DEPARTMENT OF VETERANS AFFAIRS
ROUDEBUSH VA MEDICAL CENTER
REPLACE ROOFS - BUILDING 1 & 22 CSR 7 & 9

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LIST OF DRAWING SHEETS

The drawings listed below accompanying this specification form a part of the contract.

Drawing No.	Title
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SECTION 01 00 00
GENERAL REQUIREMENTS

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SECTION 01 00 00
GENERAL REQUIREMENTS

1.1 GENERAL INTENTION

A. Contractor shall completely prepare site for building operations, including demolition and removal of existing structures, and furnish labor and materials and perform work for the Richard L. Roudebush VA Medical Center located at 1481 W. 10th Street in Indianapolis, IN 46202 AND 2669 Cold Spring Road, Indianapolis, IN 46202 concerning Project no. 583-12-112, "**Replace Roofs - Building 1 & 22 CSR 7 & 9**" as required by drawings and specifications.

B. Site visits must be conducted during the designated site visit with the COR and Contracting Officer (CO).

C. All employees of general contractor and subcontractors shall comply with VA security management program and obtain permission of the VA police, be identified by project and employer, and restricted from unauthorized access.

D. Prior to commencing work, general contractor shall provide proof that a 30 HRS. of OSHA training/certified "competent person" (CP) or on-site superintendent (29 CFR 1926.20(b)(2) shall maintain a presence at the work site whenever the general or subcontractors are present.

E. Training:

1. All employees of general contractor or subcontractors shall have the 10-hour OSHA certified Construction Safety course.
2. Submit training records of all such employees for approval before the start of work.

1.2 STATEMENT OF BID ITEM(S)

A. Refer to Bid Schedule for Bid Items.

1.3 SPECIFICATIONS AND DRAWINGS FOR CONTRACTOR

A. AFTER AWARD OF CONTRACT, specifications and drawings shall be made by the Contractor, at Contractor's expense. The drawings and specifications shall be made available through the Issuing Office.

1.4 CONSTRUCTION SECURITY REQUIREMENETS

A. Security Plan:

1. The security plan defines both physical and administrative security procedures that shall remain effective for the entire duration of the project.
2. The General Contractor is responsible for assuring that all sub-contractors working on the project and their employees also comply with these regulations.

B. Security Procedures:

1. General Contractor's employees shall not enter the project site without appropriate badge. They shall also be subject to inspection of their personal effects when entering or leaving the project site.
2. For working outside the "regular hours" as defined in the contract, The General Contractor shall give 3 days' notice to the Contracting Officer so that security arrangements can be provided for the employees. This notice is separate from any notices required for utility shutdown described later in this section.
3. No photography of VA premises is allowed without written permission of the Contracting Officer.
4. VA reserves the right to close down or shut down the project site and order General Contractor's employees off the premises in the event of a national emergency. The General Contractor shall return to the site only with the written approval of the Contracting Officer.

C. Key Control:

1. The General Contractor shall provide duplicate keys and lock combinations to the COR for the purpose of security inspections of every area of project including tool boxes and parked machines and take any emergency action.
2. The General Contractor shall turn over all permanent lock cylinders to the VA locksmith for permanent installation.

D. Document Control:

1. Before starting any work, the General Contractor/Sub Contractors shall submit an electronic security memorandum describing the approach to following goals and maintaining confidentiality of "sensitive information". This phrase is defined in VA Directive 6500, paragraph 5q. This definition covers all information as defined in 38

USC 5727(19), and in 38 USC 5727(23). The phrase "VA sensitive information" as used in this document means:

"All Department data, on any storage media or in any form or format, which requires protection due to the risk of harm that could result from inadvertent or deliberate disclosure, alteration, or destruction of the information. The term includes information whose improper use or disclosure could adversely affect the ability of an agency to accomplish its mission, proprietary information, records about individuals requiring protection under various confidentiality provisions such as the Privacy Act and the HIPAA Privacy Rule, and information that can be withheld under the Freedom of Information Act. Examples of VA sensitive information include the following: individually-identifiable medical, benefits, and personnel information, financial, budgetary, research, quality assurance, confidential commercial, critical infrastructure, investigatory, and law enforcement information, information that is confidential and privileged in litigation such as information protected by the deliberative process privilege, attorney work-product privilege, and the attorney-client privilege, and other information which, if released, could result in violation of law or harm or unfairness to any individual or group, or could adversely affect the national interest or the conduct of federal programs."

2. The General Contractor is responsible for safekeeping of all drawings, project manual and other project information. This information shall be shared only with those with a specific need to accomplish the project.
3. Certain documents, sketches, videos or photographs and drawings shall be marked "Law Enforcement Sensitive" or "Sensitive Unclassified". Secure such information in separate containers and limit the access to only those who shall need it for the project. Return the information to the Contracting Officer upon request.
4. These security documents shall not be removed or transmitted from the project site without the written approval of Contracting Officer.
5. All paper waste or electronic media such as CD's and diskettes shall be shredded and destroyed in a manner acceptable to the VA. Iron mountain Service company is the service used by VAMC.

6. Notify Contracting Officer and Site Security Officer immediately when there is a loss or compromise of “sensitive information”.
7. All electronic information shall be stored in specified location following VA standards and procedures using an Engineering Document Management Software (EDMS).
    a. Security, access and maintenance of all project drawings, both scanned and electronic shall be performed and tracked through the EDMS system.
    b. “Sensitive information” including drawings and other documents shall be attached to e-mail provided all VA encryption procedures are followed.

E. Motor Vehicle Restrictions
1. Vehicle authorization request shall be required for any vehicle entering the site and such request shall be submitted 24 hours before the date and time of access. Access shall be restricted to picking up and dropping off materials and supplies.
2. Separate permits shall be issued for General Contractor and its employees for parking in designated areas only.

1.5 FIRE SAFETY

A. Applicable Publications: Publications listed below form part of this Article to extent referenced. Publications are referenced in text by basic designations only.
1. American Society for Testing and Materials (ASTM):
E84-2008.....Surface Burning Characteristics of Building Materials
2. National Fire Protection Association (NFPA):
10-2006 .....Standard for Portable Fire Extinguishers
30-2007 .....Flammable and Combustible Liquids Code
51B-2003.....Standard for Fire Prevention During Welding, Cutting and Other Hot Work
70-2007 .....National Electrical Code
241-2004 .....Standard for Safeguarding Construction, Alteration, and Demolition Operations
3. Occupational Safety and Health Administration (OSHA):
29 CFR 1926.....Safety and Health Regulations for Construction

B. Fire Safety Plan: Establish and maintain a fire protection program in accordance with 29 CFR 1926. Prior to start of work, prepare a plan detailing project-specific fire safety measures, including periodic status reports, and submit to COR for review for compliance with contract requirements prior to any worker for the contractor or subcontractors beginning work, they shall undergo a safety briefing provided by the general contractor's competent person per OSHA requirements. This briefing shall include information on the construction limits, VAMC safety guidelines, means of egress, break areas, work hours, locations of restrooms, or use of VAMC equipment. Documentation shall be provided to the COR that individuals have undergone contractor's safety briefing.

C. Site and Building Access: Maintain free and unobstructed access to facility emergency services and for fire, police and other emergency response forces in accordance with NFPA 241.

D. Separate temporary facilities, such as trailers, storage sheds, and dumpsters, from existing buildings and new construction by distances in accordance with NFPA 241. For small facilities with less than 6 m (20 feet) exposing overall length, separate by 3m (10 feet).

E. Temporary Heating and Electrical: Install, use and maintain installations in accordance with 29 CFR 1926, NFPA 241 and NFPA 70.

F. Means of Egress: Do not block exiting for occupied buildings, including paths from exits to roads. Minimize disruptions and coordinate with COR.

G. Egress Routes for Construction Workers: Maintain free and unobstructed egress. Inspect daily. Report findings and corrective actions weekly to COR.

H. Fire Extinguishers: Provide and maintain extinguishers in construction areas and temporary storage areas in accordance with 29 CFR 1926, NFPA 241 and NFPA 10.

I. Flammable and Combustible Liquids: Store, dispense and use liquids in accordance with 29 CFR 1926, NFPA 241 and NFPA 30.

J. Existing Fire Protection: Do not impair automatic sprinklers, smoke and heat detection, and fire alarm systems. VA staff Chiller plant shall provide fire watch for impairments more than 4 hours in a 24-hour period, however the contractor is responsible for notifying staff in a timely manner to allow arrangements for these conditions. Request interruptions in accordance with Article, OPERATIONS AND STORAGE AREAS, and coordinate with COR. All existing or temporary fire protection systems (fire alarms, sprinklers)

located in construction areas shall be tested as coordinated with the medical center. Parameters for the testing and results of any tests performed shall be recorded by the medical center and copies provided to the COR.

K. Hot Work: Perform and safeguard hot work operations in accordance with NFPA 241 and NFPA 51B. Coordinate with COR. Obtain permits from facility Safety Officer at least 48 hours in advance. Designate contractor's responsible project-site fire prevention program manager to permit hot work.

L. Fire Hazard Prevention and Safety Inspections: Inspect entire construction areas weekly. Coordinate with, and report findings and corrective actions weekly to COR.

M. Smoking: Smoking is prohibited in and adjacent to construction areas inside existing buildings and additions under construction. In separate and detached buildings under construction, smoking is prohibited except in designated smoking rest areas.

N. Dispose of waste and debris in accordance with NFPA 241. Remove from buildings daily.

O. Perform other construction, alteration and demolition operations in accordance with 29 CFR 1926.

P. If required, submit documentation to the COR that personnel have been trained in the fire safety aspects of working in areas with impaired structural or compartmentalization features.

1.6 OPERATIONS AND STORAGE AREAS

A. Working space and space available for storing materials shall be as determined by COR.

B. Workmen are subject to rules of Medical Center applicable to their conduct.

C. Execute work so as to interfere as little as possible with normal functioning of Medical Center as a whole, including operations of utility services, fire protection systems and any existing equipment, and with work being done by others. Use of equipment and tools that transmit vibrations and noises through the building structure, are not permitted in buildings that are occupied, during construction, jointly by patients or medical personnel, and Contractor's personnel, except as permitted by COR where required by limited working space.

   1. Do not store materials and equipment in other than assigned areas.

2. Schedule delivery of materials and equipment to immediate construction working areas within buildings in use by Department of Veterans Affairs in quantities sufficient for not more than two work days. Provide unobstructed access to Medical Center areas required to remain in operation.
3. Where access by Medical Center personnel to vacated portions of buildings is not required, storage of Contractor's materials and equipment shall be permitted subject to fire and safety requirements.

D. Utilities Services: Maintain existing utility services for Medical Center at all times. Provide temporary facilities, labor, materials, equipment, connections, and utilities to assure uninterrupted services. Where necessary to cut existing water, steam, gases, sewer or air pipes, or conduits, wires, cables, . of utility services or of fire protection systems and communications systems (including telephone), they shall be cut and capped at suitable places where shown; or, in absence of such indication, where directed by COR.
1. No utility service such as water, gas, steam, sewers or electricity, or fire protection systems and communications systems shall be interrupted without prior approval of COR. Electrical work shall be accomplished with all affected circuits or equipment de-energized. When an electrical outage cannot be accomplished, work on any energized circuits or equipment shall not commence without the Medical Center Director’s prior knowledge and written approval.
2. Contractor shall submit a request to interrupt any such services to COR, in writing, 48 hours in advance of proposed interruption. Request shall state reason, date, exact time of, and approximate duration of such interruption.
3. Contractor shall be advised (in writing) of approval of request, or of which other date and/or time such interruption shall cause least inconvenience to operations of Medical Center. Interruption time approved by Medical Center shall occur at other than Contractor's normal working hours.
4. Major interruptions of any system shall be requested, in writing, at least 15 calendar days prior to the desired time and shall be performed as directed by the COR.
5. In case of a contract construction emergency, service shall be interrupted on approval of COR. Such approval shall be confirmed in writing as soon as practical.

6. Whenever it is required that a connection fee be paid to a public utility provider for new permanent service to the construction project, for such items as water, sewer, electricity, gas or steam, payment of such fee shall be the responsibility of the Government and not the Contractor.

E. Abandoned Lines: All service lines such as wires, cables, conduits, ducts, pipes and the like, and their hangers or supports, which shall abandoned but are not required to be entirely removed, shall be sealed, capped or plugged. The lines shall not be capped in finished areas, but shall be removed and sealed, capped or plugged in ceilings, within furred spaces, in unfinished areas, or within walls or partitions; so that they are completely behind the finished surfaces.

1.7 ALTERATIONS

A. Survey: Before any work is started, the Contractor shall make a thorough survey with the COR areas of buildings in which alterations occur and areas which are anticipated routes of access, and furnish a report, signed by both, to the Contracting Officer. This report shall list by rooms and spaces:
   1. Existing condition and types of resilient flooring, doors, windows, walls and other surfaces not required to be altered throughout affected areas of building.
   2. Existence and conditions of items such as plumbing fixtures and accessories, electrical fixtures, equipment, Venetian blinds, shades required by drawings to be either reused or relocated, or both.
   3. Shall note any discrepancies between drawings and existing conditions at site.
   4. Shall designate areas for working space, materials storage and routes of access to areas within buildings where alterations occur and which have been agreed upon by Contractor and COR.

B. Any items required by drawings to be either reused or relocated or both, found during this survey to be nonexistent, or in opinion of COR, to be in such condition that their use is impossible or impractical, shall be furnished and/or replaced by Contractor with new items in accordance with specifications which shall be furnished by Government. Provided the contract work is changed by reason of this subparagraph B, the contract shall be modified accordingly, under provisions of clause entitled "DIFFERING SITE

CONDITIONS" (FAR 52.236-2) and "CHANGES" (FAR 52.243-4 and VAAR 852.236-88) of Section 01 00 00, GENERAL REQUIREMENTS / CONDITIONS.

C. Re-Survey: Thirty days before expected partial or final inspection date, the Contractor and COR together shall make a thorough re-survey of the areas of buildings involved. They shall furnish a report on conditions then existing, of resilient flooring, doors, windows, walls and other surfaces as compared with conditions of same as noted in first condition survey report:
   1. Re-survey report shall also list any damage caused by Contractor to such flooring and other surfaces, despite protection measures; and, shall form basis for determining extent of repair work required of Contractor to restore damage caused by Contractor's workmen in executing work of this contract.

D. Protection: Provide the following protective measures:
   1. Wherever existing roof surfaces are disturbed they shall be protected against water infiltration. In case of leaks, they shall be repaired immediately upon discovery.
   2. Temporary protection against damage for portions of existing structures and grounds where work is to be done, materials handled and equipment moved and/or relocated.
   3. Protection of interior of existing structures at all times, from damage, dust and weather inclemency. Wherever work is performed, floor surfaces that are to remain in place shall be adequately protected prior to starting work, and this protection shall be maintained intact until all work in the area is completed.

1.8 INFECTION PREVENTION MEASURES

A. Implement the requirements of VAMC’s Infection Control Risk Assessment (ICRA) team. ICRA Group shall monitor dust in the vicinity of the construction work and require the Contractor to take corrective action immediately if the safe levels are exceeded.

B. Establish and maintain a dust control program as part of the contractor’s infection preventive measures in accordance with the guidelines prepared by the Facility Infection Control team (COR will be providing Contractor with ICRA Form signed by VA Infection Control Group). Prior to start of work, prepare a plan detailing project-specific dust protection measures, including periodic status reports, and submit to COR and Facility ICRA team for review for compliance with contract requirements.

1. All personnel involved in the construction or renovation activity shall be educated and trained in infection prevention measures established by the medical center.

C. Medical center Infection Control personnel shall monitor for airborne disease (e.g. aspergillosis) as appropriate during construction. A baseline of conditions shall be established by the medical center prior to the start of work and periodically during the construction stage to determine impact of construction activities on indoor air quality. In addition:
   1. The COR and VAMC Infection Control personnel shall review pressure differential monitoring documentation to verify that pressure differentials in the construction zone and in the patient-care rooms are appropriate for their settings. The requirement for negative air pressure in the construction zone shall depend on the location and type of activity. Upon notification, the contractor shall implement corrective measures to restore proper pressure differentials as needed.
   2. In case of any problem, the medical center, along with assistance from the contractor, shall conduct an environmental assessment to find and eliminate the source.

D. In general, following preventive measures shall be adopted during construction to keep down dust and prevent mold.
   1. Dampen debris to keep down dust and provide temporary construction partitions in existing structures where directed by COR. Blank off ducts and diffusers to prevent circulation of dust into occupied areas during construction.
   2. Do not perform dust producing tasks within occupied areas without the approval of the COR. For construction in any areas that shall remain jointly occupied by the medical Center and Contractor’s workers, the Contractor shall:
      a. Vacuum and wet mop all transition areas from construction to the occupied medical center at the end of each workday. Vacuum shall utilize HEPA filtration. Maintain surrounding area frequently. Remove debris as they are created. Transport these outside the construction area in containers with tightly fitting lids.
      b. The contractor shall not haul debris through patient-care areas without prior approval of the COR and the Medical Center. When, approved, debris shall be hauled in enclosed dust proof containers or wrapped in plastic and sealed with duct tape. No sharp objects shall be allowed to cut through the plastic. Wipe down

the exterior of the containers with a damp rag to remove dust. All equipment, tools and material transported through occupied areas shall be made free from dust and moisture by vacuuming and wipe down.

c. Using a HEPA vacuum, clean inside the barrier and vacuum ceiling tile prior to replacement. Any ceiling access panels opened for investigation beyond sealed areas shall be sealed immediately when unattended.

d. There shall be no standing water during construction. This includes water in equipment drip pans and open containers within the construction areas. All accidental spills shall be cleaned up and dried within 12 hours. Remove and dispose of porous materials that remain damp for more than 72 hours.

e. At completion, remove construction barriers and ceiling protection carefully, outside of normal work hours. Vacuum and clean all surfaces free of dust after the removal.

E. Final Cleanup:

1. Upon completion of project, or as work progresses, remove all construction debris from above ceiling, vertical shafts and utility chases that have been part of the construction.
2. Perform HEPA vacuum cleaning of all surfaces in the construction area. This includes walls, ceilings, cabinets, furniture (built-in or free standing), partitions and flooring.
3. All new air ducts shall be cleaned prior to final inspection.

1.9 DISPOSAL AND RETENTION

A. Materials and equipment accruing from work removed and from demolition of buildings or structures, or parts thereof, shall be disposed of as follows:

1. Reserved items which are to remain property of the Government are identified by attached tags or noted on drawings or in specifications as items to be stored in a Government-controlled location. Items that remain property of the Government shall be removed or dislodged from present locations in such a manner as to prevent damage which would be detrimental to re-installation and reuse. The Government shall store such items where directed by COR.

2. Items not reserved shall become property of the Contractor and be removed by Contractor from Medical Center.
3. Items of portable equipment and furnishings located in rooms and spaces in which work is to be done under this contract shall remain the property of the Government. When rooms and spaces are vacated by the Department of Veterans Affairs during the alteration period, such items which are NOT required by drawings and specifications to be either relocated or reused shall be removed by the Government in advance of work to avoid interfering with Contractor's operation.

1.10 RESTORATION

A. Remove, cut, alter, replace, patch and repair existing work as necessary to install new work. Except as otherwise shown or specified, do not cut, alter or remove any structural work, and do not disturb any ducts, plumbing, steam, gas, or electric work without approval of the COR. Existing work to be altered or extended and that is found to be defective in any way, shall be reported to the COR before it is disturbed. Materials and workmanship used in restoring work, shall conform in type and quality to that of original existing construction, except as otherwise shown or specified.

B. Upon completion of contract, deliver work complete and undamaged. Existing work (walls, ceilings, partitions, floors, mechanical and electrical work, lawns, paving, roads, and walks) disturbed or removed as a result of performing required new work, shall be patched, repaired, reinstalled, or replaced with new work, and refinished and left in as good condition as existed before commencing work.

C. At Contractor's own expense, Contractor shall immediately restore to service and repair any damage caused by Contractor's workmen to existing piping and conduits, wires, and cables of utility services or of fire protection systems and communications systems (including telephone) which are indicated on drawings and which are not scheduled for discontinuance or abandonment.

D. Expense of repairs to such utilities and systems not shown on drawings or locations of which are unknown shall be covered by adjustment to contract time and price in accordance with clause entitled "CHANGES" (FAR 52.243-4 and VAAR 852.236-88) and "DIFFERING SITE CONDITIONS" (FAR 52.236-2) of Section 01 00 00, GENERAL REQUIREMENTS / CONDITIONS.

1.11 AS-BUILT DRAWINGS

A. The contractor shall maintain two full size sets of as-built drawings which shall be kept current during construction of the project, to include all contract changes, modifications and clarifications.

B. All variations shall be shown in the same general detail as used in the contract drawings. To insure compliance, as-built drawings shall be made available for the COR's review, as often as requested.

C. Contractor shall deliver two approved completed sets of as-built drawings to the COR within 15 calendar days after each completed phase and after the acceptance of the project by the COR.

D. Paragraphs A, B, & C shall also apply to all shop drawings.

1.12 USE OF ROADWAYS

A. For hauling, use only established public roads and roads on Medical Center property and, when authorized by the COR, such temporary roads which are necessary in the performance of contract work. Temporary roads shall be constructed by the Contractor at Contractor's expense. When necessary to cross curbing, sidewalks, or similar construction, they shall be protected by well-constructed bridges.

B. When new permanent roads shall be a part of this contract, Contractor shall construct them immediately for use to facilitate building operations. These roads shall be used by all who have business thereon within zone of building operations.

C. When certain buildings (or parts of certain buildings) are required to be completed in advance of general date of completion, all roads leading thereto shall be completed and available for use at time set for completion of such buildings or parts thereof.

1.13 AVAILABILITY AND USE OF UTILITY SERVICES

A. Contractor shall install meters at Contractor's expense and furnish the Medical Center a monthly record of the Contractor's usage of electricity as hereinafter specified.

B. Heat: Furnish temporary heat necessary to prevent injury to work and materials through dampness and cold. Use of open salamanders or any temporary heating devices which shall be fire hazards or shall smoke and damage finished work, shall not be permitted. Maintain minimum temperatures as specified for various materials:

1. Obtain heat by connecting to Medical Center heating distribution system.

a. Steam is available at no cost to Contractor.

C. Electricity (for Construction and Testing): Furnish all temporary electric services.

1.14 INSTRUCTIONS

A. Contractor shall furnish Maintenance and Operating manuals and verbal instructions when required by the various sections of the specifications and as hereinafter specified.

B. Manuals: Maintenance and operating manuals (four copies each) for each separate piece of equipment shall be delivered to the COR coincidental with the delivery of the equipment to the job site. Manuals shall be complete, detailed guides for the maintenance and operation of equipment. They shall include complete information necessary for starting, adjusting, maintaining in continuous operation for long periods of time and dismantling and reassembling of the complete units and sub-assembly components. Manuals shall include an index covering all component parts clearly cross-referenced to diagrams and illustrations. Illustrations shall include "exploded" views showing and identifying each separate item. Emphasis shall be placed on the use of special tools and instruments. The function of each piece of equipment, component, accessory and control shall be clearly and thoroughly explained. All necessary precautions for the operation of the equipment and the reason for each precaution shall be clearly set forth. Manuals shall reference the exact model, style and size of the piece of equipment and system being furnished. Manuals referencing equipment similar to but of a different model, style, and size than that furnished shall not be accepted.

C. Instructions: Contractor shall provide qualified, factory-trained manufacturers' representatives to give detailed instructions to assigned Department of Veterans Affairs personnel in the operation and complete maintenance for each piece of equipment. All such training shall be at the job site. These requirements are more specifically detailed in the various technical sections. Instructions for different items of equipment that are component parts of a complete system, shall be given in an integrated, progressive manner. All instructors for every piece of component equipment in a system shall be available until instructions for all items included in the system have been completed. This is to assure proper instruction in the operation of inter-related systems. All instruction periods shall be at such times as scheduled by the COR and shall be considered concluded only when the COR is satisfied in regard to complete and thorough coverage.

The Department of Veterans Affairs reserves the right to request the removal of, and substitution for, any instructor who, in the opinion of the COR, does not demonstrate sufficient qualifications in accordance with requirements for instructors above.

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SECTION 01 33 23
SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

1-1. Refer to Articles titled SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION (FAR 52.236-21) and, SPECIAL NOTES (VAAR 852.236-91), in GENERAL REQUIREMENTS / CONDITIONS.

1-2. For the purposes of this contract, samples, test reports, certificates, and manufacturers' literature and data shall also be subject to the previously referenced requirements. The following text refers to all items collectively as SUBMITTALS.

1-3. Submit for approval, all of the items specifically mentioned under the separate sections of the specification, with information sufficient to evidence full compliance with contract requirements. Materials, fabricated articles and the like to be installed in permanent work shall equal those of approved submittals. After an item has been approved, no change in brand or make shall be permitted unless:

A. Satisfactory written evidence is presented to, and approved by Contracting Officer, that manufacturer cannot make scheduled delivery of approved item or;

B. Item delivered has been rejected and substitution of a suitable item is an urgent necessity or;

C. Other conditions become apparent which indicates approval of such substitute item to be in best interest of the Government.

1-4. Forward submittals in sufficient time to permit proper consideration and approval action by Government. Time submission to assure adequate lead time for procurement of contract - required items. Delays attributable to untimely and rejected submittals shall not serve as a basis for extending contract time for completion.

1-5. Submittals shall be reviewed for compliance with contract requirements by COR, and action thereon shall be taken on behalf of the Contracting Officer.

1-6. Upon receipt of submittals, COR shall assign a file number thereto. Contractor, in any subsequent correspondence, shall refer to this file and identification number to expedite replies relative to previously approved or disapproved submittals.

1-7. The Government reserves the right to require additional submittals, whether or not particularly mentioned in this contract. If additional submittals beyond those required by the contract are furnished pursuant to request therefor by Contracting Officer, adjustment

in contract price and time shall be made in accordance with Articles titled CHANGES (FAR 52.243-4) and CHANGES - SUPPLEMENT (VAAR 852.236-88) of the GENERAL REQUIREMENTS / CONDITIONS.

1-8. Schedules called for in specifications and shown on shop drawings shall be submitted for use and information of Department of Veterans Affairs. However, the Contractor shall assume responsibility for coordinating and verifying schedules. The Contracting Officer and COR assumes no responsibility for checking schedules or layout drawings for exact sizes, exact numbers and detailed positioning of items.

1-9. Submittals shall be submitted by Contractor only and shipped prepaid. Contracting Officer assumes no responsibility for checking quantities or exact numbers included in such submittals.

A. Submit shop drawings, schedules, manufacturers' literature and data, and certificates in duplicate, except where a greater number is specified.

B. Submittals shall receive consideration only when covered by a transmittal letter signed by Contractor and shall contain the list of items, name of Medical Center, name of Contractor, contract number, applicable specification paragraph numbers, applicable drawing numbers (and other information required for exact identification of location for each item), manufacturer and brand, ASTM or Federal Specification Number (if any) and such additional information as shall be required by specifications for particular item being furnished. In addition, catalogs shall be marked to indicate specific items submitted for approval.

1. A copy of letter shall be enclosed with items, and any items received without identification letter shall be considered "unclaimed goods" and held for a limited time only.
2. Each sample, certificate, manufacturers' literature and data shall be labeled to indicate the name and location of the Medical Center, name of Contractor, manufacturer, brand, contract number and ASTM or Federal Specification Number as applicable and location(s) on project.
3. Required certificates shall be signed by an authorized representative of manufacturer or supplier of material, and by Contractor.

C. If submittal samples have been disapproved, resubmit new samples as soon as possible after notification of disapproval. Such new samples shall be marked "Resubmitted Sample" in addition to containing other previously specified information required on label and in transmittal letter.

D. Approved samples shall be kept on file by the COR at the site until completion of contract, at which time such samples shall be delivered to Contractor as Contractor's property. Where noted in technical sections of specifications, approved samples in good condition shall be used in their proper locations in contract work. At completion of contract, samples that are not approved shall be returned to Contractor only upon request and at Contractor's expense. Such request shall be made prior to completion of the contract. Disapproved samples that are not requested for return by Contractor shall be discarded after completion of contract.

E. Submittal drawings (shop, erection or setting drawings) and schedules, required for work of various trades, shall be checked before submission by technically qualified employees of Contractor for accuracy, completeness and compliance with contract requirements. These drawings and schedules shall be stamped and signed by Contractor certifying to such check.

1. For each drawing required, submit one legible photographic paper or vellum reproducible.
2. Reproducible shall be full size.
3. Each drawing shall have marked thereon, proper descriptive title, including Medical Center location, project number, manufacturer's number, reference to contract drawing number, detail Section Number, and Specification Section Number.
4. A space 120 mm by 125 mm (4-3/4 by 5 inches) shall be reserved on each drawing to accommodate approval or disapproval stamp.
5. Submit drawings, ROLLED WITHIN A MAILING TUBE, fully protected for shipment.
6. One reproducible print of approved or disapproved shop drawings shall be forwarded to Contractor.
7. When work is directly related and involves more than one trade, shop drawings shall be submitted to COR under one cover.

1-10. Samples for approval shall be sent to COR at:

VA Medical Center

1481 W. 10th Street

Indianapolis, IN 46202

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SECTION 01 57 19
TEMPORARY ENVIRONMENTAL CONTROLS

EP-1. DESCRIPTION

A. This section specifies the control of environmental pollution and damage that the Contractor shall consider for air, water, and land resources. It includes management of visual aesthetics, noise, solid waste, radiant energy, and radioactive materials, as well as other pollutants and resources encountered or generated by the Contractor. The Contractor is obligated to consider specified control measures with the costs included within the various contract items of work.

B. Environmental pollution and damage is defined as the presence of chemical, physical, or biological elements or agents which:

1. Adversely affect human health or welfare,
2. Unfavorably alter ecological balances of importance to human life,
3. Effect other species of importance to humankind, or;
4. Degrade the utility of the environment for aesthetic, cultural, and historical purposes.

C. Definitions of Pollutants:

1. Chemical Waste: Petroleum products, bituminous materials, salts, acids, alkalis, herbicides, pesticides, organic chemicals, and inorganic wastes.
2. Debris: Combustible and noncombustible wastes, such as leaves, tree trimmings, ashes, and waste materials resulting from construction or maintenance and repair work.
3. Sediment: Soil and other debris that has been eroded and transported by runoff water.
4. Solid Waste: Rubbish, debris, garbage, and other discarded solid materials resulting from industrial, commercial, and agricultural operations and from community activities.
5. Surface Discharge: The term "Surface Discharge" implies that the water is discharged with possible sheeting action and subsequent

soil erosion shall occur. Waters that are surface discharged shall terminate in drainage ditches, storm sewers, creeks, and/or "water of the United States" and would require a permit to discharge water from the governing agency.

6. Rubbish: Combustible and noncombustible wastes such as paper, boxes, glass and crockery, metal and lumber scrap, tin cans, and bones.

7. Sanitary Wastes:

a. Sewage: Domestic sanitary sewage and human and animal waste.

b. Garbage: Refuse and scraps resulting from preparation, cooking, dispensing, and consumption of food.

EP-2. QUALITY CONTROL

A. Establish and maintain quality control for the environmental protection of all items set forth herein.

B. Record on daily reports any problems in complying with laws, regulations, and ordinances. Note any corrective action taken.

EP-3. REFERENCES

A. 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.

B. U.S. National Archives and Records Administration (NARA):

33 CFR 328.....Definitions

EP-4. PROTECTION OF ENVIRONMENTAL RESOURCES

A. Protect environmental resources within the project boundaries and those affected outside the limits of permanent work during the entire period of this contract. Confine activities to areas defined by the specifications and drawings.

B. Protection of Land Resources: Prior to construction, identify all land resources to be preserved within the work area. Do not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, top soil, and land forms without permission from the VAMC Indianapolis COR. Do not fasten or attach ropes, cables, or guys to

trees for anchorage unless specifically authorized, or where special emergency use is permitted.

1. Work Area Limits: Prior to any construction, mark the areas that require work to be performed under this contract. Mark or fence isolated areas within the general work area that shall saved and protected. Protect monuments, works of art, and markers before construction operations begin. Convey to all personnel the purpose of marking and protecting all necessary objects.
2. Protection of Landscape: Protect trees, shrubs, vines, grasses, land forms, and other landscape features shown on the drawings to be preserved by marking, fencing, or using any other approved techniques.
    a. Box and protect from damage existing trees and shrubs to remain on the construction site.
    b. Immediately repair all damage to existing trees and shrubs by trimming, cleaning, and painting with antiseptic tree paint.
    c. Do not store building materials or perform construction activities closer to existing trees or shrubs than the farthest extension of their limbs.
3. Handle and dispose of solid wastes in such a manner that shall prevent contamination of the environment. Place solid wastes (excluding clearing debris) in containers that are emptied on a regular schedule. Transport all solid waste off Government property and dispose of waste in compliance with Federal, State, and local requirements.
4. Store chemical waste away from the work areas in corrosion resistant containers and dispose of waste in accordance with Federal, State, and local regulations.
5. Handle discarded materials other than those included in the solid waste category as directed by the VAMC Indianapolis COR.

C. Protection of Water Resources: Keep construction activities under

surveillance, management, and control to avoid pollution of surface and ground waters and sewer systems. Implement management techniques to control water pollution by the listed construction activities that are included in this contract.

1. Washing and Curing Water: Do not allow wastewater directly derived from construction activities to enter water areas. Collect and place wastewater in retention ponds allowing the suspended material to settle, the pollutants to separate, or the water to evaporate.
2. Control movement of materials and equipment at stream crossings during construction to prevent violation of water pollution control standards of the Federal, State, or local government.
3. Monitor water areas affected by construction.

D. Protection of Air Resources: Keep construction activities under surveillance, management, and control to minimize pollution of air resources. Burning is not permitted on the job site. Keep activities, equipment, processes, and work operated or performed, in strict accordance with the State of Indiana Clean Air Acts and Federal emission and performance laws and standards. Maintain ambient air quality standards set by the Environmental Protection Agency, for those construction operations and activities specified.

1. Particulates: Control dust particles, aerosols, and gaseous byproducts from all construction activities, processing, and preparation of materials (such as from asphaltic batch plants) at all times, including weekends, holidays, and hours when work is not in progress.
2. Particulates Control: Maintain all excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, borrow areas, and all other work areas within or outside the project boundaries free from particulates which would cause a hazard or a nuisance. Sprinklering, chemical treatment of an approved type, light bituminous treatment, baghouse, scrubbers, electrostatic

precipitators, or other methods are permitted to control particulates in the work area.

3. Hydrocarbons and Carbon Monoxide: Control monoxide emissions from equipment to Federal and State allowable limits.

4. Odors: Control odors of construction activities and prevent obnoxious odors from occurring.

E. Reduction of Noise: Minimize noise using every action possible. Perform noise-producing work in less sensitive hours of the day or week as directed by the VAMC Indianapolis COR. Maintain noise-produced work at or below the decibel levels and within the time periods specified.

1. Perform construction activities involving repetitive, high-level impact noise only between 8:00 a.m. and 5:00 p.m. unless otherwise permitted by local ordinance or the VAMC Indianapolis COR. Repetitive impact noise on the property shall not exceed the following dB limitations:

Time Duration of Impact Noise	Sound Level in dB
More than 12 minutes in any hour	70
Less than 30 seconds of any hour	85
Less than three minutes of any hour	80
Less than 12 minutes of any hour	75

2. Provide sound-deadening devices on equipment and take noise abatement measures that are necessary to comply with the requirements of this contract, consisting of, the following:

a. Maintain maximum permissible construction equipment noise levels at 15 m (50 feet) (dBA):

EARTHMOVING	MATERIALS HANDLING
FRONT LOADERS 75	CONCRETE MIXERS 75
BACKHOES 75	CONCRETE PUMPS 75
DOZERS 75	CRANES 75
TRACTORS 75	DERRICKS IMPACT 75
SCAPERS 80	PILE DRIVERS 95

GRADERS 75	JACK HAMMERS 75
TRUCKS 75	ROCK DRILLS 80
PAVERS,	
STATIONARY 80	PNEUMATIC TOOLS 80
PUMPS 75	SAWS 75
GENERATORS 75	VIBRATORS 75
COMPRESSORS 75	

b. Use shields or other physical barriers to restrict noise transmission.

c. Provide soundproof housings or enclosures for noise-producing machinery.

d. Use efficient silencers on equipment air intakes.

e. Use efficient intake and exhaust mufflers on internal combustion engines that are maintained so equipment performs below noise levels specified.

f. Line hoppers and storage bins with sound deadening material.

g. Conduct truck loading, unloading, and hauling operations so that noise is kept to a minimum.

3. Measure sound level for noise exposure due to the construction at least once every five successive working days while work is being performed above 55 dB(A) noise level. Measure noise exposure at the property line or 15 m (50 feet) from the noise source, whichever is greater. Measure the sound levels on the A weighing network of a General Purpose sound level meter at slow response. To minimize the effect of reflective sound waves at buildings, take measurements at 900 to 1800 mm (three to six feet) in front of any building face. Submit the recorded information to the VAMC Indianapolis COR noting any problems and the alternatives for mitigating actions.

F. Restoration of Damaged Property: If any direct or indirect damage is done to public or private property resulting from any act, omission, neglect, or misconduct, the Contractor shall restore the damaged property to a condition equal to that existing before the damage at no

additional cost to the Government. Repair, rebuild, or restore property as directed or make good such damage in an acceptable manner.

G. Final Clean-up: On completion of project and after removal of all debris, rubbish, and temporary construction, Contractor shall leave the construction area in a clean condition satisfactory to the VAMC Indianapolis COR. Cleaning shall include off the station disposal of all items and materials not required to be salvaged, as well as all debris and rubbish resulting from demolition and new work operations.

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SECTION 01 74 19
CONSTRUCTION WASTE MANAGEMENT

PART 1 – GENERAL

1.1 DESCRIPTION

A. This section specifies the requirements for the management of non-hazardous building construction and demolition waste.

B. Waste disposal in landfills shall be minimized to the greatest extent possible. Of the inevitable waste that is generated, as much of the waste material as economically feasible shall be salvaged, recycled or reused.

C. Contractor shall use all reasonable means to divert construction and demolition waste from landfills and incinerators, and facilitate the salvage and recycling of construction debris using the following techniques:

1. Waste Management Plan development and implementation.
2. Techniques to minimize waste generation.
3. Sorting and separating of waste materials.
4. Salvage of existing materials and items for reuse or resale.
5. Recycling of materials that cannot be reused or sold.

D. At a minimum the following waste categories shall be diverted from landfills:

1. Soil.
2. Inerts (eg, concrete, masonry and asphalt).
3. Clean dimensional wood and palette wood.
4. Green waste (biodegradable landscaping materials).
5. Engineered wood products (plywood, particle board and I-joists).
6. Metal products (eg, steel, wire, beverage containers, copper).
7. Cardboard, paper and packaging.
8. Bitumen roofing materials.
9. Plastics (eg, ABS, PVC).
10. Carpet and/or pad.
11. Gypsum board.
12. Insulation.
13. Paint.

14. Fluorescent lamps.

1.2 RELATED WORK

A. Section 02 41 00, DEMOLITION.

B. Section 01 00 00, GENERAL REQUIREMENTS.

1.3 QUALITY ASSURANCE

A. Contractor shall practice efficient waste management when sizing, cutting and installing building products. Processes shall be employed to ensure the generation of as little waste as possible. Construction /Demolition waste includes products of the following:

1. Excess or unusable construction materials.
2. Packaging used for construction products.
3. Poor planning and/or layout.
4. Construction error.
5. Over ordering.
6. Weather damage.
7. Contamination.
8. Mishandling.
9. Breakage.

B. Establish and maintain the management of non-hazardous building construction and demolition waste set forth herein. Conduct a site assessment to estimate the types of materials that shall be generated by demolition and construction.

C. Contractor shall develop and implement procedures to reuse and recycle new materials to a minimum of 50 percent.

D. Contractor shall be responsible for implementation of any special programs involving rebates or similar incentives related to recycling. Any revenues or savings obtained from salvage or recycling shall accrue to the contractor.

E. Contractor shall provide all demolition, removal and legal disposal of materials. Contractor shall ensure that facilities used for recycling, reuse and disposal shall be permitted for the intended use to the extent required by local, state, federal regulations. The Whole Building Design Guide website http://www.wbdg.org provides a Construction Waste Management Database that contains information on companies that haul, collect, and process recyclable debris from construction projects.

F. Contractor shall assign a specific area to facilitate separation of materials for reuse, salvage, recycling, and return. Such areas shall kept neat and clean and clearly marked in order to avoid contamination or mixing of materials.

G. Contractor shall provide on-site instructions and supervision of separation, handling, salvaging, recycling, reuse and return methods to be used by all parties during waste generating stages.

H. Record on daily reports any problems in complying with laws, regulations and ordinances with corrective action taken.

1.4 TERMINOLOGY

A. Class III Landfill: A landfill that accepts non-hazardous resources such as household, commercial and industrial waste resulting from construction, remodeling, repair and demolition operations.

B. Clean: Untreated and unpainted; uncontaminated with adhesives, oils, solvents, mastics and like products.

C. Construction and Demolition Waste: Includes all non-hazardous resources resulting from construction, remodeling, alterations, repair and demolition operations.

D. Dismantle: The process of parting out a building in such a way as to preserve the usefulness of its materials and components.

E. Disposal: Acceptance of solid wastes at a legally operating facility for the purpose of land filling (includes Class III landfills and inert fills).

F. Inert Backfill Site: A location, other than inert fill or other disposal facility, to which inert materials are taken for the purpose of filling an excavation, shoring or other soil engineering operation.

G. Inert Fill: A facility that can legally accept inert waste, such as asphalt and concrete exclusively for the purpose of disposal.

H. Inert Solids/Inert Waste: Non-liquid solid resources including, soil and concrete that does not contain hazardous waste or soluble pollutants at concentrations in excess of water-quality objectives established by a regional water board, and does not contain significant quantities of decomposable solid resources.

I. Mixed Debris: Loads that include commingled recyclable and non-recyclable materials generated at the construction site.

J. Mixed Debris Recycling Facility: A solid resource processing facility that accepts loads of mixed construction and demolition debris for the purpose of recovering re-usable and recyclable materials and disposing non-recyclable materials.

K. Permitted Waste Hauler: A company that holds a valid permit to collect and transport solid wastes from individuals or businesses for the purpose of recycling or disposal.

L. Recycling: The process of sorting, cleansing, treating, and reconstituting materials for the purpose of using the altered form in the manufacture of a new product. Recycling does not include burning, incinerating or thermally destroying solid waste.

   1. On-site Recycling – Materials that are sorted and processed on site for use in an altered state in the work, i.e. concrete crushed for use as a sub-base in paving.
   2. Off-site Recycling – Materials hauled to a location and used in an altered form in the manufacture of new products.

M. Recycling Facility: An operation that can legally accept materials for the purpose of processing the materials into an altered form for the manufacture of new products. Depending on the types of materials accepted and operating procedures, a recycling facility shall or shall not be required to have a solid waste facilities permit or be regulated by the local enforcement agency.

N. Reuse: Materials that are recovered for use in the same form, on-site or off-site.

O. Return: To give back reusable items or unused products to vendors for credit.

P. Salvage: To remove waste materials from the site for resale or re-use by a third party.

Q. Source-Separated Materials: Materials that are sorted by type at the site for the purpose of reuse and recycling.

R. Solid Waste: Materials that have been designated as non-recyclable and are discarded for the purposes of disposal.

S. Transfer Station: A facility that can legally accept solid waste for the purpose of temporarily storing the materials for re-loading onto other trucks and transporting them to a landfill for disposal, or recovering some materials for re-use or recycling.

1.5 SUBMITTALS

A. In accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, and SAMPLES, furnish the following:

B. Prepare and submit to the COR a written demolition debris management plan. The plan shall include, at a minimum, the following information:
    1. Procedures to be used for debris management.
    2. Techniques to be used to minimize waste generation.
    3. Analysis of the estimated job site waste to be generated:
        a. List of each material and quantity to be salvaged, reused, recycled.
        b. List of each material and quantity proposed to be taken to a landfill.
    4. Detailed description of the Means/Methods to be used for material handling.
        a. On site: Material separation, storage, protection where applicable.
        b. Off site: Transportation means and destination. Include list of materials.
            1) Description of materials to be site-separated and self-hauled to designated facilities.
            2) Description of mixed materials to be collected by designated waste haulers and removed from the site.
        c. The names and locations of mixed debris reuse and recycling facilities or sites.
        d. The names and locations of trash disposal landfill facilities or sites.
        e. Documentation that the facilities or sites are approved to receive the materials.
C. Designated Manager responsible for instructing personnel, supervising, documenting and administer over meetings relevant to the Waste Management Plan.
D. Monthly summary of construction and demolition debris diversion and disposal, quantifying all materials generated at the work site and disposed of or diverted from disposal through recycling.

1.6 APPLICABLE PUBLICATIONS

A Publications listed below form a part of this specification to the extent referenced. Publications are referenced by the basic designation only. In the event that criteria requirements conflict, the most stringent requirements shall be met.

B. U.S. Green Building Council (USGBC):
LEED Green Building Rating System for New Construction

1.7 RECORDS

Maintain records to document the quantity of waste generated; the quantity of waste diverted through sale, reuse, or recycling; and the quantity of waste disposed by landfill

or incineration. Records shall be kept in accordance with the LEED Reference Guide and LEED Template.

PART 2 - PRODUCTS

2.1 MATERIALS

A. List of each material and quantity to be salvaged, recycled, reused.

B. List of each material and quantity proposed to be taken to a landfill.

C. Material tracking data: Receiving parties, dates removed, transportation costs, weight tickets, tipping fees, manifests, invoices, net total costs or savings.

PART 3 - EXECUTION

3.1 COLLECTION

A. Provide all necessary containers, bins and storage areas to facilitate effective waste management.

B. Clearly identify containers, bins and storage areas so that recyclable materials are separated from trash and can be transported to respective recycling facility for processing.

C. Hazardous wastes shall be separated, stored, disposed of according to local, state, federal regulations.

3.2 DISPOSAL

A. Contractor shall be responsible for transporting and disposing of materials that cannot be delivered to a source-separated or mixed materials recycling facility to a transfer station or disposal facility that can accept the materials in accordance with state and federal regulations.

B. Construction or demolition materials with no practical reuse or that cannot be salvaged or recycled shall be disposed of at a landfill or incinerator.

3.3 REPORT

A. With each application for progress payment, submit a summary of construction and demolition debris diversion and disposal including beginning and ending dates of period covered.

B. Quantify all materials diverted from landfill disposal through salvage or recycling during the period with the receiving parties, dates removed, transportation costs, weight tickets,

manifests, invoices. Include the net total costs or savings for each salvaged or recycled material.

C. Quantify all materials disposed of during the period with the receiving parties, dates removed, transportation costs, weight tickets, tipping fees, manifests, invoices. Include the net total costs for each disposal.

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SECTION 02 41 00
DEMOLITION

PART 1 - GENERAL

1.1 DESCRIPTION:

This section specifies demolition and removal of buildings, portions of buildings, utilities, other structures and debris from trash dumps shown.

1.2 RELATED WORK:

A. Safety Requirements: GENERAL CONDITIONS Article.

B. Disconnecting utility services prior to demolition: Section 01 00 00, GENERAL REQUIREMENTS.

C. Reserved items that are to remain the property of the Government: Section 01 00 00, GENERAL REQUIREMENTS.

D. Construction Waste Management: Section 017419 CONSTRUCTION WASTE MANAGEMENT.

F. Infectious Control: Section 01 00 00, GENERAL REQUIREMENTS, Article 1.8, INFECTION PREVENTION MEASURES.

1.3 PROTECTION:

A. Perform demolition in such manner as to eliminate hazards to persons and property; to minimize interference with use of adjacent areas, utilities and structures or interruption of use of such utilities; and to provide free passage to and from such adjacent areas of structures. Comply with requirements of GENERAL CONDITIONS Article.

B. Provide safeguards, including warning signs, barricades, temporary fences, warning lights, and other similar items that are required for protection of all personnel during demolition and removal operations. Comply with requirements of Section 01 00 00, GENERAL REQUIREMENTS, Article PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES AND IMPROVEMENTS.

C. Maintain fences, barricades, lights, and other similar items around exposed excavations until such excavations have been completely filled.

D. Provide enclosed dust chutes with control gates from each floor to carry debris to truck beds and govern flow of material into truck. Provide overhead bridges of tight board or

prefabricated metal construction at dust chutes to protect persons and property from falling debris.

E. Prevent spread of flying particles and dust. Sprinkle rubbish and debris with water to keep dust to a minimum. Do not use water if it results in hazardous or objectionable condition such as, ice, flooding, or pollution. Vacuum and dust the work area daily.

F. In addition to previously listed fire and safety rules to be observed in performance of work, include following:

   1. No wall or part of wall shall be permitted to fall outwardly from structures.
   3. Wherever a cutting torch or other equipment that might cause a fire is used, provide and maintain fire extinguishers nearby ready for immediate use. Instruct all possible users in use of fire extinguishers.
   4. Keep hydrants clear and accessible at all times. Prohibit debris from accumulating within a radius of 4500 mm (15 feet) of fire hydrants.

G. Before beginning any demolition work, the Contractor shall survey the site and examine the drawings and specifications to determine the extent of the work. The contractor shall take necessary precautions to avoid damages to existing items to remain in place, to be reused, or to remain the property of the Medical Center; any damaged items shall be repaired or replaced as approved by the COR. The Contractor shall coordinate the work of this section with all other work and shall construct and maintain shoring, bracing, and supports as required. The Contractor shall ensure that structural elements are not overloaded and shall be responsible for increasing structural supports or adding new supports as shall be required as a result of any cutting, removal, or demolition work performed under this contract. Do not overload structural elements. Provide new supports and reinforcement for existing construction weakened by demolition or removal works. Repairs, reinforcement, or structural replacement shall have COR's approval.

H. The work shall comply with the requirements of Section 01 00 00, GENERAL REQUIREMENTS, Article 1.8 INFECTION PREVENTION MEASURES.

1.4 UTILITY SERVICES:

A. Demolish and remove outside utility service lines shown to be removed.

B. Remove abandoned outside utility lines that would interfere with installation of new utility lines and new construction.

PART 2 - PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 DEMOLITION:

A. Completely demolish and remove buildings and structures, including all appurtenances related or connected thereto, as noted below:
   1. As required for installation of new utility service lines.
   2. To full depth within an area defined by hypothetical lines located 1500 mm (5 feet) outside building lines of new structures.

B. Debris, including brick, concrete, stone, metals and similar materials shall become property of Contractor and shall be disposed of by him daily, off the Medical Center to avoid accumulation at the demolition site. Materials that cannot be removed daily shall be stored in areas specified by the COR. Break up concrete slabs below grade that do not require removal from present location into pieces not exceeding 600 mm (24 inches) square to permit drainage. Contractor shall dispose debris in compliance with applicable federal, state or local permits, rules and/or regulations.

D. Remove and legally dispose of all materials, other than earth to remain as part of project work, from any trash dumps shown. Materials removed shall become property of contractor and shall be disposed of in compliance with applicable federal, state or local permits, rules and/or regulations. All materials in the indicated trash dump areas, including above surrounding grade and extending to a depth of 1500mm (5feet) below surrounding grade, shall be included as part of the lump sum compensation for the work of this section. Materials that are located beneath the surface of the surrounding ground more than 1500 mm (5 feet), or materials that are discovered to be hazardous, shall be handled as unforeseen. The removal of hazardous material shall be referred to Hazardous Materials specifications.

E. Remove existing utilities as indicated or uncovered by work and terminate in a manner conforming to the nationally recognized code covering the specific utility and approved by the COR. When Utility lines are encountered that are not indicated on the drawings, the COR shall be notified prior to further work in that area.

3.2 CLEAN-UP:

On completion of work of this section and after removal of all debris, leave site in clean condition satisfactory to COR. Clean-up shall include off the Medical Center disposal of all items and materials not required to remain property of the Government as well as all debris and rubbish resulting from demolition operations.

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SECTION 05 50 00
METAL FABRICATIONS

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section specifies items and assemblies fabricated from structural steel shapes and other materials as shown and specified.

B. Items specified.

1. Ladders
2. Railings
3. Catwalk

1.2 RELATED WORK

A. Colors, finishes, and textures: Refer to sec. 2.4 Fabrication General Part(F) subpart(2) item(a).

B. Prime and finish painting: Refer to sec. 2.4 Fabrication General part(F) subpart(2) item(a).

1.3 SUBMITTALS

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Shop Drawings:

1. Each item specified, showing complete detail, location in the project, material and size of components, method of joining various components and assemblies, finish, and location, size and type of anchors.
2. Mark items requiring field assembly for erection identification and furnish erection drawings and instructions.
3. Provide templates and rough-in measurements as required.

C. Manufacturer's Certificates:

1. Live load designs as specified.

D. Design Calculations for specified live loads including dead loads.

E. Furnish setting drawings and instructions for installation of anchors to be preset into concrete and masonry work, and for the positioning of items having anchors to be built into concrete or masonry construction.

1.4 QUALITY ASSURANCE

A. Each manufactured product shall meet, as a minimum, the requirements specified, and shall be a standard commercial product of a manufacturer regularly presently manufacturing items of type specified.

B. Each product type shall be the same and be made by the same manufacturer.

C. Assembled product to the greatest extent possible before delivery to the site.

D. Include additional features, which are not specifically prohibited by this specification, but which are a part of the manufacturer's standard commercial product.

1.5 APPLICABLE PUBLICATIONS

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

B. American Society of Mechanical Engineers (ASME):

B18.2.2-87(R2005).....Square and Hex Nuts

C. American Society for Testing and Materials (ASTM):

A36/A36M-08.....Structural Steel

A53-10.....Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless

A123-09.....Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

A269-10.....Seamless and Welded Austenitic Stainless Steel Tubing for General Service

A307-10.....Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength

A653/A653M-10.....Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process

C1107-08.....Packaged Dry, Hydraulic-Cement Grout (Non-shrink)

F436-10.....Hardened Steel Washers

F593-02(R2008).....Stainless Steel Bolts, Hex Cap Screws, and Studs

F1667-11.....Driven Fasteners: Nails, Spikes and Staples

D. American Welding Society (AWS):

D1.1-10.....Structural Welding Code Steel

D1.3-08.....Structural Welding Code Sheet Steel

E. National Association of Architectural Metal Manufacturers (NAAMM)

AMP 521-01.....Pipe Railing Manual

AMP 500-06.....Metal Finishes Manual

MBG 531-09.....Metal Bar Grating Manual

MBG 532-09.....Heavy Duty Metal Bar Grating Manual

F. Structural Steel Painting Council (SSPC)/Society of Protective Coatings:

SP 1-04.....No. 1, Solvent Cleaning

SP 2-04.....No. 2, Hand Tool Cleaning

SP 3-04.....No. 3, Power Tool Cleaning

G. Federal Specifications (Fed. Spec):

RR-T-650E.....Treads, Metallic and Nonmetallic, Nonskid

PART 2 - PRODUCTS

2.1 DESIGN CRITERIA

A. In addition to the dead loads, design fabrications to support the following live loads unless otherwise specified.

B. Ladders and Rungs: 120 kg (250 pounds) at any point.

C. Railings and Handrails: 900 N (200 pounds) in any direction at any point.

D. Catwalk: 120 kg (250 pounds) at any point.

2.2 MATERIALS

A. Structural Steel: ASTM A36.

B. Steel Pipe: ASTM A53.

1. Galvanized for exterior locations.
2. Type S, Grade A unless specified otherwise.
3. NPS (inside diameter) as shown.

C. Modular Channel Units:

1. Factory fabricated, channel shaped, cold formed sheet steel shapes, complete with fittings bolts and nuts required for assembly.

2. Form channel within turned pyramid shaped clamping ridges on each side.

3. Provide case hardened steel nuts with serrated grooves in the top edges designed to be inserted in the channel at any point and be given a quarter turn so as to engage the channel clamping ridges. Provide each nut with a spring designed to hold the nut in place.

4. Factory finish channels and parts with Mansard brown enamel coating to match building finish. Channels fabricated of ASTM A525, G90 galvanized steel. Finish screws and nuts with zinc coating.

5. Fabricate snap-in closure plates to fit and close exposed channel openings of not more than 0.3 mm (0.0125 inch) thick stainless steel.

2.3 HARDWARE

A. Rough Hardware:

1. Furnish rough hardware with a standard plating, applied after punching, forming and assembly of parts; Use G90 galvanized coating on ferrous metal for exterior work unless stainless is used.

B. Fasteners:

1. Bolts with Nuts:

a. ASME B18.2.2.

b. ASTM A307 for 415 MPa (60,000 psi) tensile strength bolts.

c. ASTM F468 for nonferrous bolts.

2. Screws: ASME B18.6.1.

3. Washers: ASTM F436, type to suit material and anchorage.

4. Nails: ASTM F1667, Type I, style 6 or 14 for finish work.

2.4 FABRICATION GENERAL

A. Material

1. Use material as specified. Use material of commercial quality and suitable for intended purpose for material that is not named or its standard of quality not specified.

2. Use material free of defects which could affect the appearance or service ability of the finished product.

B. Size:

1. Size and thickness of members as shown.

2. When size and thickness is not specified or shown for an individual part, use size and thickness not less than that used for the same component on similar standard commercial items or in accordance with established shop methods.

C. Connections

1. Except as otherwise specified, connections shall be made by welding or bolting.

2. Field riveting shall not be approved.

3. Design size, number and placement of fasteners, to develop a joint strength of not less than the design value.

4. Holes, bolts: Accurately punched or drilled and burrs removed.

5. Size and shape welds to develop the full design strength of the parts connected by welds and to transmit imposed stresses without permanent deformation or failure when subject to service loadings.

6. Use bolts of material selected to prevent corrosion (electrolysis) at bimetallic contacts. Plated or coated material shall not be approved.

7. Use stainless steel connectors for removable member’s machine screws or bolts.

D. Fasteners and Anchors

1. Use methods for fastening or anchoring metal fabrications to building construction as shown or specified.

2. Where fasteners and anchors are not shown, design the type, size, location and spacing to resist the loads imposed without deformation of the members or causing failure of the anchor or fastener, and suit the sequence of installation.

3. Use material and finish of the fasteners compatible with the kinds of materials which are fastened together and their location in the finished work.

4. Fasteners for securing metal fabrication to existing construction or new construction shall be expansion bolts, toggle bolts, power actuated drive pins, welding, self-drilling and tapping screws or bolts.

E. Workmanship

1. General:

a. Fabricate items to design shown.

b. Furnish members in longest lengths commercially available within the limits shown and specified.

c. Fabricate straight, true, free from warp and twist, and where applicable square and in same plane.

d. Provide holes, sink ages and reinforcement shown and required for fasteners and anchorage items.

e. Provide openings, cut-outs, and tapped holes for attachment and clearances required for work of other trades.

f. Prepare members for the installation and fitting of hardware.

g. Cut openings in gratings and floor plates for the passage of ducts, sumps, pipes, conduits and similar items. Provide reinforcement to support cut edges.

h. Fabricate surfaces and edges free from sharp edges, burrs and projections which shall cause injury.

2. Welding:

a. Weld in accordance with AWS.

b. Welds shall show good fusion, be free from cracks and porosity and accomplish secure and rigid joints in proper alignment.

c. Where exposed in the finished work, continuous weld for the full length of the members joined and have depressed areas filled and protruding welds finished smooth and flush with adjacent surfaces.

d. Finish welded joints to match finish of adjacent surface.

3. Joining:

a. Miter or butt members at corners.

b. Where frames members are butted at corners, cut leg of frame member perpendicular to surface, as required for clearance.

4. Anchors:

a. Where metal fabrications are shown to be built into masonry use factory recommended anchoring hardware.

5. Cutting and Fitting:

a. Accurately cut, machine and fit joints, corners, copes, and miters.

b. Fit removable members to be easily removed.

c. Design and construct field connections in the most practical place for appearance and ease of installation.

d. Fit pieces together as required.

e. Fabricate connections for ease of assembly and disassembly without use of special tools.

f. Joints firm when assembled.

g. Conceal joining, fitting and welding on exposed work as far as practical.

h. Do not show screws prominently on the exposed face.

i. The fit of components and the alignment of holes shall eliminate the need to modify component or to use exceptional force in the assembly of item and eliminate the need to use other than common tools.

F. Finish:

1. Finish exposed surfaces in accordance with NAAMM Metal Finishes Manual.

2. Steel and Iron: NAAMM AMP 504.

a. Zinc coated (Galvanized) with Factory coated Mansard brown enamel coating to match building finish: ASTM A123, G90 unless noted otherwise.

b. Surfaces exposed in the finished work:

1) Finish smooth rough surfaces and remove projections.

2) Fill holes, dents and similar voids and depressions with epoxy type patching compound.

G. Protection:

1. Spot prime all abraded and damaged areas of zinc coating which expose the bare metal, using zinc rich paint on hot-dip zinc coat items and zinc dust primer on all other zinc coated items.

2.5 SUPPORTS

A. General:

1. Fabricate ASTM A36 structural steel shapes as shown.

2. Use clip angles or make provisions for welding hangers and braces to overhead construction.

3. Field connections shall be welded or bolted.

2.6 LADDERS and CATWALKS

A. Steel Ladders and Catwalks:

1. Fixed-rail type with steel rungs shallered and headed into and welded to rails.

2. Fabricate angle brackets of 50 mm (2 inch) wide by 13 mm (1/2 inch)thick steel; brackets spaced maximum of 1200 mm (4 feet) apart and of length to hold ladder 175 mm (7 inches) from wall to center of rungs. Provide turned ends or clips for anchoring.

3. Provide holes for anchoring with expansion bolts through turned ends and brackets.

4. Where shown, fabricate side rails curved, twisted and formed into a gooseneck.

5. Galvanize exterior ladders after fabrication, ASTM A123, G-90.

B. Ladder Rungs:

1. Fabricate from 25 mm (one inch) diameter steel bars.

2. Fabricate so that rungs shall extend at least 100 mm (4 inches) into wall with ends turned 50 mm (2 inches), project out from wall 175 mm(7 inches), be 400 mm (16 inches) wide and be designed so that foot cannot slide off end.

3. Galvanized after fabrication, ASTM A123, G-90 rungs for exterior use and for access to pits.

C. Ships Ladder:

1. Fabricate from heavy duty bar grating stair treads, walk-thru

handrail, Factory welded handrails of 1 1/2" x 14 ga. square tubing, 10" structural channel stringers, factory coated Mansard brown enamel finish to match building finish, 24" wide treads, 27" overall stair width, with a tread depth is 6".

D. Fixed steel ladder:

1. Shall be a fixed steel ladder with walk-thru handrails at the top landing surface and safety cage, to meet or exceed ANSI A14.3, OSHA 1910.27 and 1926.1053 standards, factory coated Mansard brown enamel finish to match building finish. A 6' length ladder guard mounted directly over the ladder climbing rungs to prevent unauthorized use. The guard shall have a one piece piano type hinge, and be furnished with lock-open and lock-closed hasps.

2.7 RAILINGS

A. In addition to the dead load design railing assembly to support live load specified.

B. Fabrication General:

1. Provide continuous welded joints, dressed smooth and flush.
2. Standard flush fittings, designed to be welded, shall be used.
3. Exposed threads shall not be approved.
4. Form handrail brackets to size and design shown.

C. Handrails:

1. Close free ends of rail with flush metal caps welded in place except where flanges for securing to walls with bolts are shown.
2. Make provisions for attaching handrail brackets to wall, ladder frame and handrail as shown.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Set work accurately, in alignment and where shown, plumb, level, free of rack and twist, and set parallel or perpendicular as required to line

and plane of surface.

B. Items set into concrete or masonry.

1. If required provide temporary bracing for such items until concrete or masonry is set.
2. Place in accordance with setting drawings and instructions.

C. Field weld in accordance with AWS.

1. Design and finish as specified for shop welding.

2. Use continuous weld unless specified otherwise.

D. Install anchoring devices and fasteners as shown and as necessary for securing metal fabrications to building construction as specified. Power actuated drive pins shall be used except for removable items and where members would be deformed or substrate damaged by their use.

E. Touch-up all abraded and damaged areas of zinc coating as specified and all abraded and damaged areas with same kind of factory coating.

F. Secure escutcheon plate with set screw.

3.2 INSTALLATION OF SUPPORTS

A. Anchorage to structure.

1. Secure angles or channels and clips to overhead structural steel by continuous welding unless bolting is shown.

2. Secure supports to concrete inserts by bolting or continuous welding as shown.

3. Secure supports to mid height of concrete beams when inserts do not exist with expansion bolts and to slabs, with expansion bolts, unless shown otherwise.

4. Secure steel plate or hat channels to studs as detailed.

3.3 LADDERS and CATWALKS

A. Anchor ladders and catwalks to walls and floors with expansion bolts through turned lugs or angle clips or brackets.

B. Ladder Rungs:

1. Build ladder rungs into masonry as the work progresses.

2. Set step portion of rung 150 mm (6 inches) from wall.

3. Space rungs approximately 300 mm (12 inches) on centers.

4. Where only one rung is required, locate it 400 mm (16 inches) above the floor.

3.4 RAILINGS

A. Steel Posts:

1. Secure fixed posts to concrete with expansion bolts through flanged fittings except where sleeves are shown with pourable grout.

2. Install sleeves in concrete formwork.

3. Set post in sleeve and pour grout to surface. Apply beveled bead of urethane sealant at perimeter of post or under flange fitting.

4. Secure removable posts to concrete with either machine screw through flanged fittings which are secured to inverted flanges embedded in and set flush with finished floor, or set posts in close fitting pipe sleeves without grout.

5. Secure sliding flanged fittings to posts at base with set screws.

6. Secure fixed flanged fittings to concrete with expansion bolts.

7. Secure posts to steel with welds.

B. Anchor to Walls:

1. Anchor rails to concrete or solid masonry with machine screws through flanged fitting to steel plate.

a. Anchor steel plate to concrete or solid masonry with expansion bolts.

b. Anchor steel plate to hollow masonry with toggle bolts.

2. Anchor flanged fitting with toggle bolt to steel support in frame walls.

3.5 CLEAN AND ADJUSTING

A. Adjust movable parts including hardware to operate as designed without binding or deformation of the members centered in the opening or frame and, where applicable, contact surfaces fit tight and even without
forcing or warping the components.

B. Clean after installation exposed prefinished and plated items and items fabricated from stainless steel, aluminum and copper alloys, as
recommended by the metal manufacture and protected from damage until
completion of the project.

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SECTION 07 01 50.19
PREPARATION FOR RE-ROOFING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Roof re-cover preparation on existing construction in preparation to receive new roofing membrane.

1.2 RELATED WORK

A. Use of the premises and phasing requirements: Section 01 00 00 GENERAL REQUIREMENTS.

B. Temporary construction and environmental-protection measures for reroofing preparation: Section 01 00 00 GENERAL REQUIREMENTS

C. HVAC equipment removal and reinstallation.

D. Electrical equipment disconnection and reconnection.

E. Siloxane Water Repellant: Section 07 19 23.

1.3 APPLICABLE PUBLICATIONS

A. Publications listed below form a part of this specification to the extent referenced. Publications are referenced in the text by the basic designation only. Editions of applicable publications current on date of issue of bidding documents apply unless otherwise indicated.

B. American National Standards Institute/Single-Ply Roofing Institute (ANSI/SPRI):

ANSI/SPRI FX-1-01(R2006) Standard Field Test Procedure for Determining the Withdrawal Resistance of Roofing Fasteners.

C. ASTM International (ASTM):

C208-08.....Cellulosic Fiber Insulating Board

C728-05.....Perlite Thermal Insulation Board

C1177/C1177M-08.....Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing

C1278/C1278M-07.....Standard Specification for Fiber-Reinforced Gypsum Panel

D1079-09.....Standard Terminology Relating to Roofing and

Waterproofing

D. FM Approvals: RoofNav Approved Roofing Assemblies and Products.

4470-10.....Approved Standard for Class 1 Roof Coverings

1-28-09.....Loss Prevention Data Sheet: Design Wind Loads.

1-29-09.....Loss Prevention Data Sheet: Above-Deck Roof Components

1-49-09.....Loss Prevention Data Sheet: Perimeter Flashing

E. National Roofing Contractors Association: Roofing and Waterproofing Manual.

1.4 MATERIALS OWNERSHIP

A. Assume ownership of demolished materials and remove from Project site and dispose of legally, unless indicated to be reused, reinstalled, or otherwise to remain Owner's property.

1.5 DEFINITIONS

A. Refer to ASTM D1079 and NRCA "The NRCA Roofing and Waterproofing Manual" for definition of terms.

1.6 QUALITY CONTROL

A. Requirements of Division 07 roofing section for qualifications of roofing system and roofing insulation Installer; work of this section shall be performed by same Installer.

B. Regulatory Requirements: Comply with governing EPA notification regulations. Comply with hauling and disposal regulations of authorities having jurisdiction.

C. Reroofing Conference: Conduct conference at Project site.

1. Meet with Owner; Architect-Engineer; testing and inspecting agency representative; roofing system manufacturer's representative; roofing Installer including project manager, superintendent, and foreman; and installers whose work interfaces with or affects reroofing.

2. Review methods and procedures related to roofing system tear-off and Replacement.

1.7 SUBMITTALS

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

C. List of proposed infill materials.

D. List of proposed temporary roofing materials.

E. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a licensed landfill facility.

1.8 PROJECT CONDITIONS

A. Owner shall occupy portions of building below reroofing area. Conduct reroofing so Owner's operations shall not be disrupted.

1. Coordinate work activities daily with Owner.

2. Provide Owner with not less than 72 hours' notice of activities that shall affect Owner's operations.

B. Protect building and landscaping from damage.

C. Maintain access to existing walkways and adjacent occupied facilities.

D. Weather Limitations: Proceed with reroofing preparation only when weather conditions permit Work to proceed without water entering existing roofing system or building.

E. Hazardous Materials: It is not expected that Contractor shall encounter hazardous materials such as asbestos-containing materials.

1. Do not disturb materials suspected of containing hazardous materials. Notify Architect-Engineer and Owner. Hazardous materials shall be removed by Owner under a separate contract.

PART 2 - PRODUCTS

2.1 TEMPORARY ROOFING MATERIALS

A. Design of temporary roofing and selection of materials are responsibilities of Contractor.

2.2 RECOVER BOARDS

A. Insulation Serving as Recover Board: Requirements are specified in Section 07 22 00 ROOF AND DECK INSULATION.

2.3 AUXILIARY REROOFING MATERIALS

A. General: Auxiliary reroofing preparation materials recommended by roofing system manufacturer and compatible with components of existing and new membrane roofing system.

B. Base Sheet Fasteners: Capped head, factory-coated steel fasteners, listed in FM Approval's "RoofNav."

PART 3 - EXECUTION

3.1 PREPARATION

A. Coordinate with Owner to shut down air-intake equipment in the vicinity of the Work. Cover air-intake louvers before proceeding with reroofing work that could affect indoor air quality or activate smoke detectors in the ductwork.

1. Comply with Owner's requirements for maintaining fire watch when temporarily disabling smoke detectors.

B. During removal operations, have sufficient and suitable materials onsite to facilitate rapid installation of temporary protection in the event of unexpected rain.

C. Maintain roof drains in functioning condition to ensure roof drainage at end of each workday. Prevent debris from entering or blocking roof drains and conductors. Use roof-drain plugs specifically designed for this purpose. Remove roof-drain plugs at end of each workday, when no work is taking place, or when rain is forecast.

1. If roof drains are temporarily blocked or unserviceable due to roofing system removal or partial installation of new membrane roofing system, provide alternative drainage method to remove water and eliminate ponding.

D. Verify that rooftop utilities and service piping have been shut off before beginning the Work.

3.2 ROOF TEAR-OFF

A. General: Notify Owner each day of extent of roof tear-off proposed for that day and obtain authorization to proceed.

B. Remove loose aggregate from aggregate-surfaced built-up caused by previous application of bituminous roofing using a power broom.

C. Roof Tear-Off: Remove existing roofing membrane and other membrane roofing system components down to the deck.

1. Remove all fasteners from deck prior to installing new roof

membrane.

3.3 DECK PREPARATION

A. Inspect deck after tear-off or partial tear-off of membrane roofing system.

B. Verify that concrete substrate is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263. Do not proceed with roofing work if moisture condenses under the plastic sheet.

C. If broken or loose fasteners that secure deck panels to one another or to structure are observed or if deck appears or feels inadequately attached, immediately notify Architect-Engineer. Do not proceed with installation until directed by Architect-Engineer.

D. If deck surface is not suitable for receiving new roofing or if structural integrity of deck is suspect, immediately notify Architect-Engineer. Do not proceed with installation until directed by Architect-Engineer.

E. Provide additional deck securement as indicated on Drawings.

3.4 TEMPORARY ROOFING MEMBRANE

A. Install approved temporary roofing membrane over area to be reroofed.

B. Remove temporary roofing membrane before installing new roofing membrane.

3.5 ROOF RE-COVER PREPARATION

A. Remove any substrate irregularities that inhibit new roofing membrane from conforming to substrate.

1. Remove loose aggregate from aggregate-surfaced built-up bituminous roofing with a power broom.
2. Broom clean existing substrate.
3. Coordinate with Owner's inspector to schedule times for tests and inspections.
4. Remove all materials.
5. Power vacuum the existing roof surface. If recommended by manufacturer, prime dried surface at recommended rate with

recommended primer.

6. Seal concrete substrate and all roof perimeter walls with no less than three coats of Siloxane water repellants before application of new roofing membrane. See specification section 07 19 23 for requirements of repellant.

7. Seal concrete roof substrate and with no less than two coats of Epoxy coating before application of new roofing membrane. See specification section 07 54 19 for requirements.

3.6 EXISTING BASE FLASHINGS

A. Remove (as required) existing base flashings around parapets, curbs, walls, and penetrations.

1. Clean substrates of contaminants such as asphalt, sheet materials, dirt, and debris.

2. Tuck-point, caulk flashing at all locations to eliminate holes, cracks at surface.

B. Do not damage metal counter flashings that are to remain. Replace metal counter flashings damaged during removal in accordance with roofing manufacturer’s recommendations.

3.7 DISPOSAL

A. Collect demolished materials and place in containers. Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.

1. Storage or sale of demolished items or materials on-site is not permitted.

B. Transport and legally dispose of demolished materials off Owner's property.

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SECTION 07 19 23
SILOXANE WATER REPELLANTS

Part 1 - GENERAL

1.01 SUMMARY

A. Section Includes: Siloxane Water Repellents for sealing masonry as specified in this documents and the drawings.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM)

1. ASTM E-514 Standard Test Method for Water Penetration and Leakage Through Masonry.

B. National Cooperative Highway Research Program (NCHRP)

1. NCHRP Report 244 Reduction of Chloride Ion Uptake.

1.03 SUBMITTALS

A. General: Submit Listed Submittals in accordance with Conditions of the Contract and Section 01 33 23, Shop Drawings, Product Data and Samples.

B. Product Data: Submit manufacturer's product data and installation instructions.

C. Quality Assurance/Control Submittals: Submit the following:

1. Certificates: Submit certificate that applicator complies with the requirements of this section.

1.04 QUALITY ASSURANCE

A. Applicator Qualifications: Utilize an applicator trained and approved by waterproofing manufacturer.

1.05 DELIVERY, STORAGE, & HANDLING

A. General; Comply with Division 1 Product Requirement Section

B. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

C. Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer.

1.06 PROJECT/SITE CONDITIONS

A. Environmental Requirements: Comply with application temperature range 40- 95F

B. Substrate shall be rain free 24 hours prior to application and 24 hours after application.

1.07 WARRANTY

A. Waterproofing Warranty: Product has a ten (10) year material warranty. Manufacturer's warranty shall be independent from any other warranties made by the Contractor under requirements of the Contract Documents and shall run concurrent with said warranties. Shall the product fail to perform as specified the manufacturer shall reimburse the purchase price of the material used or supply new material for replacement.

PART 2 - PRODUCTS

2.01 SILOXANE WATER REPELLENT

A. Siloxane Water Repellants include the following:

1. A-Tech Masonry & Brick Sealer

a. Material: Water-based emulsion Siloxane water repellent

b. Siloxane Content: 7-10%

c. Application Method: [Brush] [Roller] [Sprayer]

d. Color: Milky white, dries clear

e. Active Content: 100%

f. Freeze Point: 32F

g. Coverage Rate: 1 gallon/100 ft2

h. Water Penetration and Leakage: (ASTM E-514): 83% average reduction

i. Chloride Ion Uptake: (NCHRP Report 244): 77% reduction

2.02 LIMITATIONS

A. Shall not prevent water through cracks, defects or open joints

B. Mortar and concrete shall be cured for 28 days prior to use

2.03 TESTING

A. Test a minimum 3’ x 3’ area on each type of masonry. Use the manufacturer’s application instructions. Let test area cure before inspection. Keep test panels available for comparison throughout application procedure.

Part 3 - EXECUTION

3.01 MANUFACTURER’S INSTRUCTIONS

A. Comply with the most current written installation instructions and recommendations of the waterproofing manufacturer.

3.02 EXAMINATION

A. Site Verification of Condition:

1. Verify that conditions are acceptable for application of the waterproofing system.

2. Do not proceed with the application until unacceptable conditions are corrected.

a. Substrate shall not have rain for 24 hours prior to and after application.

b. Site temperatures shall be above 40F during and after application.

3.03 PREPARATION

A. Surface Preparation:

1. Ensure that surfaces to be coated are structurally sound and free of moisture, dust, loose materials, frost, loose mortar or any materials or obstructions that would be detrimental to the penetration of the sealer.

3.04 APPLICATION

A. Stir before use. Do not dilute. So not apply in high winds. Protect glass and metal from coverage. Wash off with soap and water.

1. Vertical Application: Brush or roll sealer onto substrate starting at bottom of area. Maintain 6-8" run down of sealer. Protect coated areas for 24 hours from rain.

2. Horizontal Application: Brush or roll sealer onto substrate.

Maintain even coating and spread out any ponding that shall occur prior to curing. Protect coated areas for 24 hours from rain.

3.05 CLEAN UP

A. Clean any over application of sealer off glass and metal with soap and water before drying.

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SECTION 07 22 00
ROOF AND DECK INSULATION

PART 1 - GENERAL

1.1 DESCRIPTION

A. Installation of Roof and deck insulation, vapor retarder, on existing construction, after preparation to receive roofing or waterproofing membrane.

1.2 APPLICABLE PUBLICATIONS

A. Publications listed below form a part of this specification to the extent referenced. Publications are referenced in the text by the basic designation only. Editions of applicable publications current on date of issue of bidding documents apply unless otherwise indicated.

B. American Society of Heating, Refrigeration and Air Conditioning (ASHRAE):

90.1-07.....Energy Standard for Buildings Except Low-Rise Residential Buildings

C. ASTM International (ASTM):

C208-08.....Cellulosic Fiber Insulating Board

C552-07.....Cellular Glass Thermal Insulation

C726-05.....Mineral Fiber Roof Insulation Board

C728-05.....Perlite Thermal Insulation Board

C1177/C1177M-08.....Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing

C1278/C1278M-07.....Standard Specification for Fiber-Reinforced Gypsum Panel

C1289-10.....Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board

C1396/C1396M-09.....Standard Specification for Gypsum Board

D41-05.....Asphalt Primer Used in Roofing, Damp proofing, and Waterproofing

D312-06.....Asphalt Used in Roofing

D1970-09.....Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection

D2178-04.....Asphalt Glass Felt Used in Roofing and Waterproofing

D2822-05.....Asphalt Roof Cement

D4586-07.....Standard Specification for Asphalt Roof Cement, Asbestos-Free

E84-09.....Standard Test Method for Surface Burning Characteristics of Building Material

F1667-05.....Driven Fasteners: Nails, Spikes, and Staples

D. FM Approvals: RoofNav Approved Roofing Assemblies and Products.

4450-89.....Approved Standard for Class 1 Insulated Steel Deck Roofs

4470-10.....Approved Standard for Class 1 Roof Coverings

1-28-09.....Loss Prevention Data Sheet: Design Wind Loads.

1-29-09.....Loss Prevention Data Sheet: Above-Deck Roof Components

1-49-09.....Loss Prevention Data Sheet: Perimeter Flashing

E. National Roofing Contractors Association: Roofing and Waterproofing Manual

F. U.S. Department of Agriculture (USDA): USDA Bio Preferred Catalog, www.biopreferred.gov

G. Underwriters Laboratories, Inc. (UL): Fire Resistance Directory (2009)

H. U.S. Department of Commerce National Institute of Standards and Technology (NIST):

DOC PS 1-09.....U.S. Product Standard for Construction and Industrial Plywood

DOC PS 2-04.....Performance Standard for Wood-Based Structural-Use Panels.

1.3 PERFORMANCE REQUIREMENTS

A. Thermal Performance (Required R40): Provide roof insulation meeting minimum overall average R-value of 33, with minimum R-value at any location of 10.

B. FM Approvals: Provide roof insulation complying with requirements in FM Approvals 4450 and 4470 as part of specified roofing system, listed in FM Approvals "RoofNav" as part of roofing system meeting Fire/Windstorm Classification in Division 07 roofing section.

1.4 QUALITY CONTROL

A. Requirements of Division 07 roofing section for qualifications of roofing system insulation Installer; Work of this Section shall be performed by same Installer.

B. Requirements of Division 07 roofing section for inspection of Work of this Section and qualifications of Inspector.

C. Unless specified otherwise, comply with the recommendations of the NRCA "Roofing and Waterproofing Manual" applicable to insulation for storage, handling, and application.

D. Requirements of roofing system uplift pressure design for specified roofing system.

E. Requirements of applicable FM Approval for specified roofing system insulation attachment.

1.5 SUBMITTALS

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Product Data:

1. Adhesive materials, each type.
2. Roofing cement, each type.
3. Roof insulation, each type.
4. Fastening requirements.

C. Shop Drawings: Include plans, sections, details, and attachments.

1. Nailers, cants, and terminations.
2. Layout of insulation showing slopes, tapers, penetration, and edge

conditions.

D. Samples:

1. Roof insulation, each type.

2. Nails and fasteners, each type.

E. Certificates:

1. Indicating type, thermal conductance, and minimum and average thickness of insulation.

2. Indicating materials and method of application of insulation system meet the requirements of FM Approvals for specified roofing system.

F. Laboratory Test Reports: Thermal values of insulation products.

G. Layout of tapered roof system showing units required.

H. Documentation of supervisors' and inspectors' qualifications.

1.6 DELIVERY, STORAGE AND MARKING

A. Comply with the recommendations of the NRCA "Roofing and Waterproofing Manual" applicable to built-up roofing for storage, handling and installation requirements. Deliver materials to the site in original sealed packages or containers marked with the name and brand, or trademark of the manufacturer or seller.

B. Keep materials dry, and store in dry, weather tight facilities or under canvas tarps. Use of polyethylene or plastic tarps to cover materials is not permitted. Store above ground, or deck level on wood pallets. Cover ground under stored materials with plastic tarp.

1. Store rolled materials (felts, base sheets, paper) on end. Do not store materials on top of rolled material.

2. Store foam insulation away from areas where welding is being performed and where contact with open flames is possible.

C. Protect from damage from handling, weather and construction operations before, during, and after installation.

1.7 QUALITY ASSURANCE:

A. Roof insulation shall have a flame spread rating not greater than 75 and a smoke developed rating not greater than 150, exclusive of covering, when tested in accordance with ASTM E84, or shall have successfully passed FM Approvals 4450.

1. Insulation bearing the UL label and listed in the UL Building Materials Directory as meeting the flame spread and smoke developed ratings shall be accepted in-lieu-of copies of test reports.

2. Compliance with flame spread and smoke developed ratings shall not be required when insulation has been tested as part of a roof construction assembly of the particular type used for this project and the construction is listed as fire-classified in the UL Building Materials Directory or listed as Class I roof deck construction in the FM Approvals "RoofNav."

3. Insulation tested as part of a roof construction assembly shall bear UL or FM labels attesting to the ratings specified herein.

PART 2 - PRODUCTS

2.1 ADHESIVE MATERIALS

A. Adhesive Materials, General: Adhesive and sealant materials recommended by roofing system manufacturer for intended use, identical to materials utilized in approved listed roofing system, and compatible with roofing membrane.

2.2 ROOF AND DECK INSULATION

A. Roof and Deck Insulation, General: Preformed roof insulation boards approved by roofing manufacturer and listed as component of FM Approvals-approved roofing system.

B. Polyisocyanurate Board Insulation: ASTM C1289, Type II, Class 1, Grade 2, felt or glass-fiber mat facer on both major surfaces.

C. Tapered Roof Insulation System:

1. Fabricate of Polyisocyanurate. Use only one insulation material for tapered sections. Use only factory-tapered insulation.

2. Cut to provide high and low points with crickets and slopes as shown.

3. Minimum thickness of tapered sections; 38 mm (1-1/2 inch).

4. Minimum slope 1:96 (1/8 inch per 12 inches).

2.3 INSULATION ACCESSORIES

A. Vapor Retarder:

1. Self-Adhering Sheet Vapor Retarder: ASTM D1970, minimum of 1.0-mm-(40-mil-) thick, polyethylene film laminated to layer of rubberized asphalt adhesive, or 0.76- to 1.0-mm- (30- to 40-mil-) thick, polyethylene film laminated to layer of butyl rubber adhesive; maximum permanence rating of 6 ng/Pa x x sq. m (0.1 perm).

2.4 FASTENERS

A. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with FM Approvals 4470, designed for fastening substrate board to roof deck.

B. Staples and Nails: ASTM F1667. Type as designated for item anchored and for substrate.

C. Concrete has been hardness tested to approx. 5,000 psi.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Comply with requirements of Division 07 roofing section.

3.2 PREPARATION

A. Comply with requirements of Division 07 roofing section.

3.3 VAPOR RETARDER INSTALLATION

A. General:

1. Install continuous vapor retarder on entire roof deck.

2. At vertical surfaces, turn up vapor retarder to base flashing.

3. At all pipes, walls, and similar penetrations through vapor retarder, seal openings with roof cement to prevent moisture entry from below.

4. Seal penetrations with roof cement.

B. Cast in Place Concrete Decks, Except Insulating Concrete:

1. Prime deck as specified.

3.4 RIGID INSULATION INSTALLATION

A. Insulation Installation, General:

1. Install roof insulation in accordance with roofing system

manufacturer's written instructions.

2. Install roof insulation in accordance with requirements of FM Approval's Listing for specified roofing system.

3. Base Sheet: Where required by roofing system, install one lapped base sheet specified in Division 07 roofing section by mechanically fastening to roofing substrate prior to installation of insulation.

4. Cant Strips: Install preformed insulation cant strips at junctures of roofing system with vertical construction.

B. Insulation Thickness:

1. Thickness of roof insulation shown on drawings is nominal. Actual thickness shall provide the average thermal resistance "R" value of not less than that specified in Performance Requirements Article (R40 required).

2. When thickness of insulation to be used is more or less than that shown on the drawings, make adjustments in the alignment and location of roof drains, flashing, gravel stops, fascia’s and similar items at no additional cost to the Government.

3. Where tapered insulation is used, the thickness of the insulation at high points and roof edges shall be as shown on the drawings; the thickness at the low point (drains) shall be not less than 38 mm(1-1/2 inches).

4. Use not less than two layers of insulation when insulation is 68 mm(2.7 inch) or more in thickness unless specified otherwise. Stagger joints minimum 150 mm (6 inches).

C. Lay insulating units with close joints, in regular courses and with cross joints broken. When laid in more than one layer, break joints of succeeding layers of roof insulation with those in preceding layer.

D. Lay units with long dimension perpendicular to the rolled (longitudinal) direction of the roofing felt.

E. Cut to fit tight against blocking or penetrations.

F. Cover all insulation installed on the same day; comply with temporary protection requirements of Division 07 roofing section.

G. Installation Method:

1. Adhered Insulation:

a. Use manufacturer’s recommendation.

b. Prime substrate as required.

c. Set each layer of insulation firmly in uniform application of full-spread insulation adhesive.

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SECTION 07 57 00
COATED FOAMED ROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Extent of sprayed insulating roofing systems work is indicated on drawings and by requirements of this section. Extent of work includes

1. Spray-applied, polyurethane foam insulation.

B. Related Sections:

1. Division 05 Section "Metal Fabrication" for roof railings and catwalks, roof penetration flashings, and counter flashings.

2. Division 07 Section "Joint Sealants" for joint sealants, joint fillers, and joint preparation.

1.3 PERFORMANCE REQUIREMENTS

A. Water tightness: Provide coated foamed roofing that is watertight and will not permit the passage of water.

B. Material Compatibility: Provide polyurethane foam, elastomeric coatings, and miscellaneous roofing materials that are compatible with one another and able to bond to substrate under conditions of service and application required, as demonstrated by coated foamed roofing manufacturer based on testing and field experience.

C. Roofing System Design: Provide a coated foamed roofing system that is identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist uplift pressure calculated according to SEI/ASCE 7. (Per I-90 Wind Up-lift Requirements)

1.4 SUBMITTALS

A. Product Data: For each type of product indicated. Include manufacturer's written instructions for evaluating, preparing, and treating substrate; technical data; and tested physical and performance properties.

B. Samples for Initial Selection: For roof coating colors.

C. Samples for Verification: For coated foamed roofing, prepared on Samples of size indicated below:

1. Samples, 24 by 24 inches, on rigid backing, showing polyurethane foam of thickness required and stepped coatings in colors required to illustrate buildup of coated foamed roofing.

D. Qualification Data: For SPFA-qualified Installer and applicators.

E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for coated foamed roofing.

F. Field quality-control reports.

G. Maintenance Data: For coated foamed roofing to include in maintenance manuals.

H. Warranty: Sample of special warranty.

1.5 QUALITY ASSURANCE

A. Manufacturer: Company specializing in manufacturing product systems specified in this Section with a minimum three (3) years' experience.

B. Installer: Firm specializing in performing work of this section with a minimum of three (3) years' experience with silicone coated polyurethane foam roofing. Installer shall be an approved applicator by Manufacturer providing the warranty for a minimum of (10) years, and is capable of receiving specified (20) year NDL roof warranty.

1. Applicator to provide proof that they are have been located and have maintained an office within 250 miles of the jobsite for at least the last three (3) years, prior to starting work on this project.

2. Applicator to provide a list of at least (5) jobs similar in size, dollar amount and scope, which have been completed within the last (3) years prior to starting work on this project.

3. Applicator to ensure all supervising personal onsite has 30 hour O.S.H.A cards.

1.6 INDEPENDENT ROOF INSPECTION SERVICES

1. SCOPE:

a. The Contractor is to provide and facilitate complete services for third party quality

control roof inspections for all new roofing installations.

b. Services must be as follows:

1. Review and approval of roofer's qualifications.

2. Review and approval of roof shop drawings and action plan.

3. Attendance and documentation of pre-roofing conference inspections, directions and conclusions. Documentation shall include electronic photographs of all deficiencies.

4. Attendance and documentation of min. 9 periodic roofing progress review meeting/inspections, including all follow-up directions, and conclusions. Contractor shall be responsible for all required follow-up return inspections

including post project review visits to address failures, including scheduling and any additional inspection costs.

5. Attendance and documentation of post-roofing inspection to include notice of any deficiencies with electronic photographs.

2. INDEPENDENT ROOF INSPECTOR'S QUALIFICATIONS

a. Roof inspector must be independent and not affiliated nor not aligned with any roof mfr. roof distributor, or contractor.

b. Roof inspector shall have been in business a min. of 3 years and have min. 3 years' experience in inspections of projects of similar size and roof system(s).

c. Roof inspector must at a min., have 75% of work per year providing inspection services.

d. Roof inspector must be RCI certified and RRC accredited or member in good standing with NRCA.

e. Roofing contractor shall submit roof inspector's qualifications and confirmation of familiarity and experience with specified/provided roof type and manufacturer.

f. Roofing contractor shall submit qualifications and references of roof inspector indicating compliance with the above requirements.

3. The roofing contractor is to facilitate and coordinate third party roof inspections with the Construction Manager/General Contractor, Owner and Architect with notice given of meetings or inspections at least one week in advance.

4. The roofing contractor is to photo document each day's work including general views and detail photographic views of the progress and electronically transmit to third party on a daily basis. Contractor to provide additional photos or documentation as requested by third party inspectors. Third party inspectors to review photos daily and document observations, concerns, and necessary corrections to the roofing contractor, general contractor and Architect within 24 hours.

5. Repetitive faulty work performed by the roofing contractor may require additional onsite visits by third party inspectors. All inspector fees/costs due to additional inspections are the responsibility of the contractor. Additional inspections may be required by the architect upon the receipt of two notices of concern provided by the third party inspector.

6. Contractor to cooperate and coordinate with a representative of the Roof Manufacturer to attend the pre-roofing conference and post roofing inspection.

7. The roofing contractor shall be responsible for coordination, review and confirmation that all corrective work is performed per roof covering manufacturer standards, for compliance with warranty requirements

8. **Warranty** commences upon substantial completion **provided that** all deficiencies noted by manufacturer's representatives, third party inspector, and Architect **are completed**. If deficiencies have not been corrected by the date of substantial completion the warranty will begin upon the date the deficiency repairs are completed and have been accepted

1.7 REGULATORY REQUIREMENTS

A. Conform to applicable code for fire resistance ratings of roof assembly.

1.8 PRE-INSTALLATION CONFERENCE

A. Conduct conference at Project site minimum one week prior to beginning Work of this Section.

B. Review installation procedures and coordination required with related work, including manufacturer's WRITTEN INSTRUCTIONS.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store liquid materials and other products in their original unopened containers or packaging until ready for installation.

B. Materials shall be clearly labeled with the manufacturer's name, product identification, safety information, and batch or lot numbers where appropriate.

C. Store materials out of the weather and out of direct sunlight in locations where the temperatures are within limits specified by manufacturer.

D. Protect stored products from ambient temperatures below 75 degrees F.

E. Comply with the manufacturer's instructions and SPFA for handling and safety procedures.

F. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.10 ENVIRONMENTAL REQUIREMENTS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's limits.

B. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

C. Do not install foam insulation under the following conditions:

1) When ambient temperature is below 55 degrees F or above 110 degrees F.

2) When relative humidity is above 95 percent.

3) When wind velocity is above 10 mph, unless wind screens are utilized.

a) Installer to have onsite a windscreen to be used when needed.

4) When raining.

5) At temperature less than 5 degrees F above dew point.

D. Do not install protective silicone overcoat under the following conditions:

1) When ambient temperature is below 40 degrees F.

2) When wind velocity is above 10 mph, unless wind screens are utilized.

3) Installer to have onsite a windscreen to be used when needed.

4) When raining.

5) At temperature less than 5 degrees F above dew point.

1.11 WARRANTY

A. MANUFACTURES ROOF WARRANTY: Submit a written **no-dollar limit, non-pro-rated**, 10 year full system warranty covering all materials & labor executed by the 5A rated Manufacturer.

1. (Refer to additional requirements in Independent Roof Inspection Services)

B. Special Roof Installer's Warranty: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering Work of this Section, including all components of polyurethane foam roof system as designed.

1. Warranty Period: Two years from date of Substantial Completion. (Refer to additional requirements in Independent Roof Inspection Services)

2 PRODUCTS

2.1 Coated Foamed Roofing – Acceptable Manufacturers OR Equal

A. BASF 81285

B. BAYER Bay Seal 2.7

C. PROGRESSIVE MATERIALS SF4228

Acceptable Products: Listed herein are manufacturer's products which have been identified as meeting the salient characteristics of this specification. Such information is only provided to identify a product which meets the salient characteristics of the product described hiring and do not, in any way, limit the offeror from providing products from other manufacturers which meet the salient product characteristics as identified in the specification.

2.2 SUBSTRATE BOARD

A. N/A.

2.3 ROOF BOARD INSULATION

A. Polyisocyanurate or Expanded Polystyrene: R-value of insulation shall be based on LTTR 6 per inch of thickness. Minimum thickness to be 1.5" – see details for total required thickness and R-values.

B. Insulation Overlay Board: 1/2 inch thick wood fiber board (recovery board) as manufactured by Celotex or as approved by coated foamed roofing manufacturer to maintain specified warranty.

2.4 FOAM INSULATION MATERIALS

A. Foam Insulation: Two component, closed-cell, rigid-class urethane foam, sprayed-in-place, with the following properties:

1) Density: ASTM D1622; 2.7 to 3.2 pounds per cubic foot.

2) Compressive Strength: ASTM D1621; 40 psi.

3) Tensile Strength: ASTM D1623, 80 psi.

4) Closed Cell Content: ASTM D2856, 90 percent, minimum.

5) Dimensional Stability: ASTM D2126, plus 8 percent maximum volume change at 28 days, 158 degrees F, 100 percent relative humidity.

6) Thermal Conductivity: ASTM C518, K factor of 0.15, aged.

7) Surface Burning Characteristics: ASTM E84, 75 maximum.

8) Smoke Developed Index: ASTM E84, 450 Maximum.

B. Substrate Primer: As required by roofing system manufacturer.

2.5 SILICONE MATERIALS

A. Overcoat: Silicone base and top coats with granulated surface complying with the following:

1) Tensile Strength: ASTM D412, 450.

2) Elongation: ASTM D412, 150 percent minimum at break at 75 degrees F.

3) Water Vapor Permeance: ASTM E398, 2.9 at 20 mils.

4) Fire resistance: ASTM E108, UL 790 Class A.

5) Color: Light Gray, Tan or White… Owner to select topcoat color.

6) Granulated surface: For cover coat complying with manufacturer's requirements.

2.6 ACCESSORIES

A. Cant: Spray applied foam insulation, filleted to interruptions and penetrations through the roof surface.

B. Sealant: Type recommended by the roofing system manufacturer.

C. Fasteners: Mechanical fasteners with plates as approved by roofing system manufacturer and in compliance with FM 4450 per I-90 wind uplift requirements.

D. Walkway Pads: Provide yellow spaghetti, breathable type mesh pads where indicated on Drawings.

3 EXECUTION

3.1 EXAMINATION

A. Verify deck surface is smooth and dry and deck joints do not exceed 1/16 inch. Verify deck slope prior to beginning installation.

B. Verify that roof openings and penetrations are in place and set and braced and that roof drains are securely clamped in place.

C. Verify that concrete substrate is cured with moisture content not exceeding 12 percent. (if applicable)

D. Verify that metal deck has no gaps and laps are closed.

E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION – GENERAL

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using methods recommended by manufacturer for achieving the best result for the substrate under project conditions indicated.

C. Roof Board Insulation: Prevent materials from getting wet.

D. Schedule work after penetrations through roof are complete and perimeter conditions are ready to receive roof system.

E. Comply with SPFA applicable guidelines.

F. Prevent materials from entering and clogging roof drains and from migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

G. Mask off adjacent surfaces that are not scheduled to receive foam.

3.3 PREPARATION - METAL DECK

A. Install insulation with fasteners recommended by roofing system manufacturer to achieve wind uplift requirements specified for roofing system.

1) Butt insulation ends firmly together along all edges without gaps or openings.

2) Protect cover board from getting wet after installation and prior to being protected by foam cover board that has been exposed to moisture must be replaced.

3) Remove loose dirt and debris by using compressed air, vacuum or light brooming.

4) Protect installed cover board from spills of contaminants such as oil, grease, solvents, etc. Replace cover board that has been exposed to such contaminants.

5) Remove materials or substances that will interfere with total adhesion of foam insulation to substrate.

6) Mask off adjacent surfaces that are not scheduled to receive foam.

3.4 SUBSTRATE BOARD INSTALLATION

1. N/A.

3.5 ROOF BOARD INSULATION INSTALLATION

A. Coordinate installation of roof board insulation components so insulation is not exposed to precipitation or left exposed at the end of the work day.

B. Install insulation to conform to slopes indicated. (See details)

C. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch with insulation.

1) Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.

D. Fastened Insulation: Install all layers of insulation and secure to deck using mechanical fasteners or adhesives specifically designed and sized for fastening specified board-type roof insulation to deck type.

1) Fasten insulation according to requirements in FMG's "Approval Guide" for specified Windstorm Resistance Classification.

2) Fasten insulation to resist uplift pressure at corners, perimeter, and field of roof.

E. Install overlay board over insulation with long joints in continuous straight lines with end joints staggered between rows. Loosely butt cover boards together and fasten to roof deck.

1) Fasten cover boards according to requirements in FMG's "Approval Guide" for specified Windstorm Resistance Classification.

2) Fasten cover boards to resist uplift pressure at corners, perimeter, and field of roof.

3.6 FOAM INSULATION INSTALLATION

A. Apply primer and foam insulation in accordance with manufacturer's written installation instructions.

B. Install foam insulation in multiple layers with minimum pass thickness of 1/2 inch.

1) Thickness: a minimum of 1 ½ inches unless otherwise indicated on Drawings.

2) Provide positive slope for drainage. (See details for tapered insulation board)

C. Extend foam 2 inches up vertical intersections, fillet insulation, and feather out.

1) Form a cant of foam at perpendicular interruptions.

D. Apply foam to permit first coat of overcoat within 24 - 36 hours. If this time limit is exceeded, prepare foam skin surface in accordance with manufacturer's written instructions.

E. Develop finish skin surface to smooth and unbroken "orange peel" texture.

1) Uneven surfaces, “tree bark” or “popcorn” textures are not acceptable.

3.7 FLASHINGS AND ACCESSORIES

A. Coordinate installation of related flashings.

B. Seal flashings and flanges of items penetrating roofing system.

C. Install flexible walkway pads in locations indicated on Drawings. Adhere walkway products to substrate with compatible adhesive recommended by roofing system manufacturer.

3.8 SILICONE COATING INSTALLATION

A. Install coating in accordance with manufacturer's instructions.

B. Prepare and seal penetration through roof with sealant.

C. Apply silicone coating in two coats with dissimilar colors for each coat to a total dry mil thickness of 25 mils minimum.

D. Extend overcoat to cover foam insulation and extend 2 inches above foam termination on protrusions to a self-terminating, water seal.

E. Install granules in top coat at rate recommended by manufacturer.

3.9 FIELD QUALITY CONTROL

A. Owner will engage the services of an independent party to periodically inspect roofing installation. Roofing system installer shall cooperate with personnel performing inspections. (If applicable)

B. Final Roof Inspection: Arrange for roofing system manufacturer’s technical personnel to inspect roofing installation on completion and submit report to Architect.

1) Notify Architect and Owner 48 hours in advance of date and time of inspection.

C. Repair or remove and replace components of roofing system where inspection results indicate that they do not comply with specified requirements.

3.10 CLEANING

A. Clean work under provisions of Division 1. Remove overspray from adjacent surfaces using cleaning agents and procedures recommended by manufacturer of affected construction.

B. Remove excess insulation or overcoat from finished surfaces.

C. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and conform to their instructions.

D. Repair or replace defaced or disfigured finishes caused by work of this section.

3.11 PROTECTION OF FINISHED WORK

A. Protect finished work under provisions of Division 1.

B. Ensure roof surface is free of traffic for minimum two (2) days after overcoat application.

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SECTION 07 57 13
SPRAYED POLYURETHANE FOAM ROOFING

PART 1 - GENERAL

1.1 DESCRIPTION

A. This roofing system consists of a layer of sprayed in-place urethane foam roof insulation covered with two coats of silicone rubber protective coating and surfaced with ceramic granules. (R40 required)

B. Roofing system to conform to requirements of a Class A system under UL 790. (R40 required)

1.2 SUBMITTALS

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Manufacturer's Data: Showing complete instructions for installation.

C. Samples: Ceramic Granules, and each color available.

1.3 DELIVERY AND STORAGE

A. Deliver materials to the job site in their original unopened packages, clearly marked with the manufacturer's name, brand name and description of contents.

B. Store materials in clean, dry areas, away from excessive heat, sparks and open flame.

C. Ventilate storage areas to prevent build-up of flammable gases.

1.4 COORDINATION

Coordinate roofing operations with sheet metal work so that flashings are installed to permit continuous elastomeric roofing operations.

1.5 APPLICABLE PUBLICATIONS

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

B. American Society for Testing and Materials (ASTM):

C177-10.....Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus

C1029-10.....Spray-Applied Rigid Cellular Polyurethane Thermal Insulation

D412-06 .....Vulcanized Rubber and Thermoplastic Elastomers-Tension

D2240-05(R2010) .....Rubber Property-Durometer Hardness

C. Underwriters Laboratories, Inc. (UL):

790-08 .....Safety Tests for Fire Tests of Roof Coverings

PART 2 - PRODUCTS

2.1 MATERIALS (R40 REQUIRED)

A. Urethane Foam:

1. ASTM C1029, Type III.
2. Thermal Conductivity conforming to ASTM C177.

B. Elastomeric Protective Coating: Silicone rubber, two coat system (base coat of light color and top coat of dark color), shall bond to urethane foam and have the following properties:

PROPERTY	ASTM TEST METHOD	VALUE
Tensile Strength, Mpa(psi)	D412	3.8-6.5 (550 - 650)
Elongation, percent	D412	150 - 200
Hardness	D2240	65

C. Ceramic Granules: No. 11 screen size, color as selected, dry and free from dust.

PART 3 - EXECUTION

3.1 GENERAL

Installation shall comply with the manufacturer's instructions, except as otherwise specified.

3.2 THICKNESS OF INSULATION

A. Thickness of insulation: Provide a coefficient of heat transmission or U-value, of _0.025__. Minimum R value of 40.

B. Use R factor of 0.38/cm (5.56 per inch) of the insulation in the computation of the overall R value.

C. The minimum thickness of insulation:

1. 7.25 inches on common roof areas.
2. 3 inches at drains.

3.3 PREPARATION

A. Surfaces to receive elastomeric roofing: Dry and free of loose coatings, surface curing agents, wax or other contaminants.

B. Workmen shall wear clean, soft-soled sneaker-type shoes.

3.4 PROTECTION OF ADJACENT SURFACES

Protect surfaces near roofing operations from spray or roofing materials.

3.5 INSTALLATION OF INSULATION

A. Spray foam on the prepared surface in 13 mm (1/2- inch) lifts. Time between lifts shall not exceed 4 hours.

B. The finished surface shall be smooth, free of voids blisters and crevices and free draining.

C. Extend foam up walls and around roof projections to form cants and flashings that terminate at least 50 mm (two inches) above finished roof surface.

D. Cured foam: Free from water, dust, oils and other materials which would impair adhesion of the protective coating.

E. No foam shall be allowed to stand overnight without a base protective coating. Cure foam at least one hour before application of protective coating.

F. Correct any non-adherence of foam to substrate and finish pinholes flush with an approved sealant before final coating is applied.

G. Do not overspray to correct an unacceptable surface condition.

H. The finished roof surface shall not vary more than 13 mm (1/2-inch) when measured with a 3000 mm (10 foot) straight edge parallel and perpendicular to the roof slope.

3.6 PROTECTIVE COATING

A. Coating shall consist of a base coat and a top coat.

B. Clean base coat exposed for more than 24 hours with a detergent solution, thoroughly rinse and dry, then give another covering of base coating before applying the top coat.

C. No traffic allowed on finished areas for 24 hours after installation.

D. Base coat shall have a dry film thickness of not less (0.2 mm) 8 mils.

E. Coating shall completely cover the foam and extend up vertical surfaces two inches beyond foam.

F. Coating shall be dry and clean before application of top coat.

G. Top coat applied at right angles to the directions of the base coat application and shall fully cover the base coat.

H. Total dry film thickness shall be not less than 0.5 mm 20 mils.

I. Granules:

1. Apply within five minutes of top coat application, using pressure equipment, at a rate of 2.4 Kg/m²(50 pounds per 100 square feet).
2. Apply a minimum of two passes made at right angles to each other.
3. Finished granule system shall be uniform over entire surface with no apparent void areas.

J. Service Walks:

1. Apply after the protective coating system has been completed and cured.
2. Fiber-glass fabric 600 mm (4 inches) wide set into a third layer of protective coating and smoothed with brush or roller.
3. Coated a minimum of 150 mm (six inches) beyond each side and covered with roofing granules.

3.7 EQUIPMENT CALIBRATION

A. Spray equipment for two component system:

1. Calibrated each day at start of operations and;
   a. After each restart if spraying operations have been terminated for more than one hour.
   b. Whenever there is a change in fan pattern or pressure.
   c. Whenever slow curing areas are noticed.
   d. Whenever a change is made in hose length or working height and after change-over between materials.

B. Calibration shall consist of demonstrating that the equipment is adjusted to deliver component in the proper proportions.

C. Calibration tests: Done on the roof adjacent to the area to be sprayed.

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SECTION 07 72 00
ROOF ACCESSORIES

PART 1 - GENERAL

1.1 DESCRIPTION

This section specifies copings, fascia's, and expansion joints.

1.2 RELATED WORK

A. Sealant material and installation: Section 07 92 00, JOINT SEALANTS.

B. Rigid insulations for roofing: Section 07 22 00, ROOF AND DECK INSULATION.

1.3 QUALITY CONTROL

A. All roof accessories shall be the products of manufacturers regularly engaged in producing the kinds of products specified.

B. Each accessory type shall be the same and be made by the same manufacturer.

C. Each accessory shall be completely assembled to the greatest extent possible before delivery to the site.

1.4 SUBMITTALS

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, and SAMPLES.

B. Samples: Representative sample panel of color anodized aluminum not less than 100 mm X 100 mm (four by four inches), except extrusions shall be a width not less than section to be used. Sample shall show coating with integral color and texture and shall include manufacturer's identifying label.

C. Shop Drawings: Each item specified showing design, details of construction, installation and fastenings.

D. Manufacturer's Literature and Data: Each item specified.

E. Certificates: Stating that aluminum has been given specified thickness of anodizing.

1.5 APPLICABLE PUBLICATIONS

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

B. American Society for Testing and Material (ASTM):

B209/209M-07.....Aluminum and Aluminum Alloy-Sheet and Plate

B221/221M-08.....Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes

C612-10.....Mineral Fiber Block and Board Thermal Insulation

D1187-97 (R2002).....Asphalt-Base Emulsions for Use as Protective Coatings for Metal

C. National Association of Architectural Metal Manufacturers (NAAMM):

AMP 500-06.....Metal Finishes Manual

PART 2 - PRODUCTS

2.1 MATERIALS

A. Aluminum, Extruded: ASTM B221/B221M.

B. Aluminum Sheet: ASTM B209/B209M.

C. Insulation: ASTM C612, Class 1 or 2.

2.2 EXTRUDED ALUMINUM ROOF EXPANSION JOINT COVERS

A. Fabricate in 3000 mm (10 foot) lengths with fastener openings slotting for expansion not over 600 mm (24 inch) centers.

B. Provide four-way expansion, for joint widths shown.

C. Mill finish on aluminum.

D. Form water stop or moisture seals of continuous sheets of neoprene, not less than 0.8 mm (0.032 inch) thick.

E. Fabricate corners as one piece assembly with mitered and welded joint and least dimension legs not less than 300 mm (12 inches) long.

F. Factory fabricates end caps and transitions to insure waterproof assembly.

G. Three piece assembly:

1. Roof expansion joint cover system consists of an extruded aluminum cover, extruded frame or curb vertical section, galvanized steel cant, and aluminum compression clamp counter flashing, complete with moisture seals. Form cover and vertical section from extruded aluminum, 2 mm (0.080 inch) minimum thickness with spring stainless steel tension or pivot bar.

2. Form cant from galvanized steel not less than 0.8 (0.029 inch) thick formed to profile shown.

3. Form splice plates of not less than 0.8 mm (0.032 inch) thick aluminum sheet.

4. Form counter flashing member of 1.3 mm (0.050 inch) thick sheet aluminum, secured with screws to the top edge of the vertical section and providing compression clamp over base flashing.

5. Provide compression gasket separating cover from curb bearing.

H. Two piece assembly:

1. Roof expansion joint system consists of an extruded aluminum cover combination extruded aluminum frame or curb with integral adjustable counter flashing flange, and moisture seals.

2. Form cover from extruded aluminum 2 mm (0.078 inch) minimum thickness.

3. Form a cover anchor system of stainless steel pivot bar.

4. Form a frame assembly of not less than 2 mm (0.076 inch) aluminum except for flashing portion.

5. Provide compression gasket separating cover from curb at bearing.

I. Insure expansion joints are installed on curbs providing not less than 200 mm (8 inch) high base flashing.

2.3 SCUPPER ASSEMBLIE SYSTEM

A. Factory fabricated scupper assemblies:

1. Fabricate scupper assembly with extended plates to match fascia-cant in 500 mm (20 inch) minimum lengths, add a PVC insert (liner) that is to be heat welded to PVC roof.

2. Extend outlet opening not less than 50 mm (two inches) with drip edge.

3. Fabricate with stainless steel cores or sleeve to drain water from toe of cant and flash in to built-up roofing with 100 mm (4 inch)wide flange.

2.4 FINISH

A. Aluminum, Clear Finish: AA-C22A41 medium matte, clear anodic coating.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install roof accessories where shown and/or recommended by roofing manufacturer.

B. Secure with fasteners in accordance with manufacture's printed installation instructions and approved shop drawings unless shown otherwise.

C. Coordinate to install insulation where shown; see Section 07 22 00, ROOF AND DECK INSULATION.

D. Comply with section 07 92 00, JOINT SEALANTS to install sealants where manufactures installation instructions require sealant.

E. Coordinate with roofing work for installation of items in sequence to prevent water infiltration.

F. Expansion Joint Covers:

1. Install to terminate base flashing 200 mm (8 inches) above roof.

2. Install moisture seals to drain water to outlets that do not permit water to enter buildings construction.

3. Use stainless steel screws when exposed.

4. Three piece assembly:

a. Install curb section with screws to wood blocking, allowing 6 mm(1/4 inch) at butt joints between sections with splice plate at joint.

b. Install cant to wood blocking by nailing along horizontal flange every 150 mm (6 inches), with galvanized roofing nails 25 mm (one inch) long.

c. After completion of base flashing install cap flashing and compression clamp and fasten to the curb or metal cant with stainless steel self-tapping screws with neoprene washers under head spaced approximately 450 mm (18 inches) on center.

d. Install expansion joint cover with a 6 mm (1/4 inch) wide end joints.

e. Install over end joint a cover plate complete with concealed aluminum flashing, centered under each joint. Fabricate flashing to lap cover not less than four inches.

5. Two piece assembly:

a. Install curb section with screws allowing 6 mm (1/4 inch) space at end joints with splice plate at joint.

b. After completion of base flashing bend down cap flashing flange and secure to blocking with screws.

c. Install expansion joint cover with 6 mm (1/4 inch) wide space at end joints and tension bars at 600 mm (24 inches) on center.

d. Install cover plates with formed aluminum flashing concealed and centered on joint. Flashing is to lap cover not less than 100 mm(4 inches).

3.2 PROTECTION OF ALUMINUM

A. Provide protection for aluminum against galvanic action wherever dissimilar materials are in contact, by separating the contact surfaces with a preformed neoprene tape having pressure sensitive adhesive coating on side.

B. Paint aluminum in contact with wood, concrete and masonry, or other absorptive materials, that shall become repeatedly wet, with two coats of asphalt coating.

3.3 ADJUSTING

Adjust expansion joints to close tightly and be watertight; insuring maximum allowance for building movement.

3.4 PROTECTION

Protect roof accessories from damage during installation and after completion of the work from subsequent construction.

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SECTION 07 92 00
JOINT SEALANTS

PART 1 - GENERAL

1.1 DESCRIPTION:

Section covers all sealant and caulking materials and their application, wherever required for complete installation of building materials or systems.

1.2 QUALITY CONTROL:

A. Installer Qualifications: An experienced installer who has specialized in installing joint sealants similar in material, design, and extent to those indicated for this Project and whose work has resulted in joint sealant installations with a record of successful in-service performance.

B. VOC: Acrylic latex and Silicon sealants shall have less than 50g/l VOC content.

1.3 SUBMITTALS:

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, and SAMPLES.

B. Manufacturer's installation instructions for each product used.

C. Manufacturer's Literature and Data:

1. Caulking compound
2. Primers
3. Sealing compound, each type, including compatibility when different sealants are in contact with each other.

1.4 PROJECT CONDITIONS:

A. Environmental Limitations:

1. Do not proceed with installation of joint sealants under following conditions:
    a. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 4.4 C(40 F).
    b. When joint substrates are wet.

B. Joint-Width Conditions:

1. Do not proceed with installation of joint sealants where joint

widths are less than those allowed by joint sealant manufacturer for applications indicated.

C. Joint-Substrate Conditions:

1. Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

1.5 DELIVERY, HANDLING, AND STORAGE:

A. Deliver materials in manufacturers' original unopened containers, with brand names, date of manufacture, shelf life, and material designation clearly marked thereon.

B. Carefully handle and store to prevent inclusion of foreign materials.

C. Do not subject to sustained temperatures exceeding 32 C (90 F) or less than 5 C (40 F).

1.6 DEFINITIONS:

A. Definitions of terms in accordance with ASTM C717 and as specified.

B. Back-up Rod: A type of sealant backing.

C. Bond Breakers: A type of sealant backing.

D. Filler: A sealant backing used behind a back-up rod.

1.7 WARRANTY:

A. Warranty exterior sealing against leaks, adhesion, and cohesive failure, and subject to terms of "Warranty of Construction", FAR clause 52.246-21, except that warranty period shall be extended to two years.

B. General Warranty: Special warranty specified in this Article shall not deprive Government of other rights Government shall have under other provisions of Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of Contract Documents.

1.8 APPLICABLE PUBLICATIONS:

A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by basic designation only.

B. American Society for Testing and Materials (ASTM):

C509-06.....Elastomeric Cellular Preformed Gasket and Sealing Material.

C612-10.....Mineral Fiber Block and Board Thermal Insulation.

C717-10.....Standard Terminology of Building Seals and Sealants.

C834-10.....Latex Sealants.

C919-08.....Use of Sealants in Acoustical Applications.

C920-10.....Elastomeric Joint Sealants.

C1021-08.....Laboratories Engaged in Testing of Building Sealants.

C1193-09.....Standard Guide for Use of Joint Sealants.

C1330-02 (R2007).....Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants.

D1056-07.....Specification for Flexible Cellular Materials—Sponge or Expanded Rubber.

E84-09.....Surface Burning Characteristics of Building Materials.

C. Sealant, Waterproofing and Restoration Institute (SWRI).

The Professionals' Guide

PART 2 - PRODUCTS

2.1 SEALANTS:

A. S-1: NP 1

1. ASTM C920, polyurethane.
2. Type S.
3. Class 25.
4. Grade NS.
5. Shore A hardness of 25-35

2.2 COLOR:

A. Sealants used with exposed masonry shall match color of mortar joints.

B. Caulking shall be white, unless specified otherwise.

2.3 JOINT SEALANT BACKING:

A. General: Provide sealant backings of material and type that are Non-staining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: ASTM C1330, of type indicated below and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:

1. Type C: Closed-cell material with a surface skin.

C. Elastomeric Tubing Sealant Backings: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D1056, nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to minus 32 C(minus 26 F). Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and otherwise contribute to optimum sealant performance.

D. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.4 FILLER:

A. Mineral fiber board: ASTM C612, Class 1.

B. Thickness same as joint width.

C. Depth to fill void completely behind back-up rod.

2.5 PRIMER:

A. As recommended by manufacturer of caulking or sealant material.

B. Stain free type.

2.6 CLEANERS-NON POUROUS SURFACES:

A. Chemical cleaners acceptable to manufacturer of sealants and sealant backing material, free of oily residues and other substances capable of staining or harming joint substrates and adjacent non-porous surfaces and formulated to promote adhesion of sealant and substrates.

PART 3 - EXECUTION

3.1 INSPECTION:

A. Inspect substrate surface for bond breaker contamination and unsound materials at adherent faces of sealant.

B. Coordinate for repair and resolution of unsound substrate materials.

C. Inspect for uniform joint widths and that dimensions are within tolerance established by sealant manufacturer.

3.2 PREPARATIONS:

A. Prepare joints in accordance with manufacturer's instructions and SWRI.

B. Clean surfaces of joint to receive caulking or sealants leaving joint dry to the touch, free from frost, moisture, grease, oil, wax, lacquer paint, or other foreign matter that would tend to destroy or impair adhesion.

1. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants.

2. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air. Porous joint surfaces include the following:

a. Concrete.

b. Masonry.

c. Unglazed surfaces of ceramic tile.

3. Remove laitance and form-release agents from concrete.

4. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.

a. Metal.

b. Glass.

c. Porcelain enamel.

d. Glazed surfaces of ceramic tile.

C. Do not cut or damage joint edges.

D. Apply masking tape to face of surfaces adjacent to joints before applying primers, caulking, or sealing compounds.

1. Do not leave gaps between ends of sealant backings.

2. Do not stretch, twist, puncture, or tear sealant backings.

3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

E. Apply primer to sides of joints wherever required by compound manufacturer's printed instructions.

1. Apply primer prior to installation of back-up rod or bond breaker tape.

2. Use brush or other approved means that shall reach all parts of joints.

F. Take all necessary steps to prevent three sided adhesion of sealants.

3.3 BACKING INSTALLATION:

A. Install back-up material, to form joints enclosed on three sides as required for specified depth of sealant.

B. Where deep joints occur, install filler to fill space behind the backup rod and position the rod at proper depth.

C. Cut fillers installed by others to proper depth for installation of back-up rod and sealants.

D. Install back-up rod, without puncturing the material, to a uniform depth, within plus or minus 3 mm (1/8 inch) for sealant depths specified.

E. Where space for back-up rod does not exist, install bond breaker tape strip at bottom (or back) of joint so sealant bonds only to two opposing surfaces.

F. Take all necessary steps to prevent three sided adhesion of sealants.

3.4 SEALANT DEPTHS AND GEOMETRY:

A. At widths up to 6 mm (1/4 inch), sealant depth equal to width.

B. At widths over 6 mm (1/4 inch), sealant depth 1/2 of width up to 13 mm(1/2 inch) maximum depth at center of joint with sealant thickness at center of joint approximately 1/2 of depth at adhesion surface.

3.5 INSTALLATION:

A. General:

1. Apply sealants and caulking only when ambient temperature is between 5 C and 38 C (40 and 100 F).

2. Do not use polysulfide base sealants where sealant shall be exposed to fumes from bituminous materials, or where water vapor in continuous contact with cementitious materials shall be present.

3. Do not use sealant type listed by manufacture as not suitable for use in locations specified.

4. Apply caulking and sealing compound in accordance with manufacturer's printed instructions.

5. Avoid dropping or smearing compound on adjacent surfaces.

6. Fill joints solidly with compound and finish compound smooth.

7. Tool joints to concave surface unless shown or specified otherwise.

8. Finish paving or floor joints flush unless joint is otherwise detailed.

9. Apply compounds with nozzle size to fit joint width.

10. Test sealants for compatibility with each other and substrate. Use only compatible sealant.

B. For application of sealants, follow requirements of ASTM C1193 unless specified otherwise.

3.6 FIELD QUALITY CONTROL:

A. Inspect joints for complete fill, for absence of voids, and for joint configuration complying with specified requirements.

3.7 CLEANING:

A. Fresh compound accidentally smeared on adjoining surfaces: Scrape off immediately and rub clean with a solvent as recommended by the caulking or sealant manufacturer.

B. After filling and finishing joints, remove masking tape.

C. Leave adjacent surfaces in a clean and unstained condition.

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SECTION 09 91 00
PAINTING

PART 1-GENERAL

1.1 DESCRIPTION

A. Section specifies field painting.

B. Section specifies prime coats which shall be applied in shop under other sections.

C. Painting includes shellacs, stains, varnishes, coatings specified, and striping or markers and identity markings.

1.2 RELATED WORK

A. Shop prime painting of steel and ferrous metals: Division 05 - METALS

B. Type of Finish, Color, and Gloss Level of Finish Coat: refer to paragraph 3.6 paint color.

1.3 SUBMITTALS

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Manufacturer's Literature and Data:

Before work is started, or sample panels are prepared, submit manufacturer's literature, the current Master Painters Institute (MPI) "Approved Product List" indicating brand label, product name and product code as of the date of contract award, shall be used to determine compliance with the submittal requirements of this specification. The Contractor shall choose to use subsequent MPI "Approved Product List", however, only one list shall be used for the entire contract and each coating system is to be from a single manufacturer. All coats on a particular substrate shall be from a single manufacturer. No variation from the MPI "Approved Product List" where applicable is acceptable.

C. Sample Panels:

1. One strip located on one set of stairs, showing not less than 50 mm (2inch) wide strips of undercoats and 100 mm (4 inch) wide strip of finish coat.

D. Manufacturers' Certificates indicating compliance with specified requirements:

1. Manufacturer's paint substituted for Federal Specification paints meets or exceeds performance of paint specified.

2. Epoxy coating.

1.4 DELIVERY AND STORAGE

A. Deliver materials to site in manufacturer's sealed container marked to show following:

1. Name of manufacturer.

2. Product type.

3. Batch number.

4. Instructions for use.

5. Safety precautions.

B. In addition to manufacturer's label, provide a label legibly printed as following:

1. Federal Specification Number, where applicable, and name of material.

2. Surface upon which material is to be applied.

3. If paint or other coating, state coat types; prime, body or finish.

C. Maintain space for storage, and handling of painting materials and equipment in a neat and orderly condition to prevent spontaneous combustion from occurring or igniting adjacent items.

D. Store materials at site at least 24 hours before using, at a temperature between 18 and 30 C (65 and 85 F).

1.5 APPLICABLE PUBLICATIONS

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

B. American Conference of Governmental Industrial Hygienists (ACGIH):

ACGIH TLV-BKLT-2008.....Threshold Limit Values (TLV) for Chemical Substances and Physical Agents and Biological Exposure Indices (BEIs)

ACGIH TLV-DOC-2008.....Documentation of Threshold Limit Values and Biological Exposure Indices, (Seventh Edition)

C. American National Standards Institute (ANSI):

A13.1-07.....Scheme for the Identification of Piping Systems

D. American Society for Testing and Materials (ASTM):

D260-86.....Boiled Linseed Oil

E. Master Painters Institute (MPI):

No. 11-07.....Exterior Latex, Semi-Gloss (AE)

No. 18-07.....Organic Zinc Rich Primer

No. 26-07.....Cementitious Galvanized Metal Primer

No. 77-07.....Epoxy Cold Cured, Gloss (EC)

No. 95-07.....Fast Drying Metal Primer

No. 98-07.....High Build Epoxy Coating

No. 101-07.....Epoxy Anti-Corrosive Metal Primer

No. 108-07.....High Build Epoxy Coating, Low Gloss (EC)

No. 135-07.....Non-Cementitious Galvanized Primer

F. Steel Structures Painting Council (SSPC):

SSPC SP 1-04 (R2004)....Solvent Cleaning

SSPC SP 2-04 (R2004)....Hand Tool Cleaning

SSPC SP 3-04 (R2004)....Power Tool Cleaning

PART 2 - PRODUCTS

2.1 MATERIALS

A. Exterior Latex, Semi-Gloss (AE): MPI 11.

B. Organic Zinc rich Coating (HR): MPI 22.

C. Cementitious Galvanized Metal Primer: MPI 26.

D. Epoxy Cold Cured, Gloss (EC): MPI 77.

E. Fast Drying Metal Primer: MPI 95.

F. High Build Epoxy Coating: MPI 98.

G. Epoxy Anti-Corrosive Metal Primer: MPI 101.

H. Waterborne Galvanized Primer: MPI 134.

I. Non-Cementitious Galvanized Primer: MPI 135.

2.2 PAINT PROPERTIES

A. Use ready-mixed (including colors), except two component epoxies, polyurethanes, polyesters, paints having metallic powders packaged separately and paints requiring specified additives.

B. Where no requirements are given in the referenced specifications for

primers, use primers with pigment and vehicle, compatible with substrate and finish coats specified.

2.3 REGULATORY REQUIREMENTS/QUALITY ASSURANCE

A. Paint materials shall conform to the restrictions of the local Environmental and Toxic Control jurisdiction.

1. Volatile Organic Compounds (VOC): VOC content of paint materials shall not exceed 10g/l for interior latex paints/primers and 50g/l for exterior latex paints and primers.

2. Lead-Based Paint:

a. Comply with Section 410 of the Lead-Based Paint Poisoning Prevention Act, as amended, and with implementing regulations promulgated by Secretary of Housing and Urban Development.

b. Regulations concerning prohibition against use of lead-based paint in federal and federally assisted construction, or rehabilitation of residential structures are set forth in Subpart F, Title 24, Code of Federal Regulations and Department of Housing and Urban Development.

3. Asbestos: Materials shall not contain asbestos.

4. Chromate, Cadmium, Mercury, and Silica: Materials shall not contain zinc-chromate, strontium-chromate, Cadmium, mercury or mercury compounds or free crystalline silica.

5. Human Carcinogens: Materials shall not contain any of the ACGIH-BKLT and ACGHI-DOC confirmed or suspected human carcinogens.

6. Use high performance latex acrylic paints in place of alkyd paints.

7. VOC content for solvent-based paints shall not exceed 250g/l and shall not be formulated with more than one percent aromatic hydro carbons by weight.

PART 3 - EXECUTION

3.1 JOB CONDITIONS

A. Safety: Observe required safety regulations and manufacturer's warning and instructions for storage, handling and application of painting materials.

1. Take necessary precautions to protect personnel and property from hazards due to falls, injuries, toxic fumes, fire, explosion, or other harm.

2. Deposit soiled cleaning rags and waste materials in metal containers approved for that purpose. Dispose of such items off the site at end of each day's work.

B. Atmospheric and Surface Conditions:

1. Do not apply coating when air or substrate conditions are:

a. Less than 3 C (5 F) above dew point.

b. Below 10 C (50 F) or over 35 C (95 F), unless specifically pre-approved by the Contracting Officer and the product manufacturer. Under no circumstances shall application conditions exceed manufacturer recommendations.

2. Do no exterior painting when it is windy and dusty.

3. Do not paint in direct sunlight or on surfaces that the sun shall soon warm.

4. Apply only on clean, dry and frost free surfaces except as follows:

a. Apply water thinned acrylic and cementitious paints to damp (not wet) surfaces where allowed by manufacturer's printed instructions.

3.2 SURFACE PREPARATION

A. Method of surface preparation is optional, provided results of finish painting produce solid even color and texture specified with no overlays.

B. General:

1. Remove prefinished items not to be painted such as lighting fixtures, escutcheon plates, hardware, trim, and similar items for reinstallation after paint is dried.

2. Remove items for reinstallation and complete painting of such items and adjacent areas when item or adjacent surface is not accessible or finish is different.

3. See other sections of specifications for specified surface conditions and prime coat.

4. Clean surfaces for painting with materials and methods compatible with substrate and specified finish. Remove any residue remaining from cleaning agents used. Do not use solvents, acid, or steam on concrete and masonry.

C. Zinc-Coated (Galvanized) Metal:

1. Clean surfaces to remove grease, oil and other deterrents to paint adhesion with an alkaline solution with a ph level from 11 to 12 but not more than 13 in accordance with SSPC-SP 1 (Solvent Cleaning).

2. Spot coat abraded and damaged areas of zinc-coating which expose base metal on hot-dip zinc-coated items with MPI 18 (Organic Zinc Rich Coating). Prime or spot prime with MPI 134 (Waterborne Galvanized Primer) or MPI 135 (Non-Cementitious Galvanized Primer) depending on finish coat compatibility.

3.3 PAINT PREPARATION

A. Thoroughly mix painting materials to ensure uniformity of color, complete dispersion of pigment and uniform composition.

B. Do not thin unless necessary for application and when finish paint is used for body and prime coats. Use materials and quantities for thinning as specified in manufacturer's printed instructions.

C. Remove paint skins, then strain paint through commercial paint strainer to remove lumps and other particles.

D. Mix two component and two part paint and those requiring additives in such a manner as to uniformly blend as specified in manufacturer's printed instructions unless specified otherwise.

E. For tinting required to produce exact shades specified, use color pigment recommended by the paint manufacturer.

3.4 APPLICATION

A. Start of surface preparation or painting shall be construed as acceptance of the surface as satisfactory for the application of materials.

B. Unless otherwise specified, apply paint in three coats; prime, body, and finish. When two coats applied to prime coat are the same, first coat applied over primer is body coat and second coat is finish coat.

C. Apply each coat evenly and cover substrate completely.

D. Allow not less than 48 hours between applications of succeeding coats, except as allowed by manufacturer's printed instructions, and approved by Project Engineer.

E. Finish surfaces to show solid even color, free from runs, lumps,
brush marks, laps, holidays, or other defects.

F. Apply by brush, roller, no spray painting, except as otherwise specified.

G. Do not spray paint in existing occupied spaces unless approved by Project Engineer.

3.5 PRIME PAINTING

A. After surface preparation prime surfaces before application of body and finish coats, except as otherwise specified.

B. Spot prime and apply body coat to damaged and abraded painted surfaces before applying succeeding coats.

C. Additional field applied prime coats over shop or factory applied prime coats are not required except for exterior exposed steel apply an
additional prime coat.

D. Prime rebates for stop and face glazing of steel.

E. Metals except boilers, incinerator stacks, and engine exhaust pipes:

1. Zinc-coated steel and iron: MPI 135 (Non-Cementitious Galvanized Primer).

3.6 PAINT COLOR

A. Color and gloss of finish; Epoxy polyamide, Semi-gloss (Mansard brown)

B. For additional requirements regarding color see COR.

C. Coat Colors:

1. Color of priming coat: Lighter than body coat.
2. Color of body coat: Lighter than finish coat.
3. Color prime and body coats to not show through the finish coat and to mask surface imperfections or contrasts.

3.7 BUILDING AND STRUCTURAL WORK FIELD PAINTING

A. Painting and finishing of interior and exterior work except as specified under paragraph 3.11 B.

1. Painting and finishing of existing work including colors and gloss of finish selected refer to paragraph 3.6 paint color.
2. Painting of disturbed, damaged and repaired or patched surfaces when entire space is not scheduled for complete repainting or refinishing.
3. Painting of ferrous metal and galvanized metal.
4. Identity painting and safety painting.

3.8 PROTECTION CLEAN UP, AND TOUCH-UP

A. Protect work from paint droppings and spattering by use of masking, drop cloths, removal of items or by other approved methods.

B. Upon completion, clean paint from hardware, glass and other surfaces and items not required to be painted of paint drops or smears.

C. Before final inspection, touch-up or refinished in a manner to produce solid even color and finish texture, free from defects in work which was damaged or discolored.

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SECTION 22 14 00
FACILITY STORM DRAINAGE

PART 1 - GENERAL

1.1 DESCRIPTION

Replacement of roof drains and 5 feet of associated piping as specified in drawings.

1.2 SUBMITTALS

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Manufacturer's Literature and Data:

1. Piping.
2. Roof Drains.
3. All items listed in Part 2- Products.

C. Detailed shop drawing of clamping device and extensions when required in connection with the waterproofing membrane.

1.3 APPLICABLE PUBLICATIONS

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

B. American National Standards Institute (ANSI).

C. American Society of Mechanical Engineers (ASME): (Copyrighted Society)

A112.21.2m-83.....Roof Drains

A13.1-07.....Scheme for Identification of Piping Systems

D. American Society for Testing and Materials (ASTM):

A74-06.....Standard Specification for Cast Iron Soil Pipe and Fittings

A536-84(R 2004).....Standard Specification for Ductile Iron Castings

C564-06a.....Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings

D2000-08.....Standard Classification System for Rubber Products in Automotive Applications

D4101-07.....Standard Specification for Propylene Plastic Injection and Extrusion Materials

E. Factory Mutual (FM):

a. Coupling Used in Hubless Cast Iron Systems for Drains, Waste and Vent Systems.

F. International Code Council (ICC):

IPC-06.....International Plumbing Code

G. Cast Iron Soil Pipe Institute (CISPI):

310-04.....Couplings for Use in Connection with Hubless Cast Iron Soil and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications

PART 2 - PRODUCTS

2.1 STORM WATER DRAIN PIPING AND VENT PIPING

A. Cast Iron Storm Pipe and Fittings: Schedule 40.

1. Cast iron storm pipe and fittings shall be used for the following applications:

c. Interior storm piping above grade.

2. The cast iron storm Pipe shall be bell and spigot, or hubless (plain end or no-hub)to connect to existing piping.

3. The material for all pipe and fittings shall be cast iron soil pipe and fittings and shall conform to the requirements of CISPI Standard 301, ASTM A-888, or ASTM A-74.

4. Joints for hubless pipe and fittings shall conform to the manufacturer’s installation instructions. Couplings for hubless joints shall conform to CISPI 310. Joints for hub and spigot pipe shall be installed with compression gaskets conforming to the requirements of ASTM Standard C-564 or be installed with leak and oakum.

2.2 ROOF DRAINS AND CONNECTIONS

A. Roof Drains: JOSAM 22010 Series, medium sump Beehive Dome, or Jay R Smith 3556 series or Wade 3500 Series or Equal.

Acceptable Products: Listed herein are manufacturer's products which have been identified as meeting the salient characteristics of this specification. Such information is only provided to identify a product which meets the salient characteristics of the product described hiring and do not, in any way, limit the offeror from providing products from other manufacturers which meet the salient product characteristics as identified in the specification.

Salient Characteristics:

a. Coated Cast Iron

b. Non-puncturing clamp ring with integral gravel stop.

c. Medium sump with roof flange and bottom outlet

d. 12 in diameter

e. Integral no-hub, soil pipe gasket

f. Adjustable drainage collar, which can be raised or lowered to meet required insulation heights.

g. Replace all roof sump pans

h. Pipe diameter as indicated on drawings.

B. Expansion Joints: Expansions joints shall be heavy cast iron with cast brass or copper expansion sleeve having smooth bearing surface working freely against a packing ring held in place and under pressure of a bolted gland ring, forming a water and air tight flexible joint.

Asbestos packing is prohibited.

C. Interior Downspouts: An expansion joint shall be provided, specified above, at top of run on straight, vertical runs of downspout piping 12 m (40 feet) long or more.

D. Downspout Nozzle: The downspout nozzle fitting shall be of brass, unfinished, with internal pipe thread for connection to downspout.

PART 3 - EXECUTION

3.1 PIPE INSTALLATION

A. The pipe installation shall comply with the requirements of the International code and these specifications.

B. Pipe shall be round and straight. Cutting shall be done with proper tools. Pipe shall be reamed to full size after cutting.

C. All pipe runs shall be laid out to avoid interference with other work.

D. Penetrations:

1. Water proofing: At floor penetrations, Clearances around the pipe shall be completely sealed and made watertight with sealant as specified in Section 07 92 00, JOINT SEALANTS.

2. All replaced piping shall be reinsulated to match existing insulation. Any fireproofing removed shall be replaced to match existing.

E. Piping shall conform to the following:

1. Storm Water Drain and Vent Drain to main stacks:

Pipe Size	Minimum Pitch
80 mm (3 inches) and smaller	2%
100 mm (4 inches)(4inches)and larger	1%

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