

PROVIDE AUXILIARY MEMBRANE MATERIALS recommended by roofing system manufacturer for intended use and compatible with membrane roofing. Liquid-type auxiliary materials shall meet VOC limits of authorities having jurisdiction.

Typical sheet flashing: Manufacturer's standard sheet flashing of same material, type, reinforcement, thickness, and color as PVC sheet membrane.

Alternative un-reinforced flashing: polyolefin sheets flashing of 55 mils minimum of same color as sheet membrane.

Bonding adhesive: Manufacturer's standard solvent-based bonding adhesive for membrane, and solvent-based bonding adhesive for base flashings.

Slip sheet: Manufacturer's recommended slip sheet, of type required for application.

Metal termination bars: Manufacturer's standard predrilled stainless-steel or aluminum bars, approximately 1 by 1/8 inch thick, with anchors.

Metal battens: Manufacturer's standard aluminum-zinc-alloy-coated or zinc-coated steel sheet, approximately 1 inch wide by 0.05 inch thick, prepunched.

Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening membrane to substrate, and acceptable to membrane roofing system manufacturer.

Miscellaneous accessories: Provide poultice sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, termination reglets, cover strips, and other accessories.

AIR RETARDER: Vapor Retarder: ASTM D 4397 polyethylene sheet, 6 mils thick minimum, with maximum permeance rating of 0.13 perm.

ROOF INSULATION: Provide preformed roof insulation boards that comply with requirements and referenced standards, selected from manufacturer's standard sizes and of thicknesses indicated.

Polyisocyanurate board insulation: ASTM C 1289, Type II, with felt or glass-fiber mat facer on both major surfaces.

Minimum Insulation Thickness: Provide multiple layers of insulation with minimum thickness of 1-1/2 inch at drains and eaves, and as required to maintain an overall average minimum aged (15 year time-weighted LTRR) insulation value only (not including substrate or air surfaces) of

R = 30

Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for positive sloping to drain. Fabricate to slopes indicated.

INSULATION ACCESSORIES: Roof insulation accessories recommended by insulation manufacturer for intended use and compatible with membrane roofing.

Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening roof insulation to substrate, and acceptable to roofing system manufacturer.

Cold Fluid-Applied Adhesive: Manufacturer's standard cold fluid-applied adhesive formulated to adhere roof insulation to substrate.

ROOF PROTECTION PADS: Provide non-porous protection pads consisting of a minimum 45 mil membrane matching primary roofing material and color, approved for use by membrane roofing system manufacturer, intended either for heat-welded or self-sticking application to the roof membrane, and as approved for use by membrane roofing system manufacturer, factory-formed or field-cut with corners trimmed to a 2" radius minimum.

WALKWAY PADS: Provide units 24" x 24" minimum or as otherwise indicated on the Drawings.

PIPING SUPPORT REINFORCEMENT: size to extend 6" outside of all piping supports.

PIPING-SUPPORT PROTECTION PADS: 45 mil minimum self-stick membrane matching primary roofing membrane color and type - sized to extend 6" outside of all piping supports setting on top of roof membrane with corners trimed to 2" radius minimum.

PART 3 - EXECUTION

EXAMINATION

EXAMINE SUBSTRATES, AREAS, AND CONDITIONS, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:

VERIFY THAT ROOF OPENINGS AND PENETRATIONS are in place and set and braced and that roof drains are securely clamped in place.

VERIFY THAT WOOD BLOCKING, CURBS, AND NAILERS are securely anchored to roof deck at penetrations and terminations and that nailers match thickness of insulation.

VERIFY THAT SURFACE PLANE FLATNESS and fastening of steel roof deck comply with requirements in Division 5 Section "Steel Deck."

PREPARATION

CLEAN SUBSTRATE of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.

PREVENT MATERIALS FROM ENTERING AND CLOGGING roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

COMPLETE TERMINATIONS AND BASE FLASHINGS and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

AIR BARRIER INSTALLATION:

LOOSELY LAY air barrier in a single layer, side and end lapping each sheet a minimum of 4 inches. Do not seal joints or seams.

INSULATION INSTALLATION

COORDINATE INSTALLING MEMBRANE ROOFING system components so insulation is not exposed to precipitation or left exposed at the end of the workday.

COMPLY WITH membrane roofing system manufacturer's written instructions for installing roof insulation.

INSTALL MULTIPLE LAYERS OF INSULATION under area of roofing to achieve required thickness, with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches in each direction.

TRIM SURFACE OF INSULATION where necessary at roof drains so completed surface is flush and does not restrict flow of water.

INSTALL INSULATION WITH LONG JOINTS of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch with insulation. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.

FASTEN INSULATION ACCORDING TO REQUIREMENTS in FMG's "Approval Guide" for specified Windstorm Resistance Classification - for "Grade-C" metal deck unless otherwise indicated.

Fasten insulation as required for a "fully-adhered" membrane installation (with air-barrier noted above)

ROOF MEMBRANE INSTALLATION - GENERAL

INSTALL ROOFING MEMBRANE over area to receive roofing according to roofing system manufacturer's written instructions. Unroll roofing membrane and allow to relax before installing. Accurately align roofing membranes and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.

LAYOUT MEMBRANE SHEETS with primary seams perpendicular to ribs of metal decking, and with seams lap-shingled with slope of deck when possible.

MECHANICALLY FASTEN all roofing membrane securely at terminations, penetrations, and perimeter of roofing, and seal all edges. Space fasteners for "Grade-C" metal deck unless otherwise indicated. Spread sealant or mastic bed over drain-flanges at deck-drains and securely seal membrane in place with clamping ring.

FULL-WELD SEAMS: Clean entire seam areas, overlap roofing membrane, and hot-air weld full-surface of seams according to manufacturer's written instructions to ensure a watertight seam installation. Probe all seams after welds have cooled to verify seam weld continuity. Apply lap sealant to seal cut edges of roofing membrane.

Verify field strength of seams a minimum of twice daily and repair seam sample areas.

Repair tears, voids, and lapped seams in roofing membrane that does not meet requirements.

AT ADHERED MEMBRANE, apply bonding-adhesive to substrate and underside of membrane roofing at rate required by manufacturer and allow to partially dry before installing membrane roofing. Do not apply to splice area of membrane roofing.

MECHANICALLY-FASTENED ROOFING-MEMBRANE INSTALLATION

IN-SPLICE ATTACHMENT: Secure one edge of roofing membrane using fastening plates or metal battens centered within membrane splice and mechanically fasten roofing membrane to roof deck. Field-splice seam.

THROUGH-MEMBRANE ATTACHMENT: Secure roofing membrane using fastening plates or metal battens and mechanically fasten roofing membrane to roof deck. Cover battens and fasteners with a continuous cover strip.

BASE FLASHING INSTALLATION

INSTALL SHEET FLASHINGS AND PREFORMED FLASHING ACCESSORIES and adhere to substrates according to membrane roofing system manufacturer's written instructions.

APPLY SOLVENT-BASED BONDING ADHESIVE to substrate and underside of sheet flashing at required rate and allow to partially dry. Do not apply bonding adhesive to seam area of flashing.

FLASH PENETRATIONS and field-formed inside and outside corners with sheet flashing.

CLEAN SEAM AREAS AND OVERLAP and firmly roll sheet flashings into the adhesive. Weld side and end laps to ensure a watertight seam installation.

TERMINATE AND SEAL TOP OF SHEET FLASHINGS and mechanically anchor to substrate through termination bars.

WALKWAY & PIPING SUPPORT SHEET INSTALLATION

PROVIDE WALKWAY PADS around sides of all rooftop equipment requiring service or maintenance, leading from the roof-hatch or other access point(s) in a regular pattern, and where specifically indicated on the Drawings. Heat weld to substrate or adhere walkway products to substrate with compatible adhesive according to roofing system manufacturer's written instructions. Place individual units with 6" minimum space between each pad.

INSTALL PIPING SUPPORT PROTECTION PADS (self-stick waste sheet) below all piping supports units provided by others. Clean roofing of dirt and debris prior to installation. Peel-back protective sheeting from protection pad and apply pad securely to surface of roofing membrane.

FIELD QUALITY CONTROL

TESTING AGENCY: Owner reserves the right to engage a qualified independent testing and roof inspecting entity to perform roof tests and inspections and to prepare test reports.

MANUFACTURER'S FINAL ROOF INSPECTION: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion and submit report to Architect.

REPAIR OR REMOVE AND REPLACE components of membrane roofing system where test results or inspections indicate that they do not comply with specified requirements. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

PROTECTING AND CLEANING

PROTECT MEMBRANE ROOFING SYSTEM from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.

CORRECT DEFICIENCIES in or remove membrane roofing system that does not comply with requirements, repair substrates, and repair or reinstall membrane roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

END OF SECTION 07 54 23

ROOF ACCESSORIES

SECTION 07 72 00

PART 1 - GENERAL

RELATED DOCUMENTS: The Drawings, and general provisions of the Contract, including the General and Supplementary Conditions, and Division-1 Sections of the Specifications, apply to this Section.

WORK INCLUDED: Provide roof accessories where indicated on the Drawings, as specified herein, and as necessary for complete installation. Types of applications include but are not limited to the following:

Roof hatches

RELATED SECTIONS include the following:

Division 5 Section "Metal Fabrications" for ladders and miscellaneous metal framing and supports.

Division 6 Section "Rough Carpentry" for roof sheathing, wood ceans, and wood nailers.

STANDARDS: Comply with the following:

SMACNA's "Architectural Steel Metal Manual" details for fabrication of units, including flanges and cap flashing to coordinate with type of roofing indicated.

NRCA's "Roofing and Waterproofing Manual" details for installing units.

SUBMITTALS

PRODUCT DATA: For each type of product indicated. Include construction details, materials, dimensions of individual components and profiles, and finishes.

SHOP DRAWINGS: Show fabrication and installation details. Indicate dimensions, weights, loadings, required clearances, method of field assembly, and components. Include plans, elevations, sections, details, and attachments to other Work.

PART 2 - PRODUCTS

MATERIALS, GENERAL

Aluminum Sheet: ASTM B 209 for alclad alloy 3005H25 or alloy and temper required to suit forming operations, with mill finish, unless otherwise indicated.

Extruded Aluminum: ASTM B 221, alloy 6063-T52 or alloy and temper required to suit structural and finish requirements, with mill finish, unless otherwise indicated.

Galvanized Steel Sheet: ASTM A 653 with G90 coating designation; commercial quality, unless otherwise indicated.

Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A 792 with Class AZ-50 coating, structural quality, Grade 40, or as required for strength.

Insulation: Manufacturer's standard rigid or semirigid glass-fiber board of thickness indicated.

Wood Nailers: Softwood lumber, pressure treated with waterborne preservatives for aboveground use, complying with AWPA C2, not less than 1-1/2 inches thick.

Security Grilles: 3/4-inch-diameter, hardened steel bars spaced 6 inches o.c. in one direction and 12 inches o.c. in the other. Weld bar intersections and ends of bars to structural frame or primary curb walls. Clean and paint with rust-inhibitive metal primer.

Fasteners: Same metal as metals being fastened, or nonmagnetic stainless steel or other noncorrosive metal as recommended by manufacturer. Match finish of exposed fasteners with finish of material being fastened.

Where removing exterior exposed fasteners affords access to building, provide nonremovable fastener heads.

Gaskets: Manufacturer's standard tubular or fingered design of neoprene, EPDM, or PVC; or flat design of foam rubber, sponge neoprene, or cork.

Bituminous Coating: SSPC-Paint 12, solvent-type bituminous mastic, nominally free of sulfur and containing no asbestos fibers, compounded for 15-mil dry film thickness per coating.

Mastic Sealant: Polyisobutylene; nonhardening, nonskinning, nondrying, nonmigrating sealant.

Elastomeric Sealant: Generic type recommended by unit manufacturer that is compatible with joint surfaces; ASTM C 920, Type S, Grade NS, Class 25, and Uses NT, G, A, and, as applicable to joint substrates indicated, O.

Roofing Cement: Prde materials compatible with roofing membrane, and approved for use by roofing manufacturer, per requirements of roofing system warranty.

CONCRETE SPLASH-BLOCK: Provide reinforced, 3000 PSI minimum pre-cast concrete splash-block, 12" wide x 30" deep minimum where indicated on the Drawings.

ROOF HATCHES WITH SAFETY POST & RAILING SYSTEM:

FABRICATE UNITS TO WITHSTAND 40-lb/sq. ft. external and 20-lb/sq. ft. internal loading pressure. Frame with minimum 12-inch-high, integral-curb, double-wall construction with 1-1/2-inch insulation, formed ceans and cap flashing (roofing counterflashing), with welded or sealed mechanical corner joints. Reinforce frame at corners for mounting safety railing. Provide double-wall cover (lid) construction with 1-inch-thick insulation core. Provide gasketing and equip with corrosion-resistant or hot-dip galvanized hardware including pinle hinges, hold-open devices, interior padlock lugs, and both interior and exterior latch handles.

TYPE: Single-lift personnel access.

SIZE: For Ladder Access (typical): 30 by 36 inches, or as otherwise indicated on drawings

MATERIAL: Aluminum or galvanized steel, or in combination

FINISH: Baked enamel in high-gloss "Safety red" color

AVAILABLE MANUFACTURERS: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

Acrulight
Bilco Company.
Custom Curb, Inc.
Greller Enterprises.
J. L. Industries, Inc.
Milcor, Inc.
O'Keefe's Inc.
Roof Products & Systems Corp.
Trimco, Inc.
Wisco Products, Inc.

Alucock-Davis Hatchways, Inc.
Bristolite Skylights
Dur-Red Products, Inc.
Pro International, Inc.
Metallic Products Corporation.
Nystrom Products Co.
Precision Stair Corporation.
ThyCurb, Inc.

LADDER SAFETY POST: Manufacturer's standard ladder safety post. Post to lock in place on full extension. Provide release mechanism to return post to closed position.

Height: 42 inches above finished roof deck.

Material and Finish: 1-5/8" minimum diameter galvanized steel tube or mill finished aluminum.

SAFETY RAILING SYSTEM: "KeeHatch" Railing System Model # RHSR-SS by Kee Industrial Products Inc. of Buffalo NY (www.kee-hatch.com/us/) or equivalent manufacturer's standard complete system including rails, clamps, fasteners, safety barrier at railing opening, and all accessories required for a complete installation.

Height: 42 inches above finished roof deck.

Pipe or Tube: 1-1/4-inch ID galvanized pipe or 1-5/8-inch OD galvanized tube.

Chain Passway Enclosure: Galvanized proof coil chain with quick link on fixed end.

Pipe Ends and Tops: Covered or plugged with weather-resistant material.

Provide weep holes or another means to drain entrapped water in hollow sections of handrail and railing members that are exposed to exterior or to moisture from condensation or other sources.

Fabricate joints that will be exposed to weather in a watertight manner.

Close exposed ends of handrail and railing members with prefabricated end fittings.

FINISHES, GENERAL

COMPLY WITH NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

PROTECT MECHANICAL FINISHES on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

APPEARANCE OF FINISHED WORK: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

INSTALLATION

COMPLY WITH MANUFACTURER'S written instructions. Coordinate installation of roof accessories with installation of roof deck, roof insulation, flashing, roofing membranes, penetrations, equipment, and other construction involving roof accessories to ensure that each element of the Work performs properly and that combined elements are watertight and weatherproof. Anchor roof accessories securely to supporting structural substrates so they are capable of withstanding lateral and thermal stresses, and inward and outward loading pressures.

INSTALL ROOF ACCESSORY ITEMS according to construction details of NRCA's "Roofing and Waterproofing Manual," unless otherwise indicated. Comply with all requirements of the roofing system's warranty requirements, so that warranty is not adversely affected by installation of units.

SEPARATE METAL FROM INCOMPATIBLE METAL or corrosive substrates, including wood, by coating concealed surfaces, at locations of contact, with bituminous coating or providing other permanent separation.

FLANGE SEALS: Unless otherwise indicated, set flanges of accessory units in a thick bed of roofing cement to form a seal.

CAP FLASHING: Where required as component of accessory, install cap flashing to provide waterproof overlap with roofing or roof flashing (as counterflashing). Seal overlap with thick bed of mastic sealant.

OPERATIONAL UNITS: Test-operate units with operable components. Clean and lubricate joints and hardware. Adjust for proper operation.

CLEANING AND PROTECTION

CLEAN EXPOSED SURFACES according to manufacturer's written instructions. Touch up damaged metal coatings.

END OF SECTION 07 72 00

FIRESTOP SYSTEMS

SECTION 07 84 00

PART 1 - GENERAL

RELATED DOCUMENTS: The Drawings, and general provisions of the Contract, including the General and Supplementary Conditions, and Division-1 Sections of the Specifications, apply to this Section.

THIS SECTION INCLUDES through-penetration firestop systems for penetrations through the following fire-resistance-rated assemblies, including both empty openings and openings containing penetrating items:

Top of demising partition seals.

PERFORMANCE REQUIREMENTS

PROVIDE THROUGH-PENETRATION FIRESTOP SYSTEMS that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of assembly penetrated.

Fire-resistance-rated non-load-bearing walls, including partitions, with fire-protection-rated openings.

F-RATED SYSTEMS: Provide through-penetration firestop systems with F-ratings indicated, as determined per ASTM E 814, but not less than that equaling or exceeding fire-resistance rating of constructions penetrated.

FOR PIPING PENETRATIONS for plumbing and wet-pipe sprinkler systems, provide moisture-resistant through-penetration firestop systems. For penetrations involving insulated piping, provide through-penetration firestop systems not requiring removal of insulation.

SUBMITTALS

PRODUCT DATA: For each type of through-penetration firestop system product indicated.

SHOP DRAWINGS: For each through-penetration firestop system, show each kind of construction condition penetrated, relationships to adjoining construction, and kind of penetrating item. Include firestop design designation of testing and inspecting agency acceptable to authorities having jurisdiction that evidences compliance with requirements for each condition indicated.

QUALITY ASSURANCE

INSTALLER QUALIFICATIONS: An experienced installer who has completed through-penetration firestop systems similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

SOURCE LIMITATIONS: Obtain through-penetration firestop systems, for each kind of penetration and construction condition indicated, from a single manufacturer.

FIRE-TEST-RESPONSE CHARACTERISTICS: Provide through-penetration firestop systems that comply with the following requirements and those specified in "Performance Requirements" Article:

Firestopping tests are performed by a qualified testing and inspecting agency. A qualified testing and inspecting agency is UL or another agency performing testing and follow-up inspection services for firestop systems acceptable to authorities having jurisdiction.

Through-penetration firestop systems are identical to those tested per ASTM E 814. Provide rated systems complying with the following requirements.

Through-penetration firestop system products bear classification marking of qualified testing and inspecting agency.

Through-penetration firestop systems correspond to those indicated by reference to through-penetration firestop system designations listed by the following:

UL in "Fire Resistance Directory."

DELIVERY, STORAGE, AND HANDLING

DELIVER PRODUCTS to Project site in original, unopened containers or packages with intact and legible manufacturers' labels identifying product and manufacturer; date of manufacture; lot number; shelf life, if applicable; qualified testing and inspecting agency's classification marking applicable to Project; curing time; and mixing instructions for multicomponent materials.

STORE AND HANDLE MATERIALS for through-penetration firestop systems to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.

PROJECT CONDITIONS

ENVIRONMENTAL LIMITATIONS: Do not install through-penetration firestop systems when ambient or substrate temperatures are outside limits permitted by through-penetration firestop system manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.

VENTILATE through-penetration firestop systems per manufacturer's written instructions by natural means or, where this is inadequate, forced-air circulation.

COORDINATION

COORDINATE CONSTRUCTION of openings and penetrating items to ensure that through-penetration firestop systems are installed according to specified requirements.

COORDINATE SIZING of sleeves, openings, core-drilled holes, or cut openings to accommodate through-penetration firestop systems.

PART 2 - PRODUCTS

AVAILABLE MANUFACTURERS: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

DAP Inc.
Firestop Systems Inc.
Hilti Construction Chemicals, Inc.
Specified Technologies Inc.
3M Fire Protection Products.
Tremco.
United States Gypsum Company.

FIRESTOPPING, GENERAL

COMPATIBILITY: Provide through-penetration firestop systems that are compatible with one another, with the substrates forming openings, and with the items, if any, penetrating through-penetration firestop systems, under conditions of service and application, as demonstrated by through-penetration firestop system manufacturer based on testing and field experience.

ACCESSORIES: Provide components for each through-penetration firestop system that are needed to install fill materials and to comply with "Performance Requirements" Article. Use only components specified by through-penetration firestop system manufacturer and approved by the qualified testing and inspecting agency for firestop systems indicated. Accessories include, but are not limited to, the following items:

Permanent forming/damming/backing materials, including the following:

Slag-rock-wool-fiber insulation.

Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state.

Fire-rated form board.

Fillers for sealants.

Temporary forming materials.

Substrate primers.

Collars.

Steel sleeves.

ACCESSORIES: Provide components for each through-penetration firestop system that are needed to install fill materials and to comply with "Performance Requirements" Article. Use only components specified by through-penetration firestop system manufacturer and approved by the qualified testing and inspecting agency for firestop systems indicated. Accessories include, but are not limited to, the following items:

Permanent forming/damming/backing materials, including the following:

Slag-rock-wool-fiber insulation.

Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state.

Fire-rated form board.

Fillers for sealants.

Temporary forming materials.

Substrate primers.

Collars.

Steel sleeves.

FILL MATERIALS

GENERAL: Provide through-penetration firestop systems containing the types of fill materials indicated in the Through-Penetration Firestop System Schedule at the end of Part 3 by reference to the types of materials described in this Article. Fill materials are those referred to in directories of the referenced testing and inspecting agencies as fill, void, or cavity materials.

LATEX SEALANTS: Single-component latex formulations that after cure do not re-emulsify during exposure to moisture.

FIRESTOP DEVICES: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.

INTUMESCENT PUTTIES: Nonhardening dielectric, water-resistant putties containing no solvents, inorganic fillers, or silicone compounds.

INTUMESCENT WRAP STRIPS: Single-component intumescent elastomeric sheets with aluminum foil on one side.

MORTARS: Prepackaged, dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogeneous mortar.

SILICONE FOAMS: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

SILICONE SEALANTS: Moisture-curing, single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below:

Grade for Vertical Surfaces: Nonsag formulation for openings in vertical and other surfaces.

PART 3 - EXECUTION

EXAMINATION: Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

PREPARATION

Surface Cleaning: Clean out openings immediately before installing through-penetration firestop systems to comply with written recommendations of firestop system manufacturer and the following requirements:

Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of through-penetration firestop systems.

Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with through-penetration firestop systems. Remove loose particles remaining from cleaning operation.

PRIMING: Prime substrates where recommended in writing by through-penetration firestop system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

USE MASKING TAPE to prevent through-penetration firestop systems from contacting adjoining surfaces that will remain exposed on completion of Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove smears from firestop system materials. Remove tape as soon as possible without disturbing firestop system's seal with substrates.

THROUGH-PENETRATION FIRESTOP SYSTEM INSTALLATION

INSTALL FIRESTOP SYSTEMS to comply with "Performance Requirements" Article and firestop system manufacturer's written installation instructions and published drawings for products and applications indicated.

INSTALL FORMING/DAMMING/BACKING MATERIALS and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated. After installing fill materials, remove combustible forming materials and other accessories not indicated as permanent components of firestop systems.

INSTALL FILL MATERIALS for firestop systems by proven techniques to produce the following results:

Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.

Apply materials so they contact and adhere to substrates formed by openings and penetrating items. For fill materials that will remain exposed after completing Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

IDENTIFY THROUGH-PENETRATION FIRESTOP SYSTEMS with pressure-sensitive, self-adhesive, preprinted vinyl labels. Attach labels permanently to surfaces of penetrated construction on both sides of each firestop system installation where labels will be visible to anyone seeking to remove penetrating items or firestop systems. Include the following information on labels:

The words: "Warning-Through-Penetration Firestop System-Do Not Disturb. Notify Building Management of Any Damage."

Contractor's name, address, and phone number.

Through-penetration firestop system designation of applicable testing and inspecting agency.

Date of installation.

Through-penetration firestop system manufacturer's name.

Installer's name.

CLEANING AND PROTECTION

CLEAN OFF EXCESS FILL MATERIALS adjacent to openings as Work progresses by methods and with cleaning materials that are approved in writing by through-penetration firestop system manufacturers and that do not damage materials in which openings occur.

PROVIDE FINAL PROTECTION AND MAINTAIN CONDITIONS during and after installation that ensure through-penetration firestop systems are without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated through-penetration firestop systems immediately and install new materials to produce through-penetration firestop systems complying with specified requirements.

THROUGH-PENETRATION FIRESTOP SYSTEM SCHEDULE:

WHERE UL-CLASSIFIED SYSTEMS ARE INDICATED, they refer to the alpha-alpha-numeric designations listed in UL's "Fire Resistance Directory" under product Category XHEZ.

TOP OF WALL SEAL: UL # HW-D-0034 using sealant or approved equivalent.