

## 1 GENERAL

### 1.01 RELATED REQUIREMENTS

- .1 Related to carrying out the re-roofing and wood carpentry work of the existing Miette Hot Springs Staff Housing Building. Work including:
  - .1 remove and dispose existing build-up roof, including gravel and abandoned flue chases. Stripping down existing build-up membranes to exposed wood deck.
  - .2 remove and dispose fascia.
  - .3 remove and replace all rotten wood deck with the same. Minimum length of new wood to be 1.83m (6') long.
  - .4 install new roofing system.
  - .5 install new fascia.
  - .6 install gutter and rainwater leaders.
  - .7 related electrical and mechanical work near or on roof.
  - .8 provide a hazardous material testing for the existing roof assembly prior to removal of existing roof assembly.
- .2 Contractor shall start the Work on April 1, 2016 and complete the Work no later than June 29, 2016.
- .3 Comply with all related regulatory requirements including but not limited to Acts, Regulations, Directives, Policies, and Guidelines. Note that follow the LEED practices, but this project does not need to meet LEED standards.
- .4 Coordinate with Parks Canada Project Manager relating to working days (Monday to Saturday, except holidays), working hours (8am to 7pm each day, workers will not be permitted on site before 8am and must vacant the site before 7pm), site access, parking, delivery and storage, and designated construction site boundary.
- .5 Building will be fully occupied during re-roofing work time period.
- .6 Business License - Roofing Contractor and all sub-contractors to apply and purchase of Parks Canada business license prior to commencement of work.
- .7 Contractor is required to apply for, and obtain, all necessary permits prior to the commencement of work.
- .8 Roofing contractor will assume the responsibilities as the General Contractor's role.
- .9 Review and incorporate Hazardous Material report (lead paint identified). Do work as per Alberta Environment and dispose all debris and waste materials at the appropriate designated landfill sites outside the park. Submit landfill receipt as proof.
- .10 Contractor's responsibilities includes snow removal from roof (if required) to designated ground location.
- .11 Soffit and exterior walls are newly painted, protect and do not damage new paint finishes.
- .12 Contractor to provide own transport, accommodation (camping in the Park is not permitted), sanity facilities, safety barrier, warning sign, site

office, storage, communication system and all other construction facilities. Make good all areas and surfaces after complete Work.

- .13 Contractor shall coordinate and provide access to Parks Canada Project Manager, or roof inspector for review.
- .14 Contractor shall provide one week notice for Final Completion of the Work to Parks Canada Project Manager and coordinate a site review for Final Completion.
- .15 Contractor shall participate lesson's learn session within one month after project final acceptance.
- .16 Contractor shall provide post construction services to address any issues.

## 1.02 REFERENCES

- .1 Aluminum Association (AA)
  - .1 DAF-45-R03, Designation System for Aluminum Finishes - latest Edition.
  - .2 ASM-35-October 2000, Specifications for Aluminum Sheet Metal Work in Building Construction, Section 5.
- .2 ASTM International
  - .1 ASTM A 167-99(2009), Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
  - .2 ASTM A 240/A 240M-11a, Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
  - .3 ASTM A 653/A 653M-10, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - .4 ASTM A 792/A 792M-10, Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot Dip Process.
  - .5 ASTM B 32-08, Standard Specification for Solder Metal.
  - .6 ASTM B 370-11, Standard Specification for Copper Sheet and Strip for Building Construction.
  - .7 ASTM D 523-89(2008), Standard Test Method for Specular Gloss.
  - .8 ASTM D 822-01(R2006), Standard Practice for Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings.
- .3 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-37.5-M89, Cutback Asphalt Plastic Cement.
  - .2 CAN/CGSB-37.29-M89, Rubber-Asphalt Sealing Compound.
  - .3 CAN/CGSB-51.32-M77, Sheathing, Membrane, Breather Type.
  - .4 CAN/CGSB-93.1-M85, Sheet Aluminum Alloy, Prefinished, Residential.
- .4 CSA International
  - .1 CSA A123.3-05(2010), Asphalt Saturated Organic Roofing Felt.
- .5 Roofing Contractors Association
  - .1 CRCA Roofing Specifications Manual.
  - .2 ARCA Roofing Application Standards Manual.
- .6 Canadian Standards Association (CSA International)
  - .1 CSA O121, Douglas Fir Plywood.
  - .2 CSA O151, Canadian Softwood Plywood.

- .7 Factory Mutual (FM Global)
  - .1 FM Approvals - Roofing Products.
- .8 Underwriters Laboratories' of Canada (ULC)
  - .1 CAN/ULC-S701, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.
  - .2 CAN/ULC-S702.2, Standard for Mineral Fibre Thermal Insulation for Buildings.
  - .3 CAN/ULC-S704, Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.
  - .4 CAN/ULC-S706, Standard for Wood Fibre Thermal Insulation for Buildings.
- .9 Department of Justice Canada (Jus)
  - .1 Canadian Environmental Protection Act (CEPA), 1999.
- .10 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .11 National Research Council Canada (NRC)/Institute for Research in Construction (IRC) - Canadian Construction Materials Centre (CCMC)
  - .1 CCMC-2011, Registry of Product Evaluations.
- .12 Transport Canada (TC)
  - .1 Transportation of Dangerous Goods Act (TDGA), 1992.

### 1.03 ADMINISTRATIVE REQUIREMENTS

- .1 Convene start-up meeting one week prior to beginning re-roofing Work, with roofing contractor's representative, Parks Canada (PC) Project Manager, PC representatives and roof inspector in accordance with Construction Progress Schedule, process, line of communication:
  - .1 Verify project requirements.
  - .2 Review installation and substrate conditions.
  - .3 Co-ordination with others hired by Departmental Representative.
  - .4 Schedule independent roofing inspector hired by Departmental Representative.
  - .5 Review manufacturer's installation instructions and warranty requirements.
  - .6 Contemplated Change Order, Change order, Site Instruction, Request For Information and standard Construction Administration procedure.
- .2 Contractor to introduce health and safety coordinator and submit site specific health and safety plan for review.
- .3 Contractor to schedule bi-weekly meeting on site, with roofing contractor's representative, Parks Canada Project Manager, PC representatives and roof inspector in accordance with Construction Progress.

### 1.04 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals for review.
- .2 Product Data:
  - .1 Submit 2 copies of the most recent manufacturer's instructions, printed product literature and data sheets for architectural standing seam metal roofing and include product characteristics, performance criteria, physical size, finish and limitations.

- .2 Proof of manufacturer's CCMC listing and listing number.
- .3 Submit 2 copies of WHMIS MSDS and indicate VOC content for all the products proposed to be used.
- .3 Submit Shop Drawings:
  - .1 Re-roofing work - indicate plan (size), flashing, perimeter, roof gutters, penetration, ridge, edge, valley, soffit, fascia, roof system details, manufacturer recommendations etc.
- .4 Samples:
  - .1 Submit duplicate 300 x 300 mm samples of each sheet metal material.
  - .2 Submit colour sample as specified.
- .5 Manufacturer's Certificate: certify that products meet or exceed specified requirements.
- .6 Test and Evaluation Reports: submit laboratory test reports certifying compliance of bitumen and membrane with specification requirements.
- .7 Provide Manufacturer's Installation Instructions: indicate special precautions required for seaming the membrane.
- .8 submit Manufacturer's field report.
- .9 Reports: indicate procedures followed, ambient temperatures and wind velocity during application.
- .10 Submit 4 hard copies and one digital copy of the Maintenance and Operating Manuel, reports, including all product information/data, name and contact information for all products/supplier/manufacturer/contractor, manufacturer's warranty, roofing company's warranty, reports, approved shop drawing, regular inspection schedule etc.

#### 1.05 QUALITY ASSURANCE

- .1 Installer qualifications:
  - .1 company and individual specializing in application of architectural standing seam metal roofing systems must be approved by the manufacturer.
  - .2 Company and site supervisor must be specializing in application of architectural standing seam metal roofing systems with minimum 10 years of experience.
- .2 Installer qualifications: Roofer and all sub-contractors must be provincial licensed.

#### 1.06 FIRE PROTECTION

- .1 Fire Extinguishers:
  - .1 Maintain minimum one cartridge operated type or stored pressure rechargeable type with host and shut-off nozzle.
  - .2 ULC labelled for A, B and C class protection.
  - .3 Size 4.5 kg on roof per torch applicator, within 6 m of torch applicator.
- .2 Maintain fire watch for one (1) hour after each day's roofing operations cease.

### 1.07 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials off ground, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect sheet metal roofing from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.
- .4 Develop Construction Waste Management Plan.
- .5 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding and packaging materials.
  - .1 Collect and separate plastic, paper packaging and corrugated cardboard for recycling facility outside National Park.
  - .2 Fold up metal banding, flatten and place in designated area for recycling facility outside National Park.

### 1.08 DISPOSAL

- .1 Removed materials and waste to be disposed of at a suitable location outside of the Park.
- .2 Dispose lead painted fascia, and rotten lead painted wood soffit at appropriate designated landfill site.
- .2 Contractor to provide landfill receipts as proof of proper disposal from the accepting facility for recording and auditing purposes.

### 1.9 WARRANTY

- .1 Standard manufacturer's warranty coverage is required.
- .2 5 years roofing company material and labour warranty certificate is required.

### 1.10 EXISTING SITE PHOTOGRAPHS

- .1 Existing Photographs are provided as an example of the existing conditions and do not show all the extent of existing conditions.
- .2 Contractor must verify condition on site prior to submit bid.

### 1.11 EXISTING DRAWINGS

- .1 Existing building drawings are provided for information only, PCA does not guarantee the accuracy of the information on the drawings, Contractor shall verify on site.
- .2 Existing drawings where extra spaces indicated "future", or "fut" have not been built, therefore do not exist.

## 1.12 EXISTING ROOF

- .1 Contractor shall verify existing roof system and conditions on site prior to start Work.
- .2 As per available existing information, existing roof system:
  - a. 2x wood deck
  - b. 4-ply felt & asphalt membrane Build Up roof system.
  - c. gravel protection

## 2 PRODUCTS

### 2.01 PERFORMANCE CRITERIA

- .1 Compatibility between components of roofing system is essential. Provide written declaration to Parks Canada Project Manager stating that materials and components, as assembled in system, meet this requirement.
- .2 Roofing System: to CSA A123.21 for wind uplift resistance.
- .3 Roofing systems accepted by ARCA and details accepted by ARCA.
- .4 Roof system components shall be ARCA accepted products.

### 2.02 PROPOSED REPLACEMENT ROOF SYSTEM

- .1 Proposed replacement roof system:
  - a. Existing dimensional lumber deck, replace rotten dimensional wood pieces with the same.
  - b. New 6.35 mm (0.25 inch) or 12.7 mm (0.5 inch) CSP or DFP plywood sheathing levelling surface mechanically-fastened with zinc coated countersunk screw.
  - c. New SBS modified bitumen vapor retarder with tri-laminated woven polyethylene facer self-adhered in primer (e.g Soprema Sopraseal 1100T), ARCA type "A" underlayment.
  - d. New 76.2 mm (3.0 inches) Type 4 butt-edge polystyrene (e.g. butt edge Dow Roofmate) primary insulation loose-laid between minimum 22 gauge galvanized vertical z-girts 2.0 ft (609.6 mm) o.c. mechanically-fastened c/w stacked 2x4 (&12.7 mm (0.5 inch) plywood as required) blocking flush along eaves, rakes, & ridges.
  - e. New 12.7 mm (0.5 inch) CSP or DFP plywood sheathing sub-deck mechanically-fastened with zinc coated countersunk screw.
  - f. New high temperature SBS modified bitumen underlayment with tri-laminated woven polyethylene facer self-adhered in primer, ARCA type "A" underlayment.
  - g. New double-lock folded minimum 24 gauge x 20 inches (508 mm) wide pre-finished steel standing seam panels - Minimum 2.0 inches (50.8 mm) standing seams c/w in-seam sealant; job site manufactured; concealed clip fastened; mechanically seamed; c/w engineered stamped shop drawing confirming panel fastening densities as per wind uplift requirements; minimum 24 gauge expansion clips; continuous panel lengths; valley flashings and drip edges at eaves to be lock-folded minimum 1.5 inches (38.1 mm); paint finish to be Stelco, Keynar 10000 Series, Dofasco 8000 Series or equivalent; exposed fasteners to be minimum #10 hex head sheet metal screws with metal-backed EPDM or neoprene washers; sealant/caulking to be compatible, non-hardening,

exterior type, and applied in tape or gun form - Panel ends at walls, curbs, ridges, and hips to be finished with a watertight pan fold - Valley flashings to be minimum 24.0 inches (609.6 mm) wide - Hip and ridge caps to be fastened to underlying J-channels instead of panels.

### 2.03 PREFINISHED STEEL SHEET

- .1 Prefinished steel with factory applied polyvinylidene fluoride.
  - .1 Class F1S.
  - .2 colour: Charcoal gray.
  - .3 Specular gloss: 30 units +/-5 to ASTM D 523.
  - .4 Coating thickness: 22 micrometres minimum.
  - .5 Resistance to accelerated weathering for chalk rating of 8, colour fade 5 units or less and erosion rate less than 20 % to ASTM D 822 as follows:
    - .1 Outdoor exposure period 2500 hours minimum.
    - .2 Humidity resistance exposure period 5000 hours minimum.

### 2.04 ACCESSORIES

- .1 Isolation coating: alkali resistant bituminous paint.
- .2 Plastic cement: to as per ARCA requirements.
- .3 Underlayment/Eave protection: Hi-temperature self-adhering, self sealing SBS modified bituminous membrane, ARCA type "A" underlayment/eave protection.
- .4 Slip sheet: if required, and as per ARCA requirements or manufacturer's specifications.
- .5 Sealant/caulking: as per ARCA requirements.
- .6 Rubber-asphalt sealing compound: to CAN/CGSB-37.29.
- .7 Clips: of same material, and temper as sheet metal, 50 mm minimum wide.
  - .1 Thickness 0.8 mm (24 Gauge) minimum.
  - .2 It is the responsibility of the roofing contractor to determine the spacing of clips to meet the wind-uplift requirements of the project. The roofing contractor shall confirm compliance with the designed wind-uplift resistance for the building location. Provide a calculation and data to PCA for record.
- .8 Fasteners: concealed, and as per ARCA requirements.
  - .1 Design pullout resistance for the building location.
- .9 Washers: of same material as sheet metal, 1 mm thick with rubber packings.
- .10 Touch-up paint: as recommended by sheet metal roofing manufacturer.
- .11 Flashings, penetration flashings and drip edge: as per ARCA specifications and details.
- .12 Z grit: 0.759 mm (22 gauge) thick galv. Z grits at 610 mm o/c vertically. Fasteners to be spaced to excess local wind-lift design load and 22 gauge

galvanized c-channels installed flush along eaves & rakes mechanically-fastened.

- .13 insulation: 76mm thick Type 4 butt-edge extruded polystyrene primary insulation.
- .14 Fascia: inner fascia board, 38 mm x 184 mm (2x8), same species as existing wood deck, to be painted by others. Outer fascia board 38 mm x 235 mm (2x10) prefinished metal clad, to match roof colour.
- .15 Gutter: 102 mm x 125 mm box pre-formed exterior gutter with 0.8 mm (24 gauge) thick prefinished metal gutter, minimum 3m (10') long, to match roof colour. Continuous gutters fastened with clips. Provide splash corner protection to every inside and outside roof corner.
- .16 Rainwater leaders and pad: Rainwater leader to be 76 mm (3") diameter, 0.8mm (24 gauge) prefinished metal with metal strip tie at 1220mm o/c with 1830 mm (6') long horizontal piece at bottom, directing water away from building. Colour to match log colour. Provide one rainwater leader at every outside and inside roof corner. Provide 760 mm x 279 mm (30" x 11") precast concrete splash pad at grade at each rainwater leader location.

## 2.05 FABRICATION

- .1 Form individual pieces in 2440 mm maximum lengths. Make allowances for expansion at joints.
- .2 Hem exposed edges on underside 12 mm, mitre and seal.
- .3 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.
- .4 Apply minimum 0.2 mm dry film thickness coat of plastic cement to both faces of dissimilar metals in contact.
- .5 Protect metals against oxidization by backpainting with isolation coating where indicated.

## 2.06 WOOD FRAMING

- .1 Plywood to CSA O121 or CSA O151.
- .2 Lumber:
  - .1 wood roof deck lumber to match existing in size, species, type, etc.
- .3 Connector: G90 hot-dip galvanized connectors and zinc coated countersink screws (nail is not permitted) for all pressure treated wood.

## 3 EXECUTION

### 3.01 EXAMINATION

- .1 Conduct a Hazardous Materials testing to the existing roof assembly. Provide the test result to PCA Project Manager for review and confirmation prior to removal of the existing roof assembly.

- .2 Verification of existing substrate conditions: verify that conditions of substrate installed are acceptable for sheet metal roofing system installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate in presence of Departmental Representative and roofing inspector.
  - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
  - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.
  - .4 Replace all rotten wood lumber roof deck with the same type, size and species. Minimum length is from roof edge to the supporting exposed beam. Lead paint identified on all existing paint and dispose at appropriate landfill site. Handling, transporting and disposing of the Lead paint will be straightly as per Hazardous Materials procedure.
  
- .3 Verification of electrical element/component:
  - .1 Verify that existing electrical element/component or system on the roof, near the building, on the fascia or near the fascia will not affect the re-roofing Work.
  - .2 Where existing electrical element/component is affected by the re-roofing Work,
    - .1 Submit a detail work plan to the Departmental Representative for approval.
    - .2 Prior to any service interruption or disconnection, submit a written request with details to Departmental Representative for review, approval and coordination with the PCA Asset group.
    - .3 Provide details of disconnection, temporary solution and permanent reconnection. The building is fully occupied during re-roofing work, service interruption cannot be longer than an hour.
    - .4 Proceed with Work by a certified, licensed electrical journeyman.
    - .5 Remove existing pipe which supports the electrical in coming wiring for the re-roofing work. Provide temporary support. Remove temporary support and reinstall pipe support on an ARCA approved roof curb and flashing after roofing work is completed.
    - .6 Test all disrupted services to ensure that they are working properly.
  
- .4 Verification of mechanical element/component:
  - .1 Verify that existing mechanical element/component or system on the roof, near the building, on the fascia or near the fascia will not affect the re-roofing Work.
  - .2 Ensure minimum fire separation and protection is provided to comply with National Building Code and Alberta Building Code requirements.
  - .3 If existing mechanical element/component is affecting the re-roofing Work,
    - .1 Submit a detail work plan to the Departmental Representative for approval.
    - .2 Prior to any service interruption or disconnection, submit a written request with details to Departmental Representative for review, approval and coordination with the PCA Asset group.
    - .3 Provide details of disconnection, temporary solution and permanent reconnection. The building is fully occupied during re-roofing work, service interruption cannot be longer than

- an hour.
- .4 Proceed with Work by a certified, licensed mechanical journeyman. If electrical Work is required, proceed with Work by a certified, licensed electrical journeyman.
- .5 Test all disrupted services to ensure that they are working properly.
- .4 Remove and dispose abandoned (which are no longer in use) existing flue chases above the bedrooms.
- .5 All obsolete stack-jacks to be removed with holes at deck level covered with minimum 22 gauge galvanized flat stock mechanically-fastened.
- .6 New EPDM compression flashings for plumbing vent stacks and electrical conduits.
- .7 Provide new flashings and curbs at the roof penetrations (e.g. heater vent, guy wire etc.) as according to ARCA requirements (specifications and details).

### 3.02 INSTALLATION

- .1 Use concealed fastenings except where approved in writing by Departmental Representative before installation.
- .2 Include underlayment in two separate locations: directly under sheet metal roofing and directly under the insulation.
  - .1 Secure in place and lap joints 100 mm minimum.
- .3 New SBS modified bitumen vapor retarder with tri-laminated woven polyethylene facer self-adhered in primer. Clean existing lumber roof deck to receive the vapor retarder as per ARCA specifications.
- .4 Install sheet metal roof panels using clips. Roofing Contractor shall confirm the cleat spacing as per local wind-lift condition.
- .5 Secure clips with 2 fasteners each and cover with cleat tabs.
- .6 Panels must be continuous from ridge to eave.
- .7 Flash roof penetrations with material matching roof panels, and make watertight.
- .8 Form seams in direction of water-flow and make watertight.

### 3.03 GUTTER AND RAINWATER LEADERS

- .1 Install gutter to all fascia boards.
- .2 Secure gutter to substrate with screws, washers and expansion shields spaced maximum 1200 mm (4') on centre and at ends of gutter.
- .3 Install gutter minimum 100mm below roof edge to prevent sliding snow ripping out the gutter from substrate.
- .4 Install rainwater leader to channel water to grade and drain away minimum 1.830m (6') from building. Install precast concrete splash pad at each rainwater leader location.

### 3.04 CLEANING

- .1 Progress Cleaning:

- .1 Building is fully occupied during Work, maintain site clean, tidy, in an orderly manner and safe at all time for occupants, public, workers and wild life.
- .2 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.
- .3 Waste Management:
  - .1 separate waste materials for reuse and recycling.
  - .2 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

### 3.05 PROTECTION

- .1 Soffit and exterior walls are newly painted, protect and do not damage paint finishes.
- .2 Protect Building from weather and from damage caused by weather while re-roofing Work is being done and at the end of each Work day.
- .3 Building will be fully occupied during re-roofing Work, protect project site and building occupants.
- .4 Protect installed products and components from damage during construction.
- .5 protect and repair damage to adjacent materials caused by sheet metal roofing installation.

**END OF SECTION**