1.0 *GENERAL*

1.1 *Related Work and UBC Guidelines*

1. *Section 07 00 10 Building Envelope - General Requirements*
2. *Section 07 21 00 Thermal Insulation*
3. *Section 013300 Submittal Procedures*
4. *UBC LEED Implementation Guidelines*
5. *UBC Energy Modelling Guidelines*
6. *Owner's Project Requirements*

1.2 *Related External Documents*

1. *Latest edition of the British Columbia Building Code (BCBC).*
2. *RCABC Roofing Practices Manual.*
3. *Roof covering to conform to CAN/ULC-S107-M "Standard Methods of Fire Tests of Roof Coverings" for a Class A, B or C classification.*
4. *CSSBI-S8 "Quality and Performance Specification for Pre-Finished Sheet Steel Used for Building Products".*
5. *ASTM-A924/A924M "Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process".*
6. *CSSBI-20M "Standard for Sheet Steel Cladding for Architectural Industrial and Commercial Building Application*
7. *CAN/CGSB-1.171 "inorganic Zinc Coating".*
8. *ASTM-A653/A653M "Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process."*
9. *AAMA 621*

1.3 *Description*

1. *Work includes sheet metal roofing, anchoring methods and fasteners.*
2. *In instances where conflicts are found between these guidelines and provincial regulations or codes, please notify the UBCV Technical Review Team Architect or UBCO Facilities Management.*
3. *These guidelines are intended to be read by design consultants and their content integrated into construction drawings and specifications. Construction documents are not to reference the technical guidelines directly.*
4. *The Coordinating Registered Professional (CRP) is required to coordinate these requirements with other disciplines.*

1.4 *Coordination*

1. *The Guidelines apply to all work completed within buildings on both UBC Vancouver and UBC Okanagan campuses unless stated otherwise.*
2. *In instances where conflicts are found between these guidelines and provincial regulations or codes, please notify the UBCV Technical Review Team Architect or UBCO Facilities Management.*
3. *These guidelines are intended to be read by design consultants and their content integrated into construction drawings and specifications. Construction documents are not to reference the technical guidelines directly.*
4. *The Coordinating Registered Professional (CRP) is required to coordinate these requirements with other disciplines.*

1.5 *Submittals*

.1 *Submit required documents to consultants in accordance with Section 013300 Submittal Procedures*

.2 *O&M Submittals*

.1 Manufacturers Safety Data sheet (MSD) for all toxic or potentially toxic materials.
.2 Environmental Product Declaration (EPD).
.3 Shop drawings (including all structural and enclosure interface details) sealed and signed by a professional Engineer.
.4 Manufacturer performance test data to confirm performance criteria.
.5 Maintenance Data
.1 As-installed hardware.
.2 Source for replacement parts.
.3 Maintenance instructions.

1.6 *Quality Control and Assurance*

.1 Quality Assurance
.1 Meet or exceed the RoofStar Guarantee 5-Year guarantee standards All roofing system products to conform to the RoofStar Guarantee Standards and to the appropriate CSA, CGSB, ULC, CULC, and ASTM Standards for the materials used in the roofing system; products to be listed in the RGC Accepted Materials List of the RoofStar Guarantee Roofing Practices Manual, and to be in conformance with the manufacturers' published product and performance data.
.2 Quality Control
.1 An Independent Inspection Agency acceptable to RoofStar Guarantee, and assigned by RoofStar Guarantee on acceptance by the Consultant and the UBC Development Manager, to conduct field review inspections as per the minimum protocols as set forth by the RoofStar Guarantee for their 5 Guarantee Program. It is understood that in addition to these responsibilities the independent inspection agency will provide re-inspection services at the 2 year anniversary – in the case of the 5 year warranty.
.1 Cost for the warranty and inspections are to be included in the contract sum.
.2 UBC reserves the right to increase the field review inspection frequency to FULL TIME site inspections while the work is in progress. Extra costs for this to be borne by UBC.
.3 Added inspections just prior to the expiration of the warranty, if required, will be arranged and the costs borne by UBC
.4 A manufacturer's representative to also inspect the work as required for the purposes of providing the manufacturer's labour, material and workmanship warranty upon completion.

2.0 ***DESIGN AND PERFORMANCE REQUIREMENTS***

2.1 *Design Requirements*

.1 Roofing is to be designed to meet Guarantee Standards of the Roofing Contractors Association of British Columbia Guarantee Corp. (RGC) as published in the "RGC Roofing Practices Manual" for a 5-Year guarantee.

.2 Design roof system to accommodate thermal movement of the roof sheet caused by ambient temperature.

.3 Use exterior insulated assemblies whenever insulated roof assemblies are utilized.

.4 Use thermal clips or bearing plates to provide a thermally efficient assembly and structurally support the roofing system.

.5 Design roof system to withstand as a minimum dead loads, seismic, movement, wind load, snow loads, snow build-up and rain load as required by the BCBC. Signed shop drawings by an professional engineer registered in BC is required.

.6 Sheet metal roofing systems are to be concealed fastener type.

2.2 ***Performance Requirements***

.1 The design service life of sheet metal roofs is 30 years to first major maintenance/ replacement.

.2 The air barrier system in sheet metal roofing systems is to function as a secondary drainage plane. All fastener penetrations are to be sealed and clamped, and the air barrier plane is to be water tight over the design service life of the roofing.

.3 Sheet metal roofs must be designed to consider potential snow slumping hazards. Snow retention stops or clips must be incorporated into roof slopes where there is the potential for injury to the public from sliding snow.

.4 Energy targets for new projects and major renovations are developed to reduce UBC's energy use over time and support UBC's Climate Action Plan (CAP 2030). Coordinate with Section 07 21 00 Thermal Insulation for effective R value of insulation for both new and re-roofing assemblies. The effective R value of insulation is to be measured at 0°C. For new roofs, it is recommended to exceed the minimum requirements of the latest version of the BC Building Code.

.5 Thermal bridging effects shall be accounted for, evaluated and provided identifying how thermal bridging will be mitigated to meet overall effective thermal performance requirements. Refer to Section 07 21 00, 2.2.4 for techniques to be used.

3.0 ***MATERIALS***

3.1 ***Product Selection***

.1 Sheet metal roofing is to be a minimum 0.71 mm thick (24 ga), Z275 (G90) galvanized. Prefinished metal work to have AAMA 621 two-coat fluoropolymer coating not less than 70% PVDF..

.1 Series 10000 paint finish by ArcelorMittal or equivalent applied over galvanizing.

.2 Kynar 500

.2 Selection of other sheet metal roofing systems should include service life and maintenance considerations in addition to design considerations. A variance will need to be granted for alternate options. The variance request should include design and performance comparisons.

.3 Sheet metal accessories for low slope roofs are to be a minimum 0.71 mm thick (24 ga), Z275 (G90) galvanized. Prefinished metal work to have Series 10000 paint finish over galvanizing or equivalent.

.4 Insulation to be rockwool or polyisocyanurate types.

.5 Metal work concealed in the roof assembly is to be at a minimum 18 ga Z275 (G90) galvanized sheet metal, protected with a bituminous coating where in contact with damp materials.

.6 Air barrier/roof underlay membrane systems considered to have adequate design service lives for use under sheet steel roofing systems are:

.1 Single ply polyester-reinforced torch applied SBS modified bitumen roofing membrane; fully reinforced 180g felt weight.

.2 Some high melting point, adhesively applied bitumen membranes, fully reinforced 180g weight.

******END OF SECTION******