

PROJECT MANUAL
FOR

32 MARY STREET

CHARLESTON AFFORDABLE HOUSING, INC.
180 MEETING STREET, SUITE 205
CHARLESTON, SOUTH CAROLINA 29401

VOLUME II TECHNICAL SPECIFICATIONS

Project No. 9221A
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Set No. 26

VOLUME II - TECHNICAL SPECIFICATIONS

32 MARY STREET
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SECTION 1A

SUMMARY OF WORK

A. GENERAL

1. Applicable provisions of the GENERAL CONDITIONS OF THE CONTRACT and the SUPPLEMENTARY CONDITIONS apply to requirements specified in this Section to the same extent as if fully included herein.
2. Work covered by the Contract Documents consists of renovations to an existing four story wood frame building, as named on the title page, and includes related site improvements, plumbing, mechanical and electrical work.
3. Work shall include all labor, equipment and materials required for construction of the complete project as indicated on the Drawings and described in the Specifications. Indication on the Drawings or naming in the Specifications of materials, articles, operations, or methods requires that the Contractor furnish each item named, of quality noted; perform each operation prescribed; and provide therefor all necessary labor, equipment, and incidentals; subject to the conditions and qualifications stated.
4. Contractor shall perform all work in accordance with the Secretary of Interior Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings; copies are available through the U.S. Department of the Interior, National Park Service, Preservation Division, Washington, D.C.

B. SEPARATE CONTRACTS OR WORK BY OTHERS

1. It is the intention of the Owner to award separate contracts and/or to have work on the project performed by others prior to or simultaneously with the work under this contract. Work by others shall include, but not necessarily be limited to, the following:
 - a. Landscaping, except as specified herein or indicated on the drawings.
 - b. Telephone wiring, except as specified in Section 16A, ELECTRICAL WORK.
2. Contractors for work under separate contracts will be required to schedule their work in cooperation with the General Contractor and to complete each portion within such time period as required to avoid delays in the work of the General Contractor and others and the final completion of the total work.

C. SUPERVISION AND COORDINATION

1. Contractor shall be fully responsible for overall supervision and coordination of the Work, including work by others, and shall cooperate as required for proper scheduling and coordination.
2. In matters concerning access to the Project, storage of materials, scheduling and execution of work, Contractor shall cooperate with separate contractors to the same extent as with persons or organizations performing work under him as subcontractors.

3. The Contractor shall act as Agent for the Owner in all matters regarding compliance with laws, ordinances, rules and regulations bearing on the conduct of the work.
 4. Contractor shall establish and maintain all grades, lines and levels necessary for the proper execution of the Work.
- D. CONTRACTOR'S USE OF SITE**
1. Contractor will be allowed adequate space on Owner's property for storage of materials and construction operations. Locations of areas for Contractor's use shall be subject to approval by Owner.
 2. Except as otherwise specified, Contractor shall have complete control of the designated portions of the site during the progress of the work.
 3. Requirements for temporary facilities related to use of site are specified in Section 1E, TEMPORARY FACILITIES.
 4. Contractor shall be fully responsible for protection of the parts of the property under his control and upon completion of the project, shall clean the designated areas and repair any damage resulting from his use of site during the progress of the work.
- E. PROTECTION OF EXISTING PROPERTY**
1. Contractor shall take all reasonable precautions to protect and prevent damage to existing building and property and shall assume full responsibility for damages resulting from construction operations. See Article 10, Paragraph 10.2 of the General Conditions.
 2. Such responsibility shall include repairs of damage to underground piping, conduit, site utilities, other concealed facilities.
 3. Damaged property or facilities shall be repaired as required to restore them to original condition. In general, damaged or scarred areas shall be patched, restored and finished as required to match adjacent or similar undamaged surfaces.
- F. TIME FOR COMPLETION**
1. Subject to the provisions of Article 8 of the General Conditions and unless otherwise stipulated in the Contract Documents, the Work shall be substantially completed within two hundred forty (240) calendar days after the date of the Notice to Proceed and shall be complete for final acceptance in all details within thirty (30) calendar days after the Date of Substantial Completion.
 2. If the Work is not substantially complete within the time originally stipulated in the Contract Documents or extended by Change Order, the Owner shall have the right to withhold any further progress payments after the stipulated time of completion until the Work is substantially complete.

SECTION 1C

MATERIALS, PRODUCTS AND SYSTEMS

A. GENERAL

1. Applicable provisions of the GENERAL CONDITIONS OF THE CONTRACT and the SUPPLEMENTARY CONDITIONS apply to requirements specified in this Section to the same extent as if fully included herein.
2. All materials, products and systems used in construction of the project shall conform to the Specifications in every respect, unless substitutions or exceptions are approved in writing by the Architect.
3. All manufactured products, materials, and equipment shall be applied, installed, or used as directed by manufacturers, unless specifically otherwise indicated. At Architect's request, Contractor shall furnish two copies of manufacturer's printed directions for any such item.
4. In general, materials shall be standard products of approved manufacturers regularly engaged in the manufacture of such products. Items for the same intended purpose shall be of identical type and manufacture throughout the work.
5. All materials shall be compatible with other materials and products with which they are in contact. This is especially important for such items as paints, sealants, adhesives, plastics, bituminous materials, other products subject to corrosion or chemical reaction with other materials.
6. Unless otherwise specified, all materials and products shall be new.

B. DELIVERY, STORAGE AND HANDLING

1. All materials shall be so delivered, stored and handled as to prevent the inclusion of foreign materials and the damage of materials by water or breakage.
2. Fixtures, equipment, and prefabricated components shall be delivered to the site and stored in manufacturers' standard cartons or packages, properly identified with factory-applied labels, until ready for use. Packages or materials showing evidence of damage will be rejected.

C. SUBSTITUTIONS

1. Where any material, product, process, system, form or type of construction is noted or specified by name of manufacturer or by manufacturer's trade name or catalog number, the intent is to establish a standard of quality. Neither such notation on the Drawings nor any mention of a specific manufacturer's name in the Specifications shall be construed as limiting.
2. Similar materials, products and systems by manufacturers other than those specified may be used if, in the opinion of the Architect and the responsible Consulting Engineer, expressed in writing, they are equal in quality and performance to those specified.

3. If the Contractor desires to make a substitution for any specified product or system, he shall submit a request to the Architect, stating the reasons for proposing the substitution and the credit or extra involved, if any, and shall provide samples, descriptive literature and other supporting data, as required to evaluate the proposed substitution.
4. If the proposed substitution is approved, the Contractor will be advised by letter and/or a Construction Change Directive or Change Order to the Contract will be issued. No oral approval, expressed or implied, will be considered valid or binding. No substitution shall be made for any material, product, process, system, form or type of construction specified by name unless written approval is obtained.
5. All substitutions will be required to conform to the general intent of the product or system originally specified. If the physical size or configuration of any substituted item is such that its use or installation will interfere with any other building component or work of other trades, Contractor shall be responsible for any required changes in the building structure, finish, position of equipment, or work of other trades.
6. In all cases involving the approval of substitute materials, the opinion, judgment and decision of the Architect and the Owner will be final and binding on all parties concerned.

D. SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

1. Unless otherwise directed, required shop drawings, product data and samples shall be submitted through the Architect's office. The number of copies submitted shall be sufficient to allow the Architect, and, if applicable, the responsible Consulting Engineer, each to retain one copy or sample of each item.
2. Insofar as practicable, all required submittals for a given trade shall be submitted in one package containing all associated items to ensure that all required information is available for complete review. Partial submittals may be rejected.
3. Before submitting shop drawings and product data for approval, Contractor shall check all such submittals for accuracy. He shall see that all work contiguous with and having bearing on the work indicated on shop drawings is accurately and distinctly illustrated and that work shown is in conformity with contract requirements.
4. Copies of approved shop drawings, product data and other submittals, corrected as required, shall be distributed by Contractor to concerned parties, or as directed by Architect.
5. For materials and products requiring selection of colors and finishes, two sets of samples shall be submitted to Architect as soon as practicable. Color schedule will not be provided until all samples have been received.

SECTION 1D
CASH ALLOWANCES

A. GENERAL

1. Applicable provisions of the GENERAL CONDITIONS OF THE CONTRACT and the SUPPLEMENTARY CONDITIONS apply to requirements specified in this Section to the same extent as if fully included herein.
2. For the purchase of certain materials, products and services required for the project and to provide for changes due to unforeseen conditions, cash allowances as specified herein shall be included in the Contract Sum.
3. In general, materials and products purchased and subcontractors to perform services under allowances will be selected by the Owner with direction and approval of the Architect; changes or additions to be covered by the contingency allowance will be authorized by the Architect.
4. Unless otherwise indicated, allowances are established for the purchase of materials and products only. No claim against cash allowances shall be made for installation, overhead, profit or other expense incidental to materials and products furnished under allowances, or for overhead and profit on work performed and paid for under the contingency allowance. See Article 3, paragraph 3.8 of the GENERAL CONDITIONS.
5. Claims against contingency allowance will not be considered unless approved in writing by the Architect or other authorized agent of the Owner.

B. CASH ALLOWANCES

1. Cash allowances for products and services:
 - a. For finish hardware, other than finish hardware specified herein or indicated on the drawings, the sum of one thousand four hundred dollars (\$1,400.00).
 - b. For kitchen appliances (electric ranges, refrigerators, and range hoods, the sum of three thousand two hundred dollars (\$3,200.00).
 - c. For vinyl window blinds, the sum of five hundred dollars (\$500.00).
 - d. For miscellaneous bathroom accessories (towel bars and toilet paper holders), the sum of one hundred dollars (\$100.00).
 - e. Contingency allowance, for changes and additions not covered by Change Order, the sum of two thousand five hundred dollars (\$2,500.00).

SECTION 1E

TEMPORARY FACILITIES

A. GENERAL

1. Applicable provisions of the GENERAL CONDITIONS OF THE CONTRACT and the SUPPLEMENTARY CONDITIONS apply to requirements specified in this Section to the same extent as if fully included herein.
2. Contractor shall provide for construction utilities, other temporary facilities as specified herein, as required by authorities having jurisdiction, or as necessary for the proper execution of the work.
3. Except as otherwise specified or approved, temporary facilities and services shall be maintained and paid for by the Contractor as long as needed for the safe and proper execution of the work, and shall be removed as rapidly as the progress of the work will permit, or as directed by the Architect.
4. Conform to applicable codes, laws, ordinances, requirements of utility companies, municipal authorities.

B. FIELD OFFICE AND TELEPHONE

1. Provide a watertight field office with a telephone at the job site. Subject to the approval of the Owner, space within the existing building may be used for field office.
2. Field office shall contain a complete set of Contract Documents in good condition available at all times for use of Architect, other authorities having jurisdiction over work.
3. Unless otherwise approved, field office and telephone service shall be maintained until the date of Substantial Completion of the Work.

C. CONSTRUCTION WATER AND POWER

1. Obtain and pay for temporary easements required to bring temporary facilities to the project site, where the Owner's permanent easement cannot be utilized for that purpose.
2. Electric power and water required for and during construction of project shall be furnished by the Contractor.
3. Connect to existing water supply system where directed and provide for conveying water to location of use.

D. TEMPORARY SIGNS

1. Contractor may, at his option, erect a painted sign bearing the name of the project, and the names and addresses of the Architect, Contractor and major subcontractors. Size, color, arrangement of lettering, and location of sign shall be subject to Architect's approval.

2. No other signs or advertisements will be allowed to be displayed on the property without Architect's approval.

E. OTHER TEMPORARY FACILITIES

1. Provide first aid supplies in compliance with governing regulations and recognized recommendations within the construction industry.
2. Where site is not secure by means of existing fences, walls, or adjacent structures, erect a temporary construction fence, entire perimeter of site. Fence shall be approximately 4' high, woven wire supported by wood posts.
3. Provide a single-occupant self-contained toilet unit of the chemical, aerated recirculation, or combustion type, properly vented and fully enclosed.
4. Provide scaffolding, barricades, warning signs, steps, ladders, platforms, other temporary construction necessary for proper execution of the work.
5. Temporary storage buildings, sheds, other temporary facilities, may be provided, at Contractor's option, to isolate areas of operation and storage of materials; locations and limits of such facilities and access routes shall be subject to Owner's approval.

SECTION 1F

PROJECT MEETINGS

A. GENERAL

1. Applicable provisions of the GENERAL CONDITIONS OF THE CONTRACT and the SUPPLEMENTARY CONDITIONS apply to requirements specified in this Section to the same extent as if fully included herein.
2. To facilitate orderly review during progress of the Work, and to provide for proper and systematic discussion of problems, the Architect will conduct project meetings as specified herein and as otherwise deemed advisable during the construction period.
3. The Contractor shall schedule meetings and notify concerned subcontractors, suppliers, and others designated to participate in project meetings, and shall provide coordination as required to establish mutually acceptable schedule.
4. In general, persons representing the Contractor or any subcontractor shall have the required authority to commit those whom they represent to decisions reached in project meetings.
5. The Contractor's relations with subcontractors and material suppliers are the Contractor's responsibility; discussions related thereto shall not be a part of project meetings.
6. Insofar as practicable, meetings will be held at the job site.

B. PRECONSTRUCTION MEETING

1. Preconstruction meeting shall be scheduled within ten days after the Contractor has been authorized to proceed with the Work. Contractor shall provide for attendance by the project superintendent and other authorized representatives of the Contractor and all major subcontractors. The Architect will notify other interested parties and request their attendance.
2. Items to be discussed at preconstruction meeting shall include, but not be limited to, the following:
 - a. Organization of Contractor's forces and personnel, and those of subcontractors, material suppliers, the Architect and Consulting Engineers.
 - b. Channels and procedures for communication.
 - c. Construction schedule, including sequence of critical operations.
 - d. Contract Documents, including distribution.
 - e. Processing of shop drawings and other submittal data.
 - f. Field decisions and change orders.

- g. Applications and certificates for payment.
- h. Rules and regulations governing performance of the Work.
- i. Contractor's use of premises, and security of the job site.

C. GENERAL MEETINGS

- 1. Unless otherwise agreed between the Contractor and the Architect, a general meeting will be held at a regular time each week.
- 2. Subcontractors, materials suppliers, and others may be requested to attend project meetings at which their work or concerns are to be discussed.
- 3. Agenda items for regular meetings shall include, but not be limited to, the following:
 - a. Review any unresolved questions from previous meeting.
 - b. Review progress of work, as related to the construction schedule.
 - c. Review status of shop drawings and submittal data.
 - d. Identify problems and causes of delays.
 - e. Discuss and plan action to keep work on schedule.
- 4. Meetings other than regular weekly meetings may be initiated by either the Contractor or the Architect.

SECTION 1G

CONTRACT CLOSEOUT

A. GENERAL

1. Applicable provisions of the GENERAL CONDITIONS OF THE CONTRACT and the SUPPLEMENTARY CONDITIONS apply to requirements specified in this Section to the same extent as if fully included herein.
2. In preparation for substantial completion of the Contract or occupancy of the building or any portion thereof, Contractor shall review the Contract Documents and inspect the project for incomplete or defective work.
3. Insofar as practicable, all defects and discrepancies shall be remedied and all submittals required before contract closeout shall be obtained before Architect is notified that the work is substantially complete and ready for inspection.
4. List of items to be completed or corrected, submitted by the Contractor in accordance with Paragraph 9.8.2 of the General Conditions, shall include, in addition to physical defects and discrepancies, any administrative requirements and details not yet completed or not in compliance with the Contract Documents.

B. FINAL CLEANING

1. Conduct final inspection of all interior and exterior surfaces, including accessible concealed surfaces.
2. In addition to general cleaning and any special cleaning specified in the Contract Documents, clean and polish all glass, finish hardware, floors; remove grease, dust, dirt, stains, labels, fingerprints, other objectionable marks or spots from fixtures and equipment.
3. Repair, patch and touch up marred surfaces to specified finish, to match adjacent surfaces.
4. Broom clean exterior surfaces of concrete and asphalt; rake clean other exterior surfaces in area of construction operations.
5. Use only cleaning materials recommended by manufacturers of surfaces to be cleaned; avoid harsh abrasives and acids on finished metal surfaces, glazed surfaces, factory-finished products.

C. OPERATION AND MAINTENANCE INSTRUCTIONS

1. Arrange for instruction of Owner's personnel in the proper use and maintenance of specialty equipment, plumbing and mechanical installations.
2. Furnish, through Architect and/or Consulting Engineers, two complete sets of operation and maintenance manuals consisting of materials lists, brochures, catalogs, wiring and control diagrams, parts lists, operation and maintenance instructions, and other manufacturers' data on all devices, fixtures,

machines, appliances and mechanical equipment furnished under the contract.

3. All information contained in manuals shall be printed or neatly typed, indexed according to respective specification sections of the work, and bound in hard-backed bindings.
4. Manuals shall be submitted directly to the responsible Consulting Engineer for review and approval. Separate binding shall be used for each major subcontract.
5. Prior to applying for final payment, provide Architect with certification signed by the Owner that required submittals have been delivered and instructions to Owner's personnel have been given and understood.

D. RECORD DOCUMENTS

1. Contract record documents, maintained and noted in accordance with Paragraph 3.11.1 of the General Conditions, shall be delivered to the Architect prior to final application for payment.

E. WARRANTIES AND GUARANTEES

1. Following is a check list, not necessarily complete, of warranties and guarantees required under the contract:
 - a. Contractor's general one-year guarantee.
 - b. Three-year special guarantee against leakage of water into building from any source.
 - c. Termite control and repair five-year warranty, specified in Section 2C, TERMITE CONTROL.
 - d. Three-year roofing guarantee by Roofing Contractor, specified in Section 7B, ROOFING AND RELATED WORK.
 - e. Twenty-five-year manufacturer's warranty on composition shingles, specified in Section 7B, ROOFING AND RELATED WORK.
 - f. Five-year warranties on air conditioning and heating equipment, specified in Section 15B, HEATING AND AIR CONDITIONING.
 - g. Manufacturer's standard warranties on window units, plumbing, mechanical and electrical items, miscellaneous specialties and accessories.
2. Contractor's general guarantee, special three-year guarantee against leakage, and three-year roofing guarantee shall be written in forms provided with these specifications and shall be signed in longhand by persons authorized to sign official documents for the guarantors.
3. All required guarantees and warranty certificates shall be submitted, approved by Architect, and delivered to Owner before final Application for Payment.

SECTION 2A

CLEARING, EXCAVATING, FILLING AND GRADING

A. GENERAL

1. The provisions of the GENERAL CONDITIONS OF THE CONTRACT, the SUPPLEMENTARY CONDITIONS, and pertinent portions of Division 1 of the Specifications, apply to the work under this Section to the same extent as if fully included herein.
2. Clear and grade site, excavate, fill and backfill as required to execute work as intended; perform other related work as indicated on drawings and specified herein. This shall include but is not limited to removal of all existing foundations, concrete slabs, abandoned walls etc.
3. All material used for fills and subgrades, whether obtained from excavation within the work limits or from off the site, shall be subject to approval for quality and suitability.
4. Excavated material that is unsuitable for construction purposes, and all excess material resulting from work under this Section, shall be removed from the site.
5. Notify Architect in due time to inspect completed excavations and/or fills and subgrades before placing footings or slabs.

B. DRAINAGE

1. Perform work in a manner and sequence that will provide for draining and keeping site reasonably dry at all times; control grading to prevent drainage into excavations; do not under any circumstances place fill in standing water.
2. Fill that becomes saturated because of improper drainage shall be removed or reconditioned to conform to specification requirements.

C. SITE CLEARANCE

1. Clear site of natural obstructions, other items which will interfere with construction operations.
2. Site clearance shall include the removal of all vegetable growth, roots, debris, other objectionable material and obstructions from designated areas.
3. In areas to be covered by new construction, remove topsoil to not less than 4 in. depth. If soil with excessive organic content is still present, remove as required to expose clean silty or clayey sand.
4. Following stripping of topsoil, proof-roll site to locate soft spots. In areas that rut or deflect excessively, remove soft material and replace with properly compacted fill.

D. COMPACTED FILL

1. For areas to be covered by construction, including parking area, construct compacted fill by removal and replacing existing soil and providing additional fill material as required to bring subgrades to proper levels.
2. Remove existing soil (after removal of topsoil) to levels not less than 1 ft. below original grade; roll or tamp the exposed surface as required to obtain maximum surface density and locate soft spots.
3. After removal of existing soil, replace with additional fill material as required. Additional fill material shall be a sand-clay mixture, approximately 80% sand, 20% clay.
4. Place fill in level layers not over 8" thick, compact each layer before applying succeeding layer, by rolling, vibrating, or tamping as required to obtain 95% of the Standard Proctor maximum dry density in accordance with ASTM D698.

E. EXCAVATION FOR FOUNDATIONS

1. Excavate for foundations to minimum depths indicated or to bearing elevations indicated on drawings.
2. In general, firm bearing soil should be encountered at bearing elevations indicated.
3. Where soil conditions permit, foundation excavations may be of exact dimensions of the concrete, and side forms omitted.
4. Shore, brace excavations as required to prevent caving or collapse.

F. BACKFILLING

1. After foundation walls and piers have been built and inspected by Architect, backfill to grade level; tamp in place.
2. Before backfilling, remove all debris subject to termite attack, rot or corrosion.
3. Deposit fill in layers not more than 8" thick.
4. Fill materials shall be free from roots, mortar droppings, debris, other unsuitable material.

SECTION 2B

DEMOLITION AND SALVAGE

A. GENERAL

1. The provisions of the GENERAL CONDITIONS OF THE CONTRACT, the SUPPLEMENTARY CONDITIONS, and pertinent portions of Division 1 of the Specifications, apply to the work under this Section to the same extent as if fully included herein.
2. Perform demolition work and salvage materials, furnishings and equipment from existing building as indicated on drawings and specified herein.
3. Execute all demolition work with care to prevent damage to existing work to remain.
4. If hazardous materials are encountered during demolition operations, comply with all applicable regulations, laws, and ordinances concerning removal, handling, disposal, and protection against exposure or environmental pollution.
5. Construct and maintain temporary shoring and bracing as required for removal of old work and installation of new work. When permanent supports are completed, remove shoring and bracing; repair cutting or other damage.
6. Assume full responsibility for damage resulting from improper execution of work under this Section.
7. Except as otherwise specified, personal property, portable equipment, furnishings, other items not forming a permanent part of the building, will be removed by the Owner from existing spaces where work is to be performed.

B. DEMOLITION, GENERAL

1. Remove portions of existing building as indicated on drawings or as required to execute work as intended.
2. Remove existing chimney in entirety.
3. Remove all existing doors, interior door frames and casings and window sashes and interior casings, jambs and heads to remain. See Window schedule and associated details for extent of window removal.
4. In existing spaces to be altered, except as otherwise specified, remove all plumbing and electrical fixtures, piping, wiring, other equipment and devices not required to remain in service.
5. Remove and replace all existing damaged, rooted and deteriorated studs, joists, beams, girders, siding etc. Replacement framing members shall be of same dimension as existing.

D. SALVAGED MATERIALS

1. Salvaged material shall not be used unless approved by architect.
2. Except as otherwise noted or specified, materials, articles, fixtures, other items removed from existing building and not specifically noted or specified to be reused, shall become the property of the Contractor and shall be removed from the site.

SECTION 2C

TERMITE CONTROL

A. GENERAL

1. The provisions of the GENERAL CONDITIONS OF THE CONTRACT, the SUPPLEMENTARY CONDITIONS, and pertinent portions of Division 1 of the Specifications, apply to the work under this Section to the same extent as if fully included herein.
2. All foundation walls and all fills and subgrades under concrete slabs shall be treated for subterranean termites as specified herein.
3. Termite treatment shall be applied by a professional exterminating specialist, licensed in accordance with regulations of governing authorities for application of soil treatment solution.
4. Schedule work and take other precautions to avoid excessive dilution of chemical solution by prolonged exposure to weather.
5. Coordinate work so that application of dampproofing courses and concrete slabs over treated soil will follow as soon as practicable.
6. Do not begin work until earthwork for slab placement has been completed. Verify that soil is in friable condition with moisture content low enough to permit absorption of toxicant solution.

B. CHEMICAL SOLUTION

1. Chemicals shall be applied in solution in water, as a water emulsion.
2. Concentration and combination of chemicals in solution shall be optional with applicator.

C. TREATMENT

1. Application under concrete slabs on fill or grade: not less than 1-1/2 gal. per 10 sq. ft. of earth area.
2. Application at foundation walls: not less than 5 gal. per 10 lin. ft. along inside of exterior walls and both sides of interior walls; not less than 2-1/2 gal. per 10 lin. ft. along outside of exterior walls.
3. Apply heavier application of chemical solution at pipe openings, other points susceptible to later entrance of termites.

GUARANTEE

1. Furnish an insured termite control and repair warranty or other form of guarantee acceptable to the Owner, stating that treatment was applied in accordance with this specification and covering a period of five years from date of treatment.

2. Guarantee shall provide for:

- a. Annual inspection of premises for evidence of termites.
- b. Retreatment of soil and structure, if required.
- c. Repair of damage caused by termites during guarantee period.

3. The guarantee shall provide that the Owner may, following the original five-year period, renew the guarantee annually for ten additional years by the payment of an annual premium.

4. Limit of liability under guaranty shall be not less than \$50,000.00.

END OF DOCUMENT

SECTION 2D

SITE IMPROVEMENTS

A. GENERAL

1. The provisions of the GENERAL CONDITIONS OF THE CONTRACT, the SUPPLEMENTARY CONDITIONS, and pertinent portions of Division 1 of the Specifications, apply to the work under this Section to the same extent as if fully included herein.
2. Construct and finish paving, walks, including modifications to existing walks, provide concrete splash blocks at downspouts; perform fine grading and topsoiling, as indicated on Site Plan and specified herein.
3. Insofar as applicable, specifications for materials and workmanship under Section 03300, CAST IN PLACE CONCRETE, shall apply to work under this Section.
4. Obtain necessary permits and conform to applicable requirements where paving or other work extends beyond Owner's property line onto public property.
5. Removal of existing paving, walks, is specified in Section 2B, DEMOLITION AND SALVAGE.
6. Fencing, planting, fertilizing, seeding, other landscaping not specified herein or indicated on the drawings, will be performed by others under separate contracts.

C. PAVING AND WALKS

1. Prepare base for paving and walks as specified in Section 2A, CLEARING, EXCAVATING, AND GRADING.
2. Install driveway to location indicated and as specified in Section 02510, ASPHALTIC CONCRETE PAVING.
3. Concrete walks and adjacent areas to be removed and replaced shall be 4" thick plain concrete, scored in ~~four~~ sections.
4. Plan locations of construction joints and expansion joints; obtain architect's approval.
5. Finish walks and paving as specified in Section 3A, CONCRETE. Finish to match existing adjacent concrete finish.

D. FINE GRADING AND TOPSOILING

1. For all areas of site not covered by building or paving, fill and grade uniformly or to levels indicated, with allowance for topsoil as specified herein.
2. Rake subgrade clear of stones, debris, rubbish; scarify subsoil to approximately 3" depth.

3. Cover areas with topsoil to not less than 4" depth. Topsoil shall be free of objectionable plant growth, rubbish. Topsoil saved from grading operation may be used.
4. Allow for uniform settlement where grade meets walks, paving.
5. Protect newly-graded areas from action of the elements; repair settlement or washing as required to reestablish grade to proper levels, slopes.
6. Finished surfaces shall be clean, uniformly smooth, compacted and free from depressions and irregular surface changes; new filled areas ready for fertilizing, seeding and planting.

E. CONCRETE SPLASH BLOCKS

1. Provide a concrete splash block at base of each downspout.
2. Splash blocks shall be precast, 4 in. thick, approximately 2 sq. ft. in area, formed so that water will spill off one end.
3. Place splash blocks after fine grading is complete; tops approximately 2 in. above grade, sloped to divert water away from building.

SECTION 02510

ASPHALTIC CONCRETE PAVING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Asphalt paving.
- B. Compacted granular base.

1.2 SYSTEM DESCRIPTION

- A. Paving: Designed for parking.

1.3 QUALITY ASSURANCE

- A. Perform Work in accordance with The Asphalt Institute Manual MS-8.
- B. Mixing Plant: Conform to The Asphalt Institute Manual MS-3.

1.4 ENVIRONMENTAL REQUIREMENTS

- A. Do not place asphalt when ambient or base surface temperature is less than 40 degrees F or base surface is wet or frozen.

PART 2 PRODUCTS

2.1 PAVEMENT MATERIALS

- A. Primer: Homogeneous medium curing liquid asphalt.
- B. Asphalt Cement: ASTM D946.
- C. Aggregate: Per Industry Standards

2.2 BASE COURSE MATERIALS

- A. Coarse Gravel, Pit run, natural stone; free of shale, clay, friable material, sand, debris.

2.3 ACCESSORIES

- A. Bumpers: Precast concrete.

2.4 ASPHALT PAVEMENT MIX

- A. Use South Carolina Highway Department standard hot-mix bituminous surface course.

PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

- A. Verify gradients and elevations of base.
- B. Verify compacted granular base, is dry and ready to support paving and imposed loads.

3.2 BASE CONSTRUCTION

- A. Fill areas to contours and elevations using unfrozen materials.
- B. Place fill materials in continuous layers not exceeding 6 inches loose depth.
- C. Compact to 95 percent of maximum laboratory density at optimum moisture content in accordance with ASTM D1557.
- D. Maintain optimum moisture content of fill materials to attain required compaction density.

3.3 PLACING ASPHALT PAVEMENT

- A. Apply primer in accordance with [manufacturer's instructions.
- B. Place asphalt within 24 hours of priming base surfaces. Place in single layer to thickness scheduled at end of section.
- C. Compact pavement by rolling to achieve even and smooth finish, without roller marks. Hand compact in areas inaccessible to rolling equipment.
- D. Install bumpers by fastening according to recommendations of manufacturer.

3.4 TOLERANCES

- A. Flatness: Maximum variation of 1/4 inch measured with 10 foot straight edge.
- B. Compacted Scheduled Thickness: Not less than minimum specified.
- C. Variation from True Elevation: Within 1/2 inch.

3.5 SCHEDULE

- A. Parking & Drive Area: 6 inches stone base course, 1 1/2 Asphalt Pavement mix for wearing course.

END OF SECTION

SECTION 3A

CONCRETE

A. GENERAL

1. The provisions of the GENERAL CONDITIONS OF THE CONTRACT, the SUPPLEMENTARY CONDITIONS, and pertinent portions of Division 1 of the Specifications apply to the work under this Section to the same extent as if fully included herein.
2. Standards of workmanship, concrete design, design of concrete mixes, methods of mixing, placing, compacting, and curing shall in no case be lower than the minimum standards of the ACI code.
3. Prior to placing concrete, notify Architect in ample time to inspect excavations, forms and in-place reinforcement.

B. MATERIALS

1. Portland cement: ASTM C150, Type I.
2. Water: clean, free from acid, alkali, soluble salts, organic matter.
3. Fine aggregate: natural sand conforming to ASTM C33; clean, hard, durable; free from loam, silt, clay, soluble salts, organic impurities.
4. Coarse aggregate: crushed stone or gravel conforming to ASTM C33; free from injurious amounts of soft, thin or laminated pieces, loam, clay, dust, organic material. Maximum size $-1\frac{1}{2}"$; or $\frac{1}{5}$ the narrowest dimension between form surfaces where concrete is to be placed; or $\frac{3}{4}$ the minimum clear distance between reinforcing bars.
5. Pea-gravel concrete fill for masonry: 3000 psi, ASTM C-476.
6. Reinforcing bars: ASTM A615, Grade 60.

C. FORMS

1. Construct forms so that finished concrete will conform to shapes, lines, dimensions shown; joints sufficiently tight to prevent leakage of mortar. Maintain sufficiently rigid to prevent deformation under weight of wet concrete, assure perfect alignment of finished work.
2. Subject to Architect's approval and local conditions, earth forms will be permitted for footings; sides - clean, even, vertical, true; bottoms - clean, level, without fill.

D. REINFORCEMENT

1. Fabricate reinforcement to indicated shapes, dimensions.
2. Clean of paint, oil, rust, mill scale, other surface coating.

3. Place where indicated; secure against displacement. Lap bars 30 diameters unless indicated otherwise. Wire tie or weld at all intersections and contact splices.
4. For concrete on earth, support reinforcement on pieces of brick or precast blocks.

E. CONCRETE MIX

1. Except as otherwise indicated, working stresses for design are based on 3000 lb. minimum 28-day compressive strength of concrete. Conform to Table 1602.2A, Standard Building Code.
2. No admixtures shall be used in concrete without Architect's approval.
3. Ready-mixed concrete may be used if in conformity with ASTM C94 and specification requirements. If concrete is delivered when atmospheric temperature is lower than 40 degrees F., temperature of concrete shall be not less than 60 degrees F.

F. PLACING CONCRETE

1. Remove water from excavations where concrete is to be placed; provide for keeping excavations properly drained. Make final check regarding embedded items, requirements to other trades.
2. Do not place concrete that has attained its initial set or has contained its water for over 2 hours.
3. Place concrete as nearly as practicable in its final position to avoid segregation due to rehandling or flowing.
4. Work concrete mixture into corners, around reinforcement; prevent formation of voids. Do not allow concrete to drop freely more than 5 ft.
5. Maintain concrete in moist condition for at least 7 days after placing.

SECTION 5A

MISCELLANEOUS METAL

A. GENERAL

1. The provisions of the GENERAL CONDITIONS OF THE CONTRACT, the SUPPLEMENTARY CONDITIONS, and pertinent portions of Division 1 of the Specifications, apply to work under this Section to the same extent as if fully included herein.
2. Provide miscellaneous, and ornamental metal work, and metal specialties shown or required to execute work as intended.
3. Execute work in accordance with detail drawings and/or approved shop drawings.
4. Metal vents, thresholds, certain other metal specialties are specified in other Sections.

B. SHOP PAINTING

1. Factory-finished items, items shown or specified to be galvanized, and items of non-corrosive metal will not be shop painted.
2. All other metal work under this Section shall have one coat approved shop paint after fabrication.
3. Do not paint surfaces to be welded until welding has been completed. Where welding is to be done in field, coat surfaces to be welded with linseed oil.

C. MISCELLANEOUS METAL ITEMS

1. Anchors, bolts: as indicated or required.
2. Other miscellaneous and ornamental metal items: as indicated on drawings.

SECTION 06100

ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Framing with dimension lumber.
2. Rooftop equipment bases and support curbs.
3. Subflooring.

1.2 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Storage: Keep materials under cover and dry. Protect against exposure to weather and contact with damp or wet surfaces. Stack lumber as well as plywood and other panels; provide for air circulation within and around stacks and under temporary coverings including polyethylene and similar materials.

1. For lumber and plywood pressure treated with waterborne chemicals, place spacers between each bundle to provide air circulation.

PART 2 - PRODUCTS

2.1 LUMBER, GENERAL

A. Lumber Standards: Furnish lumber manufactured to comply with PS 20 "American Softwood Lumber Standard" and with applicable grading rules of inspection agencies certified by American Lumber Standards Committee's (ALSC) Board of Review.

B. Grade Stamps: Provide lumber with each piece factory-marked with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing, and mill.

1. For exposed lumber furnish pieces with grade stamps applied to ends or back of each piece; or omit grade stamps entirely and provide certificates of grade compliance issued by inspection agency.

C. Nominal sizes are indicated, except as shown by detail dimensions. Provide actual sizes as required by PS 20, for moisture content specified for each use.

2.2 DIMENSION LUMBER

- A. For structural light framing (2 to 4 inches thick, 2 to 4 inches wide), provide the following grade and species:
 - 1. "No. 2" grade.
- B. For structural framing (2 to 4 inches thick, 5 inches and wider), provide the following grade and species:
 - 1. "No. 2" grade, Southern Pine graded under SPIB rules.

2.3 MISCELLANEOUS LUMBER

- A. General: Provide lumber for support or attachment of other construction including rooftop equipment curbs and support bases, cant strips, bucks, nailers, blocking, furring, grounds, stripping, and similar members.
- B. Fabricate miscellaneous lumber from dimension lumber of sizes indicated and into shapes shown.
- C. Moisture content: 19 percent maximum for lumber items not specified to receive wood preservative treatment.
- D. Grade: "Standard" grade light-framing-size lumber of any species or board-size lumber as required. "No. 3 Common" or "Standard" grade boards per WCLIB or WWPA rules or "No. 2 Boards" per SPIB rules.

2.4 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
 - 1. Where rough carpentry is exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners with a hot-dip zinc coating per ASTM A 153 or of AISI Type 304 stainless steel.
- B. Nails, Wire, Brads, and Staples: PS PF-N-105.
- C. Power Driven Fasteners: National Evaluation Report NER-272.
- D. Wood Screws: ANSI B18.6.1.
- E. Lag Bolts: ANSI B18.2.1.
- F. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and where indicated, flat washers.

2.5 MISCELLANEOUS MATERIALS

- A. Adhesives for Field Gluing Panels to Framing: Formulation complying with APA AFG-01 that is approved for use with type of construction panel indicated by both adhesive and panel manufacturer.
- B. Water Repellent Preservative: NWWDA-tested and -accepted formulation containing 3-iodo-2-propynyl butyl carbonate (IPBC) as its active ingredient.

2.6 PRESERVATIVE WOOD TREATMENT BY PRESSURE PROCESS

- A. General: Where lumber or plywood is indicated as preservative-treated wood or is specified herein to be treated, comply with applicable requirements of AWP Standards C2 (Lumber) and C9 (Plywood). Permanently mark each treated item with AWPB Quality Mark, name of treatment applicator, year of treatment, moisture content and retention of chemical. No plastic end tags allowed.
- B. Pressure-treat above-ground items with water-borne preservatives to a minimum retention of 0.25 pcf. After treatment, kiln-dry lumber and plywood to a maximum moisture content of 15 percent.
- C. Pressure-treat wood members in contact with ground or fresh water with water-borne preservatives to a minimum retention of 0.40 pcf.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Discard units of material with defects that impair quality of rough carpentry construction and that are too small to use in fabricating rough carpentry with minimum joints or optimum joint arrangement.
- B. Set rough carpentry to required levels and lines, with members plumb and true to line and cut and fitted.
- C. Fit rough carpentry to other construction; scribe and cope as required for accurate fit. Correlate location of furring, nailers, blocking, grounds, and similar supports to allow attachment of other construction.
- D. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated.
- E. Countersink nail heads on exposed carpentry work and fill holes.

- F. Use common wire nails, unless otherwise indicated. Use finishing nails for finish work. Select fasteners of size that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting of wood; predrill as required.

3.2 WOOD FRAMING, GENERAL

- A. Framing Standard: Comply with N.F.P.A. "Manual for House Framing," unless otherwise indicated.
- B. Install framing members of size and spacing indicated.
- C. Anchor and nail as shown, and to comply with the following:
 - 1. National Evaluation Report No. NER-272 for pneumatic or mechanical driven staples, P-Nails, and allied fasteners.
 - 2. "Table 1705.1 - Fastening Schedule," of Standard Building Code.
- D. Do not splice structural members between supports.

3.3 STUD FRAMING

- A. General: Arrange studs so that wide face of stud is perpendicular to direction of wall or partition and narrow face is parallel. Install single bottom plate and double top plates using 2-inch-thick members whose widths equal that of studs; except single top plate may be used for non-load-bearing partitions. Nail or anchor plates to supporting construction.
- B. Construct corners and intersections with not less than 3 studs. Install miscellaneous blocking and framing as shown and as required for support of facing materials, fixtures, specialty items, and trim.
 - 1. Install continuous horizontal blocking row at mid-height of single-story partitions over 8 feet high and at midpoint of multi-story partitions, using 2-inch thick members of same width as wall or partitions.
- C. Frame openings with multiple studs and headers. Install nailed header members of thickness equal to width of studs. Set headers on edge and support on jamb studs.
 - 1. For nonbearing partitions, install double-jamb studs and headers not less than 4 inches deep for openings 3 feet and less in width, and not less than 6 inches deep for wider openings.

2. For load-bearing partitions, install double-jamb studs for openings 6 feet and less in width, and triple-jamb studs for wider openings. Install headers of depth shown, or if not shown, as recommended by N.F.P.A. "Manual for House Framing."

3.4 FLOOR JOIST FRAMING

- A. General: Install floor joists with crown edge up and support ends of each member with not less than 1-1/2 inches of bearing on wood or metal, or 3 inches on masonry. Attach floor joists as follows:
 1. To wood bearing members by toe nailing or metal framing anchors.
 2. To wood supporting members with wood ledgers as shown, or if not shown, with metal joist hangers.
- B. Frame openings with headers and trimmers supported by metal joist hangers; double headers and trimmers where span of header exceeds 4 feet.
- C. Do not notch in middle third of joists; limit notches to 1/6-depth of joist, 1/3 at ends. Do not bore holes larger than 1/3-depth of joist or locate closer than 2 inches from top or bottom. Install solid blocking (2 inches thick by depth of joist) at ends of joists unless nailed to header or bearing member.
- D. Lap members framing from opposite sides of beams, girders or partitions not less than 4 inches or securely tie opposing members together. Install solid blocking (2 inches thick by depth of joist) over supports.
- E. Anchor members paralleling masonry with 1/4-inch by 1-1/4-inch metal strap anchors spaced not more than 8 feet o.c. Extend anchors at least 4 inches into masonry, turn up 4 inches and extend over and fasten to 3 joists.
- F. Under jamb studs at openings, install solid blocking between joist.
- G. Under non-load-bearing partitions, install double joists separated by solid blocking equal to depth of studs above.
 1. Install triple-joists separated as above, under partitions receiving ceramic tile and similar heavy finishes or fixtures.
- H. Install bridging of type indicated below between joists where nominal depth-to-thickness ratio exceeds 6, at intervals of 8 feet.
 1. Solid wood bridging 2 inches thick by depth of joist, end nailed to joist.
- I. Install special framing as shown for eaves, overhangs, dormers and similar conditions, if any.

END OF SECTION

SECTION 6B

FINISH CARPENTRY AND MILLWORK

A. GENERAL

1. The provisions of the GENERAL CONDITIONS OF THE CONTRACT, the SUPPLEMENTARY CONDITIONS, and pertinent portions of Division 1 of the Specifications, apply to work under this Section to the same extent as if fully included herein.
2. Standards:
 - a. Insofar as applicable and except as otherwise specified, the Quality Standards of the Architectural Woodwork Institute shall apply to interior finish carpentry and millwork.
 - b. For shelving in storage spaces and closets, material and workmanship shall conform to Economy Grade Requirements of the AWI Quality Standards.
 - c. For all other woodwork, exterior and interior, except as otherwise specified, materials and workmanship shall conform to AWI Quality Standards requirements for Custom Grade Woodwork for opaque finish.
3. Protect lumber and keep covered, both in transit and at job site. Do not deliver unduly long before required for use in work.
4. Wood doors (other than cabinet doors), wood windows, glass for cabinet doors, glazing, finish hardware for doors and cabinets, laminated plastic, certain other items related to finish carpentry, are specified in other Sections.
5. Other work related to finish carpentry is specified in Section 9E, PATCHING AND RESTORING, and Section 2B, DEMOLITION AND SALVAGE.
6. Preservative treatment: all shop and factory-assembled millwork products which will be exposed to weather, such as doors, windows, door and window frames, shall be preservative treated in accordance with the Water Repellent Preservative Minimum Standards of the national Woodwork Manufacturers Association, Inc. and shall bear the NWMA seal of approval.
7. Note requirements for priming and back-priming, as specified in Section 9E, PAINTING AND FINISHING.

B. PRODUCTS

1. Lumber, general:
 - a. All lumber for finish carpentry and millwork shall be well-seasoned, kiln dried, and shall conform to standard grading rules of the various lumber manufacturers' associations having jurisdiction.

- b. Lumber for stock items shall be manufacturers' standard grades and species for items specified or approved.
 - c. Except as otherwise specified or approved, lumber for exterior finish carpentry shall be B and Better Finish Pine, Fir or Cedar.
 - d. Except where other specific grades and/or species are noted or specified, lumber for interior finish carpentry and millwork shall be B and Better Finish White Pine or equivalent grade of Poplar, Basswood, other approved.
- 2. Softwood plywood: American Plywood Association grade-trademarked; to conform to requirements of Product Standard PS 1-74; exposed surfaces Grade A; semi-exposed surfaces Grade B; concealed surfaces Grade C or D; 3/4" thick unless noted otherwise.
 - 3. Hardwood plywood: to conform to requirements of Product Standard PS 51-71; grades and face qualities as required under applicable AWI Quality Standards; veneer core, hardboard core, or lumber core, at millwork manufacturer's option, except that exposed edges of veneer core will not be permitted; face veneers - Birch or other approved close-grain species, for paint finish.
 - 5. Wood siding: 1 x 8 Pine, B or better, to match existing.
 - 6. Exterior wood ceilings: 1/2 A/C plywood, with wood trim at joints, as indicated on the drawings.
 - 7. Nails, bolts, anchors: standard types, as indicated or required; for exterior work - hot dip galvanized or aluminum.

C. WORKMANSHIP, GENERAL

- 1. Execute finish carpentry in a substantial, workmanlike manner, in accordance with best standard practice. Assemble, fit, set work accurately with all joints close, smooth, true, all returns mitered.
- 2. For interior work, join parts with concealed nails and screws, and with glued blocks where practicable. Where surface nailing is necessary, set nail heads and fill holes unless otherwise specified. Trim work bearing hammer marks will not be accepted.
- 3. Secure work to grounds, otherwise fasten in position to hold correct surfaces, lines, levels.
- 4. Install doors, window units, other built-in items specified in other Sections of the Specifications.
- 5. Install shop or factory-assembled items as detailed and/or in accordance with manufacturer's directions.

D. EXTERIOR WOOD SIDING, CEILING

1. Exterior walls of new section shall be of wood siding to match existing.
2. Ceilings of porches shall be of plywood and wood trim, as indicated on the drawings.
3. Apply exterior wood siding over plywood sheathing, specified in Section 06100, ROUGH CARPENTRY. Nail through sheathing to wood framing.
4. Apply wood ceiling directly to framing, furring, or blocking as indicated. Nail securely to every bearing member. Shim as required to maintain true planes.

F. CABINET, COUNTERS, SHELVING

1. Build cabinets, counters, shelving, similar items as indicated. Except as may be inconsistent with requirements specified herein, conform to AWI Quality Standards Section 400.
2. Doors, drawer fronts, other large exposed surfaces shall be of hardwood plywood; face plates, rails, divider strips, other narrow pieces, shall be of solid stock; doors and drawer fronts - in general to conform to AWI Quality Standards Section 400 requirements for casework and cabinet doors.
3. For counter tops, other surfaces indicated to be covered with laminated plastic, core or backing material shall be plywood. Surfaces to receive plastic shall be Grade B.
4. Except as otherwise specified, semi-exposed and concealed surfaces may be of softwood plywood or solid stock.
5. Except as otherwise specified, specific grades of plywood and solid stock for various locations shall be as required by AWI Quality Standards Section 400.
6. Except as otherwise indicated or approved, exposed shelves, mouldings, trim, other members with edges exposed, shall be of solid stock.
7. Shelving in storage spaces or semi-concealed in cabinets may be of softwood solid stock or softwood plywood with solid edges.
8. Install cabinets, shelving plumb, level, true; anchor securely in place. Secure wall cabinets to wood framing and/or blocking, not to wallboard.
9. Install cabinet accessories; fit doors, drawers, shelves, neatly with finishing hardware.

G. UNDERLAYMENT FOR RESILIENT FLOORING:

1. In spaces scheduled to receive resilient flooring, apply underlayment of plywood, not less than 3/8" thick.

2. Apply underlayment over building paper and existing wood floor or new sub-floor, as applicable.
3. Nail underlayment to sub-floor with 4d ringed nails or cement-coated barbed nails, spaced 6" o.c. at edges of plywood sheets, not more than 8" o.c. both ways intermediate.

H. OTHER MILLWORK ITEMS

1. Interior door frames: not less than 1 1/16" thick, or as detailed. Stops be integral or applied. See Section 8A, WOOD DOORS for provisions for prehung doors.
2. Wood steps, railings: as indicated; double stringer trim both exterior sets of stairs each side;; treads not less than 1" thick. Install exterior grade B or better to underside of stringers accross full width of stairs, battens shall be installed at 4' O.C. finished to conseal joints.
3. Wood trim: base, door and window casings, other trim and mouldings as indicated or required.
4. Install wood handrail at interior stair which runs from second floor to third floor. Railing shall run full length of stair and be fastened securely to wall.

SECTION 6C

LAMINATED PLASTIC

A. GENERAL

1. The provisions of the GENERAL CONDITIONS OF THE CONTRACT, the SUPPLEMENTARY CONDITIONS, and pertinent portions of Division 1 of the Specifications, apply to the work under this Section to the same extent as if fully included herein.
2. Counter tops, other surfaces indicated to have laminated plastic finish shall be clad with high pressure laminate as detailed or specified.
3. In general, laminated plastic work shall conform to applicable requirements of the Architectural Woodwork Institute Quality Standards Section 400 for Custom Grade high pressure laminate work.
4. Surfaces to receive laminated plastic include tops, edges, and backsplashes for cabinetwork in kitchens and bathrooms, and as indicated on the drawings.
5. Submit samples to Architect for approval.

B. MATERIALS

1. Laminated plastic: Formica, General Purpose Grade 10, or equal grade of Micarta, Wilson Art, Nevamar, other approved; selected color.
2. Adhesives, other materials: as furnished and/or recommended by manufacturer of plastic material.

C. WORKMANSHIP

1. Unless otherwise indicated or approved, laminated plastic shall be applied on the job.
2. Surfaces to receive plastic material must be free from moisture, paint, oil, wax.
3. Plan location of joints in plastic surfacing. Except where counter lengths exceed size of material available, joints across counter tops will not be accepted.

SECTION 7A

WATERPROOFING AND DAMPPROOFING

A. GENERAL

1. The provisions of the GENERAL CONDITIONS OF THE CONTRACT, the SUPPLEMENTARY CONDITIONS, and pertinent portions of Division 1 of the Specifications, apply to the work under this Section to the same extent as if fully included herein.
2. Surfaces to receive waterproofing and dampproofing materials must be clean, smooth, dry, free from loose material.
3. Do not apply materials when temperature is below 40 degrees.
4. Requirements for roofing, flashing, and related work are specified in Section 7B, ROOFING AND RELATED WORK.

B. PRODUCTS

1. Material for concealed flashing: Membrane flashing - MEL-ROL polymeric waterproofing membrane, 56 mils thick on 4 mil thick cross-laminated polyethylene film, self adhesive backing.
2. Asphalt mastic: Sonneborn's Hydrocide 700 Mastic, or equal by A. C. Horn, Toch Brothers, other approved.

C. WATERPROOFING OF MASONRY WALLS BELOW GRADE

1. For masonry walls below grade where indicated apply mastic waterproofing prior to backfilling, from top of footings to top of grade.
2. Waterproofing shall consist of two trowelled coats of asphalt mastic reinforced with a glass fabric membrane, total thickness not less than 1/8" at any point.
3. Apply coatings in strict accordance with manufacturer's directions. Coat surfaces thoroughly with first coat; within 4 hours apply glass fabric membrane over surfaces of coating; overlapping all edges at least 3", and press firmly into place without wrinkles. Apply second coat within 24 hours.
4. Do not backfill against waterproofing for at least 24 hours after application. Protect surfaces as required.
5. Place backfill with care to avoid rupture or damage to film or displacement of coatings or membrane.

SECTION 7B

ROOFING AND RELATED WORK

A. GENERAL

1. The provisions of the GENERAL CONDITIONS OF THE CONTRACT, the SUPPLEMENTARY CONDITIONS, and pertinent portions of Division 1 of the Specifications, apply to the work under this Section to the same extent as if fully included herein.
2. Cooperate with other trades as required to assure proper installation of exhaust ducts, vent stacks, other items related to roofing and not specified in this Section.
3. Other flashing materials (not related to roofing) are specified in Section 7A, WATERPROOFING AND DAMPPROOFING.
4. To enable the Owner to consider optional roofing systems and materials, alternates have been established for roofing and related work. See Section 1B, ALTERNATES.

B. MATERIALS FOR SHINGLE ROOFING

1. Shingles: Approved mineral-surfaced shingles conforming to Underwriters Laboratories requirements for Class A fire resistance rating; of fiberglass and asphalt composition, weighing not less than 240 lbs. per square; with approved self-sealing feature; color to match existing.
2. Material for metal flashing, counterflashing, gutters, downspouts, sheet metal work not specifically otherwise noted or specified: 26 gauge galvanized steel, painted as specified in Section 9D, PAINTING AND FINISHING.
3. Felt: asphalt-impregnated roofing felt, ASTM D226; 15 lbs. per square, unperforated, 36" wide.
4. Bituminous plastic cement: Federal Specification SS-C-153B, Type 1.
5. Roofing nails: No. 11 or 12 ga., barbed shank, of sufficient length to penetrate roof sheathing; heads not less than 3/8" diameter; of non-corrosive metal.

C. FELT UNDERLAYMENT

1. Cover entire roof area with felt; lap horizontal joints at least 2", end joints at least 4".
2. Lap felt not less than 6" from both sides over hips and ridges.
3. At valleys, apply 36" wide strip of felt underlayment, centered in valley; cut horizontal courses of underlayment to overlap valley underlayment at least 6".

4. Secure underlayment to roof sheathing with sufficient fasteners to hold in place until shingles are applied.

D. FLASHING

1. Flash roof in accordance with best roofing practice and shingle manufacturer's specifications.
2. Provide continuous metal flashing and counterflashing where roofing abuts parapet wall, other vertical surfaces. Counterflashing shall be not less than 4" high. Base flashing shall extend onto surface of roof 4" (min).
3. Nail base flashings to roof deck only; use plastic cement for securing to vertical surfaces.
5. At eaves and rakes, provide metal eave strips as indicated on drawings; nail strips along eaves before application of felt underlayment, along rakes after application of felt underlayment.
6. Flash as required around plumbing vent stacks, roof caps from exhaust ducts, other items furnished under other Sections of the specifications.

E. APPLICATION OF SHINGLES (BASE BID)

1. Apply shingles over felt in strict accordance with manufacturer's specifications, with 1/2" overhang at eaves and rakes; use 9" starter strip of mineral-surfaced roll roofing at eaves.
2. For porch roofs, conform to manufacturer's recommendations for low slope application.
3. Avoid nailing through sheet metal base flashings; use plastic cement to secure shingles to metal surfaces.

F. GUARANTEE

1. Furnish a written guarantee, executed by the Roofing Contractor and countersigned by the General Contractor, stating that all work under this Section will be maintained free from defects in material and workmanship for a period of two years from Date of Substantial Completion.
2. Guarantee shall be written on the form provided with these Specifications, or other form acceptable to the Owner and the Architect.

SECTION 7D

THERMAL INSULATION

A. GENERAL

1. The provisions of the GENERAL CONDITIONS OF THE CONTRACT, the SUPPLEMENTARY CONDITIONS, and pertinent portions of Division 1 of the Specifications, apply to the work under this Section to the same extent as if fully included herein.
2. The intent of this specification is to provide thermal insulation for walls, floors, ceilings as required to form a complete insulating "envelope" around the conditioned spaces of the building, as indicated on drawings and specified herein.
3. Where insulation conceals electrical work, ductwork, other mechanical work, do not apply insulation until mechanical work has been inspected.
4. Do not proceed with application of wallboard, other work covering insulation until insulation has been inspected, approved.

B. INSULATION MATERIALS

1. Insulation batts and blankets: Johns-Manville, other approved fiberglass rolls and/or batts; widths to fit spacing of framing, lengths as long as practicable; conform to general requirements of Federal Specification HH-I-521E.
 - a. For ceiling between floors - Kraft-Faced, with flanged kraft paper vapor barrier; 3-1/2" thick, resistance factor not less than R-11.
 - b. For Third floor ceilings -
 1. Above level area of ceiling: Kraft-Faced, with flanged kraft paper vapor barrier; 9-1/2" thick, resistance factor not less than R-30 area.
 2. Above sloped area of ceiling: Kraft-Faced, with vapor barrier, 5-1/2" thick, resistance factor not less than R-19 with 1" airspace minimum roof deck and outside of insulation.
 - c. For walls - Kraft-Faced, with flanged kraft paper vapor barrier; 3-1/2" thick, slightly wider than spaces to be filled; resistance factor not less than R-13 with 1" minimum airspace between exterior siding or plywood sheathing and outside of insulation.
3. Adhesives, other materials: as required to execute work in accordance with manufacturers' specifications and best standard practice.

C. APPLICATION

1. In general, insulation shall be installed in accordance with manufacturer's directions; apply tightly against joists, electrical outlet boxes, ductwork.

2. Where existing exterior walls are indicated to be insulated, maintain 1" minimum clearance between insulation and face of exterior siding.
3. Provide baffles or other approved means to maintain 3-inch minimum clearance between insulation and recessed fixtures, fans, other heat-generating electrical devices.
4. Floors:
 - a. Insulate floors with batt or blanket type insulation.
 - b. Apply insulation between floor joists with vapor barrier side up; secure in place with flexible metal strips or other approved method.
5. Walls:
 - a. Insulate exterior walls with batt-type insulation.
 - b. Insulate all interior common walls between tenant spaces.
 - c. Apply insulation between framing members after electrical wiring is complete and ready for installation of fixtures and other electrical devices.
 - d. At doors, windows, other openings, fill spaces between rough framing and finished frames with rock wool, fiberglass, other approved insulation material.
6. Ceilings:
 - a. Insulate all ceilings between tenant spaces.

SECTION 07900

JOINT SEALERS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Preparing sealant substrate surfaces.
- B. Sealant and joint backing.

1.2 SYSTEM DESCRIPTION

- A. Caulk around window and door frames, and other joints so indicated on drawings and/or required to make structure moisture and air tight.
- B. Caulk around prefabricated fiberglass tub to prevent the intrusion of water to backside or bottom of tub. Color: To match tub. Type: Type as recommended by tub manufacturer.
- C. Caulk to bottom of backsplash at plastic laminate counters to prevent intrusion of water into joint. Color: To match Plastic Laminate. Type as recommended by Plastic Laminate manufacturer.

1.3 QUALITY ASSURANCE

- A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

1.5 ENVIRONMENTAL REQUIREMENTS

- A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

PART 2 PRODUCTS

2.1 SEALANTS

- A. Caulking Compound for Exterior Work: Sonneborn's Butakauk, other approved butyl polymer base compound, conforming to federal Specifications TT-S-001657, selected color.

2.2 ACCESSORIES

- A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.
- B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.

PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

- A. Verify that substrate surfaces and joint openings are ready to receive work.
- B. Remove loose materials and foreign matter which might impair adhesion of sealant.
- C. Verify that joint backing and release tapes are compatible with sealant.

3.2 INSTALLATION

- A. Clean and prime seal joints in accordance with manufacturer's instructions.
- B. Install sealant in accordance with manufacturer's instructions.
- C. Measure joint dimensions and size materials to achieve required width/depth ratios.
- D. Install joint backing to achieve a neck dimension no greater than $\frac{1}{3}$ the joint width.
- E. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- F. Tool joints as required to make smooth, neat joints and assure maximum adhesion of compound to sides of grooves.

END OF SECTION

SECTION 8A

WOOD DOORS

A. GENERAL

1. The provisions of the GENERAL CONDITIONS OF THE CONTRACT, the SUPPLEMENTARY CONDITIONS, and pertinent portions of Division 1 of the Specifications, apply to work under this Section to the same extent as if fully included herein.
2. Insofar as applicable, general requirements for materials and workmanship specified in Section 6B, FINISH CARPENTRY AND MILLWORK and Section 8D, GLAZING AND RELATED WORK, shall apply to work under this Section.
3. Types, designs, and sizes of doors are shown and scheduled on drawings.
4. At Contractor's option and subject to Architect's approval, minor adjustments in sizes may be made to conform to existing conditions and manufacturer's standard shop practices.
5. At Contractor's option, new wood swinging doors and folding doors may be furnished as pre-assembled units, complete with frames, trim, and operating hardware. Frames, trim and hardware shall conform to requirements specified in other Sections and indicated on the Drawings.
6. Prior to or immediately after delivery to the job site, top and bottom edges of doors and all wood exposed by cutouts shall be sealed as required to prevent moisture penetration.
7. Exposed edges, applied mouldings, glazing mouldings, trim: of solid material, species and quality compatible with face material of doors.

B. SUBMITTALS

1. Submit shop drawings and product data for approval; indicate general construction details, joining methods, and locations of cutouts for hardware and glazing.

D. PANEL, GLAZED, AND LOUVERED DOORS

1. Panel, glazed, louvered and screen doors shall be of stile and rail construction; conform to applicable requirements of AWI Quality Standards Section 1400.
2. Panel doors and glazed doors: thicknesses scheduled; panels solid, hip-raised, not less than 1-1/16" thick for 1-3/4" doors, 3/4" thick for 1-3/8" doors; ovolo sticking; glazing mouldings as indicated or required.
3. Louvered doors: thickness scheduled; louver slats not less than 1/4" thick, routed into stiles, with spaces not over 3/8".
4. Except as otherwise specified, doors shall be of White Pine, Hemlock, other approved species.

SECTION 8C

FINISH HARDWARE

A. GENERAL

1. The provisions of the GENERAL CONDITIONS OF THE CONTRACT, the SUPPLEMENTARY CONDITIONS, and pertinent portions of Division 1 of the Specifications, apply to the work under this Section to the same extent as if fully included herein.
2. Provide finish hardware for wood doors and for cabinets and shelving as specified herein and as necessary to meet requirements of operation.
3. Finish hardware for windows, certain other specialty items, shall be furnished by manufacturers of these items and is specified in other Sections.
4. All hardware items shall be complete with strikes, brackets, trim, appurtenances, screws, bolts and other devices as required for complete installation.
5. Except as otherwise specified, finish hardware shall be furnished under a cash allowance. Hardware supplier will be selected by Owner and/or Architect. Contractor shall be fully responsible for installation. See Section 1D, CASH ALLOWANCES.
6. A complete schedule of finish hardware to be furnished under allowance will be furnished to the Contractor by the hardware supplier.
7. Where any item is specified by manufacturer's name, trade name, or catalog number, similar products of equal weight and quality by other manufacturers will be considered, subject to Architect's approval.

B. KEYS AND KEYING

1. Except as otherwise specified, all locks and exit bolts shall be masterkeyed as directed.
2. In general, locks for two or more doors opening into the same space shall be keyed alike.
3. Furnish four keys for each lock or group of locks keyed alike, and four masterkeys. All keys shall be die stamped with number of lock change and set symbol number or letter. Deliver keys to Owner.
4. All locks shall be "construction masterkeyed". Construction masterkey shall operate all locks during construction, but shall not operate locks after regular key or masterkey has been inserted in cylinders.

C. HARDWARE FOR CABINETS

1. Hinges: Julius Blum concealed self-closing, adjustable.
2. Pulls: 3" wire pulls, satin aluminum finish.
3. Drawer slides: Knappe and Vogt No. 1400-18", full extension type; required for all cabinet drawers.
4. For open shelves - Grant No. 120AL flush standards, No. 21 supports.
5. For shelves in closed cabinets - Grant No. 125 AL standards, 21Z supports.

D. OTHER HARDWARE - CASH ALLOWANCE

1. Hardware other than that specified above or in other Sections shall be purchased under the allowance.
2. Hardware to be purchased under allowance shall include, but not necessarily be limited to, the following:
 - a. Deadbolts for entrance doors.
 - b. Locksets and latchsets for other doors.
 - c. Standard butt hinges.
 - d. Stops, silencers, push plates, pulls, kick plates, thresholds, weather strips, hold-open arms, other miscellaneous hardware required.
3. Note that no claim shall be made against hardware allowance for hardware specified herein and for miscellaneous hardware included in other Sections.

SECTION 08605

WOOD WINDOWS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Factory assembled site finished wood double hung windows.
- B. Site finished window replacement kits.
- C. Factory assembled site finished wood awning type windows.

1.2 SYSTEM DESCRIPTION

- A. Design and size members to withstand dead loads caused by pressure and suction of wind.

1.3 QUALITY ASSURANCE

- A. Fabricate and install windows in accordance with ANSI/NWWDA IS-2 - Wood Windows.

PART 2 PRODUCTS

2.1 WINDOW UNITS

- A. Window Unit Manufacturers for factory assembled site finished double hung wood windows:
 - 1. Kolbe & Kolbe Style: Wood Double Hung
 - 2. Marvin Style: Historic Magnum Wood Double Hung
 - 3. or approved equal
- B. Window Unit Manufacturers for site finished window replacement kits.
 - 1. Kolbe & Kolbe Style: Tilt-in window replacement sash kit.
 - 2. Marvin Style: Historic Magnum Tilt Pack
 - 3. or approved equal
- C. Window Unit Manufacturers for factory assembled site finished awning type wood windows:
 - 1. Kolbe & Kolbe Style: Wood Awning Type
 - 2. Marvin Style: Wood Awnings
 - 3. or approved equal
- D. Window Configuration: Outward projecting, double hung or double hung window replacement kits in sizes and types as scheduled on drawings.

2.2 FRAME MATERIALS AND ACCESSORIES

- A. Window units shall be factory-assembled, complete with manufacturers standard operating mechanism, locking devices, weather stripping; and extension jambs where required.
- B. Wood: Clear pine or fir species, clear preservative treated to ANSI/NWWDA IS-4 of type suitable for transparent or opaque exterior and interior finish.
- C. Sills: Replace factory installed sills of factory finished double hung units with treated wood sills to match existing; sloped at 10 degrees for positive wash, one piece full width of opening and jamb angles to terminate sill length.
- D. Sealant and Backing Materials: As specified by manufacturer.
- E. Anchor Devices: Non-corroding as specified by manufacturer.

2.3 GLASS AND GLAZING MATERIALS

- A. Glass and Glazing Materials in Awning Type Window Lights: 1/2" insulated, clear plate glass per manufacturers specifications.
- B. Glass and Glazing Materials in Double Hung Window Lights: Single glazed with authentic divide light (ADL) with Energy Panel (EP). Clear plate glass per manufacturers specifications.

2.4 FINISHES

- A. Exterior Surfaces: Opaque as specified in Section 09900.
- B. Interior Surfaces: Opaque] as specified in Section 09900.

PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

- A. Verify that rough openings are correctly sized and located. Coordinate existing sill slope with manufacturer where required be manufacturer.
- B. Prepare opening to permit correct installation of frame and achieve continuity of air and vapor barrier seal.

3.2 INSTALLATION

- A. Install frames, and flashings in accordance with manufacturer's instructions.
- B. Use anchorage devices to securely attach frames to structure.

- C. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work. Adjust sash as required for smooth and proper operation.
- D. Coordinate attachment and seal of air and vapor barrier materials. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- E. Install perimeter type sealant, backing materials, and installation requirements in accordance with Section 07900.

END OF SECTION

3. Proportions:

- a. Scratch coat: 2 parts portland cement, 1 part lime, 6 parts sand.
- b. Brown coat: 2 parts portland cement, 1 part lime, 6 parts sand.
- c. Finish coat: 2 parts portland cement, 2 parts lime, 8-10 parts sand.

E. APPLICATION OF STUCCO

- 1. Surfaces to receive plaster or stucco: clean and free from defects.
- 2. Dampen surfaces of masonry thoroughly and uniformly before application of stucco.
- 3. Base coats for stucco (scratch & brown coats) shall be portland cement-lime plaster applied in two applications, thickness not less than 1/2" from face of masonry; apply to full thickness, straighten to true surface, leave rough to receive finish coat.
- 4. Apply finish stucco to reasonably uniform thickness of approximately 1/4"; minimum thickness at any point, 1/8". Finish to true planes, corners plumb and straight.
- 5. Apply Thoroseal Waterproofing System to all exterior stucco surfaces. Waterproofing shall be applied between the base coats and the final coat. Comply with manufacturers recommendations for coverage, application methods, and other requirements for installation.
- 6. Unless otherwise indicated or approved, finished stucco surfaces shall have a smooth trowelled finish.
- 7. At new 6' CMU wall finish to match existing adjacent finish.

SECTION 9B

GYPSUM DRYWALL CONSTRUCTION

A. GENERAL

1. The provisions of the GENERAL CONDITIONS OF THE CONTRACT, the SUPPLEMENTARY CONDITIONS, and pertinent portions of Division 1 of the Specifications, apply to the work under this Section to the same extent as if fully included herein.
2. Walls and ceilings so indicated or scheduled shall be of gypsum drywall construction. Except as otherwise indicated, drywall systems shall be applied to wood framing, furring or blocking, specified in Section 06600, ROUGH CARPENTRY.
3. Cooperate with other trades as required to assure proper installation of thermal insulation, mechanical and electrical devices, other equipment and accessories built into or secured to drywall construction.

B. PRODUCTS

1. Gypsum board: as manufactured by U. S. Gypsum, other approved; 4 ft. wide by lengths as required; long edges rounded or tapered; of the following types according to requirements:
 - a. SYM. A: Regular; - USG Sheetrock panels, 1/2" thick unless otherwise specified.
 - b. SYM. B: - Fire Rated Type; USG Sheetrock panels, Firecode "C", 1/2" thick unless other wise specified.
 - b. SYM. C: - Water-Resistant Type; - USG Sheetrock WR, 1/2" thick.
2. Corner beads, reinforcement, control joints, metal trim, other metal accessories: as indicated or required; manufacturer's standard, of galvanized steel.
3. Fastening devices: annular ring nails or special screws as furnished and/or recommended by manufacturer of wall board system for various applications.
4. Sealing, caulking and jointing compounds: sealants, adhesives, tapes, jointing and taping compounds as furnished or recommended by manufacturer of wallboard systems.

C. WORKMANSHIP, GENERAL

1. In general, application of wallboard shall be in accordance with the latest printed directions or specifications of the United States Gypsum Company, or other approved manufacturer.
2. Walls and ceilings of bathrooms, and other areas exposed to moisture, shall be of water-resistant type gypsum board.

3. Except as otherwise indicated or specified, drywall construction shall be regular wallboard applied in a single layer directly to framing, furring or blocking.
4. Make provisions for expansion and contraction in accordance with best standard practice and manufacturer's recommendations.
5. Where possible, work shall be planned using maximum available lengths of material so that joints are kept to a minimum and made with rounded or tapered edges except at corners.
6. Finished surfaces shall be in true, uniform planes; walls plumb, ceilings level, corners true to line.

D. METAL ACCESSORIES

1. Install metal trim, control joints, reinforcement, where indicated or required. Install corner beads at all external corners.
2. Install metal accessories in single lengths except where needs exceed stock lengths.

E. APPLICATION OF WALLBOARD

1. Apply gypsum board to framing or furring as indicated; secure to every framing or furring member with fasteners spaced in accordance with manufacturer's specifications.
2. For walls, apply face board with long dimension vertical, all abutting ends and edges occurring over studs or furring strips. Stagger joints on opposite sides of partitions. Unless otherwise indicated or approved, no horizontal joints will be permitted.
3. For ceilings, apply board with long dimension at right angles to supports, all end joints over supports.

F. DRYWALL FINISHING

1. Finish drywall surfaces in accordance with manufacturer's specifications and best standard practice.
2. Prefill open spaces between boards with compound; allow to harden before proceeding with taping.
3. Tape, fill and finish joints in not less than three operations; allow each application of compound to harden before applying succeeding coat. At metal accessories, non-tapered joints, feather out at least four inches on either side, each coat slightly beyond the preceding coat.
4. Fill and finish fastener depressions with at least three coats of compound; allow each coat to dry hard before applying succeeding coat.
5. Sand where necessary between coats and following final application, avoid roughing paper surfaces; leave surfaces smooth, ready for painting.

**SECTION 9C
RESILIENT FLOORING**

A. GENERAL

1. The provisions of the GENERAL CONDITIONS OF THE CONTRACT, the SUPPLEMENTARY CONDITIONS, and pertinent portions of Division 1 of the Specifications, apply to the work under this Section to the same extent as if fully included herein.
2. Install resilient (composition) flooring where indicated or scheduled on drawings.
3. Colors shall be approved by Owner and/or Architect before work is started; not more than three colors of each product will be used throughout the work.
4. Preliminary selection of colors will be made from manufacturers' standard samples. After preliminary selection, provide three full size samples of each color for final approval.
5. Do not begin installation of resilient materials until painting, other finish work is substantially complete.
6. Test substrates for presence of moisture before work is started. Do not install flooring where condition of sub-floor does not conform to recommendations of manufacturer of flooring materials.

B. PRODUCTS

1. Resilient flooring: Armstrong's Premium Excelon VCT (vinyl composition tile), 1/8" thick, 12" x 12", selected colors.

C. PREPARATION OF SURFACES

1. Surfaces to receive resilient materials must be free from moisture, paint, oil, wax, other foreign matter.
2. Fill voids and cracks, sand surfaces, otherwise prepare both new and existing surfaces to receive resilient materials as required to conform to manufacturer's recommendations.

D. INSTALLATION AND WORKMANSHIP

1. Install resilient materials in strict accordance with manufacturer's specifications for conventional full spread system. Use adhesives recommended by the tile manufacturer for the substrates indicated.
3. Unless otherwise directed or approved, all edges of resilient flooring shall be concealed by shoe moulding or threshold strips of approved design.
3. Clean, polish floors as recommended by manufacturer. Protect until final acceptance.

SECTION 9D

PAINTING AND FINISHING

A. GENERAL

1. The provisions of the GENERAL CONDITIONS OF THE CONTRACT, the SUPPLEMENTARY CONDITIONS, and pertinent portions of Division 1 of the Specifications, apply to the work under this Section to the same extent as if fully included herein.
2. Except as otherwise specified, paint and/or finish all exposed surfaces, both new and existing, of wood, metal, gypsum board, or other material as required to make a complete job, including, but not limited to, the following:
 - a. Exterior and interior woodwork and trim.
 - b. Wood finish floors.
 - c. Wood piazza ceiling.
 - d. Walls, ceilings, other surfaces of gypsum wallboard.
 - e. Surfaces of stucco.
 - f. Electrical panels, exposed piping and conduit, other mechanical work to be permanently exposed in areas where walls are scheduled to be painted.
 - g. Surfaces where finish is marred by demolition, alteration, etc., whether specifically scheduled or not.
3. All new exterior woodwork and wood trim shall be backprimed prior to installation. Contractor shall notify Architect prior to installation of exterior cornice, trim, other wood components subject to moisture and high relative humidities. Failure to comply with this provision may result in removal and replacement at Contractor's expense.
4. New wood doors shall be primed immediately upon delivery to the job site. Tops and bottoms shall be sealed to prevent the intrusion of moisture.
5. The following will not require painting under this Section:
 - a. Factory-finished items.
 - b. Surfaces of copper or aluminum.

B. PRODUCTS

1. All paints, other materials, shall be as manufactured by Pittsburgh, Benjamin Moore, DuPont, Devoe and Raynolds, Pratt and Lambert, Rust-Oleum, Porter, Sherwin-Williams, or other standard brands approved by the Architect, of best grades recommended by manufacturers for the purposes intended. Oils, thinners, driers shall be only those recommended by manufacturers of paints.
2. Deliver materials to job in original containers with labels intact, seals unbroken.
3. Colors shall be selected by Owner and/or Architect; do not proceed with work until written approval of color schedule is obtained.

C. PREPARATION

1. Remove switch plates, escutcheons, similar items. Reposition such items upon completion of each space.
2. Surfaces to be finished: smooth, clean, dry; free from dust, rust, grit, other loose material.
3. Damaged or scarred areas shall be filled and patched as required to receive specified finish.
4. Previously painted surfaces:
 - a. If existing paint is sound, clean thoroughly and spackle or glaze out all irregularities; sand smooth; touch-up bare spots.
 - b. If existing surface is checked, cracked, loose or alligatored, strip to bare original surface; spackle irregularities; sand smooth.
 - c. Test existing surfaces as required to ensure compatibility of new finish materials with existing.
5. Woodwork to be painted: sand smooth; wash sap spots with mineral spirits, touch up spots and knots with approved sealer. Set nails, fill holes and voids with putty, other approved fuller, after primer is dry.
6. Interior woodwork to be clear finished: sand smooth and free of marks or discoloration; fill voids, nail holes after primer or first coat is dry, using a transparent filler compatible with finish required.
7. Sand wood floors to clean, smooth, uniform surface, using sandpaper not coarser than No. 0 for the final sanding.
8. Ferrous metal: remove foreign materials, including rust and mill scale, which will interfere with adhesion of specified paint. Clean welded surfaces to remove all residue; immediately reprime with rust-inhibitive paint.
9. Galvanized metal: clean, free of contaminants and grease with mineral spirits, apply an acid etch and allow to dry according to manufacturer's directions.

D. WORKMANSHIP, GENERAL

1. All paints and other finishing products shall be used and applied in accordance with manufacturers' label directions.
2. Do not begin interior painting until building is closed in, surfaces thoroughly dry, and in winter, until building has been heated.
3. Allow each coat of paint to dry hard before applying succeeding coats.
4. Except as otherwise specified, coatings may be applied by brush, roller or spray. Finished surfaces shall be smooth, evenly spread, free from drops, ridges, runs, laps, waves, brush marks, other defects.

5. On woodwork and trim, except as otherwise specified or approved, sand between coats as required to assure smoothness and adhesion of subsequent coats.
6. Each coat of paint shall have a slight variation in color to distinguish it from the preceding coats.
7. Protect floors, adjacent work, equipment and furnishings during painting.
8. Where primer coats are hereinafter specified, they may be omitted on existing surfaces which have previously been painted.
9. The number of coats specified is the minimum acceptable in each case; additional coats shall be applied if necessary to produce a smooth first class paint job.
10. Notify Architect before applying final coats; Owner and/or Architect shall have the right to change color shades before application of final coats.
11. All coats specified in this Section are in addition to those specified in other Sections.

E. EXTERIOR PAINTING

1. Wood porch floors and step treads: 1 coat alkyd base undercoat, 2 finish coats alkyd base porch and deck enamel, gloss luster.
2. Wood windows, doors, door and window frames, siding, ceiling cornices, railings, columns, other exterior woodwork and trim: 1 coat acrylic base primer, 2 finish coats acrylic base exterior paint, gloss luster.
3. Ferrous metal surfaces: touch-up shop coating with rust-inhibiting primer; 2 finish coats alkyd or oil base exterior metal finishing paint, gloss luster.
4. Galvanized metal surfaces: 1 coat galvanized metal exterior primer, 2 finish coats alkyd or oil base exterior metal finishing paint, gloss luster.

F. INTERIOR PAINTING

1. Gypsum board surfaces: 1 coat tinted primer-sealer, 2 finish coats flat latex.
2. Wood floors: 3 coats polyurethane, gloss finish, or other approved, applied in accordance with manufacturer's specifications.
3. Wood cabinets, shelving, doors, windows, other woodwork and trim: 1 coat alkyd base enamel undercoat, 2 finish coats alkyd base semi-gloss enamel.
4. Exposed piping, conduit, electrical panels, other exposed metal surfaces not otherwise specified: 1 coat rust-inhibiting primer if not shop-primed, 1 coat undercoat, 1 coat finish paint to match adjacent surfaces.

SECTION 9E

PATCHING AND RESTORING

A. GENERAL

1. The provisions of the GENERAL CONDITIONS OF THE CONTRACT, the SUPPLEMENTARY CONDITIONS, and pertinent portions of Division 1 of the Specifications, apply to the work under this Section to the same extent as if fully included herein.
2. Perform all patching, cleaning, refinishing and touch-up work as required to restore to acceptable condition all components of the building, exterior and interior, as indicated on the drawings and specified herein and in other Sections of the Specifications. Except as otherwise indicated, it is intended that the entire building be renovated and restored, including repairing and/or replacing damaged windows, woodwork, trim, masonry piers, metal work and glazing.
3. In general, damaged or scarred areas shall be patched, restored and finished as required to match adjacent or similar undamaged surfaces.
4. All work shall be properly supervised and in accordance with OSHA Regulations, federal, state, and local ordinances, and all other rules, regulations, and requirements of authorities having jurisdiction over the project, including, but not limited to: South Carolina Department of Labor 1926.26 Lead Construction Standards.
5. Contractor shall perform all work in accordance with the Secretary of Interior Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings; copies are available through the U.S. Department of the Interior, National Park Service, Preservation Division, Washington, D.C.
6. For existing woodwork to remain, check thoroughly for loose members, unsound blocking, open joints; repair as required to conform to specifications for new finish carpentry and millwork; disassemble and reassemble if necessary.
7. Insofar as applicable, specifications for workmanship and quality of materials specified in other Sections shall apply to work under this Section.
8. Finish carpentry, new doors and windows, laminated plastic, patching related to existing roof, caulking, glazing, stucco, painting and finishing, other work related to patching and restoring, are specified in other Sections.

B. WOOD FLOORS

1. For existing wood floors to remain, remove deteriorated sections, including supporting framing; replace to match existing.
2. Check thoroughly for loose boards; repair and secure as required to restore to true levels and eliminate creaking.
3. Requirements for sanding and refinishing of wood floors are specified in Section 9D, PAINTING AND FINISHING.

C. EXTERIOR WOODWORK

1. Repair exterior woodwork, including siding, cornices, mouldings, as required to restore to sound condition, with true lines, levels, closely-fitted joints.
2. For cornices and cornice returns, disassemble if necessary to determine that structural framing and blocking is adequate. For portions required to be replaced or indicated to be modified and rebuilt, provide all necessary framing, blocking.

SECTION 10A

MISCELLANEOUS SPECIALTIES AND ACCESSORIES

A. GENERAL

1. The provisions of the GENERAL CONDITIONS OF THE CONTRACT, the SUPPLEMENTARY CONDITIONS, and pertinent portions of Division 1 of the Specifications, apply to the work under this Section to the same extent as if fully included herein.
2. Provide miscellaneous accessories and specialty items as indicated on drawings and specified herein.
3. Except as otherwise specified, miscellaneous specialties and accessories shall be complete with all component parts necessary for installation, complete and ready to operate.
4. Kitchen appliances, towels bars, and toilet paper holders, robe hooks, other miscellaneous accessories: as selected by Owner and/or Architect under allowance. See Section 1D, CASH ALLOWANCES.
5. Submit for approval manufacturer's product data, shop drawings, and installation details, as appropriate, for work under this Section.

B. ACCESSORIES AND SPECIALTY ITEMS

1. Medicine Cabinet Type 1: Nutone HM-FS-470, recessed type with framed mirror, stainless steel finish, 16" x 26", 1 required, each bathroom. total.
2. Medicine Cabinet Type 2: Nutone AH-75 - Amercian Heritage, recessed type with unfinished wood lover, painted to match trim 16" x 24", 1 required, Bathroom No. 010. Bottom of frame at 38" AFF.
3. Shower Curtain Rods: Hallmack HM-382-A, adjustable type, stainless steel with rubber tipped holder, 1" diameter. 1 required, each shower unit.
4. Clothes hanger rods: 1-1/4" o.d. galvanized iron pipe. Secure to wall as indicated or approved.
5. Door Chimes: Nutone LB-12 contour, off-white; with PB-6L lighted pushbutton; 1 required for each apartment unit.
6. Soffit vents: Alcoa Vent-A-Strip, Type VAS 70; aluminum, factory-finished white.
7. Handicapped Grab Bars: Bobrick B6806 Series, grab bar behind handicapped toilet in Unit #1 shall be 36" in length, grab bar adjacent to handicapped toilet in Unit #1 shall be 42" in length. Install at 34" AFF. Install according to manufacturers instructions. Provide necessary blocking according to manufacturers instructions as required. Grab bars shall be in compliance with current American with Disabilities Act (ADA) standards and practices.

C. INSTALLATION AND WORKMANSHIP

1. Items named under this Section, including those to be furnished by Owner, shall be installed, set in place, or built into walls, as required.
2. Carefully position, securely attach all items as directed by manufacturers. Use expansion shields or toggle bolts where necessary for installing screws in masonry or wallboard. Use of wood plugs not permitted.

SECTION 15A

PLUMBING

A. GENERAL

1. The provisions of the GENERAL CONDITIONS OF THE CONTRACT, the SUPPLEMENTARY CONDITIONS, and pertinent portions of Division 1 of the Specifications, apply to work under this Section to the same extent as if fully included herein.
2. Scope: Furnish all labor, materials, equipment, appliances; perform all operations in connection with installation of plumbing system and fixtures, complete, as indicated on drawings and specified herein. The principal items included are as follows:
 - a. Fixtures, accessories and equipment as indicated.
 - b. Interior and exterior soil, waste, drain and vent piping, including connection to existing waste piping system.
 - c. Hot and cold water piping, including connection to existing water supply system.
3. Standards: All work shall be performed by licensed mechanics under proper supervision and in accordance with best standard practice. Work shall conform to the Standard Building Code, the Standard Plumbing Code (SBOCI), OSHA Regulations, federal, state, and local ordinances, and all other rules, regulations, and requirements of authorities having jurisdiction over the project.
4. The Owner shall be responsible for the taps fees and the installation of the water meters. The Contractor shall be responsible for the coordination of the work with CPW, and other work affected by the installation of the meters.
5. Permits, certificates: the Contractor shall obtain and pay for all necessary permits, certificates of inspection, as required by authorities having jurisdiction.
6. Prior to submitting a bid, the Contractor shall visit the site, verify all dimensions and existing conditions and notify the Architect of any deviations from or discrepancies in the drawings or the specifications.
7. The Contractor shall be responsible for the coordination of the work under this Section with the work of other trades; consult other trades and in conjunction with them, establish necessary space requirements and tie-ins for each trade.

B. SUBMITTALS

1. Within 15 days after award of contract, submit for approval six (6) copies of shop drawings and/or descriptive literature for fixtures, devices, and equipment specified under this Section and described on the drawings. All

submittals shall state project names, addresses, date, contractor and/or supplier, and must indicate materials submitted.

C. FIXTURES AND ACCESSORIES

1. Except as otherwise specified, fixtures and accessories shall be new, in perfect condition, complete with fittings, trim, supply pipes, stop valves, traps, supports, bolt caps, other appurtenances as required for complete installation. Except as otherwise specified, trim, fittings, pipe, traps, other metal parts exposed on interior shall be chromium-plated brass.
2. Fixtures and accessories: as scheduled on drawings.
3. Wall hydrants: Woodford No. B-15, freeze-proof design, with vacuum breaker; for 3/4" hose.
4. Valves: Keystone, Hammond, other approved; designed for minimum 125 psi steam working pressure; cast bronze body, with working pressure and manufacturer's name cast on body.

D. PIPE AND FITTINGS

1. Soil waste, drain and vent piping:
 - a. For soil, waste, drain and vent piping - ABS or PVC Schedule 40 DWV pipe and fittings conforming to ASTM D2665 or D2661.
 - b. Cleanouts, adapters, other special fittings - as furnished and/or recommended by manufacturers of pipe.
2. Water pipe and fittings: PVC, of approved manufacture; pressure-rated (160 psi minimum) for water supply service; with permanent identification markings as specified by applicable standards.
3. All pipe and fittings shall conform to Table 500 of the Standard Plumbing Code.

E. INSTALLATION AND WORKMANSHIP, GENERAL

1. Unless otherwise noted, conceal all piping in walls and/or below floors; install straight, without sags and graded for drainage according to applicable code; pipe ends cut square, reamed, and cleaned of all dirt, scale, etc., before assembly. Off-set pipes as required to pass cabinets, structural members, etc. Make adequate provisions for expansion and contraction of pipes.
2. Install fixtures and accessories in accordance with manufacturer's recommendations. Plastic pipe and fittings shall be installed in accordance with recommendations of the Plastic Pipe Institute.
3. Protect pipe openings, drains, from damage, by plugs or caps.
4. Install pipe without damaging structural members; secure and support in accordance with best standard practice.

5. Where pipes pass through finished walls or floors, fill spaces around pipes with inorganic non-combustible material; fit with chromium-plated escutcheons.

F. SOIL, WASTE, DRAIN AND VENT SYSTEMS

1. Check existing main sewer line for condition; complete system with installation of waste and vent lines of proper sizes for all fixtures.
2. Unless otherwise noted, install horizontal pipe with uniform grade not less than $1/4$ " per foot for pipes 3" and smaller, and $1/8$ " per foot for larger pipes.
3. Make changes in pipe sizes with reducing fittings, changes in direction with 45 degree wyes, half wyes, long sweep bends. Do not use short radius bends without approval; straight tapped tees and crosses not permitted.
4. Make connections between earthenware fixtures and drain pipes by means of floor flanges, soldered, caulked, or screwed to drain pipes.
5. Provide clean-outs, full size of pipe, not over 50 ft. apart in horizontal 4" lines, at changes of direction over 45 degrees, and where shown. Exterior clean-outs shall be set in concrete flush with finish grade.
6. Run vent lines through attic spaces and extend through and above roof not less than 1 ft.; flashing extended 8" from pipe, or with approved prefabricated flashing collars.
7. Make joints in plastic pipe with slip joints and couplings and/or screwed fittings in strict accordance with manufacturer's specifications.
8. Make connections between piping of dissimilar materials by means of special fittings and adapters as furnished or recommended by manufacturer of pipe and fittings.

G. HOT AND COLD WATER PIPING

1. Connect to existing water supply system and run cold water lines to fixtures; connect to water heaters and run hot water lines to sinks, lavatories, and washing machine boxes, as scheduled.
2. Install water supply lines as recommended by manufacturer of pipe and fittings; all pipe sizes indicated are nominal sizes. PVC piping shall be supported by pipe hangers; spacing no greater than 5 ft.
3. Joints and connections:
 - a. Screwed - American Standard Taper Thread with non-toxic compound on external threads only.
 - b. Soldered - hard solder (95-5) capable of withstanding water at 200 psi and 250 degree F; use soldering nipples or couplings between screwed and soldered pipe and fittings.

- c. Final connections at equipment to be by unions. Union to match material of adjacent pipes. Where pipe materials change, install EPCO insulating unions.
- 4. Piping shall be pitched to assure venting and drainage.
- 5. Unless otherwise indicated, branches to fixtures shall be 1/2" for single fixture, 3/4" for two fixtures.
- 6. Piping outside building shall be run not less than 18" below grade.
- 7. Provide air chambers on hot and cold water supply lines at each fixture, one pipe size larger than supply riser and at least 18" long. Offset air chambers as required to avoid obstructions above fixtures.
- 8. Provide valves where indicated and in other locations if required to provide for drainage of entire system.
- 9. Locate valves so they are easily accessible. Install valves with handles turned up where possible and not below the horizontal position.
- 10. Install valves below grade in cast iron valve boxes; covers flush with finish grade, valve handles within 12 inches of top.
- 11. All valves shall be of same nominal size as lines in which they are installed.

H. TESTING AND INSPECTION

- 1. Soil, waste and vent lines shall be tested by filling system to a point not less than 10 feet above highest fixture. Water must stand for not less than 30 minutes without appreciable drop in water level. The system may be tested in sections with the approval of the Architect.
- 2. Water lines shall be tested with water to 100 psi hydrostatic pressure. If water pressure is not sufficient to obtain this pressure, it shall be built up by pumping. Blank off equipment and accessories not designed for test pressure.
- 3. Any defective material or workmanship uncovered by tests shall be removed from the lines or repaired and tests repeated until lines are tight.
- 4. Tests shall be made before lines are concealed or covered, and in the presence of the Architect or his representative. Underground lines shall not be covered until inspected and approved by Architect.

SECTION 15B

HEATING AND AIR CONDITIONING

A. GENERAL

1. The provisions of the GENERAL CONDITIONS OF THE CONTRACT, the SUPPLEMENTARY CONDITIONS, and pertinent portions of Division 1 of the Specifications, apply to work under this Section to the same extent as if fully included herein.
2. Furnish all labor, materials, equipment, devices; perform all operations required for installation of heating and air conditioning systems, complete and ready to operate, as indicated on drawings and specified herein. The principal items included are as follows:
 - a. Heating and cooling equipment.
 - b. Air distribution systems, including ductwork and accessories, flexible connections between air handling equipment and duct systems, diffusers, registers and grilles.
 - c. Automatic temperature controls.
 - d. Control wiring.
3. Standards: All work shall be performed by experienced and capable mechanics under proper supervision, in accordance with best standard practice. Air distribution system shall conform to applicable ASHRAE and SMACNA Standards for low pressure heating and air conditioning duct systems. Entire installation shall conform to applicable codes and standards of authorities having jurisdiction and the requirements of the electrical utility company serving the project.
4. Coordination: Consult other trades and in conjunction with them, establish necessary space requirements and tie-ins for each trade.
5. Drawings and Specifications are complementary and what is called for by either shall be as binding as if called for by both. Drawings are diagrammatic and exact locations of ductwork, grilles and diffusers are subject to building and structural conditions.
6. General location and arrangement of equipment, ductwork, grilles and diffusers shall be as indicated on drawings. If, in the opinion of the Mechanical Contractor, the location or arrangement of equipment or ductwork is indicated in such manner that it will not result in proper performance and distribution of air, this condition shall be brought to the attention of the Architect before the equipment is installed. Changes in location or arrangement may be made with the approval of the Architect.
7. General: Heating and air conditioning equipment shall be complete with all component parts, accessories, trim, fittings, appurtenances and devices as required for complete installation in accordance with manufacturer's specifications. These specifications and the schedules on the Drawings do not necessarily constitute a complete listing of items required.
8. The entire heat pump system shall consist of matched components rated in accordance with A.R.I. 240 and shall be UL labeled.

B. SPLIT-SYSTEM HEAT PUMP SYSTEMS

1. Indoor Unit:

- a. The indoor unit shall be constructed of galvanized steel and coated with a baked enamel finish. The cabinet shall be insulated with neoprene coated fiberglass. The cabinet panels shall be easily removed for service to all components. The indoor unit shall be complete with direct expansion coil, multi-speed or belt drive centrifugal fan and motor, condensate collector, and shall be completely wired to a terminal block. The capacity shall be as scheduled on the drawings. Provide filter frame and throw away filters unless noted otherwise. Filters shall be replaced at the completion of the project.
- b. The electric strip heater shall be a component part of the indoor unit and shall have the KW and electrical characteristics as scheduled on the drawings. Heaters shall be complete with thermal and overload protection, including a 24 volt control transformer. In addition, the heater shall be provided with an air flow pressure differential control wired through the motor control circuit.

2. Outdoor unit:

- a. The casing shall be galvanized steel with baked enamel finish. The compressor shall be a welded hermetic type with internal vibration isolation and external neoprene mounts. The compressor shall have thermal and overcurrent protection, high pressure cutout and crankcase heater.
- b. Condenser fan shall be direct drive with vertical or horizontal discharge propeller fan and fan and coil guards. Fan motor shall be permanently lubricated, inherently protected, and resiliently mounted.
- c. Condenser coil shall be mechanically bonded fin and tube with change over valve, quick attach refrigerant couplings, gauge taps, filter-drier, and refrigerant metering device.
- d. Control shall be factory wired and shall include an anti-recycle timer control, outdoor thermostat, automatic defrost controls, control transformer, compressor, contactor, and wiring terminal block with all components enclosed in a weatherproof compartment.

3. Room Thermostat:

- a. Room thermostat shall be provided by the heat pump manufacturer. Thermostat shall have "HEAT-OFF-COOL", "FAN-AUTO", and shall be provided with an emergency heat switch, which will activate the strips heaters and lock-out compressor operation.

4. Factory Charged Tubing:

- a. Provide prefabricated factory charged tubing. Tubing shall be soft drawn deoxidized, bright annealed copper conforming to ASTM B280, factory dehydrated and furnished with a balanced charge of refrigerant recommended by the equipment manufacturer. Tubing shall be factory

insulated with 3.8 inch minimum thickness of closed cell foamed plastic conforming to ASTM C-534 with a permanence rating not to exceed 1.0. Tubing shall contain quick connectors with caps or plug to protect couplings. Provide couplings for suction and liquid line connections of the indoor and outdoor sections. Where insulation is exposed to the weather, coat with vinyl lacquer coating, two coats minimum.

5. Condensate Drain Piping: For air handling units, provide condensate drain piping to exterior. Piping shall be Schedule 40 PVC with solvent cemented joints. Provide P-trap at unit and insulate entire drain line with 1/2" thick foam plastic insulation. Condensate drain lines shall 1" diameter, and pitched for drainage as indicated or as recommended by equipment manufacturer.
6. All equipment shall be designed for 120/208 volt, single phase, 60 cycle electrical power.

7. Grilles and diffusers: as indicated on drawings.

C. INSTALLATION OF EQUIPMENT

1. Install equipment in locations indicated and in accordance with manufacturers' specifications.
2. Install outdoor units with vibration isolators as indicated or as recommended by equipment manufacturer. Outdoor units shall be mounted on raised wood platform as shown on the Drawings.
3. Install refrigerant piping completely concealed in building construction or crawl spaces.

D. AIR DISTRIBUTION SYSTEM

1. Except as otherwise specified or indicated on drawings, entire air distribution duct system shall be fabricated, installed and supported in accordance with ASHRAE and SMACNA standards for metal duct systems.
2. All supply and return ductwork shall be galvanized sheet steel, not lighter than 28 ga. for round duct less than 8" diameter, 26 ga. for larger round duct and for rectangular duct not over 12" in width or height, 24 ga. for larger ducts.
3. In general, ductwork shall be positioned approximately as indicated on drawings. Provide offsets, fittings as required to suit factory-fabricated equipment. Make changes necessary to avoid piping, structural or other interferences. Sizes and shapes may be changed provided cross-sectional areas are not reduced and altered configuration provides equal pressure drop per unit of length.
4. Ducts shall be air-tight, smooth inside and neatly finished outside, all joints sealed with "Cadoprene 725" prior to application of duct insulation. For construction details and materials not specified herein, refer to ASHRAE Guide or SMACNA Duct Manual.
5. Duct branch connections, elbows, transitions and other fittings shall be

fabricated and installed in a manner to allow air flow with minimum noise, friction and air leakage.

6. Ductwork shall be fabricated for connection to air handling units, registers, diffusers and grilles. Terminal ends at discharge outlets shall be flanged to fit the face of the finished wall and floor surfaces, and to snugly fit frames grilles, registers, and diffusers.
7. Provide fixed type prefabricated metal turning vanes built into ductwork at tees and 90-degree ells where indicated. At tees, provide adjustable splitter dampers with control rods.
8. All rectangular duct take-offs shall be streamlined or 45-degree take-offs; no butt connections permitted. Provide a manually-adjustable volume control damper in each round duct runout as closely as possible to the main trunk line.
9. Provide other dampers, deflectors, air control devices and accessories as required for uniform air distribution and to achieve proper balancing.
10. Provide flexible connectors in ducts at supply and return connections to air handlers. Connectors shall be Duro Dyne "Durolon" MPD-4-100 or equal.
11. Install, support and brace ductwork so that it will not sag not vibrate when fan is operating at maximum speed or capacity, and so that it will be substantially airtight and no dust marks from air leaks will show at joints, connections or outlets.
12. Supports for ducts shall be attached only to structural framing members.
13. Install diffusers, registers and grilles in accordance with manufacturers' specifications; mount securely to building construction as approved. Verify exact locations with Architect before installation.

E. DUCT INSULATION

1. Insulate all supply and return ductwork with 2" thick, 3/4-lb. per cu. ft. density, flexible blanket type insulation, faced with a reinforced aluminum sheet vapor barrier. Lap vapor barrier 2" at all joints; secure with outward-clinch staples on 4" centers. Seal all joints, seams and punctures with tape and "Cadoprene 725" vapor barrier mastic.
2. Insulate interior of all rectangular return ductwork with 1/2" thick, 1 1/2-lb. per cu. ft. density, semi-rigid duct liner; secure with MMEC-128 quick-tacking adhesive, spread over the entire duct surface, or as recommended by insulation manufacturer, and with "stic-clip" mechanical fasteners spaced 16" at top where width exceeds 16" and on sides where width exceeds 24". Top and bottom pieces of insulation shall lap side pieces.

F. ELECTRICAL WORK

1. Power wiring and disconnect switches for equipment furnished under this Section are indicated on electrical plans and will be furnished and installed under Section 16A, ELECTRICAL WORK.

2. All other wiring and electrical work necessary for complete installation of HVAC equipment, including control wiring, relays, starters, and controls shall be furnished and installed by the Mechanical Contractor.
3. All electrical work shall be in accordance with the National Electric Code, and in strict accordance with manufacturer's recommendations.
4. All electrical motors, devices and equipment to match available electric service.
5. Provide all miscellaneous control devices required for full sequence of operation of equipment.

G. CLEANING, TESTS, AND ADJUSTMENTS

1. After completion, entire duct system shall be thoroughly cleaned of rubbish, dirt, other debris. After connections are made to air handling equipment and before any grilles, registers or outlets are installed, entire system shall be blown out with dampers and outlets wide open.
2. Upon completion of installation, check all equipment and devices for proper operation; make necessary adjustments required to leave in proper working order. Test air supply at each outlet; balance system to maintain even temperature in all spaces.
3. Replace filters immediately prior to final inspection.

H. OPERATION AND MAINTENANCE INSTRUCTION

1. Provide operation and maintenance instructions as specified in Section 1F, CONTRACT CLOSEOUT, consisting of complete instructions for operation and maintenance of system, including recommended schedule for routine maintenance, parts and materials lists, wiring diagrams, piping plans, and other information on all equipment and devices.
2. Wiring diagrams shall include both power and control wiring and shall show location and function of switches, breakers, other devices.

I. GUARANTEE AND SERVICE

1. Systems shall be guaranteed to operate safely, quietly and efficiently to generate and distribute air at proper temperatures in accordance with the design.
2. Under the terms of the standard one-year guarantee, Contractor shall provide without charge all necessary service, including repairs, adjustments, parts (except filters), and labor for a period of one year after date of Substantial Completion.
3. In addition to standard one-year guarantee on entire installation, compressors shall be guaranteed by the manufacturer against defects in material and workmanship for an additional period of five years.
4. Register warranties with the manufacturer and furnish copies as specified in Section 1G, CONTRACT CLOSEOUT.

SECTION 16A

ELECTRICAL

A. GENERAL

1. The provisions of the GENERAL CONDITIONS OF THE CONTRACT, the SUPPLEMENTARY CONDITIONS, and pertinent portions of Division 1 of the Specifications, apply to the work under this Section to the same extent as if fully included herein.
2. Scope: Furnish all labor, materials, equipment and perform all operations required for the installation of a complete and fully operable electrical system as indicated on plans and specified herein.
3. Standards: All work shall be performed by experienced and capable mechanics under proper supervision and in accordance with best standard practice. Work shall conform to requirements of local, state, other authorities having jurisdiction and the National Electrical Code.
4. Drawings and Specifications are complementary and what is called for by either shall be as binding as if called for by both. Drawings are diagrammatic and actual locations of wiring and outlets are subject to building and structural conditions.
5. To ensure proper coordination of work, the contractor for work under this Section shall review all drawings for project and familiarize himself with the work of other trades. If for any reason it is found that electrical installation cannot properly be made as specified, the Architect or other authorized representative of the Owner shall be notified with a request for specific instructions.

B. MATERIALS AND ACCESSORIES

1. Except as otherwise specified, all materials and devices shall be new, of types and grades required by referenced specifications and standards; Underwriters listed and approved, bearing Underwriters official labels where such labeling is customary.
2. Similar products of other manufacturers may be proposed as substitutions for materials and devices specified or scheduled on drawings.
3. Use only such devices and materials as are suitable for job conditions and meet governing codes and requirements. Inferior substitutes will not be accepted.
4. Panels and service equipment: Square D, Westinghouse, other approved, for flush installation; with individually-housed trip-element, thermal-magnetic, toggle-handle, trip-indicating breakers; hinged plain doors with chrome-plated latches.
5. Lighting fixtures, complete with lamps: as scheduled on the drawings.
6. Wall switches, convenience outlets, other devices: as indicated on drawings,

ivory color unless otherwise indicated or approved.

7. Finishing plates: plastic, ivory color unless otherwise indicated or approved; standard sizes; gang plates for multiple devices.
8. Special outlets, devices: as indicated on the drawings.
9. Exhaust fans, accessory items: as scheduled on drawings, complete with appurtenances and devices as required for complete installation.
10. Other fixtures, scheduled by manufacturer's name and model number, shall be furnished under the contract. No claim against allowances or adjustment of Contract Sum will be considered for fixtures scheduled or otherwise indicated to be provided by the Contractor.
11. Fixtures shall include lamps of proper types and sizes for initial installation. Upon completion of project, all fixtures shall be complete with lamps. Replace broken or burned out lamps at completion of the project.
12. Other materials: The following listed materials shall be used in the project, subject to their suitability and compliance with governing requirements. Note that these Specifications do not necessarily constitute a complete listing of materials required.
 - a. Raceways, fittings and outlet Boxes or other standard non-metallic conduits, UL listed.
 - b. Rigid galvanized conduit with full weight screwed fittings.
 - c. Electrical metallic conduit (EMT) with compression type fittings.
 - d. Outlet Boxes, zinc-coated steel, Federal Specification W-O-821a.
 - e. Outlet Boxes, non-metallic, UL Listed.
13. Wires and Cables
 - a. Building wires, thermoplastic insulated, type THW, copper conductors, UL listed.
 - b. Non-metallic sheathed cables, type TW, insulated with #12 grounding conductor, copper conductors, UL listed.
 - c. Armored bushed cables, type TW insulated, Federal Specification J-C-71a.
 - d. Cord, all rubber, type S, heavy duty grade, UL Listed.
14. Miscellaneous Materials
 - a. Insulating tapes: vinyl 7 mil & 10 mil, Federal Specification MIL-I779A.
 - b. Lamps: Incandescent type, general service, 120-volt, Federal Specification W-L-101e. Fluorescent type, warm white.

C. INSTALLATION AND WORKMANSHIP, GENERAL

1. Arrange for connection to existing power service pole, installation of new meters, and new underground service as indicated on drawings and as required by power company.
2. Install meters where indicated or directed. Run new service entrance conductors to main panels.
3. All outlets, devices and fixtures shall have outlet boxes of size and type to properly accommodate the devices and the size and number of cables required.
4. Mount boxes so that covers and plates will finish flush with wall or ceiling surfaces. Secure rigidly in position.
5. In general, location of outlets and switches is shown on Drawings. Unless otherwise directed, set switches 4 ft. above floor line, convenience outlets 18 in. above floor line or, where indicated at cabinets, 8 in. above countertop level.
6. Position outlets as directed with relation to architectural features and where possible, clear trim and corners by 4 inches. Switch boxes shall be located adjacent to door openings, (strike sides) unless particularly shown otherwise.
7. Unless otherwise indicated or directed, receptacles shall be installed in vertical position.
8. Cover all devices with cover plates; multiple switches or outlets in gang plates.
9. Final location of devices is subject to Owner's approval. No claim for extra work shall be made for changes in wiring or relocation of outlets and/or switches made necessary by failure to have location approved.
10. All workmanship shall be in accordance with best standard practice.

D. WIRING

1. Service entrance conductors from power pole to meters shall be run underground in rigid conduit.
2. All wiring, unless otherwise indicated or approved, shall be run concealed in walls, ceilings and floors.
3. In ceilings, run wiring parallel to and between joists where practicable. In frame walls, studs shall be bored; no notching permitted.
4. Cables for service entrance and feeder conductors shall have type THW insulation; for branch circuit wiring type THHN insulation.
5. Wiring in wood construction may be non-metallic cable with ground or

armored cable with ground.

6. Minimum sizes of conductors shall be figured in accordance with National Electric Code carrying capacity, allowing for all circuits fully loaded. Feeders shall be of sufficient size so that drop in line voltage with all circuits fully loaded shall not exceed 2% of line voltage.
7. Reduction in size of wire between outlet and panel will not be permitted.
8. Insofar as practicable, avoid splicing conductors. Where necessary, make splices in readily accessible outlet or junction boxes or outlet fittings of conventional types.
9. Make taps and splices in wire No. 6 or larger with brass or copper pressure type connectors applied after conductors are properly cleaned; then make tight and fully insulate the joint as specified for smaller wires.
10. Make taps and splices in wire No. 8 and smaller mechanically tight by using Western Union or pigtail splices, properly cleaned, soldered and insulated; flashover or insulation value of joints shall be at least 100 percent in excess of wire insulation. Mechanical wire splices and joints, except those using set screws bearing directly on conductors, or having rigid insulation (no wire nuts) may be used.
11. All branch circuits shall be of minimum wire size No. 12.

E. INSTALLATION OF EQUIPMENT, FIXTURES

1. Install fixtures, equipment and accessories as indicated and in accordance with manufacturers' specifications.
2. Install and connect lighting fixtures as scheduled on drawings. All fixtures shall be properly polarized.
3. Provide power wiring and disconnect switches for heating and air conditioning equipment as indicated. All other wiring necessary for installation of heating and air conditioning equipment is specified in Section 15B, HEATING AND AIR CONDITIONING.
4. Provide power wiring and connect water heater, kitchen and laundry appliances, exhaust fans, other electrical items specified in other Sections and/or indicated on the drawings.

F. GROUNDING

1. In general, all wiring systems shall be grounded in accordance with the rules of Article 250 of the National Electrical Code.
2. Ground service entrance to driven Copperweld ground in the manner prescribed by the code, with grounding clamps accessible. Ground each box, raceway, cabinet, and grounding conductor.
3. Where non-metallic sheathed cables are used, outlets and enclosures shall be grounded.

G. PROVISIONS FOR TELEPHONES

1. Where telephone outlets are indicated, install outlet boxes with conduit to crawl space. Telephone receptacles and telephone sets will not be provided under this contract.
2. Install galvanized pull wires in conduit for installation of wiring by others.
3. Do not permit telephone mechanics to run exposed wiring within building. Cover unused outlets with cover plates.

H. INSPECTION AND TESTS

1. Following completion of wiring installation, test the system and eliminate any grounding of potential conductors, short circuits, other faults.
2. At time of testing, all feeders, branches, panels and outlets shall be connected and the wiring system complete from point of service connection.