

**DEPARTMENT OF TRANSPORTATION**

DIVISION OF ENGINEERING SERVICES

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September 13, 2013

11-SD-5506

11-287704

Project ID 1100000345

Addendum No. 2

Dear Contractor:

This addendum is being issued to the contract for BUILDING CONSTRUCTION IN SAN DIEGO COUNTY IN SAN DIEGO AT THE KEARNY MESA MATERIALS LAB.

Submit bids for this work with the understanding and full consideration of this addendum. The revisions declared in this addendum are an essential part of the contract.

Bids for this work will be opened on Thursday, September 26, 2013.

This addendum is being issued to revise the project plans and the *Notice to Bidders and Special Provisions*.

Project plan sheets 16, 18, 26, 35, 37, 42, 43, 44, 45, 46, 47, 48, 49, 50, and 51 are replaced and attached for substitution for the like-numbered sheets.

In the Special Provisions, Section 99-075423, is added as attached.

To *Bid* book holders:

Inquiries or questions in regard to this addendum must be communicated as a bidder inquiry and must be made as noted in the *Notice to Bidders* section of the *Notice to Bidders and Special Provisions*.

Indicate receipt of this addendum by filling in the number of this addendum in the space provided on the signature page of the *Bid* book.

Submit bids in the *Bid* book you now possess. Holders who have already mailed their book will be contacted to arrange for the return of their book.

Inform subcontractors and suppliers as necessary.

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This addendum and attachment are available for the Contractors' download on the Web site:

**[http://www.dot.ca.gov/hq/esc/oe/project\\_ads\\_addenda/11/11-287704](http://www.dot.ca.gov/hq/esc/oe/project_ads_addenda/11/11-287704)**

If you are not a *Bid* book holder, but request a book to bid on this project, you must comply with the requirements of this letter before submitting your bid.

Sincerely,



LAURIE BERMAN  
District Director

Attachment

## **99-075423 - THERMOPLASTIC POLYOLEFIN (TPO) ROOFING**

### **99-075423A General**

#### **99-075423A(1) Summary**

Scope:

- 1.. Mechanically fastened thermoplastic polyolefin (TPO) roofing system.
2. Vapor retarder.
3. Roof insulation.

#### **99-075423A(2) Definitions**

Roofing Terminology: Definitions in ASTM D 1079 and glossary in NRCA's "The NRCA Roofing and Waterproofing Manual" apply to work of this Section.

#### **99-075423A(3) Preinstallation Meetings**

Not Used

#### **99-075423A(4) Action Submittals**

Product Data: For each type of product.

Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other work, including:

1. Base flashings and membrane terminations.
2. Tapered insulation, including slopes.
3. Roof plan showing orientation of steel roof deck and orientation of roofing, fastening spacings, and patterns for mechanically fastened roofing.
4. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.

Samples for Verification: For the following products:

1. Sheet roofing, of color required.
2. Walkway pads or rolls, of color required.

#### **99-075423A(5) Informational Submittals**

Qualification Data: For Installer and manufacturer.

Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.

Submit evidence of compliance with performance requirements.

Product Test Reports: For components of roofing system, tests performed by manufacturer and witnessed by a qualified testing agency.

Research/Evaluation Reports: For components of roofing system, from ICC-ES.

Field quality-control reports.

Sample Warranties: For manufacturer's special warranties.

#### **99-075423A(6) Closeout Submittals**

Maintenance Data: For roofing system to include in maintenance manuals.

**99-075423A(7) Quality Assurance**

Manufacturer Qualifications: A qualified manufacturer that is UL listed and FM Global approved for roofing system identical to that used for this Project.

Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.

**99-075423A(8) Delivery, Storage, and Handling**

Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.

Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.

Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

Handle and store roofing materials, and place equipment in a manner to avoid permanent deflection of deck.

**99-075423A(9) Field Conditions**

Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

**99-075423A(10) Warranty**

Special Warranty: Manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period.

Special warranty includes roofing, base flashings, roof insulation fasteners, cover boards, substrate board, roofing accessories, and other components of roofing system.

Warranty Period: 20 years from date of Substantial Completion.

**99-075423B Products****99-075423B(1) Manufacturers**

Source Limitations: Obtain components including roof insulation fasteners for roofing system from same manufacturer as membrane roofing or manufacturer approved by membrane roofing manufacturer.

**99-075423B(2) Performance Requirements**

General Performance: Installed roofing and base flashings must withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Roofing and base flashings must remain watertight.

Accelerated Weathering: Roofing system must withstand 2000 hours of exposure when tested according to ASTM G 152, ASTM G 154, or ASTM G 155.

Impact Resistance: Roofing system must resist impact damage when tested according to ASTM D 3746 or ASTM D 4272.

Material Compatibility: Roofing materials must be compatible with one another and adjacent materials under conditions of service and application required, as demonstrated by roofing manufacturer based on testing and field experience.

Roofing System Design: Tested by a qualified testing agency to resist the following uplift pressures:

Corner Uplift Pressure: 53 lbf/sq. ft.

Perimeter Uplift Pressure: 36 lbf/sq. ft.

Field-of-Roof Uplift Pressure: 21 lbf/sq. ft.

FM Global Listing: Roofing, base flashings, and component materials must comply with requirements in FM Global 4450 or FM Global 4470 as part of a built-up roofing system, and must be listed in FM Global's "RoofNav" for Class 1 or noncombustible construction, as applicable. Identify materials with FM Global markings.

Fire/Windstorm Classification: Class 1A-90.

Hail-Resistance Rating: MH.

Solar Reflectance Index: Not less than 78 when calculated according to ASTM E 1980, based on testing identical products by a qualified testing agency.

Energy Star Listing: Roofing system must be listed on the DOE's ENERGY STAR "Roof Products Qualified Product List" for low-slope roof products.

Energy Performance: Roofing system must have an initial solar reflectance index of not less than 0.70 and an emissivity of not less than 0.75 when tested according to CRR-1.

Exterior Fire-Test Exposure: ASTM E 108 or UL 790, Class A; for application and roof slopes indicated; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

### **99-075423B(3) TPO Roofing**

Fabric-Reinforced TPO Sheet: ASTM D 6878, internally fabric- or scrim-reinforced, uniform, flexible fabric-backed TPO sheet.

Thickness: 80 mils, nominal.

Exposed Face Color: White

### **99-075423B(4) Auxiliary Roofing Materials**

General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with roofing.

Liquid-type auxiliary materials must comply with VOC limits of 24 CA Code of Regs Pt 11 and with local requirements if more stringent.

Sheet Flashing: Manufacturer's standard unreinforced TPO sheet flashing, 80 mils thick, minimum, of same color as TPO sheet.

Bonding Adhesive: Manufacturer's standard, water based.

Slip Sheet: Manufacturer's standard, of thickness 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 complying with corrosion-resistance provisions in FM Global 4470, designed for fastening roofing to substrate, and acceptable to roofing system manufacturer.

Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, lap sealants, termination reglets, and other accessories.

**99-075423B(5) Substrate Boards**

Not Used

**99-075423B(6) Vapor Retarder**

Polyethylene Film: ASTM D 4397, 6 mils thick, minimum, with maximum permeance rating of 0.13 perm.

Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.

**99-075423B(7) Roof Insulation**

General: Preformed roof insulation boards manufactured or approved by TPO roofing manufacturer, selected from manufacturer's standard sizes suitable for application, of thicknesses indicated and that produce FM Global-approved roof insulation.

Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class 1, Grade 3, felt or glass-fiber mat facer on both major surfaces.

Tapered Insulation: Provide factory-tapered insulation boards fabricated to slope of 1/4 inch per 12 inches unless otherwise indicated.

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

**99-075423B(8) Insulation Accessories**

General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatibility with roofing.

Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Global 4470, designed for fastening roof insulation and cover boards to substrate, and acceptable to roofing system manufacturer.

Insulation Adhesive: Insulation manufacturer's recommended adhesive formulated to attach roof insulation to substrate or to another insulation layer as follows:

Bead-applied, low-rise, one-component or multicomponent urethane adhesive.

Cover Board: ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum substrate, 1/2 inch thick, factory primed.

Protection Mat: Woven or nonwoven polypropylene, polyolefin, or polyester fabric, water permeable and resistant to UV degradation, type and weight as recommended by roofing system manufacturer for application.

**99-075423B(9) Asphalt Materials**

Not Used

**99-075423B(10) Ballast**

Not Used

**99-075423B(11) Walkways**

Flexible Walkways: Factory-formed, nonporous, heavy-duty, slip-resisting, surface-textured walkway pads, approximately 3/16 inch thick and acceptable to roofing system manufacturer.

## **99-075423C - Execution**

### **99-075423C(1) Examination**

Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work:

Verify that roof openings and penetrations are in place, curbs are set and braced, and roof-drain bodies 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 thicknesses of insulation.

Proceed with installation only after unsatisfactory conditions have been corrected.

### **99-075423C(2) 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.

### **99-075423C(3) Roofing Installation, General**

Install roofing system according to roofing system manufacturer's written instructions.

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.

### **99-075423C(4) Substrate Board Installation**

Not Used

### **99-075423C(5) Vapor-Retarder Installation**

Polyethylene Film: Loosely lay polyethylene-film vapor retarder in a single layer over area to receive vapor retarder, side and end lapping each sheet a minimum of 2 inches and 6 inches, respectively. Continuously seal side and end laps with tape.

Completely seal vapor retarder at terminations, obstructions, and penetrations to prevent air movement into roofing system.

### **99-075423C(6) Insulation Installation**

Coordinate installing roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.

Comply with roofing system and insulation manufacturer's written instructions for installing roof insulation.

Install tapered insulation under area of roofing to conform to slopes indicated.

Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2.7 inches or greater, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches in each direction.

Where installing composite and noncomposite insulation in two or more layers, install noncomposite board insulation for bottom layer and intermediate layers, if applicable, and install composite board insulation for top layer.

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.

**Mechanically Fastened and Adhered Insulation:** Install each layer of insulation to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type.

Fasten first layer of insulation to resist uplift pressure at corners, perimeter, and field of roof.

Set each subsequent layer of insulation in a uniform coverage of full-spread insulation adhesive, firmly pressing and maintaining insulation in place.

Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches in each direction. Loosely butt cover boards together and fasten to roof deck.

Fasten cover boards to resist uplift pressure at corners, perimeter, and field of roof.

Install slip sheet over cover board and immediately beneath roofing.

#### **99-075423C(7) Adhered Roofing Installation**

Not Used

#### **99-075423C(8) Mechanically Fastened Roofing Installation**

Mechanically fasten roofing over area to receive roofing according to roofing system manufacturer's written instructions. Unroll roofing and allow to relax before retaining.

Start installation of roofing in presence of roofing system manufacturer's technical personnel.

Accurately align roofing, and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.

Mechanically fasten or adhere roofing securely at terminations, penetrations, and perimeter of roofing.

Apply roofing with side laps shingled with slope of roof deck where possible.

**In-Seam Attachment:** Secure one edge of TPO sheet using fastening plates or metal battens centered within seam, and mechanically fasten TPO sheet to roof deck.

**Seams:** Clean seam areas, overlap roofing, and hot-air weld side and end laps of roofing and sheet flashings according to manufacturer's written instructions to ensure a watertight seam installation.

Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of sheet.

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

Repair tears, voids, and lapped seams in roofing that do not comply with requirements.

Spread sealant bed over deck-drain flange at roof drains, and securely seal roofing in place with clamping ring.

#### **99-075423C(9) Loosely Laid and Ballasted Roofing Installation**

Not Used

#### **99-075423C(10) Base Flashing Installation**

Install sheet flashings and preformed flashing accessories, and adhere to substrates according to roofing system manufacturer's written instructions.

Apply bonding adhesive to substrate and underside of sheet flashing at required rate, and allow to partially dry. Do not apply to seam area of flashing.

Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.

Clean seam areas, overlap, and firmly roll sheet flashings into the adhesive. Hot-air 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.

**99-075423C(11) Walkway Installation**

Flexible Walkways: Install walkway products in locations indicated. Heat weld to substrate or adhere walkway products to substrate with compatible adhesive according to roofing system manufacturer's written instructions.

**99-075423C(12) Field Quality Control**

Testing Agency: Engage a qualified testing agency to inspect substrate conditions, surface preparation, membrane application, flashings, protection, and drainage components, and to furnish reports to Engineer.

Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion.

Repair or remove and replace components of roofing system where inspections indicate that they do not comply with specified requirements.

Additional testing and inspecting, at Contractor's expense, will be performed to determine if replaced or additional work complies with specified requirements.

**99-075423C(13) Protecting and Cleaning**

Protect roofing system from damage and wear during remainder of construction period. When remaining construction does not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report to the Engineer.

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