

NO SCALE



#### EMERGENCY SHOWER EYEWASH EEWS (TV-1) TEMPERING SYSTEM NO SCALE BRADLEY NAVIGATOR \$19-2250

#### **GENERAL PLUMBING NOTES**:

- 1. MAKE PIPING CONNECTIONS AS REQUIRED TO ALL FIXTURES AND EQUIPMENT EVEN THOUG ALL BRANCH MAINS, ELBOWS AND CONNECTIONS ARE NOT SHOWN.
- 2. CHECK WITH ARCHITECTURAL WORKING DRAWING BEFORE ROUGHING-IN PLUMBING FIXTURES.
- 3. ALL PIPES SHALL BE COORDINATED WITH OTHER NEW AND EXISTING DUCTS, PIPES, LIGHT STRUCTURAL SYSTEM, CEILING SUPPORTS AND FRAMING BEFORE INSTALLATION. MINOR PIPE OFFSETS SHALL BE PROVIDED AS REQUIRED. MEASUREMENTS FOR VERTICAL CLEARANCES SHALL BE TAKEN AT THE JOB SITE BEFORE INSTALLATION OF ANY PIPING.
- 4. WASTE PIPE BELOW FLOOR, VENT PIPING ABOVE CEILING, PIPING OFFSET FOR CLARITY.
- 5. DOMESTIC WATER PIPING SHALL BE INSTALLED ABOVE CEILINGS OR NEAR CEILING UNLES NOTED OTHERWISE. DOMESTIC WATER PIPING SHOWN IN PIPE CHASE WALLS SHALL BE INSTALLED IN CHASE SPACE, PIPING OFFSET FOR CLARITY.
- 6. DOMESTIC WATER PIPING SHALL NOT BE INSTALLED IN LOCATIONS SUBJECT TO FREEZING OR SPACES EXTERIOR TO BUILDING INSULATION.
- 7. ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S PUBLISHED INSTRUCTIONS. COORDINATE HOT AND COLD WATER, SANITARY WASTE AND VENT PIPING AND ROUGH-IN INSTALLATION WITH ALL EQUIPMENT MANUFACTURERS' REQUIREMENTS.
- 8. MATERIALS AND INSTALLATION SHALL COMPLY WITH LOCAL CODES, APPLICABLE PROVISIONS OF LATEST EDITION OF NATIONAL FIRE PROTECTION ASSOCIATION, LOCAL UTILITY REGULATIONS AND GOVERNMENTAL DEPARTMENTS HAVING JURISDICTION.
- 9. WHERE PIPE CONNECTIONS ARE SHOWN CONNECTING TO EXISTING, CONTRACTOR SHALL DETERMINE EXACT LOCATIONS AND CONNECTION SIZES PRIOR TO INSTALLATION.
- 10. LIMITS OF CONTRACT: DOMESTIC WATER SERVICE AND SANITARY WATER PIPING SHALL BE EXTENDED UNDER THIS SECTION OF THE SPECIFICATIONS TO POINTS WITH-IN THE BUILDIN LINES, UNLESS OTHERWISE INDICATED ON THE DRAWINGS, WHERE THE PIPES SHALL BE CAPPED OR PLUGGED AND LEFT READY FOR CONNECTION AND EXTENSION BY OTHERS, AN THE LOCATIONS MARKED WITH A STAKE OR OTHER APPROVED MEANS.
- 11. INFORMATION ON EXISTING PLUMBING SHOWN WAS OBTAINED FROM PLANS DATED 11, 4, 1966. THE CONTRACTOR SHALL ADJUST WORK AS REQUIRED TO SUIT ACTUAL LOCATIONS DIFFERENT FROM CONTRACT DOCUMENTS.
- 12. PIPING SHALL NOT BE INSTALLED ABOVE ELECTRICAL PANELS. COORDINATE INSTALLATION OF PIPES WITH ELECTRICAL PANELS WHEN SHOWN NEAR PANELS OR OVER ELECTRICAL ROOMS.

## PLUMBING LEGEND

GH	CEILING CHECK VALVE DIRECTION OF FLOW DOMESTIC COLD WATER PIPE, NEW EXISTING TO REMAIN	CLG CW CW	EX
S,	EXISTING TO BE REMOVED DOMESTIC HOT WATER PIPE, NEW EXISTING TO REMAIN DOWN EMERGENCY EYE/FACE WASH EMERGENCY EYEWASH/SHOWER EXISTING	CW - HW - HW - DN EEFW EEWS EX	CW
S	EXISTING, REMOVE FROM THIS POINT		
	FLOOR	FL	
<u>i</u>	FLOOR DRAIN	FD	
D	FROM GATE VALVE BALL VALVE MOP SINK NATURAL GAS PIPE, NEW EXISTING TO REMAIN	FR GV MS G G	GG
	NEW CONNECTED TO EXISTING		•
E NG	PIPING INDICATION WITH RESPECT TO WATER FLOW TOP TAKEOFF TURN DOWN OR FROM BELOW TURN UP OR DOWN TURN UP OR FROM ABOVE	-	
	SANITARY WASTE PIPE, NEW SHOCK ABSORBER SINK TEMPERING VALVE	SW - SA SK TV	
IF			Π
Ν	THERMOMETER TEMPERED WATER VENT PIPE, NEW EXISTING TO REMAIN WASTE PIPE EXISTING TO REMAIN WASTE/VENT	TW V V W W W W/V	EXW

FIXTURE CONNECTION SCHEDULE						
MARK	FIXTURE	WASTE	VENT	COLD	НОТ	REMARKS
SK-1	SINK (DOUBLE COMPARTMENT)	1 1/2"	1 1/2"	1/2"	1/2"	COUNTER TOP
SK-2	SINK (DOUBLE COMPARTMENT)	1 1/2"	1 1/2"	1/2"	1/2"	COUNTER TOP, HANDICAPPED#
MS	MOP SINK	3"	1 1/2"	1/2"	1/2"	FLOOR MOUNTED
EEFW	EMERGENCY EYE/ FACE WASH	2"	-	1/2"	1/2"	BARRIER FREE
EEWS	EMERGENCY EYEWASH/ SHOWER	2"	-	1"	1"	BARRIER FREE

# INSTALLATION SHALL MEET 2010 AMERICANS WITH DISABILITIES ACT (ADA) ACCESSIBILITY GUIDELINES FOR BUILDINGS AND FACILITIES.

	WEALTHOP	Ц.
UNI ORO	09.19.2024	
PRO P	LIC. NO. U3456	
	SSIONAL EN	



P001

VIRGINIA TECH UBO APPROVAL



#### PLUMBING SYSTEMS NOTES & SPECIFICATIONS

CODES, STANDARDS AND REGULATIONS: MATERIALS, EQUIPMENT, INSTALLATION, DISINFECTION AND TESTING SHALL BE IN COMPLIANCE WITH, BUT NOT LIMITED TO THE FOLLOWING CODES AND STANDARDS:

- A. LOCAL CODES OR ORDINANCES. VIRGINIA CONSTRUCTION CODE (VCC).
- PIPING, FITTINGS, PUMP SYSTEMS, EQUIPMENT AND FIXTURES THAT ARE CONNECTED TO POTABLE WATER SYSTEM SHALL MEET THE 1996 SAFE WATER DRINKING ACT AND THE 2011 REDUCTION OF LEAD IN DRINKING WATER ACT, AND WHERE APPLICABLE SHALL MEET NSF STANDARD 61 AND SHALL BE I ABELED AND CERTIFIED
- D. VIRGINIA TECH DESIGN & CONSTRUCTION MANUAL 2022. SHOP DRAWINGS: FURNISH ELECTRONIC FILES OF PLUMBING MATERIALS AND EQUIPMENT TO ARCHITECT FOR REVIEW.
- DESCRIPTION OF WORK:
- A. THE WORK INCLUDES PROVIDING A COMPLETE PLUMBING SYSTEM INCLUDING, BUT NOT NECESSARILY RESTRICTED TO, THE FOLLOWING:
- (1) SANITARY SEWER SYSTEM TO A POINT WITHIN BUILDING. (2) DOMESTIC WATER SYSTEM TO A POINT WITHIN BUILDING.
- (3) NATURAL GAS PIPING SYSTEM.
- (4) ACID WASTE PIPING SYSTEMS.
- (5) COMPRESSED AIR SYSTEMS. (6) INSTALLATION AND CONNECTIONS TO EQUIPMENT FURNISHED BY OWNER. (7) CONNECTIONS TO FIXTURES AND EQUIPMENT PROVIDED UNDER OTHER
- SECTIONS OF THESE SPECIFICATIONS. (8) MISCELLANEOUS WORK AS DESCRIBED HEREIN, AS SHOWN ON DRAWINGS,
- AND AS REQUIRED FOR A COMPLETE SYSTEM. PIPE AND EQUIPMENT SUPPORTS, PIPE SLEEVES AND WALL CEILING PLATES:
- A. PROVIDE IN ACCORDANCE WITH THE VIRGINIA CONSTRUCTION CODE.
- B. PIPE SLEEVES PROVIDE SLEEVES FOR PIPING AND CONDUIT PASSING THROUGH CONCRETE FLOOR SLABS AND CONCRETE, MASONRY, TILE, AND GYPSUM WALL CONSTRUCTION. SLEEVES SHALL NOT BE PROVIDED FOR PIPING AND CONDUIT RUNNING EMBEDDED IN CONCRETE OR SLAB ON GRADE, EXCEPT THAT COPPER PIPING SHALL REQUIRE SLEEVES THROUGH SLABS ON GRADE. SLEEVES THROUGH STRUCTURAL MEMBERS SHALL BE ONLY AS DIRECTED BY ARCHITECT. IN INTERIOR WALL, PROVIDE 1/4 INCH SPACE ALL AROUND BETWEEN SLEEVE AND CONDUIT, PIPING, OR INSULATION OF
- SLEEVES PLACED IN EXTERIOR WALLS BELOW GRADE SHALL BE O.Z. GEDNEY TYPE 'FSK' OR EQUAL, THUNDERLINE 'LINK SEAL', OR EQUAL SLEEVE ASSEMBLIES SIZED FOR THE PIPE OR CONDUIT ENCOUNTERED, EXCEPT FOR CAST IRON PIPING. SLEEVE ASSEMBLY SHALL PROVIDE WATERTIGHT SEAL AND ELECTRICAL INSULATION TO REDUCE CATHODIC REACTION. WHEN A SLEEVE PASSES THROUGH A WALL BELOW A CONCRETE SLAB ON GRADE, THE SEALING ASSEMBLY SHALL BE ON THE 7. OUTSIDE OF THE WALL. WHEN A SLEEVE PASSES THROUGH A WALL INTO A CRAWL SPACE OR THE BUILDING INTERIOR, THE SEALING ASSEMBLY SHALL BE IN THE CRAWL SPACE OR INTERIOR OF THE BUILDING. PROVIDE SLEEVE ASSEMBLY FOR COPPER PIPING THROUGH SLAB ON GRADE, WITH SEALING ASSEMBLY LOCATED ON INTERIOR SIDE OF FLOOR SLAB. WHERE SLEEVES ARE LOCATED THROUGH FIRE-RATED WALLS AND FLOOR/CEILING ASSEMBLIES, PROVIDE SLEEVES AND PROTECT THE PENETRATION IN ACCORDANCE WITH UNDERWRITER'S LABORATORIES, INC., FIRE RESISTANCE DIRECTORY, VOLUME II, RATINGS FOR THROUGH FIRESTOP PENETRATIONS
- SLEEVES IN MECHANICAL ROOMS WITH FLOOR DRAINS OR HOSE BIBBS SHALL EXTEND 4 INCHES ABOVE FLOOR. PROVIDE FLANGES OR FLASHING RINGS WITH SLEEVES IN FLOORS WITH WATERPROOF MEMBRANE AND CLAMP OR FLASH INTO THE MEMBRANE. PROVIDE SLEEVES FLUSH WITH FLOOR IN OTHER ROOMS.
- 4. SLEEVES SHALL BE CONSTRUCTED OF 20 GAGE GALVANIZED SHEET STEEL WITH LOCK SEAM JOINTS FOR ALL SLEEVES SET IN CONCRETE FLOOR SLABS TERMINATING FLUSH WITH THE FLOOR. ALL OTHER SLEEVES SHALL BE CONSTRUCTED OF GALVANIZED STEEL PIPE UNLESS OTHERWISE INDICATED
- SOIL, WASTE AND VENT PIPING

CAST IRON SOIL PIPE AND FITTING: PIPE SHALL BE BELL AND SPIGOT, MODIFIED HUB, OR PLAIN END (NO-HUB) AS REQUIRED BY SELECTED JOINTING METHOD. PIPE AND FITTINGS SHALL BE LISTED BY NSF INTERNATIONAL, IAPMO, ICC OR OTHER THIRD PARTY ORGANIZATION THAT IS ACCREDITED AS AN ANSI-GUIDE 65 ORGANIZATION AS LISTED ON WWW.ANSI.ORG

- (1) MATERIAL (PIPE AND FITTINGS): ASTM A888, ASTM A74 OR CISPI 301, SERVICE WEIGHT (2) JOINTS: PROVIDE ANY ONE OF THE FOLLOWING TYPES TO SUIT PIPE
- FURNISHED. A. MECHANICAL, COMPRESSION-TYPE (ASTM C564) MOLDED NEOPRENE
- GASKET. GASKETS SHALL SUIT CLASS OF PIPE BEING JOINTED. DUAL-SERVICE GASKETS WILL NOT BE ACCEPTED. B. MECHANICAL: MECHANICAL JOINT COUPLING (ASTM C564 AND ASTM C1277) SHALL BE HEAVY DUTY AND SHALL CONSIST OF A STAINLESS
- STEEL COUPLING AND NEOPRENE GASKETS (ASTM C564) (CSA CAN/CSA-B602). DO NOT INSTALL BELOW GRADE. (3) COATING: PROVIDE A HEAVY COAT OF ASPHALT OR BITUMASTIC PAINT ON
- PIPE BURIED IN EARTH OR INSTALLED IN CINDERS OR CONCRETE CONSTRUCTION (4) CAST IRON SOIL PIPE MARKINGS: ALL CAST IRON SOIL PIPE SHALL BE
- CLEARLY MARKED WITH THE MANUFACTURER'S NAME, COUNTRY OF ORIGIN, EIGHT-DIGIT DATE CODE, PIPE DIAMETER AND LENGTH, RELEVANT ASTM STANDARD AND REGISTERED TRADEMARK OF THE THIRD PARTY CERTIFIER.
- (5) MATERIAL TEST REPORTS: SUPPLIER OF CAST IRON SOIL PIPE SHALL BE ABLE TO SUPPLY MATERIAL TEST REPORTS IN ACCORDANCE WITH THE RELEVANT ASTM STANDARD AND SHALL INCLUDE TESTING AND ANALYSIS ON RADIOACTIVITY, DIMENSIONAL CHARACTERISTICS, TENSILE STRENGTH AND CHEMICAL/METALLURGICAL CONTENT. SUPPLIERS SHALL ALSO SUPPLY MSDS SHEETS ON ALL COATINGS.
- B. STEEL PIPE AND FITTINGS: VENT PIPING
- (1) PIPE GALVANIZED: ASTM A 53, SCHEDULE 40. (2) FITTINGS--SANITARY VENT PIPING: MALLEABLE IRON, ASME B16.3, OR
- CAST IRON, ASME B16.4. ALL TO BE SAME KIND. (3) JOINTS: THREADS SHALL CONFORM TO ASME B1.20.1. PIPE-JOINT
- COMPOUND OR TAPE SHALL BE APPLIED ON THE MALE THREADS ONLY. PLASTIC PIPE: MAY BE USED FOR PIPING ABOVE GROUND AND BELOW
- GROUND. FOAM CORE PIPING IS NOT ACCEPTABLE. ALL PLASTIC PIPE, FITTINGS AND COMPONENTS SHALL BE THIRD PARTY CERTIFIED TO NSF 14. PVC SHALL NOT BE USED IN RETURN AIR PLENUMS.
- (1) PIPE: PVC SCHEDULE 40 DWV, ASTM D 2665.
- (2) FITTINGS: PVC SCHEDULE 40 ASTM D3311 FITTINGS FOR SOLVENT JOINTS. (3) JOINTS: ASTM F656 PURPLE PRIMER, SOLVENT ASTM D2564 (NOT PURPLE IN COLOR) COMPLYING WITH SCAQMD RULE #1168, JOINTS MADE IN ACCORDANCE WITH ASTM D2855.
- ACID-RESISTANT PIPING (INCLUDING ACID-RESISTANT VENTS): HIGH-SILICON CAST IRON:
  - PIPE AND FITTINGS: EXTRA-HEAVY WEIGHT BELL & SPIGOT OR MJ TYPE CLOSE-GRAINED, ACID-RESISTING CAST IRON (ASTM A-518-86 & ASTM A-861-86) CONTAINING 14.5 PERCENT SILICON AS MANUFACTURED BY THE DURIRON CO., INC.
  - (2) JOINTS: MECHANICAL JOINT UTILIZING TFE AND NEOPRENE SLEEVES AND 300 SERIES STAINLESS STEEL COUPLING, OR HUB & SPIGOT JOINTS MADE BY PACKING THE BOTTOM HALF OF THE HUB WITH SPECIAL ACID RESISTANT ROPE PACKING, SEALITE RED STRIPE NO. 312, ON TOP OF WHICH MOLTEN LEAD SHALL BE POURED AND PROPERLY CAULKED.
- POLYPROPYLENE: (ORION) (1) UNDERGROUND PIPING SCHEDULE 40 POLYPROPYLENE CONFORMING TO ASTM F 1412 TOLERANCES FROM FLAME RETARDANT MATERIAL IN 10' LENGTHS. POLYPROPYLENE MATERIAL SHALL CONFORM TO ASTM D 4101. CONTRACTOR HAS THE OPTION ON BELOW GRADE PIPE THAT MEETS ABOVE SPECIFICATION EXCEPT WITHOUT FLAME RETARDANT ADDITIVE. EACH 10' SECTION OF PIPE SHALL BE FACTORY GROOVED.
- (2) ABOVE GRADE NON FIRE RATED PIPING: SCHEDULE 40 FLAME RETARDANT POLYPROPYLENE TO ASTM F-1412 TOLERANCES FROM IN 10' LENGTHS. POLYPROPYLENE MATERIAL SHALL CONFORM TO ASTM D 4101.
- (3) ABOVE GRADE FIRE RATED PIPING: SCHEDULE 40 POLYVINYLIDENE FLUORIDE (PVDF) CONFORMING TO ASTM F-1673 IN 10' LENGTHS. PVDF MATERIAL SHALL CONFORM TO ASTM D-3322. MATERIAL SHALL BE CODE APPROVED FOR USE IN NON-COMBUSTIBLE PLENUM AS DESCRIBED IN

BOCA RESEARCH REPORT 98-38. ADDITIONALLY MATERIAL SHALL MEET UL-723 (ASTM E-84) WITH COPY OF CERTIFICATE. (4) FITTINGS:

- A. UNDERGROUND SCHEDULE 40 POLYPROPYLENE MATERIAL CONFORMING TO ASTM D-4101 AND ASTM F-1412. FITTING LAYOUTS SHALL CONFORM TO ASTM D-3311. ALL FITTINGS SHALL BE MOLDED DRAINAGE PATTERN FITTINGS. THE JOINING SYSTEM SHALL BE EITHER RIONFUSE COIL FUSION, TO CONFORM TO ASTM 1290 TECHNIQUE I, OR SOCKET FUSION TO CONFORM TO ASTM 2657 TECHNIQUE I.
- ABOVE GROUND NON FIRE RATED AREAS SCHEDULE 40 FLAME RETARDANT POLYPROPYLENE CONFORMING TO ASTM D-4101 AND ASTM F-1412. FITTING LAYOUTS SHALL CONFORM TO ASTM D-3311. 11. ALL FITTINGS SHALL BE MOLDED DRAINAGE PATTERN FITTINGS. THE JOINING SYSTEM SHALL BE MECHANICAL JOINT. EACH COUPLING SHALL HAVE AN OUTER BAND OF 300 SERIES STAINLESS STEEL WITH 5/16 BOLTS, NUTS AND WASHERS PLATED TO MEET 100 HOUR SALT SPRAY PER ASTM B-117. THE MECHANICAL JOINT SHALL CONFORM 12. TO THE REQUIREMENTS OF ASTM F-1412.
- ABOVE GROUND FIRE RATED AREAS SCHEDULE 40 POLYVINYLIDENE FLUORIDE (PVDF) PER ASTM F-1673 USING MATERIAL CONFORMING TO ASTM D-3322. MATERIAL SHALL BE CODE APPROVED FOR USE IN NON COMBUSTIBLE PLENUMS AS DESCRIBED IN BOCA RESEARCH REPORT 98-38. ADDITIONALLY MATERIAL SHALL MEET UL-723 (ASTM E-84) WITH COPY OF CERTIFICATE. FITTING LAYOUTS SHALL CONFORM TO ASTM D-3311 AND ASTM F-1673. ALL FITTINGS SHALL BE MOLDED DRAINAGE PATTERN FITTINGS. THE JOINING SYSTEM SHALL BE MECHANICAL JOINT. EACH COUPLING SHALL HAVE AN OUTER BAND OF 300 SERIES STAINLESS STEEL WITH 5/16 BOLTS, NUTS AND WASHERS PLATED TO MEET 100 HOUR SALT SPRAY TEST PER ASTM B-117. THE MECHANICAL JOINT SHALL CONFORM TO THE REQUIREMENTS OF ASTM F-1412.
- C. CPVC CHEMICAL WASTE DRAINAGE SYSTEM PIPE AND FITTINGS: SPECIAL DRAINAGE SYSTEM FOR CORROSIVE OR ACID WASTE SHALL BE MANUFACTURED FROM CPVC TYPE IV GRADE I COMPOUNDS CONFORMING TO ASTM F2618. PIPE SHALL BE SCHEDULE 40 DIMENSIONS. ONE-STEP SOLVENT CEMENT SHALL BE SPECIALLY FORMULATED FOR CHEMICAL WASTE APPLICATIONS AND CONFORM TO ASTM F493. PIPE, FITTINGS AND CEMENT SHALL BE SUPPLIED AS A SYSTEM BY A SINGLE MANUFACTURER. ALL PIPE. FITTINGS AND CEMENT SHALL BE THIRD-PARTY CERTIFIED BY NSF INTERNATIONAL FOR USE IN CORROSIVE WASTE DRAINAGE SYSTEMS AND SHALL BEAR THE MARK "NSF-CW." INSTALLATION TO BE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND ALL APPLICABLE LOCAL CODE REQUIREMENTS.
- INTERIOR DOMESTIC WATER PIPING COPPER TUBE AND FITTINGS
- (1) TUBE: ASTM B88:
- A. ABOVE GROUND FLOOR: TYPE L, HARD DRAWN. (2) FITTINGS: WROUGHT COPPER, ASME B16.22 OR CAST COPPER ALLOY
- ASME B16.18.
- (3) JOINTS: A. ABOVE GROUND FLOOR: ASTM B32 LEAD FREE SOLDER, ASTM B813 13. BACKFLOW PREVENTERS LEAD FREE FLUX. LEAD FREE SHALL MEAN LESS THAN 0.2 PERCENT IFAD
- COMPRESSED AIR PIPING A. PIPE:
  - 2 INCH AND SMALLER STEEL, ASTM A53 B, SEAMLESS OR TYPE F (CW), SCHEDULE 40; COPPER ASTM B88 TYPE K. NIPPLES: STEEL FOR STEEL PIPE
  - FITTINGS: MALLEABLE IRON, CLASS 150, CAST IRON, CLASS 125; WROUGHT COPPER
- JOINTS: THREADED, BRAZED. B. PIPE: 2 1/2 INCH AND LARGER - STEEL, A53 B ERW SCHEDULE 40; COPPER ASTM B88 TYPE L. FITTINGS: WROUGHT STEEL, WROUGHT COPPER
- JOINTS: WELDED, BRAZED.
- INTERIOR GAS PIPING: NATURAL GAS
- PIPE: BLACK STEEL, ASTM A 53 GRADE B OR A 106, SCHEDULE 40.
- NIPPLES: STEEL, ASTM A733, SCHEDULE 40. FITTINGS, 2 INCHES AND SMALLER: MALLEABLE IRON, ASME B16.3. (THREADED) JOINTS: THREADED ENDS (ASME B1.20.1). PIPE-JOINT COMPOUND OR TAPE
- APPLIED TO MALE THREADS ONLY (LOCHINVAR USE NO TEFLON TAPE); WELDED. 16. DO NOT USE GAS FITTERS CEMENT, EXCEPT ON OUTLET CAPS. E. GAS PIPING INSTALLED IN CONCEALED LOCATIONS SHALL NOT HAVE UNIONS, TUBING FITTINGS OR RUNNING THREADS.
- 10. VALVES: (DOMESTIC WATER) A. GATE VALVES (RISING STEM): VALVES 2 1/2 INCH AND SMALLER SHALL BE CLASS 125 RISING STEM, UNION BONNET, SOLID WEDGE AND MANUFACTURED IN ACCORDANCE WITH MSS-SP 80. BODY, BONNET AND WEDGE SHALL BE OF BRONZE ASTM B-62. STEMS SHALL BE OF DEZINCIFICATION-RESISTANT SILICON BRONZE ASTM B-371 OR LOW-ZINC ALLOY B-99, NON-ASBESTOS PACKING AND
- MALLEABLE OR DUCTILE IRON HANDWHEEL. WHERE HIGHER OPERATING PRESSURES APPROACH 150 PSI, CLASS 150 UNION BONNET VALVES OF LIKE CONSTRUCTION SHALL BE USED. VALVE ENDS SHALL BE THREADED OR SOLDER-TYPE. [CLASS 125 NIBCO T124 (THREADED); CLASS 150 NIBCO T134 (THREADED), S134 (SOLDER)] BALL VALVES: VALVES 2 1/2 INCH AND SMALLER SHALL BE RATED 150 PSI SWP
- AND 600 PSI NON-SHOCK WOG AND SHALL HAVE 2 PIECE CAST BRONZE BODIES, TFE SEATS, FULL PORT, SEPARATE PACKNUT WITH ADJUSTABLE STEM PACKING, ANTI-BLOWOUT STEMS AND CHROME-PLATED BRASS/BRONZE BALL. VALVE ENDS SHALL HAVE FULL DEPTH ANSI THREADS OR EXTENDED SOLDER CONNECTIONS AND BE MANUFACTURED TO COMPLY WITH MSS-SP110. [NIBCO T585-80-LF (THREADED); S585-80-LF (SOLDER)] NOTE: WHERE PIPING IS INSULATED, BALL VALVES SHALL BE EQUIPPED WITH 2" EXTENDED HANDLES OF NON-THERMAL CONDUCTIVE MATERIAL. ALSO, PROVIDE A PROTECTIVE SLEEVE THAT ALLOWS OPERATION OF THE VALVE
- WITHOUT BREAKING THE VAPOR SEAL OR DISTURBING THE INSULATION. MEMORY STOPS, WHICH ARE FULLY ADJUSTABLE AFTER INSULATION IS APPLIED, SHALL BE INCLUDED. [NIBCO T585/70NS (THREADED); S585-0NS (SOLDER)] C. GLOBE VALVES: VALVES 2-1/2 INCH AND SMALLER SHALL BE CLASS 125 AND
- MANUFACTURED IN ACCORDANCE WITH MSS-SP80, BODY AND BONNET SHALL BE OF BRONZE ASTM B-62. STEMS SHALL BE OF DEZINCIFICATION-RESISTANT SILICON BRONZE ASTM B-371 OR LOW-ZINC ALLOY B-99, NON-ASBESTOS PACKING, TFE SEAT DISC AND MALLEABLE OR DUCTILE IRON HANDWHEEL WHERE HIGHER OPERATING PRESSURES APPROACH 150 PSI, CLASS 150 UNION BONNET VALVES OF THE LIKE CONSTRUCTION SHALL BE USED. VALVE ENDS SHALL BE THREADED OR SOLDER-TYPE. [CLASS 125 NIBCO GLOBE T211-Y (THREADED); S211-Y (SOLDER); CLASS 150 NIBCO GLOBE T235-Y (THREADED); S235-Y (SOLDER)]
- CHECK VALVES: VALVES 2 INCH AND SMALLER SHALL BE TYPE INLINE LIFT, CLASS 125, THREADED OR SOLDER ENDS; ASTM A582 STAINLESS STEEL STEM, 316 STAINLESS STEEL SPRING, AND ASTM A276 STAINLESS STEEL SEAT SCREWS; TFE DISC AND SEAT RING; BODIES AND END CONFORMING TO ASTM
- B-584 BRONZE, SPRING ACTUATED TYPE DISC. (NIBCO T-480, S-480) E. HOSE BIBBS AND HOSE-END DRAIN VALVES: EQUIPMENT ROOMS AND SIMILAR SPACES. WATTS LFSC-5 (1/2 INCH), MATCO-NORCA 646 RLF OR EQUAL ROUGH BRASS, LEAD-FREE.
- WATER HAMMER ARRESTORS: JOSAM "ABSORBOTRON" 75000 SERIES, SMITH 5000 SERIES "HYDROTROLS", ZURN Z1700 "SHOKTROLS", WADE "SHOKSTOP", OR EQUAL, BELLOWS TYPE, LEAD-FREE, STAINLESS STEEL. (SA-A MAX. 11 SFU; SA-B MAX. 32 SFU; SA-C MAX. 60 SFU. PROVIDE ON BOTH HOT AND COLD WATER BRANCHES. JOB FABRICATED AIR CHAMBERS WILL NOT BE PERMITTED. O-RING TYPE SHOCK ABSORBERS WILL NOT BE ACCEPTED. (ASME/ANSI A112.26.1 OR ASSE 1010)
- G. TEMPERING VALVE (BRADLEY, WATTS OR EQUAL):
- TV-1 BRADLEY NAVIGATOR S19-2250
- TV-2 BRADLEY NAVIGATOR S19-2000. TV-3 INDIVIDUAL FIXTURE:
- A. PROVIDE WATTS MODEL SERIES LFUSG-B-M2 UNDER-SINK GUARDIAN ASSE 1070 THERMOSTATIC TEMPERING VALVE FOR SINGLE LAVATORY AND HAND SINK. PROVIDE AT ALL LAVATORY AND HAND SINK LOCATIONS. SET VALVE FOR MINIMUM 105 DEG. F., MAXIMUM 109 DEG E
- B. PROVIDE WATTS MODEL SERIES LFMMV, BRADLEY S59-4000A, POWERS LFG480, OR EQUAL THERMOSTATIC MIXING VALVE ASSE 1070 FOR MULTIPLE LAVATORY AND HAND SINK APPLICATIONS.

EEWS

C. FIXTURES:

SK-1

EEFW

18. CLEANOUTS

PROVIDE AT ALL LAVATORY AND HAND SINK LOCATIONS. SET VALVE FOR MINIMUM 105 DEG. F., MAXIMUM 109 DEG. F.

BALANCING VALVES SHALL BE CIRCUIT SETTERS AS MANUFACTURED BY (BELL AND GOSSETT) (WATTS) OR EQUAL, AND SHALL BE A BALANCING VALVE OF ALL BRONZE CONSTRUCTION. VALVE SHALL HAVE PRESSURE TAPS WITH BUILT-IN CHECK VALVES TO DETERMINE PRESSURE DROP ACROSS VALVE. THE PRESSURE DROP AND THE SETTING OF THE VALVE SHALL DETERMINE THE ACTUAL SYSTEM FLOW RATE REQUIREMENT. VALVE SHALL BE FURNISHED WITH ADJUSTABLE MEMORY STOP AND PREFORMED POLYURETHANE INSULATION SUITABLE FOR USE ON DOMESTIC HOT WATER AND COLD WATER SYSTEMS. UNIT TO BE SUITABLE FOR 125 PSI WORKING PRESSURE AT 250 DEG. F. OPERATING TEMPERATURE.

VALVES: NATURAL GAS A. GENERAL: EACH ITEM SHALL HAVE THREADED OR FLANGED, CONNECTIONS AS 19. FLOOR DRAINS APPLICABLE TO MATCH JOINTS SPECIFIED FOR ITS RESPECTIVE SERVICE. GAS VALVES-4 INCHES AND SMALLER: BRONZE TWO PIECE BALL VALVE, CHROME PLATED BALL, AGA & UNDERWRITERS LABORATORIES LISTED.

VALVES: (COMPRESSED AIR) A. GENERAL: ALL VALVES AND SPECIALTIES SHALL BE SUITABLE FOR 125 PSI WORKING PRESSURE EXCEPT AS OTHERWISE INDICATED. EACH ITEM SHALL HAVE THREADED, FLANGED, OR SWEAT CONNECTIONS AS APPLICABLE TO MATCH JOINTS SPECIFIED FOR ITS RESPECTIVE SERVICE.

B. COMPRESSED AIR SERVICE: ACCEPTABLE MANUFACTURERS SUBJECTED TO COMPLIANCE WITH REQUIREMENTS ARE NIBCO, APOLLO, CENTER LINE, POWELL, AND MCDONALD.

(1) BALL VALVES: VALVES 2 1/2 INCH AND SMALLER SHALL BE RATED 600 PSI COLD WORKING PRESSURE AND SHALL HAVE 2-PIECE CAST BRONZE BODIES, FTE SEATS, FULL PORT, SEPARATE PACKNUT WITH ADJUSTABLE STEM PACKING, ANTI-BLOWOUT STEMS AND CHROME-PLATED BRASS/BRONZE BALL. VALVE ENDS SHALL HAVE FULL DEPTH ANS THREADS AND BE MANUFACTURED TO COMPLY WITH MSS SP100. WHERE 20. INSULATION: APPLICABLE FOR ISOLATION, VALVES SHALL BE IN COMPLIANCE WITH OSHA LOCKOUT/TAGOUT STANDARD 1910-147 AND SHALL BE DESIGNED TO VENT AIR TO ATMOSPHERE UPON CLOSURE. VALVES SHALL BE FITTED WITH LOCKING DEVICE SO VALVES CAN BE LOCKED IN OPEN OR CLOSED POSITION

(2) GLOBE VALVES: VALVES 2 INCH AND SMALLER SHALL BE CLASS 150, BODY AND BONNET OF ASTM B-62 CAST BRONZE COMPOSITION, THREADED ENDS, SILICON BRONZE ALLOY STEM, REPLACEABLE TEFLON DISC, BRASS PACKING GLAND, TEFLON-IMPREGNATED PACKING AND MALLEABLE HANDWHEFI

(3) CHECK VALVES: (NOTE: IF AIR COMPRESSOR IS RECIPROCATING TYPE CHECK VALVES SHALL BE DOWNSTREAM OF RECEIVER TANK.) VALVES 2-1/2 INCH AND SMALLER SHALL BE Y-PATTERN SWING-TYPE MANUFACTURED IN ACCORDANCE WITH MSS-SP80, CLASS 125 BRONZE ASTM B-62 BODY WITH TFE SEAT DISC OR SPRING LOADED LIFT-TYPE WITH 21. RESILIENT SEATING. VALVE ENDS SHALL BE THREADED-TYPE C. AIR LINE REGULATOR: BALCRANK MODEL 820280 OR EQUAL WITH CAST ZINC

BODY, STAINLESS STEEL STRAINER AND DIAL PRESSURE GAUGE. D. QUICK DISCONNECTS FOR COMPRESSED AIR CONNECTIONS AS DIRECTED BY THE OWNER.

A. PROVIDE BACKFLOW PREVENTION DEVICES AT ALL LOCATIONS SHOWN OR SPECIFIED. DEVICE SHALL BE SAME SIZE AS LINE IN WHICH INSTALLED. LISTED BELOW IS A LIST OF CONNECTION TO THE POTABLE WATER SYSTEM THAT SHALL BE PROTECTED AGAINST BACKFLOW OR BACK SIPHONAGE:

 ATMOSPHERIC VACUUM BREAKER (ASSE 1001; CSA CAN/CSA-B64.1): WATTS NO. 288AC (1/2 INCH THRU 1 INCH) 288A (1/4 INCH THRU 3 INCH) OR EQUAL. UNIT SHALL NOT BE SUBJECT TO BACK-PRESSURE AND SHALL BE INSTALLED ON DISCHARGE SIDE OF THE LAST CONTROL VALVE.

A. COMMERCIAL DISHWASHERS (288AC) (2) INTERMEDIATE ATMOSPHERIC VENT CONTINUOUS PRESSURE TYPE (ASSE 1024; CSA CAN/CSA-B64.6): WATTS NO. LF7R LEAD-FREE OR EQUAL.

A. WATER FILTRATION 15. PRESSURE GAGES FOR WATER: WEKSLER TYPE HA14-4, 4-1/2 INCH DIAMETER DIAL, 1/4" NPT CONNECTION SIZE, ALL METAL ALUMINUM CASE, BOTTOM CONNECTED. DIALS SHALL BE BLACK ON WHITE BACKGROUND THROUGHOUT, 1 PSI GRADUATION, 20 PSI FIGURE GRADUATION, BRASS BOURDON TUBE AND SOCKET. RANGE SHALL BE 0 TO 160 PSIG. PROVIDE TEE HANDLE COCK AND BRASS PRESSURE SNUBBER FOR WATER SERVICE.

THERMOMETERS: WEKSLER TYPE AS5H-9-AL OR EQUAL, ADJUSTABLE ANGLE FORM, BLUE SPIRIT MERCURY-FREE COLUMN APPROXIMATELY 9 INCHES LONG, 30 TO 240 DEG. F. RANGE, AND COMPLETE WITH BRASS WELL.

17. PLUMBING FIXTURES GENERAL: FIXTURES EQUAL TO THOSE AS HEREINAFTER SPECIFIED SHALL BE FURNISHED AND INSTALLED COMPLETE WITH ALL SUPPLIES, WASTE AND VENT CONNECTIONS, ALL FITTINGS, ALL NECESSARY HANGERS AND SUPPORTS, BOLT CAPS, FAUCETS, VALVES AND TRAPS. ALL TRIM SHALL BE BRASS WITH POLISHED CHROMIUM PLATED FINISH WITH CHROME SETSCREW ESCUTCHEON AT WALL, EXCEPT FIXTURE SUPPLY PIPES MAY BE CHROMIUM PLATED COPPER WITH CHROME SETSCREW ESCUTCHEONS AT WALL. TRAPS SHALL BE (17 GAUGE) CAST BRASS WITH CLEANOUT PLUG. ALL FIXTURES SHALL BE WHITE. HANDICAPPED LAVATORIES AND SINKS SHALL HAVE BOTH WATER SUPPLIES AND TRAP INSULATED AND WRAPPED WITH HANDY-SHIELD (BY PLUMBEREX), HANDI LAV-GUARD (BY TRUEBRO) OR PROWRAP (BY MCGUIRE). (WHERE BELOW DECK MIXING VALVE ARE SPECIFIED. PROVIDE ZURN MODEL Z6900-V9 VANDAL GUARD ENCLOSURE OR EQUAL BY TRUEBRO.) COLOR SHALL BE WHITE AND FASTENERS SHALL REMAIN OUT OF SIGHT. ALL SINKS THAT SHARE A COUNTER WITH A HANDICAPPED SINK SHALL HAVE BOTH WATER SUPPLIES AND TRAP INSULATED AND WRAPPED.

PROVIDE LOCK-SHIELD, LOOSE-KEY OR SCREW DRIVER PATTERN POLISHED CHROMIUM PLATED ANGLE STOPS, WITH EACH SINK FAUCET. FAUCETS FOR MOP SINK SHALL BE FURNISHED WITH INTEGRAL STOPS.

#### DESIGNATION STANDARD FIXTURE TYPE

SINK: OWNER-PROVIDED DOUBLE-COMPARTMENT SINK, FAUCET LEDGEBACK, STAINLESS STEEL WITH ELKAY LKD-2442BHC WITH LEVER HANDLES, SWING SPOUT, 2.2 GPM AT 60.0 PSI DISCHARGE, ROSETTA SPRAY NON-AERATED FLOW DEVICE AND LK-35 STRAINER IN EACH COMPARTMENT.

DESIGNATION HANDICAPPED FIXTURE TYPE (ADA) SINK: OWNER-PROVIDED DOUBLE-COMPARTMENT SINK. FAUCET LEDGEBACK, WITH ELKAY LKD2437BHC FAUCET WITH RETRACTABLE SPRAY AND HOSE, WRIST BLADE HANDLES, SWING SPOUT, 2.2 GPM AT 60.0 PSI DISCHARGE, LKAD-35 STRAINER AND LKAD05 OFFSET TAILPIECE (IN EACH COMPARTMENT).

COMBINATION EMERGENCY EYE/FACE WASH: EXISTING PEDESTAL-MOUNTED EMERGENCY EYE/FACE WASH RELOCATED. PROVIDE TV-2 BRADLEY NAVIGATOR S19-2000 EFX8 THERMOSTATIC MIXING VALVE ANSI Z358.1, 4.0 GPM AT 10 PSI PRESSURE DROP, ASSE 1071. SET FOR 85°F. MIXING VALVE SHALL CLOSE DOWN ON FAILURE OF COLD WATER SUPPLY, HAVE INTERNAL COLD WATER BYPASS AND DIAL THERMOMETER.

EMERGENCY EYEWASH/SHOWER: BRADLEY MODEL S19314 PDCZS BARRIER FREE 1-1/4" STAINLESS STEEL PIPING SUPPLY, PLASTIC SPINTEC SHOWER HEAD, PLASTIC BOWL AND DUST COVER, EYEWASH SPRAY HEAD ASSEMBLY, 1/2" STAY-OPEN VALVE, 1-1/4" DRAIN OUTLET. PROVIDE TV-1 BRADLEY NAVIGATOR S19-2250 WITH LIQUID-FILLED THERMOSTAT WITH INTEGRAL STRAINER CHECKSTOPS ON INLETS, ADJUSTABLE SETPOINT OF 85°F, MIXING VALVE SHALL CLOSE DOWN ON FAILURE OF COLD WATER SUPPLY, HAVE INTERNAL COLD WATER BYPASS AND DIAL THERMOMETER, SHALL HAVE FLOW CAPACITIES OF 27.0 GPM AT 15 PSI PRESSURE DROP. ASSE 1071, ANSI 7358.1

SAME SIZE AS PIPE SERVED UP TO 4 INCHES. FIVE AND SIX INCH MAINS SHALL 23. IDENTIFICATION OF PIPES AND VALVES: HAVE FOUR-INCH CLEANOUTS. CLEANOUTS SHALL BE EASILY ACCESSIBLE. ALL CLEANOUT PLUGS SHALL BE BRONZE, SET IN GRAPHITE GREASE. (ASTM A74, ASME A112.3.1, ASME A112.36.2M) COVERS SHALL BE SET FLUSH WITH FINISHED FLOOR OR WALL. PROVIDE CARPET MARKERS IN ALL CARPETED AREAS. (1) BASE OF VERTICAL STACKS: JOSAM 58600-COT, SMITH 4530, ZURN Z-1446 WITH STAINLESS STEEL WALL COVER. LOCATED 24 INCHES ABOVE FLOOR. (2) HORIZONTAL PIPES ABOVE GRADE: CLEANOUTS SHALL BE FERRULE WITH

BRONZE SCREW PLUG IN FITTING OR TAPPED CAST IRON FERRULE WITH BRONZE PLUG

- (3) FLOORS: FLOOR CLEANOUTS SHALL HAVE CAST IRON BODY, BRONZE PLUG, AND ABS OR CAST IRON FRAME WITH ROUND OR SQUARE ADJUSTABLE HEAVY-DUTY SCORIATED SECURED NICKEL BRONZE TOP.
- A. LIGHT TRAFFIC FLOORS: JOSAM SERIES 55000 CAST IRON FLOOR CLEANOUT WITH (SECURED)(VANDAL RESISTANT) ROUND OR SQUARE COVERS OF SATIN BRONZE FOR FINISHED CONCRETE FLOORS AND SATIN FINISH NIKALOY ELSEWHERE.
- B. FOR ACID WASTE SYSTEM: SHALL BE OF THE SAME MATERIAL USED FOR THE ACID WASTE PIPING SYSTEM WITH COUNTER-SUNK PLUG, ADJUSTABLE TOP NICKEL BRONZE COVER WITH "AWCO" (ACID WASTE CLEANOUT) CAST IN COVER.
- A. ALL FLOOR DRAINS SHALL BE FURNISHED WITH 4-INCH DEEP SEAL P-TRAP. ALL FLOOR DRAINS SHALL CONFORM TO ASME A112.6.3 OR CSA B79. (1) JANITOR ROOMS: JOSAM 30000-E SERIES COATED CAST IRON FLOOR
- DRAIN, ADJUSTABLE SATIN NIKALOY SECURED ROUND OR SQUARE TRACTOR STRAINER, AND PERFORATED STAINLESS STEEL BASKET.
- (2) ALL OTHER LOCATIONS: JOSAM SERIES 30000-A CAST IRON BODY AND FLANGED COLLAR, AND SECURED SIX INCH (DIAMETER)(SQUARE) NIKALOY STRAINER
- (3) ACID WASTE DRAINS: SHALL BE OF THE SAME MATERIAL AS USED FOR THE ACID WASTE PIPING WITH GRATE STRAINER AND 1/2" TRAP PRIMER.
- TRAP SEALER: SURE SEAL MODEL SS PRE-ASSEMBLED INLINE FLOOR DRAIN TRAP SEALER. SEALER SHALL BE CONSTRUCTED OF HIGH DENSITY POLYETHYLENE (HDPE) HOUSING AND KEEPER PIN, HEAVY DUTY SILICONE DIAPHRAGM AND SOFT EPDM SEALING GASKETS. RATED FOR FLOOR ASSE-1072 AF-GW THIRD PARTY TESTING AND LISTED BY IAPMO. PROVIDE IN ALL FLOOR DRAINS

A. ALL DOMESTIC WATER PIPING AND ALL HORIZONTAL STORM PIPING ABOVE LOWEST FLOOR INCLUDING ROOF DRAINS FROM UNDERSIDE OF DECK TO JUST 24. PROTECTION OF ELECTRICAL EQUIPMENT: PLUMBING AND SPRINKLER PIPING SHALL BELOW FITTING AT TOP OF VERTICAL PORTION OF STACK AND FITTINGS AT TOP AND BOTTOM OF VERTICAL SECTIONS OF HORIZONTAL OFFSETS SHALL BE INSULATED. INSULATION SHALL BE JOHNS MANVILLE, OWENS CORNING, OR ARMSTRONG. ALL MATERIALS AND PVC TYPE FITTING COVERS USED SHALL HAVE COMPOSITE FLAME SPREAD RATING NOT EXCEEDING 25 AND A SMOKE DEVELOPED RATING NOT EXCEEDING 50, AS TESTED UNDER PROCEDURE ASTM E\_84, NFPA 90A AND 90B.

PIPING INSULATION: FIBERGLASS INSULATION SHALL BE 1 INCH THICK AND SHALL HAVE A MAXIMUM THERMAL CONDUCTIVITY (K) FACTOR OF 27.0 PER INCH OF THICKNESS AT A MEAN TEMPERATURE OF 75 DEG. F. FIBERGLASS INSULATION SHALL HAVE A WHITE KRAFT BONDED TO ALUMINUM FOIL,

REINFORCED WITH FIBERGLASS YARN JACKET, LAP JOINTS, TAPE AND SEAL. NEUTRALIZING/DILUTION TANK: TANKS INSTALLED BELOW SINKS SHALL BE ORION STYLE 8 POINT-OF-USE DILUTION TANK T8 POU, 1.5 USG TANK SEAMLESS, ROTATIONALLY MOLDED FROM VIRGIN PE RESINS CONFORMING TO ASTM D1248 WITH INTEGRAL COVER, SINGLE FIP INLET WITH DIP TUBE, SINGLE FIP OUTLET, WITH 3" TOP 26. <u>TESTS</u>: CLEANOUT. TANK SHALL BE PROVIDED WITH CALCIUM CARBONATE ROCK MEDIA. TANK SIZE 12.5"W X 8.5"D X 11.2"H.

22. INSTALLATION: A. GENERAL

- (1) SUSPENDED HORIZONTAL PIPING SHALL BE SUPPORTED BY ADJUSTABLE WROUGHT STEEL CLEVIS HANGERS. WHERE SUPPORTS BEAR ON COPPER PIPE, THEY SHALL BE COPPER PLATED. WHERE SUPPORTS BEAR ON INSULATED PIPING, PROVIDE INSULATION SHIELD. CHAIN, STRAP, WIRE OR OTHER MAKESHIFT DEVICES WILL NOT BE PERMITTED AS HANGERS OR SUPPORTS.
- (2) INSTALL BRANCH PIPING FOR WATER, WASTE AND GAS, FROM THE RESPECTIVE PIPING SYSTEMS AND CONNECT TO ALL FIXTURES, VALVES, COCKS, OUTLETS, CASEWORK, CABINETS AND EQUIPMENT, INCLUDING THOSE FURNISHED BY THE OWNER OR SPECIFIED IN OTHER SECTIONS OF THESE SPECIFICATIONS.
- (3) INSTALL TRIM AND FITTINGS PROVIDED WITH CASEWORK, CABINETS AND LABORATORIES. INCLUDING THOSE FURNISHED BY THE OWNER. BUT NOT INSTALLED AT POINT OF FABRICATION.
- (4) WELDED JOINTS SHALL BE FUSION WELDED BY QUALIFIED WELDERS IN ACCORDANCE WITH ANSI B31.1 SECTION 6, UNLESS OTHERWISE REQUIRED. MITERING OR NOTCHING PIPE TO FORM ELBOWS AND TEES, AND DRILLING OR PUNCHING TO MAKE CONNECTIONS WILL NOT BE
- PERMITTED. (5) COMPRESSION GASKET JOINTS FOR CAST IRON SEWER PIPE SHALL BE MADE WITH NEOPRENE COMPRESSION GASKETS CONFORMING TO ASTM
- (6) NO-HUB JOINTS FOR CAST IRON PIPES SHALL BE MADE WITH NEOPRENE GASKETS (ASTM C564) AND STAINLESS STEEL CLAMPS CONFORMING TO
- ASTM C564 AND ASTM C1277 (7) MECHANICAL JOINTS ELASTOMERIC SEALING SLEEVE FOR CAST IRON PIPE
- SHALL BE IN ACCORDANCE WITH ASTM C564. (8) SOLVENT CEMENT FOR PVC PIPING SHALL BE HANDLED IN ACCORDANCE WITH ASTM F402.
- (9) PLASTIC PIPE SHALL NOT BE LOCATED IN RETURN AIR CEILING PLENUMS. (10) PLASTIC PIPE SHALL NOT PENETRATE A FIRE ASSEMBLY OR SMOKESTOP. (11) PROVIDE CHROME PLATED ESCUTCHEONS AT ALL LOCATIONS WHERE
- PIPING PENETRATES FLOORS, WALLS AND CEILINGS IN EXPOSED LOCATIONS, EXCEPT IN MECHANICAL ROOMS.
- (12) WHERE SUPPORTS BEAR ON INSULATED PIPING, PROVIDE INSULATION SHIFI DS B. PIPING SHALL CONFORM TO THE FOLLOWING:
- (1) WASTE CONDUCTORS:

A.	SLOPE SOIL AND WASTE PIPING AS FOLLOWS:		
	PIPE SIZE	MINIMUM PITCH	
	SOIL, WASTE AND VENT		
	2-1/2 INCH & SMALLER	1/4" TO THE FOOT	
	3 INCH & LARGER	1/8" TO THE FOOT	
B.	CHANGES IN DIRECTION OF	PIPING SHALL BE MADE WITH FITTINGS.	
-			

- C. CONTRACTOR IS CAUTIONED TO VERIFY INVERT OF SANITARY SEWER AND TO COORDINATE INVERTS OF NEW WORK TO SUIT CONDITIONS ENCOUNTERED
- D. SANITARY SEWER SHALL BE PROVIDED COMPLETE WITH ALL PLUMBING FIXTURES, DRAINS, ETC., PROPERLY CONNECTED AND VENTED IN ACCORDANCE WITH THE APPLICABLE CODES. ALL VENTS THROUGH THE ROOF SHALL EXTEND TWELVE INCHES ABOVE THE ROOF
- (2) DOMESTIC WATER: A. GRADE ALL LINES TO FACILITATE DRAINAGE. PROVIDE HOSED-END 29. <u>REPORTS</u>: REPORT OF CLEANING, STERILIZING AND TESTING: CONTRACTOR SHALL DRAIN VALVES AT LOCATIONS INDICATED ON THE DRAWINGS. ALL UNNECESSARY TRAPS IN CIRCULATING LINES SHALL BE AVOIDED.
- B. CONNECT BRANCH LINES AT BOTTOM OF MAIN SERVING FIXTURES BELOW AND PITCH DOWN SO THAT MAIN MAY BE DRAINED THROUGH FIXTURE. CONNECT BRANCH LINES TO TOP OF MAIN SERVING ONLY FIXTURES LOCATED ON FLOOR ABOVE.
- (3) GAS: INSTALL GAS PIPING WITH PLUGGED DRIP POCKETS AT LOW POINTS Α. AND AHEAD OF THE CONNECTION TO EACH PIECE OF EQUIPMENT. PLUGS SHALL BE MINIMUM 2 INCHES ABOVE (FLOOR)(ROOF SURFACE). ENTIRE GAS PIPING INSTALLATION SHALL BE IN ACCORDANCE WITH REQUIREMENTS OF VIRGINIA CONSTRUCTION
- CODE B. MINIMUM SLOPE SHALL BE 1/4 INCH PER FIFTEEN FEET IN DIRECTION OPPOSITE FLOW.
- C. SHUT-OFF COCK SHALL BE PROVIDED AT EACH BURNER, IF NOT
- PROVIDED WITH THE RESPECTIVE EQUIPMENT. C. BONDING OF GAS PIPING: ALL METAL GAS PIPING ATTACHED TO THE BUILDING SHALL BE BONDED IN ACCORDANCE WITH THE REQUIREMENTS OF THE CURRENT EDITION OF NFPA 70, ARTICLE 250.104(B) AND SECTION 26 05 26 OF THE ELECTRICAL SPECIFICATIONS.

A. PIPES SHALL BE IDENTIFIED USING PRE-PRINTED MARKERS SIZED

APPROPRIATELY FOR THE PIPES BEING IDENTIFIED (SHOP DRAWINGS REQUIRED). MARKERS SHALL BE SETON "SETMARK" TYPE OR APPROVED EQUAL OR EQUIVALENT STENCIL. PIPE IDENTIFICATION SHALL MEET THE MOST CURRENT EDITION OF ANSI SPECIFICATION A13.1. APPLY A MINIMUM OF TWO COMPLETE WRAPS OF TAPE AT EACH END OF PRE-PRINTED PIPE MARKERS EQUAL TO SETON STYLE #AR OR APPROVED EQUAL. MARKERS SHALL BE

LOCATED CLOSE TO VALVES OR FLANGES AND ADJACENT TO CHANGES IN DIRECTION, BRANCHES AND WHERE PIPES PASS THROUGH WALLS OR FLOORS, AND AT MAXIMUM INTERVALS OF 15 FEET ON STRAIGHT RUNS. PROVIDE A COLOR CODE CHART, FRAMED WITH GLASS FRONT, INDICATING PIPING SERVICE AND COLOR CODE SCHEDULE. POST IN MECHANICAL ROOM WHERE DIRECTED BY OWNER.

#### B. COLOR CODE SCHEDULE

		COLOR BANDING CODE	=
	NUMBE	r color ca	TALOG NUMBER
	1.	ORANGE	NO. F65 E 36
	2.	BLUE	NO. F65 L 3
	3.	BROWN	NO. F65 N 11
	4.	RED	NO. F65 R 1
	5.	BLACK	NO. F65 B 1
	6.	YELLOW	NO. F65 Y 48
	7.	GREEN	NO. F65 G 40
_			

- C. PIPE SHALL BE IDENTIFIED WITH FLOW ARROWS AS DESCRIBED BELOW 1. ARROWS SHALL BE STENCIL TYPE. ARROWS SHALL BE READABLE FROM FLOOR. ARROWS SHALL BE INSTALLED EVERY 15'-0" MAXIMUM.
- 4. ARROWS SHALL BE PAINTED ON PIPES. D. IDENTIFICATION OF VALVES: PROPERLY MARK SERVICE AND CONTROL VALVES. VALVE MARKERS SHALL BE METAL TAGS WITH DESIGNATIONS STAMPED THEREON OR LAMINATED ENGRAVED PLASTIC CHAINED WITH JACK CHAINS (NOT BEADED CHAINS) TO THEIR RESPECTIVE VALVES. IDENTIFICATION SYMBOLS OR DESIGNATIONS SHALL BE THE SAME AS SHOWN ON THE CONTRACT DOCUMENTS.
- VALVE LOCATIONS ABOVE ACOUSTIC TILE CEILINGS: PROVIDE COLORED BRASS PUSH-PINS COMPLETE WITH A MINIMUM 1/2" SHANK AND 5/8" DIAMETER HEAD. PIN HEAD COLOR SHALL BE BLUE OR COLOR AS SELECTED BY ARCHITECT OR OWNER. LOCATE PUSH-PINS DIRECTLY BELOW ALL SCHEDULED PLUMBING FQUIPMENT

NOT BE INSTALLED DIRECTLY OVER ELECTRICAL PANELBOARDS, SWITCHBOARDS OR MOTOR CONTROL CENTERS, UNLESS THE PIPE IS A MINIMUM OF 6 FEET ABOVE THE ELECTRICAL EQUIPMENT OR ABOVE A STRUCTURAL CEILING (CONCRETE CAP OR SIMILAR). IF COMPLIANCE WITH THIS REQUIREMENT IS NOT POSSIBLE, NOTIFY THE ENGINEER IMMEDIATELY. IF THE PIPING IS DIRECTLY ABOVE AND AT LEAST 6 FEET ABOVE THE ELECTRICAL EQUIPMENT, PROVIDE A GALVANIZED STEEL DRAIN PAN INSTALLED DIRECTLY UNDER THE PIPING. DRAIN PAN SHALL HAVE MINIMUM 2 INCH HIGH SIDES WITH A DRAIN PIPE CONNECTION AT THE LOWEST POINT AND SHALL BE FULL WIDTH OF THE ELECTRICAL EQUIPMENT BEING PROTECTED. EXTEND DRAINPIPE TO EXTERIOR OR TO NEAREST FLOOR DRAIN. 25. <u>PROTECTION OF PLASTIC PIPE</u>: ALL PLASTIC PIPING SHALL BE INSTALLED WITH SUFFICIENT DISTANCE AND/OR INSULATION RELATIVE TO RECESSED LIGHT FIXTURES

IN ACCORDANCE WITH PLASTICS PIPE INSTITUTE (PPI) TECHNICAL NOTE 56 INSTALLATION OF PLASTIC PRESSURE PIPING MATERIALS NEAR IC-RATED AND NON-IC-RATED RECESSED LIGHTING FIXTURES".

- A. GENERAL: CONTRACTOR SHALL PROVIDE ALL INSTRUMENTS, MATERIALS, AND LABOR REQUIRED. TESTS SHALL BE MADE IN THE PRESENCE OF THE OWNER OR AUTHORITY HAVING JURISDICTION OR AS OTHERWISE DIRECTED BY THE ARCHITECT WHO SHALL BE GIVEN FIVE (5) DAYS NOTICE BY THIS CONTRACTOR OF HIS READINESS TO PERFORM SUCH TESTS. ANY LEAKS THAT DEVELOP DURING THE TESTS SHALL BE REPAIRED BY REMAKING THE JOINT OR REPLACING PIPE AND FITTINGS. TEMPORARY CAULKING WILL NOT BE PERMITTED. NO PIPING SHALL BE INSULATED OR CONCEALED UNTIL IT HAS BEEN TESTED, WITH RESULTS ACCEPTABLE TO THE ARCHITECT. AIR TESTING WILL BE ACCEPTABLE WHERE PERMITTED BY THE VIRGINIA CONSTRUCTION CODE. DO NOT PERFORM AIR TESTING ON SYSTEMS WHERE PLASTIC PIPING. INCLUDING CPVC AND PEX PIPING, ARE INSTALLED. TEST SYSTEMS EITHER IN ITS ENTIRETY OR IN SECTIONS.
- SOIL, WASTE AND VENT SYSTEMS:
- CONDUCT TESTS BEFORE TRENCHES ARE BACKFILLED OR FIXTURES ARE CONNECTED. CONDUCT WATER TEST AS DIRECTED IN ACCORDANCE WITH THE VIRGINIA CONSTRUCTION CODE AND THIS SPECIFICATION. (2) WATER TEST: IF ENTIRE SYSTEM IS TESTED, TIGHTLY CLOSE ALL
- OPENINGS IN PIPES EXCEPT HIGHEST OPENING AND FILL SYSTEM WITH WATER TO POINT OF OVERFLOW. IF SYSTEM IS TESTED IN SECTIONS, TIGHTLY PLUG EACH OPENING EXCEPT HIGHEST OPENING OF SECTION UNDER TEST, FILL EACH SECTION WITH WATER AND TEST WITH AT LEAST 10-FOOT HEAD OF WATER. IN TESTING SUCCESSIVE SECTIONS, TEST AT LEAST UPPER 10 FEET OF NEXT PRECEDING SECTION SO THAT EACH JOINT OR PIPE EXCEPT UPPERMOST 10-FOOT HEAD OF WATER. KEEP WATER IN SYSTEM, OR IN PORTION UNDER TEST, FOR AT LEAST 15 MINUTES BEFORE INSPECTION STARTS. SYSTEM SHALL THEN BE TIGHT AT ALL JOINTS
- C. POTABLE WATER SYSTEM: TEST AFTER INSTALLATION OF PIPING AND DOMESTIC WATER HEATERS, BUT BEFORE PIPING IS CONCEALED, BEFORE COVERING IS APPLIED AND BEFORE PLUMBING FIXTURES ARE CONNECTED FILL SYSTEMS WITH WATER AND MAINTAIN HYDROSTATIC PRESSURE OF 125 PSIG OR AT 50 PERCENT HIGHER THAN ACTUAL OPERATING PRESSURE WHICH EVER IS GREATER FOR ONE HOUR DURING INSPECTION AND PROVE TIGHT WITHOUT ANY LOSS OF PRESSURE
- D. GAS SYSTEM: GAS PIPING SHALL BE TESTED AND INSPECTED IN ACCORDANCE WITH VIRGINIA CONSTRUCTION CODE.
- E. COMPRESSED AIR SYSTEM: TEST PNEUMATICALLY AT NOT LESS THAN 200 PSI FOR ONE HOUR WITHOUT ANY LOSS OF PRESSURE. EACH JOINT SHALL BE CHECKED WITH SOAP SUDS IF ANY LOSS OF PRESSURE OCCURS.
- F. OPTIONAL TESTS FOR CONNECTIONS TO EXISTING SYSTEMS: AFTER INSTALLATION OF PIPING AND CONNECTING TO EXISTING SYSTEMS, AND WHERE HEREIN BEFORE SPECIFIED TESTS ARE IMPRACTICAL, TEST ALL NEW PIPING UNDER ACTUAL OPERATING CONDITIONS AND PROVE TIGHT TO THE

SATISFACTION OF THE ARCHITECT. 27. DISINFECTION: AFTER TESTS HAVE BEEN SUCCESSIVELY COMPLETED, THOROUGHLY FLUSH AND DISINFECT THE INTERIOR DOMESTIC WATER DISTRIBUTION SYSTEM IN ACCORDANCE WITH THE VIRGINIA CONSTRUCTION CODE. 28. <u>CLEANING</u>:

- A. REMOVE TRASH, PLASTER, DUST, PAINT SPOTS AND ALL FOREIGN MATTER FROM INSIDE AND OUTSIDE OF ALL FIXTURES AND EQUIPMENT.
- B. THE CONTRACTOR SHALL CHECK EACH LENGTH OF PIPE BEFORE IT IS PUT IN PLACE TO MAKE CERTAIN THERE IS NOT FOREIGN MATERIAL (STONES, SAND, ETC.) IN THE SYSTEMS. PROVIDE TEMPORARY BYPASS AROUND EQUIPMENT IF OR AS REQUIRED. ALL PLUMBING PIPES SHALL BE THOROUGHLY FLUSHED WITH WATER TO REMOVE CONSTRUCTION DEBRIS BEFORE FINAL CONNECTIONS ARE MADE TO EQUIPMENT AND FIXTURES.

VERIFY IN WRITING BEFORE COMPLETION OF THE JOB THAT ALL SPECIFIED CLEANING PROCEDURES, TESTS AND STERILIZING HAVE BEEN PERFORMED, WITH RESULTS AS SPECIFIED OR AS REQUIRED BY CODES.

09.19.2024 SRODNEY D. FANNING Lic. No. 034568  $\cap$ 0 Ζ R  $\square$ Ш Δ S C ш Ω Ζ ש  $\frown$  $\supset$ R Designed | DHH CAD Drawn Checked RDF 09.19.2024 Date Project No. 17533

> THOMPSON & LITTON

Sheet No



VIRGINIA TECH UBO APPROVAI









SECOND FLOOR DEMOLITION PLAN - PLUMBING SCALE: 1/8" = 1'-0"

SECOND FLOOR NEW WORK PLAN - PLUMBING







AND

O

GEOS

PLUMBIN

S Z

Δ

ORK

 $\geq$ 

NEW

HALL

DERRING

ECH

VIRGINIA



#### PLAN NOTES:

- 1. REMOVE EXISTING SEDIMENT TRAP AND DRAIN PIPING. CAP WASTE PIPING BELOW FLOOR.
- 2. REMOVE EXISTING SINK, FAUCET, P-TRAP AND HOT AND COLD WATER PIPING. CAP WATER PIPING BELOW FLOOR.
- 3. CAP VENT PIPING ABOVE CEILING.
- 4. PATCH FLOOR OR WALL TO MATCH EXISTING CONDITIONS.





Designed DHH

Checked RDF

Drawn

Date

Project No.

CAD

17533

09.19.2024

LAWRENCE PERRY & ASSOCIATES Consulting Engineers 15 E Salem Avenue SE, Suite 101 Ph: (540) 342-1816 Roanoke, Virginia 24011 Fax: (540) 344-3410 Comm. No.: 23101.40  $\odot$ Lawrence Perry and Associates, Inc.



# THIRD FLOOR DEMOLITION PLAN - PLUMBING





## THIRD FLOOR NEW WORK PLAN - PLUMBING SCALE: 1/8" = 1'-0"















### DEMO PLAN NOTES:

- 1. EXISTING AIR COMPRESSOR TO REMAIN.
- 2. EXJISTING AIR FILTER/REGULATOR TO REMAIN.

- 5. EXISTING HOOD WITH COLD WATER AND AIR TO REMAIN.
- 7. REMOVE EXISTING WATER TO HIGH CEILING AND CAP.

- 9. REMOVE EXISTING HOT AND COLD WATER PIPING TO WITHIN WALL AND CAP FOR NEW WORK.

# NEW WORK PLAN NOTES:

- LARGER.

- 3. RELOCATE EXISTING EYE/FACE WASH.

- 6. NEW OWNER PROVIDED LAB SINK AND CONTRACTOR PROVIDED FAUCET.
- 7. EXTEND NEW 1/2" HOT AND COLD WATER PIPING TO LAB SINK.
- 8. EXTEND NEW 1 1/4" DRAIN TO EXISTING CAPPED WASTE OUTLET.

- 10. EXTEND NEW 1/2" HOT AND COLD WATER PIPING TO EXISTING RISERS.

- 9. EXTEND NEW 1 1/4" DRAIN TO EXISTING WASTE RISER.



# 3. EXISTING EYE/FACE WASH WITH DRAIN AND WATER TO BE RERELOCATED. SEE NEW WORK THIS SHEET. 4. EXISTING SINK, DECK MOUNTED HOT AND COLD WATER FAUCET WITH GLASS DRAIN TO BE REMOVED. 6. EXISTING SINK WITH STANDARD DRAIN, HOT AND COLD WATER WITH VACUUM BREAKER TO REMAIN.

8. REMOVE EXISTING FLOOR DRAIN TO BELOW FLOOR AND CAP. PATCH FLOOR TO MATCH EXISTING CONDITIONS.

10. REMOVE EXISTING 1 1/4" DRAIN TO WITHIN WALL AND CAP FOR NEW WORK.

1. EXTEND NEW 3" SANITARY WASTE PIPING TO EXISTING SANITARY WASTE OF EQUAL SIZE OR

2. NEW 2" VENT PIPING. EXTEND UP TO EXISTING VENT PIPING OF EQUAL SIZE OR LARGER.

4. 1/2" TEMPERED WATER DOWN TO EYE/FACE WASH. MAKE FINAL CONNECTIONS.

5. DISCHARGE 1-1/4" DRAIN OVER NEW 3"FD. TERMINATE 3 PIPE DIAMETERS ABOVE FLOOR DRAIN.

11. NEW ACID NEUTRALIZATION/DILUTION TANK.

12. PROVIDE ACID RESISTANT WASTE PIPING FROM SINK TO NEUTRALIZATION TANK. PROVIDE STANDARD WASTE PIPING FROM TANK TO EXISTING BUILDING WASTE PIPING.



# 1 P102 PARTIAL PLAN - PLUMBING SCALE: 1/4" = 1'-0"

VIRGINIA TECH UBO APPROVAL

LAWRENCE PERRY & ASSOCIATES **Consulting Engineers** 15 E Salem Avenue SE, Suite 101 Ph: (540) 342-1816 Roanoke, Virginia 24011 Fax: (540) 344-3410 omm. No.: 23101.40 C Lawrence Perry and Associates, Inc.



#### FOURTH FLOOR DEMOLITION PLAN - PLUMBING SCALE: 1/8" = 1'-0"



#### FOURTH FLOOR NEW WORK PLAN - PLUMBING SCALE: 1/8" = 1'-0"

#### DEMO PLAN NOTES:

- 1. EXISTING HAND SINK WITH FAUCET AND STANDARD DRAIN TO BE REMOVED.
- 2. REMOVE EXISTING HOT AND COLD WATER PIPING TO WITHIN WALL AND CAP.
- 3. EXISTING 1 1/4" DRAIN TO BE REMOVED TO WITHIN WALL AND CAP.
- 4. EXISTING LAB SINK WITH FAUCETS AND DRAIN TO BE REMOVED.
- EXISTING CONDITIONS.
- 6. EXISTING 1 1/4" DRAIN TO BE REMOVED TO BELOW FLOOR AND CAP.
- 7. REMOVE EXISTING HOT AND COLD WATER PIPING TO BELOW FLOOR AND CAP.

- 10. REMOVE EXISTING PRECISION SCIENIFIC EQUIPMENT
- 11. REMOVE EXISTING DISHWASHER. REMOVE EXISTING DRAIN PIPING TO BELOW FLOOR AND CAP. REMOVE EXISTING HOT AND COLD WATER PIPING TO WITHIN THE NEW STORAGE RM 4021A AND CAP.
- 12. EXISTING 2"V DOWN TO BE REMOVED AND CAP.
- PATCH FLOOR TO MATCH EXISTING CONDITIONS. REMOVE ALL HOT & COLD WATER PIPING.
- FLOOR. PATCH FLOOR TO MATCH EXISTING CONDITIONS.
- 16. EXISTING STEAM PIPING SHALL BE REMOVED OR RELOCATED. SEE MECHANICAL PLAN.
- 17. EXSITING BARNSTEAD ELECTRIC STILL ABOVE AUTOCLAVE SHALL REMAIN.
- 18. EXISTING ELECTRICAL PANEL TO BE REMOVED OR RELOCATED. SEE ELECTRICAL PLANS.
- 19. REMOVE EXISTING DRENCH SHOWER AND PIPING BACK TO RISER OR ACTIVE COLD WATER SERVICE LINE.





KEY PLAN