

DIVISION 7 – THERMAL AND MOISTURE PROTECTION

A. DAMPROOFING AND WATERPROOFING

1. Waterproofing shall be provided for exterior face of all walls below grade that enclose interior area including crawl spaces. Waterproofing product shall be equal to Sonneborn HLM 5000, moisture curing, bitumen-modified polyurethane elastomeric waterproofing membrane system.
2. Extent of waterproofing and application method shall be indicated on drawings when applicable.
3. Vapor barriers shall be provided under slab floors and around drilled piers.

B. BUILDING INSULATION

1. Insulation used in combination with other building materials shall give minimum "U" factors in accordance with the requirements of current ASHRAE Standards and IBC.
2. Batt insulation shall be kraft faced fiberglass batts manufactured by Certainteed, Owens Corning, or Equal unless otherwise specified. Preferred minimum "R" values for insulated surfaces are:
 - a. Roofs: R30
 - b. Floors over un-insulated spaces: R30
 - c. Exterior Walls: R19
3. When under occupied space, boiler room ceilings shall be sufficiently insulated.
4. Foundation insulation shall be 1-1/2" thick Styrofoam manufactured by Dow Chemical Co. or equal.
5. Rigid wall insulation shall be fiberglass equal to Celotex "Thermax" sheathing.
6. Concrete block insulation shall be equal to "Korofil" concrete block insulating system manufactured by Grace Construction Products.
7. Foil faced insulation required at all plenum conditions.
8. Insulation specifications to be cross-referenced and coordinated with mechanical load calculations.
9. Sound insulation shall be provided around music rooms, toilet rooms, meeting rooms, and mechanical equipment rooms.

C. ROOFING

Roofing Standards and Reference Documents: All roofing materials and installation methods shall comply with the NRCA Roofing and Waterproofing Manual, latest edition, published by the National Roofing Contractors Association. All metal roofing materials and installation methods shall comply with the Architectural Sheet Metal Manual, latest edition, published by the Sheet Metal and Air Conditioning Contractors Association.

The following District Standards for design, material specifications, and installation/application methods shall be required for all new roof and re-roofing projects:

1. Submit roof plan drawings and details indicating slopes, all roof perimeter conditions, roof curbs, etc. to further include all roofing related specification sections to the Owner and/or Architect for approval prior to proceeding with work or submitting plans for permit.
2. If more than one type of roofing system is specified, it is essential that one Contractor be responsible for the contract and warranty for all types of roofing specified for a project.
3. Roofing system shall satisfy UL Class A and Factory Mutual Class I-90 requirements.
4. All roofing applications shall include a 5-year full service warranty from the Roofing Contractor and shall further include a 20-year manufacturer's warranty for built-up roofing systems. Contractor must submit original signed copies of manufacturer's warranties signed by an authorized representative from the

manufacturer with as-built drawings and other required contract closeout documents. Final payments will be withheld until properly executed warranty documents are delivered to the Owner.

5. All roofing components, including flashing, fasteners, insulation, roof vents, ballast and expansion joints, shall be installed in strict compliance with manufacturer's written recommendations and details unless noted otherwise in this specification section.
6. Walkways shall be provided around rooftop mechanical units.
7. Roofing for additions shall be chemically and physically compatible with existing roof areas on a building.
8. Built-up roofing shall be four-ply asphalt with fiberglass felts and shall conform to the requirements of the NRCA Roofing and Waterproofing Manual and the following:
 - a. ASTM 2178: Type IV Felts
 - b. ASTM D-312: Type III Asphalt
 - c. ASTM D1863: Aggregate
 - d. NRCA Specification: 42-IAGA, Four Ply asphalt glass fiber felt roof membrane, insulated deck with aggregate surface.
9. Shingle roofs shall be premium, heavyweight, laminated, asphalt saturated, fiberglass shingles on new underlayment and shall comply with the following:
 - a. ASTM D-3462, ASTM D-3018, and ASTM E-108: Asphalt shingles
 - b. ASTM D-2626: Asphalt-saturated and coated organic felt base sheet used in roofing
 - c. ASTM D-4586: Asphalt roof cement
 - d. FM (Factory Mutual) roof assembly classifications
 - e. UL (Underwriters Laboratory) fire hazard classifications
10. Pre-finished metal roofing and/or pre-finished metal siding shall be raised rib galvanized sheet metal with Kynar 500 or equal coating. Material shall be UL 90 rated and shall be equal to AEP-Span SN24.
11. When existing roofing materials are to be removed, remove and replace with new all existing built-up roofing, base flashing, counter flashing, gutters, downspouts, and other roofing elements.
12. Roof drainage shall be designed and provided in a manner which will accomplish positive drainage on the roof and on the site. The installed system may include crickets of expanded insulation, new roof drains, new scuppers and/or downspouts, etc. Scuppers and downspouts shall be placed so that they do not drain onto walking surfaces. When possible, roof designs should avoid drainage discharge in shady areas or on North side of buildings. If drainage on or near a walking surface cannot be prevented, design must include trench drains through sidewalks.
13. Where full taper systems are required, insulation shall be "Perlite" rigid insulation but may have polyisocyanurate or expanded polystyrene insulation as filler. Rigid insulation shall be mechanically attached to meet or exceed I-90 wind resistance standards. Fiberboard or "Perlite" cover-board shall be installed over all polyisocyanurate or extruded polystyrene. Where new insulation is specified, it shall be applied over entire roof surface. Cricketts shall be provided where appropriate to eliminate ponding. Polystyrene insulation may be used only where dimensional stability is not a concern.
14. The entire installed roofing system shall provide and accomplish a complete watertight barrier against weather, precipitation, wind, and other environmental conditions.

D. SEALANTS

1. All exterior joints to receive caulking including but not limited to joints between dissimilar materials, where required for watertight seals, expansion and/or control joints in masonry, and all other areas where caulking is required for a finished and neat appearance. Unless otherwise specified, all new exterior

caulking shall be GE SCS2000 SilPruf colored silicone sealant and adhesive. Any substitute materials must be approved by the CSSD #11 Project Manager.

2. Materials must develop UL rated assemblies where required.
3. All interior joints to be caulked with acrylic latex caulk or equal.
4. Color samples and written information describing each type of caulking to be used shall be submitted to the Owner and/or Architect for approval prior to commencement of caulking work.

E. SHEET METAL AND FLASHING

1. Flashing, gutters, downspouts, and all other sheet metal components shall conform to the requirements of the SMACNA Architectural Sheet Metal Manual.
2. Provide 24 gauge galvanized sheet metal unless otherwise specified.
3. Provide prefinished colored sheet metal for all locations where exposed to public view unless otherwise specified. Where new prefinished sheet metal is used, provide 24 gauge material with Kynar 500 finish. Provide samples of manufactures standard colors for color selection by Owner or Architect.
4. For re-roof projects, replace all counter flashing and back flashing with new flashing material. Remove all other existing roof-related sheet metal items including gutters and downspouts and replace with new similar items. Prefinished metal shall be used for all locations visible to public view. Galvanized sheet metal may be used in non-visible locations.
5. New cap flashing shall have drive lock joints and continuous cleats. No open joints will be allowed. Do not solder or attach with sheet metal screws. Provide for necessary expansion control. Use pre-formed corner joints when possible.
6. New counter flashing shall be set in saw cut reglets.
7. Expansion joints shall have new curbs with custom fabricated galvanized sheet metal expansion joint covers with elevated slip joints or prefabricated expansion joint covers with rubber expansion elements integrated with galvanized sheet metal flashing.
8. Provide sheet metal rain cap and flashing on all masonry parapet walls, except where stone or other monolithic material is used in conjunction with flashing. Where stone, precast, brick or block caps are used, install proper anchorage and through-wall flashing.
9. Parapet tops shall be sloped to drain toward roof.
10. All exposed sheet metal to result in neat straight lines, without waviness, bowing dents, or oil-canning.

F. ROOF DRAINS

1. All roofs should discharge water below grade (if possible) away from foundation of building. All discharge above grade must be reviewed carefully to prevent ice build-up. Where roof drains discharge onto site, set at base of bank to prevent erosion. Protect downspouts and gutters from freezing, and discharge of water over sidewalks. Provide spillway at discharge of drains. Drywells shall not be used. At exterior downspouts and leaders, detail to discourage climbing or abuse. All roofs shall drain to the soil – no discharge across sidewalks, dripping off overhangs without gutter, etc.
2. For all new and re-roof projects, lower and/or “sumpout” insulation around roof drains.
3. Attempt to locate all roof drains in areas where they will not be shaded from the winter sun.

G. SKYLIGHTS AND SOLAR TUBES

In general, the use of skylights for provision of natural lighting is discouraged in District facilities. Use of skylights will be considered on a case by case basis but must be approved by the District Project Manager (COTR). If utilized, skylights shall have an insulated polycarbonate pyramid shape dome, insulated anodized aluminum frame, and minimum 9” manufactures curb equal to CAP-2 Duralite Series as manufactured by Thermo-Vu Skylights. Where natural light is desired for interior spaces, clerestory windows or solar tubes should be considered. Skylights,

clerestory windows, or solar light tubs (if used) shall incorporate a means of reducing glare and darkening classrooms. Follow manufacturer's recommendations and/or architectural details for installation. Where solar light tubes are specified, provide Solatube "SolaMaster" series tubular skylights manufactured by Solatube International, Vista, CA. or approved equal.

H. ROOF HATCH

A roof hatch shall be provided for all new schools and shall also be provided for additions if there is no existing roof hatch or if addition area is not easily accessible from adjacent existing roof area. Roof hatches shall be minimum 30" x 36" size. Unless otherwise noted, roof hatches shall be Babcock-Davis B-RHG with integral curb.

I. CONSTRUCTION PROVISIONS

1. Contractor shall provide for continuous cleanup of roofing debris on roof and around building while construction is in progress and shall further assure that site is free of all roofing debris, fasteners, etc. prior to completion of project.
2. Contractor shall provide continuous jobsite supervision and monitoring to assure quality workmanship by skilled qualified personnel through duration of project.
3. Tar kettle shall be located in an area away from public walkways and shall be fenced or barricaded in a manner to prevent public access when on site. Contractor shall provide for continuous attendance of tar kettle at all times when hot. Contractor shall further provide a means of minimizing emissions from tar kettle.
4. Contractor shall provide temporary waterproofing for all work during roofing construction.

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