Roofing Project Specifications

Underground Utilities
Meter Shop Roof Replacement
1821 N. 21st Ave.
Hollywood, FL

City of Hollywood
Department of Public Utilities
Engineering and Construction Services
1621 N. 14th Avenue
Hollywood, FL 33020

THIS DOCUMENT MUST REMAIN INTACT

December 19, 2017

SECTION 011100 – SUMMARY OF WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Documents affecting work of this Section include, but are not necessarily limited to bidding documents and drawings.

1.2 SUMMARY

A. Furnish and install roof materials, insulation, flashings, and miscellaneous materials on the following designated roof areas:

B. Meter Shop roof replacement includes:

1. Approximately 11,700 SF of roof area – bidding contractor is responsible for verifying quantities.
2. Existing gravel surface roof system shall be power broomed, vacuumed, or wet vacuumed to ensure all loose gravel, dust and / or debris have been removed from existing roof surface.
3. Install new pressure treated wood nailer to perimeter of roof areas to match insulation thickness in roof manufacturer's product approval.
4. Install new expansion joint in compliance with manufacturer's recommendations.
5. Install roof insulation over existing roof system set in roof manufacturer's approved adhesive in compliance with manufacturer's recommendations and product approval.
6. Install 60 mil TPO Fleece Back Membrane and associated flashings in compliance with manufacturer's recommendations.
7. Install sheet metal curb caps to concrete curbs.
8. Install TPO coated drip edge to perimeter in compliance with manufacturer's recommendations.
9. Any / all mechanical and / or electrical work necessary to complete the project shall be included in the price.
10. Any / all testing, engineering, and permit fees necessary to complete the project shall be included in the price.
11. Provide manufacturer's warranty as specified.
12. Bid shall include line item price to provide and install aluminum gutters and downspouts.

1.3 INTENT OF THE SPECIFICATIONS

A. The intent of these specifications is to describe the materials and methods of construction required for the performance of the work. In general, it is intended that the

drawings shall delineate the detailed extent of the work. When there is a discrepancy between drawings, referenced specifications, and standards and this specification, this specification shall govern.

1.4 PROTECTION

A. The Contractor shall use every available precaution to provide for the safety of property owner, visitors to the site, and all connected with the work under the specification.

B. All existing facilities both above and below ground shall be protected and maintained free of damage. Existing facilities shall remain operating during the period of construction unless otherwise permitted. All access roadways must remain open to traffic unless otherwise permitted.

C. Barricades shall be erected to fence off all construction areas from operations personnel.

D. Safety Requirements

1. All application, material handling, and associated equipment shall conform to and be operated in conformance with OSHA safety requirements.
2. Comply with federal, state, local and owner fire and safety requirements.
3. Advise owner whenever work is expected to be hazardous to owner employees and/or operations.
4. Maintain a crewman as a floor area guard whenever roof decking is being repaired or replaced.
5. Maintain proper fire extinguisher within easy access whenever power tools, roofing kettles, torches and heat welding equipment are being used.
6. All safety requirements of the building owner must be followed. No exceptions will be permitted. Safety orientation meeting required prior to performing any work

1.5 HOUSEKEEPING

A. Keep materials neat and orderly.

B. Remove scrap, waste and debris from project area.

C. Maintenance of clean conditions while work is in progress and cleanup when work is completed shall be in strict accordance with the "General Requirements" of this contract.

END OF SECTION 011100

SECTION 012663 – CHANGE ORDERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Documents affecting work of this Section include, but are not necessarily limited to bidding documents and drawings.

1.2 DESCRIPTION

A. Work included:

1. Make such changes in Work, in Contract Sum, in Contract Time of Completion, or any combination thereof, as are described in written Change Orders signed by Owner and Designated Owner’s representative and issued after execution of Contract, in accordance with provisions of this Section.

1.3 QUALITY ASSURANCE

A. Include within Contractor's quality assurance program such measures as are needed to assure familiarity of Contractor's staff and employees with these procedures for processing Change Order data.

1.4 SUBMITTALS

A. Make submittals directly to Designated Owner’s representative at his normal place of business.

B. Submit number of copies called for under various items listed in this Section.

1.5 PROCESSING CHANGES INITIATED BY THE OWNER

A. Should Owner contemplate making a change in Work or a change in Contract Time of Completion, Designated Owner’s representative will issue a "Bulletin" to Contractor.

1. Bulletins will be dated and will be numbered in sequence.
2. The Bulletin will describe contemplated change, and will carry one of following instructions to Contractor:

a. Make described change in Work at no change in Contract Sum and no change in Contract Time of Completion.
b. Promptly advise Designated Owner’s representative as to credit or cost proposed for described change. This is not an authorization to proceed with change.

B. If Contractor has been directed by Designated Owner's representative to promptly advise him as to credit or cost proposed for described change, Contractor shall:

1. Analyze described change and its impact on costs and time.
2. Secure required information and forward it to Designated Owner's representative for review.
3. Meet with Designated Owner's representative as required to explain costs and, when appropriate, determine other acceptable ways to achieve desired objective.
4. Alert pertinent personnel and subcontractors as to impending change and, to maximum extent possible, avoid such work as would increase Owner's cost for making change, advising Designated Owner's representative in writing when such avoidance no longer is practicable.

1.6 PROCESSING CHANGES INTIATED BY THE CONTRACTOR

A. Should Contractor discover a discrepancy among Contract Documents or other cause for suggesting a change in Work, a change in Contract Sum, or a change in Contract Time of Completion, he shall notify Designated Owner's representative as required by pertinent provisions of Contract Documents.

B. Upon agreement by Designated Owner's representative that there is reasonable cause to consider Contractor's proposed change, Designated Owner's representative will issue a Bulletin in accordance with provisions described in Article 1.6 above.

1.7 PROCESSING BULLETINS

A. Make written reply to Designated Owner's representative in response to each Bulletin.

1. State proposed change in Contract Sum, if any.
2. State proposed change in Contract Time of Completion, if any.
3. Clearly describe other changes in Work required by proposed change, or desirable therewith, if any.
4. Include full backup data such as subcontractor's letter of proposal or similar information.
5. Submit this response in single copy.

B. When cost or credit for change has been agreed upon by Owner and Contractor Designated Owner's representative will issue a "Change Order" to Contractor.

1.8 PROCESSING CHANGE ORDERS

A. Change Orders will be dated and will be numbered in sequence.

B. Change Order will describe change or changes will refer to Bulletin or Bulletins involved, and will be signed by Owner and Designated Owner's representative.

C. Designated Owner's representative will issue three copies of each Change Order to Contractor.

1. The Contractor promptly shall sign all three copies and return two copies to Designated Owner’s representative.
2. The Designated Owner’s representative will retain one signed copy in his file and will forward one signed copy to Owner.

D. Should Contractor disagree with stipulated change in Contract Sum or change in Contract Time of Completion, or both:

1. Contractor promptly shall return two copies of Change Order, unsigned by him, to Designated Owner’s representative with a letter signed by Contractor and stating reason or reasons for Contractor's disagreement.
2. Contractor's disagreement with Change Order shall not in any way relieve Contractor of his responsibility to proceed with change as ordered and to seek settlement of dispute under pertinent provisions of Contract Documents.

END OF SECTION 012663

SECTION 013119 – PROJECT MEETINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Documents affecting work of this Section include, but are not necessarily limited to bidding documents and drawings.

1.2 PRE-CONSTRUCTION CONFERENCE

A. Preconstruction Conference will be scheduled within 15 working days after Owner has issued Notice to Proceed, but prior to actual start of Work.

B. Attendance: Representative of owner, roofing manufacturer/supplier, and contractor.

C. Minimum agenda: Data will be distributed and discussed on:

1. Organizational arrangement of Contractor's forces and personnel, and those of subcontractors, materials suppliers, and Project Manager.
2. Channels and procedures for communication.
3. Review set-up area.
4. Review all required permits.
5. Review insurance requirements.
6. Construction schedule, including sequence of critical work.
7. Contract Documents, including distribution of required copies of Drawings and revisions.
8. Processing of Shop Drawings and other data submitted to Project Manager for review.
9. Processing of field decisions and Change Orders.
10. Rules and regulations governing performance of work.
11. Procedures for safety and first aid, security, quality control, housekeeping, and related matters.

1.3 PROGRESS MEETINGS

A. Will be scheduled by owner's representative weekly or as described at pre-bid meeting.

B. Attendance: Owner, Contractor, Job Superintendent, Roofing Material Manufacturer/Supplier, and Sub-Contractors, as appropriate.

C. Minimum Agenda:

1. Review of work progress.
2. Field observations, problems, and decisions.
3. Identification of problems which impede planned progress.
4. Maintenance of progress schedule.

5. Corrective measures to regain projected schedules.
6. Planned progress during succeeding work period.
7. Coordination of projected progress.
8. Maintenance of quality and work standards.
9. Effect of proposed changes on progress, schedule, and coordination.
10. Other business relating to work.

1.4 PRE-FINAL INSPECTION

A. Contractor must inform material supplier and building owner's representative when he is ready to schedule a pre-final inspection.

B. Installations or details noted as deficient during inspection must be repaired and corrected by applicator.

C. Once corrections have been made, contractor must inform material supplier and building owner's representative so a second inspection can be scheduled.

D. Material supplier must approve roofing system prior to application of cap sheet.

1.5 FINAL INSPECTION

A. Scheduled by roofing material manufacturer upon job completion.

B. Attendance: Owner or designated representative, contractor, roofing material manufacturer/supplier.

C. Minimum Agenda.

D. Walkover inspection.

E. Identification of needed corrections to be completed by contractor with final approval from warrantor.

END OF SECTION 013119

SECTION 013219 – SUBMITTALS SCHEDULE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Documents affecting work of this Section include, but are not necessarily limited to bidding documents and drawings.

1.2 SUBMITTAL PROCEDURES

A. Coordination of submittals.

1. Prior to each submittal, carefully review and coordinate all aspects of each item being submitted.
2. Verify that each item and submittal for it conforms in all respects with specified requirements.
3. By affixing Contractor's signature or approval stamp to each submittal, he/she certifies that this coordination has been performed.

B. Substitutions:

1. The Contract is based on standards of quality established in Contract Documents. To give all bidders equal opportunity, use of any materials or methods other than those specified will require proper submittal information and must be pre-approved in written addenda 10 days prior to bid due date.
2. Products requiring no further approval:

    a. Minor products specified by reference to standard specification such as ASTM and similar standards.
    b. Products specified by manufacturer's name and catalog model number.

3. Building owner reserves right to final authority on acceptance or rejection of any substitute.
4. Request for substitutions will be accepted from prime bidders only. Requests for substitutions from parties not bidding on project as a primary contractor will not be considered.

C. "Or equal":

1. Specified materials are named to denote kind and quality required, whether or not words "or approved equal" are used. These materials shall serve as standards and all proposals shall be based upon same.
2. Where phrase "or equal," or "or equal as approved by Owner," occurs in Contract Documents, The material or method must be so approved for this Work by Owner prior to receipt of bids.
3. Owner’s decision is final.

D. "Basis of Design":

1. Materials, manufacturer's product designations, and/or manufacturer's names specified herein shall be regarded as the minimum standard of quality required for work of this specification. Comply with all manufacturer and contractor/ fabricator quality and performance criteria specified within this document.

1.3 SUBMITTAL DOCUMENTS – **MUST BE SUBMITTED WITH PROPOSAL / BID**

A. Copy of Miami Dade County Notice of Acceptance (NOA) or Florida Building Code HVHZ approval for proposed roof system for concrete decks.

B. Product data sheets for the following:

- Insulation adhesive, insulation board, expansion joint, TPO membrane, TPO adhesive, TPO flashing membrane, TPO flashing adhesive, roof system manufacturer’s flashing details for drip edge, curb flashing, curb cap, and expansion joint flashing.

C. A letter on company letterhead from proposed roof system manufacturer stating that quality control inspections shall be done a minimum of three (3) times weekly and weekly Inspection Reports shall be provided to the owner for the duration of the project.

D. A list of five (5) jobs of similar size where proposed materials have been used, under similar conditions as specified.

E. Shop Drawings:

1. Make Shop Drawings accurately to a scale sufficiently large to show all pertinent aspects of item and its method of connection to Work.
2. Owner will review and comment on required changes. The Contractor may make and distribute corrected copies as are required for his purposes.

F. Sample of roofing supplier’s warranty which meets all requirements of specified warranty.

G. Material supplier providing roofing warranty shall have an ISO 9001 certification.

H. Letter from material supplier on company stationery, confirming that all bidding documents have been approved, that site has been inspected and meets requirements for suitability, and that specified warranty shall be provided upon satisfactory completion of project.

I. Any proposed substitute materials or methods must also be accompanied by following documentation:

1. A detailed analysis of roofs being bid on.
2. A complete specification of proposed substitute. If, after review, substitute is found to be acceptable, copies will be provided to each bidder who has picked up original specification.

3. Written explanation of why substitutions should be considered is required.

1.4 BID DOCUMENTS

A. Bid and Proposal Form shall contain quotes to be identified “BASE BID” for specified materials and methods. Quotes for approved substitutions or specified alternates shall be identified as ‘DEDUCTION FROM BASE BID” for installation.

B. Certificate of insurance for General Liability, Worker’s Compensation Insurance, and auto insurance.

END OF SECTION 013219

SECTION 014200 – REFERENCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Documents affecting work of this Section include, but are not necessarily limited to bidding documents and drawings.

1.2 REFERENCE STANDARDS

A. Referenced specifications and standards published by national societies, associations, and institutes shall be considered as part of this specification. In all cases, referenced specification or standard shall be most recent publication date. Abbreviated identifications for particular organizations involved are as listed below:

1. AIA - The American Institute of Architects
2. ANSI – American National Standards Institute
3. ASCE - American Society of Civil Engineers
4. ASHRAE - The American Society of Heating, Refrigerating and Air-Conditioning Engineers
5. ASTM - American Society for Testing and Materials
6. AWPA - American Wood Preservers Association
7. AWPB - American Wood Preservers Bureau
8. FM - Factory Mutual Global
9. MDC – Miami Dade County Product Control Division
10. NRCA - National Roofing Contractors Association
11. OSHA - Occupational Safety and Health Administration
12. SMACNA - Sheet Metal and Air-conditioning Contractors National Association
13. UL - Underwriters Laboratory
14. WH - Warnock-Hersey.

END OF SECTION 014200

SECTION 014500 – QUALITY CONTROL

PART 1 - GENERAL

RELATED DOCUMENTS

A. Documents affecting work of this Section include, but are not necessarily limited to bidding documents and drawings.

QUALTIY CONTROL

B. Contractor shall:

1. Be experienced in TPO roofing installations.
2. Be acceptable by owner and roofing material Manufacturer/supplier.

C. Roofing manufacturer shall:

1. Be an Associate Member in good standing with National Roofing Contractors Association (NRCA).
2. Be recognized in roofing, waterproofing and moisture survey industry.
3. Be approved by owner.
4. Material manufacturer/supplier must supply representative to perform periodic inspections throughout course of project. Written reports must be submitted to owner's representative and copies to contractor.
5. Material supplier providing roofing warranty shall have an ISO 9001 certification.

D. Any deficiencies noted during inspections must be corrected by contractor and approved in writing by material manufacturer/supplier's representative.

RANDOM SAMPLINGS

E. During course of work, owner/owner's representative, may secure samples of materials being used from containers at job site and submit them to an independent laboratory for comparison to specified material.

F. Materials shall be tested using ASTM D2829 - 07 (or most recent) Standard Practice for Sampling and Analysis of Existing Built-Up Roof Systems or other ASTM Standards for collecting, sampling and testing roof materials.

G. If test results prove that a material is not functionally equal to specified material:

1. Contractor shall pay for all testing.
2. Owner will charge Contractor a penalty up to 20 percent of contract price when all work has been completed before test results become known.

3. Owner will charge Contractor a penalty in proportion to amount of work completed before test results become known. Remaining work shall be completed with specified materials.

PART 2 - PRODUCTS

GENERAL

A. Comply with Quality Control, References, Specification, and Manufacturer's data. Where conflict may exist, more stringent requirements govern.

B. Provide primary products, including each type of TPO roofing sheet, TPO flashings, miscellaneous flashing materials, and sheet metal components which has produced that type of product successfully for not less than ten (10) years. Provide secondary products (insulation, mechanical fasteners, lumber, etc.) only as recommended by manufacturer of primary products for use with roofing system specified.

PART 3 - EXECUTION

SUBMITTALS

A. Provide building owner's representative a letter from roof material manufacturer indicating that applicator is approved to install their products and will provide warranty for this installation.

END OF SECTION 014500

SECTION 016600 – PRODUCT STORAGE AND HANDLING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Documents affecting work of this Section include, but are not necessarily limited to bidding documents and drawings.

1.2 DESCRIPTION

A. Delivery of Materials

1. Deliver materials to job-site in new, dry, unopened and well-marked containers showing product and manufacturer's name.
2. Deliver materials in sufficient quantity to allow continuity of work.

B. Storage of Materials

1. Store materials in dry area protected from water or extreme humidity.
2. Store coatings and adhesives in an area where the minimum temperature is 40ºF.
3. Stack insulation on pallets.
4. Remove plastic packing shrouds. Cover all stored materials with tarpaulin top to bottom. Secure tarpaulin.
5. Rooftop storage: Disperse material on roof to avoid overloading the structure.

C. Material Handling

1. Handle all materials on site to avoid bending, tearing, or other damage during transportation and installation.
2. Material handling equipment shall be selected and operated so as not to damage existing construction or applied roofing. Do not operate or situate material handling equipment in locations that will hinder smooth flow of vehicular or pedestrian traffic.
   Environmental Requirements
3. Do not work in rain or in presence of water.

END OF SECTION 016600

SECTION 017836 – WARRANTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Documents affecting work of this Section include, but are not necessarily limited to bidding documents and drawings.

1.2 GENERAL

A. This specification section sets forth warranty requirements.

1.3 WARRANTY

A. Quotations will include a price for a twenty (20) year NDL (no dollar limit), non prorated warranty to be provided by the material supplier. If the supplier is a subsidiary company, the warranty must be issued by the parent company.

B. The material supplier will issue the warranty to owner upon material supplier acceptance of project completion and full payment of all bills related to project.

C. Warranty supplier shall require annual roof maintenance. Each maintenance visit will include Inspections, Housekeeping, Routine Maintenance and Preventive Maintenance as described below.

1. General

    a. All repairs will follow the manufacturer's written repair and maintenance guidelines or NRCA recommended repair procedure.

2. Debris

    a. A complete walkover of the existing roof areas to determine the immediate surface conditions of the roof.
    b. Removal of all naturally occurring debris (i.e., leaves, branches, paper and similar items) from the roof membrane.
    c. Service will include removal of surface debris from the roof drains, gutters, and scuppers, but not clogged piped or plumbing.
    d. All debris will be disposed of at the owner's approved site location.

3. Terminations and Flashing

    a. Sealant voids in termination bars, counter flashings and parapet caps will be cleaned and resealed as required.
    b. Exposed fasteners will be resealed on perimeter metal details where required.

c. All pitch pans will be refilled and topped off as required.
d. Metal projections (hoods and clamps) will be checked and resealed.
e. Soil stack leads will be inspected for cuts or holed and temporarily resealed when required with appropriate materials until arrangements can be made for permanent repair.
f. Re-secure loose metal coping caps, termination bars, counter flashings and metal edge systems where required with appropriate fasteners.

4. Membrane

a. Tears, splits and breaks in the perimeter and internal membrane flashing systems and flashing strip-ins will be repaired with appropriate repair materials.
b. Visible membrane defects which may allow water into the roofing system will be repaired with appropriate repair materials.
c. Dress-up reflective coatings where mastic repairs have been made.
d. Drains and Gutters
e. Check and re-secure drain bolts and clamping rings.
f. Check strip-in around drain leads, coat with approved mastics if required.
g. Reattach loose gutter straps, seal open gutter joints, and repair gutter strip-ins where required.
h. Check scupper boxes for open solder or caulking and seal with appropriate materials if required.

END OF SECTION 017836

SECTION 072113 – ROOF AND DECK INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Roof Insulation

B. This portion of the specification describes materials and workmanship required for installation of insulation over roof decks.

C. All materials described herein shall be furnished and installed by roofing contractor unless specifically noted otherwise.

1.3 PERFORMANCE REQUIREMENTS

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

B. Material Compatibility: Provide insulation materials that are compatible with one another under conditions of service and application required, as demonstrated by membrane roofing manufacturer based on testing and field experience.

C. FM Approvals Listing: Provide membrane roofing, base flashings, and component materials that are consistent with requirements in FM Approvals 4470 as part of a membrane roofing system, Identify materials with FM Approvals markings.

1. Fire/Windstorm Classification: FM 1-120 (minimum)

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer that has UL, FM, and Miami Dade County Product Control Division or Florida Building Code HVHZ approvals approved for membrane roofing system consistent to that used for this Project.

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

C. Source Limitations: Obtain components including roof insulation, fasteners, adhesive, and etc. as approved by membrane roofing manufacturer.

D. Preliminary Roofing Conference: Before starting construction, conduct conference at Project site.

1. Meet with Owner’s representative, roofing Installer, roofing system manufacturer's representative.
2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
4. Review deck substrate requirements for conditions and finishes, including flatness and fastening.
5. Review structural loading limitations of roof deck during and after roofing.
6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
7. Review governing regulations and requirements for insurance and certificates if applicable.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.

1.5 DELIVERY, STORAGE, AND HANDLING

A. 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.

B. Insulation shall be delivered to site in an undamaged and dry condition. Material received that is not dry or is otherwise damaged shall be rejected.

C. Proper storage on or off site shall be roofing contractor responsibility.

D. 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.

E. Any unused insulation remaining on roof at end of workday shall be returned to storage.

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

1.6 INSULATION – GENERAL

A. All insulation materials must be approved by warrantor of primary roof membrane materials. Samples should be provided to manufacturer and written approval from warrantor of primary roof membrane materials is required before ordering these materials for project.

B. Insulation boards shall be full size except when cutting is required at roof edges and openings. Boards that are broken, cracked, have been exposed to moisture, or are otherwise damaged shall not be used.

C. Proper installation and fit of wood nailers, blocking, and other rough carpentry in appropriate locations shall be verified prior to installation of roof insulation.

D. Caution shall be exercised with construction traffic to avoid damage to new insulation. Breaking or crushing of insulation is unacceptable and any damaged insulation shall be replaced at roofing contractor's expense.

E. Insulation shall be laid with end joints staggered and all joints tight; however, boards shall not be forced into place.

F. No more insulation shall be installed during any work period than can be covered by all plies of roofing during same work period. At end of work period, temporary edge seals shall be installed to protect roof insulation. Upon resumption of work, they must be removed. Such seals shall consist of strips of roofing felt applied and top-coated with specified adhesive.

G. Insulation surfaces shall be cleared of all debris before roofing is placed.

H. All precautions should be made to prevent bitumen dripping during and after application of insulation and roofing materials.

1.7 PROJECT CONDITIONS

A. 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.

1.8 WARRANTY

A. Refer to warranty section for requirements.

PART 2 - PRODUCTS

2.1 ROOF INSULATION

A. General: Preformed roof insulation boards manufactured or approved membrane roofing manufacturer, selected from manufacturer's standard sizes suitable for application, of thicknesses indicated.

B. Base layer: Provide insulation boards in compliance with roof system manufacturer’s Miami Dade Product approval or Florida Building Code HVHZ product approval, minimum thickness – 1.5”.

2.2 INSULATION ACCESSORIES

A. General: Furnish roof insulation accessories recommended by insulation manufacturer for intended use and compatibility with membrane roofing.

B. Bead-Applied Insulation Adhesive: Insulation manufacturer's recommended bead-applied, low-rise, two component urethane adhesive formulated to attach roof insulation to substrate or to another insulation layer.

1. Products: Subject to compliance with requirements in compliance with roof system manufacturer’s Miami Dade County Product approval or Florida Building Code HVHZ product approval.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of insulation system:

1. Verify that roof openings and penetrations are in place and curbs are set and braced and that roof drain bodies are securely clamped in place.
2. Verify that wood cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
3. Contractor must verify deck slopes and determine if insulation stops and/or backnailing is required by warranty supplier based on system being installed.
4. Prior to installing insulation, deck must be inspected and accepted by roofing contractor and roofing system warrantor.

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

3.2 PREPARATION

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

B. 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.

C. Roofing contractor shall perform all other work of preparing deck. When insulation is applied, deck shall be dry and free of dew, frost, ice, and snow.

3.3 INSULATION INSTALLATION

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

B. Insulation Cant Strips: Install and secure preformed 45-degree insulation cant strips at junctures of roofing membrane system with vertical surfaces or angle changes more than 45 degrees.

C. All boards installed shall be 18 inches in length or width, minimum.

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

E. 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.

1. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.

F. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.

G. Install tapered edge strips at perimeter edges of roof that do not terminate at vertical surfaces.

H. Adhered Insulation: Install each layer of insulation and adhere to substrate as follows:

1. Set each layer of insulation in beads of approved Polyurethane Foam Insulation Adhesive per manufacturer’s instructions

I. Install specified cover board over insulation in beads of approved Polyurethane Foam Insulation Adhesive per manufacturer’s instructions with long joints in continuous straight lines with end joints staggered between rows. Offset joints a minimum of 6 inches in each direction from joints of insulation below.

3.4 FIELD QUALITY CONTROL

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

1. Notify owner’s representative 48 hours in advance of date and time of inspection.

B. Roofing system will be considered defective if it does not pass inspections.

3.5 PROTECTING AND CLEANING

A. Protect 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 the owner’s representative.

B. 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.

C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 072113

SECTION 075216 - TPO FLEECEBACK ROOFING

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

1. Thermoplastic Polyolefin Single-Ply Roofing Membrane

1.02 REFERENCES

A. Factory Mutual (FM Global)

B. Underwriters Laboratories (UL)

C. American Society for Testing and Materials (ASTM)

D. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA)

E. National Roofing Contractors Association (NRCA)

F. American Society of Civil Engineers (ASCE)

G. U.S. Green Building Council (USGBC)

1.03 DEFINITIONS

A. Roofing Terminology: Refer to ASTM D1079 and the glossary of the National Roofing Contractors Association (NRCA) *Roofing and Waterproofing Manual* for definitions of roofing terms related to this section.

1.04 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Manufacturer shall provide a roofing system that meets or exceeds all criteria listed in this section.

1.05 PERFORMANCE REQUIREMENTS

A. Provide an installed roofing membrane and base flashing system that does not permit the passage of water, and will withstand the design pressures calculated in accordance with the most current revision of ASCE 7.

B. Manufacturer shall provide all primary roofing materials that are physically and chemically compatible when installed in accordance with manufacturers current application requirements.

1.06 REGULATORY REQUIREMENTS

A. All work shall be performed in a safe, professional manner, conforming to all federal, state and local codes.

B. Install system per Miami-Dade County Notice of Acceptance or Florida Building Code HVHZ approval for proposed roof system.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

1. Carlisle SynTec Systems
2. GAF Materials Corp
3. Johns Manville

2.02 THERMOPLASTIC POLYOLEFIN (TPO) MEMBRANE

A. TPO membrane with a 55-mil fleece bonded to the underside.

1. Color: White.
2. Membrane Thickness: 115 mil nominal / 60 mil over fleece.
3. Sheet Dimensions:
   a. Width: 12 feet (3.66 m) maximum.
   b. Length: 100 feet (30.5 m) maximum.
4. Performance:
   a. Breaking Strength: FB 100 - 300 lbf (1.3 kN) minimum / FB 115 - 400 (1.8 kN) minimum.
   b. Tear Strength: 55 lbf/in (245 N/m) minimum.
   c. Elongation: 25 percent.

2.02 FLASHING MATERIALS

A. A smooth type, polyester scrim reinforced thermoplastic polyolefin membrane with a nominal 0.060 inch (60 mil) thickness, for use as a single ply roofing membrane. Meets or exceeds the minimum requirements of ASTM D-6878. UL Listed, FM Approved, Miami Dade County Product Approval, Florida Building Code Approved. White membrane is Energy Star Listed, CRRC Listed and Title 24 Compliant.

2.03 ADHESIVES, SEALANTS and PRIMERS

A. Two component, low rise polyurethane foam adhesive. VOC free and contains no solvents.

B. Solvent-based Bonding Adhesive (for flashing membrane only)

C. Solvent based liquid, required to protect field cut edges TPO membranes.

D. Solvent based primer for preparing surfaces to receive butyl based adhesive tapes.

E. Low VOC solvent based primer for preparing surfaces to receive butyl based adhesive tapes.

F. Solvent based seam cleaner used to clean exposed or contaminated seam prior to heat welding.

G. Low VOC TPO cleaner designed to clean exposed or contaminated seams prior to heat welding to remove any residual soap or revitalize aged membranes.

H. Solvent based, trowel grade synthetic elastomeric sealant. Durable and UV resistant suitable for use where caulk is typically used.

I. Commercial grade roofing sealant suitable for sealing the upper lip of exposed termination bars and penetrations and around clamping rings. Meets the performance criteria of ASTM D412, ASTM D2196, ASTM D1475 and ASTM D1644.

J. One part butyl based high viscosity sealant suitable for sealing between flashing membrane and substrate surface behind exposed termination bars and for sealing between roofing membrane and drain flange.

K. 100% solids epoxy based two-part sealant suitable for filling sealant pans at irregularly-shaped penetrations.

2.04 ACCESSORIES

A. FLASHING ACCESSORIES

1. A smooth type, unreinforced thermoplastic polyolefin based membrane for use as an alternative flashing/reinforcing material for penetrations and corners.

2. An 8 inch (20 cm) wide smooth type, polyester scrim reinforced thermoplastic polyolefin membrane strip for use as a cover strip over coated metal and stripping-in coated metal flanges and general repairs: 0.045 inches (45 mils) nominal thickness.

3. Extruded aluminum termination bar with angled lip caulk receiver and lower leg bulb stiffener.

4. A 6 inch (14 cm) wide, smooth type, heat-weldable polyester scrim reinforced thermoplastic polyolefin membrane strip. Designed for use as a cover strip over non-coated metal edges and flanges.

B. WALL & CURB ACCESSORIES

1. .045” thick reinforced TPO membrane fabricated corners.

2. 0.045” thick molded TPO membrane outside corners of base and curb flashing.

3. 0.055” molded TPO membrane inside corners of base and curb flashing.

C. FIELD OF ROOF ACCESSORIES

1. .055” thick smooth type, unreinforced thermoplastic polyolefin membrane designed for use as a conforming membrane seal over T-joints in 60 and 80 mil membrane applications.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that the surfaces and site conditions are ready to receive work.

B. Verify that the deck is supported and secured.

C. Verify that the deck is clean and smooth, free of depressions, waves, or projections, and properly sloped to drains, valleys, eaves, scuppers or gutters.

D. Verify that the deck surfaces are dry and free of ice or snow.

E. Verify that all roof openings or penetrations through the roof are solidly set, and that all flashings are tapered.

3.02 SUBSTRATE PREPARATION

A. Structural Concrete Deck

1. Minimum deck thickness for structural concrete is 4” (10.2 cm).
2. Only poured in place concrete decks that provide bottom side drying are acceptable. Decks that are installed over non-vented metal decks or pans that remain in place may trap moisture in the deck beneath the roof system and are not acceptable.
3. The roof deck shall be properly cured prior to application of the roofing system
4. The deck must be smooth, level and cannot be wet or frozen. If deck is determined to be wet, it must be allowed to dry.
5. Treat cracks greater than 1/8” (3 mm) in width in accordance with the deck manufacturer’s recommendations.

3.03 INSTALLATION - GENERAL

A. Install TPO roofing system according to all current application requirements in addition to those listed in this section.

B. Start the application of membrane plies at the low point of the roof or at the drains, so that the flow of water is over or parallel to, but never against the laps.

3.04 MEMBRANE APPLICATION

A. Fully Adhered:
   1. Place membrane so that wrinkles and buckles are not formed. Any wrinkles or buckles must be removed from the sheet prior to permanent attachment. Roof membrane shall be fully adhered immediately after it is rolled out, followed by welding to adjacent sheets.
   2. Overlap roof membrane a minimum of 3” (15 cm) for side laps and 3” (15 cm) for end laps.
   3. Install membrane so that the side laps run across the roof slope lapped towards drainage points.
   4. All exposed sheet corners shall be rounded a minimum of 1”.
   5. Use full width rolls in the field and perimeter region of roof.
   6. Use appropriate bonding adhesive for substrate surface, applied with a solvent-resistant roller, brush or squeegee.
   7. Apply adhesive directly to substrate per manufacturer’s recommendations. Adhesive should be approximately 70°F (22°C) when being dispensed. As adhesive is applied, allow the adhesive to begin rising, then place membrane. Roll in membrane with a 250 lb membrane roller or equivalent.
   8. Prevent seam contamination by keeping the adhesive application a few inches back from the seam area.
   9. Adhere approximately one half of the membrane sheet at a time. One half of the sheet’s length shall be folded back in turn to allow for adhesive application. Lay membrane into adhesive once the bonding adhesive is tacky to the touch.
   10. Roll membrane with a weighted roller to ensure complete bonding between adhesive and membrane.
   11. Membrane laps shall be heat-welded together. All welds shall be continuous, without voids or partial welds. Welds shall be free of burns and scorch marks.
   12. Weld shall be a minimum of 1-1/2” in width for automatic machine welding and a minimum 2” in width for hand welding.
   13. All cut edges of reinforced membrane must be sealed with sealant.
   14. Supplemental membrane attachment is required at the base of all walls and curbs, and where the angle of the substrate changes by more than five (5) degrees (1” in 12”). Roofing membrane shall be secured to the structural deck with appropriate screws and plates spaced every 12” o.c. The screws and plates must be installed no less than ½” from the membrane edge. Alternatively, the roofing membrane may be turned up the vertical plane a minimum of 3” and secured with screws and termination bar.
   15. Supplemental membrane attachment to the structural deck is required at all penetrations unless the insulation substrate is fully adhered to the deck.
   16. Fasteners must be installed to achieve the proper embedment depth. Install fasteners without lean or tilt.

17. Install fasteners so that the plate or termination bar is drawn down tightly to the membrane surface.

3.05 FLASHINGS

A. Flash all perimeter, curb, and penetration conditions with coated metal, membrane flashing, and flashing accessories as appropriate to the site condition.

B. All coated metal and membrane flashing corners shall be reinforced with preformed corners or non-reinforced membrane.

C. Hot-air weld all flashing membranes, accessories, and coated metal. A minimum 2” wide (hand welder) weld or minimum 1 - 1/2" automatic machine weld is required.

D. All cut edges of reinforced membrane must be sealed with sealant.

3.06 ROOF PROTECTION

A. Protect all partially and fully completed roofing work from other trades until completion.

B. Whenever possible, stage materials in such a manner that foot traffic is minimized over completed roof areas.

C. Temporary tie-ins shall be installed at the end of each workday and removed prior to commencement of work the following day.

3.07 CLEAN-UP

A. All work areas are to be kept clean, clear and free of debris at all times.

B. Do not allow trash, waste, or debris to collect on the roof. These items shall be removed from the roof on a daily basis.

C. All tools and unused materials must be collected at the end of each workday and stored properly off of the finished roof surface and protected from exposure to the elements.

D. Dispose of or recycle all trash and excess material in a manner conforming to current EPA regulations and local laws.

E. Properly clean the finished roof surface after completion, and make sure the drains and gutters are not clogged.

F. Clean and restore all damaged surfaces to their original condition.

END OF SECTION

SECTION 076200 – SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Documents affecting work of this Section include, but are not necessarily limited to, General Requirements, bidding documents and drawings.

1.2 GENERAL

A. Roofing contractor shall furnish and install all materials described herein unless specifically noted otherwise

1.3 SUMMARY

A. Formed sheet metal work for flashing is specified in this section.

1.4 SUBMITTALS

A. Submit in accordance with Section 013323, Shop Drawings, Product Data, and Samples.

B. Shop drawings:

1. Flashings.
2. Manufacturer's Literature and Data.

1.5 APPLICABLE PUBLICATIONS

A. The publications listed below for a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.

B. American Society for Testing and Materials (ASTM):

1. A167-99(R 2004): Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip
2. A653/A653M-05: Steel Sheet Zinc-Coated (Galvanized) or Zinc Alloy Coated (Galvanized) by the Hot- Dip Process
3. B32-04: Solder Metal
4. B209-04: Aluminum and Aluminum-Alloy Sheet and Plate
5. B370-03: Copper Sheet and Strip for Building Construction
6. D173-03: Bitumen-Saturated Cotton Fabrics Used in Roofing and Waterproofing
7. D412-98 (R2002): Vulcanized Rubber and Thermoplastic Elastomers-Tension

8. D1187-97 (R2002): Asphalt Base Emulsions for Use as Protective Coatings for Metal
9. D1784-03: Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds
10. D3656-04: Insect Screening and Louver Cloth Woven from Vinyl-Coated Glass Yarns
11. D4586-00: Asphalt Roof Cement, Asbestos Free

C. Sheet Metal and Air Conditioning Contractors National Association (SMACNA): Architectural Sheet Metal Manual (Fifth Edition, 1993).

D. National Association of Architectural Metal Manufacturers (NAAMM):

1. AMP 500 Series: Metal Finishes Manual

E. American Architectural Manufacturers Association (AAMA):

1. 605-98: Voluntary Specification for High Performance Organic Coatings on Architectural Extrusions Panels

PART 2 - PRODUCTS

2.1 MATERIALS

A. TPO coated metal approved by roof system manufacturer.

B. Fasteners:

1. Use stainless steel fasteners with neoprene grommets.
2. Nails:

a. Minimum diameter for stainless steel nails: 2 mm (0.095 inch) and annular threaded.
b. Length to provide not less than 7/8” penetration into anchorage.

3. Rivets: Not less than 3 mm (1/8 inch) diameter.
4. Expansion Shields: Fed Spec A-A-1925A.

C. Gutters and downspouts - .032 white aluminum.

2.2 SHEET METAL THICKNESS

A. Except as otherwise shown or specified use thickness or weight of sheet metal as follows:

B. Exposed Locations:

1. .050 kynar aluminum

2.3 FABRICATION

A. Jointing:

1. In general, copper, stainless steel and copper clad stainless steel joints, except expansion and contraction joints, shall be locked and soldered.
2. Joints shall conform to following requirements:

a. Flat-lock joints shall finish not less than 3/4 inch wide.
b. Lap joints subject to stress shall finish not less than one inch wide and shall be soldered and riveted.

3. Soldering:

a. Pre tin both mating surfaces with solder for a width not less than 1 1/2 inches of uncoated copper, stainless steel, and copper clad stainless steel.
b. Wire brush to produce a bright surface before soldering lead coated copper.
c. Treat in accordance with metal producers recommendations other sheet metal required to be soldered.
d. Completely remove acid and flux after soldering is completed.

B. Metal Options:

1. Where options are permitted for different metals use only one metal throughout.
2. Stainless steel may be used in concealed locations for fasteners of other metals exposed to view.
3. Where copper gravel stops, copings and flashings will carry water onto cast stone, stone, or architectural concrete, or stainless steel

2.4 FINISH

A. Use same finish on adjacent metal or components and exposed metal surfaces unless specified or shown otherwise.

B. In accordance with NAAMM Metal Finishes Manual, unless otherwise specified.

1. TPO coated metal approved by roof system manufacturer

2.5 CURB CAPS FOR CONCRETE CURBS

A. .050 kynar coated aluminum – color white

PART 3 - EXECUTION

3.1 INSTALLATION

A. General:

1. Install flashing and sheet metal items as shown in Sheet Metal and Air Conditioning Contractors National Association, Inc., publication, ARCHITECTURAL SHEET METAL MANUAL, except as otherwise shown or specified.
2. Apply sheet metal and other flashing material to surfaces which are smooth, sound, clean, dry and free from defects that might affect the application.
3. Remove projections which would puncture the materials and fill holes and depressions with material compatible with the substrate. Cover holes or cracks in wood wider than 1/4 inch with sheet metal compatible with the roofing and flashing material used.
4. Confine direct nailing of sheet metal to strips 12 inch or less wide. Nail flashing along one edge only. Space nails not over 4 inches on center unless specified otherwise.
5. Install bolts, rivets, and screws where indicated, specified, or required in accordance with the SMACNA Sheet Metal Manual. Space rivets at 3 inch on centers in two rows in a staggered position. Use neoprene washers under fastener heads when fastener head is exposed.
6. Coordinate with roofing work for the installation of metal base flashings and other metal items having roof flanges for anchorage and watertight installation.
7. Nail continuous cleats on 3 inch on centers in two rows in a staggered position.
8. Nail individual cleats with two nails and bend end tab over nail heads. Lock other end of cleat into hemmed edge.
9. Install flashings in conjunction with other trades so that flashings are inserted in other materials and joined together to provide a water tight installation.
10. Where required to prevent galvanic action between dissimilar metal isolate the contact areas of dissimilar metal with sheet lead, waterproof building paper, or a coat of bituminous paint.

END OF SECTION 076200