

SPECIFICATIONS FOR WORK

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SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Access to site.
4. Coordination with occupants.
5. Work restrictions.
6. Specification and drawing conventions.
7. Miscellaneous provisions.

B. Related Requirements:

1. Division 01 Section "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.
2. Work shall meet or exceed all specifications set forth in the project manual, the manufacturer's specifications, and the Montana Public Works Standard Specifications. If there is a conflict between specifications, the more stringent will apply, unless otherwise specifically authorized by the Owner.

1.2 PROJECT INFORMATION

A. Project Identification: Miles City Fish Hatchery Residential Houses & Garages Re-roofing Project

1. Project Location:
#89 and #101 Fish Hatchery Road
Miles City, Montana

B. Owner: State of Montana Fish Wildlife & Parks, Miles City, Montana.

1. Owner's Representative:

Phillip Jagoda, Project Manager
State of Montana Fish, Wildlife and Parks
Design & Construction Bureau.
1522 Ninth Avenue
Helena, Montana
Phone: (406) 841-4009

1.3 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of Project is defined by the Contract Documents and consists of the following:

1. The work consists of removing existing asphalt shingles and related materials from the Miles City Fish Hatchery residential houses and garages, located at #89 and #101 Fish Hatcher Road, Miles City, MT. Replace the roofing with underlayment, laminated (architectural) asphalt shingles, install new drip edge, pipe boots, flashing, and miscellaneous roofing accessories as required.
2. The work will also consist of installing an egress window in the master bedroom at House #89, which will include interior finish/trim work, and associated exterior work as necessary. All interior and exterior work required as part of the egress window installation shall meet or exceed the existing house material. Contractor will review with Owner the colors and types of finish & trim work, which shall be chosen by the Owner.
3. Egress window shall be a Jeld-Wen Brand (or equivalent w/approval of Owner), with dimensions of approximately 24" x 36".

B. Type of Contract.

1. Project will be constructed under a single prime contract.

1.4 ACCESS TO SITE

A. General: Contractor shall have limited use of Project site for construction operations as indicated by requirements of this Section.

B. Use of Site: Limit use of Project site to work in areas of re-roofing. Do not disturb portions of Project site beyond areas in which the Work is indicated.

1. Driveways, Walkways and Entrances: Keep driveways, loading areas, and entrances serving premises clear and available to Owner, Owner's employees, the public, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
 - a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
 - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

C. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.

1.5 COORDINATION WITH OCCUPANTS

A. Full Owner Occupancy: Owner will occupy site and existing building(s) during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate safe Owner and the Public usage. Perform the Work so as not to

interfere with Owner's day-to-day operations. Maintain existing exits unless otherwise indicated.

1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and approval of authorities having jurisdiction.
2. Notify Owner not less than 72 hours in advance of activities that will affect Owner's operations.

1.6 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
 1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.
- B. On-Site Work Hours: Project work will be limited to the hours of 7:00 a.m. to 7:00 p.m., Monday through Friday. Saturday and Sunday work may be allowed with Owner's approval.
- C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
 1. Notify Owner not less than two days in advance of proposed utility interruptions.
 2. Obtain Owner's written permission before proceeding with utility interruptions.
- D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.
 1. Notify Owner not less than two days in advance of proposed disruptive operations.
- E. Nonsmoking Building: Smoking is not permitted within the building or within 25 feet (8 m) of entrances, operable windows, or outdoor-air intakes.

1.7 MISCELLANEOUS PROVISIONS

- A. See Special Conditions.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 012500 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.

1.2 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

1.3 ACTION SUBMITTALS

- A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
 - b. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
 - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. Certificates and qualification data, where applicable or requested.
 - g. List of similar installations for completed projects with project names and addresses and names and addresses of Engineers and owners.
 - h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - i. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - j. Cost information, including a proposal of change, if any, in the Contract Sum.
 - k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.

1. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
2. Engineer's Action: If necessary, Engineer will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Engineer will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
 - a. Forms of Acceptance: Change Order.

1.4 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.
 1. Conditions: Engineer will consider Contractor's request for substitution when the following conditions are satisfied:
 - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - b. Requested substitution will not adversely affect Contractor's construction schedule.
 - c. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - d. Requested substitution is compatible with other portions of the Work.
 - e. Requested substitution has been coordinated with other portions of the Work.
 - f. Requested substitution provides specified warranty.
 - g. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
- B. Substitutions for Convenience: Not allowed.

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Requirements:
 - 1. Division 01 Section "Summary" for work restrictions and limitations on utility interruptions.

1.2 USE CHARGES

- A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to Engineer and authorities having jurisdiction.
- B. Electric Power Service from Existing System: Electric power from Owner's existing system may be available for use without metering and without payment of use charge. Contractor must review with Owner before start of work. Provide connections and extensions of services as required for construction operations. Contractor must plan on providing portable generators for the project.

1.3 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service.

1.4 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use.

PART 2 - PRODUCTS

2.1 TEMPORARY FACILITIES

- A. Field Offices, General: Prefabricated or mobile units. Contractor's option- Field office not required at project site

- B. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations. Contractor's option – Storage shed not required at project site.
- C. Toilet Facility: Locate port-a-jon as directed by Owner's project representative.

2.2 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work.
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed.

3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Connect to existing service.
- B. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
 - 1. Toilets: Use of Owner's existing toilet facilities will not be permitted.
- C. Electric Power Service: Connect to Owner's existing electric power service, if approved by Owner. Maintain equipment in a condition acceptable to Owner. Provide Contractor supplied portable generators.
- D. Telephone Service: Provide job superintendent with a cellular phone to use on the job site or away from the job site.

3.3 SUPPORT FACILITIES INSTALLATION

- A. Parking: Use designated areas of Owner's existing parking areas for construction personnel.
- B. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. The Owner's waste receptacles shall not be used by the Contractor.
- C. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.

1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
- B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
- C. Tree and Plant Protection: Protect vegetation from damage from construction operations. Replace vegetation damaged from work in this Contract. Replace damaged trees and plants as directed by the MT FW&P landscape architect and/or Engineer. All costs are to be borne by Contractor.
- D. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses.

3.5 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Termination and Removal: Remove each temporary facility when need for its service has ended. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

END OF SECTION

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Substantial Completion procedures.
 - 2. Final completion procedures.
 - 3. Warranties.
 - 4. Final cleaning.

1.2 ACTION SUBMITTALS

- A. Contractor's List of Incomplete Items: Submittal at Substantial Completion.

1.3 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.

1.4 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Engineer 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.
- B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.

PART 2 - PRODUCTS (Not used)

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning:

1. Complete the following cleaning operations before de-mobilizing from the site and requesting final inspection.
 - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Remove from concrete walkways and pavement stains, and other foreign deposits caused by construction activities.
 - c. Clean exposed exterior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances caused by construction activity.

END OF SECTION

SECTION 070150 - PREPARATION FOR RE-ROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Roof tear-off.

1.2 SUBMITTALS

A. Contractor shall submit to the Owner the following information at least 5 business days prior to starting work:

1. Procedures for protecting shrubs, trees, HVAC units, and other utilities or landscaping features which may be impacted by the reroofing project.
2. Procedures to allow a safe working environment for FWP employees and continued service to the public. The buildings proposed to be reroofed are continuously used to serve the public, and FWP employees will be actively using the grounds and buildings.
3. Nail removal management, clean-up procedures, and disposal container locations.

1.3 PERMITS

- A. Contractor will be responsible to obtain and pay for all necessary permits to complete the work.
- B. Copies of the permit(s) shall be provided to the Owner before the start of any work.

1.4 PROJECT CONDITIONS

- A. Owner will occupy buildings immediately below reroofing areas. Conduct reroofing so Owner's operations will not be disrupted. Provide Owner with not less than 72 hours notice of activities that may affect Owner's operations.
- B. Protect building to be reroofed, adjacent buildings, walkways, site improvements, exterior plantings, HVAC units, and landscaping from damage or soiling from reroofing operations.
- C. Weather Limitations: Proceed with reroofing preparation only when existing and forecasted weather conditions permit work to proceed without water entering existing roofing system or building.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PREPARATION

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

3.2 ROOF TEAR-OFF

- A. General: Notify Owner each day of extent of roof tear-off proposed for that day.
- B. Contractor to remove existing cedar shake shingles and underlayment down to roof decking.
- C. Exception to IBC 1511.3: Where the existing roof assembly includes an ice barrier membrane that is adhered to the roof deck (and could result in unnecessary damage to the roof decking), the existing ice barrier membrane shall be permitted to remain in place and covered with an additional layer of ice barrier membrane in accordance with IBC Section 1507.

3.3 DECK PREPARATION

- A. Inspect deck after tear-off of existing shingles.
- B. If broken or loose fasteners that secure deck panels to one another or to structure are observed or if deck appears or feels inadequately attached, immediately notify Owner's representative. Do not proceed with installation until directed by Owner's representative. Minor work to re-secure decking in areas where fasteners are needed is allowed without prior approval.
- C. If deck surface is not suitable for receiving new roofing or if structural integrity of deck is suspect, immediately notify Owner's representative. Do not proceed with installation until directed by Owner's representative.

3.4 EXISTING BASE FLASHINGS

- A. Remove and replace existing base flashings around curbs and penetrations as required.
- B. Remove and replace drip edge around perimeter as required.
- C. Do not damage metal counterflashings that are to remain. Replace metal counterflashings damaged during removal with counterflashings of same metal, weight or thickness, and finish. Metal counterflashings determined to be damaged or not able to be reused by the Owner's Representative, shall also be replaced.

3.5 NAIL REMOVAL AND COLLECTION

- A. Contractor will be required to control the collection of removed nails and minimize the amount of nails that may land onto sidewalks, landscaped areas, and gravel/paved parking areas. Control procedures may consist of using tarps or other means to collect the nails as the existing shingles are removed.
- B. Contractor will be required to police the grounds at the end of each work day and at the end of the project completion for stray removed nails. Magnets or other collection devices should be used to properly collect nails. Owner will inspect and approve the clean-up areas at the end of the project before final payment will be approved.

3.6 DISPOSAL

- A. All materials removed become the property of the Contractor and is therefore responsible for disposal and removal from the site. Collect and place demolished materials in Contractor furnished containers. Promptly dispose of demolished materials at permitted facility, in accordance with applicable regulations. Do not allow demolished materials to accumulate on-site.
- B. The function of the buildings, continued use by employees, and service to the public will require the Contractor to clean the grounds on a daily basis, and not allow removed materials to accumulate on the landscaped grounds, sidewalks, or parking areas.
- C. Transport and legally dispose of demolished materials off Owner's property.

END OF SECTION

SECTION 073113 – LAMINATE SHINGLES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Laminate (Architectural) shingles.
 - 2. Synthetic Underlayment.

1.2 SUBMITTALS

- A. Product Data: Manufacturer's data sheets and detail drawings for each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Product literature.
 - 4. Installation methods.
- B. Samples: For each exposed product and for each color and blend specified.
- C. Product test reports.
- D. Warranties: Sample of special warranties.

1.3 QUALITY ASSURANCE

- A. Fire-Resistance Characteristics: Where indicated, provide asphalt shingles and related roofing materials identical to those of assemblies tested for fire resistance per test method below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing agency.
 - 1. Exterior Fire-Test Exposure: Class “A” ASTM E 108-91 or UL 790, for application and roof slopes indicated.
- B. Wind-Resistance-Test Characteristics: Provide products identical to those that have passed test ASTM D3161 modified to 110 mph.
- C. Manufacturer Qualifications: Provide all primary roofing products, including shingles, underlayment, leak barrier, and ventilation, by a single manufacturer.
- D. Pre-installation Conference: The Installer and a Representative of the manufacture and fabricators involved in the affect by installation of the roofing shingle shall attend. Conduct the conference at the beginning of the roofing shingle installation activity to allow the Representative of the shingle manufacture to observe installation of the laminate shingles. Advise the Owner’s project representative of scheduled meeting date.

- E. All work shall comply with federal, state, and local codes, including but not limited to the International Building Code (IBC), Uniform Building Code (UBC), ASTM methods, or other regulations or codes as required. If there is a conflict between codes, the more stringent code will apply, unless specifically authorized by the Owner.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to site in manufacturer's unopened bundles with labels intact and legible.
- B. Store all products in manufacturer's unopened, labeled packaging until they are ready for installation.
- C. Handle and store materials on site to prevent damage. Store products in a protected, ventilated area, at temperature not more than 110 degrees Fahrenheit (43 degrees Celsius); do not store near steam pipes, radiators, or other structures which may introduce excessive heat.
- D. Store bundles on a flat surface. Do not stack product more than 2 pallets high. If stacking 2 pallets high, use separator boards to protect the shingles below. Store all rolls on end.
- E. Do not install underlayment or shingles on wet surfaces.
- F. Store and dispose of solvent-based materials in accordance with all federal, state and local regulations.
- G. For rooftop loading, lay shingle bundles flat. Do not bend over the ridge.

1.5 PROJECT CONDITIONS

- A. Proceed with work only when existing and forecasted weather conditions will permit work to be performed in accordance with manufacturer's recommendations, and not expose roof sheathing to precipitation or extreme weather conditions. Contractor will be responsible for maintaining a watertight work environment to the underlying Owner's office spaces.

1.6 WARRANTY

- A. Special Warranty: Standard form in which the Contractor agrees to repair or replace laminated shingles that fail in materials or workmanship within specified 2 year warranty period. See special warranty at the end of this Section.
 - 1. Material Warranty Period: Minimum Limited Lifetime Warranty from date of Substantial Completion, prorated, with first 10 years non-prorated.
 - 2. Algae-Discoloration Warranty Period: Asphalt shingles will not discolor 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 LAMINATE FIBERGLASS SHINGLES

- A. Laminated-Strip Asphalt Shingles (Architectural): ASTM D 3462, laminated, multi-ply overlay construction, glass-fiber, ceramic-granule surfaced and self-sealing.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide product or comparable product by one of the following:
 - a. Malarkey Roofing Products. "The Highlander NEX" Laminate Shingle
 - b. Owens Corning
 - c. Atlas Roofing Corporation.
 - d. CertainTeed Corporation.
 - e. GAF Materials Corporation.
 - f. IKO.
 - g. TAMKO Roofing Products, Inc.
 - 2. Algae Resistance: Granules treated to resist algae discoloration.
 - 3. Color and Blends: As selected by Owner from manufacturer's full range of color and blends.
- B. Hip and Ridge Shingles: Provide hip and ridge shingles of width sufficient to cover vent material and color to match roofing shingle.

2.2 UNDERLAYMENT MATERIALS

- A. Underlayment: Fiberglass reinforced felt underlayment, 30# ASTM felt.
 - 1. Test and Standards
 - a. Wrinkle resistant, water resistant, breather type cellulose/glass fiber composite roofing underlayment.
 - b. Standards/Qualifications: ASTM D226 (Type II), ASTM D4869 (Type IV), ASTM D6757, UL Class A and Class C fire rating.
- B. Self-Adhering, High-Temperature Sheet: Minimum 45 mil. thick, consisting of slip-resisting polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer. Similar to Titanium "PSU" 30 or equivalent.
 - 1. Thermal Stability: ASTM D 1970; stable after testing at 240 deg F (116 deg C).
 - 2. Low-Temperature Flexibility: ASTM D 1970; passes after testing at minus 20 deg F (29 deg C).
- C. Self-Adhering Ice & Water Sheet Underlayment: Self-adhering, self-sealing, bituminous ice and water barrier.
 - 1. Test, Properties & Standard
 - a. ASTM D1970, ASTM E108/UL 790 (Class A Fire Resistance), ICC-ESR 1783, CCMC 13403-R,
 - b. Width per roll: 36 inches

2.3 RIDGE VENTS

- A. Shingle-Over Ridge Vent: Manufacturer's standard, rigid section high-density polypropylene or other UV-stabilized plastic ridge vent with nonwoven geotextile filter strips and external deflector baffles; for use under ridge shingles.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide comparable product by one of the following, or an approved equal provided by shingle manufacturer:
 - a. Air Vent, Inc.; a Gibraltar Industries company.
 - b. Core-A-Vent, Inc.
 - c. Trimline Building Products.- High profile, 1" thick Shingle Over Ridge Vent
 - 2. Minimum Net Free Area: 12 inches/ft.
 - 3. Width: Width of manufacturers ridge shingle.
 - 4. Thickness: 1 inch.

2.4 ACCESSORIES

- A. Asphalt Roofing Cement: ASTM D 4586, Type II, asbestos free.
- B. Roofing Nails: ASTM F 1667; aluminum, stainless-steel, or hot-dip galvanized-steel wire shingle nails, minimum 0.120-inch- (3-mm-) diameter, barbed shank, sharp-pointed, with a minimum 3/8-inch- (9.5-mm-) diameter flat head and of sufficient length to penetrate 3/4 inch (19 mm) or extend at least 1/8 inch (3 mm) through OSB or plywood sheathing. Only hand nail or pneumatic driven nails will be allowed, staple guns will not be allowed.
 - 1. Where nails are in contact with metal flashing, use nails made from same metal as flashing.
- C. Felt Underlayment Nails: Plastic cap roofing nails having a minimum 1" diameter plastic cap smooth leg nail as recommended by underlayment manufacturer. No staples allowed.

2.5 METAL FLASHING AND TRIM

- A. General: Comply with requirements in Division 07 Section "Roof Specialties."
 - 1. Sheet Metal: Zinc-tin alloy-coated steel with Kynar finish, Match color of fascia.
- B. Fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of the item.

PART 3 - EXECUTION

3.1 UNDERLAYMENT INSTALLATION

- A. General: Comply with underlayment manufacturer's written installation instructions applicable to products and applications indicated unless more stringent requirements apply.

- B. Self-Adhering Ice and Water Barrier Underlayment: Install, wrinkle free, on roof deck at the eaves and rake. Comply with low-temperature installation restrictions of underlayment manufacturer if applicable. Install at locations as required, lapped in direction to shed water. Lap sides not less than 3-1/2 inches (89 mm). Lap ends not less than 6 inches (150 mm) staggered 24 inches (600 mm) between courses. Roll laps with roller. Cover roof deck from outer edge parallel with and starting at the eave to a point at least 24-inches inside the exterior wall line of the building as per IBC 1507.2.8.2.
- C. Single-Layer Felt Underlayment: Install on roof deck parallel with and starting at the eaves. Lap sides a minimum of 2 inches (50 mm) over underlying course. Lap ends a minimum of 4 inches (100 mm). Stagger end laps between succeeding courses at least 72 inches (1830 mm) or as recommended by synthetic roofing underlayment manufacturer. Fasten with felt underlayment plastic cap roofing nails as recommended by manufacturer.
 - 1. Install felt underlayment on roof deck not covered by self-adhering sheet underlayment. Lap sides of felt over self-adhering sheet underlayment not less than 3 inches (75 mm) in direction to shed water. Lap ends of felt not less than 6 inches (150 mm) over self-adhering sheet underlayment.
 - 2. Install fasteners at a minimum per surface markings spaced 6" o. c. in the vertical and horizontal laps and 12" o. c. along the center of the roll as marked.

3.2 METAL FLASHING INSTALLATION

- A. General: Install metal flashings and other sheet metal to comply with requirements in Division 07 Section "Roof Specialities."
 - 1. Install metal flashings according to recommendations in ARMA's "Residential Asphalt Roofing Manual" and asphalt shingle recommendations in NRCA's "The NRCA Roofing and Waterproofing Manual."

3.3 LAMINATE SHINGLE INSTALLATION

- A. General: Install shingles according to manufacturer's written instructions, recommendations in ARMA's "Residential Asphalt Roofing Manual," and asphalt shingle recommendations in NRCA's "The NRCA Roofing and Waterproofing Manual."
- B. Install starter strip along lowest roof edge and along rake, with edge of shingles extending 1/4 in (6.4 mm) over edge of roof.
- C. Install first and successive courses of shingles stepping diagonally up and across roof deck with manufacturer's recommended offset at each succeeding course. Maintain uniform exposure of shingles at each succeeding course.
- D. Fasten laminate shingle strips with roofing nails located according to manufacturer's written instructions. Minimum of four (4) fasteners for each shingle. Fasteners must not be overdriven to cut into the shingle or under driven. Install nails perpendicular to the roof slope.
- E. Closed-Cut Valleys: Extend asphalt shingle strips from one side of valley 12 inches (300 mm) beyond center of valley. Use one-piece shingle strips without joints in valley. Fasten with extra

nail in upper end of shingle. Install asphalt shingle courses from other side of valley and cut back to a straight line 2 inches (50 mm) short of valley centerline. Trim upper concealed corners of cut-back shingle strips.

- F. Ridge Vents: Install continuous shingle-over shingle over vent according to manufacturer's written instructions. Fasten with roofing nails of sufficient length to penetrate sheathing. Fasten ridge cap shingle to cover ridge vent without obstructing airflow.
- G. Ridge and Hip Cap Shingles: Maintain same exposure of cap shingles as roofing shingle exposure. Lap cap shingles at ridges to shed water away from direction of prevailing winds. Fasten with roofing nails of sufficient length to penetrate sheathing.

END OF SECTION

SECTION 077100 - ROOF SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Roof-edge flashings.
 - 2. Roof-edge drainage systems.
 - 3. Roof fascia & drip edge.
 - 4. Plumbing vents.

1.2 PERFORMANCE REQUIREMENTS

- A. Approvals' Listing: Manufacture and install roof-edge flashings and fascia approved for windstorm classification, Class 1-90.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For roof specialties. Include plans, elevations, expansion-joint locations, keyed details, and attachments to other work. Distinguish between plant- and field-assembled work.
- C. Samples: For each exposed product and for each color and texture specified.
- D. Product test reports.

1.4 WARRANTY

- A. Special Warranty on Painted Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace roof specialties that show evidence of deterioration of factory-applied finishes within 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 EXPOSED METALS

- A. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 (Z275) coating designation.
 - 1. Surface: Smooth, flat finish.

2. Exposed Coil-Coated Finishes: Prepainted by the coil-coating process to comply with ASTM A 755/A 755M. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - a. Two or Three-Coat Fluoropolymer: AAMA 621. System consisting of primer, fluoropolymer color coat, and clear fluoropolymer topcoat, with both color coat and clear topcoat containing not less than 70 percent PVDF resin by weight. Manufacturer's standard Fluoropolymer finish.

2.2 CONCEALED METALS

- A. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 (Z275) coating designation.

2.3 UNDERLAYMENT MATERIALS

- A. Self-Adhering, High-Temperature Sheet: Minimum 45 mil. thick, consisting of slip-resisting polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer. Similar to Titanium "PSU" 30 or equivalent.
 1. Thermal Stability: ASTM D 1970; stable after testing at 240 deg F (116 deg C).
 2. Low-Temperature Flexibility: ASTM D 1970; passes after testing at minus 20 deg F (29 deg C).
- B. Felt Underlayment: No. 30, un-perforated organic felt complying with Type I, ASTM 226.
 1. Fasteners: Manufacturer's recommended fasteners, suitable for fascia application and design to meet metal fascia manufacturer's requirements

2.4 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items required by manufacturer for a complete installation.
 1. Fasteners: Manufacturer's recommended fasteners, suitable for application and designed to meet performance requirements.
- B. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.

2.5 ROOF-EDGE FLASHINGS & DRIP EDGE

- A. Roof-Edge Fascia: Manufactured, two-piece, roof-edge fascia consisting of snap-on metal fascia cover in section lengths not exceeding 10 feet or as recommended by manufacturer and a continuous formed- or extruded-aluminum anchor bar with integral drip-edge cleat to engage fascia cover. Provide matching corner units.
 1. Basis-of-Design Product: Subject to compliance with requirements, provide product designated or comparable product by one of the following:

- a. Berridge Manufacturing Company
 - b. Metal-Era, Inc.
 - c. Metal-Fab Manufacturing, LLC.
 - d. National Sheet Metal Systems, Inc.
 - e. Hickman Company – 24 ga. “Special Condition”
2. Fascia Cover: Fabricated from the following exposed metal:
 - a. Zinc-Coated Steel: 24 gauge.
 3. Corners: Factory mitered and continuously welded or manufacturer’s standard prefabricated corners.
 4. Splice Plates: Concealed, of same material, finish, and shape as fascia cover.
 5. Fascia Accessories: Fascia extenders with continuous hold-down cleats. Fasteners by others are to have minimum pullout strength of 250# per fastener.
- B. Drip Edge:
1. Basis-of-Design Product: Subject to compliance with requirements, provide product designated or comparable product by one of the following:
 - a. Carlisle Metal Products
 - b. Berger Building Products
 2. Decorative metal Drip Edge with continuous cleat. Cleat to be pre-punched for precise attachment.
 - a. Drip Edge Material:
 1. .040 inch (1 mm) thick formed aluminum.
 2. 24 gauge Galvalume coated steel.
 3. 24 gauge zinc coated steel
 - b. Finish:
 1. 35 year color as selected by the Owner from manufacturer’s product color chart.
 - c. Length:
 1. Standard 10’-0”(3.048m), or up to 20’-0”(6.096m) maximum.
 - d. Attachment:
 1. 1-1/4” Stainless Steel Ring Shank Nails provided by manufacturer attached to substrate at 12” on center through cleat.
 2. Certified per ANSI/SPRI ES-1 Standard to a design pressure of 390 lbs./ft² (24GA Steel) and 410 lbs./ft² (.040” AL) to comply with the International Building Code.

2.6 ROOF-EDGE DRAINAGE SYSTEMS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Architectural Products Company.
 2. ATAS International, Inc.
 3. Hickman Company, W. P.
 4. Metal-Era, Inc.
 5. Metal-Fab Manufacturing, LLC.
 6. MM Systems Corporation.
 7. National Sheet Metal Systems, Inc.

8. Roof Drainage Components & Accessories, Inc.

- B. Gutters (if required): Manufactured in uniform section lengths not exceeding 12 feet (3.6 m) with matching corner units, ends, outlet tubes, and other accessories. Elevate back edge at least 1 inch (25 mm) above front edge. Furnish flat-stock gutter straps, gutter brackets, expansion joints, and expansion-joint covers fabricated from same metal & type as existing gutters.
1. Fabricate from the following exposed metal:
 - a. Zinc-Coated Steel – 24 gauge, color metal to match fascia
 2. Gutter Profile: Style “D” or as similar to replace each respective section of gutter length, according to SMACNA's "Architectural Sheet Metal Manual."
 3. Corners: Factory mitered and watertight.
 4. Gutter Supports: Manufacturer's standard supports and wedges as selected by Architect or Owner’s project representative with finish matching the gutters.
- C. Downspouts (if required): Corrugated rectangular complete with smooth-curve elbows, manufactured from the following exposed metal. Furnish with metal hangers, from same material as downspouts, and anchors. Locate new downspouts at location of existing downspouts that are scheduled to be removed.
1. Zinc-Coated Steel: 24 gauge prefinished to match color of gutter.
- D. Zinc-Coated Steel Finish: Two or three coat fluoropolymer finish or as per manufacturer’s standard finish.
1. Color: As selected by Owner from manufacturer's full range.

2.7 PLUMBING VENTS

- A. All existing vents shall remain.
- B. Furnish and install new rubber boots around existing plumbing vents with equal or improved quality rubber boots.

2.8 STATIC ROOF VENTS (TURTLE VENTS)

- A. All existing static roof vents shall remain.
- B. Contractor to furnish and install flashing as required around vents to provide for a watertight seal.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. General: Install roof specialties according to manufacturer's written instructions. Anchor roof specialties securely in place, with provisions for thermal and structural movement. Use

fasteners, protective coatings, separators, sealants, and other miscellaneous items as required to complete roof-specialty systems.

1. Install roof specialties level, plumb, true to line and elevation; with limited oil-canning and without warping, jogs in alignment, buckling, or tool marks.
 2. Provide uniform, neat seams with minimum exposure of sealant.
 3. Install roof specialties to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before manufacture.
 4. Torch cutting of roof specialties is not permitted.
 5. Install underlayment: Apply in shingle fashion to shed water, with lapped joints of not less than 2 inches (50 mm). Roll laps of self-adhering sheet underlayment with roller; cover within 14 days.
- B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.
- C. Expansion Provisions: Allow for thermal expansion of exposed roof specialties.
1. Space movement joints at a maximum of 12 feet (3.6 m) with no joints within 12 inches of corners or intersections unless otherwise shown on Drawings.
 2. When ambient temperature at time of installation is between 40 and 70 deg F (4 and 21 deg C), set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures.
- D. Fastener Sizes: Use fasteners of sizes that will penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.
- E. Seal joints with sealant as required by roofing-specialty manufacturer.
- F. Seal joints as required for watertight construction. Place sealant to be completely concealed in joint. Do not install sealants at temperatures below 40 deg F (4 deg C).

3.2 ROOF-EDGE FLASHING INSTALLATION

- A. Install cleats and other anchoring and attachment accessories and devices with concealed fasteners.

3.3 ROOF-EDGE DRAINAGE-SYSTEM INSTALLATION

- A. General: Install components to produce a complete roof-edge drainage system according to manufacturer's written instructions.
- B. Gutters (if required): Join and seal gutter lengths. Allow for thermal expansion. Attach gutters to firmly anchored gutter supports spaced not more than 24 inches (610 mm) apart or as recommended by manufacturer. Attach ends with rivets and seal with sealant to make watertight. Slope to downspouts.

1. Install gutter with expansion joints at locations indicated but not exceeding 50 feet (15.2 m) apart. Install expansion joint caps.
- C. Downspouts (if required): Join sections with manufacturer's standard telescoping joints. Provide hangers with fasteners designed to hold downspouts securely to walls and 1 inch (25 mm) away from walls; locate fasteners at top and bottom and at approximately 60 inches (1500 mm) o.c.

3.4 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Remove temporary protective coverings and strippable films as roof specialties are installed.

END OF SECTION