DIVISION 07 - THERMAL AND MOISTURE PROTECTION

Contents

07 05 00 Common Work Results for Thermal and Moisture Protection

Design Standards

1. Existing roofing systems will be replaced with a like system unless approved.

2. Roof systems shall be designed and selected to best serve the building aesthetically and functionally.

3. Specifications that allow an undetermined roofing manufacturer to determine the acceptability of a condition or detail to be used is not allowed.

4. Follow general construction and detail recommendations from the following as applicable to the roof type being installed:

    - Asphalt Roofing Manufacturers Association (ARMA)
    - Single Ply Roofing Institute (SPRI)

5. All roof designs shall comply with the following:

    - Most Current Version of the NRCA Roofing Manual
    - Most Current version of SMACNA Architectural Sheet Metal Manual.

6. A minimum slope of ½" per foot is required on all new flat roofs. In the case of some large roof areas, a slope of ¼" per foot is acceptable for existing roofs.

7. Provide an existing roofing plan showing actual field dimensions, actual conditions, penetrations, roof mounted equipment, and any core sample information or summaries. Indicate any equipment or penetrations that are to be abandoned.

8. Provide a new roofing plan, identifying slopes, penetrations, equipment, and any other details necessary to provide adequate information to the contractor. The use of isometric details is preferred where applicable.

9. Roof access shall be via interior stairs or penthouse for new construction. Renovations will be considered on a case-by-case basis. Ladders on the exterior of buildings are strictly prohibited.

10. Roof hatches used on existing buildings, shall be designed such that opening, closing, locking and unlocking functions can be done from floor level prior to any climbing. Ladders associated with roof hatches shall be permanently mounted and both the ladder and hatch system shall comply with the applicable sections of the SC OSHA Standards.

11. Installation of exterior roof access ladders are strictly prohibited.

12. Protective mats or pads shall be strategically placed at exit/entry points, around roof mounted equipment and anticipated heavy travel areas.

13. Fall Protection: All areas that expose workers to a fall into hazardous equipment or

material or a fall of 4 feet or greater shall be protected by permanent guardrails or parapet walls When not feasible, provide horizontal lifelines and anchorages as a part of a complete OSHA complaint fall arrest system. All workers performing work requiring fall protection shall have fall protection training that satisfies the requirements from Clemson's Office of Occupational and Environmental Safety.

14. Coordinate the installation of any required lightning protection system and adequately address the need for certification or recertification of the system.

15. Specify that all lightning protection systems be made operational at the end of the workday.

16. Use crickets, saddles, and edge strips to direct waterway from penetrations and parapet walls to ensure positive drainage to scuppers, drains, and gutters.

17. A minimum distance of twelve (12) inches between roof penetrations shall be maintained to allow for proper flashing details.

18. Avoid the use of pitch pans. When existing pitch pans cannot be eliminated, specify a preformed pan with a minimum height of 4", 4" flange, and a minimum clearance of 2" on all sides of the penetration. The pitch pan shall also include the appropriate hood or umbrella.

19. Use round shapes for equipment supports. These supports shall be a minimum of 14" high, with higher supports necessary for larger pieces of equipment.

20. Locate interior roof drains at mid spans and low points of the roof deck. Do not locate drains at columns. When flashing drains, taper insulation 24" around drain. Extend membrane or any flashing under drain bowl clamping ring. Do not use exposed lead sump pans.

21. The designer shall specify that the contractor will confirm, prior to final inspection, in the presence of the appropriate Facilities personnel, that existing roof drains are open and functioning properly without any leaks.

22. Specify the method of protection of roof drains during construction.

07 32 00 Tile Roofing

1. Clemson University has a number of facilities with tile roof systems. Many of these facilities are considered to be part of the historic resources of the University. The replacement of roof systems on these facilities shall be coordinated with the design information and guidelines available from University Planning.

07 50 00 Membrane Roofing

1. Clemson University has utilized built-up bituminous roofing, modified bituminous membrane roofing, and elastomeric membrane roofing systems on its facilities. Each facility shall be analyzed with the Project Manager to determine the type of roofing in this category to be used.

07 51 00 Built-Up Bituminous Roofing

1. Asphalt kettles are not allowed.

2. Clemson's standard of design for built-up roofing systems consists of a 3-ply built-up system with a cold applied modified bitumen cap sheet and Low VOC/no odor adhesives.

07 53 00 Elastomeric Roof Membranes

1. Ethylene-Propylene-Diene-Monomer (EPDM) is the preferred single-ply roofing system when used. Minimum thickness shall be 90 mil.

07 60 00 Flashing and Sheet Metal

1. Due to the various types of metal roofing employed on campus, University Planning shall approve material selections.

2. Sheet metal incorporated into roof systems shall have the equivalent life expectancies of the adjoining roofing system and be compatible with the architectural intent of the facility.

07 71 00 Roof Specialties

1. Do not specify interior or built-in gutters, and/or built-in downspout systems unless their use is determined by the University Historic Preservation Officer to be of architectural importance in the historical district of Campus.

2. Material selection for gutter and downspout systems shall use the same standards as indicated for other sheet metal flashing and trim from Section 07 60 00 above.

3. When designing primary roof drain systems, a multiplier of 1.25 shall be applied to the maximum hourly rainfall indicated for the building location in the edition of the International Plumbing Code referenced in Chapter 5 of the OSE Manual.

4. All parts of gutter systems mounted to the exterior of the building shall be designed to withstand the windspeeds listed in the IBC as referenced in Chapter 5 of the OSE Manual for the location of construction and appropriate risk category.

5. Secondary/overflow drains, if present, shall be designed using the multiplier in paragraph 3 above, but ponding depths shall be reduced as much as physically possible to minimize roof loading.07 72 00 Roof Accessories

07 72 53 Snow Guards

1. Specify snow and ice guards above all exterior doorways anytime there is the possibility of material sliding off the roof and into door or the pedestrian pathway

leading to it.

07 72 73 Vegetative Roof Systems

1. All decorative vegetation placed on roofs shall be in self-contained planters that are impervious to root penetration. These planters shall also connect to the roof drainage system to prevent spillage of water and debris onto roofing system.

07 76 00 Roof Pavers

1. Clemson University has limited installations of roof deck paver systems on their facilities. Specify that all future dead and live loading is accounted for. This includes that from construction activities, maximum occupancy, change of furnishings, green roof irrigation, etc.

07 80 00 Fire and Smoke Protection

07 81 23 Intumescent Firestopping

1. Specify that for every type and application of firestopping, a manufacturer's label shall be placed in the proximity of the work stating the type of material, when placed, and responsible contractor.

07 84 00 Firestopping

07 84 13 Penetration Firestopping

1. All though penetrations to fire rated flooring, wall and ceiling systems for passing wiring or cabling shall be protected with a manufactured permanent sleeving system containing firestopping medium that creates a reusable pathway. The sleeving systems installed in all new electrical, mechanical, and IT rooms and closets shall have capacity for 200% of the anticipated initial cabling volume.

PRODUCTS AND MATERIALS- DIVISION 07 – THERMAL AND MOISTURE PROTECTION

Fiberglass Roofing Felts

- Tamko
- Johns-Manville
- GAF

Modified Bitumen Base Flashing

- DynaFlex by Johns-Manville
- FiberTite
- Ruberoid by GAF SOPREMA

Modified Bitumen Cap Sheet

- DynaGlas by Johns-Manville
- Fibertite
- Ruberoid Mop FR by GAF SOPREMA

Roof Drains

- Smith Series 1010 –Y-R-C-G or approved equal
- Wade Series W-3000-NH-40-52-53 or approved equal

Sealants

- Exposed Joints: Dow Corning 790, SikaFlex 1A, or Tremco Mono 555
- Interior Joints: Dow Corning 790, Tremco Caulking Compound, or approved equal

Fire Caulking and Putty

All must comply with ASTM E814 standards.

- 3m
- Hilti
- Tremco
- STI

Firestopping Systems for Penetrations

- Hilti: CFS and CP series or approved equal
- STI: FA and CA series or approved equal