SECTION 07 54 19 - SINGLE PLY PVC REROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. All roofing areas, flashings, penetrations and equipment shall be included in the work under this section.

B. Furnish materials and perform labor as specified and as necessary to complete the specified reroofing, including but not limited to these major items:

1. Removal and disposal of existing single ply, built-up or cap sheet roofing material from specified roofs and walls and reroofing with a California Title 24 compliant 60 mil single ply PVC membrane over insulation and Dens Deck underlayment board. Color to be designated from factory available colors.
2. Removal and disposal of existing coating at rotunda dome and reroofing with a California Title 24 compliant 80 mil single ply felt-backed PVC membrane adhered over the concrete substrate.
3. Roofing shall be fully adhered in all sections. Except system shall be mechanically attached on the landside canopies and penthouses.
4. Installation of tapered insulation and crickets behind equipment or elsewhere as required correcting inadequate drainage. (See tapered insulation plans.)
5. Installation of new cast iron drains and overflow drains.
6. Water testing of existing drains.
7. Installation of walkway pads.
8. Installation of new metal ladders where designated.
9. Installation of new PVC expansion joints to replace existing metal expansion joints.
10. NOTE: The entire roof surface shall be washed after completion of installation.
11. NOTE: Owner to oversee the work shall utilize City and/or private inspection services.
12. NOTE:. Tear-off and disposal of asbestos containing materials must be performed in accordance with governing codes and regulations.

1.2 PERFORMANCE REQUIREMENTS

A. General: Provide and install specified membrane and its base flashings that remain watertight, do not pond water, resist thermal movement and resist exposure to weather without failure.

B. Factory Mutual Research Corporation (FM) – Norwood, MA

1. Class 1-90

C. Underwriters Laboratories, Inc. (UL) – Northbrook, IL

1. Class A Assembly

D. Solar Reflectance Index (SRI)

1. Solar Reflective Index of 104

E. Accelerated Weathering – ASTM G154

1. Minimum 5000 hours without cracking, crazing or discoloration.

1.3 REFERENCES

A. American Society for Testing & Materials (ASTM)

B. Federal Specifications (FS)

C. Underwriters 1 Laboratories (UL)

D. Factory Mutual (FM)

E. Los Angeles Research Report (LARR)

1.4 QUALITY ASSURANCE

A. Compliance to Specifications

1. Roofing foreman shall have a copy of these specifications on the job at all times during application and shall refer to same for proper application methods.
2. Whenever specification items found herein are less stringent than the roofing manufacturer's published specifications, the manufacturer's minimum *requirements* shall be followed. Owner will invite the roofing manufacturer's representative to the pre-construction conference, and the representative will visit the work in progress.
3. Written specifications submitted to the roofing contractor do not relieve the roofing contractor of his obligation to thoroughly check the size, substrate, slope and other conditions of the roof.
4. Contractor must provide product data submittals of roofing materials and components including MSDS information and physical samples of materials at the pre-construction conference, for the purpose of review and approval by NRC prior to the start of the work.

B. Regulatory Requirements

1. Fire Regulations: Roofing contractor shall be responsible for meeting fire regulations. A certified fire extinguisher of adequate size shall be located on the roof near the work.
2. Roof Membrane Attachment: Membrane attachment shall conform to roofing manufacturer, California Building Code, Factory Mutual and shall include upgrades to modify attachment for special requirements in area where building is located.
   a. Minimum attachment shall conform to FM I-90.
3. Safety barriers shall be erected around chute to dumpster for demolition, and ladder to roof level. A person shall be on the ground to watch at all times when work is in progress

at roof edges above. Warning tape shall be placed at material storage location and roof edges where roofing is in progress.

4. Roofing contractor shall be responsible to meet OSHA and Cal-OSHA requirements for safety of all involved and around buildings. Workers shall be properly restrained from falling when working near building edges.
5. Hazardous materials shall be disposed of according to government regulations. See hazardous materials report.
6. Roofing contractor shall obtain any required permits from the City of Los Angeles as needed.

C. Quality Control

1. National Roofing Consultants (NRC), 118 Lincoln Ave, Pomona CA 91767, Phone (909) 620-0177, will provide periodic quality control inspections.
2. Responsibility for Payment: Owner will provide and make payment to NRC for all daily observation, however, the roofing contractor will be responsible (by whatever arrangements are mutually agreed upon between the roofing contractor and the Airport) for observation costs incurred as the result of unapproved time delays and observation costs incurred when work is not performed as scheduled.
3. At option of and where designated by the NRC representative, 1-1/2" sample welds shall be taken by roofing contractor each morning and afternoon prior to commencing application. Areas from which test cuts have been taken shall be repaired in manner directed by NRC representative and manufacturer representative as part of the work
4. Coordination
    a. a. Job Conference: Prior to commencement of work Owner representative 1 shall arrange a conference to be held at the job site to review specifications and to walk deck. Roofing contractor, manufacturer representative, Owner representative, and NRC representative are to be in attendance.
    b. Notification: The roofing contractor shall give 72 hours prior notice to consulting service before starting application and shall notify the same each time work is to be performed. Lack of notification of work schedule changes shall result in compensation for NRC's lost time and expenses at the contractor's expense.
    c. Final/Punch List
        (1) Consulting service and Owner representative shall be notified upon completion of roof and shall return and do final/punch list.

D. Roofing Contractor’s Qualifications

1. Bidder must include, with bid, a letter from manufacturer stating that bidder is certified to install manufacturer's product.
2. Bidder must include a minimum of three (3) similar projects within the last two (2) years with the names of contacts. Failure to submit list may disqualify bid.
3. Job Experience: The roofing contractor installing the system shall have a minimum of two (2) years of experience successfully applying the same or similar materials. The roofing contractor shall only use skilled workmen who are familiar with the products and application methods.

E. Coordination

1. Contractor is required to attend a pre-construction conference with the Inspector and Owners representative and material manufacturer representative, which will establish start date.

1.5 SUBMITTALS

A. Necessary items pertaining to Section 1.4A4.

B. Necessary items pertaining to Section 1.4E1.

1.6 DELIVERY, STORAGE AND HANDLING

A. Delivery: Deliver all materials in their original containers with seals unbroken and manufacturer label and product identification clearly legible on each package.

B. Storage: Store materials at site on end on pallets and under cover and maintain in dry condition.

1.7 PROJECT CONDITIONS

A. Moisture: Wet materials shall not be applied nor shall roofing application proceed when moisture is on roof or deck.

B. Water tightness: Roofing contractor shall be responsible for maintaining roof in a watertight condition at all times. Interior damage caused by leakage during roof application shall be the responsibility of the roofing contractor.

C. Building Protection

1. Tear-off and debris transit must not disturb operations of the building. Enclosed chutes and other methods shall be used to contain dust and debris.
2. The building exterior must be protected from damage, markings, or spillage by the use of tarpaulins or protective sheeting.
3. The contractor will be responsible for damage to grass, shrubs, trees or 1 grounds including curbs and sidewalks. Protective covers shall be utilized under any equipment that would damage or stain any surface.

D. Clean Up: Premises shall be kept clean **daily** during application and left clean when roof is completed.

1.8 SEQUENCING AND SCHEDULING

A. Time Limitation: Roofing contractor shall complete a minimum of 3,500 sq. ft. per day over continuous working days, weekend days and inclement weather days excepted.

B. Roofing contractor shall inform Owner representative and receive approval for start date, work duration time, material and equipment storage area and vehicle, equipment and pedestrian traffic pattern.

1.9 GUARANTEE

A. Roofing Contractor's Guarantee

1. Roofing contractor shall provide to Los Angeles World Airports a written guarantee against defects of workmanship and to maintain roof in a watertight condition for a period of five (5) years from final acceptance of product by Los Angeles World Airports.

B. Manufacturer’s Warranty

1. Provide manufacturer's 20-year NDL warranty to provide repairs or correction of roof stemming from material defects, contractor workmanship and ordinary wear and tear of elements.
2. Warranty shall not exclude ponding water of any kind.

PART II PRODUCTS

2.1 MATERIALS

A. Membrane

1. The roofing system shall be a fully adhered, reinforced polyvinyl chloride (PVC) membrane. Non-fleece backed for attachment over Dens Deck/insulation. Material components shall all be from one (1) manufacturer, shall have a U/L Class A fire rating, and shall be manufacturer’s current published specification.
2. Color: To be designated

B. Approved Manufacturers and Products

1. Manufacturer shall confirm that the actual (not nominal) polymer thickness of the product supplied for this project is minimum 58 mils (78 for 80 mil) for roofing and 58 mils (78 for 80 mil) for flashing. Polymer thickness variance shall not exceed plus-or-minus three mils (3 thousandths of an inch), with at least 45% of the overall polymer thickness above the reinforcement scrim. Standard ASTM plus-or-minus tolerance for membrane thickness is not acceptable.
2. Manufacturer shall confirm that the actual (not nominal) weight of the membrane to be installed for field and flashing achieves the minimum weight requirement within this specification.
3. Roofing system shall have been manufactured directly by the Manufacturer with the current formulation in use for the past 15 years minimum (pigments may vary).
4. No "Private Label" or third party membrane manufacturers will be approved as alternates or substitutes.
5. Manufacturers
   a. Sika Sarnafil: Contact Paul Phillips 1 (310) 528-3348
   b. Or other approved equal
6. Products
   a. Sika Sarnafil: G410-60
   b. Or other approved equal

C. SUMMARY OF MATERIALS: Materials shall not be less than the following per 100 square feet.

Base Bid:

1. Insulation: Polyisocyanurate (R-30 where required)	086 lbs.
2. Fire Retardant Underlayment (1/4")	111.0 lbs.
3. Adhesive	011.0 lbs.
4. Single Ply Membrane	032.2 lbs.
TOTAL APPROXIMATE WEIGHT	240.2 lbs.

D. STANDARDS: All materials shall conform to the following

1. PVC Membrane: 60 mils (minimum) tan, heat-welded polyvinyl chloride sheet roofing with polyester reinforced membrane, 80 mil felt-backed where required to adhere to concrete at rotunda dome. ASTM D4434.
2. Paint: Dunn-Edwards Flex Tex W-321 or approved equal; color to match existing.
3. Coping Sealant: One (1) part silicone sealant, Dow 795, or Sika Sikasil WS-295.
4. Membrane Adhesive: Manufacturer's recommended adhesive.
5. Termination Bar: 16-gauge extruded VOC compliant aluminum.
6. Walk Pad: 1/8" thick polyester reinforced PVC protection mat, embossed to increase slip resistance, and tinted green so that it can be differentiated from the membrane.
7. Walk Pad Adhesive: solvent-based elastomeric adhesive.
8. Flashing Membrane: PVC membrane of specified thickness to be used for flashing.
9. Miscellaneous Materials: Materials required or supplied by the manufacturer.
10. Metal Edge: 24-gauge PVC clad aluminum metal edge with 4" flange and face with 1/2" drip edge.
11. Tapered Insulation: Tapered polyisocyanurate, minimum 1/2" per foot or twice the roof slope, whichever is greater.
12. Coping Lap Sealant: Elastomeric silicone, one part; Dow 795 or GE Silpruf SCS 2000 or Sika Sikasil WS-295.
13. Pipe Supports: Cooper B-Line Dura Block rubber supports, Miro Industries pipe supports or Erico-Caddy EZ Series pipe stands.
14. Underlayment Board: 1/4" GP Dens Deck Prime (1/2" on walls) fire retardant gypsum board or manufacturers required fire retardant gypsum board.
15. Penetration Seal: Pre-fabricated polymer curb with self-leveling, pourable sealant. Chem Curb by Chem Link, (800) 826-1681.
16. Insulation and Underlayment Adhesive: Manufacturers recommended two-part low-rise foam adhesive.
17. Roof System Insulation: R-30 polyisocyanurate with fiberglass facers, ASTM C209.
18. Drains: 3" diameter J.R. Smith 1010 or 1020 cast iron body with combination membrane flashing clamp and low silhouette cast iron dome. Include leaders and all associated fittings.
19. Miscellaneous Sheet Metal: 24-gauge Kynar-coated aluminum.

PART III EXECUTION

3.1 PREPARATION OF SURFACES

A. All Sections

1. All roofing materials shall be removed from deck and walls and deck shall be thoroughly cleaned. Drive nails flush. Deck shall be clean, smooth and dry.
2. At rotunda dome, blast or grind surface to remove existing coating.

B. Wet Lightweight Insulating Fill

1. Cut out and discard wet lightweight insulating fill down to the steel substrate.
2. Fill in the entire removal area with manufacturer's recommended insulation to match the existing fill thickness. Secure insulation using foam adhesive.
3. Install Dens Deck Prime underlayment board per manufacturer's guidelines.

C. Provide water cutoffs or otherwise complete terminations and base flashings and seals to prevent water from entering completed work at the end of the day or when rain is eminent. Remove and discard temporary seals before beginning work on adjoining roofing.

3.2 UNUSED JACKS, PIPES, PADS, ETC.

A. Remove from roof and level off. Fill large opening flush with deck level. Cover smaller holes with 24-gauge sheet metal, nailed solid. It is the roofing contractor's responsibility to identify all items to be removed before submitting bid.

3.3 EXAMINATION

A. Verify that roof penetrations are in place and secured.

B. Verify that wood blocking, curbs and nailers are securely anchored to the substrate.

C. Verify that substrate is visibly dry and free of moisture.

D. Verify that contaminants that will impair adhesion of roofing components have been removed.

E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.4 OUTLETS

A. Drains

1. Water test all drains and downspouts before and after application to assure unrestricted flow.
2. PVC membrane shall extend into drain bowl and a minimum of 1" beyond inside rim of bowl.

3. Discard existing plastic drain domes or missing drain domes and replace with new specified cast iron drain domes.
4. Install new drains where specified or replace entire drain when existing drain is damaged or new drain dome and/or clamping ring cannot be obtained.

B. Scuppers

1. Provide new fully soldered clad metal scuppers and seal within the membrane per manufacturer's requirements. Extend scupper a minimum of 1-1/2" beyond face of wall and seal around outside with elastomeric sealant.

3.5 FLASHINGS

A. Pipe or Conduit Penetrations

1. Remove and discard metal flashings and apply aluminum tape around penetrations, if required, or use cone or prefabricated boot. Seal tape with PVC flashing membrane and clamp off top with a hose clamp. Seal the clamp with specified 1 sealant. Include replacement of missing or damaged existing vandal-proof caps in base bid. Roofer shall replace all other broken safety caps damaged as a result of his work, at his own expense.

B. Multiple (nested) Penetrations

1. At Freon lines, 4" conduits or other multiple penetrations, provide Chem Curb penetration seals installed per manufacturers requirements.

3.6 PARAPETS

A. Walls

1. Install wood nailers on top of wall if missing.
2. Install 1/2" Dens Deck or manufacturers felt fabric, fully adhered and sealed on the face of the wall.
3. Install fully adhered membrane on walls extending over the top of the wall to the back side. Secure per manufacturer requirements.

B. Base Flashings

1. Install (adhere) roofing membrane to the base of the wall, and then secure to deck with termination bar. Install flashing on wall to the bottom of the reglet with proper adhesive. Secure top of flashing with termination bar. Install face-mounted two-piece reglet where none exists and then seal top with specified sealant.

C. Copings

1. Carefully remove metal copings or cap flashings and save for reuse. After application of wall covering, replace metal and/or tiles in a straight, clean, secure and watertight manner. Seal between and laps with elastomeric sealant as stated in these specifications.
2. Seal external coping laps with a 1/8" thick application of sealant straddled across lap, neatly applied and taped to avoid over application.

3.7 EQUIPMENT

A. Air-Conditioners

1. Units on wood sleepers
   a. Discard wood sleepers and build new pads extending 10" above roof membrane. These shall be blocked 2' on center and covered with 3/4" plywood and 26-gauge galvanized sheet metal caps with 2" counter-flashings. Roofing contractor shall be responsible for extension of lines and ducts, and repair to any lines broken during application of the roofing. All electrical and HVAC work shall be completed by qualified personnel possessing appropriate California license.
   b. Add sheet metal extensions to existing counter-flashings where necessary to properly counter-flash the top of the base flashing.

B. B. Exhaust Fans

1. Lift hoods and apply membrane over curb to the back side and secure.
2. After reinstallation, seal hood corners with elastomeric sealant.

C. Curbs

1. Curbs 4" and lower shall be removed and replaced with curbs extending 10" above roof membrane. Roofing contractor shall be responsible for extension of lines and ducts, and repair to any lines broken during application of the roofing. All electrical and HVAC work shall be completed by qualified personnel possessing appropriate California license.

3.8 INSULATION AND COVER BOARD

A. Insulation

1. Over structural concrete, gypsum, or LWIF, insulation will be adhered in foam adhesive approved by manufacturer.
2. Over metal deck first layer of insulation will be mechanically attached using fasteners approved by the manufacturer.
3. Do not install wet, damaged or warped insulation boards.
4. Install boards with staggered joints in one direction.
5. Install boards snug. Gaps between boards shall not exceed 1/4". Fill gaps in excess of 1/4" with foam.
6. Secure tapered insulation with additional specified fasteners per manufacturer requirements.

B. Underlayment Board

1. Install boards over rigid insulation using manufacturers approved foam adhesive.
2. Install boards over tapered insulation crickets using manufacturer's approved foam adhesive.
3. Apply additional fasteners around perimeters and in corners. Also apply additional fasteners at vertical transitions as required by manufacturer.

3.9 ROOFING MEMBRANE

A. The system is to be fully adhered. Secure tapered insulation with additional specified fasteners per manufacturer requirements. Adhere felt-backed membrane directly to concrete at rotunda. Adjacent sheets shall have minimum lap areas of 6" side and 3" end. When machine welding, welds shall be 1-1/2" and 2" when hand welding. Welding equipment shall be provided by or approved by manufacturer. Use half width rolls to conform to manufacturer's requirements around roof perimeters. All completed welded seams shall be checked after cooling using a round screwdriver or other suitable blunt object. Visible evidence that welding is proceeding acceptably is smoke during the welding process, shiny membrane and an uninterrupted flow of black material from the edge of completed joints**.**

3.10 PIPES ON ROOF

A. Replace existing wood sleepers with new specified pipe supports. Leave supports standing freely on roof surface on buffer pads of membrane.

3.11 WALK PADS (where required – see diagram)

A. Install fully adhered/welded PVC walk pads. Pads shall be adhered with adhesive except for 2" around the perimeter, which shall be fully heat welded.

3.12 CLEAN-UP/TOUCH-UP/CLOSE-OUT

A. Paint all new and existing metal (or use Kynar-coated metal), including new counter-flashings with specified coating or paint in a minimum of two (2) coats. Color to be designated.
B. Protect membrane from damage and wear during remainder of roof installation period. When remaining installation will not affect finished sections, inspect membrane for deterioration and damage and correct.
C. Water test all drains in the presence of the NRC representative to assure free flow. Rout drains with restricted flow.
D. Perform Owner representative and manufacturer final inspections.
E. Correct deficiencies or remove membrane that does not comply 1 with manufacturer requirements. Clear membrane of quality control observer's pencil or crayon markings. Membrane shall be free of damage or any condition that may prohibit or delay warranty implementation.
F. After final inspections, Owner representative shall determine an appropriate time for a complete pressure beauty washing of the membrane to locate any potential leaks. Washing shall be completed with the applicator present to repair any identified problems.
G. Clean spillage or traffic marring using cleaning agents and procedures recommended by the manufacturer.

END OF SECTION 07 54 19

28 June 2012 Source: LAX T5 Roof Replacement