SECTION 22 05 00

COMMON WORK RESULTS FOR PLUMBING

1.0 GENERAL

1.01 DESCRIPTION

A. This Division 22 and the accompanying drawings cover the provision of all labor, equipment, appliances, and materials and performing all operations in connection with the construction of the plumbing systems as specified herein and as shown.

B. All work specified in this Section is governed by the Common Work Results for Plumbing 22 05 00.

C. The General Provisions and Division 1, including the general, supplementary and other conditions and other Divisions, as appropriate, apply to work specified in this Division.

1.02 EXISTING CONDITIONS

A. Attention is called to the fact that the work is to be performed within an existing, operational facility. Prior to the submission of bids, each bidder shall visit the project site, thoroughly investigate and be familiar with all existing conditions which will affect their work; especially the work to be performed above the existing ceilings.

B. Connect new work to existing work in a neat and workmanlike manner. Where an existing structure must be cut or existing utilities interfere, such obstructions shall be bypassed, removed, replaced or relocated, patched and repaired. Work disturbed or damaged shall be replaced or repaired to its prior condition.

C. Prior to the start of any demolition or construction, secure the services of a qualified, EPA Certified Asbestos Abatement Agency to check the existing insulation, etc. for asbestos. Should asbestos be found, do not proceed with demolition or construction; notify the Architect in any case in writing of the Agency's findings.

1.03 INTENT OF DRAWINGS AND SPECIFICATIONS

A. The implied and stated intent of the drawings and specifications is to establish minimum acceptable standards for materials, equipment and workmanship, and to provide operable plumbing systems complete in every respect.

B. The engineering drawings are diagrammatic, intended to show general arrangement and sizes of system components, and shall not be scaled. Rather, the architectural and structural drawings shall govern space constraints, dimensions and finishes. All offsets and fittings which will be necessary to accomplish the finished installation shall be provided at no additional cost or increase in the Contract.

1.04 SPACE PRIORITY

A. Ensure optimum use of available space for materials and equipment installed above ceilings. Allocate space in the order of priority as listed below except as otherwise detailed. Items are listed in the order of priority, with items of equal importance listed under a single priority number.

1. Gravity flow piping systems
2. Vent piping systems
3. Recessed lighting fixtures
4. Concealed HVAC terminals and equipment
5. Air duct systems
6. Sprinkler piping systems
7. Pressurized piping systems
8. Electrical conduit, wiring, control air tubing

B. Order of space priority does not dictate installation sequence. Installation sequence shall be as required to install all affected trades.

C. The work of this Division 22 shall not obstruct access for installation, operation and maintenance of the work of any other Division.

D. All major items of equipment shall be arranged so as to provide a minimum of 28" clear aisle space. Additional space shall be provided between and around equipment for maintenance and proper operation as shown in the Equipment Manufacturer's literature.

1.05 COORDINATION

A. Coordinate all work under this Division 22 with work under all other Divisions, providing adjustment as necessary.

B. Coordination of space requirements with respect to Division 26 shall be performed such that:

1. No equipment, piping or ductwork, other than electrical, shall be installed within 42" of switchboards or panelboards.
2. No piping or ductwork which ever operates at a temperature in excess of 120°F shall be installed within 3" of any electrical conductor.

C. All items mounted in or below the ceiling, and all items penetrating the ceiling, shall be coordinated with the architectural reflected ceiling plans. If any items are not shown on these plans, or any items need to be relocated for coordination purposes, prepare a reflected ceiling plan and submit it to the Architect for approval.

1.06 CODE COMPLIANCE

A. All workmanship and materials provided under this Division 22 shall comply with all laws, ordinances, codes and regulations of all Federal, State and Local Authorities Having Jurisdiction.

B. All fire suppression, plumbing, heating, ventilating, and air conditioning materials and workmanship shall comply with all local, state, and federal codes and the following standards as minimum requirements:

1. NFPA 70, National Electrical Code, 2017 Edition
2. Life Safety Code (NFPA 101) – 2015 Edition
3. All other NFPA Codes and Standards – Applicable Editions
4. North Carolina State Building Code – 2018 Edition
5. North Carolina State Energy Code – 2018 Edition
6. North Carolina State Fire Prevention Code – 2018 Edition
7. North Carolina State Mechanical Code – 2018 Edition
8. North Carolina State Plumbing Code – 2018 Edition
9. ASME A17.1 Safety Code for Elevators and Escalators – 2013 Edition
10. North Carolina Accessibility Code – 2018 Edition
11. American with Disabilities Act, January 26, 1992
12. American National Standard Handicapped Code, A117.1 – 1986 Edition

C. Secure and pay all fees associated with all permits and licenses required for execution of the Contract. Arrange for all inspections required by City, County, State and other Authorities Having Jurisdiction, and deliver certificates of approval to the Architect.

D. The code requirements are strictly a minimum and shall be met without incurring additions to the Contract. Where requirements of the drawings or specifications exceed the code requirements, the work shall be provided in accordance with these drawings or specifications. In the event of conflict or ambiguity between the various codes, the most stringent requirement shall govern.

1.07 ELECTRICAL REQUIREMENTS AND INTERFACE

A. All electrical equipment and wiring provided under this Division 22 shall comply with the electrical system characteristics indicated on the electrical drawings and specified in Division 26.

B. Electric controls, contactors, starters, pilot lights, push buttons, etc., shall be provided complete as part of the motor, heater or other equipment which it operates. All electrical components shall be in conformance with the requirements of the National Electrical Code and Division 26. Starters shall be wye-delta, closed transition type. Reference Division 26 and the electrical engineering drawings for those motor starters provided under that Division 26. All starters not shown shall be provided under this Division 22. Unless specified otherwise under other individual equipment Sections, motor starters shall conform to the following minimum requirements:

1. Starters for motors 1/3 horsepower or smaller shall be manual unless remote or automatic starting is required, in which case the starters shall be magnetic, full voltage, non-reversing, single-speed, unless otherwise indicated. All other starters shall be magnetic.
2. Each starter for a three-phase motor shall be furnished with three (3) overload relays sized for the full load running current of the motor actually provided. Provide an external "HAND-OFF-AUTO" selector switch with red "RUNNING" light. Provide a green pilot light to indicate motor "STOPPED". Each pilot light shall have a legend plate indicating reason for signal.
3. Each overload relay shall have a normally open alarm contact which will close only when actuated by an overload (not to be confused with N.O. or N.C. auxiliary contacts). These contacts shall be properly wired to their respective blue pilot light provided on the starter front cover and having a "TRIPPED" legend plate.
4. Individually mounted motor starters shall be in a NEMA Type 1 general purpose enclosure in unfinished areas and shall be flush mounted in all finished areas. All starters mounted in exterior areas shall have a NEMA 3R enclosure. Each starter shall have a laminated nameplate to indicate equipment unit number, function and circuit number.
5. All motor starters, push buttons and pilot lights shall be of the same manufacturer as the switchboard and shall be General Electric, Square D, Siemens I.T.E., or Westinghouse.

C. Motor starters for the following equipment shall be provided under this Division 22 by the Manufacturer of the equipment:

6. Pumps without VFDs
7. Other equipment hereinafter specified in other Sections to be provided with integral starters

D. Unless otherwise noted or specified in individual Sections, all 3-phase motors shall be standard NEMA continuous duty "B" type, with Class B insulation, open drip-proof frame for indoor service, TEFC for outdoor service and a service factor of 1.15. All motors 5 HP and larger shall be U.S. Motors Hi-Efficiency Model or Reliance XE Hi-Efficiency Model.

E. All power wiring and final connections to equipment shall be provided under Division 26.

F. Control components, all interlocks (control valves, leak sensors, etc.) and control wiring (120 volt, single phase and less) shall be provided under this Division 22 as required to achieve the specified control sequences.

G. All control wiring over 30 volts shall be installed by a Licensed Electrician working under this Division 22.

1.08 SLEEVES, SEALS AND ESCUTCHEONS

A. Sleeves shall be provided through all pipe penetrations of concrete or masonry walls, elevated floors and roofs, except those plumbing piping penetrations for fixtures, vents, etc.

B. Sleeves shall be fabricated from Schedule 40 steel pipe through 10" and Standard Wall steel pipe for sleeve sizes 12" and larger. All sleeves penetrating exterior walls, underground walls, pit or vault walls shall be provided with a 3" x 3/8" thick waterstop ring welded completely to the midpoint of the sleeve.

C. All sleeves penetrating exterior walls, underground walls, pit or vault walls and elevated floors shall be packed and sealed watertight.

D. Sleeves through roofs shall extend above the roof surface and be flashed watertight.

E. Sleeves through walls shall be cut and finished flush with each surface of the wall in which they are installed.

F. Sleeves through elevated floors shall extend at least ½" above the finished floor and be sealed waterproof between the sleeve and slab.

G. Sleeves shall be sized to provide a minimum of 1/2" clearance between the inside surface of the sleeve and the outside finished surface of the pipe plus any insulation specified.

H. Fire-stops shall be provided as specified herein. All annular spaces between piping and sleeves which do not require fire-stops shall be packed with mineral wool and caulked.

I. Fire-stopping or packing at elevated floor penetrations shall be level with or above the elevation of the top of sleeve to prevent any water ponding on top of the sleeve.

J. Provide round, chrome-plated escutcheons on all exposed piping penetrations passing through walls, floors, partitions and ceilings.

K. All penetrations through rated slabs, walls, etc. shall be in accordance with UL listed systems. Provide rated box-out, fire caulking, etc. as needed to ensure fire rating is maintained in compliance with UL listed systems.

1.09 FIRESTOPS

A. Where piping, conduit, etc. pass through fire partitions, fire walls and floors, a firestop shall be provided that will ensure an effective barrier against the spread of fire, smoke and gases. Firestop material shall be packed tight and completely fill gaps between the ductwork, piping, conduit, etc. and the perimeter of their rough openings.

B. All penetrations shall be in accordance with UL 1479 or ASTM E 814 listed systems, and products used shall be specifically applicable for the appropriate installation conditions. Assemblies shall provide a minimum rating equal to the construction penetrated. Products shall be by HILTI, 3M, or ProSet.

C. Installation shall be by a Qualified Installer. Installer shall be certified, licensed, or otherwise qualified by the Firestopping Manufacturer as having the necessary training to install the Manufacturer's specific product. A Manufacturer or Vendor's willingness to sell the firestopping product to the Contractor or Installer does not in itself confer qualification.

D. Installer shall have at least one of the following qualifications:

1. FM 4991 Approved Contractor
2. UL Approved Contractor
3. HILTI, 3M, or ProSet Accredited Fire Stop Specialty Contractor

E. Installing Firm shall have no less than 3 years of experience with firestop installation.

F. A Manufacturer's direct Representative (not Distributor or Agent) shall be on site during initial installation of firestop systems to train appropriate Contractor personnel in proper selection and installation procedures.

G. The firestop Contractor or Installer shall supply As-Built documentation of each individual penetration location on the project. Documentation shall include a sequential location number, detailed description of the penetration location, size, and type, tested system number, type of assembly penetrated, and rating to be achieved. As-Built documentation shall be included with the close-out materials.

H. Identify through-penetration firestop systems with pressure-sensitive, self-adhesive, preprinted vinyl labels. Attach label permanently on both sides of penetrated construction in a visible location. The label shall include the following:

1. The words "Warning – Through Penetration Firestop System–Do Not Disturb"
2. Through Penetration firestop system designation and Manufacturer
3. Date of Installation

1.10 CORE DRILLING

A. Cutting of holes through concrete and masonry shall be by diamond core or concrete saw. Pneumatic hammer, impact electric and hand or manual hammer type drills will not be allowed, except as permitted by the Architect where required by limited working space. Locate holes such that they will not affect structural sections such as ribs or beams. Holes shall be laid out well in advance of the installation. These layout locations shall be approved by the Architect prior to drilling.

1.11 IDENTIFICATION OF PIPING

A. All aboveground plumbing systems piping and valves sized 3/4" and larger which are installed in accessible locations (including piping above removable ceilings and behind access panels) shall be identified in strict conformance with the "Scheme for the Identification of Piping Systems" (ANSI A13.1-2015)

B. Piping labels in exposed areas shall be oriented and located in coordination with the Architect.

C. System names shall, at minimum, uniquely identify the system and performance category – i.e. 140°F Hot Water Supply, High Pressure Cold Water, etc.

D. Specialized piping (grease waste, acid waste, fuel piping, etc.) installed underground shall be labeled. The label shall be corrosion resistant or shall be permanently marked.

E. Each identification marker shall include the following:

1. Proper color-coded background
2. Proper color of legend in relation to background color
3. Proper legend letter size
4. Proper marker length
5. Direction of flow arrow shall be included on each marker

F. Locations for pipe markers shall be as follows:

1. Adjacent to each valve and fitting
2. At each branch and riser take off
3. At each pipe passage through walls, floors and ceilings
4. On all straight pipe runs every 25 feet except that piping underground required to be labeled shall be labeled every 10 feet or more often as required by the AHJ

G. Identification markers may be stenciled or shall be Setmark Pipe Markers, as manufactured by Seton Name Plate Corporation.

H. All valves shall be identified with the appropriate service designation and valve number brass valve tags. Each valve tag shall be 19 gauge brass with 1/4" black-filled letters over 1/2" black-filled numbers. Tags shall be fastened to valves with brass "S" hooks or brass jack chain. Brass tags and fasteners shall be as manufactured by Seton Name Plate Corporation.

I. Provide charts of all valves. Valve charts shall include the following items:

1. Valve identification Number
2. Location
3. Purpose/Material

2.0 PRODUCTS

2.01 BID BASIS AND SUBSTITUTION PROCEDURES

A. Manufacturer names, series and model numbers, as noted or specified, are for the purpose of describing type, capacity, and quality of equipment, materials and products to be used. Unless "or equal" is specifically stated, bids shall be based only on the specified "basis of design" Manufacturer. The listing of a particular manufacturer as an "equal" or "acceptable substitute" manufacturer shall not be misconstrued as approving, nor allowing the substitution of, that Manufacturer's standard product in place of the basis of design. No consideration will be given to a product which would require dimensional, spatial or aesthetic changes to the project. "Acceptable substitute" and "equal" manufacturers shall only bid those products which exactly match the size and other characteristics of the specified basis of design. Any changes to other disciplines and trades of work required by an "or equal" or "substitute" product shall be duly considered and priced accordingly prior to bidding or pricing. The decision as to whether or not a proposed substitute or "equal" product is actually equal to that specified shall rest solely with the Architect.

B. Requests to provide "equal" products in lieu of those specified shall be submitted to the Architect in writing at least ten (10) days prior to final pricing and execution of the Contract. No consideration will be given to substitute products after final pricing and execution of the Contract.

C. Any "or equal" product or proposed product substitution which will cause a change in the appearance, dimensions or design of any part of the building, structure, electrical system, or any other engineered systems shall be accompanied by a scaled drawing and written description of the required change(s) for approval by the Architect. If deemed necessary by the Architect, design changes shall be signed and sealed by a registered Professional Engineer, currently licensed in this State. This shall be performed under the Contractor selecting the substitution's scope.

D. Any and all changes due to a substitution of basis of design equipment including but not limited to electrical connection, physical size, access, piping connections, controls, etc. shall be solely the responsibility of Contractor selecting the substitution.

2.02 MINIMUM STANDARDS

A. Every piece of energy consuming equipment, all fire suppression products and life safety equipment shall comply with the following standards as applicable; especially in regard to prevailing codes:

1. Factory Mutual Laboratories (FM)
2. Industrial Risk Insurers (IRI)
3. Underwriters Laboratories, Inc. (UL)
4. ADC: Air Diffusion Council
5. AGA: American Gas Association
6. AMCA: Air Moving and Conditioning Association, Inc.
7. ANSI: American National Standards Institute
8. API: American Petroleum Institute
9. AHRI: Air Conditioning, Heating, and Refrigeration Institute
10. ASHRAE: American Society of Heating, Refrigerating and Air Conditioning Engineers
11. ASME: American Society of Mechanical Engineers
12. ASTM: American Society of Testing and Materials
13. AWWA: American Water Works Association
14. IBR: Institute of Boiler and Radiator Manufacturers
15. MSS: Manufacturers Standardization Society
16. NBBPVI: National Board of Boiler and Pressure Vessel Inspectors
17. NEMA: National Electrical Manufacturer's Association
18. OSHA: Occupational Safety & Health Administration
19. PDI: Plumbing Drainage Institute
20. PPI: Plastic Pipe Institute
21. CISPI: Cast Iron Soil Piping Institute

2.03 PIPE HANGERS AND SUPPORTS

A. Pipe hangers, hanger rods, trapeze type hangers, upper attachments and other supports shall be selected based on pipe size (plus insulation of pipes specified to be insulated) and the weight of the medium being transported or the medium used for testing, whichever is greater. Provide all hangers and rods, turnbuckles, angles, channels, and other structural supports to support the piping systems. Rods for pipe hangers shall be full size of the Hanger Manufacturer's catalog listed rod size for each type hanger specified. Hangers and supports shall be Michigan, ITT Grinnell or B-Line.

B. All material utilized for the hanging and support of the piping systems shall be manufactured products which are specifically intended for the purpose of hanging piping systems. The use of wire, steel straps, plastic ties, etc. is strictly prohibited.

C. Pipe hangers selected for supporting horizontal insulated piping shall be sized to fit around the outside of the pipe insulation. Insulated piping shall be supported on galvanized shields.

1. Shields shall be as follows:
   a. Pipes 2" and smaller: 18 gauge x 12" long
   b. Pipes 2 1/2" and larger: 16 gauge x 18" long
2. Shields shall be 180 degrees around the lower half of the pipe at all pipe hangers, except that on trapeze hangers, pipe racks and floor supported horizontal pipes, shields shall be 360 degrees around the entire pipe.

D. Pipe hangers touching copper piping shall be copper plated or the piping shall be dielectrically isolated from any steel hangers or clamps that are used. Note the requirement for domestic water piping requires the hangers to be installed over the insulation.

E. Steel rods, framing and clamps shall be plated or primed to prevent rust formation.

3.0 EXECUTION

3.01 GENERAL

A. All piping, valves, and fittings shall be products of a domestic Manufacturer and made in the USA.

B. Flexible piping connections shall be provided and installed at all suction and discharge connections of packaged booster pumps and at any pump 2.0 HP and above. Flexible piping connections shall be suitable for 300 psi working pressure or the system pressure at the installation location, whichever is greater, and be suitable for the temperature of the system. Flexible connections shall be stainless steel braided hose type, with a length not less than their pipe diameter. Provide and install restraining rods if recommended by the Manufacturer for the installation location and application.

C. Provide and install shut-off valves at any and all equipment including water heaters, domestic booster pumps, recirculation pumps, storage and pressure tanks, etc. and at any locations required by code, such as branch lines from risers serving more than one fixture. Shut-offs shall be in addition to those specifically shown or noted in the Contract Documents.

3.02 SUBMITTALS

A. Before preparing submittals, study all Contract Drawings and specifications in detail, obtain manufacturer's recommended instructions, and have submittals prepared based on specific equipment and material proposed for installation. An officer of the contracting firm shall sign all shop drawings (certifying conformance with plans and specifications) before submitting to the Architect or releasing to the field.

B. The submittal process shall not be utilized as an avenue to substitute products after the execution of the contract. Should an unspecified or unequal product be submitted, it will be rejected. If a second attempt at substitution is made during the resubmittal of the same product, then no more reviews of that product will be performed without direct compensation to the Engineer being paid for the additional services required for the third review and any further reviews.

C. All submittals shall be submitted and returned electronically.

D. Submittals will not be accepted for review unless they:

1. Comply with the requirements of Division 1.
2. Include complete information pertaining to all appurtenances and accessories.
3. Are submitted as complete packages which pertain to all related items in Division 22. Separate packages shall be submitted as follows:
   a. All plumbing equipment, piping, specialties, and components
   b. All plumbing fixtures
4. Are properly marked with equipment, service or function identification as related to the project and are marked with pertinent specification paragraph number.

E. Submit catalog information, factory assembly drawings, field installation drawings and certifications as required for complete explanation and description of all items of equipment. The submittal data shall provide ample, unquestionable compliance with the Contract Documents.

F. Review of submittals shall not be construed as authorizing any deviations from the plans and specifications unless such deviations are clearly identified and separately submitted in the form of a letter that is enclosed with the submittals.

G. Submittals are required on all manufactured equipment, especially energy consuming equipment. Submittals shall include, but are not limited to, the following items of equipment:

1. Water Heaters
2. Pumps
3. Plumbing Fixtures

3.03 EXCAVATION, TRENCHING AND BACKFILLING

A. Perform all excavation, trenching and backfilling for underground work under this Division 22. During excavation, the excavated material shall be piled back from the banks of the trench to avoid overloading, slides or cave-ins. Do not exceed the angle of repose unless written approval is obtained in advance from the Architect for shoring, bracing or other alternate excavation methods. All excavated material not used for backfilling shall be removed from the building and disposed of as indicated or directed by the Architect. Take measures to prevent surface water from flowing into trenches and other excavations and any water accumulating therein shall be removed by pumping. All excavation shall be made by open cut. Tunneling shall not be allowed.

B. The bottom of all trenches shall be evenly graded to provide firm support and an even bearing surface. Pipe shall be laid on firm soil, laid in straight lines and on uniform grades. Provide bell holes so that the barrel of the pipe rests evenly on the bottom of the trench along the entire length of the pipe.

C. Pipe shall be inspected and tested prior to backfilling. Trench shall be handfilled to a minimum of 12" above the top of pipe with suitable earth (free of rocks, trash, large clods and organic material) and compacted to a minimum 95% proctor. After the first layer is completed, subsequent layers shall be filled and compacted the same as the first layer. Settling the backfill with water shall not be permitted.

3.04 INSTALLATION REQUIREMENTS

A. All equipment shall be installed in strict conformance with the recommendations of the Equipment Manufacturer, as indicated on the Drawings, and as specified.

B. Provide installation manuals for each piece of equipment. Submit in separately bound volumes after review of submittals.

C. Provide supplementary steel framing and welded steel equipment support stands as required for proper hanging and support of the plumbing systems. Steel angles, channels and tubing utilized for such framing shall be selected for a maximum deflection of 1/360th of the span.

D. All roof curbs shall be a minimum of 12" high and selected for the various roof pitches. Curbs installed on roofs having pitches of not more than 1/4" per foot may be standard curbs shimmed level with steel channels or Zs to provide suitable support and flashing surfaces.

3.05 CLEANING, LUBRICATION AND ADJUSTMENT

A. The exterior surfaces of all plumbing equipment, piping, conduit, etc., shall be cleaned and free of all dirt, grease, oil, paint splatter, and other construction debris.

B. Bearings that require lubrication shall be lubricated in strict accordance with the manufacturer's recommendations.

C. All control equipment, valves, equipment settings, pressure tanks, etc. shall be adjusted to the settings required for the performance specified.

D. All materials, equipment, etc. subject to weather, corrosion, dust, debris, water etc. to be installed or utilized for the project shall be fully protected. This is inclusive of piping and duct openings and internal fan ventilation intakes and discharges. This Division's scope includes protection and remediation of any and all Division materials, etc. including cleaning, vacuuming, dusting, etc. required for a clean system and operation. Insulation and equipment with electrical connections subject to water shall be replaced in their entirety. Coordinate with all other trades and schedules.

3.06 PAINTING

A. All uncoated and uninsulated steel surfaces exposed to sight inside the building, such as piping, equipment hangers and supports, which are not provided with factory prime coat or galvanizing, shall be cleaned and painted with one coat of rust inhibiting primer. In addition, all surfaces in finished spaces shall also be painted with two coats of finish paint in a color selected by the Architect.

B. Steel items exposed outside the building, such as equipment supports, uninsulated piping and hangers which are not factory painted or galvanized shall be cleaned and painted with one coat of rust inhibiting primer and two coats of asphaltic base aluminum paint. Insulated steel pipes outside the building shall be cleaned and painted with one coat of rust inhibiting primer before installing insulation.

C. Factory painted equipment that has been scratched or marred shall be repainted to match the original factory color.

3.07 PIPING LEAK TESTING

A. Sanitary, waste, storm, and vent piping shall be tested with water before installing fixtures. Water test shall be applied to the system either in its entirety or to the individual sections. Each opening except the highest opening of the section under test shall be plugged, and the section shall be filled with water and tested with a head of water of at least ten (10) feet above the highest point in the system. The water shall be kept in the portion under test, for at least thirty (30) minutes; no drop in the water level will be acceptable.

B. The water piping systems shall be tested at a minimum pressure of 125 psi, or 1.5 times the system operating conditions, whichever is greater, and proved tight at this pressure for not less than thirty (30) minutes or longer if required to permit inspection of all joints. No loss in pressure will be permitted.

C. All compressed air piping shall be tested pneumatically and proved tight at a pressure of not less than 100 psi for a period of not less than two (2) hours. No loss in pressure will be permitted.

D. All leaks shall be repaired by tightening, remaking joints, or replacing pipe and fittings. Caulking of joints shall not be permitted.

E. See specification section 23 11 23 for testing requirements of natural gas and liquid propane gas piping. System shall be part of Division 22 scope unless otherwise arranged within the Contract. Coordinate with Division 23.

3.08 RECORD (AS-BUILT) DRAWINGS

A. At the completion of the project, provide a set of reproducible prints to the Architect which reflects all changes, deviations and revisions made to the original design documents. Locations of all underground piping and utilities shall be clearly shown and dimensioned from permanent reference points such as building column lines. Record drawings shall be produced in electronic format compatible with AUTOCAD. Furnish electronic copies of all drawings in dwg. format, and two (2) bond copies of all drawing sheets. As-Builts for electronic incorporation by the Design Team, as applicable, shall be redline mark-ups of the Construction Documents.

3.09 OPERATING AND MAINTENANCE MANUALS AND INSTRUCTIONS

A. Complete operating and maintenance manuals shall be provided to the Owner. Four copies shall be provided. Each copy shall be bound in a separate 3-ring, loose leaf notebook. Operating instructions shall be provided for each plumbing system, and shall each include a brief system description, a simple schematic and a sequence of operation. Operating and maintenance instructions shall be provided for each piece of equipment. A control system wiring diagram shall be included in each operating and maintenance manual.

B. Prior to final acceptance or beneficial occupancy, provide the services of a Competent Technician for not less than one (1) day to instruct the Owner in the operation of the plumbing systems.

3.10 MINIMUM HANGER SPACING

A. Pipe hangers or supports shall be provided within 18" of each horizontal fitting, equipment connection, valve, etc. and within 18" of the centerline of horizontal or vertical changes in direction summing to 90° or more. Specific attention is called to turns into vertical risers.

B. Piping supports shall be provided, at a minimum, in accordance with the greater of the below or code minimum. Where the below or code does not address support for specific piping, supports shall be in accordance with manufacturer's requirements.

Piping Material	Max. Horz. Spacing	Max. Vert. Spacing
Cast-iron pipe	5'	15'
Copper pipe	12'	10'
Copper tubing ≤ 1-1/4" dia.	6'	10'
Copper tubing ≥ 1-1/2" dia.	10'	10'

C. Riser clamps shall be provided at each floor penetration. For pressurized piping systems, provide vibration isolation at all riser clamps with two (2) pad-type mountings consisting of a minimum 3/8" thick ribbed or waffled elastomeric pads bonded between minimum 16-gauge galvanized steel separator plates. Pads shall be sized for a deflection of 0.12" to 0.16". Pads shall be minimum 3"x3" square.

3.11 WARRANTY

A. All work provided under this Division 22 shall be subject to a minimum one year warranty. The warranty shall include prompt repair or replacement of equipment or system failures and shall include all parts and labor. In addition, all compressors shall carry an additional four year parts-only warranty. Extended warranties shall be provided on all other equipment so specified in other Sections.

3.15 OWNER TRAINING

A. Owner training shall be provided for all systems and equipment and shall include the following:

1. 8-hours of training for each type of equipment
2. 16-hours for overall system operational training

B. A training summary and schedule shall be submitted to the Architect for approval within ninety (90) days of the date of substantial completion.

C. Training timing will vary and shall be assumed to include multiple sessions as required by the Owner.

3.17 BID REQUIREMENTS

A. The Contractor shall include all systems, equipment and accessories shown on the plans and specifications.

B. The Contractor is responsible for providing all Contract Documents to all SubContractors. All systems, equipment and accessories shall be included in the bid, whether shown on the SubContractor applicable plans or other design documents.

C. Should any discrepancy occur in the Contract Documents, the Contractor shall provide a request for clarification prior to bid or note the discrepancy in the bid and provide an appropriate cost allowance in the bid.

D. The Contractor shall acknowledge that the Contract Documents are diagrammatic and shall provide all systems, equipment and accessories required for a complete facility. Any areas that appear to be void of systems or inappropriate systems shall be noted in the bid. No post bid change order shall be considered for areas or discrepancies not noted in the bid.

E. All installation coordination and means and methods and labor and materials required for proper system installation shall be included.

F. These requirements are in addition to bid procedures and requirements of the RFP or general specifications.

END OF SECTION

DRAWING NO.
CFD-XXX-P-0001-XXXXXX

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HARNETT COUNTY, NC 28334

OPERATIONS BUILDING

MARK	DATE	DRN BY	REVISION
	05.24.23		ISSUED FOR CONSTRUCTION

PROJECT NO:

DRAWING NUMBER
CFD-XXX-P-0001-XXXXXX

ELECTRONIC FILE NAME: P0001.DWG

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SHEET TITLE:
SPECIFICATIONS - PLUMBING

SHEET NO.
P-0001

SECTION 22 07 00

PLUMBING INSULATION

1.0 GENERAL

1.01 DESCRIPTION

A. All work specified in this Section is governed by the Common Work Results for Plumbing Section 22 05 00.

B. This Section 22 07 00 and the accompanying drawings cover the provision of all labor, equipment, appliances, and materials and performing all operations in connection with the insulation of the plumbing systems as specified herein and as shown. These systems include, but are not limited to, the following:

1. Sanitary waste and vent systems
2. Domestic water systems

1.02 INTENT

A. It is the intent of this Section of the specifications to provide complete and operable plumbing systems complete with insulation, which are free of unreasonable noise, vibration and sweating, and fabricated so as to fit the space allotted.

B. The word "piping" is defined to mean all piping, fittings, joints, hangers, coatings, valves, cocks, insulation and accessories necessary for the plumbing systems described, shown and specified.

1.03 ACCEPTABLE MANUFACTURERS

A. Insulation products shall be as manufactured by Owens Corning, Knauf, Manville, Certainteed, Dow, Armacell, or Armstrong.

2.0 PRODUCTS

2.01 PLUMBING INSULATION

A. All pipe insulation products shall have a permanent composite insulation, jacket and adhesive fire and smoke hazard rating as tested by procedure ASTM-84, NFPA 255 and UL 723 not exceeding Flame Spread 25 or Smoke Developed 50.

B. Preformed insulation for all domestic hot water piping shall be minimum 1-1/2" thick for piping less than or equal to 1-1/2" diameter, 2" thick for piping above 1-1/2" in diameter, preformed fiberglass pipe insulation with white all-service jacket. All longitudinal joints shall be lapped, self-sticking type with all butt joints, tears, etc. sealed with a matching white vapor barrier tape. Elbows shall be mitered or may be Zeston covers filled with equivalent fiberglass insulation. The maximum conductivity (k-value) of the insulation shall be 0.23 BTU per inch/h ft^2 °F at 75°F.

C. Preformed insulation for all domestic cold water piping, except trap primer piping underground, shall be minimum 1" thick, preformed fiberglass pipe insulation with white all-service jacket. All longitudinal joints shall be lapped, self-sticking type with all butt joints, tears, etc. sealed with a matching white vapor barrier tape. Elbows shall be mitered or may be Zeston covers filled with equivalent fiberglass insulation. The maximum conductivity (k-value) of the insulation shall be 0.23 BTU per inch/h ft^2 °F at 75°F.

D. Insulation shall be continuous over all valve bodies, fittings, and wall and floor penetrations. Do not insulate unions on hot water piping; nor instruments, gauges, valve handwheels, etc. on any piping.

E. Closed-cell insulation shall be provided over all piping called to have insulation that is installed below ground. Closed-cell piping insulation shall match the thicknesses for above ground piping, 25/50 Armaflex or Rubatex. All glues and coatings shall be products of the same manufacturer as the insulation. The insulation shall be installed by the slip-on method; slitting of the insulation is prohibited and shall be cause for rejection.

3.0 EXECUTION

3.01 ARRANGEMENT

A. Follow the general piping layout, arrangement, schematics and details. Provide all offsets, vents, drains and connections necessary to accomplish the installation. Fabricate piping accurately to measurements established at the project site to avoid interference with ductwork, other piping, equipment, openings, electrical conduits and light fixtures. Make suitable provision for expansion and contraction with expansion loops and offsets.

3.02 INSULATION INSTALLATION

A. Provide blanket insulation over all horizontal roof drain piping which is within the building and including the vertical risers to the roof drains and the underbody of the roof drains.

1. Blanket insulation shall be wrapped around the piping and underbodies of roof drains. Ends of insulation shall overlap at least 2" and bottom of insulation shall overlap pipe insulation at pipe connection to roof drain at least 3". Adhere insulation to roof drain underbodies with 100% coverage of fire retardant adhesive and tape all joints with 3" wide foil reinforced kraft tape.

B. Provide insulation over all above ground hot and cold water piping, except that no insulation is required on cold water lines installed inside interior plumbing chases (those chases with no exterior wall). In addition, no insulation is required for cold water piping outside the building vapor barrier and designed to be drained down for freeze-protection, such as parking deck hose bibbs for washdown.

1. All joints and tears shall be sealed with matching white vapor barrier tape

C. See specification 23 07 19 for HVAC piping insulation requirements.

END OF SECTION

SECTION 22 10 00

PLUMBING PIPING

1.0 GENERAL

1.01 DESCRIPTION

A. All work specified in this Section is governed by the Common Work Results for Plumbing Section 22 05 00.

B. This Section 22 10 00 and the accompanying drawings cover the provision of all labor, equipment, appliances, and materials and performing all operations in connection with the construction of the plumbing systems as specified herein and as shown. These systems include, but are not limited to, the following:

1. Sanitary, waste, and vent systems
2. Domestic water systems

C. Provide all final plumbing connections to all equipment furnished by Owner.

D. Provide isolation valve and reduced pressure backflow preventer or vacuum breaker at the service entrance and at those connections (especially to kitchen equipment) required by local plumbing code.

1.02 INTENT

A. It is the intent of this Section of the specifications to provide complete and operable plumbing systems as shown and specified which are free of leaks, properly vented, free of unreasonable noise, vibration and sweating, and fabricated so as to fit the space allotted and to exhibit a minimum resistance to fluid flow.

B. The word "piping" is defined to mean all piping, fittings, joints, hangers, coatings, valves, cocks, insulation and accessories necessary for the plumbing systems described, shown and specified.

1.03 GENERAL REQUIREMENTS

A. Provide all reducing fittings, flanges, couplings and unions of the size and type of material to match the piping connections at each fixture, piece of equipment, valve and accessory.

B. Union joints, couplings or flanges shall be provided in each pipe line connected to each piece of equipment, fixture and elsewhere as indicated and specified. Unions shall match the piping system in which they are installed.

C. Unions or flanges shall be provided between all copper to steel connections. These unions shall be dielectric, insulating type.

D. All changes in direction and branches shall be made with manufactured fittings.

E. The use of offset-type reducers is strictly prohibited in any piping system.

F. In all water piping systems, changes in horizontal pipe line sizes shall be made with eccentric reducers installed flat on top for proper air venting. Reducing tees, reducing elbows and concentric reducers shall only be allowed in water piping systems for changing pipe sizes in vertical risers and for making connections to equipment and accessories from vertical risers.

G. All pipe joints shall be cut square and all burrs shall be removed.

H. Open ends of pipe lines not currently being handled shall be plugged during installation to keep dirt, water and foreign material out of the system.

I. Sanitary waste and storm drainage piping shall slope down in the direction of flow as shown on the drawings or as prescribed by Code, but not less than 1 percent.

J. All vents through roof (VTRs) shall be offset just below the roof such that their termination points are at least 15 ft from any outside air intake of any HVAC unit; special attention is called to packaged rooftop and dedicated make-up air units.

K. Trap primers shall be provided at all floor drains, floor sinks, trench drains, and hub drains except trap primers may be omitted where drain routes to the storm system. Route water piping from nearest cold water line and as allowed by code.

L. All piping, valves, and fittings shall be provided by a domestic Manufacturer and manufactured in the USA.

2.0 PRODUCTS

2.01 SANITARY WASTE AND VENT SYSTEMS

A. All underground sanitary waste and vent piping shall be PVC, DWV Solid Wall Schedule 40 with socket-type, solvent welded joints in sizes up to 12"; 14" and larger piping shall be PVC, DWV Solid Wall Schedule 80 with socket-type, solvent welded joints. All PVC piping shall be installed in accordance to ASTM D2321.

B. All underground sanitary, waste, and vent piping shall be service weight hub and spigot cast iron soil pipe with lead and oakum or neoprene double-seal compression gaskets in sizes up to 12"; All 15" and larger piping shall be cast iron soil pipe with lead and oakum or neoprene double-seal compression gaskets. All cast iron soil pipe and fittings shall bear the collective trademark of the Cast Iron Soil Pipe Institute and listed by NSF International or receive prior approval by the Architect/Engineer.

1. Piping shall be gray cast iron and conform to ASTM A 74.
2. Compression gaskets shall be manufactured from an elastomer meeting the requirements of ASTM C 564.

E. Joints on hubless cast iron soil pipe shall be made with neoprene couplings and stainless steel clamps. Gaskets shall conform to ASTM C 564. Couplings and gaskets shall be produced by the same manufacturer and shall be installed in accordance with the manufacturer's recommendations, including band tightening sequence and torque. All couplings shall be manufactured to the CISPI 310 standard, ASTM C 1277, ASTM C 150, FM Standard 1680 Class I and certified by NSF International. Coupling shall be as follows:

1. 1 ½" to 3" – Two (2) stainless steel bands
2. 4" to 8" – Four (4) stainless steel bands
3. 10" to 15" – Heavy duty coupling with six (6) stainless steel bands. Heavy duty couplings shall conform to ASTM C 1540.

F. All offsets on 8" pipe and larger shall have metal restraining straps by Holdrite or approved equal.

G. Cleanouts shall be provided at the locations indicated and, as a minimum, where required by Code. Floor cleanouts shall be a minimum of 4" and shall be complete with a flush plug and removable, scoriated bronze floor plate. Provide carpet buttons in carpeted areas. Wall cleanouts shall be threaded cleanout tees and plugs with polished stainless steel coverplate with centerset screw.

H. Floor drains in toilets and finished areas shall be JR Smith 2000 Series with 6" Type B square adjustable strainers finished in satin nickel bronze; or equal products by Josam or Zurn. Provide vandalproof secured tops.

I. Floor drains in mechanical rooms and unfinished concrete floors shall be JR Smith 2131 Series with round 11 3/4" cast iron grate, sediment bucket and deep-seal P-trap; or equal products by Josam or Zurn. Provide vandalproof secured tops.

J. Hub drains (HD) shall be made with a reducer fitting with opening at least one nominal size larger than the connected piping as scheduled. HDs shall be sized to receive all discharges without splashing.

2.03 DOMESTIC WATER SYSTEM

K. All underground copper branch lines (1/2" and 3/4" only) shall be continuous lengths of soft Type K copper tubing with no joints allowed underground.

L. Aboveground domestic water system piping 3" in size and smaller shall be Type L hard drawn copper tubing with wrought copper fittings and soldered joints.

J. All valves in potable water systems shall be "lead-free" type.

K. All valves 3/4" and smaller shall be "full-port" type, and greater than 3/4" may be "reduced-port" type.

L. Ball valves:

9. Valves 2 inch and smaller shall be two piece bronze body, full port with solid, smooth bore chrome plated brass ball, meeting MSS-SP110 and rated for no less than 300 psi. Seats shall be reinforced TFE with Teflon packing ring and threaded adjustable packing nut. Valves on insulated lines will be provided with stem extensions to provide clearance for two inches of pipe insulation. Valves to be Apollo Valves 77C, Hammond/Milwaukee UP8301, or Watts B-6080.

10. Valves larger than 2 inch and up to 4 inch shall be two piece bronze body, standard port with solid, smooth bore chrome plated brass ball, meeting MSS-SP110, and rated for no less than 300 psi. Seats shall be reinforced TFE (or TFM for 4") with Teflon packing ring and threaded adjustable packing nut. Valves on insulated lines will be provided with stem extensions to provide clearance for two inches of pipe insulation. Valves to be Apollo Valves 70-100, Hammond/Milwaukee UP8501, or Watts B-6000.

N. Balancing valves:

1. Valves shall be NSF/ANSI 61/372 certified and suitable for potable water applications. Valve shall be suitable for the greater of 125 psig pressure and 40°F to 250°F temperature or the system's operating conditions. Valve shall provide positive shut-off and be rated for 300 psig. Each balancing valve shall be equipped with two gauge taps with check valves and drip caps. Provide preformed insulation to encase valve assembly in insulated piping.

2. Valves up to 3" shall have lead-free brass body, full-port ball constructed of 304 stainless steel, and shall have calibrated nameplate with memory stop. Balancing valves shall be Bell and Gossett Circuit-Setter Plus or equal by Nexus, FlowDesign, or Watts. After the test and balance is complete, provide to the Owner a differential pressure gauge to match the balancing valves. Autoflow valves are acceptable as a substitution provided the flow cartridge is replaceable and the flowrate is clearly and permanently labeled.

O. Check valves:

1. Valves in water systems shall be NSF/ANSI 61/372 certified and suitable for potable water applications. Valve shall be swing-type, brass body, bronze seat, Apollo Valves 161S-LF up to 200 psi CWP, or equal by Milwaukee UP968 or Hammond.

2. All check valves on pump discharges shall be non-slam type.

3. All check valves shall be installed in an orientation allowed by the manufacturer's recommendations.

4. All check valves installed in insulated piping systems shall have the check valve location explicitly labeled on the outside of the insulation.

P. Backflow preventers at carbonated beverage machines shall meet ASSE 1022 UON and all other appliances shall meet ASSE 1024. Backflow preventers shall be approved by the AHJ. ASSE 1022 ports shall be piped with copper tubing to an indirect drain location. Backflow preventers at dishwashers shall meet ASSE 1020 unless otherwise noted. Other equipment and appliances shall be protected from backflow as required by Code and/or manufacturer's requirements.

Q. Water connections to appliances shall be made with flexible copper tubing or commercial grade double-reinforced stainless steel braided hose, no less than 3/8" in size, or the connections size of the appliance, whichever is greater.

R. Point of use mixing valves shall be Leonard 170-LF or an approved equal with lead-free construction, vandal resistant adjustment cap, and integral inlet check valves. Mixing valve shall be ASSE 1070 rated. Mixing valve shall be sized by the Manufacturer for the fixture(s) served. Mixing valve shall have no more than 0.25 gpm minimum flowrate required.

S. All water hammer arresters (WHA) shall be PDI Certified, Size A, B, C, D, E or F, as indicated for the fixture units served; Josam, JR Smith, Watts, or Zurn. WHAs that are not PDI Certified are disallowed. WHAs in potable water applications shall be lead-free.

T. The hose bibbs (HB) shall be complete with vacuum breaker and **vandal resistant handle; Watts, Apollo Valves, JR Smith, or Zurn.

BB. Soldered joints shall be made with tin-antimony/silver solder. Solder containing lead shall not be permitted.

CC. Saddle valves and "T" fittings that rely on puncturing the piping main are disallowed.

DD. Thermometers and pressure gauges shall be products of Trerice, Weksler, or Weiss. Select all devices to operate within 20% of the midpoint of their scales under normal operating conditions. Gauges provided on pumps shall be compound type.

EE. Pressure and temperature (P&T) test plugs shall be constructed of brass with two (2) self-closing Nordel cores and be complete with cap and gasket. Plugs shall be as manufactured by Peterson or Lancaster. Provide a complete test kit to the Owner at the time of final inspection. Test kit shall be complete with pressure gauge, thermometer, probes and carrying case.

3.0 EXECUTION

3.01 ARRANGEMENT

A. Follow the general piping layout, arrangement, schematics and details. Provide all offsets, vents, drains and connections necessary to accomplish the installation. Fabricate piping accurately to measurements established at the project site to avoid interference with ductwork, other piping, equipment, openings, electrical conduits and light fixtures. Make suitable provision for expansion and contraction with expansion loops and offsets.

B. Water hammer arresters shall be installed at the top of each riser and on each fixture branch in accordance with Plumbing and Drainage Institute Standard WH201. WHAs shall also be installed at all water service to appliances with quick-closing valves, such as clothes washers, kitchen warewashers, icemakers, etc.

C. Cleanouts shall be provided at the base of all sanitary and storm risers and as required by code.

D. Fittings, unions, joints, couplings (including no-hub couplings), etc. shall not be within slabs.

E. All potable domestic water connections to equipment shall be provided with backflow prevention as required by the specification section and code.

F. Pressure gauges and thermometers called to be permanently installed shall be easily visible from a standing position on the ground.

3.02 UNDERGROUND WATER PIPING

A. All domestic water piping shall have a minimum cover of 3'-0", or below the frost line, whichever is deeper, except piping at least 20' from any exterior wall may be installed 3* or more below the bottom of the slab.

B. For water piping 2* and above, provide concrete thrust blocks at all changes of direction and secure all mechanical joints with restraining rods.

C. All copper water lines, or other material subject to corrosion, shall be protected from corrosion with a continuous plastic sheathing or coating and wrapping. This sheathing or coating and wrapping shall be extended 6" to 12" above finished floor. The protection shall be installed on the outside of any insulation required.

3.04 PIPING INSTALLATION ABOVE CEILINGS

A. All domestic hot and cold water piping installed above the insulated ceilings shall be installed just above (within 2") of the top of the finished ceiling with the building insulation over the piping to avoid freeze-up.

3.05 DISINFECTION

A. All domestic water piping installed under this Division shall be disinfected with chlorine before it is placed into operation. The chlorinating material shall be liquid chlorine conforming to Federal Specification BB-C-120 and shall be introduced to the system by experienced operators only. The chlorine solution applied to the piping sections or system shall contain at least fifty parts per million of available chlorine and shall remain in the sections or system for a period of not less than sixteen (16) hours. During the disinfection period, all valves shall be opened and closed at least four times. After the disinfection period, the chlorinated water shall be flushed from the system with clear water until the residual chlorine content is not greater than two-tenths parts per million (0.2 PPM). Submit certification to the Architect that the system was disinfected.

END OF SECTION

SECTION 22 30 00

PLUMBING EQUIPMENT

1.0 GENERAL

1.01 DESCRIPTION

A. All work specified in this Section is governed by the Common Work Results for Plumbing Section 22 05 00.

B. This Section 22 30 00 and the accompanying drawings cover the provisions of all labor, equipment, appliances, and materials and performing all operations in connection with the construction of the water heating systems as specified herein and as shown. These systems include, but are not limited to, the following:

1. Water Heaters
2. Hot Water Circulator

1.02 GENERAL REQUIREMENTS

A. All plumbing equipment installed in locations with a water hardness of 25 grains per gallon or more, shall be resistant to corrosion. Where copper materials are in the water stream, it shall be Cupro-Nickel of not more than 90% copper.

B. All water heaters shall be NSF/ANSI 61 certified "lead free" for potable water service.

C. All water heaters shall have ASME rated temperature and pressure relief valve(s). Valve(s) shall be provided by the Manufacturer and sized for the discharge location noted in the plans.

D. All water heaters and tanks shall be glass-lined, 1600°F fired, with a working pressure of 150 psi, a test pressure of 300 psi, or the system pressure at the installation location, whichever is greater, and shall have magnesium anodes for electrolytic protection. Separate storage tanks may also be cement-lined. Tanks shall be ASTM stamped.

E. All water heaters shall meet or exceed the energy efficiency requirements of the latest version of ASHRAE 90.1.

F. All water heaters and pumps shall be UL approved and labeled, and be AGA certified where applicable.

G. All water heaters and pumps shall be NEMA rated appropriate for the installation location in which they are installed.

H. Water heater controls shall include an operating thermostat and manual reset high limit control for each heating element or burner. The safety high limit control shall prevent over heating in the event of a thermostat failure.

I. All controls shall be factory-wired and require no external power source.

J. Water heaters and tanks shall have drain with external access and hose end connection.

K. All water heater condensate lines shall be protected from freezing or shall be heat traced in accordance with specification 23 05 93.

2.0 PRODUCTS

2.02 WATER HEATER COMMERCIAL ELECTRIC

A. The water heater shall be as scheduled. Acceptable substitute manufacturers are AO Smith, Lochinvar, State, Rheem, and Bradford White, subject to substitution requirements. Water heaters shall be commercial-grade.

B. The immersion heating elements shall be low watt density with a plated incoloy sheath material for long life. The heating elements shall mount in individual screw-in tank flanges.

C. All field electrical wiring connections to the water heater shall be made to a main terminal block. All internal wiring shall be made to solderless terminal lug wiring connections. Wiring to be color coded for ease of servicing. The water heater shall be factory assembled, wired and tested.

2.04 HOT WATER CIRCULATOR

A. Hot water circulator shall be as scheduled. Acceptable substitute manufacturers are B&G, Goulds, and Grundfos, subject to substitution requirements.

B. Hot water circulators used in potable water system shall be lead-free.

3.0 EXECUTION

3.01 INSTALLATION

A. The water heaters and accessories shall be installed in strict accordance with the manufacturer's recommendations and the Contract Documents.

B. All temperature and pressure relief valves shall be piped full size to an indirect waste such as the nearest floor drain, service sink, sink tailpiece, etc. Piping shall be in accordance with specification 22 10 00 for DWV services. Size shall be in accordance with manufacturer's requirements.

C. All water heaters shall have internal heat traps or shall have heat traps installed in the cold water and hot water piping. Instantaneous water heaters shall be provided with heat traps unless manufacturer documentation specifically allows exclusion.

D. Water heaters shall be completely encased in high density insulation of sufficient value to meet the energy efficiency standards of latest version of ASHRAE 90.1, or shall be factory insulated with non-CFC polyurethane closed-cell foam insulation. Provide removable insulation panels to maintain access to all required components.

E. All water heaters or boilers subject to condensing under normal steady-state operating conditions shall be provided and installed with accessory condensate neutralization kits.

3.02 WARRANTY

A. Provide 5-year limited warranty on all tanks and heat exchangers, and 1-year limited warranty on parts unless otherwise noted.

END OF SECTION

SECTION 22 40 00

PLUMBING FIXTURES

1.0 GENERAL

1.01 DESCRIPTION

A. All work specified in this section is governed by the Common Work Results for Plumbing Section 22 05 00.

B. This Section 22 40 00 and the accompanying drawings cover the provisions of all labor, fixtures, equipment, appliances and materials, and performing all operations in connection with the construction and installation of the plumbing fixtures and trim as specified herein and as shown.

C. All finishes shall be as selected by the Architect. Where the Architect does not have a preference, finishes shall be in accordance with this specification.

D. All exposed piping, valves, stops, P-traps, etc. shall be chrome-plated. Also, all exposed piping penetrations through walls, floors or ceilings shall be provided with chrome-plated cast brass escutcheons.

E. All P-traps shall be minimum 17-gauge brass.

F. All exposed P-traps subject to contact, such as those below wall-mounted lavatories, shall be provided with insulated covers as required.

G. Flush valves shall have non-hold open feature, vacuum breakers and cover cap on angle-type stop.

H. Provide all final connections to all equipment and fixtures furnished by Owner.

I. Unless otherwise specified in an individual fixture description, all enameled cast-iron and porcelain fixtures shall be white.

J. All lavatories and other hand-washing fixtures shall be provided and installed with ASSE 1070 point-of-use mixing valve on the hot water connection. Mixing valve shall be set to provide no more than 110°F hot water.

1.02 INTENT

A. It is the intent of this Section of the specifications to provide complete, operable, adjusted, clean plumbing fixtures as shown and specified, which are free of leaks, noise, air, vibration and waterflow fluctuations.

1.03 BASIS OF DESIGN

A. The basis of design is as outlined for each fixture in the 2.0 PRODUCTS subsection. Any proposed substitutions shall be proven equal in all respects to the equipment specified as the basis of design.

1.04 ACCEPTABLE MANUFACTURERS

A. Acceptable fixture manufacturers for each type of fixture is as follows:

1. Water Closets – American Standard, Kohler, Sloan, and Zurn
2. Urinals – American Standard, Kohler, Sloan, and Zurn
3. Manual Flushvalves – American Standard, Kohler, Sloan, and Zurn
4. Automatic Flushvalves – American Standard, Kohler, Sloan, TOTO, and Zurn
5. Lavatories – American Standard, Bradley, Crane, Kohler, Sloan, and Zurn.
6. Lavatory Faucets – American Standard, Bradley, Chicago, Delany, Grohe, Kohler, Sloan, TOTO, and Zurn
7. Breakroom/Kitchen/Pantry/Etc. Sinks – American Standard, Elkay, Grohe, Just, and Kohler
8. Breakroom/Kitchen/Pantry/Etc. Faucets – American Standard, Chicago, Delta, Elkay, Just, Kohler, and Zurn
9. Water Coolers and Water Fountains – Acorn, Elkay, Halsey Taylor, and Oasis
10. Service and Laundry Sinks – Fiat, Kohler, Mustee, ProFlo, and Stern-Williams
11. Service and Laundry Faucets – American Standard, Delta, Elkay, Fiat, Kohler, T&S Brass, Speakman, and Stern-Williams

2.0 PRODUCTS

2.01 WATER CLOSETS

A. Fixtures P-1 shall be American Standard "Madera" #3043.001 vitreous china, syphon jet, 16 1/2" high, 1.28 GPF, bottom outlet, 1 ½" top spud, floor-mounted with flat bolt covers.Flush valve shall be a battery powered sensor type flush valve; Sloan "G2 Optima Plus;" Model 8111-1.28. Provide with batteries. Fixtures P-1 shall be mounted in accordance with the handicap code.

2.02 LAVATORIES

A. Fixtures P-2 shall be American Standard "Ovalyn" #0495-221, 19"X16" vitreous china, undercounter, oval lavatory complete with front overflow and 1 1/4" drain. Faucet shall be Sloan Optima Faucet, EAF-225, hardwired, plug adapter, mixing valve, or approved equal with chrome-plated die cast metal, strainers, P-trap, loose key supply stops and all other trim. Provide with Sloan ESD-2000 hard wired soap dispenser. Coordinate with electrical. Coordinate finish with architect.

B. Fixtures P-7 shall be American Standard "Lucerne" #0356.015, vitreous china, wall hung lavatories with concealed carrier and anchoring screws; 8" centers faucet punching and 1 1/4" drain. Faucet shall be Sloan Optima Faucet, EAF-225, hardwired, plug adapter, mixing valve, or approved equal with chrome-plated die cast metal, strainers, P-trap, loose key supply stops and all other trim. Provide with Sloan ESD-2000 hard wired soap dispenser. Coordinate with electrical. Coordinate finish with architect.

2.03 URINALS

A. Fixture P-3 shall be American Standard "Washbrook Flowise", vitreous china, 0.125 GPF, wall hung, washout flush with integral flushing rim and ¾" top spud. Flush valve shall be exposed, battery powered, sensor operated Sloan "G2 Optima Plus" #8186-0.125 or approved equal.

2.04 SERVICE SINKS

B. Fixtures P-4 shall be a Terrazzo floor service sink, 24" x 24" x 12" high, complete with one-piece stainless steel cap all-around top edge, cast brass 3" caulked drain with stainless steel strainer; Stern-Williams "Serviceptor" Model SB-900 or approved equal. Faucet set shall be T-10-VB sink fitting complete with wall brace, hose end, vacuum breaker and chrome finish. *Provide 24" tall, 20 gauge stainless steel splash panels on all walls adjacent to sink.*

A. Fixtures P-9 shall be a FL-7 Molded-Stone Laundry Tub. Overall dimensions are 24" x 20" x 13 3/8" high. FL-7 model is furnished with cup supported by white baked enamel steel angle legs. Provide with integral drain.

2.05 DRINK FOUNTAINS AND WATER COOLERS

A. Fixtures P-5 shall be barrier free split level surface mounted electric water cooler with a bottle filling station; each complete with P-trap and supply service stops. Electric water cooler shall deliver 8.0 GPH of 50°F water at 90°F ambient and 80°F inlet water. Cooler shall have horizontal stainless steel top. Bubbler shall have flexible guard and operate between 20 and 120 psi. Separate valve and diaphragm-type automatic stream regulator shall be mounted with cabinet. Refrigeration system shall employ high efficiency, positive start compressor, non-pressurized counter-flow cooling coil with totally encapsulated insulation and shall be controlled by an integral, adjustable thermostat. Coolers shall have front pushbar water controls with raised lettering for the visually impaired. Coolers shall comply with ANSI 117.1 for both visual and motion disabilities and ADA. Cabinet shall have removable front panels and be finished in a neutral-gray baked enamel. Coolers shall be certified by ARI to meet Standard 1010. Coolers shall be Elkay EZSTL8LC.

2.06 SINKS

A. Fixtures P-6 shall be single compartment, 18 gauge stainless steel with sound-deadening, 25" x 22" inside dimensions, 6" deep; Kohler Model No. K-3894-4. Faucet punching shall be 1 hole O.C. Faucet shall include Moen Model 9126EVC, battery powered (6 D Alkaline), lever style, chrome-plated tailpieces, chrome grid strainer, P-trap, supply stops and all other trim. Select faucet to match sink hole punching. Wall supply stops, drains and tailpieces shall be offset wheelchair type. Install fixtures per ADA act guidelines and ANSI A117.1.

2.07 SHOWERS

A. Fixture P-8 shall be Kohler Freewill 45"X37 ½" shower stall. Model k-1210-C or approved equal. When a taller shower is required, use an ADA accessible shower stall from Kohler.

3.0 EXECUTION

3.01 INSTALLATION

A. Units shall be installed as indicated and in conformance with the manufacturer's recommendations. Coordinate the actual units to be provided with all trades.

B. All plumbing fixtures shall be free of leaks, provided completely finished, trimmed, adjusted, cleaned and ready for use. They shall be properly secured to the structure by the use of thru-bolting, backplates, carriers, expansion shields (for floor mounting only) or toggle bolts.

C. Wall hung fixtures supported on chair carriers shall be bolted to the floor slab. Carefully coordinate space requirements and fixture mounting height requirements with supports being furnished.

D. Fixtures supported with wall hangers on masonry chase walls shall be fastened to the wall with not less than 3/8" bolts which shall pass through the wall and through a 1/4" x 4" wide steel backplate on the unfinished chase wall side.

E. Where fixtures are hung on single masonry walls without a pipe chase behind, they shall be mounted with 3/8" toggle bolts.

F. Fixtures on steel stud walls shall have a 1/4" x 4" wide steel backplate wired with 1/16" steel wire to the studs. Bolts not less than 3/8" shall secure the fixtures through the fixture hanger and the backplate.

G. All mounting holes provided in fixtures shall be used for support. In addition to the main hangers, 1/4" toggle bolts shall secure the bottom of all wall hung fixtures at each drilling provided for this purpose.

H. Mount wall-hung fixtures at the heights indicated on the Architectural Drawings or as prescribed by local code. Special attention is called to the installation requirements of the ANSI Handicap Code.

3.02 CLEANING AND ADJUSTMENT

A. The units shall be cleaned, tested and field-adjusted to provide optimum flow and drainage. Specific attention is called to adjustment of automatic flush valves and faucets for empirical conditions.

B. All flush valves, diaphragms, strainers, aerators, etc. shall be fully cleaned after all piping and fixture flushing.

END OF SECTION

DRAWING NO.
CFD-XXX-P-0002-XXXXXX

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Remove Exposures to Hazards
Reinforce Safe Behavior

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BWA JOB # 2022-0632

SEAL
05/24/23

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MARK	DATE	DRN BY	REVISION
	05.24.23		ISSUED FOR CONSTRUCTION

PROJECT NO:

DRAWING NUMBER
CFD-XXX-P-0002-XXXXXX

ELECTRONIC FILE NAME: P0001.DWG

DRAWN BY: TAYLOR SUBER

CHK'D BY: DAVID CONDON

E-MAIL: DCONDON@barrettwoodyard.com

SHEET TITLE:
SPECIFICATIONS - PLUMBING

SHEET NO.
P-0002

LEGEND

——— - ———	COLD WATER
——— - ———	HOT WATER
———————	HOT WATER RETURN
— — —	VENT
———————	SANITARY WASTE
———————	GAS
//////////	WORK TO BE REMOVED
FD	FLOOR DRAIN
HB	HOSE BIBB
⊙	FLOOR CLEAN–OUT
═	WALL CLEAN–OUT

ABBREVIATIONS

A/C	ABOVE CEILING
AD	ACCESS DOOR
ADJ	ADJUSTABLE
AFF	ABOVE FINISHED FLOOR
AUTO	AUTOMATIC
AC	AIR CONDITIONING
AHU	AIR HANDLING UNIT
ARP	ACID RESISTANCE PIPING
BAL	BALANCING
B/F	BELOW FLOOR
B/G	BELOW GRADE
BHP	BRAKE HORSEPOWER
BCO	BASE CLEANOUT
CW	COLD WATER (DOMESTIC)
CO	CLEANOUT
DN	DOWN
DR	DRAIN
do	DITTO
DWG	DRAWING
EA	EACH
ECC	ECCENTRIC
EFF	EFFICIENCY
EOD	EMERGENCY OVERFLOW DRAIN
EWT	ENTERING WATER TEMPERATURE
FCO	FLOOR CLEANOUT
FD	FLOOR DRAIN
FLR	FLOOR
FOB	FLAT ON BOTTOM
FOT	FLAT ON TOP
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FT	FEET
G	GATE
GA	GAUGE
GPM	GALLONS PER MINUTE
GL	GLOBE
GCO	GRADE CLEANOUT
HD	HUB DRAIN
HP	HORSEPOWER
HTG	HEATING
HW	HOT WATER (DOMESTIC)
HWR	HOT WATER RETURN
HWRR	HOT WATER REVERSE RETURN
HWS	HOT WATER SUPPLY
ID	INSIDE DIMENSION
IN	INCHES
KW	KILOWATTS
LB	POUNDS
LWR	LOOP WATER RETURN
LWS	LOOP WATER SUPPLY
MIN	MINIMUM
MAX	MAXIMUM
MFR	MANUFACTURER
NC	NORMALLY CLOSED
NG	NATURAL GAS
NFGH	NON–FREEZE GROUND HYDRANT
NFWH	NON–FREEZE WALL HYDRANT
NO	NORMALLY OPEN
NOM	NOMINAL
OD	OVERFLOW DRAIN
PSI	POUNDS PER SQUARE INCH
RAD	RADIUS
RED	REDUCER
RS	REFRIGERANT SUCTION
RTU	ROOFTOP UNIT
SAN	SANITARY
SQ	SQUARE
ST	STORM
TEMP	TEMPERATURE
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
V	VENT
VA	VALVE
VTR	VENT THRU ROOF
WC	WATER COLUMN
WHA	WATER HAMMER ARRESTOR
WT	WEIGHT
W	WASTE

FIXTURE SCHEDULE

DESCRIPTION	WASTE	VENT	CW	HW	FLOWRATE
WATER CLOSET (P-1, P-1H)	4"	2"	1 1/2"	---	1.28 GPF
LAVATORY (P-2, P-7)	4"	2"	1/2" MXV1	1/2" MXV1	0.5 GPM
URINAL (P-3)	3"	2"	1 1/4"	---	0.5 GPF
MOP BASIN & LAUNDRY SINK (P-4, P-9)	3"	2"	3/4"	3/4"	NA
DRINKING FOUNTAIN (P-5)	3"	2"	3/4"	---	NA
BREAK SINK (P-6, P-9)	4"	2"	3/4"	3/4"	1.5 GPM
SHOWER (P-8)	3"	2"	3/4"	3/4"	1.5 GPM
FLOOR DRAIN (FD)	3"	2"	1/2" TP	---	---
HUB DRAIN (HD)	3"	2"	1/2" TP	---	---

TP: PROVIDE WITH 1/2" TRAP PRIMER

MXV1: PROVIDE WITH ASSE 1070 MIXING VALVE AT FIXTURE. SET MIXING VALVE TEMP TO 110°F MAX. ONE MIXING VALVE CAN SERVE MULTIPLE LAVS, IF THE MIXING VALVE IS SIZED FOR COMBINED FLOW OF THE LAVS AND THE LAVS ARE IN CLOSE PROXIMITY.

ELECTRIC WATER HEATER SCHEDULE

I.D. TAG	TYPE OF WATER HEATER	TANK CAPACITY (GALLONS)	RECOVERY @ 100°F (GPH)	POWER INPUT (kW)	ELEC. CHAR. (VOLTS/PHASE)	WEIGHT (lbs)	BASIS OF DESIGN	REMARKS
WH-A	ELEC TANK TYPE	66	49	12.2 kW	277/1	--	A.O. SMITH DEN-66	(1) (2)

(1) REFER TO DETAIL 1/P-0003 FOR INSTALLATION.
(2) WATER HEATER SHALL BE BOTTOM FILLED WATER HEATER.

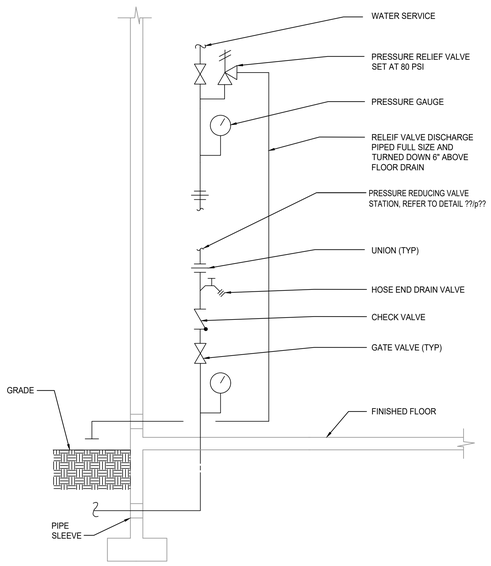
PUMP SCHEDULE

I.D. TAG	FLUID	TYPE OF PUMP	FLOW (GPM)	HEAD (FT)	MAX. NPSHR (FT.)	MAXIMUM RPM	MOTOR HP	VOLTS/ PHASE	MINIMUM EFFICIENCY	BASIS OF DESIGN	REMARKS
RP-A	WATER	HW RECIRC PUMP	20	15	---	2,650	1/6	120/1	--	BELL & GOSSETT PL-36	(1)

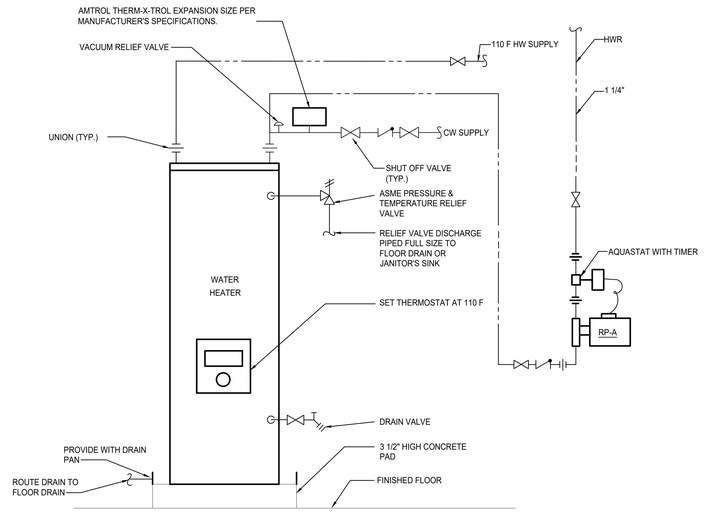
(1) PROVIDE PUMP WITH AN AQUASTAT AND TIMER.

GENERAL NOTES

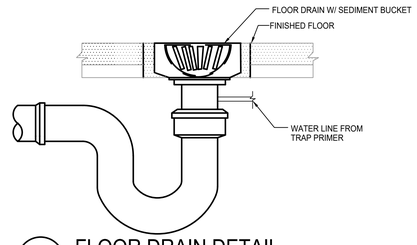
1. THESE DRAWINGS ARE SCHEMATIC IN NATURE AND ARE NOT INTENDED TO SHOW ALL POSSIBLE CONDITIONS. IT IS INTENDED THAT A COMPLETE TENANT MECHANICAL SYSTEM BE PROVIDED WITH ALL NECESSARY EQUIPMENT, ACCESSORIES, OPTIONS AND CONTROLS, COMPLETELY COORDINATED WITH ALL DISCIPLINES. ALL ITEMS AND LABOR REQUIRED FOR A COMPLETE TENANT MECHANICAL SYSTEM IN ACCORDANCE WITH ALL APPLICABLE CODES, STANDARDS AND THE BASE BUILDING CONTRACT DOCUMENTS SHALL BE FURNISHED WITHOUT INCURRING ADDITIONS TO THE CONTRACT.
2. REFER TO THE ARCHITECTURAL DRAWINGS FOR EXACT PARTITION LAYOUTS, REFLECTED CEILING PLANS, DIMENSIONS, ETC.
3. VISIT SITE AND CAREFULLY EXAMINE EXISTING CONDITIONS PRIOR TO SUBMITTING BID. THE EXISTING CONDITIONS SHOWN ARE BASED ON DOCUMENTS PROVIDED BY OTHERS AND HAVE NOT BEEN VERIFIED BY THE ENGINEER. IF EXISTING CONDITIONS DIFFER FROM DRAWINGS IN SUCH A MANNER THAT WILL AFFECT PRICING, (I.E., DUCTWORK, VAV OR PIU ARE NOT IN THE SHOWN LOCATION) CONTRACTOR WILL NOTIFY OWNER SO THAT A RESOLUTION CAN BE MADE PRIOR TO SUBMITTING BIDS. NO ALLOWANCE WILL BE MADE FOR LACK OF KNOWLEDGE OF EXISTING CONDITIONS.
4. REFER TO THE ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATIONS OF ALL CEILING MOUNTED AIR DISTRIBUTION DEVICES. IF ANY ITEMS ARE NOT SHOWN ON THE REFLECTED CEILING PLANS, PREPARE A DRAWING OF THE PROPOSED LOCATION AND PRESENT IT TO THE ARCHITECT FOR APPROVAL PRIOR TO INSTALLATION.
5. ALL PLUMBING FIXTURES SHALL BE PROVIDED AS COMPLETE PACKAGES PROVIDING ALL RELATED ACCESSORIES SUCH AS TAIL PIECES, SUPPLY STOPS, P–TRAPS ETC., SO AS TO FURNISH A COMPLETE JOB. SEE ARCHITECTURAL DRAWINGS FOR SINK SPECIFICATION.
6. ALL SANITARY WASTE, VENT AND WATER PIPING SHALL BE AS SPECIFIED IN THE BASE BUILDING DOCUMENTS.
7. ALL HOT AND COLD WATER PIPING SHALL BE INSULATED WITH 1" THICK PERFORMED FIBERGLASS PIPE INSULATION WITH ALL–SERVICE JACKET. ALL LONGITUDINAL JOINTS, TEARS, ETC., SEALED WITH A MATCHING WHITE VAPOR BARRIER TAPE. ELBOWS SHALL BE MITERED OR MAY BE ZESTON COVERS FILLED WITH EQUIVALENT FIBERGLASS INSULATION.



3 P-0003 WATER SERVICE RISER
NO SCALE



1 P-0003 WATER HEATER DETAIL
NO SCALE



2 P-0003 FLOOR DRAIN DETAIL
NO SCALE

DRAWING NO.
CFD-XXX-P-0003-XXXXXX

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BWA JOB # 2022–0632

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 041126 DANIEL A. CONDON

SEAL 05/24/23

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OPERATIONS BUILDING

MARK	DATE	DRN BY	REVISION
	05.24.23		ISSUED FOR CONSTRUCTION

PROJECT NO:

DRAWING NUMBER
CFD-XXX-P-0003-XXXXXX

ELECTRONIC FILE NAME: P0001.DWG

DRAWN BY: TAYLOR SUBER

CHK'D BY: DAVID CONDON

E-MAIL: DCONDON@barrettwoodyard.com

SHEET TITLE:
NOTES & DETAILS - PLUMBING

SHEET NO.
P-0003

1 P-101 FIRST FLOOR PLAN - SAN & VENT - PLUMBING

3/32" = 1'-0"

GENERAL NOTES
(APPLY TO ALL SHEETS)

1. PLENUM IS USED FOR RETURN AIR. MATERIALS EXPOSED WITHIN PLENUMS SHALL BE NONCOMBUSTIBLE OR SHALL HAVE A FLAME SPREAD INDEX OF NOT MORE THAN 25 AND A SMOKE-DEVELOPED INDEX OF NOT MORE THAN 50 WHEN TESTED IN ACCORDANCE WITH ASTME 84 OR OTHER APPROPRIATE STANDARDS.

2. ALL HUB DRAINS SHALL BE READILY ACCESSIBLE.

3. ALL PLUMBING SHUTOFF VALVES SHALL BE COORDINATED WITH MECHANICAL EQUIPMENT AND SHALL BE EASILY ACCESSED FOR FUTURE OPERATION.

4. COORDINATE FINAL LOCATIONS OF ALL NFWH WITH BUILDING OWNERS REP, ARCHITECT, ETC.

5. ALL HORIZONTAL SANITARY, WASTE, & STORM PIPING SHALL BE SLOPED AT 1/8" PER FOOT, UNLESS OTHERWISE NOTED, IN DIRECTION OF FLOW.

6. ALL UNDERGROUND SANITARY WASTE AND VENT PIPING SHALL BE SERVICE WEIGHT HUB AND SPIGOT CAST IRON SOIL PIPE WITH LEAD AND OAKUM OR NEOPRENE DOUBLE-SEAL COMPRESSION GASKETS. WHERE PERMITTED BY CODE, PVC, DWV SCHEDULE 40 WITH SOCKET-TYPE, SOLVENT WELDED JOINTS, CAN BE USED IN PLACE OF CAST IRON.

7. UNDERGROUND DOMESTIC WATER SERVICE ENTRANCE PIPING 3" AND SMALLER IN SIZE SHALL BE TYPE K HARD DRAWN COPPER TUBING WITH WROUGHT COPPER FITTINGS. ALL JOINTS SHALL BE BRAZED.

8. ABOVEGROUND DOMESTIC WATER SYSTEM PIPING 3" IN SIZE AND SMALLER SHALL BE TYPE L HARD DRAWN COPPER TUBING WITH WROUGHT COPPER FITTINGS AND SOLDERED JOINTS.

KEY NOTES
(APPLY TO THIS SHEET ONLY)

1. AREA DRAIN IN GARAGE SHALL BE TRAFFIC RATED. REFER TO SPECIFICATIONS 221000.
2. CONTRACTOR TO PROVIDE A 100 GALLON OIL INTERCEPTOR GREEN TURTLE OMC 100 OR APPROVED EQUAL.
3. CONTRACTOR SHALL NOT ROUTE WASTE OR VENT PIPING ABOVE THIS ELECTRICAL OR IT CLOSET.
4. CONTRACTOR SHALL PROVIDE NEW 4" SANITARY LINE. COORDINATE EXACT LOCATION WITH EXISTING CONDITIONS, CIVIL, AND ARCHITECT.
5. PROVIDE 3" FLOOR DRAIN. COORDINATE LOCATION WITH ARCHITECT.
6. PROVIDE 4" FLOOR DRAIN BELOW ICE MAKER FOR CONDENSATE DRAIN.
7. PROVIDE NEW VENT TO ROOF IN THIS AREA. OFFSET VENT PIPE BELOW ROOF TO ENSURE THAT VENT TERMINATION IS AT LEAST 10 FEET AWAY FROM ANY OUTSIDE AIR INTAKE.
8. PROVIDE 2" HUB DRAIN BELOW COUNTER FOR ICE MAKER DRAIN. HUB DRAIN SHALL BE LOCATED IN AN ACCESSIBLE LOCATION. COORDINATE EXACT LOCATION TO AVOID CONFLICTS WITH ADA CLEARANCES. P-TRAP SHALL BE INSULATED. REFERENCE ELEVATIONS FOR HUB DRAIN PRIOR TO FLOOR PENETRATION.

DRAWING NO.
CFD-XXX-P-101-XXXXX

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BW&A JOB #2022-2832

NORTH CAROLINA PROFESSIONAL SEAL 041139 ENGINEER JONATHAN A. CONDON

SEAL 09/22/23

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OPERATIONS BUILDING

MARK	DATE	DRN BY	REVISION
0	05.24.23	RTAP	ISSUED FOR CONSTRUCTION
1	09.22.23		

PROJECT NO: 9900019.00

DRAWING NUMBER
CFD-XXX-P-101-XXXXX

ELECTRONIC FILE NAME:

DRAWN BY: Author

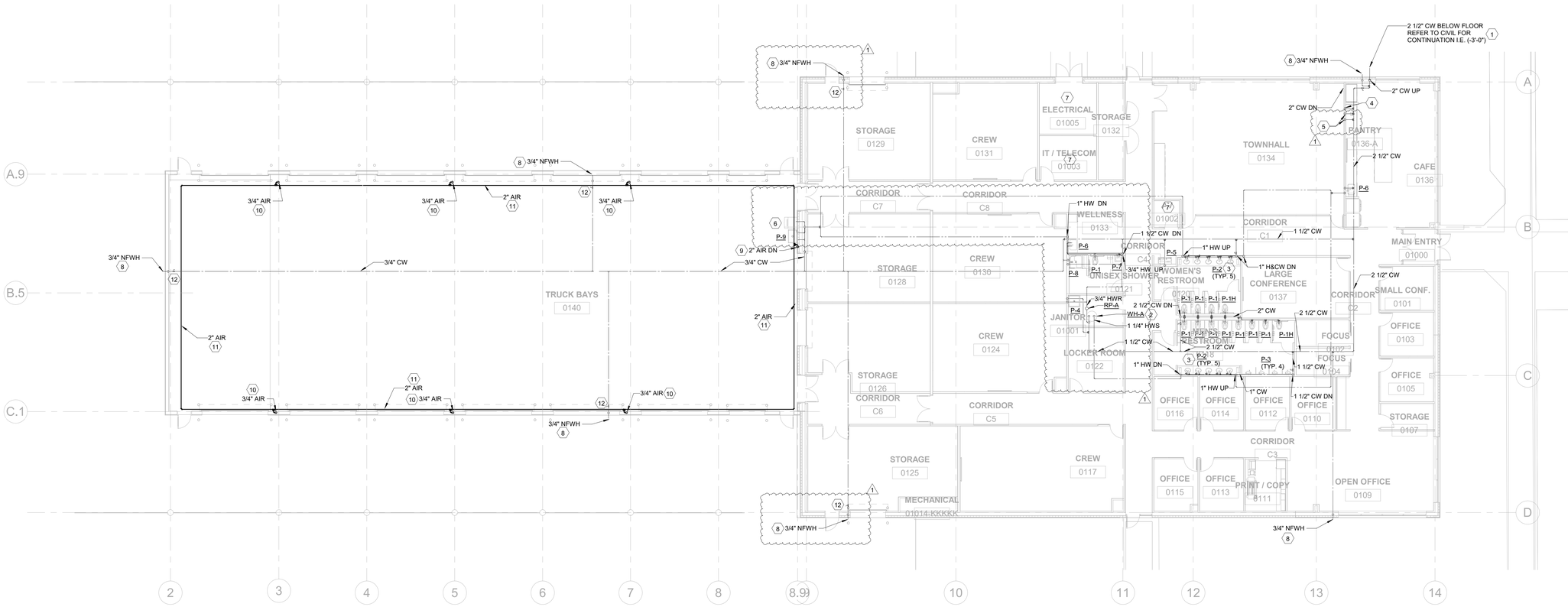
CHK'D BY: Checker DATE:

E-MAIL:

SHEET TITLE:
FIRST FLOOR PLAN - SAN & VENT - PLUMBING

SHEET NO.
P-101

CONSTRUCTION DOCUMENTS



1 P-201 FIRST FLOOR PLAN - H&CW - PLUMBING

3/32" = 1'-0"

COMPRESSED AIR NOTES:

1. ALL COMPRESSED AIR PIPING SHALL BE GALVANIZED STEEL.
2. PIPING SHALL BE ROUTED SO THAT IT SLOPES TO A DRAIN POINT AWAY FROM CONNECTIONS.
3. DIRT LEGS SHALL BE PROVIDED AT EACH VERTICAL DROP AND AN ACCESS PANEL WHERE PIPING IS CONCEALED.
4. PROVIDE SURFACE MOUNTED OR SEMI-RECESSED QUICK CONNECT ADAPTER CONNECTIONS AS REQUIRED.

KEY NOTES
(APPLY TO THIS SHEET ONLY)

1. CONTRACTOR SHALL PROVIDE NEW 2 1/2" CW LINE. COORDINATE EXACT LOCATION WITH EXISTING CONDITIONS, CIVIL, AND ARCHITECT.
2. CONTRACTOR SHALL LOCATE WATER HEATER IN JANITOR'S CLOSET. REFER TO 1/P-0003 FOR INSTALLATION DETAILS. COORDINATE WITH DIV. 26.
3. WATER LINES SHALL BE RUN DIRECTLY BEHIND SINK FAUCET CONNECTIONS.
4. PROVIDE 1/2" CW LINE UP THROUGH COUNTERTOP WITH GROMMET INSTALLED FOR WATER DISPENSER/ICE MAKER IN THIS AREA. COORDINATE EXACT LOCATION WITH ARCHITECT PRIOR TO DRILLING. PROVIDE BACK FLOW PREVENTER AS REQUIRED BY LOCAL AUTHORITY.
5. PROVIDE 1/2" CW LINE UP THROUGH COUNTERTOP WITH GROMMET INSTALLED FOR COFFEE MAKER IN THIS AREA. COORDINATE EXACT LOCATION WITH ARCHITECT PRIOR TO DRILLING. PROVIDE BACK FLOW PREVENTER AS REQUIRED BY LOCAL AUTHORITY.
6. PROVIDE 1/2" CW LINE FOR ICE DISPENSER IN THIS AREA. COORDINATE EXACT LOCATION WITH ARCHITECT PRIOR TO DRILLING. PROVIDE BACK FLOW PREVENTER AS REQUIRED BY LOCAL AUTHORITY.
7. DO NOT ROUTE ANY WATER PIPING OVER SERVER ROOM. IF THERE IS ANY EXISTING WATER PIPING LOCATED ABOVE THE CEILING, REROUTE THE PIPING OUTSIDE OF THE ROOM.
8. COORDINATE FINAL LOCATION OF NFWH AND HB WITH ARCHITECTURE. REFER TO ARCHITECTURAL DRAWINGS FOR ELEVATION.
9. CONTRACTOR TO ROUTE COMPRESSED AIR PIPING SIZED AS SHOWN AND CONNECT TO OWNER PROVIDED COMPRESSED AIR SYSTEM DOWNSTREAM OF STORAGE TANK/COMPRESSOR.
10. CONTRACTOR TO RUN 3/4" COMPRESSED AIR LINE DOWN TO 50'-0" HOSE REAL. PROVIDE SHUT-OFF VALVE, PRIOR TO CONNECTING TO HOSE REAL. CONTRACTOR TO SUPPORT COMPRESSED AIR LINE FROM STRUCTURE ABOVE. COORDINATE TERMINATION HEIGHT WITH OWNERS REP.
11. ROUTE COMPRESSED AIR PIPING ABOVE GARAGE DOORS.
12. CONTRACTOR TO PROVIDE SHUT-OFF VALVE IN THE VERTICAL PIPE 13'-0" AFF.

DRAWING NO.
CFD-XXX-P-201-XXXXX

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BW&A JOB #2022-2832

SEAL
NORTH CAROLINA REGISTERED PROFESSIONAL ENGINEER SEAL 041139 JOHN A. CONDON
09/22/23

DUNN OPERERATIONS CENTER

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HARNETT COUNTY, NC 28334

OPERATIONS BUILDING

MARK	DATE	DRN BY	REVISION
A	09.22.23	RTAP	ISSUED FOR CONSTRUCTION
Δ	05.24.23		

PROJECT NO: 9900019.00

DRAWING NUMBER
CFD-XXX-P-201-XXXXX

ELECTRONIC FILE NAME:

DRAWN BY: Author

CHK'D BY: Checker DATE:

E-MAIL:

SHEET TITLE:
FIRST FLOOR PLAN - H&CW - PLUMBING

SHEET NO.
P-201

CONSTRUCTION DOCUMENTS