DIVISION 7 - THERMAL AND MOISTURE PROTECTION

Section 07000 - General Discussion

Introduction

This General Discussion Section contains material which is critical to successful moisture protection systems in new construction and renovation, but which is not the sole responsibility of any individual trade. In many cases, the issues involved are fundamental to the basic design of the project, and the success or failure of the moisture protection concept is determined at the very outset of the design process.

The Consultant is expressly responsible for incorporating these overall requirements into the project, and for ensuring that all subconsultants are aware of the requirements and incorporate them into their designs as well.

Reliance on “after-the-fact” material selections to compensate for a problematic design decision is unacceptable.

Below Grade Spaces

- Below grade spaces are high-risk, expensive designs. Wherever possible, avoid
  - The use of finished below grade spaces requiring drainage systems and wall waterproofing
  - Planters above or adjacent to basement areas

- FDC actively discourages below grade elements in University projects. Designs incorporating below grade finished spaces will receive the strongest scrutiny during the programming and conceptual design phases. Be prepared to thoroughly document the unavoidable need for such elements.

- The University has experienced numerous instances of subsurface moisture working through concrete floor slabs on grade and destroying floor finishes. This seems mostly to be problem with below grade spaces. Ground floor slabs on grade have, so far, been safe from this condition. To ensure that this situation does not arise again, provide an impermeable moisture barrier under all slabs on grade.

- Wherever below grade walls are exposed to naturally flowing groundwater or substantial landscape irrigation water, even if simply foundation walls, include a foundation drainage system in addition to dampproofing or waterproofing the walls.

Traffic Decks

- Traffic bearing decks are very difficult and expensive to successfully waterproof and maintain. Wherever possible, avoid use of finished spaces with traffic decks exposed to the weather above them.

- FDC actively discourages use of such elements in University projects. Designs incorporating horizontal traffic decks will receive the strongest scrutiny during the programming and conceptual design phases. Be prepared to thoroughly document the unavoidable need for such elements. Failing such documentation, the Consultant will be directed to revise or even start completely anew the design.

  Special attention should be given to ensure that all horizontal traffic surfaces provide appropriate slip resistance.

Roof Design

- Do not design roofs which are intended to serve as walking surfaces for user functions. Activities which must be conducted on the roof top (e.g. astronomical or weather observations, greenhouses, etc.) require a design which incorporates platforms, penthouses or similar special enclosures.

- Similarly, do not design roofs which are required to be used as working platforms for maintenance of mechanical and electrical equipment. Enclose such elements in a penthouse.
• Avoid wherever possible use of conduit and piping installed on top of the roof.

• Any mechanical or electrical equipment which must be installed on the roof must be installed on either a prefabricated curb or a field fabricated platform. Where the top surface of such curbs and platforms is not completely covered and waterproofed by the actual equipment, the top surface must be a solid sheet metal cap. Design must meet OSHA workspace and fall precaution criteria.

• Installation of any type of roof top mechanical or electrical equipment on sleepers is not acceptable.

• Wherever possible, make the basic roof slope, and the slope of the crickets to the drains, part of the structural system (slope the structure). Avoid as much as possible thickness of roof insulation greater than 2”. By sloping the structure, it will be possible to eliminate use of lightweight concrete fill altogether.

• Dead flat roofs are not acceptable.

• Design for a slope of 3/8” per foot, throughout the field of the roof and for all crickets, at the time of construction. Ensure that anticipated deflections and proposed cambers will result in a minimum slope of 1/4” per foot throughout the life of the facility.

• Space drains so that slopes in cricket valleys are at least 1/8” per foot.

• Provide metal or wood framing and sub-framing for large crickets. Cricket surfaces must be able to accept live loads similar to those of the basic roof deck.

• Small crickets up-slope of equipment curbs must maintain 1/8” per foot slope in their valleys, and may be fabricated of tapered insulation, not to exceed 4” thick.

• Design the project to allow for one complete re-roofing without removal of the existing roof system, should the University decide to do so. This includes:
  • Structural load capacity
  • Camber and deflection
  • Parapet heights
  • Joints, drains, and flashings

• Ensure that the design makes adequate allowance for proper flashing of perimeters and penetrations. Sufficient vertical dimension to install the cant strip, base flashing, counterflashing, and coping, will result in a parapet at least 18” above the finished roof at the highest point of the roof slope. Include a specific detail in the construction documents. This includes:
  • Parapet walls
  • Partial roof structures
  • Equipment curbs and platforms
  • Door and window sills

• Do not assume that base flashings and counterflushing can be successfully nailed into concrete or masonry. Provide a 3/4" plywood nailer at all parapets.

• Do not use interior roof drains without the specific permission of the Project Coordinator. When unavoidable, provide positive overflow drainage, preferably with a scupper through the parapet wall to daylight, or with a complete separate parallel overflow drain system.

• Design all roof drains and overflow drains in a depressed sump.
• Reroofing must comply with the requirements for new installations as much as possible. The Consultant is responsible for preparing complete details and specifications for the required reroofing work.

• Roofing repairs (e.g. installation of a new exhaust fan), must comply with the requirements for new installations as much as possible. The Consultant is responsible for preparing complete details and specifications for the required repair work. Generic notes such as "flashing as required" are not acceptable. While the University is not interested in telling the Consultant whether the Architect or the Mechanical Engineer should prepare the details and specifications for this type of repair, the information must be thorough and complete regardless of the author.

End of Section 07000
DIVISION 7 - THERMAL AND MOISTURE PROTECTION

Section 07100 - Waterproofing and Dampproofing

Introduction

Waterproofing and dampproofing are not interchangeable materials. Project may have one, both, or neither.

Waterproofing is a relatively secure system, and is used on surfaces which enclose habited space and where moisture penetration is not acceptable.

Dampproofing is a less restrictive system, and is used to reduce moisture migration through exterior surfaces such as retaining walls and planters.

Where such surfaces are intended to be subject to foot traffic, and therefore are not "roofs", refer to the requirements of Section 07590 Horizontal Traffic Surfacing.

Pay particular attention to the drainage course against the wall and to perimeter drains. Describe requirements for these elements on the drawings.

This is a section where the consultant should use a "performance specification". Do not specify proprietary manufacturer’s names or materials, and do not restrict vendors to a limited list.

Part 1 - General

• Require that materials manufacturer(s) and installer(s) demonstrate 5 years of successful installations of similar systems.

• Require submittal of manufacturer's literature describing the system, and samples of proposed membrane materials.

• Require a pre-installation conference, scheduled after the substrates are complete, and including the Contractor, Architect, Owner, materials manufacturer, and installing subcontractor(s).

• Specify expanded warranties as follows:
  • 5 year warranty from the installer covering defects in installation
  • 10 year warranty from the materials manufacturer including defects in materials and installation, and guaranteeing to maintain the system in a waterproof or dampproof condition (as applicable) for the life of the warranty
  • Include sealing of all perimeters, joints, and penetrations
  • Renewal option for an additional 10 years from the materials manufacturer
  • Full replacement value without proration
  • Both furnished on the University's special warranty form

Part 2 - Products

• Expressly prohibit the use of asbestos-containing materials.

• Require that all materials be supplied by a single manufacturer, or approved by the primary materials manufacturer, to ensure single-point responsibility for the installation and warranty.

• Specify a waterproofing system which includes the following:
  • Joint preparation
  • Continuous self-healing sheet membrane, or
- Fluid-applied membrane which cures in place to form a continuous monolithic self-healing membrane
- Termite-resistant protection board embedded in a fluid-applied coating to prohibit displacement

Specify a dampproofing system which includes the following:

- Joint preparation
- At least two layers of trowel-grade bituminous coating with interweaved mesh membrane reinforcement
- Termite-resistant protection board embedded in bituminous coating to prohibit displacement

Part 3 - Execution

- Require that the in-progress installation be observed by the materials manufacturer to ensure that the complete assembly will qualify for the required warranty.

- Require that all penetrations be installed in the wall prior to membrane application, so they can be properly sealed by the membrane installer. Avoid the installation of unnecessary sleeves and pay particular attention to the detailing of those that are required.

End of Section 07100
DIVISION 7 - THERMAL AND MOISTURE PROTECTION

Section 07200 - Insulation

Introduction

This is a section where the consultant should use a "performance specification". Do not specify proprietary manufacturer's names or materials, and do not restrict vendors to a limited list.

This section includes insulation used for thermal purposes, and which is installed as an independent material. Insulation which is an integral of a specific system (e.g. membrane roofing or exterior insulation and finish systems), is described in the appropriate Sections.

Such insulation may be included in the total assembly R-value. However, such insulation must not be the sole source of thermal resistivity for the building.

Design building surfaces which experience a significant temperature differential across their thickness to meet the following thermal resistance ("aged R-value") criteria:
   - R-19 at walls
   - R-30 at roofs and exposed floors

Do not specify any form of insulation to be laid directly on accessible ceilings. Instead, detail horizontal insulation at the top of the cavity, and extend vertical insulation up to that level.

Part 1 - General

- Replace all insulation that becomes wet.

Part 2 - Products

- Expressly prohibit the use of asbestos-containing materials.
- Specify only molded or extruded polystyrene board, or fiberglass batt, insulation.
- Require fiberglass insulation to have an integral kraft paper or foil vapor barrier.
- Use blown-in insulations only in remodeling projects where the wall or ceiling/roof assembly is inaccessible for installation of board or blanket materials, and only with specific permission of the Project Coordinator.

Part 3 - Execution

- Specify mechanical attachment for all insulation. Do not specify insulation to be adhesive applied or installed loose.

End of Section 07200
DIVISION 7 - THERMAL AND MOISTURE PROTECTION

Section 07240 - Exterior Insulation and Finish Systems

Introduction

Use only Type PM (mechanically attached) systems. Use Type PB (adhesive applied) systems only with specific permission of the Project Coordinator.

Consider alternative exterior cladding systems in areas where the finish may be subject to physical abuse.

Indicate all required expansion, control, and design joints on the drawings.

Part 1 - General

- Require that all materials manufacturer(s) and applicator(s) demonstrate 5 years of successful installation of similar systems.

- Require that applicators be approved and licensed by the materials manufacturer. Use an approved applicator system as a test for manufacturer approval.

- Specify a special 5 year guarantee against defects in materials and installation; including attachment failure, delamination, cracking, peeling, and fading.

- Require mock-up.

Part 2 - Products

- Require that all materials be supplied by a single manufacturer, or approved by the primary materials manufacturer, to ensure single-point responsibility for the installation and warranty.

- Specify only extruded polystyrene insulation board, with Class A flame spread and smoke developed characteristics.

- Specify only acrylic-modified Portland cement adhesive and base coat.

- When required, specify only 100% acrylic, integrally colored finish coat, without the need for additional pigmented coatings.

- Where the system will be exposed to potential physical abuse, specify only manufacturers standard “high impact” components.

- Show control joint and expansion joint locations or require submittal of same.

Part 3 - Execution

- Specifically require the system to be installed in accordance with the manufacturer’s recommendations.

- Require the applicators to maintain a “wet edge” until a natural break point is achieved. Expressly prohibit scaffold lines and cold joints.

End of Section 07240
DIVISION 7 - THERMAL AND MOISTURE PROTECTION

Section 07250 - Fireproofing

Introduction

Indicate on the drawings the UL Listing Number and fire resistance rating which is required for each condition of structural fireproofing.

Fireproofing systems which are part of a renovation project (e.g. repair of damaged or missing systems, or removal and replacement of existing systems) should follow these standards. Existing fire resistance ratings must not be compromised. The consultant must prepare a complete specification and details for the required repair work. Generic “repair fireproofing as required” notes are not acceptable.

This is a section where the consultant should use a “performance specification”. Do not specify proprietary manufacturer’s names or materials, and do not restrict vendors to a limited list.

Part 1 - General

• Require that all materials manufacturer(s) and applicator(s) demonstrate 5 years of successful installation of similar materials.

• Require submittal of manufacturer’s literature describing all materials, and the specific systems to be applied for this project.

Part 2 - Products

• Specifically prohibit the use of asbestos containing materials.

• When re-fireproofing structural elements where asbestos-containing fireproofing has been abated by the University, specify only materials which are known to be compatible with asbestos encapsulants.

Part 3 - Execution

• Describe requirements for protection of completed fireproofing.

• Describe specific requirements for repair of fireproofing in the event of damage.

• When re-fireproofing structural elements where asbestos-containing fireproofing has been spot-abated by the University, specifically describe precautions which the Contractor must take to protect adjoining asbestos-containing fireproofing which remains.

End of Section 07250
DIVISION 7 - THERMAL AND MOISTURE PROTECTION

Section 07270 - Firestopping

Introduction

Describe in this Section all requirements for firestopping wall penetrations, floor penetrations, ceiling penetrations, and joints. Do not rely on general references in the sealants section. This includes boards, blankets, modules, pillows, tapes, caulks, foams, intumescents, and other similar materials.

Specifically describe on the drawings all requirements for installation of firestopping. Generic notes such as "firestopping as required" are not acceptable. Reliance on the Contractor understanding the building code and "complying at no additional cost" is similarly not acceptable.

This is a section where the Consultant should use a "performance specification". Do not specify proprietary manufacturer's names or materials, and do not restrict vendors to a limited list.

Part 1 - General

• Require that materials manufacturer(s) and installer(s) demonstrate 5 years of successful installations of similar materials.

• Require submittal of complete manufacturer's literature, including UL test results for each material-and-application system required for the project.

• It is desirable to have all trades use the same product.

Part 2 - Products

•Specify each type of firestopping material required in the project.

• Product shall be trowallable and paintable.

Part 3 - Execution

• Provide a schedule identifying location and type of firestopping.

• Require installation of sleeves at all wall, floor, and ceiling penetrations.

• Specifically require firestopping materials to be installed in accordance with the manufacturer’s recommendations.

• Specifically require that all firestopping be observed as complete prior to being covered by other work.

End of Section 07270
DIVISION 7 - THERMAL AND MOISTURE PROTECTION

Section 07310 - Shingles

Introduction

Systems described in this Section are intended to be installed in situations where the roof slope is at least 4 inches per foot, and where the roofs are not intended to receive regular foot traffic for equipment maintenance.

Specify a complete roofing system, making the materials manufacturer responsible for the roofing and flashing system. Require the materials manufacturer to make periodic inspections of the work in progress to ensure that the completed work will qualify for the required warranties.

Do not use roof deck insulation as the only element in the overall building thermal resistance system. Refer to Section 07200.

This is a section where the consultant should use a "performance specification". Do not specify proprietary manufacturer's names or materials, and do not restrict vendors to a limited list.

Shingle roof repairs and modifications which are part of a renovation project (e.g. installation of a new exhaust fan) should follow these standards as much as possible. Existing roof warranties must not be compromised. The consultant must prepare a complete specification and details for the required repair work. Generic "flashing as required" notes (which often appear on engineering details for new exhaust fans) are not acceptable.

Be sure to coordinate specification requirements with roofing, flashing, and parapet wall details.

Part 1 - General

• Require that materials manufacturer(s) and installer(s) demonstrate 5 years of successful installations of similar systems.

• Require submittal of manufacturer's literature describing the system, and samples of proposed shingles.

• Require a pre-installation conference, scheduled after the substrates are complete, and including the Contractor, Architect, Owner, materials manufacturer, and installing subcontractor(s).

• Shingle roofing is a finish material, not a staging platform for further construction work. Include the following provisions:
  • Require the Contractor to install a "temporary roof" if he desires to "dry-in" the building to allow interior construction to begin or to provide a platform for further exterior construction
  • Describe this requirement as a "Contractor's Option", that is, if he wants to dry-in, he must do so only with a temporary roof
  • Reference the National Roofing Contractor's Association (NRCA) requirements for temporary roofs, including "sacrificial" insulation on metal decks
  • Specifically prohibit "phased roofing"
  • Require that finished roofs be protected with plywood sheets for any and all construction traffic, and that all equipment moving be accomplished with rollers

• Specify expanded warranties as follows:
  • 5 year warranty from the installer covering defects in installation
  • 30 year warranty from the materials manufacturer including defects in materials and installation, and guaranteeing to maintain the system in a waterproof condition for the life of the warranty
  • Full replacement value without proration
Include all components of the roof assembly, from the deck up
Include sealing of all perimeters, joints, and penetrations
Both furnished on the University's special warranty form

Part 2 - Products

Expressly prohibit the use of asbestos-containing materials.

Require that all primary and secondary materials be supplied by a single manufacturer, or approved by the primary materials manufacturer, to ensure single-point responsibility for the installation and warranty.

Specify a manufacturer's standard shingle roofing system as follows:

- UL Class A fire rating
- UL Class 90 wind uplift rating
- Minimum 15-lb asphalt saturated underlayment
- 30 year fiberglass-reinforced asphalt shingles

Limit roof insulation to 2" thick. Specify insulations which provide adequate load-bearing capacity at the 2" thickness.

Part 3 - Execution

Specifically require the roof to be installed in accordance with the manufacturer's recommendations.

Refer to and describe the appropriate SMCNA details for each edge and penetration condition.

Require the roofing installer to receive, accept, and install, all sheet metal flashings.

Specifically prohibit:

- Pitch pans
- Guy wires fastened directly to the deck

Specify (or detail) 3/4" plywood nailers at all parapet walls.

Require a spray test after completion of the roofing system, to be witnessed by the Contractor, Architect, Owner, materials manufacturer, and installing contractor(s).

End of Section 07310
DIVISION 7 - THERMAL AND MOISTURE PROTECTION

Section 07320 - Clay Tile Roofing

Introduction

Systems described in this Section are intended to be installed in situations where the roof slope is at least 4 inches per foot, and where the roofs are not intended to receive regular foot traffic for equipment maintenance.

Specify a complete roofing system, making the materials manufacturer responsible for the roofing and flashing system. Require the materials manufacturer to make periodic inspections of the work in progress to ensure that the completed work will qualify for the required warranties.

Do not use roof deck insulation as the only element in the overall building thermal resistance system. Refer to Section 07200.

This is a section where the consultant should use a "performance specification". Do not specify proprietary manufacturer's names or materials, and do not restrict vendors to a limited list.

Clay tile roof repairs and modifications which are part of a renovation project (e.g. installation of a new exhaust fan) should follow these standards as much as possible. Existing roof warranties must not be compromised. The consultant must prepare a complete specification and details for the required repair work. Generic "flashing as required" notes (which often appear on engineering details for new exhaust fans) are not acceptable.

Be sure to coordinate specification requirements with roofing, flashing, and parapet wall details.

Part 1 - General

- Require that materials manufacturer(s) and installer(s) demonstrate 5 years of successful installations of similar systems.

- Require submittal of manufacturer's literature describing the system, and samples of proposed clay tile.

- Require a pre-installation conference, scheduled after the substrates are complete, and including the Contractor, Architect, Owner, materials manufacturer, and installing subcontractor(s).

- Clay tile roofing is a finish material, not a staging platform for further construction work. Include the following provisions:
  - Require the Contractor to install a "temporary roof" if he desires to "dry-in" the building to allow interior construction to begin or to provide a platform for further exterior construction
  - Describe this requirement as a "Contractor's Option", that is, if he wants to dry-in, he must do so only with a temporary roof
  - Reference the National Roofing Contractor's Association (NRCA) requirements for temporary roofs, including "sacrificial" insulation on metal decks
  - Specifically prohibit "phased roofing"
  - Specifically prohibit all traffic from the finished roof

- Specify expanded warranties as follows:
  - 5 year warranty from the installer covering defects in installation
  - 10 year warranty from the materials manufacturer including defects in materials and installation, and guaranteeing to maintain the system in a waterproof condition for the life of the warranty
  - Renewal option for an additional 10 years from the materials manufacturer
  - Full replacement value without proration
  - Include all components of the roof assembly, from the deck up
• Include sealing of all perimeters, joints, and penetrations
• Both furnished on the University's special warranty form

Part 2 - Products

• Require that all primary and secondary materials be supplied by a single manufacturer, or approved by the primary materials manufacturer, to ensure single-point responsibility for the installation and warranty.

• Specify a manufacturer's standard clay tile roofing system as follows:
  • UL Class A fire rating
  • UL Class 90 wind uplift rating
  • Minimum 30-lb asphalt saturated underlayment
  • Barrel or tapered clay mission tile, closely approximating the existing University context in both color and form.

• Limit roof insulation to 2" thick. Specify insulations which provide adequate load-bearing capacity at the 2" thickness.

Part 3 - Execution

• Specifically require the roof to be installed in accordance with the manufacturer's recommendations.

• Specify only galvanized wire-tied tile installation.

• Refer to and describe the appropriate SMCNA details for each edge and penetration condition.

• Require the roofing installer to receive, accept, and install, all sheet metal flashings.

• Specifically prohibit:
  • Pitch pans
  • Guy wires fastened directly to the deck

• Specify (or detail) 3/4" plywood nailers at all parapet walls.

• Require a spray test after completion of the roofing system, to be witnessed by the Contractor, Architect, Owner, materials manufacturer, and installing contractor(s).

End of Section 07320
DIVISION 7 - THERMAL AND MOISTURE PROTECTION

Section 07410 - Preformed Roof and Wall Panels

Introduction

Systems described in this Section are intended to be installed in situations where the roof slope is at least 2-1/2 inches per foot, and where the roofs are not intended to receive regular foot traffic for equipment maintenance.

Specify a complete roofing system, making the materials manufacturer responsible for the roofing and flashing system. Require the materials manufacturer to make periodic inspections of the work in progress to ensure that the completed work will qualify for the required warranties.

Do not use roof deck insulation as the only element in the overall building thermal resistance system. Refer to Section 07200.

This is a section where the consultant should use a "performance specification". Do not specify proprietary manufacturer's names or materials, and do not restrict vendors to a limited list.

Metal roof repairs and modifications which are part of a renovation project (e.g. installation of a new exhaust fan) should follow these standards as much as possible. Existing roof warranties must not be compromised. The consultant must prepare a complete specification and details for the required repair work. Generic "flashing as required" notes (which often appear on engineering details for new exhaust fans) are not acceptable.

Be sure to coordinate specification requirements with roofing, flashing, and parapet wall details.

Part 1 - General

- Require that materials manufacturer(s) and installer(s) demonstrate 5 years of successful installations of similar systems.

- Require submittal of:
  - Manufacturer's literature describing the system
  - Shop drawings showing panel layout, and all edge, transition, and penetration details
  - Samples of proposed metal panels

- Require a pre-installation conference, scheduled after the substrates are complete, and including the Contractor, Architect, Owner, materials manufacturer, and installing subcontractor(s).

- Metal roofing is a finish material, not a staging platform for further construction work. Include the following provisions:
  - Require the Contractor to install a "temporary roof" if he desires to "dry-in" the building to allow interior construction to begin or to provide a platform for further exterior construction
  - Describe this requirement as a "Contractor's Option", that is, if he wants to dry-in, he must do so only with a temporary roof
  - Reference the National Roofing Contractor's Association (NRCA) requirements for temporary roofs, including "sacrificial" insulation on metal decks
  - Specifically prohibit "phased roofing"
  - Specifically prohibit all traffic from the finished roof

- Specify expanded warranties as follows:
  - 5 year warranty from the installer covering defects in installation
  - 30 year warranty from the materials manufacturer including defects in materials and installation, and guaranteeing to maintain the system in a waterproof condition for the life of the warranty
• Full replacement value without proration
• Include all components of the roof assembly, from the deck up
• Include sealing of all perimeters, joints, and penetrations
• Both furnished on the University's special warranty form

Part 2 - Products

• Require that all primary and secondary materials be supplied by a single manufacturer, or approved by the primary materials manufacturer, to ensure single-point responsibility for the installation and warranty.

• Specify a manufacturer's standard preformed metal roofing system as follows:
  • UL Class A fire rating
  • UL Class 90 wind uplift rating
  • Minimum 15-lb asphalt saturated underlayment
  • Factory formed panels, steel, aluminum, or copper
  • Concealed fastener installation
  • Factory applied polyvinylidene fluoride finish, or natural metal finish intended for exposure to the elements

• Limit roof insulation to 2" thick. Specify insulations which provide adequate load-bearing capacity at the 2" thickness.

• Minimum gauges
  • Roofs 22 ga
  • Walls 18 ga

• Minimum panel width 12"

Part 3 - Execution

• Specifically require the roof to be installed in accordance with the manufacturer's recommendations.

• Refer to and describe the appropriate SMCNA details for each edge and penetration condition.

• Require the roofing installer to receive, accept, and install, all sheet metal flashings.

• Specifically prohibit:
  • Pitch pans
  • Guy wires fastened directly to the deck

• Specify (or detail) 3/4" plywood nailers at all parapet walls.

• Require a spray test after completion of the roofing system, to be witnessed by the Contractor, Architect, Owner, materials manufacturer, and installing contractor(s).

End of Section 07410
DIVISION 7 - THERMAL AND MOISTURE PROTECTION

Section 07500 - Membrane Roofing

Introduction

Systems described under this Section are not intended to receive regular foot traffic. Occasional traffic for maintenance of equipment is acceptable.

Where horizontal surfaces enclosing habited spaces are intended to be regularly occupied or otherwise used for the building occupants’ activities, refer to the requirements of Section 07590 Horizontal Traffic Surfacing.

Specify a complete roofing system, making the materials manufacturer responsible for the roofing and flashing system. Require the materials manufacturer to make periodic inspections of the work in progress to ensure that the completed work will qualify for the required warranties.

The University uses a built-up SBS-modified bitumen roofing system, applied either hot mopped, self adhered or cold emulsion, in virtually all conditions. Use of other roofing systems must receive specific permission from the Project Manager.

- Gravel surface roofs shall NOT be specified.
- Torch-applied materials of any kind shall NOT be specified.
- Single-ply roofs shall NOT be specified.
- Asbestos-containing materials shall NOT be specified.

Do not use roof deck insulation as the only element in the overall building thermal resistance system. Refer to Section 07200.

This is a section where the consultant should use a “performance specification”. Do not specify proprietary manufacturer's names or materials, and do not restrict vendors to a limited list.

Membrane roof repairs and modifications which are part of a renovation project (e.g. installation of a new exhaust fan) should follow these standards as much as possible. Existing roof warranties must not be compromised. The consultant must prepare a complete specification and details for the required repair work. Generic “flashing as required” notes (which often appear on engineering details for new exhaust fans) are not acceptable.

Be sure to coordinate specification requirements with roofing, flashing, and parapet wall details.

Part 1 - General

- Require that materials manufacturer(s) and installer(s) demonstrate 5 years of successful installations of similar systems.

- Require submittal of manufacturer's literature describing the system, and samples of proposed membrane materials.

- Require a pre-installation conference, scheduled after the substrates are complete, and including the Contractor, Architect, Owner, materials manufacturer, and installing subcontractor(s).

- Membrane roofing is a finish material, not a staging platform for further construction work. Include the following provisions:
  - Require the Contractor to install a "temporary roof" if he desires to "dry-in" the building to allow interior construction to begin or to provide a platform for further exterior construction.
  - Describe this requirement as a "Contractor's Option", that is, if he wants to dry-in, he must do so only with a temporary roof.
  - Reference the National Roofing Contractor's Association (NRCA) requirements for temporary roofs, including "sacrificial" insulation on metal decks.
  - Specifically prohibit "phased roofing".
  - Specifically prohibit patches in the finished roof.
• Require that finished roofs be protected with plywood sheets for any and all construction traffic, and that all equipment moving be accomplished with rollers.

• Specify expanded warranties as follows:
  • 5 year warranty from the installer covering defects in installation.
  • 10 year warranty from the materials manufacturer including defects in materials and installation, and guaranteeing to maintain the system in a waterproof condition for the life of the warranty.
  • Renewal option for an additional 10 years from the materials manufacturer.
  • Full replacement value without proration.
  • Include all components of the roof assembly, from the deck up.
  • Include sealing of all perimeters, joints, and penetrations.
  • Both warranties shall be furnished on the University's special warranty form.

• Calculate insulation thickness to allow for 8" minimum clearance for all roof penetrations, doors, curbs, windows, etc.

Part 2 - Products

• Require that all primary and secondary materials be supplied by a single manufacturer, or approved by the primary materials manufacturer, to ensure single-point responsibility for the installation and warranty.

• Specify a manufacturer's standard built-up roofing system as follows:
  • UL Class A fire rating.
  • UL Class 90 wind uplift rating.
  • 3-ply SBS-modified bitumen system. (Base sheet + 2 ply sheets)
  • Mineral surface cap sheet (4th ply)
  • Applied with either hot asphalt mop, self adhered or cold emulsion.

• Limit roof insulation to 2" thick. Specify insulations which provide adequate load-bearing capacity at the 2" thickness.

Part 3 - Execution

• Specifically require the roof to be installed in accordance with the manufacturer's recommendations.

• Refer to and describe the appropriate SMCNA details for each edge and penetration condition. Require the roofing installer to receive, accept, and install, all sheet metal flashings.

• Specifically prohibit:
  • Pitch pans.
  • Guy wires fastened directly to the deck.

• Specify (or detail) 3/4" plywood nailers at all parapet walls.

• Require a spray test after completion of the roofing system, to be witnessed by the Contractor, Architect, Owner, materials manufacturer, and installing contractor(s). Do not require a flood test.

End of Section 07500
DIVISION 7 - THERMAL AND MOISTURE PROTECTION

Section 07570 - Traffic Topping

Introduction

Systems described under this Section are intended to be installed on exterior waking surfaces which do not enclose habited space.

Where horizontal surfaces enclosing habited spaces are intended to be regularly occupied or otherwise used for the building occupants' activities, refer to the requirements of Section 07590 Horizontal Traffic Surfacing.

Specify a complete traffic topping system, making the materials manufacturer responsible for the roofing and flashing system. Require the materials manufacturer to make periodic inspections of the work in progress to ensure that the completed work will qualify for the required warranties.

This is a section where the consultant should use a "performance specification". Do not specify proprietary manufacturer's names or materials, and do not restrict vendors to a limited list.

Traffic topping repairs and modifications which are part of a renovation project should follow these standards as much as possible. Existing warranties must not be compromised. The consultant must prepare a complete specification and details for the required repair work. Generic "flashing as required" notes are not acceptable.

Be sure to coordinate specification requirements with traffic topping, flashing, and parapet wall details.

Part 1 - General

- Require that materials manufacturer(s) and installer(s) demonstrate 5 years of successful installations of similar systems.
- Require submittal of manufacturer's literature describing the system, and samples of proposed membrane materials.
- Require a pre-installation conference, scheduled after the substrates are complete, and including the Contractor, Architect, Owner, materials manufacturer, and installing subcontractor(s).
- Traffic topping is a finish material, not a staging platform for further construction work. Include the following provisions:
  - Specifically prohibit "phased installation" of traffic topping
  - Specifically prohibit patches in the finished membrane
  - Require that finished decks be protected with plywood sheets for any and all construction traffic, and that all equipment moving be accomplished with rollers
- Specify expanded warranties as follows:
  - 5 year warranty from the installer covering defects in installation
  - 10 year warranty from the materials manufacturer including defects in materials and installation, and guaranteeing to maintain the system in a waterproof condition for the life of the warranty
  - Renewal option for an additional 10 years from the materials manufacturer
  - Full replacement value without proration
  - Include all components of the traffic topping assembly, from the deck up
  - Include sealing of all perimeters, joints, and penetrations
  - Both furnished on the University's special warranty form
Part 2 - Products

- Expressly prohibit the use of asbestos-containing materials.
- Require that all primary and secondary materials be supplied by a single manufacturer, or approved by the primary materials manufacturer, to ensure single-point responsibility for the installation and warranty.
- Specify a manufacturer's standard traffic topping system as follows:
  - UL Class A fire rating
  - Manufacturer's proprietary primer
  - Fully-adhered, fabric-reinforced, rubberized urethane waterproof membrane
  - Elastomeric polyurethane wear surface, with integral color and slip-resistant finish
  - Minimum system thickness 225 mils
  - Integral cove flashing

Part 3 - Execution

- Specifically require the traffic topping to be installed in accordance with the manufacturer's recommendations.
- Refer to and describe the appropriate SMCNA details for each edge and penetration condition.
- Require the traffic topping installer to receive, accept, and install, all sheet metal flashings.
- Specifically prohibit:
  - Pitch pans
  - Guy wires fastened directly to the deck
- Specify (or detail) 3/4" plywood nailers at all parapet walls.
- Require a spray test after completion of the roofing system, to be witnessed by the Contractor, Architect, Owner, materials manufacturer, and installing contractor(s).

End of Section 07570
DIVISION 7 - THERMAL AND MOISTURE PROTECTION

Section 07590 - Horizontal Traffic Surfacing

Introduction

Systems described under this Section are intended to be installed on exterior walking surfaces which enclose habited space.

Where horizontal surfaces which do not enclose habited spaces are intended to be regularly occupied or otherwise used for the building occupants' activities, refer to the requirements of Section 07570 Traffic Topping.

Specify a complete horizontal traffic surfacing system, making the materials manufacturer responsible for the surfacing and flashing system. Require the materials manufacturer to make periodic inspections of the work in progress to ensure that the completed work will qualify for the required warranties.

Do not use traffic deck insulation as the only element in the overall building thermal resistance system. Refer to Section 07200.

This is a section where the consultant should use a "performance specification". Do not specify proprietary manufacturer's names or materials, and do not restrict vendors to a limited list.

Horizontal traffic surfacing repairs and modifications which are part of a renovation project should follow these standards as much as possible. Existing warranties must not be compromised. The consultant must prepare a complete specification and details for the required repair work. Generic "flashing as required" notes are not acceptable.

Be sure to coordinate specification requirements with traffic surfacing, flashing, and wall details.

Part 1 - General

• Require that materials manufacturer(s) and installer(s) demonstrate 5 years of successful installations of similar systems.

• Require submittal of:
  
  • Manufacturer's literature describing the system
  • Samples of proposed membrane materials
  • Samples of the proposed pavers

• Require a pre-installation conference, scheduled after the substrates are complete, and including the Contractor, Architect, Owner, materials manufacturer, and installing subcontractor(s).

• Horizontal traffic surfacing is a finish material, not a staging platform for further construction work. Include the following provisions:

  • Require the Contractor to install a "temporary roof" if he desires to "dry-in" the building to allow interior construction to begin or to provide a platform for further exterior construction
  • Describe this requirement as a "Contractor's Option", that is, if he wants to dry-in, he must do so only with a temporary roof
  • Reference the National Roofing Contractor's Association (NRCA) requirements for temporary roofs, including "sacrificial" insulation on metal decks
  • Specifically prohibit "phased" traffic surfacing installation
  • Specifically prohibit patches in the finished membrane
  • Require that finished systems be protected with plywood sheets for any and all construction traffic, and
that all equipment moving be accomplished with rollers

- Specify expanded warranties as follows:
  - 5 year warranty from the installer covering defects in installation
  - 10 year warranty from the materials manufacturer including defects in materials and installation, and guaranteeing to maintain the system in a waterproof condition for the life of the warranty
  - Renewal option for an additional 10 years from the materials manufacturer
  - Full replacement value without proration
  - Include all components of the traffic surfacing assembly, from the deck up, including removal and reinstallation of the pavers
  - Include sealing of all perimeters, joints, and penetrations
  - Both furnished on the University's special warranty form

Part 2 - Products

- Expressly prohibit the use of asbestos-containing materials.

- Require that all primary and secondary materials be supplied by a single manufacturer, or approved by the primary materials manufacturer, to ensure single-point responsibility for the installation and warranty.

- Specify a manufacturer's standard horizontal traffic surfacing system as follows:
  - UL Class A fire rating
  - Fabric-reinforced fully-adhered, rubberized asphalt membrane, 225 mils minimum thickness
  - Integral cove flashing
  - Manufacturer's proprietary protection sheet
  - Manufacturer's proprietary drainage sheet
  - 1” thick, cfc-free, extruded polystyrene foam insulation, approved by horizontal traffic surfacing system manufacturer
  - Precast concrete pavers
    - Special attention shall be given so as to ensure that concrete pavers provide appropriate slip resistance. Stained, coated or painted pavers are expressly prohibited.

Part 3 - Execution

- Specifically require the horizontal traffic surfacing to be installed in accordance with the manufacturer's recommendations.

- Refer to and describe the appropriate SMCNA details for each edge and penetration conditions.

- Require the traffic surfacing installer to receive, accept, and install, all sheet metal flashings.

- Specifically prohibit:
  - Pitch pans
  - Guy wires fastened directly to the deck

- Specify (or detail) 3/4” plywood nailers at all parapet walls.

- Require a spray test after completion of the roofing system, to be witnessed by the Contractor, Architect, Owner, materials manufacturer, and installing contractor(s).

End of Section 07570
DIVISION 7 - THERMAL AND MOISTURE PROTECTION

Section 07600 - Flashing and Sheet Metal

Introduction

Wherever possible, describe flashing systems which use concealed fasteners, clips, and cleats. Where exposed fasteners are unavoidable, specifically describe a fastening system which absolutely prohibits entrance of water, and which will remain watertight for the life of the facility.

Wherever possible, avoid reliance on sealants as the sole means of prohibiting entrance of water.

Use matching materials on renovations of existing buildings which contain copper flashing materials.

Describe all requirements for installation of sheet metal work which is associated with the roofing system and its special warranties in the appropriate roofing section, to maintain single-point responsibility for the roof warranty.

Describe all requirements for sealants in Section 07900.

Specifically detail all conditions on the drawings, including references to specific requirements of the Sheet Metal and Air Conditioning Contractor's National Association (SMACNA) "Architectural Sheet Metal Manual".

Part 1 - General

- Require submittal of shop drawings and details of each condition and joint.

Part 2 - Products

- Specify minimum 24 gauge thickness for galvanized metal, and identify specific heavier gauges where the project requires.
  -OR-
- Specify minimum 16 ounce for copper, and identify specific heavier materials where the project requires.
- Use only minimum 16 ounce copper for masonry through-wall, lintel, or other similar embedded flashings.
- Use only 4 pound lead for roof drain sump pans.
- When necessary, use 4 pound lead for flashings involving compound curves or where sheetmetal can not be adequately formed. This application requires a galvanized sheet metal protective cover.
- Where 2-piece reglets are required, describe the specific shape and substrate conditions, but do not reference proprietary manufacturer's products.
- Do not specify roof jacks or boots which utilize integral neoprene seals.
- Use only galvanized structural steel tube or pipe for downspout sections which are subject to impact and abuse.
- Specify only 50/50 tin/lead solder when applicable.
- Specify only non-corrosive fasteners, same material as metal being fastened, with matching finish on exposed heads. Specify neoprene-backed washers for screw fasteners.

Part 3 - Execution
• Specifically describe requirements for expansion and contraction joints, and for sealing joints in running flashings. Do not rely on generic “provide expansion joints as required” notes.

• Specifically design joints to allow for removal and reinstallation of flashings during re-roofing. Two-piece reglets are preferred.

• Specifically describe requirements for separating dissimilar metals.

End of Section 07600
DIVISION 7 - THERMAL AND MOISTURE PROTECTION

Section 07700 - Roof Specialties and Accessories

Introduction

Include all items which become an integral part of the roof moisture protection system in this Section.

In certain limited situations where items are more appropriately described in other sections (e.g. prefabricated mechanical equipment curbs), make specific cross references in both sections, and require the installation of those items to comply with the requirements of the appropriate Division 7 Section(s).

Describe all requirements for installation of roof accessories which are associated with the roofing system and its special warranties in the appropriate roofing section, to maintain single-point responsibility for the roof warranty.

Accessories which require structural support (e.g. antennae) must be supported from the building structure. Do not specify and expressly prohibit attachments through the roof membrane, and guy wires.

Items which must pass through the roof membrane (e.g. antennae cables) must pass through a conduit. Do not specify and expressly prohibit penetrations directly through the membrane, and cables snaked through other penetrations.

Detail and specify burglar bars (6" maximum spacing each way) in all situations where roof deck openings would otherwise allow entry to the building.

Part 1 - General

- Require submittal of manufacturer's literature, and installation details.

Part 2 - Products

- Specify only metal accessories. Specifically prohibit use of PVC and other plastics.

- Wherever possible, specify accessories which have integral curbs sufficiently tall to permit secure installation of flashing and counterflashing.

- Where roof accessories are not ordinarily curbed, specify and detail custom fabricated curbs.

- Avoid as much as possible accessory units which rely on flat flanges to permit secure application of roof membrane.

Part 3 - Execution

- There are no unique University requirements in this Section.

End of Section 07700
DIVISION 7 - THERMAL AND MOISTURE PROTECTION

Section 07800 - Skylights

Introduction

Avoid use of skylights wherever possible. Clerestories and light monitors are superior solutions. Use skylights, clerestories, and monitors only with specific permission of the Project Manager.

Existing skylights which are part of a renovation project should always be considered for removal or replacement with alternative light gathering elements. Specifically discuss such situations with the Project Manager.

Describe all requirements for flashing and sealing of skylights in the appropriate roofing section, to maintain single-point responsibility for the roof warranty.

Skylights which require structural support must be supported from the building structure. Do not specify and expressly prohibit attachments through the roof membrane.

Detail and specify burglar bars (6" maximum spacing each way) in all situations where roof deck openings would otherwise allow entry to the building.

Part 1 - General

• Require submittal of manufacturer's literature, and installation details.

• Part 2 - Products

• Specify only double-domed, solar-glazed, steel or aluminum-framed skylights.

• Wherever possible, specify skylights which have integral curbs sufficiently tall to permit secure installation of flashing and counterflashing.

• Where the required skylight roof is not integrally curbed, specify and detail custom fabricated curbs.

• Do not use skylights which rely on flat flanges to permit secure application of roof membrane.

• Part 3 - Execution

• There are no unique University requirements in this Section.

End of Section 07800
Section 07900 - Sealants

Introduction

Describe all requirements for installation of sealants required to prohibit the penetration of moisture and dust, and required to seal joints between dissimilar materials, in this Section.

Specify certain specialized sealants which are ordinarily part of a "complete in place" installation by a particular trade (e.g. glazing sealants and painting) in the appropriate sections.

Reliance on caulking which might (or might not) be provided by a painter as part of that finish operation, as the moisture- or dust-seal, is unacceptable.

Pay particular attention in sealant system design to expected joint movement, joint dimensions, sealant position (horizontal, vertical, or overhanging), and potential for physical abuse of the sealed joint.

Specifically describe and detail on the drawings all joints requiring installation of sealants. Generic notes such as "sealant as required" are not acceptable.

This is a section where the Consultant should use a "performance specification". Do not specify proprietary manufacturer's names or materials, and do not restrict vendors to a limited list.

Part 1 - General

• Require that all materials manufacturer(s) and installer(s) demonstrate 5 years of successful installations of similar materials.

• Require submittal of the following:
  • Manufacturer's literature documenting compliance with specification requirements
  • Actual sealant samples for color selection
  • Sample joints, where unique conditions require

• Maximum allowable exterior joint width, for caulking/sealant, shall not exceed 1”.

Part 2 - Products

• Specify each particular type of sealant and sealant system required, including:
  • Primers
  • Backers
  • Fillers
  • Colors

• Expressly prohibit the use of latex and butyl sealants.

• Specify only non-staining materials.

Part 3 - Execution

• Provide a sealant schedule identifying location and type of sealant.

• Specifically require sealants to be installed in accordance with the manufacturer's recommendations.

• Specifically require all joints to be observed by the Owner prior to installation of sealants.

End of Section 07900