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Project Number: 01-920-029
Project Name: Reroof & Gutter Replacement for
Facility Name: LaFayette High School Concession Buildings

Owner Name: Walker County School District
201 S. Duke ST, LaFayette, GA 30728

Bid Date: 05/26/2022

Addendum Date: 05/20/2022

TO REGISTERED HOLDERS OF BID DOCUMENTS

INFORMATION CONTAINED IN THIS ADDENDUM SUPERSEDES PREVIOUS INFORMATION CONTAINED IN BID DOCUMENTS

Notice: Addenda to the Drawings and Specifications contain detailed description of proposed changes to the information contained in the bid documents that could alter the scope and the cost of the project. Information contained in addenda supersedes previous information contained in bid documents. Addenda will become part of the Contract for Construction and all bidders are required to examine the information included in all issued addenda.

GENERAL INFO:

- 1) Change the new roof system from a PVC membrane to a new metal roof. The revisions to the contract documents below reflect this change.

CHANGES TO SPECS:

- 1) Delete the following specification sections as they no longer apply to this project:
 - a. Section 07 54 19 – PVC Roofing
- 2) Add the following attached specification sections:
 - a) Section 07 41 13 – Standing Seam Metal Roof Panels
- 2) Replace the following specification sections with revised the attached revised specification changing PVC roofing sections to Metal Roofing:
 - a) Section 01 33 00 – Submittal Procedures
 - b) Section 01 77 00 – Closeout Procedures

CHANGES TO DRAWINGS:

- 1) Roof Plans and Details A100
 - a) Replace drawing in its entirety with the attached revised attached drawing dated May 20, 2022 showing updated “ROOF RENOVATION – SCOPE OF WORK” notes, and “LEGEND TO ROOF PLAN” notes. Roof Sections 5/A101 and 6/A101 have been updated.
- 2) Details A101

- a) Replace drawing in its entirety with revised attached drawing dated May 20, 2022, showing updated “Details and Sections”. PVC Roof has been deleted and changed to Metal Roofing. 2/A101 has been added to detail sheet.

ATTACHMENTS:

Specifications: 01 33 00, 01 77 00, 07 41 13

Revised Drawings: A100, A101

END OF ADDENDUM NO. 2

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. Related Requirements:
 - 1. Section 01 29 00 "Payment Procedures" for submitting Applications for Payment and the schedule of values.
 - 2. Section 01 32 00 "Construction Progress Documentation" for submitting schedules and reports, including construction schedule.
 - 3. Section 01 78 23 "Operation and Maintenance Data" for submitting operation and maintenance manuals.
 - 4. Section 01 78 39 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.

1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Architect/Engineer's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Architect/Engineer's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

1.4 SUBMITTAL SCHEDULE

- A. Submit a schedule of submittals electronically, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect/Engineer and additional time for handling and reviewing submittals required by those corrections.
 - 1. Submit concurrently with the first complete submittal of construction schedule.

1.5 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Architect's/Engineer's Digital Data Files: Discipline specific electronic digital data files of certain Drawings will be provided by Architect/Engineer for use in preparing submittals as follows:
 - 1. Civil/Site: No files will be provided.
 - 2. Architectural: Architectural floor plans and reflected ceiling plans showing walls, doors, windows and fixed equipment.
 - 3. Structural: No files will be provided.
 - 4. Fire Protection: Architectural floor plans and reflected ceiling plans
 - 5. Mechanical: Architectural floor plans and reflected ceiling plans.
 - 6. Electrical: Architectural floor plans and reflected ceiling plans.
 - 7. Food Service: Kitchen floor plan with equipment layout.
 - a. Architect/Engineer makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.
- B. Coordination: Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 1. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are approved in advance.
 - 2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Architect/Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Processing Time: Allow time for submittal review, including time for resubmittals. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
 - 1. Initial Review: Allow **15** days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect/Engineer will advise Contractor/Construction Manager when a submittal being processed must be delayed for coordination.
 - 2. Resubmittal Review: Allow **15** days for review of each resubmittal.
- D. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:
 - 1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.

2. Provide means for insertion to permanently record Contractor's/Construction Manager's review and electronic approval markings and action taken by Architect/Engineer.
 3. Transmittal Form for Electronic Submittals: Use electronic form acceptable to Owner, containing the following information:
 - a. Project name.
 - b. Date.
 - c. Name of Contractor/Construction Manager.
 - d. Name of firm or entity that prepared submittal.
 - e. Names of subcontractor, manufacturer, and supplier.
 - f. Specification Section number and title.
 - g. Drawing number and detail references, as appropriate.
 - h. Location(s) where product is to be installed, as appropriate.
 - i. Related physical samples submitted directly.
 4. Metadata: Include the following information as keywords in the electronic submittal file metadata:
 - a. Project name.
 - b. Number and title of appropriate Specification Section.
 - c. Manufacturer name.
 - d. Product name.
- E. Options: Identify options requiring selection by Architect/Engineer.
- F. Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's/Construction Manager's letterhead, record relevant information, requests for data, revisions other than those requested by Architect/Engineer on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.
- G. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
 1. Note date and content of previous submittal.
 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
 3. Resubmit submittals until they are marked with approval or approved as noted notation from Architect/Engineer's action stamp.
- H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- I. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval or approved as noted notation from Architect/Engineer's action stamp.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

- A. General Submittal Procedure Requirements: Prepare and submit all submittals required by individual Specification Sections to Contractor/Construction Manager.
1. Submit electronic submittals via email as PDF electronic files.
 - a. Architect/Engineer will return annotated file. Annotate and retain copy of file as an electronic Project record document file.
 2. Action Submittals: Submit electronic copy of each submittal required by the individual specification section. Architect/Engineer will retain two copies and will return all remaining copies.
 - a. Samples: In addition to electronic submittal of material and color samples, transmit actual samples for selection of color, texture and pattern.
 3. Informational Submittals: Submit electronic copy of each submittal.
 4. Certificates and Certifications Submittals: Provide a notarized statement on original paper copy certificates that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
 - a. Digital signatures are not acceptable for certificates and certifications.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
1. Mark each copy of each submittal to show which products and options are applicable.
 2. Include catalog cuts, product specifications, color charts, statement of compliance with specified referenced standards, test reports, application of testing agency labels and seals and coordination requirements.
 3. For equipment, also include wiring diagrams showing factory-installed wiring, printed performance curves, operational range diagrams and clearances required to other construction, if not indicated on accompanying Shop Drawings.
 4. Submit Product Data in the following format:
 - a. PDF electronic file.

- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
 - 1. Preparation: Fully illustrate requirements in the Contract Documents. Include identification of products, schedules, compliance with specified standards, coordination requirements, dimensions established by field measurement, relationship and attachment to adjoining construction and seal and signature of professional engineer if specified.
 - 2. Submit Shop Drawings in the following format:
 - a. PDF electronic file.
- D. Samples: Submit actual physical units or sections of material for review of kind, color, pattern, and texture and for coordination of these characteristics with other elements
 - 1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
 - 2. For projects where electronic submittals are required, provide corresponding electronic submittal of Sample transmittal, digital image file illustrating Sample characteristics, and identification information for record.
 - 3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - 4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
 - a. Number of Samples: Submit one full set of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will retain submittal for use in preparation of color boards.
 - 5. Samples for Verification: Submit full-size units or Samples prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected.
 - a. Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
 - b. If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit sufficient number of units for verification.
- E. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
- F. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.
- G. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- H. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- I. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- J. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- K. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- L. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- M. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
- N. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

2.2 DELEGATED-DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor/Construction Manager by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect/Engineer.
- B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required electronic submittals, submit two paper copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor/Construction Manager to be designed or certified by a design professional.
 - 1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

PART 3 - EXECUTION

3.1 CONTRACTOR/CONSTRUCTION MANAGER REVIEW

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with electronic approval stamp before submitting to Architect/Engineer.
- B. Project Closeout and Maintenance Material Submittals: See requirements in Section 01 77 00 "Closeout Procedures."
- C. Approval Stamp: Stamp each submittal with a uniform, electronic approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's/Construction Manager's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S/ENGINEER'S ACTION

- A. Action Submittals: Architect/Engineer will review each submittal, make electronic marks to indicate corrections or revisions required, and return it. Architect/Engineer will electronically stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.
- B. Informational Submittals: Architect/Engineer will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect/Engineer will forward each submittal to appropriate party.
- C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect/Engineer.
- D. Incomplete submittals are unacceptable and will be returned for resubmittal without review.
- E. Submittals not required by the Contract Documents may be returned by the Architect without action.

3.3 SUBMITTAL SCHEDULE

1. 01 21 00 ALLOWANCES
 - a. Action Submittals
 - 1) Proposals
 - b. Informational Submittals
 - 1) Invoices
 - 2) Time Sheets
2. 01 25 00 SUBSTITUTION PROCEDURES
 - a. Informational Submittals
 - 1) Subcontractor List
 - 2) Key Personnel
3. 01 31 00 PROJECT MANAGEMENT AND COORDINATION
 - a. Informational Submittals
 - 1) Subcontractor List
 - 2) Key Personnel
4. 01 32 00 CONSTRUCTION PROGRESS DOCUMENTATION
 - a. Informational Submittals
 - 1) Initial Construction Schedule
 - 2) Construction Schedule Updates
 - 3) Daily Construction Reports
 - 4) Special Reports
5. 01 40 00 QUALITY REQUIREMENTS
 - a. Informational Submittals
 - 1) Quality Control Plan
 - 2) Qualification Data
 - 3) Testing Agency Qualification
6. 01 60 00 PRODUCT REQUIREMENTS
 - a. Action Submittals
 - 1) Basis-of-Design Product Submittals

7. 01 73 00 EXECUTION
 - a. Informational Submittals
 - 1) Land Surveyor Certificates
8. 01 77 00 CLOSEOUT PROCEDURES
 - a. Action Submittals
 - 1) Contractor's List of Incomplete Items
 - 2) Certified List of Incomplete Items
9. 01 78 39 PROJECT RECORD DOCUMENTS
 - a. Survey (Informational) Submittals
 - 1) As-Built Erosion Control Survey
 - 2) Final As-Built Site & Topographic Survey
 - 3) Inventory of Removed and Salvaged Items
10. 02 41 19 SELECTIVE STRUCTURE DEMOLITION
 - a. Informational Submittals
 - 1) Inventory of Removed and Salvaged Items
 - 2) Warranties for Existing Systems
11. 06 10 53 MISCELLANEOUS ROUGH CARPENTRY
 - a. Informational Submittals
 - 1) ICC-ES Evaluation Report for Fire Retardant Treated Wood
12. 06 16 00 SHEATHING
 - a. Action Submittals
 - 1) Product Data
 - b. Informational Submittals
 - 1) ICC-ES Evaluation Report for Fire Retardant Treated Wood
13. 07 41 13 STANDING SEAM METAL ROOF PANELS
 - a. Maintenance Data
 - b. Material and workmanship warranty (2 years)
 - c. Panel finish warranty (20 years)
 - d. Weather tightness warranty (20 years)
14. 07 62 00 SHEET METAL FLASHING AND TRIM
 - a. Action Submittals
 - 1) Product Data
 - 2) Shop Drawings
 - 3) Samples
15. 07 71 00 ROOF SPECIALTIES
 - a. Action Submittals
 - 1) Product Data
 - 2) Shop Drawings
 - 3) Samples
 - b. Informational Submittals
 - 1) Sample Warranty
16. 07 72 00 ROOF ACCESSORIES
 - a. Action Submittals
 - 1) Product Data
 - 2) Shop Drawings
 - 3) Samples
 - b. Informational Submittals
17. 07 92 00 JOINT SEALANTS
 - a. Action Submittals
 - 1) Product Data
 - 2) Samples

END OF SECTION 01 33 00

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PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout.
- B. Related Requirements:

1. Section 01 73 00 "Execution" for progress cleaning of Project site.
2. Section 01 78 23 "Operation and Maintenance Data".
3. Section 01 78 39 "Project Record Documents".

1.3 ACTION SUBMITTALS

- A. Contractor's/Construction Manager's List of Incomplete Items: Initial submittal at Substantial Completion.
- B. Certified List of Incomplete Items: Final submittal at Final Completion.

1.4 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's/Construction Manager's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's/Construction Manager's punch list).
- B. Submittals Prior to Substantial Completion: Complete the following before requesting inspection for determining date of Substantial Completion.

1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, property surveys, and similar final record information.
3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to Owner. Label with manufacturer's name and model number where applicable.
5. Submit test/adjust/balance records.
6. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.

- C. Procedures Prior to Substantial Completion: Complete the following before requesting inspection for determining date of Substantial Completion.

1. Advise Owner of pending insurance changeover requirements.
2. Complete startup and testing of systems and equipment.
3. Perform preventive maintenance on equipment used prior to Substantial Completion.
4. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
5. Advise Owner of changeover in utilities.
6. Terminate and remove temporary facilities from Project site.
7. Complete final cleaning requirements, including touchup painting.
8. Touch up, repair and restore marred exposed finishes to eliminate visual defects.

- D. Inspection: Submit a written request for inspection. Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor/Construction Manager of items that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections is completed or corrected.
2. Results of completed inspection will form the basis of requirements for final completion.

1.5 FINAL COMPLETION PROCEDURES

- A. Submittals Prior to Final Completion: Before requesting final inspection complete the following:

1. Submit a final Application for Payment according to Section 01 29 00.
2. Submit certified copy of Architect's Substantial Completion punch list, endorsed and dated by Architect. Certified copy shall state that each item has been completed or otherwise resolved for acceptance.
3. Submit pest-control final inspection report and warranty.

- B. Inspection: Submit a written request for final inspection. Architect will either proceed with inspection or notify Contractor/Construction Manager of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor/Construction Manager of construction that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections is completed or corrected.

1.6 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Organization of List: Identify each space and area containing items needing correction including areas disturbed by Contractor/Construction Manager that are outside the limits of construction.
1. Organize list of spaces in sequential order, starting with exterior areas first.
 2. Submit list of incomplete items to the Architect in the following format:
 - a. PDF electronic file. Architect will return annotated file.
- 1.7 SUBMITTAL OF PROJECT WARRANTIES
- A. Time of Submittal: Submit two copies of written warranties to Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty. Verify that all warranties requiring signatures by the Owner or contractor have been completed.
- B. Organize warranties into an orderly sequence based on the table of contents of Project Manual.
1. Bind warranties in heavy-duty, three-ring binders.
 2. Provide dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation.
 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
 4. At the upper right hand corner of each sheet, include the specification number that the warranty applies to and a description of what is covered by the warranty.
 5. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document. Submit all electronic copies on a minimum 4G flash drive.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials recommended by manufacturer of the surface to be cleaned.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local, state and federal laws and ordinances.
- B. Cleaning: Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions. Complete the following cleaning operations:
- a. Clean site of rubbish, waste material and litter.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains.
 - c. Remove tools, equipment, machinery, and surplus material from site.
 - d. Remove snow and ice to provide safe access to building.
 - e. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances.
 - f. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 - g. Sweep concrete floors broom clean in unoccupied spaces.
 - h. Clean transparent materials, including mirrors and glass in doors and windows. Polish mirrors and glass, taking care not to scratch surfaces.
 - i. Remove labels that are not permanent.
 - j. Wipe surfaces of mechanical and electrical equipment and similar equipment.
 - k. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 - l. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
 - m. Leave Project clean and ready for occupancy.
- C. Construction Waste Disposal: Comply with waste disposal requirements in Section 01 50 00 "Temporary Facilities and Controls." and Section 01 74 19 "Construction Waste Management and Disposal."
- 3.2 REPAIR OF THE WORK
- A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.
- B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.

2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that that already show evidence of repair or restoration.
 - a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.
3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

3.3 CLOSEOUT SUBMITTAL SCHEDULE

1. 01 78 23 OPERATIONS AND MAINTENANCE DATA
 - a. Operations Manuals
 - b. Product Maintenance Manuals
 - c. Systems and Equipment Maintenance Manuals
2. 01 78 39 PROJECT RECORD DOCUMENTS
 - a. Record Drawings
 - b. Record Specifications
 - c. Miscellaneous Record Submittals
 - d. Weekly Reports
3. 02 41 19 SELECTIVE STRUCTURE DEMOLITION
 - a. Warranties for Existing Systems
4. 07 41 13 STANDING SEAM METAL ROOF PANELS
 - a. Maintenance Data
 - b. Material and workmanship warranty (2 years)
 - c. Panel finish warranty (20 years)
 - d. Weather tightness warranty (20 years)
5. 07 71 00 ROOF SPECIALTIES
 - a. Warranty (20 years)
6. 07 72 00 ROOF ACCESSORIES
 - a. Operations and Maintenance Data
 - b. Warranties (20years)

END OF SECTION 01 77 00

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PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes standing-seam metal roof panels.
- B. Related Sections:
 - 1. Section 07 42 17 "Metal Soffit Panels" for horizontal soffits.
 - 2. Section 07 72 53 "Snow Guards" for prefabricated snow holding devices.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Roofing Conference: Conduct conference at Project site.
 - 1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
 - 2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
 - 3. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
 - 5. Review structural loading limitations of roof deck during and after roofing.
 - 6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that affects roofing system.
 - 7. Review governing regulations and requirements for insurance and certificates if applicable.
 - 8. Review temporary protection requirements for roofing system during and after installation.
 - 9. Review roof observation and repair procedures after roofing installation.

1.4 ACTION SUBMITTALS

- A. Product Data: Include product specifications, construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.
- B. Shop Drawings: Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
 - 1. Accessories: Include details of the flashing, trim, and anchorage systems, at a scale of not less than **1-1/2 inches per 12 inches (1:10)**.
- C. Samples for Initial Selection: Submit color charts or chips showing Manufacturer's full range of standard colors, except metallic, for each type of panel, accessory and trim indicated.
 - 1. Sample submittals are required before preparation of Architect's Exterior Color Schedule.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Inspection Reports: From certified third party inspector.
- C. Sample Warranties: For special warranties.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For metal panels to include in maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
- B. Third Party Inspections: Employ a manufacturer approved and certified independent third party inspection firm to inspect the installation as required by the roofing manufacturer but not less than at start-up, at mid-point of installation and at completion of installation and to provide a Certificate of Compliance for each inspection. For installations exceeding 50,000 sq. ft. of roof area per building, the third party inspector shall provide an additional inspection for every 25,000 sq. ft. over the minimum 50,000 sq. ft. requirement. The inspection firm shall also certify that the roof system is approved to receive a manufacturer's 20 year, no dollar limit warranty with no exclusions. All third party inspection reports shall be distributed to the Owner, Architect and General Contractor/Construction Manager.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.
- B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.

- D. Retain strippable protective covering on metal panels during installation.
- 1.9 FIELD CONDITIONS
 - A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal panels to be performed according to manufacturers' written instructions and warranty requirements.
- 1.10 COORDINATION
 - A. Coordinate sizes and locations of roof curbs, equipment supports, and roof penetrations with actual equipment provided.
 - B. Coordinate metal panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.
- 1.11 WARRANTY
 - A. Special Warranty: Manufacturer's standard form, signed by the manufacturer, in which manufacturer agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures including rupturing, cracking, or puncturing.
 - b. Deterioration of metals and other materials beyond normal weathering.
 - 2. Warranty Period: **Two** years from date of Substantial Completion.
 - B. Special Panel Finish Warranty: Manufacturer's standard warranty form, signed by the manufacturer, in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - 2. Finish Warranty Period: **20** years from date of Substantial Completion.
 - C. Special Weathertightness Warranty: Manufacturer's standard form, signed by the manufacturer, in which manufacturer agrees to repair or replace standing-seam metal roof panel assemblies that fail to remain weathertight, including leaks, within specified warranty period.
 - 1. Warranty Period: **20** years from date of Substantial Completion.
 - D. Special Project Warranty: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering the Work of this Section, including all components of roofing system such as roofing, base flashing, roof insulation, fasteners, cover boards, substrate boards, vapor retarders, roof pavers, and walkway products, for the following warranty period:
 - 1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Energy Performance: Provide roof panels that are listed on the EPA/DOE's ENERGY STAR "Roof Product List" for low and/or steep-slope roof products as indicated on the Drawings.
 - B. Energy Performance: Provide roof panels with an aged Solar Reflectance Index of not less than 0.64 when tested according to CRRC-1.
 - C. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E 1592:
 - 1. Live Loads: Provide roof panel assemblies that can safely support 20 psf of live load for the spans indicated on the Drawings. Where panels are subjected to snow drifting or sliding snow from adjacent buildings, panels must be able to safely support these loads.
 - 2. Wind Loads: As indicated on Structural Drawings for corner, perimeter and field zones per IBC and ASCE 7.
 - 3. Other Design Loads: As indicated on Structural Drawings.
 - D. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E 1646 at the following test-pressure difference:
 - 1. Test-Pressure Difference: **6.24 lbf/sq. ft. (300 Pa)**.
 - E. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change (Range): **120 deg F (67 deg C)**, ambient; **180 deg F (100 deg C)**, material surfaces.
- ### 2.2 STANDING-SEAM METAL ROOF PANELS
- A. General: Provide factory-formed metal roof panels designed to be installed by lapping and interconnecting raised side edges of adjacent panels with joint type indicated and mechanically attaching panels to supports using

concealed clips in side laps. Include clips, cleats, pressure plates, and accessories required for weathertight installation.

1. Steel Panel Systems: Unless more stringent requirements are indicated, comply with ASTM E 1514.
- B. Vertical-Rib, Snap-Joint, Standing-Seam Metal Roof Panels: Formed with vertical ribs at panel edges and a flat pan between ribs; designed for sequential installation by mechanically attaching panels to supports using concealed clips located under one side of panels, engaging opposite edge of adjacent panels, and snapping panels together.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. [AEP Span; a BlueScope Steel company.](#)
 - b. [Architectural Metal Systems; a Nucor company.](#)
 - c. [CENTRIA Architectural Systems.](#)
 - d. [Dimensional Metals, Inc.](#)
 - e. [Englert, Inc.](#)
 - f. [Fabral.](#)
 - g. [Garland Company, Inc. \(The\)](#)
 - h. [IMETCO.](#)
 - i. [MBCI; a division of NCI Building Systems, L.P.](#)
 - j. [McElroy Metal, Inc.](#)
 - k. [Metal-Fab Manufacturing, LLC.](#)
 - l. [Metal Sales Manufacturing Corporation.](#)
 - m. [Morin; a Kingspan Group company.](#)
 - n. [Petersen Aluminum Corporation.](#)
 2. Metallic-Coated Steel Sheet: Zinc-coated (galvanized) steel sheet complying with ASTM A 653/A 653M, **G90 (Z275)** coating designation, or aluminum-zinc alloy-coated steel sheet complying with ASTM A 792/A 792M, **Class AZ50 (Class AZM150)** coating designation; structural quality. Prepainted by the coil-coating process to comply with ASTM A 755/A 755M.
 - a. Nominal Thickness: **0.028 inch (0.71 mm).**
 - b. Exterior Finish: Two-coat fluoropolymer.
 - c. Color: **[As selected by Architect from manufacturer's full range of standard colors, except metallics].**
 3. Clips: Manufacturer's standard one-piece fixed or two-piece floating to accommodate thermal movement.
 - a. Material: **0.064-inch- (1.63-mm-)** nominal thickness, zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet.
 4. Panel Coverage: **12 inches (305 mm).**
 5. Panel Height: **1.75 inches (44 mm).**
- C. Vertical-Rib, Seamed-Joint, Standing-Seam Metal Roof Panels: For sloped or curved installations, provide panels formed with vertical ribs at panel edges and a flat pan between ribs; designed for sequential installation by mechanically attaching panels to supports using concealed clips located under one side of panels, engaging opposite edge of adjacent panels, and mechanically seaming panels together.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. [AEP Span; a BlueScope Steel company.](#)
 - b. [Architectural Metal Systems; a Nucor company.](#)
 - c. [ATAS International, Inc.](#)
 - d. [Berridge Manufacturing Company.](#)
 - e. [CENTRIA Architectural Systems.](#)
 - f. [Dimensional Metals, Inc.](#)
 - g. [Englert, Inc.](#)
 - h. [Fabral.](#)
 - i. [Firestone Metal Products, LLC.](#)
 - j. [Garland Company, Inc. \(The\)](#)
 - k. [IMETCO.](#)
 - l. [MBCI; a division of NCI Building Systems, L.P.](#)
 - m. [McElroy Metal, Inc.](#)
 - n. [Metal-Fab Manufacturing, LLC.](#)
 - o. [Petersen Aluminum Corporation.](#)
 - p. [PMRS Inc.](#)
 2. Metallic-Coated Steel Sheet: Zinc-coated (galvanized) steel sheet complying with ASTM A 653/A 653M, **G90 (Z275)** coating designation, or aluminum-zinc alloy-coated steel sheet complying with ASTM A 792/A 792M, **Class AZ50 (Class AZM150)** coating designation; structural quality. Prepainted by the coil-coating process to comply with ASTM A 755/A 755M.

- a. Nominal Thickness: **0.028 inch (0.71 mm)**.
 - b. Exterior Finish: Two-coat fluoropolymer.
 - c. Color: As selected by Architect from manufacturer's full range of standard colors, except metallics.
3. Clips: Manufacturer's standard one-piece fixed or two-piece floating to accommodate thermal movement.
- a. Material: **0.064-inch- (1.63-mm-)** nominal thickness, zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet.
4. Joint Type: Manufacturer's standard single or double folded joint.
5. Panel Coverage: **12 inches (305 mm)**.
6. Panel Height for Sloped or Curved Roofs: **2.0 inches (51 mm)**.

2.3 THERMAL INSULATION

2.4 UNDERLAYMENT MATERIALS

- A. Self-Adhering, High-Temperature Underlayment: Provide self-adhering, cold-applied, sheet underlayment, a minimum of **30 mils (0.76 mm)** thick, consisting of slip-resistant, polyethylene-film top surface laminated to a layer of butyl or SBS-modified asphalt adhesive, with release-paper backing. Provide primer when recommended by underlayment manufacturer.
1. Thermal Stability: Stable after testing at **240 deg F (116 deg C)**; ASTM D 1970.
 2. Low-Temperature Flexibility: Passes after testing at minus **20 deg F (29 deg C)**; ASTM D 1970.
 3. **Products:** Subject to compliance with requirements, provide one of the following:
 - a. [Carlisle Residential, a division of Carlisle Construction Materials](#); WIP 300HT.
 - b. [Grace Construction Products, a unit of W. R. Grace & Co.](#); Grace Ice and Water Shield HT.
 - c. [Henry Company](#); Blueskin PE200 HT.
 - d. [Kirsch Building Products, LLC](#); Sharkskin Ultra SA.
 - e. [Metal-Fab Manufacturing, LLC](#); MetShield.
 - f. [Mid-States Asphalt](#); Quik-Stick HT.
 - g. [Owens Corning](#); WeatherLock Metal High Temperature Underlayment.
- B. Slip Sheet: If recommended by roofing or underlayment manufacturer, provide recommended slip sheet, of type required for application.

2.5 MISCELLANEOUS MATERIALS

- A. Miscellaneous Metal Subframing and Furring: ASTM C 645; cold-formed, metallic-coated steel sheet, ASTM A 653/A 653M, **G90 (Z275 hot-dip galvanized)** coating designation or ASTM A 792/A 792M, **Class AZ50 (Class AZM150)** coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal panel system.
- B. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, mullions, sills, corner units, ridge closures, clips, flashings, gutters, downspout,s sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.
1. Closures: Provide closures at eaves and ridges, fabricated of same metal as metal panels.
 2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
 3. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum **1-inch- (25-mm-)** thick, flexible closure strips; cut or premolded to match metal panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
- C. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers. Finish flashing and trim with same finish system as adjacent metal panels.
- D. Gutters: Formed from same material as roof panels, complete with end pieces, outlet tubes, and other special pieces as required. Fabricate in minimum **96-inch- (2400-mm-)** long sections, of size and metal thickness according to SMACNA's "Architectural Sheet Metal Manual." Furnish gutter supports spaced a maximum of **36 inches (914 mm)** o.c., fabricated from same metal as gutters. Provide wire ball strainers of compatible metal at outlets. Finish gutters to match metal roof panels.
- E. Downspouts: Formed from same material as roof panels. Fabricate 4 inch by 6 inch downspouts in **10-foot- (3-m-)** long sections, complete with formed elbows and offsets, of size and metal thickness according to SMACNA's "Architectural Sheet Metal Manual." Finish downspouts to match gutters.
- F. Roof Curbs: Fabricated from same material as roof panels, **0.048-inch (1.2-mm)** nominal thickness; with bottom of skirt profiled to match roof panel profiles and with welded top box and integral full-length cricket. Fabricate curb subframing of **0.060-inch- (1.52-mm-)** nominal thickness, angle-, C-, or Z-shaped steel sheet. Fabricate

curb and subframing to withstand indicated loads of size and height indicated. Finish roof curbs to match metal roof panels.

1. Insulate roof curb with **1-inch- (25-mm-)** thick, rigid insulation.

G. Panel Fasteners: Self-tapping screws designed to withstand design loads.

H. Panel Sealants: Provide sealant type recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.

1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape **1/2 inch (13 mm)** wide and **1/8 inch (3 mm)** thick.

2. Joint Sealant: ASTM C 920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended in writing by metal panel manufacturer.

3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C 1311.

2.6 FABRICATION

A. General: Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

B. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.

C. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.

1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.

2. Steel Sheet Seams: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.

3. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.

4. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.

5. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.

a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal panel manufacturer for application, but not less than thickness of metal being secured.

2.7 FINISHES

A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are unacceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Steel Panels and Accessories:

1. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

2. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish consisting of prime coat and wash coat with a minimum total dry film thickness of **0.5 mil (0.013 mm)**.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.

1. Examine primary and secondary roof framing to verify that rafters, purlins, angles, channels, and other structural panel support members and anchorages have been installed within alignment tolerances required by metal roof panel manufacturer.

2. Examine solid roof sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal roof panel manufacturer.

a. Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

B. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.

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

3.2 PREPARATION

- A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C 754 and metal panel manufacturer's written recommendations.

3.3 UNDERLAYMENT INSTALLATION

- A. Self-Adhering Sheet Underlayment for Roof Areas Over Unconditioned Spaces: Apply primer if required by manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation. Apply at locations indicated below, wrinkle free, in shingle fashion to shed water, and with end laps of not less than **6 inches (152 mm)** staggered **24 inches (610 mm)** between courses. Overlap side edges not less than **3-1/2 inches (90 mm)**. Roll laps with roller. Cover underlayment within 14 days.

1. Apply over the roof area indicated below:

- a. Roof perimeter for a distance up from eaves of **36 inches (914 mm)** beyond interior wall line.
- b. Valleys, from lowest point to highest point, for a distance on each side of **18 inches (460 mm)**. Overlap ends of sheets not less than **6 inches (152 mm)**.
- c. Rake edges for a distance of **18 inches (460 mm)**.
- d. Hips and ridges for a distance on each side of **12 inches (305 mm)**.
- e. Roof-to-wall intersections for a distance from wall of **18 inches (460 mm)**.
- f. Around dormers, chimneys, skylights, and other penetrating elements for a distance from element of **18 inches (460 mm)**.

- B. Felt Underlayment: Apply at locations indicated below, in shingle fashion to shed water, and with lapped joints of not less than **2 inches (50 mm)**.

1. Apply on roof not covered by self-adhering sheet underlayment. Lap over edges of self-adhering sheet underlayment not less than **3 inches (75 mm)**, in shingle fashion to shed water.

- C. Slip Sheet: Where recommended by roofing or underlayment manufacturer, apply slip sheet over underlayment before installing metal roof panels.

- D. Flashings: Install flashings to cover underlayment to comply with requirements specified in Section 07 62 00 "Sheet Metal Flashing and Trim."

3.4 METAL PANEL INSTALLATION

- A. General: Install metal panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Shim or otherwise plumb substrates receiving metal panels.
2. Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.
3. Install screw fasteners in predrilled holes.
4. Locate and space fastenings in uniform vertical and horizontal alignment.
5. Install flashing and trim as metal panel work proceeds.
6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
7. Align bottoms of metal panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
8. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.

- B. Fasteners:

1. Steel Panels: Use stainless-steel fasteners for surfaces exposed to the exterior; use galvanized-steel fasteners for surfaces exposed to the interior.
2. Stainless-Steel Panels: Use stainless-steel fasteners.

- C. Anchor Clips: Anchor metal roof panels and other components of the Work securely in place, using manufacturer's approved fasteners according to manufacturers' written instructions.

- D. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.

- E. Standing-Seam Metal Roof Panel Installation: Fasten metal roof panels to supports with concealed clips at each standing-seam joint at location, spacing, and with fasteners recommended in writing by manufacturer.

1. Install clips to supports with self-tapping fasteners.
2. Install pressure plates at locations indicated in manufacturer's written installation instructions.
3. Snap Joint: Nest standing seams and fasten together by interlocking and completely engaging factory-applied sealant.
4. Seamed Joint: Crimp standing seams with manufacturer-approved, motorized seamer tool so clip, metal roof panel, and factory-applied sealant are completely engaged.
5. Sealant and Tape Installation to Prevent Water and Air Leaks:
 - a. Apply a continuous ribbon of sealant or tape to seal joints of metal panels, using sealant or tape as recommend in writing by manufacturer as needed to make panels watertight.

- b. Provide sealant or tape between panels and protruding equipment, vents, and accessories.
 - c. At panel splices, nest panels with minimum **6-inch (152-mm)** end lap, sealed with sealant and fastened together by interlocking clamping plates.
- F. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.
- 1. Install components required for a complete metal panel system including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by metal roof panel manufacturers; or, if not indicated, types recommended by metal roof panel manufacturer.
- G. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.
- 1. Install exposed flashing and trim that is without buckling and tool marks, and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and achieve waterproof and weather-resistant performance.
 - 2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of **10 feet (3 m)** with no joints allowed within **24 inches (610 mm)** of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than **1 inch (25 mm)** deep, filled with mastic sealant (concealed within joints).
- H. Gutters: Join sections with riveted and soldered or lapped and sealed joints. Attach gutters to eave with gutter hangers spaced not more than **36 inches (914 mm)** o.c. using manufacturer's standard fasteners. Provide end closures and seal watertight with sealant. Provide for thermal expansion.
- I. Downspouts: Join sections with telescoping joints. Provide fasteners designed to hold downspouts securely **1 inch (25 mm)** away from walls; locate fasteners at top and bottom and at approximately **60 inches (1524 mm)** o.c. in between.
- 1. Provide elbows at base of downspouts to direct water away from building.
- 3.5 FIELD QUALITY CONTROL
- A. Third Party Inspection Service: Engage a certified third party inspector to test and inspect metal roof panel installation, including accessories. Report results in writing.
 - B. Remove and replace applications of metal roof panels where tests and inspections indicate that they do not comply with specified requirements.
 - C. Additional tests and inspections, at Contractor's expense, are performed to determine compliance of replaced or additional work with specified requirements.
 - D. Prepare test and inspection reports.
- 3.6 CLEANING AND PROTECTION
- A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.
 - B. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 07 41 13

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