Section 22 40 00

Plumbing
V10092017

1. General

1.1. Summary

1.1.1 Provide all materials and equipment and perform all labor required to install plumbing complete as indicated, as required by code, and as specified herein. All sizes, etc. are Publix minimum and if local code requirements are higher, the work shall be bid and installed accordingly.

1.1.1.1 Obtain and pay for all permits, bonds, inspection

1.1.1.2 Provide 2-1/2" water service line, with water meter and 2-1/2" backflow preventer.

1.1.1.3 Provide hot and cold water mains and distribution piping, all overhead and concealed except main water supply into building and where indicated on the Drawings. No PVC pipe allowed above floor slab. (except plumbing waste piping, unless not code approved).

1.1.1.4 Provide a system of soil and waste drains, vents, and connections to all sewer, and water mains and all fixtures.

1.1.1.5 Plumbing Fixtures: Provide and adjust, except as herein specified.

1.1.1.6 Provide Grease Interceptors as specified and as required by local codes.

1.1.1.7 Provide all piping hanging and hangers.

1.1.1.8 Provide gas piping and all indirect drains required for equipment furnished in other sections, and by Owner, except provide indicated drains (floor drains, hub drains, floor sinks, etc.) for refrigerated cases, walk-in coolers, and freezers.

1.1.1.9 Provide rough-in plumbing for fixtures indicated as furnished by Publix or others, and make required connections. Include uncrating equipment, moving into place, and installing complete.

1.1.1.10 Coordinate plumbing work with all other trades including Refrigeration Contractor's work.

1.1.1.11 Provide all other materials and services required for a complete working installation described in Contract Documents.

1.1.2 All apparatus shall be installed at exact height and locations as shown on the Architectural Drawings, or if not shown, at heights and locations determined by applicable codes and laws.

1.1.3 Perform all excavation and backfill required for services, and for all plumbing and work inside and outside the building. Cutting of curbs, walks, concrete and paving required for excavation shall be done by appropriate trade.

1.1.4 All store cases, coolers, and freezers will be furnished and set in place by Publix. The Refrigeration Contractor shall make all condensate waste connections required to Plumbing Contractors stub ups. Check equipment drawings against Drawings in order to verify exact locations. Provide gas piping as indicated.

1.2. Definitions: Explanation and Precedence of Documents:

1.2.1 For purposes of clarity and legibility, Plumbing Drawings are essentially diagrammatic and, although size and location of equipment are drawn to scale wherever possible, Contractor shall make use of all Contract Documents.

1.2.2 The Drawings indicate size, connection points and routes of pipe. It is not intended, however, that all offsets, rises and drops are shown. Install piping as required to fit structure, avoid obstructions, and retain clearance, headroom, openings and passageways.

1.2.3 Carefully examine all existing conditions, existing piping and premises and compare the Drawings with the existing conditions. Submittal of bid indicates that the Contractor has examined the site and Drawings and has included all required work in his bid. No allowances will be made for any error resulting from Contractor's failure to visit Job Sites and to review Drawings.

1.2.4 Conflicts, discrepancies, interferences and omissions in documents shall be brought to the attention of the Publix Engineer for clarification prior to commencement of work.

1.3. Submittals:

1.3.1 Submit LOI in accordance with Section 01 33 00 Submittal Procedures.

1.3.2 Within 30 days of Contract Commencement (Authorization to Proceed), submit for Publix' Architect's approval:

Fixtures and trim with cuts including rough-in dimensions
Equipment (water heaters, expansion tanks, other items)
Drains and cleanouts (floor and wall)
Valves, stops, hose bibbs
Miscellaneous
Roof flashing
Hangers and Seismic Bracing
Piping, piping diagrams
Other items required to complete the Work

1.3.3 Submit two (2) identical bound copies of all items. Arrange categories in order listed above.

1.3.4 All cuts for the above shall have rough-in dimensions, connection sizes, and any special installation requirements. In addition, furnish motor horsepower voltage and phase for all equipment.

1.3.5 Project Record Drawings: Comply with Section 01 78 39.

1.3.6 Do not order materials or proceed with work until all submittals have been reviewed, and approved.

1.3.7 Confirm electrical and other requirements with other contractors.

1.4. Quality:

1.4.1 Subcontractor:

1.4.1.1 The Plumbing Subcontractor shall be a reputable firm regularly engaged in this type of work, employing skilled workmen, and with proper equipment.

1.4.1.2 Upon request Subcontractor shall show evidence of at least two similar jobs, of comparable size and character, installed and operating within the previous two years prior to bid opening.

1.4.1.3 Publix reserves the right to refuse any Subcontractor with or without disclosing cause.

1.4.2 Personnel:

1.4.2.1 Employ an experienced Superintendent to oversee all operation.

1.4.2.2 Work shall not proceed without adequate supervision present at all times.

1.4.2.3 Work shall be accomplished by workers certified in their trade as masters, journeymen, and apprentices in accordance with regulations of the governing authority or customary practice. Utilize workers with skills in proportion to complexity of tasks required.

1.4.2.4 Publix reserves the right to refuse assignment of workers to Publix work, with or without disclosing cause.

1.4.3 Quality Standards

1.4.3.1 Work shall be accomplished to ensure leak-proof installation.

1.4.3.2 Work will be judged by Publix in comparison to work of similar types. Substandard construction as judged by Publix Representative will not be accepted.

1.4.3.3 Neatness counts. Make all joints, connections, unions, etc. with proper care to insure that tight connections are made without excess material, well secured to supports.

1.4.3.4 Install piping with runs straight, accurately formed radiuses at bends, and adequate supports.

1.4.4 Regulations. Comply with applicable provisions of the following codes (latest version adopted by governing agencies):

State Sanitary Code
Local Building Code
ASME Code for Unfired Pressure Vessels
International Plumbing & Gas Code
Florida State Plumbing & Gas Code
Georgia State Plumbing & Gas Code
North Carolina State Plumbing & Gas Code
OSHA - for construction
Other applicable laws and regulations

1.4.5 Coordination. Work shall be accomplished along with the work of other trades. Cooperate with others to benefit the job as a whole.

1.4.6 Participate in the Pre-Construction Conference.

1.5. Sequencing

1.5.1 Notify General Contractor, or any others, of all required chases, sleeves and openings required so that the work can be accomplished without delay. Provide necessary sleeves, etc., to be installed. Otherwise, Plumber shall pay for appropriate trades to perform cutting and patching.

1.5.2 Joists, girders, beams, columns or reinforcing steel shall not be cut.

1.5.3 Where construction necessitates the routing of piping through structural members, framing or under footings, permission to make such installation shall first be obtained from the Publix Field Representative.

1.6. Temporary Operation:

1.6.1 The Owner may require operation of parts or all of the installation prior to Final Acceptance.

1.6.2 Cost of utilities for such operation shall be paid by the Contractor. This operation does not constitute acceptance of the Contractor's work.

1.6.3 All gas and water used for construction shall be paid for by the General Contractor. Furnish and install all temporary water piping required for construction purposes and remove piping when use is no longer required. Restore site and piping to original conditions.

1.7. The Owner reserves the right to make emergency repairs as required to keep equipment in operation without voiding the Contractor's guarantee or relieving the Contractor of his responsibilities during the guarantee period.

1.8. Operating Instructions and Service Manual:

1.8.1 Provide two (2) neatly bound copies of maintenance and instructions books, parts lists pertaining to all equipment furnished.

1.8.2 Each section shall be indexed and include parts lists, instruction books, suppliers' phone numbers and addresses, and individual equipment guarantees all in separate sections.

1.8.3 Representatives of the Owner shall be instructed by the Contractor as to complete care and operation of the plumbing system. Inform the Engineer in writing as to the persons who received the instructions and the date that this was done.

1.9. Polypropylene Piping and Products Warranty:

1.9.1 Manufacturer shall warranty pipe and fittings for 10 years to be free of defects in materials or workmanship.

1.9.2 Warranty shall cover labor and material costs of repairing and/or replacing defective materials and repairing any incidental damage caused by failure of the piping system due to defects in materials or workmanship.

2. Products:

2.1. Materials:

2.1.1 All materials shall be new, full weight, of the best quality with the same brand or manufacturer used for each class of materials or equipment. All similar materials such as valves, pumps, boilers, fixtures, shall be of the same type and manufacturer unless otherwise designated.

2.1.2 All plumbing fixtures shall be "first quality" as defined and set forth in Commercial Standard CS 20-36 As Promulgated By The U.S. Department of Commerce.

2.2. Fixtures

2.2.1 Provide vitreous white china fixtures (unless otherwise noted)

2.2.2 Support wall-mounted fixtures w/ manufacturer approved carriers.

2.2.3 American Standard product designations have been used for consistency. Equivalent fixtures by Crane, Kohler, Zurn, Sloan, or Toto may be accepted.

2.2.4 Install all owner furnished fixtures and provide all the necessary components as required for a complete installation.

2.3. Equipment

2.3.1 Grease Interceptor: Rectangular, pre-cast concrete, all in accordance with state and local codes. Two cast iron traffic tops with traffic cast iron clean-outs are required. Tanks and lids shall be designed for an H-20 traffic load. Tanks shall be reinforced with welded wire mesh and steel bars. Compressive strength of concrete shall be a minimum of 5500 PSI at 28 days. Provide additives or coatings to protect tank interiors to minimum PH of 3.

2.3.2 Drains, Clean-outs. As scheduled. Approved manufacturers:

JR Smith
Zurn

2.4. Pipe and Fittings:

2.4.1 Hot and cold water piping:

2.4.1.1 ASTM B88 type "L" seamless copper tubing. Main service type "K" with red lion seal cote coating, or approved equal.

2.4.1.2 Fittings: Wrought copper solder fittings, solder with silvaloy, streamline 122, phos-copper or approved equal no-lead solder.

2.4.1.3 Alternate: Copper press fittings shall conform to the material and sizing requirements of ASME B16.18 or ASME B16.22. O-rings for copper press fittings shall be EPDM. Approved Manufacturers:

Viega

2.4.2 Gas Piping: Shall be schedule-40-A-120 black steel pipe with black banded malleable iron fittings, pipe shall be welded. Grounding by Electrical Contractor.

2.4.2.1 Indoors: ASTM A53 steel pipe, schedule 40, black forged steel weld fittings.

2.4.2.2 Outdoors: ASTM A53 steel pipe, schedule 40, mill galvanized, fittings as required.

2.4.3 Plastic Gas Piping: Used underground only. Shall conform to the requirements of ASTM D2513 for medium-density polyethylene pipe and tubing. Fittings shall comply with the requirements of ASTM D2683 for socket type, ASTM D3261 for butt fusion and ASTM F1055 for electrofusion. Pipe shall be yellow and marked in accordance with ASTM D2513.

2.4.4 Soil, Waste, Vent Pipe:

2.4.4.1 PVC DWV pipe (where allowed by codes): PVC schedule 40 solid wall pipe and PVC DWV fittings used in sanitary drain, waste, and vent (DWV) and storm drainage applications. Pipe shall be IPS conforming to ASTM D1785 and ASTM D2665. Fittings shall conform to ASTM D2665. Solvent cement shall conform to ASTM D2564.

2.4.4.2 ABS DWV pipe (where allowed by codes): Unplasticized, ASTM D2661, Type I, Grade I, solvent cement joints, DWV fittings, schedule 40 unless indicated otherwise on the Drawings, all elbows shall be long sweep type. Use only where indicated on the drawings.

2.4.4.3 Cast Iron Pipe: Coated service weight cast iron soil pipe using coated service weight cast iron fittings.

2.4.4.4 Vent Piping Option: All vent piping above grade may be copper DWV, with copper drainage fittings, solder as for hot and cold water.

2.4.5 Provide field fabricated DWV copper or cast brass traps with an integral clean out at bottom of traps for stainless steel utility sinks, except those which discharge to a floor sink.

2.5. Valves, Stops, Specialties

2.5.1 Materials: Valves 3" and smaller shall be bronze with threaded or soldered ends. Furnish unions adjacent to all screwed control valves and at all connections to equipment. Valves shall be made in the USA. All water service valves, stops and specialties shall be lead free.

2.5.2 Approved Manufacturers:

Apollo
Hammond/Milwaukee
Mueller
Nibco
Watts
Wilkins

2.5.3 Gate Valves: 1/4"-3", bronze body, solid bronze wedge, rising stem, union bonnet, 300 psi non-shock CWP, MSS-80.

2.5.3.1 Basis of design: Nibco T/S-111-LF

2.5.4 Check Valves:

2.5.4.1 Swing Check Valves: 1/4"-2", bronze body, horizontal swing, Y-pattern renewable seat and PTFE disc, 200 psi non-shock CWP, MSS-SP-80.

2.5.4.1.1 Basis of design: Nibco T/S-413-Y-LF

2.5.4.2 Lift Check Valves: 1/2"-2", bronze body, inline lift, PTFE discs, stainless steel spring, MSS-SP-80.

2.5.4.2.1 Basis of design: Nibco T/S-480-Y-LF

2.5.5 Ball Valves: 1/4"-2", two piece bronze body, full port, bronze trim, chrome plated brass ball, blow out proof stem, 600 psi non-shock CWP, MSS-SP-110.

2.5.5.1 Basis of design: Nibco T/S-585-66-LF

2.5.6 Gas Valves: 1/4"-3", two piece bronze body, full port, bronze trim, chrome plated brass ball, blow out proof stem, 600 psi non-shock CWP, MSS-SP-110, ASME B16.33.

2.5.6.1 Basis of design: Nibco T-585-70-UL (1/4"-1")

2.5.6.2 T-580-70-UL (1-1/4"-3")

2.5.7 Mechanical Gas Valve with Remote Pull: ASCO Automatic Switch Co., Model as indicated on Drawings.

2.5.8 Mixing Valves: Anti-scald, thermostatic point of use. Bronze body, locking control, integral check valves, ASSE 1070 approved

2.5.8.1 Approved Manufacturers:

Apollo
Bradley
Lawler
Powers
Watts
Wilkins
Zurn

2.5.9 Interior Hose Bibbs and Stops

2.5.9.1 Stops: Quarter turn, angle ball stop valve, all brass construction. Brasscraft, McGuire, Bestman

2.5.9.2 Interior Hose Bibbs:

Chicago #387 Brass 3/4" R.C.P W-Watts No. 8BC Vacuum Breaker, or T&S Brass B-0737-POL.

2.5.10 Exterior Hose Bibbs and Hydrants:

2.5.10.1 Description: All shall have integral vacuum breakers and an integral stop valve. If an integral stop valve is not available, provide an in-line gate valve.

2.5.10.2 Approved Manufacturers:

Acorn
J.R. Smith
Zurn

2.5.11 Flush Valves:

2.5.11.1 Description: Cast brass or bronze body with corrosion-resistant internal components; non-hold open, control stop with check valve; vacuum breaker and copper or brass tubing; polished, chrome-plated finish on exterior parts, vandal-resistant stop cap, ADA compliant handle.

2.5.11.2 Manufacturers:

Toto
Sloan - Sloan
Zurn - Z6000AV

2.5.12 Faucets:

2.5.12.1 Description: Cast brass body with corrosion-resistant internal components, polished, chrome-plated finish.

2.5.12.2 Manufacturers:

Chicago Faucet
T & S Brass
Sloan-Basys EPX-250-500 (lavatories only)

2.5.13 Drain Valves

2.5.13.0.1 Description: Cast brass body, stainless steel ball dual teflon seats, vandal resistant, stainless steel strainer, 1/4" turn lever handle.

2.5.13.0.2 Manufacturers:

Drain King

2.5.14 Hand Sinks:

2.5.14.1 Description: Wall hanging; 18 gauge, 304 stainless steel, polished [illegible] basin with radius corners, deck for faucet, integral side support panels, approximately [illegible] x5" with 2-3/16" drain outlet.

2.5.14.2 Manufacturers:

Elkay
Just
Amtrol

2.5.15 Storage Water Heaters:

2.5.15.1 Electric: Where indicated to be contractor provided tanks shall be glass-lined steel, 2" foam insulation and enamel finish on metal outer jacket. Electric heating elements shall be low or medium density, screw in type ceramic terminal blocks, heavy duty contactors and internal power circuit fusing. Element operation shall be linear sequencing. Corrosion resistant drain valve, replaceable anode rod.

2.5.15.2 Gas: Where indicated to the contractor provided tanks shall be glass-lined steel, 2" foam insulation and enamel finish on metal outer jacket. Sealed combustion chamber with helical heat exchanger, integral intelligent control panel. Corrosion resistant drain valve, replaceable anode rod.

2.5.15.3 Approved Manufacturers.

AO Smith/State
Rheem/Ruud

2.6. Miscellaneous:

2.6.1 Faucet (Janitor Room): Sink faucet with top brace, 9" - 10" rigid spout with bucket hook, vacuum breaker and integral stops, at 36" above floor.

T&S Brass
Chicago Faucet

2.6.2 Vacuum Breakers, Backflow Preventers, Dual Check Valves, Bronze body, lead free threaded connections for 2" NPS and smaller. Shall be installed on all fixtures where required.

Apollo
Watts
Wilkins

2.6.3 Unions. Malleable iron ground joint equivalent and similar to Crane 519, up to and including 2 inch. Over 2 inch shall be cast iron flanged with a Garlock 7022 Gasket.

2.6.4 Reducing and Regulation: Water, oil, gas. Watts or approved equal, model as indicated on the Drawings.

2.6.5 A shut off valve shall be placed near the building on the water main. It shall be placed in a box or tile pipe and have a removable plate cover of cast iron, equal to McKinley Iron Works, Fort Worth, Texas, Type MB14, for 8000# loading.

2.7. Pipe Insulation

2.7.1 Rigid fiberglass pipe insulation:

2.7.1.1 Heavy density molded insulation from inorganic glass fibers bonded with a thermosetting resin, jacketed with a reinforced, wrinkle-resistant, all-service vapor retarder facing and a factory-applied longitudinal double-pressure adhesive closure system. Use factory butt strips to complete joints. Thermal conductivity [K factor (BTU-inch/ft²-hr-°F) at 75°F mean] shall be 0.25 maximum.

2.7.1.2 Manufacturers.

Owens-Corning
Johns Manville
CertainTeed

2.7.2 Flexible polyethylene/polyolefin pipe insulation:

2.7.2.1 Unicellular polyethylene thermal plastic, preformed pipe insulation, white color, 25/50 rated, pre-slit with factory-applied adhesive on both surfaces. Use factory adhesive for gluing butt joints. Thermal conductivity [K factor (BTU-inch/ft²-hr-°F) at 75°F mean] shall be 0.27 maximum.

2.7.2.2 Manufacturers:

Armacell
Nomaco

2.7.3 Insulation thickness:

2.7.3.1 For domestic hot water:

Diameter	Thickness
<= 1"	0.5"
>= 1 1/4"	1.0"

2.8. Pipe Hangers and Supports:

2.8.1 Piping shall be held firmly in place by adjustable galvanized carbon steel band or clevis hangers which comply with MSS-SP-69. Hangers shall be located adjacent to fittings, at each offset or change of direction, at ends of branches over 5 feet long, at riser pipes, and along piping where necessary to prevent sags, bends or vibrations.

2.8.2 Band Hangers: Steel and PVC piping equal to Empire fig. 310G. Copper and PPR piping equal to Empire fig. 310CTL.

2.8.3 Clevis Hangers: Steel and PVC piping equal to Empire fig. 110EG. Copper and PPR piping equal to Empire fig. 110CTL.

2.8.4 Stainless steel pipe straps and hangers shall be used for all exposed piping and underslab piping where structural slabs are provided.

2.8.5 Pipe straps shall be heavy gauge galvanized iron factory fabricated to fit against supporting surface when installed. Makeshift devices are not acceptable. No plumbing tape is allowed. Use insulation shields at each pipe hanger and support.

2.8.6 The maximum spacing between hangers or supports measured along the piping shall be as listed below:

	Steel		Copper		PVC/Polypropylene	
	H	V	H	V	H	V
1/2" and 3/4"	12 ft.	15 ft	6 ft	10 ft	4.0 ft	10 ft.
1" and 1-1/4"	12 ft.	15 ft.	6ft.	10 ft.	4.0 ft.	10 ft.
1-1/2", 2" & 2-1/2"	12 ft.	15 ft.	10 ft.	10 ft.	4.0 ft	10 ft.
3"	12 ft.	15 ft.	10 ft.	10 ft.	4.0 ft	10 ft.
4"	12 ft.	15 ft	10 ft.	10 ft.	4.0 ft	10 ft.
6"	12 ft.	15 ft	10 ft.	10 ft.	4.0 ft	10 ft.

2.9. Roof flashings: All vent and roof drains shall be flashed by Roofing Contractor with lead flashing furnished by the Plumbing Contractor. Flashing shall turn down 2" into vent pipes.

2.10. Isolating Couplings. Provide dielectric protection for gas and water main risers inside building. Isolate connections of copper and steel pipe with cathodic isolating unions. Acceptable Manufacturers:

EPCO
W & K Dielectric
F.H. Maloney

2.11. Polypropylene Pipe and Piping Products (PPR):

2.11.1 Polypropylene pipe and fittings shall be manufactured from a PP-R resin meeting the short-term properties and long-term strength requirements meeting the short-term properties and long-term strength requirements of ASTM F 2389. The pipe shall contain no rework or recycled materials except that generated in the manufacturer's own plant from resin of the same specification from the same raw material. All pipe shall be made in a three layer extrusion process. Domestic hot water and heating piping shall contain a fiber layer (faser) to restrict thermal expansion. All piping shall comply with the rated pressure requirements of ASTM F 2389. All pipe shall be certified by NSF International as complying with NSF 14, NSF 61, and ASTM F 2389 or CSA B137.11. Valves with brass components shall be manufactured in accordance with the manufacturer's specifications and shall be certified by NSF International as complying with NSF 61.

2.11.2 Polypropylene hot water piping shall be insulated as required to meet the equivalent insulation rating indicated for copper piping systems.

2.11.3 Acceptable Manufacturer:

Aquatherm Greenpipe, Aquatherm, Inc
Aquatherm Faser, Aquatherm, Inc.

3. Execution

3.1. Examination:

3.1.1 Verify all field dimensions and locations of equipment and fixtures within the layout as established by the General Contractor to insure close, neat fit, with other trades work.

3.1.2 Examine all work of others. Notify Architect in writing if any conditions exist which will prevent satisfactory installation of materials or equipment. Start of work without notification indicates acceptance of work in place.

3.2. Excavation:

3.2.1 Perform excavation for trenches under slab and outside building lines as required for installation. Excavate true to lines and grades shown to achieve adequate fall on drain lines and as needed for refrigeration drainage.

3.2.2 Bell holes shall be dug to allow soil pipe to be fully supported.

3.2.3 Rock shall be excavated 3 inches below the laying depth, and the trench shall be backfilled with sand 3 inches deep.

3.2.4 Over-excavation shall be added in 12 inch lifts (max) and mechanically compacted. Flooding or puddling not permitted.

3.2.5 All piping which will be under walks, planters, arcades, parking lots, concrete or asphalt shall be mechanically compacted in 12 inch lifts (max).

3.3. Interface with Site Utilities:

3.3.1 Coordinate with other work. Connect to site supplies and storm drain at 5'-0" denising line.

3.3.2 Provide waste connection to site sewer at 5'-0" denising line. Provide grease-bearing waste connection to grease trap and from grease trap to waste line located as shown on the Drawings or otherwise indicated.

3.4. Pipe Installation:

3.4.1 Install horizontal sanitary and drain piping, to a uniform grade of not less than 1/8" per foot, unless otherwise noted.

3.4.2 Openings in pipes, drains, fitting, apparatus and equipment shall be capped or plugged to prevent accumulating obstructions during piping.

3.4.3 Run piping free of traps, sags, bends, and other defects, provide and valve for complete drainage and control of the system.

3.4.4 All waste, vent and water lines shall be concealed, and all water lines shall be overhead.

3.4.5 Maintain headroom and keep passageways clear, offset to maintain the required clearance and conform with architectural and structural features of building. Run parallel and straight with adjacent walls or ceilings to present a uniform appearance. Group piping runs together to run concealed in finished rooms.

3.4.6 All rough-ins shall be exact to measurements furnished by manufacturer. Batteries of fixtures shall have rough outlets set in straight lines at equal spacing.

3.4.7 Flush out all waste to insure that they are clear of obstructions prior to the setting of refrigerated cases. If lines are not clear and a case is set, the Plumbing Contractor shall be responsible for the removal and re-set cost.

3.4.8 Water piping shall not be embedded in concrete nor concealed within the floor slab within the building, unless shown on drawings). Isolate copper piping from concrete with fir paper or PVC sleeve.

3.4.9 All piping shall be installed to prevent unusual noise from the flow of water under normal conditions. Install pipe isolators at ring hangers consisting of a metal sheath with end flanges assuring positive retention in the ring hangers. Separate cold lines from hot lines by 6".

3.4.10 Provide dirt pockets on low point of vertical gas piping. Install full pipe size drip pockets at low point in change of grade.

3.4.11 For refrigeration case drains, stub up a 3" line 1" above floor, no hub required.

3.5. Pipe, joints, fittings, and connection-installation

3.5.1 Cast Iron Soil Pipe: Pack tight with first quality oakum to within 1 inch of end hub. Fill remaining space with one pouring of molten lead and caulk tight; or make-up with neoprene gaskets.

3.5.2 Screwed Piping: Make up with pipe dope, applied only to male thread. Remake leaky joints with new material without use of thread cement or caulking. Paint exposed threads of all pipe with asphaltic paint.

3.5.3 Copper Tubing:

3.5.3.1 Solder with 95-5 (no-lead solder) and a noncorrosive flux. Thoroughly clean inside and outside surfaces with sandpaper or wire brush before assembly. Defective joints shall be dismantled, cleaned, and resoldered. Do not use acid Solder.

3.5.3.2 Press Connections: Copper press fittings shall be made in accordance with the manufacturer's installation instructions. The tubing shall be fully inserted into the fitting and the tubing marked at the shoulder of the fitting. The fitting alignment shall be checked against the mark on the tubing to assure that the tubing is fully engaged (inserted) in the fitting. The joints shall be pressed using the tool approved by the manufacturer.

3.5.4 Copper, brass pipe and chromed, polished or painted connections from fixtures shall show no tool marks.

3.5.5 PVC Joints: Clean socket and pipe ends with cleaner recommended by cement manufacturer. Liberally apply solvent cement to both socket and pipe ends. Make up joint firmly.

3.5.6 Gas Piping:

3.5.6.1 Black iron schedule 40, welded except at equipment connections. Certified welding is required.

3.5.6.2 At each piece of equipment, provide shut-off valve, union, drip leg (minimum 4 times pipe diameter, capped) and flexible pipe connection.

3.5.7 Springing, bending or forcing of pipe will not be allowed. Use fittings for all offsets or changes in alignment of piping. Center lines of cast iron will lay straight without pinched joints.

3.5.8 Street elbows, bushings, and long screw fittings will not be allowed on metal pipe.

3.5.9 Cleanly cut pipe and tubing and remove burrs to full diameter of pipe. Excessive reaming will not be permitted. Remove metal particles from ends of pipe and clear each section of foreign material before assembling.

3.5.10 Cut pipe threads to full depth of die and screw up tight to fully engage thread in fitting. Threads to comply with ASA No B 2.1, and be cut with clean sharp dies.

3.5.11 Clean outs. Clean outs shall be placed as shown on Drawings, or max. 50' o.c., at bases of stacks, at major changes in direction, and at the ends of all lines that have 2 or more openings going into that line, or as required by code. Clean outs shall be as indicated on Drawings. If PVC is used include hub adaptor.

3.5.12 Provide shut-off valves in access panels to allow shut down of area of fixtures where indicated on Drawings.

3.5.13 Provide shock absorbers with isolating gate or ball valves as indicated on the Drawings. Mount in the vertical position as recommended by the manufacturer.

3.5.14 The inside of all pipes shall be clean, reamed smooth with no burrs, fins or other obstructions. All drains including trap under utility sinks shall be copper with soldered joints. No pipe shall be run exposed, unless approved by Publix Representative.

3.6. Polypropylene Piping System:

3.6.1 Install listed pipe materials and joining methods below in the following applications:

3.6.1.1 Underground: Service entrance piping shall be Type K copper with the transition to Polypropylene (PP-R) no less than 1 ft. A.F.F.

3.6.1.2 Aboveground: Polypropylene (PP-R) piping in SDR 6, 7.5 or 11 based on the required minimum pressure rating and use temperature.

3.6.2 Fusion Welding of Joints:

3.6.2.1 Install fittings and joints using socket-fusion, electro fusion or butt-fusion as applicable of the fitting type. All fusion-weld joints shall be made in accordance with the pipe and fitting manufacturer's specifications and product standards.

3.6.2.2 Fusion-weld tooling, welding machines and electro fusion devices shall be as specified by the pipe and fittings manufacturer.

3.6.2.3 Prior to joining, the pipe and fittings shall be prepared in accordance with ASTM F 2389 and the manufacturer's specifications.

3.6.2.4 Joint preparation, setting and alignment, fusion process, cooling times and working pressure shall be in accordance with the pipe and fitting manufacturer's specifications.

3.7. Pipe Insulation

3.7.1 Sealed at all joints and seams with adhesive in accordance with insulation manufacturer's recommendations. Pipe supports shall be on the outside of the insulation with 6" minimum length saddles of galvanized sheet metal.

3.7.2 Fiberglass seams shall be sealed with factory furnished self sealing lap and butt joints in accordance with manufacturer's recommendation.

3.7.3 Polyolefin seams shall be sealed with factory-furnished, self-adhering, pressure sensitive seams. Butt joints shall also be glued with factory-furnished adhesive.

3.8. Fixture Installation

3.8.1 Stub out to the exact location of the fixtures. All stubs shall be set symmetrically with fixture.

3.8.2 Install fixtures and trim supplied by Publix or others. Connect to plumbing as required. Finish out and trim fixtures as needed for complete installation.

3.8.3 Caulking: All plumbing fixtures shall be bedded and caulked along joint at walls, and other intersecting surfaces with butyl caulking compound, counter tops and brass shall be caulked with "plumbers putty".

3.8.4 Backing shall be of 2 x 6 pressure treated wood flush with stud face and extending to next stud beyond fixture on each side. Secure as required.

3.9. Inspection:

3.9.1 The Work shall be installed under the inspection and with the approval of Publix' Authorized Representative.

3.9.2 Notify the Publix' Representative two days in advance of backfilling, enclosing or covering all plumbing lines so that he may inspect installation.

3.9.3 Do not cover or enclose plumbing until inspection is made and installation is acceptable. Correct deficiencies in installation as directed by Publix' Representative.

3.10. Tests and Adjustments

3.10.1 All soil, waste, and vent piping shall be filled with water to the highest point in each system with air removed. The lines shall be flushed by removing the test plug. Piping may be tested in sections providing that all portions to be concealed shall be subjected to not less than a 10 ft. head for 24 hours with no leaks. Standpipe installed for head test shall be 2 in. minimum diameter.

3.10.2 Sewer piping shall be filled with water to it's highest point.

3.10.3 Verify that all drain lines have been flushed and are clear of debris prior to completion of Work.

3.10.4 Water piping shall be flushed out, tested at 100 psi and shall be left under pressure of supply main for the balance of the construction period.

3.10.5 Plumbing fixtures shall be filled with water and checked for leaks or retarded flow.

3.10.6 All flush valves, loose key stops, valves and similar equipment shall be adjusted and balanced to provide for the proper operation of the various systems.

3.10.7 Each piece of plumbing equipment and the entire plumbing system shall be adjusted and readjusted as required to insure proper functioning and shall be left in first class operating condition.

3.10.8 Gas piping, shall be tested at 15 psi air pressure for 24 hours, in excess of the requirements of NFPA 54.

3.11. Disinfection:

3.11.1 Purge system of all deleterious material before proceeding with disinfection.

3.11.2 Comply with local health department regulations.

3.11.3 Flush with clean, potable water until water runs clear.

3.11.4 Fill system with with chlorine solution containing at least 50 ppm of chlorine. Allow to stand for at least 24 hours.

3.11.5 Purge system of chlorine solution before putting into service.

3.12. Inspection

3.12.1 Notify inspector as required by local authority when all work is completely installed and tested leak-tight.

3.12.2 Do not conceal piping or fixtures until approval has been obtained from inspector.

3.13. Cleaning Equipment and Premises:

3.13.1 Thoroughly clean all parts of fixtures and equipment, exposed parts which are to be painted shall be thoroughly cleaned of foreign matter with [illegible] soldering flux, etc. removed.

3.13.2 Exposed metal work shall be carefully brushed down with steel brushes to remove rust and other spots and touched up with primer.

End of Section 22 40 00

Note:

Not all project specifications may be applicable to this remodel.

End of section

Section 23 70 00

Central HVAC Equipment
V10092017

1. General

1.1 Summary

1.1.1 Provide all materials and equipment and perform all labor required to install HVAC systems complete as indicated, as required by code, and as specified herein. All sizes, etc. are Publix minimum and if local code requirements are higher, the work shall be bid and installed accordingly.

1.1.1.1 Obtain and pay for all permits, bonds, inspection

1.1.1.2 Provide roof top and split HVAC systems or install systems provided by Publix as described below

1.1.1.3 All A/C curbs shall be set for drying-in by Roofer.

1.1.1.4 All roof mounted fans will be furnished by Publix and installed by HVAC Contractor. Curbs will be furnished by Publix for installation by Roofer.

1.1.1.5 Provide hurricane brackets and other supports required to secure units to structure for wind and seismic conditions.

Seismic: Seismic hazard level as designated by Authority Having Jurisdiction.

Hurricane: FM 1-90 or higher if designated by Authority Having Jurisdiction.

1.1.1.6 Provide sheet metal duct systems as indicated on Drawings and described in Specifications.

1.1.1.7 Provide exhaust ducts between the cooking hoods and the roof mounted exhaust fans.

1.1.1.8 Provide double-wall metal gas vents.

1.1.1.9 Provide all other materials and services required for installation described in Contract Documents.

1.1.2 HVAC Equipment.

1.1.2.1 Publix will provide equipment delivered to the site of Construction. Coordinate delivery schedule with construction progress. Provide all labor, equipment, materials, and services required for installation and satisfactory completion of HVAC work.

1.1.2.2 In addition to above, provide equipment, delivery, required staging and storage, and all other services required to complete the Work.

1.1.3 Coordinate work with work of others. Notify concerned parties before proceeding with work that will affect them.

1.2. Definitions: Explanation and precedence of Documents:

1.2.1 For purposes of clarity and legibility, HVAC drawings are essentially diagrammatic and, although size and location of equipment are drawn to scale wherever possible, Contractor shall make use of all Contract Documents.

1.2.2 Although the locations of the equipment and ductwork may be shown on the Drawings in certain positions, the Contractor shall be guided by the architectural details and conditions existing at the job, correlating this work with that of others.

1.2.3 The Drawings indicate size, connection points and routes of ducts and equipment. It is not intended, however, that all offsets, rises and drops are shown. Install all items as required to fit structure, avoid obstructions, and retain clearance, headroom, openings and passageways.

1.2.4 Remodels: Carefully examine all existing conditions, existing work in place and premises and compare the Drawings with the existing conditions. Submittal of bid indicates that the Contractor has examined the Site and Drawings and has included all required work in his bid. No allowances will be made for error resulting from Contractor's failure to visit job sites and to review Drawings.

1.2.5 Conflicts, discrepancies, interferences and omissions in Documents shall be brought to the attention of the Publix Engineer for clarification prior to commencement of work.

1.3. Submittals:

1.3.1 Submit LOIs in accordance with Section 01 33 00 Submittal Procedures.

1.3.2 Within 30 days of Contract Commencement (Authorization to Proceed), submit the following shop drawings and cut sheets for Publix Engineer's approval:

Cooling Equipment
Air Handling Equipment
Heating Equipment
Air Distribution
Valves, Gauges, Specialties, Thermometers, Misc.
Insulation
Round and Oval Duct - submittals and shop drawings
All submitted data shall have rough-in dimensions, connection sizes, any special installation requirements, certified performance data and horsepower, voltage and phase for all equipment.
Equipment, fixtures and trim with cuts including rough-in dimensions.
Other items required to complete the work

1.3.3 Submit two (2) identical bound copies of all items. Arrange categories in order listed above.

1.3.4 Literature for the above shall have rough-in dimensions, connection sizes, and special installation requirements.

1.3.5 Project Record Drawings. Comply with Section 01 78 39.

1.3.6 Do not order materials or proceed with work until all submittals have been reviewed, and approved.

1.3.7 Confirm electrical and other requirements with other contractors.

1.4. Quality

1.4.1 Subcontractor:

1.4.1.1 The HVAC Subcontractor shall be a reputable firm regularly engaged in this type of work, employing skilled workmen, and with proper equipment.

1.4.1.2 Upon request Subcontractor shall show evidence of at least two similar jobs, of comparable size and character, installed and operating within the previous two years prior to Bid Opening.

1.4.1.3 Publix reserves the right to refuse any Subcontractor with or without cause.

1.4.2 Personnel:

1.4.2.1 Employ an experienced Superintendent to oversee all operation.

1.4.2.2 Work shall not proceed without adequate supervision present at all times.

1.4.2.3 Work shall be accomplished by workers certified in their trade as masters, journeymen, and apprentices in accordance with regulations of the governing authority or customary practice. Utilize workers with skills in proportion to complexity of tasks required.

1.4.2.4 Publix reserves the right to reject personnel with or without cause.

1.4.3 Quality standards: Work will be judged in comparison to work of similar types. Substandard construction as judged by Publix Representative will not be accepted.

1.4.4 Regulations: Comply with applicable provisions of the following codes (latest version adopted by governing agencies):

Local Building Code
ASME Code for Unfired Pressure Vessels
International Mechanical & Energy Codes
Florida State Mechanical & Energy Codes
Georgia State Mechanical & Energy Codes
North Carolina State Mechanical & Energy Codes
OSHA - for construction

1.4.5 Coordination: Work shall be accomplished along with the work of other trades. Cooperate with others to benefit the job as a whole.

1.4.6 Participate in the pre-construction conference.

1.5. Sequencing:

1.5.1 Notify General Contractor, or any others, of all chases, sleeves and openings required so that the work can be accomplished without delay. Provide necessary sleeves, etc., to be installed. Otherwise, HVAC Sub-Contractor shall pay for appropriate trades to perform cutting and patching.

1.5.2 Joists, girders, beams, columns or reinforcing steel shall not be cut.

1.5.3 Where construction necessitates the routing of ducts or piping through structural members, or framing, permission to make such installation shall first be obtained from the Publix Field Representative.

1.6. Temporary Operation: The Owner may require operation of part or all of the installation prior to Final Acceptance.

1.7. After acceptance of the Work, the Owner reserves the right to make emergency repairs as required to keep equipment in operation without voiding the Contractor's guarantee nor relieving the Contractor of his responsibilities during the guarantee period.

1.8. Operating Instructions and Service Manual:

1.8.1 Provide two (2) neatly bound copies of maintenance and instructions books, parts lists pertaining to all equipment furnished.

1.8.2 Each section shall be indexed and include parts lists, instruction books, suppliers' phone numbers and addresses, and individual equipment guarantees all in separate sections.

1.8.3 Representatives of the Owner shall be instructed by the Contractor as to complete care and operation of the HVAC system. Inform the Engineer in writing as to the persons who received the instructions and the date that this was done.

1.9. Warranty.

1.9.1 Units shall have manufacturer's standard one-year warranty against all defects.

1.9.2 Provide individual standard five year compressor replacement warranty.

2. Products

2.1. General: All equipment and materials shall be furnished in strict accordance with the equipment schedules and specifications requirements. See Section 01 11 00 - Summary of Work to determine responsibilities regarding supplying and installing of equipment.

2.2. Nameplates

2.2.1 Nameplates shall not be painted

2.2.2 All switches, starters, and major pieces of equipment shall be identified with black plastic nameplates with engraved white letters.

2.3. Packaged Rooftop Air Conditioners: Self-contained, factory assembled and wired unit. Consists of cabinet compressor(s), evaporator fan, evaporator coil(s), air filters, air cooled condenser, fully charged with refrigerant and oil, and controls.

2.4. Power Ventilators: Direct or belt-drive centrifugal fans consisting of housing, wheel, fan, shaft, bearings, motor and disconnect switch drive assembly, curb base and accessories.

2.5. Controls:

2.5.1 An Environmental Control Panel will be furnished and installed by Publix to control all AC units. Conduit, line voltage circuits, interlocks, etc., shall be furnished and installed by the Contractor, as shown on drawings.

2.6. Filter Media: Full two inch thick dust density polyester material.

2.7. Air Distribution:

2.7.1 General:

2.7.1.1 All air distribution shall be supplied by manufacturers whose testing procedures are in accordance with ASHRAE Standard 70.

2.7.1.2 Furnish and install, unless otherwise noted, all grilles, registers, and outlets at the location and of the type and size shown on the Drawings. Install foam rubber gaskets behind flanges of all grilles and registers to prevent leakage and streaking. Adjust air volumes and set deflection in accordance with Drawings.

2.7.1.3 Approved manufacturers:

Airguide
Anemostat
Bailey and Tuttle
Lindab
Krueger
Metal Industries
Nailor Industries
Price
Titus
Other manufacturers as approved by Publix Engineer

2.7.2 Return Air Grilles and Registers:

2.7.2.1 Return air grilles, outlets, registers and door grilles shall be of etched aluminum with acrylic finish and as indicated.

2.7.2.2 All grilles shall be suitable for smooth surface mounting. Coordinate installation door grilles with door installation.

2.7.2.3 Where indicated, provide opposed blade dampers.

2.7.3 Supply Registers and Diffusers:

2.7.3.1 All supply outlets shall be aluminum (or aluminized steel where required when part of rated roof-ceiling assembly) and products of a single manufacturer.

2.7.3.2 Provide steel grilles and fire dampers, radiation dampers as indicated on the Drawings and in accordance with U.L. roof-ceiling assembly design where indicated.

2.7.3.3 Where indicated, provide opposed blade dampers.

2.7.4 Louvers: Aluminum, drainable with bird screen, AMCA certified.

Greenheck ESD-403
Ruskin ELF-375D
Louvers and Dampers Inc. LEL-4-100, ALL Series
Pottorff

2.8. Bypass Terminal Units: 22 gage galvanized steel construction, 1/2" thick 1.5 lb/ft³ density coated fibrous glass insulation, complying with NFPA 90A and UL-181. Steel damper and actuator shaft with self-lubricating bearings. Field adjusted minimum air volume stop and 24V AC actuator.

2.8.1 Approved Manufacturers:

Metal Industries
Price
Titus

2.9. Sheet Metal Ductwork:

2.9.1 Galvanized Ductwork: All duct and fittings shall be manufactured from galvanized steel of lock forming quality per ASTM A653. The zinc coating shall be minimum G90 (1.25 oz. 1 sq. ft.) per ASTM A924. Seams on fittings shall be welded or locked & sealed. Individual fittings are required, manifolding is not permitted. Comply with SMACNA requirements for duct construction for ventilation and air conditioning systems.

2.9.2 Stainless steel ductwork: ASTM A480, Type 316 sheet-form with #4 finish for surfaces exposed to view; Type 304 sheet-form, with #1 finish for concealed ducts.

2.9.3 Rectangular Duct Work:

2.9.3.1 Panels shall be cross broken. (Beaded duct not acceptable)

2.9.3.2 Longitudinal standing seams may be used

2.9.3.3 Corner closures are not required

2.9.3.4 Hangers shall be galvanized steel strapping and galvanized rods

2.9.3.5 Elbows shall be as drawn.

2.9.3.6 Where indicated vaned elbows shall be double vaned.

2.9.3.7 Connections shall be either 90 degree straight with Titus Model AG-45 control grid or radius tap-in.

2.9.3.8 Inspection plates and test holes are not required.

2.9.3.9 Fresh air intake shall be square or rectangular standard.

2.9.3.10 Access doors shall be insulated and removable.

2.9.3.11 Sealer on all joints: Sealants shall have a Flamespread Rating of 25 or less, Smoke Developed Rating of less than 50 to comply with NFPA 90A.

Hardcast Iron Grip Water-Based Duct Sealant 601.
United McGill United Duct Sealer.
Precision Adhesives PA-2084A Duct Sealant.
Fosters 32-19

2.9.4 Round and Flat Oval Duct:

2.9.4.1 All exposed ductwork shall be spiral lockseam construction standard SMACNA gauges tested to +10WG. Longitudinal seam duct is prohibited. Comply fully with SMACNA recommendations.

2.9.4.2 Where ductwork is exposed to view, provide G90 galvanized metal suitable for painting.

2.9.4.3 Field Joints in Exposed Ductwork: Lindab Inc. SPIRO safe duct system, or Ductmate Industries Spiralmate Round Duct Connector and "Ovalmate Flat Oval Duct Connector" or approved equals.

2.9.4.4 Substitutions of sizes by cross section area or equivalent round formula must have written prior approval.

2.9.4.5 Ductwork assemblies shall be the type tested to 10" WG (min.) by UL 181.

2.9.4.6 Approved Duct Manufacturers:

Eastern Sheet Metal
Lindab, Inc
Semco
United McGill Corp.
Crown Products Company
Hamlin Sheet metal

2.9.4.7 Gauges (Single Wall Ductwork):

Round Duct

Diameter	Spiral	Fitting
3" - 18"	26 Ga.	26 Ga
19" - 24"	26 Ga.	24 Ga.
25" - 42"	24 Ga.	22 Ga.
43" - 60"	22 Ga.	20 Ga.
61" - 66"	22 Ga.	18 Ga.
67" - 84"	20 Ga.	18 Ga.

Oval Duct

Major Axis	Spiral	Fitting
3" - 24"	24 Ga.	24 Ga.
25" - 26"	22 Ga.	[illegible]
27" - 42"	22 Ga.	[illegible]
43" - 48"	22 Ga.	[illegible]
49" - 60"	20 Ga.	20 [illegible]
[illegible]	[illegible]	18 Ga.
[illegible] - 84"	[illegible]	18 Ga.

2.9.4.8 Double Wall Ductwork

2.9.4.8.1 Double wall duct and fittings shall consist of a [illegible] inner liner, a 1 inch, 1.50 lb/ft³ (unless otherwise [illegible]) [illegible] fiber glass insulation and a solid outer pressure shell. A [illegible] fabric shall be wrapped between the perforated inner [illegible] the fiber glass insulation.

2.9.4.8.2 All fittings (only from 5" to 24" OD), shall have rolled edges for added [illegible] and rigidity during installation and shipping.

2.9.4.8.3 Double wall/single wall transitions shall be provided where insulated duct connects to non-insulated, single wall [illegible] transitions also act as insulation ends reducing the double wall outer shell diameter to the inner shell diameter.

2.9.4.8.4 Gauges (Double Wall Ductwork):

Round Duct

Diameter	Spiral	Fitting
3" - 18"	26 Ga.	26 Ga.
19" - 24"	26 Ga.	24 Ga.
25" - 42"	24 Ga.	22 Ga.
43" - 60"	22 Ga.	20 Ga.
61" - 66"	22 Ga.	18 Ga.
67" - 84"	20 Ga.	18 Ga.

Oval Duct

Diameter	Spiral	Fitting
3" - 22"	24 Ga.	20 Ga.
23" - 34"	22 Ga.	20 Ga.
35" - 46"	22 Ga.	18 Ga.
47" - 58"	20 Ga.	18 Ga.
59" - 60"	20 Ga.	16 Ga.
61" - 68"	20 Ga.	16 Ga.
69" - 84"	18 Ga.	16 Ga.

2.9.4.9 Duct Hangers - 8'0" C/C max distance.

2.10. Flexible Duct:

2.10.1 Factory insulated on aluminum liner, UL listed Class 1 Air Duct, STD. 181 and NFPA Bulletin 90A, with FR kraft metallized mylar vapor barrier jacket. Flamespread rating less than 25, and smoke developed 50 or less.

2.10.2 Minimum working pressure 6" w.g.

2.10.3 Maximum length 6 feet.

2.10.4 Supports shall be spaced maximum 3 feet, support band min. 2 in. wide. Use Wiremold duct collars and galvanized strap clamps or equal as approved by Engineer.

2.10.5 Spin in fittings shall be Metal Masters Model MS1-6G or equal as approved by Engineer.

2.10.6 Approved products:

Flexmaster TL-M
Insulated Metalflex V-250-UL
Thermo-Flo Type A-300

2.11. Duct Leakage Loss:

2.11.1 Each system shall meet SMACNA and ASHRAE leakage class 3. This leakage will be determined by the test and balance consultant.

2.11.2 Loss exceeding leakage class 3 requirements shall be corrected by the HVAC Contractor prior to acceptance by Publix.

2.12. Duct Hangers:

2.12.1 Duct hangers shall be threaded rods or metal straps with metal bands or angles see details in the mechanical drawings.

2.12.2 Preferred Method for Exposed Ductwork system: Load-rated cable suspension system. The system shall have a specified manufacturer's safe working load (SWL) and supplementary safety factor of at least five times the SWL. The system shall be verified by SMACNA Testing & Research and shall be in compliance with SMACNA Duct Construction Standards guidelines.

2.12.3 Approved System: Gripple Hang-Fast.

2.12.4 Seismic bracing and design to comply with local conditions.

2.13. Grease Hoods: Owner furnished, contractor installed

2.13.1 Install UL classified range hoods as indicated on the Drawings and in accordance with NFPA 96. Hoods shall be 18 gage (stainless steel to be specified on drawings), liquid tight welds, grease extractors, vapor proof lights and factory pre-piped fire suppression system.

2.13.2 Grade of stainless steel to be listed in the mechanical drawings.

2.14. Fire Suppression

2.14.1 Provide fire protection system (specified Section 15355-Automatic Fire Suppression System) for all grease-laden air removal hoods (Designated GH-). Shall conform to NFPA 17.

2.14.2 Fire dampers shall be at the supply air inlets.

2.15. Grease Hood Exhaust Duct

2.15.1 Fabricate kitchen hood ducts from 16 ga. galvanized steel sheets, 18 ga. stainless steel where exposed. Conform to NFPA 96. All joints and seams shall be welded liquid tight. Provide a flange for duct at top of exhaust fan curb.

2.15.2 Access doors shall be U.L. listed

Ductmate, F2
Flame Gard
Ascdor Products Inc.

2.16. Prefabricated Oven, Grease and Engine Exhaust Venting

2.16.1 Approved Manufacturers

Metal-Fab
Selkirk
Captive Aire

2.16.2 Type B Venting

2.16.2.1 Provide a complete insulated double wall gas venting system (U.L. Listed #103),1400 degrees F. rating and draft hood for the gas fired equipment and bakery ovens where indicated.

2.16.2.2 Thimbles, flashing, rain cap as required.

2.16.2.3 Air Intake: Single wall construction.

2.16.3 Grease Duct

2.16.3.1 Provide complete doublewall, fiber insulated exhaust system as listed and compliant with NFPA 96

2.16.3.2 Use manufacturers sealants and support system and components for a complete system

2.16.3.3 Exhaust piping shall terminate per local code or as required by NFPA 96

2.16.3.4 Minimum 10 year warranty

2.16.4 Engine Exhaust

2.16.4.1 Provide complete double wall fiber insulated exhaust system with insulation thickness as listed on the project plans

2.16.4.2 Use manufacturers sealants and support system and components for a complete system.

2.16.4.3 Exhaust piping shall terminate per local code or as required by NFPA 37.

2.16.4.4 Minimum 10 year Warranty.

2.17. Devices and other miscellaneous items.

2.17.1 Dampers: Opposed blade, butterfly type, or splitter, all factory made as indicated. Each shall have a locking quadrant accessible for adjustment, with extension sleeve for duct wrap insulation.

2.17.2 Air Turning Device for Registers: Titus model AG-45 or similar device as approved by Architect

2.17.3 Radiation Dampers: UL listed and installed where indicated

2.17.4 Piping System for Condensate: Schedule 40 PVC

2.18. Insulation.

2.18.1 Concealed HVAC Ductwork.

2.18.1.1 Insulate externally with foil scrim kraft (FSK) fiberglass blanket type insulation, ASTM C1136, thickness and R value as indicated on the Drawings.

2.18.1.2 Comply with ASHRAE 90.1 and energy code requirements of the AHJ

2.18.1.3 Materials shall have flamespread less than 25, and smoke developed less than 50.

2.18.1.4 Approved manufacturers:

Johns Manville
CertainTeed
Owens Corning
Knauf

2.18.1.5 Neatly cut and fit insulation to the duct surface with all duct joints overlapped 2" minimum, secured with outward-clinch staples 4" on center each way.

2.18.1.6 On ducts 24" or greater in width the insulation on the underside of the duct shall be secured to the sheet metal surface with Foster's 85-20, or equal, adhesive, and secured mechanically with sheet metal screws and caps, or mechanical fasteners adhered to the duct on not more than 18" centers each way.

2.18.1.7 All transverse and longitudinal seams, and penetrations of the vapor barrier facing shall be covered with SMACNA rated foil backed tape applied in and sealed with Foster's #30-80 or 130-65, or equal, vapor barrier mastic.

2.18.2 Where indicated, exposed double wall HVAC duct work shall be internally insulated with fiberglass

2.18.2.1 Insulate internally with fiberglass rigid board insulation and retaining fabric, ASTM C1136, thickness and R value as indicated on the Drawings.

2.18.2.2 Materials shall have flamespread less than 25, and smoke developed less than 50.

2.18.2.3 Approved Manufacturers:

Johns Manville
CertainTeed
Owens Corning
Knauf

2.18.3 Where indicated, exposed [illegible] ductwork shall be internally lined

2.18.3.1 Flexible duct liner shall be glass fibers bonded with a thermo-setting resin.

2.18.3.2 Airstream surface shall be protected by a flexible glass mat coating.

2.18.3.3 Edges, joints and seams shall be sealed using manufacturer's approved coating/sealer.

2.18.4 Fire-resistant Grease Duct Wrap

2.18.4.1 Alternative to 1 and 2 hour fire resistant rated gypsum shaft enclosures. Product shall be a flexible, 0" clearance, non-asbestos system, encapsulated with a scrim re-enforced foil, no flame, no smoke characteristics for the foil blanket. Install per manufacturer's guidelines.

2.18.4.2 Follow the manufacturer's guidelines for securing duct wrap, welded stickpins only, banding and sealers.

2.18.4.3 Approved Manufacturers:

FireWrap Elite, Unifrax
Fire Barrier Ductwrap 15A, 3M
FastWrap +, Thermal Ceramics FireMaster

2.19. Ductwork accessories.

2.19.1 Control Dampers

2.19.1.1 Provide dampers with parallel blades for 2 position control, or opposed blades for modulating control

2.19.1.2 All metal parts galvanized steel. Blades: 16ga., bearings: Heavy duty molded nylon, axles: 1/2" dia. steel, 9" CC.

2.19.1.3 Steel Frames:

2.19.1.3.1 Up to 25 sq. ft.: 2"X1/2"X1/8"

2.19.1.3.2 Over 25 sq. ft.: 4"X1 1/4"X16ga.

2.19.1.4 Acceptable Manufacturers:

Greenheck
Ruskin

2.19.2 Fire Dampers.

2.19.2.1 Fire dampers shall be rated where indicated and shall be UL 555 listed.

2.19.2.2 All metal parts galvanized steel, dynamically rated, casings: 20 ga., blades: 24 ga., fusible Link: 160 - 165 deg. F.

2.19.2.3 Damper: Positive lock type with curtain type blade, positive lock in closed position, with curtain 100% out of airstream.

2.19.2.4 Steel Frames:

2.19.2.4.1 Up to 25 sq. ft.: 2"X1/2"X1/8"

2.19.2.4.2 Over 25 sq. ft.: 4"X1 1/4"X16ga.

2.19.2.5 Acceptable Manufacturers:

Greenheck
Ruskin

2.19.3 Duct access doors.

2.19.3.1 Construct of same gauge or heavier as ductwork served. Provide insulated doors for insulated ductwork. Provide flush frames for un-insulated ductwork, extended frames for externally insulated ductwork. Provide one side hinged, other side with one handle type cam latch for all doors. If space is limited for a hinged door swing, then provide a two handle type cam latch door.

2.19.3.2 Door sizes shall accommodate to allow fire dampers and other devices to be accessed for repair or reset to normal position after being activated.

Largest Dimension of Duct	Access Door Nom. Dimension
Up to 10"	6"X6"
10" to 16"	8"X8"
17" to 24"	12"X12"
25" to 36"	16"X16"
37" and larger	24"X16"

2.19.3.3 Acceptable manufacturers:

Greenheck
Ruskin

3. Execution:

3.1. General

3.1.1 Neatness counts. Make all joints, connections, unions, etc. with proper care to insure that tight connections are made without excess material, well secured to supports.

3.1.2 Install duct with runs straight, shop formed radiuses at bends, and adequate supports.

3.1.3 Verify all field dimensions and locations of equipment and fixtures within the layout to ensure close, neat fit, with other trades work.

3.2. Installation

3.2.1 All equipment shall be protected from dust, moisture and odors by sealing all openings with plastic sheeting before and during installation.

3.2.2 Installation of rooftop A.C. units:

3.2.2.1 Publix will furnish factory fabricated steel roof curbs complete with wood nailer strips. Curbs are shipped fully assembled and tapered to fit roof slope.

3.2.2.2 Provide materials and coordination with other trades required to ensure that curbs are installed properly and level. Use gasket material provided by curb manufacturer for sealing A/C equipment to roof curbs.

3.2.2.3 Attach units to curbs as indicated on the Drawings.

3.2.2.4 Lift all A/C units with spreader bars to prevent cable damage to cabinets and components.

3.2.2.5 Publix will accept only those units which are in new condition without dents or other damage. Scratches or paint damage are to be re-painted with manufacturer's paint.

3.2.2.6 In the event that field repair involves the refrigeration circuit of any unit, such repair is to be made by the unit manufacturer or their representative.

3.2.2.7 Provide each unit with a PVC condensate drain trap in accordance with Drawings and unit manufacturer's recommendation.

3.2.2.8 Piping of unit mounted heat reclaim coil(s) will be by the refrigeration contractor.

3.2.3 Installation of rooftop fans:

3.2.3.1 Publix will furnish factory fabricated steel roof curbs complete with wood nailer strips. Curbs are shipped fully assembled and pre-sloped. Additional slope accommodation is through steel frame provided under other sections.

3.2.3.2 Provide materials and coordination with other trades required to ensure that curbs are installed properly and level.

3.2.3.3 Attach fans to curbs as indicated on the Drawings.

3.2.4 Installation of Ductwork:

3.2.4.1 Comply with SMACNA Duct Cleanliness for New Construction Guidelines Intermediate Level. Protect ductwork during shipment, delivery to the jobsite and storage on site. Sections to be clear of debris before installing. Protect risers from entry of the debris and moisture into the duct.

3.2.4.2 Run straight and level or slope with roof as indicated in Construction Drawings.

3.2.4.3 Hanger for ductwork shall attach to the top chord of bar joist.

3.2.4.4 Install seismic bracing as required to comply with local conditions.

3.3. Equipment Start-Up.

3.3.1 All rooftop A.C. units shall be started and adjusted for proper operation by the manufacturer or his representative. No equipment shall be run prior to this start-up. All units shall be made ready for start-up at the same time.

3.3.2 Contractor shall have qualified personnel in attendance to coordinate ductwork and electrical aspects of the start-up.

3.3.3 While in operation during construction, all returns in areas under construction shall be closed off or have filters installed over openings or grilles to minimize contamination.

3.3.4 Prior to test and balance, contractor is to replace all air filters.

3.4. Substantial Completion Inspection

3.4.1 All of the following items must be completed prior to Substantial Completion Inspections. No exceptions will be made and no payment will be made until all items are completed.

3.4.2 Cleaning Equipment and Premises:

3.4.2.1 Thoroughly clean all parts of the apparatus and equipment. Exposed parts which are to be painted shall be thoroughly cleaned of cement, plaster, and other material and all oil and grease spots shall be removed. Repaint or touch up as required to make look like new. Surfaces shall be carefully wiped and all cracks and corners scraped out.

3.4.2.2 Exposed metal work shall be carefully brushed down with steel brushes to remove rust and other spots and touched up with primer.

3.4.3 Testing and Balancing Systems

3.4.3.1 Publix will provide a test and balance contractor. This service will be done in the presence of the HVAC Sub- Contractor, so that deficiencies can be noted.

3.4.3.2 Comply with "Standards for Field Measurement and Instrumentation" Form No. 81266 Volume One, as published by the Associated Air Balance Council.

3.4.3.3 Submit three (3) copies of complete test reports to the Publix Refrigeration Department prior to Final Acceptance of the Project.

3.4.3.4 Provide sufficient time before final completion date so that testing and balancing can be accomplished and remediation [illegible].

3.4.3.5 Put all HVAC equipment into full operation and continue operation during each working day of testing and balancing.

3.4.3.6 All dampers shall be made open or neutral position prior to test and balance of system.

3.4.3.7 Implement changes recommended by the testing and balancing contractor, including pulley changes, balancing dampers and other items as required to obtain proper system balance as judged by the testing and balancing contractor and the Publix Engineer.

3.4.4 Continue operation of the system for a minimum of 24 hours after balance has been obtained. Notify Publix Architect so that he may inspect the system under operating conditions.

3.5. Prior to requesting a Final Inspection, submit a typed schedule or a marked up set of drawings indicating the observed velocity of each grille, register or outlet. These test data shall be final readings after balancing the system.

3.6. Duct streaking on exposed duct systems: After 6 months, examine all exposed ductwork for duct streaking. Where streaking has occurred, the causes of the streaking shall be determined and repaired. Streaked surfaces shall be cleaned and touched up to match the original finish.

End of Section 23 70 00

Note:

Not all project specifications may be applicable to this remodel.

End of section

Order Plans @ www.LDILine.com

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SOUTH CAROLINA
BRANDT ENGINEERING, INC.
No. 1442
CERTIFICATE OF AUTHORIZATION
EXPIRES: 03/31/2021

Digitally Signed
2019.10.16 10:35:45-04'00'

SIENNA LITE DECOR

ARCHITECT OF RECORD:
TIM MORRISON
SOUTH CAROLINA REGISTRATION # 5687
STRUCTURAL ENGINEER OF RECORD:
DANIEL P. WRAY
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SCOTT T. ERCOLE
SOUTH CAROLINA REGISTRATION # 34783

ISSUE FOR
100% FOR CONSTRUCTION

ISSUE DATE
10/16/2019

REVISIONS

NO.	REASON	DATE

PROJECT TEAM
PRINCIPAL IN CHARGE
John Parker, PE
PROJECT MANAGER
Perry Morrow
DESIGN TEAM
DM/JWH

PROJECT NAME
PUBLIX 1485 Remodel
Village at Cherry Road
2186 N. Cherry Road
Rock Hill, SC 29732

PROJECT NUMBER
122.12061.00

SHEET TITLE
PROJECT MANUAL

NORTH

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