

PART 1 - GENERAL

1.01 DESCRIPTION:

- A. INCLUDE ALL NECESSARY APPARATUS, EXCAVATING, CONTROLS, VALVES AND FITTINGS REQUIRED FOR A COMPLETE SANITARY PLUMBING SYSTEM.

PART 2 - PRODUCTS

2.01 PIPING:

A. DOMESTIC HOT AND COLD WATER PIPING: (COPPER)

- ABOVE GRADE: HARD COPPER TUBE: ASTM B88, TYPE "L", WATER TUBE, HARD DRAWN TEMPER, WITH SOLDERED JOINTS AND WROUGHT COPPER SOCKET FITTINGS.
  - CPVC PIPING, CPVC PIPE: ASTM F 441/F 441M, SCHEDULE 40 OR SCHEDULE 80. CPVC PIPING SYSTEM: ASTM D 2846/D 2846M, SDR 11, PIPE AND SOCKET FITTINGS
- B. BUILDING SOIL, DRAIN, WASTE, VENT AND STORM PIPING:
- INTERIOR BELOW GRADE: SCHEDULE 40 PVC PIPE: SHALL BE MANUFACTURED FROM PVC COMPOUND WITH A CELL CLASS OF 12454 PER ASTM D 1784 AND CONFORM WITH NATIONAL SANITATION FOUNDATION (NSF) STANDARD 14. PIPE SHALL BE IRON PIPE SIZE (IPS) CONFORMING TO ASTM D 1785 AND ASTM D 2665. INSTALLED IN ACCORDANCE WITH ASTM D 2321. FOAM-CORE PVC PIPING WILL NOT BE ACCEPTABLE.
  - INTERIOR ABOVE GRADE: HUBLESS CAST IRON PIPE: HUBLESS CAST IRON PIPE AND FITTINGS SHALL BE MANUFACTURED FROM GRAY CAST IRON AND SHALL CONFORM TO ASTM A 888 AND CISPI STANDARD 301. ALL PIPE SHALL BE MARKED WITH THE COLLECTIVE TRADEMARK OF THE CAST IRON SOIL PIPE INSTITUTE AND LISTED BY NSF INTERNATIONAL. ONLY PIPING PRODUCTS MADE IN THE USA WILL BE ACCEPTABLE. SHALL BE MANUFACTURED BY CHARLOTTE PIPE AND FOUNDRY COMPANY, TYLER PIPE OR AB&I FOUNDRY.

2.02 PIPE FITTINGS:

- A. DOMESTIC HOT AND COLD WATER PIPING: FOR ABOVE GRADE PIPING, WROUGHT COPPER, SOLDER-JOINT PRESSURE FITTINGS, ASME B16.22. PROVIDE REDUCING FITTINGS TO REDUCE PIPE SIZE. BUSHINGS WILL NOT BE ACCEPTABLE.
- B. PVC PIPING FITTINGS SHALL BE MANUFACTURED FROM PVC COMPOUND WITH A CELL CLASS OF 12454 PER ASTM D 1784 AND CONFORM WITH NATIONAL SANITATION FOUNDATION (NSF) STANDARD 14. FITTINGS SHALL BE SCHEDULE 40 PVC PLASTIC WITH SOLVENT CEMENTED JOINTS. FITTINGS SHALL CONFORM TO ASTM D 2665. FOAM-CORE PVC PIPING WILL NOT BE ACCEPTABLE. IN AREAS OF THE BUILDING DEFINED AS PLENUMS, PROVIDE SERVICE WEIGHT NO-HUB PATTERN CAST IRON SOIL PIPE IN LIEU OF PVC. ALL PVC DWV PIPE FITTINGS 8 INCH AND LARGER SHALL BE MADE FROM THE SAME MANUFACTURER.
- C. HUBLESS CAST IRON PIPING FITTINGS: SHALL BE MANUFACTURED FROM GRAY CAST IRON AND SHALL CONFORM TO ASTM A 888 AND CISPI STANDARD 301. ALL FITTINGS SHALL BE MARKED WITH THE COLLECTIVE TRADEMARK OF THE CAST IRON SOIL PIPE INSTITUTE AND LISTED BY NSF INTERNATIONAL. ONLY PIPE AND FITTINGS MADE IN THE USA WILL BE ACCEPTABLE. ALL SHALL BE MANUFACTURED BY CHARLOTTE PIPE AND FOUNDRY COMPANY, TYLER PIPE OR AB&I FOUNDRY.

2.03 PIPE JOINTS:

- A. SOLDER JOINTS (2-1/2" AND SMALLER) IN TYPE L COPPER TUBING AND ON ALL COPPER WASTE PIPING: WIRE SOLDER, 95/5 LEAD FREE, IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
- B. JOINTS IN PVC PIPING:
- JOINTS FOR SCHEDULE 40 PVC PIPING SHALL BE SOLVENT CEMENT. SOLVENT CEMENTS SHALL CONFORM TO ASTM D 2564. PRIMER SHALL CONFORM TO ASTM F 656.
- D. JOINTS FOR NO-HUB SOIL PIPING SHALL CONFORM TO CISPI STANDARD 310 AND BE CERTIFIED BY NSF INTERNATIONAL. GASKETS SHALL CONFORM TO ASTM C 564. ALL PIPE AND FITTINGS TO BE PRODUCED BY A SINGLE MANUFACTURER AND ARE TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND APPLICABLE CODE REQUIREMENTS. COUPLINGS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S BAND TIGHTENING SEQUENCE AND TORQUE RECOMMENDATIONS. TIGHTEN BANDS WITH A PROPERLY CALIBRATED TORQUE LIMITING DEVICE. THE SYSTEM SHALL BE HYDROSTATICALLY TESTED AFTER INSTALLATION TO 10 FT. OF HEAD (4.3 PSI MAXIMUM). NO-HUB COUPLINGS SHALL BE MANUFACTURED BY HUSKY, CHARLOTTE, OR MISSION.
- E. JOINT CONSTRUCTION FOR SOLVENT-CEMENTED PLASTIC PIPING: CLEAN AND DRY JOINING SURFACES. JOIN PIPE AND FITTINGS ACCORDING TO THE FOLLOWING:
- COMPLY WITH ASTM F 402 FOR SAFE-HANDLING PRACTICE OF CLEANERS, PRIMERS, AND SOLVENT CEMENTS. APPLY PRIMER.
  - CPVC PIPING: JOIN ACCORDING TO ASTM D 2846/D 2846M APPENDIX.

2.04 GRADES:

- A. HORIZONTAL DRAINAGE PIPING LESS THAN 3 INCH DIAMETER SHALL BE INSTALLED WITH FALL OF NOT LESS THAN 1/4 INCH PER FT. DRAINAGE PIPING 3 INCH DIAMETER AND LARGER SHALL BE INSTALLED WITH FALL OF NOT LESS THAN 1/8 INCH PER FOOT UNLESS OTHERWISE SHOWN ON THE DRAWINGS.

2.05 VALVES AND SPECIALTY ITEMS:

- A. GATE VALVES: 200 PSI WOG, NON-RISING STEM, SOLID WEDGE, SOLDER ENDS AND BOLTED BONNET ON SIZES 2 INCH AND SMALLER. FLANGED ENDS AND BOLTED BONNET ON SIZES 2-1/2 INCH AND LARGER.
- B. CHECK VALVES: 200 PSI WOG, HORIZONTAL SWING, REGROUND TYPE, RENEWABLE DISCS, Y-PATTERN AND SOLDER ENDS ON SIZES 2 INCH AND SMALLER. BOLTED BONNET, RENEWABLE SEAT AND DISCS AND FLANGED ENDS ON SIZES 2-1/2 INCH AND LARGER. CHECK VALVE, NIBCO U51BC OR EQUIVALENT, SHALL BE ACCEPTABLE.
- C. BALL VALVES: 400 PSI WOG, FULL PORT, 3/4" CONNECTION, BLOW-OUT PROOF STEM, SOLDER ENDS, 2 INCH AND SMALLER ONLY. PVC BALL VALVE, NIBCO U51TB-E, OR EQUIVALENT SHALL BE ACCEPTABLE.
- D. ASSE 1070 THERMOSTATIC POINT OF USE MIXING VALVE, 1/2" INLETS, 1/2" OUTLET, IPS CONNECTIONS, LEAD FREE BRASS BODY LOCKED TEMPERATURE ADJUSTMENT CAP (VANDAL RESISTANT), COPPER ENCAPSULATED THERMOSTAT ASSEMBLY WITH POLYMER THERMOPLASTIC SHUTTLE STAINLESS STEEL SPRINGS INTERNAL CHECK VALVES ON HOT AND COLD INLETS.
- E. CALIBRATED BALANCE VALVES: CLASS 125 AT 250 DEGREES F, BRONZE BODY, LEAK TIGHT BALL CONSTRUCTION. VALVES SHALL HAVE DIFFERENTIAL PRESSURE READ OUT CHART WITH CHECK VALVES ACROSS THE VALVE SEAT AREA. VALVES SHALL HAVE MEMORY STOP FEATURE TO ALLOW VALVE TO BE CLOSED FOR SERVICE AND REOPENED TO SET POINT WITHOUT DISTURBING BALANCE POSITION. VALVES SHALL BE CAPABLE OF METERING TO A MINIMUM OF 0.5 GPM. VALVES SHALL HAVE AN ATTACHED CALIBRATED NAMEPLATE TO INDICATE DEGREE OF CLOSURE.
- F. ESCUTCHEONS: PROVIDE METAL ESCUTCHEON PLATES FOR PIPING ENTERING WALLS AND CEILINGS IN PROSELT SPACES. PROVIDE POLISHED STAINLESS STEEL PLATES OR CHROMIUM-PLATED FINISH ON CHROMIUM ALLOY PLATES IN FINISHED SPACES. PROVIDE PAINT FINISH ON METAL PLATES IN UNFINISHED SPACES.

2.06 HANGERS AND SUPPORTS:

- A. UPPER ATTACHMENTS:
- HANGERS SHALL BE ATTACHED TO WOOD STRUCTURE BY MEANS OF 3/8 INCH LAG BOLTS OR 2 INCH NO. 18 WOOD SCREWS.
  - IN POURED-IN-PLACE CONCRETE, INSTALL EITHER CONCRETE INSERTS OR DRILL CONCRETE ANCHORS. DO NOT DRILL IN PRECAST PANS.
    - INSERTS SHALL BE: B-LINE FIG. B 3014 OR EQUAL BY ELCEN OR GRINNELL.

- ANCHORS SHALL BE EXPANSION "DROP-IN" TYPE. INSTALL ANCHORS IN DRILLED HOLES PER MANUFACTURER'S RECOMMENDATIONS. HILTI SERIES 5490000 OR EQUAL BY RED HEAD OR RAWL.
- STEEL: MALLEABLE BEAM CLAMP WITH LOCKNUT MANUFACTURED BY B-LINE B-3055 OR EQUAL BY ELCEN, GRINNELL, OR MICHIGAN HANGER.
  - CHANNEL IRON: WHEN PIPING RUNS PARALLEL TO BAR JOISTS AND CANNOT BE HUNG DIRECTLY FROM JOISTS, PROVIDE ANGLE IRON TO SPAN TWO BAR JOISTS AND USE ANGLE IRON AS UPPER ATTACHMENT.

B. PIPE ATTACHMENTS:

- PIPE CLEVIS HANGERS SHALL BE MANUFACTURED BY B-LINE B-3100 OR EQUAL BY GRINNELL OR MICHIGAN HANGER.
- COPPER TUBING HANGERS SHALL BE MANUFACTURED BY B-LINE B-3172CT OR EQUAL BY GRINNELL OR MICHIGAN HANGER.
- WROUGHT IRON AND STEEL PIPE CLEVIS HANGERS SHALL BE MANUFACTURED BY B-LINE B-3100 OR EQUAL BY GRINNELL OR MICHIGAN HANGER.
- PIPE SHIELDS SHALL BE MANUFACTURED BY B-LINE B3380 SERIES.
- PROVIDE INSULATED PIPING LARGER THAN 2-1/2 INCH WITH CALCIUM SILICATE INSERTS AT ALL SUPPORTS AND HANGERS.

C. HANGER RODS:

PIPE SIZE	ROD DIAMETER
2 INCH AND SMALLER	3/8 INCH ROD
2-1/2 INCH TO 4 INCH	1/2 INCH ROD

- D. VERTICAL SUPPORTS SHALL BE OFFSET PIPE CLAMP MANUFACTURED BY B-LINE B-3148 OR EQUAL BY ELCEN OR MICHIGAN HANGER.
- E. RISER CLAMP SHALL BE MANUFACTURED BY B-LINE B-3373 OR EQUAL BY GRINNELL OR MICHIGAN HANGER.

2.07 PIPING INSULATION:

- A. PRE-MOLDED GLASS FIBER PIPE INSULATION: PIPE INSULATION SHALL BE 4 PCF DENSITY FIBROUS GLASS WOOL ACCURATELY MOLDED TO CONFORM TO THE OUTSIDE DIAMETER OF THE PIPE. INSULATION SHALL BE THE ONE PIECE SNAP-ON OR SELF-SEALING LAP TYPE WITH WHITE ALL-SERVICE JACKET AND VAPOR BARRIER. INSULATION SHALL BE SUITABLE FOR USE ON HOT OR COLD LINES WITH A TEMPERATURE RANGE OF 35 TO 400 DEGREES F. THERMAL CONDUCTIVITY SHALL NOT EXCEED 0.26 AT 75 DEGREES F MEAN TEMPERATURE.
- B. PRE-MOLDED GLASS FIBER INSULATION THICKNESS IN INCHES:

UP TO SERVICE	1"	2"
HOT WATER AND HOT WATER CIRCULATING	1"	1-1/2"
COLD WATER	1/2"	1/2"

C. INSULATE THE FOLLOWING WITH PRE-MOLDED GLASS FIBER INSULATION:

- DOMESTIC HOT WATER PIPING BELOW GROUND.
- CONDENSATE DRAIN PIPING.

D. GLASS FIBER WRAP PIPE INSULATION:

- PIPE INSULATION SHALL BE 1 PCF DENSITY FIBROUS GLASS WOOL WRAPPING WITH FACTORY APPLIED ALL-SERVICE JACKET. INSULATION SHALL BE SEALED WITH VAPOR BARRIER TAPE.
- INSULATE THE FOLLOWING WITH 1-1/2" THICK GLASS FIBER WRAP PIPE INSULATION: THE P-TRAP BODY AND THE FIRST 10 FEET OF THE HORIZONTAL PORTION OF SANITARY DRAIN PIPING WHENEVER A FLOOR DRAIN IS USED FOR CONDENSATE DRAIN COLLECTION AND WHEN THE FLOOR DRAIN IS LOCATED ON AN ELEVATED SLAB.

2.08 TRAP PRIMER:

- A. PROVIDE TRAP PRIMERS ON ALL FLOOR DRAINS. CONNECT TRAP PRIMER TO DOMESTIC COLD WATER PIPING AT LEAST 2" ABOVE THE TRAPS TO ENSURE PROPER FLOW. TRAP PRIMERS SHALL BE ACCESSIBLE AND SHALL BE INSTALLED ABOVE CEILING SPACE IN AREAS WHERE LIFT OUT TILE SUSPENDED CEILING ARE PRESENT. PROVIDE ACCESS PANELS IN AREAS WITH NON-REMOVABLE CEILINGS.
- B. TRAP PRIMERS SHALL BE MANUFACTURED BY PRECISION PLUMBING PRODUCTS MODEL PRIME-RITE OR EQUAL BY SMOAN, WATTS, MIFAB OR ZURN.

2.09 TRAP GUARD:

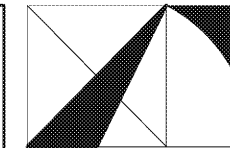
- A. SEWER GAS AND SEWAGE BACKUP PROTECTION FLOOR DRAINS: TRAP GUARD® FLOOR DRAIN.
- DESCRIPTION:
- MATERIAL: SMOOTH, SOFT, FLEXIBLE, ELASTOMERIC PVC MATERIAL MOLDED INTO SHAPE OF DUCK'S BILL, OPEN ON TOP WITH CURL CLOSURE AT BOTTOM.
  - ALLOWS WASTEWATER TO OPEN AND ADEQUATELY DISCHARGE FLOOR DRAIN THROUGH ITS INTERIOR.
  - CLOSES AND RETURNS TO ORIGINAL MOLDED SHAPE AFTER WASTEWATER DISCHARGE IS COMPLETE.
- C. COMPLIANCE:
- ASME A112.6.3.
  - NSF/ANSI 14.
- D. MANUFACTURER: PROSET SYSTEMS, INC., 1355 CAPITAL CIRCLE, LAWRENCEVILLE, GEORGIA 30043. TOLL FREE (800) 262-5355. PHONE (770) 339-1782. FAX (770) 339-1784. WEBSITE WWW.TRAP GUARD.COM.

2.10 CLEANOUTS:

- A. CLEANOUTS IN SOIL PIPE LINES SHALL BE PROVIDED WITH THREADED PLUG WITH SQUARE HEAD.
- B. CLEANOUTS IN FLOORS SHALL BE J.R. SMITH SERIES 4000 OR EQUAL BY ZURN, WADE, WATTS, MIFAB OR JOSAM. FLOOR CLEANOUTS SHALL HAVE INSIDE CAULK OUTLET, COATED CAST IRON INTERNAL CLEANOUT WITH LEAD SEAL, BRASS RIM, AND NICKEL BRONZE COVER PLATE FOR LIGHT TRAFFIC, SECURED TO PLUG BY COUNTERSUNK SCREW FOR INSTALLATION FLUSH WITH FINISHED FLOOR. CLEANOUTS IN WALLS SHALL BE J.R. SMITH SERIES 4422 OR EQUAL BY ZURN, WADE, JOSAM, MIFAB OR WATTS.
- C. WHERE PIPING IS CONCEALED IN WALLS INSTALL CLEANOUTS WITH COUNTER-SUNK PLUGS AND CHROME PLATED OR STAINLESS STEEL COVERS ON THE SURFACE OF THE WALL. FOR CLEANOUTS IN FLOORS WITH VINYL COMPOSITION TILE (VCT) PROVIDE COVER PLATE WITH DEPRESSION FOR INSET IN THE VCT. PROVIDE CARPET MARKER IN CARPETED AREAS

2.11 WATER HAMMER ARRESTORS:

- A. FIELD FABRICATED AIR CHAMBERS WILL NOT BE ACCEPTABLE.
- B. SELECT AND SIZE WATER HAMMER ARRESTORS IN STRICT ACCORDANCE WITH STANDARD PDI - WH201.
- C. ARRESTORS SHALL BE MANUFACTURED BY PRECISION PLUMBING PRODUCTS SC-500, SC-750 OR SC-1000, OR EQUAL BY ZURN, J.R. SMITH, WADE, JOSAM OR WATTS.

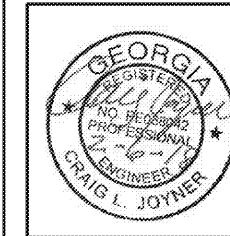


THE ARCHITECTURE GROUP, INC.

377 Peachtree St. N.  
Atlanta, GA 30308  
Phone: (678) 222-0375  
Fax: (678) 222-0384  
http://www.architecturegroup.com

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2018 MRRF CAMPUS-WIDE ADA IMPROVEMENTS  
PROJECT No. IGSU-026-18  
TAG PROJECT No. 1706  
GEORGIA STATE UNIVERSITY  
ATLANTA, GEORGIA


100% CDE 2/5/2017  
REVISIONS

DATE 2/5/2017

DRAWN BY

CHECKED

APPROVED

SCALE AS NOTED

PROJECT NUMBER 1706

DRAWING TITLE

PLUMBING SPECIFICATIONS

DRAWING NUMBER

UL P0.3



SPENCER BRISTOL ENGINEERING, INC.  
A Gray Company  
3577 Parkway Lane, Suite 250  
Peachtree Corners, Georgia 30092  
Tel. 770.414.1628 Fax 770.414.6024  
SBE Project No. 1744