- A. Reference: All portions of General Conditions apply to Plumbing work.
- B. Guarantees: Provide written one year guarantee for all systems and equipment. Compressors shall be guaranteed for five years.
- C. Codes: Comply with National, State and City codes and other applicable standards. All portions of the International Energy Conservation Code (IECC) and Current Local AHJ Commercial Energy Conservation Codes must be complied with.
- D. Supervision: Provide supervisor in field for each phase of work.
- E. Coordination: Coordinate all work with other trades. Provide mechanical and plumbing equipment with electrical characteristics compatible with that shown on the Electrical Drawings and described in the Electrical Division of the specifications. The engineer reserves the right to move services as required to coordinate the work, at no cost to the
- F. The drawings are schematic in nature, and should not be scaled, but show the various components of the systems approximately to scale and attempt to indicate how they are to be integrated with other parts of the building. Determine exact locations by job measurements, by checking the requirements of other trades, and by reviewing all Contract Documents. The drawings indicate general routing of the various parts of the systems, but do not indicate all fittings, offsets, and run outs which are required. The Contract shall include all fittings, offsets, and run outs required to fit the system into
- G. Shop Drawings and Submittal Data: PAPERLESS SUBMITTAL ONLY TO ENGINEER. All Shop Drawings and Submittal Data shall be an electronic file format only. PDF format is acceptable. All equipment and materials shall be submitted, including piping and equipment changes, as required. Submitted items that deviate from the drawings and specifications shall be highlighted in yellow for easy distinction. Requests for substitutions shall be submitted for review and approval a minimum of 15 business days prior to final bids. Mark all items and show that they comply with the IECC. The Engineer shall issue a letter stating the action taken on the submittal. The letter shall be copied and attached to the submittal, by the contractor, and distributed as required.
- H. Record Data: Obtain, at Contractor's expense, a set of prints and keep these on the job site during construction. During construction, mark on these prints any changes that are made, noting particularly locations of those items that will need to be for servicing. Convert record data to an Electronic Format (PDF) and submit to the Architect. Furnish one set of shop drawings and maintenance manuals in brochure form. Record Brochures shall be given to the owner at completion of the work.
- I. Permits, Fees: Secure and pay for all fees and charges for the work. Furnish certificates of acceptance at completion of the job from City.
- J. Substitutions: No substitutions shall be made without prior approval from the Architect and Engineer.
- K. Cutting and Patching: Cutting to be by this section, with patching and furring by General Contractor. Patching required after completion of work shall be paid for by Contractor.
- L. Clean Up: Clean and touch-up paint all equipment at completion of work. Protect all equipment from damage during construction. Provide name plates on all equipment.
- M. Tests: Tests all piping systems per local code. Sterilize all new water piping per Health Department requirements.
- N. Test all equipment and prove performance results to Architect. Modify all drives, balance all systems as shown on the drawings. After Owner has occupied and is using the building, make additional inspections of the system. Correct any Owner's observed temperature imbalances. Check correct operation of equipment and verify by letter to the Architect, on each trip. List in the letter corrections made. At the opposite season of the startup inspect and verify correct operation of all systems. Tests all control systems. Furnish complete copy of all test data to Architect. Instruct owner for one day in operation of all systems. Filters and strainers shall be clean when systems are accepted by the owner. Testing Regulations must meet local City Requirements.
- O. Excavating and Backfilling: Excavate to provide minimum 2 feet cover over all piping and conduit. Back fill to original compaction. Saw-cut existing finishes and patch to matching original conditions.
- P. Noise and Vibration: All equipment shall operate with minimum of noise and vibration. Contractors shall rectify any objectionable conditions.
- Q. Temporary Services: Furnish temporary utility as required for new construction.
- R. Equipment Connections: Provide all martial and labor for connecting of all equipment furnished in other sections or by owner. Field verify all equipment for dimensions and roughing-in. Furnish all valves, drain piping, traps, etc., as required to install the
- S. Floor Drains: Final location will be determined by equipment layout and location must be field approved. Provide trap primers to all floor drains. T. Examination of Site: The contractor is responsible for visiting the job site and confirming the location of existing conditions before bidding. If existing conditions require

modification due to elevation, obstruction, size, etc., the contractor will advise in writing

END OF SECTION 15010

before beginning construction.

- 1.2 15030 PLUMBING SPECIFICATIONS
- A. Provide all materials and labor for complete plumbing system.

B. Cleanouts "CO":

- Unfinished Areas and Chases "CO": Smith #4400. Finished Walls "WCO": Smith#4430, With 7" x 7" nickel-bronze plate. 3. Finished Floors "FCO": Smith#4020 with nickel-bronze plate.
- 4. Outside Areas "GCO": Smith#4240 in concrete pad 24"x 24"x6". 5. Equal Cleanouts: Wade, Mifab, Watts, Zurn, or Josam. Install at changes in direction, maximum of 90' spacing, and base on risers and local code.
- C. Valves: Valves to be Nibco or equal by Milwaukee: Ball #T-FP-600A-LF, Globe -#T-211-B Check - #T-413-Y-LF.
- D. Underground valves to be installed in cast iron boxes, with cast iron cover marked
- E. Pipe Hangers: Securely suspend pipes from building structure.
- 1. Individual hangers B-Line #B3100, Standard clevis hanger, pre-galvanized. MSS SP-58 and SP-69, Type 1. 2. Multiple pipes - B-Line #B22SH, 1-5/8" x 1-5/8" pre-galvanized 12 gauge slotted strut trapeze hanger, MSS SP-58 and MSS SP-69 Type 59. Secure with B-Line #B2400 series standard pipe clamps, MSS SP-58 and MSS SP-69 Type 26. Provide B-Line #B199 VibraCushion isolation on copper piping. 3. Wall supports - B-Line #B22SH, 1-5/8" x 1-5/8" pre-galvanized 12 gauge slotted strut anchored to the wall. Secure pipes to strut with B-Line #B2400 series standard pipe clamps. Provide B-Line #B1999 VibraCushion isolation on copper piping. 4. Horizontal Steel Piping shall be supported in accordance with MSS SP-69 Tables 3
- 5. Provide pipe shields in accordance with insulation manufacturers published recommendations per MSS SP-58. 6. Vertical piping floor supports: B-Line #3373, Standard pre-galvanized riser clamps.
- 7. All materials used in supporting pipe to be pre-galvanized. 8. Provide chrome plated wall, ceiling and floor escutcheons where pipes pass through walls or ceilings in exposed areas.

insulation must comply with IECC. Seal all joints with self sealing tape. Fittings shall

be pre molded type, sealed as required. Insulate all cold water piping in outside wall

- 9. Provide pre-galvanized steel pipe sleeves for pipes through walls, floors, and roofs. 1. Insulate hot water piping with MicroLok, fire retardant, white jacketed insulation. All
- chases, or ceilings same as hot water pipe. Exterior piping shall be insulated with water proof-covered insulation and covered with aluminum covers. Provide 18 gauge galvanized saddles at support points as required. 2. Insulate storm drainage piping with minimum 1/2 inch thick MicroLok, fire retardant, white jacketed insulation. Seal all joints with self sealing tape. Fittings shall be pre molded type, sealed as required. Insulate roof drain bodies, vertical pipe to elbow, elbows at roof drains, horizontal runs of storm drainage piping, and first elbow turning

G. Sanitary System (Waste and Vent):

- 1. Below grade: Schedule 40 solid wall PVC pipe conforming to ASTM D2665 and ASTM D1785 and PVC drainage pattern fittings conforming to ASTM D3311 and ASTM D2665 as manufactured by Charlotte Pipe. Install per manufacturer's recommended installation procedures. Buried PVC pipe shall be installed per ASTM D2321. Cellular (Foam) Core piping conforming to ASTM F891 is NOT acceptable. 2. Below grade: Service weight cast iron bell and spigot pipe and fittings conforming to ASTM A-74 as manufactured by Charlotte Pipe, Tyler Pipe, or equal. Make joints with compression gaskets conforming ASTM C564. 3. Above grade: Schedule 40 solid wall PVC pipe conforming to ASTM D2665 and
- ASTM D1785 and PVC drainage pattern fittings conforming to ASTM D3311 and ASTM D2665 as manufactured by Charlotte Pipe. Install per manufacturer's recommended installation procedures.
- 4. Above grade: Service weight cast iron bell and spigot pipe and fittings conforming to ASTM A-74 as manufactured by Charlotte Pipe, Tyler Pipe, or equal. Hubless cast iron soil pipe and fittings conforming CISPI 301. All cast iron soil pipe and fittings shall be marked with the Collective Trademark of the Cast Iron Soil Pipe Institute and be listed by NSF International. Install all cast iron soil pipe systems per the Cast Iron Soil Pipe Institute Handbook.

H. Storm System (Primary and Secondary):

- 1. Below grade: Schedule 40 solid wall PVC pipe conforming to ASTM D2665 and ASTM D1785 and PVC drainage pattern fittings conforming to ASTM D3311 and ASTM D2665 as manufactured by Charlotte Pipe. Install per manufacturer's recommended installation procedures. Buried PVC pipe shall be installed per ASTM D2321. Cellular (Foam) Core piping conforming to ASTM F891 is NOT acceptable. 2. Below grade: Service weight cast iron bell and spigot pipe and fittings conforming to ASTM A-74 as manufactured by Charlotte Pipe, Tyler Pipe, or equal. Make joints with compression gaskets conforming ASTM C564.
- Above grade: Service weight cast iron bell and spigot pipe and fittings conforming to ASTM A-74 as manufactured by Charlotte Pipe, Tyler Pipe, or equal. b. Hubless cast iron soil pipe and fittings conforming CISPI 301.
- c. All cast iron soil pipe and fittings shall be marked with the Collective Trademark of the Cast Iron Soil Pipe Institute and be listed by NSF International. d. Install all cast iron soil pipe systems per the Cast Iron Soil Pipe Institute Handbook.

Water Systems:

- Water piping inside the building shall be type "K or L" copper with copper fittings. Underground service lines shall be ductile iron water pipe and fittings or type "K" copper with brazed copper joints. Provide dielectric fittings at points of connection of
- dissimilar metals. 2. FlowGuard Gold CTS CPVC pipe and fittings shall conform to ASTM D 2846. Pipe and fittings shall be manufactured as a system and be the product of one manufacturer. All pipe and fittings shall be manufactured in the United States. Pipe and fittings shall conform to National Sanitation Foundation (NSF) Standards 14 and

J. Gas Piping System:

- 1. Above Ground Gas System: Black steel, Schedule 40, with malleable iron screw fitting. Test as required by Code but minimum test pressure of 50 PSI held for not less than eight hours without noticeable drop.
- 2. Underground Gas Piping: Outside Building: Provide service line to utility main, extend to buildings and provide meter stations at location indicated. Underground piping shall be Plexco Yellow Pipe, medium density polyethylene resin classified to ASTM D 1248. The piping material shall be rated for medium pressure systems (25 psi or less.) Lay piping in bed of bank sand and back fill with bank sand 6" above top of pipe before beginning back fill with original earth materials. Install a #10 THWN copper conductor tracer wire. Install schedule 40 steel epoxy coated casing Meter Risers (Anode less risers) at meter locations or as piping extends out of ground. Underground system must meet the following standards; ASTM D2513, D.O.T. 192.283. Test as required by Code but minimum test pressure of 50 PSI held for not less than eight hours without noticeable drop.

K. Compressed Air System:

- 1. Furnish and install a Parker Legris Transair pneumatic piping system. All piping shall be low pressure under 100 psig. System shall be aluminum piping with Transair fitting, valves and connectors. Slope piping for proper drainage. 2. Schedule 40 black steel with malleably iron screwed fittings. Slope piping for proper
- Lab Gas: Gas piping for oxygen or nitrogen. Piping to be cleaned and capped hard drawn copper with silver soldered joints. 3/8" gas piping. Gas pressure not to exceed 200psi. Lab gas bottle manifolds and regulators by owner. Final connections by contractor.
- M. Purple Pipe" HDPE Reclaimed Water Service Tubing: Scope: This material specification designates the requirements for Vanguard Pipe & Fittings Ltd. "Purple Pipe" HDPE, PE 3408 reclaimed water service tubing products. All "Purple Pipe" CTS dimension tubing products meet the requirements of ASTM D2737. Material: All "Purple Pipe" tubing products are manufactured from PE 3408 high density polyethylene resin. The inner layer contains a minimum of 2% carbon black ultraviolet light protection to met the cell classification 345464C per ASTM D3350. The outer, purple later contains pigments and ultraviolet stabilizers to meet the cell classification of 345464E per ASTM D3350. Marking and Certification: All "Purple Pipe" tubing products are marked with the name Vanguard Pipe and Fittings, Ltd. as the manufacturer, Reclaimed Water name, nominal size, design pressure rating and temperature ratings, relevant ASTM standards number, manufacturing date and production code, with incremental footage markings and is indent marked for permanent identification. Recommended Uses: "Purple Pipe" tubing is intended and recommended for use in reclaimed water service lines and is not approved for potable water. Design pressure/temperature rating is 200 psi @ 73.4°F for SDR-9 tubing.
- N. Pipe Installation: Install water piping level. Provide drains at low points of system. Sewers and condensate shall be sloped at not less than 1/8 inch per foot. Provide deep seal traps for all floor drains. Pipe shall run parallel to building lines. Full provision shall be made for expansion and contraction of piping. Provide air chambers at each fixture, full line size 12" high. Vent pipes shall be flashed at the roof with approved roof flashing, extending not less than 12" in all directions in all directions. Turn flashing down in to vent 1 inch. Provide a stop valve at every fixture or equipment. All connection to equipment shall be made with unions. Piping shall not contact an electrical conduit at any point. Access doors or panels shall be furnished by this contractor.

O. Piping Joints:

- 1. Cast Iron Bell and Spigot Compression gaskets conforming ASTM C564. 2. Cast Iron No-Hub - Standard Duty hubless couplings conforming to CISPI 310, certified by NSF International, and made in the United States. 3. Cast Iron No-Hub - Heavy Duty hubless couplings conforming to ASTM C1540 and
- manufactured in the United States. 4. Copper pipe - Press type copper fittings with automatic leak detection as manufactured by Viega or equal by Nibco or solder type copper fittings with Lead free
- 5. Screw Joints American standard with Teflon tape. Mechanical joints - ASA S 21.11-53
- ′. Unions At each item of equipment. Where copper and steel pipes are connected
- make connections with insulated type fittings.

P. Plumbing Fixtures:

- 1. All plumbing fixtures shall meet the requirements for water conservation as required by ANSI and local code. 2. Fixtures and installation must meet all ADA requirements.
- 3. Reference drawings for Plumbing Fixture Schedules.
- 4. Acceptable Manufacturers: a. Water Closets (Vitreous China): American Standard, Toto, Sloan.
- b. Water Closets (Stainless Steel): Acorn, Bradley, Willoughby.
- c. Lavatories (Vitreous China): American Standard, Toto, Sloan. d. Lavatories (Stainless Steel): Advance Tabco, Acorn, Bradley, Willoughby, Elkay,
- e. Lavatories (Decks with integral bowls): Bradley, Sloan, Willoughby.
- f. Urinals (Vitreous China): American Standard, Toto, Sloan. g. Urinals (Stainless Steel): Acorn, Bradley, Willoughby.
- h. Mop Sinks/Sevice Sinks: Stern Williams, Fiat. i. Drinking Fountains/Electric Water Coolers: Elkay, Halsey Taylor, Haws, Murdock,
- j. Drains and Carriers: Jay R. Smith, Wade, Watts, Mifab, Zurn, Josam.
- k. Sinks (Stainless Steel): Elkay, Just.
- I. Faucets (Manual): Delta Teck, Chicago, T&S Brass, Symmons, American Standard, Toto.
- m. Faucets (Sensor): Toto, Sloan, Delta Teck, Chicago, Symmons, Bradley. n. Shower Trim: Symmons, Bradley, Chicago, Delta Teck, American Standard,
- Powers, Leonard. o. Emergency Fixtures: Bradley, Guardian, Haws, Encon, Acorn.
- p. Stops, Supplies, P-Traps, Tailpieces: Mcguire. q. ADA Covers: Plumberex, Truebro.
- r. Flush Valves: Sloan, Toto, American Standard, Delaney, Zurn.

Q. Plumbing Accessories:

1. Water Hammer Arrestors shall be installed at all fixtures. Minimum size shall be 3/4". Mechanical devices designs shall be used as allowed by code. Provide access doors for maintenance as required by manufacturer. 2. Trap Primer "TP": Traps shall have P.P.P Inc. Oregon #1 trap primers. Provide trap primer distribution unit for one through four drains. Extend 3/8" copper pipe to all fixtures as required by code or showed on the drawings. Inline Floor Drain Trap

Sealer "Trap Guard" may be installed if allowed by code.

- R. Water Heater:
- 1. Electric Water Heater shall be heavy gauge steel tanks with glass lining and magnesium anodes. Fiberglass insulated tanks with bonderized steel jackets, baked enamel finish. Provide ASME T&P relief valves. Dual electric heating elements, brass hose bibb for draining tanks. Units placed above ceilings shall have auxiliary drain pans with drains line. All drain and relief lines to be minimum 1" copper. Units shall have three year commercial warranty. Systems must comply with IECC. 2. Gas Water Heater shall be heavy gauge steel tanks with glass lining and magnesium
- finish. Provide ASME T&P relief valves. Heater shall be AGA and U.L. Listed. System shall have a thermostat, electronic ignition, safety controls, relays, disconnects, contactors, etc. and be suitable for specified voltage, brass hose bibb for draining tanks. All drain and relief lines to be minimum 1" copper. Units shall have three year commercial warranty. Systems must comply with IECC.

anodes. Fiberglass insulated tanks with bonderized steel jackets, baked enamel

- 3. Instantaneous Electric Water Heater: Units shall be wall mounted, have adjustable temperature settings, designed for low flow continuous supply of 110 degree F hot water, copper sheathed heating elements, solid copper heat exchanger, lead free construction, voltage and watts as specified. Rheem or approved equal. Systems
- must comply with IECC. 4. Instant Hot Water Dispenser: Instant hot water dispensers with Stainless Steel Tank and filter. 200°F water all in one system. In-Sink-Erator Indulge Contemporary F-GN1100. 115 volts.
- S. Interceptors: All interceptors shall be manufactured by Parks USA and shipped to the
- job site ready for instillation. Size shall be per code or as indicated on the drawings. Grease Interceptors Lint Traps
- Holding Tanks Water Meter Vaults Sampling Well Ports Acid Neutralization Systems
- Electrical: Contractors shall coordinate electrical characteristics with Electrical Contractor. Before ordering any equipment, submit a list of maximum overload circuits for all equipment to the Electrical Contractor and Engineer. This Contractor shall furnish all disconnects, control instruments and wiring diagrams showing terminal identification numbers. Electrical Contractor will do all the electrical wiring for power supply and
- U. Fire Sprinkler System:
- 1. Provide a complete NFPA, local code approved fire sprinkler system for the entire building as showed on the drawings. System shall be designed by a State Approved Licensed Engineer. Prepare detailed drawings of the system and obtain approval of local and state authorities. Coordinate locations of sprinkler heads with Architectural, Mechanical and Electrical features of the building. All sprinkler heads in general shall be in a straight line and parallel to the lines of the building. Locate all sprinklers heads in center of ceiling tiles as directed by Architect. 2. Tests and Inspections: Arrange and pay for all tests required by authorities having
- 3. Piping: Schedule 40 Black Steel inside. Underground piping shall be the same as
- described for underground exterior domestic water. Conceal piping in areas with suspended ceilings.
- 4. Equipment: Sprinklers: Viking chrome plated pendants with escutcheons. Provide a sprinkler cabinet with six sprinklers of each type and sprinkler wrench. 5. Alarm Valves: Provide in each main supply riser to sprinkler system. Valves shall have all required trim including U.L. approved water motors operated alarm gongs. Each valve shall have one set of normally closed contacts and one set of normally open contacts to connect to fire alarm system.
- Gongs: Wall mounted, UL listed electric. Siamese Fire Connections shall be located as required by Local Fire Department.
- V. Demolition: Provide materials and labor required for the removal of all plumbing devices as noted on the drawings. Remove all devices related to the demolition of partitions and ceilings of the existing building.

END OF SECTION 15030

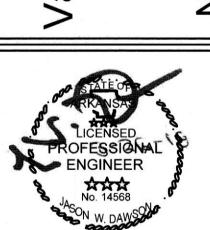
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REVISIONS ISSUE FOR CONSTRUCTION 'B'-ISSUE DATE 'C'-ISSUE

> **PLUMBING SPECIFICATIONS**

P0.01