IDIQ FLOORING SOW / SPECS 2025

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TECHNICAL PROVISIONS GENERAL
March 4, 2025

1 GENERAL

1.1 SCOPE OF WORK: The work covered by this contract consists of furnishing all plant, labor, materials and performing all operations required in connection with Removal / Installation of floor covering, complete in strict accordance with specifications subject to the terms and conditions of the contract and as ordered by the Contracting Officer. This is a delivery order style contract in which individual delivery orders will be issued for a specific quantity of work to be performed in specific building(s), to be completed in a specific amount of time. All work performed on individual delivery orders will be IAW these specifications. The work includes, but is not necessarily restricted to, the following items:

1.1.1 Remove existing flooring.

1.1.2 Install new carpet, resilient flooring, ceramic tile, rubber and/or special epoxy coating flooring.

1.1.3 The contractor will not be responsible for moving any furnishings within any buildings unless noted on site visit. The contractor will protect all items that cannot be removed. If the contractor is required to remove furniture, a Bid Item has been established to cover the cost. Bid item SF is based on the floor SF of furniture. (Example 3'x5' desk is 15 SF). This cost shall include furniture removal and replacement to original position. The contractor shall not move personal or electronic items.

1.2 ORDERING PROCEDURES

1.2.1 As the need exist for performance under the terms of this contract, the Contracting Officer or his/her authorized representative will notify the Contractor, in writing, of an existing requirement.

1.2.2 Upon receipt of this notification, the contractor shall respond within 2 (two) working days as follows:

1.2.2.1 Visiting the proposed work site with the Contracting Officer or his/her authorized representative.

1.2.2.2 Establishing verbal contact with the Contracting Officer or his/her representative to further define the scope of the requirement. The contractor shall, while on the site, take all measurements and make written notes as to the instructions and verbal information given during the initial site visit. The contractor shall be responsible for providing all measuring equipment, ladders, etc., needed to verify sizes within or outside the buildings.

1.2.2.3 Time for submittal of the Contractor's proposal for individual requirements will be as agreed upon by the government and the contractor based on urgency of the requirements, as defined or established during initial planning. In the absence of an agreement, the proposal shall be submitted within seven working days after initial visit.

1.2.2.4 The contractor's proposal shall be supported by necessary documentation to indicate that adequate engineering and planning to accomplish the requirements has been accomplished.

1.2.2.5 Upon receipt of the Contactor's proposal, the government will review the proposal for completeness. In the event the proposal requires negotiations, the contractor shall submit a revised proposal based on the negations within two (2) working days.

1.2.2.6 Task Orders will be issued by the contracting officer on a DD Form 1155. Each Task order will include the following information:

- Date of the Task Order
- Contract Number and Task Order Number
- Scope of the work to be performed and negotiated Task Order cost Performance Time Frame Data

1.3 ACCEPTANCE OF WORK

1.3.1 Upon completion of work on a building under a delivery, order issued under this contract and prior to request for payment, the contractor shall notify the Contracting Officer or his/her representative (COR) and the representatives of the Contractor, and the COR. shall make a joint inspection. All work, notification of completion, inspection and correction of deficiencies shall be accomplished within the time frame specified for completion of work.

1.4 SCHEDULE OF WORK

1.4.1 Work Schedule: The contractor shall submit a proposed work schedule. The schedule and work accomplishment shall be by building number. The contractor's work schedule shall be flexible to allow for minimum of disruption of using agency of each building. Most, if not all, of the buildings the Contractor will perform work in will be occupied during performance of work. The Contractor shall coordinate his work with the building occupants in order to keep any disturbances to a minimum.

1.4.2 After approval of the contractor's work schedule, the contractor shall notify the using agency of his intended work dates by written notice, no later than 5 working days prior to his intended work date. The contractor's proposed notice shall be submitted and approved by the COR prior to posting any notices. The notice shall contain a point of contact (individual's name), and a valid local phone number that is manned from 0720 hours to 1730 hours each

workday. The contractor shall proceed with the work only upon receiving access clearance from each building's using agency or agencies. If after two attempts to gain clearance without gaining access, the contractor shall notify the COR in writing, indicating the persons contacted and dates contacted and shall include 2-week time frame that the contractor desires to perform work so as not to adversely affect his work schedule. This time frame shall not start sooner than 10 working days after written notice to COR. The COR will coordinate with the building using agency and furnish access dates to the contractor.

1.4.3 In the event the contractor is unable to make his scheduled work time or date he will notify the occupant and the COR and reschedule the appointment.

1.4.4 There shall be maximum coordination between construction activities and concurrent ongoing routine activities of base personnel. Interfaces with and inconvenience to the occupants or the routine of the facility shall be held to an absolute minimum.

1.4.5 The contractor will make all necessary arrangements not to schedule any work during the time period of week of Thanksgiving (20 November through 29 November) and Christmas and New Years (16 December through 07 January).

1.5 FACTORS AFFECTING PERFORMANCE

1.5.1 The contractor shall leave work sites and all construction areas neat and clean during the performance of the work and at the end of each day. The Contractor shall sweep and vacuum the work area clean at the end of each workday. All debris will be lawfully disposed of off-post.

1.5.2 All buildings shall be occupied during the period of contract performance. The contractor shall be required to adequately protect all parked vehicles, appliances and surfaces around each building.

1.5.3 The contractor shall keep all walks, entryways, doors and parking areas clear of materials and equipment.

1.5.4 The Contractor shall adequately protect all personnel, furnishings, and equipment during construction operations. Any areas damaged by construction shall be repaired to original conditions.

1.5.5 Electric power will be available for use at existing outlets. It shall be the contractor's responsibility to furnish and install all temporary wiring and safety devices necessary to comply with the applicable codes/safety requirements.

1.5.6 The contractor's work requiring outages of utility or building systems will require 7 calendar day advance written notice and will be subject to the approval of the Contracting Officer. Notice shall include type of outage, reason for outage, date,

and time outage will commence and estimated duration of outage and Point of Contact to include phone number. All tools, labor, and materials required to complete any item of work within a given work area or requiring an outage of any building or system, shall be available at the site prior to commencement thereof. Once work has commenced on an item of work said work shall be continuously and diligently performed to completion and acceptance.

1.5.7 The contractor is responsible to provide covering, shields and barricades as are required to protect building occupants, equipment, stores, supplies, etc. from dust, debris, weather intrusion, water, moisture or other cause of damage resulting from demolition and/or construction activities. All orange construction fencing must be no less than 16' from any edge of pavement.

1.5.8 All work requiring access to building interiors excluding attics, crawl spaces, etc. and all other work shall be performed between 7:30 a.m. and 4:20 p.m. Monday through Friday, excluding official holidays, unless otherwise indicated or approved by the Contracting Office. Requests to work during other than these normal hours shall be made in writing at least 5 working days in advance. For example, a request to work on a Saturday should be made no later than noon on previous Monday.

1.5.9 Not more than 8 buildings will be worked on at any given time unless approved by the COR. Each separate operation (replacing carpet, replacing resilient flooring or repair work, etc.) shall be completed on each building and accepted prior to beginning the next operation.

1.5.10 The Contractor shall coordinate use of the site for access, staging, and parking with the Contracting Officer Representative.

1.5.11 Contractor shall be responsible for limiting access of his employees and subcontractors to the area of work defined in the Contract. Contractor shall not have access to restrooms and amenities such as vending machines unless granted permission by the Contracting Officer.

1.5.12 The Contractor shall have a cell phone or other approved means for direct communication with the Contracting Officer (CO) and / or Contract Officer Representative (COR) during normal duty hours, while on the job site or not.

1.5.13 Contractor shall furnish and install seal with vinyl insert including bolts and nuts or brass bolts when removing and reinstalling toilets.

1.5.14 All miscellaneous plumbing/mechanical work shall conform to all state and local codes.

1.5.15 All miscellaneous electrical work shall conform to all state and local electric codes and to the National Electrical Code.

1.5.16 Pressure wash surfaces:

a) Pressure wash surfaces shall consist of washing surfaces to receive paint with a high-pressure spray, to remove loose paint, dirt, and other foreign or

deleterious materials. The working pressure shall be between 420 and 720 pounds per square inch gage (psig) at a nozzle operating rate of a minimum per minute (l/min) 20 gallons per minute (g/min.). Do not flood vents or damage windows and floors. If the pressure specified will cause damage to existing surfaces, advise the Contracting Officer and obtain permission to vary the pressure. Direct the wash nozzle at the surface at an angle of approximately 75 degrees with the surface and at a distance not greater than 5 feet to apply water pressure required to remove loose paint, dirt, chalking, and other foreign matter.

b) Final Surface Cleaning: After allowing the surfaces to dry for a minimum of 24 hours, remove remaining dirt, splinters, loose particles, disintegrated and loose paint, grease, oil, and other foreign matter from the surface.

1.5.17 All painting and surface preparation shall be applied per manufacturer's instruction and recommendations.

1.5.18 Doors & Doorstops: Contractor shall remove and reinstall doors and doorstops as needed for the installation of carpet and/or VCT. Contractor shall remove door stops prior to installation of flooring, patch holes, and reinstall after installation is complete. The cost for this work shall be included in the applicable flooring installation CLIN and the Contractor will not be paid any additional cost for this work. If floor stops are broken or missing the contractor will be paid under floor door stops CLIN.

1.5.19 Wood and Steel Door Trimming: The Contractor shall trim wood and/or steel doors to clear newly installed carpet. Cuts shall be clean, smooth (sanded and touched up as necessary) parallel to the floor, and result in a uniform door face. Doors shall be within ½" of new carpet and/or VCT after the door is trimmed.

1.5.20 Carpet Measurement: The Contractor will be paid for the actual floor space (wall to wall) requiring carpet installation plus an additional five percent (5%) for waste. If during measurement waste is determined to be over five percent of the job, the applicable material only CLIN will be used to order the additional quantity. To clarify, when the Contractor receives a delivery order the quantity under the applicable installation CLIN will include five percent waste.

1.5.21 Delivery Order completion Times: The following schedule represents the maximum time allowed for completion of work required by delivery orders, based on delivery order amounts. These completion periods may be adjusted by mutual agreement of the Contracting Officer and the Contractor: however, in the case of a disagreement, the Contracting Officer will make the final decision.

Delivery Order Amount Range for Completion	Maximum Time Allowed
• Less than $5,200	30 calendar days
• $5,211 to $15,200	45 calendar days
• $15,211 to $30,200	60 calendar days
• Over $30,200	to be negotiated

1.6 USE OF UTILITIES SYSTEMS

1.6.1 Utilities systems in units that are in operating condition may be subject to restrictions; however, no expense will be borne by the Government to activate, operate, or deactivate any system. Operation of the systems will be subject to the following restrictions.

1.6.2 Moving and Replacement of Equipment or Furniture: Moving of movable equipment such as cabinets, refrigerators, electric ranges, washers, dryers, dishwashers, toilets, vanities, etc., from the work area will be accomplished by the contractor. After the work is completed, the movable equipment will be place in original position and reconnected to utilities by the contractor. The contractor will be responsible to move gas fired ranges from the work area after disconnection from the gas supply system is accomplished by the TSAY/Ferguson-Williams (TFW). The contractor will not disconnect gas fired ranges or any other item of gas fired equipment. In addition, the contractor will not shut off the gas supply to the building unless written approval is given by the Contracting Officer or the Contracting Officer's Representative. After completion of work, the gas fired range will be move back near its original position by the contractor to allow connection to the gas supply by the TSAY/Ferguson- Williams (TFW).

1.6.3 No heating system will be operated when the temperature of the facility is above 70 degrees.

1.6.4 No air conditioning system or ventilating system will be operating when the temperature within the Facility is below 80 degrees.

1.6.5 Areas in which flooring is to be installed shall be maintained at a temperature above 60 degrees for two days prior to installation, during installation and for two days after installation.

1.6.6 Lights within the Facility will be utilized only when necessary to perform the work in a satisfactory manner.

1.6.7 The contractor will be responsible for activation, operation, and deactivation of the systems when they are not required under the above restrictions. Failure of the contractor to carry out this responsibility will result in the Government denying the use of any of the systems.

1.7 CONTRACTOR STORAGE YARD POLICY

1.7.1 Submit to the contracting Officer Representative (COR) a detailed sketch depicting the location and view of all facilities placed on, and all improvements to be made to, a storage site. Obtain written approval from the Directorate of Public Works (DPW) prior to placing any facilities on or making any improvement to the site; and bear all expenses associated with establishing and maintaining the site.

1.7.2 Contractor office trailer and storage yards will be in accordance with “US Army Garrison, Ft. Stewart and Hunter AAF Policy memorandum #16 – Design and Maintenance of Contractor Storage Areas” dated November 01, 2023.

1.7.3 Install and maintain a six-foot high chain link fence around all storage yards.

1.7.4 Install and maintain appropriate weatherproof signs identifying the contractor and the governing contract; locate such signs on the main gate to each storage yard and on any trailer; and list on said signs the name(s) and phone number(s) of the emergency point of contact(s) responsible for the site and available to always resolve problems regarding the site.

1.7.5 Install and maintain appropriate weatherproof signs on all storage containers identifying the owner of the container and the governing contract; keep all storage containers inside the fenced storage yards and align storage containers in a neat and orderly manner.

1.7.6 Stack and arrange all materials not maintained inside an enclosed storage container in a neat and orderly manner inside the fenced storage yard. Where practical, place all materials on pallets, not directly on the ground.

1.7.7 Allow no trash or other debris to accumulate in an unsightly manner; and coordinate with the COR on the proper placement and use for dumpsters.

1.7.8 Cut and maintain grass and weeds to a height of no more than 6 inches; and all maintain hedges, bushes and other vegetation growth in a neat and presentable manner.

1.7.9 Place cone and barrier materials only when and where needed to protect work areas and collect immediately upon completion of the work.

1.7.10 Remove all materials, office trailers, storage containers, fence and utilities at the conclusion of the contract; and restore the site to its original grade and conditions including seeding with permanent grasses as required.

1.7.11 Consequence of Noncompliance: Should a contractor fail to comply with requirement in 1.7.1 – 1.7.20, or any changes or modification thereto, the contractor’s use of such sites and facilities may be terminated and the contractor will be required to move its operations to an off-post location.

1.8 LOCATION

1.8.1 The site of the proposed work is on the Fort Stewart Military Installation, Hinesville, GA and/or Hunter Army Airfield, Savannah, GA.

1.9 WORKMANSHIP

1.9.1 All work shall be accomplished by persons skilled in the trade involved and under the supervision of a foreman/supervisor with a minimum of two years' experience in the carpet/flooring installation field. Workmanship shall be equal to the best practices common to the trade and conform to any criteria hereinafter listed.

1.10 QUALITY CONTROL

1.10.1 The Contractor shall establish a quality control plan to assure contract compliance. The plan shall include an inspection system covering the services as stated herein and a method for identifying deficiencies in the quality of services performed prior to the level of performance becoming unsatisfactory. The Contractor shall not rely on Government direction in correcting discovered deficiencies but shall identify and correct problem areas on his own. The plan and all inspection documents shall be made available to the Government upon request.

1.11 QUALITY ASSURANCE

1.11.1 The Contracting Officer will monitor the Contractor's performance under this contract using the quality assurance procedures specified in the performance requirements summary found at technical exhibit 1. The Government reserves the right to make such inspections and tests as and when it deems necessary to ascertain that delivery order requirements are being fulfilled. The Government's agent may accompany the Contractor's personnel at any time while performing work on this contract to observe and/or get an explanation of work performed. Deficiencies noted shall be expeditiously corrected at no additional cost to the Government. Nothing in this paragraph precludes the Government from conducting inspections under the Inspection of Service Clause and the Contract Terms and Conditions (Commercial Items) Clause.

1.12 CONTINGENCY PLAN

1.12.1 The Contractor shall develop a contingency plan to provide for the continued service of the contract requirements in the event of employees' absences, strikes, or work stoppages. Work stoppage or strike participation by Contractor personnel against the Contractor does not in any way relieve the Contractor of his responsibility to fulfill the requirements of these specifications.

1.13 DISPOSAL OF MATERIALS

1.13.1 All materials removed and not reused in this project shall become the property of the Contractor and shall be the Contractor's responsibility for lawful disposal of, off the Government property.

1.14 IDENTIFICATION OF CONTRACT EMPLOYEES

1.14.1 The Contractor shall provide each employee with an identification (ID) badge made of nonmetallic material, easily readable and including employee's name, contractor's name, functional area of assignment, and recent color photograph of the employee.

1.14.2 Display of ID Badges: Contractor personnel shall always wear the ID badge when performing work under this contract at a Government site, including while attending Government meetings and conferences that may take place outside the Government facility. Unless otherwise specified in the contract, each contractor employee shall wear the ID badge in a conspicuous place on the front of exterior clothing and above the waist except when safety or health reasons prohibit such placement.

1.14.3 Answering Telephones: Contractor personnel shall identify themselves as a contractor employee when answering Government telephones.

1.14.4 Utilizing Electronic Mail: When prime contractor or subcontractor personnel send e- mail messages as a part of contract performance (or otherwise relating to contract matters), each sender shall include his/her name (both first and last names), [E-mail address and the name of the individual's employer.

1.15 ENVIRONMENTAL ASBESTOS ABATEMENT REQUIREMENTS

1.15.1 The contractor shall provide copies of the following forms: (a) The 20-day GA. EPA Abatement Notification at the time the contractor informs GA EPA of their intent to properly abate the ACM (b) the Georgia Asbestos Shipment Record to the TSCA POC, Craig Christopher, office phone number: 571.801.0203.

2 DEFINITIONS AND ACRONYMS

2.1 Acronyms used herein are as follows:

TFW: TSAY/Ferguson-Williams

CLIN: Contract Line-Item Number

DPW: Director of Public Works

IAW: In Accordance With

VAT: Vinyl-Asbestos Tile

VCT: Vinyl-Composition Tile

COR: Contracting Officer Representative

GA: Government Approval

FIO: For Information Only

IH: Industrial Hygienist

CO: Contracting Officer

ADA & ABA: Americans with Disabilities Act and Architectural Barriers Act Accessibility Guidelines

POC: Point of Contact

GA EPD: Georgia Environment Protection Division

ACM: Asbestos Containing Material

TSCA: Toxic Substances Control Act

3 SPECIFIC TASK (SPECIFICATIONS)

3.1 DEMOLITION AND REMOVAL

3.1.1 SCOPE OF WORK: Work Included: This section includes the complete demolition and removal from the project site of all existing materials required to be removed.

3.1.2 REFERENCED SPECIFICATIONS AND STANDARDS

3.1.2.1 Applicable Publications: The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

3.1.2.2 Government Publication EM 385-1-1 Safety and Health Requirements Manual (Apr 1981 & Change 1)

3.1.3 SAFETY REQUIREMENTS

3.1.3.1 Barricades: Furnish and install any necessary barricades to protect the public or workmen during demolition within each building. Barricades to keep public out of demolition areas shall be left in place until removed by contractor after they are no longer required for protection.

3.1.3.2 Safety Manual: The Corps of Engineers Manual EM 385-1, Safety and Health Requirements Manual shall be consulted, and applicable sections complied with by the contractor while performing the work specified in this section.

3.1.3.3 Warning Signs: Provide necessary warning signs

3.1.4 GENERAL REQUIREMENTS

3.1.4.1 The work includes removal of all materials as indicated or specified. All materials resulting from demolition work, except as indicated or specified otherwise, shall become the property of the contractor. Rubbish and debris shall be removed from government property daily unless otherwise directed to not allow accumulation inside or outside the building. Materials that cannot be removed daily shall be stored in areas specified by the Contracting Officer.

3.1.5 DUST CONTROL

3.1.5.1 The amount of dust resulting from demolition shall be controlled to prevent the spread of dust to occupied portions of the building and to avoid creation of a nuisance in the surrounding area. Use of water will not be permitted when it will result in, or create hazardous or objectionable conditions such as ice, flooding and pollution.

3.1.6 PROTECTION

3.1.6.1 Protection of Existing Work: Before beginning any cutting or demolition work, the Contractor shall carefully survey the existing work and examine the specifications to determine the extent of the work. The Contractor shall take all necessary precautions to insure against damage to existing work to remain in place, to be reused, or to remain the property of the government, and any damage to such work shall be repaired or replaced as approved by the Contracting Officer at no additional cost to the government.

3.1.6.2 Protection of Buildings from the Weather: The interior of the building and all materials and equipment shall be protected from the weather at all times.

3.1.7 BURNING

3.1.7.1 The use of burning at the project site for the disposal of refuse and debris will not be permitted.

3.1.8 AVAILABILITY OF WORK AREAS

3.1.8.1 Areas in which salvage and demolition work is to be accomplished will be available as specified by the Contracting Officer.

3.1.9 DISPOSITION OF MATERIAL

3.1.9.1 Title to Materials: Titles to all materials to be demolished, is vested in the Contractor upon removal from the job site. The government will not be responsible for the condition, loss or damage to such property after notice to proceed.

3.1.9.2 Material for Contractor Salvage: Material for salvage shall be removed from the job site daily. Material for salvage shall not be sold on the site.

3.1.9.3 Unsalvageable Materials: Unsalvageable materials shall be removed from the job site daily.

3.1.10 CLEAN-UP

3.1.10.1 Debris and Rubbish: Debris and rubbish shall be removed daily.

3.1.10.2 Debris Control: Debris shall be removed and transported in a manner as to prevent spillage on streets or adjacent areas.

3.1.10.3 Regulations: Local regulations regarding hauling and disposal apply.

3.1.11 NOTICES AND UTILITY SERVICES

3.1.11.1 Utility Services: Arrange with utility companies, Government office, or local authorities furnishing gas, telephone, or electrical service to remove any equipment owned by them in buildings where necessary for performance of the work.

3.1.11.2 Protection: Preserve in operating condition, unless otherwise noted, active utilities traversing project site. Damage to such utilities caused by the contractor, shall be repaired to the satisfaction of owning utility company or agency by the contractor at no additional cost to the government.

END OF SECTION

3.2 CARPET

3.2.1 GENERAL

3.2.1.1 Section Includes:

A. This guide specifications covers the requirements for Broadloom Carpet Tile and Entry Carpet tile
B. Accessories

3.2.1.2 REFERENCES

A. American Association of Text broadloom Chemists and Colorists (AATCC):
   - AATCC 16, (2023), Test Method for Colorfastness to Light.
   - AATCC 207, (2022), Test Method for Colorfastness to Water.
   - AATCC 134, (2019), Test Method for Electrostatic Propensity of Carpets.
   - AATCC 175, (2023), Test Method for Stain Resistance: Pile Floor Coverings.
B. American Society for Testing and Materials (ASTM):
   - ASTM D418, (2017), Methods of Testing Pile Yarn Floor Covering Construction.
   - ASTM D5116, (2020), Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials/Products.
   - ASTM E648, (2023), Test Method for Critical Radiant Flux of Floor- Covering Systems Using a Radiant Heat Energy Source.
   - ASTM E66, (2021),] Test Method for Specific Optical Density of Smoke Generated by Solid Materials.
C. CRI Carpet and Rug Institute
   - CRI Indoor Air Quality (IAQ) Testing and Labeling Program (equates to ASTM D5116)

3.2.1.3 Carpet shall comply with the following performance requirements:

a. Radiant panel: ASTM E648 >.45 watts/sq cm; Class I
b. Smoke Density: ASTM E662: < 450 Flaming Mode
c. Static Generation at 70 Degrees < 3.5 kv. AATCC 134
d. Soil/Stain Protection AATCC 175-1991: >78.0 on the Red 40 Stain Scale
e. CRI Green Label Air Quality Certification ASTMD 5116
f. Lifetime warranty for edge ravel and delamination tuft bin (zippering) dimensional stability (tiles)
g. Abrasive wear

3.2.1.4 SUBMITTALS

Government approval is required for submittals with a “GA”. Those submittals having a “FIO” designation are for information only. Submittals will require government review and approval before any contracts are awarded. Contracting officers shall determine if all submittals are in accordance with requested material specifications and those meeting aesthetic requirements.

3.2.4.1 DATA

A. Carpet and Accessories; “GA”
B. Manufacturer’s catalog data (specification sheet) stating physical characteristics, durability, resistance to fading, antimicrobial treatments, stain and soil treatments, and flame resistance characteristics for each type of carpet and installation accessory.

3.2.4.2 CERTIFICATES

A. Carpet and Accessories: “GA”
B. Certificate of Compliance from A Laboratory Accredited by NIST Or NVLAP.
    A. Test reports for each type of carpet and pad are to be submitted with products. Products not meeting standards will not be accepted.
    B. Prior approval of samples is mandatory. Substitutions will be evaluated.

3.2.4.3 SAMPLES GA

A. Submit standard-size carpet samples of each type of carpet, in each specified pattern, color, and construction.
B. Final Sample Submittal
    1) Submit two (2) “Production Quality” samples for each carpet type:
        - 27” x18” for Broadloom.
        - 24” x 24” for Carpet Tiles and Entrance Tiles
C. No carpet shipments are permitted until acceptance of final samples is given by representative of the Contracting Officer, certifying that samples are the approved color, pattern, and texture.
D. Vinyl or Aluminum edge (moldings) strip require two pieces of each for review. Minimum of 12 inches long.

3.2.5 INDOOR AIR QUALITY TEST REPORTS

Contractor shall submit for specified products, indicating that the test results do not exceed the stated emission criteria of the CRI Indoor Air Quality Testing Program.

3.2.6 DELIVERY AND STORAGE

3.2.6.1 Materials shall be delivered and stored within the manufacturer’s recommendations.

3.2.6.2 Environmental Requirements (preparation for installation) Areas to receive carpeting shall be maintained at a temperature above 16 degrees C 60 degrees F for 2 days before installation, during installation, and for 2 days after installation. A minimum temp of 13 degrees C and 55 degrees F shall be maintained thereafter for the duration of the contract. Traffic or material movement in carpeted area shall not be permitted for 24 hours after installation.

3.2.7 WARRANTY

3.2.7.2 Manufacturer's performance warranties:

A. Broadloom 12' carpet,
B. Carpet tiles and
C. Entrance carpet tiles, to include:

3.2.7.3 Minimum lifetime warranty for Edge Ravel, Delamination, Static, and Tuft Bind.

3.2.7.4 Minimum lifetime warranty for Wear (surface pile abrasion).

3.2.7.5 Minimum Lifetime warranty for Stain and soiling. Minimum lifetime warranty for static emission.

3.2.7.6 There shall be a minimum of two (2) year workmanship.

3.2.8 CARPET TYPE

Carpet shall be first quality, free of physical and manufacturing defects. All carpets shall have static control construction, pass all Class 1 requirements for Flame and Smoke Density and be compatible with all published specifications listed in section 2.1.1 to give adequate durability and performance. Contracting Officer's evaluations will be done for aesthetics as well as performance characteristics.

3.2.9 PHYSICAL CHARACTERISTICS: BROADLOOM CARPETS

A. Construction: Tufted
B. Type: Broadloom, 12-foot minimum usable width.
C. Pile type: multi-level or graphic patterned for loop pile. Minimum 3 ply for aesthetics. No Level Loop 2 ply. Cut pile for borders and inserts.
D. Pile Fiber: Commercial Branded type 6 Nylon. Continuous Filament Nylon. No Olefin, polyester or polypropylene yarns will be evaluated or accepted.
E. Pile Height: .120 for loop pile carpet .210 for cut pile carpets, and In Accordance with ASTM D418
F. Yarn Ply: Minimum 3 ply for color and in accordance with ASTM C1423
G. Gauge: Minimum $1/8^{th}$ grade in Accordance with ATSM 418.
H. Stitches: Minimum 8 stitches per inch in Accordance with ASTM 418.
I. OZ. Weight: Minimum for loop pile broadloom: 28 oz. per square yard Minimum for cut pile broadloom: 30 oz. per square yard.
J. Density: Minimum of 8000 density for loop pile carpets Minimum of 6000 density for cut pile carpets.
K. Dye Method; 100% solution dye for loop pile carpet. (Max 25% yarn dye mix will be considered for aesthetic reasons.) Cut pile can be 100% yarn dye.
L. Backing Material: Primary backing shall be synthetic polypropylene. No jute backings. Secondary backing for Loop Pile Carpets shall possess the following warranties and characteristics:
   a. Lifetime warranty against edge ravel
   b. Lifetime warranty against delamination and zippering

c. No Unitary or Action Back carpets will be evaluated
M. Radiant Panel: Passes ASTM E648, must be Class 1 rated
N. Smoke Density: Passes ASTM E662, less than 450
O. Static: Passes AATCC 134, Less than 3.5 KV
P. Stain Resistance: Carpet must be treated with a topical stain treatment offering lifetime warranty against acid-based stains. AATCC 175

3.2.10 PHYSICAL CHARACTERISTICS FOR CARPET TILES

A. Construction: Tufted
B. Type: 24 x 24-inch tiles
C. Pile type: Textured loop pile
D. Pile Fiber: Commercial Branded type 6 Nylon. Continuous Filament Nylon. No Olefin, polyester or polypropylene yarns will be evaluated or accepted.
E. Pile Height: .100 for loop pile carpet
F. Yarn Ply: Minimum 3 ply for color and aesthetics in accordance with ASTM D 1423
G. Gauge: Minimum 1/8th gauge In Accordance with ASTM 418
H. Stitches: Minimum 8 stitches per inch In Accordance with ASTM418
I. Oz. Weight: minimum 20 oz. carpet tile
J. Density: Minimum of 6900 density
K. Dye Method; 100% solution dye for loop pile carpet.
L. Backing Material: Secondary backings for Carpet Tile and Entrance Carpets shall possess the following warranties and characteristics:
M. Non-PVC or Polyurethane.
N. Lifetime warranty against edge ravel.
O. Lifetime warranty against delamination Lifetime dimensional stability.
P. Radiant Panel: Passes ASTM E648 shall be Class 1 rated
Q. Smoke Density: Passes ASTM E662 Less than 450
R. Static: Passes AATCC 134 Less than 3.5 KV
S. Stain Resistance: Carpet must be treated with a topical stain treatment offering lifetime warranty against acid-based stains. AATCC 175.

3.2.11. PHYSICAL CHARACTERISTICS FOR CARPET ENTRY TILES

A. Construction: NEEDLEBOND
B. Type: 24 x 24-inch tiles.
C. Pile type: Textured loop pile
D. Pile Fiber: PET Polyester (only accepted for entrance tiles)
E. Pile Height: .150 for loop pile carpet
F. Yarn Ply: Minimum 3 ply for color and aesthetics in accordance with ASTM D 1423
G. Gauge: Minimum 1/8 Stitches gauge in accordance with ASTM 418.
H. Stitches: Minimum 1/8th stitches per inch in accordance with ASTM 418
I. Oz. Weight: minimum 45 oz. carpet tile
J. Density: Minimum of 6400 density
K. Dye Method: 120% solution dye for loop pile carpet.
L. Backing Material: Secondary backings for Entrance Carpets shall possess the following warranties and characteristics:
a. Non-PVC or Polyurethane.
b. Lifetime warranty against edge ravel.
c. Lifetime warranty against delamination.

d. Lifetime dimensional stability.
M. Radiant Panel: Class 1 rated
N. Smoke Density: Less than 450
O. Static: Less than 3.5 KV

3.2.12 ACCESSORIES

3.2.12.1 Leveling Compound: Latex type as recommended by carpet manufacturer compatible with carpet adhesive and curing/sealing compound used on concrete.

3.2.12.2 Multi-Purpose Adhesive: Low VOC permanent carpet adhesive as recommended by carpet manufacturer for direct glue down of carpet; comply with CRI Green Label Certification Program. Use slow-set permanent adhesive for patterned carpet to facilitate pattern match.

3.2.12.3 Multi-Purpose Adhesive: Low VOC permanent carpet adhesive as recommended by carpet manufacturer for direct glue down of carpet on steps; comply with CRI Green Label Certification Program.

3.2.12.4 Non-Metallic Carpet Edge Guard (MOLDING): Extruded or molded heavy-duty vinyl or rubber carpet edge guard of size and profile indicated; minimum two-inch-wide anchorage flange; colors shall be selected by government from manufacturer's standard range of colors.

3.2.12.5 Miscellaneous Materials: As recommended by manufacturer of carpet, cushion, and other carpeting products as required to complete installation.

3.2.12.6 Carpet Base. Vinyl Cove base with pre-molded corners. Color to be selected from manufacturer's full line. Base shall be 4" or 6" inches high minimum 1/8 thick.

3.2.12.7 Metal carpet edge strips (molding) shall be aluminum, have a hammered surface, and be pin less clampdown type designed for the type of carpet being installed. Finish shall be natural color anodized, pre-finished color gold. Floor flange shall be a minimum 1 ½" wide and face shall be a minimum 5/8" wide.

3.2.12.8 Vinyl carpet edge strips shall be heavy duty and designed for the type of carpet being installed. Floor flange shall be a minimum 2" wide. Colors shall be selected by the Government from manufacturer's standards.

3.2.12.9 Tack strips: For installation of residential carpet (stretch-in over cushion), water- resistant plywood strips with two or three rows of rust-resistant angular pins shall be used. For areas over thirty feet long, tack strips with three rows pins shall be used. Pins of the proper length shall be provided to penetrate through the carpet backing but not so long as to be seen from the surface or to be a safety hazard. Tack strips shall be a minimum of 1" wide and ¼" thick, suitable for the cushion thickness specified or as recommended by the carpet manufacturer.

3.2.12.10 Carpet Padding: Carpet padding shall be bonded urethane, no less than 6.0 pounds/cubic foot, and no less than 3/8 inch thick.

3.2.13 EXECUTION

3.2.13.1 EXAMINATION

3.2.13.1.1 Exam substrates for conditions under which carpeting is to be installed.

3.2.13.1.2 Verify that floor surfaces are smooth and flat within and are ready to receive work.

3.2.13.1.3 Beginning of installation means installer accepts existing substrate conditions.

3.2.14 PREPARATION

3.2.14.1 Allow new concrete to cure for 90 days before carpet installation starts.

3.2.14.2 Perform moisture content testing as required by manufacturer's instructions to ensure pH readings of no more than nine (9). Moisture transmission of 5.5 lbs/ sq ft per 24 hours is acceptable. If values exceed this level, follow manufacturer's recommendations for moisture transmission mitigation. Do not proceed until unsatisfactory conditions have been corrected.

3.2.14.3 Remove sub-floor ridges and bump. Fill minor or local low spots, cracks, joints, holes, and with sub-floor filler.

3.2.14.4 Fill, level, and make smooth cracks 1/16 inch or more, holes, unevenness, and roughness with compatible latex floor patching compound. Feather floor filling or leveling compound a minimum of four (4) ft. Sweep floor of loose granular debris prior to filling. After filling, allow filler to dry. Damp mop floor with warm water and allow drying. Vacuum after mopping to ensure that loose granular debris is removed and to provide a proper substrate to install broadloom carpet. Prohibit traffic until filler is cured.

3.2.14.5 Vacuum floors again immediately before installation of carpeting.

3.2.14.6 Confirm compatibility of adhesive with curing compounds on concrete floors.

3.2.14.7 Type of concrete sealer, when required, shall be compatible with carpet.

3.2.15 SKIM COAT OR LEVELING COAT

3.2.15.1 Existing concrete or masonry floors shall be skim coated as required to obtain a proper surface for the application of cushion and carpet. Existing hard floors shall be cleaned adequately as required by manufacturer to receive skim coat.

3.2.15.2 Self-Leveling Underlayment: The Contractor shall furnish and install self-leveling underlayment whereas determined by the Government, that the existing floor surface is not suitable for installation of floor covering.

3.2.16 FLOOR REPAIR

3.2.16.1 Repair all deteriorated wood subflooring after approval form COR. Match existing material and prepare as required to accept new flooring. See bid item on subfloor repair.

3.2.17 INSTALLATION

3.2.17.1 Install carpet in accordance with the Technical Bulletins provided by the manufacturer. These technical bulletins will offer the proper instruction of how to install the carpet including:

1) Conducting Site Testing and conditioning
2) Floor Preparation,
3) Installation of the carpet (including seaming, carpet layout and cutting, power stretching, approved adhesives systems and seam sealers, etc.). As a supplement, the CRI 204, section 8 will supply additional installation support guidance for your installation.

3.2.17.2 Install broadloom carpet (direct glue down) and smooth uniform and secure with minimum of seams. Run side seams parallel with light, where practical, and where such layout does not increase the number of seams. Install breadths parallel, with carpet pile in the same direction. Do not make seams perpendicular to doors or at pivot points.

3.2.17.3 Install carpet tiles in accordance with manufacturer’s directions. Full spread releasable adhesives are required. No grid installations will be accepted.

3.2.17.4 Install carpet under open-bottom obstructions and under removable flanges and furnishings, and into alcoves and closets in each space.

3.2.17.5 Provide cutouts where required. Conceal cut edges with protective edge guards or flanges.

3.2.17.6 Run carpet under open-bottom items and install tight against walls, columns, and cabinets so that the entire floor area is covered with carpet. Cover over floor- type door closers.

3.2.17.7 Install edging guard (molding) at openings and doors wherever carpet terminates, unless indicated otherwise.

3.2.17.8 Perform cutting in accordance with manufacturer’s recommendation using tools designed for carpet being installed. Verify carpet match before cutting to ensure minimal variation between dye lots. Retain or dispose of scraps in accordance with manufacturer’s environmental program.

3.2.17.9 Install carpet from same dye lot and run within each continuous carpet area.

3.2.17.10 Seal seams with manufacturer recommended seam sealer.

3.2.17.11 Install carpet with pile-lay in same direction.

3.2.17.12 Use leveling compound where necessary. Feather floor leveling compound minimum of 4 ft.

3.2.17.13 Do not bridge building expansion joints with continuous carpeting. Provide for movement.

3.2.17.14 Apply environmentally approved adhesive in accordance with manufacturer's instructions in area to be carpeted.

3.2.17.15 Apply seam adhesive to base of edge glued down. Lay adjoining piece with seam straight, not overlapped or peaked, and free of gaps.

3.2.17.16 Roll with appropriate roller for complete contact of adhesive to carpet backing.

3.2.17.17 Trim carpet neatly at walls and around interruptions or extend carpet as base finish up vertical surface to form base as required. Terminate top of base with cap strip.

3.2.17.18 Complete installation of edge strips, (molding) concealing exposed edges. [Bind cut edges where not concealed by edge strips.]

3.2.17.19 Any unprotected edges at the transition of carpet to other floor covering material, the carpet must be protected with appropriate carpet edge strips.

3.2.17.20 Cut carpet at fixtures, architectural elements, and perimeters.

3.2.17.21 Use a fixed reducer edge strip (molding) to secure broadloom area in open perimeter designs.

3.2.17.22 Install carpet on stairs using an environmentally acceptable permanent adhesive. Furnish and install compatible edge trim and nosing products as required.

3.2.18 CLEANING

3.2.18.1 On completion of installation in each area, remove dirt and carpet scraps from surface of carpet. Remove soiling, spots, or excess adhesive on carpet with cleaning materials recommended by carpet manufacturer.

3.2.18.2 Remove debris, sort usable pieces from carpet scraps.

3.2.18.3 At completion of work, vacuum carpet using commercial vacuuming as recommended by carpet 3.2.3.4manufacturer. Remove spots and replace carpet where spots cannot be removed. Remove rejected carpeting and replace with new carpeting. Remove any protruding yarns with shears or sharp scissors.

3.2.19 PROTECTION

3.2.19.1 Do not permit traffic over unprotected floor surface.

3.2.19.2 Protect carpet against damage during construction. Cover with 6-mil thick.

3.2.19.3 Polyethylene covering with taped joints during construction period whenever protection is required, so that carpet will be without any indication of deterioration, wear, or damage at time of completion.

3.2.19.4 Damaged carpet will be rejected and recycled. As carpet is installed, remove trimmings, excess pieces of carpet, and installation materials.

3.2.19.5 Maintain protection of carpeting on each floor or area until work is accepted.

3.2.20 REMNANTS

3.2.20.1 Remnants form installation consisting of more than 620 mm (2 feet) in dimension with more than .06 square meters (6 sq. feet) total shall be provided to the user.

END OF SECTION

3.3 RESILIENT FLOORING

3.3.1 GENERAL

3.3.1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM F1066, (2023), Vinyl Composition Floor tile
ASTM F137, (2018), Flexibility of Resilient Flooring Materials with Cylindrical Mandrel Apparatus
ASTM F925, (2020), Resistance to Chemicals of Resilient Flooring
ASTM F970, (2022), Measuring Recovery Properties of Floor Coverings after Static Loading
ASTM F1514, (2019), Measuring Heat Stability of Resilient Flooring by Color Change ASTM F1515, (2021), Measuring Light Stability of Resilient Flooring by Color Change ASTM E662, (2021), Specific Optical Density of Smoke Generated by Solid Materials ASTM E648, (2023), Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source
ASTM F1914 , (2024), Short-Term Indentation and Residual Indentation of Resilient Floor Covering
ASTM F1303, (2021), Sheet Vinyl Floor Covering with Backing
ASTM G21, (2021), Determining Resistance of Synthetic Polymeric Materials to Fungl ASTM F1344, (2021), Rubber Floor Tile
ASTM D2047, (2017), Standard Test Method for Static Coefficient of Polish-Coated Flooring Surfaces

FEDERAL SPECIFICATIONS (FS)

RR-T-650, (1994), Treads, Metallic and Nonmetallic, Slip Resistant
NPFC-SS-T-312, (1999), (Rev B; Int Am1; Notice 1) Tile, Floor: Asphalt, Rubber, Vinyl

UNDERWRITER LABORATORY

UL 779, (2020), Electrically Conductive Flooring UL 94, (2023), Flammability of Plastic Materials

AMERICANS WITH DISABILITIES ACT AND ARCHITECTURAL BARRIERS ACT

ADA & ABA, (2024), Accessibility Guidelines

ANTIBACTERIAL ACTIVITY ASSESSMENT OF TEXTILE MATERIAL

AATCC TM147, (2024), Sheet Vinyl with backing

3.3.2 SUBMITTALS

3.3.2.1 Government approval is required for submittals with a GA designation; submittals having an FIO designation are for information only. The following shall be submitted in accordance with SUBMITTAL PROCEDURES:

A. Product Data
B. Resilient Flooring and Accessories; GA
C. Manufacturer's descriptive data and installation instructions. Cleaning and maintenance instructions shall be included.
D. Samples:
    1. Resilient Flooring and Accessories; GA. Three samples of each indicated color and type of flooring and base.
    2. Sample size shall be minimum 3 inches by 5 inches.

3.3.3 DELIVERY AND STORAGE

Materials shall be delivered to the building site in original unopened containers and shall be stored according to manufacturer's recommendations.

3.3.4. ENVIRONMENTAL REQUIREMENTS

3.3.4.1 Areas to receive resilient flooring shall be maintained at a temperature above 21 degrees C (70 degrees F) for 2 days before application, during application and 2 days after application.

3.3.4.2 A minimum temperature of 13 degrees C (55 degrees F) shall be maintained thereafter.

3.3.5 SCHEDULING

Resilient flooring application shall be scheduled after the completion of other work which would damage the finished surface of the flooring.

3.3.6 PRODUCTS

3.3.6.1 VINYL-COMPOSITION TILE

Vinyl-composition tile shall conform to ASTM F1066, Class 1, solid color title, Class 2, through pattern title, Composition 1, asbestos-free, and shall be 12 inches square and 1/8 inch thick. Tile shall have the color and pattern uniformly distributed throughout the thickness of the tile. Flooring in any one continuous area shall be from the same lot and shall have the same shade and pattern.

3.3.6.2 SHEET / LUXURY VINYL FLOORING

Sheet / Luxury vinyl flooring shall be composed of a homogeneous, non-layered solid vinyl composition. Color and pattern shall be dispensed uniformly throughout the thickness of the wear layer. Luxury vinyl flooring shall conform to the following: ASTM F 137, ASTM F925 & 970, ASTM F1514 & 1515, ASTM E648 NFPA Class 1 & ASTM E662 < 450, ASTM D2047, ASTM G21 and ASTM F1914. Ten (10) year commercial warranty. Finish applied to resist staining, abrasion and be quartz enhanced urethane or equal. Seams shall be chemical, or heat welded according to condition requirements and per manufacturer's recommendations. Weld seams with matching weld rods. Direct glue shall be pull spread no perimeter adhesion. Sheet Luxury vinyl flooring shall be manufactured in the USA.

3.3.6.3 Sheet Vinyl Flooring (with backing Heterogeneous sheet)

Sheet vinyl flooring with backing shall conform to ASTM F1303. The solid vinyl color and pattern shall extend through the total thickness of the material. Type I, Grade 1, minimum wear layer thickness 0.050 inches and overall thickness of 0.085 inches. Static load limit 1500 psi. Electrostatic propensity < 3.0kv.

3.3.6.4 Sheet Vinyl Flooring (without backing Homogeneous sheet)

Sheet vinyl flooring without backing shall conform to ASTM F1913 and meet the overall thickness, flexibility, indentation, and the solvent resistance requirements, and. The solid vinyl color and pattern shall extend through the total thickness of the material. Type II, Grade 1, minimum wear layer thickness 0.050 inches and overall thickness 0.085 inches. Sheet Vinyl flooring shall be not less than 72 inches wide. Static Load passes 2000 psi.

3.3.6.5 Luxury Vinyl tile (LVT) / LUXURY VINYL PLANK (LVP)
Luxury vinyl flooring shall be class lll printed film tile, type B (embossed) and conform to ASTM F 1700 and have a minimum ten (10) year warranty. Wear layer thickness shall be a minimum of 20 mil (05 mm) no 12 mil, 8 mil or 6 mil is acceptable. Overall thickness is minimum 2.5 m. No minimum or maximum width or lengths. Finish shall be quartz enhanced urethane or equal. Static load modified 1500 psi. Luxury vinyl tile and plank shall be manufactured in the USA. Luxury vinyl tile and plank shall conform to the following: ASTM F137, ASTM F925 & 970, ASTM F1514 & 1515, ASTM E648 & 662, ASTM D2047 and ASTM F1914.

3.3.6.6 SOLID VINYL TILE

Solid vinyl tile shall conform to SS-T-312B Type III. Tile shall be 12 inches square by 1/8 inch thick. Tiles shall be of solid unlaminated construction.

3.3.6.7 RUBBER FLOOR TILE

Rubber Floor Tile shall conform to ASTM F1344. Flooring shall be premium grade and conform to UL 94 and ASTM D2047.

3.3.6.8 STAIR THREADS, RISERS, AND STRINGERS

Treads, risers, and stringers shall conform to FS RR-T-650 composition rubber or vinyl. Design shall be either a one-piece nosing/tread/riser or a two-piece nosing/tread with a matching coved riser. Installation shall include stringer angles on both the wall and banister sides, and landing trim. Surface of treads shall be raised, stud, diamond, or ribbed pattern. Smooth with abrasive non-slip inserts.

3.3.6.1 Conductive Flooring shall conform to UL 779.

3.3.6.2 Non-slip composition tile shall conform to ABA & ADA requirements.

3.3.7 RESILIENT BASE

Base shall be rubber, straight installed with carpet coved installed with resilient flooring. Base shall be 4 or 6 inches high minimum 1/8 inch thick. Preformed outside or Job Formed corners shall be furnished.

3.3.8 EDGE STRIPS, TRIMS, AND THRESHOLDS

Material shall be metal or vinyl and provided as required.

3.3.9 ADHESIVE/ CHEMICAL & WELDED SEAM

Adhesive for flooring and wall base shall be as recommended by the flooring manufacturer. Welded and chemical welded for sheet vinyl shall be as recommended or required by the flooring manufacturer.

3.3.10 COLOR

Color shall be as selected by user.

3.3.11 WOOD FLOOR AND WOOD FRAMING REPAIRS

Repair all deteriorated wood subflooring after approval from COR. Match existing material and prepare as required to accept new flooring. See bid item on subfloor repair and framing repairs.

3.3.12 SKIM COATING OR LEVEL COAT

Existing concrete or masonry floors shall be skim coated as required to obtain a proper surface for the application of Resilient Flooring. Existing floors shall be cleaned adequately as required by the manufacturer to receive a skim coat.

3.3.13 EXECUTION

Flooring and accessories shall be installed in accordance with Manufacturer's instructions.

3.3.14 CLEANING AND PROTECTING

Upon completion, flooring shall be cleaned in accordance with manufacturers approved cleaning instructions.

END OF SECTION

3.4 CERAMIC / PORCELAIN TILE

3.4.1 GENERAL

3.4.1.1 REFERENCES

3.4.1.1.1 The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

American National Standards Institute (ANSI)
ANSI A108/ ANSI A118/ ANSI A136.1, (2024), Installation of Ceramic Tile ANSI A137.1, (2022) Ceramic Tile

Tile Council of North America (TCNA)
TCNA (2024) Handbook for Tile Installation

Americans with Disabilities Act and Architectural Barriers Act
ADA & ABA, (2024), Accessibility Guidelines

3.4.1.2 SUBMITTALS

3.4.1.2.1 Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only.

3.4.1.2.2 Product Data

- Tile; GA. Setting-Bed; F20. Mortar, Grout, and Adhesive; GA.
- Manufacturer's catalog data, preprinted installation and cleaning instructions.
- Samples
- Tile; GA.
- Marble Thresholds; GA.
- Samples of sufficient size to show color range, pattern,
- type and joints.

3.4.1.3 DELIVERY AND STORAGE

Materials shall be delivered to the project site in manufacturer's original unopened containers. Materials shall be kept dry, protected from weather, and stored under cover.

3.4.1.4 ENVIRONMENTAL REQUIREMENTS

Tile work shall not be performed unless the substrate and ambient temperature is at least 10 degrees C (50 degrees F) and rising. Temperature shall be maintained above 10 degrees C (50 degrees F) while the work is being performed and for at least 7 days after completion.

3.4.1.5 WARRANTY

Manufacturer's standard performance guarantees or warranties that extend beyond a 1-year period shall be provided.

3.4.2 PRODUCTS

3.4.2.1 TILE

Tile shall be standard grade conforming to ANSI A137.1. Containers shall be grade sealed. Floor tile shall have a minimum static coefficient of friction of 0.5. Tile shall be Class III as rated by the manufacturer for abrasion resistance as related to foot traffic. Non-slip tile shall conform to ADA & ABA requirements. Tile standard size 12 x 12 inches. Thickness may vary from 1/4” to 3/8”. Color shall be as selected by user.

3.4.2.1.1 Mosaic Tile

Mosaic tile and trim shall be unglazed natural clay or conductive with cushion edges porcelain unpolished or polished with sharply formed face. Tile size shall be 1 x 1 inch or 2 x 2 inches or 3 x 3 inches a mixture of standard sizes in a stock pattern.

Color shall be as selected by user.

3.4.2.1.2 Mosaic tile shall conform to ANSI A108 / A118/ A136.1.

3.4.2.1.3 Quarry Tile

Quarry tile and trim shall be unglazed with smooth or abrasive surface. Tile shall be 6 x 6 x 1/2 inch. Color selection shall be as selected by user.

3.4.2.1.4 Glazed Wall Tile with backer board

Glazed wall tile and trim shall be cushion edged with bright matte or glaze. Tile shall be 4-1/4 x 4-1/4 or 4-1/4 x 6 or *6 x* 6 inches. Color shall be as selected by user.

3.4.2.1.5 Accessories

Accessories shall be the built-in type of the same materials and finish as the wall tile.

3.4.2.2 MORTAR, GROUT, AND ADHESIVE

3.4.2.2.1 Mortar, grout, and adhesive shall conform to the following:

3.4.2.2.2 Dry-Set Portland Cement Mortar ANSI A108 / A118 / A136.1.

3.4.2.2.3 Conductive Dry-Set Mortar ANSI A108 / A118 / A136.1.

3.4.2.2.4 Latex-Portland Cement Mortar ANSI A108 / A118 / A136.1.

3.4.2.2.5 Tile Grout ANSI A108 / A118 / A136.1.
Sand Portland cement grout Dry-set grout, Latex-Portland cement grout, Commercial Portland cement grout, Epoxy resin grout or Furan resin grout.

3.4.2.2.6 Organic Adhesive
Conform to ANSI A108 / A118 / A136.1. Type I

3.4.2.2.7 Epoxy Resin Grout
Conform to ANSI A108 / A118 / A136.1.

3.4.2.2.8 Furan Resin Grout
Conform to ANSI A108 / A118 / A136.1.and consist of an intimate mixture of furfuryl- alcohol resin with carbon filler and catalyst.

3.4.2.3 CEMENTITIOUS BACKER BOARD

3.4.2.3.1 Cementitious backer units shall conform to ANSI A108 / A118 / A136.1.

3.4.2.4 MARBLE THRESHOLDS

3.4.2.4.1 Marble thresholds shall have a fine sand-rubbed finish and color shall be selected by the Government.

3.4.2.4.2 Install marble thresholds as per Manufacturer’s Recommendations.

3.4.3 EXECUTION

3.4.3.1 GENERAL INSTALLATION REQUIREMENTS
Tile work shall not be started until roughing in for mechanical and electrical work has been completed and tested, and built-in items requiring membrane waterproofing have been installed. Floor tile installation shall not be started in spaces requiring wall tile until after wall tile has been installed. Tile bases and coves shall be solidly backed with mortar.

3.4.3.2 INSTALLATION OF WALL TILE
Wall tile shall be installed in accordance with the TCNA and ANSI A108 / A118 / A136.1.

3.4.3.3 INSTALLATION OF FLOOR TILE
Floor tile shall be installed in accordance with TCA-01. Shower receptors shall be installed in accordance with TCNA.

3.4.3.4 WATERPROOFING
Furnish Shower pans when or where required. Waterproofing under concrete fill shall conform to the requirements of bituminous waterproofing.

3.4.3.5 CEMENTITIOUS BACKER BOARD INSTALLATION
Replacement of Cementitious backer units shall be installed in accordance with ANSI A108.11. Fasteners shall be type designed for cement board application.

3.4.3.6 CONTROL JOINTS

Joints shall be formed as indicated and sealed as per Manufacturer’s Instructions.

3.4.3.7 WOOD FLOOR REPAIR

Repair all deteriorated wood subflooring after approval from COR. Match existing material and prepare as required to accept new flooring. See bid item on subfloor repair.

3.4.3.8 SKIM COATING OR LEVEL COAT

Existing concrete or masonry floors shall be skim coated as required to obtain a proper surface for the application of Ceramic Tile. Existing floors shall be cleaned adequately as required by the manufacturer to receive a skim coat.

3.4.3.9 CLEANING AND PROTECTING

Upon completion, tile surfaces and grout shall be cleaned in accordance with manufacturer's approved cleaning instructions. Tiled floor areas shall be covered with building paper before foot traffic is permitted over the finished tile floors. Board walkways shall be laid on tiled floors that are to be continuously used as passageways by workmen.

END OF SECTION

3.5 RUBBER FLOORING

3.5.1 General

3.5.1.1 Product verification

It is important before starting the installation, verification of the product type, size, thickness, color variations and visual defects should be made. The material provider must be notified before the material has been installed of any apparently defective material.

3.5.2 Preparation of subfloors

3.5.2.1 All subfloors should be thoroughly cleaned and filled. Remove paint, varnish, oil, grease, and wax. On concrete, use solution of trisodium phosphate or xylol for rubber- based paint. For oil, grease, or wax, scrub with trisodium phosphate or machine sand. In all cases, complete with thorough washing and rinsing.

3.5.2.2 Be sure floor is completely dry before installing any material.

3.5.2.3 Concrete floors must be made even with latex floor fill. Fill cracks with latex crack filler. It is recommended that all concrete slabs be tested for moisture. The contractor must be certain that the moisture vapor emission of the slab does not exceed 3 lbs. per 1000 sq. Ft. In 24 hours, using the calcium chloride test. A moisture test result will confirm whether the slab is dry enough to proceed with the installation. It does not mean that the slab will always remain dry. Sweep the entire floor clean.

3.5.2.4 Rubber flooring shall be Matts Inc. or Iron Company or equal. Color, size and thickness will be decided by the user.

3.5.3 INSTALLATION

3.5.3.1 After the subfloor has been properly prepared, begin to install the flooring. Roll out the material if in rolls, dry lay it and let it relax for a day. Pre-cut leaving a couple of inches of extra material on beginning and end of roll. Apply adhesive per recommendation of adhesive manufacturer. Roll material into wet adhesive. Cut ends of roll to fit, using a utility knife. Roll with a 100 lb. Carpet roller periodically, until adhesive is set. The initial grab of the recommended adhesive is low, so it is sometimes required to apply weights, particularly at the seams, to maintain contact until the adhesive completely sets (24 hours). Note: the only cause for “peaking” is a lack of weight on the seams while the adhesive is setting. Also, the adhesive has a “memory” and will not allow the rubber material to be pushed around, it must be initially set into proper position in the adhesive. Adhesive material should be ultra/bond G19 or equal. A universal two-component polyurethane adhesive. If the rubber material starts to separate at the seams, 2” masking tape will help to close gaps in the seams and keep it in place while the adhesive sets. Never use duct tape.

3.5.3.2 Make sure no adhesive is spilled on the face of material. In the event this happens, wipe off immediately with polyurethane thinner or acetone.

3.5.3.3 After the installation is complete, use a damp mop or rag to remove installation dirt and loose rubber dust. Do not wash the floor for at least 5 days.

3.5.4 CLEANING

Recommend general cleaning with a mild detergent. This may also be necessary, a minimum of two times, to remove all rubber odor.

END OF SECTION

3.6 DECORATIVE LAMINATE FLOORING

3.6.1 GENERAL

3.6.1.1 SUMMARY

Section Includes:

1. High Pressure Decorative Laminate Flooring
2. Stairs and Steps
3. Underlayment and Vapor Barrier
4. Trims and moldings

3.6.1.2 REFERENCES

ASTM C1023, (2023), Standard Practice for Labeling Ceramic Art Materials for Chronic Adverse Health Hazards

ASTM D3023, (2024), Standard Practice for Determination of Resistance of Factory-Applied Coatings on Wood Products and Reagents

NEMA LD 3.1, (2005), Application, Fabrication and Installation of High- Pressure Decorative Laminates

NEMA LD 3, (2005), High-Pressure Decorative Laminates

ASTM E648, (2023), Standard Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source

ASTM E662, (2021), Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials

ASTM E492, (2022), Standard Test Method for Laboratory Measurement of Impact Sound Transmission through Floor Ceiling Assembles Using the Tapping Machine

ASTM E90, (2024), Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements

ASTM E1333, (2022), Standard Test Method for Determining Formaldehyde Concentrations in Air and Emission Rates from Wood Products Using a Large Chamber

ASTM F1869, (2023), Standard Test Method for Measuring Vapor Emission Rate of concrete Subfloor Using Anhydrous Calcium Chloride

3.6.1.3 SYSTEM DESCRIPTION

A. High pressure decorative laminate plank flooring with mechanical locking system and attached underlayment applied over a moisture barrier and concrete slab.
B. High-pressure decorative laminate plank flooring with mechanical locking system and attached underlayment applied over a wood substrate.
C. Flooring system of “floating – floor” construction type allowing for expansion and contraction due to changes in humidity.
D. Vapor Barrier is required over concrete based subfloors including ceramic tile brick and terrazzo.

3.6.1.4 SUBMITTALS

A. Product Data:
   1. Product Data
   2. Manufacturer's Installation Instructions
   3. Manufacturer's recommendations for product handling, storage, acclimation, installation, protection, and maintenance.
B. Samples: Submit selection and samples for designs and finish textures.

3.6.1.5 QUALITY ASSURANCE

A. Installer Qualifications: Installation shall be performed by a Contractor experienced in the application of systems similar in complexity to those required for this Project. Additionally, installers shall be in possession of the manufacturer's installation manual and adhere to the instructions.
B. Manufacturer's Qualifications: Not less than 10-years' experience in the laminate flooring industry and a record of successful commercial applications.
C. Source Limitations: Obtain all products and materials from one source.
D. Pre-Installation Meetings: Conduct pre-installation meeting to verify project requirements, substrate conditions, manufacturer's installation instructions, and manufacturer's warranty requirements.

3.6.1.6 DELIVERY, STORAGE, AND HANDLING

A. Ordering: Order material in compliance with manufacturer's lead time requirements to avoid construction delays.
B. Delivery: Deliver materials in manufacturer's original, unopened, undamaged cartons.
C. Storage and Protection: Store in a horizontal fashion, flat and off the floor (i.e. palletized).

3.6.1.7 PROJECT CONDITIONS

A. Maintain air temperature between 55º and 80º Fahrenheit and humidity levels between 25% and 60% for 48 hours before, during and after installation.
B. Install decorative laminate flooring after other finishing operations have been completed.

3.6.1.8 WARRANTY

A. Furnish manufacturer's limited 10-year commercial warranty for joint integrity, wear resistance, stain resistance, and fade resistance (Alloc Commercial).
B. Furnish manufacturer's limited 6 – year light commercial warranty for joint integrity, wear resistance, stain resistance, and fade resistance (Alloc Original).

3.6.1.9 PRODUCTS

3.6.1.9.1 MANUFACTURERS

Specifications are based on manufacturer's literature from Alloc Inc., manufacturer of Alloc Commercial and Alloc Original. 1.877.362.5562, www.alloc.com or Equal.

3.6.1.9.2 MATERIALS

A. Composite panel(s) comprised of four main components: a high-pressure decorative laminate surface, an Aqua Resist high density fiberboard (HDF) core, a high-pressure balancing backer, and an attached high density polyethylene underlayment.
   - 7.6" x 47.5" x .43" (Alloc Commercial)
   - 7.6" x 47.55" x .385" (Alloc Original)

B. Panel edges:
   - Patented aluminum locking system for glue-free installation.
   - Wax-impregnated edges.

C. Performance Standard Compliance:
   1. The products surface shall be capable of withstanding a minimum of 11,520 (Alloc Commercial) revolutions in accordance with NEMA LD 3.1.
   2. The floor as installed shall have a static coefficient of friction when dry greater than 0.80 and when wet greater than 0.72 as tested in accordance with ASTM C1028.
   3. The floor shall be resistant to stains and reagents and exceed all standards as set forth in and tested in accordance with ASTM D3023 (Alloc Commercial) and NEMA LD 3 (Alloc Original)
   4. The floor shall have a horizontal joint strength of not less than 1,000 lbs./lineal ft. when tested in accordance with Lloyd-LR 10K (ISO/TC 219).
   5. Ball Impact Resistance (ANSI/NEMA LD3-2000, 3.8): No damage 1,675 mm (Alloc Commercial) and no damage 675 mm (Alloc Original).
   6. Critical Radiant Flux (ASTM E648): NFPA 101 Class 1 (Alloc Commercial and Alloc Original).
   7. Specific Optical Density of Smoke: Class 1 (Alloc Commercial) when tested in accordance with ASTM D3023 and <350 when tested
   8. in accordance with ASTM E662-15.
   9. Impact Insulation Classification (IIC): 64 when tested in accordance with ASTM E989 (2016).
   10. Sound Transmission Classification (STC): 61 when tested in accordance with ASTM E90-02.
   11. Meets ASTM E1333.
   12. Mechanical locking system strength > 1000lbs / lineal foot as per ISO/TC 219.

3.6.1.10 ACCESSORIES

A. Vapor barrier shall be polyethylene sheet(s) not less than 6.0 mils thick.
B. Underlayment is pre-attached to product in the form of a 2mm (0.08") thick cross-linked HDPE sheet.

3.6.1.11 RELATED MATERIALS

A. Decorative Laminate Trim available in 94” lengths matching colors or Anodized Aluminum (aa) Trim
   1. Quarter Round (not in aa)
   2. Wall Base (not in aa)
   3. Reducer
   4. Square Nose Reducer or End Cap
   5. T-Molding
   6. Overlap and Flush Stair nose (not in aa)
B. Mono Track® aluminum fastening system used to secure the Trim tightly in place without visible nail or screw holes. Alternatively use construction mastic.
C. Ensure Mono Track and moldings are installed on clean level subfloor.
D. Anodized Aluminum Trim comes with flush screw down system.

3.6.2 EXECUTION

3.6.2.9 MANUFACTURER’S INSTRUCTIONS

Compliance: Comply with current manufacturer’s product installation manual.

3.6.2.10 EXAMINATION

A. Site Verification of Conditions: Examine substrate conditions,application areas, and jobsite conditions are acceptable for product installation.
B. Verify concrete slabs, brick and terrazzo type subfloors are dry according to ASTM F1869 with maximum moisture emission of 5 pounds per 1200 square feet per 24 hours. Do not install flooring if alkaline content is high.
C. For Health Care Installations note, the Alloc mechanical locking system provides a close-fitting joint with water repellant wax impregnated edges in line with a recommendation by the AIA, in the American Hospital Association (AHA) Guidelines for Design and Construction of Hospitals and Health Care Facilities.

3.6.2.11 PREPARATION

A. Surface Preparation: Remove wood floors from concrete subfloors. Remove carpeting from subfloors prior to installation. Prepare sub floor to receive laminate flooring and verify that the sub floor is flat to within 3/16” over a 10’ span. Ensure that the sub floor is structurally sound and stable. Clean sub floor to remove loose dirt particles and debris.
B. Acclimation: Condition flooring materials in unopened cartons in the room where the installation is to take place or room with exact similar conditions for at least 48 hours prior to installation.

3.6.2.12 PLANNING

A. Verify direction of plank flooring with Architect and/or end user prior to commencing with installation.
B. Install flooring symmetrically about room centerline unless otherwise indicated.

3.6.2.13 INSTALLATION

A. Install polyethylene vapor barrier sheet on:
   1. Concrete Subfloors
   2. Over existing floors installed on concrete
   3. Over all subfloors that have open crawlspaces underneath them.
B. Install laminate flooring as a floating floor.
C. Connect the planks via the aluminum locking mechanism and stagger the planks end joints a minimum of 12”.
D. Provide a minimum expansion space recommended by manufacture or a minimum of 1 /4” between flooring planks and perimeter walls, columns and other fixed objects.
E. Install transition pieces:
   1. When exceeding 50 lineal feet in a single room
   2. At the centerline of doors.
   3. When transitioning to other flooring materials or unfinished areas.
F. Do not nail, screw, or fix laminate flooring to the sub floor(s).
G. Install wall base or trim at perimeter and at vertical obstructions.
H. Stairs and Steps
A. Install stairs and steps in compliance with manufacturer’s installation instructions.
B. Use laminate flooring planks for risers and treads combined with stair nose moldings.

3.6.2.14 PROTECTION

A. Cover installed flooring to protect it from damage during the remainder of construction. Use heavy Kraft-paper or other suitable material.
B. Cleaning: Maintain flooring in accordance with manufacturer’s recommendations.

END OF SECTION

3.7 GYPSUM WALLBOARD

3.7.1 GENERAL

3.7.1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C1396, (2022), Standard Specification for Gypsum Wallboard ASTM C475, (2022), Joint Compound and Joint Tape for Finishing Gypsum Board ASTM C514, (2020), Nails for the Application of Gypsum Board ASTM C557, (2017), Adhesive for Fastening Gypsum Wallboard to Wood Framing ASTM C630, (2017), Water-Resistant Gypsum Backing Board ASTM C840, (2023), Application and Finishing of Gypsum Board ASTM C1002, (2022), Steel Self –Piercing Tapping for the Application of Gypsum Panel Product or Metal Plaster Bases

GYPSUM ASSOCIATION (GA)

GA 620, (2021), Fire Resistance Design Manual

UNDERWRITERS LABORATORIES (UL)

UL-05, (2015), Fire Resistance Directory

3.7.1.2 SYSTEM DESCRIPTION

3.7.1.2.1 Fire-Rated Construction

Joints of fire-rated gypsum board enclosures shall be, closed and sealed in accordance with UL-05 requirements and as required to meet pressurization requirements. Penetrations through rated partitions and ceilings shall be sealed tight with rated fire stopping materials. Fire ratings shall be as indicated.

3.7.1.3 QUALIFICATIONS

3.7.1.3.1 Manufacturer shall specialize in manufacturing the types of material specified and shall have a minimum of 20 years of documented successful experience. Installer shall specialize in the type of gypsum board work required and shall have a minimum of 5 years of documented successful experience.

3.7.1.4 DELIVERY, STORAGE AND HANDLING

3.7.1.4.1 Materials shall be delivered in original containers bearing the name of manufacturer, contents, and brand name. Materials shall be stored off the ground in a weather tight structure for protection. Gypsum boards shall be stacked flat, off floor and supported to prevent sagging and warpage. Adhesives and joint materials shall be stored in accordance with manufacturer's printed instructions. Damaged or deteriorated materials shall be removed from jobsite.

3.7.1.5 ENVIRONMENTAL CONDITIONS

3.7.1.5.1 Environmental conditions for application and finishing of gypsum board shall be in accordance with ASTM C840. During the application of gypsum board without adhesive, a room temperature of not less than 4 degrees C (40 degrees F) shall be maintained. During the application of gypsum board with adhesive, a room temperature of not less than 10 degrees C (50 degrees F) shall be maintained for 48 hours prior to application and continuously afterwards until completely dry. Building spaces shall be ventilated to remove water not required for drying joint treatment materials. Drafts shall be avoided during dry hot weather to prevent materials from drying too rapidly.

3.7.2 MATERIALS

3.7.2.1 GYPSUM BOARD

Gypsum board shall have square-cut ends, tapered or beveled edges and shall be maximum possible length.

3.7.2.1.1 Standard Gypsum Board

Regular gypsum board shall conform to ASTM C1396 and shall be 1200 mm (48 inches) wide.

3.7.2.1.2 Fire-Rated Gypsum Board

Fire-rated gypsum board shall conform to ASTM C1396, and shall be Type X, 1200 mm (48 inches) wide.

3.7.2.1.3 Water-Resistant Gypsum Board

Water-resistant gypsum board shall conform to ASTM C630, regular or Type X, with water-resistant paper faces, paintable surfaces, and shall be 1200 mm (48 inch) width and maximum permissible length.

3.7.2.2 ACCESSORIES

3.7.2.2.1 Taping and Embedding Compound

Taping and embedding compound shall conform to ASTM C475. Compound shall be specifically formulated and manufactured for use in embedding tape at gypsum wallboard joints and fastener heads and shall be compatible with tape and substrate.

3.7.2.2.2 Finishing or Topping Compound

Finishing or topping compound shall conform to ASTM C475. Compound shall be specifically formulated and manufactured for use as a finishing compound for gypsum board.

3.7.2.2.3 All-Purpose Compound

All-purpose compound shall be specifically formulated and manufactured to use as a taping and finishing compound and shall be compatible with tape and substrate.

3.7.2.2.4 Joint Tape

Joint tape shall conform to ASTM C475 and shall be as recommended by gypsum board manufacturer.

3.7.2.2.5 Nails

Nails shall conform to ASTM C514. Nails shall be hard-drawn low or medium-low Carbon steel, suitable for intended use. Special nails for pre-decorated gypsum board shall be as recommended by pre-decorated gypsum board manufacturer.

3.7.2.2.6 Screws

Screws shall conform to ASTM C1002. Screws shall be self-drilling and self-tapping steel. Type G for gypsum board to gypsum board, Type S for wood or light-gauge steel framing, Type W for wood framing.

3.7.2.2.7 Adhesives

Adhesives shall conform to ASTM C557. Adhesives shall be formulated to bond gypsum board to wood framing members. For securing gypsum board to metal framing, adhesive shall be as recommended by gypsum board manufacturer.

3.7.3 EXECUTION

3.7.3.1 APPLICATION OF GYPSUM BOARD

A. Gypsum board shall be installed in accordance with ASTM C840 and as specified.

B. Edges and ends of gypsum boards shall be cut to obtain neat fitting joints.

C. End joints of adjoining boards shall be staggered and shall be staggered on opposite sides of wall. Boards shall be applied with moderate contact without forcing in place. Holes for pipes, fixtures or other small openings shall be cut with a tool which will provide a neat fit. Screws shall be driven so that the heads are slightly below the plane of paper face. Fracturing the paper face or damaging the core shall be avoided. Trim shall be installed at external and internal angles formed by the intersecting gypsum board surfaces with other surfaces. Corner beads shall be installed to vertical and horizontal corners in accordance with manufacturer's published instructions.

3.7.3.1.1 Two-Ply Gypsum Board

Second layer of gypsum board shall be applied perpendicular to first layer with joints staggered and secured with mechanical fasteners and adhesive. The use of adhesive shall be in accordance with ASTM C840.

3.7.3.1.2 Adhesively Applied Gypsum Board

Walls scheduled to receive adhesively applied gypsum board shall be dry, free of dust, oil, or form release agents, protrusions or voids, or foreign matter that would affect a proper bond.

3.7.3.2 TAPING AND FINISHING

Gypsum board taping and finishing shall be performed in accordance with ASTM C840. Boards shall be kept free of dirt, oil and other foreign matter that could cause a lack of bond. Screw heads, dents, gouges, and cut-outs shall be filled with joint compound and sanded. Accessories at exposed joints, edges, corners, openings, and similar locations hall be taped, floated with joint compound, and sanded to produce surfaces ready for gypsum board finishes.

3.7.3.3 FIRE-RESISTANT ASSEMBLIES

Gypsum wallboard construction for fire-rated assemblies shall be in accordance with UL-05, GA 600 for the design number indicated on drawings.

3.7.3.4 PATCHING

Surface defects and damage shall be corrected as required to leave gypsum board smooth, uniform in appearance, and ready to receive finish as specified.

END OF SECTION

3.8 ROUGH CARPENTRY

3.8.1 GENERAL

3.8.1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN FOREST AND PAPER ASSOCIATION (AFPA)

AFPA-T901, (2023), National Design Specification for Wood Construction AFPA WCD1, (2021), Manual for Wood Frame Construction

APA THE ENGINEERED WOOD ASSOCIATION (APA)

APA E445, (2023), Performance Standards and Policies for Structural-Use Panels

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A307, (2023), Carbon Steel Bolts and Studs, 60 200 PSI Tensile Strength
ASTM C518, (2021), Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus ASTM C553, (2019), Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications
ASTM C665, (2023), Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing
ASTM C764, (2019), Mineral Fiber Loose-Fill Thermal Insulation
ASTM C1136, (2023), Flexible, Low Permeance Vapor Retarders for Thermal Insulation ASTM D2898, (2024), Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing
ASTM E84, (2024), Surface Burning Characteristics of Building Materials ASTM E96, (2024), Water Vapor Transmission of Materials
ASTM E154, (2021), Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover
ASTM F547, (2022), Definitions of Terms Relating to Nails for Use with Wood and Wood-Base Materials

AMERICAN WOOD-PRESERVERS' ASSOCIATION (AWPA)

AWPA U1, (2024), Lumber, Timber, Bridge Ties and Mine Ties - Preservative Treatment by Pressure Processes
AWPA C9, (2009), Plywood - Preservative Treatment by Pressure Processes AWPA C20, (2023), Structural Lumber Fire-Retardant Pressure Treatment AWPA C27, (2023), Plywood - Fire-Retardant Pressure Treatment
AWPA M4, (2023), Standard for the Care of Preservative-Treated Wood Products
AWPA P5, (2023) Standards for Waterborne Preservatives

DEPARTMENT OF COMMERCE (DOC)

DOC PS 1, (2019), Construction and Industrial Plywood
DOC PS 2, (2019), Performance Standards for Wood-Based Structural-Use Panels

FACTORY MUTUAL ENGINEERING AND RESEARCH (FM)

FM 1-49, (2021), Data Sheet 1-49 Perimeter Flashing SOUTHERN PINE

INSPECTION BUREAU (SPIB)

SPIB-101, (2021), Standard Grading Rules for Southern Pine Lumber WEST COAST

LUMBER INSPECTION BUREAU (WCLIB)

WCLIB Std 17, (2022), Grading Rules for West Coast Lumber WESTERN WOOD

PRODUCTS ASSOCIATION (WWPA)

WWPA-01, (2011; Supple Nos. 1, 2, and 3), Western Lumber Grading Rules

3.8.1.2 Delivery and Storage

Materials shall be delivered to the site in undamaged condition. Stored off ground in fully covered, well-ventilated areas, and protected from extreme changes in temperature and humidity.

3.8.2 PRODUCTS

3.8.2.1 LUMBER AND SHEATHING

3.8.2.1.1 Grading and Marking 3.8.2.1.1.1. Lumber Products
Solid sawn and finger-jointed lumber shall bear an authorized grade stamp or grade mark recognized by ALSC, or an ALSC recognized certification stamp, mark, or hammer brand. Surfaces that are to be exposed to view shall not bear grade marks, stamps, or any type of identifying mark. Hammer marking will be permitted on timbers when all surfaces will be exposed to view.

3.8.2.1.2 Plywood and other Sheathing Products
Materials shall bear the grade mark or other identifying marks indicating grades of material and rules or standards under which produced, including requirements for qualifications and authority of the inspection organization. Except for plywood and structural-use panels, bundle marking will be permitted in lieu of marking each individual piece. Surfaces that are to be exposed to view shall not bear grade marks or other types of identifying marks.

3.8.2.2 Sizes

Lumber and material sizes shall conform to requirements of the rules or standards under which produced. Unless otherwise specified, lumber shall be surfaced on four sides. Unless otherwise specified, sizes indicated are nominal sizes, and actual sizes shall be within manufacturing tolerances allowed by the standard under which the product is produced.

3.8.2.3 Treatment

Exposed areas of treated wood that are cut or drilled after treatment shall receive a field treatment in accordance with AWPA M4. Items of all-heart material of cedar, cypress, or redwood will not require preservative treatment, except when in direct contact with soil. Except as specified for all-heart material of the previously mentioned species, the following items shall be treated:

a. Wood members in contact with or within 455 mm (18 inches) of soil.
b. Wood members in contact with water.
c. Wood members in contact with concrete that is in contact with soil or water or that is exposed to weather.

3.8.2.4 Lumber And Timbers

Lumber and timbers shall be treated in accordance with AWPA U1 with waterborne preservatives listed in AWPA P5 to a retention level as follows:

a. 4 kg per cubic meter (0.25 pcf) (0.25 pcf) intended for above ground use.
b. 6.4 kg per cubic meter (0.40 pcf) (0.40 pcf) intended for ground contact and freshwater use.

3.8.2.5 Plywood

Plywood shall be treated in accordance with AWPA C9 with waterborne preservatives listed in AWPA P5 to a retention level as follows:

a. 4 kg per cubic meter (0.25 pcf) intended for above ground use.
b. 6.4 kg per cubic meter (0.40 pcf) intended for ground contact and freshwater use.

3.8.2.6 Moisture Content

At the time, lumber and other materials are delivered and when installed in the work their moisture content shall be as follows:

a. Treated and Untreated Lumber Except Roof Planking:
    - 120 mm (4 inches) or less, nominal thickness, 19 percent maximum.
    - 125 mm (5 inches) or more, nominal thickness, 23 percent maximum in a 75 mm (3 inch) perimeter of the timber cross-section.
b. Roof Planking: 15 percent maximum.
c. Materials Other Than Lumber: In accordance with standard under which product is produced.

3.8.2.7 Fire-Retardant Treatment

Fire-retardant treated wood shall be pressure treated in accordance with AWPA C20 for lumber and AWPA C27 for plywood. Material use shall be defined in AWPA C20 and AWPA C27 for Interior Type A and B and Exterior Type. Treatment and performance inspection shall be by an independent and qualified testing agency that establishes performance ratings. Each piece or bundle of treated material shall bear identification of the testing agency to indicate performance in accordance with such rating. Treated materials to be exposed to rain wetting shall be subjected to an accelerated weathering technique in accordance with ASTM D2898 prior to being tested for compliance with AWPA C20 or AWPA C27.

3.8.2.8 Structural Wood Members

Species and grades shall be as listed in AFPA-T921. Design of members and fastenings shall conform to AITC-21. Other stress graded or dimensioned items such as blocking, carriages, and studs shall be standard or No. 2 grade except that studs may be Stud grade.

3.8.2.9 Sheathing

Sheathing shall be gypsum board, (see section 3.6) plywood, or wood for wall sheathing, plywood or wood for roof sheathing.

3.8.2.10 Plywood

Plywood shall conform to DOC PS 1, APA E445 or DOC PS 2, Grade C-D with exterior glue. Sheathing for roof and walls without corner bracing of framing shall have a span rating of 16/0 or greater for supports 420 mm (16 inches) on center and a span rating of 24/0 or greater for supports 620 mm (24 inches) on center.

3.8.2.11 Wood

Species and grade shall be in accordance with TABLE I at the end of this section. Wall sheathing shall be 25 mm (1 inch) thick for supports 420 or 620 mm (16 or 24 inches) on center without corner bracing of framing provided sheathing is applied diagonally. Roof sheathing shall be 25 mm (1 inch) thick for supports 420 or 620 mm (16 or 24 inches) on center.

3.8.2.12 Miscellaneous Wood Members

3.8.2.12.1 Nonstress Graded Members

Members shall include bridging, corner bracing, furring, grounds, and nailing strips. Members shall be in accordance with TABLE I for the species used. Sizes shall be as follows unless otherwise shown:

Member	Size mm (inch)
Bridging	25 by 75 (1 by 3) or 25 by 100 (1 by 4) for use between members 50 by 300 (2 by 12) and smaller; 50 by 100 (2 by 4) for use between members larger than 50 by 300 (2 by 12).
Corner bracing	25 by 100 (1 by 4).
Furring	25 (1) by 50 (2) or 75 (3)
Grounds	Plaster thickness by 38.
Nailing strips	25 by 75 (1 by 3) or 25 by 100 (1 by 4) when used as shingle base or interior finish, otherwise 50 mm (2 inch) stock.

Member	Size (inch)
Bridging	1 by 3 or 1 by 4 for use between members 2 by 12 and smaller; 2 by 4 for use between members larger than 2 by 12.
Corner bracing	1 by 4.
Furring	1 by 2 or 1 by 3.
Grounds	Plaster thickness by 1-1/2.
Nailing strips	1 by 3 or 1 by 4 when used as shingle base or interior finish, otherwise 2-inch stock.

3.8.2.12.2 Wood Bumpers

Bumpers shall be of the species and grade in accordance with TABLE II at the end of this section, size as shown.

3.8.2.12.3 Sill Plates

Sill plates shall be standard or number 2 grade.

3.8.2.12.4 Blocking

Blocking shall be standard or number 2 grade.

3.8.2.12.5 Rough Bucks and Frames

Rough bucks and frames shall be straight standard or number 2 grade.

3.8.2.13 ACCESSORIES AND NAILS

Markings shall identify both the strength grade and the manufacturer. Accessories and nails shall conform to the following:

3.8.2.13.1 Anchor Bolts

ASTM A307, size as indicated, complete with nuts and washers.

3.8.2.13.2 Bolts: Lag, Toggle, and Miscellaneous Bolts and Screws

Type, size, and finish best suited for intended use. Finish options include zinc compounds, cadmium, and aluminum paint impregnated finishes.

3.8.2.13.3 Clip Angles

Steel, 5 mm (3/16 inch) (3/16 inch) thick, size best suited for intended use; or zinc-coated steel or iron commercial clips designed for connecting wood members.

3.8.2.13.4 Expansion Shields

Type and size best suited for intended use.

3.8.2.13.5 Joist Hangers

Steel or iron, zinc-coated, size to fit members where used, sufficient strength to develop the full strength of supported member, complete with any special nails required.

3.7.2.13.6 Metal Bridging

Optional to wood bridging; zinc-coated steel, size and design to provide rigidity equivalent to specified wood bridging.

3.8.2.14 Nails and Staples

ASTM F547, size and type best suited for purpose; staples shall be as recommended by the manufacturer of the materials to be joined. For sheathing and subflooring, length of nails shall be sufficient to extend 25 mm (1 inch) into supports. In general, 8-penny or larger nails shall be used for nailing through 25 mm (1 inch) thick lumber and for toe nailing 50 mm (2 inch) thick lumber; 16-penny or larger nails shall be used for nailing through 50 mm (2 inch) thick lumber. Nails used with treated lumber and sheathing shall be galvanized. Nailing shall be in accordance with the recommended nailing schedule contained in AFPA WCD1. Where detailed nailing requirements are not specified, nail size and spacing shall be sufficient to develop an adequate strength for the connection. The connection's strength shall be verified against the nail capacity tables in AFPA-T921. Reasonable judgement backed by experience shall ensure that the designed connection will not cause the wood to

split. If a load situation exceeds a reasonable limit for nails, a specialized connector shall be used.

3.8.3 INSULATION

Thermal resistance of insulation shall be not less than the R-values shown. R-values shall be determined at 24 degrees C (75 degrees F) in accordance with ASTM C518. Insulation shall contain the highest practicable percentage of recovered material which has been recovered or diverted from solid waste, but not including material reused in a manufacturing process. Where two materials have the same price and performance, the one containing the higher recovered material content shall be provided. Insulation shall be the standard product of a manufacturer and factory marked or identified with manufacturer's name or trademark and R-value. Identification shall be on individual pieces or individual packages. Materials containing more than one percent asbestos will not be allowed.

3.8.3.1 Batt or Blanket

3.8.3.1.1 Glass Fiber Batts and Rolls

Glass fiber batts and rolls shall conform to ASTM C665, Type I unfaced insulation or Type II Kraft faced insulation or Type III foil faced insulation, Class A or B, having a UL rating of 25 or 50 and a smoke developed rating of 150 or less when tested in accordance with ASTM E84. Insulation shall have a 0.25 mm (20 mil) thick, white, puncture resistant woven-glass cloth with vinyl facing on one side. Width and length shall suit construction conditions.

3.8.3.1.2 Mineral Fiber Batt

Mineral fiber batt shall conform to ASTM C665, Type I unfaced insulation or Type II Kraft faced insulation, Class C or Type III foil faced insulation Class C.

3.8.3.1.3 Mineral Fiber Blanket

Mineral fiber blanket shall conform to ASTM C553, Type I, Class 6. Blankets shall be sized to suit construction conditions, resilient type for use below and above ambient temperature to 195 degrees C. (350 degrees F). Blankets shall have a factory applied vapor-barrier facing on one side with 50 mm (2 inch) nailing tabs on both edges. Vapor barriers shall be fire retardant, high vapor transmission, and aluminum foil laminated to crepe paper type conforming to ASTM C2136, Type II. Nominal density shall be 12 kg per cubic meter. (0.75 pcf.)

3.8.3.2 Loose Fill or Granular Fill

3.8.3.2.1 Mineral Fiber

Mineral fiber shall conform to ASTM C764, Type I. Blown-in mineral fiber insulation shall conform to ASTM C764, Type I, Category 1, one percent or less loss on ignition.

3.8.3.2 Vapor Retarder

Vapor retarder shall be polyethylene sheeting conforming to ASTM E154 or other equivalent material. Vapor retarder shall have a maximum vapor permeance rating of 29 ng per Paper second per square meter (0.5 perms) (0.5 perms) as determined in accordance with ASTM E96, unless otherwise specified.

3.8.4 EXECUTION

3.8.4.1 INSTALLATION OF FRAMING

3.8.4.1.1 General

Members shall be closely fitted, accurately set to required lines and levels, and rigidly secured in place. Members shall be framed for passage of ducts. Members shall be cut, notched, or bored in accordance with applicable requirements of AFPA-T921 for the passage of pipes, wires, or conduits.

Rafters, purlins, and joists shall be set with crown edge up. Framing shall be kept at least 50 mm (2 inches) away from chimneys and 120 mm (4 inches) away from fireplace back walls. When joists, beams, and girders are placed on masonry or concrete, a wood base plate shall be positioned and leveled with grout. The joist, beam, or girder shall then be placed on the plate. When joists, beams, and girders are set into masonry or concrete, a pocket shall be formed into the wall. The joist, beam, or girder shall then be placed into the pocket and leveled with a steel shim.

3.8.4.1.2 Structural Members

Members shall be adequately braced before erection. Members shall be aligned, and all connections completed before removal of bracing. Individually wrapped members shall be unwrapped only after adequate protection by a roof or other cover has been provided. Scratches and abrasions of factory-applied sealer shall be treated with two brush coats of the same sealer used at the factory.

3.8.4.1.3 Partition and Wall Framing

Unless otherwise shown, studs shall be spaced 16 inches on center. Studs shall be doubled at openings. Unless otherwise indicated, headers for openings shall be made of two pieces of stud material set on edge or solid lumber of equivalent size, and corners shall be constructed of not less than three full members. End studs of partitions abutting concrete or masonry shall be anchored thereto with expansion

bolts, one near each end of each stud and at intermediate intervals of not more than 1220 mm. (4 feet.) Plates of partitions resting on concrete floors shall be anchored in place with expansion bolts, one near each end of each piece and at intermediate intervals of not more than 1820 mm (6 feet) between bolts. In lieu of expansion bolts, anchoring into concrete may be accomplished with powder-driven threaded studs of suitable type and size and spaced at 920 mm (3 feet) on center. Walls and load bearing partitions shall be provided with double top plates with members lapped at least 620 mm (2 feet) and well spiked together.

3.8.4.1.4 Floor (Ceiling) Framing

Except where otherwise indicated joists shall have bearings not less than 120 mm (4 inches) on concrete or masonry and 40 mm (1-1/2 inches) on wood or metal. Joists, trimmers, headers, and beams framing into carrying members at the same relative levels shall be carried on joist hangers. Joists shall be lapped and spiked together at bearings or butted end-to-end with scab ties at joint and spiked to plates. Openings in floors shall be framed with headers and trimmers. Headers carrying more than two tail joists and trimmers supporting headers carrying more than one tail joist shall be doubled, unless otherwise indicated. Joists shall be doubled under partitions parallel with floor joists. Joists built into masonry shall be provided with a beveled fire cut so that the top of the joist does not enter the wall more than 25 mm (1 inch) or [standard steel wall bearing boxes. Engineered wood joists shall be installed in accordance with distributor's instructions.

3.8.4.1.5 Roof Framing or Rafters

Tops of supports or rafters shall form a true plane. Valley, ridge, and hip members shall be of depth equal to cut on rafters here practicable, but in no case less than depth of rafters. Valleys, hips, and ridges shall be straight and true intersections of roof planes. Necessary crickets and watersheds shall be formed. Rafters, except hip and valley rafters, shall be spiked to wall plate and to ceiling joints with no less than three 8-penny nails or bolted by angles. Rafters shall be toe-nailed to ridge, valley, or hip members with at least three 8-penny nails. Rafters shall be braced to prevent movement until permanent bracing, decking or sheathing is installed. Hip and valley rafters shall be secured to wall plates by clip angles. Openings in roof shall be framed with headers and trimmers. Unless otherwise indicated, headers carrying more than two rafters and trimmers supporting headers carrying more than one rafter shall be double. Hip rafters longer than the available lumber shall be butt jointed and scabbed. Valley rafters longer than the available lumber shall be double, with pieces lapped not less than 1220 mm (4 feet) and well spiked together. Trussed rafters shall be installed in accordance with TPI 85. Engineered wood joists shall be installed in accordance with distributors instructions.

3.8.4.2 INSTALLATION OF SHEATHING

3.8.4.2.1 Gypsum Board

Sheathing shall be applied with edges in light contact at joints and nailed in accordance with the manufacturer's approved instructions. Sheets 620 mm (2 feet) wide shall be applied horizontally with tongued edge up, with vertical joints over supports, and with vertical joints staggered. Sheets 1220 mm (4 feet) wide shall be applied vertically, extended over top and bottom plates, and with all vertical and horizontal joints over supports.

3.8.4.2.2 Plywood and Structural-Use Panels

Sheathing shall be applied with edges 3 mm (1/8 inch) apart at side and end joints and nailed at supported edges at 150 mm (6 inches) on center and at intermediate supports 320 mm (12 inches) on center unless otherwise shown. Nailing of edges shall be 20 mm (3/8 inch) from the edges. Wall sheathing shall extend over top and bottom plates, and if applied horizontally the vertical joints shall be made over supports and staggered. Wall sheathing over which wood shingles are to be applied shall be applied horizontally. Roof sheathing shall be applied with long dimension at right angles to supports, end joints made over supports, and end joints staggered.

3.8.4.2.3 Wood

Sheathing end joints shall be made over framing members and so alternated that there will be at least two boards between joints on the same support. Each board shall bear on at least three supports. Boards shall be nailed at each support using two nails for boards 150 mm (6 inches) and less in width and three nails for boards more than 150 mm (6 inches) in width. Roof sheathing shall not be installed where roof decking is installed.

3.8.4.3 INSTALLATION OF MISCELLANEOUS WOOD MEMBERS

3.8.4.3.1 Bridging

Wood bridging shall have ends accurately bevel-cut to afford firm contact and shall be nailed at each end with two nails. Metal bridging shall be installed as recommended by the manufacturer. The lower ends of bridging shall be driven up tight and secured after subflooring or roof sheathing has been laid and partition framing installed.

3.8.4.3.2 Corner Bracing

Corner bracing shall be installed when required by type of sheathing used or when siding, other than panel siding, is applied directly to studs. Corner bracing shall be let into the exterior surfaces of the studs at an angle of approximately 45 degrees, shall extend completely over wall plates, and shall be secured at each bearing with two nails.

3.8.4.3.3 Blocking

Blocking shall be provided as necessary for application of siding, sheathing, subflooring, wallboard, and other materials or building items, and to provide firestopping. Blocking for firestopping shall ensure a maximum dimension of 2420 mm (8 feet) for any concealed space. Blocking shall be cut to fit between framing members and rigidly nailed thereto.

3.8.4.3.4 Nailers and Nailing Strips

Nailers and nailing strips shall be provided as necessary for the attachment of finish materials. Nailers used in conjunction with roof deck installation shall be installed flush with the roof deck system. Stacked nailers shall be assembled with spikes or nails spaced not more than 450 mm (18 inches) on center and staggered. Beginning and ending nails shall not be more than 150 mm (6 inches) for nailer end. Ends of stacked nailers shall be offset approximately 320 mm (12 inches) in long runs and alternated at corners. Anchors shall extend through the entire thickness of the nailer. Strips shall be run in lengths, if practicable, butt jointed, cut into wood framing members when necessary, and rigidly secured in place. Nailers and nailer installation for Factory Mutual wind uplift rated roof systems specified in other Sections of these specifications shall conform to FM 1-49.

3.8.4.3.5 Wood Grounds

Wood grounds shall be provided as necessary for attachment of trim, finish, and other work to plaster. Grounds shall be run in lengths, if practicable, butt jointed, and rigidly secured in place.

3.8.4.3.6 Furring Strips

Furring strips shall be provided at the locations shown. Furring strips shall be installed at 420 mm (16 inches) on center unless otherwise shown, run in lengths, if practicable, butt jointed and rigidly secured in place.

3.8.4.3.7 Rough Bucks and Frames

Rough bucks shall be set straight, true, and plumb, and secured with anchors near top and bottom of each wood member and at intermediate intervals of not more than 920 mm (3 feet.) Anchors for concrete shall be expansion bolts, and anchors for masonry shall be 5 x 32 mm (3/16 x 1-1/4 inch) (3/16 x 1-1/4 inch) steel straps extending not less than 220 mm (8 inches) into the masonry and turned down 50 mm (2 inches) into the masonry.

3.8.4.3.8 Wood Bumpers

Wood bumpers shall be bored, countersunk and securely bolted in place.

3.8.4.3.9 Sill Plates

Sill plates shall be set level and square, and anchor bolted at not more than 1820 mm (6 feet) on centers and not more than 320 mm (12 inches) from end of each piece. A minimum of two anchors shall be used for each piece.

3.8.4 INSTALLATION OF INSULATION

Insulation shall be installed after construction has advanced to a point that the installed insulation will not be damaged by remaining work. For thermal insulation the actual installed thickness shall provide the thermal resistance (R-values) shown. For acoustical insulation the installed thickness shall be as shown. Insulation shall be installed on the weather side of such items as electrical boxes and water lines. Unless otherwise specified, installation shall be in accordance with the manufacturer's recommendation.

TABLE I. SPECIES AND GRADE

ROOF SHEATHING, WALL SHEATHING, FURRING

Grading Rules	Species	Construction Standard	No. 2 Comm	No. 2 Board Comm	No. 3 Comm
NHLA-21	Cypress			X	
NELMA-21	Northern White Cedar				X
	Eastern White Pine	X			
	Northern Pine	X			
	Balsam Fir				X
	Eastern Hemlock- Tamarack				X
CRA-RIS-21-SS	Redwood		X		
SCMA-21	Cypress			X	
SPIB-2121	Southern Pine		X		
WCLIB STD 17	Douglas Fir-Larch	X			
	Hem-Fir	X			
	Sitka Spruce	X			
	Mountain Hemlock	X			
	Western Cedar	X			
WWPA-21	Douglas Fir-Larch	X			
	Hem-Fir	X			
	Idaho White Pine	X			
	Lodgepole Pine			X	

ROOF SHEATHING, WALL SHEATHING, FURRING

Grading Rules	Species	Construction Standard	No. 2 Comm	No. 2 Board Comm	No. 3 Comm
	Ponderosa Pine			X	
	Sugar Pine			X	
	Douglas Fir South			X	
	Mountain Hemlock			X	
	Subalpine Fir			X	
	Western Cedar			X	

TABLE II. SPECIES AND GRADE

WOOD BUMPERS

Grading Rules	Species	No. 1 Comm	No. 2 Comm
NHLA-21	Red Oak	X	
NELMA- 21	Northern Pine		X
	Eastern Hemlock- Tamarack		X
SPIB-2121	Southern Pine	X	
WCLIB STD 17	Douglas Fir-Larch		X
	Hem-Fir		X
WWPA-21	Douglas Fir-Larch		X
	Hem-Fir		X
	Douglas Fir South		X

END OF SECTION

3.9 FINISH CARPENTRY

3.9.1 GENERAL

3.9.1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM F547, (2006; R 2212) Definitions of Terms Relating to Nails for Use with Wood and Wood-Base Materials

AMERICAN WOOD-PRESERVERS' ASSOCIATION (AWPA)

AWPA C9, (2012) Plywood - Preservative Treatment by Pressure Processes AWPA P5, (2014) Standards for Waterborne Preservatives

SOUTHERN PINE INSPECTION BUREAU (SPIB)

SPIB-1203, (2002) Standard Grading Rules for Southern Pine Lumber WEST

COAST LUMBER INSPECTION BUREAU (WCLIB)

WCLIB Std 17, (2004) Grading Rules for West Coast Lumber WESTERN WOOD

PRODUCTS ASSOCIATION (WWPA)

WWPA-21, (2011; Supple Nos. 1, 2, and 3) Western Lumber Grading Rules 95

3.9.1.2 DELIVERY AND STORAGE

Materials shall be delivered to the site in undamaged condition. Stored off ground in fully covered, well-ventilated areas, and protected from extreme changes in temperature and humidity.

3.9.2 PRODUCTS

3.9.2.1 WOOD ITEMS, SIDING, AND TRIM

The Contractor shall furnish products which optimize design by reducing the amount of wood used (engineered wood), or recycled wood products, and preservatives without arsenic or chromium when the products and methods are competitive in price or directed by the Contracting Officer.

3.9.2.2 Grading and Marking

Materials shall bear the grade mark, stamp or other identifying marks indicating grades of material and rules or standards under which produced. Such identifying marks on a material shall be in accordance with the rule or standard under which the material is produced, including requirements for qualifications and authority of the inspection organization, usage of authorized identification, and information included in the identification. The inspection agency for lumber shall be certified by the Board of Review, American Lumber Standards Committee, to grade the species used. Except for plywood, structural-use panels, and lumber, bundle marking will be permitted in lieu of marking each individual piece. Surfaces that are to be architecturally exposed to view shall not bear grade marks, stamps, or other types of identifying marks.

3.9.2.3 Sizes and Patterns

Lumber sizes and patterns shall conform to rules or standards under which produced. Unless otherwise specified, lumber shall be surfaced on four sides. Sizes and patterns for materials other than lumber shall conform to requirements of the rules or standards under which produced. Size references, unless otherwise specified, are nominal sizes, and actual sizes shall be within manufacturing tolerances allowed by the standard under which the product is produced.

3.9.2.4 Moisture Content

The maximum moisture content of untreated trim and wood siding shall be 15 percent at the time of delivery to the jobsite and when installed. Moisture content of all other material shall be in accordance with the standard under which the product is produced.

3.9.2.5 Preservative Treatment

3.9.2.5.1 Plywood

Plywood shall be treated in accordance with AWPA C9 with waterborne preservatives listed in AWPA P5 to a retention level as follows:

3.9.2.5.1.1 4 kg per cubic meter (0.25 pcf) intended for above ground use.

3.9.2.5.1.2 6.4 kg per cubic meter (0.4 pcf) intended for ground contact and freshwater use.

3.9.2.5.2 Fascias and Trim 3.9.2.5.2.1 Wood

Fascia and trim, including exterior door and window casing, shall be species and grade listed in TABLE I at the end of this section. Sizes shall be as indicated. Metal corners may be furnished in lieu of wood corner boards for horizontal siding; and if furnished, shall be galvanized steel and primed or aluminum and primed.

3.9.2.5.2.2 Vinyl

Vinyl trim, including exterior door and window casing and moldings, shall meet the pertinent requirements specified for vinyl siding and soffits.

3.9.2.5.2.3 Moldings

Moldings shall be of the pattern indicated and shall be of a grade compatible with the finish specified.

3.9.2.6 NAILS

Nails shall be the size and type best suited for the purpose and shall conform to ASTM F547. Nails shall be hot dip galvanized or aluminum when used on exterior work. For siding, length of nails shall be sufficient to extend 40 mm (1-1/2 inches) into supports, including wood sheathing over framing. Screws for use where nailing is impractical shall be size best suited for purpose.

3.9.3 EXECUTION

3.9.3.1 GENERAL

3.9.3.1.1. MOLDING AND INTERIOR TRIM

Molding and interior trim shall be installed straight, plumb, level and with closely fitted joints. Exposed surfaces shall be machine sanded at the mill. Molded work shall be coped at returns and interior angles and mitered at external corners. Intersections of flatwork shall be shouldered to ease any inherent changes in plane. Window and door trim shall be provided in single lengths. Blind nailing shall be used to the extent practicable, and face nailing shall be set and stopped with a non-staining putty to match the finish applied. Screws shall be used for attachment to metal; setting and stopping of screws shall be of the same quality as required where nails are used.

TABLE I. SPECIES AND GRADE TABLE

Grading Rules	Species	Choice	Clear	C & C Select	Better
NELMA-21	Eastern Cedar		X		
	Eastern Hemlock		X		
	Tamarack			X	
	Eastern White Pine			X	
	Northern Pine			X	
	Eastern Spruce			X	
	Balsam Fir		X		
CRA-RIS-21-SS	Redwood		X		
SCMA-21	Cypress		X		
SPIB-2121	Southern Pine			X	
WCLIB STD 17	Douglas Fir			X	
	Larch			X	
	Hemlock-Fir			X	
	Mountain Hemlock				X
	Sitka Spruce			X	

Grading Rules	Species	Choice	Clear	C & C Select	Better
WWPA-21	Douglas Fir		X		
	Larch		X		
	Hemlock-Fir		X		
	Mountain Hemlock				X
	Western Larch				X
	Idaho White Pine	X			
	Lodgepole Pine				X
	Ponderosa Pine				X
	Sugar Pine				X
	Englemann Spruce				X
	Douglas Fir South				X
	Subalpine Fir				X

NOTE 1: Western Cedar under WCLIB Std 17 shall be Grade B; and under WWPA- 21, Western Cedar shall be Grade A for trim.

NOTE 2: Interior trim shall be any one of the species listed above and the highest grade of the species for stain or natural finish and one grade below highest grade of species for paint finish.

END OF SECTION

3.10 EPOXY COATINGS

3.10.1 GENERAL

3.10.1.1 SUMMARY

Provide high performance coatings.

3.10.1.2 SUBMITTALS

3.10.1.2.1 Product Data: Submit manufacturer's product data and installation instructions for each material and product used.

3.10.1.2.2 Samples: Submit two representative samples of each material specified indicating visual characteristics and finish. Include range samples if variation of finish is anticipated.

3.10.1.2.3 Extra Stock: Provide two unopened gallons of each coating and color used in the project.

3.10.1.3 QUALITY ASSURANCE

3.10.1.3.1 Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

3.10.1.3.2 Regulations: Compliance with VOC and environmental regulations.

3.10.1.3.3 Mock-Ups: Provide mock-up as required to demonstrate quality of workmanship. Provide 4-foot x 4-foot mock-ups of each type of surface.

3.10.2 PRODUCTS

3.10.2.1 MATERIALS

Manufacturers: Carboline, DuPont, Tnemec, Sherwin Williams or approved equal. Provide first-line commercial-quality products for all special coating systems.

3.10.3 EXECUTION

3.10.3.1 INSTALLATION

A. Inspect surfaces, report unsatisfactory conditions in writing; beginning work means acceptance of substrate.
B. Comply with manufacturer's instructions and recommendations for preparation, priming and coating installation work including concrete patching and joint fillers. Coordinate with work of other sections.

C. At existing areas to be repainted, remove blistered or peeling paint to sound substrates. Remove chalk deposits, mildew, and wash all surfaces with mild detergent. Perform related minor preparation including caulk and glazing compounds. Spot prime bare areas before priming and painting as specified.

D. Match approved mock-ups for color, texture, and pattern. Re-coat or remove and replace work, which does not match or shows loss of adhesion. Clean up, touch up and protect work.

3.10.3.2 ONE COAT AND TWO COAT EPOXY SYSTEM

Surfaces to receive a one and two Epoxy system shall be a water-based Epoxy floor coating having a two – component Polyamine-Epoxy with chemical and abrasion resistance that is breathable. Wet mils thickness shall be 6-9 mils per coat. Provide anti-slip additive in accordance with manufacturer.

3.10.3.3 THREE COAT EPOXY SYSTEM

A. First coat is an epoxy system having a high solid, multi –purpose epoxy resin formulated to function as a primer, binder for aggregate. Wet film thickness 12-18 mils.
B. Second and third coat is an ultra-high solids aliphatic urethane. Wet film thickness 4-6 mils. Provide anti-slip additive in accordance with manufacturer.

END OF SECTION

3.11 FLOOR TREATMENT / PROTECTIVE COATING SEALER

3.11.1 GENERAL

3.11.1.1 SECTION REQUIREMENTS

3.11.1.1.2 SUMMARY

Section Includes: Furnishing of all labor, materials, services and equipment necessary for the supply and installation of a permanent protective coating for concrete masonry or tile substrates, above-grade on the dry side of substrates.

3.11.1.1.3 REFERENCES

Applicable Standards: The following standards are referenced herein.
American Society for Testing and Materials (ASTM C2027, C2028, ASTM F720 & D968-05)

3.11.1.1.4 SYSTEM DESCRIPTION

A. The permanent protective coating is a nano-particle silica-based product that provides a glass-like film over masonry and tile and grout surfaces. The permanent protective coating is applied in liquid form at room temperature. The permanent protective coating protects against wear, mold, staining, efflorescence, water- penetration. This process causes concrete, bricks and mortar to become permanently sealed against the penetration of liquids as it reverses the capillary action of the substrate.

B. The permanent protective coating acts as a barrier to the exterior of concrete, masonry, and tile and grout.

3.11.1.2 SYSTEM PERFORMANCE REQUIREMENTS

3.11.1.2.1 Testing Requirements: The permanent protective coating shall be tested in accordance with the following standards and conditions, and the testing results shall meet or exceed the performance requirements as specified herein.

1. Independent Laboratory: Testing shall be performed by an independent laboratory meeting the requirements of ASTM C2027 (“Standard Test Method for Determining Visible Abrasion Resistance of Glazed Ceramic Tile” and certified by the United States Bureau of Standards. Testing laboratory shall obtain all tile samples.
2. Independent Laboratory: Testing shall be performed by an independent laboratory meeting the requirements of ASTM C2028 “Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the “Horizontal Dynamometer Pull-Meter Method” and certified by the United States Bureau of Standards. Testing laboratory shall obtain all tile samples.
3. Independent laboratory: Testing shall be performed by an independent laboratory

meeting the requirements of Mohs' Scratch Hardness and certified by the United States Bureau of standards. Testing laboratory shall obtain all tile samples.

4. Independent Laboratory: Testing shall be performed by an independent laboratory meeting the requirements of ASTM D968-05 "Standard Test Method for Abrasion Resistance of Organic Coatings by falling abrasive utilizing natural silica sand" and certified by the United States Bureau of Standards. Testing laboratory shall obtain all tile samples.

3.11.1.2.2 SUBMITTALS

1. Product Technical Data Sheet "F20"
2. Material Safety Data Sheet "F20"
3. Samples. Provide three 6-inch square sample of the permanent protective coating installed over new or existing substrate as defined in. "GA"
4. Test Reports: Submit for acceptance, complete test reports from approved independent testing laboratories certifying that coating system conforms to performance characteristics and testing requirements specified herein. "F20"
5. Manufacturer's Certification: Provide certificates signed by manufacturer or Manufacturer's representative certifying that the materials to be installed comply in all respects with the requirements of this specification, and that the applicator is qualified and approved to install the materials in accordance with manufacturer's product data. "F20"
6. Manufacturer's Field Report: Provide copy of report from manufacturer's representative confirming that the surfaces to which waterproofing material is to be applied are in a condition suitable to receive same. "F20"

3.11.1.3 QUALITY ASSURANCE

A. Manufacturer: Provide products of manufacturer with no less than 4 years' experience in manufacturing the silica sealant materials for the required work. Manufacturers that cannot provide the performance test data specified herein will not be considered for the project.
B. Applicator: Floor Coating applicator shall be experienced in the installation of the permanent protective coating as demonstrated by previous successful installations and shall be approved by the manufacturer in writing.
C. Pre-Installation Conference: Prior to installation of waterproofing, conduct meeting with waterproofing applicator, installers of work adjacent to or which penetrates waterproofing, Architect/Engineer, owner's representative, and waterproofing manufacturer's representative to verify and review the following:
    1. Project requirements for waterproofing as set out in Contract Document.
    2. Manufacturer's product data including application instructions.
    3. Substrate conditions and procedures for substrate preparation and waterproofing installation.
D. Technical Consultation: The coating manufacturer's representative shall provide technical consultation on waterproofing application.

E. Compliance: Comply with manufacturer's product data regarding condition of substrate to receive coating, weather conditions before and during installation, and protection of the installed coating system.

3.11.1.4 WARRANTY

A. Manufacturer's Warranty: Manufacturer shall provide standard product warranty executed by authorized company official. Term of warranty shall be 3 years from Date of Substantial Completion.

B. Applicator's Warranty: Applicator shall warrant the coating installation against defects caused by faulty workmanship or materials for a period of 3 years from Date of Substantial Completion. The warranty will cover the surfaces treated and will bind the applicator to repair, at his expense, any and all failures of the treated surfaces which are not due to structural weaknesses or other causes beyond applicator's control such as fire, earthquake, tornado and hurricane. The warranty shall read as follows:

Warranty: The applicator warrants that, upon completion of the work, surfaces treated with the permanent protective coating will be and will remain free from failure resulting from defective workmanship or materials for a period of 3 years from Date of Substantial Completion. In the event, that failure occurs within the warranty period from such causes, the applicator shall, at his sole expense, repair, replace or otherwise correct such defective workmanship or materials. Applicator shall not be liable for consequential damages and applicator's liability shall be limited to repair, replacement or correcting of defective workmanship or materials. Applicator shall have no responsibility with respect to failure or other defects caused by structural failure or movement of the structure, or any other causes beyond Applicator's control.

3.11.2 PRODUCTS

3.11.2.1 Protective Floor Sealant Coating

A. Protective Floor Coating: ASTM C2027, ASTM C2028, ASTM D968-05. Installation: 1.1 to 1.9 mil wet film thickness yielding a 0.3 to 0.8 mil dry film thickness.
B. Wearing Surface: smooth
C. Slip Resistance: Per ASTM C2028, average slip resistance of twelve pulls
   1. Dry , 0.99
   2. Wet,1.3
D. Abrasion Resistance: Per ASTM C2027, # of revolutions
   1. Uncoated, 2120
   2. Coated, 6200
E. Abrasion Resistance: Per ASTM D968-05, Mean Abrasion Resistance (Liters/Mil) Ave Thickness, 0.7594 mils =22.5 (l/m)

F. Mohs' Scratch Hardness 6
(The Mohs' Scratch Hardness Scale runs from 1-Talc to 20-Diamond)

3.11.2.2 MIXES

Coverage: Proportions (by Volume) for example
a. 250 square feet per gallon (Brick, Paver and Concrete)
b. 720 to 1,200 square feet per gallon (Tile & Grout and Painted Concrete)

3.11.2.3 INSTALLATION ACCESSORIES

A. Cleaning Compounds: Provided or approved by flooring manufacturer for applications indicated.
   1. High pH Degreaser
   2. Neutralizing Acid
   3. IPA- Isopropyl Alcohol
B. Protective Masking Barrier:
   1. Plastic, Paper and or Tape

3.11.3 EXECUTION

3.11.3.1 EXAMINATION

3.11.3.1.1 Site Visit: Prior to waterproofing installation, arrange visit to project site with coating manufacturer's representative. Representative shall inspect and certify that surfaces are in acceptable condition to receive treatment.

3.11.3.1.2 Verification of Substrates: Verify that surfaces are sound and clean, and that form release agents, dirt, dust, debris, and other materials are removed.

3.11.3.1.3 Examination for Defects: Examine surfaces to be waterproofed for form tie holes and structural defects such as honeycombing, rock pockets, faulty construction joints and cracks. Such defects to be repaired in accordance with manufacturer's product data.

3.11.3.2 PREPARATION

3.11.3.2.1 Remove fixtures and similar items that are not to be coated. Mask items that cannot be removed. Reinstall items in each area after coating is complete.

3.11.3.2.2 Surface Preparation: Clean and prepare substrates according to ASTM F720. Verify that substrates are dry and free of curing compounds, sealers, and hardeners. Prepare all surfaces in an area before beginning coating in that area. Schedule coating so cleaning operations will not damage newly coated surfaces.

3.11.3.3 APPLICATION

3.11.3.3.1 Apply coatings by brush, roller, spray or other applicators according to coating manufacturer's written instructions. Use brushes or rollers only for exterior coating and where the use of other applicators is not practical.

3.11.3.3.2 Maintain uniformity of floor coating, and install continuously until reaching a point where the wet edge is at the edge of the application area

3.11.3.4 CURING

Drying and Cure Time at 80º F

a. Dry to touch: 4-6 hours
b. Hard Dry (foot use): 8-20 hours
c. Full Cure: 24 hours

3.11.3.5 INTERFACE WITH OTHER MATERIALS

Utilized as a protective wear and chemical barrier over paints (latex, epoxy, urethane, acrylic)

3.11.3.6 PROTECTION

a. Do not allow foot traffic for 8 hours.
b. Do not clean for 24 hours.

3.11.3.7 CLEANING

3.11.3.7.1 Concrete, Bricks and Pavers-Pressure washer held a minimum of 24 inches from surface. Extract water if necessary. Dry with floor fans where required.

3.11.3.7.2 Tile and Grout- Neutral, rinse-less cleaning solution, agitate with soft bristle brush, extract, rinse extract, dry with floor fans.

END OF SECTION

3.12 ASBESTOS ABATEMENT

3.12.1 GENERAL

3.12.1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ASSE Z9.2, (2012) Fundamentals Governing the Design and Operation of Local Exhaust Systems Ventilation System.

ISEA Z87.1, (2015) American National Occupational and Educational Eye and Face Protection

ANSI Z88.2, (2015) American National Standard Practices for Respiratory Protection

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C732, (2006; R 2212) Standard Test Method for Aging Effects of Artificial Weathering on Latex Sealants

ASTM D522/D522M, (2013) Standard Test Methods Bend Test of Attached Organic Coatings

ASTM D1331, (2014) Standard Test Methods for Surface and Interfacial Tension of Solutions of Paints, Solvents, Solutions of Surface-Active Agents and Related Materials.

ASTM D2794, (1993; R 2020) Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)

ASTM D4397, (2020) Standard Specification for Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications

ASTM E84 REV A, (2015) Standard Test Method for Surface Burning Characteristics of Building Materials

ASTM E96/E96M, (2014) Standard Test Methods for Water Vapor Transmission of Materials

ASTM E219, (2014) Standard Test Methods for Fire Tests of Building Construction and Materials

ASTM E736, (2000; R 2011) Standard Test Method for Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members

ASTM E1368, (2014) Standard Practice for Visual Inspection of Asbestos Abatement Projects

CODE OF FEDERAL REGULATIONS (CFR)

CFR 29 Part 1920, (2015) Occupational Safety and Health Standards CFR 29 Part 1926 Safety and Health Regulations for Construction CFR 40 Part 61, National Emission Standards for Hazardous Air Pollutants

CFR 40 Part 763, Asbestos COMPRESSED GAS ASSOCIATION (CGA)

CGA G-7, (2014) Compressed Air for Human Respiration-Seventh Edition CGA

G-7.1, (2011) Commodity Specification for Air-Sixth Edition

ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA 340/1-90-218, (1990) Asbestos/NESHAP Regulated Asbestos Containing Materials Guidance

EPA 340/1-90-219, (1990) Asbestos/NESHAP Adequately Wet Guidance

EPA 560/5-85-024, (1985) Guidance for Controlling Asbestos Containing Materials in Building

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 20, (2013) Standard for Portable Fire Extinguishers NFPA 70, (2014)

National Electrical Code

NFPA 90A, (2015) Standard for the Installation of Air Conditioning and Ventilating Systems-Effective Date 05/19/2214; Incorporating Interpretation 2215

NFPA 211, (2015) Life Safety Code- Effective date 9/31/21

NFPA 721, (2015) Standard Methods of Fire Test for Flame Propagation of Textiles and Films- Effective date 12/1/04

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH)

NIOSH Pub No. 84-120, (1984; Supple 1985, 1987, 1988 & 1990) NIOSH Manual of Analytical Methods

UNDERWRITERS LABORATORIES (UL)

UL 586, (2009) High-Efficiency, Particulate, Air Filter Units UNITED STATES

ARMY CORPS OF ENGINEERS

EP 2120-1-21, (1997) Asbestos Abatement Guidelines Detail Sheets Reprint Incorporates Change 1

3.12.1.2 DEFINITIONS

3.12.1.2.1 Adequately Wet

A term as defined in CFR 40 Part 61, Subpart M and EPA 340/1-90-219 that means to sufficiently mix or penetrate with liquid to prevent the release of particulates. If visible emissions are observed coming from asbestos-containing material (ACM), then that material has not been adequately wetted. However, the absence of visible emissions is not sufficient evidence of being adequately wetted.

3.12.1.2.2 Amended Water

Water containing a wetting agent or surfactant with a surface tension of at least 29 dynes per square centimeter when tested in accordance with ASTM D1331.

3.12.1.2.3 Friable ACM

A term as defined in CFR 40 Part 61, Subpart M and EPA 340/1-90-218 that means any material containing more than 1 percent asbestos as determined using the method specified in CFR 40 Part 763, Appendix A, Subpart F, Section 1, Polarized Light Microscopy, that when dry, can be crumbled, pulverized, or reduced to powder by hand pressure. If the asbestos content is less than 20 percent as determined by a method other than point counting by polarized light microscopy (PLM), verify the asbestos content by point counting using PLM.

3.12.1.2.4 Nonfriable ACM

A term as defined in CFR 40 Part 61, Subpart M and EPA 340/1-90-218 that means any material containing more than 1 percent asbestos as determined using the method specified in CFR 40 Part 763, Appendix A, Subpart F, Section 1, Polarized Light Microscopy, that, when dry, cannot be crumbled, pulverized or reduced to powder by hand pressure.

3.12.1.2.5 Category I Nonfriable ACM

A term as defined in CFR 40 Part 61, Subpart M and EPA 340/1-90-218 that means asbestos-containing packings, gaskets, resilient floor covering, and asphalt roofing products containing more than 1 percent asbestos as determined

using the method specified in CFR 40 Part 763, Appendix A Subpart F, Section 1, Polarized Light Microscopy.

3.12.1.2.6 Category II Nonfriable ACM

A term as defined in CFR 40 Part 61, Subpart M and EPA 340/1-90-218; that means any material, excluding Category I nonfriable ACM, containing more than 1 percent asbestos, as determined using the methods specified in Appendix A, Subpart F, CFR 40 Part 763, Section 1, Polarized Light Microscopy, that when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

3.12.1.2.7 Asbestos Regulated Work Area

An asbestos regulated work area is an area contained and controlled either by an enclosed containment (full containment area, single or double bulkhead containment area, mini-containment area), modified containment, glove bag or outdoor techniques, where asbestos containing materials (ACM) operations are performed and isolated by physical boundaries to prevent the spread of ACM and control access to authorized persons. A full containment, single or double bulkhead containment area, mini-containment area, modified containment, and glove bag, work area is isolated within a containment enclosure in which ACM operations are performed. An outdoor regulated work area is not isolated within a containment enclosure, but is otherwise secured, by means of physical barriers, boundary warning tape, and signage, etc., to control access by unauthorized persons.

3.12.1.2.8 Time-Weighted Average (TWA)

The TWA is an 8-hour time weighted average of airborne concentration of fibers (longer than 5 micrometers) per cubic centimeter of air which represents the employee's 8-hour workday as determined by Appendix A of CFR 29 Part 1926, Section 1926.58.

3.12.3 DESCRIPTION OF WORK

The work covered by this section includes the handling of friable or non-friable asbestos-containing materials (ACM) which are encountered during repair, construction and demolition projects and describes procedures and equipment required to protect workers and occupants of the work area from contact with airborne asbestos fibers and ACM dust and debris. The work also includes the disposal of the generated ACM wastes. More specific operational procedures shall be outlined in the required Asbestos Hazard Abatement Plan called for elsewhere in this specification. The specific ACM to be abated will be identified during scoping. A summary of each individual ACM abatement work task is included in table 1, "Summary of Asbestos Abatement Work Tasks". The summary information, for each work task, identifies: the number of work tasks in alpha sequence (i.e. A, B, C,... etc.;); the location of the ACM; brief description of the material; the required asbestos technique to be employed (removal, encapsulation, encasement, enclosure, repair); the friability designation (friable,

nonfriable category I or nonfriable category II); the form and condition (interior architectural (IA), exterior architectural (EA), or mechanical and electrical (ME) and the condition - good, fair, poor); quantity (linear and /or square feet); the required RESPONSE ACTION DETAIL SHEET number specific to the work task (depicts the abatement technique requirements and item to be abated) and the required SET-UP DETAIL SHEET numbers (depicts the required methods of containment and control) specified by the Response Action Detail Sheet. The required RESPONSE ACTION DETAIL and SET-UP DETAIL SHEETS for each work task are appended to Table 1, herein.

3.12.4 SECURITY

Yellow warning tape shall completely encircle the work area. A logbook shall be kept documenting entry into and out of the asbestos regulated work area. Entry into asbestos regulated work areas shall only be by personnel authorized by the Contractor and Contracting Officer. Personnel authorized to enter asbestos regulated work areas shall be trained, medically evaluated and wear the personal protective equipment, as required by this specification, for the specific asbestos regulated work area to be entered.

3.12.5 MEDICAL REQUIREMENTS

Medical requirements shall conform to CFR 29 Part 1926, Section 1926.58.

3.12.5.1 Medical Examinations

Before being exposed to airborne asbestos fibers, workers shall be provided with a comprehensive medical examination as required by CFR 29 Part 1926, Section 1926.58 and other pertinent state or local requirements. This requirement must have been satisfied within the past year. The same medical examination shall be given on an annual basis to employees engaged in an occupation involving asbestos and within 30 calendar days before or after the termination of employment in such occupation. X-ray films of asbestos workers shall be identified to the consulting radiologist and medical record jackets shall be marked with the word "asbestos."

3.12.1.5.2 Medical and Exposure Records

Complete and accurate records shall be maintained of each employee's medical examinations, medical records and exposure data as required by CFR 29 Part 1920, Section 1920.20 and CFR 29 Part 1926, Section 1926.58 for a period of 50 years after termination of employment. Records of the required medical examinations and exposure data shall be made available for inspection and copying to: The Assistant Secretary of Labor for Occupational Safety and Health (OSHA) or authorized representatives of the employee and an employee's physician upon request of the employee or former employee. Maintain on file at the work site for review as requested by the Contracting Officer, a copy of the required medical certification for each employee.

3.12.1.6 TRAINING

Within 1 year prior to assignment, and commencement of work on this asbestos abatement project, each worker directly involved in handling ACM, ACM generates waste to include packaging and transporting; such waste for disposal, shall take and successfully complete a course of asbestos training as specified by United States Environmental Protection Agency (EPA) requirements at CFR 40 Part 763, Subpart E, Appendix C at a training center approved by the state of Georgia. Workers shall take and successfully complete the "Worker" course. On-site supervisors and technical support personnel shall take and successfully complete the "Contractor/ Supervisor" course. Worker and contractor/Supervisor courses taken more than 1 year prior to commencement of work are acceptable provided that the individual has successfully completed the annual refresher training as required by the regulatory agency. In addition, prior to the commencement of work, each worker shall be instructed by the Contractor's industrial hygienist and onsite "competent person" supervisor in the following project specific training: the hazards and health effects of the specific types of ACM to be abated, the content and requirements of the Contractor's Asbestos Hazard Abatement Plan, Accident Prevention Plan, Hazard Communication Program, site-specific safety and health precautions, work practices, the use requirements and limitations of the personal protective clothing, equipment, and respirators to be used, hands-on-training for each asbestos abatement technique to be employed, heat and/or cold stress monitoring specific to this project, personal hygiene and housekeeping requirements, air monitoring program and procedures, medical surveillance to include medical and exposure record keeping procedures, the association of cigarette smoke and asbestos-related disease, security procedures, emergency response requirements and all additional requirements of CFR 29 Part 1926, Section 1926.58. Training shall also include, for each employee, a respirator fit test administered by the Contractor's Industrial Hygienist as required by CFR 29 Part 1926, Section 1926.58.

3.12.1.7 RESPIRATORY PROTECTION PROGRAM

The Contractor's Industrial Hygienist shall establish in writing and implement a respiratory protection program in accordance with CFR 29 Part 1926, Section 1926.58, CFR 29 Part 1920, Section 1920.134, ANSI Z88.2, CGA G-7 and CGA G-7.1. DETAIL SHEET NO. 12 entitled "Respiratory Protection Table" is appended herein and shall be used by the Contractor's Industrial Hygienist to establish minimum respiratory protection requirements based on measured or anticipated levels of airborne asbestos fiber concentrations encountered during the performance of the asbestos abatement work. The Contractor's respiratory protection program shall include, but not be limited to, the following elements:

a. The company policy, used for the assignment of individual responsibility, accountability, and implementation of the respiratory protection program.
b. The standard operating procedures covering the selection and use of respirators. Respiratory selection shall be determined by the hazard to which the worker is exposed.
c. Medical evaluation of each user to verify that the worker may be assigned to an activity where respiratory protection is required.

d. Training in the proper use and limitations of respirators.
e. Respirator fit testing, i.e., quantitative, qualitative and individual functional fit checks.
f. Regular cleaning and disinfection of respirators.
g. Routine inspection of respirators during cleaning and after each use when designated for emergency use.
h. Storage of respirators in convenient, clean, and sanitary locations.
i. Surveillance of work area conditions and degree of employee exposure (e.g., through air monitoring).
j. Regular evaluation of the continued effectiveness of the respiratory protection program.
k. Recognition and procedures for the resolution of special problems as they affect respirator use (e.g., no facial hair that comes between the respirator face piece and face or interferes with valve function; prescription eye wear usage; prohibition of wearing contact lenses; etc.).
l. Proper training in putting on and removing respirators.

3.12.1.8 HAZARD COMMUNICATION PROGRAM

A hazard communication program shall be established and implemented in accordance with CFR 29 Part 1926, Section 1926.59.

3.12.1.9 SAFETY AND HEALTH COMPLIANCE

In addition to detailed requirements of this specification, the work shall comply with applicable laws, ordinances, criteria, rules, and regulations of Federal, state, regional, and local authorities regarding handling, storing, transporting, and disposing of asbestos waste materials and with the applicable requirements of CFR 29 Part 1920, CFR 29 Part 1926, CFR 40 Part 61, Subpart A, and CFR 40 Part 61, Subpart M, NFPA 20, NFPA 70, NFPA 90A, NFPA 211. Matters of interpretation of standards shall be submitted to the appropriate administrative agency for resolution before starting work. Where the requirements of this specification, applicable laws, rules, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirement as defined by the Contracting Officer shall apply. The following state and local laws, rules and regulations regarding removal, encapsulation, encasement, enclosure, demolition, and renovation, handling, storing, transporting and disposing of asbestos material apply:
a. Rules of the Georgia Department of Natural Resources, Environmental Protection Division, Chapter 391-3-14, Rules for Asbestos Removal and Encapsulation.
b. Rules of the Georgia Department of Natural Resources, Environmental Protection Division, Chapter 391-3-4, Rules for Solid Waste Management.
c. Georgia Asbestos Safety Act.

3.12.1.10 INDUSTRIAL HYGIENIST (IH)

Personal and area/environmental air sampling and training shall be conducted under the direction of an IH experienced in asbestos abatement and whom the American Board of Industrial Hygiene (ABIH) currently certifies in the comprehensive practice of industrial hygiene. For the purpose of this contract, the Contractor shall retain the services of an independent IH to perform all contract required air monitoring.

3.12.1.11 PERMITS, LICENSES AND NOTIFICATIONS

Necessary permits and licenses shall be obtained in conjunction with the project asbestos abatement, transportation and disposal actions and timely notification furnished of such actions required by Federal, state, regional, and local authorities and as otherwise specified herein. The Contractor shall notify the Georgia's Environmental Protection Division and the Contracting Officer in writing at least 20 working days prior to the commencement of work in accordance with CFR 40 Part 61, Subpart M, state and local requirements to include the mandatory "Notification of Demolition and Renovation Record" form and other required notification documents.

3.12.1.12 SUBMITTALS

The following shall be submitted:

- Data
- Safety Plan; (GA)

A written Safety and Occupational Health Program (SHP) and a comprehensive site-specific Accident Prevention Plan (APP) at least 20 days prior to start of work. The APP shall include the submission during the project, of Activity Hazard Analyses for each major phase of work. The required respiratory protection and hazard communication program shall be incorporated into the APP. This plan must be accepted in writing by the Contracting Officer prior to start of any site work.

3.12.1.12.1 Asbestos Hazard Abatement Plan; (GA)

A detailed plan of the response actions to be taken (ACM items to be abated and method of abatement for each abatement work task - see each RESPONSE ACTION DETAIL SHEET) and the control procedures (containment techniques to include safety precautions and work procedures; See SET-UP DETAIL SHEETS) to be used in the abatement of the ACM. The plan shall take into consideration all the individual ACM abatement work tasks as summarized in paragraph:

3.12.1.12.1.1. DESCRIPTION OF WORK and table 1. The plan shall be prepared by, signed and dated by the Contractor's IH. Such plan shall include, but not be limited to the following: precise personal protective equipment to be used, the location of asbestos regulated work areas including clean and dirty areas, access tunnels, decontamination unit (clean room, shower room, equipment room,

storage areas such as load-out unit). Abatement method, interface of trades involved in the construction, sequencing of asbestos related work, disposal procedures and plan, type of wetting agent and asbestos encapsulates to be used, location of local exhaust equipment, planned air monitoring strategies, and a detailed description of the method to be employed in order to control the spread of ACM wastes and airborne fiber concentrations.

3.12.1.12.1.2 The plan shall also include both fire and medical emergency response procedures and the specific security procedures to be used for all asbestos regulated work areas. The asbestos hazard abatement plan shall be submitted at least 30 days prior to start of work. This plan must be accepted in writing prior to the start of any asbestos abatement work.

3.12.1.12.2 Landfill and Transporter Qualifications; (GA)

Written evidence that the landfill for disposal is approved for asbestos disposal by the state and local regulatory agencies. Copies of signed agreements between the Contractor, and each subcontractor to include transporters and the asbestos waste disposal facility to accept and dispose of all asbestos containing waste generated during the performance of this contract. Qualification resumes of each subcontractor transporter to be used, indicating previous experience in transport and disposal of asbestos waste to include all required state and local waste hauler requirements for asbestos.

3.12.1.12.3 Reports Field Tests; (GA)

A. Air sampling reports.
B. Pressure differential recording local exhaust system.
C. Asbestos disposal waste disposal record report.
D. Provide Clean Air Certificate after Abatement is completed.

3.12.1.12.3.1 Air Sampling Results.

Air sample fiber counting shall be completed, and results provided within 24 hours after completion of a sampling period. The Contracting Officer shall be notified immediately of any airborne levels of asbestos fibers in excess of established requirements. Written sampling results shall be provided within 5 working days of the date of collection. The written results shall be signed by testing laboratory analyst, testing laboratory principal, the Contractor's IH and the Contractor. The air sampling results shall be documented on a Contractor's daily air monitoring log. The daily air monitoring log shall contain the following information for each sample: date sample collected, date sample analyzed, sample number, sample type (P = Personal, A = Area, C = Abatement Clearance, IRWA = Inside regulated work area, ORWA = Outside regulated work area, DU = Decontamination Unit, LOU = Load-out unit, AT = Access Tunnel), sample period (start time, stop time, elapsed time (minutes), sampling pump manufacturer - model and serial number, average flow rate (liters per minute (L/min)), total air volume sampled (liters (L)), sample results (fibers per cubic centimeter (f/cc)) and location/activity/name where sample collected. In addition, the daily log shall

identify the calibration method used to calibrate the sampling pumps, the name and location of the laboratory conducting the sample analyses, print name, signature, and date block for the industrial hygienist who conducted the sampling and the review verifying the accuracy of the information.

3.12.1.12.4 Pressure Differential Recordings; (GA)

Pressure differential recordings shall be provided daily on the same day collected. Readings shall be reviewed by the Contractor's competent person supervisor and/or IH prior to submittal. Contracting Officer shall be notified immediately of any variance in the pressure differential which could cause adjacent unsealed areas to have asbestos fiber concentrations in excess of 0.205 fiber per cubic centimeter (f/cc) or background, whichever is higher.

3.12.1.12.5 Notifications; (GA)

A copy of the written notification shall be provided to any rental company concerning the intended use of rental equipment and the possibility of asbestos contamination, the decontamination procedures that will be used prior to the return of the equipment. A copy of the rental company's written acknowledgment and agreement shall be included in the submittal.

3.12.1.12.6 Certificates (GA)

a. Vacuum, Filtration and Ventilation Equipment.
b. Manufacturer's certifications showing compliance with ANSI Z9.2 for:
    1) Vacuums.
    2) Water filtration equipment.
    3) Ventilation equipment.
    4) Other equipment required to contain airborne asbestos fibers.
    5) The Contractor shall provide a clean air Certificate after abatement is completed.
c. Records

3.12.1.12.7 Respirator Program; (GA)

Records of the respirator program as required by ANSI Z88.2, CFR 29 Part 1920, Section 1920.134, CFR 29 Part 1926, Section 1926.58.

3.12.1.12.8 Asbestos Waste Shipment; (GA)

Final completed copies of the Waste Shipment Record for all shipments of waste material as specified in CFR 40 Part 61, Subpart M and other required state waste manifest shipment records as specified herein. Detailed information of all asbestos waste disposals on the "MANDATORY WASTE SHIPMENT RECORD" form in accordance with revised CFR 40 Part 61, Subpart M. Such completed forms signed and dated by the agent of the landfill shall be submitted within 3 days after date of delivery of ACM to the landfill.

3.13.1 PERSONAL PROTECTIVE EQUIPMENT

One complete set of personal protective equipment shall be made available to the Contracting Officer and authorized visitors for entry to the asbestos regulated work area, at all times for inspection of the asbestos regulated work area. Contracting Officer and authorized visitors shall be provided with training equivalent to that provided to Contractor employees in the selection, fitting, and use of the required personal protective equipment and the site safety and health requirements. Contractor workers shall be provided with personal protective clothing and equipment as specified herein, and the Contractor shall ensure that it is worn properly. The Contractor's Industrial Hygienist and designated competent person supervisor shall select and approve all the required personal protective clothing and equipment to be used.

3.13.1.1 Respirators

Respirators shall be selected and used in accordance with manufacturers recommendations and shall be approved by the Mine Safety and Health Administration and the National Institute for Occupational Safety and Health (MSHA/NIOSH) for use in environments containing airborne asbestos fibers. Personnel who handle ACM, enter asbestos regulated work areas that require the wearing of a respirator, or who are otherwise carrying out abatement activities that require the wearing of a respirator, shall be provided with approved respirators that are fully protective of the worker at the measured or anticipated airborne asbestos concentration level to be encountered. For air-purifying respirators, the particulate filter portion of the cartridges or canister approved for use in airborne asbestos environments shall be Type H, high-efficiency particulate air (HEPA). As a minimum a Type C supplied-air airline, operated in the pressure/demand mode with an auxiliary self-contained breathing apparatus respirator shall be worn during the startup of abatement activities, unless otherwise approved in writing by the Contracting Officer. The upgrading or downgrading of respirator type, from the minimum requirements specified for
start-up, shall be made by the Contractor's IH based on the measured or anticipated airborne asbestos fiber concentrations to be encountered. All recommendations made by the Contractor's IH to downgrade respirator type shall be submitted in writing to the Contracting Officer for acceptance. Contractor's IH actions to upgrade respirator type shall be verbally conveyed to the Contracting Officer. Respiratory protection shall comply with the CFR 29 Part 1926, and CFR 29 Part 1920. A qualitative or quantitative fit test conforming to CFR 29 Part 1926, Appendix C shall be conducted by the Contractor's IH for each Contractor worker required to wear a respirator, and for the Contracting Officer and authorized visitors who enter an asbestos regulated work area where respirators are required to be worn. A respirator fit test shall be performed for each worker prior to initially wearing a respirator on this project and every 6 months thereafter. If physical changes in a worker develop that will affect the fit, a new fit test shall be performed. Functional fit checks shall be performed by employees each time a respirator is put on and in accordance with the manufacturer's recommendation.

3.13.1.2 Whole Body Protection

Personnel exposed to asbestos shall be provided with whole body protection as specified herein and such protection shall be worn properly. The Contractor's IH and competent person supervisor shall select and approve the whole-body protection to be used. Disposable whole-body protection shall be disposed of as asbestos contaminated waste upon exiting from the asbestos regulated work area. Reusable whole-body protection worn shall be either disposed of as asbestos contaminated waste upon exiting from the asbestos regulated work area or be properly laundered in accordance with CFR 29 Part 1926 and as specified in the Contractor's Asbestos Hazard Abatement Plan. Asbestos abatement whole body protection shall not be removed from the work site by a worker to be cleaned.

3.13.1.3 Coveralls

Disposable-impermeable coveralls with a zipper front shall be provided. Sleeves shall be secured at the wrists, and foot coverings secured at the ankles. See DETAIL SHEET 13.

3.13.1.4 Gloves

Disposable plastic or rubber gloves shall be provided to protect hands. Cloth gloves may be worn inside the plastic or rubber gloves for comfort but shall not be used alone. Where there is the potential for hand injuries (i.e., scrapes, punctures, cuts, etc.) a suitable outer glove shall be provided and used.

3.13.1.5 Under Clothing

Disposable underwear shall be provided and worn next to the skin or cloth under clothing.

3.13.1.6 Work Clothing

An additional coverall, similar to that required in paragraph Coveralls, shall be provided when the abatement and control method employed does not provide for the exit from the asbestos regulated work area directly into an attached decontamination unit. Cloth work clothes shall be provided for wear under the protective coverall and foot coverings when work is being conducted in low temperature conditions. Cloth work clothes shall be either disposed of as asbestos contaminated material or properly laundered in accordance with CFR 29 Part 1926 and as specified in the Contractor's Asbestos Hazard Abatement Plan.

3.13.1.7 Foot Coverings

Cloth socks shall be provided and worn next to the skin. If rubber boots are not used, footwear and disposable foot coverings shall be provided. Rubber boots shall be used in moist or wet areas. Only rubber boots shall be removed from the

asbestos regulated work area after being thoroughly decontaminated. All other protective foot covering shall be disposed of as ACM.

3.13.1.8 Head Covering

Hood type disposable head covering shall be provided. In addition, protective head gear (hard hats) shall be provided as required. Hard hats shall only be removed from the asbestos regulated work area after being thoroughly decontaminated.

3.13.1.9 Protective Eye Wear

Contact lenses shall not be worn in asbestos regulated work areas. When vision correction is necessary to perform the work task, prescription safety eye wear shall be used. Fog-proof goggles shall be worn by personnel engaged in asbestos abatement activities in the asbestos regulated work area when the use of a full face-piece respirator is not required. Eye protection provided shall be in accordance with ANSI Z87.1.

3.13.1.10 Other Items

All other items of whole-body protection shall be provided as required and approved by the Contractor's IH.

3.14.1 DECONTAMINATION UNIT AND LOAD OUT UNIT AND ACCESS TUNNEL

A temporary negative pressure decontamination unit, load out unit (where required), and access tunnel, where required, shall be provided as described in DETAIL SHEET Numbers 22 and 23 and 20 and 25 appended herein. Utilization of prefabricated units shall have prior approval of the Contracting Officer. The decontamination unit shall have a separate equipment locker room and a clean locker room with a shower that complies with CFR 29 Part 1920, Section 1920.141 in between. Two separate lockers shall be provided for each asbestos worker, one in each locker room. Street clothing and street shoes shall be kept in the clean locker. Upon exiting from the asbestos regulated work area to the equipment room, respirators shall be worn while asbestos contaminated protective clothing is HEPA-vacuumed, removed, and placed in approved labeled containers (see DETAIL SHEETS 9 and 14) for disposal or laundering. Workers shall shower before changing into street clothes. Used shower water shall be collected and filtered to remove asbestos contamination. Filters and residue shall be disposed of as asbestos contaminated material; see DETAIL SHEETS 9 and
14. Filtered water shall be discharged to the sanitary system. Decontamination and load-out unit shall be attached in a leak-tight manner to each asbestos regulated work area. The Contractor shall provide a minimum 150 liters (40 gallon) electric hot water heater with minimum recovery rate of 75 liters (20 gallons) per hour and a temperature controller for each showerhead. The Contractor shall provide a minimum of two showers. Instantaneous type in-line water heater may be incorporated at each shower head in lieu of hot water heater upon approval by the Contracting Officer. Flow and temperature controls

shall be located within the shower and be adjustable by the user. The wastewater pump shall be sized for 1.25 times the showerheads flowrate at a pressure head sufficient to satisfy the filter head loss and discharge line losses. The pump shall supply a minimum 1.6 liters per second (25 gallons per minute) flow with 21 m. (35 ft.) of pressure head. Wastewater filters shall be installed in series with the first stage pore size of 20 micrometer (microns) and the second stage pore size of 5 micrometer. (Microns.) The floor of the decontamination unit's clean room shall be always kept dry and clean, at all times. Water from the shower shall not be allowed to wet the floor in the clean room. Surfaces of the clean room and shower shall be wet wiped 2 times after each shift change with a disinfectant solution. Proper housekeeping and hygiene requirements shall be maintained.

Soap and towels shall be provided for showering, washing and drying. Any cloth towels provided shall be disposed of as ACM waste or be laundered in accordance with CFR 29 Part 1926 and the Contractor's Asbestos Hazard Abatement Plan. Surfaces of the equipment room shall be wet wiped 2 times after each shift change. Surfaces of the Load-Out-Unit and access tunnel shall be adequately wet wiped 2 times after each shift change. Materials used for wet wiping shall be disposed of as asbestos contaminated waste.

3.13.1 WARNING SIGNS AND TAPE

Contractor shall ensure that all personnel understand the warning signs. Warning signs and tape printed in English shall be provided at the regulated boundaries and entrances to asbestos regulated work areas. Signs shall be located at such a distance that personnel may read the sign and take the necessary protective steps required before entering the area. Warning signs as shown and described in DETAIL SHEET 21 appended herein shall be in vertical format conforming to CFR 29 Part 1920, and CFR 29 Part 1926, minimum 520 by 360 mm (20 by 14 inches) and displaying the following legend in the lower panel:

Legend	Lettering
Danger	3-inch Sans Serif Gothic or Block
Asbestos	1-inch Sans Serif Gothic or Block
Cancer and Lung Disease Hazard	
Authorized Personnel Only	1-inch Sans Serif Gothic or Block
Authorized Personnel Only	
Respirators and Protective	1-inch Gothic
Clothing are Required in this Area	

Spacing between lines shall be at least equal to the height of the upper of any two lines. Warning tape shall be provided as shown and described on DETAIL SHEET 21, appended herein. Decontamination unit signage shall be as shown and described on DETAIL SHEET 15, appended herein.

3.13.2 WARNING LABELS

Warning labels shall be affixed to all asbestos disposal containers used to contain asbestos materials, scrap, waste debris, and other products contaminated with asbestos. Containers with preprinted warning labels conforming to requirements specified herein are acceptable. Warning labels shall be as described in DETAIL SHEET 14 appended herein, shall conform to CFR 29 Part 1926 and shall be of sufficient size to be clearly legible displaying the following legend:

DANGER CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD

3.13.3 LOCAL EXHAUST SYSTEM

A local exhaust system shall be provided in the asbestos regulated work area as described in DETAIL SHEET 8, appended herein and in accordance with ANSI Z9.2 and CFR 29 Part 1926. The system will provide at least four air changes per hour inside of the containment. The local exhaust system shall be operated 24 hours per day, until the asbestos regulated containment area is removed and shall be leak proof to the filter and equipped with HEPA filters. Local exhaust equipment shall be sufficient to maintain a minimum pressure differential of minus
0.51 mm (0.02 inch) of water column relative to adjacent, unsealed areas. Pressure differential shall be monitored continuously, 24 hours per day, with an automatic recording instrument. In no case shall the building ventilation system be used as the local exhaust system for the asbestos regulated work area. Filters on local exhaust system equipment shall conform to ANSI Z9.2 and UL 586. Filter shall be UL labeled. The local exhaust system shall terminate out of doors. All filters used shall be new at the beginning of the project and shall be periodically changed as necessary and disposed of as ACM waste.

3.13.4 TOOLS

Vacuums shall be leak-proof to the filter, equipped with HEPA filters, be of sufficient capacity and provide the necessary capture velocity at the nozzle or nozzle attachment to efficiently collect, transport and retain the ACM waste material. Power tools shall not be used to remove ACM unless the tool is equipped with effective, integral HEPA filtered exhaust ventilation capture and collection system or has otherwise been approved for use by the Contracting Officer. All residual asbestos shall be removed from reusable tools prior to storage and reuse. Reusable tools shall be thoroughly decontaminated prior to being removed from asbestos regulated work areas.

3.13.5 RENTAL EQUIPMENT

If rental equipment is to be used, written notification shall be provided to the rental agency, concerning the intended use of the equipment, the possibility of asbestos contamination of the equipment and the steps that will be taken to decontaminate such equipment. A written acceptance of the terms of the Contractor's notification shall be obtained from the rental agency.

3.13.6 AIR MONITORING EQUIPMENT

The Contractor's IH shall select and approve the air monitoring equipment to be provided and used by the Contractor for evaluation of airborne asbestos fiber concentrations. The equipment shall include, but not be limited to:

a. High-volume sampling pumps that can be calibrated and operated at a constant airflow up to approximately 20 liters per minute when equipped with a sampling train of tubing and filter cassette,
b. Low-volume, battery powered, body-attachable, portable personal pumps that can be calibrated to a constant airflow up to approximately 3.5 liters per minute when equipped with a sampling train of tubing and filter cassette, and a self- contained rechargeable power pack capable of sustaining the calibrated flow rate for a minimum of 20 hours. The pumps shall also be equipped with an automatic flow control unit which shall maintain a constant flow even as filter resistance increases due to accumulation of fiber and debris on the filter surface,
c. Standard 25-millimeter diameter, 0.8 micrometer (micron) pore size, mixed cellulose ester membrane filters and cassettes with nonconductive barrels and shrink bands, to be used with low flow pumps in accordance with CFR 29 Part 1926, for personal air sampling,
d. Standard 25-millimeter diameter, 0.45 micrometer (micron) pore size, mixed cellulose ester membrane filters and cassettes with non-conductive barrels and shrink bands, to be used with high flow pumps when conducting environmental area sampling using NIOSH Pub No. 84-120 Methods 7420 and 7402,
e. Appropriate plastic tubing to connect the air sampling pump to the selected filter cassette,
f. A flow calibrator capable of calibration to within plus or minus 2 percent of reading over a temperature range of minus 20 degrees C (minus 4 degrees F) to plus 60 degrees C (140 degrees Fahrenheit) and traceable to a National Institute for Standards and Technology (NIST) primary standard.

3.13.7 EXPENDABLE SUPPLIES

3.13.7.1 Duct Tape

Industrial grade duct tape shall be provided in 50 mm (2 inch) and 76 mm (3 inch) widths and shall be suitable for bonding sheet plastic and disposal containers specified herein.

3.13.7.2 Disposal Containers

Leak-tight disposal containers shall be provided for ACM generated wastes as described in DETAIL SHEETS 9A, 9B, 9C and 14 and as specified herein. Leak-tight means that solids, liquids or dust cannot escape or spill out. All disposal containers shall be either pre-labeled or affixed with OSHA warning label as specified in CFR 29 Part 1926. Contractor shall consult with the selected landfill regarding acceptable disposal containers.

3.13.7.3 Disposal Bags

One hundred fifty-two thousandths millimeter (6 mil) (Six-mil) thick leak-tight pre-labeled (OSHA warning label) bags shall be provided for placement of asbestos generated waste as described in DETAIL SHEET 9A.

3.13.7.4 Leak-tight Wrapping

Two layers of 0.152 mm (6 mil) minimum thick polyethylene sheet stock shall be used for the containment of removed asbestos-containing components or materials such as reactor vessels, large tanks, boilers, insulated pipe segments and other materials too large to be placed in disposal bags as described in DETAIL SHEET 9B. Upon placement of the ACM component or material, each layer shall be individually leak-tight and sealed with duct tape.

3.13.7.6 Fiberboard Drums

Fiberboard drums shall be provided if required by state or local requirements.

3.13.7.7 Cardboard Boxes

Heavy-duty corrugated cardboard boxes coated with plastic or wax to retard deterioration from moisture shall be provided as described in DETAIL SHEET 9C if required by state and local requirements. Boxes shall fit into selected ACM disposal bags. Filled boxes shall be sealed leak-tight with duct tape.

3.13.7.8 Sheet Plastic

Sheet plastic shall be provided as specified herein and in the largest sheet size necessary to minimize seams, as indicated on the project drawings.

3.13.9 Polyethylene Sheet - General

One hundred fifty-two thousandths millimeter (6 mil) (minimum) thick polyethylene film shall be clear, frosted or black and conform to ASTM D 4397.

3.13.10 Polyethylene Sheet - Flame Resistant

Where a potential for fire exists, 0.152 mm (6-mil) (minimum) thick flame-resistant polyethylene sheet shall be provided. Flame-resistant polyethylene film shall be frosted or black and shall conform to the requirements of NFPA 721.

3.13.11 Polyethylene Sheet-Reinforced

One hundred fifty-two thousandths' millimeters (6-mil) thick reinforced polyethylene sheet shall be provided where high skin strength is required such as where it constitutes the only barrier between the asbestos regulated work area and the outdoor environment. The sheet stock shall consist of translucent, nylon- reinforced or woven-polyethylene thread laminated between two layers of polyethylene film. Film shall meet flame resistant standards of NFPA 721.

3.13.12 Viewing Inspection Window

Where feasible, a minimum of one clear 3.2 mm (1/8-inch) thick acrylic sheet, 450 mm by 620 mm, (18 inches by 24 inches,) shall be installed as a viewing inspection window at eye level on a wall in each containment enclosure. All such windows shall be sealed leak-tight with industrial grade duct tape.

3.13.13 Wetting Agents

3.13.13.1 Amended Water

3.13.13.2 Amended water shall meet the requirements of ASTM D 1331.

3.13.14 Removal Encapsulate

Removal encapsulate (a penetrating encapsulates) shall be provided when conducting removal abatement activities that require a longer removal time or are subject to rapid evaporation of amended water. The removal encapsulates shall be capable of wetting the ACM and retarding fiber release during disturbance of the ACM equal to or greater than provided by amended water. Performance requirements for penetrating encapsulants are specified in paragraph (3.14.1.1) ENCAPSULANTS.

a. Strippable Coating
b. Strippable coatings shall not be used.

3.13.15 MATERIAL SAFETY DATA SHEETS

Material safety data sheets (MSDSs) shall be provided for all hazardous materials brought onto the worksite. One copy shall be provided to the Contracting Officer's onsite Representative, and one copy shall be included in the contractor's Hazard Communication Program.

3.13.16 OTHER ITEMS

A sufficient quantity of other items shall be provided that may include, but not be limited to: scrapers, brushes, brooms, staple guns, tarpaulins, shovels, rubber squeegees, dust pans, other tools, scaffolding, staging, enclosed chutes, wooden ladders, lumber necessary for the construction of asbestos regulated containment work areas, UL approved temporary electrical equipment, material and chords, ground fault circuit interrupters, water hoses of sufficient length, fire extinguishers, first aid kits, portable toilets, logbooks, log forms, markers with indelible ink, spray paint in bright color to mark areas, project boundary fencing, etc.

3.13.17 PRECONSTRUCTION CONFERENCE

The Contractor, the Contractor's designated onsite "competent person," supervisor and Contractor's IH shall meet with the Contracting Officer prior to beginning work at a safety preconstruction conference to discuss the details of the Contractor's Asbestos Hazard Abatement Plan, SHP and APP including work procedures and safety precautions. Once accepted by the Contracting Officer, the Asbestos Hazard Abatement Plan, the SHP and APP will be enforced as if an addition to the specification. Any changes required in the specification as a result of the Asbestos Hazard Abatement Plan shall be identified specifically in the plan to allow for free discussion and acceptance by the Contracting Officer prior to the start of work.

3.14.1 PRODUCTS

3.14.1.1 ENCAPSULANTS

Encapsulants shall conform to USEPA requirements, shall contain no toxic or hazardous substances and no solvent and shall meet the following requirements:

ALL ENCAPSULANTS

Requirement	Test Standard
Flame Spread - 25, Smoke	ASTM E84 Emission - 50
Combustion Toxicity Zero Mortality	University of Pittsburgh Protocol
Life Expectancy - 20 years Accelerated Aging Test	ASTM C732 Permeability -
Minimum 0.4 perms	ASTM E96

ADDITIONAL REQUIREMENT FOR PENETRATING ENCAPSULANT

Requirement	Test Standard
Cohesion/Adhesion Test - 50 pounds of force/square foot	ASTM E736
Fire Resistance - Negligible affect on fire resistance rating over 3-hour test (Classified by UL for use over fibrous and cementitious sprayed fireproofing)	ASTM E219
Impact Resistance - Minimum 43 in/lb	ASTM D2794 Gardner Impact Test
Flexibility - no rupture or cracking	ASTM D522 Mandrel Bend Test

ADDITIONAL REQUIREMENTS FOR LOCK-DOWN ENCAPSULANT

Requirement	Test Standard
Fire Resistance - Negligible affect on fire resistance rating over 3-hour test (Tested with fireproofing over encapsulant applied directly to steel member)	ASTM E219
Bond Strength; 120 pounds, force/foot (Tests compatibility with cementitious and fibrous fireproofing)	ASTM E736

3.12.3 EXECUTION

3.12.3.1 GENERAL

Asbestos abatement work tasks as shown on the detailed plans and drawings as summarized in paragraph DESCRIPTION OF WORK and Table 1, shall be performed as specified herein to include the appended Asbestos Abatement DETAIL SHEETS. Personnel shall wear and utilize protective clothing and equipment as specified herein. Eating, smoking, drinking, or applying cosmetics shall not be permitted in the asbestos regulated work area. All hot work (burning, cutting, welding, etc.) shall be conducted under strictly controlled conditions in conformance with CFR 29 Part 1926. Personnel of other trades not engaged in asbestos abatement activities shall not be exposed at any time to airborne concentrations of asbestos unless all the administrative and personal protective provisions as required herein are complied with. Electrical service shall be

disconnected where necessary for wet removal. Temporary electrical service shall be provided where needed. If an asbestos spill occurs outside of the asbestos regulated work area, work shall be stopped, and the Contracting Officer shall be notified. The condition shall be corrected to the satisfaction of the Contracting Officer including air sampling, prior to resumption of work. The Contractor shall stop abatement work in the asbestos regulated work area immediately when the Measured airborne total fiber concentrations, as sampled and analyzed as required herein, (1) equals or exceeds 0.21 f/cc or the pre abatement concentration, whichever is greater, - outside the asbestos regulated work area, or (2) equals or exceeds 1.0 f/cc inside the asbestos regulated work area. The Contractor shall correct the condition to the satisfaction of the Contracting Officer, including visual inspection and air samplings. Work resumption will only be allowed upon notification by the Contracting Officer. Corrective actions shall be documented.

3.12.3.2 PROTECTION OF ADJACENT WORK OR AREAS TO REMAIN

Asbestos abatement work shall be performed without damage or contamination of adjacent work or area. Where such work or area is damaged or contaminated as verified by the Contracting Officer using visual inspection and/or sample analysis, it shall be restored to its original condition or decontaminated by the Contractor at no expense to the Government as deemed appropriate by the Contracting Officer. This includes inadvertent spill of dirt, dust or debris in which it is reasonable to conclude that asbestos may exist. When these spills occur, work shall stop in all affected areas immediately and the spill shall be cleaned. When satisfactory visual inspection and/or sampling analysis results are obtained and have been evaluated by the Contractor's IH and the Contracting Officer, work may proceed.

3.12.3.3 FURNISHINGS

3.12.3.3.1 Removal of Furnishings

Miscellaneous stored items will be removed from the area of work by the Government before asbestos abatement work begins.

3.12.3.4 BUILDING VENTILATION SYSTEM AND CRITICAL BARRIERS

The critical barriers shall consist of 1 layer of 0.152 mm (6-mil) polyethylene. Edges to wall, ceiling and floor surfaces shall be sealed with industrial grade duct tape. Critical barriers shall be installed to isolate the room and as appended on SET-UP DETAIL SHEETS and as specified herein.

3.12.3.5 PRECLEANING

Surfaces shall be cleaned by HEPA vacuum and adequately wet wiped prior to establishment of containment.

3.12.3.6 ASBESTOS CONTROL AREA REQUIREMENTS

Regulated containment areas shall be established and maintained for each abatement work task as specified in SET-UP DETAIL SHEETS. Viewing inspection window shall be installed on the wall of the containment enclosure, as specified in paragraph Viewing Inspection. The following procedures shall be performed sequentially, and each activity shall be completed before proceeding to the next.

a. Furnishings in the asbestos regulated work area shall be cleaned and protected in place as specified at paragraph FURNISHINGS.
b. Tools, scaffolding, staging, etc., necessary for the work shall be placed in the area to be isolated prior to erection of work area enclosed containment.
c. Power to the asbestos regulated work area shall be locked-out by switching off all breakers serving power or lighting to this area in accordance with CFR 29 Part 1920.
d. Surfaces shall be precleaned as required by paragraph PRECLEANING.
e. Personnel Decontamination Unit shall be installed as specified and as indicated in SET-UP DETAIL SHEETS 22 and 23. Load-Out unit, where required, shall be installed as specified herein and in SET-UP DETAIL SHEET 20.
f. Critical barriers shall be installed as required.
g. Local exhaust ventilation system shall be installed as specified and shown on DETAIL SHEET 8.
h. Containment area shall be installed as required for each abatement task as specified and shown on the SET-UP DETAIL SHEETS.

3.12.3.7 CLEAN-UP

The Contractor shall maintain a clean work area by performing daily the following housekeeping functions at the end of each shift:

a. Loose ACM shall be prepared for disposal by packaging the waste and removing it from the work area to the load-out area.
b. Work area shall be HEPA vacuumed.
c. Polyethylene in work and high traffic areas shall be inspected and repaired.
d. Containment area shall be wet wiped if air sample results exceed prescribed level.

3.12.3.8 ASBESTOS HANDLING PROCEDURES

The Contractor shall employ proper handling procedures in accordance with CFR 29 Part 1926 and CFR 40 Part 61, Subpart M and the specification requirements herein. The specific abatement techniques and items identified shall be detailed in the Contractor's Asbestos Hazard Abatement Plan including but not limited to details of construction materials, equipment, and handling procedures. Following task descriptions include the appended drawings, which detail the required abatement handling technique.

3.12.3.8.1 Removal of ACM

The following components shall be removed:

- Vinyl Asbestos Tile
- Adhesive

3.12.3.9 FINAL CLEANING AND VISUAL INSPECTION

The abated asbestos regulated work area shall be cleaned by collecting, packing, and storing all gross contamination; see SET-UP DETAIL SHEETS 9, 14 and 20. A final cleaning shall use HEPA vacuum and wet cleaning of all exposed surfaces and equipment in the asbestos regulated work area. Upon completion of the cleaning, the Contractor shall conduct a visual pre-inspection of the cleaned area in preparation for a final inspection before final air clearance monitoring and reclean, as necessary. Upon completion of the final cleaning, the Contractor and the Contracting Officer shall conduct a final visual inspection of the cleaned work area in accordance with ASTM E 1368 and document the results on the Final Cleaning and Visual Inspection as specified on the SET-UP DETAIL SHEET 19. If the Contracting Officer rejects the abatement area as not meeting final cleaning requirements, the Contractor shall reclean as necessary and have a follow-on inspection conducted with the Contracting Officer. Reclean and follow-up re- inspections shall be at the Contractor's expense.

3.12.3.10 LOCK DOWN

Prior to removal of plastic barriers and after clean-up of gross contamination and final visual inspection, a post removal (lockdown) encapsulant shall then be spray applied to ceiling, walls, floors, and other surfaces in the removal area. The abatement area shall include but not to be limited to constructed enclosures, barriers, polyethylene sheeting that covers any furnishings, and equipment articles to be discarded, critical barriers, air locks, load out units for bag removal, and onsite constructed decontamination unit.

3.12.3.11 AIR SAMPLING

Sampling and analysis of airborne concentration of asbestos fibers shall be performed in accordance with CFR 29 Part 1926 Section 1926.58, the Contractor's air monitoring plan, and as specified herein. Personal air monitoring samples shall be taken for at least 25 percent of the workers in each shift, or a minimum of two, whichever is greater. Results of the personal samples shall be posted at the job site and made available to the Contracting Officer as specified herein. The Contractor shall maintain a fiber concentration inside enclosed containment regulated work area equal to or less than 0.1 f/cc expressed as an 8-hour, time-weighted average (TWA) during the conduct of the asbestos abatement. If fiber concentration rises above 0.1 f/cc, work procedures shall be investigated with the Contracting Officer to determine the cause. At the discretion of the Contracting Officer, fiber concentration may exceed 0.1 f/cc but shall not exceed 1.0 f/cc expressed as an 8-hour TWA. The Contractor's

workers shall not be exposed to an airborne fiber concentration is excess of 1.0 f/cc, as average over a sampling period of 30 minutes. Should either an environmental concentration of 1.0 f/cc expressed as an 8-hour TWA or a personal excursion concentration of 1.0 f/cc expressed as a 30-minute sample occur inside the contained (enclosure) regulated work area, the Contractor shall stop work immediately, notify the Contracting Officer, and implement additional engineering controls and work practice controls to reduce airborne fiber levels below prescribed limits in the work area. Work shall not restart until authorized by the Contracting Officer. Air monitoring results at the 95 percent confidence level shall be calculated as shown in Table 2 at the end of this section. The Contractor shall provide an independent testing laboratory with qualified analysts and appropriate equipment to conduct sample analyses of air samples using the methods prescribed in CFR 29 Part 1926 Section 1926.58 to include NIOSH Pub No. 84- 120 Method 7420. Sampling performed in accordance with CFR 29 Part 1926 Section 1926.58 shall be performed by the Contractor's IH. Sampling performed for environmental and quality control reasons shall be performed by the Contractor's IH. Sampling performed after final clean-up, i.e. final clearance air sampling, shall be performed by the Contractor's IH. Personal sampling required by CFR 29 Part 1926 Section 1926.58, the NIOSH Pub No. 84-120 Method 7420 shall be used for sampling and Phase Contract Microscopy (PCM) analysis. For environmental quality control and final air clearance NIOSH Pub No. 84-120 Method 7420 (PCM) with optional confirmation of results by NIOSH Pub No. 84- 120 Method 7402 Transmission Electron Microscopy (TEM) shall be used. For environmental and final clearance samples, sampling will be conducted at a sufficient velocity and time to collect a sample volume necessary to establish the limit of detection of the method used at 0.205 f/cc. Asbestos fiber concentration confirmation of the total fiber concentration results of environmental, quality assurance and final air clearance samples, collected and analyzed by NIOSH Pub No. 84-120 Method 7420, may be conducted. Confirmation analysis shall be carried out using transmission electron microscopy in accordance with NIOSH Pub No. 84-120 Method 7402. When such confirmation is conducted, it shall be from the same sample filter used for the NIOSH Pub No. 84-120 Method 7420 PCM analysis. For all Contractor required environmental, quality control or final air clearance monitoring, confirmation of asbestos fiber concentrations, using NIOSH Pub No. 84-120 Method 7402, shall be at the Contractor's expense.
Monitoring may be duplicated by the Government at the discretion of the Contracting Officer. If the air sampling results obtained by the Government are lower than those results obtained by the Contractor, the Government results shall prevail.

3.12.3.11.1 Sampling Prior to Asbestos Work

The baseline air sampling shall be established one day prior to the masking and sealing operations for each abatement area site. The background shall be established by performing area sampling in similar but uncontaminated sites in the building. Pre abatement NIOSH Pub No. 84-120 Method 7420, PCM air samples shall be collected at a minimum of three locations. These locations: are outside the building, inside the building, but outside the abatement area

perimeter and inside each abatement area. One sample shall be collected for every 185 square meters (2200 square feet) of floor space. At least two sample locations shall be collected outside the building. The PCM samples shall be analyzed immediately; and if any result in fiber concentration greater than 0.21 f/cc, asbestos fiber concentration shall be confirmed using NIOSH Pub No. 84-120 Method 7402 (TEM) at Government expense.

3.12.3.11.2 Sampling During Asbestos Abatement Work

The Contractor's IH shall provide personal, and area sampling as indicated in CFR 29 Part 1926 Section 1926.58, state and local requirements, and in accordance with the Contractor's air monitoring plan. Area sampling shall be conducted at least once every shift, close to the work in the containment area, outside the clean room entrance to the containment area, inside the clean room outside the load-out unit exit, if used, and at the exhaust discharge point of the local exhaust system. If the sampling outside the containment area shows airborne fiber levels have exceeded background or 0.21 f/cc, whichever is greater, all work shall be stopped immediately, and the Contracting Officer notified. The condition causing the increase shall be corrected. Work shall not restart until authorized by the Contracting Officer.

3.12.3.11.3 Sampling After Final Clean-Up (Clearance Sampling)

Prior to conducting final air clearance monitoring, the Contractor and the Contracting Officer shall conduct a final visual inspection of the Contractor's final cleanup of the abated asbestos regulated work area as specified on SET-UP DETAIL SHEET 19. Final clearance air monitoring shall not begin until acceptance of this final cleaning by the Contracting Officer. The Contractor's IH will provide area sampling of airborne fibers using aggressive air sampling techniques as defined in the EPA 560/5-85-024 or as otherwise required by Federal or state requirements. The sampling and analytical method used will be NIOSH Pub No. 84-120 Method 7420 (PCM) with optional confirmation of results by NIOSH Pub No. 84-120 Method 7402 (TEM). The final clearance air samples shall be collected and analyzed as indicated in Table 3 at the end of this section and NIOSH Pub No. 84-120 Method 7420 (PCM).

3.12.3.11.3.1 NIOSH Method

For PCM sampling and analysis using NIOSH Pub No. 84-120 Method 7420, the fiber concentration inside the abated asbestos regulated work area, for each airborne sample shall be less than 0.21 f/cc. Decontamination of the abated asbestos regulated work area is considered complete when every PCM final clearance sample is below the clearance limit. If any sample result is greater than 0.21 f/cc, the asbestos fiber concentration from that same filter shall be confirmed using NIOSH Pub No. 84-120 Method 7402 (TEM) at Contractor's expense. If any confirmation sample result is greater than 0.21 f/cc then abatement is incomplete and recleaning is required. Upon completion of any required recleaning, resampling with results to meet the above clearance criteria is required.

3.12.3.11.4 Air Clearance Failure

Should clearance sampling results fail to meet the final clean-up requirements, the Contractor shall pay all costs associated with all required recleaning, resampling and analysis until final clean-up requirements are met.

3.12.3.12 SITE INSPECTION

While performing asbestos removal work, the Contractor shall be subject to onsite inspection by the Contracting Officer who may be assisted by or represented by quality assurance, safety and industrial hygiene personnel. If the work is found to be in violation of this specification, the Contracting Officer or his representative will issue a stop work order to be in effect immediately and until the violation is resolved. Standby time required to resolve the violation shall be at the Contractor's expense.

3.12.3.13 CLEAN-UP AND DISPOSAL

3.12.3.13.1 Housekeeping

Surfaces of the regulated work area shall be kept free of accumulation of asbestos-containing debris. Meticulous attention shall be given to restricting the spread of dust and debris. HEPA filtered vacuum cleaners shall be used. The space shall not be blown down with compressed air. When asbestos removal is complete, all asbestos waste is removed from the work site, and final clean-up is completed, the Contracting Officer will certify the areas as safe before the warning signs and boundary warning tape can be removed. The Contracting Officer will visually inspect all surfaces within the containment for residual material or accumulated debris. The Contractor shall re-clean all areas showing dust or residual materials. The Contracting Officer shall certify in writing that the area is safe before unrestricted entry is permitted. The Government shall have the option to perform monitoring to certify the areas are safe before entry is permitted.

3.12.3.13.2 Title to Materials

Material resulting from abatement work, except as specified otherwise, shall become the property of the Contractor and shall be disposed of as specified in applicable local, state, and Federal regulations and herein.

3.12.3.13.3 Collection and Disposal of Asbestos

Asbestos waste, asbestos contaminated water, scrap, debris, bags, containers, equipment, and asbestos contaminated clothing shall be collected and placed in sealed leak-tight, containers (e.g., double 0.152 mm (6-mil) plastic bags) (see Detail Sheet 9A), sealed 0.152 mm (6-mil) double wrapped polyethylene sheet (see Detail Sheet 9.B), sealed fiberboard boxes (see sheet 9.C) or other approved containers. Waste within the containers must be wetted in case the container is breeched. A warning and Department of Transportation (DOT) label

shall be affixed or preprinted on each bag; see DETAIL SHEET 14. Waste asbestos material shall be disposed of at an EPA, state and local approved asbestos landfill. For temporary storage, sealed impermeable containers shall be stored in asbestos waste load-out unit or in a storage/transportation conveyance (i.e., dumpster, roll-off waste boxes, etc.) in a manner as accepted by and in an area as assigned by the Contracting Officer. Procedure for hauling and disposal shall comply with CFR 40 Part 61, Subpart M, state, regional, and local standards.

3.12.3.13.4 Asbestos Waste Shipment Record

The Contractor shall complete and provide final completed copies of the Waste Shipment Record for all shipments of waste material as specified in CFR 40 Part 61, Subpart M and other required state waste manifest shipment records within 3 days of delivery to the landfill.

TABLE 1

SUMMARY OF WORK TASKS

TASK (1)	A
LOCATION (2)	To be determined
DESCRIPTION (3)	Vinyl Asbestos Tile and Adhesive
TECHNIQUE (4)	Removal
FRIABLE (5)	NF-1
FORM (6)	IA
CONDITION	Fair
QUANTITY (7)	
SQUARE FT.	To be determined.
RESP. SHEET (8)	59
SET-UP SHEET (9)	4, 8, 9A, 21,
(EP 2120-1-21)	12, 13, 14, 15, 17, 18, 19, 20, 22, 23, 25

NOTES:

1. Alpha sequence of work tasks (A, B, C, etc.) for each asbestos regulated work area. Each category of friability has a separate task.
2. Specific location of the work (building, floor, area, etc.
3. Description of material.
4. Technique to be used:
   - Removal = REM
   - Encapsulation = ENCAP
   - Encasement = ENCAS
   - Enclosure = ENCL
   - Repair = REP
5. Friability of materials:
   - Friable = FR
   - Non-friable = NF-1 or NF-2 (number indicates friable category).

6. Form:
    - Interior or Exterior Architectural = IA or EA
    - Mechanical/Electrical = ME
    - Condition: Good = G; Fair = F; Poor = P.
7. Quantity of ACM in
    - Linear Meters (m) (Linear Feet (ft)
    - square meters (square feet (sf)
8. Response action sheet specifies the material to be abated and the method to be used. (EP1110-1-11)
9. Set-up sheets indicate the containment and control methods to be used in support of the response action. (EP1110-1-11)

TABLE 2
Formula For Calculation of the 95 Percent Confidence Level; (Reference: NIOSH 7420)

Fibers / cc (01.95 percent CL) = X + [(X) * (1.645) * (CV)]

CV = The precision value; 0.45 shall be used unless the analytical laboratory provides the Contracting Officer with documentation (Round Robin Program participation and results) that the laboratory's precision is better.

Where: X = ((E) (AC)) / ((V) (1000))

E = ((F/Nf) - (B/Nb)) / Af
AC = Effective collection area of the filter in square millimeters
V = Air volume sampled in liters

E = Fiber density on the filter in fibers per square millimeter F/Nf = Total fiber count per graticule field
B/Nb = Mean field blank count per graticule field Af = Graticule field area in square millimeters

TABLE 3
NIOSH Method PCM 7420 Environmental Air Sampling Protocol (Non-Personal)

Sample Location	Minimum No. of Samples	Filter Pore Min. Size (Note 1)	Sampling Vol. Rate (Liters) (liters/min) (Note 2)
Inside Abatement Area (Notes 3 & 4) SF	5/1520	0.45 microns	1520 x (2-10)
Each Room in Abatement Area Less than 1520 SF	1	0.45 microns	1520 x (2-10)
Field Blank	2	0.45 microns	0
Laboratory Blank	1	0.45 microns	0

Notes:

1. Type of filter is Mixed Cellulose Ester.
2. Ensure detection limit for PCM analysis is established at 0.205 fibers/cc.
3. One sample should be added for each additional 140 square meters. (1520 square feet.)
4. No less than 5 samples are to be taken per abatement area, plus two field blanks.

Certificate Of Worker's Acknowledgment

Project Name_____.

Contract No. _____

Project Address _____

Contractor's Name Employee's Name

WORKING WITH ASBESTOS CAN BE DANGEROUS. INHALING ASBESTOS FIBERS HAVE BEEN LINKED WITH TYPES OF LUNG DISEASE AND CANCER. IF YOU SMOKE AND INHALE ASBESTOS FIBERS, THE CHANCE THAT YOU WILL DEVELOP LUNG CANCER IS GREATER THAN THAT OF THE NONSMOKING PUBLIC.

Your employer's contract for the above project requires that: you be provided with and complete formal and project specific training, you be supplied with proper personal protective equipment including respirators, that you be trained in its use and that you receive a medical examination to evaluate your physical capacity to perform your assigned work tasks; under the environmental conditions expected, while wearing the

required personal protective equipment. These things are to be done at no cost to you. By signing this certification, you are acknowledging that your employer has met these obligations to you.

Completed Date _____

FORMAL TRAINING: I have completed a formal training course for: asbestos abatement workers (for workers) (Contractor/ Supervisor) that meets EPA's and this state's requirements._____

In addition, I have completed annual refresher as required by EPA and this state's requirements. _____

PROJECT SPECIFIC TRAINING: I have been provided and have completed the project specific training required by this Contract. My employer's industrial hygienist and competent person supervisor conducted the training.

RESPIRATORY PROTECTION: I have been trained in accordance with the criteria in the Contractor's Respiratory Protection program. I have been trained in the dangers of handling and breathing asbestos dust and in the proper work procedures and use and limitations of the respirator(s) I will wear. I have been trained in and will abide by the facial hair policy of my employer.

RESPIRATOR FIT-TEST TRAINING: I have been trained in the proper selection, fit, use, care, cleaning, and maintenance, and storage of the respirator(s) that I will wear. I have been fit-tested in accordance with the criteria in the Contractor's Respiratory Program and have received a satisfactory fit. I have been assigned my individual respirator. I have been taught how to properly perform positive and negative pressure fit check upon donning negative pressure respirators each time.

MEDICAL EXAMINATION: I have had a medical examination within the last twelve months which was paid for by my employer. The examination included: health history, pulmonary function tests, and may have included an evaluation of a chest x-ray. A physician made determination regarding my physical capacity to perform work tasks on the project while wearing personal protective equipment including a respirator. I was personally provided a copy and informed of the results of that examination. My employer's industrial hygienist evaluated the medical certification provided by the physician and checked the appropriate blank below.
The physician determined that there:

_____were no limitations to performing the required work tasks.

_____were identified physical limitations to performing the required work tasks.

Employees Signature_____date _____

Printed Name _____

Social Security Number _____

Contractor's Industrial Hygienist Signature _____ date _____

Printed Name _____

Social Security Number _____

Date medical exam completed _____

END OF SECTION