

PLUMBING WORK SPECIFICATIONS

1. GENERAL:
A. THE "GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION," AIA DOCUMENT A201, LATEST EDITION, AND THESE SPECIFICATIONS AS APPLICABLE ARE PART OF THIS CONTRACT.
B. ALL APPLICABLE CODES, LAWS AND REGULATIONS GOVERNING OR RELATING TO ANY PORTION OF THIS WORK ARE HEREBY INCORPORATED INTO AND MADE PART OF THESE SPECIFICATIONS, AND THESE PROVISIONS SHALL BE CARRIED OUT BY THE CONTRACTOR WHO SHALL INFORM THE OWNER, PRIOR TO SUBMITTING A PROPOSAL, OF ANY WORK OR MATERIAL WHICH VIOLATES ANY OF THE ABOVE LAWS AND REGULATIONS. ANY WORK DONE BY THE CONTRACTOR CAUSING SUCH VIOLATION SHALL BE CORRECTED BY THE CONTRACTOR AT THEIR OWN COST.
C. INVESTIGATE EACH SPACE THROUGH WHICH EQUIPMENT MUST BE MOVED. WHERE NECESSARY, EQUIPMENT SHALL BE SHIPPED FROM THE MANUFACTURE IN SECTIONS OF A SIZE SUITABLE FOR MOVING THROUGH AVAILABLE RESTRICTIVE SPACES. ASCERTAIN FROM THE BUILDING OWNER AND TENANT AT WHAT TIMES OF THE DAY EQUIPMENT MAY BE MOVED THROUGH ALL AREAS.
D. DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS AND WORK. PIPE ROUTING IS SHOWN DIAGRAMMATICALLY AND DOES NOT SHOW ALL OFFSETS, DROPS AND RISES OF RUNS. THE CONTRACTOR SHALL ALLOW IN HIS HER PRICE FOR ROUTING OF PIPING TO AVOID OBSTRUCTIONS. COORDINATION WITH EXISTING SERVICES, INCLUDING THOSE OF OTHER TRADES IS REQUIRED. MAINTAIN HEADROOM AND SPACE CONDITIONS.
E. SUPPORT ALL PIPING FROM BUILDING STRUCTURE AND/OR FRAMING IN AN APPROVED MANNER. WHERE OVERHEAD CONSTRUCTION DOES NOT PERMIT FASTENING OR SUPPORTS FOR EQUIPMENT, FURNISH ADDITIONAL FRAMING INSERTS SHALL BE STEEL, SLOTTED TYPE AND FACTORY PAINTED. SINGLE ROD SHALL BE SIMILAR TO GRINNELL FIG. 281. MULTIPLE RODS SHALL BE SIMILAR TO FEE'S MASON SERIES 9000 WITH END CAPS AND CLOSURE STRIPS. MAXIMUM LOADING INCLUDING PIPES CONTENT AND COVERING SHALL NOT EXCEED 75% OF RATED INSERT CAPABILITY. WHEN SUPPORTING FROM BUILDING USE BEAM CLAMPS IN APPROVED MANNER. PROVIDE SEISMIC RESTRAINTS AS REQUIRED BY CODE.
F. INSTALL WORK AS TO BE READILY ACCESSIBLE FOR OPERATION, MAINTENANCE AND REPAIR. MINOR DEVIATIONS FROM THE DRAWINGS MAY BE MADE TO ACCOMPLISH THIS, BUT CHANGES WHICH INVOLVE EXTRA COST, SHALL NOT BE MADE WITHOUT OUR OR OWNER APPROVAL.
G. REMOVAL AND RELOCATION OF CERTAIN EXISTING WORK MAY BE NECESSARY FOR THE PERFORMANCE OF THE GENERAL WORK. ALL EXISTING CONDITIONS CANNOT BE COMPLETELY DETAILED ON THE DRAWINGS. THE CONTRACTOR SHALL SURVEY THE SITE AND INCLUDE ALL CHANGES AND CHARGES IN MAKING UP THE WORK PROPOSED.
H. CONNECTIONS TO EXISTING WORK: INSTALL NEW WORK AND CONNECT TO EXISTING WORK WITH A MINIMUM INTERFERENCE TO EXISTING FACILITIES. TEMPORARY SHUTDOWNS OF EXISTING SERVICES SHALL BE PERFORMED AT NO ADDITIONAL CHARGES. AT TIMES NOT TO INTERFERE WITH NORMAL OPERATION OF EXISTING FACILITIES AND ONLY WITH WRITTEN CONSENT OF THE OWNER. ALARM AND EMERGENCY SYSTEMS SHALL NOT BE INTERRUPTED. MAINTAIN CONTINUOUS OPERATION OF THE EXISTING FACILITIES AS REQUIRED WITH NECESSARY TEMPORARY CONNECTIONS BETWEEN NEW AND EXISTING WORK. CONNECT NEW WORK TO EXISTING WORK IN NEAT AND ACCEPTABLE MANNER. RESTORE EXISTING DISTURBED WORK TO ORIGINAL CONDITION, INCLUDING MAINTENANCE OF WIRING CONTINUITY AS REQUIRED.
I. DISCONNECT, REMOVE AND/OR RELOCATE EXISTING MATERIAL, EQUIPMENT AND OTHER WORK AS NOTED OR REQUIRED FOR PROPER INSTALLATION OF NEW WORK.
J. ALL EXISTING MATERIAL, EQUIPMENT AND CONSTRUCTION DEBRIS TO BE REMOVED UNDER THIS CONTRACT SHALL BECOME THE PROPERTY OF THE CONTRACTOR WITH THE EXCEPTION OF SPECIFIC EQUIPMENT AND APPARATUS REQUESTED BY THE BUILDING REPRESENTATIVE, ARCHITECT OR AS NOTED TO BE RELOCATED TO OTHER AREAS. EXCESS MATERIAL, EQUIPMENT SHALL BE PROPERLY DISPOSED OF BY THIS CONTRACTOR.
K. THE CONTRACTOR SHALL KEEP ALL EQUIPMENT AND MATERIALS AND ALL PARTS OF THE BUILDING, EXTERIOR SPACES AND ADJACENT STREETS, SIDEWALKS AND PARKINGS, FREE FROM MATERIAL AND DEBRIS RESULTING FROM THE EXECUTION OF THIS WORK. EXCESS MATERIALS WILL NOT BE PERMITTED TO ACCUMULATE EITHER ON THE INTERIOR OR THE EXTERIOR.
L. SEAL OPENING THROUGH PARTITIONS, WALLS AND FLOORS WITH MINERAL WOOL OR OTHER NONCOMBUSTIBLE MATERIAL. ALL PENETRATIONS THROUGH NEW AND EXISTING RATED FIRE AND SMOKE PARTITIONS AND/OR FLOORS SHALL BE COMPLETELY SEALED USING MATERIALS AND METHODS DESCRIBED IN SUBSEQUENT "FIRE STOPPING" SPECIFICATIONS SECTIONS.
M. PROVIDE ALL NECESSARY FLASHING AND COUNTERFLASHING TO MAINTAIN THE WATERPROOFING INTEGRITY OF THE BUILDING AS REQUIRED BY THE INSTALLATION OR REMOVAL OF PIPING AND EQUIPMENT. PROVIDE EQUIPMENT CURBS AS REQUIRED AND POSITIVELY ATTACH THE EQUIPMENT TO THE STRUCTURE BELOW.
N. THE WORK IN THE BUILDING SHALL BE DONE WHEN AND AS DIRECTED, IN A MANNER SATISFACTORY TO THE OWNER. THE WORK SHALL BE PERFORMED AS TO CAUSE THE LEAST POSSIBLE INCONVENIENCE AND DISTURBANCE TO THE PRESENT OCCUPANTS.
O. THE CONTRACTOR'S PROPOSAL FOR ALL WORK SHALL BE PREDICATED ON THE PERFORMANCE OF THE WORK DURING REGULAR WORKING HOURS. WHEN SO DIRECTED, HOWEVER, THE CONTRACTOR SHALL INSTALL WORK DURING OVERTIME HOURS AND THE ADDITIONAL COST TO BE CHARGED THEREFORE SHALL BE ONLY THE "PREMIUM" PORTION OF THE WAGES PAID.
P. UNLESS OTHERWISE SPECIFICALLY NOTED OR SPECIFIED, INCLUDE ALL CUTTING AND PATCHING OF EXISTING FLOORS, WALLS, PARTITIONS AND OTHER MATERIALS IN THE EXISTING BUILDING. THE CONTRACTOR SHALL RESTORE THESE AREAS TO ORIGINAL CONDITION.
Q. PC IS RESPONSIBLE TO PROVIDE ACCESS PANELS FOR ANY CONCEALED PLUMBING WORK THAT MUST BE ACCESSIBLE EITHER BY CODE OR AS INDICATED IN THE DOCUMENTS. ALL ACCESS DOOR LOCATIONS SHALL BE REVIEWED AND APPROVED BY ARCHITECT PRIOR TO INSTALLATION OF DEVICE REQUIRING THE ACCESS PANEL. ALL ACCESS DOORS MUST MATCH THE FIRE RATING AND CONSTRUCTION TYPE OF THE CEILING OR WALL PENETRATION AS DESIGNATED ON THE ARCHITECTURAL DRAWINGS.
R. ALL MATERIAL AND EQUIPMENT SHALL BE NEW UNLESS OTHERWISE NOTED AND SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
S. SUBMISSION OF A PROPOSAL SHALL BE CONSTRUED AS EVIDENCE THAT A CAREFUL EXAMINATION OF ALL OF THE PLANS APPLICABLE FOR THE PROJECT AND NOT JUST THE PLUMBING PLANS AND IS FAMILIAR WITH ANY PROPOSED CONDITIONS THAT WILL NEED TO BE COORDINATED IN THE FIELD. FOR EXISTING BUILDINGS, THE PORTIONS OF THE EXISTING

BUILDING, EQUIPMENT, ETC., WHICH AFFECT THIS WORK, AND THE ACCESS TO SUCH SPACES, HAS BEEN MADE AND THAT THE CONTRACTOR IS FAMILIAR WITH EXISTING CONDITIONS AND DIFFICULTIES THAT WILL AFFECT THE EXECUTION OF THE WORK. THE CONTRACTOR IS RESPONSIBLE TO INDICATE ANY DISCREPANCIES BETWEEN THE CONTRACT DRAWINGS AND ACTUAL FIELD CONDITIONS PRIOR TO SUBMITTAL OF BID. SUBMISSION OF A PROPOSAL WILL BE CONSTRUED AS EVIDENCE THAT THE CONTRACTOR HAS THOROUGHLY REVIEWED ALL OF THE DOCUMENTATION ASSOCIATED WITH THE PROJECT AND IF AN EXISTING BUILDING REVIEWED ALL OF THE EXISTING CONDITIONS. LATER CLAIMS SHALL NOT BE MADE FOR LABOR, EQUIPMENT OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN DURING SUCH AN EXAMINATION AND REVIEW. THE ON-SITE INSPECTION SHALL VERIFY EXISTING EQUIPMENT AND PIPING (SIZES, CLEARANCES, ETC.) AND CONDITIONS.
T. INSURANCE: IN ACCORDANCE WITH BUILDING REQUIREMENTS AND SHALL INCLUDE A HOLD HARMLESS CLAUSE FOR OWNER AND ENGINEER.
U. THE FINAL ACCEPTANCE SHALL BE MADE AFTER THE CONTRACTOR HAS ADJUSTED HIS EQUIPMENT, TESTED AND BALANCED THE VARIOUS SYSTEMS, DEMONSTRATED THAT IT FULFILLS THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS AND HAS FURNISHED ALL THE REQUIRED CERTIFICATES OF INSPECTION AND APPROVAL.
V. SPECIFICATIONS ARE OF SIMPLIFIED FORM AND INCLUDE INCOMPLETE SENTENCES. WORDS OR PHRASES SUCH AS "THE CONTRACTOR SHALL," "SHALL BE," "FURNISH," "PROVIDE," "A," "THE," AND "ALL," HAVE BEEN OMITTED FOR BREVITY.
W. DEFINITIONS:
1. "PROVIDE": TO SUPPLY, INSTALL AND CONNECT UP COMPLETE AND READY FOR SAFE AND REGULAR OPERATION THE PARTICULAR WORK REFERRED TO UNLESS SPECIFICALLY OTHERWISE NOTED.
2. "INSTALL": TO ERECT, MOUNT AND CONNECT COMPLETE WITH RELATED ACCESSORIES.
3. "FURNISH" OR "SUPPLY": TO PURCHASE, PROCURE, ACQUIRE AND DELIVER COMPLETE WITH RELATED ACCESSORIES.
4. "WORK": LABOR, MATERIALS, EQUIPMENT, APPARATUS, CONTROLS, ACCESSORIES AND OTHER ITEMS REQUIRED FOR PROPER AND COMPLETE INSTALLATION.
5. "CONCEALED": EMBEDDED IN MASONRY OR OTHER CONSTRUCTION, INSTALLED IN FURRED SPACES, WITHIN DOUBLE PARTITIONS OR HUNG CEILING, IN TRENCHES, IN CRAWL SPACES, OR IN ENCLOSURES.
6. "EXPOSED": NOT INSTALLED UNDERGROUND OR "CONCEALED" AS DEFINED ABOVE.
7. "SIMILAR" OR "EQUAL": EQUAL IN MATERIALS, WEIGHT, SIZE, DESIGN AND EXTENSION OF SPECIFIED PRODUCT.
2. SCOPE OF WORK:
A. THE SCOPE OF WORK SHALL CONSIST OF PROVIDING LABOR, MATERIALS, EQUIPMENT, SERVICES AND FEES NECESSARY FOR COMPLETE AND SAFE INSTALLATION IN CONFORMITY WITH THE NATIONAL STANDARD PLUMBING CODE OR ALL OTHER APPLICABLE INDUSTRY, STATE, NATIONAL AND LOCAL CODES AND AUTHORITIES HAVING JURISDICTION, AS INDICATED ON THE DRAWINGS AND HEREIN SPECIFIED.
B. ALL DRAWINGS, PLANS, DETAILS, SPECIFICATIONS AND SPECIFICATION ADDENDA ARE MADE PART OF THIS CONTRACT AND SHALL APPLY TO ALL WORK UNDER THE CONTRACT UNLESS OTHERWISE AMENDED, MODIFIED, SUPPLEMENTED OR SPECIFIED HEREIN.
C. THE CONTRACTOR SHALL FURNISH A WRITTEN GUARANTEE TO REPLACE OR REPAIR PROMPTLY AND ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED FOR ANY WORKMANSHIP AND EQUIPMENT IN WHICH DEFECTS DEVELOP WITHIN ONE YEAR FROM THE DATED OF FINAL CERTIFICATE FOR PAYMENT AND/OR FROM DATE OF ACTUAL USE OF EQUIPMENT OR OCCUPANCY OF SPACES BY THE OWNER INCLUDED UNDER THE VARIOUS PARTS OF THE WORK, WHICHEVER DATE IS EARLIER. THIS WORK SHALL BE DONE AS DIRECTED BY THE OWNER. THIS GUARANTEE SHALL ALSO PROVIDE THAT WHERE DEFECTS OCCUR, THE CONTRACTOR SHALL ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED IN REPAIRING AND REPLACING WORK OF OTHER TRADES AFFECTED BY DEFECTS, REPAIRS OR REPLACEMENTS IN EQUIPMENT SUPPLIED BY THE CONTRACTOR.
D. THE CONTRACTOR SHALL GIVE NECESSARY NOTICE, FILE DRAWINGS AND SPECIFICATIONS WITH ALL DEPARTMENTS HAVING JURISDICTION, OBTAIN PERMITS OR LICENSES NECESSARY TO CARRY OUT THIS WORK AND PAY ALL FEES THEREFOR. THE CONTRACTOR SHALL ARRANGE FOR INSPECTION AND TESTS OF ANY OR ALL PARTS OF THE WORK IF SO REQUIRED BY AUTHORITIES FOR, AND FURNISH TO THE OWNER BEFORE BILLING, ALL CERTIFICATES NECESSARY AS EVIDENCE THE WORK INSTALLED CONFORMS WITH ALL REGULATIONS WHERE THEY APPLY TO THIS WORK.
3. SHOP DRAWINGS:
A. PRIOR TO THE INSTALLATION OF ANY WORK AND PROCUREMENT OF EQUIPMENT, THE CONTRACTOR SHALL PROVIDE COMPLETE SETS OF COORDINATED SHOP DRAWINGS OF ALL NEW AND EXISTING EQUIPMENT, OTHER TRADES SUCH AS BUT NOT LIMITED TO HVAC AND STRUCTURAL BEAMS, INDICATING CAPACITY, DIMENSIONS AND SEQUENCE OF OPERATION FOR WRITTEN APPROVAL BY THE ARCHITECT AND ENGINEER.
B. INDICATE ON EACH SHOP DRAWINGS SUBMITTED:
1) PROJECT NAME AND LOCATION
2) NAME OF ARCHITECT AND ENGINEER
3) ITEM IDENTIFICATION
4) APPROVAL STAMP OF THE PRIME CONTRACTOR
C. SUBMISSIONS:
1) SUBMISSIONS 11 IN X 17 IN OR SMALLER, IF THE SUBMISSION IS A CATALOG CUT, THEN THE CONTRACTOR SHALL SUBMIT ONE ORIGINAL AND TWO COPIES. OTHERWISE, HE SHALL SUBMIT THREE COPIES. THE ARCHITECT WILL FORWARD THE ORIGINAL AND ONE COPY (TWO COPIES WHEN NO ORIGINAL IS RECEIVED) TO THE ENGINEER. ALL CATALOG CUTS SHALL BE COMPLETE.
2) SUBMISSIONS LARGER THAN 11 IN X 17 IN, SUBMIT TWO PRINTS TO THE ARCHITECT. THE ARCHITECT WILL FORWARD ONE PRINT TO THE

ENGINEER.
D. SUBMIT SHOP DRAWINGS FOR THE FOLLOWING:
1) PIPING
2) VALVES
3) INSULATION
4) FITTINGS
5) FIXTURES AND EQUIPMENT
6. INSULATION:
A. ALL INSULATION (INCLUDING JACKET, FACING AND ADHESIVE) SHALL HAVE COMPOSITE FIRE AND SMOKE HAZARD RATINGS AS TESTED BY PROCEDURES LISTED IN ASTM E-84, NFPA 265 AND UL 273, NOT EXCEEDING A FLAME SPREAD OF 25 AND A SMOKE DEVELOPED OF 50.
B. ON VALVES AND FITTINGS PROVIDE PPE-MOLDED FIBERGLASS FITTINGS, VAPOR SEAL INSULATION ON "CW".
C. "CW" PIPING: PROVIDE 1/2 IN. THICK FIBERGLASS SECTION PIPE COVERING WITH VAPOR BARRIER JACKET.
D. "HW" PIPING: PROVIDE 1 IN. THICK FIBERGLASS SECTIONAL PIPE COVERING WITH VAPOR BARRIER JACKET.
E. STEAM PIPING: PROVIDE 3/4 IN. THICK FIBERGLASS SECTION PIPE COVERING WITH VAPOR BARRIER JACKET.
F. INTERIOR STORM PIPING: PROVIDE 1 IN. THICK FIBERGLASS SECTIONAL PIPE COVERING WITH VAPOR BARRIER JACKET.
7. PLUMBING FIXTURES:
A. QUALITY ASSURANCE
1. QUALITY AND GAUGE OF MATERIALS. NEW, BEST OF THEIR RESPECTIVE KINDS, FREE FROM DEFECTS AND LISTED BY UNDERWRITERS LABORATORIES, INC. OR BEARING THEIR LABEL. MATERIALS AND EQUIPMENT OF SIMILAR APPLICATION SHALL BE OF SAME MANUFACTURER, EXCEPT AS NOTED.
2. ALL MATERIALS AND WORKMANSHIP SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR FROM DATE OF ACCEPTANCE OF WORK.
B. PRODUCT DELIVERY, STORAGE AND HANDLING
1. MOVING OF EQUIPMENT: WHERE NECESSARY, SHIP IN CARTON SECTIONS OF SIZE TO PERMIT PASSING THROUGH AVAILABLE SPACES.
2. ACCESSIBILITY: FOR OPERATION, MAINTENANCE AND REPAIR, MINOR DEVIATIONS SHALL BE PERMITTED. CHANGES OF MAGNITUDE OR INVOLVING EXTRA COST ARE NOT PERMISSIBLE WITHOUT REVIEW. GROUP CONCEALED ELECTRICAL EQUIPMENT REQUIRING ACCESS WITH EQUIPMENT FREELY ACCESSIBLE THROUGH ACCESS DOORS.
C. PAINT SHALL BE THE BEST GRADE FOR ITS PURPOSE. DELIVER IN ORIGINAL SEALED CONTAINERS AND APPLY IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. COLORS SHALL BE AS SELECTED, RED LEAD OR ZINC CHROMATE WITH FINISH TO MATCH SURROUNDINGS SHALL BE USED FOR MARRED SURFACES OF STEEL EQUIPMENT. A FIELD APPLIED ZINC CHROMATE PRIME COAT SHALL BE UTILIZED FOR STEEL OR IRON WORK.
D. BRUSH AND CLEAN WORK PRIOR TO CONCEALING, PAINTING AND ACCEPTANCE. PAINTED EXPOSED WORK, SOILED OR DAMAGED, CLEAN AND REPAIR TO MATCH ADJOINING WORK BEFORE FINAL ACCEPTANCE. REMOVE DEBRIS FROM INSIDE AND OUTSIDE OF MATERIAL AND EQUIPMENT.
E. G. FINAL LOCATIONS AND MOUNTING ORIENTATIONS OF ALL PLUMBING FIXTURES SHALL BE VERIFIED BY ARCHITECT.
F. H. ALL ACCESS DOOR LOCATIONS SHALL BE REVIEWED BY ARCHITECT PRIOR TO INSTALLATION.
8. PLUMBING PIPING MATERIALS:
A. SANITARY DRAINAGE AND VENT
1. HUBLESS CAST IRON SOIL PIPE AND FITTINGS WITH EXTRA HEAVY DUTY GASKETED HUBLESS COUPLINGS FOR FOOD SERVICE APPLICATIONS.
2. SCHEDULE 40 PVC PIPE WITH CEMENT TYPE SLIP FIT PIPE AND FITTINGS.
3. GALVANIZED SCHEDULE 40 STEEL PIPE WITH GALVANIZED THREADED MALLEABLE IRON FITTINGS.
B. DOMESTIC WATER
1. TYPE L HARD COPPER TUBING WITH CAST BRONZE OR WROUGHT COPPER FITTINGS AND 95/5 TIN ANTIMONY SOLDER JOINTS.
2. STANDARD WEIGHT RED BRASS PIPE WITH STANDARD WEIGHT CAST BRONZE THREADED FITTINGS.
C. STORM PIPING
1. HUBLESS CAST IRON SOIL PIPE AND FITTINGS WITH EXTRA HEAVY DUTY GASKETED HUBLESS COUPLINGS.
2. SCHEDULE 40 PVC PIPE WITH CEMENT TYPE SLIP FIT PIPE AND FITTINGS.
3. GALVANIZED SCHEDULE 40 STEEL PIPE WITH GALVANIZED THREADED MALLEABLE IRON FITTINGS.
D. STEAM PIPING
1. SCHEDULE 80 BLACK STEEL WITH WELDED JOINTS
E. ALL EXPOSED PIPE AND FITTINGS SHALL BE CHROME PLATED BRASS.
9. EXPANSION ANCHORS:
1. PROVIDE SMOOTH WALL, NON SELF-DRILLING INTERNAL PLUG EXPANSION TYPE ANCHORS CONSTRUCTED OF A502, 1/2" DIA STEEL AND ZINC PLATED IN ACCORDANCE WITH FED. SPEC. QQ-A-325 TYPE 1, CLASS 3.
2. DO NOT EXCEED 1/4" OF AVERAGE VALVES FOR A SPECIFIC ANCHOR SIZE USING 2000 PSIG (13,800 KPA) CONCRETE ONLY, FOR MAXIMUM WORKING LOADS.
3. PROVIDE SPACING AND INSTALL ANCHORS IN ACCORDANCE WITH THE

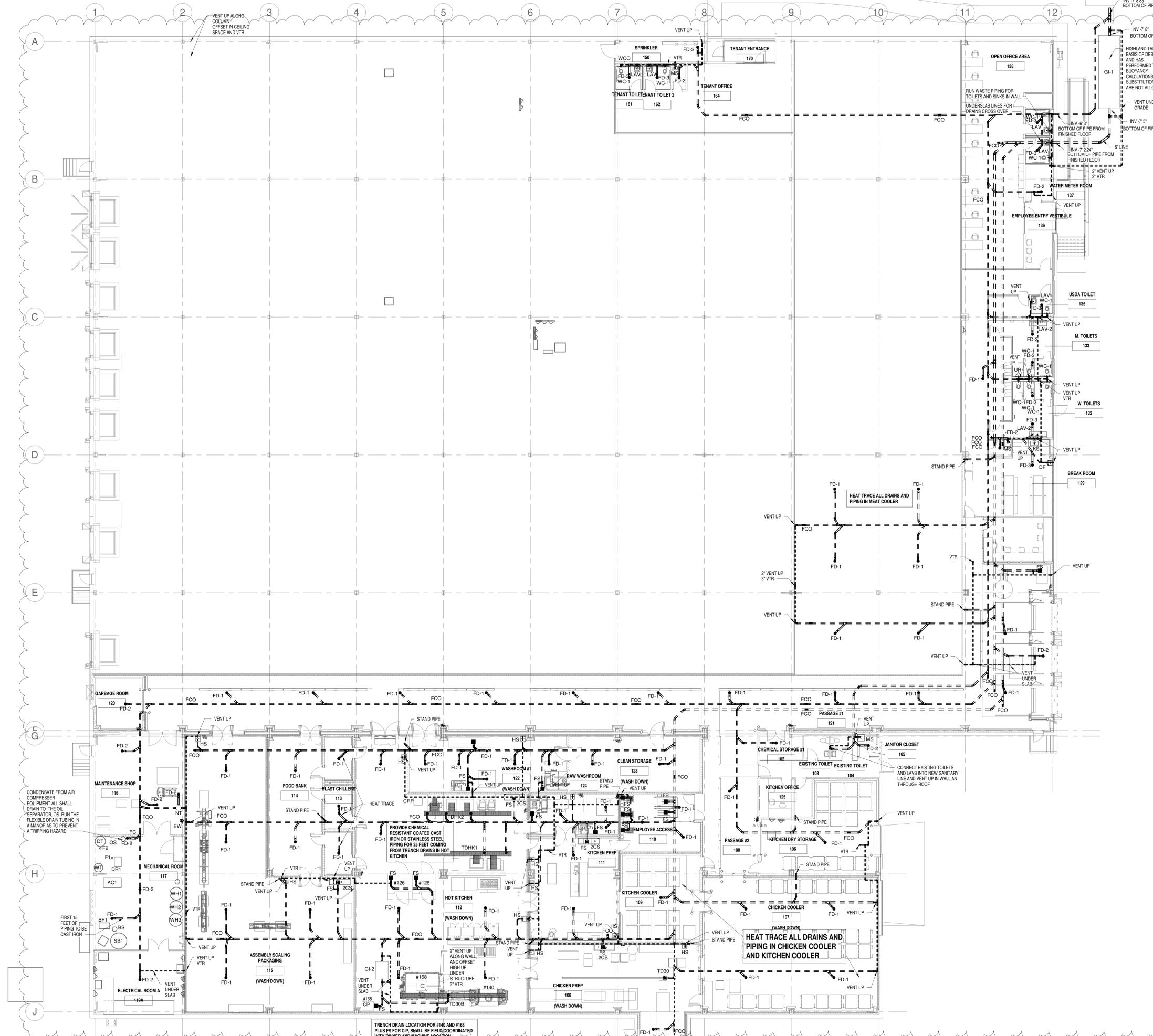
F. ALL EXPOSED PIPING PASSING THROUGH WALLS, FLOORS, CEILING, AND PARTITIONS SHALL BE PROVIDED WITH CHROME PLATED CAST BRASS ESCUTCHEONS HELD IN PLACE WITH SET SCREWS.
2. VALVES:
A. GATE VALVES: 1. BRONZE RISING STEM, 200 PSI WOG, SIMILAR TO STOOCKHAM #B-105, B-109.
B. BALL VALVES: 1. TWO PIECE, BRONZE, END ENTRY, 800 PSI WWP, SIMILAR TO STOOCKHAM #S-216 SR-FIT, #S-216 BR-S.
C. CHECK VALVES: 1. BRONZE, ZEPHYRUS CAP, TEFLOM DISC, SIMILAR TO STOOCKHAM #B307, B-320T.
4. INSULATION:
A. ALL INSULATION (INCLUDING JACKET, FACING AND ADHESIVE) SHALL HAVE COMPOSITE FIRE AND SMOKE HAZARD RATINGS AS TESTED BY PROCEDURES LISTED IN ASTM E-84, NFPA 265 AND UL 273, NOT EXCEEDING A FLAME SPREAD OF 25 AND A SMOKE DEVELOPED OF 50.
B. ON VALVES AND FITTINGS PROVIDE PPE-MOLDED FIBERGLASS FITTINGS, VAPOR SEAL INSULATION ON "CW".
C. "CW" PIPING: PROVIDE 1/2 IN. THICK FIBERGLASS SECTION PIPE COVERING WITH VAPOR BARRIER JACKET.
D. "HW" PIPING: PROVIDE 1 IN. THICK FIBERGLASS SECTIONAL PIPE COVERING WITH VAPOR BARRIER JACKET.
E. STEAM PIPING: PROVIDE 3/4 IN. THICK FIBERGLASS SECTION PIPE COVERING WITH VAPOR BARRIER JACKET.
F. INTERIOR STORM PIPING: PROVIDE 1 IN. THICK FIBERGLASS SECTIONAL PIPE COVERING WITH VAPOR BARRIER JACKET.
10. PIPING SUPPORTS:
A. SUPPORT ALL PIPING FROM BUILDING CONSTRUCTION BY PROVIDING INSERTS, BEAM CLAMPS, STEEL FISHPATES (IN CONCRETE FILL ONLY), AND TYPE V BRACKETS. SUBMIT ALL METHODS FOR REVIEW.
B. PROVIDE TRAPEZE HANGERS OF BOLTED ANGLES OR CHANNELS FOR GROUPED LINES AND SERVICES.
C. PROVIDE ADDITIONAL FRAMING WHERE BUILDING CONSTRUCTION IS INADEQUATE. SUBMIT FOR REVIEW.
D. SUPPORT ALL PIPING INDEPENDENTLY FROM STRUCTURE USING HEAVY IRON-HINGED TYPE HANGERS, SIMILAR TO GRINNELL CLEVIS NO. 260.
2. PROVIDE ENGLISH AND SMALLER PIPING.
3. PROVIDE WALL BRACKETS FOR WALL SUPPORTED PIPING, AND PROVIDE PIPE SADDLES FOR FLOOR MOUNTED PIPING.
4. PROVIDE SUPPORTS WITH COPPER LINING FOR UNINSULATED COPPER PIPING.
5. SUSPEND PIPING FROM INSERTS, USING BEAM CLAMPS WITH RETAINING CLAMP OR LOCKOUT, STEEL FISHP PLATES, CANTILEVER BRACKETS OR OTHER ACCEPTED MEANS. BEAM CLAMPS SHALL BE SIMILAR TO GRINNELL FIGURES 61, 67, 81, OR 225.
6. SUSPEND PIPING BY RODS WITH DOUBLE NUTS.
7. PROVIDE ADDITIONAL STEEL FRAMING AS REQUIRED AND ACCEPTED WHERE OVERHEAD CONSTRUCTION DOES NOT PERMIT FASTENING HANGER RODS IN REQUIRED LOCATIONS.
8. SUPPORT BRANCH FIXTURE WATER PIPING IN CHASES WITH COPPER-PLATED METAL BRACKETS, SECURED TO STUDS, SIMILAR TO HOLDRITE NOS. 102-18, 107-18, 102-26, OR 101-26.
E. PROVIDE 180 DEGREE ARC GALVANIZED METAL COVERING SHIELDS ON HANGERS FOR INSULATED PIPING WITHOUT INCOMPRESSIBLE INSULATING BLOCK IN INSULATION AT HANGERS.
F. MAXIMUM HANGER SPACING AS INDICATED.
1. PIPE 1/4 INCH AND SMALLER SHALL BE EVERY 8 FEET.
2. PIPE 1/4 INCH AND LARGER SHALL BE EVERY 10 FEET.
3. COPPER TUBING 1/4 INCH AND SMALLER SHALL BE EVERY 6 FEET.
4. COPPER TUBING 1/2 INCH AND LARGER SHALL BE EVERY 10 FEET.
5. CAST IRON: EVERY 5 FEET AND AT EVERY FITTING OR JOINT.
G. EXPANSION ANCHORS:
1. PROVIDE SMOOTH WALL, NON SELF-DRILLING INTERNAL PLUG EXPANSION TYPE ANCHORS CONSTRUCTED OF A502, 1/2" DIA STEEL AND ZINC PLATED IN ACCORDANCE WITH FED. SPEC. QQ-A-325 TYPE 1, CLASS 3.
2. DO NOT EXCEED 1/4" OF AVERAGE VALVES FOR A SPECIFIC ANCHOR SIZE USING 2000 PSIG (13,800 KPA) CONCRETE ONLY, FOR MAXIMUM WORKING LOADS.
3. PROVIDE SPACING AND INSTALL ANCHORS IN ACCORDANCE WITH THE

MANUFACTURER'S RECOMMENDATIONS.
4. EXPANSION ANCHORS SHALL BE U.L. LISTED AND SIMILAR TO HLTI HDI.
11. TESTS:
A. DOMESTIC WATER PIPING:
1. TEST PIPING HYDROSTATICALLY AT A PRESSURE OF 125 PSIG.
2. DURATION OF TEST SHALL BE 2 HOURS WITHOUT A LOSS IN PRESSURE.
B. DRAINAGE AND VENT PIPING:
1. CAP ALL OUTLETS AND FILL PIPING SYSTEM TO OVERFLOWING FROM A POINT AT LEAST 10 FEET ABOVE THE FLOOR.
2. THE WATER LEVEL SHALL REMAIN CONSTANT THROUGHOUT THE TEST DURATION OF 2 HOURS.
C. ARRANGE AND COORDINATE TESTS WITH OWNER 48 HOURS IN ADVANCE. NOTIFY ENGINEER AND ARCHITECT OF TEST DATE AND TIME.
D. DEFECTS DISCLOSED BY THE TESTS SHALL BE REPAIRED OR REPLACED. TESTS SHALL BE REPEATED AS DIRECTED UNTIL ALL WORK IS PROVEN SATISFACTORY.
E. TAKE ALL PRECAUTIONS NECESSARY TO PREVENT DAMAGE TO THE BUILDING AND ITS CONTENTS AS A RESULT OF SUCH TESTS. REPAIR ANY DAMAGE CAUSED.
12. FLUSHING AND DISINFECTING POTABLE WATER SYSTEMS:
a) FLUSHING
1. THE WATER DISTRIBUTION PIPING TO ALL FIXTURES AND OUTLETS SHALL BE FLUSHED UNTIL THE WATER RUNS CLEAR AND FREE OF DEBRIS AND PARTICLES. FAUCET AERATORS OR SCREENS SHALL BE REMOVED DURING FLUSHING OPERATIONS.
b) DISINFECTING
1. THE HOT AND COLD WATER DISTRIBUTION PIPING IN NEW OR RENOVATED POTABLE WATER SYSTEMS SHALL BE DISINFECTED AFTER FLUSHING AND PRIOR TO USE. THE PROCEDURE USED SHALL BE AS FOLLOWS OR AN APPROVED EQUIVALENT:
a. ALL WATER OUTLETS SHALL BE POSTED TO WARN AGAINST USE DURING DISINFECTING OPERATIONS.
b. DISINFECTING SHALL BE PERFORMED BY PERSONS EXPERIENCED IN SUCH WORK.
c. THE WATER SUPPLY TO THE PIPING SYSTEM OR PARTS THEREOF BEING DISINFECTED SHALL BE VALVED OFF FROM THE NORMAL WATER SOURCE TO PREVENT THE INTRODUCTION OF DISINFECTING AGENTS INTO A PUBLIC WATER SUPPLY OR PORTIONS OF A SYSTEM THAT ARE NOT BEING DISINFECTED.
d. THE PIPING SHALL BE DISINFECTED WITH A WATER-CHLORINE SOLUTION. DURING THE INJECTION OF THE DISINFECTING AGENT INTO THE PIPING, EACH OUTLET SHALL BE FULLY OPENED SEVERAL TIMES UNTIL A CONCENTRATION OF NOT LESS THAN 50 PARTS PER MILLION CHLORINE IS PRESENT AT EVERY OUTLET. THE SOLUTION SHALL BE ALLOWED TO STAND IN THE PIPING FOR AT LEAST 24 HOURS.
e. AN ACCEPTABLE ALTERNATE TO THE 50 PPM/24-HOUR PROCEDURE SHALL BE TO MAINTAIN A LEVEL OF NOT LESS THAN 200 PARTS PER MILLION FOR NOT LESS THAN THREE HOURS. IF THIS ALTERNATE PROCEDURE IS USED, THE HEAVILY CONCENTRATED CHLORINE SHALL NOT BE ALLOWED TO STAND IN THE PIPING SYSTEM FOR MORE THAN 6 HOURS. ALSO, SPECIAL PROCEDURES SHALL BE USED TO DISPOSE OF THE HEAVILY CONCENTRATED CHLORINE IN AN ENVIRONMENTALLY ACCEPTABLE AND APPROVED MANNER.
f. AT THE END OF THE REQUIRED RETENTION TIME, THE RESIDUAL LEVEL OF CHLORINE AT EVERY OUTLET SHALL BE NOT LESS THAN FIVE PARTS PER MILLION. IF THE RESIDUAL IS LESS THAN FIVE PARTS PER MILLION, THE DISINFECTING PROCEDURE SHALL BE REPEATED UNTIL THE REQUIRED MINIMUM CHLORINE RESIDUAL IS OBTAINED AT EVERY OUTLET.
g. AFTER THE REQUIRED RESIDUAL CHLORINE LEVEL IS OBTAINED AT EVERY OUTLET, THE SYSTEM SHALL BE FLUSHED TO REMOVE THE DISINFECTING AGENT. FLUSHING SHALL CONTINUE UNTIL THE CHLORINE LEVEL AT EVERY OUTLET IS REDUCED TO THAT OF THE INCOMING WATER SUPPLY.
h. FURNISH A WRITTEN RECORD OF THE DISINFECTING TEST RESULTS.
13. NATURAL GAS PIPING
A. GENERAL REQUIREMENTS
1. QUALITY ASSURANCE: COMPLY WITH NFPA 54 AND ALL LOCAL BUILDING CODES.
B. PRODUCTS
1. PIPE, TUBE, AND SPECIALTIES
a) STEEL PIPE: ASTM A 53, TYPE S (SEAMLESS), GRADE B, SCHEDULE 40, PLAIN ENDS.
b) MALLEABLE IRON THREADED FITTINGS: ASME B16.3, CLASS 150.
c) MANUAL VALVES: COMPLY WITH STANDARDS LISTED OR, IF APPROPRIATE, TO ANSI Z21.15.
d) GAS STOPS: AGA CERTIFIED, BRONZE-BODY, PLUG TYPE WITH BRONZE PLUG, FOR 2-PSIG OR LESS NATURAL GAS. INCLUDE AGA STAMP, FLAT OR SQUARE HEAD OR LEVER HANDLE, AND THREADED ENDS COMPLYING WITH ASME B1.1.
e) GAS VALVES: 150-PSIG WOG, CAST-IRON OR BRONZE BODY, BRONZE PLUG, STRAIGHTAWAY PATTERN, SQUARE HEAD, TAPERED-PLUG TYPE.
C. NO RIGID CONNECTIONS BETWEEN EQUIPMENT AND THE BUILDING

1) FLEXIBLE CONNECTORS: ANSI Z21.24, COPPER ALLOY.
C. EXECUTION
1. INSTALLATION
a. CLOSE EQUIPMENT SHUTOFF VALVES BEFORE TURNING OFF GAS TO SECTION OF PIPING. PERFORM LEAKAGE TEST AS SPECIFIED TO DETERMINE THAT ALL EQUIPMENT IS TURNED OFF IN AFFECTED PIPING SECTION.
b. LOW PRESSURE, 0.5 PSIG OR LESS, NATURAL GAS SYSTEMS: USE THE FOLLOWING: NPS 2" AND SMALLER: STEEL PIPE, MALLEABLE IRON THREADED FITTINGS, AND THREADED JOINTS.
c. INSTALL GAS STOPS FOR SHUTOFF TO APPLIANCES WITH NPS 2" OR SMALLER.
d. DRIPS AND SEDIMENT TRAPS: INSTALL DRIPS AT POINTS WHERE CONDENSATE MAY COLLECT. INCLUDE OUTLETS OF GAS METERS LOCATE WHERE READILY ACCESSIBLE TO PERMIT CLEANING AND EMPTYING. DO NOT INSTALL WHERE CONDENSATE WOULD BE SUBJECT TO FREEZING.
e. INSTALL GAS PIPING AT UNIFORM SLOPE OF 0.1 PERCENT UPWARD TOWARD RISERS.
f. USE ECCENTRIC REDUCER FITTINGS TO MAKE REDUCTIONS IN PIPE SIZES. INSTALL FITTINGS WITH LEVEL SLOPE.
g. CONNECT BRANCH PIPING FROM TOP OR SIDE OF HORIZONTAL PIPING.
h. INSTALL STRAINERS ON SUPPLY SIDE OF EACH CONTROL VALVE, GAS PRESSURE REGULATOR, SOLENOID VALVE, AND ELSEWHERE AS INDICATED.
i. INSTALL VALVES IN ACCESSIBLE LOCATIONS, PROTECTED FROM DAMAGE. TAG VALVES WITH METAL TAG INDICATING PIPING SUPPLIED. ATTACH TAG TO VALVE WITH METAL CHAIN.
j. CONNECT GAS PIPING TO EQUIPMENT AND APPLIANCES WITH SHUTOFF VALVES AND UNIONS.
k. INSTALL GAS VALVE UPSTREAM FROM AND WITHIN 72 INCHES OF EACH APPLIANCE USING GAS. INSTALL UNION OR FLANGED CONNECTION DOWNSTREAM FROM VALVE.
D. GAS PIPING INSPECTION, TESTING, AND PURGING
1. INSPECT, TEST, AND PURGE PIPING ACCORDING TO NFPA 54 AND REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION.
14. SEISMIC RESTRAINTS
A. A. ALL FUEL OIL, GASOLINE, NATURAL GAS, STEAM OR ANY PIPING CONTAINING HAZARDOUS, FLAMMABLE, COMBUSTIBLE, TOXIC OR CORROSIIVE MATERIALS
1. SEISMIC RESTRAINED PIPES SHALL NOT BE ISOLATED FROM THE BUILDING STRUCTURE.
2. ALL GAS PIPING SHALL BE SEISMICALLY RESTRAINED OR BRACED. TYPE V SEISMIC CABLES RESTRAINTS OR RESILIENT SINGLE ARM BRACES SHALL BE USED.
B. TYPE V: SEISMIC CABLE RESTRAINTS VMC: SCR AB: ERS
1. SEISMIC CABLE RESTRAINTS SHALL CONSIST OF GALVANIZED STEEL AIRCRAFT CABLES SIZED TO RESIST SEISMIC LOADS WITH A MINIMUM SAFETY FACTOR OF TWO AND ARRANGED TO PROVIDE ALL-DIRECTIONAL RESTRAINT. CABLE END CONNECTIONS SHALL BE STEEL ASSEMBLIES THAT SWIVEL TO FINAL INSTALLATION ANGLE AND UTILIZE TWO CLAMPING BOLTS TO PROVIDE PROPER CABLE ENGAGEMENT. CABLES MUST NOT BE ALLOWED TO BEND ACROSS SHARP EDGES. SINGLE ARM BRACES WITH RESILIENT BUSHINGS CAN BE SUBSTITUTED FOR SEISMIC CABLE RESTRAINTS.
C. TYPE VI: RIGID ARM BRACE VMC: SAB AB: SAB
1. SEISMIC SOLID BRACES SHALL CONSIST OF STEEL ANGLES OR CHANNELS TO RESIST SEISMIC LOADS WITH A MINIMUM SAFETY FACTOR OF TWO AND ARRANGED TO PROVIDE ALL DIRECTIONAL RESTRAINT. SEISMIC SOLID BRACE END CONNECTIONS SHALL BE STEEL ASSEMBLIES THAT SWIVEL TO THE FINAL INSTALLATION ANGLE AND UTILIZE TWO THROUGH BOLTS TO PROVIDE PROPER ATTACHMENT SPACED TO ICB0 STANDARDS FOR ATTACHMENT TO CONCRETE.
D. TYPE VIII: SEISMIC WATERPROOF FOUNDATION WALL SLEEVE VMC: SFWFS AB: SFWFS
1. SEISMIC WATERPROOF FOUNDATION WALL SLEEVES SHALL CONSIST OF TWO ELASTOMERIC SLEEVES THAT SHALL BE MOUNTED BOTH INSIDE AND OUT OF THE VERTICAL FOUNDATION WALL. THE CONICAL DESIGN SHALL HAVE A SUITABLY WATERPROOF MEANS OF FASTENING TO BOTH CONCRETE AND TO ITS CONCENTRIC UTILITY PIPE. ALLOWABLE VERTICAL DRIFT SHALL BE PLUS OR ANS. ALL FITTINGS "Y" TO THE INSTALLED NEUTRAL POINT ALONG THE VERTICAL. "MINUS Z" SHALL BE STAINLESS STEEL OR GALVANIZED.
PART 3 - EXECUTION
3.1 EXAMINATION
A. ALL AREAS THAT WILL RECEIVE COMPONENTS REQUIRING VIBRATION CONTROL, SEISMIC OR WIND LOAD BRACING SHALL BE THOROUGHLY EXAMINED FOR DEFICIENCIES THAT WILL AFFECT THEIR INSTALLATION OR PERFORMANCE. SUCH DEFICIENCIES SHALL BE CORRECTED PRIOR TO THE INSTALLATION OF ANY SUCH SYSTEM.
B. EXAMINE ALL ROUGH INS INCLUDING ANCHORS AND REINFORCING PRIOR TO PLACEMENT.
3.2 COMPONENT INSTALLATION, (GENERAL)
A. ALL SEISMIC SYSTEMS MUST BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURERS WRITTEN INSTRUCTIONS AND ALL CERTIFIED SUBMITTAL DATA.
B. INSTALLATION OF SEISMIC RESTRAINTS MUST NOT CAUSE ANY CHANGE OF POSITION OR EQUIPMENT, PIPING OR DUCTWORK RESULTING IN STRESSES OR MISALIGNMENT.
C. NO RIGID CONNECTIONS BETWEEN EQUIPMENT AND THE BUILDING

STRUCTURE SHALL BE MADE THAT DEGRADES THE NOISE AND VIBRATION CONTROL SYSTEM SPECIFIED HEREIN.
D. COORDINATE WORK WITH OTHER TRADES TO AVOID RIGID CONTACT WITH THE BUILDING.
E. OVER STRESSING OF THE BUILDING STRUCTURE MUST NOT OCCUR BECAUSE OF OVERHEAD SUPPORT OF EQUIPMENT. CONTRACTOR MUST SUBMIT LOADS TO THE STRUCTURAL ENGINEER OF RECORD FOR APPROVAL. GENERAL BRACING MAY OCCUR FROM FLANGES OF STRUCTURAL BEAMS, UPPER TRUSSES IN BAR COST CONSTRUCTION AND CAST IN PLACE INSERTS OR WEDGE TYPE DRILL-IN CONCRETE ANCHORS.
F. SEISMIC CABLE RESTRAINTS SHALL BE INSTALLED SLIGHTLY SLACK TO AVOID SHORT CIRCUITING THE ISOLATED SUSPENDED EQUIPMENT OR PIPING.
G. SEISMIC CABLE ASSEMBLIES ARE INSTALLED TAUT ON NON-ISOLATED SYSTEMS. SEISMIC SINGLE ARM BRACES MAY BE USED IN PLACE OF CABLES ON RIGIDLY ATTACHED SYSTEMS BUT CAN ALSO BE USED ON ISOLATED SYSTEMS WHEN INCORPORATING RESILIENT BUSHINGS.
H. AT LOCATIONS WHERE SEISMIC CABLE RESTRAINTS OR SEISMIC SINGLE ARM BRACES ARE LOCATED, THE SUPPORT RODS MUST BE BRACED WHEN NECESSARY TO ACCEPT "E" COMPRESSIVE LOADS. SEE TABLE.
I. AT ALL LOCATIONS WHERE SEISMIC CABLE BRACES AND SEISMIC CABLE RESTRAINTS ARE ATTACHED TO THE PIPE CLEVIS, THE CLEVIS BOLT MUST BE REINFORCED WITH PIPE CLEVIS CROSS BOLT BRACES OR DOUBLE INSIDE NUTS IF REQUIRED BY SEISMIC ACCELERATION LEVELS.
3.4 PIPING AND ISOLATION
A. VIBRATION ISOLATION OF PIPING
1. GAS LINES SHALL NOT BE ISOLATED.
2. SEISMIC RESTRAINT OF PIPING
1. ALL HIGH HAZARD AND LIFE SAFETY PIPE REGARDLESS OF SIZE SUCH AS FUEL OIL, PIPING, GAS PIPING SHALL BE SEISMICALLY RESTRAINED OR BRACED. TYPE V SEISMIC CABLES RESTRAINTS OR RESILIENT SINGLE ARM BRACES SHALL BE USED IF PIPING IS ISOLATED. TYPE V SEISMIC CABLE RESTRAINTS OR TYPE VI SINGLE ARM BRACES MAY BE USED ON NON-ISOLATED PIPING. THERE ARE NO EXCLUSIONS FOR SIZE OR DISTANCE IN THIS CATEGORY.
2. SEISMIC ALLY RESTRAIN PIPING LOCATED IN SOLER ROOMS, MECHANICAL EQUIPMENT ROOMS I.D. AND LARGER TYPE V SEISMIC CABLES AND REFRIGERATION EQUIPMENT ROOMS THAT IS 1 1/4" RESTRAINTS OR RESILIENT SINGLE ARM BRACES SHALL BE USED IF PIPING IS ISOLATED. TYPE V SEISMIC CABLE RESTRAINTS OR TYPE VI SINGLE ARM BRACES MAY BE USED ON UNISOLATED PIPING.
3. SEE TABLE D FOR MAXIMUM SEISMIC BRACING DISTANCES.
4. MULTIPLE RUNS OF PIPE ON THE SAME SUPPORT SHALL HAVE DISTANCE DETERMINED BY CALCULATION. "E"
5. ROD BRACES SHALL BE USED FOR ALL ROD LENGTHS AS LISTED IN TABLE.
6. CLEVIS HANGERS SHALL HAVE BRACES PLACED INSIDE OF HANGER AT SEISMIC BRACE LOCATIONS.
7. WHERE THERMAL EXPANSION IS A CONSIDERATION, GUIDES AND ANCHORS MAY BE USED AS TRANSVERSE AND LONGITUDINAL RESTRAINTS PROVIDED THEY HAVE A CAPACITY EQUAL TO OR GREATER THAN THE RESTRAINT LOADS IN ADDITION TO THE LOADS INDUCED BY EXPANSION OF CONSTRUCTION.
8. FOR FUEL OIL AND ALL GAS PIPING, TRANSVERSE RESTRAINTS MUST BE AT 20" MAXIMUM AND LONGITUDINAL RESTRAINTS AT 40" MAXIMUM SPACING.
9. TRANSVERSE RESTRAINT FOR ONE PIPE SECTION MAY ALSO ACT AS LONGITUDINAL RESTRAINT FOR A PIPE SECTION OF THE SAME SIZE CONNECTED PERPENDICULAR TO IT IF THE OF THE ELBOW OR TEE OR COMBINED STRESSES ARE WITHIN "E" RESTRAINT IS INSTALLED WITHIN 24" ALLOWABLE LIMITS AT LONGER DISTANCES.
11. BRANCH LINES MAY NOT BE USED TO RESTRAIN MAIN LINES.
12. WHERE PIPE PASSES THROUGH A TWO-SIDED SHEETROCK WALL, THE WALL, IF TIGHT TO THE " " PIPE, SHALL ACT AS A LATERAL/TRANSVERSE BRACE FOR PIPE SIZES UP TO AND INCLUDING 4 PROVIDED HOLE IS REINFORCED WITH METAL CORNER BEAD.
13. WHERE HORIZONTAL PIPE CROSSES A BUILDING'S DRIFT EXPANSION JOINT, ALLOWANCE SHALL BE PART OF THE DESIGN TO ACCOMMODATE DIFFERENTIAL MOTION.
ISSUED FOR:
REVIEW:
PLANNING BOARD:
BUILDING DEPT:
CITY:
CONSTRUCTION:
BRIAN D. TANNENHAUS
NJ PROFESSIONAL ENGINEER
NO. CE 42801
DATE: 09/24/2022
PLUMBING SPECIFICATIONS
date:
locat:
release date:
drawing date: 09/24/2021
drawn by: RL
approved by: KF
project no.: 2102
drawing no.:
P-101.00
DOB BARCODE:
Total

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BRIAN D. TANNENHAUS
NJ PROFESSIONAL ENGINEER NO. CE 42801 DATE: 09/24/2022
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P-101.00
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GENERAL NOTES:

- UNLESS OTHERWISE NOTED, ALL SINKS, FLOOR DRAINS, FLOOR SINKS AND/OR STANDPIPES SHALL BE TRAPPED JUST BELOW THE FLOOR.
- EXISTING SANITARY LOCATION IS APPROXIMATE. FIELD VERIFY ALL FINAL LOCATIONS PRIOR TO BIDDING.
- UNLESS OTHERWISE NOTED, PROVIDE NEW CONDENSATE DRAIN LINES TO EXISTING HUB DRAINS FOR ALL NEW AND RELOCATED CASES.
- REFER TO RISER DIAGRAM FOR ADDITIONAL INFORMATION.
- SEE PLUMBING SCHEDULES FOR FUTURE PIPE CONNECTION SIZES.
- CONDENSATE PIPING PROVIDED BY PLUMBING CONTRACTOR. REFER TO REFRIGERATION PLANS FOR INFORMATION.

SANITARY GENERAL NOTES:

- UNLESS OTHERWISE NOTED, ALL SINKS, FLOOR DRAINS, FLOOR SINKS AND/OR STANDPIPES SHALL BE TRAPPED JUST BELOW THE FLOOR.
- EXISTING SANITARY LOCATION IS APPROXIMATE. FIELD VERIFY ALL FINAL LOCATIONS PRIOR TO BIDDING.
- UNLESS OTHERWISE NOTED, PROVIDE NEW CONDENSATE DRAIN LINES TO EXISTING HUB DRAINS FOR ALL NEW AND RELOCATED CASES.
- REFER TO RISER DIAGRAM FOR ADDITIONAL INFORMATION.
- SEE PLUMBING SCHEDULES FOR FUTURE PIPE CONNECTION SIZES.
- CONDENSATE PIPING PROVIDED BY PLUMBING CONTRACTOR. REFER TO REFRIGERATION PLANS FOR INFORMATION.

ALL NEW WORK SHALL BE COORDINATED WITH EXISTING UNDERGROUND PIPING. PC TO CONFIRM EXISTING CONDITIONS PRIOR TO BEGINNING WORK.

05/06/22 ISSUED FOR CLIENT REVIEW 4

01/14/22 REVISION 2

Date Description #

Revisions

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ISSUED FOR: REVIEW

PLANNING BOARD

BUILDING DEPT

CONSTRUCTION

BRIAN D. TANNENHAUS

NJ PROFESSIONAL ENGINEER
NO. CE 42801
DATE: 02/24/2022

PLUMBING SANITARY PLAN

Scale: As indicated

Release date: 05/06/22

Drawing date: 09/24/2021

Drawn by: RL

Approved by: KF

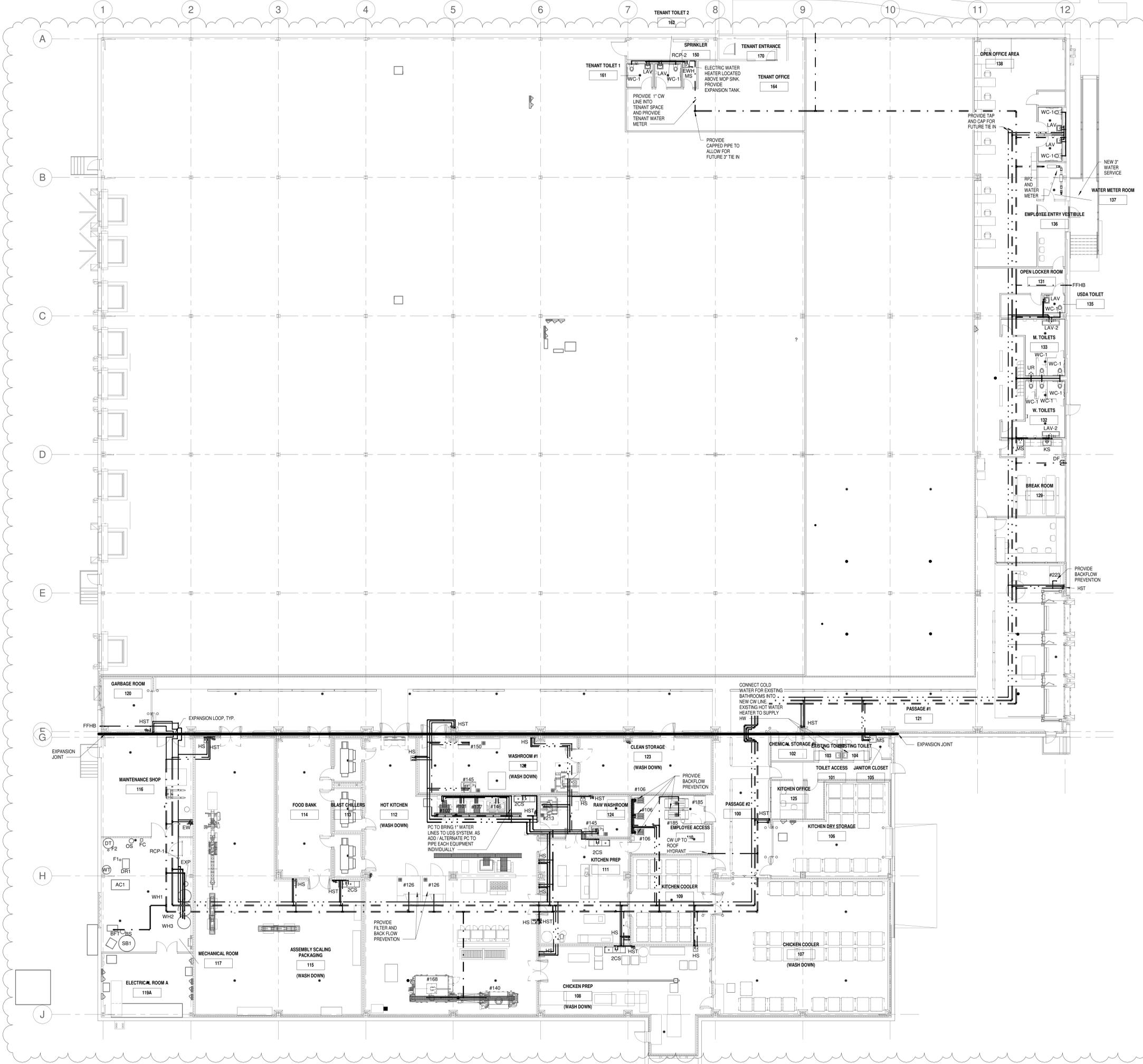
Project no.: 2102

Sheet no.: P-200.00

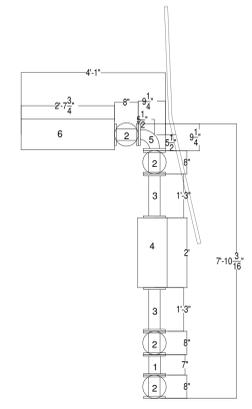
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1 PLUMBING SANITARY PLAN
3/32" = 1'-0"

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- WATER GENERAL NOTES:**
- UNLESS OTHERWISE NOTED, ALL BRANCH PIPING SHALL HAVE A SHUTOFF VALVE INSTALLED WHERE THE BRANCH TAKE OFF BEGINS FROM THE MAIN.
 - UNLESS OTHERWISE NOTED, ALL PLUMBING FIXTURES SHALL HAVE SHUT OFF VALVES AT THE FIXTURE.
 - REFER TO RISER DIAGRAM FOR ADDITIONAL INFORMATION.
 - REFER TO PLUMBING SCHEDULES FOR FIXTURE PIPE CONNECTION SIZES.
 - REFER TO DETAILS FOR SPECIFIC INSTALLATION REQUIREMENTS.
 - PROVIDE EXPANSION LOOP AT ALL EXPANSION JOINTS.



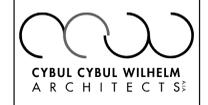
- AUTOMATIC CONTROL VALVE - WATTS LFM115-74 ANGLE FLANGED 3" DUCTILE IRON
- OS&Y VALVE - AMERICAN 3" SERIES 2500-1 FLANGED DUCTILE IRON
- 15" FLANGED SPOOL US PIPE SIZE 3" DUCTILE IRON
- WATER METER 3" FROM SUEZ WATER NEW JERSEY
- 90° ELBOW US PIPE SIZE 3 FLANGED DUCTILE IRON
- BACKFLOW PREVENTOR - WATTS 957 OS&Y 3"

**TRUE OVERALL LENGTH OF ENTIRE ASSEMBLY WILL BE LARGER AS GASKETS HAVE NOT BEEN ACCOUNTED FOR.

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Date	Description	#
05/06/22	ISSUED FOR CLIENT REVIEW	4
01/14/22	REVISION	2
11/29/21	CLIENT CHANGES	1

Revisions



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DOB STAMP

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BUILDING DEPT	
BID	
CONSTRUCTION	

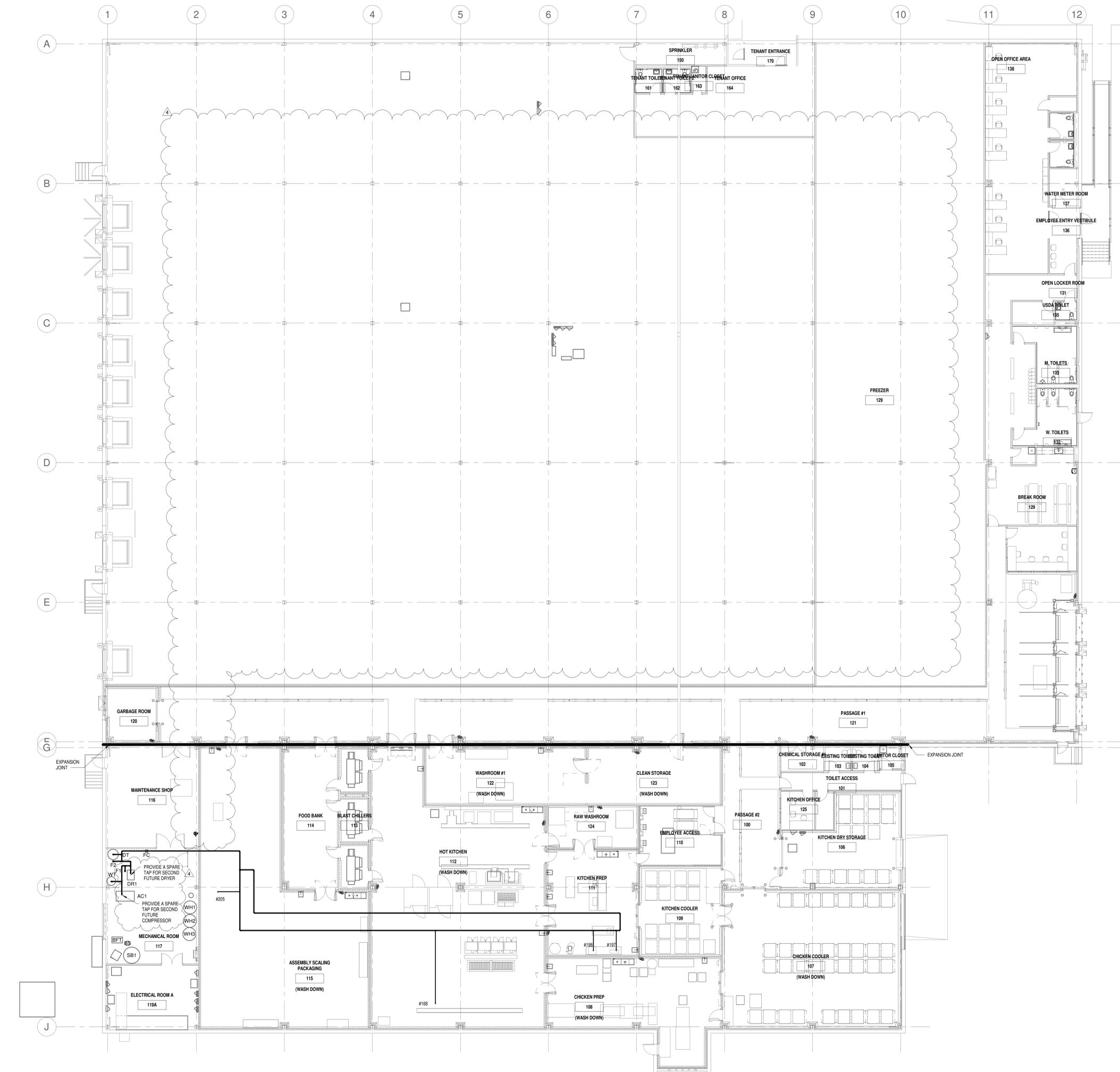
BRIAN D. TANNENHAUS

NJ PROFESSIONAL ENGINEER
 NO. GE 45801
 DATE: 09/24/2022

PLUMBING WATER PLAN	
scale:	As indicated
release date:	05/06/22
drawing date:	09/24/2021
drawn by:	RL
approved by:	KF
project no.:	2102
drawing no.:	P-400.00
DOB BARCODE:	
Total	

1 PLUMBING WATER PLAN
 3/32" = 1'-0"

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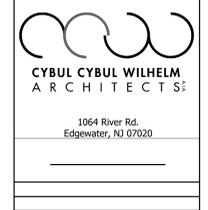


COMPRESSED AIR NOTES:

1. FINAL LOCATIONS OF AIR DROPS TO BE FIELD VERIFIED WITH OWNER ONCE EQUIPMENT IS PUT IN PLACE. CONTRACTOR SHALL ASSUME IN THEIR BIDDING THE FARTHEST LENGTH OF COMPRESSED AIR DROP. ALL COMPRESSED AIR DROPS TO BE A MINIMUM OF 34". CONFIRM WITH OWNER.
2. PROVIDE EXPANSION LOOP AT ALL EXPANSION JOINTS.

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Date	Description	Revision #
05/06/22	ISSUED FOR CLIENT REVIEW	1
01/14/22	REVISION	2



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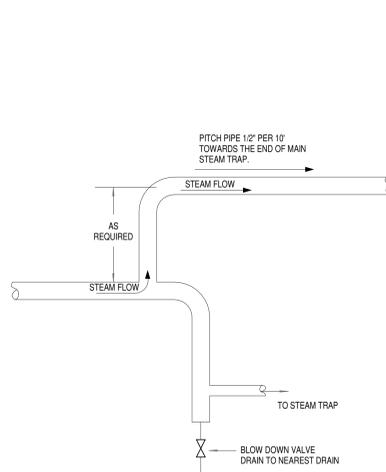


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ISSUED FOR: REVIEW
 PLANNING BOARD
 BUILDING DEPT
 BID
 CONSTRUCTION

BRIAN D. TANNENHAUS
 NJ PROFESSIONAL ENGINEER
 NO. CE 45801
 DATE: 02/24/2022

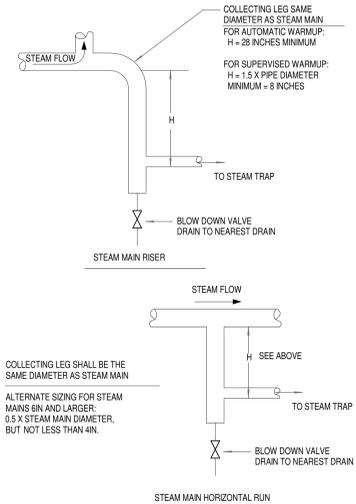
drawing name:	PLUMBING COMPRESSED AIR PLAN
scale:	As indicated
release date:	05/06/22
drawing date:	09/24/2021
drawn by:	RL
approved by:	KF
project no.:	2102
drawing no.:	P-500.00
DCP BARCODE:	
Total	



NOTES:

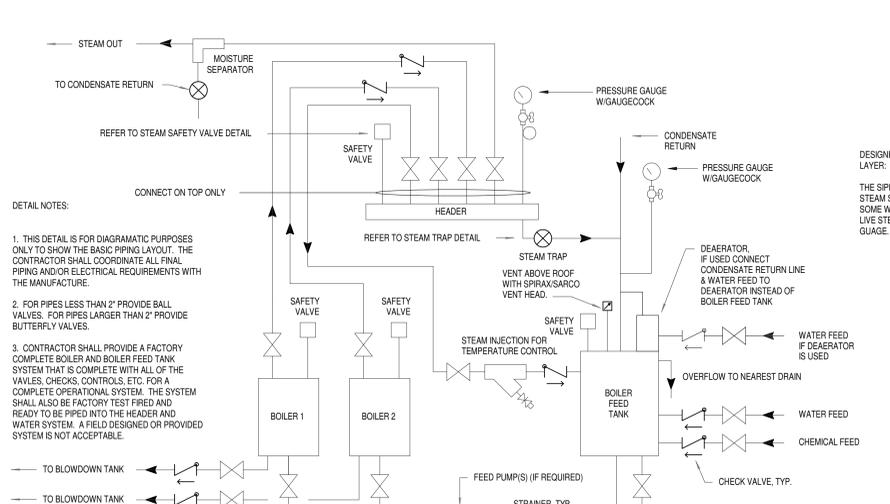
1. THE CONTRACTOR SHALL MAINTAIN A MINIMUM PITCH AS INDICATED ABOVE FOR THE STEAM SUPPLY MAIN, WHERE INDICATED ON THE PLANS OR REQUIRED DUE TO LIMITED HEADROOM THE CONTRACTOR SHALL PROVIDE THIS DETAIL TO RAISE THE MAIN AND CONTINUE THE PITCH. IT IS RECOMMENDED TO PROVIDE THIS PITCH RECOVER METHOD AT EACH MAIN DRIP LEG.

STEAM SUPPLY MAIN PITCH RECOVER RISER
SCALE: NONE



This detail is from Figure 4 on page 10.5 in the 2004 ASHRAE Handbook for HVAC Systems and Equipment.

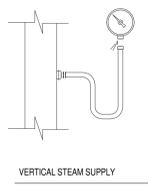
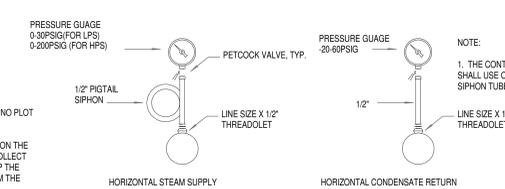
METHOD OF DRIPPING STEAM MAINS
SCALE: NONE



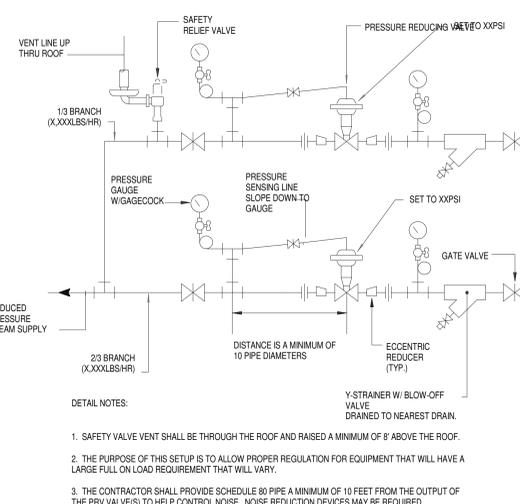
DETAIL NOTES:

1. THIS DETAIL IS FOR DIAGRAMATIC PURPOSES ONLY TO SHOW THE BASIC PIPING LAYOUT. THE CONTRACTOR SHALL COORDINATE ALL FINAL PIPING AND/OR ELECTRICAL REQUIREMENTS WITH THE MANUFACTURER.
2. FOR PIPES LESS THAN 2" PROVIDE BALL VALVES. FOR PIPES LARGER THAN 2" PROVIDE BUTTERFLY VALVES.
3. CONTRACTOR SHALL PROVIDE A FACTORY COMPLETE BOILER AND BOILER FEED TANK SYSTEM THAT IS COMPLETE WITH ALL OF THE VALVES, CHECKS, CONTROLS, ETC. FOR A COMPLETE OPERATIONAL SYSTEM. THE SYSTEM SHALL ALSO BE FACTORY TEST FIRED AND READY TO BE PIPED INTO THE HEADER AND WATER SYSTEM. A FIELD DESIGNED OR PROVIDED SYSTEM IS NOT ACCEPTABLE.

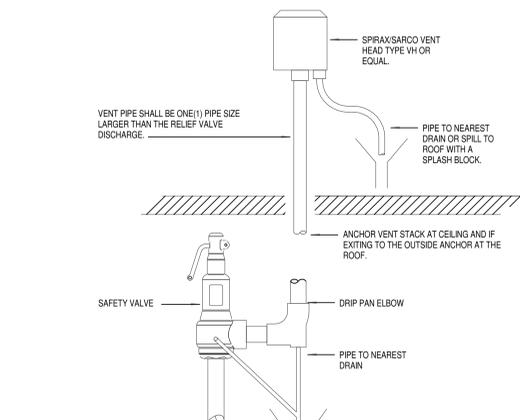
MULTIPLE BOILER PIPING SCHEMATIC
SCALE: NONE



PRESSURE GAUGES
SCALE: NONE



1/3, 2/3 STEAM PRESSURE REGULATION SETUP
SCALE: NONE



NOTES:

1. THE SAFETY VALVE SET PRESSURE SHALL BE SET HIGH ENOUGH TO ALLOW THE VALVE TO REMAIN CLOSED DURING NORMAL OPERATION, YET ALLOW IT TO OPEN AND RESET TIGHTLY WHEN CYCLING. A MINIMUM DIFFERENTIAL OF 5 PSI OR 10% OF INLET PRESSURE (WHICHEVER IS GREATER) IS TO BE THE SET POINT OF THE SAFETY VALVE.
2. INSTALLATION OF THE VALVE SHALL BE VERTICALLY WITH THE DRAIN HOLES OPEN OR PIPED TO THE NEAREST DRAIN.
3. PROVIDE A DRIP PAN ELBOW PIPED TO THE NEAREST DRAIN. THE DRAIN PIPING FROM THE DRIP PAN ELBOW SHALL BE PROPERLY SECURED TO CARRY THE WEIGHT FROM THE DISCHARGE PIPING. THE SAFETY VALVE SHALL NOT CARRY ANY OF THE WEIGHT OF THE DISCHARGE PIPING OR THE VALVE SEAT COULD BECOME DISTORTED AND MALFUNCTION.
4. THE CONTRACTOR SHALL USE A MODERATE AMOUNT OF PIPE THREAD LUBRICANT (FIRST 2 TO 3 THREADS) ON MALE THREADS ONLY.
5. INSTALL CLEAN FLANGE CONNECTIONS WITH NEW GASKETS, PROPERLY ALIGNED AND PARALLEL, AND BOLTED WITH EVEN TORQUE TO PREVENT DISTORTION.
6. WIRE OR CABLE PULLS SHALL BE ATTACHED TO TEST LEVERS TO ALLOW REMOTE TESTING OF THE SAFETY RELIEF VALVES. THE WIRE OR CHAIN SHALL ALLOW A VERTICAL PULL AND THEIR WEIGHT SHALL NOT BE CARRIED BY THE VALVE.

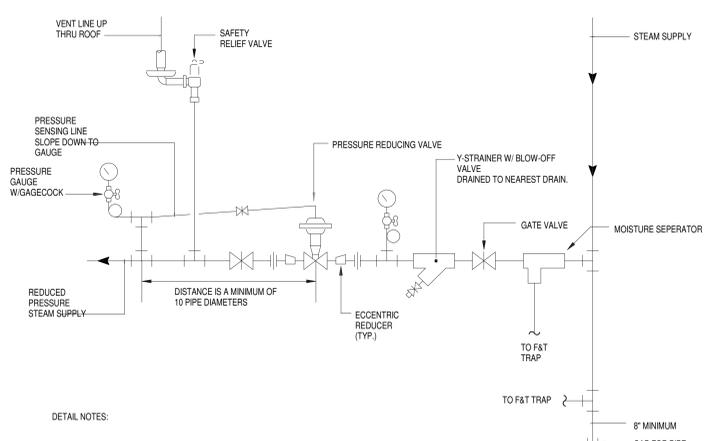
APPLICATION	TRAP SELECTION	SAFETY FACTOR
BOILER HEADER	INVERTED BUCKET, F&T	1.5
STEAM MAINS AND BRANCH LINES	INVERTED BUCKET, F&T AND THERMOSTATIC	3
STEAM SEPARATOR	INVERTED BUCKET	3
TRACER LINES	INVERTED BUCKET, THERMOSTATIC	2
UNIT HEATERS AND AIR HANDLERS	INVERTED BUCKET, F&T	3
FINNED RADIATION AND PIPE COILS	INVERTED BUCKET, F&T AND THERMOSTATIC	3
PROCESSOR AIR HEATERS	INVERTED BUCKET, F&T	2.3
SHELL AND TUBE HEAT EXCHANGERS	INVERTED BUCKET, F&T	2
FLASH TANK	INVERTED BUCKET, F&T	3

NOTES:

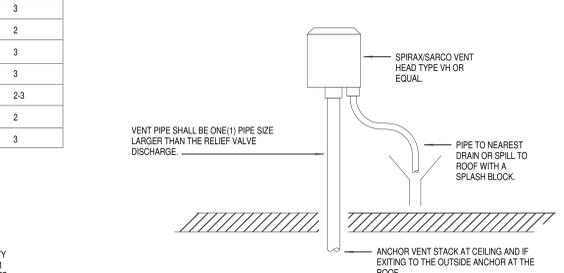
1. REFER TO THE DRAWINGS FOR ADDITIONAL INFORMATION FOR THE TRAP TYPES FOR THE VARIOUS APPLICATIONS.
2. THIS CHART IS A STANDARD DETAIL. NOT ALL OF THE APPLICATIONS SHOWN MAY BE APPLICABLE FOR THIS PROJECT. REFER TO THE DRAWINGS FOR ADDITIONAL INFORMATION.
3. THE TRAP PROVIDED SHALL BE SIZED FOR THE APPROPRIATE CONDENSATE LOAD TIMES THE SAFETY FACTORS SHOWN ABOVE. THE FINAL SIZE OF THE TRAP SHALL TAKE INTO CONSIDERATION THE STEAM SYSTEM WARMUP LOAD. IF THE WARMUP OF THE SYSTEM IS AUTOMATIC THE TRAP SHALL BE SIZED TO HANDLE THE EXTRA CONDENSATE AND AIR LOAD. IF IT IS A SUPERVISED (MANUAL) START UP THEN THE TRAP NEEDS TO BE SIZED FOR THE RUNNING LOADS. THE TRAP SIZES SHALL BE COORDINATED WITH THE MANUFACTURE AND SHALL BE CAPABLE OF HANDLING THE DESIGN STEAM PRESSURE.
4. THE STEAM TRAP SHALL BE INSTALLED AS CLOSE AS POSSIBLE TO THE DRIP LEG.
5. IF A REQUIRED STEAM TRAP SIZE IS NOT AVAILABLE OR THE STEAM TRAP IS TO BE OVERSIZED DUE TO AN AUTOMATIC WARMUP REQUIREMENT THEN THE CONTRACTOR SHALL PROVIDE SMALLER STEAM TRAPS WITH THE SAME AGGREGATE CAPACITY IN PARALLEL. QUANTITY OF PARALLEL STEAM TRAPS TO BE AS REQUIRED FOR THE LOAD. PROVIDE ALL NECESSARY STRAINERS, ISOLATION AND TESTING VALVES AS SHOWN ON THE DETAILS FOR ONE STEAM TRAP.

This chart is from page 10-8 2000 ASHRAE Handbook for HVAC Systems and Equipment.

STEAM TRAP SELECTION AND SAFETY FACTORS
SCALE: NONE



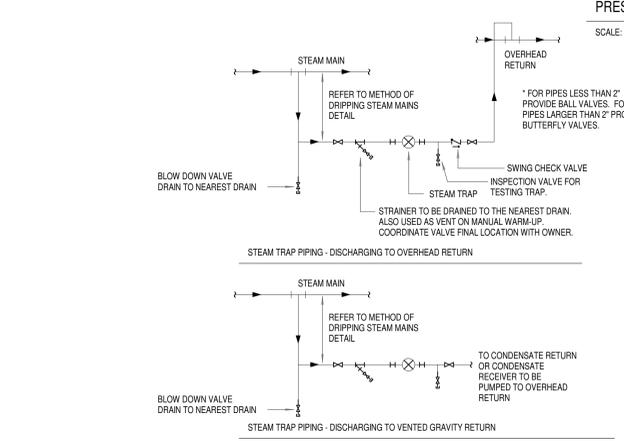
STEAM PILOT OPERATED PRESSURE REDUCING STATION
SCALE: NONE



NOTES:

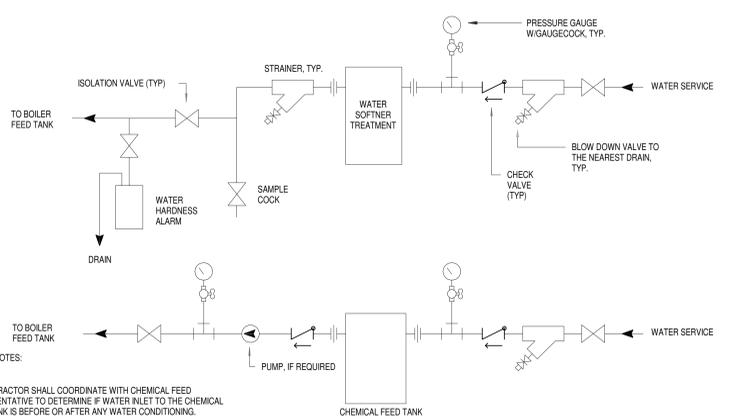
1. THIS VENT HEAD SHALL BE USED ON ALL STEAM VENTING APPLICATIONS EXCEPT FOR SAFETY VALVE VENTING. EXAMPLES OF STEAM VENTING APPLICATIONS ARE BUT ARE NOT LIMITED TO, FLASH TANKS, STEAM PROCESS, BLOW DOWN TANK, ETC.

STEAM VENT HEAD
SCALE: NONE



This detail is from Figure 5 and 8 on page 10.5 in the 2004 ASHRAE Handbook for HVAC Systems and Equipment.

STEAM TRAP PIPING
SCALE: NONE



WATER SOFTNER & CHEMICAL FEED
SCALE: NONE

GENERAL CONDITIONS NOTE:
THIS DRAWING AND THE DESIGN DESCRIBED THEREIN SHALL BE THE EXCLUSIVE PROPERTY OF THE ENGINEER AND SHALL NOT BE REPRODUCED, COPIED, OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE WRITTEN PERMISSION OF THE ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS, LICENSES, AND APPROVALS FROM THE APPROPRIATE AGENCIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS, LICENSES, AND APPROVALS FROM THE APPROPRIATE AGENCIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS, LICENSES, AND APPROVALS FROM THE APPROPRIATE AGENCIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS, LICENSES, AND APPROVALS FROM THE APPROPRIATE AGENCIES.

Date	Description	#

Revisions

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ISSUED FOR:

REVIEW

PLANNING BOARD

BUILDING DEPT

CONSTRUCTION

BRIAN D. TANNENHAUS

NJ PROFESSIONAL ENGINEER
NO. CE 45801
DATE: 09/24/2021

PLUMBING DETAILS

release date:

09/24/2021

approved by: RL

approved by: KF

project no.: 2102

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Total

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