

PROJECT MANUAL

**THE MEADOWS APARTMENTS
RADON REMEDIATION**

**4855 PINTAIL CREEK DR.
CANAL WINCHESTER, OHIO**

PREPARED FOR:



**COLUMBUS METROPOLITAN
HOUSING AUTHORITY**
COMMUNITY. COMMITMENT. COLLABORATION.

COLUMBUS METROPOLITAN HOUSING AUTHORITY

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COLUMBUS, OHIO

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CONSTRUCTION DOCUMENTS

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SECTION 01 11 00

SUMMARY OF WORK

PART 1 GENERAL

1.01 GENERAL PROJECT DESCRIPTION

1. The Summary of Work for this project involves the following:

- a. Create one suction point per unit and install piping from first floor to the attic and roof. See Radon System Installation Requirements for additional information.
- b. At First Floor, provide full height gypsum board chase wall around piping.
- c. At Second Floor, provide full height gypsum board chase wall around piping.
- d. Patch and repair ceilings affected by installation of chase wall.
- e. Finish chase wall and install wood base to match existing.
- f. Where new piping and chase wall passes through a closet, modify existing wire shelf as required to install chase wall. Provide supports as required to support new extents of shelves.
- g. Extend vent piping through roof. Flash around opening and patch/repair shingle roof. Extend piping so that the final location is towards the rear side of the building.

The discharge from vent stack pipes of active soil depressurization systems shall prevent re entrainment of radon. prevent vent stack blockage due to heavy snowfall and prevent the direct exposure of individuals outside of buildings to high levels of radon by meeting all the following requirements:

1. Located above the highest eave of the roof and as close to the roof ridge line as possible;
 2. Ten feet or more above ground level;
 3. Ten feet or more above any yard, patio, deck, or occupiable space that is less than ten feet away from the discharge point. The ten feet may be measured either directly between the two points or be the sum of measurements made around intervening obstacles;
 4. Ten feet or more from any window, door or other opening into conditioned spaces of the structure that is less than two feet below the exhaust point. The ten feet may be measured either directly between the two points or be the sum of measurements made around intervening obstacles;
 5. Ten feet or more from any opening into an adjacent building;
 6. For vent stack pipes that penetrate the roof, at least twelve inches above the surface of the roof; and
 7. For vent stack pipes attached to or penetrating the sides of buildings, vertical and at least twelve inches above the edge of the highest roof where it is attached, and in a position to prevent blockage from snow or other materials and from being filled with water from the roof or an overflowing gutter.
- h. All work is to be carried out in occupied units.

2. Radon System Installation Requirements:

- a. Radon system suction points shall be constructed by drilling a five inch diameter through the first floor slab in areas identified on the drawings. The suction pits will be excavated to provide a 10-20 inch suction pit approximately eight inches deep. The four inch radon vent pipe will be inserted just below the bottom edge of the concrete slab. The radon vent pipe will be sealed in the suction pit using backer rod and urethane caulk to provide an airtight seal. The radon vent pipe will penetrate two floors with a tee fitting installed in the attic with four inch dampers to facilitate connecting additional apartment units to a single fan and balancing airflow and system pressure the radon vent pipe will be routed through the rear of the building through the roof. The radon vent pipe will be sealed on the roof by flashing to the existing roof shingles. The radon vent pipe will also be painted to match existing roof flashing and penetrations with a varmint guard model VG-440 with ½ inch screen available from Radon Control Inc. installed on the end of the radon vent pipe. When the radon vent penetrates floors, walls, ceilings and other openings these will be sealed with HILTI FS-ONE fire rated sealant to maintain existing fire rated assemblies or approved equal. See Firestopping Specification 07 84 00.
- b. The radon vent piping shall be enclosed in a constructed pipe chase which will be insulated, drywalled and completely finished to match existing trim as part of the radon mitigation project.
- c. A pressure gauge (U-tube manometer) shall be mounted in the attic of the apartment where the radon fan is located. This gauge will monitor radon system air flow and static pressure. The maintenance personnel will monitor this gauge during routine unit inspections.
- d. The Radon mitigation fans installed in the attics will be RADON AWAY Model RP265 or Fantech Model HP220 (No substitutions). The radon fan can be plugged into an outlet provided by an electrician as long as the radon fan cord is no longer than six feet. If the fan cord is longer than six feet, the fan must be hard wired to a switch which shall be located in the attic within eyesight of the radon fan.

3. Post-Mitigation Radon Testing

- a. After the radon mitigation systems are operational, post mitigation radon testing shall be conducted. A single short term radon test will be deployed in all ground floor units. All groundfloor units will be tested simultaneously at the completion of the project. For this measurement a charcoal packet manufactured and analysed by AirChek or an equivalent Ohio State Licensed radon lab will be deployed. The radon test will be 2-7 days in duration and the results take about 7-10 days to receive. Project completion documentation within 10 days of receipt of post mitigation test results from the radon lab.

4. Operation & Maintenance Requirements

- a. The radon mitigation contractor shall implement the Operation and Maintenance Program immediately after completion and receipt of the post mitigation radon

testing with the maintenance personnel at The Meadows Apartments. A check list shall be provided to the maintenance department during that inspection in order to conduct in-house annual inspections of the radon systems. At least every two years it is recommended by the U.S. E.P.A. that all units be retested to confirm proper system operation and radon level in the apartments are below 4pCi/l.

END OF SECTION

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SECTION 01 32 16

CONSTRUCTION SCHEDULES

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

- A. These requirements generally describe the form of the construction schedule, a basic description of the schedule contents and the submittal procedures. Refer to General Conditions for additional requirements regarding the Contractor's necessity to maintain the approved construction schedule and the project completion.
- B. Authorization to proceed with the work will not be given until the construction schedule has been approved by the Architect.
- C. Provide a coordinated project construction schedule for the entire work.

1.02 FORM OF SCHEDULES

- A. Prepare schedules in the form of a horizontal bar chart.
 - 1. Provide separate horizontal bar for each trade or operation.
 - 2. Horizontal Time Scale: Identify the first work day of each week.
 - 3. Scale and Spacing: To allow space for notations and future revisions.
- B. Format of Listings: Format of Listings: Conform to Schedule of Values, HUD Forms and schedule of payments.
- C. Identification of Listings: By major specification section numbers.

1.03 CONTENT OF SCHEDULES

- A. Construction Schedule
 - 1. Show the complete sequence of construction by activity.
 - 2. Show the dates for the beginning and completion of each major element of construction. Specifically list:
 - a. Demolition work.
 - b. Installations.
 - c. Finishing.
 - d. Punch list.
 - e. Close-out.
 - 3. Show projected percentage of completion for each item, as of the first day of each month.

1.04 PROGRESS REVISIONS

- A. Indicate progress of each activity to date of submission.
- B. Show changes occurring since previous submission of schedule:
 - 1. Major changes in scope.
 - 2. Activities modified since previous submission.
 - 3. Revised projections of progress and completion.
 - 4. Other identifiable changes.
- C. Provide a narrative report as needed to define:
 - 1. Problem areas, anticipated delays, and the schedule.
 - 2. Corrective action recommended, and its effect.
 - 3. The effect of changes on schedules of other prime contractors.

1.05 SUBMITTALS

- A. Submit initial schedules within 15 days after award of Contract.
 - 1. Architect will review schedules and return review copy within 10 days after receipt.
 - 2. If required, resubmit within 7 days after return of review copy.
- B. Submit revised progress schedules with each application for payment.
- C. Submit the number of opaque reproductions which the Contractor requires, plus 3 copies which will be retained by the Architect.

1.06 DISTRIBUTION

- A. Distribute copies of the reviewed schedules to:
 - 1. Job site file.
 - 2. Subcontractors.
 - 3. Other concerned parties.

END OF SECTION

SECTION 01 33 23

SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

- A. Requirements of this Section are in addition to the requirements of the General Conditions.
- B. This Section includes procedures for processing:
 - 1. Shop drawings.
 - 2. Product data.
- C. Submittals as approved do not constitute a change order.
- D. Submit all submittals under Contractor's Transmittal letter. Include the following:
 - 1. Project by title.
 - 2. Contractor's contract number.
 - 3. Work and products by Specification Section and Article number.
- E. Resubmittals: When Architect requires that a submittal be resubmitted, comply with requirements of this section.
 - 1. Identify changes made since the previous submittal.
- F. Notify Architect in writing at time of submittal of deviations from the requirements of the Contract Documents.
- G. Make all submittals far enough in advance of scheduled dates for installation to provide sufficient time for reviews, for securing necessary approvals, for possible revisions and resubmittals, and for placing orders and securing delivery.
 - 1. Architect's Review Time: In scheduling, allow at least 10 working days for Architect's review.
 - 2. Delays caused by the tardiness of the Contractor in preparing and forwarding submittals will not be an acceptable basis for an extension of the Contract completion date or for consideration of alternate products which do not meet the specified requirements of this Project Manual.
 - 3. Include submittal dates in Construction Schedule.

1.02 SHOP DRAWINGS

- A. Reproduction of any portion of the Contract Documents for use as submittals for

Shop Drawings is not acceptable.

- B. Submit Shop Drawings in a clear and thorough manner.
 - 1. Title each drawing with Project name.
 - 2. Identify each element of drawings by reference to sheet number and detail, schedule, or room number of Contract Documents.
- C. Identify the following:
 - 1. Requirements of the individual section of Project Manual.
 - 2. Field measurements.
 - 3. Field construction criteria.
 - 4. Relation to adjacent or critical features of the Work or products.
 - 5. Conformance of submittal with requirements of Contract Documents.
- D. Each sheet of Shop Drawings shall be stamped and signed by Contractor before submitting to Architect. Certify compliance with requirements of Contract Documents.
- E. Review by the Architect shall not relieve Contractor from his responsibility in preparing and submitting proper Shop Drawings in accordance with his current obligations.
- F. All submissions which, in the opinion of the Architect are incomplete, contain errors or have not been checked or only superficially checked, will be returned unchecked by the Architect for resubmission.
- G. Fabrication of products or start of work before required Shop Drawings are approved by Architect and returned to Contractor shall be at Contractor's risk.
- H. Required Printing: Five (5) copies as specified in the Special Conditions.
 - 1. This procedure is to be followed for each submission of a drawing or group of drawings until they are finally approved by the Architect.
- I. Prepare coordination drawings and fully coordinate same with other trades and contiguous work.
 - 1. Working drawings for coordination shall be submitted as directed by the Architect.
 - 2. Architect reserves the right to require the submittal and/or approval of composite coordination drawings prior to the release of an individual Contractor's Shop Drawing and/or fabrication drawing.

1.03 PRODUCT DATA

- A. Submit only pages which are pertinent.
 - 1. Mark each copy of standard printed data to identify pertinent products,

referenced to Specification Section and Article number.

2. Show reference standards, performance characteristics, and capacities; wiring and piping diagrams and controls; component parts; finishes; dimensions; and required clearances.
- B. Modify manufacturer's standard schematic drawings and diagrams to supplement standard information and to provide information specifically applicable to the work. Delete information not applicable.
- C. Stamp and sign each set of manufacturer's product data before submitting to Architect to certify compliance with Contract Documents.
- D. Number of Copies Required: Three (3) copies as specified in the Special Conditions.
- E. Upon approval, one copy of the approved data will be returned to the Contractor for his file. Contractor should submit additional sets above the minimum if he desires more than one copy with the Architect's comments.

1.04 OFFICE SAMPLES

- A. Submit full range of manufacturer's standard finishes except when more restrictive requirements are specified, indicating colors, textures and patterns for Architect's selection.
- B. Submit samples to illustrate functional characteristics of products, including parts and attachments.
- C. Approved samples which may be used in the work are indicated in the specification section.
- D. Label each sample with identification required for transmittal letter.
- E. Number Required: As specified in individual specification section.

1.05 SAMPLE WARRANTIES

- A. Submit for approval, sample copies of all specific warranties required in excess of one year duration.
- B. Include sample warranties with related shop drawing submittal. Shop drawing review will not start without warranty submittal nor will shop drawings be released for fabrication or installation until sample warranty is approved.

1.06 CERTIFICATES OF COMPLIANCE

- A. Where required by the specific specification sections, submit "Certificates of Compliance" certifying that all materials used in the work comply with all specified provisions thereof.

1. Submit in the form of a letter or company standard forms.
2. If test reports are submitted with "Certificates of Compliance". Test reports shall include data or dates of testing and results of testing.

1.07 TEST REPORTS

- A. Test reports certified by an independent testing laboratory must be made available upon request by Architect.

END OF SECTION

SECTION 01 35 13

SPECIAL PROJECT PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

- A. The existing building will remain occupied during construction. No interruption of services offered by the Owner is permitted. Consult and carefully schedule with the Owner to achieve this aim.

1.02 PROCEDURES IN OPERATIONAL BUILDING

A. Occupancy of Building

- 1. The existing building will be occupied throughout the entire course of construction. As such, contractors and their personnel are restricted to construction areas of the building only.
- 2. Access to areas within the work area of the project which must occur through occupied areas or over occupied areas must be coordinated with the Owner's Representative and the Architect so as to allow spaces to be vacated in time for the work to be accomplished, approximately 48 hours advance notice is required.
 - a. Where the Owner vacates to allow work in an area, services and utilities may be cut as long as the continuity of that service does not affect other areas. Access must be maintained to all other areas in a safe and sanitary manner.
 - b. Perform work with cooperation and consideration toward occupants and caution toward existing finishes. Clean-up of work areas in occupied spaces shall be performed at the end of each work day. Debris will not be permitted to accumulate.
- 3. Operations which are particularly noisy or hazardous to building occupants must be scheduled during weekends or at night. Access to the building will be coordinated with the Owner's Representative and Architect who will generally allow work as required by the construction schedule throughout the normal work day, at night and on weekends as required.
 - a. The cost of work performed at times other than the "normal" working areas established for the project will be borne by the Contractor(s) involved. No additional payment will be due Contractors whose operations result in "premium" hour work.

- B. Conduct: Contractor and workmen under his/her control are to be quiet and non-offensive. Radios are prohibited.

C. Dress Code

1. Required Apparel: Shirt, long pants, shoes with laces; all suitably clean.
2. Not Permitted: Offensive graphics or messages on clothing, short pants, tank tops, sandals, open toed shoes, bare torso, bare feet.

D. No utilities or services may be interrupted without full consent of and prior scheduling with the Owner's representative. All functions of existing building must be maintained at all times unless specific written permission is obtained from the Owner. Critical functions include, but are not limited to:

1. Exits
2. Utilities

1.03 UTILITY SHUT-DOWN

A. Advance notice required: Contractor to request, a minimum 14 days in advance, Owner's permission to shut down electric power, gases or systems to occupied portions of the building. Request to be in writing and indicate the area(s) affected, time and date shut-down requested to commence, and anticipated duration of shut-down. Approved time and date may not be as requested, will be at times least disruptive to Owner, and may be during non-normal working hours.

1. Disclaimer: No additional payments will be allowed due to Contractor's difficulties due to being held to the above restrictions.

1.04 NOISE AND SAFETY

A. Prohibited Methods: Prohibited methods and materials include, but are not limited to, the following:

1. Use of explosives.
2. Use of jack hammers or similar equipment which can cause structure-borne vibration detrimental to the use of the occupied facilities.

B. Construction noise limited to Normal Working Hours.

1.05 NO SMOKING POLICY

A. Smoking is not permitted within the building or within 25 feet of entrances, operable windows, or outdoor-air intakes.

1.06 SITE AND BUILDING ACCESS

A. Existing driveways and entrances which serve the premises must be maintained. They must be available to the Owner and public at all times. Do not use these areas for parking or storage of materials.

1. Do not unreasonably encumber the site with materials or equipment. Confine stock piling of materials and location of storage trailers to the areas indicated on the drawings or as directed by the Architect.
2. Architect will administer available space equitably among other prime

- contractors.
3. Schedule deliveries so as to minimize space and time requirements for storage of materials and equipment on the site.

END OF SECTION

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SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 PROJECT CONDITIONS

- A. This Section is not intended to limit types and amounts of temporary construction facilities and controls required. Omission from this Section will not be accepted as an application that such temporary activity is not required for successful completion of the work and compliance with requirements of the Contract Documents.
- B. Provide and maintain each temporary construction facility and control when required for proper performance of the work. Terminate and remove when no longer needed.
- C. Obtain and pay for all required applications, fees, permits and inspections required for temporary construction facilities and controls.
- D. Install, operate, maintain and protect temporary construction facilities and controls in a manner and at locations which are safe, non-hazardous, sanitary and adequately protect project work, workmen and the public.

1.02 REQUIREMENTS OF REGULATORY AGENCIES

- A. Provide and maintain all temporary facilities in compliance with governing rules, regulations, codes, ordinances and laws of agencies and utility companies having jurisdiction over work involved in project.
- B. Be responsible for all temporary work provided, and obtain any necessary permits and inspections for such work.
- C. Confine equipment, storage of materials, and operation of workmen to the limits indicated or directed and abide by law, ordinances, conditions stated in permits and directions of the Architect.
- D. Do not interfere with normal use of roads in vicinity of project site except as indicated or as absolutely necessary to execute required work, and then only after proper arrangements have been made with authorities having jurisdiction, including traffic control as applicable.

1.03 COST OF CONSUMED UTILITIES

- A. Water Service Use Charges: Water consumed during construction from the Owner's existing system is to be used without metering and without payment of use charges.

- B. Electric Power Service Use Charge: Electric power consumed during construction from the Owner's existing system is to be used without metering and without payment of use charges.

1.04 SPECIAL PRECAUTIONS AND REQUIREMENTS

- A. Do not interfere with normal use of existing buildings, existing driveway access to existing building and existing building utility services, except as absolutely necessary to execute required work, and then only after proper arrangements have been made through the Owner with persons in charge of existing facilities.
- B. Do not block required exits from existing buildings.

1.05 TEMPORARY STORAGE AND DOCUMENTATION

- A. Provide and maintain weather tight, portable, securable job boxe(s) as required at the site for own use.
- B. All construction storage scope and items TBD with Owner approval
- C. Copies of permits, approved shop drawings, plans and specifications marked up-to-date with all revisions and all addenda shall be kept at site at all times.

1.06 TEMPORARY SANITARY FACILITIES

- A. Provide temporary portable toilets, acceptable to public health authorities, as required to service the project. Maintain in a clean, sanitary condition. Locate as directed by Architect.

1.07 WEATHER PROTECTION

- A. Protect work and existing or adjacent property against weather, to maintain work, materials, apparatus and fixtures free from injury or damage during the entire construction period. Work likely to be damaged shall be covered or protected at the end of each day's work. Any work damaged by failure to provide protection required, shall be removed and replaced with new work at the Contractor's expense.

1.08 SAFETY

- A. Safety requirements shall be in accordance with the General Conditions.
- B. Strict attention and full adherence must be given the Williams-Steiger Occupational Safety and Health Act of 1970, U.S. Department of Labor.

1.09 SECURITY CONDITIONS

- A. Contractor shall be responsible for all infractions of rules and regulations by his/her workers.

1.10 PARKING

- A. Parking and Laydown Areas: To be coordinated with CMHA. Use of areas not coordinated with CMHA is prohibited.

END OF SECTION

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SECTION 01 60 00
PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY

- A. Requirements of this Section apply to the Work of all other Sections.
- B. Section Includes:
 - 1. Transportation and Handling.
 - 2. Storage and Protection.
 - 3. Standards.
 - 4. Manufacturers and Types.

1.02 RELATED SECTIONS

- A. Cutting and Patching: Section 01 73 29.
- B. Shop Drawings, Product Data and Samples: Section 01 33 23.
- C. Execution Requirements: Section 01 73 00.

1.03 STANDARDS

- A. Standards, codes and regulations published by Manufacturer's Associations, governmental agencies and other regulatory authorities form a part of these Specifications as minimum requirements. Such references include the latest issue and all amendments up to 30 days prior to the Bid Date.
- B. "Governing Authority" means all federal, state and local laws and regulations.
- C. Where differences occur between the Contract Documents and such standards, the most restrictive requirement shall apply.
- D. Supply all materials and perform all work in accordance with the Manufacturer's Specifications and installation procedures, and in conformance with published trade and manufacturer's association standards, unless specifically noted otherwise herein.

1.04 TRANSPORTATION AND HANDLING

- A. Arrange deliveries of products in accordance with construction schedules and installation, coordinate to avoid conflict with work and conditions at the site.
 - 1. Transport products by methods to avoid product damage.

2. Deliver products in undamaged condition, in manufacturer's original containers or packaging, with identifying labels intact and legible.
 3. Immediately on delivery, inspect shipments to assure compliance with requirements of Contract Documents and accepted submittals, and that products are properly protected and undamaged.
- B. Provide equipment and personnel to handle products by methods to prevent soiling or damage.
- 1.05 DELIVERY, HANDLING, STORAGE AND PROTECTION
- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
- B. Delivery and Handling
1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected. Reject damaged and defective items.
- B. Storage products in accordance with manufacturer's instructions.
1. Store products with seals and labels intact and legible.
 2. Store products to allow for inspection and measurement of quantity or counting of units.
 3. Store products subject to damage by the elements in weathertight enclosures.
 4. Maintain temperature and humidity within the ranges required by manufacturer's instructions.
 5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
- C. Exterior Storage
1. Store fabricated products above the ground, on blocking or skids, to prevent soiling or staining. Cover products which are subject to deterioration with impervious coverings. Provide adequate ventilation to avoid condensation.
- D. Arrange storage in a manner to provide access for inspection. Make periodic

inspections of stored products to assure that products are maintained under specified conditions, and free from damage.

- E. Protection After Installation: Provide coverings as necessary to protect installed products from damage from traffic and subsequent construction operations. Remove when no longer needed.

PART 2 PRODUCTS

2.01 GENERAL PRODUCT REQUIREMENTS

- A. Products include materials, equipment and systems.
- B. Products incorporated into the work:
 - 1. Comply with specifications and referenced standards as minimum requirements.
 - 2. Undamaged.
 - 3. Manufactured and fabricated products:
 - a. Design, fabricate and assemble in accordance with the best engineering and shop practices.
 - b. Two or more items of the same kind shall be identical, by the same manufacturer.
 - c. Products shall be suitable for service conditions.
 - 4. Do not use material or equipment for any purpose other than that for which it is designed or is specified.
 - 5. New and unused at time of installation, except as otherwise indicated.
 - 6. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 - 7. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.

2.02 MANUFACTURER AND PRODUCT SELECTION PROCEDURES

- A. Specified Product: Where specifications name a single manufacturer and product or refer to a single manufacturer and product indicated on the drawings, provide the named product. Comparable products or substitutions for Contractor's convenience will not be considered.
- B. Specified Manufacturer: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
- C. Multiple Specified Products: Where more than one manufacturer and specific product is listed, provide one of the products named. No substitutions will be

permitted after signing the contract. Comparable products or substitutions for Contractor's convenience will not be considered

- D. Multiple Manufacturers: Where specifications include a list of manufacturers names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
- E. Basis of Design: Where specifications name a Basis of Design or refer to a Basis of Design product indicated on the drawings, the design is based on the product listed. Subject to compliance with requirements, provide the specified product or a product manufactured by one of the other manufacturers listed.
 - 1. The characteristics of the Basis-of-Design Product establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.
 - 2. Equipment or materials from these manufacturers will be acceptable contingent upon their meeting the design, appearance and functional standards established by the specified items. If equipment or a material of an acceptable manufacturer requires changes; electrically, mechanically, structurally, from what is indicated on the drawings, it shall be the responsibility of the Contractor requiring such change, to pay all costs involved with no additional costs to the Owner.
 - 3. Submit evaluations as follows:
 - a. Submit proposed comparable products for evaluation by the Architect at least two weeks prior to awarding contract to the manufacturer of a comparable product.
 - b. Obtain samples of Basis-of-Design product.
 - c. Select comparable products that comply with the characteristics specified. Submit evidence demonstrating compliance.
 - d. Submit samples of comparable products displayed side-by-side with samples of Basis-of-Design products. Architect will determine whether the proposed comparable product is acceptable. Architect is not obligated to prove non-equivalence of proposed comparable products.
- F. Where a performance is specified and no manufacturer is listed, submit through the Shop Drawing procedure the name of the manufacturer, the product proposed, and detailed information showing its characteristics. Such proposal shall meet or exceed the specification, line item by line item, or be rejected.
- G. Equivalent components (articles, devices, materials, forms of construction, fixtures, etc.) may be submitted to the Architect for approval prior to bidding regardless of listed manufacturers.
- H. Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with

requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

PART 3 EXECUTION

Not Applicable

END OF SECTION

SECTION 01 73 00

EXECUTION REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY

- A. Requirements of this Section apply to the Work of all other Sections.
- B. Section Includes:
 - 1. Examination of Substrate.
 - 2. Preparation.
 - 3. Installation.
 - 4. Workmanship.
 - 5. Protection.

1.02 RELATED SECTIONS

- A. Quality Control: Section 01 45 00.
- B. Cutting and Patching: Section 01 73 29.
- C. Shop Drawings, Product Data and Samples: Section 01 33 23.

1.03 STANDARDS

- A. Standards, codes and regulations published by Manufacturer's Associations, governmental agencies and other regulatory authorities form a part of these Specifications as minimum requirements. Such references include the latest issue and all amendments up to 30 days prior to the Bid Date.
- B. "Governing Authority" means all federal, state and local laws and regulations and HUD requirements.
- C. Where differences occur between the Contract Documents and such standards, the most restrictive requirement shall apply.
- D. Supply all materials and perform all work in accordance with the Manufacturer's Specifications and installation procedures, and in conformance with published trade and manufacturer's association standards, unless specifically noted otherwise herein.

1.05 NON-CONFORMING WORK

- A. Faulty work or work not in conformance with the Contract Documents will not be permitted by the Architect.

1. It is the responsibility of the Contractor to propose a remedy by means of detailed drawings and written documentation and submit such documentation to the Architect for comments.
2. All costs for the removal and reconstruction of such work, as well as additional services of the Architect, shall be paid for by the Contractor.

PART 2 PRODUCTS - NOT APPLICABLE

PART 3 EXECUTION

3.01 EXAMINATION OF SUBSTRATE

- A. Examine the substrates or structure to which a product is to be applied or installed. Do not proceed until unsatisfactory conditions have been corrected. Starting the work indicates acceptance of conditions and the installer assumes full responsibility for results.
- B. Check the substrate or structure for proper tolerances and clearances. Tolerances are listed under individual specification Sections.

3.02 PREPARATION

- A. Substrate: Where the products are applied to a substrate, prepare the substrate as recommended by the product manufacturer. That generally includes the following:
 1. Bringing substrate to a uniform surface by smoothing uneven surfaces and filling holes, cracks and depressions with recommended filler or compatible type material.
 2. Remove substances such as dust, oils and other foreign matter, not compatible with the product.
 3. Surfaces shall be dry, unless moisture content or wetting requirement is specified or recommended.
- B. Inserts and Anchorages
 1. Anchorages where not detailed are the responsibility of the installer to design a suitable connection, structurally sound, and aesthetically acceptable to the Architect.
 2. It is the responsibility of the installer to furnish built-in fastening devices for his/her product to the proper trade for installation as the work proceeds.
 3. In the event such devices are not furnished in time to be built-in, it is the installer's responsibility to provide other methods for attaching their product. Submit drawings and other required data to the Architect.
- C. Dimensions
 1. If the exact location of an item is not indicated by dimension on the Drawings or noted in the Specifications, the Architect reserves the right to

- determine such location in the field prior to roughing-in.
2. If the exact dimensions of a product are not indicated, the Architect reserves the right to determine dimensions prior to the ordering or fabrication of a product.
 3. Such dimensional changes shall not be a basis for changes in the Contract Sum.

3.03 INSTALLATION

- A. Install products in accordance with manufacturer's recommendations or the requirements of trade associations, listed standards, Shop Drawings and Contract Documents.
- B. If a conflict exists between these references, the most strict requirements govern. If printed instructions are not available, consult with the manufacturer or the manufacturer's field representative, where applicable.
- C. Install work that will not interfere with the proper installation of the Work of other trades.
- D. Install work in a manner to facilitate operating, servicing and repairing.
- E. 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.

3.04 WORKMANSHIP

- A. Install products straight, plumb, level and in line. Securely attach items to the substrate, using recommended adhesives, mechanical fasteners or other devices. Where holes are provided for attachment, do not field drill or cut new holes without the approval of the Architect.
- B. Where applicable, match finished work to the approved samples or mock-ups.
- C. 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.
- D. Recheck measurements and dimensions, before starting each installation.

3.05 PROTECTION

- A. Protect finished surfaces of product being installed and surrounding products from damage during installation. Provide protective devices as required and as recommended by the manufacturer. Cover work subject to damage at the end of each day's work.
- B. Correct damage by repairing or replacing as directed by the Architect. Repairing will be permitted only where the repair is undetectable and does not cause

structural damage or interfere with proper functioning of the part.

- C. Protect finish of installed products until Substantial Completion of the Project by use of wrappings, covers or other approved protective devices. Remove such protection immediately prior to final cleaning.
- D. Limiting Exposures: Coordinate and 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.

END OF SECTION

SECTION 01 73 29

CUTTING AND PATCHING

PART 1 GENERAL

1.01 DESCRIPTION

- A. Execute cutting, fitting or patching of Work, required to:
 - 1. Make several parts fit properly.
 - 2. Uncover Work to provide for installation of ill-timed Work.
 - 3. Remove and replace defective Work.
 - 4. Remove and replace Work not conforming to requirements of Contract Documents.
 - 5. Remove samples of installed Work as specified for testing.
 - 6. Install specified Work in existing construction.
- B. In addition to contract requirements, upon written instructions of Architect:
 - 1. Uncover Work to provide for Architect's observation of covered Work.
 - 2. Remove samples of installed materials for testing.
 - 3. Remove Work to provide for alteration of existing Work.
- C. Do not endanger any Work by cutting or altering Work or any part of it.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Patching of materials and surfaces shall be in accordance with the requirements of the Contract Documents. Where not otherwise defined, patching shall match adjacent surfaces and proper materials shall be provided accordingly.

PART 3 EXECUTION

3.01 INSPECTION

- A. Inspect existing conditions of Work, including elements subject to movement or damage during cutting and patching.
- B. After uncovering Work, inspect conditions affecting installation of new products.

3.02 PREPARATION PRIOR TO CUTTING

- A. Provide shoring, bracing and support as required to maintain structural integrity of

Project.

- B. Provide protection for other portions of the Project, including all Contractors' personnel.

3.03 PERFORMANCE

- A. Execute fitting and adjustment of products to provide finished installation to comply with specified tolerances, finishes.
- B. Execute cutting and demolition by method which will prevent damage to other Work, and will provide surface to receive installation of repairs and new Work.
 - 1. No cutting shall be performed which will, in any way, reduce the structural strength of the building. Should such cutting be necessary, consult Architect and do not proceed with such operation unless written approval is given.
 - 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 - 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
- C. Restore Work which has been cut or removed; install new products to provide completed Work in accord with requirements of Contract Documents.
- D. Patching of materials and surfaces shall be in accordance with the requirements of the Contract Documents. Where not otherwise defined, patching shall match existing or adjacent surfaces and proper materials shall be provided accordingly.
 - 1. Wherever existing walls, floors, ceilings, etc., are cut, the exposed surfaces must be neatly finished by patching, painting, wall covering, etc., as required to blend patched areas into adjacent existing surfaces. Patched areas shall not be visible when viewing entire wall surface.
 - a. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 - 2. Where painting or finishing of patched surfaces or application of wall or floor covering is required, finish the entire plane of surface in which patched area occurs.
 - 3. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
 - 4. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.

3.04 SLEEVES AND OPENINGS

- A. Where pipes, conduits, ductwork or other materials pass through new walls, partitions, floors, roof or ceilings, provide suitable sleeves in these elements or provide openings where sleeves are not practical.

- B. Where pipes, conduit, ductwork etc., pass through, behind, or above existing construction, provide all cutting, patching, and refinishing for doing this work as specified herein.

3.05 CLEANING

- A. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

END OF SECTION

SECTION 01 74 00

CLEANING

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

- A. Execute cleaning, during progress of the work and at completion of the work, as required by Contract Documents.

1.02 RELATED SECTIONS

- A. Cutting and Patching: Section 01 73 29.

1.03 CLEANING AND DISPOSAL REQUIREMENTS

- A. Standards: Maintain project in accord with the following safety and insurance standards:
 - 1. Applicable Federal and State Requirements.
 - 2. National Fire Protection Association.
- B. Hazards Control: Comply with the following requirements:
 - 1. Store volatile wastes in covered metal containers, and remove from premises daily.
 - 2. Prevent accumulation of wastes which create hazardous conditions.
 - 3. Provide adequate ventilation during use of volatile or noxious substances.
- C. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.
 - 1. Do not burn or bury rubbish and waste materials on project site.
 - 2. Do not dispose of volatile wastes such as mineral spirits, oil or paint thinner in storm or sanitary sewers.
 - 3. Do not dispose of waste into streams or waterways.
 - 4. Wet down dry materials and rubbish to prevent dust.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Select and use cleaning materials and equipment with care to avoid scratching, marring, defacing, staining or discoloring surfaces cleaned.

PART 3 EXECUTION

3.01 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
- B. Provide, maintain and empty dumpster type containers for collection of waste materials, debris and rubbish. Locate containers as directed by Architect.
 - 1. Provide containers with adequate capacity to accommodate anticipated needs. If containers do not have adequate capacity, increase intervals of waste removal or capacity of containers until adequate capacity is provided.
- C. At reasonable intervals during progress of Work, but in no case less than once a week, dispose of waste materials, debris and rubbish.
- D. Site: Maintain Project site free of waste materials and debris.
- E. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
 - 1. Remove liquid spills promptly.
 - 2. At the close of each work day, clean areas of nails using a wheeled magnetic sweeper or similar type device.
- F. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- G. Schedule operations so that dust and other contaminants resulting from cleaning process will not fall on wet or newly-coated surfaces.
- H. Handle materials in a controlled manner with as few handlings as possible; do not drop or throw materials from heights.

3.02 FINAL CLEANING

- A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
 - 1. Leave Project clean and ready for occupancy.
- B. Employ experienced workmen, or professional cleaners for final cleaning.

- C. At the completion of the work, remove all surplus material, false work, temporary structures, and debris of every nature resulting from their operations and put the site in a neat and orderly condition.
- D. In preparation for substantial completion or occupancy, conduct final inspection of sight-exposed exterior surfaces.
- E. Remove waste, foreign matter, and debris from roofs, gutters, areaways, and drainage systems.
- F. Clean exposed exterior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
- G. Site/Exterior Items: Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - 1. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - 2. Rake grounds that are neither planted nor paved to a smooth, even textured surface.
 - 3. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - 4. Clean exposed hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces.
 - 5. Perform final cleanup with magnetic sweeper.
- H. Maintain cleaning until Final Completion.
- I. Prior to Final Completion, or Owner occupancy, Contractor shall conduct an inspection of sight exposed exterior surfaces, and all work areas, to verify that the entire work is clean.

END OF SECTION

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SECTION 06 10 00
ROUGH CARPENTRY

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Provide rough carpentry work as shown and specified. Work includes:
1. Wood framing, nailers, blocking, grounds and furring.
 2. Concealed blocking for support of accessories, equipment.
 3. Preservative treatment.
 4. Rough hardware and accessory materials.

1.02 SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
- B. Preservative Treated Wood: Submit certification by treating plant stating chemical and process used and conformance with applicable standards.

1.03 QUALITY ASSURANCE

- A. Softwood Lumber: Grading rules and wood species shall conform with the voluntary Product Standards PS 20 including grading rules of the following associations, as applicable:
1. Southern Pine: Standard Grading Rules for Southern Pine Lumber, published by Southern Pine Inspection Bureau (SPIB).
 2. Douglas Fir, Western Larch and Hemlock: Western Lumber Grading Rules, published by Western Wood Products Association (WWPA), Standard Grading and Dressing Rules for West Coast Lumber Inspection Bureau (WCLIB) or National Lumber Grades Authority (NLGA).
 3. Western Spruce, Pine and Fir: Western Spruce-Pine-Fir Association (WSPFA) and current Canadian Grading Rules by National Grades Association, Canada.
- B. Softwood Plywood: Grading rules and wood species shall conform with Product Standard PS 1.
- C. Grade Marks
1. General: Identify all lumber and plywood by official grade mark.
 2. Lumber: Grade stamp to contain symbol of grading agency, mill number or

name, grade of lumber, species or species grouping, or combination designation, rules under which graded, where applicable and condition of seasoning at time of manufacture.

3. Softwood Plywood: Appropriate grade trademark of the American Plywood Association.
 - a. Type, grade, class and identification index.
 - b. Inspection and testing agency mark.

1.04 STORAGE AND HANDLING

- A. Store off the ground.
- B. Protect from direct contact with the weather.
- C. Provide proper ventilation.
- D. Adhesives
 1. Do not store adhesives with materials that have a high capacity to absorb VOC emissions (i.e., materials which are woven, fibrous or porous in nature, such as acoustical ceilings, carpets, textiles, etc.).
 2. Do not store adhesives in occupied spaces.

1.05 JOB CONDITIONS

- A. Time delivery and installation of carpentry work to avoid delaying trades whose work is dependent on, or affected by, the carpentry work and to comply with protection and storage requirements.
- B. Installer must examine the surfaces and supporting structure and the conditions under which the carpentry work is to be installed, and notify the Contractor in writing of conditions detrimental to the work. Do not proceed with the installation until unsatisfactory conditions have been corrected in a manner acceptable to the installer.
- C. Correlate location of furring, nailers, blocking, grounds and similar supports so that attached work will comply with design requirements.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Dimension Lumber - General
 1. Nominal sizes are indicated, except as shown by detailed dimensions. Provide lumber complying with lumber producer's inspection agency grading rules certified as conforming to the "National Grading Rule for Dimension Lumber," by Board of Review of the American Lumber Standards Committee (ALCS), established under Section 10 of PS 20.
 2. Dress dimension lumber S4S unless otherwise shown or scheduled.

3. Provide seasoned dimension lumber with 19% maximum moisture content at time of dressing and complying with the dry size requirements of PS 20. Mark lumber "S-DRY".
 - a. 15% maximum moisture content for fire-retardant wood.
 4. Provide materials produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship":
 1. Provide "Construction" grade light framing and mark "CONST".
 2. Where stud framing is shown, provide "Stud" grade lumber and mark "STUD".
 3. Specie: Any commercial softwood.
- B. Light Framing Lumber: Where framing lumber from 2" through 4" thick, and 4" or less wide is indicated, provide lumber complying with the specified requirements for dimension lumber and with the following grading, unless otherwise indicated:
1. Provide "Construction" grade light framing and mark "CONST".
 2. Where stud framing is shown, provide "Stud" grade lumber and mark "STUD".
 3. Specie: Any commercial softwood.
- C. Miscellaneous Lumber
1. Provide wood for support or attachment of other work such as cant strips, nailers, blocking, furring, grounds, bucks, stripping and similar members. Provide lumber of the sizes shown or specified, worked to shapes shown and as follows:
 - a. Specie: Any commercial softwood, construction grade.

2.02 PRESERVATIVE WOOD TREATMENT

- A. Preservative Treatment by Pressure Process: AWPB U1; Use Category UC3b.
1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
 2. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.
- C. Mark each piece of treated lumber with AWPB Quality Mark designation denoting conformance to the appropriate specification.
1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece.
- D. Application: Treat items indicated on Drawings, and the following:
1. Wood nailers, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.

2. Wood sills, sleepers, blocking, and similar concealed members in contact with masonry or concrete.
3. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.
4. Wood framing members that are less than 18 inches above the ground in crawl spaces or unexcavated areas.
5. Wood floor plates that are installed over concrete slabs-on-grade.

2.04 ROUGH HARDWARE

- A. General: Provide all necessary spikes, screws, nails, bolts and other hardware for satisfactory erection of work. Except where noted to be stainless steel, provide hot-dipped galvanized finish for hardware exposed to exterior, located in toilet rooms, in contact with treated wood or in contact with roofing or flashing.
1. Nails: ASTM F1667. Common wire nails, except where noted otherwise on drawings; sizes as noted or specified herein.
 - a. Subflooring: Deformed shank nails.
 2. Attachment to Concrete or Masonry: Metal expansion type shields or inserts; sizes as required to accommodate applied fastener; spacing as indicated on drawings.
 - a. "DH" or "Ankr-Tight" by WEJ-IT or equal by RED HEAD or HILTI.
 - b. Sleeve type for masonry.
 - c. Wedge type for concrete.
 3. Adhesive Type Anchor Bolts – In Hollow CMU: Chemically grouted adhesive anchor systems with nylon or stainless steel screen inserts. Use 1/2 inch diameter anchors, unless otherwise noted.
 - a. HIT HY20 Adhesive Anchors, HILTI, INC.
 - b. EPCON System, ITW/RAMSET/RED HEAD
 - c. Chem-Stud Adhesive Anchors, RAWLPLUG COMPANY, INC.
 - d. Simpson Set Epoxy- Tie Adhesive Anchors, SIMPSON STRONG-TIE COMPANY, INC.
 4. Roof Construction
 - a. Wood-to-Wood Attachment: 300 Series stainless steel, flat head.
 - 1) Plywood to Nailers: Minimum #8 x 1-3/4".
- B. Provide plates, anchors, hangers and other miscellaneous steel and iron shapes as required for framing and supporting woodwork and for anchoring or securing woodwork to concrete or wood structures.
1. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, G60 coating designation.
 - a. Use for interior locations unless otherwise indicated.
 2. Hot-Dip Heavy-Galvanized Steel Sheet: ASTM A653; Structural Steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G185 coating designation; and not less than 0.036 inch thick.
 - a. Use for wood-preservative-treated lumber and where indicated.
 3. Manufacturers: Provide products by one of the following:
 - a. SIMPSON STRONG-TIE COMPANY

- b. CLEVELAND STEEL SPECIALTY COMPANY
- c. USP STRUCTURAL CONNECTORS
- d. PHOENIX METAL PRODUCTS

2.05 MISCELLANEOUS ITEMS

- A. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber or rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch.

PART 3 EXECUTION

3.01 INSTALLATION

A. General

1. Discard units of material which are unsound, warped, bowed, twisted, improperly treated, not adequately seasoned or too small to fabricate the work with a minimum of joints or the optimum jointing arrangement.
2. Fit carpentry work to other work. Scribe and cope as required for accurate fit.
3. Set wood framing accurately to required lines and levels.
4. Provide framing members of sizes and at spacing shown, and frame openings as shown, or if not shown, comply with the recommendations of the "National Design Specifications for Wood Construction and Supplements" as published by the American Wood Council.
5. Cut, join and tightly fit framing around other work.
6. Do not splice structural members between supports unless otherwise detailed.
7. Anchor and nail as indicated, or if not indicated to comply with the "Fastening Schedule" of the [OBC], 2304.9.
8. Fasteners
 - a. Use common wire nails, except as otherwise shown or specified herein.
 - b. Use finishing nails for exposed work.
 - c. Do not wax or lubricate fasteners that depend on friction for holding power.
 - d. Select fasteners of size that will not penetrate members where opposite side will be exposed to view or will receive finish materials.
 - e. Make tight connections between members.
 - f. Install fasteners without splitting of wood; predrill as required. Do not drive threaded friction type fasteners; turn into place.
 - g. Tighten bolts and lag screws at installation and retighten as required for tight connections prior to closing in or at completion of work.
 - h. Countersink nail heads on exposed carpentry work and fill holes.
 - i. Provide washers under bolt heads and nuts in contact with wood.
9. Nail plywood to comply with the recommendations of the American Plywood Association and OBC 2304.9.

10. Provide sill plates where wood framing is supported by concrete or masonry walls or piers. Anchor to embedded bolts as shown.
 11. Where wood-preserved-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.
- B. Stud Framing: Provide stud framing where shown. Erect on lines shown, to true planes, plumb, level and rigidly secured. Use 2" by 4" studs spaced at 16" on center, except as otherwise indicated. Cut wood framing square at bearing.
1. Provide single bottom plate and double top plates, 2" thick and of same width as studs. Overlap top plates at corners and intersections. Single top plate may be used for non-bearing partitions.
 2. Construct corners and intersections of partitions and walls with not less than three studs 2" thick, to provide bearing surface for wall finishes.
 3. Provide blocking and framing, same width as studs, required for support of facing materials, fixtures, specialty items, trim, cabinets, drapery hardware and accessories. Blocking and framing for subsequently applied work shall be reviewed and be acceptable to the Architect before installation of finish materials.
 4. Frame openings with double studs (triple studs for openings wider than 6'-0") and headers of double members of thickness equal to width of studs. Set headers on edge and support on jamb studs. Provide headers of depth shown.
 5. Notch framing for wiring and piping as required. No cut or hole may exceed 40% of the stud cross sectional area. Install steel plates at stud face notches to prevent drywall fastener damage.
- C. Wood Grounds, Nailers and Blocking
1. Provide wherever 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 or screeded.
 2. Coordinate location with other work; refer to shop drawings of such work, if any.
 3. Attach to surfaces securely with anchor bolts or other attachment devices as shown, and as required to support applied loading. Countersink bolts and nuts flush with surfaces, unless otherwise indicated. Build into masonry as work progresses, cutting to fit masonry unit size involved. Anchor to formwork before concrete placement.
 4. Provide grounds of dressed, key-bevelled lumber not less than 1-1/2" wide and of the thickness required to bring face of ground to exact thickness of finish material involved. Remove temporary grounds when no longer required. Where indicated as permanent grounds, provide treated lumber.
 5. Anchor plates, blocking, nailers, etc. to masonry and concrete masonry units (units with cores grouted solid) with minimum 1/2" diameter fasteners spaced at 4' o.c., unless otherwise indicated. Situations requiring special bolting shall be with size and spacing of bolts as required.

END OF SECTION

SECTION 06 20 00
FINISH CARPENTRY

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Provide finish carpentry as indicated and specified. Work includes:
 - 1. Softwood trim.
or
 - 2. MDF trim.
 - 3. Miscellaneous fasteners and hardware.

1.02 RELATED SECTIONS

- A. Rough Carpentry: Section 06 10 00.
- B. Painting and Finishing: Section 09 91 00.

1.03 REFERENCES

- A. Standards: Wherever the following abbreviations are used herein, they shall refer to the corresponding standard:
 - 1. ANSI: American National Standards Institute.
 - 2. AWI: Architectural Woodwork Institute.
 - 3. P.S.: U.S. Product Standard.

1.04 SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials, dimensions, profiles, textures, and colors and include construction and application details.
- B. Submit samples of all finish materials, include the following:
 - 1. Lumber with opaque finish. (12")

1.05 QUALITY ASSURANCE

- A. Installation: Performed only by experienced skilled finish carpenters.
- B. Provide lumber factory marked with type, grade, mill and grading agency identification on concealed surfaces. Omit marking and submit mill certificates for materials to receive transparent finishes that cannot be marked on a concealed

surface.

- C. Quality Grade: Materials and fabrication shall be "custom grade" in accordance with "Quality Standard Illustrated," of the AWI conforming to the following sections:
 - 1. Section 300: Standing and running trim.
 - 2. Section 1700: Installation of architectural woodwork.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Do not deliver materials until concrete, masonry and other similar wet work has been completed and is thoroughly dry, outside door openings are permanently watertight, exterior windows are glazed and, in case of temperature dropping below 60 degrees F., until temporary heating and ventilating systems are in operation.
 - 1. Do not store adhesives with materials that have a high capacity to absorb VOC emissions (i.e., materials which are woven, fibrous or porous in nature, such as acoustical ceilings, carpets, textiles, etc.).
 - 2. Do not store adhesives in occupied spaces.
- B. Protect finish carpentry during delivery, storage and handling to prevent damage, soiling and deterioration.

1.07 PROJECT CONDITIONS

- A. Provide and maintain a constant temperature and humidity before, during and after installation as required to maintain optimum moisture content of installed materials.
- B. Obtain measurements and verify dimensions and details before proceeding with finish carpentry.
- C. Do not install finish carpentry materials that are wet, moisture damaged, or mold damaged.
 - 1. Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 PRODUCTS

2.01 MATERIALS, Provide one of the following to match existing adjacent.

- A. Interior Wood Trim - Painted Finish: In accordance with AWI 300, "Custom" Grade, and AWI 100, Grade I, except no checks will be allowable on visible surfaces. Plain sliced poplar. Well seasoned and kiln dried. Moisture content at time of fabrication shall not exceed 12%.
- B. Medium Density Fiberboard (MDF) Trim: ANSI A208.2 Shapes as indicated on

Drawings. Maximum moisture content of 8%. Formaldehyde free. Meet the following minimum standards:

1. Internal Bond: 90 psi.
2. Modulus of Rupture: 2,500 psi.
3. Screw Holding Power: 325 pounds.
4. Density: Minimum 40 pounds per cubic foot.
5. Fire Rating: ASTM E84 Class A
 - a. Smoke Developed: 95
 - b. Flame Spread: 15

2.02 ACCESSORIES

- A. Wood Filler: Oil or solvent base, tint to match surface color.

2.03 FABRICATION

- A. General: Except as specified hereinafter, fabricate all work in accordance with AWI quality standards as specified. Work not specified with a level of quality shall be not less than "Custom" quality per AWI.
- B. Standing and Running Trim: Fabricate to dimensions, profiles of existing.
 1. Cut moldings, wood door and window frames, trims and stops clean and sharply defined. Ease edges to approximately 1/16" radius, unless otherwise shown.
 2. Machine sand all flat work, except items to receive resawn surfaces.

PART 3 EXECUTION

3.01 PREPARATION

- A. Condition finish carpentry materials and products to average prevailing humidity conditions in installation areas before installing.
- B. Install blocking and anchoring devices built into substrates for anchorage of finish carpentry items.
- C. Verify mechanical, electrical, and building items affecting this Section are placed and ready to receive this work.
- D. Verify field dimensions.
- E. Backprime lumber for painted finish exposed on the exterior or to moisture and high relative humidity on the interior. Comply with requirements of Section 09 91 00.

3.02 INSTALLATION

- A. Discard material which is unsound, warped, bowed, twisted, improperly treated, not

adequately seasoned or too small to fabricate work with minimum of joints or optimum jointing arrangements.

- B. Install finish carpentry materials and products plumb, level, true and straight with no distortion. Shim as required using concealed shims. Install to a tolerance of 1/8" in 8'-0" for plumb and level, and with 1/16" maximum offset in flush adjoining surfaces, 1/8" maximum offsets in revealed adjoining surfaces.
- C. Scribe and cut work to fit adjoining work and refinish cut surfaces or repair damaged finish at cuts.
- D. Standing and Running Trim: Install with minimum number of joints possible; using full-length pieces (from maximum length of lumber available) to the greatest extent possible. Stagger joints in adjacent and related members. Cope at returns, miter at corners and comply with Quality Standards for joinery.
- E. Anchor woodwork to anchors or blocking built-in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk concealed fasteners and blind nailing as required for a complete installation. Use fine finishing nail for exposed nailings, countersunk and filled flush with woodwork.

3.03 CLEANING AND PROTECTION

- A. Repair damaged and defective finish carpentry materials to eliminate functional and visual defects. Where not possible to repair properly, replace finish carpentry as directed by the Architect.
- B. Protect installed work during remaining construction operations.
- C. Clean woodwork on exposed and semi-exposed surfaces. Touch-up shop applied finishes to restore damaged or soiled areas.

END OF SECTION

SECTION 07 01 30

MAINTENANCE OF ROOFING SHINGLES

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Modify existing roofing shingles for new penetrations.

1.02 SUBMITTALS

- A. Product Data: Provide manufacturer's printed product information indicating material characteristics, performance criteria, and product limitations.
- B. Manufacturer's Installation Instructions: Provide published instructions that indicate preparation required and installation procedures.

1.03 QUALITY ASSURANCE

- A. Installer Qualifications: Contractor shall provide qualified workers, trained and experienced in roofing systems of this configuration, and shall submit documentation of 5 consecutive years of work of this type.

1.04 PROJECT/SITE CONDITIONS

- A. Environmental Requirements: Do not proceed with work unless existing and forecasted weather conditions permit work to be performed in accordance with manufacturer's recommendations.
- B. Temporary Protection Materials: Provide and maintain materials on the site at all times for temporary roofing, flashing, and other protection when delays and/or changed weather conditions do not permit completion of each unit of work prior to the end of each working day. Materials which have been used for temporary roofing, flashing and other protection shall be removed and discarded.

PART 2 PRODUCTS

2.01 ASPHALT GLASS FIBER ROOFING SHINGLES

- A. Type: Glass fiber mat base; ceramically colored/UV resistant mineral surface granules across entire face of shingle; self-sealing type.
- B. Conformance: ASTM D3018 Type I - self-sealing; UL Certification of ASTM D3462; UL 997 Wind Resistance and UL Class A Fire Resistance
- C. Style and Manufacturer: Match existing.

- D. Roofing Felt: Asphalt-saturated felt. ASTM D4869, Type I.
- E. Self Adhering Underlayment Material: Polyethylene sheet backed rubberized asphalt membrane, 40 mils thick. Provide primer as recommended by membrane manufacturer. Conformance: ASTM D1970.
 - 1. Manufacturers: Bituthene Ice and Water Shield by W. R. GRACE; Polyken 640 Underlayment Membrane by POLYKEN TECHNOLOGIES; Polyguard Deck Guard by POLYGUARD PRODUCTS; Weather Watch by GAF; Winterguard by CERTAINTEED.
- F. Nails: 11 ga., 1-1/4 inch long (ridge 1-1/2 inch long), 7/16 inch diameter head, galvanized. Use longer nails where additional roofing material is used or if required by manufacturer. Staples not permitted.
- G. Roof Penetration Vent Flashing: Hard thermoplastic plastic, ultraviolet resistant, base roof vent flashing with elastomer collar.

PART 3 EXECUTION

3.01 EXAMINATION AND INSTALLATION

- A. Verify that roof penetrations and plumbing stacks are in place and flashed to deck surface.
- B. Verify roof openings are correctly framed prior to installing work of this section.
- C. Verify deck surfaces are dry and free of ridges, warps, or voids.
- D. Follow shingle and vent flashing manufacturer's recommendations for acceptable roof deck materials, procedures and installation for watertight installation.

END OF SECTION

SECTION 07 84 00

FIRESTOPPING

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Provide firestop systems consisting of a material, or combination of materials installed to retain the integrity of fire-rated construction by maintaining an effective barrier against the spread of flame, smoke, and/or hot gases through penetrations, blank openings, construction joints, or at perimeter fire containment in or adjacent to fire-rated barriers in accordance with the requirements of the Building Code for this project.
- B. Firestop systems shall be used in locations including, but not limited to, the following:
 - 1. Penetrations through fire resistance rated construction including both empty openings and openings containing pipes, ducts, and other penetrating items.

1.02 DEFINITIONS

- A. Firestopping: Material or combination of materials (assembly) to retain integrity of fire rated construction by maintaining an effective barrier against the spread of flame, smoke, and gases.
- B. Through-penetration: Any penetration of a fire-rated wall or floor that completely breaches the barrier.
- C. Through-Penetration Firestop Systems: Material or combination of materials which are field constructed of fill, void, or cavity materials and forming materials, designed to resist fire spread when installed as a complete firestop system.
- D. Through-Penetration Firestop Devices: Factory built products designed to resist fire spread. Complete when delivered to site; ready for installation.
- E. System: The use of a specific firestop material or combination of materials in conjunction with a specific wall or flow construction type and a specific penetrant(s).
- F. Barrier: Any bearing or non-bearing wall or floor that has an hourly fire and smoke rating.
- G. Membrane-penetration: Any penetration in a fire-rated wall that breaches only one side of the barrier.

- H. Fire Resistive Joint: Any gap, joint, or opening, whether static or dynamic, between two fire rated barriers including where the top of a wall meets a floor; wall edge to wall edge applications; floor edge to floor edge configurations; floor edge to wall.
- I. Perimeter Barrier: Any gap, joint, or opening, whether static or dynamic, between a fire rated floor assembly and a non-rated exterior wall assembly.

1.04 REFERENCES

- A. American Society for Testing and Materials (ASTM)
 - 1. E84: Test Method for Surface Burning Characteristics of Building Materials.
 - 2. E119: Fire Tests of Building Construction Materials.
 - 3. E814: Fire Tests of Through Penetration Fire Stops.
 - 4. E2174: Standard Practice for On-Site Inspection of Installed Fire Stops
- B. National Fire Protection Association (NFPA)
 - 1. 70: National Electrical Code (NEC)
 - 2. 101: Code for Safety to Life from Fire in Buildings and Structures (Life Safety Code).
- C. Underwriters' Laboratories (UL)
 - 1. UL1479: Fire Tests of Through Penetration Fire Stops.
 - 2. UL2079: Tests for Fire Resistance of Building Joint Systems
- D. Firestop Design Classification References
 - 1. Warnock Hersey Listing Manual
 - 2. UL Fire Resistance Directory - Vol. 1
- E. Factory Mutual (FM) Research
 - 1. FM Approval Standard of Firestop Contractors – Class 4991

1.05 SYSTEM PERFORMANCE REQUIREMENTS

- A. System Design and Product Selection: Contractor responsible for selection of products and tested designs that fulfill the firestopping requirements of this section.
- B. General: Provide firestopping systems that are produced and installed to resist the spread of fire, according to requirements indicated, and the passage of smoke and other gasses.
- C. F-Rated Through Penetration Firestop Systems: Provide through penetration firestop systems with F ratings indicated as determined per ASTM E814, UL

1479 but not less than that equaling or exceeding the fire resistance rating of the constructions penetrated.

- D. T-Rated Through-Penetration Firestop Systems: Provide through-penetration firestop systems with T ratings, in addition to F ratings, as determined per ASTM E814, where indicated and where systems protect penetrating items exposed to contact with adjacent materials in occupiable floor areas. T -rated assemblies are required where specified by codes or where the following conditions exist:
1. Where firestop systems protect penetrations located outside of wall cavities.
 2. Where firestop systems protect penetrations located outside fire resistive shaft enclosures.
 3. Where firestop systems protect penetrations located in construction containing doors required to have a temperature rise rating.
 4. Where firestop systems protect penetrating items larger than a 4 inch diameter nominal pipe or 16 square inch in overall cross sectional area.
- E. L – Rated Through-Penetration Firestop Systems: Provide firestop systems with L ratings, in addition to F and T ratings, as determined per UL 1479, where indicated by Code.
- F. Fire Resistive Joint Sealants: Provide joint sealants with fire resistance ratings indicated, as determined per ASTM E119, UL 1479 and UL 2079 but not less than that equaling or exceeding the fire resistance rating of the construction in which the joint occurs.
- G. For firestopping exposed to traffic, moisture, and physical damage, provide products that do not deteriorate when exposed to these conditions and will meet load requirements.
1. For piping penetrations for plumbing and wet pipe sprinkler systems, provide moisture-resistant through-penetration firestop systems.
 2. For floor penetrations with annular spaces exceeding 4 inches in width and exposed to possible loading and traffic, provide firestop systems capable of supporting floor loads involved either by installing floor plates or by other means.
 3. For penetrations involving insulated piping, provide through-penetration firestop systems not required removal of insulation.
- H. For through-penetration firestop systems exposed to view, provide products with flame spread of less than 25 and smoke developed ratings of less than 450, as determined per ASTM E 84.
- I. Where there is no specific third party tested and classified firestop system available for an installed condition, obtain from the firestopping material manufacturer an Engineering Judgment (EJ) to be submitted to the Approving Authority and Authority Having Jurisdiction for approval prior to installation. The EJ shall follow International Firestop Council (IFC) guidelines.

- J. Mold Resistance: Provide penetration firestopping with mold and mildew resistance rating of one (1) or less as tested per ASTM G21.

1.06 SUBMITTALS

- A. Product Data: Manufacturer's specifications and technical data for each material including the composition and limitations, documentation of UL or other nationally recognized independent testing laboratories firestop systems to be used, and manufacturer's installation instructions.
 - 1. Manufacturer's engineering judgement identification number and drawing details when no tested system is available.
- B. Shop drawings detailing materials, installation methods, and relationships to adjoining construction for each through-penetration firestop system, and each kind of penetrating item. Include firestop design designation of qualified testing and inspecting agency evidencing compliance with requirements for each condition indicated.
 - 1. Submit documentation, including illustrations, from a qualified testing and inspecting agency that is applicable to each through-penetration firestop configuration for construction and penetrating items.
 - 2. Where project conditions require modification of qualified testing and inspecting agency's illustration to suit a particular through-penetration firestop condition, submit illustration approved by firestopping manufacturer with modifications marked.
- C. Product certificates signed by manufacturers of firestopping products certifying that their products and installation comply with specified requirements. Certification shall be signed by the Installer.
- D. Certification is required from manufacturer that Installer has been trained in the handling and installation of their products.
- E. Firestopping installer shall provide a letter of certification stating that all firestopping systems have been installed in accordance with the Contract Documents.

1.07 QUALITY ASSURANCE

- A. Meet requirements of ASTM E814 or UL 1479 tested assemblies that provide a fire rating equal to that of construction being penetrated and other ASTM Standards as applicable for the installation.
 - 1. ASTM E84 "Test Method for Surface Burning Characteristics of Building Materials."
 - 2. ASTM E119 "Test Methods for Fire Tests of Building Construction and Materials."
- B. Requirements of Regulatory Agencies: Comply with the applicable requirements

for fire separations and penetrations of the following:

1. OBC: See Chapter 6, Table 601 and 602 for the time rated construction requirements.
 2. NFPA 70.
 3. NFPA 101.
- C. Installer: Specialist in the installation of type(s) of firestopping required; trained and approved by the firestop manufacturer.
1. Shown to have successfully completed not less than 5 firestop projects similar in type and size to that of this Project.
- D. Provide firestopping products containing no detectable asbestos as determined by the method specified in 40 CFR Part 763, Subpart F, Appendix A, Section 1, "Polarized Light Microscopy".
- E. Do not use any product containing solvents that require hazardous waste disposal or which after curing dissolve in water.
- F. Coordinating Work: Coordinate construction of openings and penetrating items to ensure that designated through-penetration firestop systems are installed per specified requirements.
- G. Single Source Responsibility: Obtain firestop systems for each kind of penetration and construction condition indicated from a single primary firestop systems manufacturer.
1. Materials of different manufacture than allowed by the tested and listed system shall not be intermixed in the same firestop system or opening.
 2. Tested and listed firestop systems are to be used before an Engineering Judgment (EJ) or Equivalent Fire Resistance Rated Assembly (EFRA) is installed.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver firestopping undamaged products to project site in original, unopened containers or packages with intact and legible manufacturers' labels identifying product and manufacturer; date of manufacturer; lot number; shelf life, if applicable; qualified testing and inspecting agency's classification marking applicable to Project; curing time; and mixing instructions for multi-component materials.
1. Comply with recommended procedures, precautions, or remedies described in material safety data sheets as applicable.
- B. Store and handle firestopping materials to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.
- C. Do not use damaged or expired materials.

1.09 PROJECT CONDITIONS

- A. Environmental Conditions: Do not install firestopping when ambient or substrate temperatures are outside limits permitted by firestopping manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.
- B. Ventilation: Ventilate firestopping per firestopping manufacturers' instructions by natural means or, where this is inadequate, forced air circulation.

1.10 SEQUENCING AND SCHEDULING

- A. Coordinate this Work as required with work of other trades. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate through-penetration firestop systems.
- B. Do not cover up those firestopping installations that will become concealed behind other construction until Owner's inspection agency and authorities having jurisdiction, if required, have examined each installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Provide products from one or more of the following manufacturers according to the suitability of the product for the intended purpose.
 - 1. W.R. GRACE (Flamesafe System)
 - 2. FYRESLEEVE INDUSTRIES
 - 3. TREMCO
 - 4. HILTI, INC.
 - 5. SPECIFIED TECHNOLOGIES (STI).
 - 6. 3M FIRE PROTECTION PRODUCTS.
 - 7. THE RECTORSEAL CORPORATION (Metacaulk and Bio Fireshield).
 - 8. NELSON FIRESTOP PRODUCTS.

2.02 MATERIALS - GENERAL

- A. As selected by Contractor. See SYSTEM PERFORMANCE REQUIREMENTS in Part 1 hereinbefore.
- B. Compatibility: Provide firestopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the firestopping under conditions of service and application, as demonstrated by firestopping manufacturer based on testing and field experience.
 - 1. All materials shall comply with ASTM E814 or E 119 (UL 1429), and shall be manufactured of nontoxic, non-hazardous, asbestos free materials, and unaffected by water or moisture when cured.

2. Primers: Conform to manufacturer's recommendations for primers required for various substrates and conditions.
 3. Backup Materials: Backup materials, supports, and anchoring devices shall be provided as required by UL testing.
 4. Provide all firestopping sealant materials within the VOC limits specified in Section 01 81 13.
- C. Accessories: Provide components for each firestopping system that are needed to install fill materials and to comply with "System Performance Requirements" in Part 1. Use only components specified by the firestopping manufacturer and approved by the qualified testing and inspecting agency for the designated fire resistance rated systems.

2.04 MIXING

- A. For those products requiring mixing before application, comply with through-penetration firestop system manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of firestopping. Do not proceed with installation until unsatisfactory conditions have been corrected.
1. Verify penetrations are properly sized and in suitable condition for application of materials.

3.02 PREPARATION

- A. Surface Cleaning: Clean out openings and joints immediately prior to installing firestopping to comply with recommendations of firestopping manufacturer and the following requirements:
1. Remove all foreign materials from surfaces of opening and joint substrates and from penetrating items that could interfere with adhesion of firestopping.
 2. Clean opening and joint substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with firestopping. Remove loose particles remaining from cleaning operation.
 3. Remove laitance and form release agents from concrete.
- B. Priming: Prime substrates where recommended in writing by through-penetration firestop system manufacturer using that manufacturer's recommended products

and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

- C. Masking Tape: Use masking tape to prevent through-penetration firestop systems from contacting adjoining surfaces that will remain exposed on completion of work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove smears from firestop system materials. Remove tape as soon as possible without disturbing firestop systems seal with substances.

3.03 INSTALLING THROUGH-PENETRATION FIRESTOPS

- A. General: Comply with the "System Performance Requirements" in Part 1 and the through-penetration firestop manufacturer's installation instructions and drawings pertaining to products and applications indicated.
- B. Install forming/damming materials and other accessories of types required to support fill materials during their application and in the position needed to produce the cross sectional shapes and depths required to achieve fire ratings of designated through-penetration firestop systems. After installing fill materials, remove combustible forming materials and other accessories not indicated as permanent components of firestop systems.
- C. Install fill materials for through-penetration firestop systems by proven techniques to produce the following results:
 - 1. Completely fill voids and cavities formed by openings, forming materials, accessories, and penetrating items.
 - 2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
 - 3. For fill materials that will remain exposed after completing Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.04 INSTALLING FIRE RESISTIVE JOINT SEALANTS

- A. General: Comply with the "System Performance Requirements" in Part 1 with ASTM C1193, and with the sealant manufacturer's installation instructions and drawings -pertaining to products and applications indicated.
- B. Install joint fillers 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 and develop fire resistance rating required.
- C. 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 width that optimum sealant movement capability. Install sealants at the same time joint fillers are installed.

- D. Tool nonsag sealants immediately after sealant application and prior to the time skinning or curing begins. Form smooth, uniform beads of configuration indicated or required to produce fire resistance rating, as well as to eliminate air pockets, and to ensure contact and adhesion of sealants with sides of joint. Remove excess sealant from surfaces adjacent to joint. Do not use tooling agents that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.

3.05 INSTALLING PERIMETER FIRE BARRIER SYSTEMS

- A. General: Comply with "System Performance Requirements" article in Part 1 and with the firestop manufacturer's installation and drawings pertaining to products and applications indicated.
- B. Install metal framing, curtain wall insulation, mechanical attachments, safing materials and firestop materials as applicable within the system design.

3.06 IDENTIFICATION

- A. Identify through-penetration firestop systems with pressure-sensitive, self-adhesive, preprinted vinyl labels. Attach labels permanently to surfaces of penetrated construction on both sides of each firestop system installation where labels will be visible to anyone seeking to remove penetrating items or firestop systems. Include the following information on labels:
 1. The words "Warning - Through-Penetration Firestop System - Do Not Disturb. Notify Building Management of Any Damage".
 2. Contractor's name, address, and phone number.
 3. Through-penetration firestop system designation of applicable testing and inspecting agency.
 4. Date of installation.
 5. Through-penetration firestop system manufacturer's name.

3.08 FIELD QUALITY CONTROL

- A. The inspector shall advise the contractor of any deficiencies noted.
- B. Do not proceed to enclose firestopping with other construction until inspection agency has verified that the firestop installation complies with the requirements.
- C. Where deficiencies are found, repair or replace the firestopping so that it complies with requirements of tested and listed system design.

3.09 CLEANING

- A. Clean off excess fill materials and sealants adjacent to openings and joints as work progresses by methods and with cleaning materials approved by manufacturers of firestopping products and of products in which opening and joints occur.

- B. Provide final protection and maintain conditions during and after installation that ensure through-penetration firestop systems are without damage or deterioration at time of Contract Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated through-penetration firestop systems immediately and install new materials to produce through-penetration firestop system complying with specified requirements.

END OF SECTION

SECTION 07 92 00

JOINT SEALANTS

PART 1 GENERAL

1.01 SCOPE

- A. General: Prepare joints and apply sealant at all locations which normally require sealing to prevent infiltration of air, water, and insects and to reduce transmission of sound.
- B. Apply sealants to exterior non-static joints.
 - 1. joint between PVC piping and concrete slab.

1.03 GENERAL PERFORMANCE

- A. Except as otherwise indicated, joint sealant is required to establish and maintain airtight and waterproof continuous seals on a permanent basis, within recognized limitations of wear and aging as indicated for each application.
- B. Failures of installed sealant to comply with this requirement will be recognized as failures of both materials and workmanship.

1.04 SUBMITTALS

- A. Submit manufacturer's product data and installation instructions.
 - 1. Certification, in the form of manufacturer's standard data sheet or by letter, stating that each type of compound and sealant to be furnished complies with these specifications.
 - 2. Statement that each product to be furnished is recommended for the application shown and is compatible with all materials to which applied.
 - 3. Instructions for handling, storage, mixing, priming, installation, curing and protection for each type of sealant.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Definition: The term "sealant" will be understood to be an elastomeric type. The term "caulk" will be understood to be a synthetic resin base of highest quality acrylic latex compound.
- B. General

1. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.
- C. Manufacturers: BOSTIK; DOW CORNING CORPORATION; EUCLID CHEMICAL; TREMCO MANUFACTURING COMPANY; GENERAL ELECTRIC COMPANY/MOMENTIVE; SIKA CHEMICAL CO.; MAMECO INTERNATIONAL; BASF BUILDING SYSTEMS; VULCHEM.
1. Manufacturer's listed under the following applications are for basis of design. Equal products by above listed manufacturers are acceptable.
- D. Exterior Vertical and Overhead Joints: Single or multi-component elastomeric polyurethane sealant meeting ASTM C920, Type M or S, Grade NS, Class 50.
1. PECORA Dynatrol II
 2. TREMCO Dymeric 240
 3. BOSTIK Chem-Calk 2020
 4. PACIFIC POLYMERS INTERNATIONAL Elastothane230 LM Type II
 5. POLYMERIC SYSTEMS INC. PSI-901
 6. GEOCEL 3300

2.02 ACCESSORIES

- A. Joint Primer/Sealer: Non-staining type, recommended by sealant manufacturer; compatible with joint forming material.
- B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming material.
- C. Bond Breaker Tape: Pressure sensitive polyethylene or plastic tape, recommended by sealant manufacturer, to suit applications where bond to substrate should be avoided for proper joint sealant performance.
- D. Joint Backing: Compressible rod stock conforming to ASTM C1330, Type B; material as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance
- E. Solvents: Cleaning agent recommended by the manufacturer of the sealant in writing to Architect.

PART 3 EXECUTION

3.01 INSPECTION

- A. Pre-Installation Meeting

1. Prior to sealant installation, and at the Contractor's direction, meet at project site to review material selections, joint preparations, installation procedures, weather conditions and coordination with other trades.
 2. Include sealant installer, Contractor, Architect, manufacturer's representative and representatives of other trades or subcontractors affected by the sealant installation.
- B. Examine substrates and installation conditions. Do not proceed with joint sealant work until unsatisfactory conditions have been corrected.
- C. Installation constitutes acceptance of existing conditions and responsibility for satisfactory performance.

3.02 PREPARATION

- A. Clean, seal and prime surfaces in accordance with manufacturer's recommendations. Confine primer/sealant to areas of sealant bond.
- B. Remove dust, dirt, loose coatings, moisture and other substances which could interfere with sealant bond.
- C. Remove lacquers and protective films from metal surfaces.
- D. Architectural Concrete and Stone: Apply masking around joints to protect adjacent surfaces from defacement and staining during sealing operations. Repair damaged masking until sealant is installed.

3.03 INSTALLATION

- A. Apply joint sealant as late as possible in construction, preceding painting and following cleaning operations. Do not apply sealant during inclement weather conditions or when temperature is above or below manufacturer's limitations for installation.
- B. Install joint sealant materials and accessories in strict accordance with manufacturer's installation instructions.
- C. Set joint filler units at depth or position in joint as indicated to coordinate with other work. Do not leave voids or gaps between ends of joint filler units.
- D. Install sealant backer rod, except where recommended to be omitted by sealant manufacturer for application indicated. Use rod diameter that will cause compression when installed.
- E. Install bond breaker tape and where required by manufacturer's recommendations to ensure that sealants will perform as intended.
- F. Apply joint sealants in uniform, continuous ribbons without gaps or air pockets, with complete "wetting" of joint bond surfaces on both sides. Fill sealant rabbet to a slightly concave surface, slightly below adjoining surfaces. At horizontal joints

between a horizontal surface and vertical surface, fill joint to form a slight cove, so that joint will not trap moisture and dirt. Hand tool and finish all joints.

- G. Install joint sealants within recommended temperature ranges and to depths indicated or when not indicated, as recommended by sealant manufacturer. For normal moving vertical and horizontal joints, fill joints to a depth equal to 50% of joint width, but not more than 1/2" deep nor less than 1/4" deep, measured at the center section of bead.
- H. Confine materials to joint areas with masking tapes or other acceptable methods. Remove excess sealant materials promptly as work progresses and clean adjoining surfaces.

3.04 CLEANING

- A. Upon completion, remove and dispose of masking materials; remove all excess sealing materials; clean adjacent materials of all soil and stain resulting from sealing operations.
 - 1. Replace damaged material and material which cannot be properly cleaned.

END OF SECTION

SECTION 09 29 00

GYP SUM WALLBOARD

PART 1 GENERAL

1.01 SCOPE

- A. Provide gypsum board systems consisting of wall board, trim and accessories. Work includes:
 - 1. Gypsum drywall wall board.
 - 2. Edge trim, corner beads, fasteners, joint treatment materials and other accessories required for a complete installation.
 - 3. Includes installation of acoustical insulation.

1.02 RELATED SECTIONS

- A. Rough Carpentry: Section 06 10 00.

1.03 QUALITY ASSURANCE

- A. Gypsum Board Systems: Comply with ASTM C840 "Recommended Specifications for Application and Finishing of Gypsum Board", and as specified.
- B. Reference Standards: Wherever the following abbreviations are used herein they shall refer to the corresponding standard:
 - 1. ASTM: American Society for Testing and Materials.
 - 2. GA: Gypsum Association.
 - 3. FS: Federal Specification.
- C. Allowable Tolerances: Provide framing fabricated and erected to conform to the following allowable tolerances:
 - 1. Ceiling Framing: Level within 1/8" in 10'-0" and erected so that deflection of any component does not exceed 1/360 of its span after installation of finish materials and equipment.
- D. Guarantee: Submit written guarantee stating that cracks, delaminations or other imperfections in the drywall work which may develop within a period of 2 years from date of acceptance will be repaired at no cost to the Owner.

1.04 SUBMITTALS

- A. Submit manufacturer's product data and installation instructions for each gypsum board system component.

- B. Submit manufacturer's certification that fire-rated assemblies proposed meet project requirements, including evidence of approved test reports acceptable to governing building code enforcing authority, that assemblies when installed with proposed materials, will meet or exceed fire ratings required.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in manufacturer's original, unopened labeled containers.
- B. Store, protect and handle materials in accordance with manufacturer's recommendations to prevent damage, soiling and deterioration.
- C. Protect adjoining surfaces against damage and soiling.

1.06 JOB CONDITIONS

- A. Coordinate installation sequencing with work of other trades.
- B. Sprayed Fireproofing
 - 1. All attachments to structural steel framing receiving sprayed fireproofing to be installed prior to application of sprayed fireproofing, if possible, to preclude removal of fireproofing.
 - 2. Where necessary to remove fireproofing and where fireproofing becomes damaged, provide for restoration in accordance with original fireproofing specifications at no additional cost to Owner.
- C. Verify completion of other work, including that of other trades, that will be concealed by gypsum drywall construction before installation of wallboard.

PART 2 PRODUCTS

2.01 GYPSUM BOARD

- A. General: Comply with ASTM C1396.
 - 1. Recycled Content of gypsum board: Provide product with average recycled content of such that postconsumer recycled content plus one-half of preconsumer recycled content is not less than 75% percent.
- B. Moisture and Mold Resistant
 - 1. ASTM C1396 (Section 5), regular type
 - 2. Edges: Tapered.
 - 3. Thickness: 1/2 inch, unless otherwise indicated.
 - 4. Resistance to Mold Growth: ASTM D3273, "Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber," the panel score was 10.

- C. Manufacturer: U.S. GYPSUM CO.; CERTAINTEED CORP.; GEORGIA-PACIFIC CORP.; GOLD BOND BUILDING PRODUCTS; CONTINENTAL BUILDING PRODUCTS.

2.02 ACCESSORIES

- A. Fasteners: Drywall screws and metal framing screws per manufacturer's instructions and recommendations for type and size, based on construction and conditions involved.
- B. Trim
 - 1. Corner Beads - Outside, Square Corners: 1-1/4 inch x 1-1/4 inch heavy gauge galvanized steel or vinyl, perforated.
 - a. Metal: BEADEX MANUFACTURING; UNIMAST; DALE INDUSTRIES; listed gypsum board manufacturers.
 - b. Vinyl: VINYL TECH; VINYL CORP.
 - 2. Corner Beads - Outside, Non-square Corners: BEADEX B-1 Splay Flexible Corner or equal. Concealed metal; two galvanized continuous strips laminated with paper trim; for application without mechanical fasteners.
 - 3. Exposed Edges (Casing Beads): L-shaped trim, size to suit wallboard.
 - a. Metal: UNIMAST 200-B; BEADEX; DALE INDUSTRIES; listed gypsum board manufacturers.
 - b. Vinyl: VINYL CORP. SB; VINYL TECH.
 - 4. Control Joints
 - a. Metal: Roll formed zinc, tape protected 1/4" wide x 7/16" deep control slot. UNIMAST No. 093; BEADEX; DALE INDUSTRIES; listed gypsum board manufacturers.
 - b. Vinyl: VINYL CORP. No. CVJ-16; VINYL TECH. Tape protected 3/16" wide x 7/16" deep control slot.
- C. Reinforcing Tape: Width to adequately cover joint.
- D. Joint Taping Compound: Designed for bonding tape to wallboard and coating corner beads and fasteners.
- E. Joint Topping Compound: Designed to sand smooth and feather well for finished surface.
- F. Additional Items: All additional accessories to complete work including nails and anchors to secure frames to walls and floors.
- G. Acoustic Materials
 - 1. Insulation
 - a. Type: Semi-rigid mineral fiber (glass fiber, slag wool or rock wool) blankets. Conform to ASTM C665, Type I, unfaced .
 - b. Thickness: 3 inch, unless otherwise indicated.
 - c. Manufacturer: Thermafiber by U.S. GYPSUM; JOHNS MANVILLE;

OWENS-CORNING FIBERGLAS; CERTAINTEED.

2. Sealant: Nonsag, paintable, nonstaining latex sealant complying with ASTM C834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E90.
 - a. Manufacturers
 - 1) USG Acoustical Sealant
 - 2) TREMCO Acoustical Sealant
 - 3) PECORA BA-98
 - b. Acoustical joint sealant shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
3. Neoprene impregnated sealant tape.

PART 3 EXECUTION

3.01 GENERAL

- A. Comply with the requirements of ASTM C840 "Standard Specification for the Application and Finishing of Wallboard", unless otherwise specified or recommended by the manufacturer.

3.02 PREPARATION

- A. Maintain uniform building temperature range not less than 55 degrees F., for 24 hours before, during and after gypsum panel installation and joint finishing treatment.
- B. Provide adequate lighting and ventilation during installation and joint finishing treatment.

3.03 INSPECTION

- A. Examine substrates and installation conditions. Do not proceed with gypsum wallboard work until unsatisfactory conditions have been corrected.
- B. Installation constitutes acceptance of existing conditions and responsibility for satisfactory performance.

3.04 FRAMING INSTALLATION

- A. Install framing for walls and ceilings/soffits receiving gypsum wallboard finish.

3.05 GYPSUM BOARD INSTALLATION

- A. General
 1. Pre-installation Conference: Before start of gypsum board installation, meet at the project site with the Architect and installers of related work,

including work requiring openings, access panels, support, similar integrated requirements and mechanical and electrical trades. Review potential interferences and conflicts and coordinate layout and sequencing requirements for proper installation and integration of the work.

- a. Do not proceed with gypsum board installation until framing, bracing and other supports for subsequently applied work have been installed, reviewed and accepted by the Architect.
- b. Do not install gypsum board until work concealed by gypsum board has been installed.

B. Application

1. Install gypsum board face side out. Do not install imperfect, damaged or damp boards.
2. Butt boards together for a light contact at edges and ends with not more than 1/16 open space between boards. Do not force into place.
3. Locate either edges or end joints over supports. Position boards so that both tapered edge joints abut. Do not place tapered edges against cut edges or ends. Stagger vertical joints over different studs on opposite sides of partitions.
4. Attach gypsum board to framing and blocking as required for additional support at openings and cutouts.
5. Floating Construction: Install gypsum board with "floating" internal corner construction, unless isolation of the intersecting board is indicated.
6. In addition to compliance with the standards, comply with specific requirements indicated for each type of arrangement of gypsum wallboard system shown. Space fasteners in accordance with manufacturer's recommendations and complying with referenced standards.
 - a. Walls and Partitions: Apply sheets horizontally or vertically. Provide maximum sheet lengths to minimize end joints with edges or ends over supports. In two layer applications, stagger joints of second layer from joints of first layer.
 - b. Cut and install panels to eliminate vertical joints in corners of door frames to ceiling.
 - c. Make cutouts to fit within wall plate, register and grille flanged. All cutouts made by knife or saw.
 - d. Make angles and corners clean, true, plumb and square; walls plumb, flat and straight and ceilings flat and level.
 - e. Ceilings: Apply gypsum board on ceilings, before application on walls and partitions. Install in direction and manner to minimize end joints. Stagger end joints over supports. In two layer applications, stagger joints of second layer from joints of first layer.

3.06 INSTALLATION OF SOUND RATED PARTITIONS

- A. Provide sound-rated construction where indicated.
- B. Acoustic Insulation: Install single layer of acoustic batt insulation in designated partitions after one side of gypsum board is installed, filling width and height of partition completely. Attach to gypsum board with adhesive spots to prevent

subsequent displacement.

- C. If sound-rated partitions intersect non-sound-rated partitions, extend sound construction to completely close-off sound flanking paths through non-rated construction. Seal joints between face layers at vertical interior angles of intersecting partitions.

3.07 TRIM AND ACCESSORIES

- A. Install corner beads at external corners of gypsum wallboard work. Use longest practical lengths.
- B. Install edge trim wherever edge of gypsum board would be exposed or semi-exposed.
 - 1. Provide beaded trim to receive joint compound at all gypsum wallboard work.
 - 2. Provide L-type trim where work is abutted to other work and Kerf-type where work is kerfed to receive kerf leg.
 - 3. Provide U-type trim where edge is exposed, revealed, gasketed or sealant filled, including expansion joints.
- C. Control Joints
 - 1. Install control joints to isolate gypsum board surfaces as recommended in ASTM C840. Verify locations with Architect prior to installation. Generally locate joints as follows when:
 - a. Ceiling or partition abuts a structural element, dissimilar wall or partition or other vertical penetration.
 - b. Construction changes within the plane of ceiling or wall.
 - c. Wall dimensions exceed 30'-0".
 - d. Ceiling dimensions exceed 50' in either direction with perimeter relief; 30'-0" without relief.
 - e. Exterior soffits exceed 20'-0" in either direction; align with window mullions, when applicable.
 - f. Wings of "L", "U", and "T"-shaped ceiling areas are joined.

3.08 FINISHING

- A. Comply with manufacturer's instructions for mixing, handling and application of materials.
 - 1. Apply treatment at joints both directions, at flanges of trim accessories, penetrations of gypsum board, fastener heads, surface defects and elsewhere indicated.
 - 2. Apply in manner that will result in each of these items being concealed when applied decoration has been completed.
- B. Prefill open joints of more than 1/16" with special chemical-hardening type bedding compound, before bedding joint tape.

- C. Apply joint tape at joints between gypsum boards, except where trim accessories are indicated.
- D. Do not use topping compound for bedding joint tape.
- E. Apply joint compound for the final coat of joint treatment, unless specifically recommended by the manufacturer for that use.
- F. Leave all exposed interior surfaces smooth and even, ready for painting.
- H. Provide where indicated on the drawings levels of finish as specified in ASTM C840, "Recommended Specification on Levels of Gypsum Board Finish". Levels of finish consist of:
 - 1. Level 4 – All joints and interior angles to have tape embedded in joint compound and three separate coats of joint compound applied over all joints, angles, fastener heads, and accessories. All joint compound shall be smooth and free of tool marks and ridges.

3.08 ADJUST AND CLEAN

- A. Nail Pop
 - 1. Repair nail pop by driving new nails approximately 1-1/2" from nail pop and reseal nail.
 - 2. When paper face is punctured, drive new nail or screw approximately 1-1/2" from defective fastener and remove defective fastener. Fill damaged surface with compound.
- B. Ridging
 - 1. Do not repair ridging until condition has fully developed: approximately 6 months after installation or one heating season.
 - 2. Sand ridges to reinforcing tape without cutting through tape.
 - 3. Fill concave areas on both sides of ridge with topping compound.
 - 4. After fill is dry, blend in topping compound over repaired area.
- C. Fill cracks with compound and finish smooth and flush.

END OF SECTION

SECTION 09 91 00

PAINTING

PART 1 GENERAL

1.01 SCOPE

A. Work Included

1. Surface preparation and painting or finishing of all interior and exterior exposed items and surfaces except as otherwise indicated. Work includes, but is not necessarily limited to, the following:
 - a. Walls, ceilings.
 - b. Paint existing surfaces and items where indicated on the drawings and where these surfaces and items are located within areas where new work is being performed.
2. Surface preparation, priming and coats of paint specified are in addition to shop priming and surface treatment specified under other sections of the work.

B. Surface Preparation

1. It is the intention of this specification that new substrates will be ready for decoration as specified herein except for normal construction dust and soiling.
2. Surfaces and materials installed by other trades are required to be acceptable for work specified under Part 3, Surface Preparation. Specifically, new surfaces to be clean, sound, free from loose particles, dirt, loose mortar and grease.

1.02 DEFINITIONS

- A. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe and duct shafts, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawl spaces, and tunnels.
- B. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.
- C. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and in duct shafts.

1.04 QUALITY ASSURANCE

- A. Application: Performed only by skilled, experienced painters.

- B. Provide lead free prime and finish coatings. All top coatings shall be mold and mildew resistant.
- C. Coordination: Provide finish coats compatible with prime paints used. Review other specification sections to ensure compatibility of total coating system with prime paints provided for the various substrates. Provide barrier coats over non-compatible primers or remove primer and reprime as required. Notify the Architect of anticipated problems using coating systems specified on substrates primed in accordance with other section requirements.
- D. Reference Specifications
 - 1. The following Society for Protective Coatings (SSPC) specifications are referenced by code number within this Section.

<u>Code</u>	<u>Method</u>
SP-1	Solvent Cleaning
SP-2	Hand Tool Cleaning

1.05 SUBMITTALS

- A. Submit a complete selection of manufacturer's color chips indicating color, texture and sheen for approval for each finish specified herein.
- B. Submit a complete schedule for identifying manufacturer and specific brand name or number of products proposed for finishing specified surfaces.
 - 1. Provide percent of solids by volume content data for each paint material.
 - 2. Provide paint label analysis and application instructions for each type paint.
- C. Provide one (1) unopened gallon of each type and color of paint and stain required for maintenance purposes. Provide original, unopened, labeled containers with color samples and a list of project use. Extra materials are not to be used for touch-up by Contractor.
- D. Provide color sampler to match existing.
- E. Statement From Manufacturer
 - 1. Contractor, in submitting the list of proposed subcontractors, shall include for approval, along with the name of the painting subcontractor, the names of the manufacturers whose materials the subcontractor proposes to use in the work.
 - 2. Following tentative approval of the subcontractor and the materials manufacturers, notify the manufacturers, in writing, that the specifications require the manufacturers to submit to the Architect, a statement by a corporate officer of the manufacturer that coatings scheduled by the Architect are proper for the intended use and that the manufacturer's

representative will be available to advise the Architect and the Contractor regarding applications of all coatings.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver all materials on the job site in original, new, unopened packages and containers bearing the manufacturer's name and label, and the following information:
 - 1. Name or title of material.
 - 2. Manufacturer's stock number and date of manufacture.
 - 3. Manufacturer's name.
 - 4. Contents by volume, for major pigment and vehicle constituents.
 - 5. Thinning instructions.
 - 6. Application instructions.
 - 7. Color name and number.
- B. Store, protect and handle materials in accordance with manufacturer's recommendations to prevent damage and deterioration. Store paint materials at minimum of 50° F.
- C. Maintain paint material storage space as clean, non-hazardous and orderly. Place waste and soiled paint rags in tightly covered metal containers; safely dispose of at end of each working day. Take every precaution to avoid fire hazards and spontaneous combustion. Provide acceptable type of fire extinguisher immediately adjacent to paint storage area.

1.07 PROJECT CONDITIONS

- A. Coordinate painting and finishing work with other trades to ensure adequate illumination, ventilation and dust-free environment during application and drying of paint and finish treatments.
- B. Maintain uniform interior building temperature of minimum 50° F for 24 hours before, during and continuously for 48 hours after painting.
- C. Do not apply coatings when relative humidity is outside the humidity ranges required by the paint product manufacturer.
- D. Provide adequate ventilation as required for specified paint and finish treatment materials in spaces scheduled. Maintain for time periods recommended by material manufacturer to provide proper drying.
- E. Provide adequate illumination on surfaces to be finished. Maintain a minimum 80 foot candle lighting level measured mid-height at substrate surface.
- F. Protect adjoining surfaces against damage or soiling.
- G. Maintain work in neat and orderly condition, promptly removing empty containers, wrappings, soiled rags, waste and rubbish from site.

- H. Material Safety Data Sheets (MSDS): Provide documents available to Owner's Representative and construction personnel at the job site. Comply with MSDS requirements.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Paint: Brands of paint and stain are specified in "Paint and Material Finish Schedule," only to establish a standard of quality. Other paint brands and manufacturers such as BENJAMIN MOORE; AKZO NOBEL (GLIDDEN PROFESSIONAL and DEVOE COATINGS); MARTIN SENOUR; PPG; PRATT AND LAMBERT; PORTER; CORONADO PAINT COMPANY, SHERWIN WILLIAMS are acceptable upon proof of satisfactory experience records for the intended use and compliance with specified VOC content.

- 1. Colors: As selected by Architect.

2.02 MATERIAL GENERAL

- A. VOC Content: Products shall comply with VOC limits of authorities having jurisdiction and, for interior paints and coatings applied at Project site, the following VOC limits when calculated according to 40 CFR 59, Subpart D (EPA Method 24)

- 1. Flat Paints and Coatings: 50 g/L.

- B. Material Compatibility

- 1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
- 2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

2.03 ACCESSORY MATERIAL

- A. Application Equipment: Not required to be new, but shall be adequate for the work and workmanship required herein.
- B. Accessories: Provide all required ladders, scaffolding, drop cloths, masking, scrapers, tools, dusters and cleaning solvents as required to perform the work and achieve the results specified herein.
- C. Secondary products not specified by name (i.e. turpentine, thinners, mineral spirits, fillers, linseed oils, etc.) shall be "best grade" or "first line" products.

1. Filler material shall be woodworker's option of material that can be tinted and worked so as to match adjacent wood surfaces.

2.04 INTERIOR PAINT AND FINISH MATERIALS SCHEDULE

- A. Apply paint and finish materials to substrate surfaces indicated. Apply touch-up prime coats in addition to shop-applied prime coats. Provide additional job site prime coats when indicated.
- B. Gypsum Board and Plaster – Walls.
 1. SW
 - a. Primer: ProMar 200 Zero VOC Interior Latex Primer B28W2600 Series.
 - b. Finish: ProMar 200 Zero VOC Interior Latex Eg-shel B20 Series Two (2) coats.
 2. PPG
 - a. Primer: SpeedHide Interior Latex Primer 6-2 Series.
 - b. Finish: Speedhide Zero 6-4310XI Series; latex eggshell. Two (2) coats.
 3. GLIDDEN PRO
 - a. Primer: Lifemaster No VOC Interior Primer 9116-1200. One (1) coat.
 - b. Finish: Lifemaster No VOC Interior Latex Eggshell Paint 9300 Series. Two (2) coats.
 4. Surfaces: Gypsum board wall surfaces.

PART 3 EXECUTION

3.01 INSPECTION

- A. Examine substrate surfaces and installation condition. Report condition(s) that might affect proper application.
- B. Do not proceed with painting work until unsatisfactory conditions have been corrected.
- C. Initial application of paint to a surface constitutes acceptance of existing conditions and responsibility for satisfactory performance.
- D. Examine specification sections of other trades and their provisions regarding painting. Surfaces left unfinished shall be painted or finished as part of the work of this Section unless specifically noted otherwise.

3.02 SURFACE PREPARATION

- A. General
 1. Broom clean and remove excess dust before painting is started in any

- area.
- 2. Broom cleaning is not permitted after operations have begun in a specific area.
- 3. Surfaces shall be clean, dry and adequately protected from dampness.
- 4. Surfaces shall be free of any foreign materials that will adversely affect adhesion or appearance of applied coating.
- 5. Remove any mildew and neutralize the surface prior to applying coating.

B. Gypsum Board

- 1. Fill minor irregularities with spackling paste.
- 2. Sand to smooth level surface and dust off.
- 3. Avoid raising nap of paper.

C. Existing Surfaces Scheduled for Painting or Finishing

- 1. Condition, clean, sand, prime, seal and prepare existing surfaces for application of finish materials specified. Provide only finish coats over existing surfaces except where condition of existing surfaces or type of existing surface requires priming and sealing.
- 2. Remove loose, blistered, scaled, or crazed finish to bare base material.
- 3. At conditions where new work adjoins existing work, prepare existing surface extending to the nearest break in the plane of the surface

3.03 APPLICATION

A. General

- 1. Only skilled mechanics shall be used.
- 2. Apply all paint in strict accordance with the manufacturer's instructions. Data sheets take precedence over these specifications if more restrictive.
- 3. Do not apply until preceding coat is dry to manufacturer's recommendations.
- 4. Do not apply to any surface unless it is thoroughly dry.
- 5. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes if moisture content of surface is greater than recommended by manufacturer.
- 6. Do not use material that has exceeded the pot life stated by the manufacturer.
- 7. Apply to the following workmanship requirements:
 - a. Neat appearance of finished surfaces.
 - b. Absence of ridges, sags, runs, drops, laps, unnecessary brush marks, holidays, air bubbles and excessive roller stipple.
 - c. Thorough mixing of paint and limited use of thinners.
 - d. Uniformity of film thickness.
 - e. Proper drying time between coats.
 - f. Protection of unpainted and finished surfaces.
- 8. Coverage and hide shall be complete. When color or undercoats show through final coat, recoat until the paint film is of uniform finish, color, appearance, and coverage, at no additional cost to Owner.

9. Edges of paint or finish adjoining other materials or colors shall be sharp and clean without overlapping.

B. Methods

1. Application may be by roller, brush, spray or other approved means.
2. When utilizing spraying, be careful not to use methods which will affect other trades work in adjacent areas.

C. Mixing

1. Mechanically mix before use.
2. Agitate during application as required.
3. Do not tint or shade in field unless permitted by Architect.

D. Thinning

1. Dilute only as required to achieve suitable application viscosity.
2. Use only type and amount recommended by manufacturer.

- E. Approvals: Do not apply succeeding coat of paint until previous coat has been inspected and written approval is given.

END OF SECTION

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SECTION 22 31 15

SUBSLAB SOIL EXHAUST SYSTEM

PART 1 GENERAL

1.01 REFERENCE

1.02 SCOPE

- A. Provide a vertical pipe system for a subslab soil exhaust system installed by a certified mitigation consultant with a mitigation specialist license.

PART 2 PRODUCTS

2.01 Soil vent piping to be as follows:

- A. Schedule 40 ASTM F891 PVC DWV pipe and fittings with socket solvent solder joints and connections may be used at this Contractor's option and unless otherwise noted and/or required by Owner.
- B. Accessories: J hook pipe support ABS plastic in sizes required for required support.

PART 3 EXECUTION

3.01 Seal vertical piping at first floor slab with backer rod and urethane caulk.

3.02 Piping to be routed per mitigation specialist direction providing Hilti FS-One fire rated sealant to maintain existing fire rated assemblies.

3.03 A pressure gauge (U-tube manometer) shall be mounted per mitigation specialist location and noted in each unit for future monitoring.

3.04 Pipe through roof shall contain a varmit guard model VG-440 with ½" screen at end of radon vent pipe.

3.05 Pipe size to be determined by mitigation specialist.

END OF SECTION

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SECTION 23 34 21

INLINE RADON FAN

PART 1 GENERAL

1.01 REFERENCE

1.02 SCOPE

- A. Furnish and install inline exhaust fans and appurtenances with sizes noted below for subslab soil exhaust system.

PART 2 PRODUCTS

- 2.01 Inline ceiling cabinet fans based on FANTECH HP 220 inline radon fan. Fan shall be UV resistant and UL listed durable plastic. Provide watertight electrical box. Unit to be enclosed for protection for indoor or outdoor use. Unit to contain 6" inlet and outlet connections.
- 2.02 Fan shall be UL listed for outdoor use or in wet locations and temperatures up to 140 degrees.
- 2.03 Motor shall be 115/60/1 with built in thermal overload protection. The motor shall be mounted to structure with mounting bracket. Provide flex couplings on inlet and outlet of fan.
- 2.04 Inline Radon exhaust fans by RadonAway model RP265 of the same type, size, capacity and meeting other specified requirements, may be furnished at the Contractor's option.

PART 3 EXECUTION

- 3.01 Provide flexible connections at inlet and discharge ducts.
- 3.02 Mount unit from structure.
- 3.03 Auxiliary steel for supporting units to be furnished and installed by the HVAC Contractor.
- 3.04 Provide plug and chord no longer than 6'.
- 3.05 Wiring of fans, by the Electrical Contractor
- 3.06 Complete installation for radon system must be a certified mitigation consultant with a mitigation specialist license.
- 3.07 A pressure gage (U-tube manometer) shall be mounted in system per certified mitigation consultant.

- 3.08 Post-Mitigation Radon Testing: After the radon mitigation systems are operational, post mitigation radon testing shall be conducted. A single short term radon test will be deployed in all ground floor units. All ground floor units will be tested simultaneously at the completion of the project. For this measurement a charcoal packet manufactured and analyzed by AirCheck or an equivalent Ohio State Licensed radon lab will be deployed. Provide completion documentation within 10 days of receipt of post mitigation test results from radon lab.
- 3.09 Operation and Maintenance Requirements: Radon mitigation contractor shall provide maintenance personnel a check list related to inspect system annually and retesting for radon level to be below 4pCi/l.

END OF SECTION

Notes:

1. Horizontal piping run in attic shown only for illustration. Stack could have penetrated straight upward through roof, if there were sufficient headroom to install fan at that location.
2. Electrical wiring to fan illustrated in later figure.

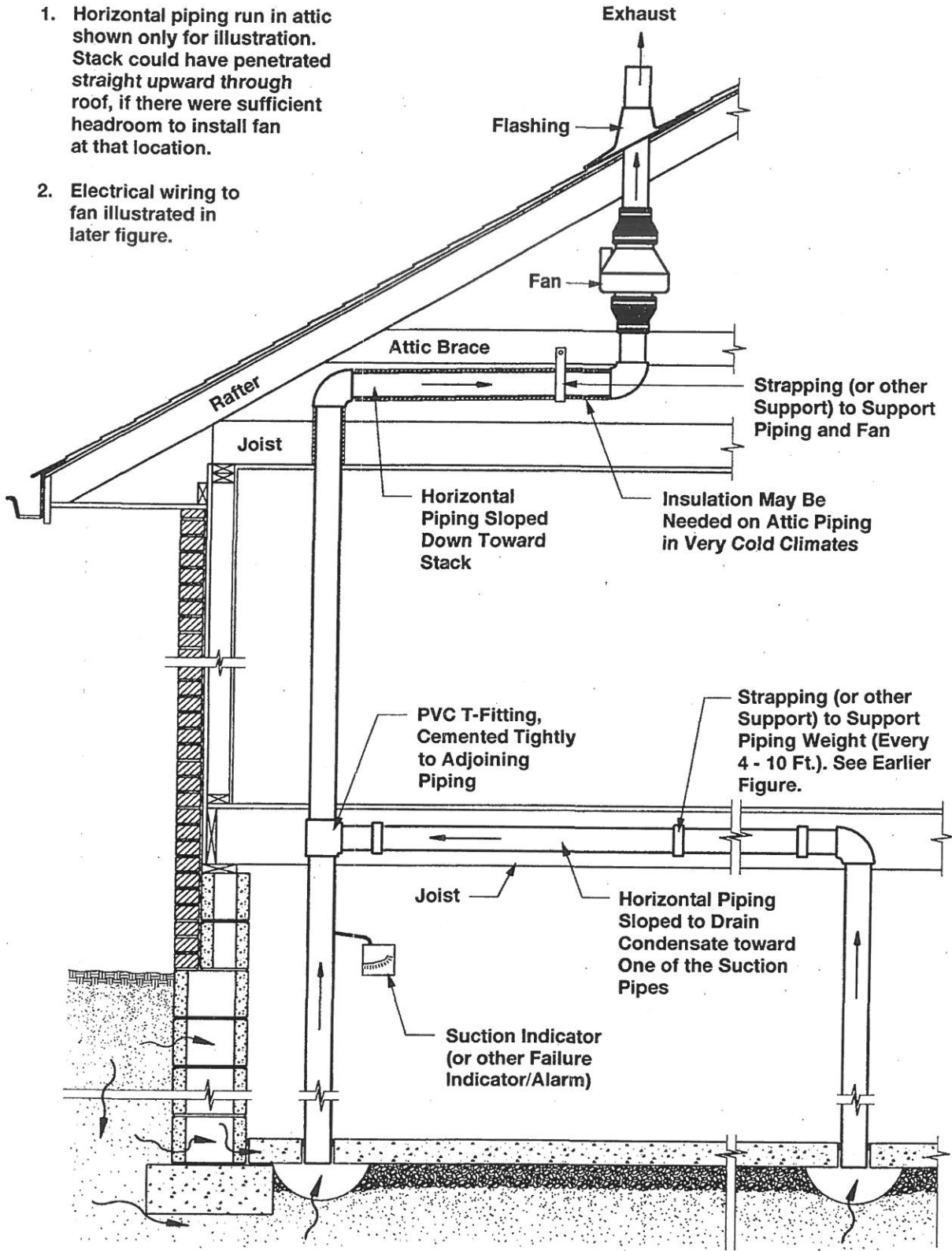


Figure 20. One representative SSD piping configuration illustrating an interior exhaust stack.

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Completed radon system check list:

Installers: _____ Date Installed: _____
Address: _____

	Installer initial upon completion
Seal radon entry routes & mechanical penetrations where needed.	_____
Radon System is labeled. (pipe, visqueen, sump cover, electrical panel)	_____
Visual Performance indicator installed to monitor vacuum pressure. (Marked Initial Pressure)	_____
Sump cover installed.	_____
Removal of sump cover explained to homeowner.	_____
Sump pump operational & Tested For Homeowner <input type="checkbox"/> Yes <input type="checkbox"/> No Sump Pump was plugged in when installers left?	_____
Crawl space sealed and completed.	_____
Pipe strapped securely. (pipe supports horizontal 1 per 6 ft.) (vertical 1 per 8 ft.)	_____
Rodent screen installed on end of pipe.	_____
Fan located per drawing. (Fan location changed per homeowner) - (have homeowner initial)	_____
Fan wired, running & Panel Marked. <input type="checkbox"/> Yes <input type="checkbox"/> No Fan Model Installed _____ Initial Pressure _____	_____
Fire collars installed in all garage options.	_____
Monitor started (paper checked/installed)	_____
Job site cleaned up.	_____
System operation explained to homeowner.	_____

The Technicians have explained the operation on the Radon Mitigation System. I have inspected the workmanship and have found it to be satisfactory. The sump pump (if applicable) was tested before and after installation of the radon cover and is working properly.

Homeowner Signature: _____