

Specification for
Solicitation DTFA1102R00037
FAA, Northwest Mt Region
Roof Replacement, Auburn , WA Air Route Traffic Control Center

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SECTION 01000 - SUMMARY OF WORK

PART 1- GENERAL

1.1 Scope of work.- These specifications, together with the referenced specifications, standards, and drawings specified in the Contract Documents, cover the requirements for all work associated with the Roof replacement/repair/recover project at the Seattle Air Route Traffic Control Center (ARTCC) located at 3101 Auburn Way, South, Auburn, Washington. Following is a general description of the work:

This project involves the partial removal, repair, and recovering of the existing roof system with a PVC single ply mechanically fastened roof system. The existing roof membrane system is a 4-ply bitumen built up roof with fiberboard insulation and gravel ballast. Existing 4-ply membrane is to be removed, new protection board installed and new single ply roof membrane and flashing system installed. Existing roof insulation is to be reused except where noted on the plans or where it is determined that the existing insulation is unsuitable. The contractor shall provide a complete roof membrane system fully warranted by the manufacturer.

The existing roofing felts between the expansion joint (near building line A) and building line K contain asbestos (10% Chrysotile) and shall be removed in accordance with all applicable State of Washington and Federal requirements. Evidence that ACM material removed from the roof has been disposed of properly shall be turned over to the Resident Engineer before final payment is made.

There is asbestos contaminated spray on fireproofing installed on the underside of the existing steel roof decking north of building line K. The contractor shall exercise caution not to disturb this material. There is no asbestos contaminated fireproofing installed on the underside of the existing steel roofing from building line K southward (the area of work). All work must be coordinated in order to maintain an operational facility. The total contract duration for completion of all work shall be 60 calendar days, excluding inclement weather. **Perspective bidders MUST perform a site visit to assess the actual roof conditions before submitting a bid. Site visits can be arranged by contacting Ken Bloom at 253-351-3776.**

1.2 Intent of specifications.-

- (a) This specification identifies all labor and equipment to perform the work required to construct the facility. All work performed and all materials and equipment used shall be approved by the Contracting Officer (CO). This shall include but not be limited to inspection, scheduling, reporting, and submittals.
- (b) Titles.- Titles to division and sections of the specifications and notes and titles on drawings referring to subcontractors, division of work by trade, or type of work, are introduced merely for convenience in reading the specifications and drawings and do not imply any separate contractual arrangements of work assignments. Such separations into titled divisions and sections shall not operate to make the Government an arbiter to establish subcontract limits between the contractor and subcontractors, or between the subcontractors themselves.

1.3 Contract documents.-

The construction of this facility shall be in accordance with the lines and grades shown on the drawings. The contractor shall not use dimensions scaled from drawings. All dimensions shown on the drawings shall be verified by the contractor by actual measurements in the field. Any discrepancies between the drawings and specifications and the existing conditions shall be referred to the CO for adjustment before any work affected is performed.

1.4 Precedence of contract documents.-

- (a) In the event of a difference between the following contract provisions, the order of precedence to determine which provision shall govern is:
1. Contract Clauses and Provisions
 2. Project Specifications
 3. Project Drawings as listed in Part III - Section J
- (b) Any discrepancies between the contract provisions, the specifications and the contract drawings shall be referred to the CO for a written determination in accordance with Contract Clause entitled **Order of Precedence** Refer to Part II, Section I.

1.5 Contracting Officer.- The term "Contracting Officer" (CO) as used herein denotes the person designated to act on behalf of the Government in the performance of this contract. Where reference is made to "Federal Aviation Administration" (FAA), "Resident Engineer" (RE), "Contracting Officer's Representative" (COR), or the like, this shall mean the Contracting Officer or his/her authorized representative.

1.6 Contractor Superintendence.- In accordance with Contract Clause entitled SUPERINTENDENCE BY THE CONTRACTOR, the Contractor shall at all times during performance of this contract and until the work is completed and accepted, directly superintend the work or assign and have on site a competent superintendent with the authority to act for the Contractor.

END OF SECTION 01000

SECTION 01020 SITE ACCESS, CONSTRUCTION LIMITS, USE OF FACILITIES AND WORK HOURS

PART 1-GENERAL

1.1 Existing facility operations.- The ARTCC is a 24 hour, 7 day per week operating facility. The Contractor shall perform all work in a manner which does not conflict with or adversely affect the air traffic operational environment or functions of the ARTCC. In the event of any actual or potential conflict, air traffic control activities shall have priority over all Contractor activities. The Contractor shall plan for and provide services in such a manner and at such times that will not disrupt facility operations, and shall conform to those procedures considered essential by the FAA for ensuring air traffic safety.

1.2 Construction limits and access.-

- (a) The contractor shall confine operations, activities, storage of materials and employee parking within the designated area, as indicated on the drawings. Additional space the contractor deems necessary shall be obtained off site, at no additional cost to the Government.
- (b) Access for the contractor, sub-contractors, employees, deliveries, etc., will be in approximate locations as indicated on the construction staging plan.
- (c) Access to the construction site shall be kept unobstructed. If temporary access obstruction is unavoidable, the contractor shall advise the RE immediately.
- (d) Temporary roadways and/or other access may be authorized only by the facility, via the RE.
- (e) Vehicles transporting materials shall not be loaded beyond the capacity prescribed by Federal, State or Local law.
- (f) Obstruction of existing roadways, driveways, etc., to the ARTCC is strictly prohibited. Access to the loading dock and ramp shall be maintained.
- (g) Damage caused by the contractor's activities to existing paving, lawns, curbs, sidewalks, interior/exterior of the building shall be repaired. All costs of repairs shall be paid by the contractor. After notice to proceed and prior to the commencement of construction, the contractor and RE shall conduct joint inspections of the existing areas affected by the construction. Existing damage/defects shall be noted and will be used as the basis for determination of damages caused by the contractor's operations.

1.3 Contractor's use of premises.-

- (a) Contractor shall assume full responsibility for the protection and safekeeping of products stored on the site.
- (b) The contractor and his subcontractors shall maintain the job site in a neat and orderly condition.
- (c) Concessionaires shall not be allowed on the grounds of the facility.
- (d) Use of the cafeteria is permitted except between the hours of 11:30 a.m. to 1:00 p.m. and only if the contractor personnel are in clean clothes and shoes.

1.4 Government use and access to premises.-

- (a) The Government reserves the right to enter the premises during the term of the contract for periodic work inspections and for maintenance of existing equipment. The Contractor shall allow the CO and RE complete access to all portions of the work.
- (b) See Part II, Section I, Contract Clause entitled OTHER CONTRACTS, for work by other contractors.

1.5 Work hours.- Work shall be performed during normal working hours (7:30 a.m. to 4:00 p.m.) except for the following:

- (a) The contractor may elect to work two shifts or may elect to work outside the normal working hours, early morning or late afternoons, due to weather conditions, provided that this is scheduled and coordinated with the RE, the facility and CO, a minimum of 5 working days in advance. No claims for increased overhead or equitable adjustment will be entertained if the Contractor elects to work more than one shift.
- (b) Shutdowns and cutovers of environmental, utility and electrical systems impacting the facility operations shall be accomplished between the hours of 10 p.m. and 6 a.m. All preparatory work shall be completed prior to shutdown/cutover to minimize downtime. Shutdown and cutovers shall be scheduled and coordinated with the RE a minimum of 10 working days in advance of the shutdown/cutover.
- (c) Construction noise within the facility must be minimized between 7:00 a.m. and 8:30 p.m. and shall be scheduled in advance, coordinated with the facility and approved by the RE.

1.6 Notification of planned overtime work.- In the event the contractor intends to work overtime, nights, weekends or holidays, he shall notify the RE, who will coordinate with the CO for approval, at least 24 hours in advance of his commencement of the overtime work and 48 hours prior to night, weekend or holiday work.

1.7 Security requirements.-

- (a) Contractor shall provide the CO prior to Notice-To-Proceed with a complete list of contractor and subcontractor personnel including social security number, date of birth, and city of residence. The list shall be kept current during project work. No Contractor employees, associates, or other representatives shall be permitted access to the ARTCC grounds until that person's name and information has been provided and the appropriate security investigation has been completed by an FAA security officer for approval of access to the site with specified restrictions, if any. The FAA security officer may refuse access to the site to any employee, associate or other representative at any time for any reason.
- (b) Contractor and subcontractor personnel may be subject to a security investigation by the FAA. The contractor shall promptly complete and return applicable security forms furnished with the contract document for each employee as required. Forms must be completed and returned to the CO prior to subject employees working in the facility.
- (c) Contractor's personnel shall report to the FAA Security Guard at the front security gate and submit proper identification to obtain an FAA badge which will be worn on an outside garment at all times while on the ARTCC premises. This badge shall be returned daily to the security guard when such personnel leave the ARTCC premises.
- (d) Work shall be arranged so that contractor's personnel can be escorted when required by the FAA, in certain areas which are considered to be restricted. No Contractor employee, associate, or other representative shall have any visual, audible, or physical access to any area marked as a "closed area". Any persons gaining access to any "closed area" shall report the access to the CO who will coordinate with the FAA security office for a de-brief. Contractor's personnel shall not violate any security regulations pertaining to the ARTCC facility. Violators may be removed from the premises with the right to re-enter revocable. Contractor's day-to-day work schedules in the restricted areas shall be so arranged to allow for minimum escort.

- (e) Current procedures at FAA facilities include the "right to search". Access to the site constitutes consent to search. If in the judgment of the FAA Security Guard a cause to search a vehicle or the person of personnel exists, such search will be made.

END OF SECTION 01020

SECTION 01030 - CONTRACTOR QUALITY CONTROL, COORDINATION, PERMITS, TESTING

PART 1 - GENERAL

1.1 The Contractor is responsible for quality control and shall establish and maintain an effective quality control system in compliance with the Contract Clause entitled "Inspection of Construction."

1.2 Quality Control /Assurance.-

1.2.1 General.- The Contractor shall monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship to produce work of specified quality and to comply fully with manufacturers' instructions. The Contractor shall identify a single person to ensure quality control/assurance. The contractor may select the project's supervisor or any person with a minimum of 5 years experience in the single-ply system. A independent Quality Control/Assurance officer is not necessary.

PART 2 - PRODUCTS

2.1 Submittals.- Procedures for processing shop drawings, samples, certificates, and other submittals shall be developed and submitted for approval as part of the Contractor's Quality Control Plan. The procedures shall include the establishment of responsibilities to assure at each level adequate review and approval; timely delivery, including verification procedures; and proper storage.

2.2 Certification.- The Contractor shall certify that, the submittals comply with contract requirements. Submittals shall be as specified in Section 01070 SUBMITTALS.

2.3 Government Approved Submittals.- Submittals requiring Government approval will be identified as having received Contractor approval by being so stamped and dated. Delays in the approval process shall not be the basis for consideration of a time extension when such delay is the result of the Contractor's failure to make proper and timely submittal or make corrections in accordance with the specifications or the Contracting Officer's comments or is the result of a resubmittal which is required because of an unsatisfactory original submittal. Approval action will not relieve the Contractor of his responsibility for compliance with the contract but will indicate only that the general method of construction and detailing is satisfactory.

2.4 Deviations.- All proposed deviations from contract requirements shall be clearly indicated and submitted in writing for approval.

PART 3 - EXECUTION

3.1 Quality Reviews.-

3.1.1 Control.- Contractor Quality Control is the means by which the Contractor ensures that the construction, to include that of subcontractors and suppliers, complies with the requirements of the contract. The controls shall be adequate to cover all construction operations, including both on-site and off-site fabrication. The controls shall include at least three phases of control for all definable features of work, as follows:

3.1.2 Preparatory Phase.- This phase shall be performed prior to beginning work on each definable feature of work and shall include:

- (a) A review of each paragraph of applicable specifications.
- (b) A review of the contract plans.
- (c) A check to assure that all materials and drawings have been submitted, and approved.
- (d) A physical examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved shop drawing or submitted data, and are properly stored.
- (e) The Government shall be notified of any of the required action of the preparatory phase. The Contractor shall instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.

3.1.3 Initial Phase.- This phase shall be accomplished at the beginning of a definable feature of work. The following shall be accomplished:

- (a) A check of preliminary work to ensure that it is in compliance with contract requirements and submittals.
- (b) Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with sample panels is appropriate.
- (c) Review application of new roof system or repair procedure.
- (d) The Government shall be notified at least 48 hours in advance of beginning the initial phase.

3.1.4 Follow-up Phase.- Daily checks with the RE shall be performed to assure continuing compliance with contract requirements. The Contractor shall not build upon or conceal non-conforming work.

3.1.5 Additional Preparatory and Initial Phases.- Additional preparatory and initial phases may be conducted on the same definable features of work as determined by the Government if the quality of on-going work is unacceptable; or if work is resumed after a substantial period of inactivity, or if other problems develop.

3.2 Contractor Request For Information (RFI).- In accordance with Contract Clause "**Specifications, Drawings, and Material Submittals**", in case of discrepancy either in the figures, in the drawings, or in the specifications, the matter shall be promptly submitted to the RE, who shall promptly respond in writing. Submit a written request to RE and allow at least 3 working days for Government response. Include the date of the request, the date response is needed, a description of the problem, identification of work on hold, impact of delay in Government response, scope changes deemed necessary and recommended solutions, and any other information pertinent. The Government reserves the right to charge the contractor for administrative costs associated with responding to an RFI, which does not involve discrepancies in the specifications and drawings.

3.3 Testing Procedure.- The Contractor shall perform tests required to verify that control measures are adequate to provide a product which conforms to contract requirements.

3.4 Completion Inspection.- At the completion of all work or any increment, the contractor with the Resident Engineer shall conduct an inspection of the work and develop a "punch list" of items which do not conform to the approved plans and specifications.

3.5 Documentation.- The Contractor shall maintain current records of quality control operations, activities, and tests performed, including the work of subcontractors and suppliers. These records must include but not be limited to the following:

- (a) Contractor/subcontractor and their area of responsibility.
- (b) Work performed today, giving location, description, and by whom.
- (c) Material received.
- (d) Identify submittals reviewed, with contract reference, by whom, and action taken.
- (e) List instructions given/received and conflicts in plans and/or specifications.
- (f) Contractor's verification statement.
- (g) These records shall indicate a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. One report shall be prepared and submitted for every seven days of no work and on the last day of a no work period. All calendar days shall be accounted for throughout the life of the contract. Reports shall be signed and dated by the Contractor.

3.6 Sample Forms.- Sample Contractor Quality Control Report forms are enclosed at the end of this section. The contractor shall choose one form or submit another one for approval.

3.7 Notification of Noncompliance.- The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor shall, after receipt of such notice, immediately take corrective action. Such notice, when delivered to the Contractor at the site of the work, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

3.8 Coordination, Local Permits and Testing.-

3.8.1 Project Coordination.-

- (a) It shall be the duty of the Contractor to prepare a detailed schedule of work and work layout to resolve conflicts and to assure coordination of the work by different trades.
- (b) It shall be the duty of the Contractor to resolve all coordination conflicts that arise among his subcontractors. If, in the opinion of the RE, a potential or actual conflict exists, the RE will notify the CO, who shall instruct the contractor to take immediate steps to coordinate the work and resolve any conflicts.

3.8.2 Local Permits.-

- (a) The Contractor shall make notification, application, pay fees, etc., to obtain asbestos abatement permits as required. A building permit is not required.
- (b) This project is designed in accordance with the Uniform Building Code, the Uniform Plumbing Code, and the National Electric Code. The Contractor shall perform all work in compliance with the latest edition of these codes.

3.8.3 Testing.- The Contractor shall arrange and pay for the services of Independent Testing Laboratories/Engineers to perform specified services and testing as required. (sample of typical Contractor's daily report)

END OF SECTION

DAILY CONSTRUCTION QUALITY CONTROL REPORT

Contract Number: _____ Date: _____ Rpt No. _____

Contract Title: _____ Location: _____

Weather: Clear __ P.Cloudy __ Cloudy __ Rainfall __ (__ % of workday)

Temperature during workday: High _____ degrees F. Low _____ degrees F.

1. WORK PERFORMED BY CONTRACTOR/SUBCONTRACTOR(S):

Contractor Name No. of Workers Crafts/Hours Work performed

2. EQUIPMENT DATA:

Type, Size, Etc. Owned/Rented Hours Used Hours Standby

3. QUALITY CONTROL INSPECTIONS AND RESULTS: (Include a description of preparatory, initial, and/or follow up inspections or meetings; check of subcontractors work and materials delivered to the site compared to submittals and/or specifications; comments on the proper storage of materials; include comments on corrective actions to be taken):

4. QUALITY CONTROL TESTING AND RESULTS (comment on tests and attach test reports):

5. DAILY SAFETY INSPECTIONS (Include comments on new hazards to be added to the Hazard Analysis and corrective action of any safety issues):

6. REMARKS (Include conversations with or instructions from the Government representatives; delays of any kind that are impacting the job; conflicts in the contract documents; comments on change orders; environmental considerations; etc.):

CONTRACTOR'S VERIFICATION: The above report is complete and correct. All material, equipment used, and work performed during this reporting period are in compliance with the contract documents except as noted above.

CONTRACTOR QC REPRESENTATIVE

TEST REPORT

STRUCTURE OR BUILDING _____ CONTRACT NO.

DESCRIPTION OF ITEM, SYSTEM, OR PART OF SYSTEM TESTED: _____

DESCRIPTION OF TEST: _____

NAME AND TITLE OF PERSON IN CHARGE OF PERFORMING TESTS FOR CONTRACTOR:

NAME _____ TITLE _____

SIGNATURE _____

I HEREBY CERTIFY THAT THE ABOVE DESCRIBED ITEM, SYSTEM, OR PART OF SYSTEM HAS BEEN TESTED AS INDICATED ABOVE AND FOUND TO BE ENTIRELY SATISFACTORY AS REQUIRED IN THE CONTRACT SPECIFICATIONS.

SIGNATURE OF CONTRACTOR QUALITY CONTROL INSPECTOR _____

DATE

REMARKS: _____

DAILY CONSTRUCTION QUALITY CONTROL REPORT

Date: _____ Report No. _____

Contract No.: _____

Description and Location of Work: _____

WEATHER: (Clear) (P. Cloudy); Temperature: _____ Min. _____ Max;
(Snow) (Rainfall) _____ Inches

Contractor/Subcontractor Activity:

	Contractor/ Subcontractor	Craft	Time Worked
a.	_____	_____	_____
b.	_____	_____	_____
c.	_____	_____	_____
d.	_____	_____	_____
e.	_____	_____	_____
f.	_____	_____	_____

Equipment Data: (Indicate items of construction equipment, other than hand tools, at the job site and whether or not used.)

	Equipment	Contractor/ Subcontractor	Craft	Time Used
a.	_____	_____	_____	_____
b.	_____	_____	_____	_____
c.	_____	_____	_____	_____
d.	_____	_____	_____	_____

SECTION 01040 - CUTTING AND PATCHING

PART 1 - GENERAL

1.1 Requirements included.- Contractor shall be responsible for all cutting, fitting and patching, required to complete the work or to:

- (a) Remove and replace defective work.
- (b) Remove and replace work not conforming to requirements

1.2 Submittals.-

(a) Submit a written Request for Information (RFI) to the RE a minimum of 2 days in advance of executing any cutting or alteration which may affect:

- 1. Work of the Government or any separate contractor.
- 2. Structural integrity of any element of the Project.
- 3. Integrity of weather-exposed or moisture-resistant elements or systems.
- 4. Efficiency, operational life, maintenance or safety of operational elements.
- 5. Visual qualities of sight-exposed elements.

(b) Request shall include:

- 1. Identification of the Project.
- 2. Description of affected work.
- 3. The necessity for cutting, alteration, or excavation.
- 4. Effect on work of Government or other work, or on structural or weatherproof integrity of the affected element.
- 5. Description of proposed work:
 - a) Scope of cutting, patching, alteration, or excavation.
 - b) Trades who will execute the work.
 - c) Products proposed to be used.
 - d) Extent of refinishing to be done.
- 6. Alternatives to cutting and patching.
- 7. Cost proposal, when applicable
- 8. Written concurrence of any separate contractor whose work will be affected.

(c) Should conditions of work or the schedule indicate a change of products from original installation, contractor shall submit request for substitution as specified in Section 1-9, "Materials and Equipment."

(d) Submit written notice to the RE designating the date and time the work will be uncovered.

PART 2 - PRODUCTS

2.1 Materials.- Comply with specifications and standards for each specific product involved.

PART 3 - EXECUTION

3.1 Inspection.-

- (a) Inspect existing conditions of project.
- (b) After uncovering work, inspect conditions affecting installation of products, or performance of work.
- (c) Report unsatisfactory or questionable conditions to the RE in writing; do not proceed with work until the RE has provided further instructions.

3.2 Preparation.-

- (a) Provide adequate temporary support as necessary to assure structural value or integrity of affected portion of work.
- (b) Provide devices and methods to protect other portions of project from damage.
- (c) Provide protection from elements for that portion of the project which may be exposed by cutting and patching work.

3.3 Performance.-

- (a) Execute cutting and demolition by methods which will prevent damage to other work, and will provide proper surfaces to receive installation of repairs.
- (b) Execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerance and finishes.

END OF SECTION

SECTION 01070 - SUBMITTALS

PART 1 - GENERAL

1.0 General.- Applicable provisions of this Section and other provisions and requirements of the Contract Documents apply to all sections, except as modified in Sections of Divisions 2 through 16.

1.1 Summary.- Submit Shop Drawings, product data, samples, warranties, certificates, test reports as required by the contract documents.

1.2 Related Requirements.

Section 01030: Contractor Quality Control, Coordination, Permits and Testing

Section 01040: Cutting and Patching

Section 01090: Materials and Equipment

Section 01120: Final Inspection and Acceptance

1.3 Submission Requirements.

1.3.1 Number of Copies.- Submit prepaid and in ample time for approval before installation. Unless otherwise noted, submit five (5) copies of documents to the Contracting Officer Representative (COR). Three (3) copies will be retained by the COR. If additional copies are required, provide the quantity and submit additional copies to meet this requirement.

1.3.2 Time for Approval.- Receive submittal approvals prior to starting the work. Time necessary for government approval or disapproval of samples, certificates, test reports, and shop drawings will not be more than fourteen (14) calendar days after receipt of a submittal. All materials installed in the work shall match the approved submittals. After a submittal has been approved, no substitutions will be permitted without written approval by the COR. No extension of Contract Time will be authorized because of failure to transmit to the COR sufficiently in advance of the Work to permit processing.

1.3.3 Submittal Approval.- The checking, marking or approval of the submittal by the FAA shall not be construed as a complete check, but will indicate only that the product or method of construction and detailing is satisfactory. Approval will not relieve the

contractor of the responsibility for compliance with the specifications or for any error which may exist. The Contractor shall be responsible for the dimensions and design of adequate connections, details, and satisfactory construction of all work. Possible approval actions taken by the FAA include:

1.3.3.1 Approved as submitted.- If "approved as submitted" is marked by the CO, each copy of the submittal will be identified as having received such approval by being stamped and dated. After submittal has been approved, no substitutions will be permitted without written approval by the CO.

1.3.3.2 Approved as noted.- If "approved as noted" is marked by the CO, the submittal is satisfactory contingent upon Contractor acceptance of corrections, notations, or both, and if accepted, does not require resubmittal.

1.3.3.3 Not approved.- If "not approved" is marked by the CO, the submittal data does not meet job requirements and the Contractor must resubmit. If the submittal is disapproved, the Contractor shall resubmit the corrected material in the same quantity as specified for the original submittal. Correct disapproved submittals and resubmit for approval by the COR. Approval of resubmittals require an additional fourteen (14) calendar days.

1.3.4 Submittal Schedule.- Identify within the Contractor's Construction Schedule a schedule of submittals for shop drawings, material approval, etc., showing the dates when submittals will be submitted for the project.

1.3.4.1 Contents.- On the schedule indicate the following information:

- (a) Schedule date for submittal
- (b) Related Section number.
- (c) Submittal category (Shop Drawings, Product Data, or Samples).
- (d) Name of the subcontractor (if applicable)
- (e) Description of the part of the Work covered.

1.3.4.2 Distribution:- Following response to the initial submittal, print and distribute copies to the COR, Government, subcontractors, and other parties required to comply with submittal dates indicated. When revisions are made, distribute to the same parties. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.

1.3.4.3 Schedule Updates: - Revise the schedule after each meeting or activity where revisions have been recognized or made.

1.3.5 Construction Progress Schedule. – The progress chart to be prepared by the Contractor pursuant to the Contract Clause entitled “**SCHEDULES FOR CONSTRUCTION CONTRACTS**” shall consist of network analysis system, or pertchart (barchart) . The contractor shall be required to complete the work under the contract within 90 calendar days after receipt of Notice to Proceed.

1. The diagram shall show a continuous activity flow from left to right. The diagram shall show the sequence in which the work is to be accomplished as planned by the Contractor.
2. Dates shall be shown on the diagram for start of the project, any milestones required by the contract, and contract completion.
3. The critical path shall be clearly identified.
4. Network activities shown shall include submittal and review of shop drawings and samples and procurement of materials and construction activities.
5. Government activities that affect progress shall be shown. These include but are not limited to: Notice-to-Proceed, approvals, and inspections.

NO PHYSICAL CONSTRUCTION WORK AT THE SITE MAY TAKE PLACE UNTIL THE CONTRACTOR SUBMITS AND THE GOVERNMENT APPROVES THE SCHEDULE. Government review of schedule submittal(s) will not exceed 3 calendar days. Resubmittal, if necessary shall not exceed 2 calendar days.

1.3.5.1 Two-week "Look Ahead" schedule.- This schedule may be of the contractor's choosing, either bar chart or CPM form. Only activities scheduled to be occurring during the forecasted two week time periods are to be shown. Schedules shall be submitted weekly. Early and Late Start and Finish dates, and subcontractors involved are data to be included in the schedule.

1.3.6 Submittals.- Submit shop drawings, material and equipment lists, and all other data required under various headings of these specifications necessary to permit commencement of work. COR will return the submittals within 14 calendar days after receipt, indicating approval or disapproval.

1.3.7 Submittal Preparation.- Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.

1.3.7.1 Transmittals.- All submittals shall be accompanied by transmittal letters identifying the contents of the submittal. It shall be clearly indicated on the transmittal

letter with a statement and signature of the Contractor that the submittal item was verified for compliance with the contract requirements and approved by the Contractor. Transmittal letters shall consist of one original and one copy.

1.3.7.2 Contents. - Submittals shall be complete and detailed and assembled into sets. Lack of completeness or clarity or inadequate description will be justification for disapproval. Submittals shall bear the following information:

- (a) Name of project or facility and contract number;
- (b) Date of submission;
- (c) Contract drawing number and latest revision;
- (d) Specification page and paragraph number;
- (e) Name of contractor and subcontractor or supplier/manufacturer;
- (f) Clearly identified contents and location of work;
- (g) Any proposed variances to specification requirements;
- (h) Contractor's approval certifying he checked and coordinated the work of other trades.

1.3.8 Submittal Log – Contractor shall keep an up-to-date submittal log (see attachment for example) to be coordinated with the COR.

1.4 Shop Drawings.

1.4.1 Applicable Documents.-

1.4.2 Presentation.- Present drawings in a clear and thorough manner. Identify details by reference to sheet and detail, building wing and section shown on contract drawings.

- (a) Submit newly prepared information drawn accurately to scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not a Shop Drawing.
- (b) Shop Drawings include fabrication and installation Drawings, setting diagrams, schedules, patterns, templates and similar Drawings.

1.4.3 Contents.- Provide the following information on each submittal:

- (a) Submittal number (paragraph 2.1 of this Section) and identify as "Part A" or "Part B" item
- (b) Date of submission
- (c) Name of project and facility (full name)
- (d) Name of Contractor or Subcontractor
- (e) Reference to drawing number (with revision, if applicable) and/or specification section
- (f) Clearly identity of contents and location of work
- (g) Contractor's approval certifying he checked and coordinated the work of other trades
- (h) Dimensions.
- (i) Identification of products and materials included by sheet and detail number.
- (j) Compliance with specified standards.
- (k) Notation of coordination requirements.
- (l) Notation of dimensions established by field measurement.
- (m) Sheet Size: Except for templates, patterns and similar full-size Drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 36 by 48 inches.

1.4.4 Submittal.- Submit blue- or black-line prints for the COR's review. Submit the number of copies the Contractor requires, plus three which will be retained by the COR.

- (a) One of the prints returned shall be marked up and maintained as a "Record Document."
- (b) Do not use Shop Drawings without an appropriate final stamp indicating action taken.

1.5 Product Data.- Collect Product Data into a single submittal for each element of construction or system. Product Data includes printed information, such as manufacturer's installation instructions, catalog cuts, Material Safety Data Sheets (MSDS), standard color charts, roughing-in diagrams and templates, standard wiring diagrams, and performance curves.

1.5.1 Preparation.

- (a) Clearly mark or highlight each copy to identify pertinent site specific products or models the Contractor intends to use
- (b) Highlight/clearly indicate all performance characteristics and capacities
- (c) Highlight/clearly indicate all dimensions and clearances required

Note: If the submittal is not clearly marked, regarding the above pertinent data, the submittal will be returned marked "DISAPPROVED".

1.6 Samples.- Submit three (3) of each sample approved for installation. Submittals include all components of the roofing system as specified and physically identical with the material or product proposed.

1.6.1 Display.- For each sample include the following:

- (a) Generic description of the Sample.
- (b) Sample source.
- (c) Product name or name of the manufacturer.
- (d) Availability and delivery time.

1.6.2 Records.- Maintain sets of Samples at the Project Site, for quality comparisons throughout the course of construction.

- (a) Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal.
- (b) Sample sets may be used to obtain final acceptance of the construction associated with each set.

1.7 Warranties/Guaranties.- Assemble two (2) copies with original signatures of warranties executed by each of the respective manufacturers, suppliers, and subcontractors into a warranty book and prepare a Table Of Contents.

1.7.1 Additional Data.- Provide complete information for each item, include the following:

- (a) Product or work team
- (b) Firm, with name of principal, address, and telephone
- (c) Scope
- (d) Effective dates of warranty based on Final Acceptance of the item.
- (e) Information for owner's personnel on proper procedures to evoke the warranty in case of failure and instances which might affect the validity of warranty

1.7.2 Warranties.- Effective after project completion and acceptance by the FAA.

1.8 Certificates.- Assemble certificates executed by each of the respective manufacturers, suppliers, and subcontractors..

1.8.1 Additional Data.- Provide complete information for each item to certify compliance with contract documents.

- (a) Product or work item
- (b) Firm, with name of principal
- (c) Scope of compliance
- (d) Signature by an officer of the manufacturer or other individual authorized to sign documents on behalf of the company.

PART 2 - PRODUCTS

2.1 Submittals.- Submittals (Schedules, Manufacturer's Literature, Shop Drawings, Samples, Test Reports, Certificates, Design Calculations, Installation Instructions, etc.) are required for the items listed in these specifications or on the drawings. All submittals shall address the systems and components specific to this project.

PART 3 - EXECUTION

- 3.1 General.- Submittals are required for the items listed in the specifications or on the drawings. The following is a partial list of submittals required: Schedules, Manufacturer's Literature, Shop Drawings, Samples, Test Reports, Warranties, Certificates, Design Calculations, and Installation Instructions . It should not be construed as a complete list of all submittals required. Submittal dates shall comply with this specification unless a more stringent date is specified. Substitutions and all requested changes will require a submittal.
- 3.2 Schedule.- For the following particular submittals under Division 1, the submittals must be approved prior to any work on site. For the following submittals of Divisions 2 thru 16, the submittals must be approved prior to any work on site involving the corresponding specification section listed.

END OF SECTION

SECTION 01080 - TEMPORARY FACILITIES

PART 1 - GENERAL

1.1 Requirement Included.-

- (a) Furnish, install and maintain temporary facilities required for construction; remove on completion of the work.
- (b) Facilities include, sanitary, water, electricity, lighting, heating, ventilation, telephone, construction aids, barriers, project sign, parking and site access.

1.2 Related Requirements.-

- (a) Section 01020: Site Access, Construction limits, Use of Facilities and Work Hours.
- (b) Section 01100: Protection of Work

1.3 References.-

Occupational Safety and Health Standards for Construction (29 CFR PART 1926)

- a) Subpart G - Signs, Signals and Barricades
- b) Subpart L - Scaffolds
- c) Subpart M - Fall Protection
- d) Subpart N - Cranes, Derricks, Hoists, Elevators and Conveyors
- e) Subpart X - Stairways and Ladders

PART 2 - PRODUCTS

2.1 Temporary Sanitary Facilities.-

- (a) The contractor may use the existing facilities.
- (b) Maintain in a clean and sanitary condition; failure to do so will result in a loss of privileges.

2.2 Temporary Water.-

- (a) The existing building water system may be used for construction purposes at no cost to the contractor. Obtain location connections from the Resident Engineer. Extend system as necessary to comply with temporary water requirements.

2.3 Temporary Electrical Power.-

- (a) Reasonable amounts of electrical power will be furnished at no cost. Contractor will have to supply breakers. Connections to the existing facility electrical system at any other point is prohibited.
- (b) The contractor shall provide a fused disconnect switch at the point of connection.
- (c) The contractor shall provide all supply lines for lights and power, extension outlets, and extension cords, trailers, receptacles, bulbs, fuses and other equipment required for safety and for proper execution of the work, and for inspection purposes.

2.4 Temporary Lighting.- Provide temporary artificial lighting for all areas when natural light does not meet minimum requirements for:

- (a) Construction Areas: Uniform illumination of 20 foot-candles.

2.5 Not Used

2.6 Temporary Ventilation.- NOT APPLICABLE.

2.7 Temporary Telephone.-

- (a) If necessary, the Contractor shall arrange with local telephone service company to provide their own direct line service for use of personnel and employees.

2.8 Construction Aids.-

- (a) Furnish, install and maintain required construction aids. Remove on completion of work.
(b) Provide construction aids and equipment required by personnel and to facilitate execution of the work i.e. trench boxes, scaffolds, staging, ladders, stairs, ramps, runways, platforms, railings, hoists, cranes, chutes and other such facilities and equipment.

2.9 Barriers.-

- (a) Furnish, install and maintain suitable barriers as required to prevent public entry, and to protect the work, existing facilities, trees and plants from construction operations; remove when no longer needed, or at completion of work.
(b) Materials of contractor's option, as appropriate to serve required purpose.
(c) Where any removal, drilling or cutting of walls or other surfaces in areas of existing facilities operations occurs, the contractor shall install temporary partitions prior to demolition to prevent entrance of dust or other matter into the working areas. Where normal activities are to be carried on inside the building adjacent to the partition, the partition shall be thermally insulated and acoustically treated to prevent entry of temperature extremes and construction noise.

2.10 Not Used

2.11 Not Used

2.12 Temporary Parking and Access.-

- (a) Provide and maintain, all weather, vehicular access to site and within site to provide uninterrupted access:
1. To temporary construction facilities, storage and work areas.
 2. For use by persons and equipment involved in construction project.
 3. For use by emergency vehicles.
- (b) Provide and maintain, all weather temporary parking facilities for use by construction personnel.
(c) Locate roads, drives, walks and parking facilities to provide uninterrupted access to construction offices, mobilization, work, storage areas, and other areas required for execution of the contract.

1. Contractor and the contractor's personnel shall utilize the parking areas designated on the drawing.
- (d) Provide access for emergency vehicles.
1. Maintain driveways a minimum of 15 feet wide between and around combustible materials in storage and mobilization areas.
- (e) Maintain traffic areas free as possible of excavated materials, construction equipment, products, snow, ice and debris.
- (f) Keep fire hydrants and water control valves free from obstruction and accessible for use.
- (g) Maintain roads, walks and parking areas in sound, clean condition.
1. Repair or replace any portions damaged during progress of construction work.
- (h) Completely remove temporary materials and construction when construction needs can be met by use of permanent installation.
1. Remove and dispose of compacted materials to depths required by various conditions to be met in completed work.
- (i) Restore areas to original or to specified conditions at completion of work.

PART 3 - EXECUTION

3.1 Utility Costs.- Consumption costs of the temporary power service and temporary water service furnished to the contractor will be paid by the Government. Extension from the point of connection, including equipment, operation and attendance shall be paid for by the contractor.

3.2 Maintenance.- All costs in connection with the maintenance of all temporary facilities shall be paid by the contractor.

3.3 Compliance.- All work covered in this section shall comply with provisions of other applicable divisions and all applicable local requirements

3.4 Operation of Permanent Equipment.- Use of permanent equipment by the contractor is strictly prohibited without written approval of the FAA prior to use.

3.5 Removal of Temporary Facilities.- The contractor shall promptly remove all temporary facilities from premises at end of work. If the contractor fails to do so within a reasonable time after notification, the FAA will have the items removed at the contractor's expense.

END OF SECTION

SECTION 01090 - _MATERIALS AND EQUIPMENT

PART 1 - GENERAL

1.1 Requirements Included.-

- (a) Material and equipment incorporated into the work:
1. Conform to applicable specifications and standards.
 2. Comply with size, make, type and quality specified, or as specifically approved in writing by the CO.
 3. Manufactured and Fabricated Products: Design, fabricate and assemble in accordance with the best engineering and shop practices.
 4. Do not use material or equipment for any purpose other than for which it is designed or is specified.

1.2 Related Requirements.-

- (a) Part I, Section E, F, G.
- (b) Section 01070: Submittals
- (c) Occupational Safety and Health Standards for Construction (29 CFR PART 1926)
Subpart H - Materials Handling, Storage, Use and Disposal

1.3 Manufacturer's Instructions.-

- (a) When Contract Documents requires that installation of work shall comply with manufacturer's printed instructions, obtain and distribute copies of such instructions to parties involved in the installation, including two copies to the RE.
- (b) Handle, install, connect, clean, condition and adjust products in strict accordance with such instructions and in conformity with specified requirements.
1. Should job conditions or specified requirements conflict with manufacturer's instructions, consult with the RE for further instructions.
 2. Do not proceed with work without clear instructions.
- (c) Perform work in accordance with manufacturer's instructions. Do not omit any preparatory step or installation procedure unless specifically modified or exempted by Contract Documents.

1.4 Transportation and Handling.-

- (a) Arrange deliveries of products in accordance with construction schedules, coordinate to avoid conflict with work and conditions at the site.
1. Deliver products in undamaged condition, in manufacturer's original containers or packing, with identifying labels intact and legible.
 2. Immediately on delivery, inspect shipments to assure compliance with requirements of Contract Documents and approved submittals, and that products are properly protected and undamaged.

- (b) Provide equipment and personnel to handle products by methods to prevent soiling or damage to products or packing.

1.5 Storage.-

- (a) Store products in accord with manufacturer's instructions, with seals and labels intact and legible.
 - 1. Store products subject to damage by the elements in weather tight enclosures.
 - 2. Maintain temperature and humidity within the ranges required by manufacturer's instructions.
- (b) Arrange storage in a manner to provide easy access for inspection.

END OF SECTION

SECTION 01100 - PROTECTION OF WORK

PART 1 - GENERAL

1.1 Requirements Included.-

- (a) It shall be the contractor's responsibility to provide protection of work from weather, physical damage, improper use, and other adverse natural conditions.
- (b) It shall be the responsibility of the contractor to replace any damaged work including material.

1.2 Related Requirements.-

- (a) Part I - Section I, Contract Clause entitled PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS.
- (b) The Respective Section of the Specification covering items of work.
- (c) Section 01090: Materials and Equipment
- (d) Section 01110: Cleaning

1.3 Protection During Installation.-

- (a) Provide protection of temporary openings in the building to protect the contents and enable work to progress.

PART 2 - PRODUCTS.- Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

SECTION 01100 - PROTECTION OF WORK

PART 1 - GENERAL

1.1 Requirements Included.-

- (a) It shall be the contractor's responsibility to provide protection of work from weather, physical damage, improper use, and other adverse natural conditions.
- (b) It shall be the responsibility of the contractor to replace any damaged work including material.

1.2 Related Requirements.-

- (a) Part I - Section I, Contract Clause entitled PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS.
- (b) The Respective Section of the Specification covering items of work.
- (c) Section 01090: Materials and Equipment
- (d) Section 01110: Cleaning

1.3 Protection During Installation.-

- (a) Provide protection of temporary openings in the building to protect the contents and enable work to progress.

PART 2 - PRODUCTS.- Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

SECTION 01110 - CLEANING

PART 1 - GENERAL

1.1 Requirements Included.-

- (a) Execute cleaning during the progress of work.
- (b) Execute cleaning for final inspection.
- (c) Execute cleaning at completion of the work.

1.2 Related Requirements.-

- (a) Section 01090: Material and Equipment
- (b) Section 01120: Final Inspection and Acceptance of Work

1.3 Disposal Requirements.- Conduct cleaning and disposal operations to comply with codes, ordinances, regulations, and anti-pollution laws.

PART 2 - PRODUCTS

2.1 Materials.-

- (a) Use only those cleaning materials which will not create hazards to health or property and which will not damage surfaces.
- (b) Use only those cleaning materials and methods recommended by manufacturers of the surface material to be cleaned.
- (c) Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

PART 3 - EXECUTION

3.1 During Construction.-

- (a) Execute daily cleaning to keep the work, the site and adjacent properties free from accumulations of waste materials, rubbish and windblown debris, resulting from construction operations.
- (b) Provide on-site containers for the collection of waste materials, debris and rubbish.
- (c) Remove waste materials, debris and rubbish from the site periodically and dispose of at legal areas away from the site.

3.2 Dust Control.- not used3.3 Final Cleaning.-

- (a) Prior to final completion, or owner occupancy, contractor shall conduct an inspection of sight-exposed exterior surfaces, and all work areas to verify that the entire work is clean.

3.4 Debris Control.-

- (a) Maintain all areas under contractor's control free of extraneous debris.
- (b) Initiate and maintain a specific program to prevent accumulation of debris at construction site, storage and parking areas, or along access roads and haul routes.

1. Provide containers for deposit of debris.
 2. Prohibit overloading of trucks to prevent spillage's on access and haul routes.
- (c) Schedule periodic collections and disposal of debris.
1. Provide additional collection and disposal of debris whenever the periodic schedule is inadequate to prevent accumulation.

END OF SECTION

SECTION 01120 - FINAL INSPECTION AND ACCEPTANCE OF WORK

PART 1 - GENERAL

1.1 General.- This section covers final inspection and acceptance of work at contract completion.

1.2 Certificate of Completion.- When the Contractor considers the work is complete, he shall submit written certification that:

- (a) Contract Documents have been reviewed and manufacturer's certificate of warranty has been issued.
- (b) Work has been inspected for compliance with contract.
- (d) Historical roofing data has been submitted.
- (e) Work is completed, premises cleaned and ready for inspection.

1.3 Final Inspection.- The RE will coordinate with the CO and facility personnel to schedule the final inspection upon approval and endorsement of the Contractor's Completion Certification.

1.4 Punch List.- The RE will furnish the contractor with a list of discrepancies in the work, material and equipment noted during the final inspection.

1.5 Acceptance Of Work.- The Contractor shall correct discrepancies noted during the final inspection, clean the premises and notify the RE that the work is ready for acceptance.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01130 - HISTORICAL RECORD

PART 1 - GENERAL

1.1 General.- The Contractor shall provide historical information as to the installation and repair of the roof. The contractor may refer to the approved submittals for any portion as appropriate. All variations during construction from the original document will be noted. The information shall contain the following but not be limited thereto:

1.1.1 Roof Drainage

- a) Include: designed slope, slope of valleys, use of crickets, scuppers, drains, etc.

1.1.2 Vapor Retarders

- a) Include: trade names, mil thickness, how sealed at end and side laps, penetrations
- b) Describe quantity of adhesive and method of application

1.1.3 Thermal Insulation

- a) Include: trade names, thickness and type of each layer, define published "R" values, method of attachment to substrate and later to layer, code numbers, U.L. or F.M. labels, method of breaking joints)

1.1.4 Roof Membrane

- a) Include: trade names, retain samples 8-1/2"x11" of each type she
- b) Describe lapping, exposure, and other details of importance

1.1.5 Roofing Surface

- a) Include: list materials for walkways, if any, and method of attachment

1.1.6 Flashing

- a) Include trade names and description or thickness, specified fasteners and frequency
- b) Describe base flashing components

1.1.7 Sheet Metal

- a) Include types used
- b) Provide shop drawings

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 Updating Field Data.- Any deviations from the approved submittals of products, shop drawings or contract documents shall be noted in the Historical Record for future reference. An explanation as to why the deviation was recommended shall be included.

3.2 Submittal of the Historical Record.- Three sets of a complete records shall be submitted to the Contracting Officer for review and approval prior to the date of final inspection. A sample of a Roof History Record form is enclosed for the contractor's use.

3.3 Costs.- All costs incurred by the Contractor in the preparation and furnishing of the historical records shall be included in the contract price and no separate payment will be made for this work. Approval and acceptance shall be accomplished before final payment is made to the Contractor.

END OF SECTION

SECTION 07220 - ROOF INSULATION

PART 1 GENERAL

1.1 References

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

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI A208.1 (1989) Wood Particleboard

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 208 (1972; R 1982) Insulating Board
(Cellulosic Fiber), Structural and
Decorative

ASTM C 552 (1991) Cellular Glass Thermal
Insulation

ASTM C 578 (1992) Rigid, Cellular Polystyrene
Thermal Insulation

ASTM C 726 (1988) Mineral Fiber Roof Insulation
Board

ASTM C 728 (1991) Perlite Thermal Insulation
Board

ASTM C 984 (1983) Perlite Board and Rigid
Cellular Polyurethane Composite
Roof Insulation

ASTM C 1050 (1991) Rigid Cellular Polystyrene -
Cellulosic Fiber Composite

FACTORY MUTUAL ENGINEERING AND RESEARCH (FM)

FM P7825 (1992; Supple I, II & III) Approval
Guide

UNDERWRITERS LABORATORIES (UL)

UL-01 (1992) Building Materials Directory

1.2 SUBMITTALS

The following shall be submitted in accordance with Section 01070
SUBMITTALS:

Instructions

Application of Insulation - Insulation manufacturer's recommendations for the application and installation of insulation.

Statements

Inspection - The inspection procedure for insulation installation, prior to start of roof insulation work.

Certificates

Insulation - Certificate attesting that the expanded perlite or polyisocyanurate insulation contains recovered material and showing estimated percent of recovered material.

1.3 Storage of Materials

Insulation, base sheet, and felt shall be kept dry at all times, before, during, and after delivery to the site and shall be stored in an enclosed building or in a closed trailer. Wet insulation, wet base sheet or wet felt shall be permanently removed from the site.

1.4 Fire Classification

Insulation shall have been tested as part of a roof construction assembly of the type used in this project and the construction shall be listed as Fire-Classified in UL-01 or Class I in FM P7825.

PART 2 PRODUCTS

2.1 Insulation

Insulation shall be a standard product of the manufacturer and shall be factory marked with the manufacturer's name or trade mark, the material specification number, the R-value at 24 degrees C, (75 degrees F,) and the thickness. Minimum thickness shall be as recommended by the manufacturer. Boards shall be marked individually. The thermal resistance of insulation shall be not less than the R-value shown on the drawings. Insulation and fiberboard shall contain the highest practicable percentage of material which has been recovered or diverted from solid waste, but not including material reused in a manufacturing process. Where 2 materials have the same price and performance, the one having the higher recovered material content shall be selected. Insulation shall be one, or combination of the following materials:

2.1.1 Cellular Glass

ASTM C 552, Type IV.

2.1.2 Composite Board Insulation

ASTM C 726, or ASTM C 984 or ASTM C 1050. Perlite, in composite board, may be replaced with ANSI A208.1 wood particle board, 11 mm (7/16-inch) minimum thickness, provided that the composite board meets specified physical requirements.

2.1.3 Expanded-Perlite Insulation Board

ASTM C 728 with a minimum recovered material content of 23 percent of the expanded perlite portion of the board.

2.1.4 Fiberboard

ASTM C 208, roof insulating board, treated with sizing, wax or bituminous impregnation.

2.1.5 Mineral-Fiber Insulation Board

ASTM C 726.

2.1.6 Foam Insulation

ASTM C578-87a for pre-formed cellular polystyrene insulation. FS HH-I-1972/1 for polyurethane or polyisocyanurate insulation.

2.2 Nails and Fasteners

Nails and fasteners shall conform to the following requirements:

2.2.1 Nails for Fastening Insulation to Flush Mounted Wood Nailers

Of sufficient length to hold insulation securely in place.

2.2.2 Fasteners

Insulation manufacturer's recommendations and shall be spaced to withstand an uplift pressure of 90 pounds per square foot.

2.2.3 Metal Disks

Flat and not less than 30 gauge thickness. Disks used with nails or fasteners for securing fiberboard insulation shall be minimum 1-inch diameter. Disks used with nails or fasteners for securing other board insulation shall be minimum 2-1/8 inches in diameter.

PART 3 EXECUTION

3.1 Coordination Requirements

Insulation and roofing membrane shall be finished in 1 operation up to the line of termination at the end of each day's work. Completed sections shall be

waterproofed when more than 1 day is required to finish the roofing. Phased construction will not be permitted.

3.2 Environmental Conditions

Air temperature shall be above 40 degrees F and there shall be no visible ice, frost, or moisture on the roof deck when the insulation and roofing are installed.

3.3 Substrate Preparation

The substrate construction of any bay or section of the building shall be completed before insulation or vapor retarder work is begun thereon. Vents and other items penetrating the roof shall be secured in position and properly prepared for flashing. Substrate surface shall be smooth, clean, and dry at time of application.

3.4 Application of Insulation

Insulation shall be laid in 2 or more layers. Units of insulation shall be laid in courses parallel with the roof slope. End joints shall be staggered. Insulation shall be cut to fit neatly against adjoining surfaces. Joints between insulation boards shall not exceed 1/4 inch. Joints in successive layers shall be staggered with respect to joints of preceding layer. Insulation which can be readily lifted after installation is not considered to be adequately secured. Insulation shall be applied so that all roof insulation applied each day is waterproofed the same day. Phased construction will not be permitted.

3.4.1 Mechanical Fastening

Method of attachment shall be in accordance with recommendations of the insulation manufacturer and requirements specified.

3.4.2 Protection Requirements

The insulation shall be kept dry at all times. Insulation boards shall not be kicked into position. Exposed edges of the insulation shall be protected by cutoffs at the end of each work day or whenever precipitation is imminent. Edges of insulation at open spaces between insulation and parapets or other walls and spaces at curbs, scuttles, and expansion joints, shall be protected until permanent roofing and flashing is applied. Storing, walking, wheeling, or trucking directly on insulation or on roofed surfaces will not be permitted. Smooth, clean board or plank walkways, runways, and platforms shall be used, as necessary to distribute weight to conform to indicated live load limits of roof construction.

3.5 Inspection

The Contractor shall establish and maintain an inspection procedure to assure compliance of the installed roof insulation with the contract requirements. Any work found not to be in compliance with the contract shall be promptly removed and replaced or corrected in an approved manner. Quality control shall include, but not be limited to, the following:

- a) Observation of environmental conditions; number and skill level of insulation workers; start and end time of work.
- b) Verification of certification, listing or label compliance with FM P7825.
- c) Verification of proper storage and handling of insulation and vapor retarder materials before, during, and after installation.
- d) Inspection of vapor retarder application, including edge envelopes and mechanical fastening.
- e) Inspection of mechanical fasteners; type, number, length, and spacing.
- f) Coordination with other materials, cants, sleepers, and nailing strips.
- g) Inspection of insulation joint orientation and laps between layers, joint width and bearing of edges of insulation on deck.
- h) Installation of cutoffs and proper joining of work on subsequent days.
- i) Continuation of complete roofing system installation to cover insulation installed same day.

End of Section

SECTION 07543 - THERMOPLASTIC SHEET (PVC)

PART 1 GENERAL

1.1 References

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

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 448 (1986) Sizes of Aggregate for Road and Bridge Construction

ASTM D 4434 (1996) Standard for Polyvinyl Chloride Sheet Roofing

FACTORY MUTUAL ENGINEERING AND RESEARCH (FM)

FM P7825 (1992; Supple I, II and III) Approval Guide

UNDERWRITERS LABORATORIES (UL)

UL 790 (1983; Rev Feb 1993) Tests for Fire Resistance of Roof Covering Materials

1.2 General Requirements

Thermoplastic Sheet (PVC) roofing shall be installed on the roof surfaces as an optional single ply system. Roofing membrane shall be furnished in the largest sheets possible to minimize joints. Membrane, flashing, and adhesives shall be the standard products of a single manufacturer or as recommended by the roofing manufacturer. Membrane shall be free of any holes, lumps, and foreign material. Roofing operations shall be coordinated with sheet metal work so that flashings are installed to permit continuous roof-surfacing operations. Roofing operations shall also be coordinated with roof insulation work so that all insulation applied each day is weatherproofed the same day with the completed membrane.

The Roofer is responsible for a complete water-tight installation including penetrations and flashings by other trades.

1.3 Submittals

The following shall be submitted in accordance with Section 01070 SUBMITTALS:

1.3.1 Drawings

Roofing System - Drawings showing size of sheets, position of sheets and splices, flashing details, nailing patterns for the sheets, expansion joint details and a plan for protection of the roofing membrane from damage until completion of work by other trades.

1.3.2 Instructions

Installation - Manufacturer's instructions including preparation, installation and splicing of the thermoplastic membrane.

1.3.3 Statements

Protection Plan - The plan of protection shall show areas to be protected, type of material used, and a description of the method of inspection and repair of the roofing.

1.3.4 Quality Assurance

- (a) Manufacturer's Qualifications - Evidence that the primary products including membrane sheet, flexible flashing, and adhesives are from a single manufacturer who has produced that type of product for no less than 5 years.
- (b) Installer Qualifications - Evidence that a single installer will perform the work and is with the firm with no less than 5 years or successful experience in installation of single ply membrane roofing systems, and shall be acceptable to or licensed by the manufacturer of primary roofing materials.
- (c) Installer Field Supervision - Evidence that the supervisor/foreman has a minimum of 5 years experience in roofing work similar in nature and scope to the specified roofing.

1.3.5 Certificates

- (a) Materials -
 - (1) Certificates of compliance attesting that the materials meet specification requirements. The certificates shall list the components required for the specified rating.
 - (2) The compatibility of the complete vertical assembly of roofing including vapor retarder, insulation, fastening accessories, flashings, slip sheets, shall be certified by the manufacturer of the primary membrane.
- (b) Installer - Certificate from the manufacturer of primary material identifying the installer is authorized for the specified roof system.

1.3.6 Samples

Samples of the following materials shall be submitted:

Membrane	8 1/2" x 11" section
Sealant	8 ounces
Walkway Pads	1 each
Drain Fabric	6"x6" section
Fastener/Anchor	1 ea. for every 10 used

1.4 Product Delivery and Storage

Materials shall be delivered to the job site in the manufacturer's original, unopened packages, clearly marked with the manufacturer's name, brand name, and description of contents. Membrane flashing and adhesives shall be stored in clean, dry areas. Storage temperature for adhesives shall be between 60 degrees F and 80 degrees F. Membrane rolls shall be stored lying down on pallets and fully protected from the weather.

1.5 Warranty

(a) Manufacturer's Warranty - Manufacturer's standard system warranty for 10 years shall be furnished. Warranty shall provide for repair or replacement of the complete roofing system, including membrane, adhesives, sealants, flashing, and other items from the primary manufacturer, if deterioration is caused by defects in materials or workmanship. Two original copies shall be furnished to the RE.

(b) Applicator/Roofing Contractor Warranty - Standard 2-year "Roofing Guarantee" signed and countersigned by the installer (roofer) and contractor to include any work performed in this section:

Roofing System
Base Flashing
Vapor Retarder
Insulation
Roof Accessories

Installer shall repair or replace any work found to be defective or otherwise not in accordance with contract documents including manufacturer's requirements. Two original copies shall be furnished to the RE.

1.6 Fire and Wind Uplift Requirements

The completed roof system shall be rated Class A as determined by UL 790. Roofing systems shall be rated Class I-60 in accordance with FM P7825.

1.7 Environmental Conditions

Membrane shall not be installed in high wind, inclement weather or when there is visible ice, frost or moisture on the deck or membrane. Unless otherwise specified by the manufacturer, membrane shall not be installed when air temperature is below 10 degrees F. or within 5 degrees of the dew point.

PART 2 PRODUCTS

2.1 Quality Standard

The Sarnafil Mechanically Attached Sarnafast System is an approved known acceptable source.

Huber + Suhner Sucoflex PVC membrane is another acceptable product

2.1 Adhesives/Sealants

Adhesives and sealants shall be as recommended by the roofing membrane manufacturer.

2.2 Flashing

Flashing shall be of material compatible with the membrane as recommended by the membrane manufacturer. Prefabricated items shall be used to the greatest extent possible.

2.3 PVC Membrane

PVC membrane shall conform to ASTM D 4434, Type III, Polyester reinforced, 0.060-inch minimum thickness. Membrane shall be white in color.

2.4 Accessories and Pipe Seals

Accessories and pipe seals shall be of types and sizes recommended by the roofing membrane manufacturer. Perimeter nailing strips and tapered edge strips shall be provided at locations as removed from existing roof system and at locations recommended by the manufacturer.

2.5 Vapor Retarder

6 mil visqueen (minimum) or provide vapor retarder recommended by the roofing membrane manufacturer.

2.6 Roof Walkways

- (a) Molded Walkway Pads - Adhered to the membrane with splicing cement
- (b) Rubber Walkway Pads - 24" x 24" or 30" x 30" molded rubber with a urethane binder, interlocked with paver keys.

2.7 Drain Fabric

Provide at the recommendation of the manufacturer.

PART 3 EXECUTION

3.1 Preparation

Insulation over which PVC roofing is installed shall conform to Section 07220 ROOF INSULATION.

3.1.1 All Roofing Sections

Surfaces on or against which membrane is applied shall be smooth, clean, and free from water, oil, grease, sharp edges and construction debris; all joints over 1/4-inch wide shall be sealed; all drains and scuppers have been reconditioned and installed properly; all roof curbs, nailers, equipment supports, vents and other roof penetrations are properly secured and prepared for new roofing materials.

3.1.2 Complete Removal of Existing Roof

All existing roofing, base flashing, deteriorated wood blocking or deteriorated metal flashing shall be removed. Remove only that amount of roofing and flashing which can be made weathertight with new materials during a one-day period.

All rusted or deteriorated existing decking shall be brought to the attention of the RE to determine method of treatment or replacement. Surface only rusted metal shall be sanded and treated with rust-inhibiting paint. Sections which have rusted deeper than the surface or are not structurally sound shall be removed and replaced.

3.1.3 Recovering of Existing Roof System

Deteriorated or wet materials are to be removed and replaced. All debris is to be removed. Install a felt system with membrane as approved by the manufacturer.

3.2 Installation

Installation shall be in accordance with the manufacturer's approved instructions for a mechanically fastened system, except as otherwise specified.

3.2.1 Flashing

Edges of membrane, projections through the roof and changes in roof planes shall be flashed. The splice between the flashing and the membrane shall be completed before bonding the flashing to vertical surfaces. The splice shall be sealed a minimum of 3 inches on each side of the fasteners which attach the membrane to nailers. The installed flashing shall be nailed at the top of the flashing a maximum of 12-inches on center under metal counter-flashing or cap. Factory prefabricated pipe seals shall be used where possible. Flashing must not extend above throughwall counterflashing and must not conceal any weep holes.

3.2.2 Membrane

Membrane shall be applied in accordance with the manufacturer's instructions and the following requirements. Loosely lay sheet membrane over roof insulation and allow the membrane to relax 30 minutes minimum before bonding, splicing or attaching. Securement must be provided at the perimeter of each roof level, roof section, expansion joint, curb flashing, interior wall, etc., at any inside angle change where slope exceeds 2 inches in one horizontal foot. Flash all penetrations passing through the sheet membrane.

3.2.3 Membrane Seams

All seams shall be hot-air welded. Seams overlaps shall be at the manufacturer's recommendations. All membrane to be welded shall be clean and dry.

3.2.4 Cutoffs

On phased roofing, when the completion of flashings and terminations is not completed by the end of each work day, provisions must be provided to temporarily close the membrane to prevent water infiltration. Cutoffs shall be installed. The insulation line shall be straightened using loose-laid cut insulation and the membrane shall be sealed to the roof deck. Membrane shall be pulled free or cut to expose the insulation when resuming work,

and cut insulation sheets used for fill-in shall be removed. Caution must be exercised to ensure that the membrane is not temporarily sealed near drains in such a way as to promote water migration below the membrane.

3.2.5 Protection of Finished Roofing

The Contractor shall provide protection of the roofing membrane from possible damage that may occur as a result of work by other trades. After completion of all work by other trades, the Contractor shall remove the protection and shall inspect the roof. Any damage shall be repaired in accordance with the recommendations of the roofing manufacturer.

3.2.6 Vapor retarder

Install vapor retarder directly over the deck or on a support board with all side and end joints sealed in accordance with the manufacturer's instructions. The vapor retarder shall be sealed to all penetrations and terminations.

3.2.7 Walkways

Walkways are required at all traffic concentration points (i.e., roof hatches, access doors, rooftop ladders) and mechanical equipment for maintenance and at the recommendation of the manufacturer.

3.2.8 Wood Nailers

Install continuous wood nailers at the perimeter of the entire roof and around roof projections and penetrations. Thickness shall be as required to match substrate or insulation height to allow a smooth transition.

3.3 Inspection

3.3.1 General

The Contractor shall establish and maintain an inspection procedure to assure compliance of the installed thermoplastic roofing with the contract requirements. The procedure shall include a checklist of points to be observed. Any work found not to be in compliance with the contract shall be promptly removed and replaced or corrected in an approved manner. Quality control shall include, but not be limited to, the following:

- a) Observation of environmental conditions; number and skill level of roofing workers; start and end time of various tasks; readiness of substrate for application of roofing.
- b) Verification of compliance of materials before, during and after installation.
- c) Inspection of insulation, nailers, flashings, penetrations and work requiring coordination with roofing.
- d) Inspection of membrane placement, splicing, and anchoring.

The supervisor/foreman shall perform the inspection functions and be on the site whenever roofing operations are in progress. The actual inspections shall be documented and a copy of the documentation furnished to the Contracting Officer at the end of each day. Refer to Section 01030.

3.3.2 Membrane Seams

The Installer shall check all welded seams for continuity using a rounded screwdriver.

END OF SECTION 07543

SECTION 07600 - FLASHING AND SHEET METAL

PART 1 GENERAL

1.1 References

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

AIR MOVEMENT AND CONTROL ASSOCIATION (AMCA)

AMCA 500 (1989) Test Methods for Louvers, Dampers and Shutters

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 167 (1991) Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip

ASTM B 209 (1992a) Aluminum and Aluminum-Alloy Sheet and Plate

ASTM B 221 (1992a) Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes

ASTM B 370 (1988) Copper Sheet and Strip for Building Construction

ASTM B 486 (1974; R 1985) Paste Solder

ASTM B 506 (1981; R 1986) Copper-Clad Stainless Steel Sheet and Strip for Building Construction

ASTM D 543 (1987) Resistance of Plastics to Chemical Reagents

ASTM D 751 (1989) Coated Fabrics

ASTM D 822 (1989) Conducting Tests on Paint and Related Coatings and Materials Using Filtered Open-Flame Carbon-Arc Light and Water Exposure Apparatus

ASTM D 1784 (1990) Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds

ASTM E 96

(1992) Water Vapor Transmission of
MaterialsSHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL
ASSOCIATION (SMACNA)

SMACNA-02

(1993) Architectural Sheet Metal
Manual

1.2 General Requirements

All flashing will be installed as part of the roofing manufacturer's approved roof system. Sheet metalwork shall be accomplished to form weathertight construction. Work shall be installed without waves, warps, buckles, fastening stresses or distortion and shall allow for expansion and contraction. Cutting, fitting, drilling, and other operations in connection with sheet metal required to accommodate the work of other trades shall be performed by sheet metal mechanics. Exposed edges shall be hemmed. Bottom edges of exposed vertical surfaces shall be angled to form drips. Flashing at the end of a run shall be formed into a three dimensional configuration to direct water to the outside of the system. Accessories and other items essential to complete the sheet metal installation, though not specifically indicated or specified, shall be provided. Installation of sheet metal items used inconjunction with roofing shall be coordinated with roofing work to permit continuous roofing operations. Factory-fabricated components shall be packed in cartons marked with the manufacturer's name or trademark. Bulk materials from which items are field fabricated shall have manufacturer's name or trademark printed or embossed at frequent intervals to permit easy identification. In general, products that are part of the manufacturer's approved roof membrane system are to be supplied and installed in accordance with manufacturer's installation instructions.

1.3 Submittals

The following shall be submitted in accordance with Section 011070 SUBMITTALS:

Drawings

Sheet Metal - Drawings showing weights, gauges, or thickness of sheet metal; type of material; joining, expansion-joint spacing, and fabrication details; and installation procedures. Materials shall not be delivered to the site until after the approved detail drawings have been returned to the Contractor.

1.4 Delivery, Storage, and Handling

Materials shall be adequately packaged and protected during shipment and shall be inspected for damage, dampness, and wet-storage stains upon delivery to the jobsite. Materials shall be clearly labeled as to type and manufacturer. Sheet metal items shall be carefully handled to avoid damage. Materials shall be stored in dry, weathertight, ventilated areas until immediately before installation.

PART 2 PRODUCTS

2.1 Materials

Materials shall conform to the requirements of the roof manufacturer's approved membrane flashing system.

2.1.1 Aluminum Extrusions

ASTM B 221, Alloy 6063, Temper T5.

2.1.2 Fasteners

Materials shall conform to TABLE 2. Fasteners shall be the best type for the application.

2.1.3 Plastic Hardsetting Sealant

As recommended by aluminum manufacturer.

2.1.4 Polyvinyl Chloride (PVC) Reglets

ASTM D 1784.

2.1.5 Sheet Metal

As recommended by roof manufacturer.

2.1.6 Solder

ASTM B 486, Alloy 50B, for use with copper and Alloy 60B for use with stainless steel.

PART 3 EXECUTION

3.1 Protection of Aluminum

Aluminum shall not be used where it will be in contact with copper or where it will contact water which flows over copper surfaces. Aluminum that will be in contact with wet or pressure-treated wood, mortar, concrete, masonry, or ferrous metals shall be protected against galvanic or corrosive action by one of the following methods:

3.1.1 Paint

Aluminum surfaces to be protected shall be solvent cleaned and given a coat of zinc-molybdate primer and one coat of aluminum paint.

3.1.2 Nonabsorptive Tape or Gasket

Nonabsorptive tape or gasket shall be placed between the adjoining surfaces and shall be cemented to the aluminum surface using a cement compatible with aluminum.

3.2 Soldering, Riveting, Seaming, and Sealing

3.2.1 Soldering

Soldering shall apply to copper, copper clad stainless steel, and stainless steel items. Edges of sheet metals, except lead coated material shall be pretinned before soldering is begun. Soldering shall be done slowly with well heated soldering irons so as to thoroughly heat the seams and completely sweat the solder through the full width of the seam. Edges of lead coated material to be soldered shall be scraped or wire-brushed to produce a bright surface, and seams shall have a liberal amount of flux brushed in before soldering is begun. Edges of stainless steel to be pretinned shall be treated with soldering acid flux. Soldering shall follow immediately after application of the flux. Upon completion of soldering, the acid flux residue shall be thoroughly cleaned from the sheet metal with a solution of washing soda in water and rinsed with clean water.

3.2.2 Riveting and Sealing

Joints in aluminum sheets 0.040 inch or less in thickness shall be made mechanically and sealed with the sealant specified.

3.2.3 Seams

Flat-lock and soldered-lap seams shall finish not less than 1-inch wide. Unsoldered plain-lap seams shall lap not less than 3 inches unless otherwise specified. Flat seams shall be made in the direction of the flow.

3.3 Covering on Minor Flat, Pitched, or Curved Surfaces

Unless otherwise specified or indicated, all minor flat, pitched, or curved surfaces, such as crickets, bulkheads, dormers, and small decks, shall be covered or flashed with 18- by 24-inch metal sheets and secured with cleats. Seams in materials other than aluminum shall be locked and soldered. Seams in aluminum shall be locked and sealed with plastic hardsetting sealing material recommended by aluminum supplier.

3.4 Cleats

A continuous cleat shall be provided where indicated or specified to secure loose edges of the sheet metalwork. Butt joints shall be spaced approximately 1/8-inch apart. The cleat shall be fastened to the supporting construction with nails evenly spaced not over 12 inches on centers. Where the fastening is to be made to concrete or masonry, screws shall be used and shall be driven in expansion shields set in concrete or masonry. The cleat for fascia anchorage shall be installed to extend below the supporting construction to form a drip and to allow the flashing to be hooked over the lower edge at least 3/4 inch. The cleat shall be

of sufficient width to provide adequate bearing area to insure a rigid installation. Where horizontal nailer is vented for insulation and the cleat is placed over masonry or concrete, the cleat shall be installed over 1/16-inch thick metal washers placed at screws. Washers shall be of metal that is electrolytically compatible with the continuous cleat.

3.5 Expansion Joints

Expansion joints shall be provided at 40-foot intervals for copper and stainless steel and at 32-foot intervals for aluminum, except that where the distance between the last expansion joint and the end of the continuous run is more than half the required interval spacing an additional joint shall be provided. Joints shall be evenly spaced.

3.6 Flashings

Flashings shall be installed at intersections of roof with vertical surfaces and at projections through roof, except that flashing for heating and plumbing, including piping, roof, and floor drains, and for electrical conduit projections through roof or walls is covered in appropriate sections for such work.

3.6.1 Base Flashing

Metal base flashing shall be installed at locations indicated and shall be coordinated with roofing work.

3.7 Reglets

Reglets shall be a factory fabricated product of proven design, complete with fittings and special shapes as may be required. Open-type reglets shall be filled with fiberboard or other suitable separator to prevent crushing of the slot during installation. Reglets shall be located not less than 8 inches nor more than 16 inches above roofing not having cant strips or shall be located not less than 5 inches nor more than 13 inches above cant strip. Reglet plugs shall be spaced not over 12 inches on centers and reglet grooves shall be filled with sealant. Friction or slot-type reglets shall have metal flashings inserted the full depth of slot and shall be lightly punched every 12 inches to crimp the reglet and cap flashing together.

3.8 Contractor Quality Control

The Contractor shall establish and maintain a quality control procedure for sheet metal used in conjunction with roofing to assure compliance of the installed sheet metalwork with the contract requirements. Any work found not to be in compliance with the contract shall be promptly removed and replaced or corrected in an approved manner.

End of Section