

Exhibit 1

Specifications and Project Manual

**Kitchen and Bath Improvements
At Marlborough Town Community
1849 Tanow Place
District Heights, MD 20747
IFB 2017-001**

For

Housing Authority of Prince George's County
9200 Basil Court, Suite 500
Largo, Maryland 20774

TABLE OF CONTENTS
LOW RISE

BIDDING AND CONTRACT REQUIREMENTS

DIVISION 1 - GENERAL REQUIREMENTS

01010	Summary of Work
01035	Modification Procedures
01040	Project Coordination
01045	Cutting and Patching
01300	Submittals
01400	Quality Control Services
01500	Temporary Facilities
01600	Materials and Equipment

DIVISION 2 - SITE WORK

Not Used

DIVISION 3 - CONCRETE

Not Used

DIVISION 4 - MASONRY

Not Used Unit Masonry

DIVISION 5 - METALS

05000 Mirror
05000 Grab bars

DIVISION 6 - WOOD AND PLASTICS

06100 Rough Carpentry
06105 Miscellaneous Carpentry

DIVISION 7 - THERMAL AND MOISTURE PROTECTION

07901 Joint Sealants

DIVISION 8 - DOORS AND WINDOWS

08351 Folding Doors

08710 Door Hardware

08800 Glazing

DIVISION 9 - FINISHES

09255 Gypsum Board Assemblies

09660 Resilient Tile Flooring

09678 Resilient Wall Base and Accessories

09900 Painting

DIVISION 10- SPECIALTIES

10160 Bathtub

10800 Toilet and Bath Accessories

DIVISION 11 - EQUIPMENT

11452 Residential Appliances

DIVISION 12 - FURNISHINGS

12372 Kitchen Casework

12511 Horizontal Louver Blinds

DIVISION 13• SPECIAL CONSTRUCTION

Not Used

DIVISION 14• CONVEYING SYSTEMS

Not Used

DIVISION 15• PLUMBING AND MECHANICAL

15410	Plumbing Piping Systems and Plumbing Specialties
15440	Plumbing Fixtures
15450	Plumbing Equipment
15865	Special Fans
15940	Air Inlets and Outlets
15990	Testing, Adjusting and Balancing

DIVISION 16• ELECTRICAL

16010	Electrical Basic Requirements
16110	Raceway
16120	Wire and Cables
16130	Electrical Boxes and Fittings
16135	Wiring Devices
16440	Disconnect Switches
16470	Panelboards
16485	Contractors
16510	Lighting Fixtures

EXHIBIT

SECTION 01010 - SUMMARY OF WORK

PART 1-GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-I Specification Sections, apply to this Section.

1.2 PROJECT DESCRIPTION

The Project consists of alternation to the following sites.

MD 15-3 MARLBOROUGH TOWNE, 1845 Tanow Place, District Heights, Md.

The work consist of rehabilitation and moderation of the buildings located at each of the listed sites.

1. The Work includes the renovation/repair of ten (10) low- rise, 1BR Dwelling Unit housing units. The work will take place at our Marlborough Town Community located 1849 Tanow Place, District Heights, MD 20747.

General: Full use of the premises to construction activities in areas indicated; allow for Owner occupancy and use by the public.

2. Interior .finishing and related construction, including interior finishes and permanent doors, and mechanical and electrical installations are required.

1.3 WORK SEQUENCE

- A. The Work will be conducted in phases to provide the least possible interference to the activities of the Owner's personnel and to permit an orderly transfer of personnel and equipment to the new facilities.

1.4 CONTRACTOR USE OF PREMISES

1. Keep driveways and entrances serving the premises clear and available to the Owner and the Owner's employees at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on site.

SUMMARY OF WORK -

01010 - 1

The HOUSING AUTHORITY OF PRINCE GEORGE'S COUNTY is soliciting bids for the renovation/repair of ten (10) low-rise, 1BR Dwelling Unit housing units. The work will take place at our Marlborough Town Community located 1849 Tanow Place, District Heights, MD 20747. This work is being financed, in whole or in part, through grants provided by the Prince George's County Community Development Block Grant (CDBG) the Housing and Urban Development, Davis-Bacon labor standards will apply.

GENERAL

1. PAINTING

Contractor to paint each unit, to include all materials labor and tools. Prepare and evenly apply 2 coats of paint to all walls, trim and ceiling surfaces, per specifications clean all surfaces upon completion. As per Specifications

2. FLOORING & BASE

Remove existing & install new Planks - Brazilian Forest 36 in. x 6 in. Vinyl Tile flooring with 4" Vinyl cove base. Remove existing wood base molding. Level all floors w/latex underlayment. All necessary thresholds are to be installed. All seams invisible. All Whole boxes of material to remain on-site. As per Specifications. For floor installation Contractor is to remove all remaining tenant belongings in to an on-site contractor provided secure storage container.

Asbestos Containing Material (ACM)

Friable materials found during demolition, such materials must be removed by a Maryland licensed asbestos abatement contractor using properly trained and licensed workers. The State, EPA and OSHA regulate these activities. Respiratory and personal protection is required worker exposure assessments for asbestos exposure must be performed if respiratory protection is to be terminated, and work areas must be isolated. Environmental monitoring should be performed both during and after asbestos removal. Notification to Maryland Department of the Environment is required for the removal of these materials. In addition, the asbestos waste must be disposed in accordance with state, EPA, and DOT regulations.

3. LIGHTING

Remove existing and install new energy efficient light fixtures. Install, connect, patch, repair and paint per CDs. LED lighting to be used wherever possible. Five (5) interior lighting and one (1) exterior light at entry are required. Project manager to select product Allowance: \$350.00

4. INTERIOR DOORS

Remove existing sliding closet door slabs at 3 locations. Replace with 6 panel hollow core door slabs, utilizing existing hanging hardware. Install Lever style dummy knobs.

Remove existing doors and frames at bedroom and bathroom. Install new Pre-hung 6 panel hollow core door, with lever style privacy hardware. Install stops at all doors. and finish per CDs.

Remove existing and install new 24: x80 bi-fold doors and furnace closet, provide new hardware

5. SMOKE DETECTORS

Remove existing and install new wired smoke detectors with battery backup unit. Install a unit in bedroom. Inter connect to existing circuit. Install, connect, patch, and repair. Paint per CDs.

6. SUPPLY AND RETURN AIR REGISTERS

Remove existing and Provide and install new supply and return registers. Five (5) supply registers and one return are required. Contractor to verify size in field. Allowance: \$100

7. ELECTRICAL OUTLET AND SWITCH COVERS

Replace all existing GFCI with new. All convenience circuits in kitchen and bath to be protected. Replace all existing outlet, switches and plates in unit with new.

8. Horizontal Louver blinds

Remove all existing blinds. Provide and install new 1" slat plastic room darkening, white horizontal Louver cordless blinds within all window jambs. Patch, repair & paint, per specifications.

Remove all existing vertical blinds at sliding door. Provide and install new 3" slat vertical blinds. Patch, repair & paint, per specifications.

9. Owner supplied Items

The Owner is to supply kitchen cabinets and countertops. The Owner is to supply the following appliances: Refrigerator, electric stove and garbage disposal.

10. Closets

Remove existing, Provide and install new 1x12 finished wood shelf, supports and rod in all closets.

KITCHEN AREAS

11. WALL & BASE CABINETS & COUNTERTOPS

Remove existing cabinets, countertops and splashes. Install new wood wall and base cabinets, countertops and splashes. Patch, repair and paint, per CDs. Contractor to install owner supplied kitchen cabinets and countertops.

12. KITCHEN SINK & FAUCET

Remove existing & install new single bowl sink, faucet & Accessories. Connect to existing waste, vent lines. Provide new Supply line and cut-off valves. Connect, patch, repair & paint, per specifications.

13. GARBAGE DISPOSALS

Install new garbage disposals. Install connect, patch, and repair and paint per CDs. The Owner is to supply garbage disposal.

14. RANGEHOODS & RANGE OUTLETS

Remove existing and install new range hoods. Install over existing range outlet and install new recessed outlet behind range. Install, connect, patch, repair and paint, per specifications.

Contractor to install Contractor to install owner supplied refrigerator and stove and wiring.

BATH ROOM AREAS

15. CERAMIC TILE FLOORING AND TUB

Remove existing wall surround panels & tub. Install new tub. Install cement backer and 6x6 Ceramic tile to tub surround (wet) area. Tile is to extend from tub rim to ceiling. Level all floors w/latex underlayment. The Bathroom floor is to receive 2x2 ceramic tiles. Apply all required bullnoseing and one course of curved base tile around perimeter of floor. Install beveled 4" marble threshold at door. Patch, repair & paint, per specifications.

16. WATER CLOSET

Remove existing and install new 2-piece 1.28 GPF HI-EFF toilet elongated seats, piping valves, accessories, and toilet paper dispensers. Patch, repair & paint, per specifications.

17. SINK, FAUCETS, MEDICINE CABS & VANITIES

Remove existing & install new sink, faucets, shower faucet, vanities, medicine cabinets light fixtures, GFI outlets, soap dish, toothbrush holders, towel rod & accessories. Water saving aerators are to be employed. Patch, repair & paint, per specifications.

18. SAFETY GRAB BARS

Remove existing if present & install new safety grab (1 ½" dia.) bars in bathroom. Patch, repair & paint, per specifications.

19. Bath Exhaust Vent

Remove existing and install bath exhaust vent. Install in existing opening. Install, connect, patch, repair and paint, per specifications

10. Quality and Workmanship

All materials and workmanship shall meet or exceed all requirements of the local plumbing and electrical codes.

END

1.5 OWNER OCCUPANCY

- A. Partial Owner Occupancy: The Owner reserves the right to occupy and to place and install equipment in completed areas of the building, prior to Substantial Completion provided that such occupancy does not interfere with completion of the Work. Such placing of equipment and partial occupancy shall not constitute acceptance of the total Work.
1. A Certificate of Substantial Completion will be executed for each specific portion of the Work to be occupied prior to Owner occupancy.
 2. Obtain (). Certificate of Occupancy from local building officials prior to Owner occupancy.
 3. Prior to partial Owner occupancy, mechanical and electrical systems shall be fully operational. Required inspections and tests shall have been successfully completed. Upon occupancy the Owner will provide operation and maintenance of mechanical and electrical systems in occupied portions of the building.

PART 2 - PRODUCTS (Not applicable).

PART 3 - EXECUTION (Not applicable).

END OF SECTION 01010

SECTION 01035 - MODIFICATION PROCEDURES

PART 1- GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification sections, apply to this section.

1.2 SUMMARY

- A. This section specifies administrative and procedural requirements for handling and processing Contract modifications.
 - 1. Multiple Prime Contracts: Provisions of this Section apply to the Work of each prime contractor.
- B. Related Sections: The following sections contain requirements that relate to this section:

1.3 MINOR CHANGES IN THE WORK

- A. Supplemental instructions authorizing minor changes in the Work, not involving an adjustment to the Contract Sum or Contract Time, will be issued by the Architect on A1A form G710, Architect's Supplemental Instructions.

1.4 CHANGE ORDER. PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Proposed changes in the Work that will require adjustment to the Contract Sum or Contract Time will be issued by the Architect, with a detailed description of the proposed change and supplemental or revised Drawings and Specifications, if necessary.
 - 1. Proposal requests issued by the Architect are for information only. Do not consider an them instruction either to stop work in progress, or to execute the proposed change.
 - 2. Unless otherwise indicated in the proposal request, within 20 days of receipt of the proposal request, submit to the Architect for the Owner's review an estimate of cost necessary to execute the proposed change.
 - a. Include a list of quantities of products to be purchased and unit costs, along with the total amount of purchases to be made. Where requested,

- furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include a statement indicating the effect the proposed change in the Work will have on the Contract Time.
- B. Contractor-Initiated Change Order Proposal Requests: When latent or other unforeseen conditions require modifications to the Contract, the Contractor may propose changes by submitting a request for a change to the Architect.
 - 1. Include a statement outlining the reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and Contract Time.
 - 2. Include a list of quantities of products to be purchased and unit costs along with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities.
 - 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - 4. Comply with requirements in Section "Product Substitutions" if the proposed change in the Work requires the substitution of one product or system for a product or system specified.
- C. Proposal Request Form: Use AIA Document G 709 for Change Order Proposal Requests.
- D. Proposal Request Form: Use forms provided by the Owner for Change Order Proposals; sample copies are included at the end of this Section.

1.5 ALLOWANCES

- A. Allowance Adjustment: Base each Change Order Proposal Request for an allowance cost adjustment solely on the difference between the actual purchase amount and the allowance, multiplied by the final measurement of work-in-place, with reasonable allowances, where applicable, for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.
 - 1. Include installation costs in the purchase amount only where indicated as part of the allowance.
 - 2. When requested, prepare explanations and documentation to substantiate the margins claimed.
 - 3. Submit substantiation of a change in scope of work claimed in the Change Orders related to unit-cost allowances.
 - 4. The Owner reserves the right to establish the actual quantity of work-in-place by independent quantity survey, measure, or count.
- B. Submit claims for increased costs because of a change in scope or nature of the

allowance described in the Contract Documents, whether for the purchase order amount or Contractor's handling, labor, installation, overhead, and profit, within 20 days of receipt of the change order or construction change directive authorizing work to proceed. Claims submitted later than 20 days will be rejected.

1. The Change Order cost amount shall not include the Contractor's or Subcontractor's indirect expense except when it is clearly demonstrated that either the nature or scope of work required was changed from that which could have been foreseen from the description of the allowance and other information in Contract Documents.
2. No change to the Contractor's indirect expense is permitted for selection of higher or lower priced materials or systems of the same scope and nature as originally indicated.

1.6 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: When the Owner and Contractor are not in total agreement on the terms of a Change Order Proposal Request, the Architect may issue a Construction Change Directive on AIA Form G714, instructing the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
 1. The Construction Change Directive will contain a complete description of the change in the Work and designate the method to be followed to determine change in the Contract Sum or Contract Time.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
 1. After completion of the change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

1.7 CHANGE ORDER PROCEDURES

- A. Upon the Owner's approval of a Change Order Proposal Request, the Architect will issue a Change Order for signatures of the Owner and Contractor on AIA Form G701, as provided in the Conditions of the Contract.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01035

SECTION 01040 - PROJECT COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division- ■Specification Sections, apply to this Section.

1.2 SUMMARY

- A.' This Section specifies administrative and supervisory requirements necessary for Project coordination including, but not necessarily limited to:
 - 1. Coordination.
 - 2. Administrative and supervisory personnel.
 - 3. General installation provisions.
 - 4. Cleaning and protection.
- B. Progress meetings, coordination meetings and pre-installation conferences are included in "Special Conditions".
- C. Requirements for the Contractor's Construction Schedule are included in Section "Submittals".

1.3 COORDINATION

- A. Coordination: - Coordinate construction activities included under various Sections of these Specifications to assure efficient and orderly installation of each part of the Work. Coordinate construction operations included under different Sections of the Specifications that are ds:pendent upon each other for proper installation, connection, and operation.
 - 1. Where installation of one part of the Work is dependent on installation of other components, either before or after its own installation, schedule construction activities in the sequence required to obtain the best results.
 - 2. Where availability of space is limited, coordinate installation of different components to assure maximum accessibility for required maintenance, service and repair.
 - 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Where necessary, prepare memoranda for distribution to each party involved outlining special procedures required for coordination. Include such items as required notices,

reports, and attendance at meetings.

1. Prepare similar memoranda for the Owner and separate Contractors where coordination of their Work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
1. Preparation of schedules.
 2. Installation and removal of temporary facilities.
 3. Delivery and processing of submittals.
 4. Progress meetings.
 5. Project Close-out activities.
- D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.
1. Salvage materials and equipment involved in performance of, but not actually incorporated in, the w Work. Refer to other sections for disposition of salvaged materials that are designated as Owner's property.

1.4 SUBMITTALS

- A. Coordination Drawings: Prepare and submit coordination Drawings where close and careful coordination is required for installation of products and materials fabricated off-site by separate entities, and where limited space availability necessitates maximum utilization of space for efficient installation of different components.
1. Show the interrelationship of components shown on separate Shop Drawings.
 2. Indicate required installation sequences.
 3. Comply with requirements contained in Section "Submittals."
 4. Refer to Division-15 Section "Basic Mechanical Requirements," and Division-16 Section "Basic Electrical Requirements" for specific coordination Drawing requirements for mechanical and electrical installations.
- B. Staff Names: Within 15 days of Notice to Proceed, submit a list of the Contractor's principal staff assignments, including the Superintendent and other personnel in attendance at the site; identify individuals, their duties and responsibilities; list their addresses and telephone numbers.
1. Post copies of the list in the Project meeting room, the temporary field office, and each temporary telephone.

PART 2 - PRODUCTS (Not Applicable).

PART 3 - EXECUTION

3.1 GENERAL INSTALLATION PROVISIONS

- A. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.
- B. Manufacturer's Instructions: Comply with manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.
- C. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.
- D. Provide attachment and connection devices and methods necessary for securing Work. Secure Work true to line and level. Allow for expansion and building movement.
- E. Visual Effects: Provide uniform joint widths in exposed Work. Arrange joints in exposed Work to obtain the best visual effect. Refer questionable choices to the Architect for final decision.
- F. Recheck measurements and dimensions, before starting each installation.
- G. Install each component during weather conditions and Project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.
- H. Coordinate temporary enclosures with required inspections and tests, to minimize the necessity of uncovering completed construction for that purpose.
- I. Mounting Heights: Where mounting heights are not indicated, install individual components at standard mounting heights recognized within the industry for the particular application indicated. Refer questionable mounting height decisions to the Architect for final decision.

3.2 CLEANING AND PROTECTION

- A. During handling and installation, clean and protect construction in progress and adjoining materials in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- B. Clean and maintain completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

C. Limiting Exposures: Supervise construction activities to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period, Where applicable, such exposures include, but are not limited to, the following:

1. Excessive static or dynamic loading.
2. Excessive internal or external pressures.
3. Excessively high or low temperatures.
4. Thermal shock.
5. Excessively high or low humidity.
6. Air contamination or pollution.
7. Water or ice.
8. Solvents.
9. Chemicals.
10. Light.
11. Radiation.
12. Puncture.
13. Abrasion.
14. Heavy traffic.
15. Soiling, staining and corrosion.
16. Bacteria.
17. Rodent and insect infestation.
18. Combustion.
19. Electrical current.
20. High speed operation,
21. Improper lubrication,
22. Unusual wear or other misuse.
23. Contact between incompatible materials.
24. Destructive testing.
25. Misalignment.
26. Excessive_ weathering.
27. Unprotected storage.
28. Improper shipping or handling.
29. Theft.
30. Vandalism.

END OF SECTION 01040

SECTION 01400 - QUALITY CONTROL SERVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division- I Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for quality control services.
- B. Quality control services include inspections and tests and related actions including reports, performed by independent agencies, governing authorities, and the Contractor. They do not include Contract enforcement activities performed by the Architect.
- C. Inspection and testing services are required to verify compliance with requirements specified or indicated. These services do not relieve the Contractor of responsibility for compliance with Contract Document requirements.
- D. Requirements of this Section relate to customized fabrication and installation procedures, not production of standard products.
 - 1. Specific quality control requirements for individual construction activities are specified in the Sections that specify those activities. Those requirements, including inspections and tests, cover production of standard products as well as customized fabrication and installation procedures.
 - 2. Inspections, test and related actions specified are not intended to limit the Contractor's quality control procedures that facilitate compliance with Contract Document requirements.
 - 3. Requirements for the Contractor to provide quality control services required by the Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

1.3 RESPONSIBILITIES

- A. Contractor Responsibilities: The Contractor shall provide inspections, tests and similar quality control services, specified in individual Specification Sections and required by governing authorities, except where they are specifically indicated to be the Owner's responsibility, or are provided by another identified entity; these services

include those specified to be performed by an independent agency and not by the Contractor. Costs for these services shall be included in the Contract Sum.

1. The Contractor shall employ and pay an independent agency, to perform specified quality control services.
 2. The Owner will engage and pay for the services of an independent agency to perform inspections and tests specified as the Owner's responsibility.
 - a. Where the Owner has engaged a testing agency or other entity for testing and inspection of a part of the Work, and the Contractor is also required to engage an entity for the same or related element, the Contractor shall not employ the entity engaged by the Owner, unless otherwise agreed in writing with the Owner.
 3. Retesting: The Contractor is responsible for retesting where results of required inspections, tests or similar services prove unsatisfactory and do not indicate compliance with Contract Document requirements, regardless of whether the original test was the Contractor's responsibility.
 - a. Cost of retesting construction revised or replaced by the Contractor is the Contractor's responsibility, where required tests were performed on original construction.
 4. Associated Services: The Contractor shall cooperate with agencies performing^o required inspections, tests and similar services and provide reasonable auxiliary services as requested. Notify the agency sufficiently in advance of operations to permit assignment of personnel. Auxiliary services required include but are not limited to:
 - a. Providing access to the Work and furnishing incidental labor and facilities necessary to facilitate inspections and tests.
 - b. Taking adequate quantities of representative samples of materials that require testing or assisting the agency in taking samples.
 - c. Providing facilities for storage and curing of test samples, and delivery of samples to testing laboratories.
 - d. Providing the agency with a preliminary design mix proposed for use for materials mixes that require control by the testing agency.
 - e. Security and protection of samples and test equipment at the Project site.
- B. Owner Responsibilities: The Owner will provide inspections, tests and similar quality control services specified to be performed by independent agencies and not by the Contractor, except where they are specifically indicated as the Contractor's responsibility or are provided by another identified entity. Costs for these services are not included in the Contract Sum.
1. The Owner will employ and pay for the services of an independent agency, testing laboratory or other qualified firm to perform services which are the Owner's responsibility.

- C. Duties of the Testing Agency: The independent testing agency engaged to perform inspections, sampling and testing of materials and construction specified in individual Specification Sections shall cooperate with the Architect and Contractor in performance of its duties, and shall provide qualified personnel to perform required inspections and tests.
 - 1. The agency shall notify the Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 - 2. The agency is not authorized to release, revoke, alter or enlarge requirements of the Contract Documents, or approve or accept any portion of the Work.
 - 3. The agency shall not perform any duties of the Contractor.

- D. Coordination: The Contractor and each agency engaged to perform inspections, tests and similar services shall coordinate the sequence of activities to accommodate required services with a minimum of delay. In addition the Contractor and each agency shall coordinate activities to avoid the necessity of removing and replacing construction to accommodate inspections and tests.
 - 1. The Contractor is responsible for scheduling times for inspections, tests, taking samples and similar activities.

1.4 SUBMITTALS

- A. The independent testing agency shall submit a certified written report of each inspection, test or similar service, to the Architect, in duplicate, unless the Contractor is responsible for the service. If the Contractor is responsible for the service, submit a certified written report of each inspection, test, or similar service through the Contractor, in duplicate.
 - 1. Submit additional copies of each written report directly to the governing authority, when the authority so directs.
 - 2. Report Data: Written reports of each inspection, test or similar service shall include, but not be limited to:
 - a. Date of issue.
 - b. Project title and number.
 - c. Name, address and telephone number of testing agency.
 - d. Dates and locations of samples and tests or inspections.
 - e. Names of individuals making the inspection or test.
 - f. Designation of the Work and test method.
 - g. Identification of product and Specification Section.
 - h. Complete inspection or test data.
 - i. Test results and an interpretation of test results.
 - j. Ambient conditions at the time of sample-taking and testing.
 - k. Comments or professional opinion as to whether inspected or tested Work complies with Contract Document requirements.
 - l. Name and signature of laboratory inspector.

- m. Recommendations on retesting.

1.5 QUALITY ASSURANCE

- A. Qualification for Service Agencies: Engage inspection and testing service agencies, including independent testing laboratories, which are prequalified as complying with "Recommended Requirements for Independent Laboratory Qualification" by the American Council of Independent Laboratories, and which specialize in the types of inspections and tests to be performed.
 - 1. Each independent inspection and testing agency engaged on the Project shall be authorized by authorities having jurisdiction to operate in the State in which the Project is located.

PART 2 - PRODUCTS (Not Applicable).

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

- A. General: Upon completion of inspection, testing, sample-taking and similar services, repair damaged construction and restore substrates and finishes to eliminate deficiencies, including deficiencies in visual qualities of exposed finishes. Comply with Contract Document requirements for "Cutting 3:11d Patching."
- B. Protect construction exposed by or for quality control service activities, and protect repaired construction. -
- C. Repair and protection is the Contractor's responsibility, regardless of the assignment of responsibility for inspection, testing or similar services.

END OF SECTION 01400

1. Health and safety regulations.
 2. Utility company regulations.
 3. Police, Fire Department and Rescue Squad rules.
 4. Environmental protection regulations.
- B. Standards: Comply with NFPA Code 241, "Building Construction and Demolition Operations", ANSI-AIO Series standards for "Safety Requirements for Construction and Demolition", and NECA Electrical Design Library "Temporary Electrical Facilities."
1. Refer to "Guidelines for Bid Conditions for Temporary Job Utilities and Services", prepared jointly by AOC and ASC, for industry recommendations.
 2. Electrical Service: Comply with NEMA, NECA and UL standards and regulations for temporary electric service. Install service in compliance with National Electric Code (NFPA 70).
- C. Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

1.5 PROJECT CONDITIONS

- A. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not overload facilities, or permit them to interfere with progress. Do not allow hazardous dangerous or unsanitary conditions, or public nuisances to develop or persist on the site.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Provide new materials; if acceptable to the Architect, undamaged previously used materials in serviceable condition may be used. Provide materials suitable for the use intended.
- B. Lumber and Plywood: Comply with requirements in Division-6 Section "Rough Carpentry."
1. For job-built temporary offices, shops and sheds within the construction area, provide UL labeled, fire treated lumber and plywood for framing, sheathing and siding.
 2. For signs and directory boards, provide exterior type, Grade B-B High Density Concrete Form Overlay Plywood conforming to PS-1, of sizes and thickness indicated.
 3. For fences and vision barriers, provide exterior type, minimum 3/8" thick

SECTION 01010 - SUMMARY OF WORK

-PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.2 PROJECT DESCRIPTION

The Project consists of alternation to the following sites.

MD 15-3	MARLBOROUGH TOWNE, 1245 Towne Place, District Heights, Md.
MD 15-4	KIMBERLY GARDENS, 9216 Cherry Lane, Laurel Md.
MD 15-7	ROLLING CREST VILLAGE, Sergeant Road, Hyattsville Md.

The work consist of rehabilitation and moderation of the buildings located at each of the listed sites.

1. The Work includes sheet metal, hollow metal doors and frames, aluminum windows, hardware, glazing, interior finishes and furnishings including vertical blinds, landscaping, plumbing, heating-ventilating-air conditioning, electrical systems, lighting, and communication-alarm-signal systems.

General: Limit use of the premises to construction activities in areas indicated; allow for Owner occupancy and use by the public.

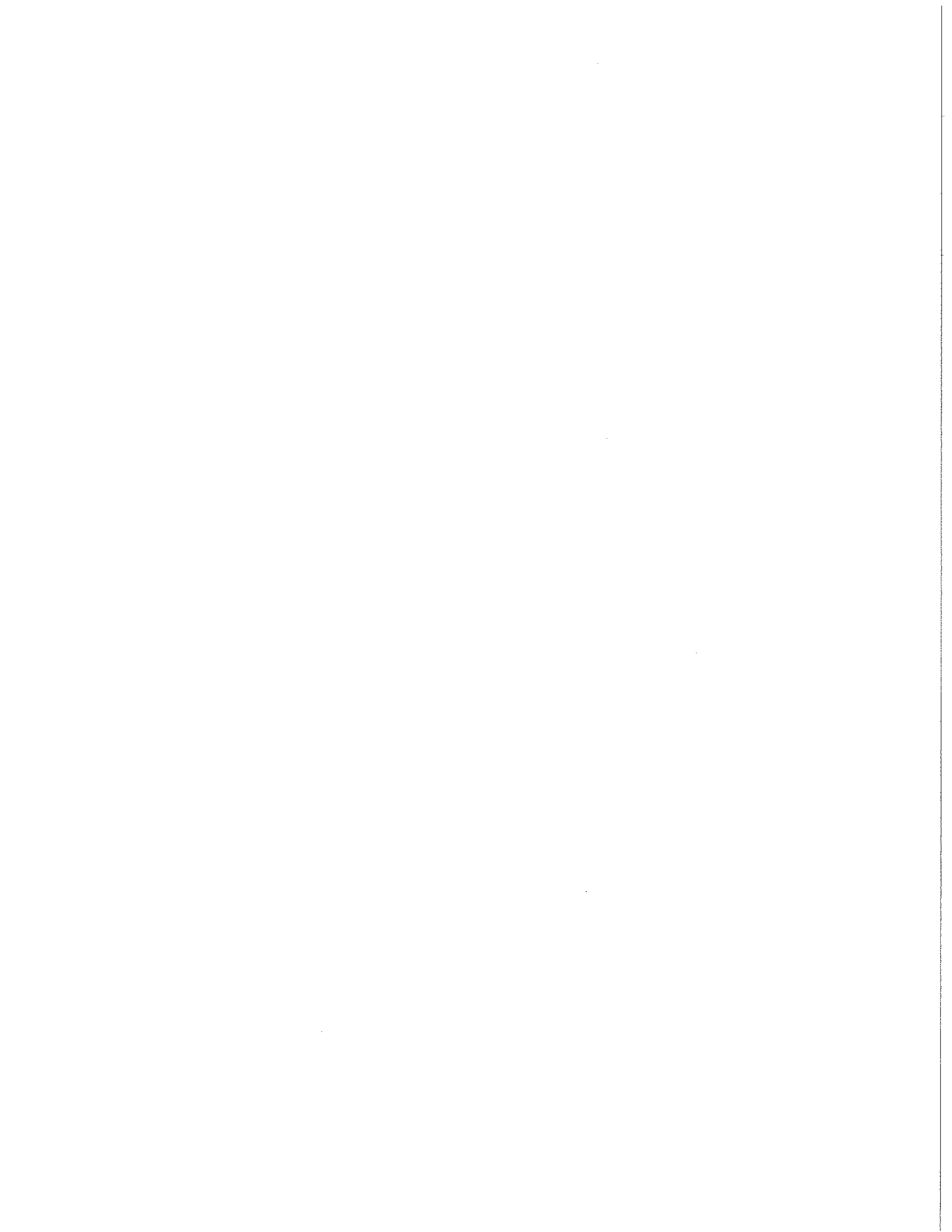
2. Interior finishing and related construction, including interior partitions and permanent doors, and mechanical and electrical installations are required.

1.3 WORK SEQUENCE

- A. The Work will be conducted in phases to provide the least possible interference to the activities of the Owner's personnel and to permit an orderly transfer of personnel and equipment to the new facilities.

1.4 CONTRACTOR USE OF PREMISES

1. Keep driveways and entrances serving the premises clear and available to the Owner and the Owner's employees. at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on site.



A. Use of the Existing Building: Maintain the existing building in a weathertight condition throughout the construction period. Repair damage caused by construction operations. Take all precautions necessary to protect the building and its occupants during the construction period.

1. Use of Existing Elevators at OWENS Road and McQuine House only: The Contractor will be permitted to use the freight elevator for freight service and transportation of construction personnel during the construction period. This elevator must also be available to the Owner at all times; coordinate usage with the Owner's representative. Provide protective pads for the cab and other appropriate protective measures for the car and entrance doors and frames. At the end of construction, restore the elevator to its original condition, replace worn cables, guide shoes and similar items of limited life. Use of other elevators by the Contractor will not be permitted.

1.5 OWNER OCCUPANCY

A. Full Owner Occupancy: The Owner will occupy the site and existing building during the entire construction period. Cooperate with the Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with the Owner's operations.

B. Partial Owner Occupancy: The Owner reserves the right to occupy and to place and install equipment in completed areas of the building, prior to Substantial Completion provided that such occupancy does not interfere with completion of the Work. Such placing of equipment and partial occupancy shall not constitute acceptance of the total

Work.

1. A Certificate of Substantial Completion will be executed for each specific portion of the Work to be occupied prior to Owner occupancy.
2. Obtain \\ Certificate of Occupancy from local building officials prior to Owner occupancy.
3. Prior to partial Owner occupancy, mechanical and electrical systems shall be fully operational. Required inspections and tests shall have been successfully completed. Upon occupancy the Owner will provide operation and maintenance of mechanical and electrical systems in occupied portions of the building.

PART 2 - PRODUCTS (Not applicable).

PART 3 - EXECUTION (Not applicable).



END OF SECTION 01010

SECTION 01035 - MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification sections, apply to this section.

1.2 SUMMARY

- A. This section specifies administrative and procedural requirements for handling and processing Contract modifications.
 - 1. Multiple Prime Contracts: Provisions of this Section apply to the Work of each prime contractor.
- B. Related Sections: The following sections contain requirements that relate to this section:

1.3 MINOR CHANGES IN THE WORK

- A. Supplemental instructions authorizing minor changes in the Work, not involving an adjustment to the Contract Sum or Contract Time, will be issued by the Architect on AIA form G710, Architect's Supplemental Instructions.

1.4 CHANGE ORDER .PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Proposed changes in the Work that will require adjustment to the Contract Sum or Contract Time will be issued by the Architect, with a detailed description of the proposed change and supplemental or revised Drawings and Specifications, if necessary.
 - 1. Proposal requests issued by the Architect are for information only. Do not consider an them instruction either to stop work in progress, or to execute the proposed change.
 - 2. Unless otherwise indicated in the proposal request, within 20 days of receipt of the proposal request, submit to the Architect for the Owner's review an estimate of cost necessary to execute the proposed change.
 - a. Include a list of quantities of products to be purchased and unit costs, along with the total amount of purchases to be made. Where requested,

- furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include a statement indicating the effect the proposed change in the Work will have on the Contract Time.
- B. Contractor-Initiated Change Order Proposal Requests: When latent or other unforeseen conditions require modifications to the Contract, the Contractor may propose changes by submitting a request for a change to the Architect.
 - 1. Include a statement outlining the reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and Contract Time.
 - 2. Include a list of quantities of products to be purchased and unit costs along with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities.
 - 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - 4. Comply with requirements in Section "Product Substitutions" if the proposed change in the Work requires the substitution of one product or system for a product or system specified.
- C. Proposal Request Form: Use AIA Document G 709 for Change Order Proposal Requests.
- D. Proposal Request Form: Use forms provided by the Owner for Change Order Proposals; sample copies are included at the end of this Section.

1.5 ALLOWANCES

- A. Allowance Adjustment: Base each Change Order Proposal Request for an allowance cost adjustment solely on the difference between the actual purchase amount and the allowance, multiplied by the final measurement of work-in-place, with reasonable allowances, where applicable, for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.
 - 1. Include installation costs in the purchase amount only where indicated as part of the allowance.
 - 2. When requested, prepare explanations and documentation to substantiate the margins claimed.
 - 3. Submit substantiation of a change in scope of work claimed in the Change Orders related to unit-cost allowances.
 - 4. The Owner reserves the right to establish the actual quantity of work-in-place by independent quantity survey, measure, or count.
- B. Submit claims for increased costs because of a change in scope or nature of the

allowance described in the Contract Documents, whether for the purchase order amount or Contractor's handling, labor, installation, overhead, and profit, within 20 days of receipt of the change order or construction change directive authorizing work to proceed. Claims submitted later than 20 days will be rejected.

1. The Change Order cost amount shall not include the Contractor's or Subcontractor's indirect expense except when it is clearly demonstrated that either the nature or scope of work required was changed from that which could have been foreseen from the description of the allowance and other information in Contract Documents.
2. No change to the Contractor's indirect expense is permitted for selection of higher or lower priced materials or systems of the same scope and nature as originally indicated.

1.6 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: When the Owner and Contractor are not in total agreement on the terms of a Change Order Proposal Request, the Architect may issue a Construction Change Directive on AIA Form G714, instructing the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

1. The Construction Change Directive will contain a complete description of the change in the Work and designate the method to be followed to determine change in the Contract Sum or Contract Time.

B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.

1. After completion of the change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

1.7 CHANGE ORDER PROCEDURES

A. Upon the Owner's approval of a Change Order Proposal Request, the Architect will issue a Change Order for signatures of the Owner and Contractor on AIA Form G701, as provided in the Conditions of the Contract.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01035

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building's aesthetic qualities, or result in visual evidence of cutting and patching.
Remove and replace Work cut and patched in a visually unsatisfactory manner.

1. If possible retain the original installer or fabricator to cut and patch the following categories of exposed Work, or if it is not possible to engage the original installer or fabricator, engage another recognized experienced and specialized firm:
 - a. Processed concrete finishes.
 - b. Acoustical ceilings.
 - c. HYAC enclosures, cabinets or covers.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Use materials that are identical to existing materials. If identical materials are not available or cannot be used where exposed surfaces are involved, use materials that match existing adjacent surfaces to the fullest extent possible with regard to visual effect. Use materials whose installed performance will equal or surpass that of existing materials.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Before cutting existing surfaces, examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed. Take corrective action before proceeding, if unsafe or unsatisfactory conditions are encountered.
 1. Before proceeding, meet at the site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

3.2 PREPARATION

- A. Temporary Support: Provide temporary support of Work to be cut.
- B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of the Project that might be exposed during cutting and patching operations.
- C. Avoid interference with use of adjoining areas or interruption of free passage to

adjoining areas.

- D. Take all precautions necessary to avoid cutting existing pipe, conduit or ductwork serving the building, but scheduled to be removed or relocated until provisions have been made to bypass them.

3.3 PERFORMANCE

- A. General: Employ skilled workmen to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay.
 - 1. Cut existing construction to provide for installation of other components or performance of other construction activities and the subsequent fitting and patching required to restore surfaces to their original condition.
- B. Cutting: Cut existing construction using methods least likely to damage elements to be retained or adjoining construction. Where possible review proposed procedures with the original installer; comply with the original installer's recommendations.
 - 1. In general, where cutting is required use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots neatly to size required with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 - 2. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.
 - 3. Cut through concrete and masonry using a cutting machine such as a carborundum saw or diamond core drill.
 - 4. Comply with requirements of applicable Sections of Division-2 where cutting and patching requires excavating and backfilling.
 - 5. By-pass utility services such as pipe or conduit, before cutting, where services are shown or required to be removed, relocated or abandoned. Cut-off pipe or conduit in partitions to be removed. Cap, valve or plug and seal the remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after by-passing and cutting.
- C. Patching: Patch with durable seams that are as invisible as possible. Comply with specified tolerances.
 - 1. Where feasible, inspect and test patched areas to demonstrate integrity of the installation.
 - 2. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
 - 3. Where removal of walls or partitions extends one finished area into another, patch and repair floor and wall surfaces in the new space to provide an even surface of uniform color and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary to achieve uniform color

SECTION 01045 - CUTTING AND PATCHING

PART 1 -GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for cutting and patching.
- B. Refer to other Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.
 - 1. Requirements of this Section apply to mechanical and electrical installations. Refer to Division-15 and Division-16 Sections for other requirements and limitations applicable to cutting and patching mechanical and electrical installations.
- C. Demolition of selected portions of the building for alterations is included in Section "Selective Demolition."

1.3 SUBMITTALS

- A. Cutting and Patching Proposal: Where approval of procedures for cutting and patching is required before proceeding, submit a proposal describing procedures well in advance of the time cutting and patching will be performed and request approval to proceed. Include the following information, as applicable, in the proposal:
 - 1. Describe the extent of cutting and patching required and how it is to be performed; indicate why it cannot be avoided.
 - 2. Describe anticipated results in terms of changes to existing construction; include changes to structural elements and operating components as well as changes in the building's appearance and other significant visual elements.
 - 3. List products to be used and firms or entities that will perform Work.
 - 4. Indicate dates when cutting and patching is to be performed.
 - 5. List utilities that will be disturbed or affected, including those that will be relocated and those that will be temporarily out-of-service. Indicate how long service will be disrupted.
 - 6. Where cutting and patching involves addition of reinforcement to structural

elements, submit details and engineering calculations to show how reinforcement is integrated with the original structure.

7. Approval by the Architect to proceed with cutting and patching does not waive the Architect's right to later require complete removal and replacement of a part of the Work found to be unsatisfactory.

1.4 QUALITY ASSURANCE

A. Requirements for Structural Work: Do not cut and patch structural elements in a manner that would reduce their load-carrying capacity or load-deflection ratio.

1. Obtain approval of the cutting and patching proposal before cutting and patching the following structural elements:
 - a. Foundation construction.
 - b. Bearing and retaining walls.
 - c. Structural concrete.
 - d. Structural steel.
 - e. Lintels.
 - f. Primary wood framing.
 - g. Structural decking.
 - h. Stair systems.
 - i. Miscellaneous structural metals.
 - j. Equipment supports.
 - k. Piping, ductwork, vessels and equipment.

B. Operational and Safety Limitations: Do not cut and patch operating elements or safety related components in a manner that would result in reducing their capacity to perform as intended, or result in increased maintenance, or decreased operational life or safety.

1. Obtain approval of the cutting and patching proposal before cutting and patching the following operating elements or safety related systems:
 - a. Shoring, bracing, and sheeting.
 - b. Primary operational systems and equipment.
 - c. Air or smoke barriers.
 - d. Water, moisture, or vapor barriers.
 - e. Membranes and flashings.
 - f. Fire protection systems.
 - g. Noise and vibration control elements and systems.
 - h. Control systems.
 - i. Communication systems.
 - j. Conveying systems.
 - k. Electrical wiring systems.

C. Visual Requirements: Do not cut and patch construction exposed on the exterior or in occupied spaces, in a manner that would, in the Architect's opinion, reduce the

SECTION 01300 - SUBMITTrALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for submittals required for performance of the Work, including;
 - 1. Contractor's construction schedule.
 - 2. Submittal schedule.
 - 3. Daily construction reports.
 - 4. Shop Drawings.
 - 5. Product Data.
 - 6. Samples.
- B. Administrative Submittals: Refer to other Division-I Sections and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to:
 - 1. Permits.
 - 2. Applications for payment.
 - 3. Performance and payment bonds.
 - 4. Insurance certificates.
 - 5. List of Subcontractors.
- C. The Schedule of Values submittal is included in Section "General Conditions."
- D. Inspection and test reports are included in Section "Quality Control Services."
- E. Submittal of Project photographs is included under Section "General Conditions."

1.3 SUBMITTAL PROCEDURES

- A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related activities that require sequential activity.
 2. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.
 - a. The Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
 3. Processing: Allow sufficient review time so that installation will not be delayed as a result of the time required to process submittals, including time for resubmittals.
 - a. Allow two weeks for initial review. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. The Architect will promptly advise the Contractor when a submittal being processed must be delayed for coordination.
 - b. If an intermediate submittal is necessary, process the same as the initial submittal.
 - c. Allow two weeks for reprocessing each submittal.
 - d. No extension of Contract Time will be authorized because of failure to transmit submittals to the Architect sufficiently in advance of the Work to permit processing.
- B. Submittal Preparation: Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.
1. Provide a space approximately 4" x 5" on the label or beside the title block on Shop Drawings to record the Contractor's review and approval markings and the action taken.
 2. Include the following information on the label for processing and recording action taken.
 - a. Project name.
 - b. Date.
 - c. Name and address of Architect.
 - d. Name and address of Contractor.
 - e. Name and address of subcontractor.
 - f. Name and address of supplier.
 - g. Name of manufacturer.
 - h. Number and title of appropriate Specification Section.
 - i. Drawing number and detail references, as appropriate.
- C. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from Contractor to Architect using a transmittal form. Submittals received from sources other than the Contractor will be returned

and appearance.

- a. Where patching occurs in a smooth painted surface, extend final paint coat over entire unbroken containing the patch, after the patched area has received primer and second coat.
 4. Patch, repair or rehang existing ceilings as necessary to provide an even plane surface of uniform appearance.
- D. Plaster Installation: Comply with manufacturer's instructions and install thickness and coats as indicated.
1. Unless otherwise indicated provide 3-coat Work.
 2. Finish gypsum plaster with smooth-troweled finish. Sand lightly to remove trowel marks and arises.
 3. Cut, patch, point-up and repair plaster to accommodate other construction and to restore cracks, dents and imperfections.

3.4 CLEANING

- A. Thoroughly clean areas and spaces where cutting and patching is performed or used as access. Remove completely paint, mortar, oils, putty and items of similar nature. Thoroughly clean piping, conduit and similar features before painting or other finishing is applied. Restore damaged pipe covering to its original condition.

END OF SECTION 01045

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without action.

1. On the transmittal Record relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including minor variations and limitations. Include Contractor's certification that information complies with Contract Document requirements.
2. Transmittal Form: Use AIA Document G 810.

1.4 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Bar-Chart Schedule: Prepare a fully developed, horizontal bar- chart type Contractor's construction schedule. Submit within 30 days of the date established for "Commencement of the Work".
 1. Provide a separate time bar for each significant construction activity. Provide a continuous vertical line to identify the first working day of each week. Use the same breakdown of units of the Work as indicated in the "Schedule of Values".
 2. Within each time bar indicate estimated completion percentage in 10 percent increments. As Work progresses, place a contrasting mark in each bar to indicate Actual Completion.
 3. Prepare the schedule on a sheet, or series of sheets, of stable transparency, or other reproducible media, of sufficient width to show data for the entire_ construction period.
 4. Secure time commitments for performing critical elements of the Work from parties involved. Coordinate each element on the schedule with other construction activities; include minor elements involved in the sequence of the Work. Show each activity in proper sequence. Indicate graphically sequences necessary for completion of related portions of the Work.
 5. Coordinate the Contractor's construction schedule with the schedule of values, list of subcontracts; submittal schedule, progress reports, payment requests and other schedules.
 6. Indicate completion in advance of the date established for Substantial Completion. Indicate Substantial Completion on the schedule to allow time for the Architect's procedures necessary for certification of Substantial Completion.
- B. Phasing: Provide notations on the schedule to show how the sequence of the Work is affected by requirements for phased completion to permit Work by separate Contractors and partial occupancy by the Owner prior to Substantial Completion.
- C. Work Stages: Indicate important stages of construction for each major portion of the Work, including testing and installation.
- D. Area Separations: Provide a separate time bar to identify each major construction area for each major portion of the Work. Indicate where each element in an area must be sequenced or integrated with other activities.
- E. Cost Correlation: At the head of the schedule, provide a two item cost correlation

line, indicating "precalculated" and "actual" costs. On the line show dollar-volume of Work performed as of the dates used for preparation of payment requests.

- . . F. Distribution: Following response to the initial submittal, print and distribute copies to the Architect, Owner, subcontractors, and other parties required to comply with scheduled dates. Post copies in the Project meeting room and temporary field office.
 - 1. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.
- G. Schedule Updating: Revise the schedule after each meeting or activity, where revisions have been recognized or made. Issue the updated schedule concurrently with report of each meeting.

1.5 SUBMITTAL SCHEDULE

- A. After development and acceptance of the Contractor's construction schedule, prepare a complete schedule of submittals. Submit the schedule within 10 days of the date required for establishment of the Contractor's construction schedule.
 - 1. Coordinate submittal schedule with the list of subcontracts, schedule of values and the list of products as well as the Contractor's construction schedule.
 - 2. Prepare the schedule in chronological order; include submittals required during the first 90 days of construction. Provide the following information:
 - a. Scheduled date for the first submittal.
 - b. Related Section number.
 - c. Submittal category.
 - d. Name of subcontractor.
 - e. Description of the part of the Work covered.
 - f. Scheduled date for resubmittal
 - g. Scheduled date the Architect's final release or approval.
- B. Distribution: Following response to initial submittal, print and distribute copies to the Architect, Owner, subcontractors, and other parties required to comply with submittal dates indicated. Post copies in the Project meeting room and field office.
 - 1. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.
- C. Schedule Updating: Revise the schedule after each meeting or activity, where revisions have been recognized or made. Issue the updated schedule concurrently with report of each meeting.

1.6 CONSTRUCTION REPORTS

- A. Prepare a weekly construction report, recording the following information concerning events at the site; and submit duplicate copies to the Architect at bi-weekly intervals:
- " 1. List of subcontractors at the site.
 - 1. Approximate count of personnel at the site.
 - 2. High and low temperatures, general weather conditions.
 - 3. Accidents and unusual events.
 - 5. Meetings and significant decisions.
 - 6. Stoppages, delays, shortages, losses.
 - 7. Meter readings and similar recordings.
 - 8. Emergency procedures.
 - 9. Orders and requests of governing authorities.
 - 10. Change Orders received, implemented.
 - 11. Services connected, disconnected.
 - 12. Equipment or system tests and start-ups.
 - 13. Partial Completions, occupancies.
 - 14. Substantial Completions authorized .

1.7 SHOP DRAWINGS •

- A. Submit newly prepared information, drawn to accurate scale. Highlight, encircle, or otherwise indicate deviations, from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not considered Shop Drawings.
- B. Shop Drawings include fabrication and installation drawings; - setting diagrams, schedules, patterns, templates and similar drawings. Include the following information:
- 1. Dimensions.
 - 2. Identification of products and materials included.
 - 3. Compliance with specified standards.
 - 4. Notation of coordination requirements.
 - 5. Notation of dimensions established by field measurement.
 - 6. Sheet Size: Except for templates, patterns and similar full-size Drawings, submit Shop Drawings on sheets at least 8-1/2" x 11" but no larger than 36" x 48".
 - 7. Initial Submittal: Submit 5 blue- or black-line prints for the Architect's review; one will be returned.
 - 8. Final Submittal: Submit 3 blue- or black-line prints and 2 additional prints where required for maintenance manuals, plus the number of prints needed by the Architect for distribution. 2 prints will be retained; the remainder returned.

- a. One of the prints returned shall be marked-up and maintained as a "Record Document".
9. Do not use Shop Drawings without an appropriate final stamp indicating action taken in connection with construction.
- C. Coordination drawings are a special type of Shop Drawing that show the relationship and integration of different construction elements that require careful coordination during fabrication or installation to fit in the space provided or function as intended.
1. Preparation of coordination Drawings is specified in section "Project Coordination" and may include components previously shown in detail on Shop Drawings or Product Data.
 2. Submit coordination Drawings for integration of different construction elements. Show sequences and relationships of separate components to avoid conflicts in use of space.

1.8 PRODUCT DATA

- A. Collect Product Data into a single submittal for each element of construction or system. Product Data includes printed information such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams and performance curves. Where Product Data must be specially prepared because standard printed data is not suitable for use, submit as "Shop Drawings."
1. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products, some of which are not required, mark copies to indicate the applicable information. Include the following information:
 - a. Manufacturer's printed recommendations.
 - b. Compliance with recognized trade association standards.
 - c. Compliance with recognized testing agency standards.
 - d. Application of testing agency labels and seals.
 - e. Notation of dimensions verified by field measurement.
 - f. Notation of coordination requirements.
 2. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.
 3. Submittals: Submit 4 copies of each required submittal; submit 4 copies where required for maintenance manuals. The Architect will retain one, and will return the other marked with action taken and corrections or modifications required.
 - a. Unless noncompliance with Contract Document provisions is observed, the

submittal may serve as the final submittal.

4. Distribution: Furnish copies of final submittal to installers, subcontractors, suppliers, manufacturers, fabricators, and others required for performance of construction activities. Show distribution on transmittal forms.
 - a. Do not proceed with installation until an applicable copy of Product Data applicable is in the installer's possession.
 - b. Do not permit use of unmarked copies of Product Data in connection with construction.

1.9 SAMPLES

- A. Submit fullsize, fully fabricated Samples cured and finished as specified and physically identical with the material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials, color range sets, and swatches showing color, texture and pattern.
 1. Mount, display, or package Samples in the manner specified to facilitate review of qualities indicated. Prepare Samples to match the Architect's Sample. Include the following:
 - a. Generic description of the Sample.
 - b. Sample source.
 - c. Product name or name of manufacturer.
 - d. Compliance with recognized standards.
 - e. Availability and delivery time.
 2. Submit Samples for review of kind, color, pattern, and texture, for a final check of these characteristics with other elements, and for a comparison of these characteristics between the final submittal and the actual component as delivered and installed.
 - a. Where variation in color, pattern, texture or other characteristics are inherent in the material or product represented, submit multiple units (not less than 3), that show approximate limits of the variations.
 - b. Refer to other Specification Sections for requirements for Samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation and similar construction characteristics.
 - c. Refer to other Sections for Samples to be returned to the Contractor for incorporation in the Work. Such Samples must be undamaged at time of use. On the transmittal, indicate special requests regarding disposition of Sample submittals.
 3. Preliminary submittals: Where Samples are for selection of color, pattern, texture or similar characteristics from a range of standard choices, submit a full set of choices for the material or product.

- a. Preliminary submittals will be reviewed and returned with the Architect's mark indicating selection and other action.
- 4. Submittals: Except for Samples illustrating assembly details, workmanship, fabrication techniques, connections, operation and similar characteristics, submit 3 sets; one will be returned marked with the action taken.
- 5. Maintain sets of Samples, as returned, at the Project site, for quality comparisons throughout the course of construction.
 - a. Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal.
 - b. Sample sets may be used to obtain final acceptance of the construction associated with each set.
- B. Distribution of Samples: Prepare and distribute additional sets to subcontractors, manufacturers, fabricators, suppliers, installers, and others as required for performance of the Work. Show distribution on transmittal forms.
 - 1. Field Samples specified in individual Sections are special types of Samples. Field Samples are full-size examples erected on site to illustrate finishes, coatings, or finish materials and to establish the standard by which the Work will be judged.
 - a. Comply with submittal requirements to the fullest extent possible. Process transmittal forms to provide a record of activity.

1.10 ARCHITECT'S ACTION

- A. Except for submittals for record, information or similar purposes, where action and return is required or requested, the Architect will review each submittal, mark to indicate action taken, and return promptly.
 - 1. Compliance with specified characteristics is the Contractor's responsibility.
- B. Action Stamp: The Architect will stamp each submittal with a uniform, self-explanatory action stamp. The stamp will be appropriately marked, as follows, to indicate the action taken:
 - 1. Final Unrestricted Release: Where submittals are marked "Reviewed," that part of the Work covered by the submittal may proceed provided it complies with requirements of the Contract Documents; final acceptance will depend upon that compliance.
 - 2. Final-But-Restricted Release: When submittals are marked "Furnish as corrected," that part of the Work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents; final acceptance will depend on that compliance.

3. Returned for Resubmittal: When submittal is marked " Rejected" or "Revise and Resubmit," do not proceed with that part of the Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal in accordance with the notations; resubmit without delay. Repeat if necessary to obtain a different action mark.
 - a. Do not permit submittals marked "Not Approved, Revise and Resubmit" to be used at the Project site, or elsewhere where Work is in progress.
4. Other Action: Where a submittal is primarily for information or record purposes, special processing or other activity, the submittal will be returned, marked "Action Not Required".

PART 2 - PRODUCTS (Not Applicable).

PART 3 - EXECUTION (Not Applicable).

END OF SECTION 01300

SECTION 01040 - PROJECT COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-I Specification Sections, apply to this Section.

1.2 SUMMARY

- A.' This Section specifies administrative and supervisory requirements necessary for Project coordination including, but not necessarily limited to:
 - 1. Coordination.
 - 2. Administrative and supervisory personnel.
 - 3. General installation provisions.
 - 4. Cleaning and protection.
- B. Progress meetings, coordination meetings and pre-installation conferences are included in "Special Conditions".
- C. Requirements for the Contractor's Construction Schedule are included in Section "Submittals".

1.3 COORDINATION

- A. Coordination:. Coordinate construction activities included under various Sections of these Specifications to assure efficient and orderly installation of each part of the Work. Coordinate construction operations included under different Sections of the Specifications that are dependent upon each other for proper installation, connection, and operation.
 - 1. Where installation of one part of the Work is dependent on installation of other components, either before or after its own installation, schedule construction activities in the sequence required to obtain the best results.
 - 2. Where availability of space is limited, coordinate installation of different components to assure maximum accessibility for required maintenance, service and repair.
 - 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Where necessary, prepare memoranda for distribution to each party involved outlining special procedures required for coordination. Include such items as required notices,

reports, and attendance at meetings.

1. Prepare similar memoranda for the Owner and separate Contractors where coordination of their Work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
1. Preparation of schedules.
 2. Installation and removal of temporary facilities.
 3. Delivery and processing of submittals.
 4. Progress meetings.
 5. Project Close-out activities.
- D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.
1. Salvage materials and equipment involved in performance of, but not actually incorporated in, the Work. Refer to other sections for disposition of salvaged materials that are designated as Owner's property.

1.4 SUBMITTALS

- A. Coordination Drawings: Prepare and submit coordination Drawings where close and careful coordination is required for installation of products and materials fabricated off-site by separate entities, and where limited space availability necessitates maximum utilization of space for efficient installation of different components.
1. Show *the* interrelationship of components shown on separate Shop Drawings.
 2. Indicate required installation sequences.
 3. Comply with requirements contained in Section "Submittals."
 4. Refer to Division-15 Section "Basic Mechanical Requirements," and Division-16 Section "Basic Electrical Requirements" for specific coordination Drawing requirements for mechanical and electrical installations.
- B. Staff Names: Within 15 days of Notice to Proceed, submit a list of the Contractor's principal staff assignments, including the Superintendent and other personnel in attendance at the site; identify individuals, their duties and responsibilities; list their addresses and telephone numbers.
1. Post copies of the list in the Project meeting room, the temporary field office, and each temporary telephone.

PART 2 - PRODUCTS (Not Applicable).

PART 3 - EXECUTION

3.1 GENERAL INSTALLATION PROVISIONS

- A. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.
- B. Manufacturer's Instructions: Comply with manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.
- C. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.
- D. Provide attachment and connection devices and methods necessary for securing Work. Secure Work true to line and level. Allow for expansion and building movement.
- E. Visual Effects: Provide uniform joint widths in exposed Work. Arrange joints in exposed Work to obtain the best visual effect. Refer questionable choices to the Architect for final decision.
- F. Recheck measurements and dimensions, before starting each installation.
- G. Install each component during weather conditions and Project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.
- H. Coordinate temporary enclosures with required inspections and tests, to minimize the necessity of uncovering completed construction for that purpose.
- I. Mounting Heights: Where mounting heights are not indicated, install individual components at standard mounting heights recognized within the industry for the particular application indicated. Refer questionable mounting height decisions to the Architect for final decision.

3.2 CLEANING AND PROTECTION

- A. During handling and installation, clean and protect construction in progress and adjoining materials in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- B. Clean and maintain completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

C. Limiting Exposures: Supervise construction activities to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period, Where applicable, such exposures include, but are not limited to, the following:

1. Excessive static or dynamic loading.
2. Excessive internal or external pressures.
3. Excessively high or low temperatures.
4. Thermal shock.
5. Excessively high or low humidity.
6. Air contamination or pollution.
7. Water or ice.
8. Solvents.
9. Chemicals.
10. Light.
11. Radiation.
12. Puncture.
13. Abrasion.
14. Heavy traffic.
15. Soiling, staining and corrosion.
16. Bacteria.
17. Rodent and insect infestation.
18. Combustion.
19. Electrical current.
20. High speed operation,
21. Improper lubrication,
22. Unusual wear or other misuse.
23. Contact between incompatible materials.
24. Destructive testing.
25. Misalignment.
26. Excessive.- weathe;:ring.
27. Unprotected storage.
28. Improper_ shipping or handling.
29. Theft.
30. Vandalism.

END OF SECTION 01040

SECTION 01400 - QUALITY CONTROL SERVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-I Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for quality control services.
- B. Quality control services include inspections and tests and related actions including reports, performed by independent agencies, governing authorities, and the Contractor. They do not include Contract enforcement activities performed by the Architect.
- C. Inspection and testing services are required to verify compliance with requirements specified or indicated. These services do not relieve the Contractor of responsibility for compliance with Contract Document requirements.
- D. Requirements of this Section relate to customized fabrication and installation procedures, not production of standard products.
 - 1. Specific quality control requirements for individual construction activities are specified in the Sections that specify those activities. Those requirements, including inspections and tests, cover production of standard products as well as customized fabrication and installation procedures.
 - 2. Inspections, test and related actions specified are not intended to limit the Contractor's quality control procedures that facilitate compliance with Contract Document requirements.
 - 3. Requirements for the Contractor to provide quality control services required by the Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

1.3 RESPONSIBILITIES

- A. Contractor Responsibilities: The Contractor shall provide inspections, tests and similar quality control services, specified in individual Specification Sections and required by governing authorities, except where they are specifically indicated to be the Owner's responsibility, or are provided by another identified entity; these services

include those specified to be performed by an independent agency and not by the Contractor. Costs for these services shall be included in the Contract Sum.

1. The Contractor shall employ and pay an independent agency, to perform specified quality control services.
 2. The Owner will engage and pay for the services of an independent agency to perform inspections and tests specified as the Owner's responsibility.
 - a. Where the Owner has engaged a testing agency or other entity for testing and inspection of a part of the Work, and the Contractor is also required to engage an entity for the same or related element, the Contractor shall not employ the entity engaged by the Owner, unless otherwise agreed in writing with the Owner.
 3. Retesting: The Contractor is responsible for retesting where results of required inspections, tests or similar services prove unsatisfactory and do not indicate compliance with Contract Document requirements, regardless of whether the original test was the Contractor's responsibility.
 - a. Cost of retesting construction revised or replaced by the Contractor is the Contractor's responsibility, where required tests were performed on original construction.
 4. Associated Services: The Contractor shall cooperate with agencies performing required inspections, tests and similar services and provide reasonable auxiliary services as requested. Notify the agency sufficiently in advance of operations to permit assignment of personnel. Auxiliary services required include but are not limited to:
 - a. Providing access to the Work and furnishing incidental labor and facilities necessary to facilitate inspections and tests.
 - b. Providing adequate quantities of representative samples of materials that require testing or assisting the agency in taking samples.
 - c. Providing facilities for storage and curing of test samples, and delivery of samples to testing laboratories.
 - d. Providing the agency with a preliminary design mix proposed for use for materials mixes that require control by the testing agency.
 - e. Security and protection of samples and test equipment at the Project site.
- B. Owner Responsibilities: The Owner will provide inspections, tests and similar quality control services specified to be performed by independent agencies and not by the Contractor, except where they are specifically indicated as the Contractor's responsibility or are provided by another identified entity. Costs for these services are not included in the Contract Sum.
1. The Owner will employ and pay for the services of an independent agency, testing laboratory or other qualified firm to perform services which are the Owner's responsibility.

- C. Duties of the Testing Agency: The independent testing agency engaged to perform inspections, sampling and testing of materials and construction specified in individual Specification Sections shall cooperate with the Architect and Contractor in performance of its duties, and shall provide qualified personnel to perform required inspections and tests.
1. The agency shall notify the Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 2. The agency is not authorized to release, revoke, alter or enlarge requirements of the Contract Documents, or approve or accept any portion of the Work.
 3. The agency shall not perform any duties of the Contractor.
- D. Coordination: The Contractor and each agency engaged to perform inspections, tests and similar services shall coordinate the sequence of activities to accommodate required services with a minimum of delay. In addition the Contractor and each agency shall coordinate activities to avoid the necessity of removing and replacing construction to accommodate inspections and tests.
1. The Contractor is responsible for scheduling times for inspections, tests, taking samples and similar activities.

14 SUBMITTALS

- A. The independent testing agency shall submit a certified written report of each inspection, test or similar service, to the Architect, in duplicate, unless the Contractor is responsible for the service. If the Contractor is responsible for the service, submit a certified written report of each inspection, test or similar service through the Contractor, in duplicate.
1. Submit additional copies of each written report directly to the governing authority, when the authority so directs.
 2. Report Data: Written reports of each inspection, test or similar service shall include, but not be limited to:
 - a. Date of issue.
 - b. Project title and number.
 - c. Name, address and telephone number of testing agency.
 - d. Dates and locations of samples and tests or inspections.
 - e. Names of individuals making the inspection or test.
 - f. Designation of the Work and test method.
 - g. Identification of product and Specification Section.
 - h. Complete inspection or test data.
 - i. Test results and an interpretation of test results.
 - j. Ambient conditions at the time of sample-taking and testing.
 - k. Comments or professional opinion as to whether inspected or tested Work complies with Contract Document requirements.
 - l. Name and signature of laboratory inspector.

- m. Recommendations on retesting.

1.5 QUALITY ASSURANCE

- A. Qualification for Service Agencies: Engage inspection and testing service agencies, including independent testing laboratories, which are prequalified as complying with "Recommended Requirements for Independent Laboratory Qualification" by the American Council of Independent Laboratories, and which specialize in the types of inspections and tests to be performed.
 - 1. Each independent inspection and testing agency engaged on the Project shall be authorized by authorities having jurisdiction to operate in the State in which the Project is located.

PART 2 - PRODUCTS (Not Applicable).

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

- A. General: Upon completion of inspection, testing, sample-taking and similar services, repair damaged construction and restore substrates and finishes to eliminate deficiencies, including deficiencies in visual qualities of exposed finishes. Comply with Contract Document requirements for "Cutting 3:11d Patching."
- B. Protect construction exposed by or for quality control service activities, and protect repaired construction. -
- C. Repair and protection is the Contractor's responsibility, regardless of the assignment of responsibility for inspection, testing or similar services.

END OF SECTION 01400

SECTION 02070 - SELECTIVE DEMOLITION

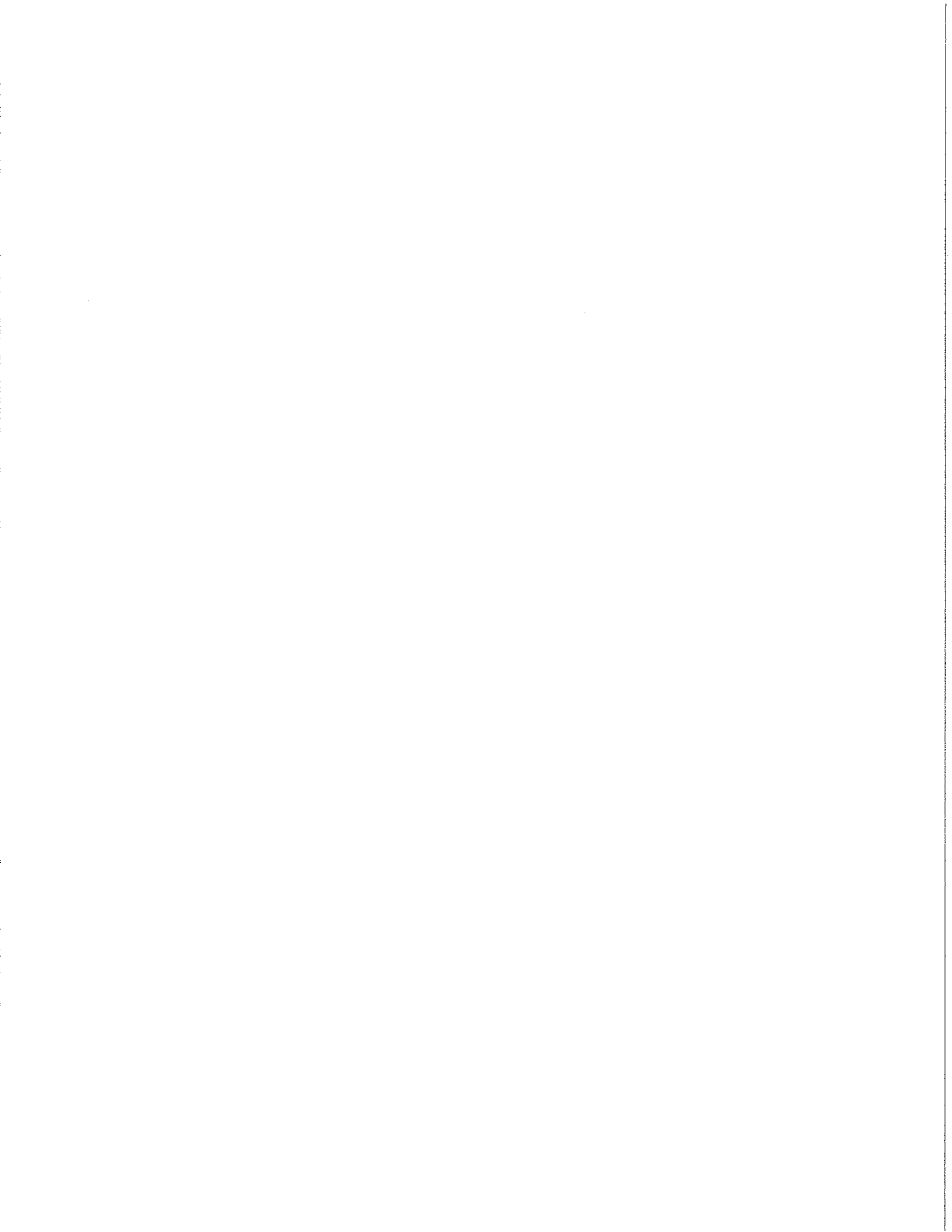
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section requires the selective removal and subsequent offsite disposal of the following:
 - 1. Portions of existing building indicated on drawings and as required to accommodate new construction.
 - 2. Removal of interior partitions as indicated on drawings.
 - 3. Removal of doors and frames indicated "remove."
 - 4. Removal of existing windows indicated to be removed.
 - 5. Protection of existing fixtures, materials, and equipment items indicated "to remain undisturbed."
- B. Removal work specified elsewhere:
 - 1. Roofing and roof insulation removal is specified in Division 7.
 - 2. Cutting nonstructural concrete floors and masonry walls for piping, ducts, and conduits is included with the work of the respective mechanical and electrical specification sections in Divisions 15 and 16.
 - 3. Cutting holes in roof deck for installation of new rooftop mechanical equipment is specified in Division 15.
- C. Related work specified elsewhere:
 - 1. Remodeling construction work and patching are included within the respective sections of specifications, including removal of materials for reuse and incorporation into remodeling or new construction.
 - 2. Relocation of pipes, conduits, ducts, and other mechanical and electrical work is specified in other Divisions.

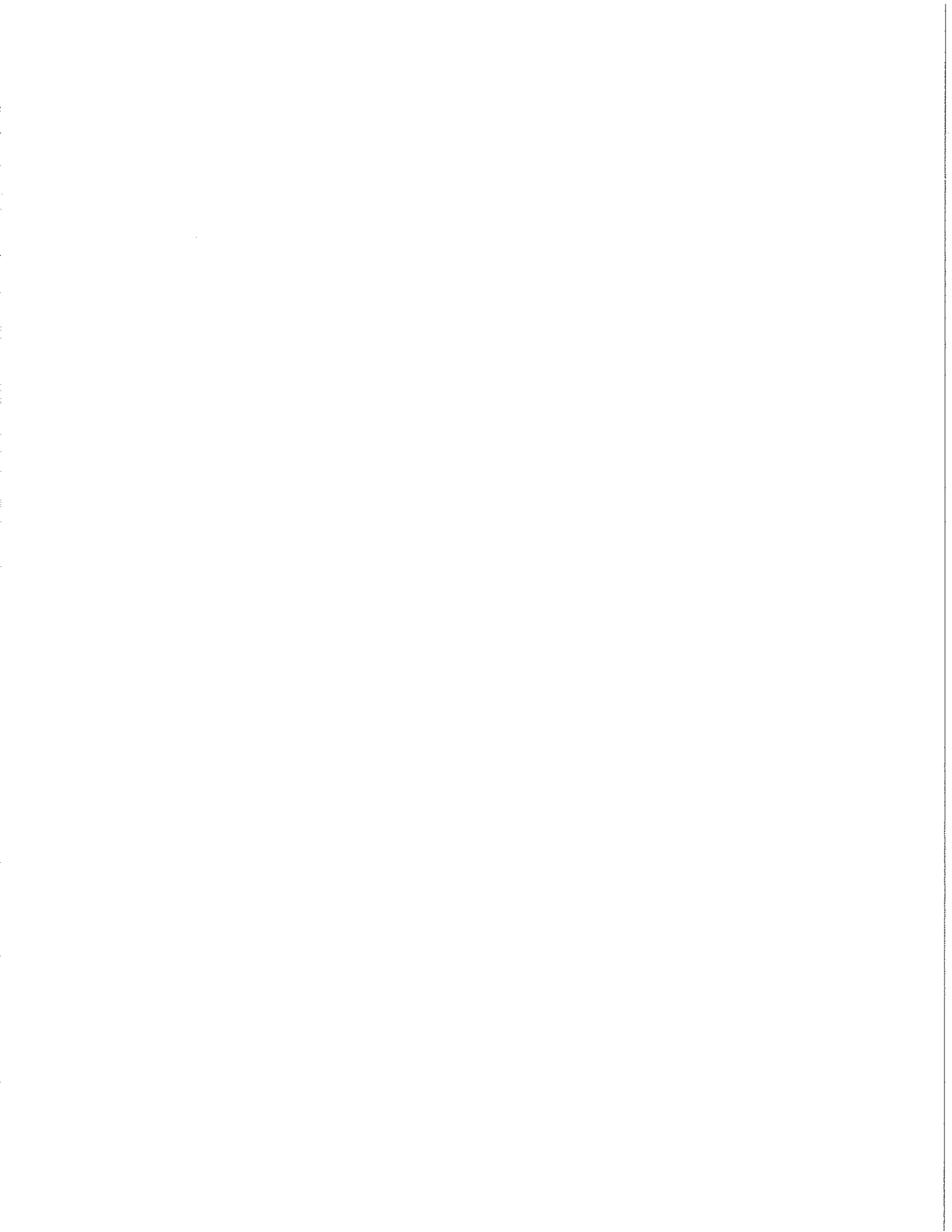


1.3 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Schedule indicating proposed sequence of operations for selective demolition work to Owner's Representative for review prior to start of work. Include coordination for shutoff, capping, and continuation of utility services as required, together with details for dust and noise control protection.
 - 1. Provide detailed sequence of demolition and removal work to ensure uninterrupted progress of Owner's on-site operations.
 - 2. Coordinate with Owner's continuing occupation of portions of existing building and with Owner's partial occupancy of completed new addition.
- C. Photographs of existing conditions of structure surfaces, equipment, and adjacent improvements that might be misconstrued as damage related to removal operations. File with Owner's Representative prior to start of work.

1.4 JOB CONDITIONS

- A. Occupancy: Owner will occupy portions of the building immediately adjacent to areas of selective demolition. Conduct selective demolition work in manner that will minimize need for disruption of Owner's normal operations. Provide minimum of 72 hours advance notice to Owner of demolition activities that will affect Owner's normal operations.
- B. Condition of Structures: · Owner assumes no responsibility for · ctual condition of items or structures to be demolished.
 - 1. Conditions existing at time of inspection for bidding purposes will be maintained by Owner insofar as practicable. However, minor variations within structure may occur by Owner's removal and salvage operations prior to start of selective demolition work.
- C. Partial ..Demolition and Removal: Items indicated to be removed but of salvageable value to Contractor may be removed from structure as work progresses. Transport salvaged items from site as they are removed.
 - 1. Storage or sale of removed items on site will not be permitted.
- D. Protections: Provide temporary barricades and other forms of protection to protect



Owner's personnel and general public from injury due to selective demolition work.

1. Provide protective measures as required to provide free and safe passage of Owner's personnel and general public to occupied portions of building.
2. Erect temporary covered passageways as required by authorities having jurisdiction. ..
3. Provide interior and exterior shoring, bracing, or support to prevent movement, settlement, or collapse of structure or element to be demolished and adjacent facilities or work to remain.
4. Protect from damage existing finish work that is to remain in place and becomes exposed during demolition operations. ..
5. Protect floors with suitable coverings when necessary.
6. Construct temporary insulated dustproof partitions where required to separate areas where noisy or extensive dirt or dust operations are performed. Equip partitions with dustproof doors and security locks.
7. Provide temporary weather protection during interval between demolition and removal of existing construction on exterior surfaces and installation of new construction to ensure that no water leakage or damage occurs to structure or interior areas of existing building.
8. Remove protections at completion of work.

E. Damages: Promptly repair damages caused to adjacent facilities by demolition work.

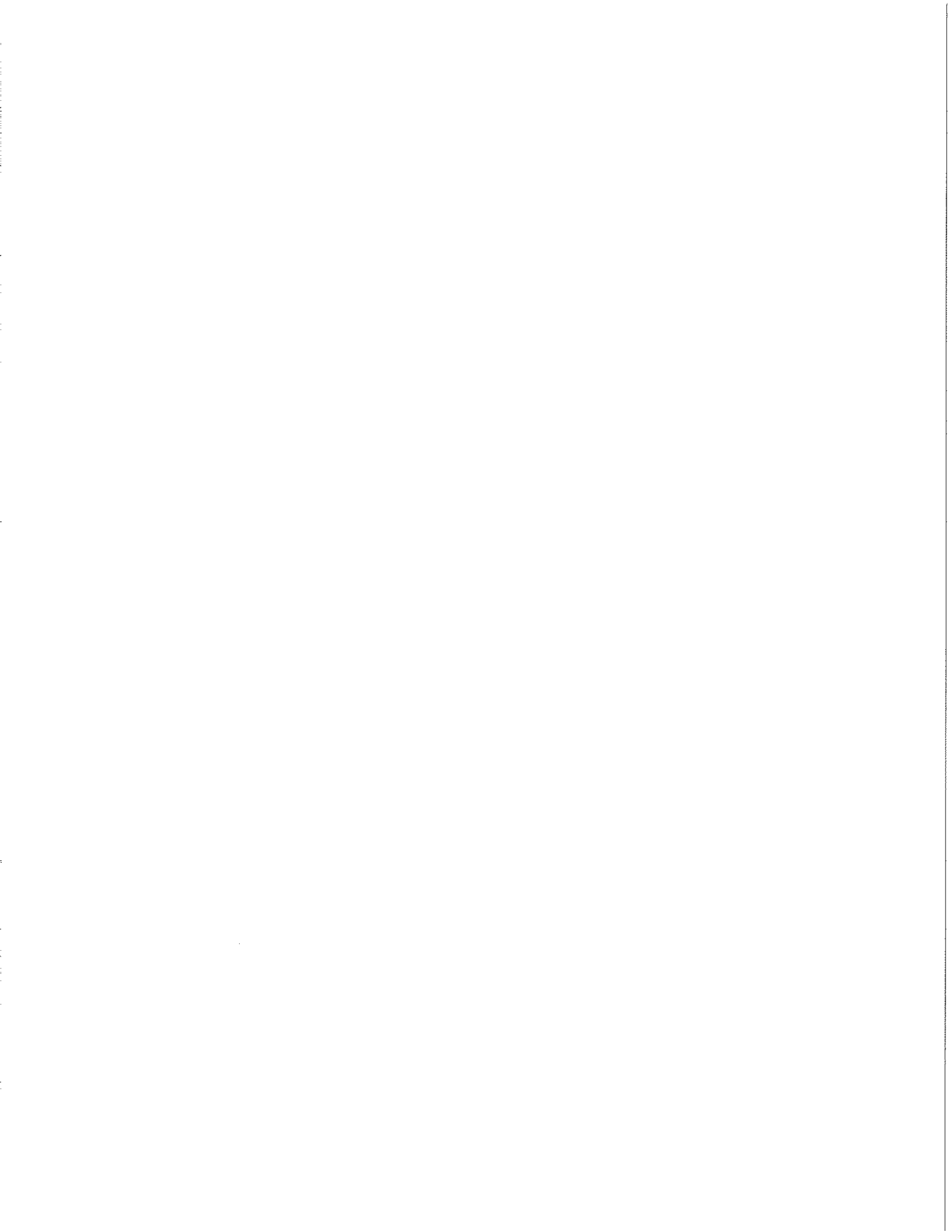
F. Traffic: Conduct selective demolition operations and debris removal to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities.

1. Do not close, block, or otherwise obstruct streets, walks, or other occupied or used facilities without written permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

G. Flame Cutting: Do not use cutting torches for removal until work area is cleared of flammable materials. At concealed spaces, such as interior of ducts and pipe spaces, verify condition of hidden space before starting flame-cutting operations. Maintain portable fire suppression devices during flame-cutting operations.

H. Utility Services: Maintain existing utilities indicated to remain in service and protect them against damage during demolition operations.

1. Do not interrupt utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction.
2. Maintain fire protection services during selective demolition operations.



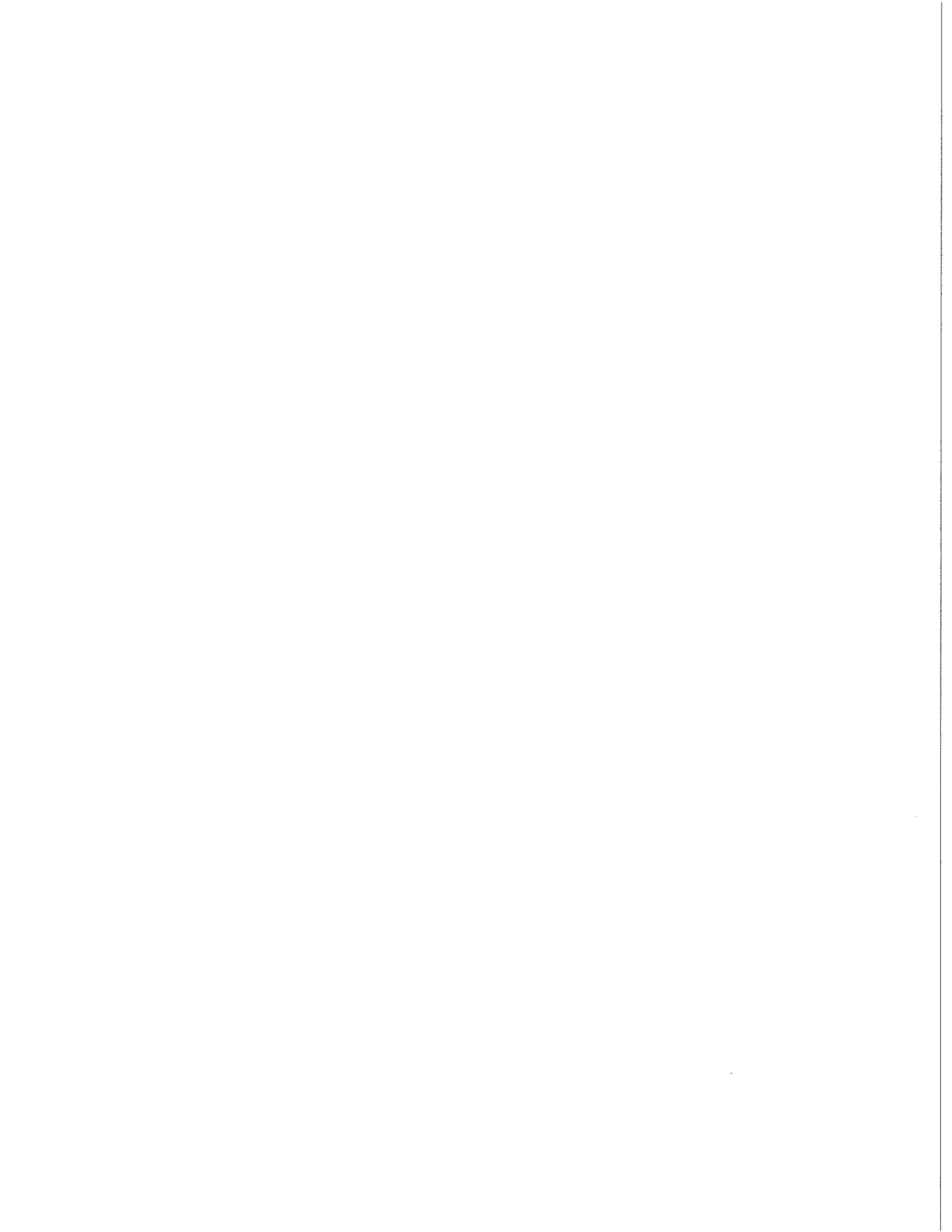
- I. Environmental Controls: Use water sprinkling, temporary enclosures, and other methods to limit dust and dirt migration. Comply with governing regulations pertaining to environmental protection.
 1. Do not use water when it may create hazardous or objectionable conditions such as ice, flooding, and pollution.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 PREPARATION

- A. General: Provide interior and exterior shoring, bracing, or support to prevent movement, settlement, or collapse of areas to be demolished and adjacent facilities to remain.
 1. Cease operations and notify Owner's Representative immediately if safety of structure appears to be endangered. Take precautions to support structure until determination is made for continuing operations.
 2. Cover and protect furniture, equipment, and fixtures from soilage or damage when demolition work is performed in areas where such items have not been removed.
 3. Erect and maintain dust-proof partitions and closures as required to prevent spread of dust or fumes to occupied portions of the building,
 - a. Where selective demolition occurs immediately adjacent to occupied portions of the building, construct dust-proof partitions of minimum 4-inch studs, 5/8-inch drywall (joints taped) on occupied side, 1/2-inch fire-retardant plywood on demolition side. Fill partition cavity with sound-deadening insulation.
 - b. Provide weatherproof closures for exterior openings resulting from demolition work.
 4. Locate, identify, stub off, and disconnect utility services that are not indicated to remain.
 - a. Provide bypass connections as necessary to maintain continuity of service to occupied areas of building. Provide minimum of 72 hours advance notice to Owner if shutdown of service is necessary during changeover.



3:2 DEMOLITION

- A. General: Perform selective demolition work in a systematic manner. Use such methods as required to complete work indicated on Drawings in accordance with demolition schedule and governing regulations.
 - 1. Demolish concrete and masonry in small sections. Cut concrete and masonry at junctures with construction to remain using power-driven masonry saw or hand tools; do not use power-driven impact tools.
 - 2. Locate demolition equipment throughout structure and promptly remove debris to avoid imposing excessive loads on supporting walls, floors, or framing.
 - 3. Provide services for effective air and water pollution controls as required by local authorities having jurisdiction.

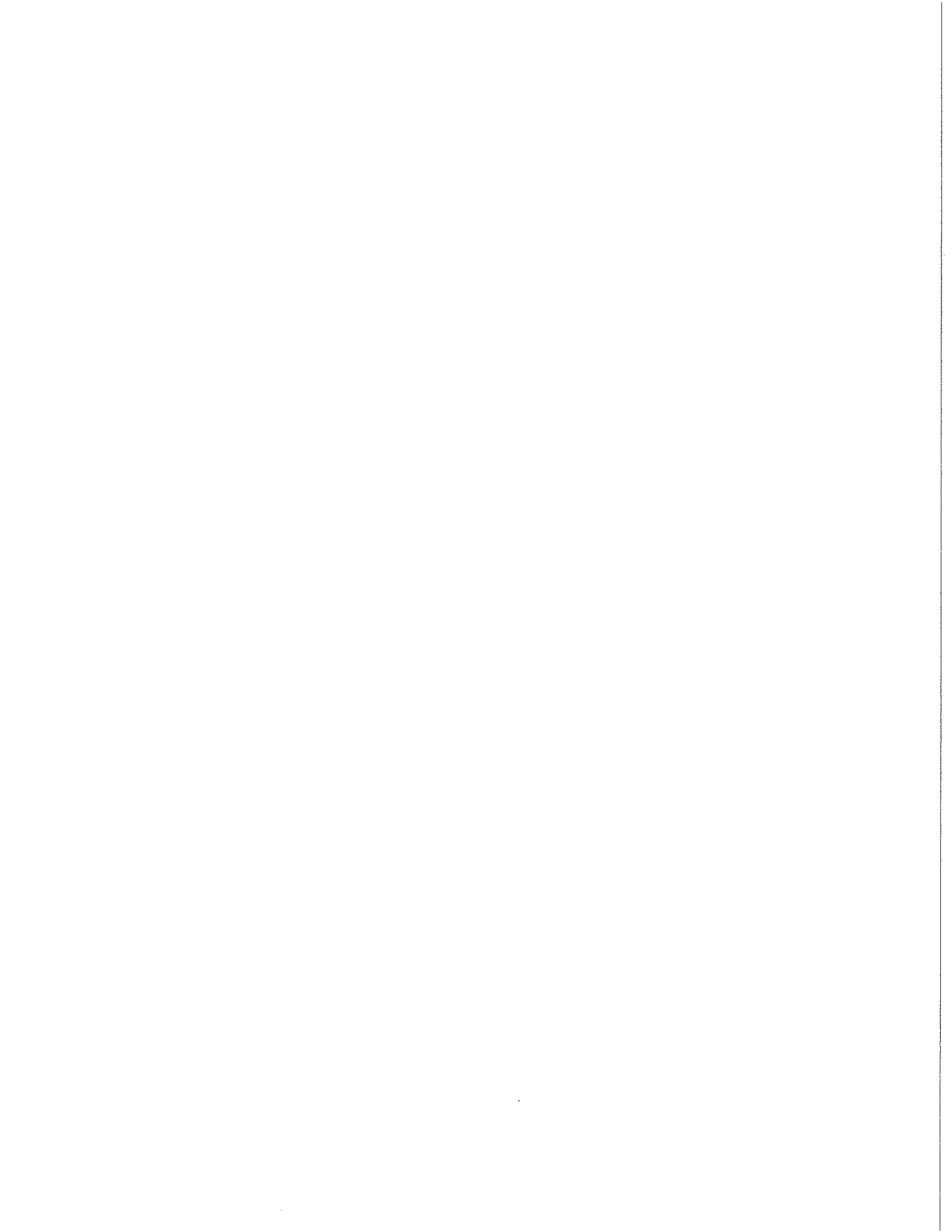
- B. If unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure both nature and extent of the conflict. Submit report to Owner's Representative in written, accurate detail. Pending receipt of directive from Owner's Representative, rearrange selective demolition schedule as necessary to continue overall job progress without undue delay.

3.3 SALVAGED MATERIALS

- A. Salvaged Items: Where indicated on Drawings as "Salvage - Deliver to Owner," carefully remove indicated items, clean, store, and turn over to Owner and obtain receipt.
 - 1. Historic; artifacts, including cornerstones and their contents, commemorative plaques; and tablets, antiques, and other articles of historic significance, remain property of Owner. Notify Owner's Representative if such items are encountered and obtain acceptance regarding method of removal and salvage for Owner.
 - 2. Carefully remove, clean, and deliver to Owner the following items:
 - a. Appliances, (ranges, refrigerators, etc...)
 - b. All plumbing fixtures, (toilets, lavatories etc..)

3.4 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove from building site debris, rubbish, and other materials resulting from



demolition operations. Transport and legally dispose offsite.

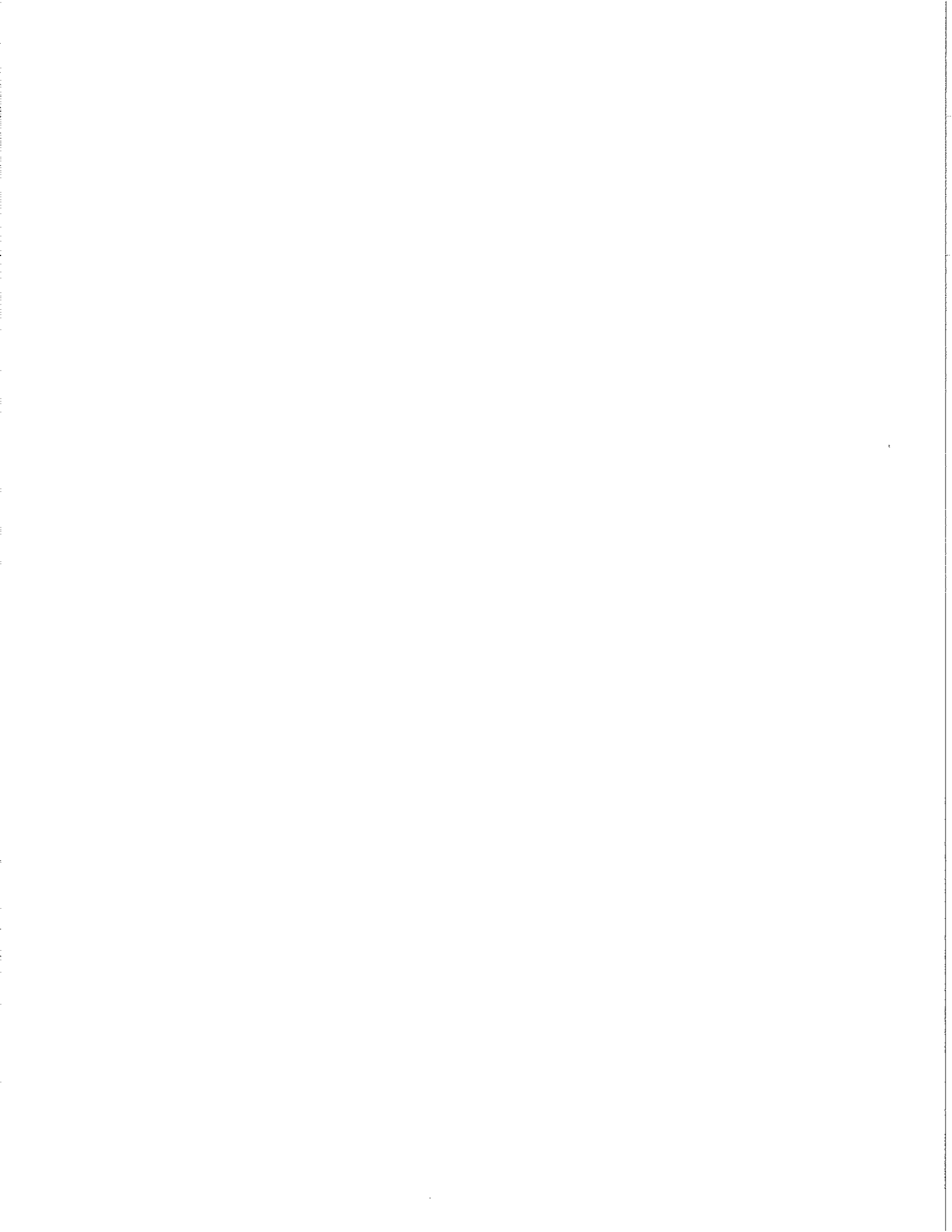
1. If hazardous materials are encountered during demolition operations, comply with applicable regulations, laws, and ordinances concerning removal, handling, and protection against exposure or environmental pollution.
2. Burning of removed materials is not permitted on project site.

3.5 CLEANUP AND REPAIR

A. General: Upon completion of demolition work, remove tools, equipment, and demolished materials from site. Remove protections and leave interior areas broom clean.

1. Repair demolition performed in excess of that required. Return elements of construction and surfaces to remain to condition existing prior to start operations. Repair adjacent construction or surfaces soiled or damaged by selective demolition work.

END OF SECTION 02070



SECTION 01500 - TEMPORARY FACILITIES

PART 1-GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies requirements for temporary services and facilities, including utilities, construction and support facilities, security and protection.
- B. Temporary construction and support facilities required include but are not limited to:
 - 1. Field offices and storage sheds.
 - 2. Temporary roads and paving.
 - 3. Sanitary facilities, including drinking water.
 - 4. Dewatering facilities and drains.
 - 5. Temporary enclosures and temporary elevator use.
 - 6. Temporary Project identification signs and bulletin boards.
 - 7. Waste disposal services.
 - 8. Rodent and pest control.
 - 9. Construction aids and miscellaneous services and facilities.
- C. Security and protection facilities required include but are not limited to:
 - 1. Temporary fire protection.
 - 2. Barricades, warning signs, lights.
 - 3. Sidewalk bridge or enclosure fence for the site.
 - 4. Environmental protection.

1.3 SUBMITTALS

1.4 QUALITY ASSURANCE

- A. Regulations: Comply with industry standards and applicable laws and regulations if authorities having jurisdiction, including but not limited to:
 - 1. Building Code requirements.

2. Health and safety regulations.
 3. Utility company regulations.
 4. Police, Fire Department and Rescue Squad rules.
 5. Environmental protection regulations.
- B. Standards: Comply with NFPA Code 241, "Building Construction and Demolition Operations", ANSI-AIO Series standards for "Safety Requirements for Construction and Demolition", and NECA Electrical Design Library "Temporary Electrical Facilities."
1. Refer to "Guidelines for Bid Conditions for Temporary Job Utilities and Services", prepared jointly by AGC and ASC, for industry recommendations.
 2. Electrical Service: Comply with NEMA, NECA and UL standards and regulations for temporary electric service. Install service in compliance with National Electric Code (NFPA 70).
- C. Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

1.5 PROJECT CONDITIONS

- A. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not overload facilities, or permit them to interfere with progress. Do not allow hazardous dangerous or unsanitary conditions, or public nuisances to develop or persist on the site.

PART 2 -PRODUCTS

2.1 1 MATERIALS

- A. General: Provide new materials; if acceptable to the Architect, undamaged previously used materials in serviceable condition may be used. Provide materials suitable for the use intended.
- B. Lumber and Plywood: Comply with requirements in Division-6 Section "Rough Carpentry."
1. For job-built temporary offices, shops and sheds within the construction area, provide UL labeled, fire treated lumber and plywood for framing, sheathing and siding.
 2. For signs and directory boards, provide exterior type, Grade B-B High Density Concrete Form Overlay Plywood conforming to PS-1, of sizes and thickness indicated.
 3. For fences and vision barriers, provide exterior type, minimum 3/8" thick

- plywood.
4. For safety barriers, sidewalk bridges and similar uses, provide minimum 5/8" thick exterior plywood.
- C. Gypsum Wallboard: Provide gypsum wallboard complying with requirements of ASTM C 36 on interior walls of temporary offices.
- D. Roofing Materials: Provide UL Class "A" standard weight asphalt shingles complying with ASTM D 3018, or UL Class "C" mineral surfaced roll roofing complying with ASTM D 249 on roofs of job- built temporary offices, shops and sheds.
- E. Paint: Comply with requirements of Division-9 Section "Finish Painting."
1. For job-built temporary offices, shops, sheds, fences and other exposed lumber and plywood, provide exterior grade acrylic-latex emulsion over exterior primer.
 2. For sign panels and applying graphics, provide exterior grade alkyd gloss enamel over exterior primer.
 3. For interior walls of temporary offices, provide two coats interior latex flatwall paint.
- F. Tarpaulins: Provide waterproof, fire-resistant, UL labeled tarpaulins with flame-spread rating of 15 or less. For temporary enclosures provide translucent nylon reinforced laminated polyethylene or polyvinylchloride fire retardant tarpaulins.
- G. Water: Provide potable water approved by local health authorities.
- H. Open-Mesh Fencing: Provide 11-gage, galvanized 2-inch, chain link fabric fencing 6-feet high with galvanized barbed wire top strand , and galvanized steel pipe posts, 1-1/2" I.D. for line posts and 2-1/2" I.D. for comer posts.

2.2 EQUIPMENT

- A. General: Provide new equipment; if acceptable to the Architect, undamaged, previously used equipment in serviceable condition may be used. Provide equipment suitable for use intended.
- B. Water Hoses: Provide 3/4" heavy-duty, abrasion-resistant, flexible rubber hoses 100 ft. long, with pressure rating greater than the maximum pressure of the water distribution system; provide adjustable shut-off nozzles at hose discharge.
- C. Electrical Outlets: Provide properly configured NEMA polarized outlets to prevent insertion of 110-120 volt plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button and pilot light, for connection of power tools and equipment.
- D. Electrical Power Cords: Provide grounded extension cords; use "hard-service" cords where exposed to abrasion and traffic. Provide waterproof connectors to connect

separate lengths of electric cords, if single lengths will not reach areas where construction activities are in progress.

- E. Lamps and Light Fixtures: Provide general service incandescent lamps of wattage required for adequate illumination. Provide guard cages or tempered glass enclosures, where exposed to breakage. Provide exterior fixtures where exposed to moisture.
- F. Heating Units: Provide temporary heating units that have been tested and labeled by UL, FM or another recognized trade association related to the type of fuel being consumed.
- G. Temporary Offices: Provide prefabricated or mobile units or similar job-built construction with lockable entrances, operable windows and serviceable finishes. Provide heated and air-conditioned units on foundations adequate for normal loading.

Temporary office space may be located in existing building upon approval by owner. This will be done on a site to site basis.
- H. Temporary Toilet Units: Provide self-contained single-occupant toilet units of the chemical, aerated recirculation, or combustion type, properly vented and fully enclosed with a glass fiber reinforced polyester shell or similar nonabsorbent material.
- I. Toilet facilities may be utilized on site, upon approval by owner. This is done on a site to site basis.
- J. First Aid Supplies: Comply with governing regulations.
- K. Fire Extinguishers: Provide hand-carried, portable UL-rated, class "A" fire extinguishers for temporary offices and similar spaces. In other locations provide hand-carried, portable, UL-rated, class "ABC" dry chemical extinguishers, or a combination of extinguishers of NFPA recommended classes for the exposures.

J;. Comply with NFPA 10 and 241 for classification, extinguishing agent and size required by location and class of fire exposure.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Use qualified personnel for installation of temporary facilities. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.
- B. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed, or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY CONSTRUCTION AND SUPPORT FACILITIES INSTALLATION

- A. Locate field offices, storage sheds, sanitary facilities and other temporary construction and support facilities for easy access.
 - 1. Maintain temporary construction and support facilities until near Substantial Completion. Remove prior to Substantial Completion.
 - 2. Field offices located in existing builds will be cleaned and return to the condition prior to construction. This will be done prior to substantial completion.
- B. Provide incombustible construction for offices, shops and sheds located within the construction area, or within 30 feet of building lines. Comply with requirements of NFPA 241.
- C. Temporary Heat: Provide temporary heat required by construction activities, for curing or drying of completed installations or protection of installed construction from adverse effects of low temperatures or high humidity. Select safe equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce the ambient condition required and minimize consumption of energy.
- D. Heating Facilities: Except where use of the permanent system is authorized, provide vented self-contained LP gas or fuel oil heaters with individual space thermostatic control.
 - 1. Use of gasoline-burning space heaters, open flame, or salamander type heating units is prohibited.
- E. Field Offices:- Provide insulated, weathertight temporary offices of sufficient size to accommodate required office personnel at the Project site. Keep the office clean and orderly for use for small progress meetings: Furnish and equip offices as follows:
 - 1. Furnish with a desk and chairs, a 4-drawer file cabinet, plan table and plan rack and a 6-shelf bookcase.
 - 2. Equip with a water cooler and private toilet complete with water. closet, lavatory and mirror-medicine cabinet unit.
- F. Storage and Fabrication Sheds: Install storage and fabrication sheds, sized, furnished and equipped to accommodate materials and equipment involved, including temporary utility service. Sheds may be open shelters or fully enclosed spaces within the building or elsewhere on the site.
- G. Sanitary facilities include temporary toilets, wash facilities and drinking water fixtures. Comply with regulations and health codes for the type, number, location, operation and maintenance of fixtures and facilities. Install where facilities will best

serve the Project's needs.

1. Provide toilet tissue, paper towels, paper cups and similar disposable materials for each facility. Provide covered waste containers for used material.
- H. Toilets: Use of the Owner's existing toilet facilities will be permitted, so long as facilities are cleaned and maintained in a condition acceptable to the Owner. At Substantial Completion, restore these facilities to the condition prevalent at the time of initial use.
- I. Toilets: Install self-contained toilet units. Shield toilets to ensure privacy. Use of pit-type privies will not be permitted.
- J. Wash Facilities: Install wash facilities supplied with potable water at convenient locations for personnel involved in handling materials that require wash-up for a healthy and sanitary condition. Dispose of drainage properly. Supply cleaning compounds appropriate for each condition.
1. Provide safety showers, eye-wash fountains and similar facilities for convenience, safety and sanitation of personnel.
- K. Drinking Water Facilities: Provide containerized tap-dispenser bottled-water type drinking water units, including paper supply.
1. Where power is accessible, provide electric water coolers to maintain dispensed water temperature at 45 to 55 deg F (7 to 13 deg C).
- L. Dewatering Facilities and Drains: For temporary drainage and dewatering facilities and operations not directly associated with construction activities included under individual Sections, comply with dewatering requirements of applicable Division-2 Sections. Where feasible, utilize the same facilities. Maintain the site, excavations and construction free of water.
- M. Temporary Enclosures: Provide temporary enclosure for protection of construction in progress and completed, from exposure, foul weather, other construction operations and similar activities.
1. Where heat is needed and the permanent building enclosure is not complete, provide temporary enclosures where there is no other provision for containment of heat. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.
 2. Install tarpaulins securely, with incombustible wood framing and other materials. Close openings of 25 square feet or less with plywood or similar materials.
 3. Close openings through floor or roof decks and horizontal surfaces with load-bearing wood-framed construction.
 4. Where temporary wood or plywood enclosure exceeds 100 square feet in area, use UL-labeled fire-retardant treated material for framing and main sheathing.

- N. Temporary Lifts and Hoists: Provide facilities for hoisting materials and employees. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.
- O. Temporary Elevator Use: The existing freight elevator will be used by the contractor during the construction phase.
- P. Project Identification and Temporary Signs: Prepare project identification and other signs of the size indicated; install signs where indicated to inform the public and persons seeking entrance to the Project. Support on posts or framing of preservative treated wood or steel. Do not permit installation of unauthorized signs.
 - 1. Project Identification Signs: Engage an experienced sign painter to apply graphics. Comply with Prince Georges Regulators.
 - 2. Temporary Signs: Prepare signs to provide directional information to construction personnel and visitors.
- Q. Temporary Exterior Lighting: Install exterior yard and sign lights so that signs are visible when Work is being performed.
- R. Collection and Disposal of Waste: Collect waste from construction areas and elsewhere daily. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Do not hold materials more than 7 days during normal weather or 3 days when the temperature is expected to rise above 80 deg F (27 deg C). Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly. Dispose of material in a lawful manner.
- S. Rodent and Pest Control: If rodent and pest are found on the construction site the contractor will employ a service to perform extermination and control procedures at regular intervals so the Project will be relatively free of pests and their residues at Substantial Completion and at no cost to the Owner. Perform control operations in a lawful manner using environmentally safe materials.
- T. Stairs: Existing eq_____stair will remain clear during construction.

3.3 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Except for use of permanent fire protection as soon as available, do not change over from use of temporary security and protection facilities to permanent facilities until Substantial Completion, or longer as requested by the Architect.
- B. Existing Fire protection system will be maintained during construction.
- C. Barricades, Warning Signs and Lights: Comply with standards and code requirements for erection of structurally adequate barricades. Paint with appropriate colors, graphics and warning signs to inform personnel and the public of the hazard being

protected against. Where appropriate and needed provide lighting, including flashing red or amber lights.

- D. Enclosure Fence: When excavation begins, install an enclosure fence with lockable entrance gates. Locate where indicated, or enclose the entire site or the portion determined sufficient to accommodate construction operations. Install in a manner that will prevent people, dogs and other animals from easily entering the site, except by the entrance gates.
 - 1. Provide open-mesh, chain-link fencing with posts set in a compacted mixture of gravel and earth.

- E. Covered Walkway: Erect a structurally adequate protective covered walkway for passage of persons along the adjacent public street. Coordinate with entrance gates, other facilities and obstructions. Comply with regulations of authorities having jurisdiction.
 - 1. Construct using scaffold or shoring framing, waterproofed wood plank overhead decking, protective plywood enclosure walls, handrails, barricades, warning signs, lights, safe and well- drained walkways and similar provisions for protection and safe passage. Extend the backwall beyond the structure to complete the enclosure fence. Paint and maintain in a manner acceptable to the Owner and Architect.

- F. Environmental Protection: Provide protection, operate temporary facilities and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways and subsoil might be contaminated or polluted, or that other undesirable effects might result. Avoid use of tools and equipment which produce harmful noise. Restrict use of noise making tools and equipment to hours that will minimize complaints from persons or firms near the site.

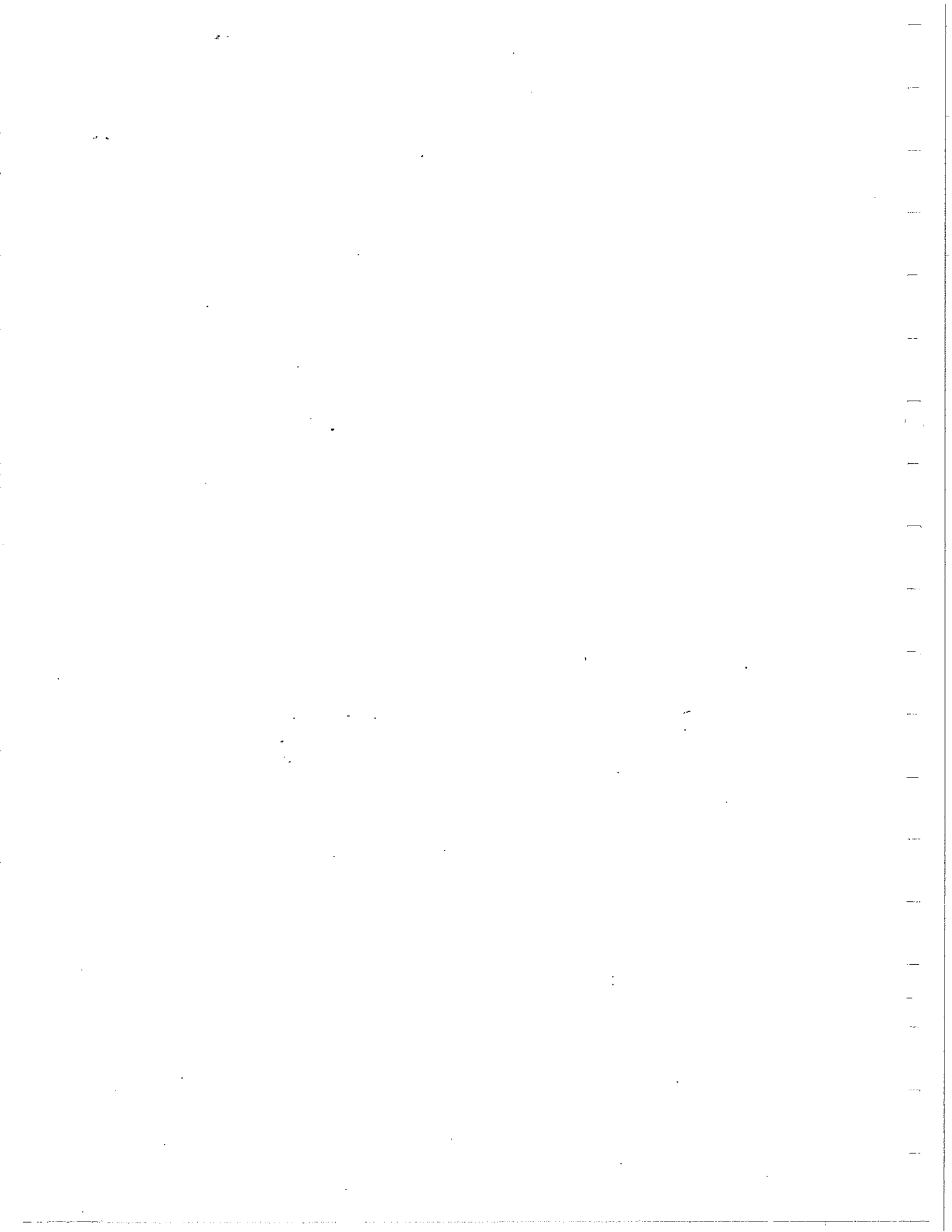
3.4 OPERATION, TERMINATION AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.

- B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage by freezing temperatures and similar elements.
 - 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation and similar facilities on a 24-hour day basis where required to achieve indicated results and to avoid possibility of damage.
 - 2. Protection: Prevent water filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.

- C. Termination and Removal: Unless the Architect requests that it be maintained longer, remove each temporary facility when the need has ended, or when replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged Work, clean exposed surfaces and replace construction that cannot be satisfactorily repaired.
1. Materials and facilities that constitute temporary facilities are property of the Contractor. The Owner reserves the right to take possession of Project identification signs.
 2. Remove temporary paving that is not intended for or acceptable for integration into permanent paving. Where the area is intended for landscape development, remove soil and aggregate fill that does not comply with requirements for fill or subsoil in the area. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances which might impair growth of plant materials or lawns. Repair or replace street paving, curbs and sidewalks at the temporary entrances, as required by the governing authority.
 3. At Substantial Completion, clean and renovate permanent facilities that have been used during the construction period, including but not limited to:
 - a. Replace air filters and clean inside of ductwork and housings.
 - b. Replace significantly worn parts and parts that have been subject to unusual operating conditions.
 - c. Replace lamps that are burned out or noticeably dimmed by substantial hours of use.

END OF SECTION 01500



SECTION 06100 - ROUGH CARPENTRY

PART 1- GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Framing with dimension lumber.
 - 2. Wood grounds, nailers, and blocking.
 - 3. Sheathing.
 - 4. Subflooring.
 - 5. Underlayment.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 6 Section "Miscellaneous Carpentry" for nonstructural carpentry items exposed to view and not specified in another Section.

1.3 DEFINITIONS

- A. Rough carpentry includes carpentry work not specified as part of other Sections and generally not exposed, unless otherwise specified.

1.4 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product data for the following products:
 - 1. Underlayment.
 - 2. Insulating sheathing.
 - 3. Air infiltration barrier.
 - 4. Metal framing anchors.
 - 5. Construction adhesives.

- C. Material certificates for dimensional lumber specified to comply with maximum allowable unit stresses. Indicate species and grade selected for each use as well as design values approved by the Board of Review of American Lumber Standards Committee.
- D. Wood treatment data as follows including chemical treatment manufacturer's instructions for handling, storing, installation, and finishing of treated material:
 - 1. For each type of preservative treated wood product include certification by treating plant stating type of preservative solution and pressure process used, net amount of preservative retained, and compliance with applicable standards.
 - 2. For water-borne treated products include statement that moisture content of treated materials was reduced to levels indicated prior to shipment to project site.
 - 3. For fire-retardant-treated wood products include certification by treating plant that treated material complies with specified standard and other requirements.
 - 4. Material test reports from qualified independent testing laboratory indicating and interpreting test results relative to compliance of fire-retardant-treated wood products with requirements indicated.
 - 5. Warranty of chemical treatment manufacturer for each type of treatment.
- E. Research reports or evaluation reports of the model code organization acceptable to authorities having jurisdiction evidencing compliance of the following wood products with specified requirements and building code in effect for Project.
 - 1. Air infiltration barriers.
 - 2. Metal framing anchors.
 - 3. Power driven fasteners.
 - 4. Fire-retardant-treated wood.

15 QUALITY ASSURANCE

- A. Single-Source Responsibility for Engineered Wood Products: Obtain each type of engineered wood products from one source from a single manufacturer.
- B. Single-Source Responsibility for Fire Retardant Treated Wood: Obtain each type of fire-retardant-treated wood products from one source for both treatment and fire-retardant formulation.
- C. Testing Laboratory Qualifications: To qualify for acceptance, an independent testing laboratory must demonstrate to Architect's satisfaction, based on evaluation of laboratory-submitted criteria conforming to ASTM E 699, that it has the experience and capability to conduct satisfactorily the testing indicated without delaying the progress of the Work.

1.6 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. Inspection Agencies: Inspection agencies and the abbreviations used to reference them with lumber grades and species include the following:
 - 1. RIS - Redwood Inspection Service.
 - 2. NLGA - National Lumber Grades Authority (Canadian).
 - 3. SPIB - Southern Pine Inspection Bureau.
 - 4. WCLIB - West Coast Lumber Inspection Bureau.
 - 5. WWPA - Western Wood Products Association.
- C. 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.
- D. 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.
 - 1. Provide dressed lumber, S4S, unless otherwise indicated.
 - 2. Provide seasoned lumber with 19 percent maximum moisture content at time of dressing and shipment for sizes 2 inches or less in nominal thickness, unless otherwise indicated.
 - 3. Provide lumber with 15 percent maximum moisture content at time of dressing and shipment for sizes 2 inches or less in nominal thickness, unless otherwise indicated.

2.2 DIMENSION LUMBER

- .. A. For light framing (2 to 4 inches thick, 2 to 4 inches wide) provide the following grade and species:
 - 1. "Standard" grade.
 - 2. Any species of specified grade.

- B. For structural light framing (2 to 4 inches thick, 2 to 4 inches wide), provide the following grade and species:
 - 1. "No. 1" grade.
 - 2. Any species of specified grade.

- C. For structural framing (2 to 4 inches thick, 5 inches and wider), provide the following grade and species:
 - 1. "Select Structural" grade.
 - 2. Douglas Fir-Larch graded under WCLIB or WWPA rules.
 - 3. Hem-Fir graded under WWPA rules.
 - 4. Southern Pine graded under SPIB rules.
 - 5. Spruce-Pine-Fir graded under NLGA rules.
 - 6. Any of the above.
 - 7. Any species and grade that complies with the following requirements for species group as defined in Table 8.1a of N.F.P.A National Design Specification, for extreme fiber stress in bending "Fb" for single and repetitive members, and for modulus of elasticity "E":
 - a. Group II species, "Fb" of 1200 psi for single member use and of 1400 psi for repetitive member use, and "E" of 1,600,000 psi.

- D. For exposed framing lumber provide material complying with the following requirements:
 - 1. Definition: Exposed framing refers to dimension lumber that is not concealed by other construction and is indicated to receive a stained or natural finish.
 - 2. Grading: Material hand-selected at factory from lumber of species and grade indicated below that complies with "Appearance" grade requirements of ALSC National Grading Rule; issue inspection certificate of inspection agency for selected material.
 - a. Same species and grade as indicated for structural framing.
 - b. Hem-Fir, "Select Structural" grade per WWPA rules.
 - c. Southern Pine, "Select Structural" grade per SPIB rules.
 - d. Spruce-Pine-Fir, "Select Structural" grade per NLGA rules.
 - e. Any of the above.

2.3 BOARDS

- A. Exposed Boards: Where boards will be exposed in the finished work, provide the following:
1. Moisture Content: 19 percent maximum, "S-DRY" or KD-19.
 - a. Redwood, "Select Heart 1H grade per RIS rules.
 - b. Western Red Cedar, or "C Select/A All Heart" grade per WWPA rules.
 2. Where painted finish is indicated, provide "No. 1 Boards" per SPIB rules, "Select Merchantable Boards" per WCLIB rules, or "No. 2 Common Boards & Better" per WWPA rules.
- B. Concealed Boards: Where boards will be concealed by other work, provide lumber of 19 percent maximum moisture content (S-DRY or KD-19) and of following species and grade:
1. Redwood "Construction Common" per RIS rules, Southern Pine "No. 2 Boards" per SPIB rules, or any species graded "Construction Boards" or "No. 3 Common" per WCLIB or WWPA rules.
 2. Redwood "Merchantable" per RIS rules, Southern Pine "No. 2 Boards" per SPIB rules, or any species graded "Standard" or "No. 3 Common Boards" per WCLIB or WWPA rules.
- C. Board Sizes: Provide sizes indicated or, if not indicated (for sheathing, subflooring and similar uses), provide 1-inch by 8-inch boards.

2.4 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 to match existing.
- C. Moisture content: 19 percent maximum for lumber items not specified to receive wood preservative treatment.
- D. Grade: "Standard" grade light-frame 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.

2.5 CONSTRUCTION PANELS, GENERAL

- A. Construction Panel Standards: Comply with PS 1 "U.S. Product Standard for Construction and Industrial Plywood " for plywood construction panels and, for products not manufactured under PS I provisions, with APA PRP-108.
- B. Trademark: Furnish construction panels that are each factory-marked with APA trademark evidencing compliance with grade requirements.

2.6 CONCEALED PERFORMANCE-RATED CONSTRUCTION PANELS

- A. General: Where construction panels are indicated for the following concealed types of applications, provide APA Performance-Rated Panels complying with requirements designated under each application for grade designation , span rating, exposure durability classification , edge detail (where applicable), and thickness.
- B. Combination Subfloor-Underlayment: APA RATED STURD-I-FLOOR.
 - 1. Exposure Durability Classification: EXTERIOR.
 - 2. Span Rating: As required to suit joist spacing indicated.
 - 3. Edge Detail: Tongue and groove.
- C. Subflooring: APA RATED SHEATHING .
 - 1. Exposure Durability Classification: EXTERIOR.
 - 2. Span Rating: As required to suit joist spacing indicated.
- D. Wall Sheathing: APA RATED SHEATHING.
 - 1. Exposure Durability Classification: EXTERIOR.
 - 2. Span Rating: As required to suit stud spacing indicated.
- E. Roof Sheathing: APA RATED SHEATHING .
 - 1. Exposure Durability Classification: EXTERIOR.
 - 2. Span Rating: As required to suit rafter spacing indicated.

2.7 CONSTRUCTION PANELS FOR BACKING

- A. Plywood Backing Panels: For mounting electrical or telephone equipment, provide fire-retardant-treated plywood panels with grade designation , APA C-D PLUGGED EXPOSURE 1, in thickness indicated , or, if not otherwise indicated, not less than 15/32 inch.

2.8 CONSTRUCTION PANELS FOR UNDERLAYMENT

- A. Plywood Underlayment for Resilient Flooring: For underlayment under 19/32 inch in indicated thickness, provide plywood construction panels with fully sanded face complying with the following requirements:
 - 1. Grade Designation: APA UNDERLAYMENT EXT.
- B. Construction Panel Underlayment for Resilient Flooring: For underlayment 19/32 inch or more in indicated thickness, provide APA RATED STURD-I-FLOOR panels, with fully sanded face and as follows:
 - 1. Exposure Classification: EXTERIOR.
- C. Plywood Underlayment for Carpet: Provide plywood construction panels in thickness indicated and complying with the following requirements:
 - 1. Grade Designation: APA Underlayment EXT.

2.9 FIBROUS-FELTED BOARD

- A. Hardboard Underlayment: ANSI/AH A 135.4, Class 4 (service), surface SIS; with back side sanded to produce boards with uniform thickness of 0.215 inch or 0.200 inch, as standard with manufacturer, plus or minus 0.005 inch, in panel sizes of 3 feet by 4 feet, 4 feet by 4 feet, or 4 feet by 8 feet.
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
 - a. Masonite Brand Underlayment; Masonite Corp.
 - b. 0.2_15 inch Hardboard Underlayment; Georgia-Pacific.
- B. Fiberboard Sheathing: ANSI/AH A 194.1, Type IV cellulosic fiberboard sheathing with square edges, class, and size as indicated below:
 - 1. Class 1 (regular density), size as follows:
 - a. Size: 1/2 inch thick by 4 feet wide by 8 or 9 feet long.

2.10 AIR INFILTRATION BARRIER

- A. Asphalt-saturated organic felt complying with ASTM D 226, Type I (No. 15 asphalt felt), unperforated.

- B. Polyethylene sheet, 0.0061 inch thick, formed by spinning continuous strands of fine high density polyethylene interconnected fibers and bonding them together by heat and pressure; with a moisture vapor transmission rate of 400 grams/sq. meter/24 hrs. per ASTM E 96, procedure B; flame spread and smoke developed ratings of 5 and 10 per ASTM E 84.
- C. Woven polyolefin sheet, 0.005 inch thick, with a moisture vapor transmission rate of 70 grams/sq. meter/24 hours per ASTM E 96, Procedure A and a flame spread not exceeding 25 per ASTM E 84.
- D. Available Products: Subject to compliance with requirements, air infiltration barriers that may be incorporated in the Work include, but are not limited to, the following:
 - 1. "Barricade Building Wrap," Simplex Products Division, Anthony Industries, Inc.
 - 2. "Tyvek Housewrap," Fibers Department, Du Pont Company.

2.11 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: FS FF-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.

2.12 METAL FRAMING ANCHORS

- A. General: Provide metal framing anchors of type, size, metal, and finish indicated that comply with requirements specified including the following:
 - 1. Current Evaluation/Research Reports: Provide products for which model code evaluation/research reports exist that are acceptable to authorities having jurisdiction and that evidence compliance of metal framing anchors for application indicated with the building code in effect for this Project.

2. Allowable Design Loads: Provide products for which manufacturer publishes allowable design loads that are determined from empirical data or by rational engineering analysis and that are demonstrated by comprehensive testing performed by a qualified independent testing laboratory.
- B. Galvanized Steel Sheet: Steel sheet **z**incted by hot-dip process on continuous lines prior to fabrication to comply with ASTM A 525 for Coating Designation G60 and with ASTM A 446, Grade A (structural quality); ASTM A 526 (commercial quality); or ASTM A 527 (lock-forming quality); as standard with manufacturer for type of anchor indicated.
 1. Use galvanized steel framing anchors for rough carpentry exposed to weather, in ground contact, or in area of high relative humidity, and where indicated.
 - C. Painted Steel Sheet: ASTM A 366 (commercial quality) cold rolled steel sheet or ASTM A 570, Grade 33 (structural quality) hot-rolled steel sheet, as standard with manufacturer for type of anchor indicated, coated after fabrication with manufacturers standard, fast-curing, lead-free "universal primer" resistant to normal atmospheric corrosion.
 1. Use painted steel framing anchors for rough carpentry not exposed to weather, in ground contact, or in area of high relative humidity.

2.13 MISCELLANEOUS MATERIALS

- A. Sill Sealer Gaskets: Glass fiber resilient insulation fabricated in strip form for use as a sill sealer; 1 inch nominal thickness compressible to 1/32 inch; selected from manufacturer's standard widths to suit width of sill members indicated; in rolls of 50 feet or 100 feet in length.
- B. 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.
- C. Water Repellent Preservative: NWWDA-tested and -accepted formulation containing 3-iodo-2-propynyl butyl carbonate (IPBC) as its active ingredient.

2.14 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 AWPA Standards C2 (Lumber) and C9 (Plywood). Mark each treated item with the AWPB or SPIB Quality Mark Requirements.
- B. Pressure-treat above-ground items with water-borne preservatives to a minimum retention of 0.25 pcf. For interior uses, after treatment, kiln-dry lumber and plywood to a maximum moisture content, respectively, of 19 percent and 15 percent. Treat indicated items and the following:

1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
 2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
 3. Wood framing members less than 18 inches above grade.
 4. Wood floor plates installed over concrete slabs directly in contact with earth.
- C. Pressure-treat wood members in contact with the ground or fresh water with water-borne preservatives to a minimum retention of 0.40 pcf.
- D. Complete fabrication of treated items prior to treatment, where possible. If cut after treatment, coat cut surfaces to comply with AWPA M4. Inspect each piece of lumber or plywood after drying and discard damaged or defective pieces.

2.15 5 FIRE-RETARDANT TREATMENT BY PRESSURE PROCESS

- A. General: Where fire-retardant-treated wood is indicated, pressure impregnate lumber and plywood with fire-retardant chemicals to comply with AWPA C20 and C27, respectively, for treatment type indicated; identify "fire-retardant- treated wood" with appropriate classification marking of Underwriters Laboratories, Inc., U.S. Testing, Timber Products Inspection, Inc. or other testing and inspecting agency acceptable to authorities having jurisdiction.
1. Current Evaluation/Research Reports: Provide fire-retardant-treated wood for which a current model code evaluation/research report exists that is acceptable to authorities having jurisdiction and that evidences compliance of fire-retardant-treated wood for application indicated.
- B. Interior Type A: For interior locations use fire-retardant chemical formulation that produces treated lumber and plywood with the following properties under conditions present after installation: .
1. No reduction takes place in bending strength, stiffness, and fastener holding capacities below values published by manufacturer of chemical formulation that are based on tests by a qualified independent testing laboratory of treated wood products identical to those indicated for this Project under elevated temperature and humidity conditions simulating installed conditions.
 2. No other form of degradation occurs due to acid hydrolysis or other causes related to manufacture and treatment.
 3. No corrosion of metal fasteners results from their contact with treated wood.
- C. Exterior Type: Use for exterior locations and where indicated.
- D. Inspect each piece of treated lumber or plywood after drying and discard damaged or defective pieces.

- E. Available Products: Subject to compliance with requirements, fire-retardant-treated wood products that may be incorporated in the Work include, but are not limited to, the following:
1. Interior Type A Fire-Retardant-Treated Wood:
 - a. "Dricon," Hickson Corporation.
 - b. "Pyro-Guard," Hoover Treated Wood Products.
 - c. "Flameproof LHC-HIT," Osmose Wood Preserving Co, Inc.
 2. Exterior Type Fire-Retardant-Treated Wood:
 - a. "Exterior Fire-X," Hoover Treated Wood Products.

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 GROUNDS, NAILERS, BLOCKING, AND SLEEPERS

- A. Install wood grounds, nailers, blocking, and sleepers where shown and where required for screeding or attachment of other work. Form to shapes as shown and cut as required for true line and level of work to be attached. Coordinate location with other work involved.

- B. Attach to substrates as required to support applied loading. Countersink: bolts and nuts flush with surfaces, unless otherwise indicated. Build into masonry during installation of masonry work. Where possible, anchor to formwork before concrete placement.
- C. Install permanent grounds of dressed, preservative treated, key-bevelled lumber not less than 1-1/2 inches wide and of thickness required to bring face of ground to exact thickness of finish material involved. Remove temporary grounds when no longer required.

3.3 WOOD FURRING

- A. Install plumb and level with closure strips at edges and openings. Shim with wood as required for tolerance of finished work.
 - 1. Firestop furred spaces on walls at each floor level and at ceiling line of top story, with wood blocking or noncombustible materials, accurately fitted to close furred spaces.
- B. Furring to Receive Plywood Paneling: Install 1-inch by 3-inch furring at 2 feet o.c., horizontally and vertically. Select furring for freedom from knots capable of producing bent-over nails and resulting damage to paneling.
- C. Furring to Receive Gypsum Drywall: Install 1-inch by 2-inch furring at 16 inches o.c., vertically.

3.4 WOOD FRAMING, GENERAL

- A. Framing Standard: Comply with N.F.P.A. "Manual for Wood Frame Construction," 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. Published requirements of manufacturer of metal framing anchors.
 - 3. "Recommended Nailing Schedule" of referenced framing standard and with N.F.P.A. "National Design Specifications for Wood Construction."
 - 4. "Table No. II - Recommended Nailing Schedule" of the Uniform Building Code.
 - 5. "Appendix C - Recommended Nailing Schedule" of the BOCA National Building Code.
 - 6. "Table 1705.1 - Fastening Schedule," of the Standard Building Code.

- D. Do not splice structural members between supports.
- E. Firestop concealed spaces of wood framed walls and partitions at each floor level and at the ceiling line of the top story. Where firestops are not automatically provided by the framing system used, use closely fitted wood blocks of nominal 2-inch-thick lumber of the same width as framing members.

3.5 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.
 - 1. For exterior walls install 2-inch by 4-inch wood studs spaced 16 inches o.c.
 - 2. For interior partitions and walls install 2-inch by 4-inch wood studs spaced 16 inches o.c.
- 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."
- D. Install diagonal bracing in stud framing of exterior walls, except as otherwise indicated. Brace both walls at each external corner, full story height, at a 45 degree angle, using either a let-in 1 by 4 or 2 by 4 blocking or metal diagonal bracing. Omit bracing where following types of sheathing are indicated.
 - 1. Plywood sheathing or corner bracing, 4-foot-wide panels vertically.
 - 2. Gypsum sheathing, 4-foot-wide panels vertically.
 - 3. Fiberboard sheathing, intermediate type, 4-foot-wide panels vertically.
 - 4. Diagonal board sheathing.

3.6 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. Fire-cut members built into masonry.
- C. Frame openings with headers and trimmers supported by metal joist hangers; double headers and trimmers where span of header exceeds 4 feet.
- D. 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.
- E. 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.
- F. 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.
- G. Under jamb studs at openings, install solid blocking between joist.
- H. 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.
- I. Install bridging of type indicated below between joists where nominal depth-to-thickness ratio exceeds 6, at intervals of 8 feet.
 - 1. Diagonal wood bridging formed from bevel cut nominal 1-inch by 4-inch lumber, double-crossed and nailed both ends to joists.
 - 2. Solid wood bridging 2 inches thick by depth of joist, end nailed to joist.
 - 3. Steel bridging installed to comply with bridging manufacturer's directions.

3.7 CEILING JOIST FRAMING

- A. Ceiling Joists: Install ceiling joists with crown up and to comply with requirements specified above for floor joists. Face nail to ends of parallel rafters.
 - 1. Where principal ceiling joists are at right angles to rafters, frame as indicated with additional short joists from wall plate to first joist; nail to ends of rafters and to top plate and nail to long joists or anchor with framing anchors or metal straps. Install 1 by 8 or 2 by 4 stringers spaced 4 feet o.c. crosswise over principal ceiling joists.

3.8 BOARD SHEATHING AND SUBFLOORING

- A. Install boards with end joints staggered over supports, and with each piece extending over at least 2 spaces between supports. Nail with 8d common nails, spaced 2 per support for board widths of 6 inches and less, 3 per support for widths of 8 inches and more.
 - 1. Apply wall sheathing at 45 degree angle with supports.

3.9 INSTALLATION OF CONSTRUCTION PANELS

- A. General: Comply with applicable recommendations contained in Form No. E30, "APA Design/Construction Guide - Residential & Commercial," for types of construction panels and applications indicated.
- B. Fastening Methods: Fasten panels as indicated below:
 - 1. Combination Subflooring-Underlayment: Glue and nail to framing throughout.
 - 2. Subflooring: Glue and nail to framing throughout.
 - 3. Sheathing: Nail to framing.
 - 4. Underlayment: Nail to subflooring.
 - a. Fill and sand edge joints of underlayment receiving resilient flooring.
 - 5. Plywood Backing Panels: Nail to supports.

3.10 HARDBOARD UNDERLAYMENT

- A. Comply with American Hardboard Association publication "Application Instructions for Basic Hardboard Products" and hardboard manufacturer's printed directions for preparation and application of hardboard underlayment.
 - 1. Nail underlayment to subflooring.
 - 2. Staple or nail underlayment to subflooring.

ROUGH CARPENTRY - LR

06100 - 16

.SECTION 06105 - MISCELLANEOUS CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Rough carpentry work not specified elsewhere and generally intended for support of other work.
 - 2. Miscellaneous blocking, grounds, nailers, and panels.

1.3 SUBMITTALS

- A. General: Submit the following according to Conditions of Contract and Division 1 Specification Sections.
- B. Wood treatment data from chemical treatment manufacturer. Include chemical treatment manufacturer's instructions for handling, storing, installing, and finishing treated material.
 - 1. Preservative Treatment: Include certification by treatment plant stating type of solution and pressure process used, net amount of preservative retained, and compliance with applicable standards.
 - 2. Fire-Retardant Treatment: Include certification by treating plant that treated wood complies with specified requirements.
 - 3. Warranty: Include warranty of chemical treatment manufacturer for each type of treatment.

1.4 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 material above ground level on uniformly spaced supports to prevent deformation.

1. For material pressure treated with waterborne chemicals, place spacers between each bundle for air circulation.

PART 2 -PRODUCTS

2.1 LUMBER, GENERAL

- A. 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: Furnish lumber with each piece factory-marked with grade stamp of inspection agency that indicates grading agency, grade, species, moisture content at time of surfacing, and mill.
 1. For exposed lumber, furnish pieces marked on ends or back of each piece.
- C. Sizes: Provide nominal sizes indicated, complying with PS 20 except where actual sizes are specifically noted as being required.
- D. Surfacing: Dressed lumber, S4S, unless otherwise indicated.

2.2 DIMENSION LUMBER FOR CONCEALED CONDITIONS

- A. Species: Any wood species listed by PS 20.
- B. Moisture Content: S-DRY, KD 19 or MC 19 (19 percent maximum moisture content).
- C. Grade: No. 2 or standard grade.

2.3 DIMENSION LUMBER FOR EXPOSED CONDITIONS

- A. Species: Any wood species listed by PS 20.

- B. Moisture Content: S-DRY, KD 19 or MC 19 (19 percent maximum moisture content).
- C. Grade: No. 2 or standard grade.

2.4 BOARDS FOR CONCEALED CONDITIONS

- A. Species: Any wood species listed by PS 20.
- B. Moisture Content: S-DRY, KD 19 or MC 19 (19 percent maximum moisture content).
- C. Grade: No. 3, 3 Common, or Standard Boards.

2.5 BOARDS FOR EXPOSED CONDITIONS

- A. Species: Any wood species listed by PS 20.
- B. Grade: No. 2, 2 Common, Construction Common, or Construction Boards.

2.6 CONSTRUCTION PANELS

- A. Standards: Comply with requirements of PS .1 Voluntary Product Standard "Construction and Industrial Plywood" for veneer plywood and APA PRP-108 "Performance Standards and Policies for Structural-Use Panels" for performance-rated panels.
 - 1. Trademark: Furnish construction panels that are each factory-marked with APA trademark for grade specified.
- B. Miscellaneous Concealed Plywood: C-C Plugged Exterior, thickness as indicated but not less than 1/2 inch nominal.
- C. Miscellaneous Concealed Panels: APA-RATED SHEATHING, Exposure 1, span rating to suit framing in each location.
- D. Miscellaneous Exposed Plywood: A-D Interior, thickness as indicated but not less than 1/2 inch nominal.
- E. Electrical/Telephone Backing Panels: APA-RATED SHEATHING, Exposure 1,

fire-retardant treated, thickness as indicated but not less than 15/32 inch.

2.7 PARTICLEBOARD

- A. Standard: Provide particleboard panels manufactured and each factory-marked to comply with requirements of ANSI A 208.1 "Wood Particleboard" for grade indicated.
- B. Wall Sheathing: Grade 2-M-1.
- C. Subflooring: Grade 2-M-W (waferboard).

2.8 FASTENERS

- A. General: Where miscellaneous 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: FS FF-N-105.
- C. Bolts: ASTM A 307, Grade A; with ASTM A 563 hex nuts and flat washers.

2.9 PRESERVATIVE WOOD TREATMENT BY PRESSURE PROCESS

- A. General: Obtain preservative-treated lumber complying with AWWA Standard C2. Mark each treated item with AWPB or SPIB Quality Mark Requirements. Coat surfaces cut after treatment to comply with AWWA M4.
- B. Above-Ground Wood Treatment: Pressure treat with waterborne preservatives to a minimum retention of 0.25 pcf.
 - 1. Kiln-dry interior dimension lumber after treatment to 19 percent maximum moisture content.
 - 2. Kiln-dry interior construction panels after treatment to 15 percent maximum moisture content.
 - 3. Treat wood items indicated and in the following circumstances:
 - a. In contact with roofing, flashing, or waterproofing.
 - b. In contact with masonry or concrete.
 - c. Within 18 inches of grade.

3:2 WOOD GROUNDS, NAILERS, BLOCKING, AND SLEEPERS

- A. Install where shown and where required for screeding or attachment of other work. Cut and shape to required size. Coordinate location with other work involved.
- B. Attach to substrates as required to support applied loading. Countersink bolts and nuts flush with surfaces, unless otherwise indicated.

3.3 CONSTRUCTION PANELS

- A. Comply with applicable installation recommendations in APA Form E30 "Design/Construction Guide--Residential & Commercial."

END OF SECTION 06105

.SECTION 07901 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes joint sealants for the following locations:
 - 1. Exterior joints in vertical surfaces and nontraffic horizontal surfaces as indicated below:
 - a. Control and expansion joints in cast-in-place concrete.
 - b. Joints between architectural precast concrete units.
 - c. Control and expansion joints in unit masonry.
 - d. Joints of stonework set with mortar including copings and cornices.
 - e. Joints between different materials listed above.
 - f. Perimeter joints between materials listed above and frames of doors and windows.
 - g. Control and expansion joints in ceiling and overhead surfaces.
 - h. Other joints as indicated.
 - 2. Exterior- joints in horizontal traffic surfaces as indicated below:
 - a. Control, expansion, and isolation joints in cast-in-place concrete
 - b. Joints between different materials listed above.
 - c. Other joints as indicated.
 - 3. Interior joints in vertical surfaces and horizontal nontraffic surfaces as indicated below:
 - a. Control and expansion joints on exposed interior surfaces of exterior walls.
 - b. Perimeter joints of exterior openings where indicated.
 - c. Perimeter joints between interior wall surfaces and frames of interior doors, windows, and elevator entrances.
 - d. Perimeter joints of toilet fixtures.
 - e. Other joints as indicated.

4. Interior joints in horizontal traffic surfaces as indicated

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 7 Section "Flashing and Sheet Metal" for sealing joints related to flashing and sheet metal for roofing.
2. Division 8 "Glass and Glazing" for sealants used in glazing.
3. Division 9 Section "Gypsum Drywall" for sealing concealed perimeter joints of gypsum board partitions to reduce sound transmission.

1.3 SYSTEM PERFORMANCE REQUIREMENTS

- A. Provide elastomeric joint sealants that have been produced and installed to establish and to maintain watertight and airtight continuous seals without causing staining or deterioration of joint substrates.
- B. Provide joint sealants for interior applications that have been produced and installed to establish and maintain airtight continuous seals that are water resistant and cause no staining or deterioration of joint substrates.

1.4 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product data from manufacturers for each joint sealant product required.
 1. Certification by joint sealant manufacturer that sealants plus the primers and cleaners required for sealant installation comply with local regulations controlling use of volatile organic compounds.
- C. Samples for initial selection purposes in form of manufacturer's standard bead samples, consisting of strips of actual products showing full range of colors available, for each product exposed to view.
- D. Samples for verification purposes of each type and color of joint sealant required. Install joint sealant samples in 1/2-inch-wide joints formed between two 6-inch-long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- E. Certificates from manufacturers of joint sealants attesting that their products comply with specification requirements and are suitable for the use indicated.

- F. Qualification data complying with requirements specified in "Quality Assurance" article. Include list of completed projects with project names addresses, names of Architects and Owners, plus other information specified.
- G. Compatibility and adhesion test reports from elastomeric sealant manufacturer indicating that materials forming joint substrates and joint sealant backings have been tested for compatibility and adhesion with joint sealants. Include sealant manufacturer's interpretation of test results relative to sealant performance and recommendations for primers and substrate preparation needed to obtain adhesion.
- H. Product test reports for each type of joint sealants indicated, evidencing compliance with requirements specified.
- I. Preconstruction field test reports indicating which products and joint preparation methods demonstrate acceptable adhesion to joint substrates.

1.5 QUALITY ASSURANCE

- A. **Installer Qualifications:** Engage an experienced Installer who has completed joint sealant applications similar in material, design, and extent to that indicated for Project that have resulted in construction with a record of successful in-service performance.
- B. **Testing Laboratory Qualifications:** To qualify for acceptance, an independent testing laboratory must demonstrate to Architect's satisfaction, based on evaluation of laboratory-submitted criteria conforming to ASTM E 699, that it has the experience and capability to conduct satisfactorily the testing indicated without delaying progress of the Work.
- C. **Single Source Responsibility for Joint Sealant Materials:** Obtain joint sealant materials from a single manufacturer for each different product required.
- D. **Preconstruction Compatibility and Adhesion Testing:** Submit to joint sealant manufacturers samples of materials that will contact or affect joint sealants for compatibility and adhesion testing as indicated below:
 - 1. Use test methods standard with manufacturer to determine if priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
 - a. Perform tests under normal environmental conditions that will exist during actual installation.
 - 2. Submit not less than 9 pieces of each type of material, including joint substrates, shims, joint sealant backings, secondary seals, and miscellaneous

- materials.
3. Schedule sufficient time for testing and analysis of results to prevent delay in the progress of the Work.
 4. Investigate materials failing compatibility or adhesion tests and obtain joint sealant manufacturer's written recommendations for corrective measures, including use of specially formulated primers.
 5. Testing will not be required when joint sealant manufacturer is able to submit joint preparation data required above that are acceptable to Architect and are based on previous testing of current sealant products for adhesion to, and compatibility with, joint substrates and other materials matching those submitted.
- E. Product Testing: Provide comprehensive test data for each type of joint sealant based on tests conducted by a qualified independent testing laboratory on current product formulations within a 24-month period preceding date of Contractor's submittal of test results to Architect.
1. Test elastomeric sealants for compliance with requirements specified by reference to ASTM C 920. Include test results for hardness, stain resistance, adhesion and cohesion under cyclic movement (per ASTM C719), low-temperature flexibility, modulus of elasticity at 100 percent strain, effects of heat aging, and effects of accelerated weathering.
 2. Include test results performed on joint sealants after they have cured for 1 year.
- F. Preconstruction Field Testing: Prior to installation of joint sealants, field-test their adhesion to joint substrates as follows:
1. Locate test joints where indicated or, if not indicated, as directed by Architect.
 2. Conduct field tests for each application indicated below:
 - a. Each type of elastomeric sealant and joint substrate indicated.
 - b. Each type of non-elastomeric sealant and joint substrate indicated.
 3. Notify Architect one week in advance of the dates and times when mock-ups will be erected.
 4. Test Method: Test joint sealants by hand pull method described below:
 - a. Install joint sealants in 5-foot joint lengths using same materials and methods for joint preparation and joint sealant installation required for completed Work. Allow sealants to cure fully before testing.
 - b. Make knife cuts horizontally from one side of joint to the other followed by 2 vertical cuts approximately 2 inches long at side of joint and meeting horizontal cut at top of 2-inch cuts. Place a mark 1 inch from top of 2-inch piece.

- c. Use fingers to grasp 2-inch piece of sealant just above 1-inch mark; pull firmly down at a 90-degree angle or more while holding a ruler along side of sealant. Pull sealant out of joint to the distance recommended by sealant manufacturer for testing adhesive capability, but not less than that equaling specified maximum movement capability in extension; hold this position for 10 seconds.
5. Report whether or not sealant in joint connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate.
6. Evaluation of Field Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multicomponent materials.
- B. Store and handle materials in compliance with manufacturer's recommendations to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.7 PROJECT CONDITIONS -

- A. Environmental Conditions: Do not proceed with installation of joint sealants under the following conditions:
 1. When ambient and substrate temperature conditions are outside the limits permitted by joint sealant manufacturer.
 2. When ambient and substrate temperature conditions are outside the limits permitted by joint sealant manufacturer or below 40 deg F (4.4 deg C).
 3. When joint substrates are wet.
- B. Joint Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than allowed by joint sealant manufacturer for application indicated.
- C. Joint Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with their adhesion are removed from joint substrates.

1.8 SEQUENCING AND SCHEDULING

- A. Sequence installation of joint sealants to occur not less than 21 nor more than 30 days after completion of waterproofing, unless otherwise indicated.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, joint fillers, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
- B. Colors: Provide color of exposed joint sealants to comply with the following:
 - !. Match colors indicated by reference to manufacturer's standard designations.

2.2 ELASTOMERIC JOINT SEALANTS

- A. Elastomeric Sealant Standard: Provide manufacturer's standard chemically curing elastomeric sealants that comply with ASTM C 920 and other requirements indicated on each Elastomeric Joint Sealant Data Sheet at end of this Section, including those requirements referencing ASTM C 920 classifications for Type, Grade, Class, and Uses.
 - !. Additional Movement Capability: Where additional movement capability is specified in Elastomeric Joint Sealant Data Sheet, provide products with the capability, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719, to withstand the specified percentage change in the joint width existing at time of installation and remain in compliance with other requirements of ASTM C 920 for Uses indicated.
- B. Available Products: Subject to compliance with requirements, elastomeric sealants that may be incorporated in the Work include, but are not limited to, the products specified in each Elastomeric Sealant Data Sheet.

2.3 SOLVENT-RELEASE-CURING JOINT SEALANTS

- A. Acrylic Sealant: Manufacturer's standard one-part, nonsag, solvent-release-curing acrylic terpolymer sealant complying with AAMA 808.3 or FS TT-S-00230 or

both, with capability when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719, to withstand the following percentage change in joint width existing at time of application and remain adhered to joint substrates indicated for Project without failing cohesively:

1. 7-1/2 percent movement in both extension and compression for a total of 15 percent.
 2. 12-1/2 percent movement in both extension and compression for a total of 25 percent.
- B. Available Products: Subject to compliance with requirements, solvent-release-curing joint sealants that may be incorporated in the Work include, but are not limited to, the following:
- C. Products: Subject to compliance with requirements, provide one of the following:
1. Acrylic Sealant:
 - a. "60+Unicrylic," Pecora Corp.
 - b. "PTI 738," Protective Treatments, Inc.
 - c. "PTI 767," Protective Treatments, Inc.
 - d. "Mono," Tremco, Inc.

2.4 LATEX JOINT SEALANTS

- A. General: Provide manufacturer's standard one-part, nonsag, mildew-resistant, paintable latex sealant of formulation indicated that is recommended for exposed applications on interior and protected exterior locations and that accommodates indicated percentage change in joint width existing at time of installation without failing either adhesively or cohesively.
- B. Acrylic-Emulsion Sealant: Provide product complying with ASTM C 834 that accommodates joint movement of not more than 5 percent in both extension and compression for a total of 10 percent.
- C. Silicone Emulsion Sealant: Provide product complying with ASTM C 834 and, except for weight loss measured per ASTM C 792, with ASTM C 920 that accommodates joint movement of not more than 25 percent in both extension and compression for a total of 50 percent.
- D. Available Products: Subject to compliance with requirements, latex joint sealants that may be incorporated in the Work include, but are not limited to, the following:

1. Acrylic-Emulsion Sealant:
 - a. "AC-20," Pecora Corp.
 - b. "Sonolac," Sonneborn Building Products Div., ChemRex, Inc.
 - c. "Tremco Acrylic Latex 834," Tremco, Inc.
2. Silicone-Emulsion Sealant:
 - a. "Trade Mate Paintable Glazing Sealant," Dow Corning Corp.

2.5 TAPE SEALANTS

- A. Tape Sealant: Manufacturer's standard, solvent-free, butyl-based tape sealant with a solids content of 100 percent formulated to be nonstaining, paintable, and nonmigrating in contact with nonporous surfaces with or without reinforcement thread to prevent stretch and packaged on rolls with a release paper on one side.
- B. Available Products: Subject to compliance with requirements, tape sealants that may be incorporated in the Work include, but are not limited to, the following:
 1. "Extru-Seal Tape," Pecora Corp.
 2. "Shim-Seal Tape," Pecora Corp.
 3. "PTI 606," Protective Treatments, Inc.
 4. "Tremco 440 Tape," Tremco, Inc.
 5. "MBT-35," Tremco, Inc.

2.6 JOINT SEALANT BACKING

- A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Plastic Foam Joint Fillers: Preformed, compressible, resilient, nonstaining, nonwaxing, nonextruding strips of flexible plastic foam of material indicated below and of size, shape, and density to control sealant depth and otherwise contribute to producing optimum sealant performance:
 1. Open-cell polyurethane foam.
 2. Closed-cell polyethylene foam, nonabsorbent to liquid water and gas, nonoutgassing in unruptured state.
 3. Proprietary, reticulated, closed-cell polymeric foam, nonoutgassing, with a

density of 2.5 pcf and tensile strength of 35 psi per ASTM D 1623, and with water absorption less than 0.02 gms/cc per ASTM C 1083.

4. Any material indicated above.
- C. Elastomeric Tubing Joint Fillers: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, capable of remaining resilient at temperatures down to -26 deg F (-32 deg C). Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and otherwise contribute to optimum sealant performance.
- D. Bond-Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.7 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming in any way joint substrates and adjacent nonporous surfaces, and formulated to promote optimum adhesion of sealants with Joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART.3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint sealant performance. Do not proceed with installation of joint sealants until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with recommendations of joint sealant manufacturer and the following requirements:
 - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 - 2. Clean concrete, masonry, unglazed surfaces of ceramic tile, and similar porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.
 - 3. Remove laitance and form release agents from concrete.
 - 4. Clean metal, glass, porcelain enamel, glazed surfaces of ceramic tile, and other nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.

- B. Joint Priming: Prime joint substrates where indicated or where recommended by joint sealant manufacturer based on preconstruction joint sealant-substrate tests or prior experience. Apply primer to comply with joint sealant manufacturer's recommendations. Confine primers to areas of joint sealant bond; do not allow spillage or migration onto adjoining surfaces.

- C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint sealant manufacturer's printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.

- B. Sealant Installation Standard: Comply with recommendations of ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

- C. Acoustical Sealant Application Standard: Comply with recommendations of ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.

- D. Installation of Sealant Backings: Install sealant backings to comply with the following requirements:
1. Install joint fillers of type indicated to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - a. Do not leave gaps between ends of joint fillers.
 - b. Do not stretch, twist, puncture, or tear joint fillers.
 - c. Remove absorbent joint fillers that have become wet prior to sealant application and replace with dry material.
 2. Install bond breaker tape between sealants where backer rods are not used between sealants and joint fillers or back of joints.
- E. Installation of Sealants: Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability. Install sealants at the same time sealant backings are installed.
- F. Tooling of Nonsag Sealants: Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets, and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.
1. Provide concave joint configuration per Figure SA in ASTM C 1193, unless otherwise indicated.
 2. Provide flush joint configuration, per Figure SB in .ASTM C 1193, where indicated.
 - a. Use masking tape to protect adjacent surfaces of recessed tooled joints.
 3. Provide recessed joint configuration, per Figure SC in ASTM C 1193, of recess depth and at locations indicated.

3.4 CLEANING

- A. Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

- · A. Protect joint sealants during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so that and installations with repaired areas are indistinguishable from original work.

END OF SECTION 07901

SECTION 08710 - DOOR HARDWARE

PART 1- GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes items known commercially as finish or door hardware that are required for swing, sliding, and folding doors, except special types of unique hardware specified in the same sections as the doors and door frames on which they are installed.
- B. This Section includes the following:
 - 1. Hinges.
 - 2. Key control system.
 - 3. Lock cylinders and keys.
 - 4. Lock and latch sets.
 - 5. Bolts.
 - 6. Exit devices.
 - 7. Push/pull units."
 - 8. Closers.
 - 9. Miscellaneous door control devices.
 - 10. Door trim units.
 - 11. Protection plates.
 - 12. Sliding door equipment.
 - 13. Bifold door hardware.
 - 14. Weatherstripping for exterior doors.
 - 15. Astragals or meeting seals on pairs of doors.
 - 16. Thresholds.
- C. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 6 Section "Interior Architectural Woodwork" for cabinet hardware.

2. Division 8 Section "Standard Steel Doors and Frames" for silencers integral with hollow metal frames.
3. Division 8 Section "Flush Wood Doors" for factory prefabricating and factory pre-machining of doors for door hardware.
4. Division 8 Section "Aluminum Entrances and Storefronts" for aluminum entrance door hardware, except cylinders.

D. Products furnished but not installed under this Section include:

1. Cylinders for locks on entrance doors.
2. Final replacement cores and keys to be installed by Owner.

1.3 HARDWARE ALLOWANCE

A. Selection and Ordering: Furnish door hardware as selected by Architect and in such quantities as provided for under Division 1 Section "Allowances" and other general provisions of the Contract.

B. Door hardware supplier's responsibilities shall be as follows:

1. Submittals: Submit through Contractor required product data, final hardware schedule, separate keying schedule, and samples as specified in this Section, unless otherwise indicated.
2. Construction Schedule: Inform Contractor promptly of estimated times and dates that will be required to process submittals, to furnish templates, to deliver hardware, and to perform other work associated with furnishing door hardware for purposes of including this data in construction schedule. Comply with this schedule. . --
3. Coordination and Templates: Assist Contractor as required to coordinate hardware- with other work in respect to both fabrication and installation. Furnish Contractor with templates and deliver hardware to proper locations.
4. Product Handling: Package, identify, deliver, and inventory door hardware specified in this Section.
5. Discrepancies: Based on requirements indicated in Contract Documents in effect at time of door hardware selection, furnish types, finishes, and quantities of door hardware, including fasteners, and Owner's maintenance tools required to comply with specified requirements and as needed to install and maintain hardware. Furnish or replace any items of door hardware resulting from shortages and incorrect items at no cost to the Owner or Contractor. Obtain signed receipts from Contractor for all delivered materials.

C. Contractor's responsibilities shall be as follows:

1. Submittals: Coordinate and process submittals for door hardware in same manner as submittals for other work.
2. Construction Schedule: Cooperate with door hardware supplier in establishing scheduled dates for submittals and delivery of templates and door hardware. Incorporate in construction schedule the times and dates related to furnishing hardware by door hardware supplier.
3. Coordination: Coordinate door hardware with other Work. Furnish hardware supplier or manufacturer with shop drawings of other work where required or requested. Verify completeness and suitability of hardware with supplier.
4. Product Handling: Provide secure lock-up for hardware delivered to the site. Inventory hardware jointly with representative of hardware supplier and issue signed receipts for all delivered materials.
5. Installation Information: The general types and approximate quantities of hardware required for this Project are indicated at the end of this Section in order to establish Contractor's costs for installation and other work not included in allowance.
6. No adjustments in Contract sum will be made for costs other than those covered by the allowances for subsequent increases or decreases in quantity of one or more hardware types that do not exceed 5 percent.

1.4 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification sections.
- B. Product data including manufacturers' technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
- C. Final hardware schedule coordinated with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
 1. Final Hardware Schedule Content: Based on hardware indicated, organize schedule into "hardware sets" indicating complete designations of every item required for each door or opening. Include the following information:
 - a. Type, style, function, size, and finish of each hardware item.
 - b. Name and manufacturer of each item.
 - c. Fastenings and other pertinent information.
 - d. Location of each hardware set cross referenced to indications on Drawings both on floor plans and in door and frame schedule.

- e. Explanation of all abbreviations, symbols, and codes contained in schedule.
 - f. Mounting locations for hardware.
 - g. Door and frame sizes and materials.
 - h. Keying information.
2. Submittal Sequence: Submit final schedule at earliest possible date particularly where acceptance of hardware schedule must precede fabrication of other work that is critical in the Project construction schedule. Include with schedule the product data, samples, shop drawings of other work affected by door hardware, and other information essential to the coordinated review of schedule.
 3. Submittal Sequence: Submit initial draft of final schedule along with essential product data in order to facilitate the fabrication of other work that is critical in the Project construction schedule. Submit final schedule after samples, product data, coordination with shop drawings of other work, delivery schedules, and similar information has been completed and accepted.
 4. Keying Schedule: Submit separate detailed schedule indicating clearly how the Owner's final instructions on keying of locks has been fulfilled.
- D. Samples of each type of exposed hardware unit in finish indicated and tagged with full description for coordination with schedule. Submit samples prior to submission of final hardware schedule.
1. Samples will be returned to the supplier. Units that are acceptable and remain undamaged through submittal, review, and field comparison process may, after final check of operation, be incorporated in the Work, within limitations of keying coordination requirements.
- E. Templates for doors, frames, and other work specified to be factory prepared for the installation of door hardware. Check shop drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

1.5 QUALITY ASSURANCE

- A. Single Source Responsibility: Obtain each type of hardware (latch and lock sets, hinges, closers, etc.) from a single manufacturer.
- B. Supplier Qualifications: A recognized architectural door hardware supplier, with warehousing facilities in the Project's vicinity, that has a record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this Project and that employs an experienced architectural

hardware consultant (AHC) who is available to Owner, Architect, and Contractor, at reasonable times during the course of the Work, for consultation.

1. Require supplier to meet with Owner to finalize keying requirements and to obtain final instructions in writing.

- C. Fire-Rated Openings: Provide door hardware for fire-rated openings that complies with NFPA Standard No. 80 and requirements of authorities having jurisdiction. Provide only items of door hardware that are listed and are identical to products tested by UL, Warnock Hersey, FM, or other testing and inspecting organization acceptable to authorities having jurisdiction for use on types and sizes of doors indicated in compliance with requirements of fire-rated door and door frame labels.

1.6 PRODUCT HANDLING

- A. Tag each item or package separately with identification related to final hardware schedule, and include basic installation instructions with each item or package.

- B. Packaging of door hardware is responsibility of supplier. As material is received by hardware supplier from various manufacturers, sort and repackage in containers clearly marked with appropriate hardware set number to match set numbers of approved hardware schedule. Two or more identical sets may be packed in same container.

- C. Inventory door hardware jointly with representatives of hardware supplier and hardware installer until each is satisfied that count is correct.

- D. Deliver individually packaged door hardware items promptly to place of installation (shop or Project site).

- E. Provide secure lock-up for door hardware delivered to the Project, but not yet installed. Control handling and installation of hardware items that are not immediately replaceable so that completion of the Work will not be delayed by hardware losses both before and after installation.

1.7 MAINTENANCE

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

c.

2.2 SCHEDULED HARDWARE

A. Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of finish hardware are indicated in the "Hardware Schedule" at the end of this Section. Products are identified by using hardware designation numbers of the following:

1. Manufacturer's Product Designations: The product designation and name of one manufacturer are listed for each hardware type required for the purpose of establishing minimum requirements. Provide either the product designated or, where more than one manufacturer is specified under the Article "Manufacturers" in Part 2 for each hardware type, the comparable product or one of the other manufacturers that complies with requirements.
2. ANSI/BHMA designations used elsewhere in this Section or in schedules to describe hardware items or to define quality or function are derived from the following standards. Provide products complying with these standards and requirements specified elsewhere in this Section.
 - a. Butts and Hinges: ANSI/BHMA A156.1.
 - b. Bored and Preassembled Locks and Latches: ANSI/BHMA A156.2.
 - c. Exit Devices: ANSI/BHMA A156.3.
 - d. Door Controls - Closers: ANSI/BHMA A156.4.
 - e. Auxiliary Locks and Associated Products: ANSI/BHMA A156.5.
 - f. Architectural Door Trim: ANSI/BHMA A156.6.
 - g. Template Hinge Dimensions: ANSI/BHMA A156.7. -
 - h. Door Controls - Overhead Holders: ANSI/BHMA A156.8.
 - i. Interconnected Locks and Latches: ANSI/BHMA A156.12.
 - j. Mortise Locks and Latches: ANSI/BHMA A156.13.
 - k. Sliding and Folding Door Hardware: ANSI/BHMA A156.14.
 - l. Closer Holder Release Devices: ANSI/BHMA A156.15.
 - m. Auxiliary Hardware: ANSI/BHMA A156.16.
 - n. Self-Closing Hinges and Pivots: ANSI/BHMA A156.17.
 - o. Materials and Finishes: ANSI/BHMA A156.18.

2.3 MATERIALS AND FABRICATION

A. Manufacturer's Name Plate: Do not use manufacturers' products that have manufacturer's name or trade name displayed in a visible location (omit removable

nameplates) except in conjunction with required fire-rated labels and as otherwise acceptable to Architect.

1. Manufacturer's identification will be permitted on rim of lock cylinders only.

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- B. Base Metals: Produce hardware units of basic metal and forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness, but in no case of lesser (commercially recognized) quality than specified for applicable hardware units by applicable ANSI/BHMA A156 series standards for each type of hardware item and with ANSI/BHMA A156.18 for finish designations indicated. Do not furnish "optional" materials or forming methods for those indicated, except as otherwise specified.
 - C. Base Metals: Produce hardware units of basic metal and forming method indicated using manufacturer's standard metal alloy, composition, temper, and hardness, but in no case of lesser (commercially recognized) quality than specified for applicable hardware units for finish designations indicated.
 - D. Fasteners: Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation. Do not provide hardware that has been prepared for self-tapping sheet metal screws, except as specifically indicated.
 - E. Furnish screws for installation with each hardware item. Provide Phillips flat-head screws except as otherwise indicated. Finish exposed (exposed under any condition) screws to match hardware finish or, if exposed in surfaces of other work, to match finish of this other work as closely as possible including "prepared for paint" surfaces to receive painted finish.
 - F. Provide concealed fasteners for hardware units that are exposed when door is closed except to the extent no standard units of type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on opposite face is exposed in other work unless their use is the only means of reinforcing the work adequately to fasten the hardware securely. Where thru-bolts are used as a means of reinforcing the work, provide sleeves for each thru-bolt or use sex screw fasteners.

2.4 HINGES, BUTIS, AND PIVOTS

- A. Templates: Except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames, provide only template-produced units.
- B. Screws: Provide Phillips flat-head screws complying with the following requirements:

1. For metal doors and frames install machine screws into drilled and tapped holes.
 2. For wood doors and frames install wood screws.
 3. For fire-rated wood doors install #12 x 1-1/4-inch, threaded-to-the-head steel wood screws.
 4. Finish screw heads to match surface of hinges or pivots.
- C. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
1. Out-Swing Exterior Doors: Nonremovable pins.
 2. Out-Swing Corridor Doors with Locks: Nonremovable pins.
 3. Interior Doors: Nonrising pins.
 4. Tips: Flat button and matching plug, finished to match leaves, except where hospital tip (HT) indicated.
- D. Number of Hinges: Provide number of hinges indicated but not less than 3 hinges per door leaf for doors 90 inches or less in height and one additional hinge for each 30 inches of additional height.
1. Fire-Rated Doors: Not less than 3 hinges per door leaf for doors 86 inches or less in height with same rule for additional hinges.

2.5 LOCK CYLINDERS AND KEYING

- A. Standard System: Except as otherwise indicated, provide new masterkey system for Project.
- B. Multiple-Building System: Except as otherwise indicated, provide new grandmasterkey system for Project.
- C. Existing System: Grandmasterkey the locks to the Owner's existing system, with a new masterkey for the Project.
- D. Review the keying system with the Owner and provide the type required (master, grandmaster or great-grandmaster), either new or integrated with Owner's existing system.
- E. Equip locks with manufacturer's special 6-pin tumbler cylinder with construction masterkey feature that permits voiding of construction keys without cylinder removal.
- F. Equip locks with cylinders for interchangeable-core pin tumbler inserts. Furnish only temporary inserts for the construction period, and remove these when directed.

1. Furnish final cores and keys for installation by Owner.

G. Metals: Construct lock cylinder parts from brass or bronze, stainless steel, or nickel silver.

H. Comply with Owner's instructions for masterkeying and, except as otherwise indicated, provide individual change key for each lock that is not designated to be keyed alike with a group of related locks.

1. Permanently inscribe each key with number of lock that identifies cylinder manufacturer's key symbol, and notation, "DO NOT DUPLICATE."

I. Key Material: Provide keys of nickel silver only.

J, Key Quantity: Furnish 3 change keys for each lock, 5 master keys for each master system, and 5 grandmaster keys for each grandmaster system.

1. Furnish one extra blank for each lock.

2. Deliver keys to key control system manufacturer.

3. Deliver keys to Owner.

2.6 KEY CONTROL SYSTEM

A. Provide a key control system including envelopes, labels, tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers; permanent markers, and standard metal cabinet, all as recommended by system manufacturer,

with capacity for 150percent of the number of locks required for the Project.

1. Provide-complete cross index system set up by key control manufacturer, and place keys on markers and hooks in the cabinet as determined by the final key schedule.

2. Provide hinged-panel type cabinet for wall mounting.

3. Provide multiple-drawer type cabinet.

2.7 LOCKS, LATCHES, AND BOLTS

A. Strikes: Provide manufacturer's standard wrought box strike for each latch or lock bolt, with curved lip extended to protect frame, finished to match hardware set, unless otherwise indicated.

1. Provide flat lip strikes for locks with 3-piece, antifriction latchbolts as recommended by manufacturer.
 2. Provide extra long strike lips for locks used on frames with applied wood casing trim.
 3. Provide recess type top strikes for bolts locking into head frames, unless otherwise indicated.
 4. Provide dust-proof strikes for foot bolts, except where special threshold construction provides nonrecessed strike for bolt.
 5. Provide roller type strikes where recommended by manufacturer of the latch and lock units.
 6. Provide standard (open) strike plates for interior doors of residential units where wood door frames are used.
- B. Lock Throw: Provide 5/8-inch minimum throw of latch on pairs of doors. Comply with UL requirements for throw of bolts and latch bolts on rated fire openings.
1. Provide 1/2-inch minimum throw of latch for other bored and preassembled types of locks and 3/4-inch minimum throw of latch for mortise locks. Provide 1-inch minimum throw for all dead bolts.
- C. Flush Bolt Heads: Minimum of 1/2-inch-diameter rods of brass, bronze, or stainless steel with minimum 12-inch-long rod for doors up to 7'-0" in height. Provide longer rods as necessary for doors exceeding 7'-0" in height.
- D. Exit Device Dogging: Except on fire-rated doors where closers are provided on doors equipped with exit devices, equip the units with keyed dogging device to keep the latch bolt retracted, when engaged.
- E. Rabbeted Doors: Where rabbeted door stiles are indicated, provide special rabbeted front on lock and latch units and bolts.

- A. Size of Units: Except as otherwise specifically indicated, comply with the manufacturer's recommendations for size of door control unit depending on size of door, exposure to weather, and anticipated frequency of use.
 - 1. Where parallel arms are indicated for closers, provide closer unit one size larger than recommended for use with standard arms.
 - 2. Provide parallel arms for all overhead closers, except as otherwise indicated.
- B. Access-Free Manual Closers: Where manual closers are indicated for doors required to be accessible to the physically handicapped, provide adjustable units complying with ANSI A117.1 provisions for door opening force and delayed action closing.
- C. Combination Door Closers and Holders: Provide units designed to hold door in open position under normal usage and to release and close door automatically under fire conditions. Incorporate an integral electromagnetic holder mechanism designed for use with UL listed fire detectors, provided with normally closed switching contacts.
 - 1. Provide integral smoke detector device in combination door closers and holders complying with UL 228.
- D. Flush Floor Plates: Provide finished metal flush floor plates for floor closers except where thresholds are indicated and cover plate is specified to be an integral part of threshold. Finish floor plate to match hardware sets, unless otherwise indicated.
- E. Recessed Floor Plates: Provide recessed floor plates where no thresholds are indicated and floor closers are located in an area of resilient flooring, stone flooring, or terrazzo. Recess plates to receive an insert of the floor finish material of the normal thickness as indicated. Provide extended spindle on closer as may be necessary to accommodate thickness of floor finish. .-
- F. Provide black resilient parts for exposed bumpers.

2.9 DOOR TRIM UNITS

- A. Fasteners: Provide manufacturer's standard exposed fasteners for door trim units consisting of either machine screws or self-tapping screws.
- B. Fabricate edge trim of stainless steel to fit door thickness in standard lengths or to match height of protection plates.

- C. Fabricate protection plates not more than 1-1/2 inches less than door width on hinge side and not more than 1/2 inch less than door width on pull side by height indicated.
 - 1. Metal Plates: Stainless steel, 0.050 inch (U.S. 18 gage).
 - 2. Metal Plates: Brass or bronze, 0.062 inch (U.S. 16 gage).
 - 3. Plastic Plates: Clear acrylic plastic, 1/8 inch thick.
 - 4. Plastic Plates: Plastic laminate or high-impact polyethylene, 1/8 inch thick, in color selected.

2.10 HARDWARE FOR INTERIOR SLIDING DOORS

- A. General: Provide manufacturer's standard hardware for interior sliding doors when not furnished as part of complete door package.
- B. Operating Hardware for Bypassing Doors: Provide manufacturer's complete set consisting of extruded aluminum overhead track, adjustable hangers (carriages), bumpers, and floor guides designed to accommodate the number, size, thickness, and weight of door leaves indicated. Provide flush pulls for each door leaf.

2.11 2 HARDWARE FOR BIFOLD DOORS

- A. General: Provide manufacturer's standard hardware for interior bifold doors when not furnished as part of complete door package.
- B. Operating Hardware: Provide manufacturer's complete sets consisting of overhead extruded aluminum track; captive nylon shoe or roller guides; rubber bumpers in track; and adjustable pivots, hinges, and door aligners all designed to accommodate the number, size, thickness, and weight of door leaves indicated.
 - 1. Provide medium-duty sets designed for leaves weighing up to 35 lb.
- C. Trim Hardware: Provide the following items as needed for operating bifold doors:
 - 1. Pulls: Single knob pull with dummy rose matching design and finish of knobs for swing doors, by manufacturer of locks and latches.

2.12 WEATHERSTRIPPING AND SEALS

- A. General: Provide continuous weatherstripping on exterior doors and smoke, light, or sound seals on interior doors where indicated or scheduled. Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.
- B. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strip is easily replaceable and readily available from stocks maintained by manufacturer.
- C. Weatherstripping at Jambs and Heads: Provide bumper-type resilient insert and metal retainer strips, surface applied unless shown as mortised or semimortised, and of following metal, finish, and resilient bumper material:
 - 1. Extruded aluminum with natural anodized finish, 0.062-inch minimum thickness of main walls and flanges.
 - 2. Sponge neoprene conforming to MIL R 6130, Class II (Closed Cell).
 - a. Grade C (67 deg F to 170 deg F, low temperature).
 - 3. Solid neoprene conforming to MIL R 6855, Class II, Grade 40.
 - a. Flexible, hollow bulb or loop insert.
- D. Weatherstripping at Door Bottoms: Provide threshold consisting of contact-type resilient insert and metal housing of design and size shown and of following metal, finish, and resilient seal strip:
 - 1. Extruded aluminum with natural anodized finish, 0.062-inch minimum thickness of main walls and flanges.
 - 2. Solid neoprene wiper or sweep seal complying with MIL R 6855, Class II, Grade 40.

2.13 THRESHOLDS

- A. General: Except as otherwise indicated, provide standard metal threshold unit of type, size, and profile as shown or scheduled.
- B. Exterior Hinged or Pivoted Doors: Provide units not less than 4 inches wide, formed to accommodate change in floor elevation where indicated, fabricated to accommodate door hardware and to fit door frames, and as follows:
 - 1. For in-swinging doors provide units with interlocking lip and interior drain channel; include hook on bottom edge of door and drain pan.

2. For out-swinging doors provide units with interlocking lip and with hook on bottom edge of door to act as weather bar.

2.14 5 HARDWARE FINISHES

- A. Match items to the manufacturer's standard color and texture finish for the latch and lock sets (or push-pull units if no latch or lock sets).
- B. Provide finishes that match those established by BHMA or, if none established, match the Architect's sample.
- C. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware.
- D. The designations used in schedules and elsewhere to indicate hardware finishes are those listed in ANSI/BHMA A156.18, "Materials and Finishes," including coordination with the traditional U.S. finishes shown by certain manufacturers for their products.
- E. The designations used in schedules and elsewhere to indicate hardware finishes are the industry-recognized standard commercial finishes, except as otherwise noted.
 1. Rust-Resistant Finish: For iron and steel base metal required for exterior work and in areas shown as "High Humidity" areas (and also when designed with the suffix -RR), provide 0.2-mil-thick copper coating on base metal before applying brass, bronze, nickel, or chromium plated finishes.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Mount hardware units at heights indicated in following applicable publications, except as specifically indicated or required to comply with governing regulations and except as otherwise directed by Architect.
 1. "Recommended Locations for Builders Hardware for Standard Steel Doors and Frames" by the Door and Hardware Institute.

2. "Recommended Locations for Builders Hardware for Custom Steel Doors and Frames" by the Door and Hardware Institute.
 3. NWWDA Industry Standard I.S.1.7, "Hardware Locations for Wood Flush Doors."
- B. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Where cutting and fitting is required to install hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation or application of surface protection with finishing work specified in the Division 9 Sections. Do not install surface-mounted items until finishes have been completed on the substrates involved.
 - C. Set units level, plumb, and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
 - D. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.
 - E. Set thresholds for exterior doors in full bed of butyl-rubber or polyisobutylene mastic sealant complying with requirements specified in Division 7 Section "Joint Sealers."
 - F. Weatherstripping and Seals: Comply with manufacturer's instructions and recommendations to the extent installation requirements are not otherwise indicated.

3.2 ADJUSTING, CLEANING, AND DEMONSTRATING .

- A. Adjust and check each operating item of hardware and each door to ensure proper operation or function -of every unit. Replace units that cannot be adjusted to operate freely and smoothly or as intended for the application made. .
 1. Where door hardware is installed more than one month prior to acceptance or occupancy of a space or area, return to the installation during the week prior to acceptance or occupancy and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.
- B. Clean adjacent surfaces soiled by hardware installation.
- C. Instruct Owner's personnel in the proper adjustment and maintenance of door hardware and hardware finishes.

- D. Six-Month Adjustment: Approximately six months after the date of Substantial Completion, the Installer, accompanied by representatives of the manufacturers of latchsets and locksets and of door control devices, and of other major hardware suppliers, shall return to the Project to perform the following work:
1. Examine and re-adjust each item of door hardware as necessary to restore function of doors and hardware to comply with specified requirements.
 2. Consult with and instruct Owner's personnel in recommended additions to the maintenance procedures.
 3. Replace hardware items that have deteriorated or failed due to faulty design, materials, or installation of hardware units.
 4. Prepare a written report of current and predictable problems (of substantial nature) in the performance of the hardware.

3.3 HARDWARE SCHEDULE

- A. General: Provide hardware for each door to comply with requirements of Section "Door Hardware," hardware set numbers indicated in door schedule, and in the following schedule of hardware sets.
1. Hardware sets indicate quantity, item, manufacturer and product designation, size, and finish or color, as applicable.
 2. Hardware sets indicate quantity, item, ANSI designation, size, and finish or color, as applicable.
 3. Lockset Designs: Provide one of the lockset designs designated below [or, if by another manufacturer, one that matches those designated]:

SECTION 09255 - GYPSUM BOARD ASSEMBLIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
1. Non-load-bearing steel framing members for gypsum board assemblies.
 2. Gypsum board assemblies attached to steel framing.
 3. Gypsum board assemblies attached to wood framing and furring members.
- B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 6 Section for the following:

a. Wood framing and furring.

1.3 DEFINITIONS

A. Gypsum Board Construction Terminology: Refer to ASTM C 11 and GA-505 for definitions of terms related to gypsum board assemblies not defined in this Section or in other referenced standards.

1.4 SUBMITTALS

- A. General: Submit the following according to Conditions of the Contract and Division 1 Specification Sections.
- B. Product data for each type of product specified.
- C. Product certificates signed by manufacturers of gypsum board assembly components certifying that their products comply with specified requirements.

1.5 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: Where fire-rated gypsum board assemblies are indicated, provide materials and construction identical to those of assemblies tested for fire resistance per ASTM E 119 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.
 - 1. Fire Resistance Ratings: As indicated by reference to GA File Numbers in GA-600 "Fire Resistance Design Manual" or to design designations in UL "Fire Resistance Directory" or in the listing of another testing and inspecting agency acceptable to authorities having jurisdiction.
- B. Single-Source Responsibility for Steel Framing: Obtain steel framing members for gypsum board assemblies from a single manufacturer.
- C. Single-Source Responsibility for Panel Products: Obtain each type of gypsum board and other panel products from a single manufacturer.
- D. Single-Source Responsibility for Finishing Materials: Obtain finishing materials from either the same manufacturer that supplies gypsum board and other panel products or from a manufacturer acceptable to gypsum board manufacturer.
- E. Field Samples: On actual gypsum board assemblies, prepare field samples of at least 100 sq. ft. in surface area for the following applications. Simulate finished lighting conditions for review of in-place unit of Work.
 - 1. Wall surfaces indicated to receive nontextured paint finishes.
 - 2. Ceiling surfaces indicated to receive nontextured paint finishes.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer or supplier.
- B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes. Neatly stack gypsum panels flat to prevent sagging.
- C. Handle gypsum board to prevent damage to edges, ends, and surfaces. Do not bend or otherwise damage metal corner beads and trim.

1.7 PROJECT CONDITIONS

- A. Environmental Conditions, General: Establish and maintain environmental conditions for applying and finishing gypsum board to comply with ASTM C 840 and with gypsum board manufacturer's recommendations.
- B. Room Temperatures: For nonadhesive attachment of gypsum board to framing, maintain not less than 40 deg F (4 deg C). For adhesive attachment and finishing of gypsum board, maintain not less than 50 deg F (10 deg C) for 48 hours prior to application and continuously after until dry. Do not exceed 95 deg F (35 deg C) when using temporary heat sources.
- C. Ventilation: Ventilate building spaces, as required, for drying joint treatment materials. Avoid drafts during hot dry weather to prevent finishing materials from drying too rapidly.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:

- 1. Steel Framing and Furring:

- a. Clark Steel Framing.
- b. Consolidated Systems, Inc.
- c. Dale Industries, Inc.
- d. Dietrich Industries, Inc.
- e. Marino Industries Corp.
- f. Gold Bond Building Products Div., National Gypsum Co.
- g. Unimast Inc.

- 2. Gypsum Board and Related Products:

- a. Domtar Gypsum.
- b. Georgia-Pacific Corp.
- c. Gold Bond Building Products Div., National Gypsum Co.

a. United States Gypsum Co.

2.2 GYPSUM BOARD PRODUCTS

- A. General: Provide gypsum board of types indicated in maximum lengths available to minimize end-to-end butt joints.
1. Thickness: Provide gypsum board in thicknesses indicated or, if not otherwise indicated, in either 1/2 inch or 5/8 inch thicknesses to comply with ASTM C 840 for application system and support spacing indicated.
- B. Gypsum Wallboard: ASTM C 36 and as follows:
1. Type: Regular for vertical surfaces, unless otherwise indicated.
 2. Type: Foil-backed where indicated.
 3. Type: Type X where required for fire-resistive-rated assemblies.
 4. Type: Sag-resistant type for ceiling surfaces.
 5. Type: Proprietary type as required for specific fire-resistive-rated assemblies.
 6. Edges: Tapered.
 7. Thickness: 1/2 inch, unless otherwise indicated.
 8. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work where proprietary gypsum wallboard is indicated include, but are not limited to, the following:
 - a. Gyprock Fireguard C Gypsum Board, Domtar Gypsum.
 - b. Firestop Type C, Georgia-Pacific Corp.
 - c. Fire-Shield G, Gold Bond Building Products Div., National Gypsum Co.
 - d. SHEETROCK Brand Gypsum Panels, FIRECODE C Core, United States Gypsum Co.
 - e. SHEETROCK Brand Gypsum Panels, ULTRACODE Core, United States Gypsum Co.
- C. Gypsum Backing Board for Multilayer Applications: ASTM C 442 or, where backing board is not available from manufacturer, gypsum wallboard, ASTM C 36 and as follows:
1. Type: Regular for vertical surfaces, unless otherwise indicated.
 2. Type: Foil-backed where indicated.
 3. Type: Type X where indicated or required for fire-resistive-rated assemblies.

4. Type: Sag-resistant type for ceiling surfaces, unless otherwise indicated.
5. Type: Proprietary type matching that indicated for face layer and as required for specific fire-resistive-rated assemblies.
6. Edges: Manufacturer's standard.
7. Thickness: 1/2 inch, unless otherwise indicated.

D. Exterior Gypsum Soffit Board: ASTM C 931, with manufacturer's standard edges, of type and thickness indicated below:

1. Type: Regular, unless otherwise indicated.
2. Type: Type X where required for fire-resistive-rated assemblies.
3. Thickness: 5/8 inch, unless otherwise indicated.

2.3 TRIM ACCESSORIES

A. Accessories for Interior Installation: Comer beads, edge trim, and control joints complying with ASTM C 1047 and requirements indicated below:

1. Material: Formed metal, plastic, or metal combined with paper, with metal complying with the following requirement:
 - a. Sheet steel zinc-coated by hot-dip process.
 - b. Sheet steel coated with zinc by hot-dip or electrolytic processes, or with aluminum or rolled zinc.
2. Shapes indicated below by reference to Fig. 1 designations in ASTM C 1047:
 - a. Comerbead on outside comers, unless otherwise indicated.
 - b. LC-bead with both face and back flanges; face flange formed to receive joint compound. Use LC-beads for edge trim unless otherwise indicated.
 - c. L-bead with face flange only; face flange formed to receive joint compound. Use L-bead where indicated.
 - d. U-bead with face and back flanges; face flange formed to be left without application of joint compound. Use U-bead where indicated.
 - e. One-piece control joint formed with V-shaped slot, with removable strip covering slot opening.

B. Zinc Accessories for Exterior Ceilings: Comer beads, edge trim, and control joints formed from rolled zinc complying with ASTM C 1047, in shapes indicated below by reference to ASTM C 1047:

1. Comer bead on outside comers, unless otherwise indicated.
2. Edge trim complying with ASTM C 1047, formed from rolled zinc, shape LC-Bead per Fig. 1, unless otherwise indicated.

- C. Aluminum Accessories: Where indicated, provide manufacturer's standard extruded aluminum accessories of profile indicated or referenced by manufacturer's product designations, complying with the following requirements:
1. Aluminum Alloy: Alloy and temper recommended by aluminum producer and finisher for type of finish indicated and with not less than the strength and durability properties of aluminum extrusions complying with ASTM B 221 for alloy and temper 6063-T5.
 2. Class II Clear-Anodized Finish: AA-C12C22A31 (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class II clear coating with a minimum thickness of 0.4 mil).
 3. Available Manufacturers: Subject to compliance with requirements, manufacturers offering aluminum accessories that may be incorporated in the Work include, but are not limited to, the following:
 - a. Fry Reglet Corp.
 - b. Gordon, Inc.
 - c. MM Systems, Inc.

2.4 JOINT TREATMENT MATERIALS

- A. General: Provide joint treatment materials complying with ASTM C 475 and the recommendations of both the manufacturers of sheet products and of joint treatment materials for each application indicated.
- B. Joint Tape for" Gypsum Board: Paper reinforcing tape, unless otherwise indicated.
1. Use pressure-sensitive or staple-attached open-weave glass-fiber reinforcing tape with compatible joint compound where recommended by manufacturer of gypsum board and joint treatment materials for application indicated.
- C. Setting-Type Joint Compounds for Gypsum Board: Factory-packaged, job-mixed, chemical-hardening powder products formulated for uses indicated.
1. Where setting-type joint compounds are indicated as a taping compound only or for taping and filling only, use formulation that is compatible with other joint compounds applied over it.
 2. For prefilling gypsum board joints, use formulation recommended by gypsum board manufacturer for this purpose.

3. For filling joints and treating fasteners of water-resistant gypsum backing board behind base for ceramic tile, use formulation recommended by the gypsum board manufacturer for this purpose.
 4. For topping compound, use sandable formulation.
- D. Drying-Type Joint Compounds for Gypsum Board: Factory-packaged vinyl-based products complying with the following requirements for formulation and intended use.
1. Ready-Mixed Formulation: Factory-mixed product.
 2. Job-Mixed Formulation: Powder product for mixing with water at Project site.
 3. Taping compound formulated for embedding tape and for first coat over fasteners and face flanges of trim accessories.
 4. Topping compound formulated for fill (second) and finish (third) coats.
 5. All-purpose compound formulated for both taping and topping compounds.

2.5 MISCELLANEOUS MATERIALS

- A. General: Provide auxiliary materials for gypsum board construction that comply with referenced standards and recommendations of gypsum board manufacturer.
- B. Laminating Adhesive: Special adhesive or joint compound recommended for laminating gypsum panels.
- C. Spot Grout: ASTM C 475, setting-type joint compound recommended for spot grouting hollow metal door frames.
- D. Fastening Adhesive for Wood: ASTM C 557.
- E. Fastening Adhesive for Metal: Special adhesive recommended for laminating gypsum panels to steel framing.
- F. Steel drill screws complying with ASTM C 1002 for the following applications:
 1. Fastening gypsum board to steel members less than 0.03 inch thick.
 2. Fastening gypsum board to wood members.
 3. Fastening gypsum board to gypsum board.
- G. Steel drill screws complying with ASTM C 954 for fastening gypsum board to steel members from 0.033 to 0.112 inch thick.
- H. Corrosion-resistant-coated steel drill screws of size and type recommended by board manufacturer for fastening cementitious backer units.

- I. Gypsum Board Nails: ASTM C 514.
- J. Asphalt-Saturated Organic Felt: ASTM D 226, Type I (No. 15 asphalt felt), nonperforated.
- K. Thermal Insulation: Material indicated below, of thickness and width to fill voids formed by Z-furring members:
 - 1. Unfaced Mineral-Fiber Blanket Insulation: Unfaced mineral-fiber blanket insulation produced by combining mineral fibers of type described below with thermosetting resins to comply with ASTM C 665 for Type I (blankets without membrane facing):
 - a. Mineral-Fiber Type: Fibers manufactured from glass or slag.
- L. Polyethylene Vapor Retarder: ASTM D 4397, thickness and maximum permeance rating as follows:
 - 1. 4.0 mils, 0.19 perms.
- M. Vapor Retarder Tape: Pressure-sensitive tape of type recommended by vapor retarder manufacturer for sealing joints and penetrations in vapor retarder.

PART 3 -EXECUTION

3.1 EXAMINATION

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"Gypsum Construction Handbook" published by United States Gypsum Co.

- A. Isolate steel framing from building structure at locations indicated to prevent transfer of loading imposed by structural movement. Comply with details shown on Drawings.
 - 1. Where building structure abuts ceiling perimeter or penetrates ceiling.
 - 2. Where partition framing and wall furring abut structure except at floor.
 - a. Provide slip^o or cushioned-type joints as detailed to attain lateral support and avoid axial loading.
- B. Do not bridge building expansion and control joints with steel framing or furring members. Independently frame both sides of joints with framing or furring members as indicated.

3.2 APPLYING AND FINISHING GYPSUM BOARD, GENERAL

- A. Gypsum Board Application and Finishing Standards: Install and finish gypsum panels to comply with ASTM C 840 and GA-216.
- B. Install ceiling board panels across framing to minimize the number of abutting end joints and avoid abutting end joints in the central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- C. Install wall/partition board panels to minimize the number of abutting end joints or avoid them entirely. Stagger abutting end joints not less than one framing member in alternate courses of board. At stairwells and other high walls, install panels horizontally with end abutting joints over studs and staggered.
- D. Install gypsum panels with face side out. Do not install imperfect, damaged, or damp panels. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.
- E. Locate both edge or end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Position adjoining panels so that tapered edges abut tapered edges, and field-cut edges abut field-cut edges and ends. Do not place tapered edges against cut edges or ends. Stagger vertical joints over different studs on opposite sides of partitions. Avoid joints at comers of framed openings where possible.
- F. Attach gypsum panels to steel studs so that the leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
- G. Attach gypsum panels to framing provided at openings and cutouts.
- H. Do not attach gypsum panels across the flat grain of wide-dimension lumber including floor joists and headers. Instead, float gypsum panels over these members using resilient channels or provide control joints to counteract wood shrinkage.

- I. Spot grout hollow metal door frames for solid core wood doors, hollow metal doors, and doors over 32 inches wide. Apply spot grout at each jamb anchor clip and immediately insert gypsum panels into frames.

- J. Form control joints and expansion joints at locations indicated and as detailed, with space between edges of adjoining gypsum panels, as well as supporting framing behind gypsum panels.
- - K. Cover both faces of steel stud partition framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chase walls that are braced internally.
 - 1. Except where concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
 - 2. Fit gypsum panels around ducts, pipes, and conduits.
 - 3. Where partitions intersect open concrete coffers, concrete joists, and other structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by coffers, joists, and other structural members; allow 1/4-to-1/2-inch-wide joints to install sealant.
- L. Isolate perimeter of non-load-bearing gypsum board partitions at structural abutments, except floors, as detailed. Provide 1/4-inch-to-1/2-inch-wide spaces at these locations and trim edges with U-bead edge trim where edges of gypsum panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- M. Floating Construction: Where feasible, including where recommended by manufacturer, install gypsum panels over wood framing, with floating internal corner construction.
- N. Space fasteners in gypsum panels according to referenced gypsum board application and finishing standard and manufacturer's recommendations.

3.3 GYPSUM BOARD APPLICATION METHODS

- A. Single-Layer' Application: Install gypsum wallboard panels as follows:
 - 1. On ceilings, apply gypsum panels prior to wall/partition board application to the greatest extent possible and at right angles to framing, unless otherwise indicated.
 - 2. On partitions/walls, apply gypsum panels vertically (parallel to framing), unless otherwise indicated, and provide panel lengths that will minimize end joints.
 - 3. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
- B. Double-Layer Application: Install gypsum backing board for base layers and gypsum wallboard for face layers.
 - 1. On ceilings, apply base layer prior to applying base layer on walls/partitions; apply face layers in same sequence. Offset face-layer joints at least 10 inches

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- from parallel base-layer joints. Apply base layers at right angles to framing members unless otherwise indicated.
2. On partitions/walls, apply base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face layer joints offset at least one stud or furring member with base layer joints. Stagger joints on opposite sides of partitions.
 3. On Z-furring members, apply base layer vertically (parallel to framing) and face layer either vertically (parallel to framing) or horizontally (perpendicular to framing) with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members.
- C. Single-Layer Fastening Methods: Apply gypsum panels to supports as follows:
1. Fasten with screws.
 2. Fasten to wood supports with single nailing.
- D. Double-Layer Fastening Methods: Apply base layer of gypsum panels and face layer to base layer as follows:
1. Fasten both base layers and face layers separately to supports with screws.
 2. Fasten base layers with screws and face layer with adhesive and supplementary fasteners.
 3. Fasten base layers to wood supports with nails and face layer with adhesive and supplementary fasteners.
- E. Exterior Soffits and Ceilings: Apply exterior gypsum soffit board panels perpendicular to supports, with end joints staggered over supports. Install with 1/4-inch open space where panels abut other construction or structural penetrations.
1. Fasten with corrosion-resistant screws.

3.4 INSTALLING TRIM ACCESSORIES

- A. General: For trim accessories with back flanges, fasten to framing with the same fasteners used to fasten gypsum board. Otherwise, fasten trim accessories according to accessory manufacturer's directions for type, length, and spacing of fasteners.
- B. Install comer beads at external comers.
- C. Install edge trim where edge of gypsum panels would otherwise be exposed or semiexposed. Provide edge trim type with face flange formed to receive joint compound except where other types are indicated.
 1. Install LC-bead where gypsum panels are tightly abutted to other construction

- and back flange can be attached to framing or supporting substrate.
2. Install L-bead where edge trims can only be installed after gypsum panels are installed.
 3. Install U-bead where indicated.
 4. Install aluminum edge trim and other accessories where indicated.
- D. Install control joints at locations indicated, and where not indicated according to ASTM C 840, and in locations approved by Architect for visual effect.
- E. Install H-molding in exterior gypsum board assemblies where control joints are indicated. Install on cut or ends of gypsum panels, not on tapered edges.

3.5 FINISHING GYPSUM BOARD ASSEMBLIES

- A. General: Apply joint treatment at gypsum board joints (both directions); flanges of corner bead, edge trim, and control joints; penetrations; fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration and levels of gypsum board finish indicated.
- B. Prefill open joints, rounded or beveled edges, and damaged areas using setting-type joint compound.
- C. Apply joint tape over gypsum board joints except those with trim accessories having concealed face flanges not requiring taping to prevent cracks from developing in joint treatment at flange edges.
- D. Levels of Gypsum Board Finish: Provide the following levels of gypsum board finish per GA-214.
1. Level 4 for gypsum board surfaces unless otherwise indicated.
- E. For level 4 gypsum board finish, embed tape in joint compound and apply three separate coats of joint compound over joints, angles, fastener heads, and accessories. Touch up and sand between coats and after last coat as needed to produce a surface free of visual defects and ready for decoration. Use the following joint compound combination:
1. Embedding and First Coat: Ready-mixed, drying-type, all-purpose or taping compound.
 2. Fill (Second) Coat: Ready-mixed, drying-type, all-purpose or topping compound.
 3. Finish (Third) Coat: Ready-mixed, drying-type, all-purpose or topping compound.

- F. Finish exterior gypsum soffit board using setting-type joint compounds to prefill joints and embed tape, and for first, fill (second) and finish (third) coats, with the last coat being a sandable product. Smooth each coat before joint compound hardens to minimize need for sanding. Sand between coats and after finish coat.
 - 1. Painting exterior gypsum soffit board after finish coat has dried is specified in Division 9 Section "Painting."

3.6 CLEANING AND PROTECTION

- A. Promptly remove any residual joint compound from adjacent surfaces.
- B. Provide final protection and maintain conditions, in a manner suitable to Installer, that ensures gypsum board assemblies remain without damage or deterioration at time of Substantial Completion.

END OF SECTION 09255

SECTION 09 3013 - CERAMIC

TILING PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Ceramic tile.
 - 2. Waterproof membrane.
- B. Related Requirements:
 - 1. Section 07 9200 "Joint Sealants" for sealing of expansion, contraction, control, and isolation joints in tile surfaces.
 - 2. Section 09 2900 "Gypsum Board" for cementitious backer units.

1.3 DEFINITIONS

- A. General: Definitions in the ANSI A 108 series of tile installation standards and in ANSI A 137.1 apply to Work of this Section unless otherwise specified.
- B. ANSI A108 Series: ANSI A108.01, ANSI A108.02, ANSI A108.1A, ANSI A108.1 B, ANSI A108.1C, ANSI A108.4, ANSI A108.5, ANSI A108.6, ANSI A108.8, ANSI A108.9, ANSI A108.10, ANSI A108.11, ANSI A108.12, ANSI A108.13, ANSI A108.14, ANSI A108.15, ANSI A108.16, and ANSI A 108.17, which are contained in its "Specifications for Installation of Ceramic Tile."

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Show locations of each type of tile and tile pattern. Show widths, details, and locations of expansion, contraction, control, and isolation joints in tile substrates and finished tile surfaces.
- C. Samples for Initial Selection: For tile, grout, and accessories involving color selection.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Certificates: For each type of product.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match and are from same production runs as products installed and that are packaged with protective covering for storage and identified with labels

describing contents.

1. Tile and Trim Units: Furnish quantity of full-size units equal to 2 percent of amount installed for each type, composition, color, pattern, and size indicated.

CERAMIC TILING

2. Grout: Furnish quantity of grout equal to 2 percent of amount installed for type, each composition, and color indicated.

1.7 QUALITY ASSURANCE

- A. Perform work in accordance with Tile Council of North America (TCNA) Handbook and ANSI A108 Series.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirements in ANSI A 137.1 for labeling tile packages.
- B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination can be avoided.
- D. Store liquid materials in unopened containers and protected from freezing.
- E. Handle tile that has temporary protective coating on exposed surfaces to prevent coated surfaces from contacting back or edges of other units. If coating does contact bonding surfaces of tile, remove coating from bonding surfaces before setting tile.

1.9 FIELD CONDITIONS

- A. Environmental Limitations: Do not install tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer's written instructions.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations for Tile: Obtain tile from single source or producer.
 - 1. Obtain tile of each type and color or finish from same production run and of consistent quality in appearance and physical properties for each contiguous area.
- B. Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from single manufacturer and each aggregate from single source or producer.

2.2 PRODUCTS, GENERAL

- A. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1 for types, compositions, and other characteristics indicated.
 - 1. Provide tile complying with Standard grade requirements.
- B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A 108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCNA installation methods specified in tile installation schedules, and other requirements specified.
- C. Factory Blending: For tile exhibiting color variations within ranges, blend tile in factory and package so tile units taken from one package show same range in colors as those taken from other packages and match approved Samples.

- D. Mounting: For factory-mounted tile, provide back- or edge-mounted tile assemblies as standard with manufacturer unless otherwise indicated.

CERAMIC TILING

1. Where tile is indicated for installation in wet areas, do not use back- or edge-mounted tile assemblies unless tile manufacturer specifies in writing that this type of mounting is suitable for installation indicated and has a record of successful in-service performance.

2.3 TILE PRODUCTS

- A. Ceramic Tile Type CT-1: Factory-mounted unglazed ceramic mosaic floor tile.
 1. Basis-of-Design Product: Subject to compliance with requirements, provide Dal-Tile Corporation; Keystones or a comparable product by one of the following:
 - a. American Olean; a division of Dal-Tile Corporation.
 2. Composition: Impervious natural clay or porcelain.
 3. Certification: Porcelain tile certified by the Porcelain Tile Certification Agency.
 4. Module Size: 2 by 2 inches.
 5. Thickness: 1/4 inch.
 6. Face: Pattern of design indicated, with cushion edges.
 7. Surface: Smooth, without abrasive admixture.
 8. Dynamic Coefficient of Friction: Not less than 0.42.
 9. Finish: Mat, opaque glaze.
 10. Tile Color and Pattern: As selected by Architect from manufacturer's full range.
 11. Grout Color: As selected by Architect from manufacturer's full range.
 12. Trim Units: Coordinated with sizes and coursing of adjoining flat tile where applicable and matching characteristics of adjoining flat tile. Provide shapes as follows, selected from manufacturer's standard shapes:
 - a. Base: Surface bullnose, coved, module built-up with two rows of tile same same as adjoining flat tile.
- B. Ceramic Tile Type CT-2: Glazed wall tile.
 1. Basis-of-Design Product: Subject to compliance with requirements, provide Dal-Tile; Semi- Gloss/Matte or a comparable product by one of the following:
 - a. American Olean; a division of Dal-Tile Corporation.
 2. Module Size: 4-1/4 by 4-1/4 inches.
 3. Face Size Variation: Rectified.
 4. Thickness: 5/16 inch.
 5. Face: Pattern of design indicated, with manufacturer's standard edges.
 6. Finish: Bright, opaque glaze.
 7. Tile Color and Pattern: As selected by Architect from manufacturer's full range. Refer to Project Drawings for pattern. Accent tiles estimated to be no more than 20% premium the coverage.
 8. Grout Color: As selected by Architect from manufacturer's full range.
 9. Trim Units: Coordinated with sizes and coursing of adjoining flat tile where applicable and matching characteristics of adjoining flat tile. Provide shapes as follows, selected from manufacturer's standard shapes:
 - a. Base: Straight surface, coved, module size same as adjoining flat tile.
 - b. Wainscot Cap: Surface bullnose, module size same as adjoining flat tile.
 - c. External Corners: Surface bullnose, same size as adjoining flat tile.

2.4 THRESHOLDS

- A. General: Fabricate to sizes and profiles indicated or required to provide transition between adjacent floor finishes.
 1. Bevel edges at 1:2 slope, with lower edge of bevel aligned with or up to 1/16 inch above adjacent floor surface. Finish bevel to match top surface of threshold. Limit height of threshold to 1/2 inch or less above adjacent floor surface.

- B. Marble Thresholds: ASTM C 503/C 503M, with a minimum abrasion resistance of 10 according to ASTM C 1353 or ASTM C 241/C 241M and with honed finish.

CERAMIC TILING

1. Description: Uniform, fine- to medium-grained white stone with gray veining.

2.5 SHOWER WATERPROOFING SYSTEM

- A. General: Manufacturer's standard product that complies with ANSI A118.10 and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.
 1. Manufacturer: Schluter Systems L.P.
- B. Schluter-KERDI (Install behind all floor and wall tile in Shower Rooms):
 1. Description: 0.008 inch (0.2 mm) thick, orange polyethylene membrane, with polypropylene fleece laminated on both sides, which is listed by CUPC® to meet or exceed requirements of the "American national standard specifications for load bearing, bonded, waterproof membranes for thin-set ceramic tile and dimension stone installation A118.10."
- C. Schluter-KERDI-BAND
 1. Description: Seams and Corners material 0.004 inch (0.1) thick, orange polyethylene membrane, with polypropylene fleece laminated on both sides.
 2. Width:
 - a. 5 inches (125 mm).
 - b. 7-1/4 inches (185 mm).
 - c. 10 inches (250mm).

2.6 SETTING MATERIALS

- A. Dry-Set Portland Cement Mortar (Thinset): ANSI A 118.1. (Masonry Walls)
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Custom Building Products.
 - b. Laticrete International, Inc.
 - c. MAPEi Corporation.
 2. For wall applications, provide mortar that complies with requirements for nonsagging mortar in addition to the other requirements in ANSI A 118.1.
- B. Latex-Portland Cement Mortar (Thinset): ANSI A118.4. (Cement Board Walls)
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Custom Building Products.
 - b. Laticrete International, Inc.
 - c. MAPEi Corporation.
 2. For wall applications, provide mortar that complies with requirements for nonsagging mortar in addition to the other requirements in ANSI A 118.4.

2.7 GROUT MATERIALS

- A. Standard Cement Grout: ANSI A118.6.
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Custom Building Products.
 - b. Laticrete International, Inc.
 - c. MAPEi Corporation.

8. Water-Cleanable Epoxy Grout: ANSI A 118.3. (At Quarry Tile Locations)
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

CERAMIC TILING

- a. Custom Building Products.
- b. Laticrete International, Inc.
- c. MAPEi Corporation.

2.8 MISCELLANEOUS MATERIALS

- A Metal Edge Strips: Height to match tile and setting-bed thickness; anodized aluminum exposed-edge material.
1. Products: Subject to compliance with requirements, provide the following:
 - a. Schluter Systems L.P; Schluter-RONDEC.
- B. Trowelable Underlayments and Patching Compounds: Latex-modified, Portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.
- C. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.

2.9 MIXING MORTARS AND GROUT

- A Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.
- B. Add materials, water, and additives in accurate proportions.
- C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
1. Verify that substrates for setting tile are firm; dry; clean; free of coatings that are incompatible with tile-setting materials, including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.
 2. Verify that concrete substrates for tile floors installed with thinset mortar comply with surface finish requirements in ANSI A108.01 for installations indicated.
 - a. Verify that surfaces that received a steel trowel finish have been mechanically scarified.
 - b. Verify that protrusions, bumps, and ridges have been removed by sanding or grinding.
 3. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed.
 4. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

CERAMIC TILING

3.2 PREPARATION

1. Fill cracks, holes, and depressions in concrete substrates for tile floors installed with thinset mortar with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer.
2. Where indicated, prepare substrates to receive waterproofing by applying a reinforced mortar bed that complies with ANSI A108.1A and is sloped 1/4 inch per foot toward drains.
3. Blending: For tile exhibiting color variations, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

3.3 CERAMIC TILE INSTALLATION

1. Comply with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for TCNA installation methods specified in tile installation schedules. Comply with parts of the ANSI A 108 series "Specifications for Installation of Ceramic Tile" that are referenced in TCNA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.
 - a. For the following installations, follow procedures in the ANSI A.108 series of tile installation standards for providing 95 percent mortar coverage:
 - a. Tile floors in wet areas.
 - b. Tile floors consisting of tiles 8 by 8 inches or larger.
2. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
3. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.
4. Provide manufacturer's standard trim shapes where necessary to eliminate exposed tile edges.
5. Jointing Pattern: Lay tile in grid pattern unless otherwise indicated. Lay out tile work and center tile fields in both directions in each space or on each wall area. Lay out tile work to minimize the use of pieces that are less than half of a tile. Provide uniform joint widths unless otherwise indicated.
 - a. For tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets so joints between sheets are not apparent in finished work.
 - b. Where adjoining tiles on floor, base, walls, or trim are specified or indicated to be same size, align joints.
 - c. Where tiles are specified or indicated to be whole integer multiples of adjoining tiles on floor, base, walls, or trim, align joints unless otherwise indicated.
6. Joint Widths: Unless otherwise indicated, install tile with the following joint widths:
 - a. Ceramic Mosaic Tile: 1/8 inch.
 - b. Quarry Tile: 3/8 inch.
 - c. Glazed Wall Tile: 1/16 inch.
 - d. Porcelain Floor Tile: 3/16 inch or 1/4 inch.

e. Porcelain Wall Tile: 1/16 inch or 1/8 inch.

CERAMIC TILING

7. Lay out tile wainscots to dimensions indicated or to next full tile beyond dimensions indicated.
8. Expansion Joints: Provide expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated. Form joints during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.
 - a. Where joints occur in concrete substrates, locate joints in tile surfaces directly above them.
9. Metal Edge Strips: Install at locations indicated.

3.4 WATERPROOFING INSTALLATION

1. Install waterproofing to comply with ANSI A 108.13 and manufacturer's written instructions to produce waterproof membrane of uniform thickness that is bonded securely to substrate.
2. Allow waterproofing to cure and verify by testing that it is watertight before installing tile or setting materials over it.

3.5 ADJUSTING AND CLEANING

- A. Remove and replace tile that is damaged or that does not match adjoining tile. Provide new matching units, installed as specified and in a manner to eliminate evidence of replacement.
- B. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
 1. Remove grout residue from tile as soon as possible.
 2. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions but no sooner than 10 days after installation. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.

3.6 PROTECTION

- A. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear. If recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors.
- B. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.
- C. Before final inspection, remove protective coverings and rinse neutral protective cleaner from tile surfaces.

CERAMIC TILING

SECTION 09660 - RESILIENT TILE FLOORING

PART 1- GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Vinyl composition floor tile.
- B. Resilient wall base, reducer strips, and other accessories installed with resilient floor tiles are specified in Division 9 Section "Resilient Wall Base and Accessories."

1.3 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product data for each type of product specified.
 - 1. Certification by tile manufacturer that products supplied for tile installation comply with local regulations controlling use of volatile organic compounds (VOC's).
- C. Samples for verification purposes in full-size tiles of each different color and pattern of resilient floor tile specified, showing full range of variations expected in these characteristics.
- D. Product certificates, in lieu of laboratory test reports when permitted by Architect, signed by manufacturer certifying that each product complies with requirements.
- E. Maintenance data for resilient floor tile, to include in Operating and Maintenance Manual specified in Division 1.

1.4 QUALITY ASSURANCE

- A. Single-Source Responsibility for Floor Tile: Obtain each type, color, and pattern of tile from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of the Work.
- B. Fire Performance Characteristics: Provide resilient floor tile with the following fire performance characteristics as determined by testing products per ASTM test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
 - 1. Critical Radiant Flux: 0.45 watts per sq. cm or more per ASTM E 648.
 - 2. Smoke Density: Less than 450 per ASTM E 662.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver tiles and installation accessories to Project site in original manufacturer's unopened cartons and containers each bearing names of product and manufacturer, Project identification, and shipping and handling instructions.
- B. Store flooring materials in dry spaces protected from the weather with ambient temperatures maintained between 50 deg F (10 deg C) and 90 deg F (32 deg C).
- C. Store tiles on flat surfaces. Move tiles and installation accessories into spaces where they will be installed at least 48 hours in advance of installation.

1.6 PROJECT CONDITIONS

- A. Maintain a minimum temperature of 70 deg F (21 deg C) in spaces to receive tiles for at least 48 hours prior to installation, during installation, and for not less than 48 hours after installation. After this period, maintain a temperature of not less than 55 deg F (13 deg C).
- B. Do not install tiles until they are at the same temperature as the space where they are to be installed.
- C. Close spaces to traffic during tile installation.

1.7 SEQUENCING AND SCHEDULING

- A. Install tiles and accessories after other finishing operations, including painting, have been completed.
- B. Do not install tiles over concrete slabs until the slabs have cured and are sufficiently dry to bond with adhesive as determined by tile manufacturer's recommended bond and moisture test.

1.8 EXTRA MATERIALS

- A. Deliver extra materials to Owner. Furnish extra materials matching products installed as described below, packaged with protective covering for storage and identified with labels clearly describing contents.
 - 1. Furnish not less than one box for each 50 boxes or fraction thereof, of each class, wearing surface, color, pattern and size of resilient floor tile installed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Products: Subject to compliance with requirements, resilient floor tiles that may be incorporated in the Work include, but are not limited to, the products specified in each Product Data Sheet at end of this Section.

2.2 RESILIENT TILE

- A. Vinyl Composition Floor Tile: Products complying with ASTM F 1066, Composition 1 (nonasbestos formulated), and with requirements specified in Vinyl Composition Floor Tile Product Data Sheet at end of this Section.

2.3 INSTALLATION ACCESSORIES

- A. Concrete Slab Primer: Nonstaining type as recommended by flooring manufacturer.
- B. Trowelable Underlayment and Patching Compounds: Latex-modified, portland-cement-based formulation provided or approved by tile manufacturer for applications indicated.

- C. Adhesives (Cements): Water-resistant type recommended by tile manufacturer to suit resilient floor tile products and substrate conditions indicated.
- D. Metal Edge Strips: Extruded aluminum with mill finish of width shown, of height required to protect exposed edge of tiles, and in maximum available lengths to minimize running joints.

PART 3 -EXECUTION

3.1 EXAMINATION

- A. General: Examine areas where installation of tiles will occur, with Installer present, to verify that substrates and conditions are satisfactory for tile installation and comply with tile manufacturer's requirements and those specified in this Section.
- B. Concrete Subfloors: Verify that concrete slabs comply with ASTM F 710 and the following:
 - 1. Slab substrates are dry and free of curing compounds, sealers, hardeners, and other materials whose presence would interfere with bonding of adhesive. Determine adhesion and dryness characteristics by performing bond and moisture tests recommended by tile manufacturer.
 - 2. Finishes of subfloors comply with tolerances and other requirements specified in Division 3 Section "Cast-In-Place Concrete" for slabs receiving resilient flooring.
 - 3. Subfloors are free of cracks, ridges, depressions, scale, and foreign deposits of any kind.
- C. For wood subfloors verify the following:
 - 1. Underlayment over subfloor complies with requirements specified in Division 6 "Rough Carpentry."
 - 2. Underlayment surface is free of surface irregularities and substances with potential to interfere with adhesive bond, show through surface, or stain tile.
- D. Do not proceed with installation until unsatisfactory conditions have been corrected.
- E. For ceramic tile floor apply latex underlayment as recommended by the tile manufacturer.

3.2 PREPARATION

- A. General: Comply with manufacturer's installation specifications to prepare substrates indicated to receive tile.
- B. Use trowelable leveling and patching compounds per tile manufacturer's directions to fill cracks, holes, and depressions in substrates.
- C. Remove coatings, including curing compounds, and other substances that are incompatible with flooring adhesives and that contain soap, wax, oil, or silicone, by using a terrazzo or concrete grinder, a drum sander, or a polishing machine equipped with a heavy-duty wire brush.
- D. Broom or vacuum clean substrates to be covered by tiles immediately before tile installation. Following cleaning, examine substrates for moisture, alkaline salts, carbonation, or dust.
- E. Apply concrete slab primer, if recommended by flooring manufacturer, prior to applying adhesive. Apply according to manufacturer's directions.

3.3 INSTALLATION

- A. General: Comply with tile manufacturer's installation directions and other requirements indicated that are applicable to each type of tile installation included in Project.
- B. Lay out tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths at perimeter that equal less than one-half of a tile. Install tiles square with room axis, unless otherwise indicated.
- C. Match tiles for color and pattern by selecting tiles from cartons in same sequence as manufactured and packaged, if so numbered. Cut tiles neatly around all fixtures. Discard broken, cracked, chipped, or deformed tiles.
 - 1. Lay tiles with grain running in one direction.
- D. Where demountable partitions and other items are indicated for installing on top of finished tile floor, install tile before these items are installed.
- E. Scribe, cut, and fit tiles to butt tightly to vertical surfaces, permanent fixtures, built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings.
- F. Extend tiles into toe spaces, door reveals, closets, and similar openings.

- G. Maintain reference markers, holes, or openings that are in place or plainly marked for future cutting by repeating on finish flooring as marked on subfloor. Use chalk or other nonpermanent marking device.
- H. Install tiles on covers for telephone and electrical ducts, and similar items occurring within finished floor areas. Maintain overall continuity of color and pattern with pieces of flooring installed on these covers. Tightly adhere edges to perimeter of floor around covers and to covers.
- I. Adhere tiles to flooring substrates without producing open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, or other surface imperfections in completed tile installation.
- J. Use full spread of adhesive applied to substrate in compliance with tile manufacturer's directions including those for trowel notching, adhesive mixing, and adhesive open and working times.
- K. Hand roll tiles where required by tile manufacturer.

3.4 CLEANING AND PROTECTION

- A. Perform the following operations immediately after completing tile installation:
 - 1. Remove visible adhesive and other surface blemishes using cleaner recommended by tile manufacturers.
 - 2. Sweep or vacuum floor thoroughly.
 - 3. Do not wash floor until after time period recommended by resilient floor tile manufacturer.
 - 4. Damp-mop tile to remove black marks and soil.
- B. Protect flooring against marks, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period. Use protection methods indicated or recommended by tile manufacturer.
 - 1. Apply protective floor polish to tile surfaces that are free from soil, visible adhesive, and surface blemishes.
 - a. Use commercially available, metal, cross-linked acrylic product acceptable to tile manufacturer.
 - b. Coordinate selection of floor polish with Owner's maintenance service.

2. Cover tiles with undyed , untreated building paper until inspection for Substantial Completion.
 3. Do not move heavy and sharp objects directly over tiles. Place plywood or hardboard panels over tiles and under objects while they are being moved. Slide or roll objects over panels without moving panels.
- C. Clean tiles not more than 4 days prior to dates scheduled for inspections intended to establish date of Substantial Completion in each area of Project. Clean tiles using method recommended by manufacturer.
1. Strip protective floor polish that was applied after completing installation prior to cleaning.
 2. Reapply floor polish after cleaning.

END OF SECTION 09660

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VINYL COMPOSIDON FLOOR TILE PRODUCT DATA SHEET

Vinyl Composition Floor Tile Designation: VCT#1 and VCT #2

Qm: VCT #1 Class 2 (through pattern tile).] VCT #2 Class 3 (Surface Pattern Tile)

Wearing Surface: VCT #1 Smooth. VCT #2 Embossed.

Thickness: 1/8 inch - VCT #1 & VCT #2

Size: 12-by-12 inches - VCT #1 & VCT #2

Color and Pattern: As selected by Architect from manufacturer's full range of colors and patterns produced for tile of class, wearing surface, thickness, size, and pattern specified or as specified by product designation below.

Available Products: Armstrong Stonetex - VCT #1
Armstrong Step Master Slip Resistant Tile - VCT #2

SECTION 09678 - RESILIENT WALL BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Resilient wall base.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 9 Section "Resilient Tile Flooring."

1.3 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product data for each type of product specified.
- C. Samples for verification purposes in manufacturer's standard sizes, but not less than 12 inches long, of each different color and pattern of product specified.
- D. Product certificates, in lieu of laboratory test reports when permitted by Architect, signed by manufacturer certifying that each product complies with requirements.

1.4 QUALITY ASSURANCE

- A. Single-Source Responsibility for Products: Obtain each type and color of product specified from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of the Work.
- B. Fire Performance Characteristics: Provide products with the following fire performance characteristics as determined by testing products per ASTM test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.

1. Critical Radiant Flux: 0.45 watts per sq. cm or more per ASTM E 648.
2. Smoke Density: Less than 450 per ASTM E 662.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to Project site in original manufacturer's unopened cartons and containers, each bearing names of product and manufacturer, Project identification, and shipping and handling instructions.
- B. Store products in dry spaces protected from the weather with ambient temperatures maintained between 50 deg F (10 deg C) and 90 deg F (32 deg C).
- C. Move products into spaces where they will be installed at least 48 hours in advance of installation.

1.6 PROJECT CONDITIONS

- A. Maintain a minimum temperature of 70 deg F (21 deg C) in spaces to receive products specified in this Section for at least 48 hours prior to installation, during installation, and for not less than 48 hours after installation. After this period, maintain a temperature of not less than 55 deg F (13 deg C).
- B. Do not install products until they are at the same temperature as that of the space where they are to be installed.
- C. Close spaces to traffic during installation of products specified in this Section.

1.7 SEQUENCING AND SCHEDULING

- A. Sequence installing products specified in this Section with other construction to minimize possibility of damage and soiling during remainder of construction period.

1.8 EXTRA MATERIALS

- A. Deliver extra materials to Owner. Furnish extra materials matching products installed as described below, packaged with protective covering for storage, and identified with labels clearly describing contents.
 1. Furnish not less than 10 linear feet for each 500 linear feet or fraction thereof of each different type and color of resilient wall base installed.

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PART 2 - PRODUCTS

2.1 1 MANUFACTURERS

- A. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, those specified in each Product Data Sheet at end of this Section.

2.2 RESILIENT WALL BASE

- A. Vinyl Wall Base: Products complying with FS SS-W-40, Type TI, and requirements specified in the Vinyl Wall Base Product Data Sheet at end of this Section.

2.3 INSTALLATION ACCESSORIES

- A. Concrete Slab Primer: Nonstaining type as recommended by flooring manufacturer.
- B. Trowelable Underlayments and Patching Compounds: Latex-modified, portland-cement-based formulation provided or approved by flooring manufacturer for applications indicated.
- C. Adhesives: Water-resistant type recommended by manufacturer to suit resilient flooring product and substrate conditions indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine ~~at~~ where installation of products specified in this Section will occur, with Installer present, to verify that substrates and conditions are satisfactory for installation and comply with manufacturer's requirements and those specified in this Section.

3.2 PREPARATION

- A. General: Comply with manufacturer's installation specifications for preparing substrates indicated to receive products indicated.
- B. Use trowelable leveling and patching compounds per manufacturers directions to fill cracks, holes, and depressions in substrates.
- C. Remove coatings, including curing compounds, and other substances that are incompatible with flooring adhesives and that contain soap, wax, oil, or silicone, by using a terrazzo or concrete grinder, a drum sander, or a polishing machine equipped

with a heavy-duty wire brush.

- D. Broom or vacuum clean substrates to be covered immediately before installing products specified in this Section. Following cleaning, examine substrates for moisture, alkaline salts, carbonation, or dust.
- E. Apply concrete slab primer, if recommended by flooring manufacturer, prior to applying adhesive. Apply according to manufacturer's directions.

3.3 INSTALLATION

- A. General: Install products specified in this Section using methods indicated according to manufacturer's installation directions.
- B. Apply resilient wall base to walls, columns, pilasters, casework, and other permanent fixtures in rooms and areas where base is required. Install wall base in lengths as long as practicable. Tightly adhere wall base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
 - 1. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient wall base with manufacturer's recommended adhesive filler material.
 - 2. Install inside and exterior corners before installing straight pieces.
 - 3. Form inside corners on job from straight pieces of maximum lengths possible by cutting an inverted V-shaped notch in toe of wall base at the point where corner is formed. Shave back of base where necessary to produce snug fit to substrate.
 - 4. Form outside corners on job from straight pieces of maximum lengths possible by shaving back of base at point where bending will occur. Remove a strip perpendicular to length of base and only deep enough to produce a snug fit without bends whitening or removal of more than half the thickness of wall base.
- C. Place resilient accessories so they are butted to adjacent materials of type indicated and bond to substrates with adhesive. Install reducer strips at edges of flooring that otherwise would be exposed.

3.4 CLEANING AND PROTECTION

- A. Perform the following operations immediately after completing installation:
 - 1. Remove visible adhesive and other surface blemishes using cleaner recommended by manufacturers of resilient product involved.
 - 2. Sweep or vacuum floor thoroughly.
 - 3. Do not wash floor until after time period recommended by manufacturer.
 - 4. Damp-mop resilient accessories to remove black marks and soil.

- B. Protect flooring against mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period. Use protection methods indicated or recommended by manufacturer of resilient product involved.
 - 1. Apply protective floor polish to resilient accessories that are free from soil, visible adhesive, and surface blemishes.
 - a. Use commercially available metal, cross-linked, acrylic product acceptable to resilient accessory manufacturer.
 - b. Coordinate selection of floor polish with Owner's maintenance service.
- C. Clean products specified in this Section not more than 4 days prior to dates scheduled for inspections intended to establish date of Substantial Completion in each area of Project. Clean products using method recommended by manufacturer.
 - 1. Strip protective floor polish that was applied after completing installation, prior to cleaning.
 - 2. Reapply floor polish after cleaning.

VINYL WALL BASE PRODUCT DATA SHEET:

Vinyl Wall Base:

filyk Cove with top-set toe.

Minimum Thickness: 0.080 inch.

Height: 4 inches.

Lengths: Coils in lengths standard with manufacturer but not less than 96 feet.

Exterior Comers: Premolded or formed on job.

Interior Comers: Premolded or formed on job.

Surface Characteristics: Smooth.

Color and Pattern: _____As selected by Architect from manufacturer's full range of colors and patterns produced for vinyl wall base complying with requirements indicated.

Available Products: Standard Vinyl Base as manufactured by Armstrong.

END OF SECTION 09678

SECTION 09900 - PAINTING

-PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division I Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes surface preparation, painting, and finishing of exposed interior and exterior items and surfaces.
 1. Surface preparation, priming, and finish coats specified in this Section are in addition to shop-priming and surface treatment specified under other Sections.
- B. Paint exposed surfaces whether or not colors are designated in schedules, except where a surface or material is specifically indicated not to be painted or is to remain natural. Where an item or surface is not specifically mentioned, paint the same as similar adjacent materials or surfaces. If color or finish is not designated, the Architect will select from standard colors or finishes available.
 1. Painting includes field-painting exposed bare and covered pipes and ducts (including color coding), hangers, exposed steel and iron work, and primed metal surfaces of mechanical and electrical equipment.
- C. Painting is not required on prefinished items, finished metal surfaces, concealed surfaces, operating parts, and labels.
 1. Prefinished items not to be painted include the following factory-finished components:
 - a. Metal toilet enclosures.
 - b. Acoustic materials.
 - c. Architectural woodwork and casework.
 - d. Elevator entrance doors and frames.
 - e. Elevator equipment.
 - f. Finished mechanical and electrical equipment.
 - g. Light fixtures.
 - h. Switchgear.
 - i. Distribution cabinets.

2. Concealed surfaces not to be painted include wall or ceiling surfaces in the following generally inaccessible areas:
 - a. Foundation spaces.
 - b. Furred areas.
 - c. Utility tunnels.
 - d. Pipe spaces.
 - e. Duct shafts.
 - f. Elevator shafts.
 3. Finished metal surfaces not to be painted include:
 - a. Anodized aluminum.
 - b. Stainless steel.
 - c. Chromium plate.
 - d. Copper.
 - e. Bronze.
 - f. Brass.
 4. Operating parts not to be painted include moving parts of operating equipment, such as the following:
 - a. Valve and damper operators.
 - b. Linkages.
 - c. Sensing devices.
 - d. Motor and fan shafts.
 5. Labels: Do not paint over Underwriters Laboratories, Factory Mutual or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.
- D. Related Sections: The following Sections contain requirements- that relate to this Section:
1. Division 8 Section "Standard Steel Doors and Frames" for shop-priming steel doors and frames.
 2. Divisions 15 and 16: Painting mechanical and electrical work is specified in Divisions 15 and 16, respectively.

13 SUBMITTALS

- A. General: Submit the following according to Conditions of the Contract and Division 1 Specification Sections.
- B. Samples for initial color selection in the form of manufacturer's color charts.
 1. After color selection, the Architect will furnish color chips for surfaces to be

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coated.

- C. Samples for Verification Purposes: Provide samples of each color and material to be applied, with texture to simulate actual conditions, on representative samples of the actual substrate.
1. Provide stepped samples, defining each separate coat, including block fillers and primers. Use representative colors when preparing samples for review. Resubmit until required sheen, color, and texture are achieved.
 2. Provide a list of material and application for each coat of each sample. Label each sample as to location and application.
 3. Submit samples on the following substrates for the Architect's review of color and texture only:
 - a. Painted Wood: Provide two 12-inch-square samples of each color and material on hardboard.
 - b. Ferrous Metal: Provide two 4-inch-square samples of flat metal and two 8-inch-long samples of solid metal for each color and finish.

14 QUALITY ASSURANCE

- A. Applicator Qualifications: Engage an experienced applicator who has completed painting system applications similar in material and extent to those indicated for the Project that have resulted in a construction record of successful in-service performance.
- B. Single-Source Responsibility: Provide primers and undercoat paint produced by the same manufacturer as the finish coats.
- C. Field Samples: ·On wall surfaces and other exterior and interior components, duplicate finishes of prepared samples. Provide full-coat finish samples on at least 100 sq. ft. of surface until required sheen, color, and texture are obtained; simulate finished lighting conditions for review of in-place work.
1. Final acceptance of colors will be from job-applied samples.
 2. The Architect will select one room or surface to represent surfaces and conditions for each type of coating and substrate to be painted. Apply coatings in this room or surface according to the schedule or as specified.
 - a. After finishes are accepted, this room or surface will be used to evaluate coating systems of a similar nature.

15 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to the job site in the manufacturer's original, unopened packages and

containers bearing manufacturer's name and label, and the following information:

1. Product name or title of material.
 2. Product description (generic classification or binder type).
 3. Manufacturer's stock number and date of manufacture.
 4. Contents by volume, for pigment and vehicle constituents.
 5. Thinning instructions.
 6. Application instructions.
 7. Color name and number.
- B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F (7 deg C). Maintain containers used in storage in a clean condition, free of foreign materials and residue.
1. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

1.6 JOB CONDITIONS

- A. Apply water-based paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 50 deg F (10 deg C) and 90 deg F (32 deg C).
- B. Apply solvent-thinned paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 45 deg F (7 deg C) and 95 deg F (35 deg C).
- C. Do not apply paint in snow, rain, fog, or mist; or when the relative humidity exceeds 85 percent; or at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.
 1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by the manufacturer during application and drying periods.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:

1. Devoe and Reynolds Co. (Devoe).
2. Fuller O'Brien (Fuller).
3. The Glidden Company (Glidden).
4. Benjamin Moore and Co. (Moore).
5. PPG Industries, Pittsburgh Paints (PPG).
6. Pratt and Lambert (P & L).
7. The Sherwin-Williams Company (S-W).

2.2 PAINT MATERIALS, GENERAL

- A. Material Compatibility: Provide block fillers, primers, finish coat materials, and related materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by the manufacturer based on testing and field experience.
- B. Material Quality: Provide the manufacturer's best-quality trade sale paint material of the various coating types specified. Paint material containers not displaying manufacturer's product identification will not be acceptable.
 1. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish the manufacturer's material data and certificates of performance for proposed substitutions.
- C. Colors: Provide color selections made by the Architect from the manufacturer's full range of standard colors.

2.3 PRIMERS

- A. Primers: Provide the manufacturer's recommended factory-formulated primers that are compatible with the substrate and finish coats indicated.
- B. Available Products: Subject to compliance with requirements, prime coat materials that may be incorporated in the Work include, but are not limited to, the following:
 1. Gypsum Drywall Primer: White, interior, latex-based primer.
 - a. Devoe: 50801 Wonder-Tones Latex Primer and Sealer.
 - b. Fuller: Pro-Tech Interior Latex Wall Primer and Sealer.
 - c. Glidden: 5019 PVA Primer.
 - d. Moore: Moore's Latex Quick-Dry Prime Seal #201.

- e. PPG: 6-2 Quick-Dry Latex Primer Sealer.
 - f. P & L: Latex Wall Primer Z30001.
 - g. S-W: ProMar 200 Latex Wall Primer B28W200.
2. Exterior Primer Coating: Exterior, alkyd wood primer.
- a. Devoe: 1102 All-Weather Alkyd House Paint Primer.
 - b. Fuller: 220-23 Exterior Wood and Masonry Primer.
 - c. Glidden: 1951 Spred Gel-Flo Base Coat.
 - d. Moore: Moorwhite Primer #100.
 - e. PPG: 1-70 or 1-870 Sun-Proof Exterior Wood Primer.
 - f. P & L: Permalize Exterior Primer.
 - g. S-W: A-100 Exterior Alkyd Wood Primer Y24W20.
3. Ferrous Metal Primers: Synthetic, quick-drying, rust-inhibiting primers.
- a. Devoe: 13101 Mirrolac Cover UpRust Penetrating Primer.
 - b. Fuller: 621-04 Blox-Rust Alkyd Metal Primer.
 - c. Glidden: 5210 Glid-Guard Universal Fast-Dry Metal Primer.
 - d. Moore: Ironclad Retardo Rust-Inhibitive Paint #163.
 - e. PPG: 6-208 Red Inhibitive Metal Primer.
 - f. P & L: Effecto Rust-Inhibiting Primer.
 - g. S-W: Kem Kromik Metal Primer B50N2/B50W1.

2.4 EXTERIOR FINISH PAINT MATERIAL

- A. Finish Paint: Provide the manufacturer's recommended factory-finished finish-coat materials that are compatible with the substrate and undercoats indicated.
- B. Available Products: Subject to compliance with requirements, finish coat materials that may be incorporated in the Work include, but are not limited to, the following:

- 1. Exterior Acrylic Emulsion: Quick-drying, flat, acrylic paint.
 - a. Devoe: 15XX Wonder-Shield Exterior Acrylic Latex Flat House Paint.
 - b. Fuller: 262-XX 100% Acrylic Exterior Flat Finish.
 - c. Glidden: 3525 Spred Glide-On.
 - d. Moore: Moore's Flat Exterior Latex Masonry & House Paint #105.
 - e. PPG: 72 Line Sun-Proof Acrylic Latex House Paint.
 - f. P & L: Vapex Latex Flat House Paint.
 - g. S-W: A-100 Acrylic Latex Flat Exterior Finish

A-6 Series.

2. Deep-Color, Exterior Alkyd Resin Trim Paint: Deep-color, ready-mixed alkyd paint.
 - a. Devoe: 155 All-Weather Exterior Alkyd Gloss House and Trim Paint Ultra Deep Base.
 - b. Fuller: 660-:XX Weather King Alkyd House & Trim Paint.
 - c. Glidden: 1901 Spred Dura Gloss Oil House Paint.
 - d. Moore: Moore's House Paint #110.
 - e. PPG: 1 Line Sun-Proof Deeptone or Rustic Base Wood Finish.
 - f. P & L: Effecto Enamel.
 - g. S-W: SWP Exterior Gloss Finish A-2 Series.

3. Medium-Shade, Exterior, Ready-Mixed Oil Paint: Medium-shade, ready-mixed oil or alkyd-oil paint.
 - a. Devoe: 1:XX All-Weather Alkyd Gloss House and Trim Paint.
 - b. Fuller: 660-:XX Weather King Alkyd House & Trim Paint.
 - c. Glidden: 1901 Spred Dura Gloss Oil House Paint.
 - d. Moore: Moore's House Paint #110.
 - e. PPG: 1 Line Sun-Proof Midtone Base Wood Finish.
 - f. P & L: Effecto Enamel.
 - g. S-W: SWP Exterior Gloss Paint A-2 Series.

4. Gloss Alkyd Enamel: Weather-resistant, high-gloss enamel.
 - a. Devoe: 70:XX Mirrolac Interior/Exterior Alkyd-Urethane Gloss Enamel.
 - b. Fuller: 312-:XX epa Compliant Heavy Duty Enamel.
 - c. Glidden: 4500 Glid-Guard Industrial Enamel.
 - d. Moore: Impervo High-Gloss Enamel #133.
 - e. PPG: 54 Line Quick-Dry Enamel.
 - f. p & L: Effecto Enamel.
 - g. S-W: Industrial Enamel B-54 Series.

5. Deep-Color, Exterior, Alkyd Resin Trim Paint: Deep-color, ready-mixed alkyd paint.
 - a. Devoe: 155 All-Weather Exterior Alkyd Gloss House and

- b. Fuller: Trim Paint Ultra Deep Base.
660-XX Weather King Alkyd House & Trim Paint.
 - c. Glidden: 1901 Spred Dura Gloss Oil House Paint.
 - d. Moore: Moore's House Paint #110.
 - e. PPG: 1 Line Sun-Proof Deeptone or Rustic Base Wood Finish.
 - f. P & L: Effecto Enamel.
 - g. S-W: SWP Exterior Gloss Finish A-2 Series.

- 6. Lusterless Alkyd Enamel: Flat, alkyd-based enamel.
 - a. Devoe: 564XX De-Vo-Ko LQ-Lustre Alkyd H.P.
 - b. Moore: Moore's PentaFlex Flat House Paint #114.
 - c. PPG: 50-52 Exterior Alkyd Flat Paint.
 - d. S-W: ProMar Alkyd Flat Exterior Finish B38 Series.

- 7. Gloss Alkyd Enamel: Weather-resistant, high-gloss enamel.
 - a. Devoe: 70XX Mirrolac Interior/Exterior Alkyd-Urethane Gloss Enamel.
 - b. Fuller: 312-XX EPA Compliant Heavy Duty Enamel.
 - c. Glidden: 4500-Line Glid-Guard Industrial Enamel.
 - d. Moore: Impervo High-Gloss Enamel #133.
 - e. PPG: 54 Line Quick-Dry Enamel.
 - f. P & L: Effecto Enamel.
 - g. S-W: Industrial Enamel B-54 Series.

2.5 INTERIOR FINISH PAINT MATERIAL

- A. Finish Paint: Provide the manufacturer's recommended factory-formulated finish-coat materials that are compatible with the substrate and undercoats indicated.

- B. Available Products: Subject to compliance with requirements, finish coat materials that may be incorporated in the Work include, but are not limited to, the following:
 - 1. Interior, Flat, Latex-Based Paint: Ready-mixed, latex-based paint for a flat finish.
 - a. Devoe: 36XX Wonder-Tones Latex Flat Wall Paint.
 - b. Fuller: 602XX Liquid Velvet Latex Wall Paint.
 - c. Glidden: 3400 Spred Satin Latex Wall Paint.
 - d. Moore: Regal Wall Satin #215.
 - e. PPG: 80 Line Wallhide Flat Latex Paint.
 - f. P & L: Vapex Latex Flat Wall Finish.
 - g. S-W: Classic 99 Wall and Trim Paint A27W10.

2. Interior, Semigloss, Odorless Alkyd Enamel: Semigloss, low-odor, alkyd enamel.

- a. Devoe: 26XX Velour Alkyd Semigloss Enamel.
- b. Fuller: 110XX Fullerglo Alkyd Semigloss Enamel.
- c. Glidden: 4200 Spred Ultra Semigloss Enamel.
- d. Moore: Moore's Satin Impervo Enamel #235.
- e. PPG: 27 Line Wallhide Semigloss Enamel.
- f. P & L: Cellu-Tone Alkyd Satin Enamel.
- g. S-W: Classic 99 Semigloss Enamel A40 Series.

3. Interior, Flat, Latex-Based Paint: Ready-mixed, latex-based paint.

- a. Devoe: 36XX Wonder-Tones Latex Flat Wall Paint.
- b. Fuller: 602XX Liquid Velvet Latex Wall Paint.
- c. Glidden: 3400 Spred Satin Latex Wall Paint.
- d. Moore: Regal Wall Satin #215.
- e. PPG: 50-35 Latex Ceiling Paint.
- f. P & L: Vapex Latex Flat Wall Finish.
- g. S-W: Classic 99 Wall and Trim Paint A27W10.

4. Exterior, Gloss, Alkyd Enamel:

- a. Devoe: 70XX Mirrolac Interior/Exterior Alkyd-Urethane Gloss Enamel.
- b. Fuller: 312XX EPA Compliant Heavy Duty Enamel.
- c. Glidden: 4500 Gild-Guard Industrial Enamel.
- d. Moore: Impervo High-Gloss Enamel #133.
- e. PPG: 54 Line Quick-Dry Enamel.
- f. P & L: Effecto Enamel.
- g. S-W: Industrial Enamel B-54 Series.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions under which painting will be performed for compliance with paint application requirements. Surfaces receiving paint must be thoroughly dry before paint is applied.

- 1. Do not begin to apply paint until unsatisfactory conditions have been corrected.
- 2. Start of painting will be construed as the Applicator's acceptance of surfaces and conditions within a particular area.

- B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.
1. Notify the Architect about anticipated problems using the materials specified over substrates primed by others.

3.2 PREPARATION

- A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted, or provide surface-applied protection prior to surface preparation and painting. Remove these items, if necessary, to completely paint the items and adjacent surfaces. Following completion of painting operations in each space or area, have items reinstalled by workers skilled in the trades involved.
- B. Cleaning: Before applying paint or other surface treatments, clean the substrates of substances that could impair the bond of the various coatings. Remove oil and grease prior to cleaning. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces. (--
- C. Surface Preparation: Clean and prepare surfaces to be painted according to the manufacturer's instructions for each particular substrate condition and as specified. /
1. Provide barrier coats over incompatible primers or remove and reprime. Notify Architect in writing about anticipated problems using the specified finish-coat material with substrates primed by others.
 2. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.
 - a. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before applying primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.
 - b. Prime, wood to be painted immediately upon delivery. Prime edges, ends, faces, undersides, and backsides of wood, including cabinets, counters, cases, and paneling. (
 - c. Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately upon delivery.
 3. Ferrous Metals: Clean ungalvanized ferrous metal surfaces that have not been shop-coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with recommendations of the Steel Structures Painting Council (SSPC).

- a. Blast steel surfaces clean as recommended by the paint system manufacturer and according to requirements of SSPC specification SSPC-SP 10.
 - b. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.
 - c. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by the paint manufacturer, and touch up with the same primer as the shop coat.
- D. Materials Preparation: Carefully mix and prepare paint materials according to manufacturer's directions.
1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
 2. Stir material before application to produce a mixture of uniform density; stir as required during application. Do not stir surface film into material. Remove film and, if necessary, strain material before using.
 3. Use only thinners approved by the paint manufacturer and only within recommended limits.
- E. Tinting: Tint each undercoat a lighter shade to facilitate identification of each coat where multiple coats of the same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

3.3 APPLICATION

- A. General: Apply paint according to manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied.
- B. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
1. Paint colors, surface treatments, and finishes are indicated in the schedules.
 2. Provide finish coats that are compatible with primers used.
 3. The number of coats and the film thickness required are the same regardless of the application method. Do not apply succeeding coats until the previous coat has cured as recommended by the manufacturer. Sand between applications where sanding is required to produce a smooth even surface according to the manufacturer's directions.
 4. Apply additional coats if undercoats, stains, or other conditions show through final coat of paint until paint film is of uniform finish, color, and appearance. Give special attention to ensure that surfaces, including edges, corners, crevices, welds, and exposed fasteners, receive a dry film thickness equivalent to that of flat surfaces.
 5. The term exposed surfaces includes areas visible when permanent or built-in

-fixtures, convector covers, covers for finned tube radiation, grilles, and similar components are in place. Extend coatings in these areas, as required, to maintain the system integrity and provide desired protection.

6. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before the final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
 7. Paint interior surfaces of ducts, where visible through registers or grilles, with a flat, nonspecular black paint.
 8. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
 9. Finish interior of wall and base cabinets and similar field-finished casework to match exterior.
 10. Finish exterior doors on tops, bottoms, and side edges same as exterior faces.
 11. Sand lightly between each succeeding enamel or varnish coat.
 12. Omit primer on metal surfaces that have been shop-primed and touch-up painted.
- C. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
1. Allow sufficient time between successive coats to permit proper drying. Do not recoat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and where application of another coat of paint does not cause the undercoat to lift or lose adhesion.
- D. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to the manufacturer's direction.
1. Brushes: Use brushes best suited for the material applied.
 2. Rollers: Use rollers of carpet, velvet back, or high-pile sheep's wool as recommended by the manufacturer for the material and texture required.
 3. Spray Equipment: Use airless spray equipment with orifice size as recommended by the manufacturer for the material and texture required.
- E. Minimum Coating Thickness: Apply materials no thinner than the manufacturer's recommended spreading rate. Provide the total dry film thickness of the entire system **as** recommended by the manufacturer.
- F. Mechanical and Electrical Work: Painting mechanical and electrical work is limited to items exposed in mechanical equipment rooms and in occupied spaces.
- G. Mechanical items to be painted include, but are not limited to, the following:
1. Piping, pipe hangers, and supports.
 2. Heat exchangers.
 3. Tanks.
 4. Ductwork.

5. Insulation.
6. Supports.
7. Motors and mechanical equipment.
8. Accessory items.

H. Electrical items to be painted include, but are not limited to, the following:

1. Conduit and fittings.
2. Switchgear.

I. Block Fillers: Apply block fillers to concrete masonry block at a rate to ensure complete coverage with pores filled.

J. Prime Coats: Before applying finish coats, apply a prime coat of material, as recommended by the manufacturer, to material that is required to be painted or finished and that has not been prime-coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no bum-through or other defects due to insufficient sealing.

K. Pigmented (Opaque) Finishes: Completely cover to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.

L. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with specified requirements.

3.4 FIELD QUALITY CONTROL

A. The Owner reserves the right to invoke the following test procedure at any time and as often as the Owner deems necessary during the period when paint is being applied:

1. The Owner will engage the services of an independent testing agency to sample the paint material being used. Samples of material delivered to the Project will be taken, identified, sealed, and certified in the presence of the Contractor.
2. The testing agency will perform appropriate tests for the following characteristics as required by the Owner:
 - a. Quantitative materials analysis.
 - b. Abrasion resistance.
 - c. Apparent reflectivity.
 - d. Flexibility.
 - e. Washability.
 - f. Absorption.
 - g. Accelerated weathering.
 - h. Dry opacity.
 - i. Accelerated yellowness.
 - j. Recoating.

-
- k. . Skinning.
- l. Color retention.
- m. Alkali and mildew resistance.

3. If test results show material being used does not comply with specified requirements, the Contractor may be directed to stop painting, remove noncomplying paint, pay for testing, repaint surfaces coated with rejected paint, and remove rejected paint from previously painted surfaces if, upon repainting with specified paint, the two coatings are incompatible.

3.5 CLEANING

- A. Cleanup: At the end of each work day, remove empty cans, rags, rubbish, and other discarded paint materials from the site.
 1. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping. Be careful not to scratch or damage adjacent finished surfaces.

3.6 PROTECTION

- A. Protect work of other trades, whether being painted or not, against damage by painting. Correct damage by cleaning, repairing or replacing, and repainting, as acceptable to Architect.
- B. Provide "Wet Paint" signs to protect newly painted finishes. . Remove temporary protective wrappings provided by others to protect their work after completing painting operations.
 1. At completion of construction activities of other trades, touch up and restore damaged {Jr defaced painted surfaces.

3.7 EXTERIOR PAINT SCHEDULE

- A. General: Provide the following paint systems for the various substrates indicated.
- B. Wood:
 1. Low-Luster Finish: Two finish coats over primer.
 - a. Primer: Exterior primer coating.
 - 1) Devoe: 1102 All-Weather Alkyd House Paint Primer.

- 2) Fuller: 220-23 Exterior Wood and Masonry Primer.
- 3) Glidden: 1951 Spred Gel-Flo Base Coat.
- 4) Moore: Moorwhite Primer #100.
- 5) PPG: 1-70 or 1-870 Sun-Proof Exterior Wood Primer.
- 6) P & L: Permalize Exterior Primer.
- 7) S-W: A-100 Exterior Alkyd Wood Primer Y24W20.

b. First and Second Coats: Exterior acrylic emulsion.

- 1) Devoe: 15:XX Wonder-Shield Exterior Acrylic Latex Flat House Paint.
- 2) Fuller: 667-XX Ful-Stain Flat Latex House Paint.
- 3) Glidden: 3600 Spred House Paint.
- 4) Moore: Moorgard Latex House Paint #103.
- 5) PPG: 72 Line Sun-Proof Acrylic Latex House Paint.
- 6) P & L: Vapex Latex Flat House Paint.
- 7) S-W: A100 Acrylic Latex Flat Exterior Finish A-6 Series.

C. Plywood Siding:

1. Lusterless (Flat) Acrylic Finish: Two finish coats over primer and sealer.

a. Sealer: Varnish-type surface sealer.

- 1) Devoe: 1502 Wonder Shield Exterior Acrylic Latex House Paint Primer.
- 2) Glidden: 3651 Spred House Paint Prime Coat.
- 3) PPG: 77-1 Rez Sealer Primer.
- 4) P & L: Varmor Penetrating Sealer.
- 5) S-W: Chek Gard Primer B42W10.

b. Primer: Exterior primer coating.

- 1) Devoe: 1102 All-Weather Alkyd House Paint Primer.
- 2) Fuller: 220-08 Exterior Latex Wood Primer.
- 3) Glidden: 3651 Spred House Paint Prime Coat.
- 4) Moore: Moorwhite Primer #100.
- 5) PPG: 1-70 or 1-870 Sun-Proof Exterior Wood Primer.
- 6) P & L: Permalize Exterior Primer.
- 7) S-W: A-100 Exterior Alkyd Wood Primer Y24W20.

c. First and Second Coats: Exterior acrylic emulsion.

- 1) Devoe: 15:XX Wonder-Shield Exterior Acrylic Latex Flat House Paint.
- 2) Fuller: 667-XX Ful-Stain Flat Latex House Paint.
- 3) Glidden: 3600 Spred House Paint.
- 4) Moore: Moorgard Latex House Paint #103.
- 5) PPG: 72 Line Sun-Proof Acrylic Latex House Paint.
- 6) P & L: Vapex Latex Flat House Paint.
- 7) S-W: AIOO Acrylic Latex Flat Exterior Finish A-6 Series.

D. Ferrous Metal: Primer is not required on shop-primed items.

1. Full-Gloss Alkyd Enamel: Two finish coats over primer.

a. Primer: Synthetic rust-inhibiting primer.

- 1) Devoe: 14920 Bar-Ox Quick Dry Metal Primer, Red.
- 2) Fuller: 621-4 Blox-Rust Alkyd Metal Primer.
- 3) Glidden: 5210 Glid-Guard Universal Fast-Dry Metal Primer.
- 4) Moore: IronClad Retardo Rust-Inhibitive Paint #163.
- 5) PPG: 6-208 Red Inhibitive Metal Primer.
- 6) P & L: Effecto Rust-Inhibiting Primer.
- 7) S-W: Kem Kromik Metal Primer B50N2/B50W1.

b. First and Second Coats: Gloss alkyd enamel.

- 1) Devoe: 70XX Mirrolac Interior / Exterior Alkyd-Urethane Gloss Enamel.
- 2) Fuller: 312-XX EPA Compliant Heavy Duty Enamel.
- 3) Glidden: 4500 Glid-Guard Industrial Enamel.
- 4) Moore: Impervo High-Gloss Enamel #133.
- 5) PPG: 54 Line Quick-Dry Enamel.
- 6) P & L: Effecto Enamel.
- 7) S-W: Industrial Enamel B-54 Series.

2. Lusterless Alkyd Enamel: Two finish coats over primer.

a. Primer: Synthetic rust-inhibiting primer.

- 1) Devoe: 14920 Bar-Ox Quick Dry Metal Primer, Red.

- 2) Moore: IronClad Retardo Rust-Inhibitive Paint #163.
- 3) PPG: 6-208 Red Inhibitive Metal Primer.
- 4) S-W: Kem Kromik Metal Primer B50N2/B50W1.

b. First and Second Coats: Lusterless alkyd enamel.

- 1) Devoe: 564XX De-Vo-Ko Lo-Lustre Alkyd H.P.
- 2) Moore: Moore's PentaFlex Flat House Paint #114.
- 3) PPG: 50-52 Snolite Exterior Alkyd Flat House Paint.
- 4) S-W: ProMar Alkyd Flat Exterior Finish B38 Series.

3. Deep-Color, High-Gloss Alkyd Trim Enamel: Two coats over primer.

a. Primer: Alkyd-type primer.

- 1) Devoe: 41820 Bar-Ox Alkyd Shop/Field Primer Grey.
- 2) Fuller: 621-5 Blox-Rust Latex Metal Primer.
- 3) Glidden: 5205 Glid-Guard Tank and Structural Primer.
- 4) Moore: Ironclad Retardo Rust-Inhibitive Paint #163.
- 5) PPG: 6-612 Speedhide Inhibitive White Primer.
- 6) p & L: Effecto Primer Red or White.
- 7) S-W: Kem Kromik Metal Primer B50N2/B50W1.

b. First and Second Coats: Deep-color, exterior, alkyd resin trim paint.

- 1) Devoe: 155 All-Weather Exterior Alkyd Gloss House and Trim Paint Ultra Deep Base.
- 2) Fuller: 660-XX Weather King Alkyd House & Trim Paint.
- 3) Glidden: 1901 Spred Dura Gloss Oil House Paint.
- 4) Moore: Moore's House Paint #110.
- 5) PPG: 1 Line Sun-Proof Deeptone or Rustic Base Wood Finish.
- 6) P & L: Effecto Enamel.
- 7) S-W: SWP Exterior Gloss Finish A-2 Series.

3.8 INTERIOR PAINT SCHEDULE

- A. General: Provide the following paint systems for the various substrates, as indicated.
- B. Gypsum Drywall Systems:

1. Lusterless (Flat) Emulsion Finish: Two coats.
 - a. Primer: White, interior, latex-based primer.
 - 1) Devoe: 50801 Wonder-Tones Latex Primer and Sealer.
 - 2) Fuller: Pro-Tech Interior Latex Wall Primer and Sealer.
 - 3) Glidden: 5019 PVA Primer.
 - 4) Moore: Moore's Latex Quick-Dry Prime Seal #201.
 - 5) PPG: 6-2 Quick-Dry Latex Primer Sealer.
 - 6) p & L: Latex Wall Primer 230001.
 - 7) S-W: Pro-Mar 200 Latex Wall Primer B28W200.
 - b. Finish Coat: Interior, flat, latex-based paint.
 - 1) Devoe: 36XX Wonder-Tones Latex Flat Wall Paint.
 - 2) Fuller: 602:XX Liquid Velvet Latex Wall Paint.
 - 3) Glidden: 3400 Spred Satin Latex Wall Paint.
 - 4) Moore: Regal Wall Satin #215.
 - 5) PPG: 80 Line Wallhide Flat Latex Paint.
 - 6) P & L: Vapex Latex Flat Wall Finish.
 - 7) S-W: Classic 99 Wall and Trim Paint A27W10.
2. Odorless Semigloss Alkyd Enamel Finish: Three coats with total dry film thickness not less than 2.5 mils.
 - a. Primer: White, interior, latex-based primer.
 - 1) Devoe: 50801 Wonder-Tones Latex Primer and Sealer.
 - 2) Fuller: Pro-Tech Interior Latex Wall Primer and Sealer.
 - 3) Glidden: 5019 PVA Primer.
 - 4) Moore: Moore's Latex Quick-Dry Prime Seal #201.
 - 5) PPG: 6-2 Quick-Dry Latex Primer Sealer.
 - 6) P & L: Latex Wall Primer 230001.
 - 7) S-W: Pro-Mar 200 Latex Wall Primer B28W200.
 - b. First and Second Coats: Interior, semigloss, odorless, alkyd enamel.
 - 1) Devoe: 26:XX Velour Alkyd Semigloss Enamel.
 - 2) Fuller: 110:XX Fullerglo Alkyd Semigloss Enamel.
 - 3) Glidden: 4200 Spred Ultra Semigloss Enamel.
 - 4) Moore: Moore's Satin Impervo Enamel #235.
 - 5) PPG: 27 Line Wallhide Semigloss Enamel.
 - 6) P & L: Cellu-Tone Alkyd Satin Enamel.
 - 7) S-W: Classic 99 Semigloss Enamel A40 Series.

C. Wood:

1. Semigloss Enamel Finish: Three coats.

a. Undercoat: Interior enamel undercoat.

- | | |
|-------------|-----------------------------------------------|
| 1) Devoe: | 8801 Velour Alkyd Enamel Undercoat. |
| 2) Fuller: | 220-07 Interior Alkyd Enamel Undercoat. |
| 3) Glidden: | 310 Glidden Wood Undercoater. |
| 4) Moore: | Moore's Alkyd Enamel Underbody #217. |
| 5) PPG: | 6-6 Speedhide Quick-Dry Enamel Undercoater. |
| 6) P & L: | Interior Trim Primer. |
| 7) S-W: | Pro-Mar 200 Alkyd Enamel Undercoater B49W200. |

b. First and Second Coats: Interior, semigloss, odorless, alkyd enamel.

- | | |
|-------------|------------------------------------------|
| 1) Devoe: | 26X:X Velour Alkyd Semigloss Enamel. |
| 2) Fuller: | 110X:X Fullerglo Alkyd Semigloss Enamel. |
| 3) Glidden: | 4200 Spred Ultra Semigloss Enamel. |
| 4) Moore: | Moore's Satin Impervo Enamel #235. |
| 5) PPG: | 27 Line Wallhide Semigloss Enamel. |
| 6) P & L: | Cellu-Tone Alkyd Satin Enamel. |
| 7) S-W: | Classic 99 emigloss Enamel A40 Series. |

D. Ferrous Metal:

1. Lusterless (Flat) Finish: Two finish coats over primer with total dry film thickness not less than 2.5 mils.

a. Primer: Synthetic, quick-drying, rust-inhibiting primer.

- | | |
|-------------|--------------------------------------------------|
| 1) Devoe: | 14920 Bar-Ox Quick Dry Metal Primer, Red. |
| 2) Fuller: | 621-04 Blox-Rust Alkyd Metal Primer. |
| 3) Glidden: | 5210 Glid-Guard Universal Fast-Dry Metal Primer. |
| 4) Moore: | Ironclad Retardo Rust-Inhibitive Paint #163. |
| 5) PPG: | 6-208 Red Inhibitive Metal Primer. |
| 6) P & L: | Effecto Rust-Inhibiting Primer. |
| 7) S-W: | Kem Kromik Metal Primer B50N2/B50W1. |

b. First and Second Coats: Interior, flat, latex-based paint.

- 1) Devoe: 36XX Wonder-Tones Latex Flat Wall Paint.
- 2) Fuller: 602XX Liquid Velvet Latex Wall Paint.
- 3) Glidden: 3400 Spred Satin Latex Wall Paint.
- 4) Moore: Regal Wall Satin #215.
- 5) PPG: 80 Line Wallhide Flat Latex Paint.
- 6) p & L: Vapex Latex Flat Wall Finish.
- 7) S-W: Classic 99 Wall and Trim Paint A27W10.

2. Semigloss Enamel Finish: Two coats over primer with total dry film thickness not less than 2.5 mils.

a. Primer: Synthetic, quick-drying, rust-inhibiting primer.

- 1) Devoe: 14920 Bar-Ox Quick Dry Metal Primer, Red.
- 2) Fuller: 621-04 Blox-Rust Alkyd Metal Primer.
- 3) Glidden: 5210 Glid-Guard Universal Fast-Dry Metal Primer.
- 4) Moore: Ironclad Retardo Rust-Inhibitive Paint #163.
- 5) PPG: 6-208 Red Inhibitive Metal Primer.
- 6) p & L: Effecto Rust-Inhibiting Primer.
- 7) S-W: Kem Kromik Metal Primer B50N2/B50W1.

b. Undercoat: Interior enamel undercoat.

- 1) Devoe: 8801 Velour Alkyd Enamel Undercoat.
- 2) Fuller: 220-07 Interior Alkyd Enamel Undercoat.
- 3) Glidden: 4200 Spred Ultra Semi-Gloss Enamel.
- 4) Moore: Moore's Alkyd Enamel Underbody #217.
- 5) PPG: 6-6 Speedhide Quick-Dry Enamel Undercoater.
- 6) P & L: Interior Trim Primer.
- 7) S-W: Pro-Mar 200 Alkyd Enamel Undercoater B49W200.

c. Finish Coat: Interior, semigloss, odorless, alkyd enamel.

- 1) Devoe: 26XX Velour Alkyd Semigloss Enamel.
- 2) Fuller: 110XX Fullerglo Alkyd Semigloss Enamel.
- 3) Glidden: 4200 Spred Ultra Semigloss Enamel.
- 4) Moore: Moore's Satin Impervo Enamel #235.
- 5) PPG: 27 Line Wallhide Semigloss Enamel.
- 6) P & L: Cellu-Tone Alkyd Satin Enamel.
- 7) S-W: Classic 99 Semigloss Enamel A40 Series.

END OF SECTION 09900

SECTION 10160 - BATHTUB-SHOWER LINERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes stock, manufactured Porcelain Enamel Bathtub Liners and Tub Surround Wall Panels.
- B. Toilet accessories, such as toilet paper holders, grab bars, and purse shelves, are specified in another Division 10 Section.

1.3 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product data for materials, fabrication, and installation including catalog cuts of anchors, hardware, fastenings, and accessories.
- C. Shop drawings for fabrication and erection of toilet compartment assemblies not fully described by product drawings, templates, and instructions for installation of anchorage devices built into other work.
- D. Samples of full range of colors for each type of unit required. Submit 6-inch-square samples of each color and finish on same substrate to be used in work, for color verification after selections have been made.

1.4 QUALITY ASSURANCE

- A. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication, where possible, to ensure proper fitting of work. However, allow for adjustments where taking of field measurements before fabrication might delay work.
- B. Coordination: Furnish inserts and anchorages which must be built into other work for installation of toilet compartments and related items. Coordinate delivery with other work to avoid delay.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the Work include, but are not limited to, the following:

1. The Nemiroff Corporation

2.2 MATERIALS

- A. General: Provide materials which have been selected for surface flatness and smoothness. Exposed surfaces which exhibit pitting, seam marks, roller marks, stains, discolorations, telegraphing of core material, or other imperfections on finished units are not acceptable.
- B. Materials: The Bathtub Liner fixture shall be made from sheet steel and coated with real Porcelain Enamel in accordance with Product Standard ANSI-A 112.19.4-1977, PORCELAIN ENAMELED FORMED STEEL PLUMBING FIXTURES - The American Society of Mechanical Engineers.
- C. Sheet Steels: The thickness of the sheet metal shall be No. 16 gauge thru 20 gauge.
- D. Porcelain Enamel: An initial enamel coating shall be applied to all surfaces and an "additional" separately fired coating of chemically resistant porcelain enamel shall be applied as a cover coat on the surfaces normally visible after installation.
- E. Sealants: All joints, seams and perimeter edges are to be sealed with Silicone Sealant, G.E. No. SCS 1702 or approved equal.
- F. Testing: Porcelain Enameled Formed Steel Plumbing Fixtures must generally comply with: ANSI-A112.19.4-1977, as developed under the procedures of the AMERICAN NATIONAL STANDARD, and published by The American Society of Mechanical Engineers.
- G. Filler Material/Backer Board: Clearances between base of old bathtubs and TubLiner are to be partially lined with bracing strips made of a Perlite or Dorvon molded polystyrene material. See 5.1 and 5.2. This material is to be similarly used as a Backer Board between the Wall panels and the existing masonry walls. Filler material shall comply with Specifications HH-1-524a and MIL-P-40619. Filler material shall further perform a function of a sound deadening and cushioning material.

2.3 FABRICATION

- A. General: Furnish standard panels fabricated for compartment system. Furnish units with cutouts, drilled holes, and internal reinforcement to receive partition-mounted hardware, accessories, and grab bars, as indicated.
- B. Panels shall be solid sections and continuous to cover areas as indicated on the Contract Drawings. The method of securing Panels shall not be visible. Wall Clips supporting Panels shall be minimum size 20 GA. Clips shall be galvanized in accordance with Federal Specifications WW-P-541b, Par. 9.6. Provide at least two (2) clips on both top and bottom flanges of each Panel. There shall be no exposed bolts, screw heads, grommets, battens, channel moldings or any other fastening devices.
- C. Panels must be bright, hard, impervious and easy to clean. Walls must retain their surface characteristics and must resist wear as a result of abrasion or scouring and staining due to the use of ordinarily household abrasive cleansers in popular use.
- D. Fastening devices shall be as required and in accordance with panel manufacturer's instructions and accepted good industry practices and as approved by the Owner. They shall be as follows; Expansion Toggle Bolts, Molly Bolts, Nylon and other Plastic Anchors. Lead Anchors or as required and subject to existing wall conditions.
- E. Panel Backer Board shall be a minimum 1/2 inch thick and as specified in Section 8.0, Filler Material/Backer Board.
- F. Enclosures shall be made from 18 thru 22 Ga. steel and coated with Porcelain Enamel applied in accordance with accepted industry practices.
- G. The Porcelain Enamel shall be applied to all areas of each unit, including backs and flanges. Porcelain Enamel must be hard, impervious and durable-, glass-like coating produced by fusing a carefully compounded mixture of the mineral substances such as Cryolite, Feldspar, Quartz, Borax, Silica, Tin and Zirconium Oxides and Clays at temperatures up to 1,800 Degrees F.
- H. Initial enamel coating shall be applied to all surfaces and additional separately fired coating of chemically resistant Porcelain Enamel shall be applied as a face coat.

2.4 FINISH

- A. Color: Color as selected by Architect.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. **Gene:** Walls Panels shall be installed as installed as an extension of the bathtub in an upward direction bearing the configuring of a bathtub and shower enclosure.
- B. The option is given the Contractor to install a one, two, three piece back wall system.
- C. Installation shall be made without grouting. All perimeter edges between new Panels and existing walls, including corner joint between windows and back wall or the two side walls, must be permanently sealed with Silicone Sealant as manufactured by General Electric SCS 1702, Dow Corning 784 or approved equal.
- D. All panels edges shall have a 90 degree flange formed as part of the face panel and of same finish.
- E. Contractor shall open or channel the bathroom wall and disconnect the existing bath spout and complete valve at the tub seat and shall replace each assembly with the equipment as specified elsewhere herein. Coordinate installation of showers with installation of Tub Wall Surrounds.
- F. The 1/2 inch shower riser pipe shall be Copper pipe, Type L Hard, standard pipe size conforming to the standards of ASTM current edition with a minimum copper content of 85. All lengths shall have the identifying names stamped on the metal. Pipes shall be so installed as to render them immobile and shall be supported by at least one conduit and pipe hanger.
- G. Fittings shall be screwed cast brass of the 125 pound or beaded malleable pattern class with a minimum copper content of 85 or cast or wrought copper fittings as required by good workmanship. At the time of the installation of the new Tub Liners, contractor is required to remove the existing waste assembly and replace same with a new L.A. Pattern "P" Trap as specified elsewhere, to the closet existing fitting on the outlet side of said new trap.

END OF SECTION 10160

SECTION 10800 - TOILET AND BATH ACCESSORIES

,pART1-GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes toilet and bath accessory items.

1.3 SUBMITTALS

- A. General: Submit the following according to Conditions of Contract and Division 1 Specifications Sections.
- B. Product data for each toilet accessory item specified, including construction details relative to materials, dimensions, gages, profiles, mounting method, specified options, and finishes.
- C. Schedule indicating types, quantities, sizes, and installation locations (by room) for each toilet accessory item to be provided for project.
- D. Setting drawings where cutouts are required in other work, including templates, substrate preparation instructions, and directions for preparing cutouts and installing anchorage devices.
- E. Maintenance instructions including replaceable parts and service recommendations.

1.4 QUALITY ASSURANCE

- A. Inserts and Anchorages: Furnish accessory manufacturers' standard inserts and anchoring devices that must be set in concrete or built into masonry. Coordinate delivery with other work to avoid delay.
- B. Single-Source Responsibility: Provide products of same manufacturer for each type of accessory unit and for units exposed to view in same areas, unless otherwise acceptable to Architect.

- A. Multipurpose Units: Provide combination unit fabricated of stainless steel with seamless 1-inch-wide wall flange, mirrored door with tumbler lock and continuous piano hinge, paper towel dispenser, 80-ounce minimum capacity soap dispenser with sight gauge and tumbler lock for servicing, shelf above soap dispenser, and the following features.
 - 1. Soap Valve for dispensing soap in liquid form.
 - 2. Towel Dispenser: Capacity for 400 C-fold towels or 700 multifold towels, designed to dispense either type without special adapters.
 - 3. Mounting: Surface mounted, concealed anchorage, and stainless steel collar.

2.7 GRAB BARS

- A. Stainless Steel Type: Provide grab bars with wall thickness not less than 0.05 inch (18 gage) and as follows:
 - 1. Mounting: Exposed, manufacturer's standard flanges and anchorages.
 - 2. Clearance: 1-1/2-inch clearance between wall surface and inside face of bar.
 - 3. Gripping Surfaces: Manufacturer's standard nonslip texture.

2.8 SOAP DISPENSERS

- A. Liquid Soap Dispenser, Horizontal-Tank Type: Fabricate for surface mounting, sized for 40-fluid-ounce minimum capacity. Provide stainless steel piston, springs, and internal parts designed to dispense soap in measured quantity by pump action. Provide cover of type 304 stainless steel in No. 4 finish, with unbreakable window-type refill indicator.
 - 1. Equip unit with push-type valve for dispensing soap in liquid form.

2.9 SHOWER AND BATH ACCESSORIES

- A. Shower Curtain Rod, Normal Duty: 1-inch o.d., 0.04-inch (20-gage) stainless steel, satin finish; furnish with 3-inch o.d., minimum 0.04-inch (20-gage) stainless steel flanges with satin finish, designed for exposed fasteners.
- B. Vinyl Shower Curtain: 42-inch-wide by 72-inch-high by minimum 8-mil-thick, opaque, matte vinyl material with hemmed edges and corrosion-resistant grommets at minimum 6 inches o.c. through top hem. Furnish in white color.
- C. Towel Bar: 24-inch-long, satin-finished, Type 304 stainless steel tubular (3/4-inch-square) bar and rectangular end brackets. Provide galvanized backplates for concealed mounting.

2.10 FOLDING SHOWER SEAT

- A. Heavy-duty hinged seat designed to fold up against wall when not in use. Provide support braces, hinges, frame, and fasteners of Type 304 stainless steel. Construct frame of all-welded tubular construction for maximum strength. Provide seat with configuration and seating surface material as follows:
 - 1. Configuration: L-shaped seat, designed for easy wheelchair access.
 - 2. Seat Material: Phenolic or polymeric composite of either slat type or one-piece construction. Color as selected from manufacturer's standard selections.

2.11 MISCELLANEOUS ACCESSORIES

- A. Medicine Cabinet: Unit designed for recessed mounting in nominal 4-inch wall depth consisting of hinged stainless steel framed mirror door concealing storage cabinet with minimum three adjustable shelves. Door equipped with full-length, piano hinge and spring-buffered, rod-type stop and magnetic door catch. Fabricate mirror frame, door, hinge, cabinet and shelves of stainless steel, mirror-glass quality, as specified under "Materials, General." Furnish in nominal 18-by-24-inch mirror size.
- B. Tumbler and Toothbrush Holder: Satin-finished stainless steel unit with 2-1/4-inch-diameter hole in center to hold tumbler and two holes on each side to accommodate total of four toothbrushes; rectangular wall bracket equipped with backplate for concealed mounting.
- C. Soap Dish: Satin-finished, stainless steel soap dish with rectangular wall bracket equipped with backplate for concealed mounting.
- D. Towel Pin: Satin-finished, stainless steel pin projecting minimum of 3 inches from wall surface; rectangular wall bracket with backplate for concealed mounting.
- E. Towel Ring: Satin-finished, stainless steel pin projection in nominal 2-1/2 inches from wall with trapezoidal ring 1/4-inch in diameter, Type 18-8 stainless steel; rectangular wall bracket with backplate for concealed mounting.

2.12 MIRROR UNITS

- A. Standard Stainless Steel Framed Mirror Units: Fabricate frame with channel shapes not less than 0.04 inch (20 gage), with square corners carefully mitered to hairline joints and mechanically interlocked. Provide in Type 430 bright polished finish.
- B. Fixed-Tilt, Stainless Steel Framed Mirror Units: Fabricate frame of not less than 0.04-inch (20-gage) stainless steel, with all joints mitered, welded, and ground smooth. Construct frame so that taper is not less than 3 inches from top to bottom.

2.13 FABRICATION

- A. General: Only a maximum 1-1/2-inch-diameter, unobtrusive stamped manufacturer logo, as approved by Architect, is permitted on exposed face of toilet or bath accessory units. On either interior surface not exposed to view or back surface,

provide additional identification by either a printed, waterproof label or a stamped nameplate, indicating manufacturer's name and product model number.

- B. General: No names or labels are permitted on exposed faces of toilet and bath accessory units. On either interior surface not exposed to view or on back surface, provide identification of each accessory item either by a printed, waterproof label or a stamped nameplate indicating manufacturer's name and product model number.
- C. Surface-Mounted Toilet Accessories, General: Except where otherwise indicated, fabricate units with tight seams and joints, exposed edges rolled. Hang doors or access panels with continuous stainless steel piano hinge. Provide concealed anchorage wherever possible.
- D. Framed Mirror Units, General: Fabricate frames for glass mirror units to accommodate wood, felt, plastic, or other glass edge protection material. Provide mirror backing and support system that will permit rigid, tamperproof glass installation and prevent moisture accumulation, as follows:
 - 1. Provide galvanized-steel backing sheet, not less than 0.034 inch (22 gage) and full mirror size, with nonabsorptive filler material. Corrugated cardboard is not an acceptable filler material.
- E. Mirror Unit Hangers: Provide system for mounting mirror units that **Will** permit rigid, tamperproof, and theftproof installation, as follows:
 - 1. One-piece, galvanized-steel, wall-hanger device with spring-action locking mechanism to hold mirror unit in position with no exposed screws or bolts.
- F. Keys: Provide universal keys for access to toilet accessory units requiring internal access for servicing, resupply, etc. Provide minimum of six keys to Owner's representative.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install toilet accessory units according to manufacturers' instructions, using fasteners appropriate to substrate as recommended by unit manufacturer. Install units plumb and level, firmly anchored in locations and at heights indicated.
- B. Secure mirrors to walls in concealed, tamperproof manner with special hangers, toggle bolts, or screws. Set units plumb, level, and square at locations indicated, according to manufacturer's instructions for type of substrate involved.
- C. Install grab bars to withstand a downward load of at least 250 ~~lb~~ ^{lf}, complying with ASTM F 446.

3.2 ADJUSTING AND CLEANING

- A. Adjust toilet accessories for proper operation and verify that mechanisms function smoothly. Replace damaged or defective items.
- B. Clean and polish all exposed surfaces strictly according to manufacturer's recommendations after removing temporary labels and protective coatings.

END OF SECTION 10800

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SECTION 11452 - RESIDENTIAL APPLIANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following types of residential appliances:
 - 1. Cooking equipment, including ranges and ovens.
 - 2. Range hoods.
 - 3. Refrigerator/freezers.
 - 4. Dishwashers.
- B. Related Sections: The following sections contain requirements that relate to this Section:
 - 1. Food service equipment is specified in Division 11 Section "Food Service Equipment."
 - 2. Unit kitchens are specified in Division 11 Section "Unit Kitchens. "
 - 3. Kitchen sinks, waste disposers and instant hot water dispensers are specified in Division 15 Section "Plumbing Fixtures."
 - 4. Plumbing connections for appliances are specified in Division 15.
 - 5. Electric services and connections for appliances are specified in Division 16.

1.3 SUBMITTALS

- A. General: Submit the following according to Conditions of the Contract and Division 1 Specification Sections.
- B. Product data for each appliance type required indicating compliance with requirements, including installation instructions. Provide complete operating and maintenance instructions for each appliance.
- C. Schedule: Submit schedule of appliances, using the same room designations as shown on drawings.
 - 1. Example of required format for appliance schedule is included in last article of this Section.

1.4 QUALITY ASSURANCE

- A. Energy Ratings: Provide residential appliances that carry labels indicating energy cost analysis (estimated annual operating costs) and efficiency information as required by Federal Trade Commission.
- B. UL and NEMA Compliance: Provide electrical components required as part of residential appliances that are listed and labeled by UL and comply with applicable NEMA standards.
- C. AGA and ANSI Standards: Provide gas-burning appliances that carry the design certification seal of the American Gas Association (AGA) and comply with ANSI Z21-Series standards.
- D. AHAM Standards: Provide appliances that conform to the following standards of the Association of Home Appliance Manufacturers:
 - 1. Refrigerators and Freezers: Total volume and shelf area ratings certified according to ANSI/ AHAM HRF-1.
- E. Single-Source Responsibility: Obtain appliances from a single supplier.
 - 1. Provide products from the same manufacturer for each type of appliance required.
 - 2. To the greatest extent possible, provide appliances by a single manufacturer for entire Project.
- F. Design Criteria: The drawings indicate sizes, profiles, and dimensional requirements of residential appliances and are based on the specific types and models indicated. Appliances by other manufacturers may be considered, provided deviations in dimensions and profiles are minor and do not change the design concept as judged by the Architect. The burden of proof of equality is on the proposer.
- G. All appliances located in handicapped accessible units shall meet ADA and UFAS requirements.

1.5 DELIVERY AND STORAGE

- A. Deliver appliances to the Project site in the manufacturer's undamaged protective packaging.
- B. Delay delivery of appliances until utility rough-in is complete and construction in the spaces to receive appliances is substantially complete and ready for installation.

1.6 WARRANTIES

- A. Warranty: Submit written warranties executed by the manufacturer of each appliance specified agreeing to repair or replace units or components that fail in materials or workmanship within the specified warranty period.
 - 1. Electric Range: 4-year limited warranty on surface burner elements.
 - 2. Refrigerator/Freezer: 5-year warranty on the sealed refrigeration system.
 - 3. Dishwasher: 5-year warranty on the dishwasher motor and pump and 10-year warranty against rust on stainless steel components.
- B. Warranties specified above shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under requirements of the Contract Documents.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering appliances that may be incorporated in the Work include, but are not limited to, the following:
 - 1. Admiral Company.
 - 2. Amana Refrigeration, Inc.
 - 3. Caloric Corporation.
 - 4. Frigidaire Appliance Company.
 - 5. General Electric Company.
 - 6. Hotpoint.
 - 7. Kitchen_Aid, Inc.
 - 8. Magic Chef, Inc.
 - 9. Maytag Company.
 - 10. Modern Maid Company.
 - 11. Whirlpool Corporation.

2.2 ELECTRIC RANGES

- A. Freestanding Electric Range: Provide 30-inch-wide, freestanding electric range with four-burner cooktop, oven, full-width storage drawer, and combination surface burner and oven control panel mounted above backsplash at rear of cooking surface. Provide four adjustable leveling legs.
 - 1. Cooktop Deck: Provide hinged, tilt-up, recessed cooktop with four surface burners.

- a. Cooktop Surface: Porcelain enamel.
 - b. Backsplash: Chrome-trimmed porcelain enamel.
 - c. Burner Type: Provide two 8-inch (2100 watts maximum) and two 6-inch (1500 watts maximum) plug-in coil burner elements.
 - d) Burner Trim: Provide each burner with a removable chrome-plated drip pan and chrome-plated trim ring.
2. Oven: Provide oven with a 2500-watt bake element, a 3400-watt broil element, and an interior oven light. Include porcelain enamel interior; four rack levels; two removable, tilt-proof, chrome-plated, self-locking racks; a two-piece porcelain enamel broiler pan; and a counterbalanced removable oven door with a towel bar handle.
- a. Oven Type: Self-cleaning.
 - or
 - b. Oven Type: Continuous-cleaning.
 - c. Oven Door Type: Porcelain enamel with observation window.
3. Control Panel: . Provide combined surface burner and oven control panel. Include surface burner controls, burner "ON" indicator light, oven controls, automatic oven timer control and clock.
- a. Control Panel Material: Porcelain enamel.
 - b. Controls: Rotary type with removable knobs.
 - or
 - c. Controls: Solid-state electronic, touch type.
 - d. Clock Type: Electronic.
 - or
 - e. Clock Type: Digital.
 - f. Cooktop Light: Provide full-width, fluorescent -light for cooktop illumination.
4. Storage Drawer: Provide removable, full-width storage drawer below oven.
- a. Storage Drawer Front Panel: Porcelain enamel.
5. . Trim: Provide the manufacturer's standard, optional, trim kit, including the following:
- a. Rear trim strip.
 - b. Backsplash.
 - c. Vertical side trim.

2.3 GAS RANGES

- A. Freestanding Gas Range: Provide 30-inch-wide, freestanding, gas range with four-burner cooktop, oven, waist-high broiler, combination surface burner and oven control panel mounted above the oven door in front of the cooking surface, and storage drawer below the oven. Provide four adjustable leveling legs.
1. Cooktop Type: Provide recessed cooktop with surface burners sealed into the cooktop surface.
 - a. Cooktop Surface: Porcelain enamel.
 - b. Backsplash: Porcelain enamel with clock and oven timer.
 - c. Cooktop Light: Provide full-width fluorescent light for cooktop illumination.
 2. Oven: Provide oven with 15,000-Btu/hr oven burner and 15,000-Btu/hr broiler burner. Include porcelain enamel interior; interior oven light; four rack levels; two removable, tilt-proof, chrome-plated, self-locking racks; and a two-piece, porcelain enamel broiler pan. Provide counterbalanced, gasketed, removable oven door with a towel-bar handle.
 - a. Oven Type: Self-cleaning.
or
 - b. Oven Type: Continuous-cleaning.
 - c. Oven Door Type: Porcelain enamel with observation window.
 - d. Broiler Type: Waist-level broiler in the oven.

2.4 EXHAUST HOODS

- A. Ventilating Exhaust Hood: Provide 30-inch hood for mounting below wall cabinets, with two-speed fan rated at 160 cfm minimum, permanent washable filter, and built-in lighting. Include exhaust duct and wall or roof cap and shutter.
1. Duct Type: 7-inch-diameter round or to match existing.
 2. Fan Exhaust: Vertical or rear exhaust to match existing.
 3. Fan Control: Two-position rocker switch.
 4. Finish: Baked Enamel.
- B. Recirculating, Nonventing Range Hood: Provide 30-inch hood for mounting below wall cabinets, with one- or two-speed fan, permanent washable grease filter, replaceable charcoal odor filter, and built-in lighting.
1. Fan Control: Two-position rocker switch.
 2. Finish: Baked Enamel.

2.5 REFRIGERATOR/FREEZERS

- A. Top-Mount Freezer-Type Refrigerator/Freezer: Provide freestanding, frost-free, two-door, top-mount freezer model refrigerator/freezer on adjustable rollers, and reversible doors with door shelves.
 - 1. Capacity: Provide the following minimum values, measured according to ANSI/AHAM HRF-1 and certified by AHAM:
 - a. Total volume: 14.5 cu. ft.

2.6 DISHWASHERS

- A. Built-In Dishwasher: Provide under-the-counter automatic dishwasher sized to replace 24-inch base cabinet. Dishwasher shall be operable at water pressures from 15 to 120 psi and shall not require more than 12.0 gallons of water for normal wash cycle. Provide two wash levels. Include full-extension, vinyl-coated upper and lower dish racks and removable silverware basket. Provide sound-absorbing exterior insulation blanket around tub and back to reduce noise. Include soft food disposer and self-cleaning food filter system.
 - 1. Tub and Door Liner: Provide dishwasher with porcelain enamel interior.
 - a. Detergent Dispenser: Provide sealed detergent dispenser and automatic rinsing-aid dispenser in the door liner.
 - 2. Wash Cycles: Provide dishwasher unit with normal wash, light (low-energy) wash, and rinse-and-hold wash cycles.
 - 3. Dry Cycles: Provide dishwasher unit with hot-air dry and energy-saving, heat-off, drying cycles.
 - 4. Control Type: Rotary dial, turn-to-start type.
 - 5. Finish: Provide the manufacturer's standard, reversible panels, with choice of colors for door front and lower access panel.

2.7 FINISHES

- A. General: Provide the manufacturer's standard porcelain enamel finish.
- B. Colors: White.
 - 1. Wherever residential appliances by more than one manufacturer are installed in the same space, provide units with color matching largest equipment item.

PART 3 - EXECUTION

=3;1 INSTALLATION

- A. General: Comply with manufacturer's instructions and recommendations.
- B. Built-In Equipment: Securely anchor units to supporting cabinets or countertops with concealed fasteners. Verify that clearances are adequate for proper functioning and rough openings are completely concealed.
- C. Freestanding Equipment: Place units in final locations after finishes have been completed in each area. Verify that clearances are adequate to properly operate equipment.
- D. Utilities: Refer to Divisions 15 and 16 for plumbing and electrical requirements.

3.2 ADJUST AND CLEAN

- A. Testing: Test each item of residential equipment to verify proper operation. Make necessary adjustments.
- B. Accessories: Verify that accessory items required have been furnished and installed.
- C. Cleaning: Remove packing material from residential equipment items and leave units in clean condition, ready for operation.

END OF SECTION 114S2

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,SECTION 12372 - KITCHEN CASEWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes wood kitchen cabinets and plastic laminate countertops.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 11 Section "Residential Appliances" for appliances mounted in kitchen casework.
 - 2. Division 15 Section "Plumbing Fixtures" for sink units mounted in countertops.

1.3 DEFINITIONS

- A. Exposed Surfaces: Surfaces visible when drawers and opaque doors are closed; behind clear glass doors; bottoms of casework 43 inches or more above finished floor.
- B. Semi-Exposed Surfaces: Surfaces which become visible when opaque doors are open or drawers are extended; bottoms of casework are more than 30 inches and less than 42 inches above finished floor.
- C. Concealed Surfaces: Surfaces considered concealed when surfaces not visible after installation; bottoms of casework less than 30 inches above finished floor; tops of casework over 78 inches above finished floor and not visible from an upper level; stretchers, blocking, and components concealed by drawers.
- D. Flush Overlay: Door and drawer faces cover cabinet frame with space between faces sufficient for operating clearance.

1.4 SUBMITTALS

- A. General: Submit the following according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product data for each casework type specified.
- C. Product data for each hardware type specified.
- D. Shop drawings for casework showing location and size, accessories, materials, finishes, and filler panels. Include fully dimensioned plans, elevations, and anchorage details to countertop and walls.
- E. Shop drawings for countertops showing sizes, shapes, edge and backsplash profiles, cutouts for plumbing fixtures, and methods of joining.
- F. Samples for verification purposes in full-size units of each type of material indicated; in sets for each color, texture, and pattern specified, showing the full range of variations expected in these characteristics.
 - 1. 12-inch-square samples of wood with a transparent finish for each species.
 - 2. 12-inch-square samples of veneered plywood with a transparent finish.
 - 3. 12-inch-square samples of plastic laminate for countertops.
 - 4. One unit of each type of exposed hardware.
- G. Product certificates signed by the manufacturer certifying that materials furnished comply with specified requirements.
- H. Maintenance data for kitchen casework to include in the "Operating and Maintenance Manual" specified in Division 1.

1.5 QUALITY ASSURANCE

- A. Kitchen Casework: Comply with ANSI/KCMA A161.1 and HUD "Minimum Property Standards," Housing 4910.1, paragraph 611-1.1.
 - 1. KCMA Certification: Provide kitchen casework with Kitchen Cabinet Manufacturers Association (KCMA) "Certified Cabinet" seal affixed in a semiexposed location of each unit, showing compliance with above standard and with all HUD standards.

- B. Plastic Laminate Countertops: Comply with ANSI A161.2.
- C. Single-Source Responsibility: Obtain kitchen casework from one source of a single manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver casework as factory-assembled units, packaged individually.

1.7 PROJECT CONDITIONS

- A. Environmental Conditions: Comply with casework manufacturer's written requirements for temperature and humidity conditions during storage and installation. Do not install casework until these conditions have been attained and stabilized.
- B. Field Measurements: Verify casework dimensions by field measurements. Verify kitchen casework can be installed in compliance with the original design and referenced standards.
- C. Field Measurements: Verify countertop size and shape prior to fabrication by field measurements taken after base units are installed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
 - 1. Kitchen Casework:
 - a. Imperial Cabinet Co., Inc.
 - b. Merillat Ind., Inc.
 - c. Triangle Pacific Corp.
 - d. Yorktowne Cabinets.
 - e. Evans Cabinet Corporation

2. Plastic Laminate for Countertops:

- a. Abet Laminati Inc.
- b. Formica Corp.
- c. Laminart.
- d. Nevamar Corp.
- e. Pioneer Plastics Corp., Pionite.
- f. Westinghouse Electric Corp., Micarta Div.
- g. Wilson Plastics Co., Wilsonart.

2.2 CABINET MATERIALS, GENERAL

- A. Sizes, dimensions, and thicknesses given are minimum dimensions.
- B. Particleboard: ANSI A208.1, mat-formed particleboard, Grade I-M-2 with minimum density of 40 pcf, internal bond of 60 psi, and minimum screw-holding capacity of 225 lb on faces and 200 lb on edges.
- C. Hardwood Plywood: ANSI/HPMA HP hardwood and decorative plywood, Good Grade (1) or better.
- D. Particleboard Core Plywood: ANSI/HPMA HP hardwood and decorative plywood, Good Grade (1) or better.
- E. Solid Wood: Clear, dry, sound, and free of defects selected from First Grade lumber as defined by NHLA.
- F. Hardboard: ANSI A 135.4, Class 1, tempered.
- G. Plastic Laminate: NEMA LD 3.
 - 1. Provide colorthrough plastic laminate.

2.3 WOOD FACE CASEWORK SPECIES AND STYLE

- A. Solid Wood and Face Veneer Species: Natural birch.
- B. Face Style: Flush overlay.

-2.4 WOOD FACE CASEWORK FABRICATION

- A. Face Frame: 1-by-1-5/8-inch solid wood frame rails and stiles with glued mortise and tenon joints.
- B. Flush Door and Drawer Fronts: 1/2-inch-thick, 5-ply, hardwood plywood with h_ardwood face veneers and crossbanding.
- C. Door and Drawer Fronts: Solid wood stiles and rails, 3/4 inch thick for doors and 3/4 inch thick for drawer fronts, with 1/4-inch-thick plywood for center panels.
- D. Back, Top, and Bottom Rails: 3/4-by-3-inch solid wood, interlocking with end panels and rabbeted to receive top and bottom panels. Back rails secured under pressure with glue and with mechanical fasteners.
- E. Exposed Cabinet Ends: 1/2-inch-thick particleboard with face veneer to match door and drawer fronts and thermoset decorative panels on interior surfaces. Connect to stile with pressure-glued tongue-and-plow joint and concealed mechanical fasteners.
- F. Concealed Cabinet Ends: 1/2-inch-thick particleboard with thermoset decorative panels on interior surfaces. Connect to stile with pressure-glued tongueand-plow joint and concealed mechanical fasteners.
- G. Cabinet Tops and Bottoms: 1/2-inch-thick particleboard or 3/8-inch-thick hardwood plywood, fully supported by and secured in rabbets in end panels, front frame, and back rail.
- H. Wall-Hung Unit Back Panels: 1/8-inch-thick hardboard or 3/16-inch-thick hardwood plywood fastened to rear edge of ends and to top and bottom rails.
- I. Base Unit Back Panels: 1/8-inch-thick hardboard with thermoset decorative panels on interior surfaces fastened to rear edge of end panels and to top and bottom rails.
- J. Front Frame Drawer Rails: 1-by-1-1/4-inch solid wood mortised and fastened into face frame.
- K. Toe Boards: 5/8-inch-thick particleboard attached between end panels and extended from bottom panel to floor.

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- L. Corner Blocks: Solid wood, glued and fastened in each top corner to maintain casework squareness and rigidity.
- M. Corner Posts: 3/4-by-7/8-inch solid wood, attached to vertical corners; fabricated with notches to provide adjustability and retainment of interior storage devices.
- N. Drawers: Fabricate with exposed fronts fastened to subfront with mounting screws from interior of body. Fabricate with subfront and back rabbeted into sides and secured with glue and mechanical fasteners as follows:
 - 1. Subfronts, Sides, and Backs: 3/8-inch-thick particleboard.
 - 2. Bottoms: Not less than 1/4-inch-thick particleboard.
 - 3. Drawer Suspension: Provide for a minimum capacity of 50 lb, with twin-track, side-mounted, drawer-glide suspension with nylon rollers. Provide self-closing feature and positive stop.
- O. Shelves: 5/8-inch-thick particleboard core plywood or 1/2-inch-thick particleboard with thermoset decorative panels on top, bottom, and exposed (front) edge.

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2.5 WOOD FACE CASEWORK, FINISHES

- A. Factory Finishing: To the greatest extent possible, finish casework at factory. Defer only final touch-up until after installation.
- B. Finish: Selection made by Architect from full range of standard finishes available.

2.6 CASEWORK HARDWARE

- A. General: Manufacturer's standard units complying with ANSI A156.9, of type, material, size, and finish as selected from manufacturer's standard choices.

2.7 COUNTERTOPS, PLASTIC LAMINATE

- A. General: Comply with ANSI A 161.2.
 - 1. Provide colorthrough plastic laminate.

- B. Plastic Laminate Substrate: Comply with ASTM D 1037.
 - 1. Medium-Density Fiberboard: Comply with ANSI A208.2, not less than 3/4 inch thick.
- C. Plastic Laminate Substrate for Countertop with Sink: Exterior grade plywood or phenolic resin particleboard complying with ASTM D 1037.
- D. Backer Sheet: Provide BK 20 backer sheet wherever the unsupported countertop area exceeds 4 sq. ft. and substrate is 3/4 inch thick; 6 sq. ft. and substrate is 1 inch thick; 8 sq. ft. and substrate is 1-1/8 inch or thicker.
- E. Countertop, Backsplash, and Endsplash Plastic Laminate: GP 50.
- F. Configuration: Provide countertops with the following front style, cove, and backsplash style:
 - 1. Front Style: Rolled.
 - 2. Cove: Cove molding.
 - 3. Backsplash and Endsplash Style: Curved or waterfall shape with scribe.

PART 3 -EXECUTION

3.1 INSTALLATION

- A. Install casework with no variations in flushness of adjoining surfaces using concealed shims. Where casework abuts other finished work, scribe and cut for accurate fit. Provide filler strips, scribe strips, and moldings in finish to match casework face.
- B. Install casework without distortion so that doors and drawers fit openings properly and are aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete the installation of hardware and accessories as indicated.
- C. Install casework and countertop level and plumb to a tolerance of 1/8 inch in 8 feet.
- D. Fasten unit of casework to adjacent unit and into structural support members of wall construction with #10 sheet metal or wood screws with washer head or washer.

- . E. Fasten solid surface countertops by screwing through comer blocks in base units into - underside of countertop. Align adjacent surfaces. . Form seams 1/8 inch wide and adhere with manufacturer's recommended joint adhesive in color to match countertop.

3.2 ADJUSTING AND CLEANING

- A. Adjust hardware to center doors and drawers in openings and lubricate to provide unencumbered operation.
- B. Clean casework on exposed and semi-exposed surfaces. Touch up factory-applied finishes to restore damaged or soiled areas.

END OF SECTION 12372

SECTION 12511 - HORIZONTAL LOUVER BLINDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes horizontal louver blinds.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Wood blocking and grounds are included in Division 6 Section "Miscellaneous Carpentry."

1.3 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product data for each type of horizontal louver blind specified. Include printed data on physical characteristics.
- C. Shop drawings showing location and extent of blinds. Show installation details at and relationship to adjoining work. Include elevations indicating blind units. Indicate location of blind controls.
- D. Samples for Verification Purposes: One 12-inch-long slat from the same production run as material installed for each color slat required.
- E. Maintenance data to include in Operating and Maintenance Manual specified in Division 1.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced Installer who has specialized in installing horizontal louver blinds similar to those required for this Project.
- B. Surface Burning Characteristics: Provide blinds identical to those tested for the following fire performance characteristics as determined by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
 - 1. Test Method: NFPA 701, Small Scale Vertical Burn Test.
- C. Single-Source Responsibility: Obtain horizontal louver blinds from one source of a single manufacturer.

1.5 PROJECT CONDITIONS

- A. Field Measurements: Check openings by field measurements before fabrication. Show recorded measurements on shop drawings. Coordinate fabrication schedule with construction progress to avoid delay in the Work.

1.6 EXTRA MATERIALS

- A. Extra Materials: Furnished from same production run as materials installed, packaged with protective covering for storage, and identified with labels describing contents. Deliver extra materials to Owner.
 - 1. Full Units: Furnish quantity of full-size units with mounting brackets and hardware equal to 5 percent of amount installed.

PART 2 -PRODUCTS.

2.1 MANUFACTURERS

- A. Available Products: Subject to compliance with requirements, horizontal louver blinds that may be incorporated in the Work include, but are not limited to, the products specified in each Horizontal Louver Blind Product Data Sheet at the end of this Section.

2.2 MATERIALS AND FABRICATION

- A. Product Standard and Description: American Window Covering Manufacturers Association (AWCMA) Document 1029. Each horizontal louver blind unit consists of slats, rails, cord lock, tilting mechanism, tapes, and installation hardware

complying with referenced product standard and requirements indicated on each Horizontal Louver Blind Product Data Sheet at the end of this Section.

- B. Lifting and Tilting Mechanisms: Noncorrosive, self-lubricating materials.
- C. Unit Sizes: Obtain units fabricated in sizes to fill window and other openings as follows, measured at 74 deg F (23 deg C):
 - 1. Blind Units Installed Between (Inside) Jambs: Width and length equal to 1/2 inch less than opening dimensions formed by jamb, head, and sill members of opening in which each blind is installed.
- D. Installation Fasteners: Not less than two fasteners per bracket, fabricated from metal noncorrosive to blind hardware and adjoining construction and to support blind units under conditions of normal use.

PART 3 -EXECUTION

3.1 EXAMINATION

- A. Examine openings where horizontal louver blinds will be installed prior to beginning installation. Verify that critical dimensions are correct and surface conditions acceptable.
 - 1. Complete all finishing operations, including painting, before beginning installation.
- B. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install blinds level, plumb, and located so exterior slat edges in any position are not closer than 1 inch to interior face of glass lites, gaps between slat ends and jambs do not exceed 1/4 inch plus or minus 1/8 inch, and bottom rail in fully lowered position is within 1/2 inch of bottom of window or other opening.

3.3 CLEANING

- A. After completing the installation, clean blind surfaces according to the manufacturer's instructions.

- B. Remove surplus materials, packaging, rubbish and debris resulting from the installation. Leave areas where installation occurred neat, clean, and ready for use.

3.4 HORIZONTAL LOUVER BLIND PRODUCT DATA SHEET

- A. Slat Description: Perforated slats complying with the following requirements: |
Unperforated slat complying with the following requirements:

- 1. Openness Factor: |
- 2. Nominal Slat Width: 1 inch (mini blinds.) |

- B. Tilt Operation:

- 1. Length of Tilter Control:
- 2. Position of Tilter Control: Left side unless otherwise indicated.
- 3. Tilt: Full

- C. Cord Lock Operation: Cord lock, locks pull cord to stop blind at any position in ascending or descending travel. [-

- 1. Position: Right unless otherwise indicated.

- D. Cord Equalizers: Self-aligning to maintain horizontal blind position.

- E. Valance: Match color of slats.

- F. Mounting: Wall. Ceiling. End. Wall extension brackets. As indicated.

- G. Color: As selected by Architect from manufacturer's full range of colors produced for horizontal blinds specified. As specified with product designation below.

- H. Available Product(s): As follows:

- 1. Manufacturer's Name:
 - a. Product Name:
 - b. Color:

HORIZONTAL LOUVER BLIND PRODUCT DATA SHEET

Slat Description: Unperforated slat complying with the following requirements.

NOMINAL SLAT WIDTH: 1 INCH (MINI BLINDS.)

Tilt Operation: Manual with wand.

Length of Tilter Control: Manufacturer's Standard

Position of Tilter Control: Left side unless otherwise indicated.

Tilt: Full.

Cord Lock Operation: Cord Lock, locks pull cord to stop blind at any position in ascending or descending travel.

Position: Right unless otherwise indicated.

Cord Equalizers: Self-aligning to maintain horizontal blind position.

Valance: Match color of slats.

Mounting: Window head.

Color: As selected by Architect from manufacturer's full range of colors produced from horizontal blinds specified.

Available <Product(s): -As follows: SEPARATE

PRODUCT. Manufacturer's Name: LeVolor.

·Product Name: Monaco.

END OF SECTION 12511

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SECTION 15010-MECHANICAL BASIC REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes general mechanical requirements for work specified in all other sections of Division 15, the drawings, schedules and by the requirements of this Section.
- B. Division 1: Refer to Division 1 sections for general requirements.

1.2 QUALITY ASSURANCE

- A. Labels and Listings: Refer to Section 01632, "Products," article "Submittals," paragraph, "Labels and Listings" for requirements that materials, appliances and equipment provided meet the requirements of the Underwriter's Laboratories, Inc. (UL) and other standards organizations. Lettering size and style shall comply with American National Standards Institute, Inc. (ANSI) A13. 1 "Scheme for the Identification of Piping Systems."
- B. National Fire Protection Association (NFPA): All work provided under this Contract shall meet the requirements of the NFPA.
- C. Current Models: All work shall be as follows.
 - 1. Manufactured items furnished shall be the current, cataloged product of the manufacturer.
 - 2. Replacement parts shall be available.
- D. Experience: Unless more stringent requirements are specified in other sections of Division 15, manufactured items shall have been installed and used, without modification, renovation or repair, on other projects for not less than one year prior to the date of bidding for this project.
- E. Experience List: Submit a list of installations where the following items have been in operation for not less than one year. Include project name, address, name and telephone number of the Owner's representative for each project.
- F. Commissioning Test: Refer to section 01650 "start/commissioning for requirements to start, test and obtain approval of the system.
- G. Compliance with State and Local Codes:

1. Government Owned Property: Compliance with Federal, State, and local regulations and codes for the prevention, control, and abatement of air and water pollution is mandatory.

1.3 SUBMITTALS

- A. Division 1: Conform to the requirements of Division 1, Section 01300, "Submittals."
- B. Submittal List: Items for which submittals are required are included in each section of Division 15.
- B. Commissioning General: Commissioning producers are described in Section 01650. "startup/commissioning."

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Refer to Section 01632, "Products", article, "Product Delivery, Storage and Handling", for the requirements of material and products to be delivered to the project site.
- B. Storage: Materials stored at the project site which become soiled with construction dirt, concrete or earthwork shall be washed, cleaned and dried to the satisfaction of the Contracting Officer's representative or removed from the project site and replaced with new. Do not install soiled material.
- C. Protection: Protect and store material and equipment in such a manner as to effectively prevent damage from climatic conditions."

1.5 LABELS AND NAMEPLATES

- A. Division 1: Conform to Section 01632, "Products", article "Submittals," paragraph "Labels and Nameplates" for all work furnished under this Division.
- B. Manufacturer's Nameplates: Nameplates on manufactured items shall be aluminum or Type 304 stainless steel sheet, not less than 20 USG, riveted or bolted to the manufactured item, with nameplate data engraved or punched to form a non-erasable record of equipment data.
- C. Field Installation: Field-installed nameplates shall be engraved melamine plastic laminate, 1/8-inch thick, engraved in block capital lettering to expose white lettering on black face. Screw or bolt to equipment. Adhesive attachment will not be permitted.

- D. Smaller Labels: Labels 20 square inches and less may be 1/16-inch thick. Secure labels with rivets, stainless steel bolts, stainless steel strap or supporting angle.
- E. Approval: Submit a schedule of nameplates, abbreviations and equipment designations for approval.
- F. Lettering Style: Comply with ANSI A13.1 for lettering size and style.

1.6 MAINTENANCE AND OPERATING MANUALS

- A. Division 1: Conform to the requirements of Section 01700, "Project Closeout," article, "Operation and Maintenance Manuals", for all manuals and operating information required under Division 15.
- B. Field Installed Schedules: Conform to the requirements of Section 01700, "Project Closeout", article, "Posted Operating Instructions", for all diagrams, charts, schedules and operating information required under Division 15.
- C. Instructions: Conform to the requirements of Section 01700, "Project Closeout," article, "Instructions to Maintenance Personnel" for all work furnished under Division 15. Examine each section of Division 15 for instruction, training and operating manual requirements.
- D. Manuals for Commissioning Tests: Operating manuals shall include those for commissioning instrumentation where submittals are required. Operating manuals shall also include test procedures for commissioning tests.

1.7 SUBSTITUTIONS

- A. Division 1: Conform to the requirements of Section 01632, "Products", article, "Submittals." .

1.8 RENOVATION PROJECTS

- A. Demolition: Provide disconnection, demolition and renovation work specified under Division 15 and as indicated and scheduled on the drawings.
- B. Damage: Where ductwork, insulation or equipment to remain is inadvertently damaged or disturbed, cut out and remove damaged section and provide new ductwork, insulation or equipment of equal capacity and quality.
- C. Abandoned Work: Buried pipe abandoned in place, shall be cut out approximately two inches beyond the face of adjacent construction, capped, and the adjacent surface patched to match existing finish.

- D. Removal: Equipment specified or indicated to be demolished, shall be removed from the project site and shall not be reused.
- E. Temporary Disconnection: Equipment required to be temporarily disconnected and relocated shall be carefully removed, stored, cleaned, reinstalled, reconnected and made operational.

1.9 SIZING

- A. Capacity: Provide equipment and material of sizes, capacities, horsepowers, power ratings and dimensions indicated on the drawings, in the schedules and as specified.
- B. Fit and Clearance: All equipment, such as chillers, pumps, boilers, air-handling equipment, and filters, shall fit the space shown on the project drawings. Provide access for servicing, repairing and inspecting apparatus at least equal to that shown. Each item of equipment shall be installed without damage to the building, building equipment, or the item itself. Verify building access constraints before delivery of equipment to the project site.
- C. Deviations: Equipment and material of greater or larger power, dimensions, capacity and ratings may be furnished, provided such proposed equipment is approved in writing and feeders, circuit breakers, conduit, motors, bases and equipment spaces are increased by the contractor at no cost to the Government. If minimum energy ratings or efficiencies of the equipment are specified, the equipment must meet the design requirements and shall be subjected to the requirements of commissioning tests specified in article "Quality Assurance," of this Section.

1.10 COORDINATION

- A. General: Coordinate mechanical work with that of other trades in order to:
 1. Avoid interferences between general construction, mechanical, electrical, structural and other specialty trades.
 2. Maintain clearances and advise other trades of clearance requirements for operation, repair, removal and testing of mechanical equipment.

1.11 MANUFACTURER'S RECOMMENDATIONS

- A. General: Where installation procedures or any part thereof are required to be in accordance with manufacturer's recommendations, furnish printed copies of the recommendations prior to installation. Installation of the item shall not proceed until recommendations are received. Failure to furnish recommendations shall be cause for rejection of the equipment or material.

PART 2 -PRODUCTS

2..1 MANUFACTURERS (Not Used)

2..2 DIVISION 15 SECTIONS

- A. General: Conform to the requirements of Division 15 sections for all products furnished under this Contract.

PART 3 - EXECUTION

3..1 PAINTING AND FINISHING

- A. Division 9: Refer to Section 09900, "Painting" for field painting requirements.
- B. Damage and Touch-Up: Repair all marred or damaged factory painted finishes with materials and procedures to match original factory finish.
- C. Identification: Provide schedules for stencilling and identification markings. Submit stencilling and identification marking for approval.

3..2 CUTTING AND PATCHING

- A. Cutting: Provide cutting, channeling, chasing and drilling of floors, walls, partitions, ceilings and other surfaces necessary for installation of mechanical work. . All cutting shall be performed by skilled mechanics of the trades involved.
- B. Patching: Repair cursurfaces to match adjacent surfaces.

3..3 FIRESTOPPING

- A. Firestopping: Unused slots, sleeves and other penetrations in floors, walls or other general construction shall be closed and sealed with an approved firestopping material.
 - 1. Firestopping material shall be UL listed and tested silicone elastomer specifically formulated for use in horizontal and vertical applications. The material shall possess intumescent characteristics; upon exposure to heat above 250 degrees F. shall expand to not less than five times its original volume to form a fireproof envelope UL rated for 2- and 3-hour protection, when applied in accordance with the manufacturer's recommendation.
 - 2. Floor slots and openings shall be closed with 16 gauge galvanized steel sheet supported on I-inch by I-inch by 1/8-inch structural angle drilled or supported

with powder-driven studs into the building structure. Firestop with a layer of silicone elastomer not less than 1-inch thick which completely fills the opening. The top surface of the silicone elastomer shall be approximately 1-inch below the finished floor slab.

3. Openings in walls shall be closed with 16 gauge galvanized steel sheet securely attached at the midpoint of the wall thickness and firestopped on both sides of the steel sheet with not less than 1/8-inch thick layer of non-sagging silicone elastomer to fully cover the opening.

B. Pipe and Ducts: The annulus between exposed pipe and ductwork and walls or floors in finished spaces shall be filled, sealed, and painted to match adjacent surfaces.

END OF SECTION 15010

SECTION 15170 - MOTORS

PART 1- GENERAL

1.1 SUMMARY

Scope: Extent of motor work required by this Section is indicated on the drawings and schedules, by the requirements of this Section, and Section 15010, "Mechanical Basic Requirements."

A. Types: Types of motors specified in this Section include:

1. Single Phase Motors

B. Related Sections: Refer to Division 16 sections for:

1. Circuit and Motor Disconnects

2. Motor Starters

1.2 QUALITY ASSURANCE

A. Codes and Standards: Conform to the requirements of National Electrical Manufacturers Association (NEMA)) MG 1 "Motors and Generators."

1.3 SUBMITTALS

A. Division 1: Refer to Section 01300, "Submittals," for basic information relating to submittal requirements.

B. Product Data: Submit manufacturer's standard technical product data indicating conformance to the stipulated reference specifications, construction material, construction details, and test procedures.

1.4 DELIVERY, STORAGE AND HANDLING

A. Delivery: Handle motors carefully to prevent damage, denting and scoring. Do not install damaged motors or components; replace with new.

B. Storage: Store motors and components in a clean, dry place. Protect from weather, dirt, water, construction debris, and physical damage.

PART 2 -PRODUCTS

2.1 MANUFACTURERS (Not Used)

2.2 MOTORS

A. General: Provide motors conforming to NEMA MG 1 and as follows.

1. Each motor shall have sufficient capacity to start and operate the machine it drives without exceeding the motor nameplate rating at the speed specified or at any speed and load which may be obtained by the drive actually furnished.
2. Each motor provided with automatic control shall be capable of making as frequent starts as the control device may demand. Motors not provided with automatic control shall be capable of making not less than 4 starts per hour.
3. Motors shall be rated for continuous duty at 100 percent of rated capacity, and temperature rise shall be based on an ambient temperature of 40 degrees Celsius.
4. Unless otherwise specified, single-phase motors shall be of the open, capacitor-start type, and shall be in accordance with NEMA MG 1. Single-phase motors shall be wound according to the electrical data on the schedules. In lieu of capacitor-start type, 1/6 hp and smaller motors may be of the split-phase type or other types as specified.

PART 3 - EXECUTION

3.1 INSTALLATION OF MOTORS

- A. General: Install motors where indicated on the drawings and in accordance with manufacturer's drawings and in accordance with manufacturer's published installation instructions.
- B. Alignment: Install each direct-connected motor such that it is securely mounted in accurate alignment. The drive must be free from both angular and parallel misalignment when both motor and driven machine are operating at normal temperatures. Provide each belt-connected motor with a securely mounted adjustable base to permit installation and adjustment of belts.

END OF SECTION 15170

SECTION 15410 - PLUMBING PIPING SYSTEMS AND PLUMBING SPECIALTIES

PART 1 - GENERAL

1..1 SUMMARY

- A. Scope: The extent of plumbing piping work is indicated on the drawings, and by the requirements of this Section and Section 15010, "Mechanical Basic Requirements."
- B. Related Sections: Refer to other sections of Division 15 for the following:
 - 1. Plumbing Fixtures.
 - 2. Plumbing Equipment.
 - 3. Mechanical Insulation.
 - 4. Testing and Balancing.
 - 5. Supports and Anchors.
- C. Other Divisions: Refer to other specification divisions for:
 - 1. Field Painting: Division 9.
 - 2. Electrical Connections and Power Wiring: Division 16.

1..2 QUALITY ASSURANCE

- A. Codes: Provide plumbing piping systems laid out and installed in accordance with the following plumbing codes:
 - 1. Washington Sanitary Suburban Code - July 1992 Update.
- B. Specimen Joints: Before commencing pipe laying, submit specimen joints of each type of piping system proposed for use under this Contract.
 - 1. Upon approval of specimen joints, such joints by the Contracting Officer shall form a standard of quality against which all subsequent piping joints will be judged.
- C. Standards: Where national or industry standards are referenced, provide materials and equipment certified by the manufacturer to be in conformance with latest issue of such national standards. Conform to the following standards:
 - 1. American National Standards Institute (ANSI):
 - a. A 112.36.2 Cleanouts
 - b. B16.12 Cast Iron Threaded Drainage Fittings
 - c. B16.18 Cast Copper Alloy Solder Joint Pressure Fittings
 - d. B16.22 Wrought Copper and Copper Alloy Solder Joint Pressure Fittings
 - e. B16.23 Cast Copper Alloy Solder Joint Drainage Fittings

- f. B16.29 Wrought Copper and Wrought Copper Alloy Solder Joint Drainage Fittings
 - g. B16.32 Cast Copper Alloy Solder Joint Fittings for Solvent Drainage Systems
2. American Society for Testing and Materials (ASTM):
- a. A 47 Standard Specification for Ferritic Malleable Iron Castings
 - b. A 53 Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded Seamless
 - c. A 74 Standard Specification for Cast Iron Soil Pipe Fittings
 - d. A 183 Standard Specification for Carbon Steel Track Bolts and Nuts
 - e. A 216/
A 216M Standard Specification for Steel Castings, Carbon , Suitable for Fusion Welding for High-Temperature Service
 - f. A 536 Standard Specifications for Ductile Iron Castings
 - g. B 32 Standard Specification for Solder Metal
 - h. B 43 Standard Specification for Seamless Red Brass Pipe, Standard Sizes
 - i. B 61 Standard Specification for Steam or Valve Bronze Castings
 - J. B 62 Standard Specification for Composition Bronze or Ounce Metal Castings
 - k. B 75 Standard Specification for Seamless Copper Tube
 - l. B 88 Standard Specification for Seamless Copper Water Tube
 - m. B 306 Standard Specification for Copper Drainage Tube (DWV)
 - n. B 584 Standard Specification for Copper Alloy Sand Castings for General Applications
 - o. C 62 Standard Specification for Building Brick (Solid Masonry Units Made From Clay or Shale)
 - p. C 478 Standard Specification for Precast Reinforced Concrete - Manhole Sections
 - q. C 564_ Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings
 - r. D 2000 Standard Classification System for Rubber Products in Automotive Applications
3. Cast Iron Soil Pipe Institute (CISPI):
- a. 301 Hubless Cast-Iron Soil Pipe and Fittings for Sanitary and Storm Drain , Waste, and Vent Piping Applications
 - b. 310 Patented Joint for Use in Connection with Hubless Cast-Iron Sanitary System
4. Federal Specifications (FS):
- a. RR-F-621 Frames, Covers, Gratings, Steps, Sump and Catch Basin, Manhole
5. Manufacturers Standardization Society of the Valve and Fittings Industry, Inc. (MSS):
- a. SP 70 Cast Iron Gate Valves, Flanged and Threaded Ends
 - b. SP 71 Cast Iron Swing Check Valves, Flanged and Threaded Ends
 - c. SP 80 Bronze Gate, Globe, Angle and Check Valves
 - d. SP 84 Steel Valves - Socket Welding and Threaded Ends

- e. SP 85 Cast Iron Globe and Angle Valves Flanged and Threaded Ends
- 6. Plumbing and Drainage Institute (PDI):
 - a. WH201 Water Hammer Arrestors

1..3 SUBMITTALS

- A. Manufacturer's Data: Submit standard manufacturer's published product literature for materials and equipment proposed for use under this Contract, including the following items:
 - 1. Soil pipe and fittings.
 - 2. Domestic water pipe and fittings.
 - 3. Drainage piping and fittings.
 - 4. Jointing methods and materials for all piping systems.
 - 5. Valves - all types.
 - 6. Traps - all types.
 - 7. Wall hydrants.
- B. Permits: Provide and pay for all permits and post, where directed, on the construction site.

PART 2 -PRODUCTS

2..1 MANUFACTURERS (Not Used)

2..2 SANITARY DRAIN, WASTE AND VENT PIPING

- A. Hub and Spigot Piping: . Hub and spigot cast iron pipe shall be either coated or uncoated service weight conforming to ASTM A 74.
 - 1. Provide caulked and leaded joints or compression gasket joints conforming to ASTM C 564.
 - 2. Provide fittings conforming to ASTM A 74.
- B. Cast Iron Hubless Pipe and Fittings: Provide pipe and fittings conforming with CISPI 301 with CISPI 310 coupling joints.
- C. Reducers: Provide eccentric reducers for changes in pipe size of soil, waste and drain lines.
- D. Bends: Changes in direction, where space permits, shall be made with long sweep bends, Y fittings and 1/8 or 1/16 bends or combination Y and 1/8 bends.
 - 1. Sanitary tee branches and 1/4 bends may be used for connection of branch lines to fixtures and from stacks to horizontal drainage.

2..3 ABOVE GROUND SOIL, WASTE, DRAIN AND VENT PIPING .

- A. Soil Pipe 3-inch Diameter and Larger: Provide standard weight cast iron pipe with cast iron hub and spigot fittings conforming to ASTM A 74 with ASTM C 564 rubber compression gasket joints or caulked and leaded joints or cast iron hubless pipe and fittings with CISPI 301 fittings and CISPI 310 coupling joints.
- B. Soil Pipe 2-1/2 Inches and Smaller: Provide cast iron or galvanized steel.
 - 1. Provide cast iron hubless pipe and fittings conforming to CISPI 301 with CISPI 310 coupling joints.
 - 2. Provide cast iron hub and spigot pipe and fittings conforming to ASTM A 74 with ASTM C 564 rubber compression gasket joints or caulked and leaded joints.
 - 3. Provide steel piping conforming to ASTM A 53, Schedule 40 hot-dipped galvanized, threaded end connections with ANSI B16.12 hot-dipped galvanized recessed threaded drainage fittings.

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2..4 WASTE AND VENT PIPING EXPOSED IN FINISHED AREAS

- A. Materials: Provide red brass, standard weight iron pipe, size and thickness conforming to ASTM B 43, in toilet rooms, kitchens, laboratories and other finished spaces. Finish shall be chrome plated.
- B. Fittings: Provide threaded cast brass recessed drainage pattern fittings.
 - 1. Joints between brass and ferrous pipe shall be threaded.
 - 2. Chromium plated piping shall be carefully measured and cut so that not more than one full turn of thread is visible beyond the face of the adjacent fitting.

2..5 ABOVE GROUND WATER PIPING

- A. Pipe 2 Inches and Larger: Provide piping conforming to ASTM A 53, Schedule 40 hot-dipped galvanized or copper tubing type ASTM B 88, Type L with ANSI B16.18 or ANSI B16.22 solder joint fittings using ASTM B 32 95-5 lead free solder.
 - 1. Fittings for steel pipe shall conform with ASTM B 16.3 or ASTM B 16.4 and shall be hot-dipped galvanized.
- B. Pipe and Fittings: Provide copper tubing, Type L, hard drawn conforming to ASTM B 88 with either wrought copper or cast brass recessed solder joint fittings.
 - I. Adaptors for connection to threaded valves and fittings shall be cast brass.
 - 2. Solder shall be in conformance with ASTM B 32 tin lead-free solder.

2..6 VALVES: MAXIMUM 125 PSIG SYSTEM WORKING WATER PRESSURE

- A. Valves 3" and smaller on systems not exceeding 125 psig water working pressure provide valves conforming to the following:
 - 1. Construct valves of ASTM B 62 bronze in conformance with MSS SP 80, Class 125 pounds.
 - 2. Ends may be threaded or solder connection type.
 - 3. Valves shall be gate valves or as indicated on the drawings.
- B. Gate 4" and larger provide gate, globe and check valves rated for 125 psig water working pressure. Conform to the following:
 - 1. Gate valves shall be cast iron or steel conforming to MSS SP 70, OS&Y rising stem pattern, with bronze seats, solid wedge disc, bronze stem and flanged end connections.
- C. Handwheels: Provide handwheels of ductile iron, malleable iron or steel.
- D. Check Valves, Swing Pattern: Provide swing pattern type check valves conforming to the requirements of MSS SP 71 and as follows:
 - 1. Body shall be cast iron with flanged end connections, bronze disc holder, resilient disc, bronze seats, cast iron flanged cap and resilient gaskets.

2..7 NON-FREEZE WALL HYDRANTS

- A. Material: Provide copper alloy valve bodies with brass or stainless steel shafts, resilient valve seats and ductile iron or steel handwheels.
- B. Arrangement: · Provide hydrants with male threaded inlet connections, automatic draining vacuum breaker outlet with threaded male connection, and provide sufficient length to extend through walls to place the valve inside the building where it is not subject to freezing.
 - 1. Arrange bonnet and stem to be removable from outside the building.

PART 3 - EXECUTION

3..1 INSTALLATION

- A. Codes: Installation of plumbing systems including piping, equipment, materials and workmanship shall be in conformance with Washington Sanitary Suburban Commission Plumbing Code.
- B. Hot and Cold Water to Fixtures: When fixtures require both hot and cold water, provide the hot water supply to the left connection and the cold to right.

- C. Threaded Connections: Jointing compound for pipe threads shall be PTFE pipe thread tape, pipe cement and oil or PTFE powder and oil.

3..2 DRAINAGE AND VENT PIPING INSTALLATION

- A. Sanitary and Storm Drainage: Soil, waste, vent, and drain piping for sanitary drainage shall be of the sizes noted, and shall be run as indicated. Pipes must be run in straight lines and have a uniform grade between elevations noted. No branch drain shall have a grade less than that indicated for the main drain to which it is connected. Where elevations are not given, pipes shall have a uniform grade of 1/4-inch per foot, except where such grade on overhead pipes would reduce the headroom substantially, the grade may be reduced to not less than 1/8-inch per foot, where approved. Where conditions do not permit building drains and services to be laid with a fall as great as that specified, a lesser slope may be permitted, provided computed velocity is at least 2 feet per second. Keep all overhead pipes as close to the ceilings as possible, unless otherwise indicated or noted.
- B. Pipe Transitions: Changes in sizes of soil, waste, and drain piping shall be made with reducing fittings, tapered increasers, or fittings bushed in the sand. Changes in pipe sizes of vent pipes shall be made with reducing fittings or fittings bushed in the sand.
- C. Fittings: Ends of threaded piping shall be cut square so as to seat in bottom of recess of fittings, and must be reamed out. All changes in direction of piping shall be made with fittings; bending of pipes shall not be permitted.
- D. Pipe Connections: Threaded joints shall be made with a noncorrosive lubricant applied on the male thread only, shall be made metal to metal, and shall not be caulked to stop or prevent leaks. Long screws and bushings, except bushings cast in the sand, shall not be used on soil, waste, vent or drain piping.

3.3 TRENCHING

- A. General: Trenches for piping shall be of sufficient width for proper installation of the work, and bottoms of trenches shall be evenly graded. Bell holes shall be provided as required, so that each length of pipe will have a solid bearing for the full length of the barrel. Organic materials, leaf mold, debris, muck, and other unstable materials shall be removed to a depth sufficient to allow the construction of a stable foundation. Rock shall be excavated to a uniform grade at least three inches below pipe bells. All cuts below the required trench grade shall be refilled with firmly compacted sand, fine gravel, or concrete, or Contractor shall provide other means for ensuring a stable surface for the piping.
- B. Trenches Safety: Trenches shall be braced and sheathed, and water shall be removed, as necessary, to protect workmen and adjacent structures and permit proper execution of work. No pipe or masonry shall be laid under water.

- C. Backfilling: After piping has been inspected or tested and approved, trenches shall be backfilled, tamped compactly in place so as to assure a stable surface. Under pavements or other surfacing, backfill shall be tamped mechanically in layers not exceeding six inches on top of the pipe. Cinders shall not be used in backfill. Backfill shall be disturbed. Surfaces outside of lot lines shall be restored as required by local regulations. Surfaces within lot lines, such as paving and grass areas shall be restored to original conditions unless otherwise specified or shown on drawings.

3.4 WATER PIPING INSTALLATION

- A. General: Water piping shall be complete to all fixtures and equipment outlets. Sizes of pipes shall be as shown or specified.
- B. Reaming: Ends of pipes and tubes shall be reamed before being made up.
- C. Threaded Joints: Threaded joints shall be made up metal-to-metal, with a noncorrosive lubricant applied to the male thread only. Larnpwick or other packing material shall not be used in making up threaded joints.
- D. Chromium Plated Piping: Chromium plated piping shall be threaded and made up carefully, and not more than one full turn of thread shall be exposed beyond any fittings.
- E. Long Screws and Bushings: Long screws and bushings (other than bushings cast in the sand) shall not be used on water piping.
- F. Soldering: Ends of tubing and recesses of fittings to be soldered shall be thoroughly cleaned. Joints shall be assembled without binding. Solder shall penetrate fully and shall fill the joint completely. Joints shall be made using lead-free solder, as specified.
- G. Joint Materials: All joint materials shall be free from oil, tar, and greasy substances, and shall be dry when placed in the joint. The material shall be handled with care to prevent contamination.
- H. Copper Tubing: All copper tubing shall be free from cuts, dents or other surface damage at the time of final inspection. Damaged tubing shall be removed and replaced with new.
- I. Reducing Fittings: Where pipe sizes shown or specified differ from the connection sizes of pumps, fixtures, outlets, and the like, reducing fittings shall be installed close to them.
- J. Pipe Branches: Branches from water supply mains shall be taken from the top, bottom or side, using crossover fittings where required by structural or operating conditions.
- K. Unions: Unions shall be installed near points of connection to each piece of equipment, and elsewhere as required for installation of piping, removal and replacement of

regulating and control equipment and the like. Right and left couplings or nipples are prohibited.

- L. Roughing: Roughing shall be provided for equipment furnished under other sections of the specifications. Where future extensions are indicated on the drawings, roughing shall extend to within the space to be served, and shall be valved, and capped or plugged.

3.5 INSTALLATION OF PIPE SLEEVES

- A. Basic Requirements: Install pipe sleeves as follows:

1. Pipe sleeves shall be provided for all pipes passing through walls, slabs on grade and floors.
2. Sleeves for pipes passing through all floors and walls shall be constructed of galvanized or black steel pipe, standard weight.

- B. Caulking and Sealing: Spaces between pipes and sleeves passing through exterior walls, slabs on grade and over crawl spaces, and waterproofed floors shall be caulked watertight. Spaces between pipes and sleeves passing through floors, walls and ceilings of machine spaces, such as mechanical equipment, refrigeration, boiler, pump, fan, and machinery rooms, shall be packed and sealed at both ends of sleeve to provide a tight acoustical barrier.

- C. Wall and Floor Plates: Uninsulated, exposed pipes shall be provided with plates at the points where they pass through floors, finished walls, and finished ceilings, including points where covering is terminated 6 feet above the floor. Where necessary to cover beads of fittings, special deep escutcheons shall be provided in lieu of plates. Plates shall be not less than 0.018-inch thick. Plates on chromium plated pipe or tubing shall be brass, chromium plated, with bright or polished finish. Wall and ceiling plates shall be secured with round head set screws, not with spring clips. Plates generally shall be of the one-piece type.

3.6 INSPECTION AND TESTS

- A. Hydrostatic Testing of Underground or Drainage in Crawl Space Piping: Before final connections are made to existing sewers and prior to backfilling of trenches or connecting of fixtures, all underground drainage piping unless otherwise specified shall be hydrostatically tested. All openings shall be capped or plugged and the system filled with water to the top of a vertical section of pipe 10 feet high, temporarily connected to the highest point of the underground system. The water shall be allowed to stand in the system for at least 30 minutes prior to inspection. If the water level remains constant and no leaks are found during the period of inspection, the water shall be drained from the system. Final connections shall then be made to the public sewer or vitrified clay or concrete drainage pipes, and the trenches backfilled.

- B. Hydrostatic Testing of Above Ground Vent and Drainage Piping: Before any fixtures are connected, all sanitary drain and vent systems, and storm drainage systems above ground, shall be hydrostatically tested. All openings shall be capped or plugged and the systems filled with water. The water shall be allowed to stand in the systems for at least 30 minutes prior to inspection. If the water level remains constant and no leaks are found during the period of inspection, the water shall be drawn off and fixtures and the like connected. No parts of a system shall be tested with less than a 10-foot head of water. No parts of a system using cast-iron bell-and-spigot shall be tested with more than a 40-foot head of water, and no parts of a system using screwed piping shall be tested with more than a 200-foot head of water. The Contractor shall be responsible for determining the amount of piping he wishes to test at one time, but the above conditions shall not be exceeded.
- C. Hydrostatic Testing of Above Ground Water Piping: Before any fixtures are connected, all domestic water systems connected to them above ground shall be hydrostatically tested and proven tight at a pressure of not less than 100 psig or 50 psi in excess of the working pressure, whichever is greater, at the lowest point in the system. The pressure shall be maintained for at least 2 hours for inspection, the water shall be drained from the systems and final connections shall then be made to the fixtures.
- D. Smoke or Peppermint Test: After all fixtures have been permanently connected and all traps filled with water, the entire sanitary drain and vent systems shall be tested with smoke or peppermint. Where the smoke test is preferred, a pungent thick smoke shall be introduced into the system by the use of one or more smoke producing machines. The smoke shall not be produced by chemical mixtures. When the smoke appears at the stack openings on the roof, they shall be closed and a pressure equivalent to 1-inch water column shall be built up and maintained for 15 minutes before inspection starts. The entire system shall then be inspected for detection of smoke or smoke odors. Where the peppermint test is preferred, 2 ounces of oil of p_eppermint shall be introduced into each stack. System shall then be closed and inspection shall be made in the same manner as specified for the smoke test.
- E. Testing Sequence: All tests shall be made when there is no danger of freezing, prior to enclosure of any parts of the system by furrings, suspended ceilings or other finishes, and prior to the applications of insulation to any joints at fittings, valves, couplings and the like.
- F. Equipment Testing: Tests to demonstrate the capacities and general operating characteristics of all equipment, such as water heating outfits, pu mps, water coolers and the like, shall meet the requirements of Section 01650, "Start-Up/Commissioning."
- G. Testing in Stages: Where conditions, buil 'ng schedules, or occupancy schedules are such as to require the systems to be testeu in sections, such tests shall be performed without additional cost.
- H. Tests as required by Section 01650, "Start-Up/Commissioning."

- I. Corrections and Retests: Should any leaks, flaws, or defective materials or equipment be found during the testing operations, such leaks or flaws shall be corrected, and defective materials and equipment replaced. All defective joints shall be remade and caulking of threaded joints will not be acceptable. After corrections have been made, tests shall be repeated until all systems are proven tight and satisfactory. All corrections and retests shall be made without additional cost.

3..7 DISINFECTION OF WATER SYSTEMS

- A. General: After completion of all tests and repairs, all new water supply systems, extensions to, and repaired sections of existing systems shall be thoroughly flushed with water to remove sediment and then disinfected. The disinfection shall be applied to all hot and cold water piping, drinking water piping, pumps, tanks and other piping and equipment connected downstream from the main cutoff valve.
- B. Disinfectant: The disinfectant shall be chlorine, either in the form of a hypochlorite solution or in the form of compressed gas applied through an approved chlorinator. During chlorination, all valves and equipment shall be operated, to ensure that chlorine reaches all parts of the system. Water and chlorination agent shall be fed into the system at rates that will provide a residual chlorine content of not less than 10 ppm after a retention period of 24 hours. (An initial application of 25 ppm or more will generally be required.) In cases of piping system repair or other emergency, a residual chlorine content of 100 ppm after a retention period of one hour, shall be provided in lieu of the content and retention time specified above.
- C. Flushing: Following disinfection, all treated water shall be flushed from the system through its extremities. Flushing shall continue until samples show that the quality of the water delivered is comparable with the quality of the public water supply and satisfactory to the public health authority having jurisdiction. Flushing shall be repeated if samples taken daily over a period of three days show the water quality is not being maintained. Samples shall be taken only from taps located and installed in such a manner that they will not contribute any contamination. Samples shall not be drawn from hydrants or through unsterilized hose. Test samples shall be certified by a recognized and approved testing laboratory, and a certificate of acceptability shall be submitted.

END OF SECTION 15410

SECTION 15440 - PLUMBING FIXTURES

:PART 1 - GENERAL

1..1 SUMMARY

- A. Scope: Extent of plumbing fixture work required by this Section is indicated on the drawings and schedules, and by the requirements of this Section and Section 15010, "Mechanical Basic Requirements."
- B. Types: Types of plumbing fixtures specified in this Section include:
 - 1. Water closets.
 - 2. Lavatories.
 - 3. Bath tubs.
 - 4. Showers.
 - 5. Laundry sink.
 - 6. Fixture supports.
 - 7. Electric water coolers.
 - 8. Kitchen sinks.
- C. Related Sections: Refer to other Division 15 sections for the following:
 - 1. Plumbing Piping Systems and Plumbing Specialties.
 - 2. Plumbing Equipment.

1..2 QUALITY ASSURANCE

- A. Manufacturer: Provide all plumbing fixtures for this project that **ate** the product of one manufacturer. . The term "manufacturer" as used in this paragraph means a company with an established reputation in the manufacture and/or assembly of plumbing outfits from products of its own manufacture or others and that assumes responsibility for products in outfits not of its own manufacture.
- B. Codes and Standards: Provide plumbing fixtures complying with the following codes and standards:
 - 1. Air-Conditioning Refrigeration Institute (ARI): Provide electric water coolers that conform to ARI 1010, "Standard For Drinking-Fountain and Self-Contained Mechanically-Refrigerated Drinking-Water Coolers."
 - 2. American National Standards Institute (ANSI):
 - a. A 112.6.1M Supports for the Off-The-Floor Plumbing Fixtures for Public Use
 - b. A 112.18.IM Finished and Rough Brass Plumbing Fixture Fittings
 - c. A 112. 19.1M Enameled Cast Iron Plumbing Fixtures
 - d. A I 12.19.2M Vitreous China Plumbing Fixtures

- e. A 112.19.3M Stainless Steel Plumbing Fixtures (Designed for Residential Use)
 - f. A 112.19.5 Trim for Water-Closet Bowls, Tanks, and Urinals (Dimensional Standards)
3. Federal: Construct and install barrier-free plumbing fixtures in accordance with Uniform Federal Accessibility Standards U.S. Government Printing Office - Fed-STD-795 April 11988.
 4. Washington Suburban Sanitary Commission Plumbing Code.
 5. Plumbing and Drainage Institute (PDI): Comply with standards established by the PDI pertaining to plumbing fixture supports.
 6. Public Law 90-480: Comply with Public Law 90-480, known as the Architectural Barriers Act of 1968.

1.3 SUBMITTALS

- A. Division 1: Conform to the requirements of Division 1, Section 01300, "Submittals."
- B. Product Data: Submit manufacturer's technical product data, including rated capacities of selected models clearly indicated, furnished specialties and accessories, and installation instructions.
- C. Shop Drawings: Submit manufacturer's shop drawings indicating dimensions, roughing-in requirements, and required clearances.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver plumbing fixtures individually wrapped in factory-fabricated containers.
- B. Handling: Handle plumbing fixtures carefully to prevent breakage, chipping and scoring of the fixture finish. Do not install damaged plumbing fixtures; replace with new.

PART 2 - PRODUCTS

2.1 MANUFACTURERS: Model Numbers on drawings are given to establish standards for plumbing fixtures. Fixtures manufactured by any of the following manufacturers which are equivalent to model numbers given on drawings are acceptable:

1. American standard
2. Kettler
3. Crane
4. Halsey Taylor

2..2 PLUMBING FIXTURES, GENERAL

- A . General: Unless otherwise specified, provide fixtures, fittings, trimmings, metals, and finishes in accordance with the applicable ANSI publication.
- B . Refer to drawings for plumbing fixture specifications.

2..3 FIXTURE SUPPORTS

- A . Lavatory Support: Provide lavatory chair carriers consisting of a pair of cast-iron feet bolted to or imbedded into the floor together with 1.66- inch (minimum) steel tubular upright members, a horizontally adjustable alignment truss or tie rod at bottom and another at the top connected to cast-iron or steel adjustment sleeves and painted cast-iron or steel adjustment sleeves, and painted cast-iron concealed arms.

PART 3 - EXECUTION

3..1 GENERAL INSTALLATION

- A. General: Provide the correct number of fixtures and roughings as indicated on the drawings.

3..2 WATER CLOSET INSTALLATION

- A. General: Install water closets as shown on the drawing and as follows:
 1. Supply pipe extending from wall shall be covered by chrome plated sleeve and wall flange.
 2. Additional wall plates shall be provided where each pipe extends through finished wall.

3..3 LAVATORY INSTALLATION

- A. General: Install lavatories as shown on the drawings and as follows:
 1. Lavatories for use by wheelchair handicapped shall be installed with a minimum rim height of 34 inches, a minimum vertical clearance of 29 inches from floor, and a minimum clear knee recess of 30 inches in width and 20 inches in depth.
 2. Trap on lavatory for use by wheelchair handicapped shall be installed so as to provide maximum clearance under bowl. Exposed waste, trap and hot water supply under lavatory shall be insulated in accordance with the requirements for domestic hot water piping.
 3. All lavatories shall be installed with a rim height of 34 inches.
 4. Each lavatory in public toilet rooms that does not have a soap dispenser recessed in the walls (specified under another section of this specification) shall be provided with a lather-type soap dispenser installed in the top fixture surface on the left or right hand side of the lavatory.

3.4 FIXTURE CONNECTIONS

- A. Floor Mounted Water Closets: Provide connections between soil pipes and floor connected water closets made with cast-iron floor flanges.
 - 1. Connection sizes shall be 4-inch for water closets.
 - 2. Floor flanges shall be slipped over the ends of the pipes and caulked in position.
 - 3. Special short radius fittings shall be used where space does not permit the use of standard fittings below the flanges.

- B. Setting Compounds and Gaskets: Provide watertight and gas tight seals between flanges and fixtures with plumbing-fixture-setting compound complying with Federal Specification TI-P-1536, "Plumbing Fixture Setting Compound" or manufacturer's standard non-asbestos gaskets.
 - 1. Neither rubber gaskets nor putty shall be used in sealing connections.
 - 2. All voids between the flange and the floor below the fixture shall be sealed watertight with plumbing-fixture-setting compound or other approved sealing material.

- C. Outlet Flanges and Ends of Soil Pipes: Provide outlet flanges and ends of soil pipes set the correct distance from the face of the floor or wall to make a joint with the gasket and fixture. Obtain approval for the setting of the flange prior to setting any fixture in place.

- D. Water Supply Branch Piping: Provide all exposed water supply branch piping (including valves and fittings) not more than 6 feet above the floor in toilet rooms and all piping below lavatories finished and chromium-plated.
 - 1. No water pipe shall be buried in floor construction of any toilet room.
 - 2. Where water piping is not sized on the drawings, it shall comply with the sizing requirements of the National Standard Plumbing Code.
 - 3. Each hot and cold water supply to each kitchen sink and lavatory shall be provided with a gate or angle valve or compression stop in an accessible location near the fixture.
 - 4. A gate valve shall be provided on the connection to each wall hydrant and water cooler.
 - 5. Stop cocks shall not be used in lieu of valves.
 - 6. Risers and drops supplying toilet rooms shall be run in chases, furred spaces, or shafts where possible.

3.5 FIXTURE SUPPORT INSTALLATION

- A. Fixture Heights: Adjust chair supports so that the height of fixtures above the finished floor will be as follows:
 - 1. Lavatory: 31 inches to top of trim.

3.6 EXTRA WASHERS

- A. General: Deliver one dozen complete sets of washers.
 - 1. Each set shall contain one washer of each size and type used in the faucets, closet tanks, mixing valves, and wall hydrants, installed in the project.
 - 2. The washers shall be enclosed in a wood or metal box with hinged cover and a separate compartment for each size and type of washer.
 - 3. If the manufacturer of the above items installed in a project regularly catalogs a metal box containing an assortment of replacement parts, a sufficient number of such boxes required to satisfy the above washer requirements may be furnished in lieu of the single box, subject to approval.

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SECTION 15450 - PLUMBING EQUIPMENT

PART 1 - GENERAL

1..1 SUMMARY

- A. Scope: Extent of plumbing equipment work required by this Section is indicated on drawings and schedules, and by requirements of this Section and Section 15010, "Mechanical Basic Requirements."
- B. Types: Types of plumbing equipment specified in this Section include the following:
 - 1. Water softeners.
 - 2. Domestic water heaters.
- C. Related Sections: Refer to other sections of Division 15 for the following:
 - 1. Meters and Gauges.
 - 2. Vibration Isolation.
 - 3. Mechanical Insulation.
 - 4. Plumbing Piping Systems and Plumbing Specialties.
 - 5. Plumbing Fixtures.
 - 6. Natural Gas Systems.
 - 7. Testing, Adjusting, and Balancing.
- D. Division 16: Refer to Division 16 for the following work:
 - 1. Power Wiring, Starters, and Disconnects.
- E. Other Divisions: Refer to other Divisions of the specification for the following work:
 - 1. Field Painting: Division 9.

1..2 QUALITY ASSURANCE

- A. Codes and Standards: Provide plumbing equipment conforming to the following codes and standards.
 - 1. American Gas Association (AGA) and National Sanitation Foundation (NSF): Provide water heaters which have been listed and labeled by AGA and NSF.
 - 2. American National Standards Institute (ANSI): Install gas-fired water heaters in accordance with ANSI Z223.1 "National Fuel Gas Code."
 - 3. American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE): Provide and install equipment to comply with ASHRAE 90A "Energy Conservation in New Building Design."

4. American Society of Mechanical Engineers (ASME): For the following equipment, comply with ASME Boiler and Pressure Vessel Code for construction, and stamp with ASME Code stamp:
 - a. Commercial Water Heaters.
 - b. Water Softener Pressure Vessel.
5. National Electrical Manufacturers Association (NEMA): Provide electric motors and components which comply with NEMA Standards.
6. National Fire Protection Association (NFPA): Comply with NFPA 70, "National Electrical Code," as applicable to installation and electrical connections of ancillary electrical components of plumbing equipment.
7. Underwriters Laboratories, Inc. (UL): Provide electric motors and components which are listed and labeled by UL. Design, manufacturer, and install plumbing pumps in accordance with UL 778, "Motor Operated Water Pumps."

1.3 SUBMITTALS

- A. Division 1: Conform to the requirements of Division I , Section 01300, "Submittals."
- B. Product Data: Submit manufacturer's technical product data for water softeners, and water heaters.
- C. Shop Drawings: Submit assembly type shop drawings indicating dimensions, weights, required clearances, and method of assembly for water softeners, and water heaters.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Delivery: Handle plumbing equipment carefully to prevent damage, denting and scoring. Do not install damaged plumbing equipment or components; replace with new.
- B. Storage: Store- plumbing equipment and components in a clean , dry place. Protect from weather, dirt, water, construction debris, and physical damage.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. General: Model Numbers on drawings are given to establish a minimum required standard for equipment. Equipment manufactured by other manufacturers which is equivalent to what is specified on drawing is acceptable.

2.2 WATER SOFTENERS

- A. General: Provide a packaged triplex, automatic water softening system consisting of three softener tanks and one brine tank.

1. The system shall provide a minimum of 450,000 grains of softening capacity per tank per regeneration using a maximum of 150 lbs. of salt. The system flow rate shall be 0 to 280 GPM with a maximum pressure drop of 15 P.S.I.
- B. Softener Tanks: Provide welded carbon steel tanks with approved epoxy lining and polyurethane finish coat over primer.
1. Construct tank for 125 psig working pressure and 150 psig test pressure, and provide ASME stamp.
 2. Interior distribution piping system shall be designed to evenly distribute the flow of water over the entire area of the exchange media.
 3. Provide pressure gauges, sample locks and control valve assembly for each tank.
 4. Control lock to add and delete tanks from service based on flow demand. Units shall alternate regeneration and lead tank functions.
- C. Brine Tank: The system shall be furnished with a brine recovery salt storage/brine maker tank, 39x60 polyethylene construction. It shall be complete with all controls to minimize salt usage such that a minimum brine recovery of 20 percent is realized during the degeneration of each softener tank, over and above the normal salt usage. A minimum of 15 regeneration shall be available between salt refill.
- D. Controls: The 24 VAC control system shall be complete with interconnecting shielded wiring, and 120/24 VAC transformer. The control shall have the capacity to be directed to alternating, parallel or parallel progressive flow mode merely by keypad operation. No additional effort or equipment shall be required. Wiring installation shall be by manufacturer's representative during start-up. A dedicated 120/1/60 duplex outlet shall be provided at the softener site.
- E. Packaged water softener shall be similar to Bruner Corporation Model 450 HBR/Q-3 twin brine reclaim system.

2.3 DOMESTIC GAS WATER HEATER

- A. General: Provide commercial gas-fired water heaters of sizes and capacities as indicated on the drawing schedules. Comply with ASHRAE 90A for energy efficiency. Provide approval for commercial water heaters by AGA.
- B. Heater Tank: Provide gas water heater tank designed for 150 psi working pressure, ASME construction.
1. Tank shall have 3/4-inch tapping for relief valve installation.
 2. Tank shall have glass lining on internal surfaces exposed to water.
 3. Tank shall have magnesium anode rod.
 4. Commercial water heater tank shall have a boiler-type hand hole cleanout.

- C. Safety Controls: Equip water heaters with automatic gas shutoff device to shut off entire gas supply in event of excessive temperature in tank and provide pilot safety shutoff.
- D. Draft Hood: Provide gas water heaters with AGA certified draft hood.
- E. Insulation: Provide water heater tank insulated with vermin-proof glass fiber insulation. Provide commercial water heater with outer steel jacket and baked enamel finish over bonderized undercoating.
- F. Warranty: Furnish 10 year limited warranty for tank leakage.
- G. Accessories: Provide water heater with brass drain valve, 1 inch pressure and temperature relief valve, radiant floor shield, and cold water dip tube.
- H. Controls: Provide water heater with gas pressure regulator, pilot gas regulator, and adjustable thermostat.

PART 3 - EXECUTION

3..1 INSTALLATION OF WATER SOFTENERS

- A. General: Install water softener system where indicated on drawings and in accordance with manufacturer's installation instructions.
- B. Support: Set softener and brine tanks on concrete pads, orient so controls and devices needing service and maintenance have adequate access. Level and plumb units.
- C. Assembly: Assemble units with piping, controls; and accessories as indicated on drawings and as recommended by manufacturer.
- D. Equipment Connections: Connect to domestic water piping system with dielectric unions and shutoff valves.
- E. Start-Up: Start-up, test, and adjust water softener in presence of manufacturer's authorized representative. Operate units including regeneration, backwashing, brining, rinsing and flushing. Adjust unit to maintain required steady state effluent water quality.
- F. Instruction: Provide services of a factory authorized representative for one 8-hour day to instruct the operating personnel in proper operation, testing and maintenance of units.

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3..2 DOMESTIC GAS WATER HEATER INSTALLATION

- A. General: Install domestic gas water heater in accordance with ANSI Z223. 1 and the manufacturer's installation instructions.

- B. Support: Install gas water heater on pads oriented so that controls and devices needing service and maintenance have adequate access. Install gas water heaters level.

END OF SECTION 15450

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SECTION 16010 - ELECTRICAL BASIC REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Scope: Extent of electrical work covered by this Section is specified in all other sections of Division 16, the drawings, schedules and by requirements of this Section.
- B. Division 1: Refer to Division 1 sections for additional electrical requirements including:
 - 1. Summary of the Work.
 - 2. Project Coordination.
 - 3. Definitions and Standards.
 - 4. Submittals.
 - 5. Schedules and Reports.
 - 6. Temporary Facilities.
 - 7. Products.
 - 8. Project Closeout.
- C. Refer to Division 15 sections for work furnished under Division 15 and installed, connected and tested under Division 16. Work includes, but is not limited to:
 - 1. Motors - single-speed and star-delta types
 - 2. Float and Pressure Switches, alarms and control power stations
 - 3. Solenoid Valves, motorized valves and damper operators

1.2 QUALITY ASSURANCE

- A. Labels and Listings: Refer to Section 01632, "Products," "Labels and Listings" paragraph, for requirements that materials, appliances and equipment provided meet the requirements of the Underwriters Laboratories, Inc. (UL), Electrical Testing Laboratories (ETL) and other standards organizations.
- B. National Fire Protection Association (NFPA): All work provided under this Contract shall meet the requirements of NFPA 70, "National Electrical Code," latest edition.
- C. Current Models:
 - 1. Manufactured items furnished shall be the current, cataloged product of the manufacturer.
 - 2. Replacement parts shall be available.
 - 3. There shall be a permanent service organization maintained or trained by the manufacturer to provide satisfactory service.

- D. Experience: Manufactured items shall have been installed and used, without modification, renovation or repair, on other projects for not less than three years prior to the date of bid opening for this project.

1..3 SUBMITTALS

- A. Division 1: Conform to the requirements of Division 1, Section 01300, "Submittals."
- B. Submittal List: Items for which submittals are required are included in each section of Division 16. In addition, provide submittals on the following:
 - 1. Raceways
 - 2. Raceway fittings
 - 3. Switches - 100 amperes
 - 4. Motor starters
 - 5. Lighting fixtures
 - 6. Underground conduits
 - 7. Wires and cables
 - 8. Wiring devices and wall and smaller plates

1..4 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Refer to Section 01632, "Products," paragraph, "Delivery, Storage and Handling," for the requirements of material and products to be delivered to the project site.
- B. Storage: Materials stored at the project site which become soiled with construction dirt, concrete or earthwork shall be washed, cleaned and dried or removed from the project site and replaced with new. Do not install soiled material.
- C. Cleaning: Clean and wipe the interior of conduit, pullboxes and panelboard backboxes, soiled by masonry trades, before proceeding with wiring.
- D. Generally, do not install damaged, broken or marred material or products, replace with new. On long delivery items which are damaged in shipping or storage, field repair may be authorized instead of replacement. Repair authorization shall be written.

1..5 MAINTENANCE AND OPERATING MANUALS

- A. Division 1: Conform to the requirements of Section 01700, "Project Closeout," "Operating and Maintenance Manuals," paragraph for all manuals and operating information required under Division 16.
- B. Field Installed Schedules: Conform to the requirements of Section 01700, "Project Closeout," "Posted Operating Instructions" paragraph for all diagrams, charts, schedules and operating information required for Division 16.

1.6 SUBSTITUTIONS AND GENERAL REQUIREMENTS

- A. Division 1: Conform to the requirements of Section 01632, "Products," "General Requirements of Electrical Work," and "Substitutions" paragraphs.

1.7 RENOVATION PROJECTS

- A. Demolition: Provide disconnection, demolition and renovation work specified under Division 16 and as indicated and scheduled on the drawings.
- B. Damage: Where conduit and wiring to remain are inadvertently damaged or disturbed, cut out and remove damaged portion and all damaged wiring from the source panelboard or pullbox to the destination connection point. Provide new wiring of equal capacity.
- C. Accessible Work: Exposed conduit to be demolished shall be removed in its entirety.
- D. Wiring: Wiring to be demolished shall be removed from both concealed and exposed conduit. No wiring which becomes unused as a result of the Contract shall be abandoned in place.
- E. Abandoned Work: Concealed conduit, abandoned in place, shall be cut out approximately two inches beyond the face of adjacent construction, plugged, and the adjacent surface patched to match existing.
- F. Removal: Equipment specified or indicated to be demolished, shall be removed from the project site and shall not be reused.
- G. Temporary Disconnection: Equipment required to be temporarily disconnected and relocated shall be carefully removed, stored, cleaned, reinstalled, reconnected and made operational.

1.8 SIZING

- A. Capacity: Provide equipment and material of sizes, capacities, horsepower, power ratings and dimensions indicated on the drawings, in the schedules and as specified.
- B. Fit and Clearance: Equipment and material of greater or larger power, dimensions, capacity and ratings may be furnished provided such proposed equipment is approved in writing and feeders, circuit breakers, conduit, motors, bases and equipment spaces are increased by the Contractor at no additional cost.

1.9 COORDINATION

- A. Coordinate electrical work with that of other trades so that:

1. Interference between general construction, mechanical, electrical, structural and other specialty trades is avoided.
2. Maintain clearances and advise other trades of clearance requirements for operation, repair, removal and testing of electrical equipment.
3. All electrical materials and equipment shall be kept as close as possible to ceiling, walls and columns to occupy the minimum amount of space.
4. Furnish and install all offsets, fittings and similar items necessary to accomplish the requirements of coordination, without additional expense.

1..10 MANUFACTURER'S RECOMMENDATIONS

- A. Where installation procedures or any part thereof are required to be in accordance with manufacturers' recommendations, furnish printed copies of the recommendations prior to installation. Installation of the item shall not proceed until recommendations are received. Failure to furnish recommendations shall be cause for rejection of the equipment or material.

PART 2 - PRODUCTS

2..1 MANUFACTURER (Not Used)

2..2 *DNISION* 16SECTIONS

- A. Conform to the requirements of Division 16 sections for all products furnished under this Contract.

PART 3 - EXECUTION

3..1 PAINTING AND FINISHING

- A. Division 9: Refer to Section 09900, "Painting" for field painting requirements.
- B. Damage and Touch-Up: Repair all marred or damaged factory painted finishes with materials and procedures to match original factory finish.

3..2 CERTIFICATION

- A. General: Provide Certification that the installation meets NFPA 70 and manufacturer's recommendations as indicated in the respective sections.

3..3 CUTTING AND PATCHING

- A. Cutting: Provide cutting, channeling, chasing and drilling of floors, walls, partitions, ceilings and other surfaces necessary for installation of electrical work. All cutting shall be performed by skilled mechanics of the trades involved.

B. Patching: Repair cut surfaces to match adjacent surfaces.

3.4 CLOSING OF OPENINGS

A. Firestopping: Unused slots, sleeves and other penetrations in floors, walls or other general construction shall be closed and sealed with an approved firestopping material.

1. Firestopping material shall be UL listed and tested silicone elastomer specifically formulated for use in horizontal and vertical applications. The material shall possess intumescent characteristics and upon exposure to heat above 250 degrees F. shall expand to not less than five times its original volume to form a fireproof envelope, UL rated for 2- and 3-hour protection, when applied in accordance with the manufacturer's recommendation.
2. Floor slots and openings shall be closed with 16 gauge galvanized steel sheet supported on 1-inch by 1-inch by 1/8-inch structural angle drilled or supported with ponder-driven studs into the building structure. Firestop with a layer of silicone elastomer not less than 1-inch thick which completely fills the opening. The top surface of the silicone elastomer shall be approximately 1-inch below the finished floor slab.
3. Openings in walls shall be closed with 16 gauge galvanized steel sheet securely attached at the midpoint of the wall thickness and firestopped on both sides of the steel sheet with not less than 1/2-inch thick layer of non-sagging silicone elastomer to fully cover the opening.
4. Single or multiple pipes passing through walls and floors shall have the annulus space between pipes or between pipes and structure filled with silicone elastomer to provide a 3-hour rated firestop for floors and walls.

B. Conduit: The annulus between exposed conduit and walls or floors in finished spaces shall be filled, sealed, and painted to match adjacent surfaces.

C. Future Slots: Identify unused sleeves and slots for future use by permanently anchored brass nameplates identifying size and purpose of the covered slot.

END OF SECTION 16010

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SECTION 16110-RACEWAYS

PART 1 - GENERAL

1.1 SUMMARY

- A. Scope: Extent of raceway work is indicated on the drawings, by the requirements of this Section, and Section 16010, "Electrical Basic Requirements."
- B. Types: Types of raceways in this Section include the following:
 - 1. Electrical metallic tubing.
 - 2. Flexible steel conduit.
 - 3. Liquid-tight flexible metal conduit.
 - 4. Rigid nonmetallic conduit.
 - 5. Surface metal raceways.
 - 6. Wireway.

1.2 QUALITY ASSURANCE

- A. National Fire Protection Association (NFPA): Comply with NFPA 70, "National Electrical Code," for application, size, location and installation of each type of raceway used.
- B. Metal Conduit and Tubing: Provide conduit and tubing in conformance with the following standards:
 - 1. Electrical metallic tubing (EMT), zinc coated shall conform to American National Standards Institute {ANSI} C80.3, "Electrical Metallic Tubing.- Zinc Coated."
 - 2. Flexible metal electrical conduit shall conform to UL 1, "Flexible Metal Conduit."
 - 3. Liquid-tight flexible steel conduit shall conform to UL 360, "Liquid-Tight Flexible"
- C. Nonmetallic Conduits and Raceways:
 - 1. Electrical plastic tubing and conduit shall conform to NEMA TC 2, "Electrical Plastic Tubing (EPT) and Conduit (EPC-80)."
- D. Wireways and Associated Fittings: Provide in conformance with ANSI 870, "Wireways and Associated Fittings."
- E. Surface Metal Raceways and Fittings: Provide in conformance with UL 5, "Surface Metal Raceways and Fittings."
- F. Metal and Plastic Conduit and Raceway Fittings:
 - 1. Fittings for conduit and outlet boxes shall conform to UL 514B, "Fittings for Conduit and Outlet Boxes."

2. PVC fittings for use with rigid PVC conduit and tubing shall conform to NEMA TC 3, "PVC Fittings for Use With Rigid PVC Conduit and Tubing."
3. Surface metal electrical raceways and fittings shall conform to UL 5.

1.3 SUBMITTALS

- A. Division 1: Conform to the requirements of Division 1, Section 01300, "Submittals."
- B. Product Data: Submit manufacturer's data for items listed, including specifications, installation instructions and general recommendations.
 1. Surface metal raceway.
 2. Wireway.
 3. Nonmetallic conduits and raceways.
 4. Raceway Seals.

PART 2 - PRODUCTS

2.1 MANUFACTURERS (Not Used)

2.2 CONDUITS, RACEWAYS AND FITTINGS

- A. Minimum Size: Size conduit and raceway in accordance with NFPA 70 unless otherwise specified or shown on the drawings.
- B. Equipment Ground Conductor (Green): Where specified, shown or required, raceway sizes shall be adequate to include the circuit conductors, an equipment ground conductor and a neutral conductor in accordance with percentage of fill requirements by NFPA 70. Size all conduits supplying motors and associated control equipment to include grounding conductor sized per NFPA 70 whether or not shown in the drawings or specified.
- C. Electrical Metallic Tubing (EMT):
 1. Do not bury in ground or in slabs on grade.
 2. Do not use in concrete where vibrators are to be used in its placement.
 3. Do not use for circuits operating over 600-volts.
- D. Flexible Metal Electrical Conduit (Green field):
 1. Use in dry location.
 2. Do not use in corrosive atmosphere or exterior locations.
 3. Use to connect motors, transformers and recessed ceiling fixture, wherever equipment must be isolated or shifted to its final position.
 4. Use where conduit must be fished in building voids.
- E. Liquid-Tight Flexible Steel Conduit:

1. Use for exterior locations.
2. Sizes 1-1/4-inch and smaller, provide with a continuous copper bonding conductor wound spirally between convolutions.
3. Sizes 1-1/2-inch and larger, provide with an internal grounding conductor and grounding bushings.

F. Electrical Plastic Conduit:

1. Electric plastic conduit - Schedule 40 (EPC-40) may be used for underground installation with or without concrete, where listed by the manufacturer for direct burial.

G. Wireways:

1. May be used to facilitate installation and future changes in wiring between panelboards, safety switches in close proximity to each other on same or adjacent walls or in same electrical equipment room or area.
2. Provide weatherproof enclosure where outdoors or subject to moisture and similar elements.
3. Use where shown on drawings or specified.
4. Shall be completely accessible.

H. Surface Metal Raceways and Multi-Outlet Assembly:

1. Do not use where subject to physical damage or wet locations.
2. Use only where shown on drawings or specified.
3. Provide continuous ground conductor.

I. Raceway Fittings, Couplings and Connectors:

1. Use fittings listed and approved for specific conduit or raceway system used; e.g.: Use PVC coated fittings with PVC coated conduit.
2. For EMT, provide steel or malleable iron "concrete-tight" or "rain-tight" couplings and connectors, compression, set screw type. Do not use indentation type of fitting.
3. Bushing and connectors shall be insulated type which maintain continuity of conduit grounding system. Insulating material shall be molded or locked into metallic body of the fitting. Bushing made entirely of non metallic material will not be allowed.
4. Set screw connectors and couplings body shall have wall thickness at least equal to wall thickness of conduit used. Couplings or conduit trade size 1/2 through 2-inch shall have two set screws per fitting and 2-1/2 through 4-inch shall have four set screws per fitting. Set screws shall be case hardened steel with hex head and cup point.
5. Provide flexible metal conduit fittings made of steel or malleable iron. They shall be insulated and one of the following types:
 - a. Wedge and screw type having an angular wedge fitting between the convolutions of the conduit.

- b. Squeeze or clamp type having a bearing surface contoured to wrap around the conduit and clamped by one or more screws.
 - c. Steel, multiple point type, for threading into internal wall of the conduit convolutions.
6. Liquid-tight flexible metal conduit shall incorporate a threaded grounding cone, a steel, nylon or equal plastic compression ring and a gland for tightening. Fitting shall be steel, or malleable iron with insulated throat, with male thread and locknut or male bushing with or without "O" ring seal.
 7. Provide expansion fittings for all rigidly fastened conduits spanning a building expansion joint and if not otherwise provided, for all runs 1-1/2-inch or larger, exceeding 150 feet in length. Fittings shall be hot-dipped galvanized malleable iron with a packing ring to prevent entrance of water, a pressure ring, a grounding ring and a separate external copper bonding jumper.
 8. All locknuts shall be the bonding type with sharp edges for digging into the metal wall of an enclosure.

PART 3 - EXECUTION

3..1 INSTALLATION OF ELECTRICAL RACEWAYS AND FITTINGS

A. General:

1. Conduit and EMT runs shall be mechanically and electrically continuous from service entrance to all outlets. Each conduit shall enter and be securely connected to a cabinet, junction box, pull box or outlet by means of a locknut on the outside and a bushing on the inside or by means of a liquid-tight, threaded, self-locking, cold-weld type wedge adapter.
2. Conceal conduit and EMT, unless indicated otherwise, within finished walls, ceilings, and floors.
3. Keep conduit at least 6 inches away from parallel runs of steam and hot-water pipes.
4. Level and square raceway runs.
5. Install horizontal raceway runs above water and steam piping.
6. Complete installation of electrical raceways before starting installation of cables/wires within raceways.
7. Provide supports for raceways as specified elsewhere in Division 16.
8. Prevent foreign matter from entering raceways; use temporary closure protection.
9. Protect stub-ups from damage where conduits rise from floor slabs. Arrange so curved portion of bends is not visible above the finished slab, nor below the slab where the slab is a finished ceiling.
10. Make bends and offsets so the inside diameter is not effectively reduced.
11. Unless otherwise indicated keep the legs of a bend in the same plane and the straight legs of offsets parallel.
12. Use raceway fittings that are of types compatible with the associated raceway and suitable for the use and location.
13. Run concealed raceways with a minimum of bends. All bends shall have the longest possible radii.

14. Install exposed raceways parallel and perpendicular to nearby surfaces or exposed structural members, and follow the surface contours.
15. Run exposed, parallel or banked raceways together.
16. Make bends in parallel or banked runs from the same center line so that the bends are parallel. Factory elbows may be used in banked runs where they can be installed parallel.
17. Join and terminate raceways with fittings designed and approved for the purpose of the raceway system and make up tight.
18. Make the setscrews of threadless fittings up tight; do not use pliers.
19. Where raceways are terminated with locknuts and bushings, align the raceway to enter squarely and install the locknuts so that the dished part is against the box. Use two locknuts where circuit voltage exceeds 250-volts, one inside and the other outside the box, and where necessary to make the termination secure.
20. Where terminating in threaded hubs, screw the raceway or fitting tight into the hub so the end bears against the wire protection shoulder.
21. Where chase nipples are used, align the raceway and coupling square to the box and tighten the chase nipple so no threads are exposed. Running threads are not allowed.
22. In wood construction, conduits and EMT shall be run in rough underflooring, on top of joists or between joists. Furring strips may be notched at any point but joists may be notched only at points not more than one foot from a point of support and notches may not be deeper than 1-3/8 inches. Conduits and EMT may be run exposed on the bottoms of joists only in unplastered rooms where permitted by the Contracting Officer.
23. Horizontal cross runs of conduit or EMT may be installed in partitions only where explicitly permitted. Exposed horizontal runs, where permitted, shall be installed close to ceiling or ceiling beams.
24. Conduits and EMT connected to wall outlets shall be run in such a manner that they will not cross water, steam or waste pipes or radiator branches.
25. Conduits and EMT shall not be run through beams, except where clearly indicated on drawings or where permitted.
26. Branch circuit conduits and raceways above suspended ceilings may be supported from the floor construction above or from the main ceiling support members, however, the finished installation shall not interfere with the removability of ceiling panels.

B. Flexible Conduit, Metallic: Provide flexible conduits for connections to motors and other electrical equipment when it is subject to movement, vibration, misalignment, cramped quarters or where noise transmission is to be eliminated or reduced. Do not use liquid-tight. Install all bonding and grounding conductors for liquid-tight within the conduit. Flexible conduit shall be of the liquid-tight type when installed under any of the following conditions:

1. Exterior locations.
2. Moisture or humidity laden atmospheres where it is possible for condensation to accumulate. Corrosive atmospheres.

3. Where water or spray due to wash-operations is frequent or possible. Wherever there is a possibility of seepage or dripping of oil, grease or water.

C. Surface Metal Raceway:

1. Surface metal raceways shall not be used except where noted on drawings.
2. Surface metal raceways shall be securely grounded to outlet boxes or to back-plates and fixtures by means of bolts, screws or other approved means.
3. Ends of raceways shall be provided with bushings at entrances to boxes or canopies.
4. A separate green ground conductor shall be installed in the raceway from the junction box supplying the raceway to receptacle or fixture ground terminals.
5. Each surface metal raceway outlet box to which a lighting fixture is attached shall be of sufficient diameter to provide a seat for the fixture canopy.

3..2 ADJUSTING AND CLEANING

- A. Upon completion of installation of raceways, inspect interiors of raceways at all outlet, junction and pull boxes, remove burrs and obstructions.
- B. Run a swab or mandrel to remove dirt and blockages. Raceways which are deformed and prevent the passage of a mandrel shall be replaced.
- C. Remove dirt and construction debris from outlet, junction and pull boxes.

END OF SECTION 161JO

SECTION 16120 - WIRE AND CABLES

PART 1 - GENERAL

1..1 SUMMARY

- A. Scope: Extent of electrical wire and cable work is indicated by drawings and schedules, by the requirements of this Section, and Section 16010, "Electrical Basic Requirements."
- B. Types: Types of electrical wire, cable, and connectors specified in this Section include the following:
 - 1. Copper conductors.
 - 2. Tap type connectors.
 - 3. Split-bolt connectors.
 - 4. Wire nut connectors.
 - 5. Mc Cable.
 - 6. AC Cable.
- C. Other Divisions: Refer to Division 15 sections for the following:
 - 1. Control Wiring

1..2 QUALITY ASSURANCE

- A. American Society for Testing and Materials (ASTM): Comply with requirements of the following:
 - 1. B 1 Standard Specification for Hard-Drawn Copper Wire
 - 2. B 2 Standard Specification for Medium-Hard-Drawn Copper Wire
 - 3. B 3 Standard Specification for Soft or Annealed Copper Wire
 - 4. B 8 Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft
- B. Electrical Testing Laboratories (ETL): Provide wiring, cabling and connector products which are ETL listed and labeled.
- C. Institute of Electrical and Electronics Engineers (IEEE): Comply with the following standards which apply to wiring systems:
 - 1. 82 Test Procedure for Impulse Voltage Tests on Insulated Conductors
 - 2. 241 Recommended Practice for Electric Power Systems in Commercial Buildings

- D. NFPA: Comply with NFPA 70 requirements for construction, installation and color coding of electrical wire, cable and connections.
- E. National Electrical Manufacturers Association (NEMA): Comply with requirements of the following:
 - 1. WC5 Thermoplastic - Insulated wire and cable for the transmission and distribution of electrical energy.
- F. UL: Provide material conforming to the following standards:
 - 1. 4 Armored Cable
- G. UL Labels: Provide wiring, cabling and connector products which are UL listed and labeled.
- H. Type AC Cable shall be installed as permitted by Code and in accordance with Articles Nos. 300 and 333.
- I. Type Mc Cable shall be installed as permitted by Code and in accordance with Articles Nos. 300 and 334.

1.3 SUBMITTALS

- A. Division 1: Conform to the requirements of Division 1, Section 01300, "Submittals."
- B. Product Data: Submit manufacturer's data on electrical wire, cables, conductors, connectors and connector crimping tools where specified.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver wire and cable packaged in factory-sealed containers, or wound on NEMA wire and cable reels.
- B. Storage: Store wire and cable in a clean dry space in original containers. Protect products from weather, damaging fumes, construction debris and traffic.
- C. Handling: Handle wire and cable carefully to avoid abrading, puncturing and tearing wire and cable insulation and sheathing. Ensure that dielectric resistance integrity of wires/cables is maintained.

PART 2 - PRODUCTS

2.1 MANUFACTURERS (Not Used)

2.2 COPPER WIRE

- A. General: Provide wire rated 600 V minimum of the single conductor annealed copper type.
 - 1. Conductors No. 10 AWG and smaller shall be solid, and No. 8 AWG and larger shall be stranded.
 - 2. Conductivity shall not be less than 98 percent at 20 degrees C. (68 degrees F.) or resistivity greater than 1.7 microhms per centimeter.
 - 3. For branch circuit wiring use a minimum wire size of No. 12.
- B. Insulation: Provide the following types of insulation:
 - 1. For dry locations provide Type THHN/THWN,.
 - 2. For dry and wet locations provide Type THW, THHN/THWN.

2..3 CABLE

- A. General: Provide UL listed cables of sizes, ampacity, temperature ratings and insulating materials indicated on the drawings.
- B. Insulation: Provide the following types of insulation:
 - 1. Type MC - Metal Clad.

2..4 CONNECTORS AND SPLICES

- A. General: Provide UL listed metal connectors of sizes, ampacity, temperature ratings, materials, and classes required by NFPA 70 and NEMA standards for applications and services indicated.
- B. Branch Circuits: For wires No. 10 AWG and smaller, provide solderless, insulated pressure cable type connectors, 600 V, of the compression or indent type or wire nut connectors. Temperature rating of connector, shall be at least equal to that of the wire on which they are used.
- C. Copper Conductors: For No. 8 AWG and larger wire, provide socket head cap, hex screw, or bolt clamp type connectors, manufactured of high conductivity copper alloy or bronze castings. Select proper connector for each wire size. Cable sizes 250 MCM and larger shall be retained in the connector by twin clamping elements.

2..5 INSULATING TAPE, PUTTY, RESIN AND SUPPORTS

- A. Tape: Provide plastic electrical insulating tape which is flame retardant, cold and weather resistant. Tape for use in areas subject to temperatures 30 degrees C. to 105 degrees C., or where the tape will be subjected to an oil splash, tape shall have a minimum thickness of 8.5 mils, and shall consist of an oil-resistant vinyl backing with an oil-resistant acrylic adhesive.

- B. Materials: Provide all insulating materials for splices and connections such as glass and synthetic tapes, putties, resins, splice cases, or compositions of the type approved for the particular use, location, voltage and temperature, and apply and install in an approved manner, all in accordance with the manufacturer's recommendations.
- C. Supports: Provide cable supports of the wedge type which firmly clamp each individual cable and tighten due to the cable weight.

PART 3 - EXECUTION

3.1 INSTALLATION OF WIRES AND CABLES

- A. General: Install electrical wires, cables and wiring connectors in compliance with applicable requirements of NFPA 70, NEMA, UL and National Electrical Contractors Association (NECA) "Standard of Installation."
- B. Conduit: Install all wiring in electric metallic tubing and non metallic conduit as indicated on the drawings. AC and MC Cables can be used where permitted by Code.
- C. Complete System: Provide wire, cables and connectors necessary for a complete installation from point of service connection to all receptacles, lighting fixtures, devices, utilization equipment and outlets for future extensions as indicated on the drawings, in schedules, and in the specification. Provide ample slack wire for connections.
- D. Voltage Rating: Wire and cables for general wiring shall be rated for 600 volts minimum. Where the operating voltage is less than 100 V, wire and cables may be insulated for 300 V, provided they are completely isolated from other higher voltage systems.
- E. Minimum Size: Minimum branch circuit conductor size shall be No. 12 AWG. Where the length of a branch circuit homerun exceeds 75 feet for a 120 V circuit, or 150 feet for 277 V, the conductor size shall be No. 10 AWG.
- F. Shelf Life: Wire and cable manufactured more than 12 months prior to date of delivery to the site shall not be used.

3.2 WIRE PULLING AND CABLE INSTALLATION

- A. Raceways: Refer to Section 16110, "Raceways," for the preparation of raceways for wire and cables.
- B. Equipment: Provide suitable installation equipment to prevent cutting and abrasion of conduits during the pulling of wires and cables.
 - 1. Ropes used for pulling of conductors shall be made of polyethylene or other suitable nonmetallic material.
 - 2. Metallic ropes shall not be used.

3. Pull conductors simultaneously where more than one is being installed in same raceway.
 4. Use pulling compound or lubricant where necessary; compound shall not deteriorate conductor or insulation.
 5. Lubricants shall conform to UL requirements applicable.
 6. Pulling lines shall be attached to conductor cables by means of either woven basket grips or pulling eyes attached directly to the conductors. Rope hitches shall not be used.
 7. All cables installed in a single conduit shall be pulled in together.
 8. Where polyethylene insulation is used and a pulling lubricant is required, the lubricant shall be certified by the manufacturer to be non-injurious to such insulation.
- C. Splices: Keep conductor splices to a minimum. Splice wires and cables only in outlet boxes, junction boxes, pullboxes, manholes and handholes.
1. In the making of a splice, connectors shall be brought up securely upon the conductors such that all conductors are equally engaged, the insulation is not ruptured, no bare wires are exposed or have "backed off" due to the application of pressure and the connection will not loosen due to cycling or vibration, in order to insure an efficient splice.
 2. The number, size and combinations of conductors permitted as listed on manufacturer's packaging of connector shall be strictly followed.
 3. Connectors shall be fully insulated by a skirt, or taped to provide an insulation value at least equal to rating of wires being connected.
- D. Connectors: Tighten electrical connectors and terminals, including screws and bolts, in accordance with manufacturer's published torque tightening values or comply with tightening torques specified in UL 486A and 486B.
- E. Color Coding: Color code all secondary service, feeder and branch circuit conductors throughout the project secondary electrical system as follows:

208y/120 Volts

Black
Red
Blue
White
Green

1. The colors shall be factory-applied entire length of the conductors by one of the following methods except as noted and limited below:
 - a. Solid color compound.
 - b. Solid color coating.
 - c. Surface printing every 12 inches, maximum spacing of 18 inches.

2. All branch circuit conductors Nos. 12 AWG and 10 AWG shall be solid color compound or solid color coating.
3. All sizes of conductors used for neutrals and equipment grounds shall be solid compound or solid color coating white and green, respectively.
4. All phase conductors No. 8 AWG and larger color coded with pressure sensitive tape shall have a background color other than white or green.
5. Field applied color coding methods may be used in lieu of factory coded wire in sizes larger than No. 10 AWG.
6. Color pressure-sensitive plastic tape shall be applied in half overlapping turns for a distance of six inches or all terminal points and in all boxes in which splices or taps are made. The last two laps of tape shall be applied with no tension to prevent possible unwinding.
7. Tape shall be 3/4-inch wide and colors shall be as specified.
8. Cable identification markings shall not be obliterated by taping and tape locations may be adjusted slightly to prevent obliteration of cable marking.

F. Cable Seals: All wires and cables entering building from underground shall be sealed between cable and conduit or sleeve where cable exits conduit, with a water and gas proof non-hardening sealing compound. See Section 16110, "Raceways," for additional information on seals.

3.3 FIELD QUALITY CONTROL

- A. Tests: Feeders and branch circuit insulation shall be tested after installation, and before connection to fixtures and appliances.
 1. Tests shall be performed with a 500-volt megger, and conductors shall test free from short-circuits and grounds.
 2. Conductors shall be tested phase-to-phase and phase-to-ground: -
 3. Furnish the instruments, materials, and labor required. Perform the tests in the presence of the Contracting Officer.
 4. Test readings shall be recorded and delivered.
- B. Demonstration: Subsequent to wire and cable hookups, energize circuit and demonstrate functioning in accordance with requirements. Where necessary, correct malfunctioning units, and then retest to demonstrate compliance.

END OF SECTION 16120

SECTION 16130 - ELECTRICAL BOXES AND FITTINGS

PART 1 -GENERAL

1..1 SUMMARY

- A. Scope: This Section covers electrical box and electrical fitting work for power and lighting.
- B. Types: Types of electrical boxes and fittings in this Section include the following:
 - 1. Outlet boxes
 - 2. Junction boxes
 - 3. Pull boxes
 - 4. Bushings
 - 5. Locknuts
 - 6. Knockout closures

1..2 QUALITY ASSURANCE

- A. National Electrical Manufacturers Association (NEMA): Conform to NEMA OS 1 "Sheet-Steel Outlet Boxes, Device Boxes, Covers, and Box Supports," for sheet-steel outlet boxes, devices boxes, covers and box supports.
- B. National Fire Protection Association (NFPA): Comply with NFPA 70, "National Electrical Code," for construction and installation of electrical wiring boxes and fittings.
- C. Underwriters Laboratories, Inc. (UL): Provide electrical boxes and fittings which are UL-listed and -labeled, and conform to UL 50, "Cabinets and Boxes," UL 514A, "Metallic Outlet Boxes," UL 514B, "Fittings for Conduit and Outlet Boxes," and UL 514C, "Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers," UL 886.

1..3 SUBMITTALS

- A. Division 1: Refer to Section 01300, "Submittals, " for basic information relating to submittal requirements.
- B. Product Data: Submit manufacturer's data on electrical boxes and fittings.

PART 2 - PRODUCTS

2..1 MANUFACTURERS (Not Used)

2..2 GENERAL

A. Product Selection: Select boxes of types appropriate for each use and location.

1. Select covers for boxes of types appropriate for each use and location.
2. Provide gaskets for covers of boxes in damp locations.

B. Corrosion resistance: Provide galvanized or other approved corrosion resistant finish for all boxes, accessories and fittings.

2.3 FABRICATED MATERIALS

A. Interior Outlet Boxes: Provide minimum 4-inch square by 1-1/2-inch deep, one piece, deep-drawn, galvanized steel, outlet boxes for general use. Provide 4-inch octagonal concrete boxes and hung ceiling boxes of the folded or welded type where required by project conditions. Provide square cornered, straight sided gang boxes wherever required by NFPA 70 or more than two wiring devices are indicated in the same location. Provide boxes of increased depth where required by the project.

1. Construct with stamped knockouts in the back and sides.
2. Provide threaded screw holes with corrosion-resistant screws for securing box covers and wiring devices.

B. Interior Outlet Box Accessories: Provide outlet box accessories as required for each installation, including plaster covers, mounting brackets, wallboard hangers, extension rings, fixture studs, cable clamps and metal straps for supporting outlet boxes, which are compatible with outlet boxes being used and filling requirements of individual wiring situations.

C. Weatherproof Outlet Boxes: Provide corrosion-resistant cast-metal weatherproof outlet boxes, of types, shapes and sizes, including depth of boxes, with threaded conduit ends, cast-metal face plates with spring-hinged waterproof caps suitably configured for each application, including face plate gaskets and corrosion-resistant fasteners.

D. Junction and Pull Boxes: Provide galvanized sheet steel junction and pull boxes, with screw-on covers and of types, shapes and sizes, to suit each respective location and installation.

1. Provide welded seams and stainless steel nuts, bolts, screws and washers.
2. Conform to the applicable requirements of NFPA 70 and to UL 50 for boxes over 100 cubic inches volume, except as modified below.
3. Where necessary for boxes to provide a rigid assembly, provide integral structural steel bracing.

E. Bushings, Knockout Closures and Locknuts: Provide corrosion-resistant punched-steel box knockout closures, conduit locknuts, malleable iron conduit bushings and offset connectors of types and sizes to suit respective uses and installation.

PART 3 - EXECUTION

3.1 INSTALLATION OF ELECTRICAL BOXES AND FITTINGS, GENERAL

- A. Coordination: Coordinate installation of electrical boxes and fittings with wire/cable and raceway installation work, and with general construction work.
- B. Weatherproof: Provide weatherproof outlets for all interior and exterior locations exposed to weather or moisture.
- C. Knockout Caps: Provide knockout closures to cap unused knockout holes where blanks have been removed.
- D. Anchoring: Support and fasten boxes securely.
- E. Sizes: Provide boxes of sizes adequate to meet NFPA 70 volume requirements, but in no case smaller than sizes indicated.

3.2 INSTALLATION OF OUTLET BOXES

- A. Grounding: Provide each box to which a lighting fixture or receptacle is to be attached with a grounding terminal, consisting of either a green-colored washer-in-head machine screw, not smaller than No. 10-32, screwed in to a tapped hole or a grounding bushing attached to one of the conduits.
- B. Mounting Height: The "mounting height" of a wall-mounted outlet box is defined as the height from the finished floor to the horizontal center line of the cover plate.
 - 1. Where mounting heights are not indicated or where heights and, locations interfere with mechanical, architectural or structural features, install outlet boxes in an approved location, without additional cost.
 - 2. Where a ceiling outlet and a dropped beam or other change in ceiling level are shown at the same location, place the outlet at least 9 inches from the finished edge of the beam or change in level, except as otherwise indicated.
- C. Doors: Locate boxes for switches near doors on the side opposite the hinges as indicated on architectural drawings and close to door trim.
- D. Ceilings: For outlets in ceilings where wiring is concealed, use outlet boxes 4 inches square by 1 1/2-inch deep, minimum.
- E. Protection: Protect outlet boxes to prevent entrance of plaster, and debris. Thoroughly clean foreign material from boxes before conductors are installed.
- F. Extension Rings: Where extension rings are required on existing outlet boxes, drill new mounting holes in the rings to align with the mounting holes on the existing boxes.

3.3 PULL AND JUNCTION BOXES

A. Installation: For installation of junction and pull boxes, conform to NFPA 70 and the following:

1. For boxes exposed to rain or installed in wet locations use weatherproof type.
2. For boxes in main feeder conduits use sizes not smaller than 8 inches square by 4 inches deep.
3. Do not exceed 6 conductors entering and 6 leaving raceways in a single box.
4. Conductors in any panel or junction box including equipment grounding conductors shall not exceed:

Size of Largest Conductors	Maximum No. of Conductors
No. 4/0 AWG	30
250 MCM	20
500 MCM	15
Over 500 MCM	10

- B. Supports: Provide in each box, including boxes above switchboards and motor control centers, with sufficient clamps, grids, or devices to which cables are secured in neat and orderly fashion permitting ready identification and so that no cable will have an unsupported length of more than 30 inches.
- C. Adjacent Boxes: Locate no box within 2 feet of any other panel or junction box.
- D. Flush Mount: Mount pull boxes concealed in nonaccessible walls or ceilings, with the covers flush with the finished wall or ceiling.

END OF SECTION 16130

SECTION 16135 - WIRING DEVICES

. PART 1 -GENERAL

1..1 SUMMARY

- A. Scope: Extent of wiring device work is indicated on drawings and schedules, by requirements of this Section, and Section 16010, "Electrical Basic Requirements."
- B. Types: Types of electrical wiring devices specified in this Section include the following:
 - 1. Receptacles.
 - 2. Ground-fault circuit interrupters.
 - 3. Switches.
 - 4. Photocells.
 - 5. Time switches.
 - 6. Wallplates.
- C. Related Sections: Refer to other sections of Division 16 for the following:
 - 1. Wire and Cables.
 - 2. Boxes.

1..2 QUALITY ASSURANCE

- A. Codes: Provide wiring devices conforming to the following:
 - 1. American National Standards Institute (ANSI): Receptacle devices constructed in accordance with ANSI C73, "Attachment Plugs and Receptacles, Dimensions of."
 - 2. National Electrical Manufacturers Association (NEMA): Provide wiring devices constructed and configured in accordance with the requirements of:
 - a. WD 1 General Requirements for Wiring Devices.
 - b. WD 6 Wiring Devices - Dimensional Requirements.
 - 3. National Fire Protection Association (NFPA): Comply with NFPA 70, "National Electrical Code" as applicable to construction and installation of electrical wiring devices.
 - 4. Underwriters Laboratories, Inc. (UL): Provide wiring devices which are UL listed and comply with the requirements of:
 - a. 5 Surface Metal Raceways and Fittings.
 - b. 20 General-Use Snap Switches.
 - c. 498 Attachment Plugs and Receptacles.
 - d. 514A Metallic Outlet Boxes.
 - e. 514C Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers.
 - f. 943 Ground-Fault Circuit Interrupters.

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's data on electrical wiring devices.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Delivery and Handling: Handle wiring devices carefully to prevent damage. Do not install damaged wiring devices, replace with new.
- B. Storage: Store wiring devices in a clean and dry place. Protect from dirt, construction debris, and physical damage.

PART 2 - PRODUCTS

2.1 MANUFACTURERS (Not Used)

2.2 WIRING DEVICES

- A. General: Provide factory-fabricated wiring devices, in types, colors, and electrical ratings as shown on drawings and to match existing devices indicated and which comply with NEMA WD 1.

2.3 RECEPTACLES

- A. Duplex Receptacles: Provide residential grade duplex receptacles 15 or 20 Amperes, 125 Volts to match existing receptacles as shown on drawings. Bathroom receptacles shall have built-in ground fault protection.
- B. Weatherproof Receptacles: Provide duplex receptacles, 20 A, 125 V, NEMA 5-20R in cast metal box with gasketed, weatherproof cast metal cover plate and gasketed cap over each receptacle opening. Provide cap with spring hinged cover flap.

2.4 SWITCHES

- A. General: Provide residential grade switches as indicated on the drawings.
- B. Snap Switches: Provide specification grade, general duty flush single pole toggle AC quiet switches, 15 or 20 A to match existing switches, 120-277 V, with mounting yoke insulated from mechanism, equip with plaster ears, switch handle and back or side-wired screw terminals. Provide captive or terminal type terminal screws not smaller than No. 8. Provide back-wired devkes with separate access holes for wiring.
- C. Three Way Switches: Provide specification grade, general duty flush 3-way AC quiet switches, 15 or 20 A to match existing switches, 120-277 V, with mounting yoke insulated from mechanism, equip with plaster ears, lock type switch handles, back or side wired screw terminals, with break-off tab features, which allows wiring with

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separate or common feed. Provide captive terminal type terminal screws not smaller than No. 8. Provide back wired devices with separate access holes for wiring.

- D. Photocells: Provide quick-response, cadmium-sulfide type photocell with 15 to 20 second built-in time delay to prevent response to momentary lightning flashes, car headlights or cloud movements. Energize photocells when north sky light decreases to 1.5 footcandles and maintain system energized until north sky light increases to 3 to 5 footcandles. Provide photocells of voltage and wattage ratings as indicated.
- E. Time Switches: Provide automatic electric motor driven time switch SPST mounted in a NEMA general purpose enclosure as indicated on the drawings. Provide a mechanism that is readily removable from the enclosure. Provide the time switch with 24-hour astronomical dial, 7-day calendar dial with one ON-OFF operations per 24-hour period. Provide timer motor that is self-starting, heavy duty with lifetime lubrication for operation on 120 V 60-cycle supply. Provide contacts that are heavy duty 30 A at 120 240 V.

2..5 WIRING DEVICE ACCESSORIES

- A. Wallplates: Provide wall plate for each switch and receptacle outlet. Do not use sectional gang plates. Provide multi-gang outlet plates for multi-gang boxes. Plates shall be plastic or painted metal to match existing.

PART 3 - EXECUTION

3..1 INSTALLATION OF WIRING DEVICES

- A. General: Install wiring devices as indicated, in accordance with manufacturer's written instructions, applicable requirements of NFPA 70 and NEMA "Standard of Installation," and in accordance with recognized industry practices to fulfill project requirements. Where not indicated, mount switch adjacent to latch jamb of door.
- B. Coordination: Coordinate with other work, including painting, electrical boxes and wiring work, as necessary to interface installation of wiring devices with other work.
- C. Boxes: Install wiring devices only in electrical boxes which are clean; free from excess building materials, dirt, and debris.
- D. Work Sequence: Install wiring devices after wiring work is completed.
- E. Connectors and Terminals: Tighten connectors and terminals, including screws and bolts, in accordance with equipment manufacturer's published torque tightening values for wiring devices.

3.2 PROTECTION OF WALL PLATES AND RECEPTACLES

- A. General: Upon installation of wall plates and receptacles, advise Contracting Officer regarding proper and cautious use of convenience outlets. At time of substantial completion, replace those items which have been damaged, including those burned and scored by faulty plugs.

3.3 GROUNDING

- A. General; Provide equipment grounding connections for wiring devices, unless otherwise indicated. Tighten connections to comply with tightening torques specified in UL 486A to assure permanent and effective grounds.

3.4 TESTING

- A. General: Test wiring devices for electrical continuity, and for short-circuits prior to energizing circuitry. Ensure proper polarity of connections is maintained. Subsequent to energization, test wiring devices to demonstrate compliance with requirements.

END OF SECTION 16135

SECTION 16440 - DISCONNECT SWITCHES

PART 1 - GENERAL

1..1 SUMMARY

- A. Scope: Extent of disconnect swi(ch work is indicated on the drawings and schedules, by the requirements of this Section, and Section 16010, "Electrical Basic Requirements."
- B. Types: Types of disconnect switches covered by this Section include the following:
 - 1. Enclosed, heavy duty non-fused switches.
 - 2. Enclosed, heavy duty fusible switches.
- C. Refer to other Division 16 sections for:
 - 1. Wire and Cable
 - 2. Raceways
 - 3. Conduit

1..2 QUALITY ASSURANCE

- A. National Electrical Manufacturers Association (NEMA): Provide switches conforming to NEMA KS 1, "Enclosed Switches."
- B. NEMA: Construct enclosures conforming to NEMA 250, "Enclosures for Electrical Equipment (1000 Volts Maximum)."
- C. National Fire Protection Association (NFPA): Conform to NFPA 70, "National Electrical Code;" for installation and minimum fusing requirements.
- D. Underwriters Laboratories, Inc. (UL): Manufacture switches conforming to the requirements of UL 98, "Enclosed and Dead-Front Switches."
 - 1. Provide switches listed and labeled by UL.
 - 2. Provide fuse holders conforming to UL 512, "Fuseholders."

1..3 SUBMITTALS

- A. Division 1: Conform to the requirements of Division 1, Section 01300, "Submittals."
- B. Product Data: For each switch provided on this project, furnish the manufacturer's published technical data, drawings, dimensions, and capacities.

PART 2 - PRODUCTS

2..1 MANUFACTURERS (Not Used)

2..2 SWITCHES

- A. General: Provide individually enclosed air-break switches as indicated on the drawings, with all current-carrying parts enclosed and manually operable by means of external handles. Switches shall be heavy duty (HD) type, ampere and horsepower rated.
 - 1. Provide cartridge enclosed fuses and rejection fuse holders when fused switches are indicated.
 - 2. Provide NEMA 1 enclosure for indoors, NEMA 3R enclosure for outdoors, or as indicated on the drawings.
- B. Ratings: Conform to NEMA KS 1 for voltage and horsepower ratings.
 - 1. Voltages shall be 240 or 600 determined by the circuit voltage.
- C. Switching Action: · Provide quick-make, quick-break type switch action.
- D. Construction: All current carrying parts shall be high conductivity copper, with heating ratings conforming to UL 98.
 - 1. Provide silver tungsten or silver-plated copper contacts.
 - 2. Provide fuse holders of the rejection type, sized for fuses scheduled.
 - 3. Provide interrupting ratings minimum 10 times locked rotor current of NEMA maximum motor horsepower rating.
 - 4. Arrange for padlocking with two locks in either "off ' or "on" position
- E. Fuses: Provide RK-5 fuses for all mechanical motor disconnect switches.

PART 3 - EXECUTION

3..1 INSTALLATION OF SWITCHES

- A. Installation: Install switches in conformance with the manufacturer's requirements and NFPA 70, paragraph , "Switches." Provide grounding in accordance with NFPA 70.

END OF SECTION 16440

SECTION 16510 - LIGHTING FIXTURES

PART 1 - GENERAL

1..1 SUMMARY

- A. Scope: Extent of interior lighting fixture work is indicated on drawings and schedules, by requirements of this Section, and Section 16010, "Electrical Basic Requirements."
- B. Types: Types of interior lighting fixtures in this Section include the following:
 - 1. Fluorescent.
 - 2. Incandescent.
- C. Related Sections: Refer to other sections of Division 16 for the following:
 - 1. Basic Electrical Materials and Methods.
 - 2. Wires and Cables.

1..2 QUALITY ASSURANCE

- A. Manufacturers: Provide interior light fixtures of manufacturers as shown on light fixture schedule on drawings or approved equal.
- B. Certified Ballast Manufacturers Association (CBM) Labels: Provide fluorescent-lamp ballasts which comply with CBM standards and carry the CBM label.
- C. National Electrical Manufacturers Association (NEMA): Comply with applicable requirements of NEMA LE 4, "Recessed Luminaries, Ceiling Compatibility" pertaining to recessed luminaries.
- D. National Fire Protection Association (NFPA): Comply with NFPA 70, "National Electrical Code," as applicable to construction and installation of interior building lighting fixtures and emergency lighting.
- E. Provide emergency and exit marker lighting units that comply with NFPA 101, "Code for Safety to Life From Fire in Buildings and Structures," and local codes.
- F. UL: Provide interior lighting fixtures and emergency lighting units which have been UL listed and labeled.

1..3 SUBMITTALS

- A. Division 1: Conform to the requirements of Division 1, Section 01300, "Submittals."
- B. Product Data: Submit manufacturer's data on lighting fixtures, lamps and ballasts.

1. Include electrical ratings and photometric data with certified results of independent laboratory tests.
 2. Include data on batteries and chargers of emergency lighting units.
- C. Shop Drawings: Submit dimensioned drawings of lighting fixtures. Submit fixture shop drawings in booklet form with separate sheet for each fixture, assembled in order of luminaire "Type" designation with proposed fixture and accessories clearly indicated on each sheet.
- D. Manuals: Prior to final inspection, provide complete set of operating and maintenance manuals. Include technical data sheets and parts ordering information. Include testing and maintenance requirements and instructions for emergency lighting equipment.

PART 2 - PRODUCTS

2..1 MANUFACTURERS (Not Used)

2..2 GENERAL

- A. Lighting Fixture Requirements: Provide fixtures which meet the requirements of these specifications and the project drawings.
- B. General Requirements: Provide lighting fixtures of sizes, types, and ratings indicated; complete with, but not necessarily limited to, housings, lamps, lamp holders, reflectors, ballasts, starters, wiring and batteries and battery charging devices.
1. Form fixture sheet metal housings to prevent warping and sagging. Return or clean all edges free of all burrs or sharp spots. Provide fixtures free from light leaks after installation.
 2. Hinged door closure frames shall operate smoothly without binding. Fabricate frames to allow lamp installation/removal without tools. Hinge mechanism shall be designed to preclude accidental falling of hinged door closure frames during relamping operations and while secured in operating position.
 3. Interior light reflecting surfaces shall have reflectance of not less than 85 percent for white surfaces, 83 percent for specular surfaces, and 75 percent for specular diffusing surfaces.
 4. Provide manufacturer's standard finish applied over corrosion-resistant primer, free of streaks, runs, holidays, stains, blisters, or similar defects. Remove any fixtures showing evidence of rust at time of final inspection.
 5. Provide each fixture with lamps as indicated. Where lamps are not indicated, provide lamps as recommended by manufacturer.

2..3 FLUORESCENT LIGHTING FIXTURES

- A. General: Conform to UL 1570, except for damp and wet locations conform to UL 57.

- B. Fluorescent Lamps: Provide the number, type, and wattage indicated. Provide lamps conforming to American National Standards Institute (ANSI) C78.
- C. Fluorescent Ballasts: Provide fluorescent ballasts conforming to UL 935, "Fluorescent-Lamp Ballasts," ANSI C82. 1, "Ballasts for Fluorescent Lamps - Specifications." Provide fixtures labeled by CBM and certified by Electrical Testing Laboratories (ETL). Ballasts shall be high power factor type, unless indicated otherwise, designed to operate on the voltage system to which they are connected. Ballasts shall be Class P with sound rating "A" unless otherwise noted. Fixtures and ballasts shall be designed and constructed to limit the ballast case temperature to 90 degrees C. when installed in an ambient temperature of 40 degrees C.
 - I. Energy-Saving Ballasts: Provide energy-saving fluorescent ballasts of the CBM certified full light output type, compatible for use with energy-saving lamps. Average input wattage 86 or less when operating two F40T12 lamps, 50 or less when operating one F40T12 lamp, 159 or less when operating two F96T12 lamps, tested in accordance with ANSI C82.2, "Fluorescent Lamp Ballasts - Methods of Measurement," methods.
- D. Lamp Sockets: Comply with UL 542 and ANSI C81.20, "Electric Lamp Bases and Holders - Fluorescent Types, Specifications for."

2.4 INCANDESCENT LIGHTING FIXTURES

- A. General: Conform to UL 1571, except lighting fixtures for damp and wet locations shall conform to UL 57.
- B. Incandescent Lamps: Provide the number, type, and wattage indicated on drawings.
- C. Lamp Sockets:- Conform to UL 496, "Edison Base Lampholders."
- D. Fixture Types: Conform to Contract Drawings.

2.5 RECESSED AND FLUSH-MOUNTED FIXTURES

- A. General: Provide type that can be relamped from the bottom, except as otherwise indicated. Trim for the exposed surface of flush-mounted fixtures shall be as indicated. Provide trims, mountings, supports and adapters for type of ceiling in which mounted. Verify before ordering.

2.6 SUSPENDED FIXTURES

- A. General: Provide hangers capable of supporting twice the combined weight of the adjoining fixtures and provide with swivel hangers to ensure a plumb installation. Hangers shall be cadmium-plated steel with swivel-ball tapped for the conduit size indicated. Where indicated, provide shock-absorbing type hangers which allow fixtures to swing within an angle of 20 degrees.

- B. Support: Brace pendants 4 feet or longer to limit swinging. Provide single-unit suspended fluorescent fixtures with twin-stem hangers.

2..7 EXIT SIGNS

- A. General: Provide exit signs conforming to UL 924, NFPA 70 and NFPA 101.
- B. Type: As shown in light fixture schedule on drawings or approved equal.
- C. Power: Provide exit signs as follows:
 - 1. AC powered exit signs.
 - 2. Self-Powered Exit Signs (Battery Type): Provide with automatic high/low trickle charger in a self-contained power pack. Battery shall be sealed, maintenance-free.

2.8 EMERGENCY LIGHTING EQUIPMENT

- A. General: Provide emergency lighting equipment conforming to UL 924, NFPA 70 and NFPA 101.
- B. Types: Provide types of emergency lighting equipment as shown in light fixture schedule on drawings or approved equal.

PART 3-EXECUTION

3.1 INSTALLATION

- A. Setting and Securing: Set lighting fixtures plumb, square, and level with ceiling and walls, in alignment with adjacent lighting fixtures, and secure in accordance with manufacturers' directions and approved shop drawings. Conform to the requirements of NFPA 70.
- B. Mounting: Mounting heights specified or indicated are to bottom of fixture for suspended and ceiling-mounted fixtures and to center of fixture for wall-mounted fixtures. Obtain approval of the exact mounting for lighting fixtures on the job before installation is commenced and, where applicable, after coordinating with the type, style, and pattern of the ceiling being installed.
- C. Support: Recessed and semi-recessed fixtures may be supported from suspended ceiling support system ceiling tees if the ceiling system support rods or wires are provided with a minimum of four rods or wires per fixture and located not more than 6 inches from each corner of each fixture.
 - 1. Do not support fixtures by ceiling acoustical panels.
 - 2. Provide rods or wires for lighting fixture support under this Section of the specifications.

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3. Additionally, for recessed fixtures, provide support clips securely fastened to ceiling grid members, a minimum of one at or near each corner of each fixture.

D. Coordination: Coordinate with other trades as appropriate to properly interface installation of lighting fixtures with other work.

3.2 EXIT AND EMERGENCY LIGHTS

A. General: Wire exit lights on separate circuits. Connect exit lights to circuit breakers in the emergency panel. Wire emergency lighting units ahead of the switch to the normal lighting circuit located in the same room or area.

3.3 ADJUST AND CLEAN

A. Clean: Clean lighting fixtures of dirt and debris upon completion of installation.

B. Protection: Protect installed fixtures from damage during remainder of construction period.

3.4 FIELD QUALITY CONTROL

A. Tests: Upon completion of installation of lighting fixtures, apply electrical energy to demonstrate capability and compliance with requirements. Where possible, correct malfunctioning units at site, then retest to demonstrate compliance; otherwise, remove and replace with new units, and proceed with retesting.

1. For normal and emergency building lighting, upon completion of the installation, conduct an operating test to show that the equipment operates in accordance with the requirements of this Section.

2. Test all wiring with an insulation testing instrument, both before and after connection of fixtures and equipment. The minimum resistance shall be 250,000 ohms.

3. To demonstrate all functions and protective operations of the exit and emergency lighting system, simulate malfunctions to verify proper functioning. Provide instruments as required to make positive observation of test results. Include the following in tests:

a. Duration of supply.

b. Low battery voltage shut down.

c. Normal transfer to battery source and retransfer to normal.

d. Low supply voltage transfer.

B. Replacement Lamps: At the time of substantial completion and prior to field tests, replace lamps in interior lighting fixtures which are observed to be noticeably dimmed after Contractor's use and testing.

END OF SECTION 16510

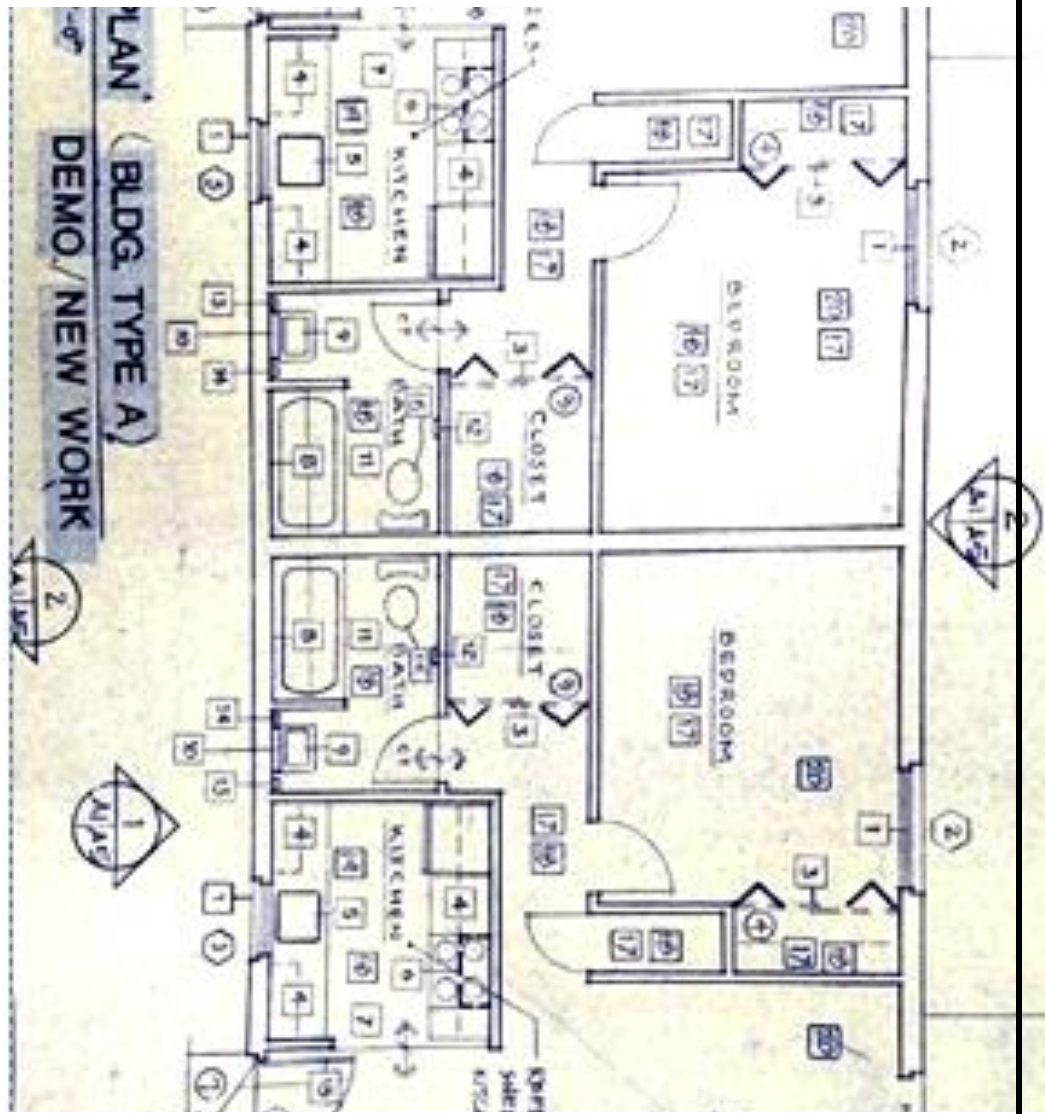
IFB No. 2017-01 Kitchen & Bathroom Renovation Project at Marlborough Towne				
		Unit Cost	LOCATION 1	LOCATION 2
DIVISIONS.				
DIVISION 2 - SITEWORK				
DIVISION 5 - METALS				
5.1	Railings			
5.2	Other Steel Work			
	Medicine cabinet w/Mirror Allowance : \$200.00 ea			
	Medicine cabinet w/Mirror Tilt (ADA) Allowance : \$200.00 ea			
DIVISION 6 - WOOD & PLASTIC				
6.1	Millwork Allowance : \$			
6.2	Installation Kitchen Cabinets & Tops			
	Installation Kitchen Cabinets & Tops (ADA)			
6.3	Bathroom Vanity & Tops Allowance : \$ 500.00			
	Sink only (ADA)			
6.4	Rough Carpentry			
	Required blocking for Grab Bars			
	WINGITS Mfr #: RC-RESGBW35-2			
6.5	Finish Carpentry			
	1x12 wood shelving and cleats			
DIVISION 7 - THERMAL & MOISTURE				
7.3	Caulking & Sealants			
DIVISION 8 - DOORS & WINDOWS				
8.1	Exterior doors, Frames & Hardware			
8.2	Interior Doors, Frames & Hardware			
	Masonite Prehung Hollow Core 6-Panel Int. Door 30-in x 80-in w/Privacy lockset : BEDROOM			
	Masonite Prehung Hollow Core 6-Panel Int. Door 30-in x 80-in w/Privacy lockset : BATHROOM			
	Closet Doors			
	4- (Primed) Solid Core 6-Panel Slab Interior Door 30-in x 80			
	2-(Primed) Solid Core 6-Panel Slab Interior Door 36-in x 80			
	1- (Primed) Full Louver Pine Bi-Fold Closet Int. Door 24-in x 80			

	DIVISION 9 - FINISHES			
9.1				
9.2				
9.3				
9.4	New Ceramic Tile & Grout			
	Wall Tile - Daltile Finesse Bright White 6 in. x 6 in. Ceramic Wall Tile (12.50 sq. ft. / case) Model # FE0166HD1P			
	Wall Tile ACCENT -Daltile Sandalo Serene White 6 in. x 6 in. Glazed Ceramic Wall Tile (12.5 sq. ft. / case) Model# SW90661P2			
	Shower surround 6" 60 sf			
	Flooring (bath room) 2" 53sf			
	Kitchen Backsplash6" 25sf (OPTIONAL)			
	Floor Tile and Backsplash - Model # WD1022HC1Y2 American Olean Weddington Russet Uniform Squares Mosaic Ceramic Floor and Wall Tile			
	Marble threshold 36"			
9.5				
9.6	Vinyl Composition Tile 600 SF + 90 SF 15% Armstrong VCT Fortress White Product # 51839			
	Planks - Brazilian Forest 600 SF + 90 SF 15% 36 in. x 6 in. Vinyl Tile Product Number D2422 Armstrong Collection Natural Living			
9.7	Painting Main -Color SW 0051 Classic Ivory Interior Bath Room - SW 8917 Shell White – Trim - SW 7102 White Flour			
	SW 0051 Classic Ivory Interior			
	DIVISION 10 - SPECIALTIES			
10.1	Mail Box & House #'s			
10.2	Bathroom Accessories (To include safety grab bars) Allowance : \$ 650.00 ea			
10.3	Wire Closet Shelving & Poles			

	Allowance : \$ 30.00 LF			
	Wood painted 1x12 shelving with cleats			
	DIVISION 11 - EQUIPMENT			
11.1	Appliances Installation ENERGY STAR RATING			
	Refrigerator Allowance : \$ 550.00 ea			
	Electric range Allowance : \$ 550.00ea			
	Garbage Disposal Allowance : \$ 110.00 ea			
	Exhaust fan			
	Range Hood			
	DIVISION 15 - MECHANICAL			
15.1	Plumbing Work			
	Kitchen Sink and faucet Allowance : Elkay 22-in x 25-in Stainless Single-Basin Drop-In Kitchen Sink Model # K125223 Three Hole - 6" Depth - 22 Gauge - Center Drain - Satin Finish - Sound Deadening Bottom - Integrated Mounting System - Standard 3-1/2" Drain BRASS CRAFT CRI9C ANLE STOPS, SI- 20A BRAIDED STAINLESS SSTEEL SUPPLIES AND 649SS ESCUTCHEONS, KEENEY 461XF-6 CAST BRASS TRAP			
	Kitchen Sink offset ADA and faucet Aspen® 25W x 22"L ADA Single Bowl Stainless Steel Sink - Three Hole - 6" Depth - 21 Gauge - Rear Right Drain - Satin Finish - Integrated Mounting System - ADA Compliant - Sound Deadening Bottom - Standard 3-1/2" Drain - Mfg #GE125213 -BRASS CRAFT CRI9C ANLE STOPS, SI- 20A BRAIDED STAINLESS SSTEEL SUPPLIES AND 649SS ESCUTCHEONS, KEENEY 461XF-6 CAST BRASS TRAP			
	Vanity with Drop-in Sink and Faucet : BOWL INTEGRAL PART OF COUNTERTOPW/CABINET			
	Seasons® Wall Hung Lavatory Sink White China Manufacturer Part Number 13-0010ADA White China Wall Hung Lavatory - 17-3/8 x 19-1/8" - 4" Centers - Front Overflow ADA			
	Bath tub replace Bootz® Enameled Steel Bathtub - Right-Handed Drain - Self- Leveling For Easy Install - White - 5' Standard Design - 60W x			

	30D x 14-1/4"H - Mfg #011-2364 Watco® 1-Hole Overflow Plate Bath Waste Half-Kit Push-Pull Schedule 40 PVC CP			
	Shower Fixtures Allowance : Delta® Activtouch Slide Bar Hand Shower - Chrome Finish - Nine-Setting Hand Shower - Features Touch-Clean® Spray Holes - 60" - 82" Stretchable Metal Hose - 28" Wall Bar W/Adjustable Slide - Push Button Spray Selection - 2.5 GPM @ 80 PSI - Mfg #51504			
	Toilet 2-piece 1.28 GPF Elong. White ADA Toilet Mansfield Alto Complete Elongated Smart Height 1.28 GPF Toilet In A Box Mansfield® Alto® 1.28 GPF Elongated Comfort Height Toilet-In-A-Box - All-In-One Kit Includes Toilet Tank, Bowl, Seat, Flange Bolts And Wax Ring - SmartHeight™ Bowl For Maximum Comfort And ADA Compliance - - Made In USA - Mfg #4137 BRASS CRAFT CR19C ANGLE STOP, 649SS ESCUTCHEON AND S1-12DL STAINLESS STEEL BRAIDED SUPPLY CONNECTOR.			
	Kitchen Faucet Delta® Foundations Core-B Single Handle Kitchen Faucet - Chrome Finish - Washerless Function - 1.8 GPM @ 60 PSI - Less Spray - Mfg #B1310LF			
	Bath Faucet Delta® Foundations Core-B Single Handle Bath Faucet - Drilled For Pop-Up - Chrome Finish - Washerless Function - 1.2 GPM @ 60 PSI -Mfg #B501LF -BRASS CRAFT · CR19C ANGLE STOPS, 51-12A BRAIDED STAINLESS STEEL SUPPLIES AND 649SS ESCUTCHEONS, KEENEY 5700PC OFFSFT TYPE GRID DRAIN AND 5463XPC CAST BRASS TRA			
	Plumberex Pro-Extreme™ Sink Tubular ADA Cover Under Sink Protector Fits Brass/Plastic1-1/4" And 1-1/2" P-Traps - ADA 4.19.4 And ANSI 117.1 Compliant - Made In USA - Meets All Plumbing Codes Mfg #x4333			
	HVAC			
	DIVISION 16 - ELECTRICAL			
	Electrical Systems			
	Lighting fixtures Allowance : \$ 200.00			

	Fire Alarm Systems			
	Smoke Alarm AL			
	15 Amp Circuit Guard Pro Lighted GFCI - White Hubbell 15 Amp Circuit Guard® Lighted GFCI Duplex - With Wall Plate - White - Mfg #GF15WLA			
	15 Amp Single Pole Wall Switch - White - Package Of 10 Mfg #336406 120 Volt - Single Pole - Wired - Use With Copper WireOnly -			
	15 Amp Decorator Receptacle - White - Package of 10 Part #: 336403			
	DIVISION 17 - ASBESTOS AND / OR LEAD ABATEMENT			
	Asbestos Abatement			
	Lead Paint Abatement			
	DIVISION 18A - ALLOWANCES			
	Allowance At Owners Discretion			
	DIVISION 18B - GENERAL CONDITIONS			
	General Conditions			
	Final Cleaning			
	Job Superintendent			
	General Liability Insurance			
	DIVISION 18C - OVERHEAD/PROFIT & PERMIT FEES			
	Overhead & Fees			
	BID- IFB No. 2017-01 Kitchen & Bathroom Renovation Project at Marlborough Towne			
	TOTAL CONSTRUCTION COST Unit			
	LOCATION 1 (5 UNITS) TOTAL CONSTRUCTION COST			
	LOCATION2 (5 UNITS) TOTAL CONSTRUCTION COST			
	LOCATION 1 & 2 (10 UNITS) TOTAL CONSTRUCTION COST			



List of Abatement Contractors

JJPS Environmental Remediation and General Construction Services

Dr. Alex Ukoh (ukoh@jjpsconstruction.com) 202-590-6699

PM Carlos Lara (elovejomacho@msn.com) 585-200-9860

Fairness Environmental Services Inc.

Ms. Ruby Martin (rmartin@fairnessenvir.com) 240-375-7698

Brandes & Cassagnol Engineers (BCE)

Pierre Cassagnol (pcassagnol@bcepc.com) 410-808-1613

Item: Mirror- Fixed Position Tilted Glass w/Stainless Steel Frame
Bobrick B-293 2436 Mirror, 24" x 36" Fixed Position Tilted Glass w/Stainless Steel Frame

DIVISION 5 - METALS

Manufacturer #
B-293 2436

Color /Finish
Glass w/Stainless Steel

Description

The Bobrick B-293 2436 is a fixed-position tilt mirror with a frame. This model has 24" W x 36" H (61 x 91 cm) dimensions. The frame is made of type 304 stainless steel and comes in a satin finish. This model is angled to provide visibility for people in wheelchairs.

- Dimensions: 24" W x 36" H (61 x 91 cm)
- Frame material: 18-8 S, type 304, heavy-gauge stainless steel with satin finish
- Tapers dimensions: From 4" (100mm) depth at top to 1" (25mm) depth at bottom
- Mirror material: No. 1 quality, 1/4" (6mm) select float glass, selected for silvering



Item:
Structural Grab Bar Winglts

DIVISION 16 - ELECTRICAL

Manufacturer #
Mfr #: RC-RESGBW35-2

Color /Finish
Blk/white

Description

Hollow Wall Anchor, Fire Retardant Structural Plastic, Drill Size 3/4 In., Screw Length 3-1/2 In., Screw Type Phillips, Features Waterproof, Use With Wing Its Grab Bars, Includes Steel Screw, Meets/Exceeds ADA/Commercial Building Codes, Package Quantity 2

REQUIRED:

Winglts Apache200 3/4 in. Drill Bit

- Drills holes through ceramic wall tile in seconds
- Engineered for cordless drills; no adapter or arbor needed
- The preferred drilling method for installing Winglts fasteners



Item: Ceramic – Floor bath room
American Olean Weddington Russet Uniform Squares Mosaic Ceramic Floor and Wall Tile

DIVISION 9 - FINISHES

Manufacturer #
Model# WDI022HCIY2

Color /Finish
Multi earth tones

Description

American Olean Weddington Russet Uniform Squares Mosaic Ceramic Floor and Wall Tile (Common: 12-in x 12-in; Actual: 11.87-in x 11.87-in)

Russet mosaic ceramic tile from the Weddington collection can be used on floors, walls and counters

Smooth surface creates an eye-catching sheen

PEI rating of 4 for moderate to heavy traffic in residential homes

Please inspect tile prior to installation, no adjustments will be allowed after installation

Vitreous tile is suitable for indoor use only

2-in x 2-in square mosaic tiles mounted on a 12-in x 12-in sheet

Durable, easy to clean and low maintenance



Item: Ceramic – Wall tile Accent
Sandalo Serene White 6 in. x 6 in. Glazed Ceramic Wall Tile (12.5 sq. ft. / case)

DIVISION 9 - FINISHES

Manufacturer #
Model# SW90661P2

Color /Finish
Serene White

Description

The soft colors emulate natural stone, but with the easy maintenance of tile.
12.5 square feet, 50 pieces per case. Carton weight is 37.4 lbs.
Grade 1, first-quality ceramic tile for wall, backsplash and countertop use
6 in. width x 6 in. length x 5/16 in. thick
Glazed smooth finish with low sheen and a random variation in ton



Item: Ceramic – Wall tile
Daltile Finesse Bright White 6 in. x 6 in. Ceramic Wall Tile (12.50 sq. ft. / case)

DIVISION 9 - FINISHES

Manufacturer #
Model # FE0166HD1P

Color /Finish
Bright White

Description

Highly durable and one of the brightest whites you'll find in tile, the Finesse collection has multiple sizes and shapes to suit just about any ceramic wall tile project. This smooth, glossy 6 in. x 6 in. has a traditional format that's popular on backsplashes and feature walls in the kitchen and bathroom, as well as shower walls. It's a classic tile in a pure white color that is hard to find.

12.5 square feet, 50 pieces per case. Case weight is 35.64 lb.
Grade 1, first-quality ceramic tile for backsplash and wall use
Actual size: 5-15/16 in. width x 5-15/16 in. length x 1/4 in. thick

Model # FE0166HD1P Internet # 201204189 Store SKU # 1001903903



Item: Flooring Vinyl Tile

DIVISION 9 - FINISHES

ARMSTRONG Planks - Brazilian Forest 36 in. x 6 in. Vinyl Tile

Manufacturer #
Model# D2422

Color /Finish
Brazilian cherry

Description

Specifications

Category	Floors
Flooring Type	Vinyl Tile Flooring
Product Number	D2422
Collection	Natural Living
Performance Class	Better
Warranty	Residential Warranty : 15 years ⓘ Light Commercial Warranty : 7 years Vinyl Tile Warranty Guide (PDF - 23KB)
Composition	Vinyl Composition ⓘ
Wear Layer	Urethane No-Wax ⓘ



Planks - Brazilian Forest



36 in. x 6 in. Vinyl Tile



[Write a review](#) [Ask a question](#)

Colors:



Item: Marble threshold 4x36" White Double Beveled 4 in. x 36 in. Engineered Marble Threshold Floor and Wall Tile	DIVISION 09 - FINISHES
Manufacturer # Model # THD2WH4X36DB	Color /Finish natural
Description <ul style="list-style-type: none"> • 3 linear foot per piece, each piece sold individually. Piece weight equals 12 lb. • Grade I, first-quality engineered marble threshold for floor and wall use • 4 in. width x 36 in. length x 3/4 in. thick • Polished smooth finish with a high sheen and slight variation in tone • P.E.I. Rating is not applicable for natural stone • Impervious flooring has water absorption of less than 0.5% for indoor or outdoor use and is frost proof 	
	

Item: Paint - Wall

DIVISION 9 - FINISHES

SW 6119 Antique White Eggshell Finish

Manufacturer #

Model# SW 6119 Antique White

Color /Finish
Antique White

Description

SW 6119

Antique White

Interior / Exterior

Locator Number: 263-C6

263

COORDINATING COLORS

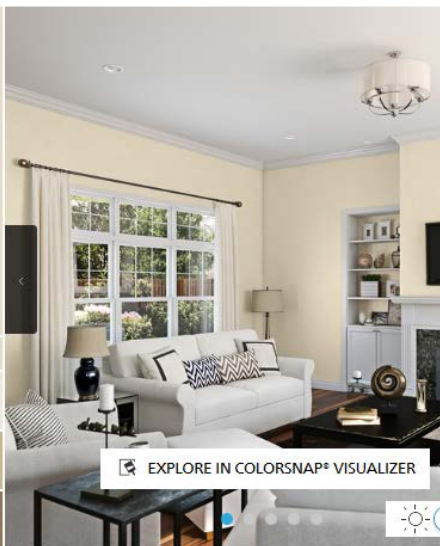
SIMILAR COLORS

DETAILS

SW 7012
Creamy

SW 6121
Whole Wheat

SW 9114
Fallen Leaves



EXPLORE IN COLORSNAP® VISUALIZER



Item: Vinyl Composite Tile
Armstrong VCT Fortress White

DIVISION 9 - FINISHES

Manufacturer #
Product #: 51839

Color /Finish
Multi earth tones on White

Description

American Olean Weddington Russet Uniform Squares Mosaic Ceramic Floor and Wall Tile (Common: 12-in x 12-in; Actual: 11.87-in x 11.87-in)

Features & Details

Size - 12" inch x 12" inch

Thickness - 1/8" inch

Covers 45 square feet /box

Color Name: Fortress White

Manufacturer: Armstrong ARM51839031

Collection: Standard Excelon Imperial Texture

Floor Type: VCT



Item: BATH Faucet
Delta Foundations Core B Lavatory Faucet Chrome Single Handle With Pop-Up

DIVISION 15 - Mechanical

Manufacturer #
Mfg #B510LF

Color /Finish
Chrome

Description

Delta(R) Foundations Core-B Single Handle Bath Faucet With Pop-Up - Chrome Finish - Washerless Function - With Metal Pop-Up - Ultra Low Lead - 1.5 GPM @ 60 PSI - Mfg #B510LF

BRASS CRAFT · CR19C ANGLE STOPS, 51-12A BRAIDED
STAINLESS STEEL SUPPLIES AND 649SS ESCUTCHEONS, KEENEY
5700PC OFFSFT TYPE GRID DRAIN AND 5463XPC CAST BRASS TRA



Item: Elongated Toilet Bowl ADA
American Standard® Cadet® PRO Elongated Toilet Bowl ADA

DIVISION 15 - Mechanical

Manufacturer #
Mfg #3517.A101

Color /Finish
white

Description

American Standard® PRO Cadet® 1.28 GPF Toilet Bowl - Virtually Eliminate Call-Backs For Clogged Toilets And Get A Toilet With A Sleek, Modern Design - Toilet Bowl, Tank Sold Separately - Elongated Bowl (ADA) - 2-1/8" Trapway With EverClean™ Antimicrobial Finish And PowerWash™ Rim That Scrubs Bowl With Each Flush - 16-1/2" Bowl Height, Meets ADA Requirements - 12" Rough-In Or 10" Rough-In When Used With 404765 Tank - Uses 20% Less Water Than Standard 1.6 GPF Toilet - 5-Year Warranty - Use With American Standard Cadet PRO Toilet Tank Only (698572 1.6 GPF, 404776 1.28 GPF, 696581 Right-Hand Trip Lever 1.28 GPF, 404765 10" Rough-In 1.28 GPF) - Mfg #3517.A101

[Home](#) / [American Standard® Cadet® PRO Elongated Toilet](#)



Item: Kitchen Faucet
Delta Foundations Core B Kitchen Faucet Chrome Single Handle

DIVISION 15 - Mechanical

Manufacturer #
Mfg #B1310LF

Color /Finish
Chrome

Description

Delta® Foundations Core-B Single Handle Kitchen Faucet - Chrome Finish - Washerless Function - 1.8 GPM @ 60 PSI - Less Spray - Mfg #B1310LF



Item: Shower Valve
Delta R10000-UNWS MultiChoice Universal Tub and Shower Valve Body

DIVISION 15 - Mechanical

Manufacturer #
R10000-UNWS

Color /Finish
Cast metal

Description

Valve body only
1/2" universal inlets accept 1/2" copper, 1/2" iron pipe, PEX or CPVC adapters
1/2" universal outlets, inlets/outlets have male threads
Back-to-back capability
BX=single box model
BXT=single box model, thin wall mounting kit included
WS=with stops, single box model
Lifetime Faucet and Finish Warranty



Item: Toilet tank
American Standard® Cadet® PRO 1.28 Gallon Toilet Tank - 12" Rough-In

DIVISION 15 - Mechanical

Manufacturer #
Mfg#4188.A104

Color /Finish
Chrome

Description

American Standard® Cadet® PRO 1.28 GPF Toilet Tank - Virtually Eliminate Call-Backs For Clogged Toilets And Get A Toilet With A Sleek, Modern Design - Toilet Tank, Bowl Sold Separately - 3" Flush Valve, Fluidmaster® Brass Shank Fill Valve, Brass Tank Lever - LeftHand Tank - 12" Rough-In - Uses 20% Less Water Than Standard 1.6 GPF Toilet - 5-Year Warranty - Use With American Standard Cadet PRO Toilet Bowl Only (404781 Round, 189818 Round ADA, 404768 Elongated, 404767 Elongated ADA, 404766 14" Rough-In Elongated ADA) - Mfg#4188.A104



Item: Tub/Shower, Trim,
Delta Tub/Shower, Trim, Lever Handle, Chrome ADA

DIVISION 15 - Mechanical

Manufacturer #
Mfr #: T13420

Color /Finish
Chrome

Description

Product Details

Classic, sensible styling that complements any home

Handle included

Single lever handle for ease of temperature and volume control

Monitor® Scald-guard® valve keeps water temperature within +/-3°F

For use with MultiChoice Universal rough valve body

Order MultiChoice Universal rough-in separately , See Sec

Easy-to-clean, Touch-Clean® showerhead provides full spray pattern



Item: Under Sink Protector ADA
Plumberex Pro-Extreme™ Sink Tubular ADA Cover

DIVISION 15 - Mechanical

Manufacturer #
Mfg #x4333

Color /Finish
White PVC

Description

Plumberex Pro-Extreme™ Under Lav Protector - Insulates Drain And Supply Lines Under Lavatories To Protect Persons Confined To Wheelchairs - 100% Molded PVC With Antimicrobial Agents - One-Piece Design With Tamper Resistant Snap-Lock Fasteners - Fits Brass/Plastic 1-1/4" And 1-1/2" P-Traps - ADA 4.19.4 And ANSI 117.1 Compliant - Made In USA - Meets All Plumbing Codes But Not Fire And Building Codes - ASME 18.9 - Code Requires Covering P-Trap Drain And Both Hot & Cold Water Supplies, - Mfg #x4333

[Home](#) / [Plumberex Pro-Extreme™ Sink Tubular ADA Cover](#)



Item:

15 Amp Decorator Receptacle - White - Package of 10

DIVISION 16 - ELECTRICAL

Manufacturer #

Part #: 336403

Color /Finish

White

Description

15 Amp Single Pole Wall Switch - White - Package Of 10

15 Amp Decorator Receptacle "Pkg Of 10" - 125 Volt - Quickwired And Side Wired - Nylon - White - Use With Copper Wire Only

[Home](#) / 15 Amp Decorator Receptacle - White -



Item: Elongated Toilet Bowl ADA
American Standard Laurel Elongated Toilet Seat with Cover, White

DIVISION 15 - Mechanical

Manufacturer #
5311.012.020

Color /Finish
white

Description

American Standard Laurel EL Molded Wood Seat and Cover provides the classic design perfect for any style. Additional Features: High-gloss molded wood seat Closed elongated seat with cover Laurel seat and cover Bolts and dual-faced adhesive washers Fits any elongated toilet. Durable molded wood construction. American standard toilet seats. Complete with bolts and dual-faced adhesive washers. Closed, elongated seat with cover. Fits any elongated toilet. Choose from several color options. Overall dimensions: 18L x 14.25W x 2.75H in..



Item: Kitchen Sink
ADA 25 x 21-1/4" Single Bowl Stainless Steel Kitchen Sink 3-Hole 5-3/8" Depth

DIVISION 15 - Mechanical

Manufacturer #
Mfg #GE125213

Color /Finish
Satin Finish

Description

Aspen® 25W x 22"L ADA Single Bowl Stainless Steel Sink - Three Hole - 6" Depth - 21 Gauge - **Rear Right Drain** - Satin Finish - Integrated Mounting System - ADA Compliant - Sound Deadening Bottom - Standard 3-1/2" Drain -

[Home](#) / ADA 25 x 21-1/4" Single Bowl Stainless Steel Kitchen :



Item: Kitchen Sink
ADA 25 x 21-1/4" Single Bowl Stainless Steel Kitchen Sink 3-Hole 5-3/8" Depth

DIVISION 15 - Mechanical

Manufacturer #
Mfg #GE125213

Color /Finish
Satin Finish

Description

Aspen® 25W x 22"L ADA Single Bowl Stainless Steel Sink - Three Hole - 6" Depth - 21 Gauge - **Rear Right Drain** - Satin Finish - Integrated Mounting System - ADA Compliant - Sound Deadening Bottom - Standard 3-1/2" Drain -

[Home](#) / [Aspen 25 x 22" Single Bowl Stainless Steel Kitchen](#)



Item: Wall Hung Lavatory ADA
 Seasons® White China Wall Hung Lavatory - 17-3/8 x 19-1/8" - 4" Centers - Front
 Overflow

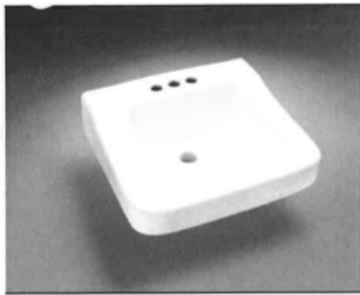
DIVISION 15 - Mechanical

Manufacturer #
 Mfg #GEI25213

Color /Finish
 white

Description

White vitreous china wall hung lavatory
 Front over flow
 17-3/8 In. x 19-1/8 In.
 ADA compliant



Wall Mount Lavatory

PRODUCT FEATURES

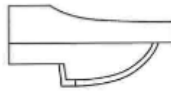
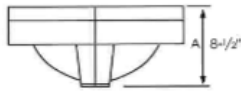
- Vitreous China
- 19-1/8" x 17-3/8" Rectangle
- 4" Center
- Front Overflow
- ADA Compliant
- Available in White or Biscuit

CERTIFICATIONS

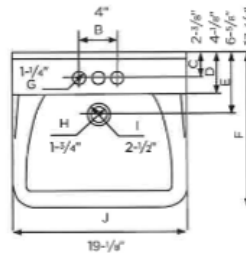
- ANSI, CSA, IAPMO

WARRANTY

- One Year Limited Warranty
- See Official Warranty Information for Additional Details



Wall Mount Lavatory
 4" Center



Item: GFCI

DIVISION 16 - ELECTRICAL

Hubbell Circuit Guard® 15A GFCI Receptacle With Matching Nylon Wallplate,
White

Manufacturer #
Mfg #GF15WLA

Color /Finish
White

Description

Hubbell 15 Amp Circuit Guard® Lighted GFCI Duplex Receptacle - 125 Volt - 20 Amp Feed-Through - NEMA 5-15 - Back And Side Wired - Color-Matched Test And Reset Buttons - With Wall Plate - White - Mfg #GF15WLA



Item:

Fire Alarm Systems Smoke Alarm ADA
120VAC/9VDC Direct Wire Cord Smoke Alarm With ADA Compliant Strobe

DIVISION 16 - ELECTRICAL

Manufacturer #
Mfg #7139CS-W

Color /Finish
White

Description

Direct Wire Cord Smoke Alarm With ADA Compliant Strobe - 120VAC Direct Wire With 9VDC Battery Backup - Photoelectric Smoke Alarm - Temporal 3 Sounder - Includes 177 Candela ADA Compliant Strobe - Includes 1 Set Form A/Form C Relay Contacts - Tandem Interconnect Capabilities With Other Gentex Alarms - Low Or Missing Battery Indicator - Wall Mount - Mfg #7139CS-W



Item:
Fire Alarm Systems Smoke Alarm

DIVISION 16 - ELECTRICAL

Manufacturer #
Mfg #21006378

Color /Finish

Description

Firex 120 Volt AC/DC Wire In Smoke Alarm, Battery Backup, Ionization
Firex® Direct Wire Ionization Smoke Alarm - 120V AC/DC - 9V Battery Backup - Test/Hush™ Button - LED Power Indicator - Interconnectable - Alarm Memory - Tamper Resistant Locking Pin - Ionization Alarms May Detect Fast Flaming Fires Sooner Than Photoelectric Alarms - Base Diameter: 5-5/8" - 10-Year Limited Warranty - Mfg #21006378

[Home](#) / Firex 120 Volt AC/DC Wire In Smoke Alarm, Battery



Item:
15 Amp Decorator Wall Receptacle

DIVISION 16 - ELECTRICAL

Manufacturer #
Mfg #RRD15W

Color /Finish
White

Description

Hubbell 15 Amp Decorator Duplex Wall Receptacle - 125 Volt - Double Pole - Three Wire - NEMA 5-15R - Push And Side Wired - White - Nylon - Use With Copper Wire Only - Mfg #RRD15W

[Home](#) / 15 Amp Decorator Receptacle - White - Package of



Item:
15 Amp Single Pole Wall Switch - White -

DIVISION 16 - ELECTRICAL

Manufacturer #
Part #: 336406

Color /Finish
White

Description

15 Amp Single Pole Wall Switch - White - Package Of 10

15 Amp Decorator Wall Switch "Pkg Of 10" - 120 Volt - Single Pole - Ground Screw - Quickwired and Side Wired - Use With Copper Wire Only - White

[Home](#) / 15 Amp Single Pole Wall Switch - White -



Item:

Decorator Wall Plate
Single Gang Decorator Wall Plate - White - Package Of 10

DIVISION 16 - ELECTRICAL

Manufacturer #
Part #: 336037

Color /Finish
White

Description

Single-Gang Decorator Wall Plate "Pkg Of 10" - Unbreakable Polycarbonate - Captive Screw - White - 2-3/4W x 4-1/2"H

[Home](#) / Single Gang Decorator Wall Plate - White - Package

