

ROOFING AND WATERPROOFING QUALITY ASSURANCE CHECKLIST

Note: This checklist applied to both "Roofing" and "Waterproofing" as applicable

Pre-design

___ Required deliverables submitted

Schematic Design

___ Required deliverables submitted

___ Roof/waterproofing assembly(ies) appropriate for the building's intended use, location and design life expectancy

___ Roof/waterproofing assembly(ies) appropriate for deck type, slope, fire, wind hail, uplift and thermal requirements, vapor control, environmental requirements and cost

___ Roof/waterproofing assembly(ies) application appropriate for climate locations considering hot and cold temperatures, wind, and precipitation

___ For low slope roofs, 2-ply modified bitumen and a single ply membrane is the system of choice. Use a modified bitumen roof in areas that require high puncture resistance, exposure to abuse or need frequent access to maintain mechanical equipment. Use a single ply membrane on complex configured roofs, roof with many penetrations or when roof access needs are minimal

___ Avoid ballasted, sprayed polyurethane foam, APP modified bitumen or cement composite roofs

___ Consider steep slope roofing systems whenever feasible

___ In high snow areas, avoid steep pitch roofs that shed snow over doors and windows. Design building shapes and roof configurations to minimize damage from sliding snow/ice to the roof itself, dormers and pipe penetrations

___ Use cold roof techniques in areas where snow and ice can accumulate on the roof.

Design Development

___ Required deliverables submitted

___ Building Code compliance with fire rating classification, wind classification and hail rating

___ Comply with NPS Roofing/Waterproofing design standards and National Roofing Contractors Association Roofing and Waterproofing Manual and International Building Code

___ Provide wind uplift calculations based on ASCE 7. Specify roof systems that meet ASCE requirements

___ Provide roof drainage calculations for sizing roof drains, leaders, downspouts and gutters

___ Provide written documentation for determination of required roof fire rating class using procedures in IBC or NFPA

___ Review building's interior temperature and humidity conditions and climate to determine vapor barrier requirements. Calculate dew point location within the wall and roof assembly

___ Determine compatibility of roof material with other materials that may settle onto the roof or flow off the roof

- ___ Determine need for construction sequencing and the affect it will have on roof assembly selection
- ___ Consider maintenance, repair and eventual reroofing (life cycle cost) in final selection of roofing system
- ___ Obtain roof slope by constructing slope in structural system in lieu of tapered insulation boards or lightweight concrete fill
- ___ Use of lightweight insulating concrete, gypsum fill or asphaltic perlite fill is not recommended unless the materials are extensively used in the project area and there is sufficient contractor competition
- ___ Determine roof pitch after considering potential roof deflections, and existing structural deck conditions to insure positive drainage. For low slope roofs, maintain a minimum $\frac{1}{4}$ "/ft. roof slope and $\frac{1}{8}$ "/ft. along valleys by using crickets and tapered insulation. For high slope roofs, consult with codes and roofing manufacturer's limitations
- ___ Review roof configuration and roof drainage layout to provide most efficient means to remove water
- ___ Use internal roof drains in climates where freeze/thaw condition is prevalent. In freeze/thaw climates, locate gutters, downspouts, scuppers and drains in area which receive sunlight if possible
- ___ Avoid built-in gutter systems in which drainage passes through or part of the interior spaces or is concealed in exterior wall cavity
- ___ Use sidewall louvers for intake and exhaust systems whenever possible
- ___ Avoid rooftop mounted HVAC equipment when possible
- ___ Buildings over 1 story should have an internal roof access means through a manufactured roof hatch
- ___ Use of asphaltic and wood shingles and shakes in tropical climates shall be fungus resistive and wood shall be pressure treated
- ___ When reroofing, provide field investigation of existing roof and deck construction and conditions. Identify existing materials and test suspect roofing materials for asbestos. Insure existing materials are suitable and compatible with proposed roof system
- ___ Outline specs provided for all required sections

100% Draft Construction Documents or 100% Draft Design-Build Construction Documents

- ___ Required deliverables submitted
- ___ Specify modern and proven technology as used in torch down and adhesive type modified bitumen systems
- ___ Specify manufacturers that have a proven product record of 20-30 year service life without manufacturer's alterations to the material during that time span
- ___ Specify roof assemblies as a complete system to include insulation, cover board, membrane and miscellaneous accessories
- ___ Specify mechanical fastening of roof system for all nailable deck. Use adhesive for non-nailable decks per membrane manufacturer's requirements
- ___ Specify fastener nailing pattern of roof insulation, cover board and base sheet when using mechanical fasteners to deck

- ____ Specify cover board with a hard durable impermeable surface with fire resistance properties
- ____ Specify roof drain strainer to be manufactured from iron
- ____ Specify use of pressure-treated wood blocking and nailers
- ____ Specify contractor compliance with FM Loss Prevention Data Sheet 1-49 recommendations concerning edge flashing design details
- ____ Specify minimum 18 gage metal for perimeter edge or fascia strips
- ____ Specify and show manufactured 2-piece counterflashing, removable coping systems, roof edge/fascia systems to aid in future reroofing
- ____ Specify and show perimeter edge metal flashing on steep roofs
- ____ Specify the appropriate underlayment for steep roofing system
- ____ Specify opened or closed valleys for steep roofing
- ____ Specify and show eave cant for slate, concrete and tile roofing
- ____ Specify public and visitor safety requirements
- ____ Specify limits on odors, noise and dust during roof applications
- ____ Specify in project closeout that a permanent sign be affixed near a roof hatch or provided to the government indicating the type of roof membrane used, the installer, the date of expiration of the warranty and emergency telephone number.
- ____ Specify final inspection of the roof by the roof manufacturer
- ____ When possible, specify a full system warranty for low slope roofs and leakproof warranty for steep slope roofs covering labor and materials with a no dollar limit for 15 to 20 year duration
- ____ Determine type and amount of insulation required and specify installation using double layer of insulation boards
- ____ Check deck and supporting structure for ponding deflections, located drains at mid span
- ____ Roof drains coordinated with architectural, civil and mechanical drawings
- ____ Primary drains and scuppers should be sumped below the roof membrane
- ____ Show and detail primary and secondary drains and scuppers, wall and curb flashing, parapet walls, crickets and special conditions not normally detailed by the manufacturer
- ____ Show and detail all roof mounted equipment, lightning protection terminals and accessories, roof penetrations, vents, exhausts, skylights, monitors and access hatches
- ____ Mechanical equipment or electrical penetrations should not be located in valleys or drainage areas. Electrical conduit should penetrate equipment curb, not roof
- ____ Provide a 24" minimum space between penetrations, curbs, drains, perimeter, walls, etc.
- ____ Crickets shall be install upslope of mechanical equipment or building features
- ____ Review need of roof expansion joints to accommodate building thermal movement, structural framing and deck changes and building configurations
- ____ Detail special flashing details to accommodate roof to wall movement.
- ____ Show minimum curb and wall flashing heights

- ___ Show cants at 90 degree angle changes when using modified bitumen roof systems.
- ___ Mount mechanical equipment on raised curbs and show securement against wind forces

- ___ Keep roof penetrations to a minimum by consolidation of vent pipes and exhaust vents
- ___ Avoid pitch pockets whenever possible
- ___ Show continuous cleat at bottom of edge or fascia strips
- ___ Provide raised fascia edge with metal flashing at roof perimeters instead of embedded edge metal flashing
- ___ Provide through wall flashing under parapet wall caps
- ___ Provide watertight membrane under coping joints, if not under the entire coping. Coping to be sloped to shed water to roof side
- ___ Show walkway pads around mechanical equipment which requires periodic servicing
- ___ Determine need for ventilating the underside of roof with eave and ridge vents
- ___ Determine need for ice dam protection membranes
- ___ Determine need and show detail of step flashing and counterflashing at vertical surfaces
- ___ Gutters shall be sloped 1/16" per foot minimum to downspouts.
- ___ Penetrations in metal roof shall occur in the roof pan and be designed to accommodate roof movements
- ___ Provide details for lightening protection, satellite dishes, hatches, skylights, antennas and other penetrations
- ___ Flood test waterproof membranes before backfilling or placing material upon it

Submit 100% Complete Construction Documents or 100% Complete Design-Build Construction Documents for Final Approval

- ___ Required deliverables submitted
- ___ All review comments from 100% Draft Review satisfactorily resolved