2. PROVIDE BRONZE VALVE FOR COPPER PIPE.
3. SHUTOFF VALVES 1" AND SMALLER
   a. PEX BALL VALVE
      1). APOLLO 77X SERIES
      2). BRONZE THREE PIECE BODY, CHROME PLATED BRASS BALL, FULL PORT, TEFLON SEATS AND STUFFING BOX RING, LEVER HANDLE WITH VALVE EXTENSIONS FOR INSULATED PIPING, CRIMP JOINT ENDS, 200 PSI WOG, NSF 61 LISTED.
4. SHUTOFF VALVES 2" AND SMALLER
   a. BRONZE BALL VALVE:
      1). SOLDERED: NIBCO S-685-66-LF.
      2). PRESS FITTING: VIEGA SERIES 2970.*ZL OR SERIES 2971.*ZL
      3). TWO PIECE, CHROME PLATED BRASS OR STAINLESS STEEL BALL, FULL PORT, REINFORCED PTFE SEATS AND STUFFING BOX RING, LEVER HANDLE WITH LOCKABLE HANDLE AND VALVE STEM EXTENSIONS FOR INSULATED PIPING, 250 PSI, NSF 61 ANNEX G LISTED.
5. BALANCE VALVES 2" AND SMALLER
   a. BELL & GOSSETT A-549LFP(C), CALEFFI, NIBCO, FLOWSET, ARMSTRONG, AND IMI HYDRONIC ENGINEERING): BRONZE BODY WITH CALIBRATED BRASS ORIFICE OR VENTURI, MEMORY STOP, SOLDERED ENDS AND PRESSURE TAPS. 125 PSIG RATING AT 240 DEG F, NSF 61 ANNEX G LISTED LEAD FREE.
   b. INSTALL 5 PIPE DIAMETERS DOWNSTREAM AND 2 PIPE DIAMETERS UPSTREAM OF A FITTING.
6. DRAIN VALVES: SHUTOFF VALVE WITH THREADED CAP. PROVIDE FOR COMPLETE SYSTEM DRAINAGE, NSF 61 LISTED.
7. SPRING LOADED CHECK VALVES
   a. 2" AND SMALLER:
      1). THREADED: NIBCO MODEL 480-Y-LF
      2). BRONZE BODY, TFE SEAT AND DISC, STAINLESS STEEL SPRING, CLASS 125, NSF 61 ANNEX G LISTED LEAD FREE.

22 11 23 NATURAL GAS PIPING AND ACCESSORIES

A. COORDINATE INSTALLATION OF GAS SERVICE WITH GAS UTILITY. CONTACT GAS UTILITY TO ARRANGE SERVICE AND ASSIST OWNER IN APPLYING FOR NEW SERVICE.
B. PIPING
   1. INSTALL, INSPECT, TEST, AND PURGE GAS PIPING IN CONFORMANCE WITH NFPA 54, UTILITY COMPANY AND ALL OTHER GOVERNING CODES.
   2. MAKE BRANCH CONNECTIONS TO THE MAIN FROM THE TOP OR SIDE.
   3. PAINT EXTERIOR GAS PIPING NOT LOCATED ON THE ROOF WITH TWO (2) COATS RUST RESISTANT PAINT, COLOR TO MATCH ADJACENT SURFACE.
C. GAS VALVES
   1. UL LISTED FOR USE AS NATURAL GAS SHUTOFF.
   2. BALL VALVES (MANUFACTURERS: NIBCO 585/580-70UL, WATTS B6000UL): BRONZE BODY, THREADED ENDS, CHROME PLATED BRONZE BALL, FULL/CONVENTIONAL PORT, TEFLON SEAT, BLOWOUT-PROOF STEM, TWO-PIECE CONSTRUCTION, 150 PSIG WORKING PRESSURE.
   3. PLUG VALVES (MANUFACTURERS: DEZURIK PEC, HOMESTEAD SERIES 612): CAST IRON BODY, FLANGED ENDS, BRONZE BEARINGS, ELECTROLESS NICKEL PLATED CAST IRON PLUG WITH HYCAR RESILIENT PLUG SEAL, BUNA-N STEM SEAL PACKING, LEVER ACTUATOR, 175 PSIG WOG.
   4. PROVIDE A MAIN GAS LINE SHUTOFF VALVE IMMEDIATELY AFTER THE METER CONNECTION.
D. GAS PRESSURE REGULATORS
   1. CAST IRON BODY, ALUMINUM SPRING CASE, ALUMINUM ORIFICE, BUNA-N DIAPHRAGM, INTERNAL RELIEF VALVE SET TO RELIEVE AT 7-10" W.C. ABOVE NORMAL OUTLET PRESSURE SETTING OF 7" WC., TOPCOAT ENAMEL.
   2. SENSUS MODELS 496.
   3. FOR REGULATORS INSTALLED INDOORS, PIPE THE RELIEF VALVE VENT FULL SIZE TO THE OUTSIDE OF THE BUILDING AT A NON-HAZARDOUS LOCATION. INCREASE VENT SIZE ONE PIPE SIZE IF VENT LENGTH EXCEEDS 10 FEET. TERMINATE WITH AN ELBOW DOWN WITH A SCREEN OVER THE OPENING. DO NOT COMBINE VENTS.
   4. MAXITROL 325 SERIES WITH VENT LIMITER ARE PERMITTED FOR INDOOR APPLICATIONS WHERE SUPPLYING LESS THAN 300,000 BTUH.
   5. FOR REGULATORS INSTALLED OUTDOORS, POSITION THE REGULATOR SO THE RELIEF VALVE VENT IS FACING DOWN OR INSTALL ELBOW FACING DOWN A MINIMUM 10 FEET FROM AN OUTSIDE AIR INTAKE AND 5 FEET FROM A GAS FLUE DISCHARGE.

22 13 00 DRAIN PIPING AND VALVES

A. PIPING INSTALLATION
   1. INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
   2. FIELD VERIFY EXISTING AND PROPOSED SEWER ELEVATIONS AND SIZES AND NOTIFY THE OWNER'S REPRESENTATIVE IN WRITING OF ANY VARIATION OF THE ELEVATIONS BEFORE BEGINNING ANY SEWER AND BUILDING DRAIN WORK.
   3. DRAWINGS AND DIAGRAMS SHOW SIZE AND APPROXIMATE LOCATION OF PIPING. THE DRAWINGS SHALL NOT BE SCALED TO DETERMINE EXACT LOCATION. PROVIDE ADDITIONAL OFFSETS TO COORDINATE WITH INSTALLATION REQUIREMENTS OF OTHER SYSTEMS.
   4. ROUTE ABOVE GROUND PIPING IN ORDERLY MANNER, PARALLEL TO BUILDING STRUCTURE. OFFSET PIPE CONNECTIONS AT EQUIPMENT TO ALLOW FOR SERVICE, SUCH AS REMOVAL OF THE EQUIPMENT.
   5. INSTALL PIPING TO CONSERVE BUILDING SPACE AND NOT INTERFERE WITH USE OF SPACE AND OTHER WORK. GROUP PIPING WHENEVER PRACTICAL AT COMMON ELEVATIONS.
   6. INSTALL PIPING TO ALLOW FOR EXPANSION AND CONTRACTION WITHOUT STRESSING PIPE, JOINTS, OR CONNECTED EQUIPMENT.
   7. PROVIDE CLEARANCE FOR INSTALLATION OF INSULATION AND ACCESS TO VALVES.
   8. DO NOT ROUTE PIPING ABOVE TRANSFORMERS, PANELBOARDS, MOTOR CONTROL CENTERS, SWITCHBOARDS OR OTHER ELECTRICAL DISTRIBUTION EQUIPMENT.
   9. PROVIDE NON-CONDUCTING DIELECTRIC CONNECTIONS WHEREVER JOINTING DISSIMILAR METALS.
   10. PROVIDE NO-HUB ADAPTER ON PVC PIPE WHERE USING NO-HUB COUPLINGS.
   11. SLOPE SANITARY PIPE 2" AND SMALLER 1/4" PER FOOT; 3" AND LARGER PIPING 1/8" PER FOOT.
   12. RUN ALL DRAIN LINES FROM EQUIPMENT OVERFLOW RECEIVERS, ETC. TO FLOOR / HUB DRAINS. DRAIN LINES SHALL BE HARD DRAWN COPPER INSTALLED WITH A MINIMUM OF 1/8" PER FOOT SLOPE. NO DRAIN LINE SHALL BE SMALLER THAN 3/4". INSTALL A TEE AT EACH ELBOW OF CONDENSATE DRAIN PIPING WITH A CLEANOUT PLUG ON THE END TEE.
B. SANITARY DRAIN PIPING TESTING: TEST DRAIN AND VENT PIPING PER CODE REQUIREMENTS.

C. AIR ADMITTANCE VALVES NOT PERMITTED.

22 15 00 COMPRESSED AIR PIPING

A. PIPING INSTALLATION
   1. DRAWINGS AND DIAGRAMS SHOW SIZE AND APPROXIMATE LOCATION OF PIPING. THE DRAWINGS SHALL NOT BE SCALED TO DETERMINE EXACT LOCATION. PROVIDE ADDITIONAL OFFSETS TO COORDINATE WITH INSTALLATION REQUIREMENTS OF OTHER SYSTEMS.
   2. ROUTE PIPING IN ORDERLY MANNER, PARALLEL TO BUILDING STRUCTURE. OFFSET PIPE CONNECTIONS AT EQUIPMENT TO ALLOW FOR SERVICE, SUCH AS REMOVAL OF THE EQUIPMENT.
   3. INSTALL PIPING TO CONSERVE BUILDING SPACE AND NOT INTERFERE WITH USE OF SPACE AND OTHER WORK. GROUP PIPING WHENEVER PRACTICAL AT COMMON ELEVATIONS.
   4. PROVIDE CLEARANCE FOR ACCESS TO VALVES AND FITTINGS.
   5. PROVIDE NON-CONDUCTING DIELECTRIC CONNECTIONS WHEREVER JOINTING DISSIMILAR METALS.
   6. USE ONLY NEW MATERIAL, FREE OF DEFECTS, RUST AND SCALE, AND MEETING THE LATEST REVISION OF THE ASTM SPECIFICATIONS.
   7. PREPARE EXPOSED UNFINISHED PIPE, FITTINGS, SUPPORTS, AND ACCESSORIES FOR FINISH PAINTING.
   8. SLOPE PIPING AND ARRANGE SYSTEMS TO DRAIN AT LOW POINTS.
   9. ALL OFFSETS SHALL BE FROM THE TOP OF THE PIPIING.
   10. USE ECCENTRIC FITTINGS FOR CHANGES IN HORIZONTAL PIPE SIZES TO MAINTAIN BOTTOM OF PIPE LEVEL. CONCENTRIC FITTINGS MAY BE USED FOR CHANGES IN VERTICAL PIPE SIZES.
   11. INSTALL VALVE STEM BETWEEN THE VERTICAL (UPRIGHT) OR HORIZONTAL POSITION.
   12. DO NOT SUPPORT WEIGHT OF PIPING ON VALVE.
B. PIPING PRESSURE TESTS
   1. EACH TEST MUST BE WITNESSED BY THE OWNER'S REPRESENTATIVE. IF LEAKS ARE FOUND, REPAIR THE AREA WITH NEW MATERIALS AND REPEAT THE TEST.
   2. TEST THE SYSTEM WITH AIR TO THE PRESSURE SETTING OF THE RELIEF VALVE FOR AN 8 HOUR DURATION.
   3. WHERE MULTIPLE NEW PIPE BRANCHES ARE EXTENDED FROM AN EXISTING MAIN, TEST THE EXISTING MAIN AND NEW BRANCHES AT 1.5 TIMES THE SYSTEM OPERATING PRESSURE IN LIEU OF THE PRESSURE ABOVE.
   4. WHERE NEW PIPING IS AN EXTENSION OF THE EXISTING SYSTEM, TEST THE NEW PIPING PRIOR TO CONNECTION TO THE EXISTING SYSTEM.
   5. REMOVE RELIEF VALVE DURING TESTS.
   6. RELIEVE PRESSURE IN SYSTEM AFTER PRESSURE TESTS.
C. UNIONS AND FLANGES
   1. STEEL PIPE 2" AND SMALLER: 150 PSIG ASTM A197/ANSI B16.3 MALLEABLE IRON UNION, WITH BRASS SEATS, THREADED, (GALVANIZED ON GALVANIZED PIPE).
D. VALVES
   1. MANUFACTURERS: NIBCO, APOLLO, HAMMOND, MILWAUKEE, KEYSTONE, CENTERLINE, DEZURIK, CRANE, MUELLER, POWELL, AND GRINNELL.
   2. MAIN PIPING
      a. BALL VALVES 2" AND SMALLER:
         1). NIBCO MODEL T-585-70
         2). TWO PIECE, FULL PORT, THREADED ENDS, BRONZE BODY.
         3). CHROME PLATED BRASS BALL, TEFLON SEATS AND STUFFING BOX RING, LEVER HANDLE; 600 PSI WOG.
   3. VALVES TO EQUIPMENT
      a. TWO PIECE, FULL PORT, THREADED ENDS BRONZE BODY.
      b. CHROME PLATED BRASS BALL, TEFLON SEATS AND STUFFING BOX RING, LEVER HANDLE, SAFETY VENT FOR PRESSURE RELIEF OF DOWNSTREAM PIPING TO EQUIPMENT; 600 PSI WOG.
      c. BALL VALVES 1" AND SMALLER: NIBCO MODEL T-585-70-SV

22 40 00 PLUMBING FIXTURES

A. FIXTURES
   1. SEE SCHEDULES FOR ADDITIONAL INFORMATION.
   2. LIKE FIXTURE TYPE (FAUCETS, WATER CLOSETS, LAVS) SHALL BE THE PRODUCT OF THE SAME MANUFACTURER.
   3. SAFETY COVERS OVER EXPOSED WASTE AND SUPPLY PIPING AT ADA ACCESSIBLE FIXTURES SHALL BE LAV-GUARD BY TRUEBRO OR EQUIVALENT.
B. SAFING
   1. SAFING MATERIAL SHALL BE WATERPROOF WHEN SUBJECTED TO 2 FEET OF HYDROSTATIC HEAD WHEN TESTED IN ACCORDANCE WITH ASTM C1306 OR ASTM D4068, AND SHALL BE RECOGNIZED BY THE MANUFACTURER AS A SAFING MATERIAL.
   2. FLOOR DRAINS
      a. NOT REQUIRED FOR AREAS OVER UNEXCAVATED PORTIONS OF A BUILDING.
      b. FURNISH AND INSTALL SAFING MATERIAL EXTENDING MINIMUM 12" FROM THE DRAIN.
C. INSTALLATION
   1. INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
   2. PROVIDE CHROME PLATED RIGID SUPPLIES TO FIXTURES WITH STOPS, REDUCERS, AND ESCUTCHEONS UNLESS OTHERWISE NOTED IN SCHEDULES AND DETAILS.
   3. SEAL FIXTURES TO WALL AND FLOOR SURFACES WITH MILDEW-RESISTANT SILICONE SEALANT, COLOR TO MATCH FIXTURE.
   4. INSTALL BARRIER-FREE FIXTURES IN COMPLIANCE WITH LOCAL CODES AND FEDERAL ADA ACCESSIBILITY GUIDELINES.
   5. EXPOSED TRAPS, PIPING, AND ESCUTCHEONS SHALL BE CHROME PLATED BRASS UNLESS OTHERWISE NOTED IN SCHEDULES AND DETAILS.
   6. ADJUST LAVATORY THERMOSTATIC MIXING VALVE TO 105 DEG F MAXIMUM OUTLET TEMPERATURE.

PIPE SCHEDULE

SERVICE	APPLICATION	PIPE MATERIAL	PIPE STANDARD	FITTINGS	JOINTS
WATER	ABOVE GROUND INSIDE BUILDING	COPPER	ASTM B42, B88 TYPE L HARD DRAWN	ANSI B16.15, B16.18, B16.22, B16.23, B16.26 B16.29, B16.32	LEAD FREE SOLDER
		PEX	ASTM F876 ASTM F877 NSF P171 CL-R	ASTM F1807	PER MFR REQUIREMENTS
	UNDERGROUND INSIDE BUILDING	COPPER	ASTM B42, B88 TYPE K ANNEALED TUBING	ANSI B16.15, B16.18, B16.22, B16.23, B16.26 B16.29, B16.32	AWS A5.8 BCuP SILVER BRAZE (1)
		PEX	ASTM F876 ASTM F877 ASTM F2023	ASTM F1807	PER MFR REQUIREMENTS
SAN, SEWER, DRAIN, WASTE, AND VENT	ABOVE GROUND INSIDE BUILDING	PVC	ASTM D1785, D2665 DWV	PVC ASTM D2665, F1866	ASTM F656 SOLVENT WELD WITH ASTM D2564 SOLVENT CEMENT
		HUBLESS CAST IRON	ASTM A888,CISPI 301, SERVICE WEIGHT	CAST IRON ASTM B16.1, B16.4, B16.12	CISPI 310 S.S. CLAMP & SHIELD W/ ASTM C564 RUBBER SEALING SLEEVE. HVY DUTY FOR SIZES >4".
	UNDER GROUND INSIDE BUILDING	PVC	ASTM D1785, D2665 SCHEDULE 40	PVC ASTM D2466, D2467	ASTM F656 SOLVENT WELD WITH ASTM D2564 SOLVENT CEMENT
		CAST IRON	ASTM A74, ASTM A888, CISPI 301 SERVICE WEIGHT	CAST IRON ASTM B16.1, B16.4, B16.12	CISPI 310 S.S. CLAMP & SHIELD W/ ASTM C564 RUBBER SEALING SLEEVE. HVY DUTY FOR SIZES >4".
GAS	ABOVE GROUND	BLACK STEEL	ASTM A53, GRADE B TYPE E OR S, SCHEDULE 40	ANSI B16.3 MALLEABLE IRON, CLASS 150	THREADED
AIR	ABOVE GROUND INSIDE BLDG	COPPER	ASTM B88 TYPE L HARD DRAWN	ANSI B16.22 WROUGHT COPPER AND BRONZE	ASTM B32 GRADE 95TA SOLDER
	UNDERGROUND INSIDE BUILDING	COPPER	ASTM B88 TYPE K ANNEALED TUBING	ANSI B16.22 WROUGHT COPPER AND BRONZE	AWS A5.8 BCuP SILVER BRAZE (1)
VACUUM	INSIDE BLDG	PVC	ASTM D1785, D2665 SCHEDULE 40	PVC ASTM D2466, D2467, F409 (2)	ASTM F656 SOLVENT WELD WITH ASTM D2564 SOLVENT CEMENT

- WHERE MULTIPLE PIPE MATERIALS ARE LISTED, CONTRACTOR MAY CHOOSE FROM TYPES LISTED UNLESS DRAWINGS SPECIFICALLY INDICATE PIPE MATERIAL.

(1) NO JOINTS PERMITTED UNDERGROUND.

(2) PROVIDE PRESSURIZED DEEP SOCKET LONG SWEEP AND WYE TYPE PATTERN FITTINGS. NO SHORT SWEEP 90'S OR TEES PERMITTED.

(3) NO MORE THAN 35 FEET PERMITTED TO BE INSTALLED IN THE HORIZONTAL POSITION.

NOTE:
P.C. SHALL PROVIDE PRODUCT SUBMITTALS TO ASMI FOR REVIEW AND APPROVAL IF PEX TUBING IS USED INSTEAD OF COPPER.

INSULATION SCHEDULE

SERVICE	LOCATION	INSULATION THICKNESS & TYPE	INSULATION JACKET
COLD WATER	GENERAL BUILDING	1/2" RIGID F.G. OR CLOSED CELL (1) (10)	NR
COLD WATER	IN WALLS	1/2" CLOSED CELL (10)	NR
COLD WATER (PEX)	ALL	NR	NR
H.W. & H.W.R. ON RECIRC. LOOP	GENERAL BUILDING	1" RIGID F.G. OR CLOSED CELL (10)	NR
H.W. BRANCH NOT ON RECIRC. LOOP	GENERAL BUILDING	1/2" RIGID F.G. OR CLOSED CELL (10)	NR
H.W.	IN WALLS	1/2" CLOSED CELL	NR

NR = NOT REQUIRED

INSULATION NOTES

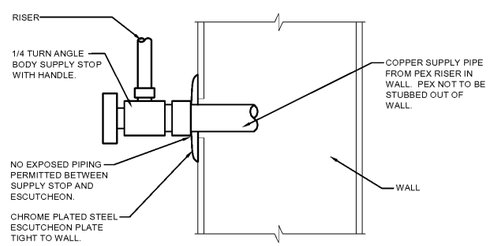
(1) INSULATE METERS, VALVES, BACKFLOW PREVENTERS AND ALL INLINE EQUIPMENT.

(10) INSULATION NOT REQUIRED FOR EXPOSED FINAL PIPING CONNECTIONS TO FIXTURES.

MAX. SPACING BETWEEN PIPE SUPPORTS AND MIN. HANGER ROD SIZES

PIPE SIZE	STEEL VAPOR	STEEL NAT. GAS	STEEL MIN. ROD	COPPER WATER	COPPER VAPOR	COPPER MIN. ROD	PVC	CAST IRON (2)	PEX	MIN. ROD
1/4" - 1/2"	8'	6'	3/8"	5'	6'	3/8"	4'	5'	32"	3/8"
3/4"	9'	8'	3/8"	5'	7'	3/8"	4'	5'	32"	3/8"
1"	9'	8'	3/8"	6'	8'	3/8"	4'	5'	32"	3/8"
1 1/4"	9'	10'	3/8"	7'	9'	3/8"	4'	5'	32"	3/8"
1 1/2"	12'	10'	3/8"	8'	10'	3/8"	4'	5'	32"	3/8"
2"	12'	10'	3/8"	8'	11'	3/8"	4'	5'	-	3/8"
2 1/2"	12'	10'	3/8"	9'	12'	3/8"	4'	5'	-	3/8"
3"	12'	10'	3/8"	10'	12'	3/8"	4'	5'	-	3/8"
4"	12'	10'	3/8"	12'	12'	3/8"	4'	5'	-	3/8"
MAX VERT. (1)	15'	10'	-	10'	10'	-	10'	15'	10'	-

(1) SUPPORT AT MINIMUM EVERY FLOOR LEVEL OR SPACING LISTED.
(2) SPACING MAY BE INCREASED TO 10' FOR 10' PIPE LENGTHS.



ANGLE STOP DETAIL

NO SCALE

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EXCEL
ARCHITECTS • ENGINEERS • SURVEYORS
1250 CAMELOT DRIVE
FOND DU LAC, WI 54935
PHONE: (920) 926-9800
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PROJECT INFORMATION
PROJECT NUMBER 1823380

TENANT BUILD-OUT FOR:
ASPEN DENTAL
4011 WARDS ROAD • LYNCHBURG, VA 24502

PROFESSIONAL SEAL

SHEET DATES
ISSUE DATE MAY 31, 2018
REVISIONS

SHEET INFORMATION
SPECIFICATIONS & GENERAL SCHEDULES
SHEET NUMBER
P0.2

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