT | | STEAM | | STEAM CONDENSATE SUPPLY | | STEAM CONDENSATE RETURN | | LOW PRESSURE STEAM SUPPLY | | LOW PRESSURE STEAM RETURN | | MEDIUM PRESSURE STEAM SUPPLY | | MEDIUM PRESSURE STEAM RETURN | | HIGH PRESSURE STEAM SUPPLY | | HIGH PRESSURE STEAM RETURN | | LOW PRESSURE CONDENSATE | | MEDIUM PRESSURE CONDENSATE | | HIGH PRESSURE CONDENSATE | | BOILER BLOW DOWN | | PUMPED CONDENSATE | | VACUUM PUMP DISCHARGE | | MAKEUP WATER | | ATMOSPHERIC VENT (STEAM OR HW) | | FUEL OIL DISCHARGE | | FUEL OIL GAUGE | | FUEL OIL SUPPLY | | FUEL OIL RETURN | | FUEL OIL VENT | | COMPRESSED AIR | | REFRIGERANT DISCHARGE | | REFRIGERANT SUCTION | | REFRIGERANT LIQUID | | FILL LINE | | HUMIDIFICATION LINE | | VACUUM (AIR) | | WET VACUUM CLEANING | | DRY VACUUM CLEANING | | MEDICAL VACUUM | | SURGICAL VACUUM | | LABORATORY VACUUM | | HOT/CHILLED WATER SUPPLY | | HOT/CHILLED WATER RETURN | <p>HVAC GENERAL NOTES</p> <ol style="list-style-type: none"> A. ALL DIMENSIONS, DUCT SIZES AND PIPE SIZES ARE IN INCHES UNLESS NOTED OTHERWISE. ALL DUCT DIMENSIONS ARE INSIDE DIMENSIONS. B. COORDINATE WALL, ROOF, FLOOR AND CEILING OPENINGS FOR NEW PIPE AND DUCT RISERS AND CONDUIT PENETRATIONS. PROVIDE SLEEVES AROUND PIPES AND DUCTS THROUGH ALL FLOORS/CEILINGS/WALLS/PARTITIONS. C. FIELD VERIFY AND COORDINATE DUCTWORK AND PROVIDE OFFSETS TO ACCOMMODATE DUCTWORK THROUGH/BETWEEN JOISTS, BETWEEN BEAMS AND EXISTING BUILDING STRUCTURE, WALL STUDS, ETC. AT NO ADDITIONAL COST. EQUIPMENT, APPLIANCES, ETC.; STRUCTURAL JOISTS, BEAMS, ETC.; AND LIGHTING FIXTURES, ELECTRICAL EQUIPMENT; ETC. WHERE SHOWN ARE FOR REFERENCE ONLY. VERIFY AND COORDINATE IN FIELD. REFER TO RESPECTIVE DRAWINGS. E. ALL EQUIPMENT, PIPING AND DUCTWORK SHALL BE SUPPORTED FROM JOIST/TRUSS TOP CHORD, UNLESS OTHERWISE NOTED. DO NOT SUPPORT ANYTHING FROM ROOF DECK. F. ALL PIPING AND DUCTWORK IN AREAS WITH CEILINGS SHALL BE RUN CONCEALED ABOVE ACoustICAL OR PLASTER CEILING UNLESS OTHERWISE NOTED. G. ALL OPENINGS IN DUCTS, PIPES OR FITTINGS SHALL BE KEPT PLUGGED OR CAPPED UNTIL CONNECTED. H. INSTALL SUFFICIENT NUMBER OF UNIONS/FLANGES IN ALL PIPE LINES TO ALLOW REMOVAL OF PIPES WITHOUT BREAKING FITTINGS. I. RUNOUTS TO EQUIPMENT SHALL BE RUN IN SIZES INDICATED AND INCREASED OR REDUCED AT POINT OF FINAL CONNECTION TO EQUIPMENT. J. THE DRAWINGS ARE DIAGRAMATIC AND INDICATE THE APPROXIMATE ARRANGEMENT OF THE SYSTEMS. THE CONTRACTOR SHALL FIELD VERIFY EXACT INFORMATION, DIMENSIONS, LOCATIONS, ETC. AS NECESSARY AND COORDINATE WORK ACCORDINGLY. NOT ALL INFORMATION IS SHOWN. K. CONNECT & EXTEND CONDENSATE DRAIN PIPING FROM EACH SSS, DOAS, MBC, SBC, ETC. TO DESIGNATED FUNNEL DRAINS ONLY. PROVIDE MINIMUM 1" PIPE SIZE AND 2 PERCENT SLOPE FOR GRAVITY DRAINS AND 1 PERCENT SLOPE FOR PUMPED DRAINS. L. REFER TO ALL CONTRACT DOCUMENTS FOR ADDITIONAL REQUIREMENTS AND COORDINATE WORK ACCORDINGLY. M. REFER TO STRUCTURAL DRAWINGS FOR REQUIREMENTS FOR OPENING REINFORCEMENT, EQUIPMENT SUPPORTS, LINTELS AND CONCRETE PADS UNLESS OTHERWISE INDICATED. N. ALL FLOOR MOUNTED EQUIPMENT AND APPURTENANCES SHALL HAVE MINIMUM 6" THICK CONCRETE HOUSEKEEPING PAD WHETHER SHOWN OR NOT. SEE DETAILS ON MECHANICAL AND STRUCTURAL DRAWINGS. O. PROVIDE FULL ROOF OPENING SIZE DUCT DROP FROM EACH EXHAUST FAN, RELIEF VENTILATOR, INTAKE PENTHOUSE, ETC. WITH MOISTURE TRAP. ALL TAKE-OFFS ARE FROM SIDE OF THE DROP. P. DO NOT INSTALL PIPING, DUCTWORK OR EQUIPMENT OVER ELECTRICAL EQUIPMENT. PROVIDE REQUIRED CLEARANCES FOR ALL ELECTRICAL EQUIPMENT PER NEC. COORDINATE LOCATIONS OF DUCTWORK, PIPING AND EQUIPMENT ABOVE CEILINGS WITH CABLE TRAYS. Q. WHERE DUCTWORK PASSES THROUGH FIRE RATED FLOORS OR WALLS (INCLUDING EXHAUST DUCTWORK), HVAC CONTRACTOR SHALL PROVIDE FUSIBLE LINK FIRE DAMPER PROVIDE MINIMUM 18x18 ACCESS PANELS AT ALL FIRE DAMPERS AND FIRE/SMOKE DAMPERS. R. PROVIDE MINIMUM 12x12 ACCESS DOOR IN NEW DUCTWORK 20"-0" ON CENTER FOR DUCT CLEANING PURPOSE. S. MAXIMUM LENGTH OF FLEXIBLE DUCTWORK SHALL BE 2'-0", ONLY WHERE SHOWN. T. CONNECT ALL DUCTS TO MECHANICAL EQUIPMENT BY FLEXIBLE DUCT CONNECTORS WITH NO LESS THAN 3" SPACING BETWEEN DUCT AND EQUIPMENT. U. COORDINATE FINAL LOCATION OF ALL CEILING GRILLES AND DIFFUSERS WITH CEILING LAYOUT, LIGHTING, SPRINKLERS AND OTHER CEILING MOUNTED ITEMS. REFER TO REFLECTED CEILING PLANS ON ARCHITECTURAL DRAWINGS. V. SHOULD THE DRAWINGS DISAGREE WITH ONE ANOTHER OR WITH THE SPECIFICATIONS, THE BETTER QUALITY OR GREATER QUANTITY OF WORK OR MATERIALS SHALL BE PERFORMED OR PROVIDED. |
| A | ABOVE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ACU | AIR CONDITIONING UNIT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| AFF | ABOVE FINISHED FLOOR | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| AFG | ABOVE FINISHED GRADE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| HPS | HIGH PRESSURE STEAM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| HSTAT | HUMIDISTAT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| HTG | HEATING | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HWR | HOT WATER RETURN | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HWS | HOT WATER SUPPLY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hz | HERTZ (FREQUENCY) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| I | INSIDE DIAMETER | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| MC | MECHANICAL CONTRACTOR | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MCA | MINIMUM CIRCUIT AMPACITY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| | SUPPLY/OUTSIDE AIR DUCT | | RETURN/RELIEF AIR DUCT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| | RETURN/RELIEF DUCT BELOW (UP AND DOWN) | | EXHAUST DUCT BELOW (UP AND DOWN) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | RECTANGULAR OR SQUARE DUCT (SIZE IN INCHES) | | ROUND DUCT (SIZE IN INCHES) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | FLAT OVAL DUCT (SIZE IN INCHES) | | ROUND OR FLAT OVAL DUCT (UP) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ROUND OR FLAT OVAL DUCT (DOWN) | | MITERED ELBOW W/ TURNING VANES | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | RADIUS ELBOW | | TRANSITION-CONCENTRIC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | TRANSITION-ECCENTRIC | | MANUAL VOLUME DAMPER | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | INCLINED RISE(R) OR DROP(D) ARROW IN DIRECTION OF AIR FLOW | | RECTANGULAR BRANCH TAKE OFF | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ROUND BRANCH TAKE OFF | | DUCT-MOUNTED REHEAT COIL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | FLEXIBLE DUCT | | FLEXIBLE CONNECTION | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | DUCT SILENCER | | DUCT ACCESS DOORS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | SUPPLY DIFFUSER | | RETURN REGISTER/GRILLE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | EXHAUST REGISTER/GRILLE | | FIRE DAMPER (HORIZONTAL/ VERTICAL) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | SMOKE DAMPER | | BACK DRAFT DAMPER | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | DUCT MOUNTED SMOKE DETECTOR | | DUCT MOUNTED HUMIDIFIER | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | DUCT MOUNTED PRESSURE SENSOR | | HVAC CONTROLS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | PIPE ANCHOR | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| | PIPE DROP | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| | PRESSURE REDUCING VALVE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | PRESSURE REGULATOR VALVE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | PRESSURE RELIEF VALVE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| | THROTTLE VALVE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | BACKFLOW PREVENTER | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| | THERMOMETER | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| | OS & Y W/ TAMPER SWITCH & FLOW INDICATOR | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | PRESSURE SENSOR | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| | FLOW DETECTOR SWITCH | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PIPING DESIGNATIONS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | CHILLED WATER SUPPLY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | CHILLED WATER RETURN | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | WATER LOOP SUPPLY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | WATER LOOP RETURN | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | HOT WATER SUPPLY (LOW TEMPERATURE) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | HOT WATER RETURN (LOW TEMPERATURE) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | MEDIUM TEMPERATURE HOT WATER SUPPLY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | MEDIUM TEMPERATURE HOT WATER RETURN | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | HIGH TEMPERATURE WATER SUPPLY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | HIGH TEMPERATURE WATER RETURN | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | CONDENSATE DRAIN | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | NATURAL GAS, LOW PRESSURE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | GAS VENT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | STEAM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | STEAM CONDENSATE SUPPLY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | STEAM CONDENSATE RETURN | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | LOW PRESSURE STEAM SUPPLY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | LOW PRESSURE STEAM RETURN | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | MEDIUM PRESSURE STEAM SUPPLY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | MEDIUM PRESSURE STEAM RETURN | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | HIGH PRESSURE STEAM SUPPLY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | HIGH PRESSURE STEAM RETURN | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | LOW PRESSURE CONDENSATE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | MEDIUM PRESSURE CONDENSATE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | HIGH PRESSURE CONDENSATE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | BOILER BLOW DOWN | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | PUMPED CONDENSATE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | VACUUM PUMP DISCHARGE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| | ATMOSPHERIC VENT (STEAM OR HW) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| | REFRIGERANT SUCTION | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | REFRIGERANT LIQUID | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | FILL LINE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | HUMIDIFICATION LINE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | VACUUM (AIR) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | WET VACUUM CLEANING | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | DRY VACUUM CLEANING | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | MEDICAL VACUUM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| | LABORATORY VACUUM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | HOT/CHILLED WATER SUPPLY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| RETURN AIR DESIGNATION | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SUPPLY AIR DESIGNATION | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| POINT OF DISCONNECTION FROM EXISTING SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PHOTO SECTION (DIRECTION OF VIEW) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| EQUIPMENT TAG | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SHEET KEYNOTE (NEW CONSTRUCTION) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DEMOLITION KEYNOTE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| REVISION SEQUENCE NUMBER | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ROOM TAG (ROOM NO NOT ALWAYS SHOWN) | | ROOM NAME | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SECTION/ ELEVATION REFERENCE | | VIEW REF | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| INTERIOR ELEVATION REFERENCE | | VIEW REF | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DETAIL / CALLOUT REFERENCE | | VIEW REF | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SYMBOL LEGEND GENERAL NOTES: A. LEGENDS ARE GENERAL. NOT ALL SYMBOLS AND/OR DESIGNATIONS MAY APPEAR ON THE DRAWINGS. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| ATC SCHEMATIC COMPONENTS | |
|--------------------------|------------------------------|
| | ELECTRIC RESISTANT HEATER |
| | AIR FLOW MONITORING STATION |
| | MOD DAMPER WITH END SWITCH |
| | DIFFERENTIAL/PRESSURE SENSOR |
| | VARIABLE FREQUENCY DRIVE |

| GRILLE, REGISTER & DIFFUSER KEY | |
|---------------------------------|------------------|
| | TAG |
| | BALANCE CFM |
| | INACTIVE PORTION |
| LOUVER KEY | |
| | WL-0x0-000-L |
| TAG | TAG |
| WIDTH | WIDTH (INCHES) |
| HEIGHT | HEIGHT (INCHES) |
| I | INTAKE |
| E | EXHAUST |
| R | RELIEF |
| B | BALANCE CFM |

| | |
|--------------------------------------|----------------------------------|
| | HVAC CONTROLS |
| (L) LETTER IN SYMBOLS INDICATE TYPE: | |
| T | TEMPERATURE SENSOR |
| H | HUMIDITY SENSOR |
| A | HAND OFF AUTO SWITCH |
| CO ₂ | CARBON MONOXIDE SENSOR |
| OC | OCCUPANCY SENSOR |
| S | EMERGENCY BURNER SHUT OFF SWITCH |
| | DOOR LOUVER, SEE ARCH. DWGS. |
| | DOOR UNDERCUT, SEE ARCH. DWGS. |



MAINTENANCE BUILDING
 10001 US HIGHWAY 70
 LAKELAND, TN 38002
 SHELBY COUNTY
 CITY OF LAKELAND
 10001 US HIGHWAY 70
 LAKELAND, TN 38002

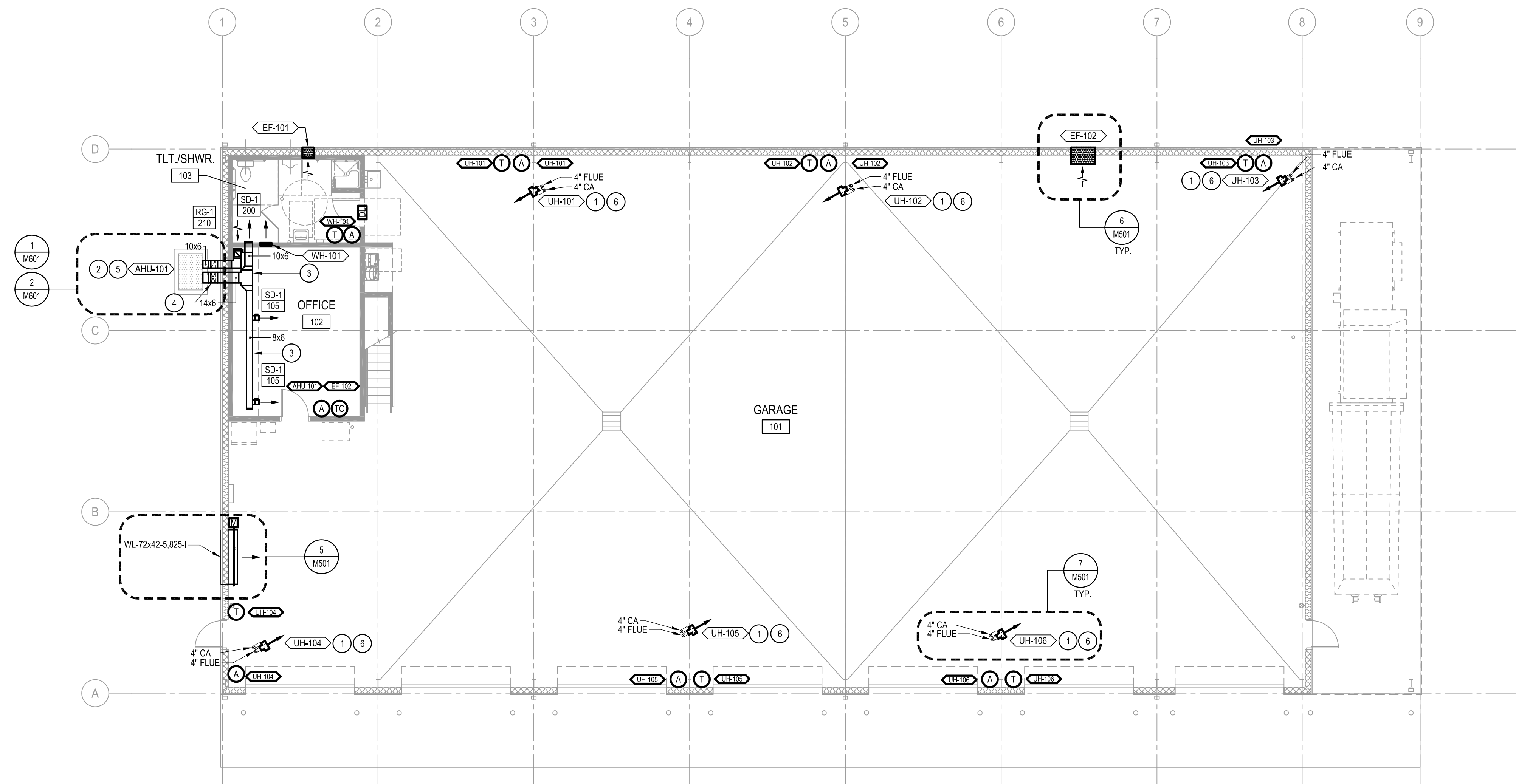
| REVISIONS | MARK | ISSUED DATE | DESCRIPTION |
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| PROJECT NO: | 81079-04 |
| ISSUED DATE: | 7/31/20 |
| DRAWN BY: | PJP / DSS |
| CHECKED BY: | BWO |
| © BUCHART HORN, INC. | |
| SHEET TITLE: | |

| |
|----------------------------------|
| LEGEND, ABBREVIATIONS, & SYMBOLS |
|----------------------------------|

FOR CODE REVIEW ONLY

SHEET NO. **M-001**



1 FLOOR PLAN - MECHANICAL
 SCALE: 1/8" = 1'-0"
 PROJECT NORTH

GENERAL NOTES

1. MAINTAIN SPACE FOR SERVICE AND MAINTENANCE OF EQUIPMENT.
2. PROVIDE A LOW-LOSS RECTANGULAR 45° TAP OR ROUND BELL-MOUTH TAP FOR EVERY RUNOUT DUCT FROM THE MAIN. INSTALL A MANUAL BALANCING DAMPER AT THE TAKE-OFF FOR USE IN BALANCING.
3. COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE" FOR BRANCH, OUTLET AND INLET, AND TERMINAL UNIT CONNECTIONS.
4. INSTALL MANUAL VOLUME DAMPERS IN ALL BRANCH DUCTS FOR BALANCING. PERFORM AIR BALANCING WITH DUCT BRANCH DAMPERS. ADJUSTABLE DAMPERS IN THE THROAT OF DIFFUSERS SHALL NOT BE USED FOR BALANCING PURPOSES.
5. INSTALL HINGED ACCESS DOOR AT ALL AUTOMATIC DAMPERS, FIRE DAMPERS, REHEAT COILS AND ANY APPARATUS THAT REQUIRES PERIODIC INSPECTION AND ROUTINE MAINTENANCE.
6. TRANSITION DUCT CONNECTIONS AS REQUIRED TO CONNECT FROM DUCT SIZES SHOWN TO UNIT CONNECTION SIZES. MAKE FINAL CONNECTIONS TO EQUIPMENT WITH FLEXIBLE CONNECTION ISOLATOR.
7. COORDINATE FINAL PLACEMENT OF HVAC EQUIPMENT TO MAINTAIN REQUIRED MAINTENANCE CLEARANCES.
8. FLEXIBLE DUCTWORK SHALL NOT EXCEED 4 LINEAR FEET IN EXTENDED LENGTH. SUPPORT DUCTS FROM OVERHEAD STRUCTURE SO AS TO MINIMIZE KINKS AND BENDS. SECURE CONNECTIONS WITH PROPER BAND ATTACHMENTS.
9. INSTALL FIRE DAMPERS WHERE REQUIRED BY THE INTERNATIONAL MECHANICAL CODE AND NFPA.
10. BOTTOM OF DUCT, B.O.D. TAG REFERENCE DIMENSION FROM ASSOCIATED FLOOR LEVEL TOP OF CONCRETE. FLOOR FINISH THICKNESS IS NOT ACCOUNTED FOR.
11. COORDINATE INSTALLATION AND FINAL LOCATION OF WALL-MOUNTED AIR DEVICES WITH ARCHITECTURAL FINISHES AND PLACEMENT OF FURNISHINGS.
12. CONTRACTOR SHALL COORDINATE FINAL PLACEMENT OF DUCTWORK AND APPURTENANCES WITH COMPONENTS OF OTHER TRADES.
13. REFER TO STRUCTURAL DRAWINGS FOR SEISMIC CLASSIFICATION FOR BUILDING. FURNISH AND INSTALL SEISMIC HANGERS AND SUPPORTS AS REQUIRED.
14. CONTROL DEVICES SHALL BE PROVIDED, INSTALLED, AND PROGRAMMED BY MECHANICAL CONTRACTOR.

KEY NOTES

1. FURNISH AND INSTALL UNIT HEATER WITH COMBUSTION AIR AND FLUE UP THROUGH ROOF. FURNISH AND INSTALL CONCENTRIC VENT KIT. SIZE, TRAP, AND INSTALL COMBUSTION AIR AND FLUE DUCT PER MANUFACTURER RECOMMENDATIONS.
2. OWNER TO PROVIDE EXISTING AIR HANDLER TO SITE. MECHANICAL CONTRACTOR SHALL INSTALL AIR HANDLER, PERFORM START-UP, ROUGH-IN AND MAKE ALL FINAL CONNECTIONS, AND REPLACE EXISTING FILTERS. FURNISH AND INSTALL OUTSIDE AIR INTAKE HOOD.
3. FURNISH AND INSTALL DUCT WITHIN BULKHEAD.
4. EXTERIOR DUCT SHALL BE STAINLESS STEEL WITH CLOSED CELL ELASTOMERIC INSULATION AND STAINLESS STEEL WRAP. SLOPE TOP OF DUCT FOR DRAINAGE.
5. FURNISH AND INSTALL 6" MINIMUM RAIL SUPPORT TO ACCOMMODATE CONDENSATE TRAP. SEE DETAIL S1051 AND S1050.
6. SUPPORT UNIT HEATER FROM STRUCTURE ABOVE. BOTTOM OF UNIT HEATER SHALL BE 1' MINIMUM ABOVE HEIGHT OF GARAGE DOOR.



MAINTENANCE BUILDING
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 LAKELAND, TN 38002
 SHELBY COUNTY
CITY OF LAKELAND
 10001 US HIGHWAY 70
 LAKELAND, TN 38002

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PROJECT NO: 81079-04
 ISSUED DATE: 7/31/20
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 SHEET TITLE:
MECHANICAL FLOOR PLAN

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 SHEET NO: **M-101**

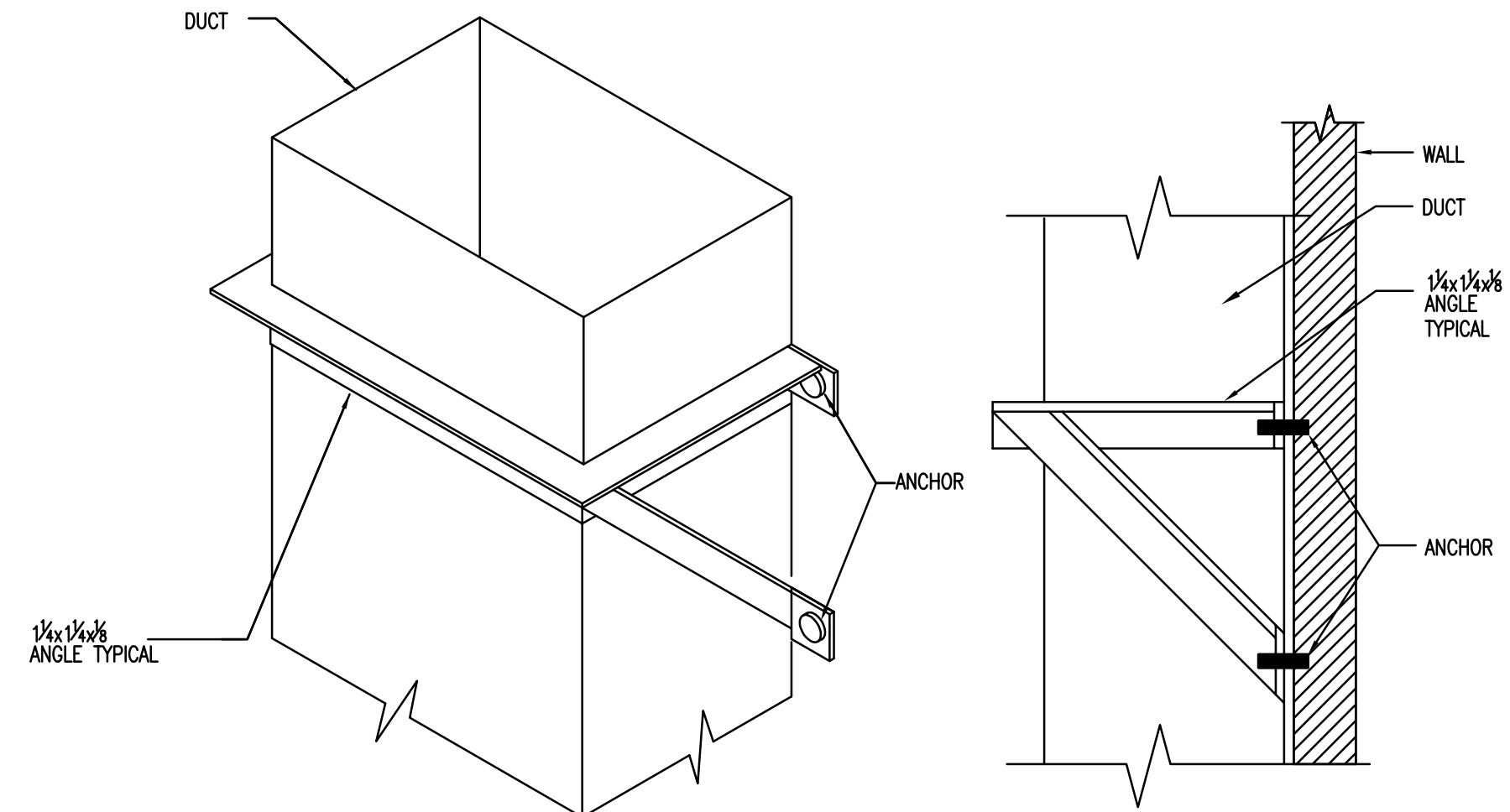
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DUCTWORK AND FITTING ASSEMBLY SCHEDULE

| SINGLE LINE | DOUBLE LINE | SYSTEM NAME | SYSTEM | PRESSURE RANGE | PRESSURE CLASS | MATERIAL | CONNECTION TYPE | 1" DUCT LINER | ANTIMICROBIAL COATING | INSULATION THICKNESS | | | | | COVERING | COVERING COLOR | IDENTIFICATION PRIMARY COLOR | IDENTIFICATION SECONDARY COLOR | IDENTIFICATION TEXT |
|-------------|-------------|---|----------------------------------|----------------|----------------|----------|-----------------|---------------|-----------------------|----------------------|--------|------------|-----|-----|-----------------------------|----------------------|------------------------------|--------------------------------|------------------------|
| | | | | | | | | | | FGF | FDW | FRI | RGF | CSI | | | | | |
| 12x10 | 12x10 | RECTANGULAR OR SQUARE DUCT (SIZE IN INCHES) | | | | | | | | | | | | | | | | | |
| ☒ | ☒ | SUPPLY AIR DUCT ELBOW (UP AND DOWN) | DOWNSTREAM OF TERMINAL UNIT | 0 - 2 IN WC | 1 - 2 IN WC | GST | SND, FLG | NO | NO | 1" | 1 1/2" | -- | 1" | -- | EXP: PVC, ALM, SST CCL: FSK | EXP: BLACK - NOTE 10 | GREEN | WHITE | SUPPLY AIR |
| ☒ | ☒ | OUTSIDE AIR DUCT ELBOW (UP AND DOWN) | UPSTREAM OF HEAT TRANSFER DEVICE | 0 - 2 IN WC | 1 - 2 IN WC | GST | SND, FLG | NO | NO | 1" | 1 1/2" | -- | 1" | -- | EXP: PVC, ALM, SST CCL: FSK | EXP: BLACK - NOTE 10 | GREEN | WHITE | OUTSIDE AIR |
| ☒ | ☒ | RETURN/RELIEF DUCT ELBOW (UP AND DOWN) | CONNECTED TO TERMINAL UNIT | 0 - 2 IN WC | 1 - 2 IN WC | GST | SND, FLG | NO | NO | 1" | 1 1/2" | -- | 1" | -- | EXP: PVC, ALM, SST CCL: FSK | EXP: BLACK - NOTE 10 | GREEN | WHITE | RETURN AIR |
| ☒ | ☒ | TRANSFER DUCT ELBOW (UP AND DOWN) | CONNECTED TO RTU / AHU | 0 - 2 IN WC | 1 - 2 IN WC | GST | SND, FLG | NO | NO | 1" | 1 1/2" | -- | 1" | -- | EXP: PVC, ALM, SST CCL: FSK | EXP: BLACK - NOTE 10 | GREEN | WHITE | TRANSFER AIR |
| ☒ | ☒ | EXHAUST DUCT ELBOW (UP AND DOWN) | UPSTREAM OF FAN | 0 - 2 IN WC | 1 - 2 IN WC | GST | SND, FLG | NO | NO | -- | -- | -- | -- | -- | EXP: PVC, ALM, SST CCL: FSK | EXP: BLACK - NOTE 10 | BLUE | WHITE | EXHAUST AIR - POSITIVE |
| ☒ | ☒ | FLUE ELBOW (UP AND DOWN) | DISCHARGE OF FAN | 0 - 2 IN WC | 1 - 2 IN WC | GST | SND, FLG | NO | NO | -- | -- | -- | -- | -- | EXP: PVC, ALM, SST CCL: FSK | EXP: BLACK - NOTE 10 | BLUE | WHITE | EXHAUST AIR - POSITIVE |
| ☒ | ☒ | KITCHEN HOOD / GREASE EXHAUST ELBOW (UP AND DOWN) | DISCHARGE OF ENGINE | 2 - 6 IN WC | 4 - 6 IN WC | SST | DWB | NO | NO | -- | -- | -- | 3" | SST | NONE | BLUE | WHITE | FLUE | |
| ☒ | ☒ | GREASE HOOD TO DISCHARGE | GREASE HOOD TO DISCHARGE | 2 - 6 IN WC | 4 - 6 IN WC | SST | WLD | NO | NO | -- | -- | ASTM E2336 | -- | FSK | EXP: BLACK - NOTE 10 | BLUE | WHITE | GREASE EXHAUST | |
| 10 Ø | 10 Ø | ROUND DUCT (SIZE IN INCHES) | | | | | | | | | | | | | | | | | |
| ☉ | ☉ | SUPPLY AIR DUCT ELBOW (UP AND DOWN) | DOWNSTREAM OF TERMINAL UNIT | 0 - 2 IN WC | 1 - 2 IN WC | GST | SND, FLG | NO | NO | -- | 2" | -- | -- | -- | EXP: PVC, ALM, SST CCL: FSK | EXP: BLACK - NOTE 10 | GREEN | WHITE | SUPPLY AIR - PRIMARY |
| ☉ | ☉ | OUTSIDE AIR DUCT ELBOW (UP AND DOWN) | UPSTREAM OF HEAT TRANSFER DEVICE | 0 - 2 IN WC | 1 - 2 IN WC | GST | SND, FLG | NO | NO | -- | 2" | -- | -- | -- | EXP: PVC, ALM, SST CCL: FSK | EXP: BLACK - NOTE 10 | GREEN | WHITE | OUTSIDE AIR |
| ☉ | ☉ | RETURN/RELIEF DUCT ELBOW (UP AND DOWN) | CONNECTED TO TERMINAL UNIT | 0 - 2 IN WC | 1 - 2 IN WC | GST | SND, FLG | NO | NO | -- | 2" | -- | -- | -- | EXP: PVC, ALM, SST CCL: FSK | EXP: BLACK - NOTE 10 | GREEN | WHITE | RETURN AIR |
| ☉ | ☉ | EXHAUST DUCT ELBOW (UP AND DOWN) | UPSTREAM OF FAN | 0 - 2 IN WC | 1 - 2 IN WC | GST | SND, FLG | NO | NO | -- | 2" | -- | -- | -- | EXP: PVC, ALM, SST CCL: FSK | EXP: BLACK - NOTE 10 | BLUE | WHITE | EXHAUST AIR - POSITIVE |
| ☉ | ☉ | FLUE DUCT ELBOW (UP AND DOWN) | DISCHARGE OF FAN | 0 - 2 IN WC | 1 - 2 IN WC | GST | SND, FLG | NO | NO | -- | 2" | -- | -- | -- | EXP: PVC, ALM, SST CCL: FSK | EXP: BLACK - NOTE 10 | BLUE | WHITE | EXHAUST AIR - POSITIVE |
| ☉ | ☉ | HAZARDOUS OR DOWNSTREAM OF HOOD | HAZARDOUS OR DOWNSTREAM OF HOOD | 2 - 6 IN WC | 4 - 6 IN WC | SST | SLD, WLD | NO | NO | -- | -- | -- | -- | -- | EXP: PVC, ALM, SST CCL: FSK | EXP: BLACK - NOTE 10 | BLUE | WHITE | EXHAUST AIR - POSITIVE |
| ☉ | ☉ | CONDENSING FLUE | CONDENSING FLUE | 2 - 6 IN WC | 4 - 6 IN WC | PVC | GLUE | NO | NO | -- | -- | -- | -- | PVC | EXP: BLACK - NOTE 10 | BLUE | WHITE | FLUE | |
| ☉ | ☉ | COMBUSTION AIR DUCT ELBOW (UP AND DOWN) | COMBUSTION AIR MAKE-UP | 2 - 6 IN WC | 4 - 6 IN WC | PVC | GLUE | NO | NO | -- | -- | -- | -- | PVC | EXP: BLACK - NOTE 10 | GREEN | WHITE | SUPPLY AIR | |

- NOTES:
- ALL DUCTWORK SYSTEMS MAY NOT BE USED ON THESE CONTRACT DOCUMENTS.
 - EXTERIOR DUCTWORK SHALL BE INSULATED WITH 2" THICK ELASTOMERIC INSULATION WITH ALUMINUM OR STAINLESS STEEL JACKET; ARMATUFF OR EQUAL.
 - LABEL DUCTWORK EVERY 25', AT EACH CONNECTION TO A TEE, AND AT FLOOR PENETRATIONS.
 - COVERING COLOR APPLIES TO EXPOSED INTERIOR DUCTWORK ONLY.
 - DUCT SIZES ARE CLEAR INTERIOR DIMENSIONS.
 - DUCT LINER REQUIREMENTS INDICATED IN THIS SCHEDULE ARE THE MINIMUM AMOUNTS REQUIRED. IF THE DRAWINGS INDICATE ADDITIONAL LINER IS REQUIRED, ADDITIONAL LINER SHALL BE PROVIDED. IF NO LINER IS INDICATED ON THE DRAWINGS, THE MINIMUM AS REQUIRED BY THIS SCHEDULE SHALL BE PROVIDED. UNDER CONTRACTOR'S OPTION, THE LINER MAY BE EXTENDED TO THE NEXT TRANSITION, BUT NO LESS THAN THE MINIMUM LENGTH SPECIFIED IN THIS SCHEDULE SHALL BE PROVIDED.
 - DO NOT PAINT CPVC DUCTWORK OR JACKET. FURNISH AND INSTALL COLORED JACKETS AND BANDS ON CPVC DUCTWORK.
 - ALL INSULATION SHALL HAVE A COVERING. DO NOT PAINT INSULATION DIRECTLY.
 - ANY NEW HVAC DUCT INSULATION SHALL BE FM APPROVED CLASS 1 MATERIALS OR NONCOMBUSTIBLE MATERIALS. IT IS ALSO ACCEPTABLE TO USE NON-PLASTIC MATERIALS WHICH HAVE BEEN TESTED TO ASTM E-84 AND HAVE SHOWN A FLAME SPREAD RATING OF 25 OR LESS.
 - VERIFY FINAL COVERING COLOR WITH PROJECT ARCHITECT ON A ROOM-BY-ROOM BASIS PRIOR TO ORDERING COVERINGS.

| | | | |
|-----------------------------|--------------------------|---------------------------------|-----------------------|
| ALM ALUMINUM | ELM ELASTOMERIC | FGF FLEXIBLE GLASS FIBER | RGF RIGID GLASS FIBER |
| ASK WHITE KRAFT FIBER PAPER | EXP EXPOSED | FSK FOIL BACK KRAFT FIBER PAPER | SLD SOLDERED |
| CCL CONCEALED | EXT EXTERIOR | FRI FIRE-RATED INSULATION | SND SLIP-N-DRIVE |
| CLG CELLULAR GLASS | FBG FIBERGLASS | GST GALVANIZED STEEL | SST STAINLESS STEEL |
| CSI CALCIUM SILICATE | FDW FIBERGLASS DUCT WRAP | PVC POLYVINYL CHLORIDE | WLD WELDED |
| DWB DOUBLE WALL BANDED | FLG FLANGED | | |



- NOTES:
- BRACKETS ARE SIZED FOR 12"-0" OF DUCT MAXIMUM.
 - LOCATE DUCTS AGAINST WALL OR A MAX OF 2" AWAY FROM WALL.
 - EACH WALL ANCHOR SHALL SATISFY THE FOLLOWING CRITERIA UNLESS OTHER ANALYSIS IS MADE:
 - TENSILE LOAD: 3/8" DUCT WEIGHT, SAFETY FACTOR OF 4
 - SHEAR LOAD: 1/2" DUCT WEIGHT, SAFETY FACTOR OF 4
 - PROVIDE VENTUREGLAD WHITE DUCT WRAP AND INSULATION FOR EXTERIOR DUCTWORK. ALL JOINTS TO BE SEALED WITH VENTUREGLAD DUCT TAPE.

1 OUTSIDE DUCTWORK SUPPORTED FROM WALL - TYPICAL
NOT TO SCALE

| TAG | SYSTEM | LOCATION | TYPE | WEIGHT POUNDS | SONES | CFM | ESP | FAN RPM | HP | ELECTRICAL | | BASIS OF DESIGN | | NOTES |
|--------|---------|------------------|--------------------|---------------|-------|------|-------|---------|------|-------------|------------|-----------------|--------|-------|
| | | | | | | | | | | VOLT/ PHASE | DISCONNECT | MFR | SERIES | |
| EF-101 | EXHAUST | 103 - TLT./SHWR. | SIDEWALL PROPELLER | 16 | 11 | 200 | 0.250 | 1650 | 0.05 | 120 / 1 | - | GREENHECK | SE | 1 |
| EF-102 | EXHAUST | 101 - GARAGE | SIDEWALL PROPELLER | 86 | 27.0 | 5825 | 0.50 | 1656 | 1 | 208 / 3 | - | GREENHECK | AER | 2 |

NOTES:

- FURNISH AND INSTALL ECM.
- FURNISH AND INSTALL VFD RATED MOTOR.

| TAG | LOCATION | TYPE | ELECTRICAL | | BASIS OF DESIGN | | NOTES |
|--------|------------------|------------------------|------------|-------------|-----------------|--------|-------|
| | | | POWER (W) | VOLT/ PHASE | MFR | SERIES | |
| WH-101 | 103 - TLT./SHWR. | RECESSED, WALL MOUNTED | 3000 | 208 / 3 | QMARK | LFK | 1 |

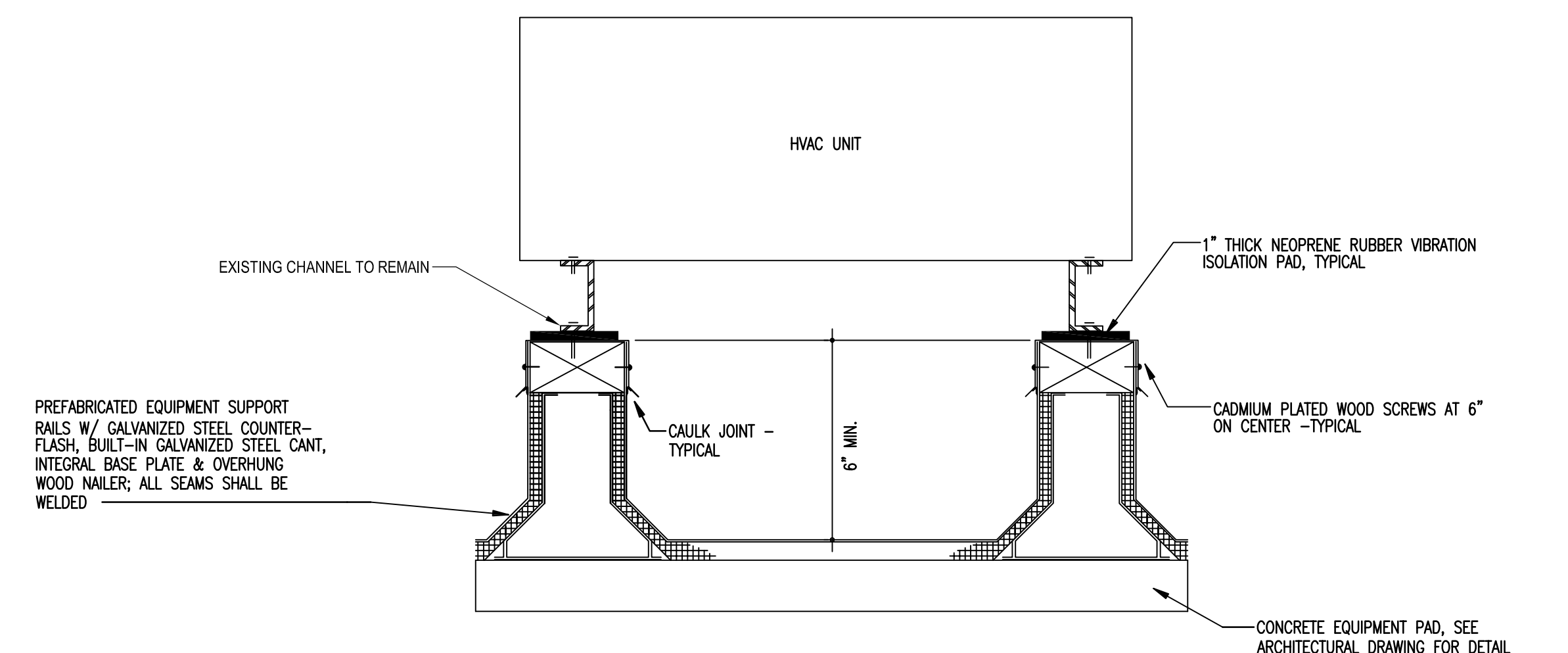
NOTES:

- COORDINATE MOUNTING REQUIREMENTS WITH CEILING/WALL ASSEMBLY.

| TAG | LOCATION | TYPE | WEIGHT POUNDS | CFM | GAS INPUT (BTU/h) | ELECTRICAL | | BASIS OF DESIGN | | NOTES |
|--------|--------------|--------------------------|---------------|------|-------------------|---------------|-------------|-----------------|--------|-------|
| | | | | | | FAN HP (WATT) | VOLT/ PHASE | MFR | SERIES | |
| UH-101 | 101 - GARAGE | CEILING HUNG: HORIZONTAL | 97 | 1345 | 100000 | 0.25 | 115 / 1 | REZNR | UDAS | |
| UH-102 | 101 - GARAGE | CEILING HUNG: HORIZONTAL | 73 | 961 | 75000 | 0.06 | 115 / 1 | REZNR | UDAS | |
| UH-103 | 101 - GARAGE | CEILING HUNG: HORIZONTAL | 73 | 961 | 75000 | 0.06 | 115 / 1 | REZNR | UDAS | |
| UH-104 | 101 - GARAGE | CEILING HUNG: HORIZONTAL | 97 | 1345 | 100000 | 0.25 | 115 / 1 | REZNR | UDAS | |
| UH-105 | 101 - GARAGE | CEILING HUNG: HORIZONTAL | 97 | 1345 | 100000 | 0.25 | 115 / 1 | REZNR | UDAS | |
| UH-106 | 101 - GARAGE | CEILING HUNG: HORIZONTAL | 73 | 961 | 75000 | 0.06 | 115 / 1 | REZNR | UDAS | |

NOTES:

-



2 HVAC UNIT - RAIL MOUNT ON CONCRETE PAD
NOT TO SCALE

| TAG | NOMIAL FACE SIZE IN | CONNECTION SIZE IN | DAMPER | NOISE CRITERIA NC | PATTERN | CFM RANGE | BASIS OF DESIGN | | NOTES |
|-------|---------------------|--------------------|--------|-------------------|-------------------|-----------|-----------------|--------|-------|
| | | | | | | | MFR | SERIES | |
| SD-01 | 6x6 | 6x6 | YES | 20 | DOUBLE DEFLECTION | 0-110 | TITUS | 300 FL | 1 |
| SD-01 | 10x6 | 10x6 | YES | 20 | DOUBLE DEFLECTION | 111-220 | TITUS | 300 FL | 1 |
| RG-1 | 10x10 | 8x8 | NO | 20 | DEFLECTION | 0-220 | TITUS | 350 FL | 1 |

NOTES:

- COORDINATE MOUNTING REQUIREMENTS WITH CEILING/WALL ASSEMBLY.

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SHEET TITLE:

MECHANICAL SCHEDULES

DIVISION 15 ABBREVIATED MASTER SPECIFICATIONS AND SPECS ON DRAWINGS

MECHANICAL SPECIFICATIONS

SECTION 15010 - GENERAL

1. MECHANICAL WORK SHALL MEET REQUIREMENTS OF THE NATIONAL FIRE PROTECTION ASSOCIATION, AND ALL FEDERAL, STATE, AND MUNICIPAL AUTHORITY'S LAWS, RULES AND REGULATIONS APPLICABLE TO THE WORK AND PUBLIC UTILITIES HAVING JURISDICTION OVER SYSTEMS SPECIFIED HEREIN.
2. ALL MECHANICAL EQUIPMENT AND MATERIALS SHALL BE UL LISTED, WHERE APPLICABLE.
3. BIDDERS SHALL VISIT SITE TO DETERMINE ACTUAL CONDITIONS WHICH WILL BE ENCOUNTERED IN COMPLETING THE WORK OF THIS PROJECT.
4. SECURE ANY AND ALL PERMITS AND INSPECTIONS REQUIRED BY APPLICABLE AUTHORITIES AND PAY ALL COSTS IN CONNECTION WITH THE WORK.
5. ALL MECHANICAL EQUIPMENT AND MATERIALS SHALL BE AS SPECIFIED HEREIN, UNLESS OTHERWISE SPECIFIED. SUBMIT A MINIMUM OF FIVE (5) COPIES OF SHOP DRAWINGS OF ALL MECHANICAL EQUIPMENT AND MATERIALS FOR REVIEW.
6. COORDINATE WITH OWNER IN ADVANCE FOR SHUT-DOWN OF ANY UTILITY OR BUILDING SERVICE.
7. PERFORM ALL CUTTING, PATCHING AND REFINISHING TO MATCH SURROUNDINGS. CORE-DRILL USING A DRILL STOP. ALL OPENINGS REQUIRED IN EXISTING CONSTRUCTION, FOR INSTALLATION OF EQUIPMENT AND MATERIAL. REVIEW WITH OWNER AND GENERAL CONTRACTOR THE LOCATION AND SIZE OF OPENINGS TO BE CUT INTO EXISTING CONSTRUCTION BEFORE STARTING OF CUTTING WORK.
8. ROOF PENETRATIONS SHALL BE MADE WATERTIGHT.
9. PROVIDE ALL EXCAVATION AND BACKFILL REQUIRED FOR WORK OF THIS PROJECT.
10. FURNISH AND INSTALL ALL CONCRETE REQUIRED FOR WORK OF THIS PROJECT.
11. FURNISH AND INSTALL HOUSEKEEPING PADS FOR EQUIPMENT INSTALLED IN MECHANICAL ROOMS. PADS SHALL BE A MINIMUM OF 3 INCHES ABOVE FINISHED FLOOR AND EXTEND A MINIMUM OF 2 INCHES BEYOND EQUIPMENT BASE OR BEDPLATE. INSERTS AND ANCHOR BOLTS SHALL BE POURED INTO PAD ACCORDING TO MANUFACTURER'S INSTRUCTIONS.
12. CONTRACTOR SHALL LIMIT HIS USE OF PREMISES FOR WORK, INCLUDING STORAGE, TO ALLOW FOR WORK BY OTHER CONTRACTORS, OWNER OCCUPANCY, AND PUBLIC USE. IN THE COURSE OF PERFORMING THE WORK, CONTRACTOR SHALL KEEP THE WORK AREA IN A CONDITION SUITABLE FOR THE PERFORMANCE OF THE OWNER'S DAILY FUNCTIONS. THE APPEARANCE OF THESE AREAS WILL BE SUBJECT TO APPROVAL BY OWNER. TAKE ALL PRECAUTIONS NECESSARY TO PROTECT OWNER'S FURNITURE AND EQUIPMENT IN WORK AREAS.
13. COORDINATE SCHEDULING OF WORK AREAS IN ADVANCE WITH OWNER.
14. NORMAL WORKING HOURS FOR WORK OF THIS PROJECT WILL BE AS DIRECTED BY OWNER. CONTRACTOR'S WORKMEN WILL NOT BE PERMITTED ON JOBSITE AT OTHER TIMES UNLESS WRITTEN APPROVAL IS GRANTED BY OWNER.
15. UNLESS OTHERWISE INDICATED ON THE DRAWINGS, PROVIDE STRUCTURAL STEEL MEMBERS AS REQUIRED FOR SUPPORT OF EQUIPMENT AND MATERIALS FURNISHED UNDER THIS DIVISION. PROVIDE ALL HANGERS AND SUPPORTS, AS SPECIFIED, DETAILED, OR IN ACCORDANCE WITH ACCEPTED INDUSTRY STANDARDS, FOR PIPING, DUCTWORK AND ASSOCIATED EQUIPMENT.
16. EQUIPMENT FACTORY FINISHES SHALL BE TOUCHED UP AS REQUIRED.
17. ALL EXPOSED PIPING, DUCTWORK, AND MISCELLANEOUS STEEL SHALL BE PRIMED AND FINISHED IN COLOR SELECTED BY OWNER.
18. CLEAN ALL WORK AT PROJECT COMPLETION, AS REQUIRED, SUBJECT TO INSPECTION AND ACCEPTANCE OF OWNER.
19. PIPING WORK, SPECIALTIES OR EQUIPMENT SHALL NOT BE CONCEALED OR COVERED UNTIL THEY HAVE BEEN TESTED AND INSPECTED.
20. COORDINATE WORK WITH THAT OF OTHER TRADES SO THAT INTERFERENCE BETWEEN PIPING, DUCTWORK, CONDUIITS, EQUIPMENT, ARCHITECTURAL OR STRUCTURAL FEATURES WILL BE AVOIDED. WORK INSTALLED IN AN ARBITRARY MANNER WITHOUT REGARD FOR WORK OF OTHER TRADES OR EQUIPMENT SERVICING REQUIREMENTS WILL BE REJECTED IN ANY SITUATION WHERE AN UNDESIRABLE CONDITION OR AN UNFAIR HARSHIP FOR OTHER TRADES, OR OWNER, RESULTS.
21. MECHANICAL WORK SHALL BE GUARANTEED FOR A PERIOD OF ONE (1) YEAR FROM DATE OF ACCEPTANCE AND SHALL PROVIDE AT NO COST TO OWNER, ALL REPLACEMENT PARTS AND ADJUSTMENTS, TO INCLUDE LABOR, WITHIN THE GUARANTEE PERIOD. GUARANTEE SHALL INCLUDE THE DETERMINATION BY CONTRACTOR OF ANY MALFUNCTIONS OF OWNER FURNISHED EQUIPMENT INSTALLED UNDER THIS PROJECT AND CONTRACTOR SHALL BE RESPONSIBLE FOR ADJUSTMENTS, TO INCLUDE LABOR, TO SAID EQUIPMENT WITHIN THE GUARANTEE PERIOD. OWNER WILL BE RESPONSIBLE TO FURNISH REPLACEMENT PARTS FOR OWNER FURNISHED EQUIPMENT INSTALLED BY CONTRACTOR.
22. MAINTAIN A RECORD SET OF DRAWINGS SHOWING ALL CHANGES DURING THE CONSTRUCTION PROCESS. DELIVER THESE RECORD DRAWINGS TO OWNER AT COMPLETION OF PROJECT.
23. PERFORM START-UP OF EQUIPMENT AND DEMONSTRATE INTENDED PERFORMANCE AND SEQUENCE OF OPERATION IN THE PRESENCE OF OWNER. DELIVER TO OWNER 3 COPIES OF ALL MANUFACTURER'S PUBLISHED INSTALLATION AND OPERATION DATA FOLLOWING START-UP.
24. OWNER WILL OCCUPY ADJACENT AREAS WHILE CONSTRUCTION WORK IS IN PROGRESS. CONTRACTOR SHALL CONDUCT HIS WORK WITH MINIMUM NOISE. ALL CORE DRILLING SHALL BE DONE

DURING HOURS APPROVED BY OWNER.

25. CONTRACTOR'S EMPLOYEES ON THE PROJECT SITE ARE REQUIRED TO ABIDE BY THE OWNER'S CURRENT SMOKING POLICY.
26. CONTRACTOR WILL BE RESPONSIBLE FOR THE FOLLOWING CONSTRUCTION CONTROL MEASURES WITHIN EACH AREA OF WORK. CONTRACTOR SHALL NOTIFY OWNER THAT ALL MEASURES ARE IN PLACE PRIOR TO STARTING WORK.
 - A. PROVIDE ACTIVE MEANS TO PREVENT AIR-BORNE DUST FROM DISPERSING INTO ATMOSPHERE AND WATER MIST WORK SURFACES TO CONTROL DUST WHILE CUTTING.
 - B. REMOVE OR ISOLATE HVAC SYSTEM AND BLOCK OFF AND SEAL AIR VENTS IN AREAS WHERE WORK IS BEING PERFORMED.
 - C. SEAL UNUSED DOORS WITH DUCT TAPE.
 - D. PLACE DUST MAT AT ENTRANCE AND EXIT OF WORK AREA.
 - E. CONTAIN CONSTRUCTION WASTE BEFORE TRANSPORT IN TIGHTLY COVERED CONTAINERS.
 - F. WET-MOP OR AND/OR VACUUM WORK AREA DAILY WITH HEPA FILTERED VACUUMS. THE USE OF SHOP VACUUMS WILL NOT BE PERMITTED UNLESS THEY ARE EQUIPPED WITH HEPA FILTERS. ALL SURFACES SHALL BE WIPED CLEAN WITH DISINFECTANT UPON COMPLETION OF WORK.

SECTION 15050 - BASIC MATERIALS AND METHODS

1. DOMESTIC WATER PIPING: TYPE L (HARD) COPPER TUBE WITH SOLDER JOINTS. INSULATION FOR ABOVE GRADE PIPING: FIBERGLASS OR FOAMED PLASTIC, 1/2" MINIMUM THICKNESS FOR DOMESTIC COLD WATER PIPING, 1" MINIMUM THICKNESS FOR DOMESTIC HOT WATER UP TO 2" AND LESS THAN 170 DEGREE SERVICE TEMPERATURE, 1-1/2" MINIMUM THICKNESS FOR LARGER PIPING. MANUFACTURER: JOHNS MANVILLE MICRO-LOK APT FOR FIBERGLASS OR ARMSTRONG AP ARMAFLEX W520 ADHESIVE FOR FOAM PLASTIC.
2. SANITARY AND VENT PIPING, ABOVE GRADE: SERVICE WEIGHT CAST IRON SOIL PIPE WITH NO-HUB JOINTS, TYPE DWV HARD COPPER DRAINAGE WITH SOLDER JOINTS (OR PVC-DWV OR ABS-DWV SCHEDULE 40 PLASTIC WITH SOLVENT CEMENT JOINTS).
3. SANITARY AND VENT PIPING, BELOW GRADE: SERVICE WEIGHT CAST IRON SOIL PIPE, WITH LEAD AND OAKUM OR PUSH-ON TYPE JOINTS.
4. FUEL OIL AND GAS PIPING, ABOVE GRADE, INTERIOR: STANDARD WEIGHT BLACK STEEL WITH THREADED JOINTS.
5. FUEL OIL AND GAS PIPING, ABOVE GRADE, EXTERIOR: STANDARD WEIGHT BLACK STEEL, WITH WELDED JOINTS, PAINTED.
6. HOT WATER PIPING: STANDARD WEIGHT BLACK STEEL WITH THREADED OR FLANGED JOINTS, OR TYPE L (HARD) COPPER TUBE WITH WROUGHT COPPER OR CAST BRONZE SOLDER JOINTS. INSULATION SHALL BE FIBERGLASS OR FOAM PLASTIC, 1" MINIMUM THICKNESS FOR PIPE SIZES UP TO 1-1/2" AND LESS THAN 161 DEGREES IN SERVICE TEMPERATURE, 2" MINIMUM THICKNESS FOR ALL OTHER HOT WATER PIPING. MANUFACTURER: JOHNS MANVILLE MICRO-LOK APT FOR FIBERGLASS OR ARMSTRONG AP ARMAFLEX W520 ADHESIVE FOR FOAM PLASTIC.
7. CONDENSATE DRAINAGE PIPING: TYPE L (HARD) COPPER TUBE WITH SOLDER JOINTS. INSULATION SHALL BE FIBERGLASS OR FOAMED PLASTIC, 1/2" MINIMUM THICKNESS. MANUFACTURER: JOHNS MANVILLE MICRO-LOK APT FOR FIBERGLASS OR ARMSTRONG AP ARMAFLEX W520 ADHESIVE FOR FOAM PLASTIC.
8. PIPE FITTING INSULATION SHALL BE FIBERGLASS BATT WITH PVC COVERS OR PREMOLDED FIBERGLASS FITTINGS COMPATIBLE WITH FIBERGLASS PIPE INSULATION OR FOAM PLASTIC INSULATION COMPATIBLE WITH FOAM PLASTIC PIPE INSULATION. ALL PIPE FITTING INSULATION SHALL HAVE A 25 FLAME/50 SMOKE RATING IN ACCORDANCE WITH ASTM E-84.
9. CHECK VALVES:
 - A. DOMESTIC WATER - NIBCO S-413-BF-918-B
 - B. SANITARY PUMPED - NIBCO T-433-BF-918-BWL
 - C. PUMPED CONDENSATE - NIBCO T-433-B
10. PLUG VALVES: WALWORTH 1700/1700F.
11. GAS COCK: CRANE NO. 250 WITH WRENCH.
12. BALL VALVES: NIBCO T-590-Y-66.
13. FLEXIBLE PIPE CONNECTORS: FLEXTRONICS TYPE PCB.
14. STRAINERS (Y-PATTERN TYPE): HAVING STAINLESS STEEL SCREENS WITH PERFORATIONS OF 20 MESH, FOR 2" AND UNDER PIPING. MANUFACTURER: SARCO.
15. DIELECTRIC CONNECTIONS: ISOLATE CATHODICALLY PROTECTED PIPE LINES WITH DIELECTRIC CONNECTIONS, RATED TO WITHSTAND TEMPERATURE AND PRESSURE OF THE PIPELINE SERVICE. MANUFACTURER: WATTS.
16. HANGERS, INSULATED PIPING: ANVIL INTERNATIONAL.
17. HANGERS, UNINSULATED PIPING: ANVIL INTERNATIONAL.
18. INSERTS, PRECAST OR CURED CONCRETE: HILTI HSL.
19. BEAM CLAMPS: ANVIL INTERNATIONAL.
20. PIPE PENETRATION (MODULAR MECHANICAL) SEAL: THUNDERLINE LINK-SEAL.
21. ACCESS PANELS: INRYCO-MILCOR.
22. FOR LINES PASSING THROUGH FLOORS, SLABS, WALLS, GRADE BEAMS OR FOUNDATIONS AT OR BELOW GRADE AND IN PITS, THE ANNULAR SPACE BETWEEN OUTSIDE OF PIPE OR INSULATION AND INSIDE OF SLEEVE SHALL BE PACKED WITH WATERPROOF MASTIC SEALER OR CEMENT BASE

QUICK-SET REPAIR MORTAR.

34. FOR LINES PASSING THROUGH WALLS AND FLOORS ABOVE GRADE AND WITH NO FIRE OR SMOKE RATING, THE ANNULAR SPACE BETWEEN OUTSIDE OF PIPE OR INSULATION AND INSIDE OF SLEEVE OR CONCRETE SHALL BE PACKED TIGHT WITH FIBERGLASS INSULATION.
35. FOR ALL LINES PASSING THROUGH WALLS AND FLOORS WITH SMOKE OR FIRE RATING OF ONE HOUR OR MORE, THE ANNULAR SPACE BETWEEN OUTSIDE OF PIPE AND INSIDE OF SLEEVE OR CONCRETE SHALL BE SEALED WITH FIRE STOP SEALING SYSTEM. UL LISTED. MANUFACTURER: DOW CORNING FIRE STOP SEALANT.
36. PIPE AND VALVE IDENTIFICATION: SHUTOFF VALVES IDENTIFIED BY MEANS OF BRASS OR PLASTIC DISCS WITH IDENTIFICATION NUMBERS PROVIDED BY OWNER. PIPING SHALL BE IDENTIFIED BY LEGEND AND FLOW ARROW CONFORMING TO ANSI A-13.1. MANUFACTURER: W. H. BRADY COMPANY.

SECTION 15150 - VIBRATION ISOLATION

1. SPRING: ADJUSTABLE PEN_SPRING ISOLATOR: PEABODY NOISE CONTROL MODEL FLS.
2. SPRING/STEEL BASE: ADJUSTABLE FREE-STANDING, OPEN-SPRING WITH A STRUCTURAL STEEL BASE: PEABODY NOISE CONTROL MODEL FDS SPRING, PEABODY NOISE CONTROL MODEL SFB BASE.
3. SPRING/INERTIA BASE: ADJUSTABLE FREE-STANDING, OPEN-SPRING WITH CONCRETE.
4. INERTIA BASE: PEABODY NOISE CONTROL MODEL FDS, FBS OR SW SPRING, PEABODY NOISE CONTROL MODEL CIB BASE.
5. HANGER: COMBINATION SPRING AND ELASTOMERIC OR FIBERGLASS HANGER CONSISTING OF A RECTANGULAR STEEL BOX, STEEL SPRING AND AN ELASTOMERIC ISOLATION ELEMENT OF NEOPRENE OR FIBERGLASS. MANUFACTURER SHALL SELECT PROPER SPRING RATES IN ACCORDANCE WITH LATEST ASHRAE SYSTEMS HANDBOOK. MANUFACTURER: PEABODY NOISE CONTROL MODEL SFH.

SECTION 15200 - DOMESTIC WATER

1. DOMESTIC WATER PIPING SHALL BE TESTED IN ACCORDANCE WITH LOCAL CODES OR BY METHOD PRESCRIBED BY LATEST EDITION OF THE ICC PLUMBING CODE. ALL DOMESTIC WATER PIPING SHALL BE DISINFECTED BEFORE SYSTEMS ARE PLACED INTO SERVICE.

SECTION 15300 - SANITARY DRAINAGE

1. EACH PLUMBING FIXTURE SHALL BE VENTED AND TRAPPED. DRAINAGE LINES SHALL BE VENTED, GRADED AND TRAPPED TO CONFORM TO LOCAL CODES. COMPLETE SANITARY DRAINAGE SYSTEM SHALL BE TESTED AND INSPECTED FOR LEAKS.

SECTION 15400 - PLUMBING FIXTURES

1. EACH HOT AND COLD WATER CONNECTION TO PLUMBING FIXTURES SHALL BE VALVED.
2. ALL PLUMBING TRIM AND EXPOSED SUPPLY AND WASTE PIPING, INCLUDING TRAPS, SHALL BE CHROME PLATED BRASS.

SECTION 15480 - FUEL HANDLING SYSTEMS

1. NATURAL GAS PIPING SHALL BE TESTED IN ACCORDANCE WITH NFPA 54.

SECTION 15700 - HEAT TRANSFER

1. FOLLOWING TESTS FOR ALL WATER PIPING, SYSTEMS SHALL BE CLEANED BY WASTING WATER UNTIL IT BECOMES CLEAR AFTER WHICH ALL STRAINERS SHALL BE CLEANED. INJECT WATER TREATMENT CHEMICALS AT TIME OF SYSTEM REFILL.
2. FOLLOWING TESTS FOR ALL WATER AND STEAM PIPING, SYSTEMS SHALL BE CLEANED BY WASTING WATER UNTIL IT BECOMES CLEAR AFTER WHICH ALL STRAINERS SHALL BE CLEANED. INJECT WATER TREATMENT CHEMICALS AT TIME OF SYSTEM REFILL.
3. WATER SPECIALTIES
 - T. EXPANSION TANK - SHALL BE A DIAPHRAGM TYPE MANUFACTURED OF GALVANIZED STEEL. THE WORKING PRESSURE SHALL BE 125 PSIG AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH ASME CODE FOR UNFIRED PRESSURE VESSELS AND SHALL BEAR ASME LABEL. MANUFACTURER: AMTROL.
 - U. BACKFLOW PREVENTER - RPZ TYPE WITH TWO INDEPENDANT SPRING LOADED CHECK VALVES, AIR GAP FITTING WITH DRAIN LINE. MANUFACTURER: WATTS 909.

SECTION 15715 - FUEL-FIRED HEATERS/FURNACES

1. GAS FIRED UNIT HEATER: AGA CERTIFIED, GALVANIZED STEEL CABINET IN BAKED ENAMEL FINISH, PROVISIONS FOR TWO-POINT TOP SUSPENSION HANGERS, REMOVABLE BOTTOM BURNER ACCESS SERVICE PANEL, ADJUSTABLE HORIZONTAL DISCHARGE LOUVER WITH MINIMUM STOPS, TEN YEAR ALUMINIZED STEEL HEAT EXCHANGER, BURNER AND DRAFT DIVERTER, ALUMINUM FAN, PROVIDE 24 VOLT COMBINATION SINGLE STAGE AUTOMATIC GAS VALVE WITH MAIN OPERATING VALVE AND PILOT SAFETY SHUTOFF, PRESSURE REGULATOR, MANUAL MAIN AND PILOT SHUTOFF VALVE AND ADJUSTABLE PILOT VALVE, PROVIDE 24 VOLT CONTROL TRANSFORMER, HIGH LIMIT AND FAN TIME DELAY RELAY. MANUFACTURER: REZNR UDAS
2. APPLIANCE FLUE PIPE: AIR-INSULATED DOUBLE WALL GALVANIZED STEEL, NFPA TYPE B, RAINPROOF CAP AT TERMINATION ABOVE ROOF.
3. APPLIANCE FLUE PIPE: AIR-INSULATED DOUBLE WALL STAINLESS STEEL, RAINPROOF CAP AT TERMINATION ABOVE ROOF.

SECTION 15800 - AIR HANDLING EQUIPMENT

1. PROPELLER WALL FAN, TYPE WFPD: ALUMINUM OR STEEL FRAME, ALUMINUM OR STEEL PROPELLER BLADES, WITH ACCESSORY WIRE FAN GUARD AND

WALL SHUTTER. MANUFACTURER: GREENHECK AER

SECTION 15850 - AIR DISTRIBUTION

1. DUCTWORK AND PLENUM CHAMBERS SHALL BE FABRICATED FROM GALVANIZED SHEET STEEL CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH SHACMA HVAC DUCT CONSTRUCTION STANDARDS AND THE LATEST RECOMMENDATIONS OF THE ASHRAE EQUIPMENT HANDBOOK. ALL DUCT DIMENSIONS SHOWN ON DRAWINGS ARE NET CLEAR INSIDE DIMENSIONS. DISTANCE FROM FLOOR TO BOTTOM OF DUCTWORK SHOWN ON DRAWINGS IS DISTANCE FROM FLOOR TO BOTTOM OF SHEET METAL, EXCLUDING JOINT REINFORCEMENTS.
2. ROUND METAL DUCTWORK SHALL BE FACTORY FABRICATED OF GALVANIZED STEEL MEETING ASTM A-577-71. DUCTS SHALL BE FABRICATED AS SPIRAL UNISEAL AND ALL FITTINGS SHALL BE FABRICATED OF GALVANIZED STEEL WITH CONTINUOUS WELDS. DUCTS, FITTINGS, TRANSITIONS AND VOLUME DAMPERS SHALL BE AS MANUFACTURED BY UNITED SHEET METAL.

3. ALL DUCT JOINTS AND SEAMS SHALL BE SEALED WITH FOSTER HIGH VELOCITY DUCT SEALANT NO. 30-02.
4. TURNING VANES SHALL BE FURNISHED AND INSTALLED IN ALL SQUARE ELBOWS.
5. OPPOSED BLADE VOLUME DAMPERS SHALL BE FURNISHED AND INSTALLED WHERE INDICATED. VOLUME DAMPERS SHALL BE EQUIPPED WITH ADJUSTABLE QUADRANT AND LOCK. MANUFACTURER: LOUVERS AND DAMPERS, MODEL CD-400, FOR DAMPERS LARGER THAN 12"; YOUNG REGULATOR CO. MODEL 820A, FOR DAMPERS SMALLER THAN 12".
6. FLEXIBLE DUCT CONNECTORS SHALL BE INSTALLED ON INLET AND OUTLET OF EACH FAN AND AIR HANDLING UNIT. CONNECTOR SHALL BE STANDARD OR METAL EDGE GLASS FABRIC DOUBLE COATED WITH NEOPRENE. FLAME SPREAD 50, SMOKE 50, ASTM E84, UL181. MANUFACTURER: DURO DYNE.
7. FLEXIBLE DUCT: FLEXIBLE DUCTWORK SHALL CONSIST OF HELICAL WOUND CORRUGATED STEEL WITH CPE FABRIC AND EXTERIOR INSULATION AND REINFORCED, METALIZED VAPOR BARRIER WITH 3/4" EXTERIOR FIBERGLASS INSULATION, NFPA 90A, FLAME SPREAD 25, SMOKE 50. MANUFACTURER: FLEXMASTER TYPE 8M, NO SUBSTITUTIONS. FLEXIBLE DUCTWORK SHALL BE CONNECTED TO TAKE-OFF CONNECTIONS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
8. TAKE-OFF FITTINGS: PREFABRICATED GALVANIZED STEEL STRAIGHT TAP-IN WITH DAMPER, SAME SIZE AS FLEXIBLE DUCT. MANUFACTURER: CLEVEPAK CORP. SPIN-COLLAR.
9. RETURN REGISTERS: EXTRUDED ALUMINUM WITH 1" FRAME, 1/2" x 1/2" EGG CRATE, OPPOSED BLADE DAMPER, BAKED WHITE ENAMEL. MANUFACTURER: TITUS 350 FL.
10. SIDEWALL SUPPLY REGISTERS: EXTRUDED ALUMINUM WITH 1" FRAME, DOUBLE DEFLECTION WITH HORIZONTAL FRONT BARS, OPPOSED BLADE DAMPER, BAKED WHITE ENAMEL. MANUFACTURER: TITUS 300 FL.
11. LOUVER, WATERPROOF: EXTRUDED ALUMINUM, 6" DEEP, ANODIZED WITH CLEAR METHACRYLATE LACQUER, AMCA CERTIFIED FOR AIR AND WATER PENETRATION, 2" MESH ALUMINUM BIRD SCREEN. MANUFACTURER: AMERICAN WARMING AND VENTILATING LE-31.
12. MOTOR-OPERATED DAMPER, LOW-LEAKAGE: GALVANIZED STEEL FRAME AND BLADES. BLADE END SEALS, INSULATED BLADE INTERIOR SURFACES. AIR LEAKAGE SHALL NOT EXCEED 8 CFM/S.F. AT 4" W.C. MANUFACTURER: LOUVERS AND DAMPERS TSD-400-UD.
13. DUCT ACCESS DOORS: INSTALL IN DUCTWORK WITHIN WORKING DISTANCE OF ALL VOLUME DAMPERS, MOTOR OPERATED DAMPERS, FIRE DAMPERS, SMOKE DAMPERS, DUCT COILS TO PERMIT ADJUSTMENTS AND INSPECTIONS. CLOSURE METHOD SHALL BE DOUBLE CAM LATCH. ACCESS DOORS SHALL BE INSULATED WHERE INSTALLED IN INSULATED DUCT SYSTEMS. MANUFACTURER: CESCO-ADVANCED AIR.

SECTION 15850 - TESTING AND BALANCING OF HVAC SYSTEM

1. SUBMIT COMPLETE TESTING AND BALANCING REPORT FOR AIR SYSTEMS SPECIFIED. REPORT SHALL INDICATE DESIGN AND ACTUAL CONDITIONS FOR:
 - A. AIR SYSTEMS: FAN CFM/RPM/IES/TPSP; MOTOR HP/RPM/VOLTS/AMPS; TERMINAL CFM.
2. SUBMIT COMPLETE TESTING AND BALANCING REPORT FOR HYDRONIC SYSTEMS SPECIFIED. REPORT SHALL INDICATE DESIGN AND ACTUAL CONDITIONS FOR:
 - A. HYDRONIC SYSTEMS: GPM, WPD, EWT/LWT, PUMP HP/RPM/VOLTS/SECTION & DISCHARGE PRESSURE.
3. TESTING AND BALANCING SHALL BE PERFORMED IN ACCORDANCE WITH STANDARDS PUBLISHED BY THE ASSOCIATED AIR BALANCE COUNCIL OR THE NATIONAL ENVIRONMENTAL BALANCING BUREAU.



MAINTENANCE BUILDING
 10001 US HIGHWAY 70
 LAKELAND, TN 38002
 SHELBY COUNTY
 CITY OF LAKELAND
 10001 US HIGHWAY 70
 LAKELAND, TN 38002

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SPECIFICATIONS

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SHEET NO. **M-901**

P L U M B I N G

| ABBREVIATIONS | | PIPING SPECIALTIES | | PIPING DESIGNATIONS | | NATURAL GAS SYSTEMS GENERAL NOTES | | PLUMBING GENERAL NOTES | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| <table border="0" style="width: 100%;"> <tr><td>A</td><td></td></tr> <tr><td>AB</td><td>ABOVE</td></tr> <tr><td>ABF</td><td>ABOVE FINISHED FLOOR</td></tr> <tr><td>AFG</td><td>ABOVE FINISHED GRADE</td></tr> <tr><td>AFLR</td><td>ABOVE FLOOD LEVEL RIM</td></tr> <tr><td>AHU</td><td>AIR HANDLING UNIT</td></tr> <tr><td>APPROX</td><td>APPROXIMATE</td></tr> <tr><td>ARCH</td><td>ARCHITECTURAL</td></tr> <tr><td>AUTO</td><td>AUTOMATIC</td></tr> <tr><td>AV</td><td>ACID VENT</td></tr> <tr><td>B</td><td></td></tr> <tr><td>BF</td><td>BELOW FLOOR</td></tr> <tr><td>BFF</td><td>BELOW FINISHED FLOOR</td></tr> <tr><td>BFG</td><td>BELOW FINISHED GRADE</td></tr> <tr><td>BFP</td><td>BACKFLOW PREVENTER</td></tr> <tr><td>BJ</td><td>BETWEEN JOISTS</td></tr> <tr><td>BLDG</td><td>BUILDING</td></tr> <tr><td>BLW</td><td>BELOW</td></tr> <tr><td>BOT</td><td>BOTTOM</td></tr> <tr><td>BTU</td><td>BRITISH THERMAL UNIT</td></tr> <tr><td>C</td><td></td></tr> <tr><td>CB</td><td>CATCH BASIN</td></tr> <tr><td>CIB</td><td>CAST IRON BOOT</td></tr> <tr><td>CIP</td><td>CAST IRON PIPE</td></tr> <tr><td>CLG</td><td>CEILING</td></tr> <tr><td>CO</td><td>CLEANOUT</td></tr> <tr><td>CONC</td><td>CONCRETE</td></tr> <tr><td>CONN</td><td>CONNECT/CONNECTION</td></tr> <tr><td>CONST</td><td>CONSTRUCT/CONSTRUCTION</td></tr> <tr><td>CONT</td><td>CONTINUED/CONTINUATION</td></tr> <tr><td>COORD</td><td>COORDINATE</td></tr> <tr><td>CW</td><td>COLD WATER</td></tr> <tr><td>D</td><td></td></tr> <tr><td>DEG</td><td>DEGREE</td></tr> <tr><td>DEPT</td><td>DEPARTMENT</td></tr> <tr><td>DF</td><td>DRINKING FOUNTAIN</td></tr> <tr><td>DIA</td><td>DIAMETER</td></tr> <tr><td>DISC</td><td>DISCONNECT</td></tr> <tr><td>DN</td><td>DOWN</td></tr> <tr><td>DR</td><td>DRAIN</td></tr> <tr><td>DWG</td><td>DRAWING</td></tr> <tr><td>E</td><td></td></tr> <tr><td>EC</td><td>ELECTRICAL CONTRACTOR</td></tr> <tr><td>ECO</td><td>EXTERIOR CLEANOUT</td></tr> <tr><td>EL</td><td>ELEVATION</td></tr> <tr><td>ELEC</td><td>ELECTRIC(AL)</td></tr> <tr><td>ENG</td><td>ENGINEER</td></tr> <tr><td>EQUIP</td><td>EQUIPMENT</td></tr> <tr><td>ERD</td><td>EXISTING ROOF DRAIN</td></tr> <tr><td>ETR</td><td>EXISTING TO REMAIN</td></tr> <tr><td>EW</td><td>EYE WASH</td></tr> <tr><td>EWV</td><td>ELECTRICAL WATER COOLER</td></tr> <tr><td>EXIST</td><td>EXISTING</td></tr> <tr><td>EXP</td><td>EXPOSED</td></tr> <tr><td>F</td><td></td></tr> <tr><td>F</td><td>FAHRENHEIT</td></tr> <tr><td>FCD</td><td>FLOOR CLEANOUT</td></tr> <tr><td>FD</td><td>FLOOR DRAIN</td></tr> <tr><td>FFE</td><td>FINISH FLOOR ELEVATION</td></tr> <tr><td>FGE</td><td>FINISH GRADE ELEVATION</td></tr> <tr><td>FLA</td><td>FULL LOAD AMPERES</td></tr> <tr><td>FLR</td><td>FLOOR</td></tr> <tr><td>FLR</td><td>FLOOD LEVEL RIM</td></tr> <tr><td>FS</td><td>FLOOR SINK</td></tr> <tr><td>G</td><td></td></tr> <tr><td>GA</td><td>GAUGE/GAGE</td></tr> <tr><td>GAL</td><td>GALLON</td></tr> <tr><td>GALV</td><td>GALVANIC or GALVANIZED</td></tr> <tr><td>GC</td><td>GENERAL CONTRACTOR</td></tr> <tr><td>GEN</td><td>GENERAL</td></tr> <tr><td>GPH</td><td>GALLONS PER HOUR</td></tr> <tr><td>GPM</td><td>GALLONS PER MINUTE</td></tr> <tr><td>GR</td><td>GRILLE</td></tr> <tr><td>GRD</td><td>GRADE</td></tr> <tr><td>GV</td><td>GATE VALVE</td></tr> <tr><td>H</td><td></td></tr> <tr><td>H</td><td>HIGH</td></tr> <tr><td>HC</td><td>HEATING (HVAC) CONTRACTOR</td></tr> <tr><td>HDCP</td><td>HANDICAPPED (ACCESSIBLE)</td></tr> <tr><td>HORIZ</td><td>HORIZONTAL</td></tr> <tr><td>HP</td><td>HORSE POWER</td></tr> <tr><td>HT</td><td>HEIGHT</td></tr> <tr><td>HTG</td><td>HEATING</td></tr> <tr><td>HW</td><td>HOT WATER</td></tr> <tr><td>HWR</td><td>HOT WATER RECIRCULATION</td></tr> <tr><td>I</td><td></td></tr> <tr><td>ID</td><td>INSIDE DIAMETER</td></tr> <tr><td>IN OR "</td><td>INCH</td></tr> <tr><td>INT</td><td>INTERIOR</td></tr> <tr><td>INV</td><td>INVERT (ER)</td></tr> <tr><td>L</td><td></td></tr> <tr><td>L</td><td>LAVATORY</td></tr> <tr><td>LB or LBS</td><td>POUND(S)</td></tr> <tr><td>M</td><td></td></tr> <tr><td>MAX</td><td>MAXIMUM</td></tr> <tr><td>MB</td><td>MOP BASIN</td></tr> <tr><td>MB (E)</td><td>MOP BASIN EXISTING</td></tr> <tr><td>MBF</td><td>MOP BASIN FLOOR</td></tr> <tr><td>MBH</td><td>THOUSAND BTU PER HOUR</td></tr> <tr><td>MC</td><td>MECHANICAL CONTRACTOR</td></tr> <tr><td>MECH</td><td>MECHANICAL</td></tr> <tr><td>MFR</td><td>MANUFACTURER</td></tr> <tr><td>MIN</td><td>MINIMUM</td></tr> <tr><td>MTD</td><td>MOUNTED</td></tr> <tr><td>MTG</td><td>MOUNTING</td></tr> <tr><td>N</td><td></td></tr> <tr><td>N/A</td><td>NOT APPLICABLE</td></tr> <tr><td>NIC</td><td>NOT IN CONTRACT</td></tr> <tr><td>NO</td><td>NUMBER</td></tr> <tr><td>NTS</td><td>NOT TO SCALE</td></tr> <tr><td>O</td><td></td></tr> <tr><td>OC</td><td>ON CENTER</td></tr> <tr><td>OFD</td><td>OVERFLOW DRAIN</td></tr> <tr><td>OPNG</td><td>OPENING</td></tr> <tr><td>P</td><td></td></tr> <tr><td>PC</td><td>PLUMBING CONTRACTOR</td></tr> <tr><td>PD</td><td>PRESSURE DROP</td></tr> <tr><td>PH</td><td>PHASE</td></tr> <tr><td>PLBG</td><td>PLUMBING</td></tr> <tr><td>PR</td><td>PIPE RISER</td></tr> <tr><td>PRESS</td><td>PRESSURE</td></tr> <tr><td>PRV</td><td>PRESSURE REDUCING VALVE/PRESSURE RELIEF VENT</td></tr> <tr><td>PSI</td><td>POUNDS PER SQUARE INCH</td></tr> <tr><td>R</td><td></td></tr> <tr><td>RCP</td><td>REINFORCED CONCRETE PIPE</td></tr> <tr><td>RD</td><td>ROOF DRAIN</td></tr> <tr><td>RF</td><td>ROOF</td></tr> <tr><td>RI</td><td>ROUGH-IN</td></tr> <tr><td>RM</td><td>ROOM</td></tr> <tr><td>RPZ</td><td>REDUCED PRESSURE ZONE</td></tr> <tr><td>RWC</td><td>RAINWATER CONDUCTOR</td></tr> <tr><td>S</td><td></td></tr> <tr><td>S</td><td>SINK</td></tr> <tr><td>S&C</td><td>STUB & CAP</td></tr> <tr><td>S&W</td><td>SOIL AND WASTE</td></tr> <tr><td>SAN</td><td>SANITARY</td></tr> <tr><td>SF</td><td>SQUARE FEET</td></tr> <tr><td>SH</td><td>SHOWER</td></tr> <tr><td>SHT</td><td>SHEET</td></tr> <tr><td>SP</td><td>SUMP PUMP</td></tr> <tr><td>SPEC</td><td>SPECIFICATIONS</td></tr> <tr><td>SQ</td><td>SQUARE</td></tr> <tr><td>SS</td><td>SERVICE SINK</td></tr> <tr><td>SST</td><td>SECONDARY STORM</td></tr> <tr><td>ST</td><td>STORM</td></tr> <tr><td>STD</td><td>STANDARD</td></tr> <tr><td>STL</td><td>STEEL</td></tr> <tr><td>STOR</td><td>STORAGE</td></tr> <tr><td>SUSP</td><td>SUSPEND/SUSPENDED</td></tr> <tr><td>T</td><td></td></tr> <tr><td>TEMP</td><td>TEMPERATURE</td></tr> <tr><td>THRU</td><td>THROUGH</td></tr> <tr><td>TJ</td><td>THROUGH JOISTS</td></tr> <tr><td>TWV</td><td>THERMOSTATIC WATER MIXING VALVE</td></tr> <tr><td>TW</td><td>TEMPERED WATER</td></tr> <tr><td>TYP</td><td>TYPICAL</td></tr> <tr><td>U</td><td></td></tr> <tr><td>UE</td><td>UNDER ELECTRICAL</td></tr> <tr><td>UG</td><td>UNDER GENERAL</td></tr> <tr><td>UH</td><td>UNIT HEATER UNDER HVAC</td></tr> <tr><td>UNO</td><td>UNLESS NOTED OTHERWISE</td></tr> <tr><td>UP</td><td>UNDER PLUMBING</td></tr> <tr><td>UR</td><td>URINAL</td></tr> <tr><td>US</td><td>UNDERSIDE OF STRUCTURE</td></tr> <tr><td>V</td><td></td></tr> <tr><td>V</td><td>VENT</td></tr> <tr><td>VR</td><td>VENT RISER</td></tr> <tr><td>VS</td><td>VENT STACK</td></tr> <tr><td>VTR</td><td>VENT THROUGH ROOF</td></tr> <tr><td>W</td><td></td></tr> <tr><td>W</td><td>WASTE</td></tr> <tr><td>W/</td><td>WITH</td></tr> <tr><td>W/O</td><td>WITHOUT</td></tr> <tr><td>WC</td><td>WATER CLOSET</td></tr> <tr><td>WCD</td><td>WALL CLEANOUT</td></tr> <tr><td>WHA</td><td>WATER HAMMER ARRESTOR</td></tr> <tr><td>WM</td><td>WATER METER</td></tr> <tr><td>WP</td><td>WEATHERPROOF</td></tr> <tr><td>WPD</td><td>WATER PRESSURE DROP</td></tr> <tr><td>WT</td><td>WEIGHT</td></tr> <tr><td>WTD</td><td>WATER TEMPERATURE DROP</td></tr> <tr><td>WTR</td><td>WATER</td></tr> </table> | A | | AB | ABOVE | ABF | ABOVE FINISHED FLOOR | AFG | ABOVE FINISHED GRADE | AFLR | ABOVE FLOOD LEVEL RIM | AHU | AIR HANDLING UNIT | APPROX | APPROXIMATE | ARCH | ARCHITECTURAL | AUTO | AUTOMATIC | AV | ACID VENT | B | | BF | BELOW FLOOR | BFF 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AMPERES | FLR | FLOOR | FLR | FLOOD LEVEL RIM | FS | FLOOR SINK | G | | GA | GAUGE/GAGE | GAL | GALLON | GALV | GALVANIC or GALVANIZED | GC | GENERAL CONTRACTOR | GEN | GENERAL | GPH | GALLONS PER HOUR | GPM | GALLONS PER MINUTE | GR | GRILLE | GRD | GRADE | GV | GATE VALVE | H | | H | HIGH | HC | HEATING (HVAC) CONTRACTOR | HDCP | HANDICAPPED (ACCESSIBLE) | HORIZ | HORIZONTAL | HP | HORSE POWER | HT | HEIGHT | HTG | HEATING | HW | HOT WATER | HWR | HOT WATER RECIRCULATION | I | | ID | INSIDE DIAMETER | IN OR " | INCH | INT | INTERIOR | INV | INVERT (ER) | L | | L | LAVATORY | LB or LBS | POUND(S) | M | | MAX | MAXIMUM | MB | MOP BASIN | MB (E) | MOP BASIN EXISTING | MBF | MOP BASIN FLOOR | MBH | THOUSAND BTU PER HOUR | MC | MECHANICAL CONTRACTOR | MECH | MECHANICAL | MFR | MANUFACTURER | MIN | MINIMUM | MTD | MOUNTED | MTG | MOUNTING | N | | N/A | NOT APPLICABLE | NIC | NOT IN CONTRACT | NO | NUMBER | NTS | NOT TO SCALE | O | | OC | ON CENTER | OFD | OVERFLOW DRAIN | OPNG | OPENING | P | | PC | PLUMBING CONTRACTOR | PD | PRESSURE DROP | PH | PHASE | PLBG | PLUMBING | PR | PIPE RISER | PRESS | PRESSURE | PRV | PRESSURE REDUCING VALVE/PRESSURE RELIEF VENT | PSI | POUNDS PER SQUARE INCH | R | | RCP | REINFORCED CONCRETE PIPE | RD | ROOF DRAIN | RF | ROOF | RI | ROUGH-IN | RM | ROOM | RPZ | REDUCED PRESSURE ZONE | RWC | RAINWATER CONDUCTOR | S | | S | SINK | S&C | STUB & CAP | S&W | SOIL AND WASTE | SAN | SANITARY | SF | SQUARE FEET | SH | SHOWER | SHT | SHEET | SP | SUMP PUMP | SPEC | SPECIFICATIONS | SQ | SQUARE | SS | SERVICE SINK | SST | SECONDARY STORM | ST | STORM | STD | STANDARD | STL | STEEL | STOR | STORAGE | SUSP | SUSPEND/SUSPENDED | T | | TEMP | TEMPERATURE | THRU | THROUGH | TJ | THROUGH JOISTS | TWV | THERMOSTATIC WATER MIXING VALVE | TW | TEMPERED WATER | TYP | TYPICAL | U | | UE | UNDER ELECTRICAL | UG | UNDER GENERAL | UH | UNIT HEATER UNDER HVAC | UNO | UNLESS NOTED OTHERWISE | UP | UNDER PLUMBING | UR | URINAL | US | UNDERSIDE OF STRUCTURE | V | | V | VENT | VR | VENT RISER | VS | VENT STACK | VTR | VENT THROUGH ROOF | W | | W | WASTE | W/ | WITH | W/O | WITHOUT | WC | WATER CLOSET | WCD | WALL CLEANOUT | WHA | WATER HAMMER ARRESTOR | WM | WATER METER | WP | WEATHERPROOF | WPD | WATER PRESSURE DROP | WT | WEIGHT | WTD | WATER TEMPERATURE DROP | WTR | WATER |
| A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| VTR | VENT THROUGH ROOF | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| W/ | WITH | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| WC | WATER CLOSET | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| WHA | WATER HAMMER ARRESTOR | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| WM | WATER METER | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| WP | WEATHERPROOF | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| WPD | WATER PRESSURE DROP | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| WT | WEIGHT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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 | | | |--|---| | | HOSE BIBB (HB) | | | WALL HYDRANT (WH) | | | ROOF DRAIN (RD) | | | ROOF DRAIN (RD) | | | OVERFLOW ROOF DRAIN (ORD) | | | FLOOR DRAIN (FD) | | | OPEN SITE DRAIN | | | WATER HAMMER ARRESTOR | | | PIPE ANCHOR | | | STUB AND CAP | | | PIPE DROP | | | PIPE RISE | | | PIPE TEE OFF BOTTOM | | | UNION | | | ALIGNMENT GUIDE | | | EXPANSION JOINT W/ ALIGNMENT GUIDES | | | FLEXIBLE CONNECTOR | | | EXPANSION COMPENSATOR | | | STRAINER W/HOSE END BLOW OFF VALVE | | | STRAINER | | | BALANCING VALVE | | | BALL VALVE | | | CHECK VALVE | | | DRAIN VALVE | | | SHUT OFF VALVE | | | NEEDLE VALVE | | | PLUG VALVE | | | PRESSURE REDUCING VALVE | | | PRESSURE REGULATOR VALVE | | | PRESSURE RELIEF VALVE | | | SOLENOID VALVE | | | THERMOMETER | | | PRESSURE GAUGE W/NEEDLE VALVE & SNUBBER (WATER, AIR, GAS) | | | PRESSURE GAUGE WITH SIPHON | | | | | |--|--| | | DOMESTIC COLD WATER PIPING | | | DOMESTIC HOT WATER PIPING | | | DOMESTIC 140°F WATER PIPING | | | DOMESTIC HOT WATER RECIRCULATION PIPING | | | DOMESTIC HIGH TEMP. WATER RECIRCULATION PIPING | | | TEMPERED HOT WATER PIPING | | | SANITARY SEWER PIPING | | | CONDENSATE DRAIN | | | STORM SEWER PIPING | | | EMERGENCY STORM SEWER PIPING | | | PUMPED FORCE MAIN PIPING | | | SANITARY SEWER VENT PIPING | | | ACID WASTE DRAIN PIPING | | | NATURAL GAS PIPING | | | HIGH PRESSURE GAS PIPING (2 PSIG) | | | GREASE WASTE | | | COMPRESSED AIR PIPING | | | FLOOR CLEANOUT (CO) # | | | FLOW DIRECTION | | A. ALL DIMENSIONS AND PIPE SIZES ARE IN INCHES, UNLESS NOTED OTHERWISE. B. SIZE PRESSURE REGULATOR VALVES BASED ON FLOW, INLET PRESSURE, & OUTLET PRESSURE. C. LOCATE PIPING CONCEALED WHERE CEILING OCCURS, UNLESS NOTED OTHERWISE. LOCATE SHUT-OFF VALVES, PRESSURE REGULATOR VALVES, UNIONS, SOLENOID VALVES, APPLIANCE REGULATORS, CONNECTORS, THREADED FITTINGS (WITH RELATED IMMEDIATE PIPING) ABOVE ACCESSIBLE CEILING OR ACCESS PANEL. D. SEE SPECIFICATIONS FOR ACCESSORIES, MATERIALS AND FITTINGS. E. PAINT GAS PIPE SAFETY YELLOW. F. INSTALLATION SHALL BE ACCORDING TO LOCAL CODES AND GAS COMPANY REQUIREMENTS. G. AFTER INSTALLATION, PIPE SHALL BE TESTED AND WITNESSED BY LOCAL GAS COMPANY AND OWNER BEFORE SERVICE IS TURNED ON. H. PROVIDE A SUITABLE BALL VALVE, APPLIANCE PRESSURE REGULATOR, DRIP LEG AND UNION AT EACH CONNECTION TO EACH PIECE OF GAS FIRED EQUIPMENT. I. EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE STANDARDS OF THE NATIONAL FIRE PROTECTION ASSOCIATION AND THE NATIONAL FUEL GAS CODE FOR GAS-FIRED EQUIPMENT, AND THESE STANDARDS SHOULD BE FOLLOWED CAREFULLY. J. AUTHORITIES HAVING JURISDICTION SHOULD BE CONSULTED BEFORE INSTALLATIONS ARE MADE TO VERIFY LOCAL CODES. K. PLUMBING CONTRACTOR SHALL COORDINATE GAS SERVICE WITH GAS COMPANY. GAS SERVICE SHALL BE SIZED FOR THE CAPACITY OF ALL GAS EQUIPMENT. PLUMBING CONTRACTOR SHALL COORDINATE GAS SERVICE WITH ALL OTHER TRADES TO AVOID CONFLICT. GAS METER LOCATION SHALL BE COORDINATED WITH GAS COMPANY AND ARCHITECT. L. ALL PRESSURE REGULATORS SHALL BE VENTED TO THE OUTDOORS PER MANUFACTURER'S RECOMMENDATION. DO NOT COMBINE VENTS. M. COORDINATE MOUNTING HEIGHTS AND LOCATIONS FOR ALL EQUIPMENT BEFORE INSTALLATION. REFER TO ARCHITECTURAL DRAWINGS, ROUGH-IN AND INSTALL BARRIER-FREE/ACCESSIBLE EQUIPMENT PER ADA REQUIREMENTS. N. PROVIDE ALL NEW 0.5 PSIG LOW PRESSURE GAS DISTRIBUTION SYSTEM INSIDE THE BUILDING FROM THE GAS METER, SIZED WITH 0.5 INCH W.C. PRESSURE DROP, NFPA 54-2012 TABLE 6.2(b), USE 0000 CFH AT 0.5 PSIG MAXIMUM BUILDING GAS LOAD. O. COORDINATE GAS SERVICE RELATED WORK WITH LOCAL GAS UTILITY. | A. ROUGH-IN AND CONNECT HW, CW, VENT, SAN. & W LINES TO FIXTURES IN ACCORDANCE WITH SIZES INDICATED ON FIXTURE SCHEDULE. B. ALL DIMENSIONS AND PIPE SIZES ARE IN INCHES, UNLESS NOTED OTHERWISE. C. FURNISH AND INSTALL 2" MINIMUM SIZE SAN. & W PIPING BELOW GROUND INSIDE BUILDING REGARDLESS OF SIZE INDICATED ON PLUMBING FIXTURE SCHEDULE. D. INSTALL ALL PIPING WITHIN BUILDING THERMAL ENVELOPE, ABOVE CEILING UNDER BUILDING INSULATION AND ON BUILDING SIDE OF WALL INSULATION, UNLESS NOTED OTHERWISE. E. FURNISH AND INSTALL ACCESS PANELS FIRE-RATED WHERE REQUIRED FOR ACCESS TO ALL CONCEALED VALVES, TRAPS OR OTHER EQUIPMENT FURNISHED UNDER THIS CONTRACT WHERE NO OTHER MEANS IS PROVIDED. PROVIDE BEADED EDGE IN PLASTER OF CWP, WALLS & CEILING. F. INSTALL UNIONS ON PIPING TO PERMIT EASY DISCONNECTING. INSTALL UNIONS AT CONNECTION TO ALL EQUIPMENT. G. ALL EQUIPMENT AND PIPING 50 POUNDS AND GREATER SHALL BE SUPPORTED FROM TRUSS TOP CORD, UNLESS NOTED OTHERWISE. H. COORDINATE LOCATION OF ALL PIPING AND DEVICES WITH THE WORK OF OTHER TRADES BEFORE INSTALLATION. WHERE A CONFLICT IN AVAILABLE CLEARANCES OCCURS, OBTAIN CLARIFICATION FROM THE ARCHITECT, AND PROVIDE WHATEVER ADDITIONAL PIPING, FITTINGS, ETC. ARE REQUIRED TO INSTALL PLUMBING SYSTEM WITHOUT ANY ADDITIONAL COST TO THE CONTRACT. I. FURNISH OPERATIONAL, MAINTENANCE AND EMERGENCY INSTRUCTIONS TO THE RESPONSIBLE DESIGNATED MAINTENANCE STAFF BEFORE ANY PART OF THE SYSTEM IS TURNED OVER TO THE OWNER, AND SUBMIT WRITTEN CONFIRMATION TO THE ARCHITECT AS TO WHAT INFORMATION WAS GIVEN TO WHOM AND WHEN. J. TEST INSTALLATION IN ACCORDANCE WITH THE APPROPRIATE CODE REQUIREMENTS AS EACH. NOTIFY THE OWNER PRIOR TO TESTING SYSTEM. SUBMIT TESTING REPORTS IN OPERATION AND MAINTENANCE MANUAL. K. PROVIDE PAINTING AS DETAILED IN THE SPECIFICATIONS. L. VERIFY MOUNTING HEIGHTS OF EQUIPMENT FIXTURES W/ARCHITECT BEFORE ROUGH-IN. M. FOR HANDICAPPED/ACCESSIBLE PLUMBING FIXTURES, CONFIRM EXACT MOUNTING HEIGHT WITH AUTHORITY HAVING JURISDICTION AND ADJUST AS REQUIRED BEFORE INSTALLATION. N. PROVIDE CONDENSATE TRAPS FOR ALL CONDENSATE DRAINS SEE DETAIL FOR INSTALLATION. O. PROVIDE RUBBER TRAP GUARDS AT EACH FLOOR DRAIN AND FLOOR SINK. P. LOCATE ROOF DRAINS AND EMERGENCY ROOF DRAINS WHERE INDICATED ON ROOF PLAN, SEE ARCH. Q. PROVIDE WATER HAMMER ARRESTORS ON HW AND CW PIPING AT EVERY TOILET GROUP, LOCATE IN ACCESSIBLE POSITION FOR SERVICING R. ALL VENTS SHALL BE LOCATED A MINIMUM OF 10 FEET AWAY FROM MECHANICAL UNIT OUTSIDE AIR INTAKES AND BUILDING OPENINGS. S. PROTECT THE OPEN ENDS OF ALL PIPE WITH PROTECTIVE PLASTIC (ON A DAILY BASIS) TO PREVENT ANY DEBRIS OR DIRT FROM ENTERING THE SYSTEM DURING CONSTRUCTION T. INSTALL WALL HYDRANTS AT 36" ABOVE FINISHED GRADE. U. THE CONTRACTOR SHALL PROVIDE FINAL CONNECTIONS TO EQUIPMENT CONNECTED TO THE INSTALLED SYSTEM INCLUDING COMPONENTS PROVIDED BY OTHERS. V. AT THE END OF EACH PHASE AND AT THE COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR A COMPLETELY OPERABLE SYSTEM. THE COMPLETED SYSTEM SHALL COMPLY WITH REQUIRED PERFORMANCE TESTING AND FULL FUNCTIONALITY AS INTENDED. W. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FULL COMPLIANCE WITH THE PROJECT PHASING AND FOR PROVIDING A COMPLETELY OPERABLE SYSTEM AT THE COMPLETION OF EACH PHASE. IF REQUIRED SERVICES TO A SYSTEM ARE NOT AVAILABLE DURING A PHASE, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING TEMPORARY UTILITIES UNTIL PERMANENT SERVICES ARE AVAILABLE. X. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SCHEDULING ALL SYSTEM PERFORMANCE TESTING, START-UP, DEMONSTRATION AND TRAINING WITH THE OWNER. FINAL OFFICIAL COPIES OF TESTING CERTIFICATES COMPLETE WITH PROPER WITNESS VALIDATION SHALL BE RETURNED TO THE OWNER AS PART OF THE FINAL OPERATION AND MAINTENANCE MANUALS SUBMITTAL. |

GENERAL NOTE: NOT ALL ABBREVIATIONS OR TERMS INDICATED ARE USED ON THESE CONTRACT DOCUMENTS.

GRAPHIC SYMBOLS

| | | |
|---|--------------|-------------------|
| PIPE FLOW DIRECTION | | S (SLOPE) |
| POINT OF CONNECTION EXISTING SYSTEM | | |
| POINT OF DISCONNECTION FROM EXISTING SYSTEM | | |
| EQUIPMENT TAG | | |
| SHEET KEYNOTE (NEW CONSTRUCTION) | | |
| DEMOLITION KEYNOTE | | |
| REVISION SEQUENCE NUMBER | | |
| ROOM TAG (ROOM NO NOT ALWAYS SHOWN) | | ROOM NAME RM # |
| SECTION/ELEVATION REFERENCE | VIEW REF | SHEET REF |
| INTERIOR ELEVATION REFERENCE | VIEW REF | SHEET REF |
| DETAIL / CALLOUT REFERENCE | VIEW REF | SHEET REF |

SYMBOL LEGEND GENERAL NOTES:
A. LEGENDS ARE GENERAL. NOT ALL SYMBOLS AND/OR DESIGNATIONS MAY APPEAR ON THE DRAWINGS.



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CITY OF LAKELAND
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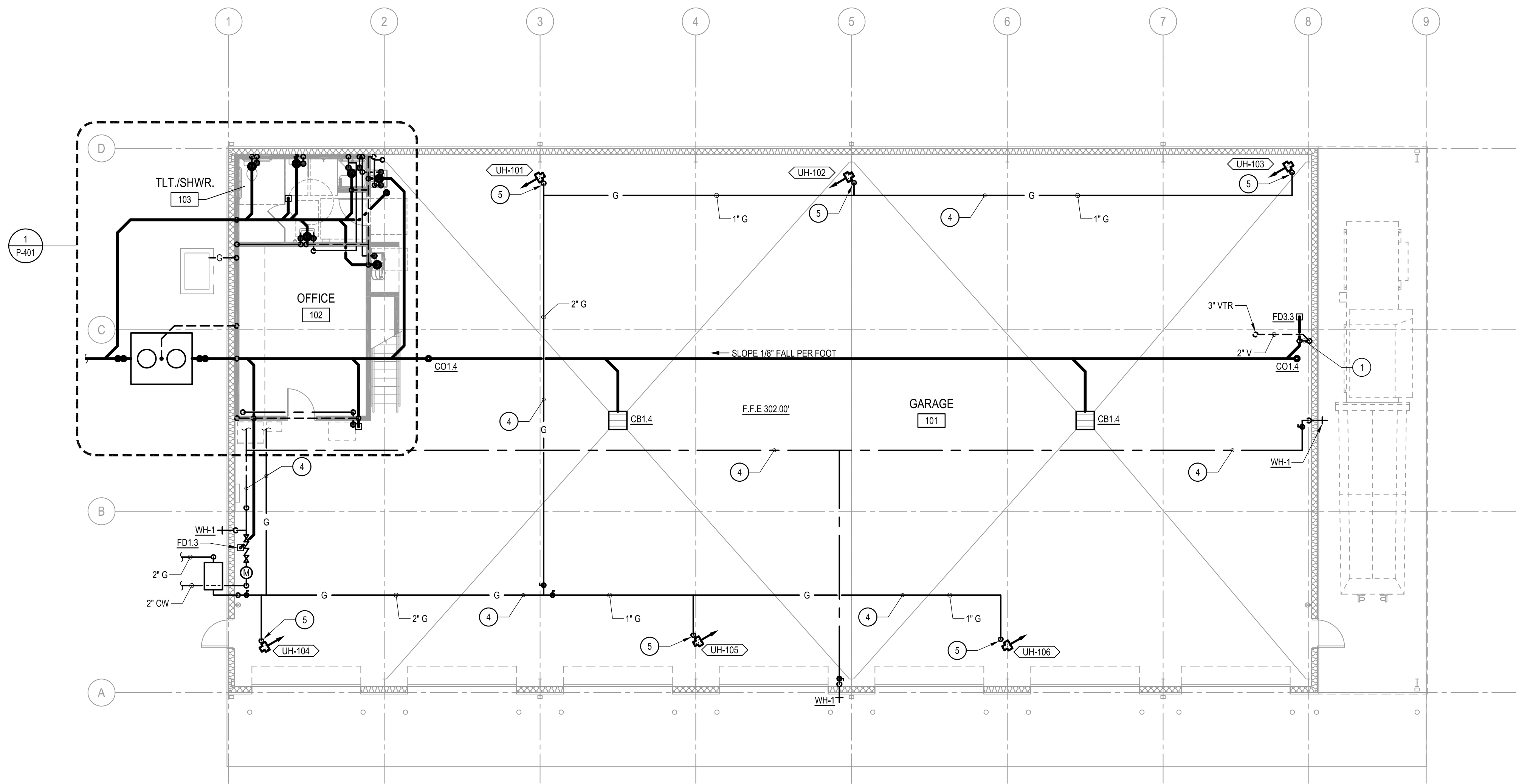
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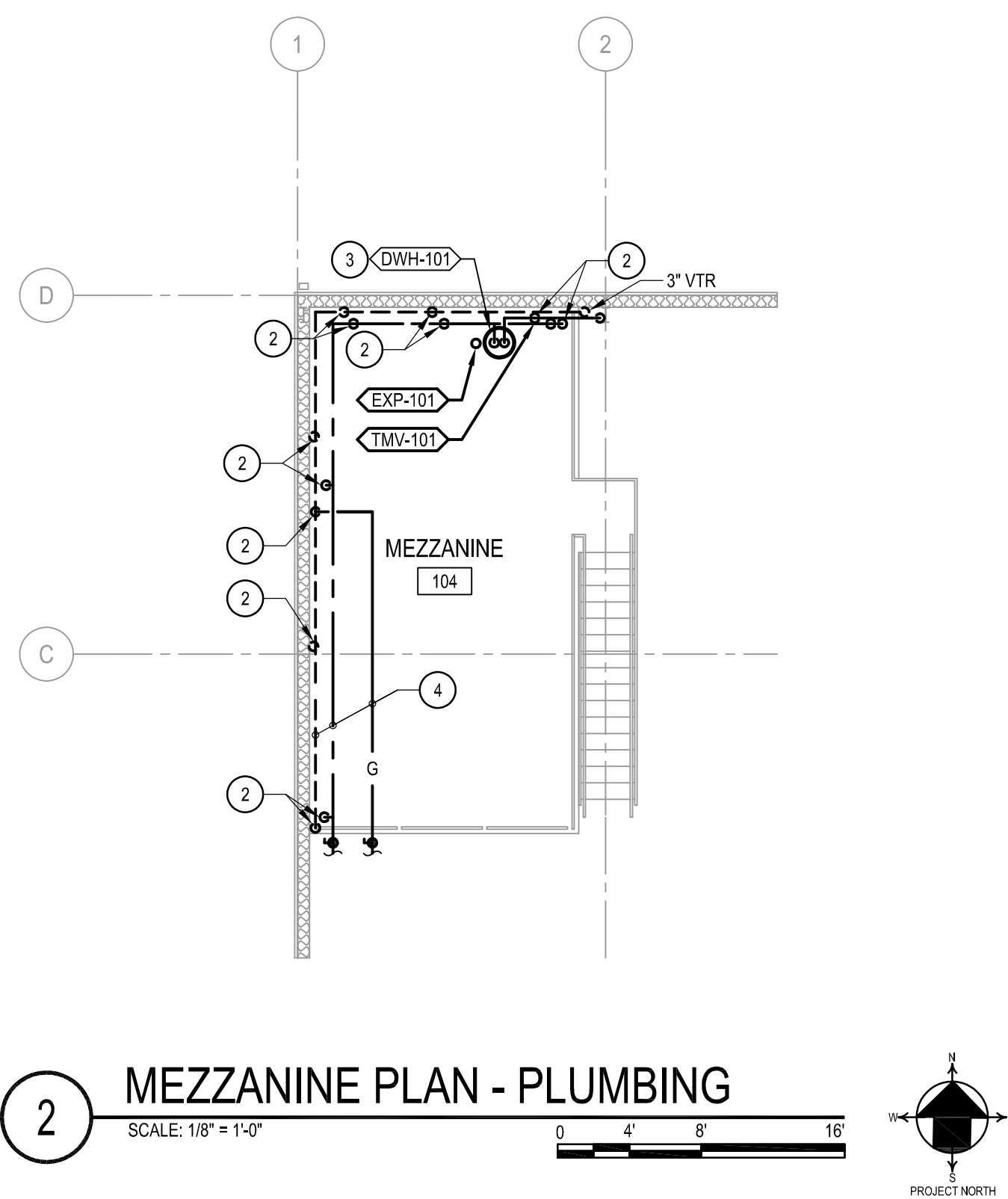
LEGENDS, ABBREVIATIONS, & SYMBOLS

FOR CODE REVIEW ONLY

SHEET NO. P-001



1 FLOOR PLAN - PLUMBING
 SCALE: 1/8" = 1'-0"
 PROJECT NORTH



2 MEZZANINE PLAN - PLUMBING
 SCALE: 1/8" = 1'-0"
 PROJECT NORTH

GENERAL NOTES

1. MAINTAIN SPACE FOR SERVICE AND MAINTENANCE OF EQUIPMENT.
2. PROTECT DRAINS DURING REMAINDER OF CONSTRUCTION PERIOD TO AVOID CLOGGING WITH DIRT AND DEBRIS AND TO PREVENT DAMAGE FROM TRAFFIC AND CONSTRUCTION WORK.
3. PLACE PLUGS IN ENDS OF UNCOMPLETED PIPING AT END OF DAY AND WHEN WORK STOPS.
4. INSTALL ISOLATION VALVES ON EACH BRANCH CONNECTION.
5. INSTALL SANITARY SLOPED AT MAXIMUM SLOPE TO THE SITE INVERT CONNECTION FROM STARTING CONNECTION. MAINTAIN A MINIMUM OF 1/4" FALL PER FOOT.
6. USE A MINIMUM OF 2" OR GREATER PIPING BELOW GRADE FOR SANITARY.
7. ROUGH-IN PIPING SERVICES FOR FIXTURES. MOUNT FIXTURES ACCORDING TO CONTRACT DOCUMENTS, LOCAL CODES AND ADA REQUIREMENTS.
8. FURNISH AND INSTALL CLEANOUTS AT THE BASE OF EACH STACK.
9. REFER TO STRUCTURAL DRAWINGS FOR SEISMIC CLASSIFICATION FOR BUILDING. FURNISH AND INSTALL SEISMIC HANGERS AND SUPPORTS AS REQUIRED.
10. REFER TO SHEET M901 FOR SPECIFICATIONS.

KEY NOTES

1. FURNISH AND INSTALL PIPING BELOW FLOOR.
2. FURNISH AND INSTALL PIPING DROP TO WITHIN WALL ASSEMBLY BELOW.
3. FURNISH AND INSTALL WATERTIGHT 16 GAUGE ALUMINUM DRAIN PAN BENEATH WATER HEATER. EXTEND 1" DRAIN FROM PAN AND TERMINATE WITH ELBOW TURN DOWN WITHIN SS-1.
4. FURNISH AND INSTALL TIGHT TO BOTTOM OF STRUCTURE.
5. FURNISH AND INSTALL DRIP LEG, UNION, FLEXIBLE CONNECTOR, AND SHUT-OFF VALVE AT NATURAL GAS CONNECTION TO UNIT HEATER.



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PLUMBING FLOOR PLAN

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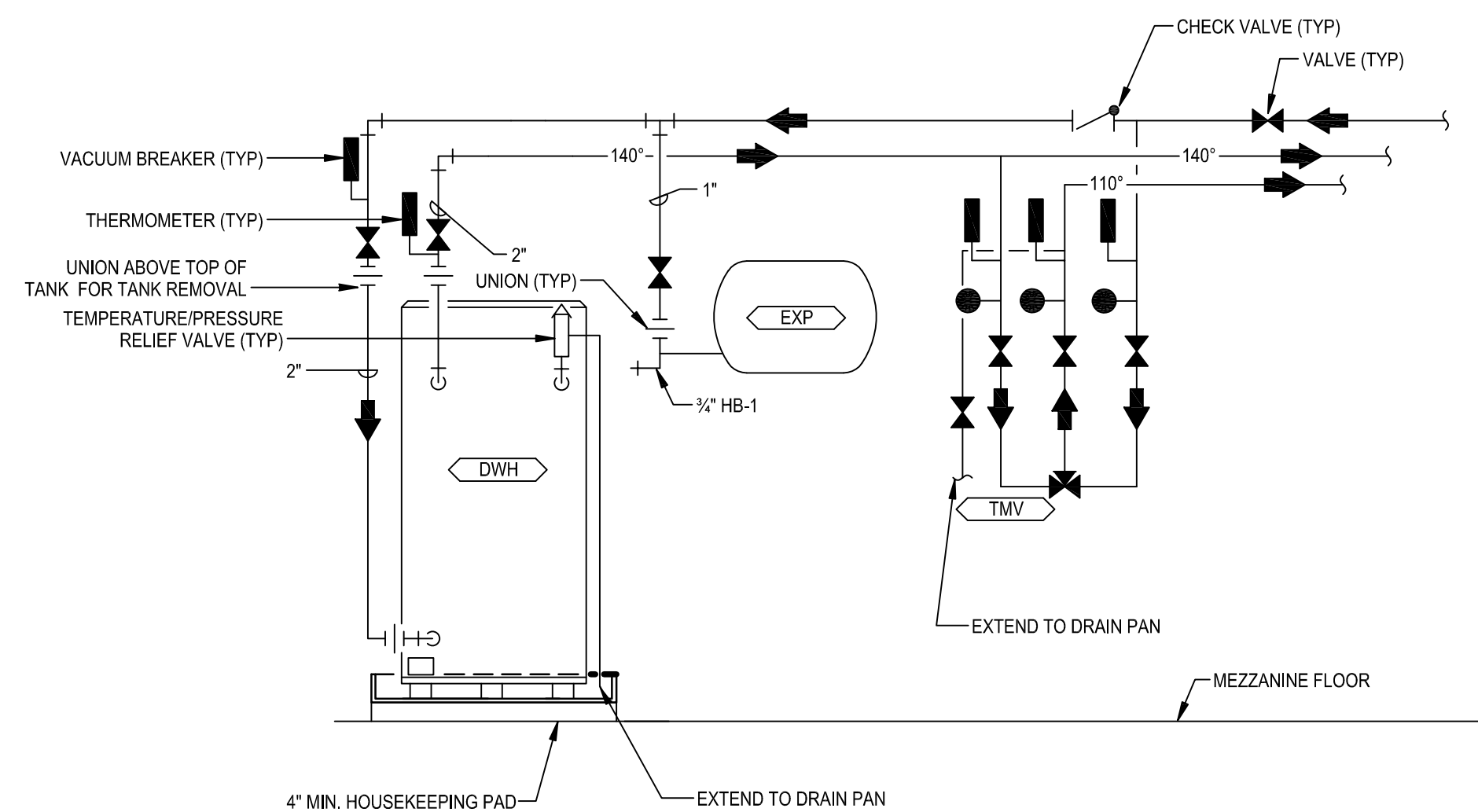
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PIPING AND FITTING ASSEMBLY SCHEDULE

| DESIGNATION | SYSTEM NAME | SYSTEM TEMP RANGE | PRESSURE RANGE | MATERIAL | CONNECTION TYPE | INSULATION MATERIAL | INSULATION THICKNESS | | | | COVERING | COVERING COLOR | IDENTIFICATION PRIMARY COLOR | IDENTIFICATION SECONDARY COLOR | IDENTIFICATION TEXT |
|-------------|----------------------|---|----------------|--|--------------------------------|----------------------------|----------------------|-------------|-------------|-------------|--|---------------------|------------------------------|--------------------------------|----------------------|
| | | | | | | | Ø<1" | 1" < Ø < 2" | 2" < Ø < 4" | 4" < Ø < 8" | | | | | |
| --- | DOMESTIC COLD WATER | ABOVE 50 DEGREES AND BELOW 100 DEGREES | 20-150 PSI | ABG: CPL, DI BEG: CPK, DI | SLD, FLG, GRV SLD, FLG, GRV | ABG: ELM, FBG BEG: NONE | 1/2" | 1" | 1" | 1" | EXP: PVC, ALM, SST CCL: FSK TRACER TAPE | EXP: BLACK - NOTE 8 | GREEN | WHITE | DOMESTIC COLD WATER |
| --- | DOMESTIC HOT WATER | ABOVE 70 DEGREES AND BELOW 130 DEGREES | 20-150 PSI | ABG: CPL, DI BEG: CPK, DI | SLD, FLG, GRV SLD, FLG, GRV | ABG: ELM, FBG BEG: NONE | 1/2" | 2" | 2" | 2" | EXP: PVC, ALM, SST CCL: FSK TRACER TAPE | EXP: BLACK - NOTE 8 | GREEN | WHITE | DOMESTIC HOT WATER |
| 140 | DOMESTIC 140°F WATER | ABOVE 130 DEGREES AND BELOW 150 DEGREES | 20-150 PSI | ABG: CPL, DI BEG: CPK, DI | SLD, FLG, GRV SLD, FLG, GRV | ABG: ELM, FBG BEG: NONE | 1/2" | 2" | 2" | 2" | EXP: PVC, ALM, SST CCL: FSK TRACER TAPE | EXP: BLACK - NOTE 8 | GREEN | WHITE | DOMESTIC 140°F WATER |
| --- | SANITARY SEWER | LESS THAN 130 DEGREES | 0-20 PSI | BEG: CPD, CIS, PVC | SLD, PSN, GLU | NONE | -- | -- | -- | -- | NONE | EXP: BLACK - NOTE 8 | GREEN | WHITE | SANITARY SEWER |
| --- | SANITARY VENT | LESS THAN 130 DEGREES | 0-20 PSI | ABG: CPD, CIS, GST BEG: CPD, CIS, PVC | SLD, NHB, NPT SLD, PSN, GLU | NONE | -- | -- | -- | -- | NONE | EXP: BLACK - NOTE 8 | GREEN | WHITE | SANITARY SEWER VENT |
| CD | CONDENSATE DRAIN | LESS THAN 100 DEGREES | 0-20 PSI | CPD, PVC, GST | SLD, GLU, NPT | ELM, FBG | 1/2" | 1" | 1" | 1" | EXP: PVC, ALM, SST CCL: FSK | EXP: BLACK - NOTE 8 | GREEN | WHITE | CONDENSATE DRAIN |
| G | NATURAL GAS | LESS THAN 130 DEGREES | 0-20 PSI | ABG: BST BEG: POLYETHYLENE | WLD, NPT GLU | NONE | -- | -- | -- | -- | NONE | EXP: BLACK - NOTE 8 | YELLOW | BLACK | NATURAL GAS - #PSI |
| GV | GAS VENT | LESS THAN 130 DEGREES | 0-20 PSI | CPL, BST | SLD, WLD, NPT | NONE | -- | -- | -- | -- | NONE | EXP: BLACK - NOTE 8 | YELLOW | BLACK | NATURAL GAS - VENT |

- NOTES:**
- ALL PIPING SYSTEM TYPES MAY NOT BE USED ON THESE CONTRACT DOCUMENTS.
 - FOR HEAT TRACED SYSTEMS, INCLUDE IDENTIFICATIONS FOR BOTH HEAT TRACING AND SYSTEM DESIGNATION.
 - WHERE PLASTIC PIPING IS USED, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO ENSURE COMPATIBILITY OF THE INSTALLED PIPING SYSTEM WITH THE BUILDING'S HVAC SYSTEM. WHERE PLENUM RATED MATERIALS ARE REQUIRED BY ANY FEDERAL, STATE, OR MUNICIPAL AUTHORITY'S CONSTRUCTION CODES, PLASTIC PIPING SHALL BE COVERED IN ITS ENTIRETY BY AN APPROVED FIRE RETARDANT INSULATING MATERIAL. FIRE RETARDANT INSULATING SYSTEMS SHALL BE CERTIFIED TO MEET ASTM E-84 AND UL 723 STANDARDS FOR FLAME SPREAD AND SMOKE GENERATION. FIRE RETARDANT INSULATING SYSTEMS SHALL BE APPROVED BY THE AUTHORITY HAVING JURISDICTION PRIOR TO INSTALLATION.
 - LABEL PIPING EVERY 25', AT EACH CONNECTION TO A TEE, AND AT FLOOR PENETRATIONS.
 - COVERING COLOR APPLIES TO EXPOSED INTERIOR PIPING ONLY.
 - DO NOT PAINT PVC PIPE OR JACKET. FURNISH AND INSTALL COLORED PVC JACKET AND COLORED BANDS ON PVC PIPE.
 - ALL INSULATION SHALL HAVE A COVERINGS. DO NOT PAINT INSULATION DIRECTLY.
 - VERIFY FINAL COVERING COLOR WITH PROJECT ARCHITECT ON A ROOM-BY-ROOM BASIS PRIOR TO ORDERING COVERINGS.

| | | | | | | | | | |
|-----|-------------------------|-----|--------------------------|-----|-----------------------------|-----|--------------------------|-----|------------------------------------|
| ABG | ABOVE GROUND | CIS | CAST IRON SERVICE WEIGHT | ELM | ELASTOMERIC | GSK | RUBBER GASKETS | SBS | SEAMLESS BLACK STEEL PIPE, SCH. 80 |
| ALM | ALUMINUM | CLG | CELLULAR GLASS | EXP | EPOXY COATED | GST | GALVANIZED STEEL | SLD | SOLDERED |
| AQT | AQUATHERM | CPD | COPPER TYPE DWV | FBG | FIBERGLASS | MW | MINERAL WOOL | SST | STAINLESS STEEL |
| ASJ | ALL SERVICE JACKET | CPK | COPPER TYPE K | FLG | FLANGED | NHB | NO HUB FITTINGS | WLD | WELDED |
| ASK | WHITE KRAFT FIBER PAPER | CPL | COPPER TYPE L | FSK | FOIL BACK KRAFT FIBER PAPER | NPT | THREADED | | |
| BEG | BELOW GROUND | CPM | COPPER TYPE M | FW | FUSION WELDED | PSN | PUSH ON | | |
| BRZ | BRAZED | CSL | CALCIUM SILICATE | GLU | GLUED | PRP | PRO PRESS | | |
| BST | BLACK STEEL PIPE | CTL | COPPER TUBING TYPE L | GRV | GROOVED | PVC | POLYVINYL CHLORIDE | | |
| CCL | CONCEALED | DI | DUCTILE IRON | | | RCP | REINFORCED CONCRETE PIPE | | |



PLUMBING ACCESSORY SCHEDULE

| TAG | DESCRIPTION | CONNECTION SIZE IN | | | | BASIS OF DESIGN | | NOTES |
|------------------|---|--------------------|---------------|---------------------------|---------------|-------------------------|-----------------|-----------------|
| | | COLD WATER | HOT WATER | WASTE | VENT | MFR | SERIES | |
| CO1.# | CLEANOUT: EXTERIOR, TRAFFIC RATED | -- | -- | REFER TO DWG'S | -- | JAY R. SMITH | 4318 | 1, 2 |
| CO2.# | CLEANOUT: INTERIOR, GENERAL DUTY | -- | -- | REFER TO DWG'S | -- | JAY R. SMITH | 4120 | 1, 2 |
| FD1.# | FLOOR DRAIN: GENERAL PURPOSE | -- | -- | REFER TO DWG'S | -- | JAY R. SMITH | 2010 | 1, 2 |
| FD3.# | FLOOR DRAIN: STAINLESS STEEL, HEAVY DUTY | -- | -- | REFER TO DWG'S | -- | JAY R. SMITH | 3001 | 1, 2 |
| CB1.# | CATCH BASIN: PRECAST CONCRETE, 2' SQUARE, CAST METAL GRATE | -- | -- | REFER TO DWG'S | -- | -- | -- | 1, 2 |

NOTES:

- COORDINATE MOUNTING REQUIREMENTS WITH ARCHITECTURAL DRAWINGS.
- REFER TO PLANS TO VERIFY ALL REQUIRED SIZES AND SERVICES (I.E. CW, HW, GAS, ETC.)

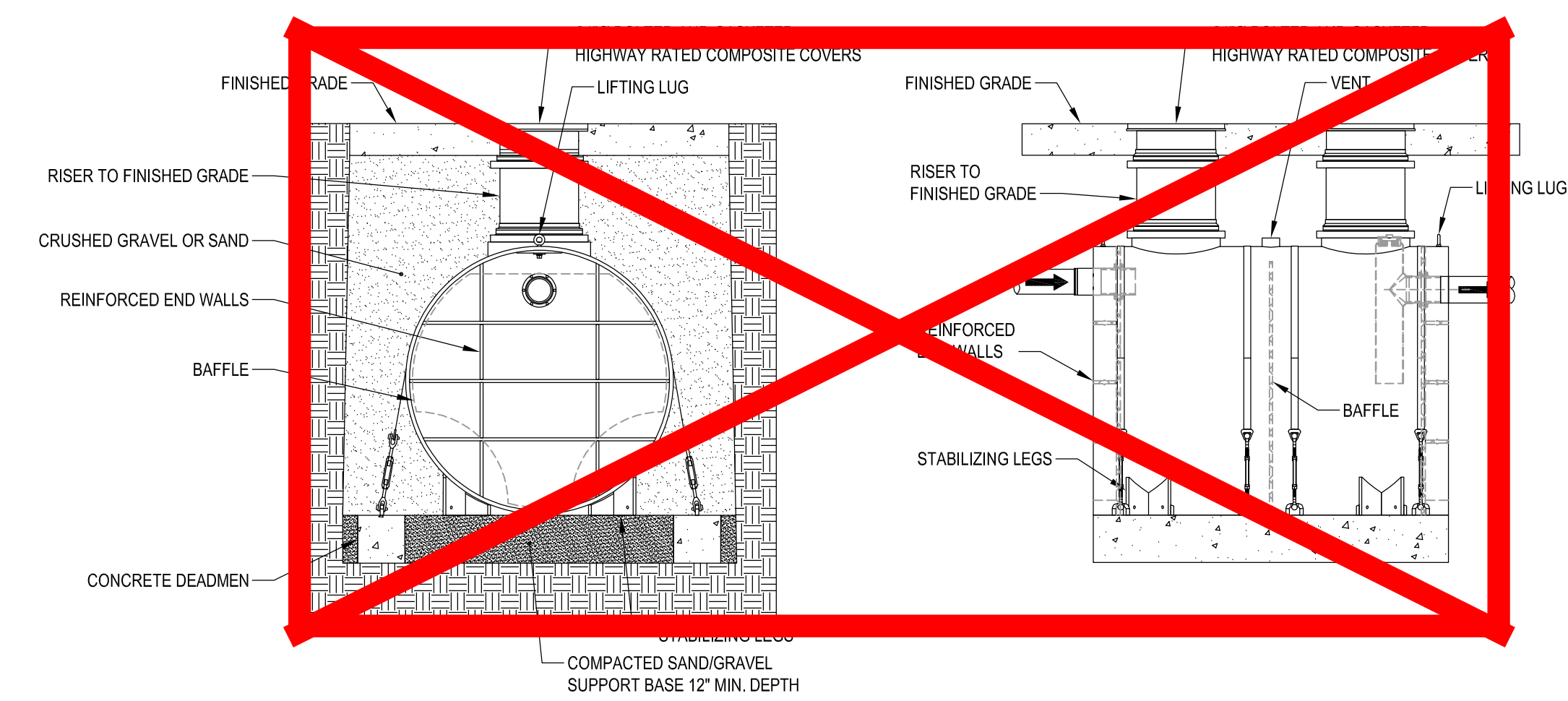
PLUMBING FIXTURE SCHEDULE

| TAG | DESCRIPTION | CONNECTION SIZE IN | | | | BASIS OF DESIGN | | NOTES |
|-----------------|---|--------------------|-----------------|---------------|---------------|-----------------|---------------|--------------------|
| | | COLD WATER | HOT WATER | WASTE | VENT | MFR | SERIES | |
| EW-2 | ELECTRIC WATER COOLER: TWIN UNIT, ADA COMPLIANT | 1/2" | -- | 1 1/2" | 1 1/2" | ELKAY | EZSTL8LC | 1, 2 |
| LAV-2 | LAVATORY: WALL MOUNTED, ADA COMPLIANT | 1/2" | 1/2" | 1 1/2" | 1 1/2" | SLOAN | SS-3103 | 1, 2 |
| SH-2 | SHOWER: SINGLE STALL, ADA COMPLIANT | 1/2" | 1/2" | 3" | 2" | -- | -- | 1, 2, 3 |
| SS-1 | SERVICE SINK: ADA COMPLIANT | 3/4" | 3/4" | 3" | 2" | KOHLER | 5-6714 | 1, 2 |
| UR-2 | URINAL: WALL MOUNTED, WASHDOWN, ADA COMPLIANT | 1 1/2" | -- | 2" | 2" | SLOAN | SU-1009 | 1, 2 |
| WB-1 | WALL BOX | 1/2" | -- | -- | -- | GUY GRAY | 88521 | 1, 2 |
| WC-6 | WATER CLOSET: FLOOR MOUNTED, TANK TYPE, ADA COMPLIANT | 1 1/2" | -- | 4" | 2" | KOHLER | K-3493 | 1, 2 |
| WH-1 | WALL HYDRANT: COLD WATER ONLY | 3/4" | -- | -- | -- | JAY R. SMITH | 5509QT | 1, 2 |

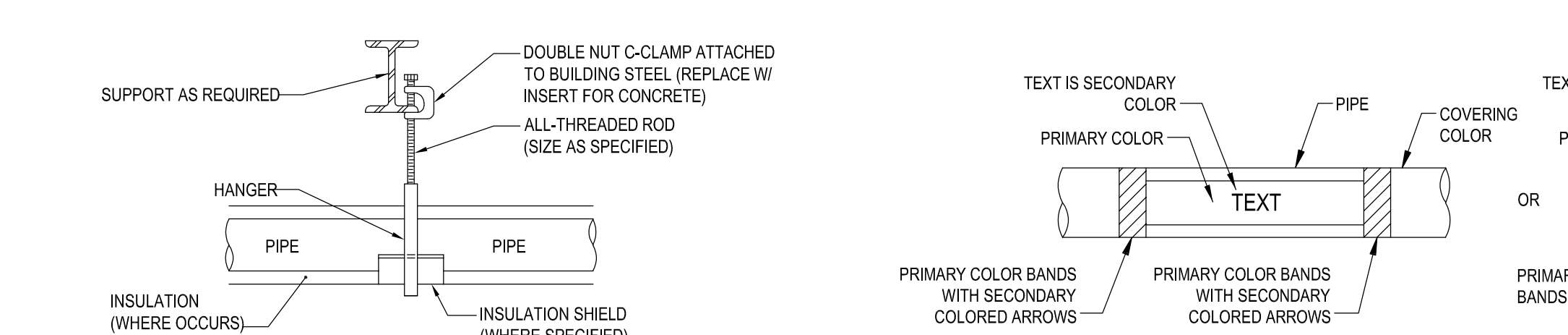
NOTES:

- COORDINATE MOUNTING REQUIREMENTS WITH ARCHITECTURAL DRAWINGS.
- REFER TO PLANS TO VERIFY ALL REQUIRED SIZES AND SERVICES (I.E. CW, HW, GAS, ETC.)
- ROUGH-IN ONLY BY PC, ENCLOSURE, LEAD DIVERTER VALVE AND APPURTENANCES BY GC.

1 DOMESTIC WATER HEATER, ELECTRIC, TANK
NOT TO SCALE

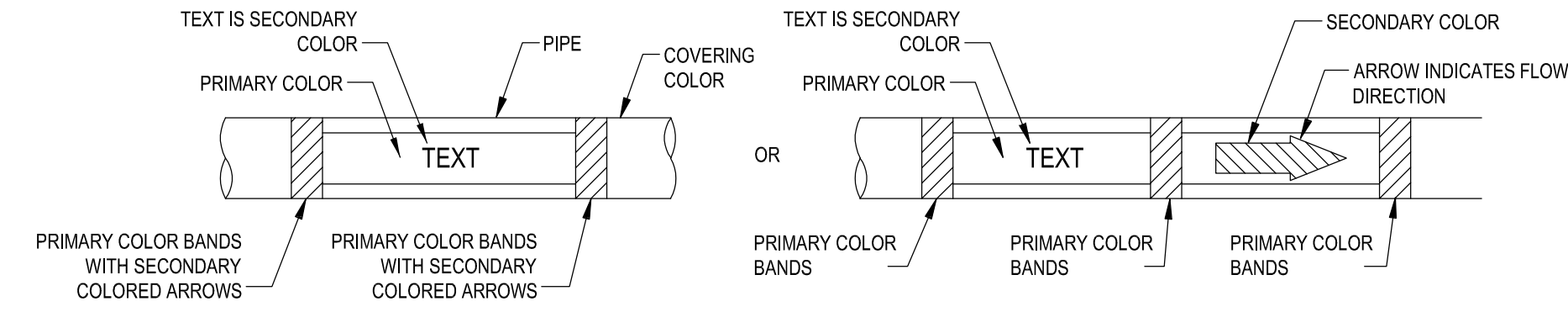


2 OIL INTERCEPTOR DETAIL
NOT TO SCALE



3 PIPE HANGER AND SUPPORT
NOT TO SCALE

4 PIPING IDENTIFICATION DETAIL
NOT TO SCALE



PLUMBING EQUIPMENT SCHEDULE

| TAG | DESCRIPTION | ELECTRICAL CHARACTERISTICS | | | BASIS OF DESIGN | | NOTES |
|-------------------|--|----------------------------|---------------|---------------|-------------------|---------------|----------------|
| | | POWER | VOLTAGE | PHASE | MFR | SERIES | |
| DWH-101 | ELECTRIC, 30 GALLON, DOMESTIC WATER HEATER | 4 KW | 208 | 3 | AO SMITH | DEN | |
| TMV-101 | THERMOSTATIC MIXING VALVE, 5 PSI LOSS AT 4 GPM, 0.5 GPM MINIMUM | -- | -- | -- | POWERS | LFLM495 | 110° DISCHARGE |
| BFP-101 | RPZ BACKFLOW PREVENTER | -- | -- | -- | WATTS | 909 | |
| OI-101 | OIL INTERCEPTOR, 750 GALLONS | -- | -- | -- | STRIEM | OS | |
| EXP-101 | EXPANSION TANK, 2.0 GALLON TOTAL, 0.9 GALLON ACCEPTANCE VOLUME, ASME RATED | -- | -- | -- | AMTROL | ST | |

GAS REGULATOR SCHEDULE

| TAG | DESCRIPTION | CONNECTED LOAD (BTU/H) | VENT SIZE | INLET PRESSURE | OUTLET PRESSURE | BASIS OF DESIGN | | NOTES |
|------|----------------------------|------------------------|-----------|----------------|-----------------|-----------------|--------|-------|
| | | | | | | MFR | SERIES | |
| GR-1 | GAS REGULATOR, NATURAL GAS | 510,000 | 1 1/2" | 2 PSI | 0.5 PSI | EMERSON | 522 | |

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PLUMBING SCHEDULES

ELECTRICAL, COMMUNICATION, PROCESS CONTROL, AND ELECTRONIC SAFETY AND SECURITY SYMBOL LEGEND

| LIGHTING | POWER DISTRIBUTION | WIRING DEVICES | WIRING DEVICES (CONTINUED) | MEDIUM VOLTAGE EQUIPMENT | SECURITY/ACCESS/SURVEILLANCE |
|--|--|---|---|--|--|
| <p>LIGHT FIXTURE:</p> <p>GENERAL</p> <p>CEILING SURFACE MOUNTED</p> <p>CEILING RECESSED</p> <p>CEILING PENDANT</p> <p>WALL MOUNTED</p> <p>NIGHT LIGHT:</p> <p>FIXTURE WITH "NIGHT LIGHT" CONNECTED TO NORMAL OR NORMAL/EMERGENCY CIRCUIT</p> <p>CEILING SURFACE MOUNTED</p> <p>CEILING RECESSED</p> <p>CEILING PENDANT</p> <p>WALL MOUNTED</p> <p>EMERGENCY:</p> <p>LIGHT FIXTURE CONNECTED TO NORMAL/EMERGENCY, EMERGENCY ONLY OR BATTERY INVERTER CIRCUIT</p> <p>CEILING SURFACE MOUNTED</p> <p>CEILING RECESSED</p> <p>CEILING PENDANT</p> <p>WALL MOUNTED</p> <p>EMERGENCY BALLAST:</p> <p>LIGHT FIXTURE WITH EMERGENCY BATTERY BALLAST</p> <p>CEILING SURFACE MOUNTED</p> <p>CEILING RECESSED</p> <p>CEILING PENDANT</p> <p>WALL MOUNTED</p> <p>EMERGENCY SOCKET:</p> <p>LIGHT FIXTURE WITH EMERGENCY ONLY SOCKET</p> <p>CEILING SURFACE MOUNTED</p> <p>CEILING RECESSED</p> <p>CEILING PENDANT</p> <p>WALL MOUNTED</p> <p>FLOOD OR SPOT LIGHT:</p> <p>CLG WALL</p> <p>EXIT SIGN:</p> <p>ILLUMINATED FACE</p> <p>WALL MOUNTED - DIRECTIONAL ARROW AS REQUIRED</p> <p>SINGLE FACE, CEILING MOUNTED - DIRECTIONAL ARROW AS REQUIRED</p> <p>DUAL FACE, CEILING MOUNTED - DIRECTIONAL ARROWS AS REQUIRED</p> <p>EMERGENCY LIGHTING UNIT:</p> <p>EMERGENCY LIGHTING UNIT - BATTERY TYPE WITH NUMBER OF HEADS AS INDICATED</p> <p>EMERGENCY LIGHTING UNIT - REMOTE HEAD WITH NUMBER OF HEADS AS INDICATED</p> <p>TRACK LIGHTING:</p> <p>TRACK MOUNTED LIGHT FIXTURES - WITH FLOOD AND/OR SPOT TYPES</p> <p>FLOOD</p> <p>M - MEDIUM</p> <p>N - NARROW</p> <p>W - WIDE SPOT</p> <p>S - NORMAL</p> <p>FEED END</p> <p>HORIZONTAL/VERTICAL RUN</p> | <p>SURFACE FLUSH</p> <p>PANELBOARD</p> <p>EQUIPMENT CABINET</p> <p>CLG FLOOR WALL</p> <p>JUNCTION BOX</p> <p>BLANK OUTLET</p> <p>JUNCTION BOX OR BLANK OUT - ABOVE FLOOR, IN CAST BOX ON RIGID CONDUIT</p> <p>JUNCTION BOX OR BLANK OUT - ABOVE COUNTER</p> <p>CONTACTOR</p> <p>RELAY</p> <p>METER</p> <p>SURGE PROTECTION DEVICE</p> <p>ENCLOSED CIRCUIT BREAKER</p> <p>SAFETY SWITCH - NON-FUSED, 3-POLE, 30A, 600V UNO</p> <p>SAFETY SWITCH - FUSED, 3-POLE, 30A, 600V UNO</p> <p>COMBINATION STARTER / DISCONNECT - 3 PHASE</p> <p>MANUAL MOTOR STARTER (HP RATED)</p> <p>THE LETTERS ADJACENT TO THE SYMBOL INDICATE STARTER TYPE:</p> <p>M - TOGGLE</p> <p>MK - KEY OPERATED</p> <p>MB - PUSHBUTTON</p> <p>MT - TOGGLE WITH THERMAL OVERLOADS</p> <p>TRANSFORMER - 120V AND GREATER</p> <p>TRANSFORMER - LOW VOLTAGE</p> <p>MOTOR OR EQUIPMENT</p> <p>ELECTRIC SOLENOID VALVE - BY OTHERS (H-HOT WATER, C-COLD WATER, G-GAS)</p> <p>MAST HEAD</p> <p>CONDUIT SLEEVE - QUANTITY AND SIZE AS REQUIRED</p> <p>CABLE TRAY - WALL HUNG</p> <p>CABLE TRAY - CENTER HUNG</p> <p>EMPTY CONDUIT - SEALED & CAPPED</p> <p>CIRCUIT</p> <p>HOMERUN TO PANELBOARD; PROVIDE 3 #12, #12 GRD, 3/4" UNLESS NOTED OTHERWISE ON DRAWING, ON PANEL SCHEDULES, OR ONE LINE DIAGRAMS</p> <p>CIRCUIT - EQUIPMENT ON SAME CIRCUIT BUT SEPARATELY CONTROLLED</p> | <p>SWITCH:</p> <p>SINGLE POLE</p> <p>THE LETTERS/NUMBERS ADJACENT TO THE SYMBOL INDICATE SWITCH TYPE. SWITCHES ARE SINGLE POLE UNLESS IDENTIFIED OTHERWISE.</p> <p>3 - THREE-WAY</p> <p>4 - FOUR-WAY</p> <p>B - TOUCHBOLT</p> <p>CK - CARD KEY</p> <p>D - DIMMER - INCANDESCENT</p> <p>DF - DIMMER - FLUORESCENT</p> <p>DL - DIMMER - LOW VOLTAGE</p> <p>ET - ELECTRONIC TAP</p> <p>K - KEY OPERATED</p> <p>MC - MAINTAINED CONTACT</p> <p>P - PILOT LIGHT</p> <p>R - LOCAL REMOTE CONTROL</p> <p>WP - WEATHERPROOF</p> <p>X - EXPLOSION PROOF</p> <p>OCCUPANCY SENSOR:</p> <p>SWITCH - PIR WITH PUSHBUTTON</p> <p>THE LETTERS/NUMBERS ADJACENT TO THE SYMBOL INDICATE SWITCH SENSOR TYPE. SWITCH SENSORS ARE PIR TYPE UNLESS IDENTIFIED OTHERWISE.</p> <p>OC1 - DUAL TECHNOLOGY WITH 1 PUSHBUTTON</p> <p>OC2 - DUAL TECHNOLOGY WITH 2 PUSHBUTTONS FOR DUAL CONTROL</p> <p>CLG WALL</p> <p>RADIAL - AUTO ON/OFF</p> <p>DIRECTIONAL - AUTO ON/OFF</p> <p>THE LETTERS ADJACENT TO THE SYMBOL INDICATE SENSOR TYPE. WHERE SENSOR SYMBOL IS SHOWN WITHOUT IDENTIFICATION, PROVIDE PIR FOR WALL TYPES AND DT FOR CEILING TYPES.</p> <p>DT - DUAL TECHNOLOGY (COMBINATION PIR & US)</p> <p>ER - EXTENDED RANGE</p> <p>HB - HIGHBAY</p> <p>HH - HIGH HUMIDITY / LOW TEMPERATURE</p> <p>HW - HALLWAY</p> <p>PIR - PASSIVE INFRARED</p> <p>R - RELAY</p> <p>US - ULTRASONIC OR MICROPHONIC</p> <p>WP - WEATHERPROOF</p> <p>WV - WIDE VIEW</p> <p>POWER PACK</p> <p>PHOTO/DAYLIGHT SENSOR:</p> <p>PHOTO SENSOR - WALL MTD (MOUNTED ON NORTH FACE OF BUILDING)</p> <p>PHOTO SENSOR - CEILING MTD</p> <p>RECEPTACLE:</p> <p>CLG FLOOR WALL</p> <p>SINGLE</p> <p>DUPLICATE</p> <p>DOUBLE DUPLICATE</p> <p>GFCI</p> <p>GFCI DOUBLE DUPLICATE</p> <p>SPD (ISOLATED GROUND)</p> <p>SPD DOUBLE DUPLICATE</p> <p>TAMPER RESISTANT</p> <p>SPLIT WIRED</p> <p>30A 30A 30A</p> <p>SINGLE PHASE, 480V RATED WITH AMPERAGE AS INDICATED</p> <p>40A 40A</p> <p>THREE PHASE, 480V RATED WITH AMPERAGE AS INDICATED</p> <p>72"</p> <p>NUMBER ADJACENT TO SYMBOL INDICATES MOUNTING HEIGHT A.F.F.</p> <p>LETTER "C" ADJACENT TO SYMBOL INDICATES RECEPTACLE ABOVE COUNTER</p> <p>ABOVE FLOOR, IN CAST BOX ON RIGID CONDUIT - RECEPTACLE TYPE AS SHOWN</p> <p>LETTER "WP" ADJACENT TO SYMBOL INDICATES WEATHERPROOF IN USE COVER THAT IS PAD LOCKABLE</p> | <p>PUSHBUTTON:</p> <p>STANDARD</p> <p>THE LETTER ADJACENT TO THE SYMBOL INDICATES TYPE. PUSHBUTTONS ARE STANDARD UNLESS IDENTIFIED OTHERWISE.</p> <p>E - EMERGENCY</p> <p>K - EMERGENCY, KEY OPERATED</p> <p>P - PANIC/ENTRANCE</p> <p>MISCELLANEOUS:</p> <p>POWER POLE - WITH WIRING DEVICES AS INDICATED</p> <p>POWER/TELECOM POLE - WITH WIRING DEVICES AS INDICATED</p> <p>FURNITURE PEDESTAL - WITH WIRING DEVICES AS INDICATED</p> <p>FIRE RATED POKE-THROUGH - WIRING DEVICES AND TELECOM OUTLETS AS INDICATED</p> <p>FLUSH FLOOR BOX - WIRING DEVICES AND TELECOM OUTLETS AS INDICATED</p> <p>SURFACE RACEWAY WITH WIRING DEVICES AS INDICATED</p> <p>VERTICAL DROP</p> <p>HORIZONTAL RUN</p> <p>SURFACE MOUNTED RACEWAY MOUNTED - WIRING DEVICES AS INDICATED</p> <p>SURFACE RACEWAY</p> <p>LTS</p> <p>LIMIT SWITCH</p> <p>FIRE ALARM:</p> <p>CLG WALL</p> <p>SMOKE DETECTOR</p> <p>HEAT DETECTOR</p> <p>CARBON MONOXIDE DETECTOR</p> <p>NUMBER ADJACENT TO SYMBOL INDICATES ZONE, IF REQUIRED</p> <p>LETTER ADJACENT TO SYMBOL INDICATES PREFERRED DETECTOR TYPE:</p> <p>D - DOOR</p> <p>P - PREACTION</p> <p>R - ELEVATOR RECALL</p> <p>RE - SHAFT & EXHAUST ELEVATOR RECALL</p> <p>RS - ELEVATOR RECALL & SPRINKLER ACTIVATION</p> <p>DUCT DETECTOR - SMOKE (NUMBER INDICATES ZONE, IF REQUIRED)</p> <p>DUCT DETECTOR - HEAT (NUMBER INDICATES ZONE, IF REQUIRED)</p> <p>AUDIBLE WITH VISUAL UNIT</p> <p>AUDIBLE ONLY UNIT</p> <p>VISUAL ONLY UNIT</p> <p>MANUAL PULL STATION (NUMBER INDICATES ZONE IF REQUIRED)</p> <p>MANUAL PULL STATION - KEY OPERATED</p> <p>MANUAL PULL STATION WITH CLEAR PROTECTIVE COVER</p> <p>DOOR HOLDER (F-FLOOR, C-CEILING, W-WALL)</p> <p>CONTROL MODULE - ZONE</p> <p>CONTROL MODULE - ADDRESSABLE</p> <p>REMOTE TEST STATION - WALL MTD</p> <p>REMOTE TEST STATION - CEILING MTD</p> <p>LETTER "I" INDICATES TEST LIGHT</p> <p>FIRE SUPPRESSION FLOW SWITCH - BY OTHERS</p> <p>FIRE SUPPRESSION TAMPER SWITCH - BY OTHERS</p> <p>SURFACE FLUSH</p> <p>FIRE ALARM CONTROL PANEL</p> | <p>FUSE</p> <p>CURRENT TRANSFORMER (CT)</p> <p>ZERO-SEQUENCE CURRENT TRANSFORMER (ZSCT)</p> <p>VOLTAGE TRANSFORMER (VT)</p> <p>LIGHTNING (SURGE) ARRESTOR</p> <p>MEDIUM VOLTAGE BREAKER (DRAW-OUT TYPE)</p> <p>ANSI FUNCTION</p> <p>TEST SWITCH</p> <p>DRAW-OUT TYPE CONTACTOR</p> <p>PROTECTIVE RELAY</p> <p>AA - MANUFACTURER AND MODEL</p> <p>MEDIUM VOLTAGE TRANSFORMER</p> <p>MEDIUM VOLTAGE NON-FUSED DISCONNECT</p> <p>POLE FUSED CUTOUTS</p> <p>PROCESS CONTROL DEVICES:</p> <p>TYPE LETTER SHOWN IN LIST BELOW</p> <p>NUMBER OF #14 DIGITAL SIGNAL WIRES INCLUDING A #14 GRD IN 3/4" UNO (BLANK IF NONE). CONDUITS TO/FROM SAME AREA MAY BE COMBINED. EC TO CONFORM TO NEC FOR CONDUIT SIZES. 24V AND 120V SHALL BE SEPARATED INTO SEPARATE CONDUITS. WIRES NOT USED ARE SPARES</p> <p>ASSOCIATED POWER SOURCE (BLANK IF NONE)</p> <p>NUMBER OF 2/0 #16 TSP ANALOG SIGNAL CABLES IN 3/4" UNO (BLANK IF NONE). CONDUITS TO/FROM SAME AREA MAY BE COMBINED. EC TO CONFORM TO NEC FOR CONDUIT SIZES. CABLES NOT USED ARE SPARES</p> <p>* - SEE INSTRUMENTATION DEVICE LIST ON EACH SHEET FOR DIGITAL AND ANALOG SIGNAL DESTINATION</p> <p>LIST OF COMMON PROCESS DEVICES</p> <p>BTS - BOWL TEMPERATURE SWITCH</p> <p>CGS - COMBUSTIBLE GAS SENSOR/TRANSMITTER</p> <p>CS - CONTROL STATION</p> <p>CTS - CABINET TEMPERATURE SWITCH</p> <p>DPS - DIFFERENTIAL PRESSURE SWITCH</p> <p>DSD - OVERHEAD DOOR SAFETY DEVICE</p> <p>EL - EMERGENCY STOP LAMP/ARD</p> <p>ESP - EMERGENCY STOP PUSH BUTTON</p> <p>FLS - FLOODING LEVEL SENSOR</p> <p>FS - FLOW SWITCH</p> <p>GFM - GAS FLOW METER</p> <p>LS - LEVEL SWITCH (FLOAT)</p> <p>LTS - LIMIT SWITCH</p> <p>MM - MAGNETIC FLOW METER</p> <p>MOG - MOTOR OPERATED GATE</p> <p>MOV - MOTOR OPERATED VALVE</p> <p>MT - MOTOR TEMPERATURE SWITCH</p> <p>OLS - OIL LEVEL SWITCH</p> <p>POS - POSITION SWITCH</p> <p>PS - PRESSURE SWITCH</p> <p>PT - PRESSURE TRANSMITTER</p> <p>RL - RADAR LEVEL PROBE</p> <p>S - SOLENOID VALVE</p> <p>SL - SUBMERSIBLE LEVEL PROBE</p> <p>SLP - SEAL LEAK PROBE</p> <p>SM - SUCTION MONITOR</p> <p>T - TRANSMITTER</p> <p>TP - TEMPERATURE PROBE</p> <p>UF - ULTRASONIC FLOW METER</p> <p>UL - ULTRASONIC LEVEL PROBE</p> <p>VFM - VENTURI FLOW METER</p> <p>ZS - ZERO SPEED SWITCH</p> <p>WIRING DIAGRAMS:</p> <p>WIRES NOT CONNECTED</p> <p>CONNECTING WIRES</p> | <p>CLG WALL</p> <p>AUDIBLE WITH VISUAL UNIT</p> <p>AUDIBLE ONLY UNIT</p> <p>VISUAL ONLY UNIT</p> <p>THE NUMBER ADJACENT TO THE SYMBOL INDICATES PREFERRED CANDELA VALUE. VISUAL SYMBOL WITHOUT IDENTIFICATION SHALL BE AS FOLLOWS:</p> <p>CORRIDORS / HALLWAYS - 30 CANDELA</p> <p>ROOMS <= 2,000 SQFT - 75 CANDELA</p> <p>ROOMS > 2,000 SQFT - 110 CANDELA</p> <p>CLG WALL</p> <p>MONITOR</p> <p>CAMERA</p> <p>NUMBER ADJACENT TO SYMBOL INDICATES MOUNTING HEIGHT A.F.F.</p> <p>CLG WALL</p> <p>MOTION DETECTOR (NUMBER INDICATES ZONE IF REQUIRED)</p> <p>SPEAKER</p> <p>INTERCOM STATION - WALL MTD</p> <p>INTERCOM STATION - MASTER</p> <p>MAGNETIC DOOR CONTACTS (NUMBER INDICATES ZONE IF REQUIRED)</p> <p>PUSHBUTTON</p> <p>KEYPAD</p> <p>CARD/PROXIMITY READER</p> <p>BIOMETRIC READER</p> <p>MULTIPLIER</p> <p>ELECTRIC LOCK - BY OTHERS</p> <p>ELECTRIC STRIKE - BY OTHERS</p> <p>SURFACE FLUSH</p> <p>SECURITY EQUIPMENT CABINET</p> <p>PHOTOELECTRIC SENSOR</p> <p>GENERAL:</p> <p>RISER, OR ONE LINE NOTE NUMBER (E.G. SEE RISER NOTE NO. E1)</p> <p>SHEET KEYNOTE (NEW CONSTRUCTION)</p> <p>DEMOLITION KEYNOTE</p> <p>REVISION SEQUENCE NUMBER</p> <p>ROOM TAG (ROOM NO NOT ALWAYS SHOWN)</p> <p>EQUIPMENT TAG</p> <p>DETAIL / CALLOUT REFERENCE</p> <p>BOX TAG/NOTE REFERENCE</p> <p>VIEW REF</p> <p>SHEET REF</p> <p>BOXED TAG(S)/NOTE(S) BELOW THE ROOM NAME/NUMBER OR PLACED IN THE SPACE INDICATE THAT THE INFORMATION IN THE BOX APPLIES TO ALL FIXTURES AND/OR RECEPTABLES IN THE ROOM/SPACE UNLESS NOTED OTHERWISE.</p> <p>PANEL NAME</p> <p>KEY NOTE (TYP.)</p> <p>SYMBOLS LEGEND NOTES:</p> <p>A. NOT ALL SYMBOLS INDICATED MAY APPEAR ON THESE CONTRACT DRAWINGS.</p> <p>B. DASHED SYMBOLS REPRESENT EXISTING EQUIPMENT OR EQUIPMENT NOT IN CONTRACT.</p> |
| <p>GROUNDING SYSTEM:</p> <p>GROUND ROD</p> <p>GROUND ROD TEST WELL</p> <p>GROUND BAR</p> | <p>SITE:</p> <p>POLE MOUNTED H.L.D. LIGHT FIXTURE - SINGLE HEAD WITH ARM BRACKET</p> <p>POLE MOUNTED H.L.D. LIGHT FIXTURE - DUAL HEAD WITH ARM BRACKET</p> <p>POLE MOUNTED H.L.D. LIGHT FIXTURE - SINGLE HEAD POST MOUNT</p> <p>BUILDING UPLIGHT FIXTURE</p> <p>BOLLARD LIGHT FIXTURE</p> <p>UNDERGROUND ELECTRICAL ENCLOSURE</p> <p>PAD MOUNT TRANSFORMER</p> <p>UTILITY POLE</p> <p>MANHOLE/VAULT</p> <p>UGE - UNDERGROUND EMERGENCY/STANDBY GENERATOR SERVICE</p> <p>UPE - UNDERGROUND ELECTRIC SERVICE (PRIMARY)</p> <p>USE - UNDERGROUND ELECTRIC SERVICE (SECONDARY)</p> <p>UTC - UNDERGROUND CATV & TELEPHONE SERVICE</p> <p>SL - UNDERGROUND SITE LIGHTING CONDUIT</p> <p>EC - UNDERGROUND EMPTY CONDUIT</p> <p>BC - UNDERGROUND BRANCH CIRCUIT CONDUIT</p> <p>TC - TELECOMMUNICATION CONDUIT</p> | | | | |

| REVISIONS | MARK | ISSUED DATE | DESCRIPTION |
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PROJECT NO: 81079-04
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CHECKED BY: SJW

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SHEET TITLE:
ELECTRICAL SYMBOL LEGEND

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ELECTRICAL ABBREVIATIONS, MOUNTING HEIGHTS, AND GENERAL LAYOUT NOTES

| ELECTRICAL ABBREVIATIONS | | EQUIP ABBRV | |
|--------------------------|---------------------------------|-------------|--------------------------------|
| NUMBER | | L | A |
| 1PH | SINGLE-PHASE | L | LONG OR LOCKABLE |
| 1Ø | SINGLE-PHASE | LA | LIGHTNING ARRESTER |
| 1P | SINGLE POLE | LB or LBS | POUND(S) |
| 2C | TWO-CONDUCTOR | LED | LIGHT EMITTING DIODE |
| 2WAY | TWO-WAY | LF | LINEAR FEET (FOOT) |
| 3C | THREE-CONDUCTOR | LIN | LINEAR |
| 3PH | THREE-PHASE | LP | LIGHT POLE |
| 3Ø | THREE-PHASE | LPW | LUMENS PER WATT |
| 4C | FOUR-CONDUCTOR | LRA | LOCKED ROTOR AMPS |
| 4PDT | FOUR-POLE DOUBLE THROW | LT | LEFT |
| 4PST | FOUR-POLE SINGLE THROW | LTG | LIGHTING |
| 4W | FOUR-WIRE | LV | LOW VOLTAGE |
| A | | M | |
| A | AMPERE | mA | MILLIAMPERE |
| A/E | ARCHITECT/ENGINEER | MAT | MATERIAL |
| ABBRV | ABBREVIATION | MATV | MASTER ANTENNA TV SYSTEM |
| AC | ALTERNATING CURRENT | MAX | MAXIMUM |
| ADA | AMERICANS WITH DISABILITIES ACT | MCB | MAIN CIRCUIT BREAKER |
| AF | AMPERE FRAME | MC | MECHANICAL CONTRACTOR |
| AFD | ABOVE FINISHED GRADE | MCA | MINIMUM CIRCUIT AMPS |
| AFF | ABOVE FINISHED FLOOR | MCC | MOTOR CONTROL CENTER |
| AFF1 | ABOVE FINISHED FIRST FLOOR | MECH | MECHANICAL |
| AFG | ABOVE FINISHED GRADE | MFA | MAXIMUM FUSE AMPS |
| AFR | ABOVE FINISHED ROOF | MFR | MANUFACTURER |
| AFS | ABOVE FINISHED SLAB | MG | MOTOR GENERATOR |
| AHJ | AUTHORITY HAVING JURISDICTION | MH | MANHOLE OR METAL HALIDE |
| AIC | AMPERE INTERRUPTING CAPACITY | MHz | MEGAHERTZ |
| ALT | ALTERNATE | MIC | MICROPHONE |
| ALT NO | ALTERNATE NUMBER | MIN | MINIMUM OR MINUTE |
| AMP | AMPERE | MISC | MISCELLANEOUS |
| APPROX | APPROXIMATE | MLO | MAIN LUGS ONLY |
| AT | AMPERE TRIP | MOC | MAX OVERCURRENT PROTECTION |
| ATC | AUTOMATIC TEMP CONTROL | MOD | MOTOR OPERATED DAMPER |
| ATS | AUTOMATIC TRANSFER SWITCH | MOP | MAX OVERCURRENT PROTECTION |
| AUX | AUXILIARY | MTD | MOUNTED |
| AV | AUDIO VISUAL | MTS | MANUAL TRANSFER SWITCH |
| AVG | AVERAGE | MV | MEDIUM VOLTAGE |
| AWG | AMERICAN WIRE GAUGE | MVA | MEGAVOLT-AMPERE |
| B | | mW | MILLIWATT |
| BAS | BUILDING AUTOMATION SYSTEM | MW | MEGAWATT |
| BFF | BELOW FINISH FLOOR | MWH | MEGAWATT HOUR |
| BFG | BELOW FINISHED GRADE | N | |
| BHP | BRAKE HORSEPOWER | N | NORTH OR NEUTRAL |
| BKBD | BACKBOARD | NA or N/A | NOT APPLICABLE |
| BKR | BREAKER | NC or NC | NORMALLY CLOSED |
| BLDG | BUILDING | NE | NORMAL/EMERGENCY |
| BLW | BELOW | NEC | NATIONAL ELECTRICAL CODE |
| BOS | BOTTOM OF STEEL | NEG | NEGATIVE |
| C | | NEUT | NEUTRAL |
| C | CELSIUS OR CONDUIT | NFPA | NATIONAL FIRE PROTECTION ASSOC |
| CATV | COMMUNITY ANTENNA TELEVISION | NF | NONFUSED |
| CB | CIRCUIT BREAKER | NIC | NOT IN CONTRACT |
| CCTV | CLOSED CIRCUIT TELEVISION | NL | NIGHT LIGHT |
| CFM | CUBIC FEET PER MINUTE | NO | NUMBER |
| CL | CENTER LINE | NO or N/O | NORMALLY OPEN |
| CLF | CURRENT LIMITING FUSE | NOM | NOMINAL |
| CLG | CEILING | NTS | NOT TO SCALE |
| CMU | CONCRETE MASONRY UNIT | O | |
| CO | COMPANY | O | ON CENTER |
| COAX | COAXIAL CABLE | OD | OUTSIDE DIAMETER |
| COL | COLUMN | OL | OVERLOAD |
| COMM | COMMUNICATION | P | |
| CPT | CONTROL POWER TRANSFORMER | P | PENDANT OR POLE |
| CRI | COLOR RENDERING INDEX | PA | PUBLIC ADDRESS |
| CT | CURRENT TRANSFORMER | PB | PULL BOX OR PUSHBUTTON |
| CU | COPPER | PC | PLUMBING CONTRACTOR |
| CU FT | CUBIC FEET | PCU | POWER CONDITIONING UNIT |
| CU YD | CUBIC YARD | PE | PROFESSIONAL ENGINEER |
| D | | PEC | PHOTOELECTRIC CELL |
| D | DEEP or DEPTH | PF | POWER FACTOR |
| DB | DECIBEL | PFDF | PROVISION FOR FUTURE BREAKER |
| DC | DIRECT CURRENT | PH | PHASE |
| DDC | DIRECT DIGITAL CONTROL | PL | PROPERTY LINE |
| DEG | DEGREE | PN | PART NUMBER |
| DEG C | DEGREES CELSIUS | PNL | PANEL |
| DEG F | DEGREES FAHRENHEIT | PO | PURCHASE ORDER |
| DEMO | DEMOLITION | PQCC | POINT OF COMMON COUPLING |
| DIA | DIAMETER | PRELIM | PRELIMINARY |
| DISC | DISCONNECT | PRI | PRIMARY |
| DISTR | DISTRIBUTION | PT | POTENTIAL TRANSFORMER |
| DIV | DIVISION | PV | PHOTOVOLTAIC |
| DL | DAMP LOCATION | PWR | POWER |
| DN | DOWN | | |

NOTE: NOT ALL ABBREVIATIONS OR TERMS INDICATED ARE USED ON THESE CONTRACT DOCUMENTS.

| WIRE SEPARATION NOTES | |
|-----------------------|---|
| 1. | ANALOG, DIGITAL, AND LOW VOLTAGE POWER CIRCUITS TO BE RUN IN SEPARATE RACEWAYS OR CABLE SETS AS INDICATED. |
| 2. | SEPARATE WIRING BY LEVEL AS OUTLINED BELOW: LEVEL 1-1 ANALOG SIGNALS, LESS THAN 50V AND LESS THAN 50mA 4-20mA SHIELDED INSTRUMENTATION, SHIELDED LOW VOLTAGE INSTRUMENTATION, VARIABLE SPEED DRIVE SPEED SIGNALS. LEVEL 1-2 DIGITAL SIGNAL AND DATA BUSES, PROGRAMMABLE LOGIC CONTROLLER BUSES, METER SYSTEM DATA BUS, INSTRUMENTATION REMOTE TERMINAL UNIT BUS. LEVEL 2-1 ANALOG SIGNALS OVER 50V AND LESS THAN 240V, TACHOMETER GENERATORS. LEVEL 2-2 DIGITAL AND DISCRETE INPUTS TO PROGRAMMABLE LOGIC CONTROLLERS AND REMOTE TERMINAL UNITS. ALL OUTPUTS SUPPLYING RELAY COILS SHALL HAVE SURGE SUPPRESSION. LEVEL 3-1 POWER CIRCUITS OF 20A OR LESS AND 120V OR LESS. LIGHTING AND RECEPTACLE CIRCUITS TO BE IN A SEPARATE CONDUIT UNO, CLASS 1 CONTROL CIRCUITS ORIGINATING IN AN MCC COMPARTMENT OR A MOTOR STARTER CAN BE ROUTED WITH POWER CIRCUIT FROM SAME COMPARTMENT. LEVEL 4-1 POWER CIRCUITS OVER 20A UP TO 400A, LESS THAN 600V. EACH SHALL BE RUN IN SEPARATE CONDUITS. LEVEL 5-1 FEEDERS OVER 400A. |
| 3. | EACH LEVEL INDICATED ABOVE TO BE INSTALLED IN SEPARATE RACEWAY OR CABLE SET UNLESS NOTED OTHERWISE OR INDICATED BY THESE CONTRACT DOCUMENTS. |
| 4. | WHERE DIFFERENT LEVEL SYSTEMS ARE INSTALLED IN PARALLEL, RUNS EXCEEDING FIVE (5) FEET OR LONGER, PROVIDE PHYSICAL SEPARATION AS SHOWN IN THE TABLE. |
| 5. | IN ALL JUNCTION/PULL BOXES WITH MULTIPLE VOLTAGES, PROVIDE GROUNDED METALLIC BARRIERS TO MAINTAIN SEPARATION. |
| 6. | ONLY EXTERNAL INTERFACE SIGNALS ARE SHOWN FOR MOTOR/CONTROLLER STARTERS, PROGRAMMABLE DEVICES, AND VARIABLE SPEED DRIVES (VSD). INTERNAL SIGNALS NECESSARY FOR CORRECT FUNCTIONING MUST BE PROVIDED AND COORDINATED WITH ALL REQUIREMENTS. |
| 7. | ALL INTERCONNECTING WIRING AND TERMINATIONS BETWEEN EQUIPMENT BY CONTRACTOR UNO. |
| 8. | CONTRACTOR SHALL PROVIDE THE OWNER WITH A FULL SIZE SET OF LOOP AND INTERFACE WIRING DIAGRAMS WITH FILLED IN TERMINAL BLOCK AND WIRE NUMBERS. |
| 9. | REFER TO WIRE SEPARATION NOTED FOR COMBINING WIRING. |

| | | LEVEL | | | | |
|---------|-----|-------|----|-----|-----|---|
| | | 1 | 2 | 3 | 4 | 5 |
| LEVEL 1 | 0 | 1" | 3" | 12" | 12" | |
| 2 | 1" | 0 | 3" | 9" | 12" | |
| 3 | 3" | 3" | 0 | 3" | 6" | |
| 4 | 12" | 9" | 3" | 0 | 0 | |


| GENERAL ELECTRICAL NOTES | |
|--------------------------|--|
| A. | COORDINATE INSTALLATION OF NEW ITEMS AND EQUIPMENT WITH THE OWNER'S REPRESENTATIVE, MAINTENANCE STAFF, AND THE WORK OF ALL SUB-CONTRACTORS. THE CONTRACTOR SHALL INCUR ALL COSTS ASSOCIATED WITH THE RELOCATION OF EQUIPMENT CONFLICTING WITH NEW WORK BY OTHER DISCIPLINES THAT HAS NOT BEEN COORDINATED. |
| B. | FIELD VERIFY ALL DIMENSIONS. DRAWINGS ARE ILLUSTRATIVE AND MAY NOT REFLECT EXACT CONDITIONS OR DIMENSIONS. |
| C. | DO NOT SCALE THE DRAWINGS. DRAWINGS ARE DIAGRAMMATIC AND SHOW THE GENERAL ARRANGEMENT OF EQUIPMENT AND SYSTEMS. THEY ARE NOT INTENDED TO SHOW EVERY OFFSET, FITTING AND COMPONENT. DO NOT USE THE PLANS FOR EXACT LOCATION OF EQUIPMENT, FIXTURES OR ARCHITECTURAL ITEMS SUCH AS WALLS, WINDOWS, SOFFITS, AND PLASTERS. SPECIFIC LOCATIONS, MOUNTING HEIGHTS AND OVERALL DIMENSIONS OF DEVICES AND FIXTURES ARE TO BE OBTAINED FROM THE ARCHITECTURAL DRAWINGS AND DETAILS WHEN AVAILABLE. |
| D. | DRAWINGS SPECIFIC TO THIS TRADE DO NOT LIMIT THE RESPONSIBILITY OR WORK REQUIRED BY THE CONTRACT DOCUMENTS. REFER TO DRAWINGS AND SPECIFICATIONS OF OTHER TRADES FOR COMPLETE INFORMATION PRIOR TO BID. |
| E. | WHERE CONFLICTS EXIST AMONG DRAWINGS, SPECIFICATIONS AND EQUIPMENT SCHEDULES, THE MOST STRINGENT SHALL APPLY. NOTIFY THE ENGINEER OF ALL CONFLICTS FOR RESOLUTION OR INTERPRETATION. |
| F. | NOTIFY THE OWNER IN WRITING AND FIELD VERIFY CONDITIONS BEFORE PERFORMING ANY SAWCUTTING, TRENCHING, CORING OR ANY OTHER STRUCTURAL MODIFICATIONS. INSURE THAT NO ADVERSE EFFECT TO THE BUILDING'S STRUCTURAL INTEGRITY WILL OCCUR. |
| G. | BRANCH CIRCUIT SIZING FROM DISCONNECT, STARTER OR VFD, OR CONTROL PANEL TO MOTOR/EQUIPMENT SHALL MATCH WHAT IS SHOWN FROM MCC/PANELBOARD TO DISCONNECT, STARTER OR VFD, OR CONTROL PANEL UNO. MOTOR BRANCH CIRCUITS FED FROM VFD SHALL BE VFD CABLE IN APPROPRIATELY SIZED CONDUIT. |
| H. | ALL WORK SHOWN IN BOLD IS NEW WORK OR MODIFICATION OF EXISTING INSTALLATIONS TO BE COMPLETED BY THE CONTRACTOR UNDER THIS PROJECT. SEE PROJECT SPECIFICATIONS, SEQUENCE / PHASING OF WORK, AND DIVISION 1 FOR ADDITIONAL REQUIREMENTS FOR THIS PROJECT. CONTRACTOR SHALL READ AND UNDERSTAND THE REQUIREMENTS BEFORE SUBMITTING BID OR COMPLETING CONTRACTOR WORK. |
| I. | EQUIPMENT LOCATIONS AND PHYSICAL SIZES ARE SHOWN APPROXIMATELY. COORDINATE ACTUAL LOCATIONS WITH OTHER TRADES TO PROVIDE ACCESS AND WORKING SPACE/CLEARANCE PER NEC REQUIREMENTS. |
| J. | THE MAJORITY OF THE EXISTING CONDUIT SHALL BE REUSED WITH NEW CONDUCTORS AND CABLES AS SHOWN. CONTRACTOR SHALL MANDREL CLEAN ALL CONDUITS BEFORE INSTALLATION OF NEW CONDUCTORS. REPAIR EXISTING CONDUIT THREADS AND EXTEND CONDUIT AS REQUIRED TO NEW EQUIPMENT. THE CONTRACTOR SHALL REPLACE EXISTING FLEXIBLE CONDUIT SYSTEMS WITH NEW CONDUIT AND FITTINGS TO MATCH. SEE SPECIFICATIONS FOR MORE INFORMATION. |
| K. | ALL ELECTRICAL EQUIPMENT AND CABLES, CONDUIT, AND ACCESSORIES REQUIRED FOR THEIR INSTALLATION SHALL BE PROVIDED BY THE CONTRACTOR. |
| L. | PROVIDE OWNER WITH "RED LINED" PRINTS NEATLY MARKED WITH SKETCHES, CIRCUIT USAGE, NOTATIONS, ETC AS REQUIRED FOR OWNER'S ENGINEER TO PROVIDE "AS-BUILT" TYPE PRINTS DEPICTING THE ACTUAL INSTALLATION. |

| MOUNTING HEIGHTS | |
|--|--|
| LIGHTING | DISTRIBUTION EQUIPMENT |
| EMERGENCY BATTERY UNIT - WALL | BLANK OUTLET - WALL |
| 18" BELOW CEILING OR 8'-0" ABOVE FINISHED FLOOR, WHICHEVER IS LOWER | SAME AS RECEPTACLES |
| EMERGENCY LIGHT - REMOTE HEAD | CABINET (EQUIPMENT) - WALL |
| 12" BELOW CEILING OR 6'-0" ABOVE FINISHED FLOOR, WHICHEVER IS LOWER | TOP OF TRIM 6'-0" ABOVE FINISHED FLOOR, IF CABINET IS OVER 6'-0" TALL, MOUNT BOTTOM EDGE 6" ABOVE FINISHED FLOOR |
| EXIT SIGN - WALL | CIRCUIT BREAKER - ENCLOSED |
| 6" ABOVE DOOR JAMB BUT NO HIGHER THAN 8'-0" ABOVE FINISHED FLOOR | 5'-0" ABOVE FINISHED FLOOR |
| LIGHT FIXTURE - WALL | CONTACTOR |
| SEE SPECIFICATIONS OR LIGHT FIXTURE SCHEDULE FOR MOUNTING HEIGHT | 5'-0" ABOVE FINISHED FLOOR |
| LIGHTING CONTROL PANEL - WALL | DISCONNECT SWITCH |
| TOP OF TRIM 6'-0" ABOVE FINISHED FLOOR, IF CABINET IS OVER 6'-0" TALL, MOUNT BOTTOM EDGE 6" ABOVE FINISHED FLOOR | 5'-0" ABOVE FINISHED FLOOR |
| WIRING DEVICES | GENERATOR REMOTE ANNUNCIATOR STATION |
| CLOCK RECEPTACLE | 5'-0" ABOVE FINISHED FLOOR |
| 7'-0" ABOVE FINISHED FLOOR | PANELBOARD / TRANSFER SWITCH |
| MOTION SENSOR - WALL | TOP OF TRIM 6'-0" ABOVE FINISHED FLOOR, IF PANELBOARD IS OVER 6'-0" TALL, MOUNT BOTTOM EDGE OF PANELBOARD 6" ABOVE FINISHED FLOOR |
| 8'-0" ABOVE FINISHED FLOOR OR AS RECOMMENDED BY MANUFACTURER | SURFACE RACEWAY - HORIZONTAL RUN |
| IN ALL JUNCTION/PULL BOXES WITH MULTIPLE VOLTAGES, PROVIDE GROUNDED METALLIC BARRIERS TO MAINTAIN SEPARATION. | SAME AS RECEPTACLES |
| PHOTOELECTRIC CELL - WALL | THERMAL SWITCH - WALL |
| 12" FROM TOP OF ROOM ON NORTH FACE OF BUILDING | SAME AS LIGHT SWITCHES |
| PUSHBUTTON - WALL | TELECOMMUNICATION / NETWORK |
| SAME AS LIGHTING SWITCHES | AREA OF RESCUE ASSISTANCE SIGN |
| RECEPTACLE - WALL | AREA OF RESCUE ASSISTANCE INTERCOM MASTER STATION |
| RECEPTACLES OCCURRING IN STRUCTURAL TILE, BRICK, OR BLOCK WALL SHALL BE LOCATED ABOVE MASONRY JOINTS NEAREST THE APPROPRIATE MOUNTING HEIGHT AS INDICATED BELOW | 6" BELOW CEILING OR 80" ABOVE FINISHED FLOOR, WHICHEVER IS LOWER |
| FINISHED SPACE STANDARD | 42" ABOVE FINISHED FLOOR |
| 18" ABOVE FINISHED FLOOR, WHERE INTERFERENCE WITH HEATING EQUIPMENT REQUIRES HIGHER MOUNTING, MOUNT AS DIRECTED BY THE ENGINEER | AREA OF RESCUE ASSISTANCE INTERCOM STATION |
| | 42" ABOVE FINISHED FLOOR |
| COUNTERS | BELL |
| 6" ABOVE BACK SPLASH OR COUNTER, CONSTRUCTION OF COUNTERS AND HEIGHTS OF BACKS SHALL BE VERIFIED BY THE CONTRACTOR BEFORE ROUGH-IN | 80" ABOVE FINISHED FLOOR |
| UNFINISHED SPACE | DATA / VOICE OUTLET - WALL |
| 42" ABOVE FINISHED FLOOR EXCEPT WHERE INTERFERENCE WITH MECHANICAL EQUIPMENT REQUIRES HIGHER MOUNTING | SAME AS RECEPTACLES |
| EXTERIOR - WALL | HORNES - OUTDOOR |
| 24" ABOVE FINISHED FLOOR, IF RECEPTACLE IS LESS THAN 24" ABOVE FINISHED GRADE, INCREASE MOUNTING HEIGHT TO MAINTAIN 24" ABOVE FINISHED GRADE | 12" BELOW EDGE OF ROOM |
| ROOF - WALL | TELEPHONE OUTLET - WALL |
| 24" ABOVE FINISHED FLOOR | LOW: SAME AS RECEPTACLES HIGH: 48" ABOVE FINISHED FLOOR |
| RECEPTACLE - SPECIAL PURPOSE | SECURITY / ACCESS CONTROL / SURVEILLANCE |
| SAME AS RECEPTACLES | AUDIBLE (BUZZER) - WALL |
| SWITCH - LIGHTING | 6" BELOW CEILING OR 80" ABOVE FINISHED FLOOR, WHICHEVER IS LOWER |
| 42" ABOVE FLOOR ON STRIKE SIDE OF DOOR, WHERE SWITCHES OCCUR IN BRICK, TILE OR BLOCK WALLS, THEY SHALL BE MOUNTED AT VERTICAL MASONRY JOINT AND IN EITHER TOP OR BOTTOM HORIZONTAL JOINT, WHICHEVER IS CLOSEST TO THE MOUNTING HEIGHT, WHERE SWITCH HEIGHT OCCURS AT POINT OF CHANGE OF FINISH, THEY SHALL BE RAISED OR LOWERED TO OCCUR IN ONE FINISH | BIOMETRIC READER |
| TELEVISION RECEPTACLE - WALL | 48" ABOVE FINISHED FLOOR |
| 7'-0" ABOVE FINISHED FLOOR OR SAME HEIGHT AS TELEVISION OUTLET | CAMERA - WALL |
| FIRE ALARM | 7'-6" ABOVE FINISHED FLOOR |
| AUDIBLE - WALL | CARD / PROXIMITY READ |
| 6" BELOW CEILING OR 80" ABOVE FINISHED FLOOR, WHICHEVER IS LOWER | 48" ABOVE FINISHED FLOOR |
| CONTROL PANEL - WALL | HORNES - OUTDOOR |
| TOP OF TRIM 6'-0" ABOVE FINISHED FLOOR, IF CABINET IS OVER 6'-0" TALL, MOUNT BOTTOM EDGE 6" ABOVE FINISHED FLOOR | 12" BELOW EDGE OF ROOF |
| PULL STATION | INTERCOM STATION |
| 42" ABOVE FINISHED FLOOR | 48" ABOVE FINISHED FLOOR |
| REMOTE ANNUNCIATOR STATION | MONITOR - WALL |
| 5'-0" ABOVE FINISHED FLOOR | 7'-6" ABOVE FINISHED FLOOR |
| REMOTE DUCT DETECTOR TEST STATION - WALL | PUSHBUTTON - WALL |
| 5'-0" ABOVE FINISHED FLOOR | SAME AS LIGHTING SWITCH |
| VISUAL - WALL | OCCUPANCY SENSOR - WALL |
| 6" BELOW CEILING OR 80" ABOVE FINISHED FLOOR, WHICHEVER IS LOWER | 6'-0" ABOVE FINISHED FLOOR OR AS RECOMMENDED BY MANUFACTURER |
| VISUAL / AUDIBLE (COMBINATION TYPE) - WALL | SPEAKER - WALL |
| 6" (CENTER OF VISUAL) BELOW CEILING OR 80" ABOVE FINISHED FLOOR, WHICHEVER IS LOWER | 7'-6" ABOVE FINISHED FLOOR |
| MOUNTING HEIGHT NOTES: | VISUAL (STROBE) - WALL |
| 1. UNLESS INDICATED OTHERWISE ON THE PLANS OR AS DIRECTED BY THE ENGINEER, CENTERLINE OF DEVICE SHALL BE AS INDICATED ABOVE. | 6" BELOW CEILING OR 80" ABOVE FINISHED FLOOR, WHICHEVER IS LOWER |
| 2. WHERE MOUNTING HEIGHTS ARE NOT DETAILED OR DIMENSIONED, THE CONTRACTOR SHALL INSTALL SYSTEMS, MATERIALS, AND EQUIPMENT TO PROVIDE THE MAXIMUM HEADROOM POSSIBLE AND COMPLY WITH THE REQUIREMENTS OF THE EQUIPMENT MANUFACTURER, WHERE EQUIPMENT IS INTENDED, SPECIFIED, OR NOTED TO BE MOUNTED OTHER THAN INDICATED ABOVE, MOUNT IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND AS DIRECTED. | |
| 3. WHERE MULTIPLE DEVICES ARE INSTALLED WITHIN CLOSE PROXIMITY TO EACH OTHER, THEY SHALL BE INSTALLED AT SAME HEIGHT. | |
| 4. NOT ALL EQUIPMENT INDICATED WITH MOUNTING HEIGHTS ARE ON THESE CONTRACT DOCUMENTS. | |

MAINTENANCE BUILDING
10001 US HIGHWAY 70
LAKELAND, TN 38002
SHELBY COUNTY



BUCHART HORN
ENGINEERS - ARCHITECTS - PLANNERS



HOANG LE NGUYEN
REGISTERED ENGINEER
NO. 10001 US HIGHWAY 70
LAKELAND, TN 38002

CITY OF LAKELAND
10001 US HIGHWAY 70
LAKELAND, TN 38002

| REVISIONS | ISSUED DATE | DESCRIPTION |
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PROJECT NO: 81079-04

ISSUED DATE: 7/31/20

DRAWN BY: HLN

CHECKED BY: SJW

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SHEET TITLE:

ELECTRICAL ABBREVIATIONS AND GENERAL INFORMATION

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SHEET NO: **E-002**

GENERAL NOTES

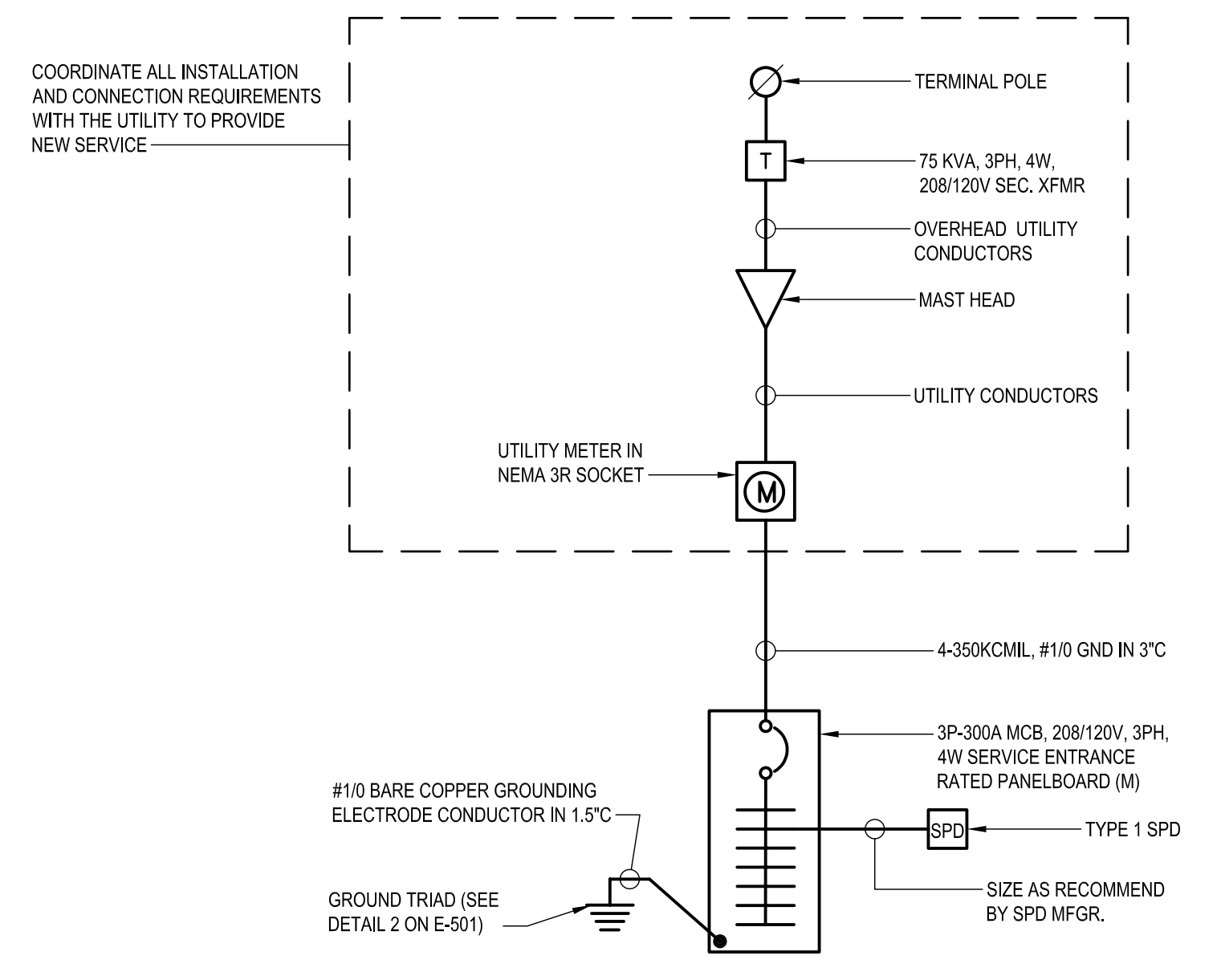
- A. SEE DRAWINGS E-001 & E-002 FOR ELECTRICAL SYMBOL LEGEND, ABBREVIATIONS, MOUNTING HEIGHTS, AND GENERAL LAYOUT NOTES.
- B. PROVIDE AND INSTALL GFCI RECEPTACLE IN LOCKABLE WP WHILE-IN-USE COVER FOR ALL EXTERIOR RECEPTACLES.
- C. LOCATIONS OF MECHANICAL/PLUMBING EQUIPMENT SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. SEE APPROPRIATE DRAWINGS FOR ACTUAL EQUIPMENT LOCATIONS.

KEY NOTES

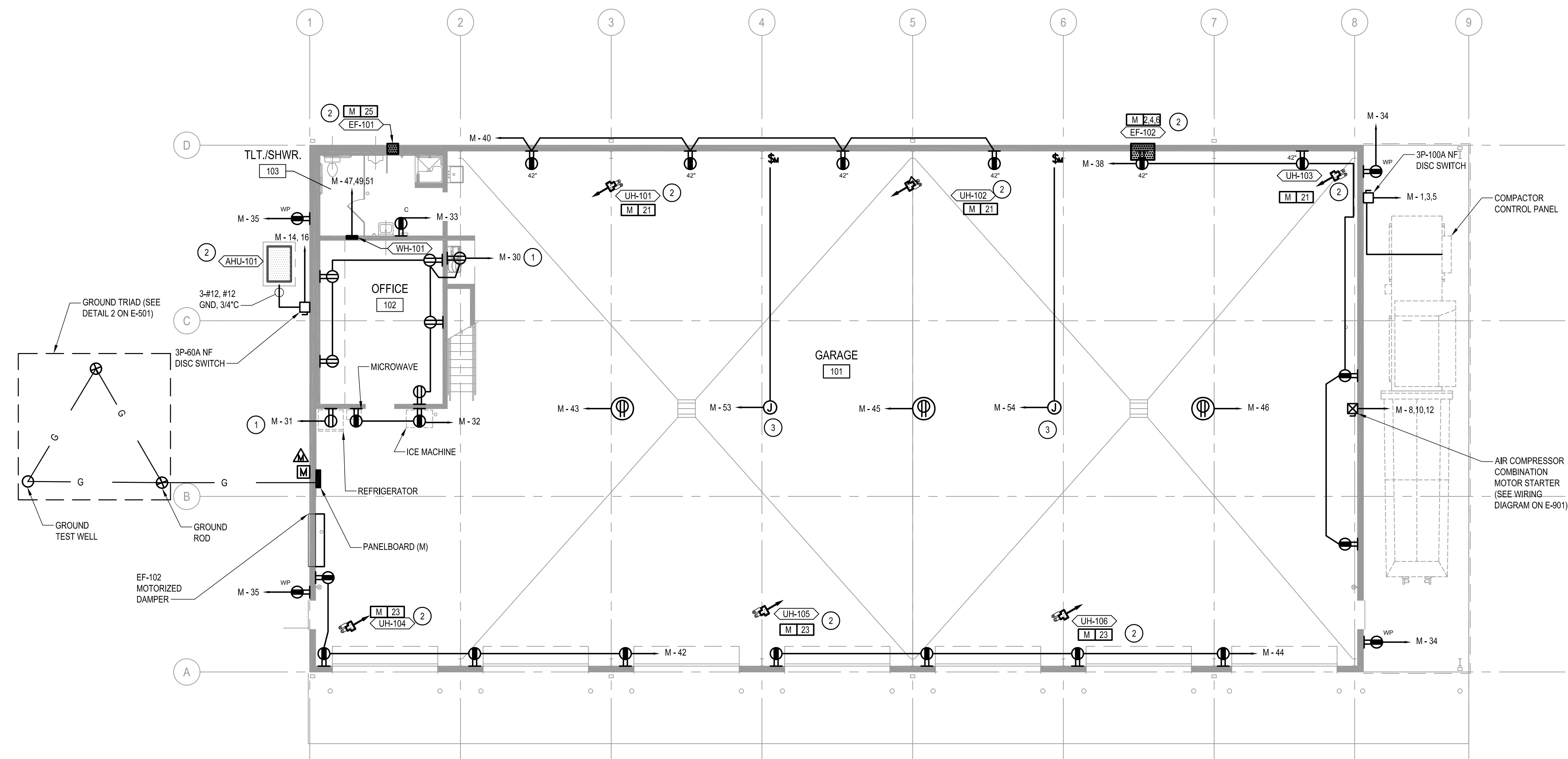
- 1. PROVIDE GFCI CIRCUIT BREAKER IN PANELBOARD FOR THIS CIRCUIT.
- 2. COORDINATE WITH PLUMBING/MECHANICAL CONTRACTOR FOR ALL WIRING REQUIREMENT.
- 3. TERMINATE THE CONDUCTORS IN THE CEILING MOUNT JUNCTION BOX. IN ADDITION, PROVIDE 18" OF CABLE SLACK FOR FUTURE INSTALLATION.



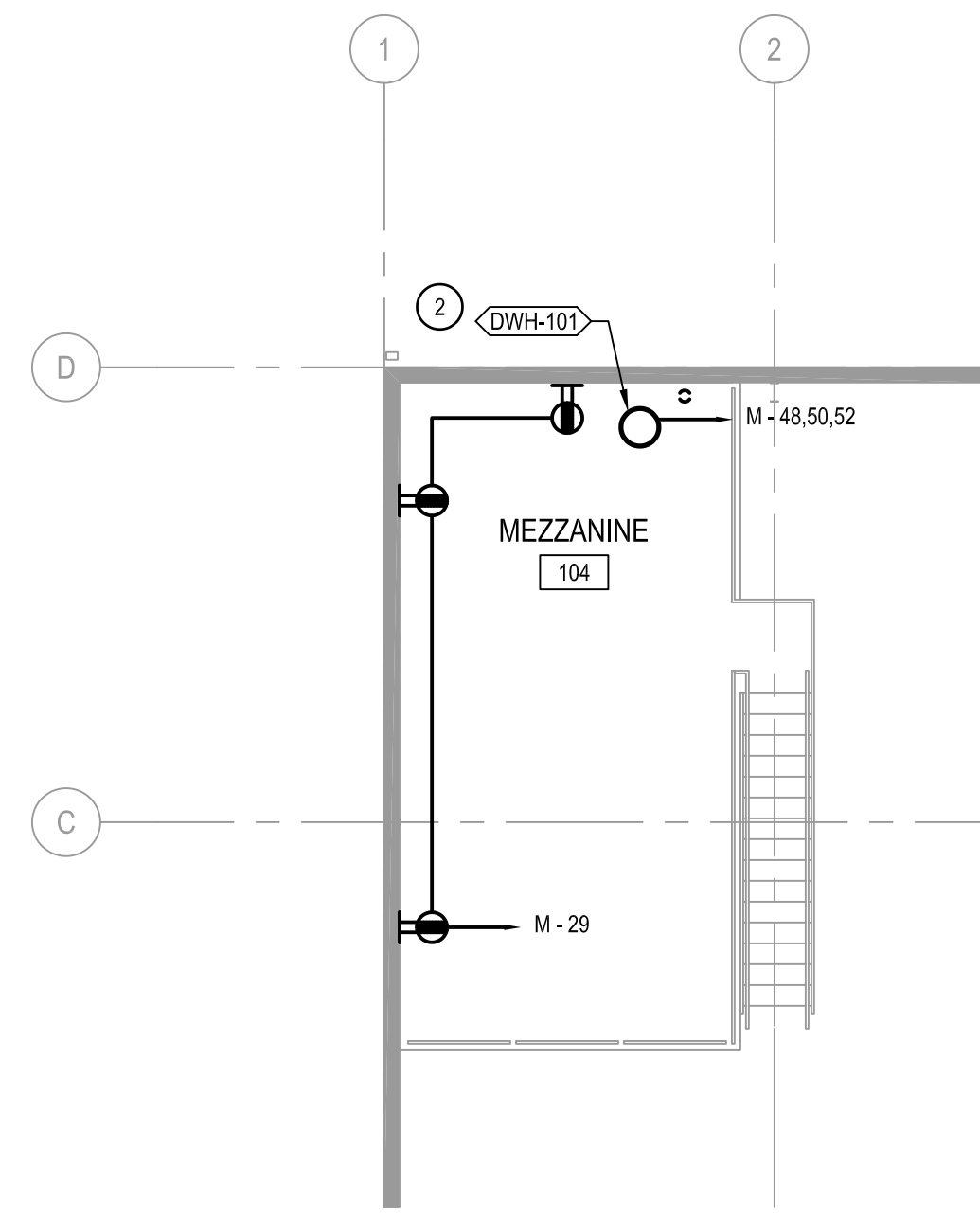
MAINTENANCE BUILDING
 10001 US HIGHWAY 70
 LAKELAND, TN 38002
 SHELBY COUNTY
 CITY OF LAKELAND
 10001 US HIGHWAY 70
 LAKELAND, TN 38002



2 ELECTRICAL ONELINE DIAGRAM



1 ELECTRICAL POWER PLAN
 SCALE: 1/8" = 1'-0"
 0 4' 8' 16'



3 MEZZANINE POWER PLAN
 SCALE: 1/8" = 1'-0"
 0 4' 8' 16'

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 SHEET TITLE:

ELECTRICAL POWER PLANS AND ONELINE DIAGRAM

SHEET NO: **E-101**

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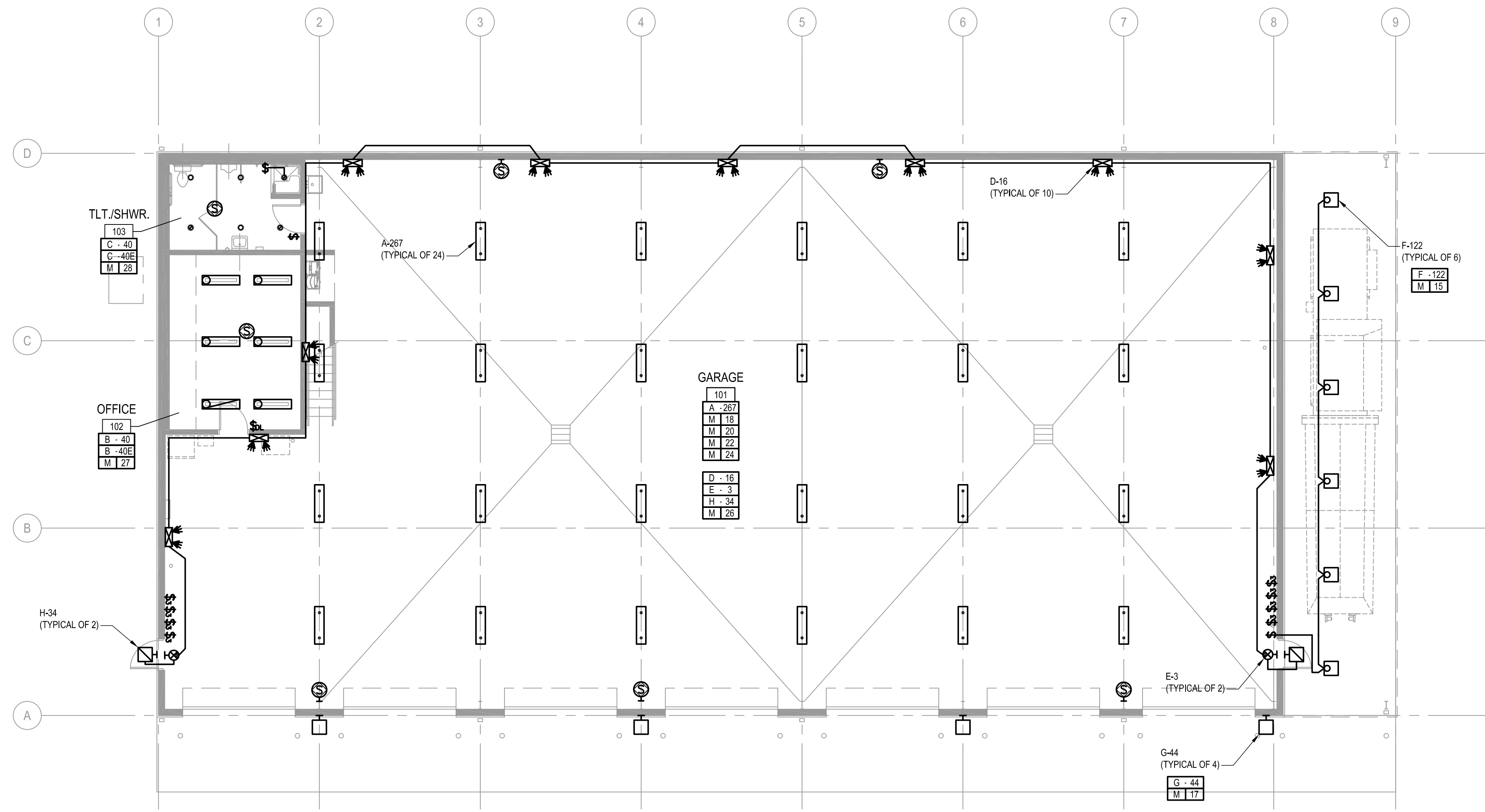
GENERAL NOTES

- A. SEE DRAWINGS E-001 & E-002 FOR ELECTRICAL SYMBOL LEGEND, ABBREVIATIONS, MOUNTING HEIGHTS, AND GENERAL LAYOUT NOTES.
- B. COORDINATE CEILING MOUNTED WORK WITH THE ARCHITECTURAL REFLECTED CEILING PLAN. WHERE CONFLICTS OCCUR, NOTIFY THE ARCHITECT BEFORE PROCEEDING WITH ANY ROUGH-IN WORK.
- C. UNLESS NOTED OR SHOWN OTHERWISE, LIGHTING SWITCHES AND OCCUPANCY SENSORS SHOWN IN THE SAME ROOM AS THE LIGHT FIXTURE(S) SHALL CONTROL SAME. ONE LIGHT SWITCH SHALL BE PROVIDED FOR EACH TWO COLUMNS OF LIGHTS IN THE GARAGE.
- D. VERIFY LOCATION AND QUANTITY OF OCCUPANCY SENSORS AND CONTROL WIRING REQUIREMENTS WITH THE MANUFACTURER BEFORE PROCEEDING WITH ANY WORK. COORDINATE FINAL LOCATION OF SENSORS WITH OTHER CONTRACTORS BEFORE PROCEEDING WITH ANY ROUGH-IN WORK.

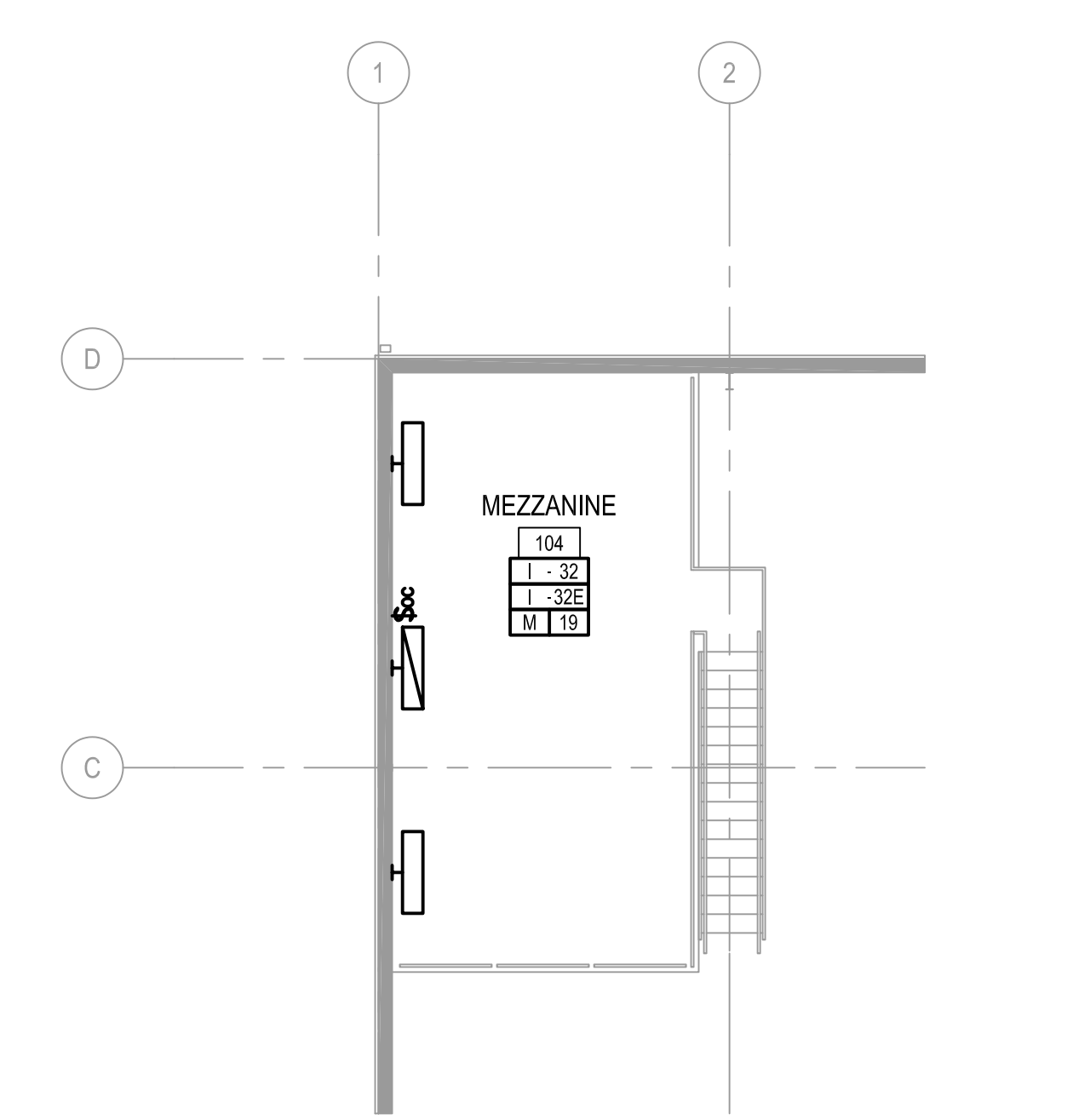


MAINTENANCE BUILDING

10001 US HIGHWAY 70
LAKELAND, TN 38002
SHELBY COUNTY
CITY OF LAKELAND
LAKELAND, TN 38002



1 ELECTRICAL LIGHTING PLAN
SCALE: 1/8" = 1'-0"
PROJECT NORTH



2 MEZZANINE LIGHTING PLAN
SCALE: 1/8" = 1'-0"
PROJECT NORTH

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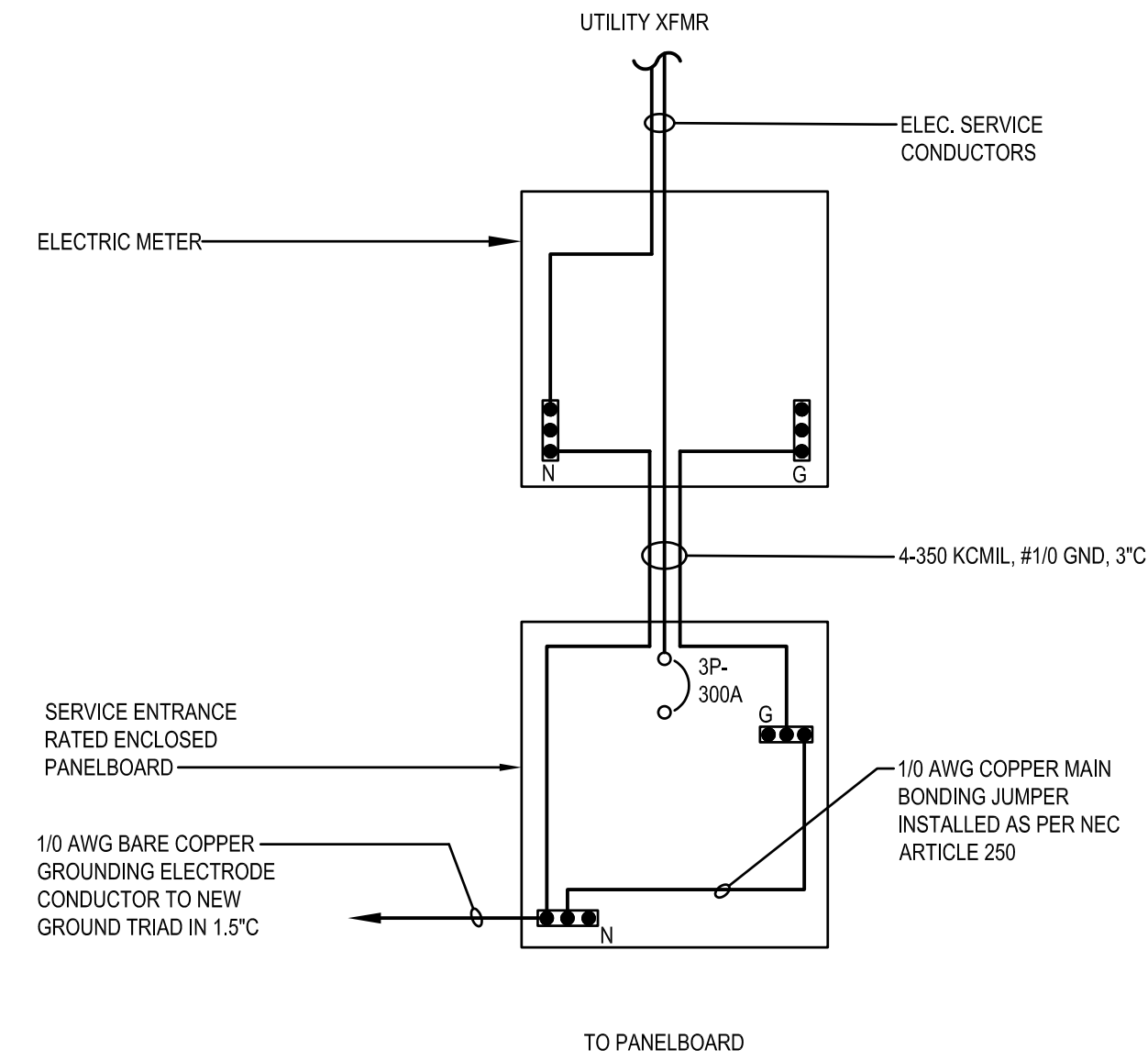
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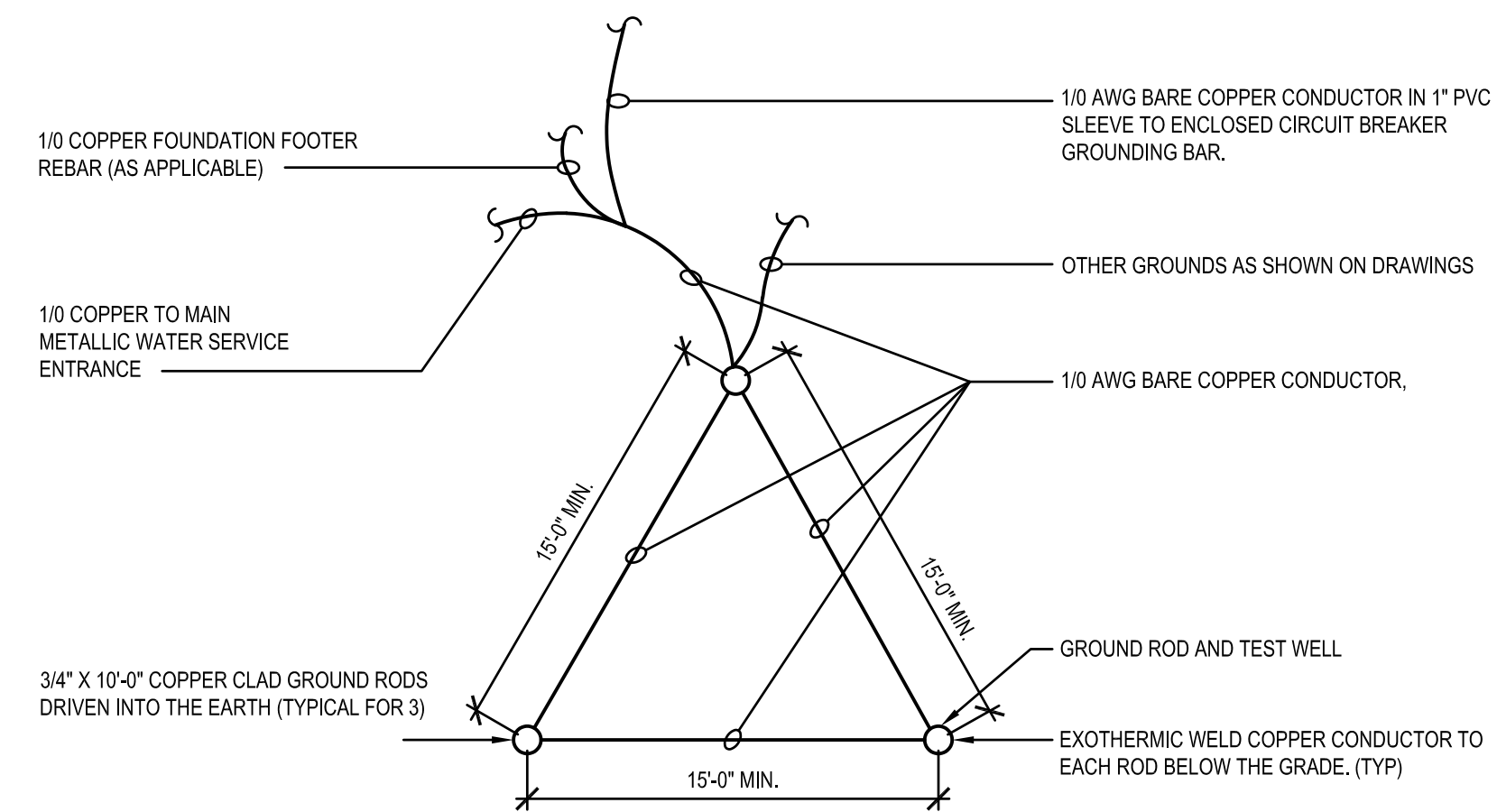
ELECTRICAL LIGHTING PLANS

SHEET NO: **E-102**

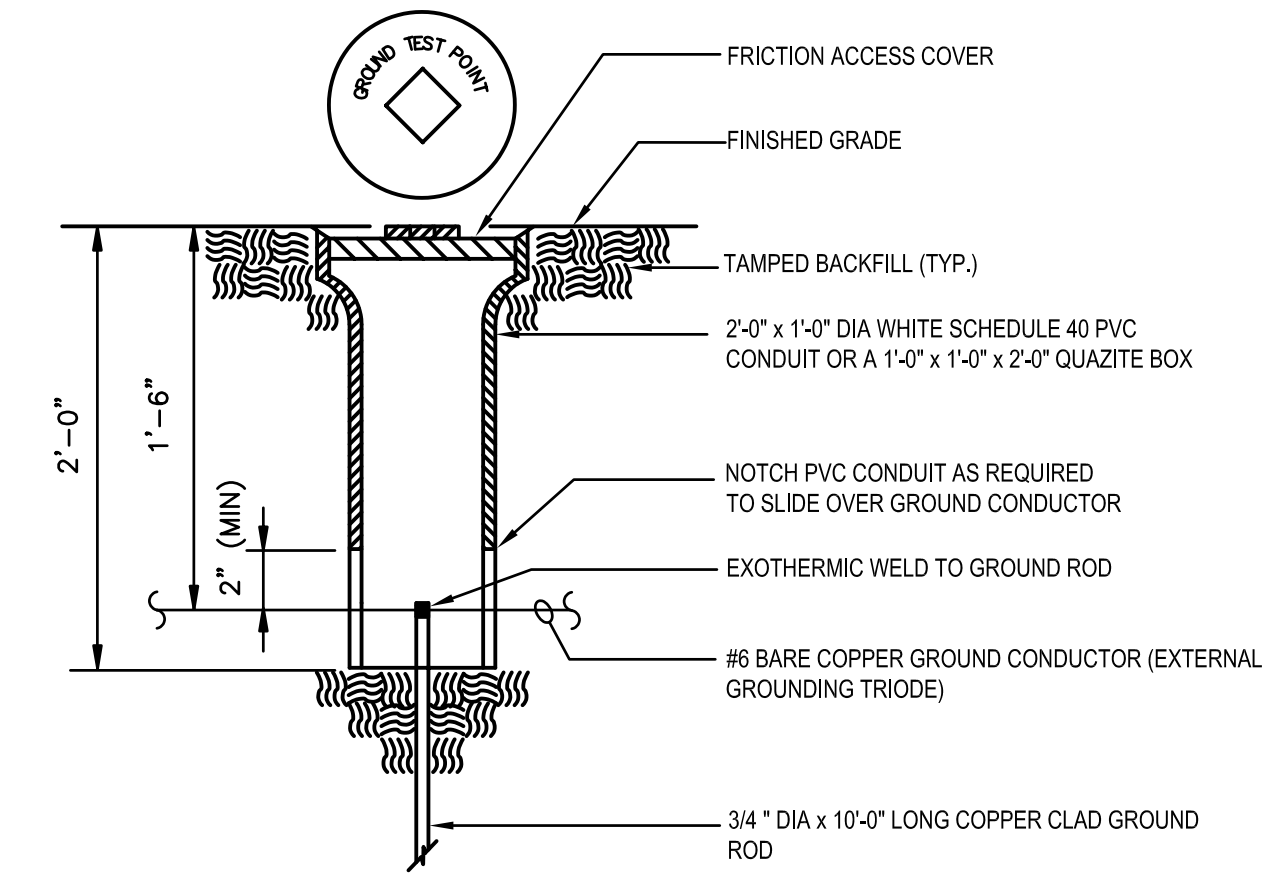
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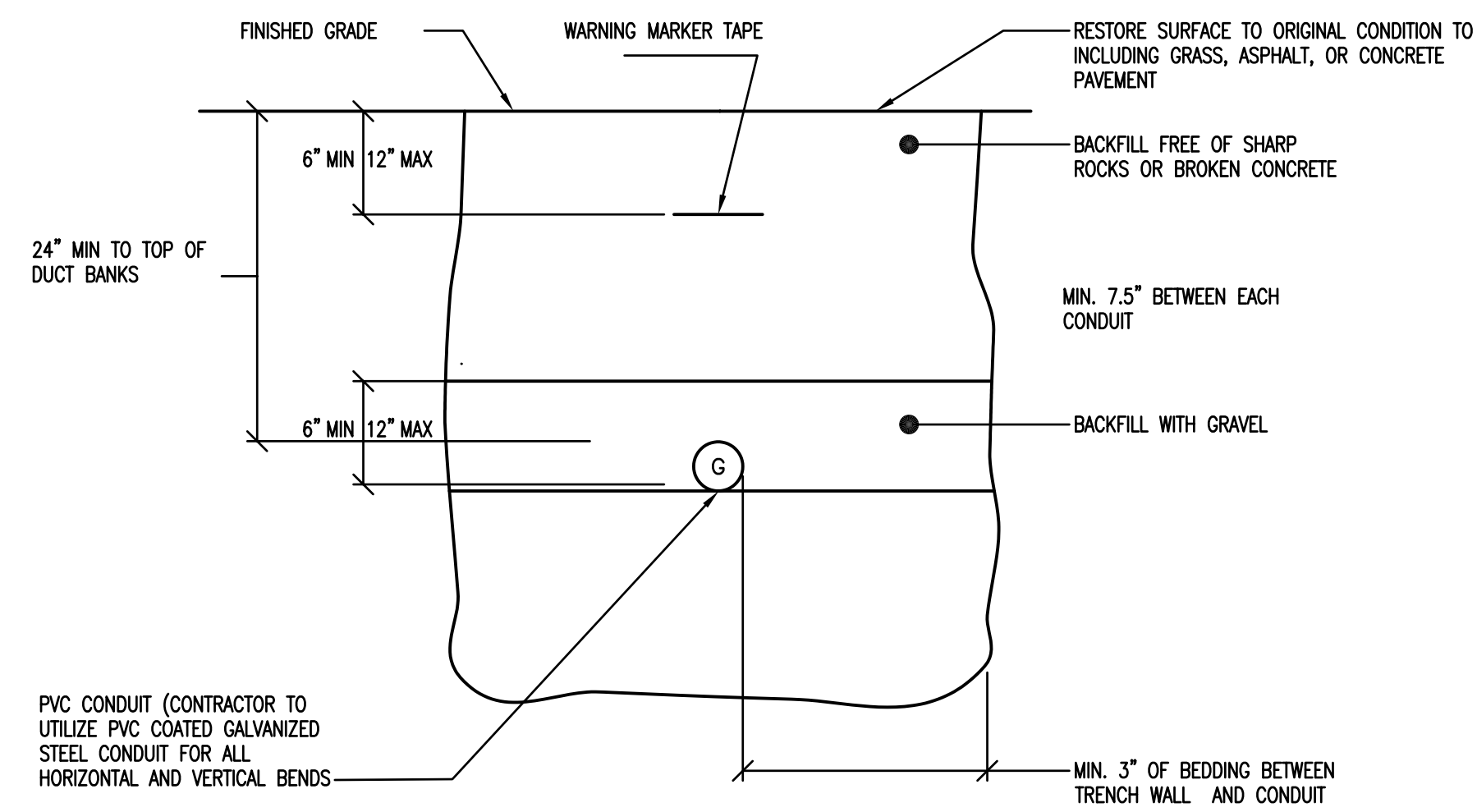
1 GROUNDING AND BONDING DETAIL



2 GROUNDING TRIAD DETAIL



3 GROUND TEST WELL DETAIL



4 DIRECT BURIED DUCTBANK DETAIL

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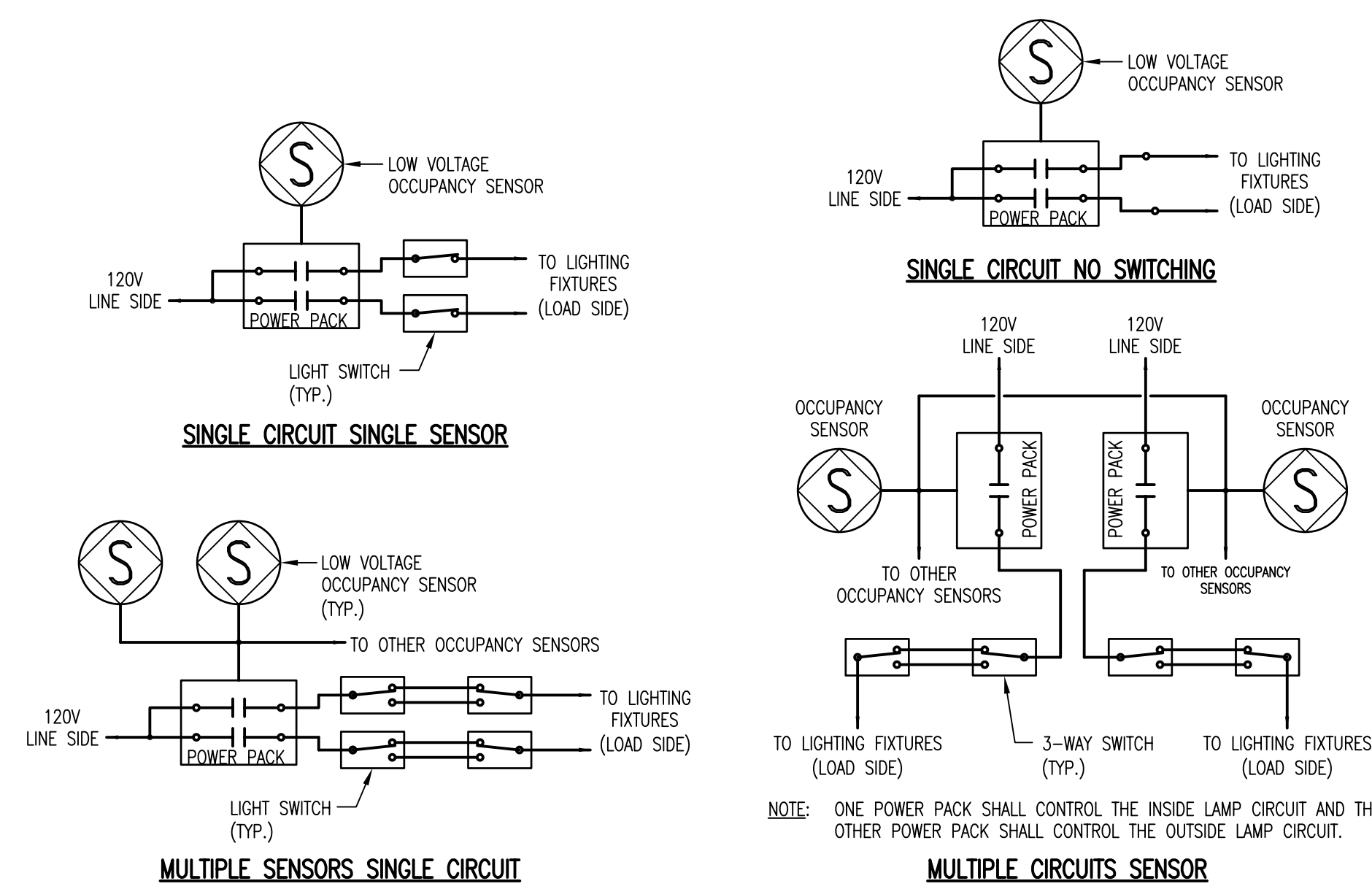
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ELECTRICAL
DETAILS

SHEET NO:
E-501

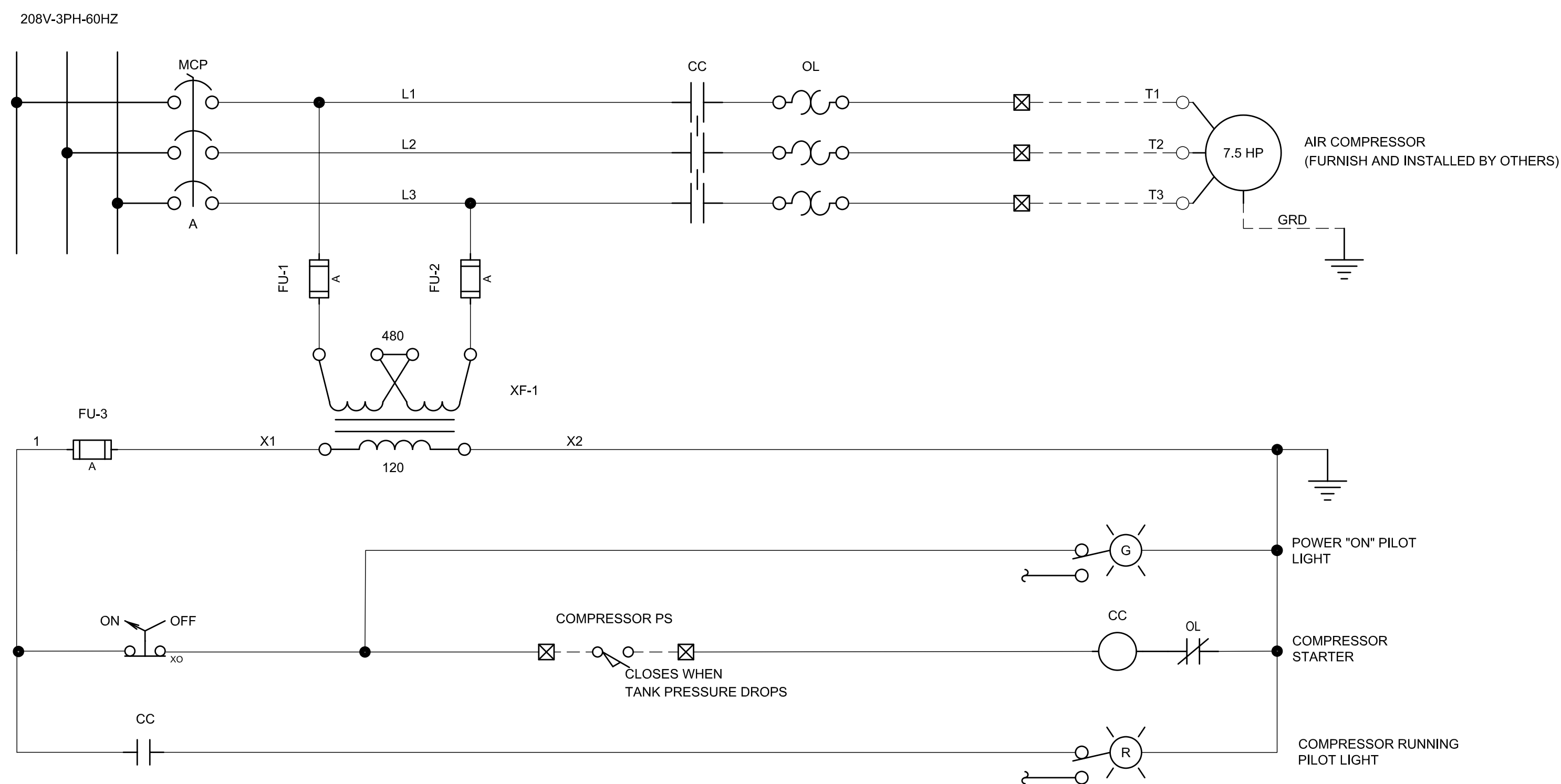
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OCCUPANCY SENSOR GENERAL NOTES:

- OS1. NUMBER AND SIZE OF CONDUCTORS AND CONDUIT SHALL BE AS REQUIRED BY THE EQUIPMENT MANUFACTURER.
- OS2. DIAGRAMS SHOWN ARE TYPICAL FOR LOW VOLTAGE OCCUPANCY SENSORS AND NEED TO BE MODIFIED AS NECESSARY TO MEET THE INTENT OF THE DRAWINGS. NOT ALL DIAGRAMS MAY BE APPLICABLE.
- OS3. PROVIDE ONE POWER/SLAVE PACK FOR EACH 20A, 120V CIRCUIT. POWER PACK SHALL BE PROVIDED WITH LOW VOLTAGE TRANSFORMER AND NO. OF RELAYS AS REQUIRED BY THE EQUIPMENT MANUFACTURER.
- OS4. PROVIDE 1 OR 2 POLE POWER/SLAVE PACK OR SENSOR AS REQUIRED TO PERMIT MULTIPLE SWITCHING SCHEMES.
- OS5. SWITCHES MAY BE SINGLE, 3-WAY, OR 4-WAY AS REQUIRED.
- OS6. EACH ZONE OR AREA OF COVERAGE AREA SHALL HAVE ONE OCCUPANCY SENSOR WITH A SPOT CLASS 2 AUXILIARY RELAY, PROVIDING AN INPUT TO BUILDING AUTOMATION SYSTEM (BAS). ALL SENSORS IN THE ZONE/AREA SHALL COMMUNICATE TO THE SENSOR WITH THE RELAY FOR STATUS TO BAS. SENSOR RELAY COIL SHALL ENERGIZE IN THE UNOCCUPIED STATE TO LOAD SHARE THE LOW VOLTAGE CURRENT FROM POWER PACK.

1 OCCUPANCY SENSOR DIAGRAMS



2 AIR COMPRESSOR WIRING DIAGRAM

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ELECTRICAL
WIRING DIAGRAMS

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