



## **Boise State University**

# **Division 07 - Thermal and Moisture Protection Guidelines**

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### **Summary**

The purpose of this document is to provide the design team with an easy to reference document containing Boise State University's guidelines for construction projects on campus and is intended as a resource to inform the design process. This document does not remove responsibility from the designer, preclude the use of engineering judgment, or relieve the designer from meeting all adopted code requirements. Questions, clarifications, or suggestions can be directed to the Boise State University Project Manager (PM).

These guidelines have been developed as a joint effort between the Facilities, Operations and Maintenance (FOM) team and the Architectural and Engineering Services (AES) team to help ensure the resiliency of Boise State's campus by considering maintenance needs, sustainability goals, future expansion, and responsible stewardship of our resources. These guidelines are created from both common industry standards and lessons learned through the practice of engineering, architectural design, and maintenance. They are arranged using the Masterspec Divisions to help facilitate a common language.

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## **Section 070000 - Thermal and Moisture Protection (General)**

1. Boise State University maintains a survey database of all roofs on campus that must be utilized in all design efforts.
2. Coordination with the University is required for selections of roofing material and/or roofing strategies.
3. All selections of roofing material and/or strategy require University review and consultation.
4. Cold joint locations require waterproofing to adequately cover and seal.
5. Exterior waterproofing requires special inspection at completion; includes below grade, roofing, etc. waterproofing systems.
6. No Dryvit / EIFS systems will be used.
7. Joints are to be sealed watertight.
8. Ice blocking is required over building entries and perimeter walkways when cover/canopy structure slopes towards entries or walks below.
9. Roof drainage must be located at the lowest point(s) and use a minimum 3-inch diameter pipe.
10. No internal downspouts or site drainage piping without review and approval.
11. Required Warranties:
  - a. During warranty periods, water damage to any other building component and/or building contents due to product defect and/or incorrect installation requires correction at no cost to Boise State University.
  - b. 30 year manufacturer warranty required for all roofing systems from the date of Substantial Completion unless stated otherwise following.
  - c. 5 year minimum installation warranty required for ALL moisture protection systems; from date of Substantial Completion.
  - d. Include a minimum 20 year paint / finish warranty on metal roofs, wall panels, and other assemblies.
12. Rain Screen Systems:
  - a. Rain screen systems must be fully detailed and specified; 'delegated design' is not permitted.
  - b. Rain screen systems must be a component of all exterior masonry veneer systems.
  - c. The system specified and detailed must be thoroughly designed, tested and detailed by the systems supplier prior to the start of work. The rain screen manufacturer must provide on-site inspection and warranty on the installed system.
  - d. Installer: Personnel installing the products must provide evidence of factory training and certification. Certification of individuals is required, not just certification of installing contactor.
  - e. Provide a product warranty of 25 years. Warranty to include replacement of rain screen system along with all other associated components/damage at no cost to Boise State University or the State of Idaho.
  - f. Provide an installation warranty of 10 years. Warranty to include repair of rain screen system along with all other associated components/damage at no cost to Boise State University or the State of Idaho..

## **Section 071000 - Dampproofing and Waterproofing**

1. Provide a 20 year manufacturer and installation warranty for all damp-proofing and waterproofing; from the date of substantial completion.
2. Damp-proofing and/or Waterproofing at footing and foundation walls:
  - a. Extend on outside faces of footings.
  - b. Extend onto intersecting walls and footings, but do not extend onto surfaces exposed to view at project completion.
  - c. Install flashings and corner protection at all corners, changes in plane, construction. Overlap and/or reinforce and seal material at joints and ends.
  - d. Install appropriate terminations at all edges with counter-flashings over all exposed edges.
  - e. Seal all penetrations through membrane, sheet, etc. watertight.

## **Section 071900 – Water Repellents**

1. Consider epoxy coated floors for all new penthouse mechanical rooms with a potential for water damage to leaks and failed piping or equipment.
2. Discuss elevator pit water mitigation with the Boise State Project Manager.
3. Any exterior concrete patios and decks above the first floor must be sealed. Discuss strategy with the Boise State Project Manager.
4. Discuss traffic coatings for any open to above parking structures with the Boise State Project Manager.

## **Section 072000 - Thermal Protection**

1. No Boise State University requirements at this time.

## **Section 072400 – Exterior Insulation and Finish Systems**

1. Exterior insulation and finish systems are prohibited at Boise State University.

## **Section 072500 – Weather Barriers**

1. No Boise State University requirements at this time.

## **Section 072700 – Air Barriers**

1. No Boise State University requirements at this time.

## **Section 074000 - Roofing and Siding Panels**

### **General**

1. Vinyl siding is not allowed.
2. Vertical panel systems must not compromise the R-value of building insulation.

3. Metal panel systems may be used over rain screen systems when approved by the University project manager.

## **Section 074213 – Metal Wall Panels**

1. Include a minimum 20 year paint / finish warranty on metal roofs, wall panels, and other assemblies.

## **Section 075000 – Membrane Roofing**

### **General**

1. Overlay on an existing roof is acceptable when code allows and when the existing roof is in acceptable condition based on a thermal scan inspection and roof coring.
2. When a re-roofing project will require mechanical equipment to be temporarily removed or curbs to be raised higher, Pre-TAB testing and equipment verification will be required before removal and during equipment start-up.
3. Provide roofing pipe / duct supports for all new and existing equipment. Basis of design supports are rubber block style supports with reflectors, galvanized steel strut channel, and pipe / duct clamps to prevent corrosion from dissimilar metals.
  - a. Haydon model HBS, or equivalent.
  - b. Wooden pipe supports are not acceptable.
4. Provide walk pads from the point of roof access to all items requiring routine maintenance or access.
5. Specify only State of Idaho, DPW approved roofing manufacturers, systems and materials.
6. Consider creating slope with the structure wherever feasible for high traffic areas.
7. When using overflow scuppers, consider their location in the appearance of the exterior elevations.
8. Ample height for parapets, curbs and other penetrations must be provided to allow for proper flashing installation. Typical minimum height is twelve (12) inches above the finished roofing surface.
9. The roof membrane must extend over the top of the parapet and down outside face to bottom of coping.
10. The Contractor must prevent dust, dirt, and fumes from cleaning solvents and adhesives from entering the building by covering air intakes and other openings with plastic, or filter media when air flow must be maintained.

### **Approved Systems**

#### Acceptable Attachment Methods

1. Fully adhered roofing systems are preferred when budget allows.
2. Mechanically attached roofing systems are acceptable when fully adhered is cost prohibitive.
3. Ballasted roofing systems are acceptable on existing roofs where installing a fully adhered system is cost prohibitive. Discuss the use of ballasted roofs on new buildings with the Boise State University Project Manager.

### Acceptable Roofing Materials / Systems

1. Thermoplastic Polyolefin (TPO): Single Ply, 80mil
2. Poly Vinyl Chloride (PVC) Single Ply, 80mil
3. Shingle Roofing: Basis of Design
  - a. Malarkey Architectural shingle lines, Color midnight black
  - b. Owens Corning Duration Flex.
4. Metal Roofing: Continuous panel with no visible fasteners, 24 gauge steel.

### Other Roofing Systems

1. EPDM: Not allowed.
  - a. Where the design team believes the University should consider EPDM, discuss with the project manager.
2. Multi-ply Built-Up Bituminous: Not Allowed.
  - a. Where the design team believes the University should consider a hot mopped system, discuss with the project manager.
3. Green Roofing: Approval required.
  - a. Boise State's experience with green roofs has been that they don't perform well in our climate and have typically been used as an accent piece. Where the design team can demonstrate that a green roof will be lower maintenance, improve building performance, or align the University with measurable sustainability / project goals or discuss with the Boise State University project manager and facilities team.
  - b. No soil may be in contact with roofing membranes.
  - c. Soil must be contained within moveable units to access the membrane and the deck. The weight of one unit must be safely removable and/or moveable by 1 individual.
  - d. Contractor is required to perform removal and replacement of the green roof system in order to access and repair warranty items.
4. Wood shingles: Requires approval from the University project manager and facilities team. For historic preservation only.
5. Roofing Tiles: Requires approval from the University project manager and facilities team.
6. Fluid Applied Recoats: Requires approval from the University project manager and facilities team.

### Roof Colors

1. White: Acceptable
2. Black / Dark Colored: Not acceptable.
  - a. Exception: Shingle and slate roofs are allowed to be a dark color.
3. Other colors as approved: Discuss with the University project manager if other solutions should be considered.

### **Warranties**

1. The required State of Idaho thirty (30) thirty year manufacturer's roofing warranty must be specified in the construction documents.
2. The required State of Idaho five (5) five year roofing installer's warranty must be specified in the construction documents.
3. Include a minimum (20) twenty year paint / finish warranty on metal roofs.

### Existing Warranties

1. New work must be done in a manner so as to not void existing warranties.
2. New work done on an existing roof under warranty must be completed by the roof warranty contractor. Coordinate with the Boise State project manager for information relating to existing roof warranties and warranty contractors.

### **Fall Protection**

1. Design for passive fall protection strategies whenever possible. Identify locations with Boise State University where parapets meeting 2018 IBC 1015 are required for passive fall protection.
2. New Roofs: Design new roofs to applicable OSHA fall protection standards.
3. Existing Roofs: Discuss existing fall protection deficiencies and strategies for compliance with OSHA standards with the Boise State project manager and facilities team.

### **Roof Insulation**

#### New roofs

1. Design new roofs to meet current code requirements or identified project goals, whichever is more stringent.

#### Existing Roofs

1. Tear off roof replacements: Add insulation as needed to bring the building up to current code requirements.
2. Overlay roof replacements: Evaluate the existing roof insulation. If the roof is severely deficient and updating the insulation can be shown to make a real difference in energy savings and or building comfort, consider adding / replacing to meet current code requirements. Discuss with the University project manager.

### **Walkways**

1. Provide slip-resistant walkways from the location of rooftop access to and around all rooftop equipment that requires maintenance.
  - a. Ballasted roofs: Precast concrete pavers typically 2' x 2' x 2" thick set over inorganic fabric approved by the roofing manufacturer must be specified.
  - b. Fully adhered / Mechanically Attached roofs: Manufacturer's walkpads following manufacturer's installation instructions.

### **Ballasts**

1. Preferred Ballast Style: 1-½" round, washed drain rock, free of dirt, sand, debris and sharp edges.
  - a. Samples of ballast may be required for approval and inspection prior to placement.
2. Paver Style Ballasted roofs must use 2' x 2' x 2" concrete pavers.
  - a. Consider insulated pavers where a cost or building performance advantage can be demonstrated to the University.
  - b. Tongue and Groove style paver systems are not allowed.



## **Roof Drains**

1. Provide heat tape in the following locations for both new projects and existing roofs where missing:
  - a. At all roof drain / overflow drain bowls.
  - b. Exterior drains and gutters from roof to ground termination.
2. Roof drains must be plugged to prevent debris from entering in and causing blockages during construction.
3. The plugs must be removed at the end of each day.
4. The drain lines must be cleaned at the completion of the project.
5. Provide cast iron roof drains and strainer baskets. Coordinate with plumbing.

## **Section 076000 - Flashing and Sheet Metal**

Includes: custom fabricated or field formed roofing composed of a single layer of metal sheets installed over structural substrate.

### **General**

1. Minimum requirement is a 2-piece flashing system.
2. NO painted metal flashing. Hand painted metal flashing is not allowed since it requires repainting every few years.
3. Flashing is required at all window lintels and sills.
4. Head flashing is required at all penetrations, openings, etc. through the exterior skin of the building.
5. Include a minimum 20 year paint / finish warranty for metal flashing.
6. 5 year minimum manufacturer and installation warranty required for all flashing; from date of Substantial Completion. Warranty must include installation, leaks, displacement, failed joints, and damages to other building components impacted by failure.

## **Section 076200 – Sheet Metal Flashing and Trim**

### **Gauge and Finish**

1. All exterior sheet metal must be a minimum twenty four (24) gauge and pre-finished with high performance coating such as Kynar 500.
2. Add ribs to flashing to eliminate potential for oil-canning.
3. Include a minimum 20 year paint / finish warranty.

### **Joints**

1. Joints must be designed to accommodate thermal movement. Joints must not rely on caulking to be waterproof.

## Concealed Fasteners

1. Use concealed fasteners whenever possible. Exposed fasteners must have pre-finished heads to match metal and neoprene washers.

## Section 077000 - Roof and Wall Specialties and Accessories

1. No Boise State University standards at this time.

### Sub-Section 077200 – Roof Accessories

1. Roofs must be designed for easy access.
2. Discuss window washing strategy with the Boise State Project Manager.
3. Avoid the use of exterior ladders for single story roofs. Interior roof access methods are preferred.
4. Coordinate with mechanical to provide catwalks and crossover steps for mechanical equipment.
5. Roof access hatches must be a minimum of 30" x 36". Coordinate with Facilities Operations and Maintenance for other sizes. Provide lifting davit to help get materials to the roof level.

## Roof Access Method Guidelines

Roof access methods below are in order of University's preference.

<b>Roof Access Methods</b>		
1	Elevators	Required for mechanical penthouse's. Preferred option for all roofs with large equipment.
2	Stairs	Provide stair access to all roofs with large equipment.
3	Ships Ladder / Roof Hatch	Non-alternating tread type ships ladder is acceptable instead of providing stairs only when stair access is not feasible. Ships ladder design must be discussed with and approved by the University PM and Facilities team.
4	Access Ladders / Roof Hatch	Coordinate with the University PM and Facilities team to discuss acceptable applications for traditional access ladders and roof hatches.
5	Alternating Tread Type Ships Ladder	Not acceptable.

## Section 078000 - Fire and Smoke Protection

1. No Boise State University standards at this time.

## **Section 078100 - Applied Fire Protection**

1. Sprayed fire resistive materials must be used only where they will be concealed and cannot be damaged.
2. Coordinate the installation of anchors and supports of other trades so that the integrity of the fire resistive system will not be compromised.
3. Exterior exposed intumescent paint is not acceptable. Interior exposed intumescent paint is acceptable.

## **Sub-Section 078413 –Penetration Firestopping**

1. Provide UL listed fire penetration sleeves for OIT and other removable and modifiable building infrastructure.
2. Standard fire caulking with a rating to match the assembly is acceptable for non removable infrastructure.

## **Section 079000 - Joint Protection**

1. No Boise State University standards at this time.

## **Sub-Section 079200 – Joint Sealants**

1. Provide low VOC materials and products.
2. Sealants must not be used as the primary weather barrier.