

**TERM CONSTRUCTION SERVICES CONTRACT
0117-1030**

THE PARTIES TO THIS CONTRACT are the City of Daytona Beach, a Florida municipal corporation, hereinafter the "CITY" or "Owner," and R/J Group, Inc., a Florida profit corporation, hereinafter the "CONTRACTOR."

WITNESSETH, that CONTRACTOR and the CITY agree as follows, for the mutual valuable consideration provided herein:

ARTICLE I. SCOPE OF WORK. CONTRACTOR will provide Roofing Repair, Maintenance, and Inspection services (hereinafter, the "Work") from time to time at the direction of the CITY during the Term of this Contract. Exhibit A, attached hereto and incorporated herein by reference, provides a detailed description of the services that may be provided under this Contract.

ARTICLE II. TERM; RENEWAL. The initial Term of this Contract is 2 years, commencing on the Effective Date. The CITY has the option to renew this Contract for up to 4 Terms of 1 year each. The CITY will exercise each such option by providing CONTRACTOR written notice at least 30 days before the end of the current Term.

ARTICLE III. WORK AUTHORIZATIONS. This Contract, in and of itself, does not require CONTRACTOR to perform any Work or provide payment for Work performed by CONTRACTOR. No Work will be performed under this Contract, and no payment obligation will arise for performance of such Work, except when specifically authorized by a work authorization issued by the CITY in accordance with this Contract and the CITY's procurement policies.

For purposes herein, a work authorization is an agreed-upon document describing the specific Project to be performed, the estimated Project Sum, Project Time, and any additional terms and conditions that the CITY may provide consistent with the terms and conditions of this Contract. A work authorization may be in the form of a mutually executed contract document, or may consist of a CITY-issued purchase order that accepts and incorporates by reference CONTRACTOR's dated, signed written quotation.

Each work authorization is subject to all of the terms and conditions of this Contract and in case of a conflict between the terms of this Contract and a work authorization, this Contract will govern.

Work Authorizations issued pursuant to the Contract will not exceed \$25,000.00

If CONTRACTOR is providing services under an open Work Authorization/purchase order at the time that this Contract expires or terminates for any reason other than CONTRACTOR'S material breach, CONTRACTOR will continue to provide such services unless and until the CITY provides CONTRACTOR a notice suspending or terminating such services. If CONTRACTOR is providing services under an open purchase order at

the time that the CITY terminates this Contract due to CONTRACTOR'S material breach, CONTRACTOR will immediately cease performing all services unless the notice of termination specifically provides otherwise.

ARTICLE IV. COMPENSATION. Subject to the terms herein, the lump sum Project Sum will be set forth in each work authorization, and will be based on the RS Means Facilities Construction Costs Book's Unit Price Schedule, which is hereby incorporated by reference, with prices localized for the City of Daytona Beach, and with the Contractor's multiplier co-efficient of 1.00 applied. In each instance the Project Sum represents CONTRACTOR's sole compensation from the CITY for performance of the Work described in the work authorization.

ARTICLE V. RESERVED

ARTICLE VI. INDEMNIFICATION.

A. CONTRACTOR hereby indemnifies and holds harmless the CITY from and against, all liabilities, damages, losses, and costs, including but not limited to reasonable attorneys' fees, arising out of or resulting from the Work provided that the liabilities, damages, losses, and costs are caused in whole or in part by any negligence, recklessness, or intentional wrongful misconduct of CONTRACTOR, any subcontractor, anyone directly or indirectly employed by any one of them or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder. This indemnification agreement is separate and apart from, and in no way limited by, any insurance provided pursuant to this agreement or otherwise.

B. CONTRACTOR indemnifies the CITY against any claim of supplier's or subcontractor's lien (in cases where such payment is not already guaranteed by payment bond). If any claim or lien remains unsatisfied after all payments are made, CONTRACTOR must refund to the CITY all monies that the latter may be compelled to pay in discharging such a lien, including all costs and a reasonable attorney's fee.

C. For purposes of the obligations stated in this Article, references to the CITY include the CITY's officers, employees, and agents.

D. CONTRACTOR's obligations under this Article are made without regard to the availability of insurance of the CITY or the Engineer/Architect.

ARTICLE VII. INSURANCE

A. Required Insurance.

CONTRACTOR will purchase and maintain, at its own expense, the following types and amounts of insurance, primary and non-contributory with the CITY's own insurance, in form and companies satisfactory to the CITY:

1. **Workers' Compensation Insurance** – As required by Florida Statutes, Chapter 440, Workers' Compensation Insurance, for all employees of CONTRACTOR employed at the project site or in any way connected with the Work.

The insurance required by this provision will comply fully with the Florida Workers' Compensation Law and include Employers' Liability Insurance with limits of not less than \$500,000 per accident. Any associated or subsidiary company involved in the service must be named in the Workers' Compensation coverage.

2. **Liability insurance – Including Commercial General Liability coverage** for operations, independent contractors, products-completed operations, broad form property damage, collapse and underground, and personal injury on an "occurrence" basis, insuring the CONTRACTOR and any other interests, including but not limited to any associated or subsidiary companies involved in the Work; and **Automobile Liability coverage** insuring claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle used by CONTRACTOR at the project site or in any way connected with the Work.

THE COMMERCIAL GENERAL LIABILITY INSURANCE POLICY WILL NAME THE CITY AS AN ADDITIONAL INSURED. Contractor's Commercial General Liability insurance policy shall provide coverage to Contractor, and City when required to be named as an additional insured either by endorsement or pursuant to a blanket additional insured endorsement, for those sources of liability which would be covered by the latest edition of the standard Commercial General Liability Coverage Form (ISO Form CG 00 01) without the attachment of any endorsements excluding or limiting coverage for Products/Completed Operations, Independent Contractors, Property of City in Contractor's Care, Custody or Control or Property of City on which contracted operations are being performed, Explosion, Collapse or Underground hazards (XCU Coverage, Contractual Liability or Separation of Insureds. When City is added as additional insured by endorsement, ISO Endorsements CG 20 10 and CG 20 37 or their equivalent shall be used to provide such Additional Insured status.

The limit of liability will be a combined single limit for bodily injury and property damage of no less than \$1,000,000 per occurrence. If insurance is provided with a general aggregate, the aggregate will be in an amount of no less than \$2,000,000. The Risk Manager may authorize lower liability limits for the automobile policy only, at the Risk Manager's sole discretion.

Unless specifically waived hereafter in writing by the Risk Manager, CONTRACTOR agrees that the insurer will waive its rights of subrogation, if any, against the CITY on each of the foregoing types of required insurance coverage.

B. Subcontractors' Insurance. Each of CONTRACTOR's subcontractors will be required to provide insurance in substantially similar form to the insurance required of CONTRACTOR above based on the services they are providing.

C. Proof of Insurance. CONTRACTOR will furnish proof of insurance acceptable to the CITY prior to or at the time of execution of this Contract. CONTRACTOR will not commence Work until all required insurance has been approved by the CITY. CONTRACTOR will furnish evidence of all required insurance in the form of certificates of insurance which will clearly outline all hazards covered as itemized above, the amounts of insurance applicable to each hazard and the expiration dates.

Upon request of the Risk Manager, CONTRACTOR will also provide the CITY copies of the insurance contracts referenced by the certificates.

D. Cancellation and Replacement. CONTRACTOR will file replacement certificates 30 days prior to expiration or termination of any required insurance occurring prior to the acceptance of the work by the CITY. If such insurance terminates without CONTRACTOR's prior knowledge, CONTRACTOR will notify the CITY immediately upon becoming aware of such termination. CONTRACTOR will send written notice to:

Risk Manager
The City of Daytona Beach
P.O. Box 2451
Daytona Beach, Florida 32115-2451

The CITY reserves the right to suspend the Work until such insurance has been replaced, or to obtain replacement insurance at CONTRACTOR's sole cost.

E. Termination of Insurance. CONTRACTOR will not cancel any required insurance coverage until the work is completed, accepted by the CITY and CONTRACTOR has received written notification from the Risk Manager that CONTRACTOR is authorized to cancel the insurance and the effective date of such authorization. The Risk Manager will provide such written notification at the request of CONTRACTOR if the request is made no earlier than two weeks before the work is to be completed.

The liabilities of CONTRACTOR under this Contract will survive and not be terminated, reduced, or otherwise limited by any expiration or termination of insurance coverage. Neither approval nor failure to disapprove insurance furnished by the contractor will relieve the CONTRACTOR or its sub-contractors from responsibility to provide insurance as required by the contract.

F. Risk Manager. All references herein to the "Risk Manager" will mean the Risk Manager for the CITY or the Risk Manager's designee.

ARTICLE VIII. NOTICES

A. Where the Contract Documents authorize or require the CITY to provide notice to CONTRACTOR, notice may be provided by delivery by hand to CONTRACTOR's designated Superintendent at the Project Site, or in the absence or unavailability of the Superintendent to any other person on the Project Site who holds himself or herself out as managing the Work on behalf of CONTRACTOR, or in lieu of either of these, by written notice to the address provided below.

B. Where the Contract Documents authorize or require CONTRACTOR to provide notice to the CITY, notice may be provided only by written notice to the address provided below.

C. Written notice is valid only if sent by certified United States mail, return receipt requested, facsimile with confirmation receipt required, or by recognized courier such as Federal Express with confirmation receipt requested. All such notices will be deemed to have been duly given and provided on (i) the date of receipt, (ii) upon receipt or refusal of delivery if transmitted by registered or certified mail, return receipt requested, or (iii) the first business day after the date of deposit, if transmitted by reputable overnight courier service, whichever occurs first. Written notices will be sent to the following persons:

If to CONTRACTOR:

Kyle Johnson - Sales & Service Manager
R/J Group, Inc.
4244 Jackson St
Port Orange, FL 32127
Fax: (386) 760-3080

If to the CITY:

David Waller, Deputy Public Works Director
Daytona Beach Public Works Dept.
950 Bellevue Ave.
Daytona Beach, FL 32114
Fax: 386-671-8620

provided, however, that either Party may by written notice change the address designated for receipt of written and faxed notices.

ARTICLE IX. CONTRACT DOCUMENTS. This Contract incorporates the CITY's Request for Proposals ("RFP") # 0117-1030 and supporting documents (the "Solicitation Documents"); CONTRACTOR's Proposal; Scope of Work (Exhibit A) the General Conditions (Exhibit B); Technical Provisions (Exhibit C); any additional Specifications; any other documents attached hereto or specifically incorporated by reference in any of the documents listed above; and each Work Authorization (hereinafter collectively, the "Contract" or "Contract Documents").

The Contract Documents are intended to include all information necessary for CONTRACTOR's proper prosecution and timely completion of the Work for each Project authorized. CONTRACTOR will prosecute the Work as necessary to produce the results indicated by the Contract Documents. The Contract Documents are complementary, and what is required by one will be as binding as if required by all.

ARTICLE X. GENERAL PROVISIONS

A. This Contract will be governed by the laws of the state of Florida without regard to any choice of law principles that could result in application of the laws of any other jurisdiction. Venue for any legal action or proceeding arising out of this Contract is exclusively in the federal or state courts in and for Volusia County, Florida. The Parties hereby waive any right to stay or dismiss any action or proceeding brought under or in connection with this Contract that is brought before the above-referenced courts on the basis of forum non-conveniens.

B. In case of litigation arising out of this Contract where the meaning of one or more provisions is at issue, the CITY will not be penalized by virtue of its having drafted this Contract. CONTRACTOR has carefully reviewed and had the opportunity to seek advice of legal counsel prior to executing this Contract.

C. The CITY and CONTRACTOR agree that they have knowingly waived the right to trial by jury and have instead agreed that, in the event of any litigation arising out of or connected to this Contract, to proceed with a trial before the court, unless both parties subsequently agree otherwise in writing.

D. In performing the services provided for herein, CONTRACTOR is an independent contractor and not an employee of the CITY.

E. The waiver of any provision of this Contract will not be deemed to be a waiver of any other provision of this Contract. No waiver of any provision of this Contract will be deemed to constitute a continuing waiver unless expressly provided in writing, nor will a waiver of any default be deemed a waiver of any subsequent defaults of the same type. The failure at any time to enforce this Contract, whether the default is known or not, does not constitute a waiver or estoppel of the right to do so.

F. All terms and conditions of this Contract which contemplate a period of time beyond completion or termination, will survive such completion or termination and not be merged therein or otherwise terminated.

G. If any word, phrase, clause, sentence or provision of the Contract, or the application of same to any person or set of circumstances is for any reason held to be unconstitutional, invalid or unenforceable, that finding will only effect such word, phrase, clause, sentence or provision, and such finding will not affect the remaining portions of this Contract; this being the intent of the Parties in entering into the Contract; and all provisions of the Contract are declared to be severable for this purpose.

H. The undersigned representative of CONTRACTOR affirms that in executing this Contract on behalf of CONTRACTOR, he or she is fully authorized to bind CONTRACTOR to the terms and conditions herein set forth.

I. No CITY officer, employee, or independent consultant who is involved in the development, evaluation, or decision-making process of the performance of any solicitation will have a financial interest, direct or indirect, in the Contract resulting from that solicitation. Any violation of this provision, with the knowledge, expressed or implied, of CONTRACTOR will render the Contract voidable by the CITY.

J. The Owner may at any time suspend the Work, or any part thereof, by giving 10 written days' notice to Contractor. The Work shall be resumed by Contractor within 10 days after the date fixed in the written notice from the Owner to Contractor to do so. The Owner shall reimburse Contractor for expense incurred by Contractor in connection with the work under this Contract as a result of such suspension.

K. If Contractor is adjudged as bankrupt or makes a general assignment for the benefit of creditors, or if a receiver is appointed on account of Contractor's insolvency, or if Contractor persistently fails or refuses, except in cases for which extensions of time are provided, to supply enough properly skilled workmen or proper materials, or if Contractor fails to make prompt payment to subcontractors or for material or labor, or persistently disregard applicable laws and regulations, including permit conditions, or is otherwise be guilty of a substantial violation of any provision of the Contract, then the Owner may, without prejudice to any other right or remedy and after giving the Contractor seven days' written notice, terminate the employment of Contractor and take possession of the project site and of all materials, tools, and appliances thereon, and finish the Work by whatever method the Owner may deem expedient. In such case, Contractor shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Work Authorization owed to Contractor under all Work Authorizations exceeds the expense of finishing the uncompleted work, including compensation for additional managerial and administrative services, such excess shall be paid to Contractor. If such expense exceeds such unpaid balance, Contractor shall pay the difference to the Owner.

The Owner's termination of the Contract shall not affect or terminate any of the rights of the Owner as against Contractor then existing or which may thereafter accrue because of such default. Any retention or payment of monies by the Owner due Contractor under the terms of the Contract shall not release Contractor from liability for such default.

The Owner may terminate performance of the Work in accordance with this clause in whole, or in part, whenever the Owner determines that such termination is in the best interest of the Owner. Any such termination shall be effected by the delivery to the Contractor of a Notice of Termination specifying the extent to which performance of the Work is terminated, and the date upon which such termination becomes effective. Upon such termination for convenience, Contractor shall be entitled to payment, in accordance with the payment provisions, for services rendered up to the termination date, and the Owner shall have no other obligations to Contractor. Contractor shall be obligated to continue performance of contract services, in accordance with this Contract, until the termination date and shall have no further obligation to perform services after the termination date.

L. Contractor shall not assign the Contract or subcontract the Work as a whole or in part without Owner's written consent. Contractor shall not assign any monies due or to become due to Contractor hereunder without the Owner's written consent. Assigning the Contract and subcontracting the Work shall not relieve the Contractor or Contractor's surety from any Contract obligations.

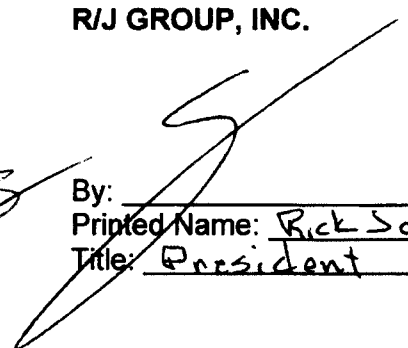
J. This Contract represents the entire and integrated agreement between the CITY and CONTRACTOR with respect to the subject matter hereof and supersedes all prior negotiations, representations or agreements, either written or oral.

IN WITNESS WHEREOF, the Parties have executed this Contract on the dates written below.

THE CITY OF DAYTONA BEACH

R/J GROUP, INC.

By: 
Derrick L. Henry, Mayor

By: 
Printed Name: Rick Johnson
Title: President

Attest: 
Leticia LaMagna, City Clerk

Date: 9-14-17

Date: 6-30-17

Approved as to legal form:

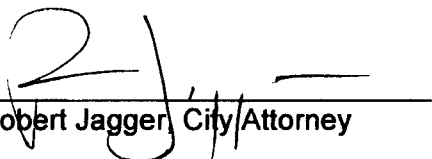
By: 
Robert Jagger, City Attorney

EXHIBIT A

I. BACKGROUND

A. Introduction: The City of Daytona Beach (City) will award an annual roofing services contract to a qualified Roofing Contractor for maintenance inspections, condition and cost assessments, routine maintenance, and emergency roof repairs.

B. WORK AUTHORIZATIONS: No Work Authorization issued pursuant to the contract will exceed \$25,000.00.

C. CURRENT STATUS:

1. The City of Daytona Beach owns buildings that range in age from more than 50 years old to new buildings. Some of these roofs may develop leaks that will need to be repaired in order to stop water intrusion into the building which could damage the facility's structural system, interior finishes and equipment.

2. There are several roofs under warranty that require manufacturers' warranty compliant maintenance during the course of the warranty. Inspections will be performed to evaluate the roof and analyze what needs to be done to bring the roof into a good condition (repair, replace or no work required).

II. SCOPE OF WORK

A. The Contractor will perform periodic preventative maintenance inspections and provide emergency repair services.

B. The Contractor will be provided a list of sites scheduled to receive routine maintenance inspections during the current fiscal year within two months of contract award, and at the start of each new fiscal year in October.

C. The Contractor will be contacted by the Technical Services staff regarding specific roof work required. The Contractor will meet with Technical Services Division staff on the roofs where work is to be accomplished. The Contractor will provide all resources, work, equipment, tools, and materials needed to achieve the Scope of Work developed after the site visit.

D. The Contractor will submit a fee proposal utilizing the most recent edition of RS Means Facilities Construction Costs Book's unit prices, localized for Daytona Beach, with the awarded multiplier applied to the total cost, within one (1) *business* day. The fee proposals will be reviewed by City staff for completeness and accuracy. RS Means Facilities Construction Costs Book is available from 4Clicks Solutions, LLC, 866-742-5425, www.4clicks.com.

E. The Contractor will subsequently meet with City Staff to discuss the measurements and quantities of the unit prices submitted in the fee proposal. Once the City and Contractor agree on the quantities, a final lump sum price will be determined, using the method provided in II.C, above.

Once the lump sum amount is established, no change orders for additional quantities will be issued unless the City requests a change to the Scope of the Work Authorization.

F. The Contractor will commence all work within 24 hours of issuance of the Work Authorization, in order to minimize damage.

G. When a Work Authorization includes “hourly” unit pricing, the Contractor will provide time/date stamped photographs of the work area and work progress to document when the Contractor arrives and leaves the jobsite.

H. The Contractor will meet with the City’s representative periodically but no less than annually at no additional cost to the City, to assess the Contractor’s performance for continuation of the contract.

EXHIBIT B: GENERAL CONDITIONS

SECTION 1. Execution, Correlation and Intent of Documents.

All references to the Contract, the Contract, or to the Contract Documents, shall be deemed to be to the Contract including all referenced Exhibits, including this Exhibit.

SECTION 2. Compliance with Law.

Contractor shall comply with all other applicable requirements of federal, state, and local law associated with the prosecution of the Work, including the following if applicable:

The Occupational Safety and Health Administration's (OSHA) Excavation Safety Standard, 29 C.F.R.s 1926.650 Sub Part P, and Chapter 90-96 Florida Statutes.

Contractor shall obtain, at Contractor's costs, all permits associated with the Work.

SECTION 3. Arrangement and Coordination.

Contractor shall arrange the performance of the Work so as not to interfere with the Owner's normal hours of operation. Contractor shall meet with the Owner on a regular basis at the project site to review the prosecution of the Work. To the extent practical, Contractor shall reasonably accommodate the needs of City employees and agents to the extent that these employees and agents need to work in the facilities during Contractor's prosecution of the Work.

If, during the performance of the Work, CONTRACTOR discovers any conflict, error, ambiguity, or discrepancy within the Work Authorizations or between any Contract Document and any Legal Requirement or of any such standard, specification, manual, or code or instructions of any manufacturer or supplier, CONTRACTOR will within three days of such discovery report it to the OWNER in writing, and CONTRACTOR will not proceed with the Work affected thereby until a Change Order has been issued. CONTRACTOR will be liable to the OWNER for failure to report any such conflict, error, ambiguity, or discrepancy of which CONTRACTOR knew or reasonably should have known. CONTRACTOR will be liable to the OWNER for CONTRACTOR's failure to report any conflict, error, ambiguity or discrepancy in the Work Authorizations within said three-day period.

SECTION 4. Materials, Equipment, Employees.

Unless otherwise stipulated, Contractor shall provide and pay for all materials, labor, water, tools, equipment, light, power, transportation, and other facilities necessary for the execution and completion of the Work. Unless otherwise specified, all materials incorporated in the Work shall be new and both workmanship and materials shall be of good quality. If requested by the Owner, Contractor furnish satisfactory evidence as to the kind and quality of materials.

SECTION 5 General Responsibilities.

Scope of Work. CONTRACTOR will provide, perform, and complete all necessary work, labor, services, transportation, equipment, materials, apparatus, machinery, tools, fuels, gas, electric, water, waste disposal, information, data and other means and items necessary to accomplish the Project at the Work Site, including measures for waste disposal, in compliance with this Contract. CONTRACTOR is required to perform all Work specified in the Work Authorizations and reasonably inferable from these Documents as being necessary to produce the intended results.

Quality. All materials and Work will be of good quality for the intended use and consistent with the quality of surrounding Work, and will conform to the requirements of the Work Authorizations and to the standards for construction of the Project generally. All materials will be new.

Construction Means and Methods. CONTRACTOR will provide continuous on-site supervision and direction of the Work using CONTRACTOR's best efforts. CONTRACTOR will have control over construction means, methods, techniques, sequences, and procedures, unless the Work Authorizations give other specific instructions concerning these matters, and is solely responsible therefore.

Discipline at the Project Site. CONTRACTOR will enforce strict discipline and good order among CONTRACTOR's employees and other persons for whose Work CONTRACTOR is responsible, including CONTRACTOR's employees, subcontractors, sub-subcontractors, and suppliers, and the agents and employees of any of them.

Responsibility for Subordinates. CONTRACTOR is responsible for the acts and omissions of all persons performing portions of the Work at the Project Site, including but not limited to CONTRACTOR's employees, subcontractors, sub-subcontractors, and suppliers, and the agents and employees of any of them.

Assignment, Scheduling and Coordination. CONTRACTOR is solely responsible for and has control over assigning, scheduling and coordinating all portions of the work under the Contract performed by CONTRACTOR's own forces and by its subcontractors, sub-subcontractors, and suppliers, in accordance with the approved Progress Schedule, unless the Work Authorizations give other specific instructions concerning these matters.

Obligations Not Relieved. CONTRACTOR is not relieved of its obligations to perform the Work in accordance with the Contract Documents, by the activities or duties of the OWNER or the E/A in the administration of the Contract or of construction, or by tests, inspections, or approvals required or performed by persons other than CONTRACTOR.

Ongoing Duty to Report Problems with Contract Documents. If, during the performance of the Work, CONTRACTOR discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents or between any Contract Document and any Legal Requirement or of any such standard, specification, manual, or code or instructions of any manufacturer or supplier, CONTRACTOR will within three days of such discovery report it to the OWNER in writing, and CONTRACTOR will not proceed with the Work affected thereby until a Change Order has been

issued. CONTRACTOR will be liable to the OWNER for failure to report any such conflict, error, ambiguity, or discrepancy of which CONTRACTOR knew or reasonably should have known. CONTRACTOR will be liable to the OWNER for CONTRACTOR's failure to report any conflict, error, ambiguity or discrepancy in the Contract Documents within said three-day period.

CONTRACTOR will store, handle, install, and test all materials in accordance with the manufacturer's or suppliers' most recent instructions and recommendations. CONTRACTOR will promptly notify the OWNER if these instructions and recommendations are in conflict with any provision of the Contract Documents or Work Authorizations issued pursuant to the Contract.

All materials and equipment will be applied, installed, connected, erected, used, cleaned, and conditioned in accordance with instructions of the applicable manufacturer and supplier, except as otherwise provided in the Work Authorizations

Title to materials delivered to the Project Site or stored off-site will not be deemed to pass to the OWNER until the OWNER accepts such title by paying for same. The OWNER will be entitled but is not required to request title documentation. Risk of loss will not pass to the OWNER until title passes.

SECTION 6 Concerning Subcontractors, Suppliers, and Others.

CONTRACTOR will retain direct control of and give direct attention to the fulfillment of this Contract. CONTRACTOR agrees not to assign this Contract, by power of attorney or otherwise, without the OWNER's prior written consent.

CONTRACTOR will not subcontract the performance of the entire Contract or the supervision and direction of the Work without the OWNER's prior written consent. CONTRACTOR will not employ any subcontractor or other person or organization, whether initially or as a substitute, against whom the OWNER may have reasonable objection. The OWNER will communicate such objections by written notice. CONTRACTOR will not substitute any subcontractor that has been accepted by the OWNER, unless the OWNER first accepts the substitute in writing.

CONTRACTOR will enter into written agreements with all subcontractors and suppliers which specifically bind the subcontractors and suppliers to the applicable terms and conditions of the Contract Documents for the OWNER's benefit. The OWNER reserves the right to specify that certain requirements will be adhered to by all subcontractors and sub-subcontractors as indicated in other portions of the Contract Documents, in which instance these requirements will be made a part of the written agreement between CONTRACTOR and each subcontractor. CONTRACTOR's standard subcontract form is subject to the OWNER's review and approval. Within five working days of the OWNER's request for subcontractor contract documents, CONTRACTOR will provide them to the OWNER.

CONTRACTOR will be fully responsible to the OWNER for all acts and omissions of the subcontractors, suppliers, and other persons and organizations performing or furnishing any of the Work under contract with CONTRACTOR and under contract with CONTRACTOR's subcontractors or suppliers, just as CONTRACTOR is responsible for CONTRACTOR's own acts

and omissions. Nothing in the Contract Documents will create for the benefit of any such subcontractor or other person or organization any contractual relationship between the OWNER and any such subcontractor or other person or organization, nor will it create any obligation on the part of the OWNER or E/A to pay or to see to the payment of any moneys due any such subcontractor or other person or organization except as may otherwise be required by Legal Requirements.

CONTRACTOR will be solely responsible for efficiently scheduling and coordinating the Work of subcontractors and other persons and organizations performing or furnishing any of the Work under a direct or indirect contract with CONTRACTOR in order to avoid any delays or inefficiencies in the prosecution of the Work. CONTRACTOR will require all subcontractors and such other persons and organizations performing or furnishing any of the Work to communicate with the OWNER through CONTRACTOR.

The divisions and sections of the Technical Provisions and the identification of any Plans will not control CONTRACTOR in dividing or delineating the Work to be performed by any specific trade.

CONTRACTOR will pay each subcontractor their appropriate share of payments made to CONTRACTOR not later than ten days of CONTRACTOR's receipt of payment from the OWNER.

To the extent allowed by Florida law, the OWNER will be deemed to be a third party beneficiary to each subcontract and may, if the OWNER elects, following a termination of CONTRACTOR, require that the subcontractor(s) perform all or a portion of unperformed duties and obligations under its subcontract(s) for the benefit of the OWNER, rather than CONTRACTOR; however, if the OWNER requires any such performance by a subcontractor for the OWNER's direct benefit, then the OWNER will be bound and obligated to pay such subcontractor the reasonable value for all Work performed by such subcontractor to the date of the termination of CONTRACTOR, less previous payments, and for all Work performed thereafter. If the OWNER elects to invoke the OWNER's right under this Section, the OWNER will provide notice of such election to CONTRACTOR and the affected subcontractor(s).

SECTION 7 Patent Fees and Royalties.

CONTRACTOR will be responsible at all times for compliance with applicable patents and copyrights encompassing, in whole or in part, any design, device, material, or process utilized, directly or indirectly, in the performance of the Work or the formulation or presentation of its Bid.

CONTRACTOR will pay all royalties and license fees and will provide, prior to commencement of Work hereunder and at all times during the performance of same, for lawful use of any design, device, material or process covered by letters, patent or copyright by suitable legal agreement with the patentee, copyright holder, or their duly authorized representative whether or not the OWNER specifies a particular design, device, material, or process.

CONTRACTOR will defend all suits or claims for infringement of any patent or copyright and will save the OWNER harmless from any loss or liability, direct or indirect, arising with respect

to CONTRACTOR's process in the formulation of its Proposal or the performance of the Work or otherwise arising in connection therewith. The OWNER reserves the right to provide its own defense to any suit or claim of infringement of any patent or copyright in which event CONTRACTOR will indemnify and save harmless the OWNER from all costs and expenses of such defense as well as satisfaction of all judgments entered against the OWNER.

The OWNER will have the right to stop the Work or terminate this Contract at any time if CONTRACTOR fails to disclose to the OWNER that CONTRACTOR's work methodology includes the use of any infringing design, device, material, or process.

Permits, Fees. CONTRACTOR will secure and pay for at CONTRACTOR's expense, all permits and licenses of a temporary nature that are required for the prosecution of the Work; provided, however, that the OWNER will reimburse CONTRACTOR for any CITY-required permits unless specified otherwise in the Supplemental General Conditions.

The OWNER will obtain licenses and easements for permanent structures and or permanent changes in existing facilities.

Diligent Prosecution. CONTRACTOR will at all times be responsible for the diligent prosecution of the Work so as to complete the Work within the Completion Time.

SECTION 8 Construction Operations.

CONTRACTOR will confine operations at the Project Site to those areas permitted by all Legal Requirements, and will not unreasonably encumber the Project Site with materials and equipment. CONTRACTOR will assume full responsibility for any damage to any portion of the Project Site, or to the owner or occupant thereof or of any adjacent land or areas, resulting from the performance of the Work. If an adjacent property owner or occupant files a claim because of or in connection with the performance of the Work, CONTRACTOR will promptly settle the claim by negotiation or as otherwise provided by law. CONTRACTOR will indemnify, defend and hold harmless the OWNER and anyone directly or indirectly employed by the OWNER, from and against all claims, costs, losses, and damages (including court costs and reasonable attorney's fees) arising out of or resulting from any claim or action, legal or equitable, brought by any such the owner or occupant against the OWNER, E/A or any other party indemnified hereunder to the extent caused by or based upon performance of the Work or failure to perform the Work.

CONTRACTOR will not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor will CONTRACTOR subject any part of the Work, the Project Site, or adjacent property to stresses or pressures that will endanger it.

All Work will be performed solely during Working Hours, unless (i) more restrictive hours are required by CITY ordinances or other Legal Requirements governing CONTRACTOR's performance of the Work, or (ii) the Contract Administrator approves expanded Working Hours in writing, such as in the event of emergencies, in which instance the Contract Administrator's approval may be terminated at any time and for any reason without recourse to CONTRACTOR. The OWNER has the right to impose further restrictions on working hours reasonably related to

the use of occupied facilities. No delays resulting from compliance with applicable Legal Requirements may form the basis for any claim by CONTRACTOR for delay damages or additional compensation or for any extensions of the Contract Time; any delays arising from restrictions related to the use of occupied facilities are non-compensable and any claims for extensions of the Contract Time relating to them will be filed in accord with Section 14 or the same will be conclusively deemed to have been waived. CONTRACTOR will not permit Work outside of Working Hours without the written consent of the OWNER; such consent, if given, may be conditioned upon payment by CONTRACTOR of the OWNER's additional costs and fees incurred in monitoring such off-hours Work. CONTRACTOR will notify the OWNER as soon as possible if Work will be performed outside such times in the interest of the safety and protection of persons or property at the Project Site or adjacent thereto, or in the event of an emergency. In no event will CONTRACTOR permit Work to be performed at the Project Site without the presence of CONTRACTOR's Superintendent and person responsible for the protection of persons and property at the Project Site and compliance with all Legal Requirements, if different from the Superintendent.

Temporary Utilities. CONTRACTOR, at its own expense, will:

Furnish all temporary heat, cooling ventilation, and humidity control including all required apparatus and fuel as may be necessary to protect the Work fully, both during its execution and until Final Completion and acceptance. CONTRACTOR will not use any method of heating, cooling, ventilation, or humidity control of the building unless approved by the OWNER in advance.

Provide all temporary on-Site water service required to perform the Work, to assure safety at the Site, and as otherwise required. All temporary services will be removed by CONTRACTOR.

Furnish all temporary electric service required to perform the Work, to assure safety at the Site, and as otherwise required.

CONTRACTOR will provide and maintain in a neat, sanitary condition such accommodations for the use of CONTRACTOR's employees, subcontractors, and others for whom CONTRACTOR may be responsible, as may be necessary to comply with Legal Requirements, and will commit no public nuisance.

Site Maintenance. During the progress of the Work and on a daily basis, CONTRACTOR will keep the Project Site free from accumulation of waste materials, rubbish, and other debris resulting from the Work. If CONTRACTOR fails to do so in a manner reasonably satisfactory to the OWNER within 48 hours after notice or as otherwise required by the Work Authorizations, the OWNER may clean the Project Site and back charge CONTRACTOR for all costs associated with the cleaning. At Substantial Completion, CONTRACTOR will leave the Project Site clean, including but not limited to the cleaning of manholes, inlets, and gravity underground piping systems, and ready for the OWNER's occupancy, and will at this point also remove all temporary buildings, waste, trash, debris, and surplus materials. At Final Completion, CONTRACTOR will remove all tools, appliances, construction equipment, and machinery, in addition to the above-referenced materials, and leave the Project Site clean and ready for OWNER's occupancy. This requirement will not apply to property used for permanent disposal of rubbish or waste materials in accordance with permission for such disposal granted to CONTRACTOR by the OWNER. CONTRACTOR will, at a minimum, restore to original condition all property not designated for

alteration by the Contract Documents. If CONTRACTOR fails to clean up at the completion of the Work, the OWNER may do so and the cost thereof will be charged against CONTRACTOR.

Risk of Performance. If CONTRACTOR performs any work involving an apparent error, inconsistency, ambiguity, construction impracticality, omission, or violation of Legal Requirements in the Work Authorizations of which CONTRACTOR is aware, or which could reasonably have been discovered by the review required by CONTRACTOR by this Contract, without prompt written notice to the OWNER and the E/A and request for correction, clarification or additional information, as appropriate, CONTRACTOR does so at its own risk and expense and all claims relating thereafter are specifically waived.

SECTION 9 Public Safety.

Contractor shall provide and maintain all necessary watchmen, barricades, red lights, or warning signs, as commonly used in the industry, to prevent endangering life and property during prosecution of the Work, and shall otherwise take all necessary precautions to avoid undue risk towards endangering life and property. Contractor shall make good any damage or loss to the Work, to Owner's property, and to other property, or due to bodily injury or death, resulting from lack of reasonable protective precautions, except to the extent that such damage, injury, or loss is caused by employees or other agents of the Owner.

In an emergency affecting public safety, or endangering life or property, Contractor is, without special instructions or authorization from the Owner, hereby permitted to act at Contractor's discretion to prevent such threatening loss or injury. Contractor shall also act, without appeal, if so authorized or instructed by the Contract Administrator.

Any compensation claimed by the Contractor on account of emergency work shall be determined by Contract.

SECTION 10. Inspection of Work.

Inspection of Work. CONTRACTOR will make frequent inspections during the progress of the Work to confirm that work previously performed by CONTRACTOR is in compliance with the requirements of this Contract, and that any portion of Work previously performed by CONTRACTOR or by others is in proper condition to receive subsequent Work.

The Owner shall provide sufficient competent personnel for the inspection of Work. The Owner shall at all times have access to the Work whenever it is in preparation or progress, and Contractor shall provide proper facilities for such access and for inspection.

If pursuant to applicable regulations any aspect of the Work must be specially tested or approved, Contractor shall give the Owner timely notice of its readiness for inspection and, if the inspection is by an authority than the Owner, of the date fixed for such inspection. Inspections by the Owner shall be promptly made, and where practicable at the source of supply. If any Work should be covered up without the Owner's approval or consent, the Owner may require Contractor to uncover

the same for examination. In such instance, the uncovering and restoration of the Work shall be at Contractor's expense.

The Owner may order re-inspection of any Work; and if so ordered, Contractor must uncover it. If such Work is found to be in accordance with the Contract, the Owner shall pay the cost of re-inspection and replacement. If such work is not in accordance with the Contract, Contractor shall pay such cost.

SECTION 11. Superintendence.

Contractor shall keep at the project site a competent English-speaking superintendent and any necessary assistants, all satisfactory to the Owner, during progress of the Work. The superintendent shall represent Contractor in Contractor's absence, and all directions given to the superintendent shall be binding as if given to the Contractor. Important directions shall immediately be confirmed in writing to Contractor. Other directions shall be confirmed on written request in each case. Contractor shall give sufficient superintendence to the work, using Contractor's best skill and attention.

SECTION 12. Changes in the Work.

In giving instructions, the Owner shall have authority to make minor changes in the work not involving extra cost and not inconsistent with the purpose of the work. No extra work or change shall be made unless in pursuance of a written order issued by the Owner, and no claim for an addition to the amount of the Work Authorization shall be valid unless the additional work was so ordered.

Contractor shall proceed with the Work as changed and the value of any such extra work or change shall be determined as provided below.

SECTION 13. Accepted Equals and Substitutions

Accepted Equals. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item, the specification or description is intended to require the item named, unless the Contract Documents, in specifying the name, specifically authorize the use of functionally equivalent item through the use of terms such as "as equal," "or equal," or "equivalent." For purposes herein, an item is only "functionally equivalent" if it is available at the same or lower cost, and if it is sufficiently similar to the item specified, including as to durability, warranty, acquisition time, and availability, so that no change in related Work will be required, and no change in the useful life, maintenance, repair cost, or quality of the completed work is anticipated.

CONTRACTOR May Propose Substitutions. CONTRACTOR may propose a substitution for any item of material or equipment, and for any means, method, technique, sequence, or procedure of construction, specified in the Work Authorizations. CONTRACTOR's will propose such substitutes at CONTRACTOR's sole cost and expense, and at CONTRACTOR's sole risk as to disruptions to the Critical Path of the current approved Progress Schedule. CONTRACTOR will provide OWNER sufficient data and documentation to allow the OWNER to review the proposal.

OWNER's Evaluation. The OWNER will be allowed a reasonable time within which to evaluate each proposal made by CONTRACTOR pursuant to this Section. The OWNER will be the sole judge of acceptability. No accepted equal or substitute will be ordered, installed, or utilized until the OWNER's review is complete, which will be evidenced by a Change Instrument. The OWNER may require CONTRACTOR to furnish at CONTRACTOR's expense a special performance guarantee or other surety bond with respect to any accepted equal or substitution or for any other delay or disruption to the Critical Path of the Project Schedule attributable to any such substitution. The OWNER will not be responsible for any delay due to review time for any proposed substitution, unless such an extension is due to CONTRACTOR, consistent with the requirements of this Contract for changes and delays. The OWNER will not be responsible for increased costs associated with the review or approval of a proposed substitution, unless the increase is required as provided in association with changes and delays. In any event, no such extension or increase will be deemed provided unless specified in the Change Instrument approving the substitution.

CONTRACTOR to Remain Responsible. The OWNER's acceptance of a substitution will not relieve CONTRACTOR from primary responsibility and liability for the suitability and performance of any proposed substitute item or substituted method or procedure, and will not relieve CONTRACTOR from its primary responsibility and liability for curing Defective Work and performing warranty work, which CONTRACTOR will cure and perform, regardless of any claim CONTRACTOR may choose to advance against the OWNER or manufacturer.

SECTION 14. Extension of Time.

The period of time for completion set forth in the Work Authorization shall be extended in amount equal to time lost due to causes which could not have been foreseen or are beyond the control of Contractor, but not due to causes which are not the result of the Contractor's fault, negligence, or deliberate act. Extension of time for completion shall also be allowed for delays in the progress of the Work caused by any act or omission on the part of the Owner, or the Owner's officers, employees, agents, or by other contractors employed by the Owner; or delays due to the Government. Strikes and labor disputes shall be cause for an extension of time. However, if Contractor may avoid a delay otherwise justifying an extension of time by rearranging the Work without undue costs, the Contractor will not be given an extension of time to complete the Work.

Contractor shall notify the Owner within ten days of any occurrence which in the Contractor's opinion entitles Contractor to an extension of time for completion. Such notice shall be in writing shall state in detail the facts supporting Contractor's assertion that additional time is required, and shall include an estimate of the additional time needed. Owner shall acknowledge in writing receipt of any such claim by Contractor within ten days of its receipt.

SECTION 15. Claims for Extra Cost.

Contractor must notify Owner in writing of a claim for extra cost within 10 days after (i) discovery of site-related conditions that are unanticipated and could not reasonably be anticipated, (ii) receipt of revised instructions or requirements of regulatory government agencies issued after the

Effective Date, or (iii) receipt of change orders issued by the Owner pursuant to the Contract. The notice must include sufficient detail to justify Contractor's claim for extra cost. If Contractor fails to provide notice of such claim within the timeframe required, or commences with Work directly in response to any of the foregoing conditions before receiving Owner's written response to such claim, which Owner will provide within 10 days after receipt, then Contractor shall be deemed to have waived Contractor's claim for extra cost.

Payment for extra work will be calculated based on extension of unit prices set forth in the latest edition of RS Means Facilities Construction Cost Book if applicable, localized for the City of Daytona Beach and factored by the multiplier; or on the basis of the Schedule of Values; or if such payment cannot be reasonably determined on the basis of unit price extension or the Schedule of Values, at mutually agreed upon unit prices or on a lump sum basis as provided for "Force Account Work."

SECTION 16. Force Account Work.

If the Owner orders, in writing, the performance of any work not otherwise covered by the Contract, and for which no item in the Contract is provided, and for which no unit price or lump sum basis can be agreed upon, then such extra work shall be done except for federally funded projects which shall comply with Federal Procurement Standard, on a cost-plus-percentage basis of payment as follows:

- Contractor shall be reimbursed for all costs incurred in doing the work, and shall receive an additional payment of 5% of all such costs to cover his indirect overhead costs, plus 10% of all costs, including indirect overhead, as his fee.
- The term "Cost" shall cover all payroll charges for men employed and supervision required under the specific order, together with all Workers' Compensation, Social Security, pension and retirement allowances, and social insurance, or other regular payroll charges on same; the cost of all materials and supplies required of either temporary or permanent character; rental of all power-driven equipment at agreed-upon rates, together with cost of fuel and supply charges on same; and any other costs incurred by Contractor as a direct result of executing the order, if approved by the Owner.
- The cost of the work done each day shall be documented and submitted to the Owner in a satisfactory form on the succeeding day, and shall be approved by him or adjusted at once.
- Monthly payments of all charges for Force Account Work in any one-month shall be made in accordance with this Contract. Those payments shall include the full amount of fee earned on the cost of the work done.

SECTION 17. Deductions for Uncorrected Work.

If the Owner deems it inexpedient to correct Work that has been damaged or that was not done in accordance with the Contract, an equitable deduction from the Work Authorization shall be made therefore.

SECTION 18. Correction of Work before Final Payment.

During the prosecution of the Work, Contractor shall promptly remove all defective materials from the project site, whether incorporated in the Work or not, and Contractor shall promptly replace and re-execute the Work in accordance with the Contract and without expense to the Owner, and shall bear the expense of making good all work of other contractors destroyed or damaged by such removal or replacement.

If Contractor does not remove such defective materials as promptly as possible, after written notice, the Owner may remove them and store the material at the expense of Contractor.

SECTION 19. Contractor's Right to Stop Work or Terminate Contract.

If the Work is stopped under an order of any court or other public authority, for a period of three months or more, through no act or fault of the Contractor or of anyone employed by him, or if the Owner fails to pay the Contractor an amount due under this Contract within 30 days of the due date, Contractor may, upon seven days' written notice to the Owner, stop work or terminate this Contract, and recover from the Owner payment for all work executed, plus any loss sustained upon any plant or materials, plus reasonable profit and damages.

SECTION 20. Removal of Equipment.

In the case of termination of this Contract before completion for any cause whatever, Contractor, if notified to do so by the Owner, shall promptly remove any part or all of Contractor's equipment or supplies from the project site; failing to, the Owner shall have the right to remove such equipment and supplies at Contractor's expense.

SECTION 21. Use of Completed Portions.

The Owner may, at any time during progress of the work, after written notice to the Contractor, take over and place in service any completed portions of the work which are ready for service, although the entire work of the Contract is not fully completed, and notwithstanding the time for completion of the entire work or such portions which may not be expired. In such case, the Owner shall issue certificates of acceptance for such portions of the Work, but such taking possession thereof shall not be deemed an acceptance of any other portions of the work, nor of any uncompleted portions, nor of any Work not completed in accordance with the Work Authorizations.

SECTION 22. Payments Withheld Prior to Final Acceptance of Work.

The Owner may withhold or, on account of subsequently discovered evidence, nullify the whole or part of any certificate of payment to such extent as may be necessary to protect the Owner from loss on account of:

- Defective Work not remedied.
- Claims filed or reasonable evidence indicating public filing of claims by other parties against the

Contractor.

- Failure of Contractor to make payments properly to subcontractors or for materials or labor.
- Damage to another contractor.

When the above grounds are removed or the Contractor provides a Surety Bond satisfactory to the Owner, which will protect the Owner in the amount withheld, payment shall be made for amounts withheld because of them.

SECTION 23. Liens.

Neither the final payment nor any part of the retained percentage shall become due until Contractor shall deliver to the Owner a complete release of all claims or liens arising out of this Contract, or receipts in full in lieu thereof and, if required in either case, an affidavit that so far as he had knowledge or information the release and receipts include all the labor and materials for which a subcontractor refuses to furnish a release or receipt in full, furnish a bond satisfactory to the Owner, to indemnify the Owner against any claim or lien (in cases where such payment is not already guaranteed by surety bond). If any claim or lien remains unsatisfied after all payments are made, Contractor shall refund to the Owner all monies that the latter may be compelled to pay in discharging such a lien, including all costs and a reasonable attorney's fee.

SECTION 24. Rights of Various Interests.

Wherever work being done by the Owner's forces or by other contractors is contiguous to Work covered by this Contract, the respective rights of the various interests involved shall be established by the Owner to secure the completion of the various portions of the work in general harmony.

SECTION 25. Separate Contracts.

The Owner reserves the right to let other contracts in connection with this work. Contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials and the execution of their work, and shall properly connect and coordinate his work with theirs.

SECTION 26. Cleaning Up.

Contractor shall remove at Contractor's own expense from the Owner's property and from all public and private property, all temporary structures, rubbish and waste materials resulting from Contractor's prosecution of the Work. This requirement shall not apply to property used for permanent disposal of rubbish or waste materials in accordance with Owner's permission.

SECTION 27. WARRANTIES

General Warranty.

CONTRACTOR warrants that the Work and all of its components will be free from defects and flaws in design, workmanship, and materials for the duration of the General Warranty Period described below; will strictly conform to the requirements of the Contract; and will be fit, sufficient and suitable for the purposes expressed in, or reasonably inferred from, the Contract. This general

warranty is in addition to any other warranties expressed or implied by law, which are hereby reserved unto the OWNER.

General Warranty Period. The General Warranty Period will be one year from Substantial Completion, except for those items of equipment or those aspects of work placed in service or approved by the OWNER after Substantial Completion, in which instance the warranty for the particular equipment or aspect of work will be one year from the date of OWNER approval; provided, however, that the General Warranty Period for particular equipment placed in continuous service before Substantial Completion may start to run from an earlier date, if expressly provided in this Contract.

CONTRACTOR will correct any and all defects that defects in material or workmanship which may appear during the General Warranty Period, even if discovered after the General Warranty Period, by repairing (or replacing with new items or new materials, if necessary) any such defect at no cost to the OWNER, within a reasonable period of time, and to the OWNER's satisfaction.

Warranty is Absolute. The only exceptions to the General Warranty will be defects or damage caused by abuse, modification or improper maintenance or operation by persons other than CONTRACTOR or CONTRACTOR's subcontractors, sub-subcontractors or suppliers; or normal wear and tear under normal usage. In all other respects the General Warranty will be absolute.

Special Warranties. CONTRACTOR will furnish all additional special warranties required by this Contract no later than Substantial Completion. The OWNER may require special warranties in connection with the approval of accepted equals and other substitute materials, equipment, methods, and procedures, and in connection with Work which is defective or nonconforming.

Limitation as to Certain Equipment. As to any equipment which the OWNER has reserved the sole right to have installed, the Warranties under this Article 8 will extend to ensure that the equipment is installed according to the Plans and Technical Provisions, and that any manufacturer or product warranties are conveyed to the OWNER; but in such instance CONTRACTOR will not be held liable for the operating performance of such equipment.

Relation to Specific Correction Provisions and Other Remedies. CONTRACTOR's general warranty and any additional or special warranties are not limited by CONTRACTOR's obligations to specifically correct Defective/Nonconforming Work, nor are they limited by any other remedies provided in the Contract Documents. CONTRACTOR will also be liable for any damage to property or persons (including death), including consequential and direct damages, relating to any breach of the General Warranty or any additional or special warranties required.

Third Party Warranties. CONTRACTOR will obtain and assign or transfer to the OWNER, all product warranties available from manufacturers or suppliers of materials to be used in the Project. CONTRACTOR will also obtain and assign or transfer to OWNER, any additional third party warranties as to materials or methods as specified in the Contract Documents. The OWNER's acceptance of any assigned warranties or guaranties will be a precondition to final payment and will not relieve CONTRACTOR of any of CONTRACTOR's guaranty or warranty obligations under this Contract.

SECTION 01 1000

SUMMARY

PART 1 GENERAL

1.01 PROJECT

- A. Project Name: Roofing Repairs, Maintenance and Inspections
- B. Owner's Name: City of Daytona Beach.

1.02 OWNER OCCUPANCY

- A. Owner intends to continue to occupy adjacent portions of the existing building during the entire construction period.
- B. Owner intends to occupy the Project upon Substantial Completion.
- C. Owner intends to occupy a certain portion of the Project prior to the completion date for the conduct of normal operations.
- D. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.
- E. Schedule the Work to accommodate Owner occupancy.

1.03 CONTRACTOR USE OF SITE AND PREMISES

- A. Arrange use of site and premises to allow:
 - 1. Owner occupancy.
 - 2. Work by Others.
 - 3. Work by Owner.
 - 4. Use of site and premises by the public.
- B. Provide access to and from site as required by law and by Owner:
 - 1. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.
 - 2. Do not obstruct roadways, sidewalks, or other public ways without permit.

END OF SECTION

**SECTION 01 4100
REGULATORY REQUIREMENTS**

PART 1 GENERAL

1.01 SUMMARY OF REFERENCE STANDARDS

- A. Regulatory requirements applicable to this project are the following:
- B. 28 CFR 35 - Nondiscrimination on the Basis of Disability in State and Local Government Services; Final Rule; Department of Justice; current edition.
- C. 28 CFR 36 - Nondiscrimination by Public Accommodations and in Commercial Facilities; Final Rule; Department of Justice; current edition.
- D. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines; current edition.
- E. 49 CFR 37 - Transportation Services for Individuals with Disabilities (ADA); current edition.
- F. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
- G. FED-STD-795 - Uniform Federal Accessibility Standards (UFAS); 1988.
- H. 29 CFR 1910 - Occupational Safety and Health Standards; current edition.
- I. State of Florida amendments to some or all of the following.
- J. City of Daytona Beach amendments to some or all of the following.
- K. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2009.

END OF SECTION

SECTION 01 4533
CODE-REQUIRED SPECIAL INSPECTIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Code-required special inspections.

1.02 DEFINITIONS

- A. Code or Building Code: 2012 Edition of the International Building Code and, more specifically, Chapter 17 - Structural Tests and Inspections, of same.
- B. Authority Having Jurisdiction (AHJ): Agency or individual officially empowered to enforce the building, fire and life safety code requirements of the permitting jurisdiction in which the Project is located.
- C. Special Inspection:
 - 1. Special inspections are inspections and testing of materials, installation, fabrication, erection or placement of components and connections mandated by the AHJ that also require special expertise to ensure compliance with the approved contract documents and the referenced standards.
 - 2. Special inspections are separate from and independent of tests and inspections conducted by Owner or Contractor for the purposes of quality assurance and contract administration.

1.03 QUALITY ASSURANCE

- A. Copies of Documents at Project Site: Maintain at the project site a copy of each referenced document.

PART 3 EXECUTION

2.01 SPECIAL INSPECTIONS FOR WIND RESISTANCE

- A. Structural Wood:
 - 1. Field gluing of components in the main wind force-resisting system; continuous.
 - 2. Nailing, bolting, anchoring and other fastening of components within the main wind force-resisting system; periodic.
- B. Wind Resisting Components:
 - 1. Roof cladding; periodic.
- C. Structural Observations for Wind Resistance: Visually observe structural system for general conformance with the approved contract documents; periodic.

2.02 CONTRACTOR DUTIES AND RESPONSIBILITIES

- A. Contractor Responsibilities, General:
 - 1. Deliver to agency at designated location, adequate samples of materials for special inspections that require material verification.
 - 2. Cooperate with agency and laboratory personnel; provide access to the work, to manufacturers' facilities, and to fabricators' facilities.
 - 3. Provide incidental labor and facilities:
 - a. To provide access to work to be tested or inspected.
 - b. To obtain and handle samples at the site or at source of Products to be tested or inspected.
 - c. To facilitate tests or inspections.
 - d. To provide storage and curing of test samples.
 - 4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing or inspection services.
 - 5. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

- B. Contractor Responsibilities, Wind Force-Resisting Systems: Submit written statement of responsibility for each item listed to AHJ and Owner prior to starting work. Statement of responsibility shall acknowledge awareness of special construction requirements and other requirements listed.

END OF SECTION

SECTION 01 5000
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Temporary utilities.
- B. Temporary sanitary facilities.
- C. Waste removal facilities and services.

1.02 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.
- B. Maintain daily in clean and sanitary condition.

1.03 BARRIERS

- A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
- B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.
- C. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.04 WASTE REMOVAL

- A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.
- B. Provide containers with lids. Remove trash from site periodically.
- C. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.
- D. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

END OF SECTION

**SECTION 07 5100
BUILT-UP BITUMINOUS ROOFING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Built-up roofing membrane, conventional and protected membrane application.
- B. Insulation, flat and tapered.
- C. Vapor retarders.
- D. Deck sheathing.
- E. Base flashings.
- F. Roofing cant strips, accessories, roofing expansion joints, roofing vents, and walkways.

1.02 REFERENCE STANDARDS

- A. M.NRCA ML104 - The NRCA Roofing and Waterproofing Manual; Fifth Edition, with interim updates.

1.03 QUALITY ASSURANCE

- A. Perform work in accordance with NRCA ML104.

PART 2 PRODUCTS

2.01 ROOFING - CONVENTIONAL APPLICATION

- A. Built-up Bituminous Roofing: Asphalt felt membrane, four ply plus base sheet, with vapor retarder and insulation.
- B. Roofing Assembly Requirements:
 - 1. Solar Reflectance Index (SRI): 78, minimum, calculated in accordance with ASTM E1980, based on 3-year aged data.
 - a. Field applied coating may not be used to achieve specified SRI.
- C. Acceptable Insulation Types - Tapered Application: Any of the types specified.

2.02 SHEET MATERIALS

- A. Vapor Retarder Felt: Asphalt-saturated organic, ASTM D226/D226M, Type I ("No.15") felt, unperforated.
- B. Fire Resistant Vapor Retarder: Reinforced Kraft paper laminate complying with requirements of fire rating classification; compatible with roofing and insulation materials.
 - 1. Fire-retardant adhesive.
- C. Base Sheet: ASTM D2626/D2626M; Asphalt-saturated and -coated organic felt; plain.
- D. Roofing Felt: ASTM D2178/D2178M; Asphalt-saturated glass fiber felt; standard duty.
- E. White Cap Sheet: Asphalt-saturated glass fiber roll roofing surfaced with flexible acrylic coating and ceramic granules; complying with ASTM D3909/D3909M.
 - 1. Solar Reflectance: 0.75, minimum, initial, and 0.60, minimum, 3-year aged, certified by Cool Roof Rating Council.
 - 2. Thermal Emissivity: 0.80, minimum, initial, and 0.85, minimum, 3-year aged, certified by Cool Roof Rating Council.
- F. Base Flashing Material: Modified bitumen, reinforced, smooth surface.

2.03 BITUMINOUS MATERIALS

- A. Bitumen: ASTM D312/D312M Type I, asphalt.
- B. Primer: ASTM D41/D41M, asphalt type.
- C. Roof Cement: ASTM D2822/D2822M, Type I, cutback asphalt type.

2.04 DECK SHEATHING

- A. Deck Sheathing: Gypsum sheathing, ASTM C1396/C1396M, Type X special fire resistant type, paper face, 5/8 inch (16 mm) thick.
- B. Coated Cellulose Fiber Coverboard:

2.05 INSULATION

- A. Cellulose Fiber Board Insulation: ASTM C208, Type II; one faces finished with mineral fiber, asphalt and Kraft paper, with the following characteristics:
 - 1. Board Size: 48 by 96 inch (1219 by 2438 mm).
 - 2. Board Thickness: 1/2 inch (13 mm).
 - 3. Board Edges: Square.
 - 4. Thermal Conductivity (k factor): 0.38 (0.62).
- B. Molded Expanded Polystyrene (EPS) Board Insulation: ASTM C578, Type XI; with drainage channels one face, and with the following characteristics:
 - 1. Board Size: 48 by 96 inch (1220 by 2440 mm).
 - 2. Board Thickness: 1-1/2 inches (38 mm).
 - 3. Board Edges: Square.
 - 4. Board Density: 0.7 lb/cu ft (12 kg/cu m).
 - 5. Compressive Resistance: 5 psi (35 kPa).
 - 6. Thermal Resistance: R-value of 3.1 (RSI-value of 0.55) per 1 inch (25.4 mm) at 75 degrees F (24 degrees C) mean temperature using ASTM C177 test method.

2.06 SURFACING MATERIALS - CONVENTIONAL APPLICATION

- A. Walkway Pads: Suitable for maintenance traffic, contrasting color or otherwise visually distinctive from roof membrane.
 - 1. Composition: Asphaltic with mineral granule surface.
 - 2. Size: 18 by 18 inch (460 by 460 mm).
 - 3. Surface Color: White or yellow.

2.07 ACCESSORIES

- A. Prefabricated Roofing Expansion Joint Flashing: Sheet butyl over closed-cell foam backing seamed to galvanized steel flanges.
- B. Cant and Edge Strips: Bitumen-impregnated wood fiberboard, compatible with roofing materials; cants formed to 45 degree angle, tapered edge strips, and other configurations as detailed.
- C. Roof Insulation Vents: Aluminum, with perforated inner tube; protective cap and mounting flange.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces and site conditions are ready to receive work.
- B. Verify deck is supported and secure.
- C. Verify deck is clean and smooth, flat, free of depressions, waves, or projections, properly sloped and suitable for installation of roof system.
- D. Verify deck surfaces are dry and free of snow or ice.
- E. Verify that roof openings, curbs, and penetrations through roof are solidly set, and cant strips are in place.

3.02 WOOD DECK PREPARATION

- A. Verify flatness and tightness of joints of wood decking. Fill knot holes with latex filler.
- B. Conventional Application: Lay one ply of dry sheathing paper; lap edges 2 inches (50 mm). Lay base sheet; lap edges 4 inches (100 mm). Nail laps 6 inches (150 mm) on center. Nail the field area at 12 inches (300 mm) on center staggered.

3.03 CONCRETE DECK PREPARATION

- A. Fill surface honeycomb and variations with latex filler.
- B. Confirm dry deck by moisture meter with 12 percent moisture maximum.
- C. Conventional Application: Apply mopped two-ply vapor retarder.

3.04 METAL DECK PREPARATION

- A. Install preformed sound absorbing glass fiber insulation strips supplied by Section 05 3100 in acoustic deck flutes. Install in accordance with manufacturer's instructions.
- B. Install deck sheathing on metal deck:
 - 1. Lay with long side at right angle to flutes; stagger end joints; provide support at ends.
 - 2. Cut sheathing cleanly and accurately at roof breaks and protrusions to provide smooth surface.
 - 3. Tape joints.
 - 4. Mechanically fasten sheathing to roof deck, in accordance with Factory Mutual requirements.
 - a. Over entire roof area, fasten sheathing using 6 fasteners with washers per sheathing board.
 - b. At roof perimeter to a distance of 4 ft (1.5 m) in from edges, fasten sheathing using 6 fasteners with washers per board.
- C. Conventional Application: Apply fire resistant vapor retarder.

3.05 VAPOR RETARDER INSTALLATION - CONVENTIONAL APPLICATION

- A. Mopped Two-ply Vapor Retarder:
 - 1. Apply primer at a rate of 1 gal/square (4.5 L/10 sq m) and allow to dry.
 - 2. Mop surface with hot bitumen and embed two plies of vapor retarder felt; lap plies 19 inches (480 mm), full mop each ply.
 - 3. Apply bitumen at 20 lb/square (98 kg/100 sq m).
 - 4. Glaze top surface of the vapor retarder with bitumen if insulation is not placed immediately.
- B. Mopped Two-ply Base Sheet/Vapor Retarder:
 - 1. Apply coat of primer by roller on top of flute surfaces. Allow to dry. Apply ribbon mop of bitumen to top of flute surfaces.
 - 2. Apply bitumen at rate of 20 lb/square (98 kg/100 sq m).
 - 3. Embed one ply of base sheet; lap plies 4 inches (100 mm); seal joints with bitumen.
 - 4. Mop bitumen glaze coat over base sheet at a rate of 10 lb/square (0.5 kg/sq m) and embed one ply of vapor retarder felt; lap edges 4 inches (100 mm); seal joints with bitumen.
- C. Fire-retardant Vapor Retarder: Apply to deck surface with adhesive in accordance with roofing and vapor retarder manufacturers' instructions.
- D. Extend vapor retarder under cant strips and blocking.

3.06 INSULATION INSTALLATION - CONVENTIONAL APPLICATION

- A. Ensure vapor retarder is clean and dry, continuous, and ready for application of roofing system.
- B. Attachment of Insulation:
 - 1. Mechanically fasten first layer of insulation to deck in accordance with roofing manufacturer's instructions and Factory Mutual requirements.
 - 2. Embed second layer of insulation into flood coat mopping of hot bitumen in accordance with roofing and insulation manufacturers' instructions.
- C. Lay subsequent layers of insulation with joints staggered minimum 6 inch (150 mm) from joints of preceding layer.
- D. Place tapered insulation to the required slope pattern in accordance with manufacturer's instructions.

- E. Lay boards with edges in moderate contact without forcing. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.
- F. Do not apply more insulation than can be covered with membrane in same day.

3.07 MEMBRANE APPLICATION

- A. Equiviscous Temperature (EVT) at Point of Application: In accordance with NRCA recommendations.
- B. Apply membrane plies, weather lap edges and ends, and mop with 20 lb/square (98 kg/100 sq m) of bitumen per ply. Apply plies 2 on 2 in same direction.
- C. Apply smooth, free from air pockets, wrinkles, fish-mouths, or tears.
- D. At end of day's operation, install two plies membrane and bitumen glaze coat for cut-off. Glaze exposed felts. Remove cut-off before resuming roofing.
- E. At intersections with vertical surfaces:
 - 1. Extend membrane and base sheet over cant strips and up a minimum of 4 inches (100 mm) onto vertical surfaces.
 - 2. Mop on base flashing of two additional plies of felt and one ply of base flashing material.
 - 3. Secure base flashing to nailing strips at 4 inches (100 mm) on center.
- F. Around roof penetrations, mop in and seal flanges and flashings with two additional plies of felt.
- G. Install walkway pads in hot bitumen at 20 lb/square (98 kg/100 sq m). Set joints 6 inches (150 mm) apart.
- H. Install one roof vent per 1,000 sq ft (93 sq m) or part thereof, of roof area.
- I. Install roofing expansion joints where indicated. Make joints watertight.
- J. Coordinate installation of roof drains and related flashings.

END OF SECTION

SECTION 07 5200
MODIFIED BITUMINOUS MEMBRANE ROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Modified bituminous roofing membrane, conventional application.
- B. Insulation, flat and tapered.
- C. Deck sheathing.
- D. Base flashings.

1.02 REFERENCE STANDARDS

- A. ASTM C208 - Standard Specification for Cellulosic Fiber Insulating Board; 2012.
- B. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2016.
- C. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2014a.
- D. ASTM D41/D41M - Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing; 2011.
- E. ASTM D312/D312M - Standard Specification for Asphalt Used in Roofing; 2015.
- F. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007 (Reapproved 2012).
- G. ASTM D4601/D4601M - Standard Specification for Asphalt-Coated Glass Fiber Base Sheet Used in Roofing; 2004 (Reapproved 2012).
- H. ASTM E108 - Standard Test Methods for Fire Tests of Roof Coverings; 2011.
- I. ASTM E1980 - Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces; 2011.
- J. FM (AG) - FM Approval Guide; current edition.
- K. FM DS 1-28 - Wind Design; 2007.
- L. NRCA ML104 - The NRCA Roofing and Waterproofing Manual; Fifth Edition, with interim updates.
- M. UL (FRD) - Fire Resistance Directory; current edition.

1.03 QUALITY ASSURANCE

- A. Perform work in accordance with NRCA ML104 and manufacturer's instructions.

PART 2 PRODUCTS

2.01 ROOFING - CONVENTIONAL APPLICATION

- A. Modified Bituminous Roofing: Two-ply membrane, with insulation.
- B. Roofing Assembly Requirements:
 - 1. Solar Reflectance Index (SRI): 78, minimum, calculated in accordance with ASTM E1980, based on 3-year aged data.
 - a. Field applied coating may not be used to achieve specified SRI.
 - 2. Roof-Ceiling Fire Resistance Rating: Conform to FM (AG) Assembly Design No. ____.
 - 3. External Fire Exposure Classification: ASTM E108 Class A, UL (FRD) listed.
 - 4. Internal Fire Spread Classification: Factory Mutual Class 1, FM-approved.
- C. Acceptable Insulation Types - Constant Thickness Application: Any of the types specified.
- D. Acceptable Insulation Types - Tapered Application: Any of the types specified.

2.02 ROOFING - PROTECTED MEMBRANE APPLICATION

- A. Modified Bituminous Roofing: Two-ply membrane, with separation sheet, insulation, water pervious fabric, and ballast.

- B. Roofing Assembly Requirements:
- C. Acceptable Insulation Types: Any of the types specified.

2.03 MEMBRANE AND SHEET MATERIALS

- A. Membrane: Polymer modified asphalt, reinforced with non-woven fabric; granule surfaced; with the following characteristics:
 - 1. Solar Reflectance: 0.75, minimum, initial, and 0.60, minimum, 3-year, certified by Cool Roof Rating Council.
 - 2. Thermal Emissivity: 0.80, minimum, initial, and 0.85, minimum, 3-year, certified by Cool Roof Rating Council.
 - 3. Color: White.
- B. Base Sheet: ASTM D4601/D4601M Type I; asphalt-coated glass fiber; unperforated.
- C. Flexible Flashing Material: Same material as membrane.
- D. Separation Sheet: Sheet polyethylene; 4 mil (0.1 mm) thick.
- E. Water Pervious Fabric: Woven polyethylene, UV stabilized, open to moisture movement, black.

2.04 BITUMINOUS MATERIALS

- A. Bitumen: Asphalt, ASTM D312/D312M Type IV; for adhering insulation, use Type III.
- B. Primer: ASTM D41/D41M, asphalt type.
- C. Roof Cement: ASTM D4586/D4586M, Type II.

2.05 DECK SHEATHING AND COVER BOARDS

- A. Deck Sheathing: Gypsum sheathing, ASTM C1396/C1396M, Type X special fire resistant type, paper face, 5/8 inch (16 mm) thick.
- B. Faced Polyisocyanurate Cover Board: High compressive strength polyisocyanurate insulation complying with ASTM C1289, Type II, Class 4, glass fiber mat both faces, and with the following characteristics:
 - 1. Compressive Strength: 100 psi (688 kPa).
 - 2. Board Thickness: 0.5 inch (13 mm).

2.06 INSULATION

- A. Cellulose Fiber Board Insulation: ASTM C208, Type II; one face finished with mineral fiber, asphalt and kraft paper, with the following characteristics:
 - 1. Board Size: 48 by 96 inch (1219 by 2438 mm).
 - 2. Board Thickness: 1/2 inch (13 mm).
 - 3. Board Edges: Square.
 - 4. Thermal Conductivity (k factor): 0.38 (0.62).
- B. Polyisocyanurate Board Insulation: Rigid cellular foam, complying with ASTM C1289, Type I, aluminum foil both faces; Class 1, non-reinforced foam core, and with the following characteristics:
 - 1. Compressive Strength: 16 psi (110 kPa)
 - 2. Board Size: 48 by 96 inch (1220 by 2440 mm).
 - 3. Board Thickness: 1.5 inch (37.5 mm).

2.07 SURFACING MATERIALS - CONVENTIONAL APPLICATION

- A. Walkway Pads: Suitable for maintenance traffic, contrasting color or otherwise visually distinctive from roof membrane.
 - 1. Composition: Asphaltic with mineral granule surface.
 - 2. Size: 18 by 18 inch (460 by 460 mm).
 - 3. Surface Color: White or yellow.

2.08 ACCESSORIES

- A. Prefabricated Roofing Expansion Joint Flashing: As specified in Section 07 7100.

- B. Cant and Edge Strips: Asphalt-impregnated wood fiberboard, compatible with roofing materials; cants formed to 45 degree angle.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces and site conditions are ready to receive work.
- B. Verify deck is supported and secure.
- C. Verify deck is clean and smooth, flat, free of depressions, waves, or projections, properly sloped and suitable for installation of roof system.
- D. Verify deck surfaces are dry and free of snow or ice.
- E. Verify that roof openings, curbs, and penetrations through roof are solidly set, and cant strips are in place.

3.02 WOOD DECK PREPARATION

- A. Verify flatness and tightness of joints of wood decking. Fill knot holes with latex filler.
- B. Confirm dry deck by moisture meter with 12 percent moisture maximum.
- C. Protected Membrane Application: Extend two plies of felt from 12 inches (300 mm) around roof perimeter to roof edge and onto wall air seal material with 8 inches of lap; seal air tight.
- D. Protected Membrane Application: Mop cant strips in place with hot bitumen.

3.03 CONCRETE DECK PREPARATION

- A. Fill surface honeycomb and variations with latex filler.
- B. Confirm dry deck by moisture meter with 12 percent moisture maximum.
- C. Protected Membrane Application: Extend two plies of felt from 12 inches (300 mm) around roof perimeter to roof edge and onto wall air seal material with 12 inches of lap; seal air tight.
- D. Protected Membrane Application: Mop cant strips in place with hot bitumen.

3.04 METAL DECK PREPARATION

- A. Install deck sheathing on metal deck:
 - 1. Lay with long side at right angle to flutes; stagger end joints; provide support at ends.
 - 2. Cut sheathing cleanly and accurately at roof breaks and protrusions to provide smooth surface.
 - 3. Mechanically fasten sheathing to roof deck, in accordance with Factory Mutual recommendations and roofing manufacturer's instructions.
 - a. Over entire roof area, fasten sheathing using 6 fasteners with washers per sheathing board.
- B. Protected Membrane Application: Mop cant strips in place with hot bitumen.

3.05 VAPOR RETARDER INSTALLATION - CONVENTIONAL APPLICATION

- A. Mopped Two-ply Vapor Retarder:
 - 1. Apply primer at a rate of 1 gal/square (4.5 L/10 sq m) and allow to dry.
 - 2. Mop surface with hot bitumen and embed two plies of vapor retarder felt; lap plies 19 inches (480 mm), full mop each ply.
 - 3. Apply bitumen at 20 pounds per square (98 kg/100 sq m).
 - 4. Glaze top surface of the vapor retarder with bitumen if insulation is not placed immediately.
- B. Extend vapor retarder under cant strips and blocking.

3.06 INSULATION INSTALLATION - CONVENTIONAL APPLICATION

- A. Ensure vapor retarder is clean and dry, continuous, and ready for application of roofing system.
- B. Place tapered insulation to the required slope pattern in accordance with manufacturer's instructions.

- C. On metal deck, place boards parallel to flutes with insulation board edges bearing on deck flutes.
- D. Lay boards with edges in moderate contact without forcing. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.
- E. Do not apply more insulation than can be covered with membrane in same day.

3.07 MEMBRANE APPLICATION

- A. Apply membrane in accordance with manufacturer's instructions.
- B. Apply membrane; lap and seal edges and ends permanently waterproof.
- C. Apply smooth, free from air pockets, wrinkles, fish-mouths, or tears. Ensure full bond of membrane to substrate.
- D. Protected Membrane Application: Extend membrane over vapor and air barrier of wall construction and seal.
- E. At end of day's operation, install waterproof cut-off. Remove cut-off before resuming roofing.
- F. At intersections with vertical surfaces:
 - 1. Extend membrane over cant strips and up a minimum of 8 inches (200 mm) onto vertical surfaces.
 - 2. Apply flexible flashing over membrane.
- G. Around roof penetrations, mop in and seal flanges and flashings with flexible flashing.
- H. Install roofing expansion joints. Make joints watertight.
- I. Coordinate installation of roof drains and sumps and related flashings.

3.08 SURFACING - CONVENTIONAL APPLICATION

- A. Apply roof coatings in accordance with roofing and coating manufacturers' instructions.
- B. Install walkway pads by setting in hot bitumen. Set joints 6 inches (150 mm) apart.

3.09 SURFACING - PROTECTED MEMBRANE APPLICATION

- A. Place separation sheet over membrane, lap edges and ends 2 inches (50 mm).
- B. Place insulation boards; butt in close contact. Place channel cut face down. Bevel insulation to allow snug fit at cant strips. Cut neatly around protrusions through roof.
- C. Place water pervious fabric over insulation boards in accordance with roofing and insulation manufacturers' instructions.
- D. Install ballast. Evenly distribute aggregate ballast.

END OF SECTION

SECTION 07 5323
EPDM THERMOSET SINGLE-PLY ROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Mechanically attached roof system with ethylene propylene diene terpolymer (EPDM) roofing membrane.
- B. Adhered roof system with ethylene propylene diene terpolymer (EPDM) roofing membrane.
- C. Ballasted roof system with ethylene propylene diene terpolymer (EPDM) roofing membrane.
- D. Insulation, flat and tapered.
- E. Flashings.
- F. Roofing cant strips, stack boots, roofing expansion joints, and walkway pads.

1.02 REFERENCE STANDARDS

- A. ASCE 7 - Minimum Design Loads for Buildings and Other Structures; 2010, with 2013 Supplements and Errata.
- B. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2015a.
- C. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2016.
- D. ASTM C1325 - Specification for Non-Asbestos Fiber-Mat Reinforced Cementitious Backer Units; 2014.
- E. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2014a.
- F. ASTM D4637/D4637M - Standard Specification for EPDM Sheet Used in Single-Ply Roof Membrane; 2015.
- G. NRCA ML104 - The NRCA Roofing and Waterproofing Manual; Fifth Edition, with interim updates.
- H. UL (DIR) - Online Certifications Directory; current listings at database.ul.com.
- I. UL 790 - Standard for Standard Test Methods for Fire Tests of Roof Coverings; Current Edition, Including All Revisions.

1.03 QUALITY ASSURANCE

- A. Perform work in accordance with NRCA ML104.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products in manufacturer's original containers, dry, undamaged, with seals and labels intact.
- B. Store products in weather protected environment, clear of ground and moisture.
- C. Protect foam insulation from direct exposure to sunlight.
- D. Keep Material Safety Data Sheets (MSDS) at the project site at all times during transportation, storage, and installation of materials.
- E. Comply with all requirements of Owner to prevent overloading or disturbance of the structure when loading materials onto the roof.

1.05 FIELD CONDITIONS

- A. Do not apply roofing membrane during unsuitable weather. Refer to manufacturer's written instructions.
- B. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.
- C. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

- D. Proceed with work so new roofing materials are not subject to construction traffic as work progresses.
- E. Do not allow grease, oil, fats, or other contaminants to come into direct contact with membrane.

PART 2 PRODUCTS

2.01 ROOFING APPLICATIONS

- A. EPDM Membrane Roofing: One ply membrane, ballasted, over insulation.
- B. Roofing Assembly Performance Requirements and Design Criteria:
 - 1. Roof-Ceiling Fire Resistance Rating: Conform to UL (DIR) Assembly Design No. ____.
 - 2. Roof Covering External Fire Resistance Classification: Class A when tested per UL 790.
 - 3. Wind Uplift:
 - a. Designed to withstand wind uplift forces calculated with ASCE 7.
 - 4. Drainage: No standing water within 48 hours after precipitation.

2.02 ROOFING MEMBRANE AND ASSOCIATED MATERIALS

- A. Membrane:
 - 1. Material: Ethylene propylene diene terpolymer (EPDM); ASTM D4637/D4637M, Type I (non-reinforced).
 - 2. Thickness: 45 mils (0.045 inch) (1.1 mm), minimum.
 - 3. Sheet Width: Factory fabricated into largest sheets possible.
 - 4. Color: Black.
- B. Seaming Materials: As recommended by membrane manufacturer.
- C. Membrane Fasteners: As recommended and approved by membrane manufacturer.
 - 1. HP-X Fastener: #15 threaded fastener with #3 Phillips drive.
 - 2. HP Purlin Fastener: Hex-head, self-drilling, black epoxy-coated.
 - 3. HP-Xtra Fastener: Oversized, 0.315 inch (8 mm), threaded steel fastener.
 - 4. CD-10 Fastener: Hammer-driven, non-threaded E-Coat fastener. Use with structural concrete decks rated 3,000 pounds per square inch (20.7 MPa) or greater.
 - 5. HD 14-10 Concrete Fastener: #14 threaded fastener with a #3 Phillips drive. Use for minimum 3,000 pounds per square inch (20.7 MPa) concrete decks.
 - 6. HP Term Bar Nail-In: 1-1/4 inch (32 mm) long expansion anchor with threaded drive pin.
 - 7. Base Sheet Fasteners and Plates:
 - a. Carlisle Dual-Prong Fastener: Manufacturer's pre-assembled, 1.8 inch (46 mm) long, galvanized steel tube and a 2.7 inch (69 mm) diameter galvalume disk and high tensile steel wire staple.
 - b. Base sheet fasteners and plates by others: FM-approved.
 - 8. HP Polymer Seam Plate: 2 inch (51 mm) diameter, barbed plastic fastening plate.
 - 9. HP XTRA Polymer Seam Plate: 2-3/8 inch (60 mm) diameter, barbed metal fastening plate.
 - 10. Polymer Batten Bar: 1 inch (25 mm) wide, 0.05 inch (1.3 mm) thick polymer bar with factory punched holes 6 inches (152 mm) on center.
 - 11. Metal Fastening Bar: 1 inch (25 mm) wide, galvalume-coated steel bar with factory punched holes 6 inches (152 mm) on center.
 - 12. Piranha Plate: 2-3/8 inch (60 mm) diameter, barbed metal fastening plate.
 - 13. Piranha Extra Plate: 2-3/8 inch (60 mm) diameter, barbed metal fastening plate with an oversized hole.
 - 14. Seam Fastening Plate: 2 inch (51 mm) diameter metal plate.
- D. Flexible Flashing Material: Same material as membrane.
- E. Base Flashing: Provide waterproof, fully adhered base flashing system at all penetrations, plane transitions, and terminations.

2.03 DECK SHEATHING AND COVER BOARDS

- A. Deck Sheathing: Gypsum sheathing, ASTM C1396/C1396M, Type X special fire resistant type, paper face, 5/8 inch (16 mm) thick.
 - 1. Product: Securock, distributed by Carlisle.
- B. Deck Sheathing: Polyisocyanurate foam plastic, complying with ASTM C1289; Type V, oriented strand board one face, glass fiber mat other face.
 - 1. Top Layer Material: 7/16 inch (11 mm) oriented strand board (OSB).
- C. Coverboard: Cement roof board, complying with ASTM C1325.
- D. Cover Board: Extruded polystyrene board; ASTM C578.

2.04 INSULATION

- A. Expanded Polystyrene (EPS) Board Insulation: ASTM C578, Type I; molded expanded polystyrene board with drainage channels one face, with the following characteristics:
 - 1. Compressive Strength: 10 pounds per square inch (69 kPa).
 - 2. Product: Carlisle InsulFoam.
- B. Polyisocyanurate Board Insulation: ASTM C1289, Type II, Class 1, fiber reinforced felt both faces; Grade 2 and with the following characteristics:
 - 1. Compressive Strength: 20 pounds per square inch (138 kPa).
- C. Extruded Polystyrene (XPS) Board Insulation: Extruded polystyrene board with natural skin surface, drainage channels one face, and with the following characteristics:
- D. Composite Polyisocyanurate Board Insulation: Top layer high-density wood fiberboard (HDF), bottom layer polyisocyanurate, complying with ASTM C1289, and with the following characteristics:
 - 1. Polyisocyanurate surfaces faced with glass fiber mat.

PART 3 EXECUTION

3.01 INSTALLATION - GENERAL

- A. Perform work in accordance with manufacturer's instructions.
- B. Do not apply roofing membrane during unsuitable weather.
- C. Do not apply roofing membrane when ambient temperature is outside the temperature range recommended by manufacturer.
- D. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.
- E. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.
- F. Coordinate the work with installation of associated counterflashings installed by other sections as the work of this section proceeds.
- G. When substrate preparation is responsibility of another installer, notify Architect of unsatisfactory conditions before proceeding.

3.02 EXAMINATION

- A. Verify that surfaces and site conditions are ready to receive work.
- B. Verify deck is supported and secure.
- C. Verify deck is clean and smooth, flat, free of depressions, waves, or projections, properly sloped and suitable for installation of roof system.
- D. Verify deck surfaces are dry and free of snow or ice.
- E. Verify that roof openings, curbs, and penetrations through roof are solidly set, and cant strips are in place.

3.03 PREPARATION, GENERAL

- A. Clean substrate thoroughly prior to roof application.

- B. Do not begin work until other work that requires foot or equipment traffic on roof is complete.
- C. Apply manufacturer's recommended vapor retarder or temporary roof before roof installation.

3.04 MEMBRANE APPLICATION

- A. Roll out membrane, free from wrinkles or tears. Place sheet into place without stretching.
- B. Shingle joints on sloped substrate in direction of drainage.
- C. Overlap edges and ends and seal seams by contact adhesive, minimum 3 inches (75 mm). Seal permanently waterproof.
- D. Mechanical Attachment:
 - 1. Apply membrane and mechanical attachment devices in accordance with manufacturer's instructions.
- E. At intersections with vertical surfaces:
 - 1. Extend membrane over cant strips and up a minimum of 4 inches (100 mm) onto vertical surfaces.
 - 2. Fully adhere flexible flashing over membrane and up to nailing strips.
- F. Coordinate installation of roof drains and sumps and related flashings. Locate all field splices away from low areas and roof drains. Lap upslope sheet over downslope sheet.
- G. Daily Seal: Install daily seal per manufacturers instructions at the end of each work day. Prevent infiltration of water at incomplete flashings, terminations, and at unfinished membrane edges.

3.05 CLEANING

- A. Remove wrappings, empty containers, paper, and other debris from the roof daily. Dispose of debris in compliance with local, State, and Federal regulations.
- B. Remove bituminous markings from finished surfaces.
- C. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and conform to their documented instructions.
- D. Repair or replace defaced or damaged finishes caused by work of this section.

3.06 PROTECTION

- A. Protect installed roofing and flashings from construction operations.
- B. Where traffic must continue over finished roof membrane, protect surfaces using durable materials.

END OF SECTION

SECTION 07 5423
THERMOPLASTIC-POLYOLEFIN ROOFING (TPO)

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Thermoplastic membrane roofing system, including all components specified.
- B. Disposal of demolition debris and construction waste is the responsibility of Contractor. Perform disposal in manner complying with all applicable federal, state, and local regulations.
- C. Comply with the published recommendations and instructions of the roofing membrane manufacturer, at <http://manual.fsbp.com>.
- D. Commencement of work by Contractor shall constitute acknowledgement by Contractor that this specification can be satisfactorily executed, under the project conditions and with all necessary prerequisites for warranty acceptance by roofing membrane manufacturer. No modification of the Contract Sum will be made for failure to adequately examine the Contract Documents or the project conditions.

1.02 REFERENCE STANDARDS

- A. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2016.
- B. ASTM C1549 - Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer; 2009 (Reapproved 2014).
- C. ASTM D312/D312M - Standard Specification for Asphalt Used in Roofing; 2015.
- D. ASTM D638 - Standard Test Method for Tensile Properties of Plastics; 2014.
- E. ASTM D1004 - Standard Test Method for Tear Resistance (Graves Tear) of Plastic Film and Sheeting; 2013.
- F. ASTM D6152/D6152M - Standard Specification for SEBS-Modified Mopping Asphalt Used in Roofing; 2012.
- G. ASTM D6878/D6878M - Standard Specification for Thermoplastic Polyolefin Based Sheet Roofing; 2013.
- H. FM (AG) - FM Approval Guide; current edition.
- I. FM 4470 - Single-Ply, Polymer-Modified Bitumen Sheet, Built-Up Roof (BUR) and Liquid Applied Roof Assemblies for use in Class 1 and Noncombustible Roof Deck Construction; 2012.
- J. FM DS 1-28 - Wind Design; 2007.
- K. FM DS 1-29 - Roof Deck Securement and Above-Deck Roof Components; Factory Mutual System; 2006.
- L. SPRI ES-1 - Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems; 2011.

1.03 QUALITY ASSURANCE

- A. Installer Qualifications: Roofing installer shall have the following:
 - 1. Current approval, license, or authorization as applicator by the manufacturer.
 - 2. Fully staffed office within 100 miles of the job site.
 - 3. At least five years experience in installing specified system.
 - 4. Capability to provide payment and performance bond to building owner.
 - 5. Capability to provide a payment performance bond.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Deliver products in manufacturer's original containers, dry and undamaged, with seals and labels intact and legible.
- B. Store materials clear of ground and moisture with weather protective covering.

- C. Keep combustible materials away from ignition sources.

1.05 WARRANTY

- A. Comply with all warranty procedures required by manufacturer, including notifications, scheduling, and inspections.

PART 2 PRODUCTS

2.01 ROOFING SYSTEM DESCRIPTION

- A. Roofing System: Thermoplastic polyolefin (TPO) single-ply membrane.
 - 1. Membrane Attachment: Fully adhered.
 - 2. Comply with applicable local building code requirements.
 - 3. Provide assembly having Underwriters Laboratories, Inc. (UL) Class A Fire Hazard Classification.
 - 4. Provide assembly complying with Factory Mutual Corporation (FM) Roof Assembly Classification, FM DS 1-28 and FM DS 1-29, and meeting minimum requirements of FM 1-90 wind uplift rating.
- B. Roofing System Components: Listed in order from the top of the roof down:
 - 1. Membrane: Thickness as specified.
 - 2. Insulation:
 - a. Total R-value of 25 (RSI-value of 4.40), minimum.
 - b. Maximum Thickness: 6 inches (150 mm).
 - c. Top Layer: Polyisocyanurate foam board, non-composite; mechanically fastened.
 - d. Bottom Layer: Polyisocyanurate foam board, non-composite; mechanically fastened.

2.02 MEMBRANE MATERIALS

- A. Membrane: Flexible, heat weldable sheet composed of thermoplastic polyolefin polymer and ethylene propylene rubber; complying with ASTM D6878/D6878M, with polyester weft inserted reinforcement and the following additional characteristics:
 - 1. Thickness: 0.060 inch (1.52 mm) plus/minus 10 percent, with coating thickness over reinforcement of 0.024 inch (0.61 mm) plus/minus 10 percent.
 - 2. Sheet Width: Provide the widest available sheets to minimize field seaming.
 - 3. Puncture Resistance: 265 lbf (1174 N), minimum, when tested in accordance FTM 101C Method 2031.
 - 4. Solar Reflectance: 0.79, minimum, when tested in accordance with ASTM C1549.
 - 5. Acceptable Product: UltraPly TPO by Firestone.
 - 6. Acceptable Product: UltraPly TPO XR 110 by Firestone.
 - 7. Acceptable Product: ReflexEON TPO by Firestone.
- B. Membrane Fasteners: Type and size as required by roof membrane manufacturer for roofing system and warranty to be provided; use only fasteners furnished by roof membrane manufacturer.
- C. Curb and Parapet Flashing: Same material as membrane, with encapsulated edge which eliminates need for seam sealing the flashing-to-roof splice; precut to 18 inches (457 mm) wide.
- D. Formable Flashing: Non-reinforced, flexible, heat weldable sheet, composed of thermoplastic polyolefin polymer and ethylene propylene rubber.
 - 1. Thickness: 0.060 inch (1.52 mm) plus/minus 10 percent.
 - 2. Tensile Strength: 1550 psi (10.7 MPa), minimum, when tested in accordance with ASTM D638 after heat aging.
 - 3. Elongation at Break: 650 percent, minimum, when tested in accordance with ASTM D638 after heat aging.
 - 4. Tearing Strength: 12 lbf (53 N), minimum, when tested in accordance with ASTM D1004 after heat aging.
 - 5. Color: White.
 - 6. Acceptable Product: UltraPly TPO Flashing by Firestone.

- E. Tape Flashing: 5-1/2 inch (140 mm) nominal wide TPO membrane laminated to cured rubber polymer seaming tape, overall thickness 0.065 inch (1.6 mm) nominal; TPO QuickSeam Flashing by Firestone.
- F. Bonding Adhesive: Neoprene and SBR rubber blend, formulated for compatibility with the membrane other substrate materials, including masonry, wood, and insulation facings; UltraPly Bonding Adhesive by Firestone.
- G. Bonding Asphalt: Hot-applied SBS polymer-modified mopping asphalt, complying with ASTM D6152/D6152M, formulated for slope requirement of ASTM D312/D312M Type IV asphalt and for heating and applying to insulation surfaces, specific existing roof surfaces, and other substrates including wood, metal, and masonry, using standard techniques.
- H. Pourable Sealer: Two-part polyurethane, two-color for reliable mixing; Pourable Sealer by Firestone.
- I. Seam Plates: Steel with barbs and Galvalume coating; corrosion-resistance complying with FM 4470.
- J. Termination Bars: Aluminum bars with integral caulk ledge; 1.3 inches (33 mm) wide by 0.10 inch (2.5 mm) thick; Firestone Termination Bar by Firestone.
- K. Cut Edge Sealant: Synthetic rubber-based, for use where membrane reinforcement is exposed; UltraPly TPO Cut Edge Sealant by Firestone.
- L. General Purpose Sealant: EPDM-based, one part, white general purpose sealant; UltraPly TPO General Purpose Sealant by Firestone.
- M. Molded Flashing Accessories: Unreinforced TPO membrane pre-molded to suit a variety of flashing details, including pipe boots, inside corners, outside corners, etc.; UltraPly TPO Small and Large Pipe Flashing by Firestone.
- N. Roof Walkway Pads: Non-reinforced TPO walkway pads, 0.130 inch (3 mm) by 30 inches (760 mm) by 40 feet (12.19 m) long with patterned traffic bearing surface; UltraPly TPO Walkway Pads by Firestone.

2.03 ROOF INSULATION AND COVER BOARDS

- A. Polyisocyanurate Board Insulation: Closed cell polyisocyanurate foam with black glass reinforced mat laminated to faces, complying with ASTM C1289 Type II Class 1, with the following additional characteristics:
 - 1. Thickness: As indicated elsewhere.
 - 2. Size: 48 inches (1220 mm) by 96 inches (2440 mm), nominal.
 - a. Exception: Insulation to be attached using adhesive or asphalt may be no larger than 48 inches (1220 mm) by 48 inches (1220 mm), nominal.
 - 3. R-value (RSI-value) (LTTR):
 - a. 1.0 inch (25 mm) Thickness: 6.0 (1.06), minimum.
 - b. 1.25 inch (32 mm) Thickness: 7.5 (1.32), minimum.
 - c. 1.5 inch (38 mm) Thickness: 9.0 (1.58), minimum.
 - d. 1.75 inch (44 mm) Thickness: 10.5 (1.85), minimum.
 - e. 2.0 inch (51 mm) Thickness: 12.1 (2.13), minimum.
 - f. 3.0 inch (76 mm) Thickness: 18.5 (3.26), minimum.
 - g. 4.0 inch (102 mm) Thickness: 25.0 (4.40), minimum.
 - 4. Compressive Strength: 20 psi (138 kPa) when tested in accordance with ASTM C1289.
 - 5. Ozone Depletion Potential: Zero; made without CFC or HCFC blowing agents.
 - 6. Recycled Content: 19 percent post-consumer and 15 percent pre-consumer (post-industrial), average.
- B. Insulation Fasteners: Type and size as required by roof membrane manufacturer for roofing system and warranty to be provided; use only fasteners furnished by roof membrane manufacturer.

2.04 METAL ACCESSORIES

- A. Metal Roof Edging and Fascia: Continuous metal edge member serving as termination of roof membrane and retainer for metal fascia; watertight with no exposed fasteners; mounted to roof edge nailer.
1. Wind Performance:
 - a. Membrane Pull-Off Resistance: 140 MPH, minimum, when tested in accordance with SPRI ES-1 Test Method RE-1, current edition.
 - b. Fascia Pull-Off Resistance: At least the minimum required when tested in accordance with SPRI ES-1 Test Method RE-2, current edition.
 - c. Provide product listed in FM (AG) with at least FM 1-270 rating.
 2. Description: Two-piece; extruded aluminum T-shaped edge member securing top and bottom edges of flat-faced formed metal fascia; Firestone AnchorGard.
 3. Edge Member Height Above Nailers: 1-1/4 inches (31 mm).
 4. Fascia Material and Finish: 0.040 inch (1.0 mm) thick formed aluminum, natural mill finish; matching concealed joint splice plates; factory-installed protective plastic film.
 5. Length: 144 inches (3650 mm).
 6. Functional Characteristics: Fascia retainer supports while allowing for free thermal cycling of fascia.
 7. Aluminum Bar: Continuous 6063-T6 alloy aluminum extrusion with pre-punched slotted holes; miters welded; injection molded EPDM splices to allow thermal expansion.
 8. Anchor Bar Cleat: 20 gage, 0.036 inch (0.9 mm) G90 coated commercial type galvanized steel with pre-punched holes.
 9. Curved Applications: Factory modified.
 10. Fasteners: Factory-provided corrosion resistant fasteners, with drivers; no exposed fasteners permitted.
 11. Special Shaped Components: Provide factory-fabricated pieces necessary for complete installation, including miters, scuppers, and end caps; minimum 14 inch (355 mm) long legs on corner pieces.
 12. Scuppers: Welded watertight.
 13. Accessories: Provide matching brick wall cap, downspout, extenders, and other special fabrications as shown on the drawings.
- B. Parapet Copings: Formed metal coping with galvanized steel anchor/support cleats for capping any parapet wall; watertight, maintenance free, without exposed fasteners; butt type joints with concealed splice plates; mechanically fastened as indicated; Firestone PTCF.
1. Wind Performance:
 - a. At least the minimum required when tested in accordance with SPRI ES-1 Test Method RE-3, current edition.
 - b. Provide product listed in FM (AG) with at least FM 1-90 rating.
 2. Description: Coping sections allowed to expand and contract freely while locked in place on anchor cleats by mechanical pressure from hardened stainless steel springs factory attached to anchor cleats; 8 inch (200 mm) wide splice plates with factory applied dual non-curing sealant strips capable of providing watertight seal.
 3. Material and Finish: 0.040 inch (1.0 mm) thick formed aluminum, clear anodized finish; matching concealed joint splice plates; factory-installed protective plastic film.
 4. Dimensions:
 - a. Wall Width: As indicated on the drawings.
 - b. Piece Length: Minimum 144 inches (3650 mm).
 - c. Curved Application: Factory fabricated in true radius.
 5. Anchor/Support Cleats: 20 gage, 0.036 inch (0.9 mm) thick prepunched galvanized cleat with 12 inch (305 mm) wide stainless steel spring mechanically locked to cleat at 72 inches (1820 mm) on center.
 6. Special Shaped Components: Provide factory-fabricated pieces necessary for complete installation, including miters, corners, intersections, curves, pier caps, and end caps; minimum 14 inch (355 mm) long legs on corner, intersection, and end pieces.

7. Fasteners: Factory-furnished; electrolytically compatible; minimum pull out resistance of 240 pounds (109 kg) for actual substrate used; no exposed fasteners.

PART 3 INSTALLATION

3.01 GENERAL

- A. Install roofing, insulation, flashings, and accessories in accordance with roofing manufacturer's published instructions and recommendations for the specified roofing system. Where manufacturer provides no instructions or recommendations, follow good roofing practices and industry standards. Comply with federal, state, and local regulations.
- B. Obtain all relevant instructions and maintain copies at project site for duration of installation period.
- C. Do not start work until Pre-Installation Notice has been submitted to manufacturer as notification that this project requires a manufacturer's warranty.
- D. Perform work using competent and properly equipped personnel.
- E. Temporary closures, which ensure that moisture does not damage any completed section of the new roofing system, are the responsibility of the applicator. Completion of flashings, terminations, and temporary closures shall be completed as required to provide a watertight condition.
- F. Install roofing membrane only when surfaces are clean, dry, smooth and free of snow or ice; do not apply roofing membrane during inclement weather or when ambient conditions will not allow proper application; consult manufacturer for recommended procedures during cold weather. Do not work with sealants and adhesives when material temperature is outside the range of 60 to 80 degrees F (15 to 25 degrees C).
- G. Protect adjacent construction, property, vehicles, and persons from damage related to roofing work; repair or restore damage caused by roofing work.
 1. Protect from spills and overspray from bitumen, adhesives, sealants and coatings.
 2. Particularly protect metal, glass, plastic, and painted surfaces from bitumen, adhesives, and sealants within the range of wind-borne overspray.
 3. Protect finished areas of the roofing system from roofing related work traffic and traffic by other trades.
- H. Until ready for use, keep materials in their original containers as labeled by the manufacturer.
- I. Consult membrane manufacturer's instructions, container labels, and Material Safety Data Sheets (MSDS) for specific safety instructions. Keep all adhesives, sealants, primers and cleaning materials away from all sources of ignition.

3.02 EXAMINATION

- A. Examine roof deck to determine that it is sufficiently rigid to support installers and their mechanical equipment and that deflection will not strain or rupture roof components or deform deck.
- B. Verify that surfaces and site conditions are ready to receive work. Correct defects in the substrate before commencing with roofing work.
- C. Examine roof substrate to verify that it is properly sloped to drains.
- D. Verify that the specifications and drawing details are workable and not in conflict with the roofing manufacturer's recommendations and instructions; start of work constitutes acceptable of project conditions and requirements.
- E. Verify that wood nailers have been properly installed.

3.03 PREPARATION

- A. Take appropriate measures to ensure that fumes from adhesive solvents are not drawn into the building through air intakes.

- B. Prior to proceeding, prepare roof surface so that it is clean, dry, and smooth, and free of sharp edges, fins, roughened surfaces, loose or foreign materials, oil, grease and other materials that may damage the membrane.
- C. Fill all surface voids in the immediate substrate that are greater than 1/4 inch (6 mm) wide with fill material acceptable insulation to membrane manufacturer.
- D. Seal, grout, or tape deck joints, where needed, to prevent bitumen seepage into building.
- E. Wood Nailers: Provide wood nailers at all perimeters and other locations where indicated on the drawings, of total height matching the total thickness of insulation being used.

3.04 INSULATION AND COVER BOARD INSTALLATION

- A. Install insulation in configuration and with attachment method(s) specified in PART 2, under Roofing System.
- B. Install only as much insulation as can be covered with the completed roofing system before the end of the day's work or before the onset of inclement weather.
- C. Lay roof insulation in courses parallel to roof edges.
- D. Neatly and tightly fit insulation to all penetrations, projections, and nailers, with gaps not greater than 1/4 inch (6 mm). Fill gaps greater than 1/4 inch (6 mm) with acceptable insulation. Do not leave the roofing membrane unsupported over a space greater than 1/4 inch (6 mm).
- E. Mechanical Fastening: Using specified fasteners and insulation plates engage fasteners through insulation into deck to depth and in pattern required by Factory Mutual for FM Class specified in PART 2 and membrane manufacturer, whichever is more stringent.

3.05 SINGLE-PLY MEMBRANE INSTALLATION

- A. Beginning at low point of roof, place membrane without stretching over substrate and allow to relax at least 30 minutes before attachment or splicing; in colder weather allow for longer relax time.
- B. Lay out the membrane pieces so that field and flashing splices are installed to shed water.
- C. Install membrane without wrinkles and without gaps or fishmouths in seams; bond and test seams and laps in accordance with membrane manufacturer's instructions and details.
- D. Install membrane adhered to the substrate, with edge securement as specified.
- E. Adhered Membrane: Bond membrane sheet to substrate using membrane manufacturer's recommended bonding material, application rate, and procedures.
 - 1. Do not apply bonding material to fleece backing or to seaming area of membrane.
- F. Edge Securement: Secure membrane at all locations where membrane terminates or goes through an angle change greater than 2 in 12 inches (1:6) using mechanically fastened reinforced perimeter fastening strips, plates, or metal edging as indicated or as recommended by roofing manufacturer.
 - 1. Exceptions: Round pipe penetrations less than 18 inches (460 mm) in diameter and square penetrations less than 4 inches (200 mm) square.
 - 2. Metal edging is not merely decorative; ensure anchorage of membrane as intended by roofing manufacturer.

3.06 FLASHING AND ACCESSORIES INSTALLATION

- A. Install flashings, including laps, splices, joints, bonding, adhesion, and attachment, as required by membrane manufacturer's recommendations and details.
- B. Metal Accessories: Install metal edgings, gravel stops, and copings in locations indicated on the drawings, with horizontal leg of edge member over membrane and flashing over metal onto membrane.
 - 1. Follow roofing manufacturer's instructions.
 - 2. Remove protective plastic surface film immediately before installation.
 - 3. Install water block sealant under the membrane anchorage leg.
 - 4. Flash with manufacturer's recommended flashing sheet unless otherwise indicated.

5. Where single application of flashing will not completely cover the metal flange, install additional piece of flashing to cover the metal edge.
6. If the roof edge includes a gravel stop and sealant is not applied between the laps in the metal edging, install an additional piece of self-adhesive flashing membrane over the metal lap to the top of the gravel stop; apply seam edge treatment at the intersections of the two flashing sections.
7. When the roof slope is greater than 1:12, apply seam edge treatment along the back edge of the flashing.

3.07 FINISHING AND WALKWAY INSTALLATION

- A. Install walkways at access points to the roof, around rooftop equipment that may require maintenance, and where indicated on the drawings.
- B. Walkway Pads: Adhere to the roofing membrane, spacing each pad at minimum of 1.0 inch (25 mm) and maximum of 3.0 inches (75 mm) from each other to allow for drainage.
 1. If installation of walkway pads over field fabricated splices or within 6 inches (150 mm) of a splice edge cannot be avoided, adhere another layer of flashing over the splice and extending beyond the walkway pad a minimum of 6 inches (150 mm) on either side.
 2. Prime the membrane, remove the release paper on the pad, press in place, and walk on pad to ensure proper adhesion.

3.08 FIELD QUALITY CONTROL

- A. Inspection by Manufacturer: Provide final inspection of the roofing system by a Technical Representative employed by roofing system manufacturer specifically to inspect installation for warranty purposes (i.e. not a sales person).
- B. Perform all corrections necessary for issuance of warranty.

3.09 CLEANING

- A. Clean all contaminants generated by roofing work from building and surrounding areas, including bitumen, adhesives, sealants, and coatings.
- B. Repair or replace building components and finished surfaces damaged or defaced due to the work of this section; comply with recommendations of manufacturers of components and surfaces.
- C. Remove leftover materials, trash, debris, equipment from project site and surrounding areas.

3.10 PROTECTION

- A. Where construction traffic must continue over finished roof membrane, provide durable protection and replace or repair damaged roofing to original condition.

END OF SECTION