

DOMESTIC WATER PIPING

- ABOVEGROUND PIPING AND JOINTS:** PROVIDE TYPE 'L' HARD DRAWN SEAMLESS COPPER TUBING (ASTM 888) AND CAST COPPER ALLOY FITTINGS (ASME B16.18) WITH LEAD FREE 95/5 TIN/SILVER SOLDER JOINTS (ASTM B32).
- PROVIDE TWO-PIECE, BRONZE OR BRASS BODY, FULL-PORT, BALL SHUTOFF VALVES WITH BLOWOUT-PROOF STEMS AND ADJUSTABLE PACKING GLANDS. PROVIDE HANDLE EXTENSIONS FOR INSULATED PIPING.
- PROVIDE UNIONS DOWNSTREAM OF VALVES AND AT EQUIPMENT CONNECTIONS.
- INSULATE PIPING ABOVE GRADE (EXCEPT EXPOSED CONNECTIONS TO PLUMBING FIXTURES) WITH GLASS FIBER INSULATION HAVING A VAPOR BARRIER AND JACKET. PIPE INSULATION SHALL HAVE A CONDUCTIVITY NOT EXCEEDING 0.27 BTU/H x SF. SEE LIST BELOW FOR INSULATION THICKNESS.
 - PROVIDE 1" THICK INSULATION FOR HOT WATER PIPING SIZES 1/2" THRU 1-1/4".
 - PROVIDE 1/2" THICK INSULATION FOR COLD WATER PIPING SIZES 1/2" THRU 1-1/4".
 - PROVIDE 1" THICK INSULATION FOR COLD WATER PIPING SIZES 1-1/2" THRU 4".
- PIPING INSULATION, JACKETS, COVERINGS, SEALERS, MASTICS AND ADHESIVES SHALL MEET A FLAME-SPREAD RATING OF TWENTY-FIVE (25) OR LESS AND A SMOKE-DEVELOPED RATING OF 50 OR LESS AS TESTED BY ASTM E84 (NFPA 255) METHOD AND SHALL BE PLENUM RATED. INSTALL INSULATION CONTINUOUSLY THROUGH WALLS AND PIPE HANGERS. PROVIDE GALVANIZED STEEL SHELDLS BETWEEN PIPE HANGERS AND INSULATION.
- PROTECT COPPER PIPING AGAINST CONTACT WITH DISSIMILAR METALS. ALL HANGERS, SUPPORTS, ANCHORS AND CLIPS SHALL BE COPPER OR COPPER-PLATED. WHERE COPPER PIPING IS CARRIED ON TRAPEZE HANGERS WITH OTHER PIPING, PROVIDE A PERMANENT ELECTROLYTIC ISOLATION MATERIAL TO PREVENT CONTACT WITH DISSIMILAR OTHER METALS. ELECTRICAL TAPE OR SIMILAR ADHESIVE WRAPPING IS NOT AN APPROVED ISOLATION METHOD.
- PROTECT COPPER PIPING AGAINST CONTACT WITH MASONRY. WHERE COPPER IS SLEEVED THROUGH MASONRY, PROVIDE COPPER OR RED BRASS SLEEVES. WHERE COPPER MUST BE CONCEALED IN OR AGAINST MASONRY PARTITIONS, PROVIDE A HEAVY COATING OF ASPHALTIC ENAMEL ON THE COPPER PIPING AND FIFTEEN (15) POUND ASPHALT SATURATED FELT BETWEEN THE PIPING AND THE MASONRY PARTITION.
- PERFORM A PRESSURE TEST ON ALL WATER PIPING. FILL PIPING WITH POTABLE WATER, CAP AND SUBJECT PIPING TO A STATIC WATER PRESSURE OF FIFTY (50) PSI ABOVE OPERATING PRESSURE, WITHOUT EXCEEDING THE PRESSURE RATING OF PIPING SYSTEM MATERIALS OR PRESSURIZE PIPING WITH AIR TO AT LEAST ONE-HUNDRED (100) PSI. ISOLATE TEST SOURCE AND ALLOW TO STAND FOR FOUR (4) HOURS. LEAKS OR LOSS IN TEST PRESSURE CONSTITUTE DEFECTS THAT MUST BE REPAIRED. REPAIR LEAKS AND DEFECTS WITH NEW MATERIALS AND RETEST PIPING OR PORTION THEREOF UNTIL SATISFACTORY RESULTS ARE OBTAINED.
- STERILIZE THE DOMESTIC WATER SYSTEM PER THE AMERICAN WATER WORKS ASSOCIATION'S INSTRUCTIONS AND LOCAL HEALTH DEPARTMENT REGULATIONS.
- SLOPE WATER PIPING FOR DRAINAGE WITH DRAIN VALVES INSTALLED AT LOW POINTS.

SANITARY WASTE AND VENT PIPING

- ABOVEGROUND PIPING AND JOINTS:** PROVIDE SERVICE WEIGHT CAST IRON NO-HUB PIPE AND FITTINGS (CISPI 301) WITH NEOPRENE GASKET AND STAINLESS STEEL CLAMP JOINTS (CISPI 310) WITH NEOPRENE GASKET / STAINLESS STEEL CLAMP JOINTS (ASTM C1540).
- SLOPE WASTE AND VENT PIPING AT 1/4" PER FOOT MINIMUM FOR PIPING 2-1/2" AND SMALLER AND 1/8" PER FOOT MINIMUM FOR PIPING 3" AND LARGER UNLESS NOTED OTHERWISE.
- PROVIDE CLEANOUTS AT THE BASE OF EACH WASTE STACK, AFTER EVERY FOUR HORIZONTAL 45° BENDS IN SERIES AND NO MORE THAN 100'-0" APART IN HORIZONTAL RUNS, IN LOCATIONS THAT PERMIT ACCESS FOR SERVICE WITHOUT DAMAGE TO THE BUILDING OR FINISHED MATERIALS.
- SANITARY WASTE AND VENT SYSTEMS SHALL BE TESTED AND PROVED WATER-TIGHT UNDER A HEAD PRESSURE OF NO LESS THAN TEN (10) FEET. THIS PRESSURE SHALL BE HELD FOR A PERIOD OF NO LESS THAN FIFTEEN (15) MINUTES.

PLUMBING GENERAL NOTES

- GENERAL AND SPECIAL CONDITIONS OF THE CONTRACT APPLY TO THE PLUMBING SCOPE OF WORK. THE PLUMBING DRAWINGS AND SPECIFICATIONS SHALL NOT BE INTERPRETED AS WAIVING OR OVERRULING ANY REQUIREMENTS EXPRESSED IN GENERAL CONDITIONS.
 - PLUMBING WORK SHALL BE INSTALLED IN ACCORDANCE WITH THE NORTH CAROLINA STATE PLUMBING CODE AND WITH THE REQUIREMENTS OF THE LOCAL AUTHORITY HAVING JURISDICTION.
 - PROVIDE ALL LABOR, MATERIAL AND EQUIPMENT REQUIRED FOR THE COMPLETION AND OPERATION OF ALL PLUMBING SYSTEMS IN ACCORDANCE WITH ALL APPLICABLE CODES.
 - APPLY AND PAY FOR ALL NECESSARY PERMITS, FEES AND INSPECTIONS REQUIRED BY ANY PUBLIC AUTHORITY HAVING JURISDICTION. ACREAGE CHARGES, FACILITIES CHARGES AND BOND PROPERTY ASSESSMENTS ARE NOT TO BE CONSTRUED TO BE A PART OF THIS CONTRACT.
 - WARRANT THE SYSTEM LABOR, MATERIALS AND EQUIPMENT FOR THE TIME PERIOD SPECIFIED IN THE PROJECT MANUAL. IF NO WARRANTY SECTION IS PROVIDED, THEN WARRANT THE SYSTEM LABOR, MATERIAL AND EQUIPMENT FOR A MINIMUM OF ONE (1) YEAR AFTER COMPLETION AND ACCEPTANCE.
 - COORDINATE ALL PLUMBING PIPING LOCATIONS, ROUGH-IN LOCATIONS AND EQUIPMENT LOCATIONS WITH OTHER TRADES TO AVOID CONFLICTS AND INTERFERENCES. FINAL PIPING AND EQUIPMENT LOCATIONS SHALL BE A CODE-COMPLIANT INSTALLATION FOR ALL TRADES.
 - PLUMBING PLANS SHALL NOT BE SCALED. REFERENCE THE ARCHITECTURAL PLANS FOR DIMENSIONS OF ALL LOCATIONS OF PLUMBING FIXTURES, FLOOR DRAINS, COLUMNS, WALLS, DOORS, ETC.
 - ALL PIPING SHALL BE MANUFACTURED IN THE UNITED STATES OF AMERICA.
 - ALL VALVES, BACKFLOW PREVENTERS, BOOSTER PUMPS, ETC. SERVING THE DOMESTIC WATER SYSTEM SHALL MEET LEAD FREE STANDARDS PER ANS/NFPA 372 AND NSF 61, ANNEX G.
 - PROVIDE COMPLETE PLUMBING FIXTURES AND EQUIPMENT, INCLUDE SUPPLIES, STOPS, VALVES, FAUCETS, DRAINS, TRAPS, TAILPIECES, ESCUTCHEONS, ETC. AND INSTALL PER THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
 - CUT WALLS, FLOORS AND CEILINGS AS REQUIRED FOR INSTALLATION OF PLUMBING WORK. ALL CUTTING SHALL BE HELD TO A MINIMUM. PATCH AND FINISH SURFACES TO MATCH ADJOINING SURFACES.
 - PIPING AND SPECIALTIES SHALL BE LOCATED CONCEALED IN WALLS, PARTITIONS OR ABOVE FINISHINGS UNLESS NOTED OTHERWISE. PIPING IN EXPOSED AREAS SHALL BE RUN TIGHT TO STRUCTURAL ELEMENTS.
 - PROVIDE ACCESS DOORS FOR ALL SPECIALTIES, VALVES, WATER HAMMER ARRESTERS, TRAP PRINTS, ETC., CONCEALED BEHIND WALLS OR CEILINGS THAT REQUIRE MAINTENANCE ACCESS.
 - DO NOT INSTALL PIPING IN AREAS SUBJECT TO FREEZING TEMPERATURES. INSULATE PIPING SHOWN IN EXTERIOR WALLS ON THE CONDITIONED SIDE OF THE WALL INSULATION.
 - PIPING, VENTS, ETC. EXTENDING THROUGH EXTERIOR WALLS ABOVE THE ROOF SHALL BE FLASHED AND COUNTER-FLASHED IN A WATERPROOF MANNER. COORDINATE FLASHING WITH THE GENERAL CONTRACTOR.
 - PROVIDE A CHROME FINISH FOR ALL EXPOSED PIPING IN RESTROOMS AND OTHER FINISHED AREAS.
 - PROVIDE NON-CONDUCTING DIELECTRIC UNIONS WHENEVER CONNECTING DISSIMILAR METALS.
 - ATTACH HANGERS TO STRUCTURE. HANGERS SHALL NOT ATTACH TO THE ROOF OR FLOOR DECK. SUPPORT PIPING IN ACCORDANCE WITH SECTION 308 OF THE NORTH CAROLINA PLUMBING CODE.
 - PROVIDE MANUFACTURER'S COMMENDED CLEARANCES AROUND ALL EQUIPMENT FOR MAINTENANCE.
 - VALVES AND PIPING ACCESSORIES REQUIRING ACCESS SHALL BE INSTALLED IN ACCESSIBLE LOCATIONS NO MORE THAN EIGHTEEN (18) INCHES ABOVE THE CEILING. PROVIDE OFFSETS IN PIPING AS NECESSARY TO ACCOMMODATE THIS REQUIREMENT.
 - RESTOP ALL PENETRATIONS OF FIRE-RATED WALLS, FLOORS AND PARTITIONS. PROVIDE A DEVICE(S) OR SYSTEM(S) WHICH HAS BEEN TESTED AND LISTED AS COMPLYING WITH ASTM E814 AND INSTALL IN ACCORDANCE WITH THE CONDITIONS OF THE LISTING. PROVIDE A DEVICE(S) OR SYSTEM(S) WITH AN F-RATING EQUAL TO THE RATING OF THE ASSEMBLY BEING PENETRATED. REFER TO ARCHITECTURAL PLANS FOR WALL AND FLOOR TYPES.
 - PROVIDE PIPING LABELS FOR ALL PLUMBING PIPING. PIPING LABELS SHALL BE ACRYLIC FACED, WRAP-AROUND TYPE. EACH LABEL SHALL INDICATE THE PIPING CONTENTS, DIRECTION OF FLOW AND SHALL MATCH THE EXISTING BUILDING'S COLOR AND NOMENCLATURE FOR THE SERVICE INDICATED.
- SUBMITTALS:**
- PROVIDE SUBMITTALS BEARING THE CONTRACTOR'S REVIEW STAMP FOR ALL PLUMBING FIXTURES, PIPING, EQUIPMENT AND ACCESSORIES IN ELECTRONIC FORMAT (PDF).
 - NO PRIVATELY LABELED MATERIALS WILL BE ACCEPTED AS EQUALS TO PRODUCTS SPECIFIED HEREIN.
 - THE PLUMBING CONTRACTOR IS RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH SUBSTITUTIONS TO SPECIFIED PLUMBING FIXTURES AND EQUIPMENT INCLUDING BUT NOT LIMITED TO; PROVIDING MAINTENANCE ACCESS CLEARANCE, PIPING, ELECTRICAL, REPLACEMENT OF OTHER SYSTEM COMPONENTS, BUILDING ALTERATIONS, ETC. AND ANY MODIFICATIONS TO ASSOCIATED MECHANICAL, ELECTRICAL OR PLUMBING SYSTEMS REQUIRED BY THE EQUIPMENT'S INSTALLATION INSTRUCTIONS. ALL COSTS ASSOCIATED WITH SUBSTITUTIONS SHALL BE INCLUDED IN THE ORIGINAL BASE BID.

PLUMBING LEGEND

SYMBOL	ABBREVIATION	DESCRIPTION
---	CW	COLD WATER PIPING
---	HW	HOT WATER PIPING
---	W	SANITARY WASTE PIPING
---	V	SANITARY VENT PIPING
---	-	PIPING ELBOW DOWN
---	-	PIPING ELBOW UP
---	-	PIPING CONTINUOUS
---	-	BALL VALVE
---	-	CHECK VALVE
---	WCO	WALL CLEANOUT
---	WHA-X	WATER HAMMER ARRESTER (X PREFIX INDICATES PDI SIZE)

ADDITIONAL ABBREVIATIONS		
AFC	ABOVE FINISHED CEILING	GPM
AFF	ABOVE FINISHED FLOOR	GALLONS PER MINUTE
AFG	ABOVE FINISHED GRADE	HORSEPOWER
BFP	BACKFLOW PREVENTER	INCH
BFC	BELOW FINISHED CEILING	KW
BFF	BELOW FINISHED FLOOR	KW/HR
BFG	BELOW FINISHED GRADE	MAX
BTU/H	BRITISH THERMAL UNIT PER HOUR	MIN
CFH	CUBIC FEET PER HOUR	PSI
-	DEGREE	SF
-	DEGREES FAHRENHEIT	T&P
-	DO	TYP
-	DO NOT	WSFU
-	DRAIN	EC
-	FEET OR FEET	GC
-	FEET OF HEAD	MC
-	GALLONS	PC
-	GALLONS PER FLUSH	SC
-	GALLONS PER HOUR	

2018 NORTH CAROLINA ENERGY CONSERVATION CODE
COMMERCIAL ENERGY EFFICIENCY - PLUMBING SUMMARY

- C401 METHOD OF COMPLIANCE**
- 2018 NCECC CHAPTER 4
 - ASHRAE 90.1-2013 PRESCRIPTIVE
 - ASHRAE 90.1-2013 PERFORMANCE
 - N/A (EXISTING LIGHTING, HVAC, AND DOMESTIC WATER HEATING SYSTEMS TO REMAIN)
 - COMCHECK PROVIDED (2018 NCECC)
 - COMCHECK PROVIDED (90.1-2013)
 - ENERGY MODELING DATA PROVIDED
- C406 ADDITIONAL EFFICIENCY PACKAGE OPTIONS**
- C406.2 EFFICIENT MECH EQUIPMENT
 - C406.3 REDUCED LIGHTING DENSITY
 - C406.4 ENHANCED LIGHTING CONTROLS
 - C406.5 ON-SITE RENEWABLE ENERGY
 - C406.6 DEDICATED OUTSIDE AIR SYSTEM
 - C406.7 SERVICE WATER HEATING

TABLE C404.2 - MINIMUM PERFORMANCE OF WATER HEATING EQUIPMENT:

EQUIPMENT TYPE	SIZE CATEGORY (INPUT)	SUB CATEGORY OR RATING CONDITION	PERFORMANCE REQUIRED a,b	REQ'D EFFICIENCY	SPECIFIED EQPM
WATER HEATER ELECTRIC	≤ 12 kW	RESISTANCE	0.97-0.00132V, EF	0.9436	0.97

- a. ENERGY FACTOR (EF) AND THERMAL EFFICIENCY (E_t) ARE MINIMUM REQUIREMENTS. IN THE ENERGY FACTOR EQUATION V IS THE VOLUME IN GALLONS.
- b. STANDBY LOSS (SL) IS THE MAXIMUM BTU/H BASED ON A NOMINAL 70° TEMPERATURE DIFFERENCE BETWEEN STORED WATER AND AMBIENT REQUIREMENTS. IN THE STANDBY LOSS EQUATION Q IS THE NAMEPLATE INPUT RATE IN BTU/H. IN THE EQUATIONS FOR ELECTRIC WATER HEATERS, V IS THE RATED VOLUME IN GALLONS AND V_m IS THE MEASURED VOLUME IN GALLONS. IN THE STANDBY LOSS EQUATION FOR GAS WATER HEATERS AND BOILERS, V IS THE RATED VOLUME IN GALLONS.
- c. REFER TO WATER HEATER SCHEDULES FOR SPECIFIED WATER HEATING EQUIPMENT TYPES, CAPACITIES (STORAGE VOLUME) AND ENERGY INPUTS (ELECTRIC AND/OR GAS).

- C408 - SYSTEM COMMISSIONING**
- PROJECT AREA IS LESS THAN 10,000 SQUARE FEET AND IS EXEMPT FROM THE SYSTEM COMMISSIONING REQUIREMENTS OF SECTION C408.
 - PROJECT AREA IS GREATER THAN 10,000 SQUARE FEET AND REQUIRES SYSTEM COMMISSIONING PER SECTION C408.

PLUMBING SYSTEMS DESIGN SUMMARY

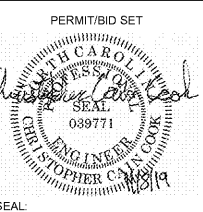
PLUMBING SYSTEM	TOTAL FIXTURE UNITS	MAXIMUM DEMAND FLOW
DOMESTIC WATER SUPPLY	42.05 WSFU	46.82 GPM
SANITARY WASTE	20.50 DFU	N/A

PLUMBING SHEET INDEX

PAGE	SHEET	TITLE
1	P001	PLUMBING LEGEND, DESIGN DATA, & SPECIFICATIONS
2	P002	PLUMBING SCHEDULES & DETAILS
3	P100	PLUMBING OVERALL PLANS
4	P201	PLUMBING ENLARGED PLANS & RISER DIAGRAMS

BUY AMERICA PROGRAM REQUIREMENTS

ALL PRODUCTS PROVIDED ON THIS PROJECT MUST BE MANUFACTURED IN COMPLIANCE WITH THE BUY AMERICA PROGRAM FOR FEDERALLY FUNDED TRANSPORTATION PROJECTS PER CODE OF FEDERAL REGULATIONS 49 DFR 661. THESE REQUIREMENTS ARE DISTINCT AND DIFFERENT FROM THOSE OF THE BUY AMERICAN ACT OF 1933.



Union Station Mezzanine Office Fit Up
City of Raleigh Transit Division
510 W Martin St., Raleigh, NC 27601

1	PERMIT/BID SET	11/08/19
NO.	SUBMISSION	DATE
CHECKED BY:	JWM	
DRAWN BY:	CCC	
PROJECT NUMBER:	1908	
SHEET NAME:	PLUMBING LEGEND, DESIGN DATA, & SPECIFICATIONS	
SHEET NUMBER:	P001	

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