

# **STATEMENT OF WORK**

**FOR THE CONSTRUCTION OF**

**Repair Storm Damage Roof  
B331**

**AT**

**ALTUS AIR FORCE BASE, OKLAHOMA**

**Project Number:  
AGGN-221023**

**Dated:  
7 April 2022**

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1. **BACKGROUND:**

Building 331 is an Airman Permanent Party Dormitory for up to 102 dorm residents in Altus AFB that was built and completed in 1984. It is adjacent to the base track and football field. The building envelope is about 33,750 SF. This building does not have lightning protection system (LPS). The work classification for this project is considered "Most Difficult", the Government assumed basic construction methods and industry standards to perform the required work. The word "Most Difficult" in this context represents the NTE pricing proposed on the basic contract by each contractor and the complexity of the project.

2. **PURPOSE:**

Remove and replace (approx. 2,000 SF) an existing standing seam metal roof (SSMR) including insulation and furring over the existing metal decking that was caused by a recent strong wind storm. Once damaged roof panels and associated roof materials are removed, provide and install a temporary weatherproofing and/or watertight membrane, if necessary, to effectively protect and cover the roof from any further weathering damage or leaks until a full roof replacement/repair is completed to make it complete and usable facility.

3. **SCOPE:**

Remove recently damaged SSMR systems caused by a recent wind storm. If necessary, remove and replace any water or condensation damaged materials between the metal deck and interior ceiling finish. Provide a temporary weatherproofing and/or watertight membrane, if necessary, to effectively protect the facility from further damage and leaks until such a permanent and long-term fix solution is acquired and/or completed due to material lead time and necessary acquisition requirements.

Roof assemblies include all items of work in the elemental classification of the American Society for Testing and Materials (ASTM) UNIFORMAT II B30. The thermal insulation, vapor retarder, membrane, drainage components, flashings, and details (roof edges, roof cap, roof gutters/downspouts, and roofing panels, etc.) are included in the scope of this effort. The features of work that are part of the structural roof assembly: framing; structural diaphragm; decking; roof joists; beams; associated hardware and fixtures, etc. This list is not all inclusive. Other damaged materials not identified in the above scope of this project will be added by direction of the Contracting Officer to make it a complete and usable roofing system while matching the overall original facility design and construction materials.

4. **PROJECT REQUIREMENTS:**

- 4.1. Design roof per UFC 3-301-01 change 3, Structural Engineering, and Sheet Metal and Air Conditioning Contractors National Association's (SMACNA) Architectural Sheet Metal Manual (current edition).

#### 4.2. SSMR Product Requirements:

- 4.2.1. The new SSMR system will match existing facility roof construction materials and design specifications. The roof shall withstand nominal design wind speed of 120-mile per hour wind 3-sec gusts, and each portion of a roof shall be able to sustain the load of rainwater based on a rainfall rate of 10.2 inches per hour. Provide roof assembly submittals including necessary clip spacing tested in accordance with ASTM E1592. Use ASCE 7 in calculating wind uplifts based on tested assembly and its structural performance characteristics.
- 4.2.2. For seam configuration: Panel edges must be of male and female interlocking design with integral sealant and machine folded (mechanically seamed) finishing of the seam. There can be no gap between any surface of interlocking male and female seam portions. Finished seam configuration shall be a 180-degree, double fold.
- 4.2.3. For painting and coating:
  - 4.1.1.1. Provide heavy-duty long lasting factory painted coating, equal to Kynar, for roof panels and trims. Minimum of 1 mil (0.0254 mm) dry film thickness consisting of 0.2 mil (.0051 mm) prime coat and 0.8 mil (0.02 mm) finish coat minimum applied by the continuous coil coating method. Paint resin for soffit application must be 70% polyvinylidene fluoride containing 100% inorganic pigments. For Carbon steel, apply paint coatings over corrosion treatment.
  - 4.1.1.2. Solar Reflectivity Indexes (SRI) roofs sloped < 2:12 shall be 78 to 100 and minimum 29 on roofs sloped > 2:12 in climates that are dominated by mechanical cooling loads or to reduce the “heat island” effect.
  - 4.1.1.3. Steel and aluminum materials shall not be in contact unless separated with a coating, sealant, or other impervious non-metallic or non-conductive material.
  - 4.1.1.4. Do not use any device that voids material and coating warranties.
  - 4.1.1.5. All roofing panels, flashing, gutters and downspout shall match existing fascia, and soffit to remain.
- 4.1.2. For sealants:
  - 4.1.2.1. Each seam must have a pre-applied bead to ensure complete hydrostatic performance. Sealant may be a hot melt butyl formulation if applied at the point of panel manufacture.
  - 4.1.2.2. Entrainment of gas sealant is permitted per UFC 3-110-03, Roofing.
  - 4.1.2.3. The roll-forming machine may apply sealant.
  - 4.1.2.4. Continuity of seal with field applications through all panel termination points is critical.
  - 4.1.2.5. Do not use silicone sealant.
  - 4.1.2.6. Conceal primary seals within a joint at all times. When secondary seals are used, one-part polyurethane sealant maybe used at exposed joints.
- 4.1.3. For panel attachments:
  - 4.1.3.1. Use thermal expansion clips. These clips are two-piece where the top portion folds into the panel seam and a base that attaches to the structure with two screw fasteners. The joining of base to top components must anticipate the full range of thermal cycling of the panels, using panel temperature differential of 200 degrees Fahrenheit (93 degrees Celsius). Attach panels with concealed clips to accommodate anticipated maximum panel series expansion and contraction.
  - 4.1.3.2. Clips must be “wetted” to the male seam component with butyl sealant as

necessary to ensure complete hydrostatic performance of the joint per ASTM E2140, Standard Test Method for Water Penetration of Metal Roof Panel Systems by Static Water Pressure Head.

- 4.1.3.3. Clip spacing for metal roof assemblies shall be per manufacturer's recommendation or a maximum spacing of 60 in. (1525 mm) on-center in the field and 30 in. (760 mm) on-center in the perimeter and corner zones.
- 4.1.3.4. Install a minimum of 16 ga. (1.5 mm) bent steel plate at all eave, rake, and ridge edges of a metal roof assembly for roof attachment. Do not use wood blocking (treated or untreated) in metal roof assemblies. See also, manufacturer's recommendation.
- 4.1.3.5. For fixed points: Rigidly fixed (pinned) standing seam panels to the building structure at a single point along the length and allow it to float at other attachment points in order to accommodate inherent thermal movement. Attachments shall be able to resist all in-plane service loads including snow and other environmental loads, thermal cycling and frictional resistance experienced at the clips, and the interface of the panel to the supporting structure or deck. Fixed clips shall be used in addition to the through panel fasteners to provide fixity. See also, manufacturer's recommendation.
- 4.1.3.6. For exposed fasteners: Fasteners that penetrate the weathering surface of the roof panels and flashings are not acceptable. Use fasteners in panels at the lower termination point (point of fixity) of the panel. Conceal behind rib closures and under flashings all fasteners through the flat of the roof panel in the ridge or hip areas. Use EPDM (not neoprene) in sealing washers to improve durability and service life. When fastening sheet-to-sheet, back-up plates are required to stiffen the joint and provide solid attachment for screws. See also, manufacturer's recommendation.
- 4.1.4. For flashings and penetrations:
  - 4.1.4.1. Locate penetration within the central portion of the standing seam panel.
  - 4.1.4.2. Do not locate or interrupt seam when applying or using pre-manufacturer flashing boot. Ensure that flashings shall be able to accommodate existing climate in Altus, Oklahoma.
  - 4.1.4.3. Preserve thermal movement characteristics and hydrostatic performance at all times. All connections of flashings, curbs, and penetrations must be hydrostatic in design to a minimum height of 6 in. (150 mm) above the drainage plane.
  - 4.1.4.4. Use sheet membrane material, such as EPDM, for a hydrostatic connection and protect it from exposure by providing sheet metal shroud flashing.
  - 4.1.4.5. Curbs, flashings, and penetrations shall not restrict movement by pinning the panels to the structure.
  - 4.1.4.6. For round pipes, flues and soil stacks: Flash small, round penetrations with pre-manufactured EPDM black rubber boots having a laminated aluminum compression ring at their base and secure at the top using a stainless steel draw band. Submit shop detail of large penetrations (wider than roof panel width minus 5 in. (mm) for approval to the Contracting Officer. See also, manufacturer's recommendation.
  - 4.1.4.7. For other roof appurtenances: Avoid using other roof accessories that penetrate the roof panels. Use the same sheet material as the roof as much as possible and incorporate the same factory finish when painted products

are used.

- 4.1.5. For gutters and downspouts:
  - 4.1.5.1. Size the roof drainage system shall match existing.
  - 4.1.5.2. Integrate downspouts with the existing architectural details of the wall system and storm drain system.
  - 4.1.5.3. Fabricate downspouts from non-corrosive materials such as zinc-coated steel or stainless steel per base standards.
  - 4.1.5.4. Angled transitional pieces shall be provided for downspouts so they fit closely against the wall for their entire length
  - 4.1.5.5. Coordinate locations of control joints in masonry and stucco walls with downspouts when possible
  - 4.1.5.6. Place downspouts away from building entries. Water discharged should not run across sidewalks
  - 4.1.5.7. Oversize downspouts, minimize turns or offsets in downspouts, and provide clean-outs at the base of downspouts
- 4.1.6. For fall protection: Per UFC 3-110-03, Roofing, permanently installed fall protection is not required.
- 4.1.7. For snow retention devices: Per ASHRAE 169-2006, Altus, Oklahoma's climate zone number is 3, subtype A.
  - 4.1.7.1. Provide continuous snow retention devices at all eaves that are non-corrosive, non-penetrating, and mechanically attached with convex setscrews to the standing seams and penetrations and roof curbs.
  - 4.1.7.2. Per manufacturer's recommendation, provide snow retention devices to resist all in-service loads considering roof slope and design snow load. Prove adequacy on a site-specific basis by calculation and lab-tested holding strengths of devices.
  - 4.1.7.3. Do not use snow retention devices that glue to panel surfaces or use attachments that penetrate to roof panels.

#### 4.3 Warranties:

- 4.1.8. General Contractor's Warranty: Provide general contractor's watertight 5 years warranty for quality installation according to manufacturer's requirements shall include all roof penetrations and flashing.

#### 4.4 Qualifications for SSMR system Manufacturer, Installer or Applicator and Inspection: For quality assurance purposes, only contractors certified to install twenty-year, no-monetary-limit full-system warranties shall install roof system.

- 4.4.1 SSMR Manufacturer's Qualification: Manufacturer who has been in the practice of manufacturing SSMR for a period of not less than twenty (20) years and who has been involved in at least five (5) projects similar in size and complexity to this project.
- 4.4.2 Manufacturer's Technical Representative: Provide a manufacturer's technical representative who is familiar with the installations of the product in the geographical area where construction will take place. This representative shall have authorization from the manufacturer to approve field changes, perform field inspections and attend meetings as required and as requested by the contracting officer. Inspect roof at least three times beginning, middle and end.
- 4.4.3 SSMR Installer or Applicator: Installer of the SSMR system shall be factory trained and authorized by a metal building manufacturer or company. Installer shall be in the practice of installing SSMR for a period of not less than three (3) years and has been involved in at least five (5) projects similar in size and complexity to this project

- 4.5 Contractor shall verify all site conditions and note areas or items that has potential issues when it comes to safety. Contractor shall arrange and schedule with contracting officer site visit(s) to verify work requirement per documents provided and obtain field information for basis of proposal and work plan.
- 4.6 Obtain all required permit and inspections prior to start or end of any work to include hot work of any kind i.e. cutting, welding, grinding or any flame or spark producing work the agency/company.
- 4.7 Contractor shall be responsible for disconnecting and reconnecting all utilities that are part of or affected in this contract.
- 4.8 Contractor shall coordinate the equipment and material lay down area prior to start of construction of the project.
- 4.9 Provide and install all new products made in the USA.
- 4.10 All material handling, delivery, storage, installation and application shall be in accordance with manufacturers' specifications. Submit all recommendations to contracting officer for review and approval.
- 4.11 All submittals shall be in accordance with the UFGS specifications. Notify contracting officer in advance for discrepancy in submittal requirements.
- 4.12 Work plan and construction shall adhere to accepted engineering standards and shall be in accordance with the ASCE, UL, ASTM guidelines, Air Force Instructions (AFI), Unified Facilities Criteria (UFC), National Fire Prevention Association (NFPA) standards and the International Building Code (IBC).
- 4.13 Contractor is required to report and repair all damages found and/or caused from construction operations to existing building and area within three (3) business days to the construction inspector and/or contracting officer.
- 4.14 Remove and dispose existing SSR panels, flashings, trims, deteriorated insulation and all other necessary items to replace the existing roof while meeting the requirements of this project.
- 4.15 Perform daily jobsite cleanup.
- 4.16 Employ dust control methods at all times to mitigate all dust created during construction.
- 4.17 Facility work hours are 24 hours a day, 6 days a week except holidays. Any portion of the construction associated with this contract shall not affect occupant's operation.
- 4.18 Contractor shall submit weekend or holiday work request at least 10 days in advance to the contracting officer for coordination and approval.

## **5 GENERAL REQUIREMENTS:**

- 5.1. All work performed on this project shall meet Local, State, Federal and DOD Codes. Work plan and construction shall adhere to accepted engineering standards and shall be in accordance with the Air Force Instructions (AFI), Unified Facilities Criteria (UFC), National Roofing Contractors Association (NRCA), Sheet Metal and Air-Conditioning Contractors National Association (SMACNA) and the International Building Code (IBC).
- 5.2. The government depends on the existing as-built drawings for the accuracy. Field verify all required information before providing a proposal.
- 5.3. Contractor shall verify all site conditions and note areas or items that has potential issues when it comes to safety. Contractor shall arrange and schedule with contracting officer site visit(s) to verify work requirement per documents provided and obtain field information for

- basis of proposal and work plan.
- 5.4. Provide and install all new products made in the USA.
  - 5.5. All submittals shall be submitted to the Government for approval. Notify Contracting Officer in advance for discrepancy in submittal requirements.
  - 5.6. Obtain all required permit and inspections prior to start or end of any work to include hot work of any kind i.e. cutting, welding, grinding or any flame or spark producing work the agency/company.
  - 5.7. Contractor shall be responsible for disconnecting and reconnecting all utilities that are part of or affected in this contract.
  - 5.8. Contractor shall coordinate the equipment and material lay down area prior to start of construction of the project.
  - 5.9. All material handling, delivery, storage, installation and application shall be in accordance with manufacturers' specifications. Submit all recommendations to contracting officer for review and approval.
  - 5.10. Remove and dispose existing metal flashings and trims, deteriorated insulation, and all other necessary items to replace the existing roof while meeting the requirements of this project.
  - 5.11. The contractor shall provide all labor, materials, travel, equipment and supervision necessary to perform all work required for this project.
  - 5.12. The contractor shall be required to accomplish various small item of work incidental that are necessary to complete the project in a satisfactory and competent manner meeting the approval of the contracting officer or their designated representative. The contractor shall include these items of work as part of their detailed estimate.
  - 5.13. Contractor to provide skilled trades man to repair and restore any damage to the building, utilities or any other element during the execution of this project to its original condition at no additional cost to the government. Contractor is required to report and repair all damages found and/or caused from construction operations to existing building and area within three (3) business days to the construction inspector and/or contracting officer.
  - 5.14. Facility work hours are 0730-1630, 7 days a week except holidays. Any portion of the construction associated with this contract shall not affect occupant's operation.
  - 5.15. Contractor shall submit weekend or holiday work request at least 10 days in advance to the contracting officer for coordination and approval.
  - 5.16. Contractor shall verify all site conditions and note areas or items that has potential issues when it comes to safety. Contractor shall arrange and schedule with contracting officer site visit(s) to verify work requirement per documents provided and obtain field information for basis of proposal and work plan.
  - 5.17. Obtain all required permit and inspections prior to start or end of any work to include hot work of any kind i.e. cutting, welding, grinding or any flame or spark producing work the agency/company.
  - 5.18. Contractor shall coordinate the equipment and material lay down area prior to start of construction of the project.
  - 5.19. Provide and install all new products made in the USA.
  - 5.20. All material handling, delivery, storage, installation and application shall be in accordance with manufacturers' specifications. Submit all recommendations to contracting officer for review and approval.
  - 5.21. Work plan and construction shall adhere to accepted engineering standards and shall be in accordance with the ASCE, UL, ASTM guidelines, Air Force Instructions (AFI), Unified Facilities Criteria (UFC), National Fire Prevention Association (NFPA) standards and the International Building Code (IBC).
  - 5.22. The Contractor shall comply with all applicable federal, state, and local statutes; Department of Defense Instructions, Air Force Instructions, manuals, handbooks,



regulations, guidance, and policy letters, including but not limited to:

- 5.23. Unified Facility Criteria (UFC) 1-200-01, DoD Building Code which brings uniformity to the military use of non-government model building codes such as the International Building Code (IBC) and the International Existing Building Code (IEBC)

## **6 REFERENCES:**

The references listed below form a part of the required criteria for this project will include to the latest editions of the following:

- AFI 32-1051 Roof Systems Management
- UFC 1-200-01 DOD Building Code General Requirements
- UFC 1-200-02 High Performance and Sustainability Building Requirements
- UFC 3-101-01 Architecture with Change 3
- UFC 3-110-03 Roofing
- UFC 3-110-04 Roofing Maintenance Repair
- UFC 3-400-02 Design Engineering Weather
- UFC 3-575-01 Lightning and Static Electricity Protection Systems
- AFI 32-1051, Roof Systems Management or current AF policy
- AFI 91-203, Air Force Consolidated Occupational Safety Instruction
- National Fire Protection Association (NFPA);
- American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE);
- Metal Building Manufacturers Association (MBMA); American Society of Civil Engineers (ASCE);
- UFC 4-010-01 DoD Minimum Antiterrorism Standards for Buildings
- ASTM E2140 Standard Test Method for Water Penetration of Metal Roof Panel Systems by Static Water Pressure Head
- ASTM E1592 Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference
- ASCE 7 Standards: Minimum Design Loads for Buildings and Other Structures
- ASHRAE 169-2006 Climate Zone
- NFPA 780, Appendix L Standard for the Installation of Lightning Protection Systems
- EM385-1-1: Safety and Health Requirements Manual

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