
**Blue Ridge Technical College
Commercial Hood Installation
(LSG 20-069)**

**Mechanical/Electrical/Plumbing
General Commercial Specifications
Permit Set**

4-23-21

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SECTION 15010MECHANICAL GENERAL PROVISIONS

The General Conditions, Supplementary General Conditions, and Division 1 - General Requirements, are parts of this Section.

WORK INCLUDED

- A. Furnish all supervision, labor, materials, tools, equipment and service necessary and incidental to install all mechanical work and related systems shown on the drawings, indicated in this Specification or necessary to provide a finished installation. The finished installation shall be in perfect working condition and be ready for continuous and satisfactory operation.
- B. Work Included: The installation of the mechanical systems shall include but not be limited to the following:
 - 1. Complete plumbing system including hot and cold domestic water, fixtures, final connections, trim and connection to the point of connection. (p.o.c.).
 - 2. Kitchen Exhaust Hood, exhaust ductwork.
 - 3. HVAC Equipment installed with ductwork, insulation, grilles, and diffusers.
 - 4. Sprinkler piping and accessories.
 - 5. Other work as indicated on the plans.

CODES, STANDARDS, AND MATERIALS

- A. All equipment furnished under this Specification shall be free from defects in workmanship and materials. All equipment, systems, and work shall meet the requirements published by the following organizations as minimum standards:
 - 1. National Fire Protection Association
 - 2. Air Moving and Conditioning Association
 - 3. Underwriter's Laboratories, Inc.
 - 4. American Society of Heating Refrigeration Air Conditioning Engineers.
 - 5. American National Standards Institute.
 - 6. International Mechanical Code, Latest Edition.
 - 7. National Standard Plumbing Code, latest edition.
 - 8. Local codes and amendments.

- B. All Work shall also meet the minimum requirements of codes and standards of agencies having jurisdiction.

REVIEW OF MATERIALS

- A. All materials and equipment furnished and installed under this Division of the contract shall be new, of standard first grade quality and correctly designed for their specific purpose.
- B. Where a Subcontractor proposes to use an item of equipment other than the specified or detailed item on the drawings that is approved by the Engineer and that requires redesign of the structure, partitions, foundations, piping, wiring, or any other part of the mechanical, electrical or architectural layout, then such redesign, new drawings, and detailing required for it shall be prepared by the Subcontractor without extra compensation. Redesign shall be approved by the Engineer prior to execution.

PRODUCTS

- A. SUBMITTAL: The Contractor shall provide submittals as follows:
1. The Contractor shall indicate on the submittal the specification section to which the submittal applies.
 2. All submittal items must have the salient features of the specified items.
 3. The Contractor by his submittal indicates his understanding and approval of the submitted item for its intended use. The Contractor by his submittal indicates that he is complying with the contract documents. The Contractor shall note on the submittal any deviations with the contract documents.
 4. The submittal which has been reviewed and approved by the Engineer, with or without comments, does not relieve the Contractor from the requirements of complying with the contract documents. Only submittals which explicitly request the Engineer to review deviations with the contract documents relieve the Contractor from the specific item of compliance.
 5. The specifications may indicate features of basic models and units. The contractor shall refer to the plans, schedules, and model numbers for required features, accessories, and options.

MINOR DEVIATIONS

- A. The locations shown on the drawings are approximate, and are to serve as a guide for installation. The shifting of locations to meet conditions (before installation) will be expected, and this shall be done at no increased cost.

- B. The Contractor shall coordinate the mechanical work and equipment with the work to be performed and equipment to be provided under other divisions of this specification.
- C. It shall be the responsibility of this Contractor to inform the Electrical Contractor as regards to the exact service requirements for each piece of mechanical equipment.
- D. Renovation work: For renovation work the Contractor shall visit the existing facility and note the existing conditions and job site limitations, prior to bidding.

WARRANTY

- A. All materials, equipment and workmanship shall be warranted to be free from defects and shall be maintained (i.e., provide filters and seasonal maintenance) by the Contractor for a period ending one (1) year from the date of formal completion and acceptance of the project. The acceptance of the project and length of warranty shall be as defined in the General Conditions section of the Specifications.

LICENSES, PERMITS, AND CERTIFICATES

- A. This Contractor shall procure and pay for all licenses, permits, and certificates necessary to construct and place in operation all work done under this section.

END OF SECTION

SECTION 15100BASIC PRODUCTS AND METHODS

GENERAL

SCOPE

- A. Application: The products and methods specified in this are to be used wherever applicable in other sections of this Division.

PRODUCTS

MATERIALS

- A. Pipe:
1. Copper Tubing, Type L ASTM B-88
 2. PVC Pipe: Schedule 40 DWV
 3. Steel Pipe: ASTM A-53 Schedule 40
 4. Service Weight Cast Iron
- B. Valves:
1. Gate valves shall be NIBCO S-180-125# Solder Type
 2. Stop and waste valves shall be NIBCO 726-125# Solder Type.
 3. Other valves as indicated on drawings.

EXECUTION

INSTALLATION

- A. Piping - General
1. For purposes of clearness and legibility, piping drawings are essentially diagrammatic and indicate only sizes, connection points, and routes. It is not intended or implied that all offsets, rises, and drops are shown.
- B. Pipe Joints and Connection:
1. PVC Pipe: Cut pipe square and clean surfaces to be joined. Apply cement to both surfaces and turn pipe slightly while inserting.
 2. Copper Tubing: Thoroughly clean mating surfaces with emery cloth or steel wool before assembly. Solder with 95-5 and a non-corrosive flux. Defective joints shall be disassembled, cleaned, and resoldered. Do not use acid solder.

3. Fixture Connection: Copper, brass, bronze, and chromed pipe and connections from fixtures will show no tool marks.
 4. Steel Pipe: Apply pipe dope to the male thread only.
 5. Cast Iron: B & S—Lubricate gasket before assembly; No Hub—Tighten N.H. bands to proper torque.
- C. Valves: Install valves at all branch run-out from mains, service connections, and equipment.
- D. Cutting and Patching: Provide all cutting and patching required for the complete installation of your discipline.
- E. Tests: Leave concealed or insulated work uncovered until required tests have been completed.
- F. Exposed piping: No rough-in piping material shall be exposed to general view or concealed within cabinets. All visible piping shall be chromium plated.
- G. Escutcheons: Provide all exposed plumbing short branch connections to fixtures and/or equipment passing through walls or floors with pressed brass, chromium-plated, solid-type escutcheon.

END OF SECTION

SECTION 15180 INSULATION

GENERAL

SCOPE

- A. Work included shall be as follows:
 - 1. Insulate domestic water piping.
 - 2. Insulate supply and return ductwork.

SHOP DRAWING AND LITERATURE

- A. Submit product literature on all insulation.

PRODUCTS

MATERIAL

- A. Domestic Hot and Cold Water Piping (NOTE: Foam insulation is not acceptable.)
 - 1. Insulation: Snap-on four (4) pound nominal density fiberglass pipe insulation with K factor of .22 at 75°F.
 - 2. Jacket: Provide fire retardant vapor barrier jacket with self-seal lap (FRJ-SSL)
 - 3. Thickness: Refer to IECC code for thickness requirements.

EXECUTION

GENERAL

- A. Items shall be tested before insulating and insulation shall be applied over clean, dry surfaces, butting adjoining sections firmly together and shall be Johns-Manville, Owens-Corning, Gustin-Bacon, or C.S.G.
- B. Apply insulation according to manufacturer's published recommendations.

END OF SECTION

SECTION 15400 PLUMBING

GENERAL

- A. Provide a hot and cold water distribution system beginning at the point of connection with connections to each plumbing fixture. Provide a complete system of sanitary piping beginning at the point of connection (p.o.c.) and continuing to all plumbing fixtures.

BASIC PRODUCTS AND METHODS

- A. The basic products as specified to Section 15100 shall be used as follows:
1. Domestic Water Piping
 - a. Pipe: Type L Copper Tubing (hard).
 - b. Fittings: Wrought Copper.
 - c. Joints: 95-5 Solder.
 2. Sanitary, Vent and Storm Water (refer to plans for any notes regarding which material to use, use cast iron in any air plenums)
 - a. Pipe: Schedule 40 PVC or service weight cast iron.
 - b. Fittings: Drainage.
 - c. Joints: Solvent weld or no Hub.
- B. Cleanouts
1. Exposed - Zurn Z-1445 or approved equal.
- C. Wall Hydrants - Refer to Schedule.
- D. Tests (Drainage and Vent)
1. A hydrostatic test shall be applied by the contractor to the drainage system either in its entirety or in sections. All openings shall be tightly closed except the highest opening and the system filled with water to point of overflow. The test shall consist of at least ten (10) foot head of water (except the uppermost ten <10> feet). The water shall be kept in the system for a period of thirty (30) minutes before inspection and the system shall be tight at all points.
 2. The water lines shall be tested hydrostatically at 100 psi for four (4) hours and proved tight.

3. A written record of all tests shall be maintained in a binder at the job site; tests shall be witnessed by the plumbing inspector. The Record of Tests shall be provided to the Owner at project closeout for the Owner's records.

E. Plumbing Fixtures and Trim

1. All fixtures shall be furnished, set, and properly connected. All proper protective paper, labels, etc., shall be removed and the fixtures and fittings shall be thoroughly cleaned after all trades have completed their work, and shall be left in condition acceptable to the Owner.
2. Fixtures shall be Kohler, American Standard or Equal.
3. Water Heater: Provide as scheduled in accordance with IECC, UL with limit controls. Unit shall carry a three (3) year warranty and be AO Smith, Ruud, or State.
4. All exposed piping to a fixture shall be chrome plated. No rough-in piping shall be visible.

F. Disinfection:

1. Completely disinfect the piping and system components with a solution of sodium hypochlorite as directed by the local Health Department.

END OF SECTION

SECTION 15500 FIRE PROTECTION SPRINKLER SYSTEM

GENERAL

1.1 DESCRIPTION

- A. Scope of Work- Adjust Existing Fire Protection System to Accommodate New Cooking Hood.
- B. Work included: Design, fabricate, install, and secure required approvals of a complete fire protection automatic sprinkler system where shown on the Drawings, as specified herein, and as needed for a complete and proper installation in accordance with pertinent requirements of the Fire Rating Bureau and governmental agencies having jurisdiction.

1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. In addition to complying with pertinent codes and regulations of governmental agencies having jurisdiction, comply with:
 - 1. Recommendations of the Fire Rating Bureau having jurisdiction;
 - 2. Pertinent recommendations contained in NFPA Pamphlet No. 13, "Standards for Sprinkler System Installations."

1.3 SUBMITTALS

- A. Comply with pertinent provisions of General Conditions.
- B. Product data:
 - 1. Materials list of items proposed to be provided under this Section;
 - 2. Design drawings, stamped as having been approved by the Fire Rating Bureau having jurisdiction, showing the complete overhead sprinkler system and indicating ceiling air diffusers, lighting fixtures, and beams;
 - 3. A plan drawing showing location of underground connections, control valves, and related items;
 - 4. Details and sections as required to clarify the design.
- C. Record Drawings:

1. Comply with pertinent provisions of General Conditions.
2. Include a copy of the Record Drawings in each copy of the operation and maintenance manual described below.

1.4 PRODUCT HANDLING

- A. Comply with pertinent provisions of General Conditions.

PRODUCTS

2.1 DESIGN

- A. Provide a design which is complete in all regards including, but not necessarily limited to:
 1. Overhead sprinkler system.
- B. Arrangement:
 1. In areas having ceilings, conceal all pipes.
 2. In storage and service areas, pipe may be exposed but hold to the minimum practicable distance below the ceiling.

2.2 MATERIALS

- A. Sprinkler heads:
 1. Provide 1/2" automatic closed type sprinkler heads of "ordinary degree" temperature rating, complying with NFPA Pamphlet No. 13. Viking Model M or approved equal.
 2. Above ceilings, provide standard upright type.
 3. In finished ceilings, provide semi-recessed type, chrome plated, with white escutcheon plates Model E-1 manufactured by Viking Corporation.
 4. Residential systems – utilize appropriate fast action residential sprinkler heads as necessary.
 5. Do not locate sprinkler heads in any luminous ceiling. Devise methods for sprinklering such areas as approved by the Fire Rating Bureau and governmental agencies having jurisdiction.
- B. Valve seals, tags, and charts:

1. Seals: Provide brass cross-link chain, all brass padlock, and two keys for each manually operated shutoff valve required to be sealed in the open position.
 2. Signs: Provide identification signs of standard design, fastened securely at designated locations in accordance with NFPA Pamphlet No. 13.
 3. Tags: Provide 2" diameter brass tags, stamped with designation numbers, secured with 12 gage copper wire to spindle of the control valves.
 4. Charts:
 - a. Provide two copies of the approved "As-Built" sprinkler system diagram and valve chart, giving designated number, function, and location of each valve;
 - b. Mount in painted glass frames, and locate where directed by the Architect.
- C. Provide supports, hangers, inserts, and associated items to properly support sprinkler piping in accordance with pertinent provisions of NFPA Pamphlet No. 13.

2.3 OTHER MATERIALS

- A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the contractor subject to the approval of the Architect.

EXECUTION

3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 INSTALLATION

- A. Coordinate as necessary with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.

- B. Install the work of this Section in strict accordance with the approved design drawings and the requirements of the Fire Marshal, governmental agencies, and Fire Rating Bureau having jurisdiction.

3.3 TESTING AND ACCEPTANCE

- A. Upon completion of the installation, provide necessary personnel and equipment and test and retest the complete system, making adjustments as required, and secure all necessary approvals.
- B. When the system has been completely approved, secure a letter of final acceptance from the Fire Rating Bureau having jurisdiction, and forward two copies of the letter to the Architect.

END OF SECTION

SECTION 15800 HVAC

GENERAL

- A. Scope-of-Work included shall be as follows:
 - 1. Provide exhaust fans, exhaust ductwork, and Cooking Hood.
- B. SUBMITTALS-Provide shop drawings and description literature for the following:
 - 1. Cooking Hood
 - 2. Exhaust Fans

PRODUCTS

MATERIALS

- A. Sheet Metal: Welded 16 Ga. Black Steel with grease duct Insulation

EQUIPMENT

- A. Equipment: As scheduled on the drawings.
- B. Exhaust Fans: As scheduled on the drawings.
 - 1. Kitchen up-blast fans – 16 GA (minimum) powder coated steel with re-greasable cast iron housing bearings, external disconnect, and welded curb. Greenheck or approved equal.

EXECUTION

MATERIALS

- A. Ductwork
 - 1. Fabricate and install ductwork and accessories in accordance with ASHRAE Guide and SMACNA Duct Manual

EQUIPMENT

A. Equipment, Exhaust Fans.

1. Installation: Install in accordance with the specified manufacturer's recommendations.

B. Test and Reports

1. The Contractor shall balance the system in accordance with the air volumes as shown on the drawings and make other minor adjustments as directed. Provide an independent air balance report, AABC Certified.
2. The contractor shall submit the name and qualifications of the balancing contractor. The engineer reserves the right to reject any balancing contractor without cause. The contractor shall submit an alternative balancing contractor without any adjustments to contract bid fee/price. The rejection is not a cause for a change order of the balancing contractor.

END OF SECTION

SECTION 16010ELECTRICAL - GENERAL PROVISIONS

The General Conditions, Supplementary General Conditions, and Division 1 - General Requirements, are a part of this section.

WORK INCLUDED

- A. Furnish all supervision, labor, materials, tools, equipment and services, necessary and incidental to install all electrical work and related systems shown on the drawings, indicated in this specification or necessary to provide a finished installation. The finished installation shall be in perfect working condition and be ready for continuous and satisfactory operation.
- B. The following definitions shall apply:
 - 1. Where the word *provide* is used, in connection with a system, equipment or item, it shall be construed to mean the furnishing and installing of the system, equipment, or item.
 - 2. Where the phrase *as directed* is used, it shall be construed to mean as directed by the Engineer or his authorized representative.
- C. Work Included: The installation of the electrical systems shall include but not be limited to the following:
 - 1. Electrical service, panelboards, lighting, branch wiring, and receptacles as shown on the drawings.
 - 2. All disconnects and final equipment connections.

LOCAL CONDITIONS

- A. Supports for electrical work shall be by means of securely attached fasteners adequately spaced and of type utilizing metal. Wood plugs, plastic or composition plug supports shall not be used.

PERMITS AND INSPECTIONS

- A. Obtain and pay for all necessary drawings, permits, and certificates required by the various governing agencies having jurisdiction.
- B. Furnish and pay for both local and Fire Underwriter's certificates of inspection and approval of the work.

CODES, STANDARDS, AND MATERIALS

- A. All equipment furnished under this Specification shall be free from defects in workmanship and materials. All equipment, systems, and work shall meet the requirements published by the following organizations as minimum standards.
1. National Fire Protection Association.
 2. National Electric Code, latest edition.
 3. Underwriter's Laboratories, Inc.
 4. National Electrical Manufacturer's Association.
 5. American National Standards Institute.
 6. Local Power Company Regulations.
 7. Local codes and amendments.

SHOP DRAWINGS

- A. Submit detailed, dimensioned shop drawings covering all items of equipment and brochures for the following:
1. Panelboards.
 2. Lighting Fixtures.
 3. Wiring devices.

MINOR DEVIATIONS

- A. The general arrangement of conduit, wiring, and equipment shall be as shown on the contract drawings. Detailed drawings of proposed changes because of field conditions or other causes shall be submitted to the Architect for approval. Such changes shall be made without the additional cost to the owner. The Contractor shall carefully examine all contract drawings and shall be responsible for the proper fittings of materials and equipment in each location as indicated, without substantial alteration.

CUTTING AND PATCHING

- A. All openings around cables, sleeves, etc., shall be sealed for weather and air infiltration.

END OF SECTION

SECTION 16100BASIC MATERIALS AND METHODS

IDENTIFICATION

- A. Provide typed directories for panelboards.

OUTLET BOXES

- A. Provide an outlet box for each and every outlet, device, fixture, etc., called for on the drawings, specified and required by the NEC. Outlet boxes shall be of approved design, construction form, and dimension suitable for the specific location, the kind of device, fixture, etc., to be used, the number of wires used, the arrangement of conduit connected.
- B. Generally, outlet boxes concealed in construction shall be galvanized steel type. Exterior boxes shall be cast aluminum with tapped openings, cast aluminum covers, and rubber gaskets. Boxes shall be set so that the edge of the collar is flush with the finished plaster, masonry or other finished surfaces.

WIRE AND CABLES

- A. Unless otherwise indicated, all wire cable for feeder and branch circuits shall be coated, soft drawn copper, and shall have 600 volt insulation. Minimum size shall be no. 12 American Wire Gauge. Conductors shall be rated 75 degrees, minimum and suitable for use in wet or dry locations.
- B. Unless otherwise noted on the drawings, general branch circuit wiring shall be copper, Type THWN cable with ground.
- C. Conceal all electrical wiring in finished areas. Where wiring is exposed in unfinished areas, it shall be in conduit, 3/4" min. Provide wiring in conduit as follows:
1. Indoors, above grade Home Runs: EMT with compression fittings.
 2. Below slab on grade: PVC
 3. In concrete: PVC
 4. Outdoors, exposed: IMC
 5. Outdoors, below grade: PVC
 6. Concealed branch circuits downstream of home run junction, "MC Cable."

WIRE CONNECTIONS AND DEVICES

- A. For wire No. 10 AWG and smaller, splices shall be made with wire caps.

SWITCHES

- A. Standard flush tumbler switches shall be 20 amps, 120 volts (AC), single-pole, double-pole, three way or four way as indicated on the drawings. Color: Ivory.

RECEPTACLES

- A. Duplex receptacles shall be 20 amps, 120 volt (AC), 3-wire grounding type with grounding terminal and shall have screw terminals arranged for side or back wiring. Color: Ivory.
- B. Specialty receptacles shall be as required for the equipment to be served, confirm type and amperage with owner prior to installation.

PLATES

- A. Provide brushed stainless steel #302 wall plates of appropriate type and size for all switches, receptacles, wiring and control devices, and signal and telephone outlets.

END OF SECTION

SECTION 16400 SERVICE AND DISTRIBUTION

SERVICE DESCRIPTION

- A. Principal electrical distribution within the building shall be as indicated on the plans.

PANELBOARDS

- A. Panelboards shall be Cutler-Hammer with cover, door and ground bar or approved equal by Square-D or General Electric.
- B. Provide an aluminum nameplate, (Seton #2065-30-PA, 3 line), for exterior panels or a Seton Ply nameplate, (Seton #2060-30-PA, 3 line), for Interior panels, labeling the panel callout, voltage and amperage.

TRANSFORMERS

- A. Transformers shall be Cutler-Hammer with KVA Rating and options as stated on plans or Approval equal by Square-D or General Electric.
- B. Provide an aluminum nameplate, (Seton #2065-30-PA, 3 line), for exterior transformers or a Seton Ply nameplate, (Seton #2060-30-PA, 3 line), for interior transformer, labeling which panel this transformer feeds, voltage in/out and KVA rating.

DISCONNECTS

- A. Disconnects shall be Cutler-Hammer with fused or non-fused component as stated on plans or approved equal by Square-D or General Electric.
- B. Provide engraved aluminum plates, (Seton #2065-30-PA, 3 line), for all exterior disconnects, labeling which equipment it serves and voltage and amperage. Provide Seton Ply nameplates, (Seton #2060-30-PA, 3 line), for all interior disconnects labeling which equipment it serves and voltage and amperage.

END OF SECTION

SECTION 16721FIRE ALARM SYSTEM

GENERAL

- 1.1 DESCRIPTION: Scope of Work- Interface the existing Fire Alarm System with the New Cooking Hood fire suppression system.
- 1.2 SUBMITTALS: Submit manufacturer's literature for manual stations, control panel including all required modules, alarm bells, horns, wire and raceway, and batteries. The Contractor shall submit erection drawings and completed wiring diagrams for approval by Fire Marshall and Engineer.
- 1.3 QUALITY ASSURANCE:
 - A. The system and all individual components shall meet the requirements of NEC, NFPA, UL, and ADA. Individual components shall be UL listed. All devices shall be of one manufacturer and UL cross listed.
 - B. The complete commercial system shall be provided by Simplex, Edwards, Notifier, or approved equal.
- 1.4 CLOSEOUT SUBMITTALS: As specified in General Conditions. Submit operation and maintenance data.

PRODUCTS

- 2.1 COMMERCIAL DETECTOR SYSTEM (ADDRESSABLE SYSTEM):
 - A. Provide components to match the existing building Fire Alarm System.

EXECUTION

- 3.1 COMMERCIAL DETECTION SYSTEM:
 - A. Install in accordance with manufacturer's recommendations.
 - B. Wiring: Where possible, conceal wiring in walls and ceiling.
 - C. Provide Programming to interface new cooking hood system with existing building fire alarm system.
- 3.2 TESTING: When system is installed, manufacturer's representative shall test entire installation in the presence of the owner's representative and the local Fire Marshall.

END OF SECTION