APPENDIX A - TECHNICAL SPECIFICATIONS

059-19 ROOFING INSTALLATION AND REPAIR SERVICES FOR JEA COMMONWEALTH SERVICE CENTER (CWSC)

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FM Global Roof Nav Assembly # 191843-48573-0 (field of roof)
FM Global Roof Nav Assembly # 315007-48573-0 (perimeters and corner zones)

Pull Test Report by OMG Roofing Products dated 10-17-2018
Report titled “Roof Evaluation” by Atlantic Engineering Services dated 12-14-2018

Safety

- Safety is everybody's responsibility. There is no project or task that is more important than one's health and well-being. Any person on a site has the authority and responsibility to stop an unsafe act.
- All contractors and subcontractors must be JEA safety qualified. This includes employees and supervisors. Supervisors may be required to have additional training. Certain job site types (such as substations) require additional training. Contractors are responsible for ensuring ALL personnel have received the appropriate training necessary.
- Any persons not following JEA's Safety Rules and Regulations will be removed from the project and will not be allowed to return to any JEA project or property.
- JEA's Safety Department will inspect work in progress, as well as employees, equipment, materials and tools, and may do so at any time. Contractors will be graded on safety. A score of 80 or below requires a meeting with the Safety Department and mandatory corrective actions.
- Contractors must wear proper Personal Protective Equipment (PPE). PPE minimums include safety footwear, hard hat, and safety glasses. Hearing protection is required while operating machinery or equipment (including saws). Ripped jeans, shorts, tennis shoes, sleeveless shirts, and shirts with offensive logos or messages are not acceptable. Footwear must have safety toes.

Security

- Contractor must ensure each person checks in and checks out daily with security.
- Contractor is required to provide whatever means necessary to ensure that the facility is secure at all times during construction. Coordination with JEA Security may be necessary before implementation; all security actions must be pre-arranged with the Project Administrator.
- Drawings, sketches, plans and other items detailing JEA facilities are to be considered sensitive items and will not be released to any 3rd party without the prior consent of JEA.

General Conditions

- Contractors will provide all labor, tools, and equipment needed for their scope of work. Unsafe tools & equipment are never permitted on JEA sites.
- Contractor is responsible for all permits, fees, approvals, licenses and taxes.
- Contractor must verify existing conditions and dimensions prior to starting work. Any discrepancies must be brought to the attention of the Project Administrator. Contractor is responsible to remove and/or provide additional items as required to comply with the contract documents.
- Construction schedules are to be provided by the Contractor and agreed to by all parties before work proceeds. Changes in the schedule must be coordinated through the Project Administrator.

- Contractor will provide any and all dust curtains, temporary partitions, walk-off mats or any other barricade or process necessary to keep site clean.
- All work will meet or exceed building codes.
- Contractors must abide by the JEA Hot Works Permits Program.
- Job sites are to be kept clean at all times. Contractor will supply his own cleaning products. In office environments, site will be vacuumed at the end of work each day. In field environments, areas will be kept broom-clean.
- Contractor is responsible for removing all debris, demolished items, and construction waste, including the proper and legal disposing of such. All costs of disposal are to be included in contractor's bid.

Site Access

- Power and Water are NOT to be turned off at any time, except emergencies, without prior notification and approval by the Project Administrator. Any work interfering with building occupants' use of space must be coordinated in advance.
- Loading, unloading, material delivery, and contractor site access points will be determined by the Project Administrator. Use of other areas is prohibited.
- Contractors are responsible for furnishing sanitary items (temporary toilets, hand-washing stations, clean drinking water, etc.) for their work force. DO NOT assume access to existing bathrooms will be granted!

Quality Control and Inspections

- Submittals must be reviewed and approved by the Project Administrator before the item is installed.
- Contractor shall provide JEA with weekly progress reports outlining:
    a. Work completed & work remaining
    b. Delays due to weather and other causes (identify causes)
    c. Plan to complete work by scheduled date
- Work that does not conform to expected levels of craftsmanship or the specifications will be redone at Contractor's expense.

Project Closeout

- Punch lists will be created by the Project Administrator, with input as necessary from the Client. The Project Administrator is the deciding authority on punch list matters.
- Final punch list items will be completed before final invoice is processed for payment.
- Final cleaning is to be provided by the Contractor. This includes lay-down areas; loading docks; and stairways, hallways, or other paths of travel used by the contractor during the job. All debris caused by the construction, both interior and exterior, will be removed from the premises and properly disposed of.

- Contractor is responsible for organizing and presenting to JEA, in a neat and accessible format, all information concerning warranties, key schedules, installation and operation manuals, as-built drawings, wiring diagrams and other documentation before final invoice will be processed.
- All equipment, material and labor will carry a 2-year warranty (minimum) against defects and workmanship.

SUMMARY OF WORK:

JEA is soliciting Bids from contractors (hereinafter referred to as "Company") for the roofing services for a new administrative building located at the Commonwealth Service center (CWSC).

This contract is executed between JEA and the General Contractor to replace portions of the facility's low slope roof and complete installation of new roof system at JEA Commonwealth Service Center (CWSC). Contract also includes repairs to existing roof, as needed. The final engineering drawings, FM Global Standards and Infrared pictures are included in Appendix C which are available for review on JEA.COM. The location of existing utilities, structures, and improvements are approximate. Discrepancies should be resolved by the Contractor prior to the commencement of work. All construction shall be performed in accordance with the approved plans and comply with all current City of Jacksonville (COJ) policies and JEA Utility Standards. JEA and COJ approval is contingent upon any required local, state or federal permit approvals such as those from the Department of Environmental Protection or the St. Johns River Water Management District (SJRWMD). The project duration is expected to be three (3) months after award of the contract. The contractor shall provide a preliminary construction schedule with their initial response and a final schedule shall be provided once the contract is finalized. The roof replacement shall comply with the requirements described in this Solicitation and Appendix A – Technical Specifications dated January 30, 2019, prepared by Loefgren & Associates, Inc.

1.01 Scope of Work

A. Warehouse Building Roof: The proposed Scope of Work includes the upper level roof that is generally above the warehouse area and the canopy roofs above the loading dock doors along the south wall of the warehouse.

B. Office Building Roof: The proposed Scope of Work does <u>not</u> include the lower level roof above office area at the north end of the building.

C. Approximate Roof Areas: The CWSC has the following approximate roof areas. Quantities are provided for information only. Contractors shall independently verify all quantities and other factors that might influence roof construction costs.
   1. Warehouse Building Roof (included in Scope) ..... 162,000 SF
   2. Loading Dock Canopy Roofs (included in Scope) ..... 2,500 SF
   3. Office Building Roof (<u>not</u> in Scope)..... 26,600 SF

1.02 Existing Roof Construction:

A. The original one-story warehouse and office building was constructed based on drawings dated 1967. Structural steel framing included precast concrete walls, steel columns, trusses, beams and open web steel joists. The roof deck included lightweight insulating concrete (LWIC) fill on a steel roof deck. The original drawings indicated that the LWIC was specified to be "Zonolite".

The existing roof membrane appeared to consist of a multi-ply built up roof with a mineral surfaced cap sheet adhered with hot mopped asphalt to a perlite or wood fiber cover board. The cover board was apparently mechanically fastened through the lightweight insulating concrete (LWIC) fill to the steel roof deck.

Several roof deck areas appeared to consist of infill deck areas that were apparently installed to cover former openings for rooftop HVAC equipment. The roof assemblies in these roof areas were assumed to include rigid roof insulation instead of LWIC.

Canopy roofs over the loading dock door openings appeared to consist of steel roof decking bearing on steel beams. Much of the roof decking appeared to have significant corrosion.

There was no lightning protection system on the roof.

B. Fastener pull tests were performed by OMG Roofing Products on October 17, 2018. Fasteners tested included Johns Manville High Load (#15), Johns Manville All Purpose (#14), and Johns Manville Ultrafast (#12). The minimum fastener pull out value was 425 lbf. A copy of OMG's test report is attached.
   1. At each pull test location, moisture readings were obtained with a Delmhorst Moisture Meter. At 9 of the 25 pull test location, the existing perlite or wood fiber cover board appeared to be damp or wet.

C. An evaluation of the existing steel deck was performed by Atlantic Engineering Services. A copy of their report is attached in Appendix C - Drawings.

1.03 Product Submittals: Before the Pre-Construction Meeting, the contractor shall submit a list of materials and assemblies proposed for use on this project. The submittal package shall include the following:

A. The specific roof assembly for each proposed new roof system. Fastener type and spacing shall be indicated for each roof zone.

B. Florida Building Code Product Approval and FM Global Roof Nav Assemblies.

C. FM Global Form 2688 – Checklist for Roofing Systems.

D. Metal edge fascia, gutter and coping details per ANSI SPRI ES-1.

E. A letter from the primary roof membrane manufacturer stating that the contractor is approved to apply specified materials and that the proposed assemblies will qualify for the manufacturer's 20 Year No Dollar Limit (NDL) Warranty.

1.04 Some HVAC equipment may need to be turned off to prevent fumes or odors from entering the building. HVAC equipment may need to be turned off during application of adhesive and coating materials, if any. Do not clean, prime, or apply liquid materials adjacent to fresh air supply hoods while HVAC equipment is in use.

1.05 Quality Assurance / Quality Control

A. The Contractor shall assign a designated Quality Control (QC) employee and provide the name to the JEA Contract Administrator at the start of the contract. This QC employee shall ensure that the work conforms to the specifications by performing site visits with, and, at the request of the JEA Contract Administrator.

B. Work that does not conform to the specifications of this contract shall be redone at the Contractor's expense.

C. The Owner may elect to engage an independent QA/QC observer to perform construction observations to document contractor's compliance with the project requirements established by this IFB and manufacturer's requirements.

D. At least once each day, coordinate construction activities with JEA's Project Manager, Lawrence Costea. Each day, the contractor shall provide a written "Daily Report" to document work locations, crew sizes, and quantities of materials used each day. Copies of the reports shall be provided to the JEA's Project Manager and Engineer by the end of the following work day.

1.06 GENERAL

A. On all installations and repairs, the Contractor will confirm that the installation and/or repairs comply with accepted practice as specified in the National Roofing Contractors Association.

B. The Contractor must perform the work in strict environmental compliance with applicable standards, specifications, and regulations including Federal (EPA), State (FDEP) and Local Environmental Protection Agencies and the Department of Agriculture.

C. Contractor will be accountable for timely clean-up and remediation associated with any contaminant spills, accidental or otherwise, including, but not limited to chemicals, diesel fuel, gasoline, lubricants, cleaning fluids, or toxic chemicals.

1.07 DISPOSAL OF WASTE GENERATED DUE TO CONTRACTOR WORK

A. The Contractor must dispose of all waste generated as a result of the contract at an officially permitted location. This includes daily disposal of tear-off and construction debris.

B. JEA will not pay additional charges/fees for waste disposal; therefore, any fees and/or charges associated with this disposal should be included in the bid price of the work.

1.08 DELIVERY, STORAGE AND HANDLING

A. Product delivery, storage and handling, surface preparation and product application to achieve specified system shall comply with these specifications. Where manufacturer's requirements are stricter or mandatory to achieve specified warranty, the Manufacturer's requirements shall be met providing they do not diminish specified performance requirements. Deviation from the specified procedure even if Manufacturer required, shall be coordinated and approved by the JEA Contract Administrator prior to installation.

B. Deliver products and materials to site in manufacturer's original, unopened containers or packages, dry and undamaged with seals and labels intact and legible. Delivery shall be in quantities to allow for continuous application.

C. All related Safety Data Sheet (SDS) documents shall be supplied and kept with materials and/or products on site in accordance with approved submittals. Additionally, approval letters from metal manufacturer for use of their metal within this particular roofing system type and approval letters from insulation manufacturer for use of their insulation within this particular roofing system type shall be provided to the JEA Contract Administrator.

D. Materials shall be stored out of direct exposure to the elements. Items adversely affected by moisture shall be protected as if stored at grade. Liquid materials such as solvents, adhesive and cutback products shall be stored away from open flames, sparks or excessive heat. Cover all material to protect from moisture.

E. Store and handle roofing sheets in a dry, well-ventilated, weather-tight place to ensure no possibility of significant moisture exposure. Store rolls of felt and other sheet materials on pallets or other raised surface. Stand all roll materials on end on a clean, flat, dry surface. Cover roll goods with a canvas tarpaulin or other breathable material (not polyethylene).

F. Stack pre-formed and pre-finished material to prevent twisting, bending, or abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.

G. All materials shall be handled in such a manner as to preclude damage and contamination with moisture or foreign matter or which may cause discoloration or staining. Rolled goods shall be handled to prevent damage to edges or ends.

H. Do not leave unused materials on the roof overnight or when roofing work is not in progress unless protected from weather and other moisture sources.

I. Store all insulation materials in a manner to protect them from the wind, sun and moisture damage prior to and during installation. Any insulation that has been exposed to any moisture shall be removed from the project site. Keep insulation materials enclosed in a watertight, ventilated enclosure (i.e. tarpaulins). Store insulation materials off the ground. Any warped, broken or wet insulation boards shall be removed from the site by the Contractor.

J. It is the responsibility of the Contractor to secure all material and equipment on the job site. If any material or equipment is stored on the roof, the contractor must make sure that the integrity of the deck is not compromised at any time. Damage to the deck caused by the Contractor will be the sole responsibility of the Contractor and will be repaired or replaced at his/her expense.

K. Any materials that are found to be damaged or stored in any manner other than stated above shall be automatically rejected and shall be removed and replaced at the Contractor's expense.

1.09 WEATHER CONDITIONS

Roofing materials shall not be applied during precipitation. The Contractor shall take adequate precautions to ensure that materials, applied roofing, and building interiors are protected from possible damage or contaminates.

1.10 SITE CONDITIONS

A. The Contractor shall prevent access by the public to materials, tools, and equipment during the course of the work.

B. All doors, hatches, and gates shall be locked and secured at all times when unattended.

C. The Contractor shall be responsible for securing and clean-up at the facility daily and after all work has been completed.

D. All job-site clean-up including building interior, exterior and landscaping where affected by the construction shall be restored to its original condition. The Contractor shall be responsible for all damage caused by roofing installation including but not limited to tire damage.

1.11 SPECIAL WEATHER EVENT

In anticipation of a weather event where damage to JEA facilities could occur, the

Contractor will take steps to ensure that JEA will be a priority for after-event repairs and that adequate staffing coverage will be available. JEA considers adequate to consist of at least one crew of one (1) journeyman and one additional worker available for necessary repairs.

1.12 PERMITS

The Contractor shall obtain all permits required by local agencies and pay all fees which may be required for the performance of the work and removal/disposal of hazardous materials. The Contractor shall provide copies of all local, state and Federal permits required for the work described in this contract to the JEA Contract Administrator.

1.13 CONTRACTOR PERSONNEL

A. ALL services rendered shall be by uniformed employees (company identified shirts and hard hats) of the Contractor or sub-contractor. Shirts with offensive logos or messages, ripped jeans, shorts, tennis shoes, and sleeveless shirts are not acceptable.

B. Assigned Contractor personnel shall be issued JEA badges and access to non-occupied areas. This badging process may require background checks and mandatory training. Badges must be visible at all times while on JEA Property.

C. Parking is the responsibility of the Contractor. Parking on JEA property may be approved at the sole discretion of the JEA Contract Administrator.

D. Any worker employed by the Contractor, who exhibits inadequate experience and knowledge or is incapable in his/her field, shall be removed from the work site at the discretion of the JEA Contract Administrator.

2.01 BASE BID Scope of Work:

The BASE BID Scope of Work includes removal and replacement of the existing low slope roof system at designated portions of the JEA Commonwealth Service Center (CWSC) in Jacksonville, Florida. Generally, the Scope of Work applies to all phases of the work.

B. Basis of Design and References

1. Basis of design is a mineral surfaced, two-ply SBS modified bituminous roof membrane assembly equivalent to Johns Manville assembly 2FID-HW and FBC Product Approval FL2948-R12, Revision 11 dated 10/14/2017. All materials shall be installed according to the manufacturer's written application instructions unless noted otherwise.

2. Substitution requests of roof system assemblies manufactured by Soprema or Siplast will be considered if they are determined to be equivalent to the specified roof system assemblies. Substitution requests must be received at least 7 business days before bid opening. If the proposed substitution is determined to be equivalent, an addendum will be issued to all bidders at least 2 business days before the bid opening date.

3. Wind uplift zones and criteria are provided on attached drawing sheet R-2.

Roof Zone	Atlantic Engineering Services Allowable Uplift Pressure (PSF)	Roof System Assembly (Note 1)	Fastener Spacing (Note 2)	FM Roof Nav Wind Uplift Criteria (Note 3)	Maximum Design Pressure, MDP (psf)
1 Field	52	S-59	1 per 1.78 SF	FM 1-120	-60 PSF
2 Edge or Perimeter	87	S-67	1 per 1 SF	FM 1-270	-135 PSF
3 Corner	130	S-67	1 per 1 SF	FM 1-270	-135 PSF

Note 1: FBC Product Approval FL 2948-R12, Revision 11 dated 10/14/2017
Note 2: UltraFast (#12) Fasteners with square galvanized steel plates
Note 3: FM Global Roof Nav Assembly # 191843-48573-0 for field of roof and FM Global Roof Nav Assembly # 315007-48573-0 for corner and perimeter zones

4. Details included by reference include:
   a. Modified bituminous roof membrane system details by Johns Manville or approved equivalent.
   b. Chapter 10 of The NRCA Roofing Manual: Membrane Roof Systems – 2011
   c. Architectural Sheet Metal Manual, 6th Edition (2003) published by SMACNA

5. Fire Rating:
   a. UL790 Class A per ASTM E108
   b. FM Approved Class 1 per NFPA 276.

6. Since the facility is insured by FM Global, all roofing work shall comply with FM Global requirements. The following documents are included by reference:
   a. FM Global Property Loss Prevention Data Sheet 1-28 – Wind Design
   b. FM Global Property Loss Prevention Data Sheet 1-29 – Roof Deck Securement and Above-Deck Roof Components
   c. FM Global Property Loss Prevention Data Sheet 1-49 – Perimeter Flashing.
   d. FM Global Property Loss Prevention Data Sheet 1-54 – Roof Loads for New Construction

C. Preparation and Removal:

1. At Perimeter and Corner Zones indicated on the Roof Plan, improve the wind uplift resistance of the existing deck by installing additional fasteners from below the deck. At every unattached flute, furnish and install corrosion resistant, self-drilling, self-tapping #12 screws with fender washers. Fasten between the angles of the top chord of open web steel joists into the bottom of the metal deck flute. Reference Detail D-1.

2. Remove and properly dispose of the existing roof membrane, rigid insulation, and flashing materials down to existing LWIC deck. Inspect existing roof deck and repair if necessary. Clean deck to prepare for application of insulation and roof assembly.

D. Roof Deck Replacement

1. Remove and replace roof deck at the following locations as indicated on the roof plan.
   a. Roof deck areas apparently installed when rooftop HVAC equipment was removed.
   b. Canopy roofs above loading dock doors along the south wall.

2. New deck shall consist of 18-gauge galvanized 1 1/2-inch deck fastened to existing steel framing with 5/8-inch puddle welds in a 36/5 pattern.

3. Add side lap fasteners (10-16 x ¾" HWH TEKS/3 manufactured by ITW Buildex) so that screws are not spaced more than 30-inches apart in the field and 18-inches apart in the perimeter and corner zones.

4. Furnish and install rigid roof insulation to match the elevation of adjacent lightweight insulating concrete fill.

5. Roof deck replacement criteria is based on the report titled "Roof Evaluation" prepared by Atlantic Engineering Services, Inc. dated December 14, 2018.

E. Roof Insulation

1. Furnish and install a roof insulation assembly to provide an overall thermal resistance of R-25 per the Florida Building Code, Energy Conservation 6th Edition (2017).

2. Furnish and install a ventilating base sheet on top of existing lightweight insulating concrete.

3. At areas designated for crickets and saddles between drains, furnish and install new rigid tapered (1/2-inch per foot) polyisocyanurate insulation. The width to length ratio of each cricket or saddle shall be 1:3.

4. Furnish and install two (2) layers of new 2.0-inch thick rigid polyisocyanurate insulation (JM ENRGY 3 25 psi). Secure each board with a minimum of 2 fasteners per board. Offset each layer of insulation so joints are covered by the next layer of insulation or cover board.

5. Furnish and install new cover board equivalent to 0.50-inch thick JM SecureRock. Offset cover board joints so insulation board joints are covered.

6. Provide corrosion resistant screw fasteners, metal plate washers and number of fasteners required for each wind uplift zone per table in section 2.01.A.4 of this specification. Secure fasteners through the entire assembly into the existing steel roof check.

F. Roof Membrane

1. Base Bid: Furnish and install new two-ply modified bituminous roof membrane assembly equivalent to Johns Manville 2FID-HW.
   a. Base ply shall be equivalent to JM DynaWeld Base torch applied to the cover board.
   b. Cap sheet shall be equivalent to JM DynaWeld Cap FR torch applied to the base ply.

2. Bid Alternate 1: Add second ply equivalent to JM DynaWeld Base torch applied. The JM assembly designation would change from 2FID-HW to 3FID-HW.

G. Roof Flashing and Miscellaneous

1. Furnish and install new cant strips at the base of parapet walls, perimeter of roof curbs and other vertical penetrations. Furnish and install new two-ply modified bituminous base flashing membrane assembly with MBR Flashing Cement or MBR Utility Cement. Base ply shall be equivalent to JM DynaBase. Cap sheet shall be equivalent to JM DynaClad Aluminum Foil-Surfaced Flashing Sheet.

2. Remove and replace all pitch pans or pitch pockets. Top edge of new metal pans shall have hemmed edges and rain hoods or bonnets. Penetration flashing materials shall be compatible with roof membrane materials, furnished by the roof membrane manufacturer, and included in the roof system warranty.

H. Sheet Metal Flashing

1. Unless noted otherwise, all sheet metal flashing shall be 0.040-inch thick aluminum with factory applied Kynar finish. Color shall be selected by Owner from manufacturer's standard colors.

2. Furnish and install FM Approved perimeter metal flashing systems at roof edges and coping on top of parapet walls. The metal flashing assemblies shall have a minimum wind rating of 120 per FM Global Property Loss Prevention Sheet 1-49 – Perimeter Flashing and shall be approved per FM 4435, Approval Standard for Edge Systems Used with Low Slope Roofing Systems, June 2013. This standard uses the test methods in the Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems, SPRI/FM 4435/ES-1, 2011.

I. Sheet Metal Wall Coping Caps

1. At the top of the parapet walls, remove all damaged or deteriorated wood blocking and replace with new preservative treated wood blocking to match dimensions of existing wood blocking. Secure existing and new wood blocking to the existing structural concrete wall framing with 3/8-inch diameter stainless steel anchor expansion bolt fasteners.
2. Fasteners shall penetrate at least 2 1/2-inches into the concrete wall framing (or more if indicated by the fastener manufacturer's test data). If necessary, furnish and install additional new fasteners spaced so that the completed fastener spacing does not exceed 36-inches on center in the Perimeter Zones and 18-inches on center in the Corner Zones.
3. Prior to installation of metal coping cap, apply tapered insulation (if necessary, for slope) and a continuous strip of 40 mil self-adhering membrane across the top of the blocking and extending down the outside and inside face approximately the width of the vertical sections of the coping cap. Use strips as long as practical, lapping all laps 6 inches.
4. Form new coping caps according to SMACNA Architectural Sheet Metal Manual Figure 3-4A. Use maximum 10-foot lengths and a minimum number of pieces in each straight run.
5. At all corners, shop form corner pieces of coping cap with 18-inch legs (joints no more than 18 inches from corner). Solder or weld joint of corner piece.
6. The top of the coping shall slope a minimum of 1-inch from exterior to interior. Both vertical sections shall lap past the bottom of the wood blocking or the top of the concrete by 1-1/2 inches.
7. Furnish and install continuous cleats on both sides of the wall. Secure vertical faces of both of the continuous cleats to wood blocking with ring shank nails spaced 6-inches on center.
8. Provide 1-inch space between ends of coping or fascia metal and provide 8-inch wide cover plates with 4 beads of sealant.
9. Reference detail D-2.

J. Overflow Through Wall Scupper

1. At locations indicated on the drawings, cut new openings through the parapet wall to accommodate new and larger overflow scupper drains.
2. Scupper openings shall be 8-inches high by 12-inches wide unless noted otherwise. Outside dimensions of cover plates shall be 14-inches high by 22-inches wide unless noted otherwise. Layout and plan opening locations near the middle of each concrete wall panel so they avoid structural anchor locations and minimize cutting of reinforcing steel. Neatly saw cut concrete to provide clean, square cuts. Rough opening should be approximately 1-inch wider and taller than the scupper tube.
3. Form new scupper liners to fit in the through wall scupper openings according to SMACNA Architectural Sheet Metal Manual Figure 1-26 and

1-30. All sheet metal flashing shall be 0.040-inch thick aluminum with factory applied Kynar finish.

4. Install scupper through the rough opening. Securely fasten the flange to the inside of the wall. Seal gap between metal scupper tube with silicone sealant and backer rod.
5. Install closure flanges at the exterior side of the wall, lock and seal cover plate seams according to detail 1 of SMACNA Architectural Sheet Metal Manual Figure 1-26. Seal top and sides of hemmed edges of exterior closure flange to exterior face of wall with silicone sealant and backer rod if necessary.
6. Reference detail D-3.

K. Expansion Joint Curbs and Area Dividers

1. At the top of the existing expansion joint curbs and area dividers, remove all damaged or deteriorated wood blocking and replace with new preservative treated wood blocking to match dimensions of existing wood blocking. If existing wood blocking is no longer fastened, secure existing and new wood blocking to the existing structural framing with 3/8-inch diameter stainless steel fasteners spaced 12-inches on center staggered.
2. The curbs shall extend at least 8-inches above the new roof assembly. Stainless steel ring shank or screw fasteners shall penetrate at least 2-inches into the previous layer of wood blocking. Fasteners shall spaced and staggered at 9-inches on center.
3. Prior to installation of metal expansion joint cover or area divider cap, apply tapered insulation (if necessary, for slope) and a continuous strip of 40 mil self-adhering membrane across the top of the blocking and extending down the outside and inside face approximately the width of the vertical sections of the coping cap. Use strips as long as practical, lapping all laps 6 inches.
4. Furnish and install FM Approved metal flashing systems at roof perimeter zones. The metal flashing assemblies shall have a minimum wind rating of 120 per FM Global Property Loss Prevention Sheet 1-49 – Perimeter Flashing and shall be approved per FM 4435, Approval Standard for Edge Systems Used with Low Slope Roofing Systems, June 2013. This standard uses the test methods in the Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems, SPRI/FM 4435/ES-1, 2011.
5. For the Expansion Joint Curb Cover, form new caps according to SMACNA Architectural Sheet Metal Manual Figure 5-5A.
6. For the Area Divider Curb, form new coping caps according to SMACNA Architectural Sheet Metal Manual Figure 3-7B.
7. Use maximum 10-foot lengths and a minimum number of pieces in each straight run.
8. Secure the vertical faces of both sides of the metal to wood blocking with stainless steel gasketed fasteners evenly spaced at 12-inches on center.
9. Provide 1-inch space between ends of metal caps and provide 8-inch wide cover plates with 4 beads of sealant.

10. Reference details D-4 and D5.

L. Gutters and Downspouts

1. At the canopy roof areas above the loading dock doors, furnish and install new continuous gutters with downspouts. Gutter, downspout and expansion joint details shall be based on SMACNA details.
   a. Fabricate gutters in 10-foot long sections. Sheet metal lap joints shall have continuous sealant joints in the lap with stainless steel rivets.
   b. Gutter dimensions shall be a minimum 6-inches wide and 6-inches deep unless drainage calculations require larger sizes.
   c. Gutter shape shall be "Style A" per SMACNA Figure 1-2.6.
   d. Provide gutter expansion joints so no gutter section is more than 45-feet long. Fabricate and install per SMACNA Figure 1-10 (ref SMACNA Architectural Sheet Metal Manual, 6th Edition).
   e. For gutters with girth less than 20-inches, gutter brackets shall be 1/4-inch x 1-inch aluminum flat bar spaced not more than 24-inches on center.
   f. Top flange of the edge fascia metal shall be fastened with 12 gauge (1-1/2-inch) galvanized ring shank roofing nails at 3-inches on center, staggered.
2. Unless field conditions indicate otherwise, install downspouts at locations of existing downspouts.
   a. Downspouts shall be minimum 5-inch square unless drainage calculations require larger sizes.
   b. Downspout brackets shall be ¼” x 1-1/2” aluminum spaced 5’-0” o. c.
   c. Where downspouts discharge at grade, furnish and install precast concrete splash blocks.
   d. For the downspout near gridline G-6, route the downspout to discharge east of the ramp wall. Downspout slope shall be 45-degrees minimum.
3. Reference detail D-6.

M. Roof Drain Flashing

1. Clean existing cast-iron roof drain assemblies. Remove and replace screw studs and nuts. Re-tap cast iron drain if necessary.
2. Replace plastic strainers, if any, with new cast iron strainers manufactured to fit the existing drain bowls.
3. Clean and paint drain bowls and cast iron strainers. Prepare surfaces and apply paint according to paint manufacturer’s written instructions.
   a. Power tool with a grinder, wire wheel, etc. to remove as much rust and loose paint.
   b. Abrade entire surface to ensure existing coating is opened up to accept the new coating.
   c. Apply corrosion inhibiting paint selected by the Owner.

4. At each drain, furnish and install a new 30-inch square (minimum) piece of lead flashing (minimum 2.5 lb./sq. ft). Apply metal primer to both sides and apply flashing to the roof surface in MBR Flashing Cement or MBR Utility Cement. Cover the lead flashing with a layer of modified bitumen membrane sheet, set in MBR Flashing Cement or MBR Utility Cement. The modified bitumen flashing piece should extend 4" (102 mm) minimum beyond the edge of the lead flashing, in all directions. The membrane, lead flashing, and flashing piece should all extend under the clamping ring. Attach the clamping ring and tighten uniformly (Reference JM Spec DGE-11).
5. Replace broken or cracked clamping rings and strainers, if any.
6. If Bid Alternate 2 is accepted, flash new overflow drains in a similar manner.

N. Sealant

1. Furnish and install continuous sealant joints at locations indicated by details, manufacturer recommendations, or industry standards.
2. At locations where sealant joints will adhere to existing materials, clean substrate, apply sealant and perform sealant adhesion tests. If sealant adhesion tests fail, prime surface where joint will be applied and retest. If sealant adhesion test passes, apply primer to each joint surface.
3. Sealant shall be one-part silicone sealant, compliant with ASTM C920, low modulus, one component, non-sag, neutral cure silicone equivalent to Dow Corning 790. Color to match adjacent materials subject to selection by the Owner.
4. Backer Rod for Sealant: Foam backer rod, non-staining, compatible with sealant primer, and of resilient nature. Materials impregnated with oil, bitumen or similar materials shall not be used. Open-cell or closed-cell polyethylene foam backer rod should be used as recommended by sealant manufacturer for material and application. Size backer rod so that it will compress to 25 percent when installed into joint. Install new foam backer rod in joint to provide an “hour glass” shaped sealant joint profile. At the center of the joint, the depth of the sealant shall be approximately 1/2 the width of the joint as recommended by the sealant manufacturer. Minimum sealant joint depth shall be 3/8-inch.
5. Where the depth of the joint does not allow the use of backer rod, install new bond-breaker tape to back side of joint to exact width of joint. Do not lap or otherwise stretch tape.
6. Apply new sealant under pressure with power actuated or manual gun. Gun must have correct nozzle size and pressure to fill joint completely. Tool joints immediately with a rounded wood or metal spatula. Do not use wet tool method. Tooling must be accomplished before sealant begins to skin.
7. All finished work must be uniform, clean, neat and free of overlapping joints.

O. Miscellaneous

1. Secure exhaust fans to curbs with stainless steel #12 screw fasteners spaced not more than 8-inches on center. Screw thread shall be appropriate for the substrate.
2. Furnish and install new traffic pad material adjacent to permanent ladder locations.

2.02 BID ALTERNATE 1 Scope of Work

The BID ALTERNATE 1 Scope of Work changes the roof membrane assembly to a 3-ply assembly. A second ply equivalent to JM DynaWeld Base HW torch applied would be added to the assembly. The JM assembly designation would change from 2FID-HW to 3FID-HW.

2.03 BID ALTERNATE 2 Scope of Work

The BID ALTERNATE 2 Scope of Work adds a complete overflow drain and piping system to the Base Bid Scope of Work.

A. Furnish and install a complete secondary roof drainage system to accommodate roof overflow in the event that the existing primary roof drain system becomes obstructed. Through wall overflow scuppers specified in paragraph 2.01.H are to be included as part of the base bid.

B. Secondary roof drainage system shall include the following components:

1. Overflow roof drains:
    a. Overflow drain assemblies shall be cast-iron, large-sump, general-purpose roof drain with underdeck clamp kit, cast iron dome strainer, and 17-inch diameter overflow dam. Furnish and install overflow drains at locations indicated on Drawing R-4 – Roof Plan - Overflow Drainage.
    b. Basis-of-Design Product: Zurn Z-100 manufactured by Zurn Plumbing Products Group or comparable product by one of the following:
        i. Josam Company.
        ii. MIFAB, Inc.
        iii. Smith, Jay R. Mfg. Co.
    c. Bottom outlet diameter of drain shall match drain pipe size indicated on roof plan.

2. Drain Pipe:
    a. Furnish and install complete drain piping system consisting of cast-iron soil pipe with hubless and fittings. Install cast-iron soil piping according to CISPI 310 and CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."

b. Provide positive drainage by sloping drain pipes at 1/4-inch per foot (2%) downward in direction of flow as indicated on the roof plan.
c. Materials:
    i. Pipe and fittings: Cast iron, service grade, pipe diameter indicated on roof plan.
    ii. Hubless Joints: Neoprene gaskets and stainless-steel clamp and shield assemblies.
d. Install changes in direction for storm piping using appropriate branches, bends, and long-sweep bends. Do not change direction of flow more than 90 degrees. Use proper size standard increasers and reducers for connection to different size pipes. Reducing size of drainage piping in direction of flow is prohibited.

3. Hanger and Support Installation
    a. Furnish and install galvanized steel, adjustable, clevis support hangers with galvanized steel threaded hangar rod to support drain piping from structural steel beams, girders, trusses, or joists. Do not fasten to metal roof decking.
    b. Since exact pipe routing has not been determined, variable conditions may be encountered. Contractor shall be responsible for all pipe hanger support design and details.
        i. Contractor-prepared shop drawings shall indicate proposed routing and connection details for pipe support systems. Contractor shall submit shop drawings to the Owner and Engineer for review and record.
        ii. Designs generally accepted as exemplifying good engineering practice, using stock or production parts, shall be utilized wherever possible.
        iii. All supports and parts shall conform to the latest requirements of the ASME Code for Pressure Piping B31.1 and MSS Standard Practice SP-58, SP-69, SP-89 and SP-90 except as supplemented or modified by the requirements of this specification.
    c. References:
        i. ASTM C1540 – 18 - Standard Specification for Heavy-Duty Shielded Couplings Joining Hubless Cast Iron Soil Pipe and Fittings
        ii. ASTM A888 - 18a - Standard Specification for Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications
        iii. ASTM F708 - 92(2018)e1 Standard Practice for Design and Installation of Rigid Pipe Hangers
    d. For horizontal piping, furnish and install pipe hangers according to the following:
        i. 100-feet and Less: MSS Type 1, adjustable, steel clevis hangers. CR
        ii. Longer Than 100-feet: MSS Type 43, adjustable roller hangers.
        iii. Install hangers spaced not more than 60-inches apart with 3/4-inch minimum diameter threaded rod.

iv. Provide hanger support within 18-inches of each fitting and coupling. Sweeps and bends shall be firmly secured.
v. Secure threaded rods to structural framing with brackets, C-clamps, or devices designed and rated for application. If structural support spacing exceeds allowable spacing of hangers, furnish and install structural framing for hangers or brackets.

e. For vertical cast-iron soil piping, install hangers or supports every 15-feet. Secure to structural framing or concrete walls with brackets or devices designed and rated for application.

4. Where overflow drain pipes discharge through concrete walls, cut penetrations through concrete walls with a concrete hole saw. Rough opening shall be approximately 1-inch larger than the outside diameter of the pipe.
   a. At the end of each pipe, furnish and install a "Downspout Nozzle Cover with Flapper" with gasket and stainless-steel screw fasteners.
   b. Basis-of-Design Product: Zurn Z-199-DC-VP manufactured by Zurn Plumbing Products Group or comparable product by one of the following:
      i. Josam Company.
      ii. MIFAB, Inc.
      iii. Smith, Jay R. Mfg. Co.
   c. Furnish and install sealant with backer rod at both sides of the wall between the pipe and the edge of the concrete opening where horizontal drain piping penetrates concrete walls.

3.01 In submitting this Bid, Bidder represents, that:

A. Bidder has examined and carefully studied the Invitation for Bid (IFB).

B. Bidder has visited the Site and become familiar with and is satisfied as to the general, local and Site conditions that may affect cost, progress, and performance of the Work. Bidder does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price(s) bid and within the times and in accordance with the other terms and conditions of the IFB.

C. Bidder is familiar with and is satisfied as to all federal, state and local Laws and Regulations that may affect cost, progress and performance of the Work.

D. The IFB is generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work for which this Bid is submitted.

3.02 PRE-CONSTRUCTION CONFERENCE

A. After the Contractor is selected and the Notice to Proceed is issued, a preconstruction conference shall be held on site to coordinate construction activities. Participants shall include the roofing contractor's project manager and project superintendent, roof materials manufacturer, Owner's representatives,

Engineer, and other parties. Construction schedules, sequencing, and site conditions will be reviewed to resolve any questions.

3.03 PROJECT CONDITIONS

A. Owner will continue to occupy the building immediately below work areas. Conduct repairs so Owner's operations will not be disrupted. Provide Owner with not less than 48 hours' notice of activities that may affect Owner's operations.

B. Protection: Protect all existing facilities including interior finishes and equipment. Protect building to be reroofed, adjacent buildings, walkways, site improvements, exterior plantings, and landscaping from damage or soiling from roof repairs operations. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.

.

C. Weather Limitations: Proceed with roof repairs only when existing and forecasted weather conditions permit Work to proceed without water entering into existing roofing system or building.

D. Hazardous Materials: It is unknown if hazardous materials such as asbestos-containing materials will be encountered in the Work. Before bidding, the Contractor shall determine if materials suspected of containing hazardous materials exist. If hazardous materials are encountered, Contractor shall remove and properly dispose of them according to current guidelines and regulations.

3.04 WARRANTY

A. Manufacturer’s Warranty: Upon completion of the work, and before final payment, Contractor shall furnish Owner an unlimited Roofing System Guarantee with flashing endorsement and wind rider up to 110 mph covering all workmanship and materials issued by the roofing materials manufacturer for a period of 20 years from date of substantial completion. The warranty shall be a term type, without deductibles or limitations on coverage amount, and shall be issued at no additional cost to the Owner. This warranty shall not exclude random areas of ponding from coverage.

B. Contractor’s Warranty: Upon completion of the work, and before final payment, Contractor shall furnish Owner a Two-Year Contractor’s Warranty, properly executed and printed on the Contractor's standard letterhead form.

APPENDIX B - MINIMUM QUALIFICATION FORM
IFB 059-19 ROOFING INSTALLATION AND REPAIR SERVICES FOR JEA COMMONWEALTH SERVICE CENTER (CWSC)

GENERAL

THE MINIMUM QUALIFICATIONS SHALL BE SUBMITTED ON THIS FORM. IN ORDER TO BE CONSIDERED A QUALIFIED BIDDER BY JEA YOU MUST MEET THE MINIMUM QUALIFICATIONS LISTED BELOW, AND BE ABLE TO PROVIDE ALL THE SERVICES LISTED IN THIS SOLICITATION.

THE BIDDER MUST COMPLETE THE BIDDER INFORMATION SECTION BELOW AND PROVIDE ANY OTHER INFORMATION OR REFERENCE REQUESTED. THE BIDDER MUST ALSO PROVIDE ANY ATTACHMENTS REQUESTED WITH THIS MINIMUM QUALIFICATIONS FORM.

PLEASE SUBMIT THE ORIGINAL, THREE (3) COPIES AND ONE (1) CD OF THIS FORM AND ANY REQUESTED ADDITIONAL DOCUMENTATION WITH THE BID SUBMISSION.

BIDDER INFORMATION

COMPANY NAME:_____

BUSINESS ADDRESS:_____

CITY, STATE, ZIP CODE:_____

TELEPHONE:_____

FAX:_____

E-MAIL:_____

PRINT NAME OF AUTHORIZED REPRESENTATIVE:_____

SIGNATURE OF AUTHORIZED REPRESENTATIVE:_____

TITLE OF AUTHORIZED REPRESENTATIVE:_____

MINIMUM QUALIFICATIONS:

The Bidder shall meet the following Minimum Qualifications to be considered eligible to submit a Bid in response to this IFB**. JEA reserves the right to ask for additional back up documentation or additional reference projects to confirm the Respondent meets the requirements stated below.** A Bidder not meeting all of the following criteria will have their Response rejected:

- Contractor shall possess a valid Certified General Contractor License issued by the State of Florida.

Certified General Contractor License Number: _____

APPENDIX B - MINIMUM QUALIFICATION FORM
IFB 059-19 ROOFING INSTALLATION AND REPAIR SERVICES FOR JEA COMMONWEALTH SERVICE CENTER (CWSC)

- Contractor shall provide two (2) account references for similar construction projects completed as the prime contractor in a commercial setting in the last two (2) years ending February 28, 2019 and valued at least $1,500,000 each. Bidder shall provide valid references for each contract listed.
    - The Contractor shall have successfully completed the referenced projects, which includes submitting as-builts to owner.
    - The account references must include the referenced company name, contact person, phone number, email address, project dates, contact amounts and a summary of the scope of work provided. JEA will contact and verify the account references.

Please provide the reference verification information requested below pertaining to this contract.

1. REFERENCE

Reference Name _____

Reference Phone Number _____

Reference Company Name _____

Address of Work _____

Reference E-Mail Address _____

Dates of Work/$ Amount _____

Description of Work _____

_____

_____

_____

_____

_____

2. REFERENCE

Reference Name _____

Reference Phone Number _____

Reference Company Name _____

Address of Work _____

APPENDIX B - MINIMUM QUALIFICATION FORM
IFB 059-19 ROOFING INSTALLATION AND REPAIR SERVICES FOR JEA
COMMONWEALTH SERVICE CENTER (CWSC)

Reference E-Mail Address _____

Dates of Work/$ Amount _____

Description of Work _____

_____

_____

_____

_____

_____

APPENDIX B – BID FORM
IFB 059-19 ROOFING INSTALLATION AND REPAIR SERVICES FOR JEA COMMONWEALTH SERVICE CENTER (CWSC)

Company Name: _____

Company's Address _____

Phone Number: _____ FAX No: _____ Email Address: _____

License: _____

BID SECURITY REQUIREMENTS
- ☐ None required
- ☒ Certified Check or Bond (Five Percent (5%)

TERM OF CONTRACT
- ☐ One Time Purchase
- ☐ Annual Requirements
- ☒ Other, Specify - Project Completion

SAMPLE REQUIREMENTS
- ☒ None required
- ☐ Samples required prior to Bid Opening
- ☐ Samples may be required subsequent to Bid Opening

SECTION 255.05, FLORIDA STATUTES CONTRACT BOND
- ☐ None required
- ☒ Bond required 100% of Bid Award

QUANTITIES
- ☐ Quantities indicated are exacting
- ☒ Quantities indicated reflect the approximate quantities to be purchased Throughout the Contract period and are subject to fluctuation in accordance with actual requirements.

INSURANCE REQUIREMENTS

Insurance required

PAYMENT DISCOUNTS	**SUNSHINE LAW ACKNOWLEDGEMENT**
☐ 1% 20, net 30 ☐ 2% 10, net 30 ☐ Other _____ ☐ None Offered	**_____(Initials) I have read and understood the Sunshine Law/Public Records clauses contained within this solicitation. I understand that in the absence of a redacted copy my bid will be disclosed to the public "as-is".**

Item	ENTER YOUR BID FOR IFB 059-19	TOTAL BID PRICE
1	**Total Bid Price Roofing Installation and Repair at CWSC – Transfer total Base Bid Response Price from Appendix B – Bid Workbook**	**$**

BIDDER'S CERTIFICATION

By submitting this Bid, the Bidder certifies that it has read and reviewed all of the documents pertaining to this Solicitation, that the person signing below is an authorized representative of the Bidder's Company, that the Company is legally authorized to do business in the State of Florida, and that the Company maintains in active status an appropriate contractor's license for the work (if applicable). The Bidder also certifies that it complies with all sections (including but not limited to Conflict Of Interest and Ethics) of this Solicitation, and that the Bidder is an authorized distributor or manufacturer of the equipment that meets the Technical Specifications stated herein.

We have received addenda

_____ through _____

_____
Handwritten Signature of Authorized Officer of Company or Agent Date

_____
Printed Name and Title

Plan Review

Lawrence A. Costea
JEA
"Commonwealth Service Center"
6674 Commonwealth Avenue
Jacksonville, FL 32254-2218
USA

Index-Rec No: 084421.60-02
Account No: 01-30626
Date of Review: February 07, 2019
Review No: 286178

Plans Submitted By: Lawrence A. Costea, JEA

Subject: Commonwealth Service Center Roof Re-cover

Executive Summary:

This review is for the roof re-cover project at the above referenced location. The checklist and specification submitted is for review prior to the information being released for bid.

This submittal is in in accordance with FM Global Standards subject to the completion of the Review Comments. Once the contractor is selected, please have the contractor provide the formal submittal prior to installation.

Scope of Review:

This confirms the receipt and review of:

- Checklist for Roofing System, Form 2688
- Technical Specifications dated January 30, 2019
- Email Communication

The review is for a 196,383 sq. ft. warehouse. The plan is to keep the Zonolite Lightweight Insulating Concrete (LWIC) in place and fasten the recover system through the form deck. Some crickets will also be installed to enhance drainage, but there is no plan to change the actual drainage system.

The upper roof measures 541 ft. x 301 ft. a height of 25 ft. Canopy no. 1 measures 12 ft. x 80 ft., and canopy no. 2 measures 12 ft. x 130 ft. The height for both canopies is 20ft. The height of the parapet for the roofs is between 6 in. and 18 in. with a roof slope of 1/8 in. per ft. The lower roof is not part of this project.

This is a bid-stage design document. After selection by JEA, the successful roofing contractor will be required to submit FM Global Form X2688 and other related submittals to Atlanta Operations Plan Review office of FM Global for further review.

The proposed arrangement calls an adhered multi-ply system RoofNav Assembly **191843-48573-0 (**1-120 Wind Uplift rating) for the field of the roof and a RoofNav Assembly **315007-48573-0 (**1-270 Wind Uplift rating) for the perimeter and corners of the roof. Both roof assemblies have a Class 1 Internal Fire rating, a Class A Exterior Fire rating and a SH hail rating. The roof assemblies are for a new roof application.

Component	Securement Details
Cap Ply: Johns Manville Corp, Roofing Systems Group DynaWeld Cap FR 39.4 in. wide, Lap width: 4 in. side, 6 in. end	Torched.
Base Play: Johns Manville Corp, Roofing Systems Group DynaWeld Base 39.4 in. wide, Lap width: 4 in. side, 6 in. end	
Cover Board: United States Gypsum Company SECUROCK Gypsum-Fiber Roof Board 0.5 in. thick	For the Field of the roof, fasten using Fastening System SSSP14973 OMG #12 Standard and 3 in. Galvalume Steel Plate. For the perimeter and corner, fasten using Fastening System SSSP22213 Johns Manville Corp, Roofing Systems Group UltraFast Fasteners #12 Phillips Head and UltraFast Square Recessed Metal Plate. The fastening rates: **Field:** 1 fastener per 1.78 sq. ft. (18 per 4 ft. x 8 ft. board) **Perimeter:** 1 fastener per 1 sq. ft. (32 per 4 ft. x 8 ft. board) **Corner:** 1 fastener per 1 sq. ft. (32 per 4 ft. x 8 ft. board)
Insulation (max 12 in.) Johns Manville Corp, Roofing Systems Group ENRGY 3 (2) 2 in. thick boards Johns Manville Corp, Roofing Systems Group Tapered ENRGY 3	
Existing LWIC	
Existing Steel Deck, 16-gauge	#12 screws and fender washers between the gap in the joist top chords to the underside of the deck at every unattached flute in the perimeter and corner zones

Note 1: Bid Alternate 1: Add second ply equivalent to JM DynaWeld Base torch applied. The JM assembly designation would change from 2FID-HW to 3FID-HW.
Note 2: The roof assembly is equivalent to Johns Manville assembly 2FID-HWFBC and FBC Product Approval FL 2948-R12, Revision 11 dated 10/14/2017.

Pull Test Results:
The following design criteria were used for this review:

- 110 mph Wind Speed (for 3 sec gusts)
- 1.15 Wind Importance Factor (for cladding)
- Ground Roughness "C"
- Partially-Enclosed Building Classification
- Moderate Hail Rating

The following wind ratings are needed for each area:

Roof Area	Dimensions	Parapet	Required Roof Classification		
			Field	Perimeter	Corner
Upper Roof	541 ft. x 301 ft. x 25 ft. (H)	Between 6 in. and 18 in.	1-90	1-135 (12 ft.)	1-195 (12 ft. x 12 ft.)
Canopy No. 1	12 ft. x 80 ft. x 20 ft. (H)	Between 6 in. and 18 in.	1-90	1-135 (3 ft.)	1-195 (3 ft. x 3 ft.)
Canopy No. 1	12 ft. x 130 ft. x 20 ft. (H)	Between 6 in. and 18 in.	1-90	1-135 (3 ft.)	1-195 (3 ft. x 3 ft.)

The pull-out test was performed by OMG in October 2018 using three types of fasteners, High Load (9 tests), All-Purpose (9 tests), and Ultrafast (7 tests). The low and high results were removed from each one and took the average of each type of fastener. The results are as follows:

- High Load = 661.86 lbf
- All-Purpose = 555.57 lbf
- Ultrafast = 551.2 lbf

The pull-out test results indicate that the fasteners can meet the required wind uplift pressures for this installation. The client also plans to have a full-time VCO for the installation.

Flashing:
The checklist indicates the flashing will be FM Approved with a max wind rating of 120 mph and will be installed per FM Global Data Sheet 1-49, *Perimeter Flashing*.

Review Comments:

1. Precautions outlined in FM Global Property Loss Prevention Data Sheet 1-33, *Safeguarding Torch-Applied Roof Installations* should be followed during this installation.

2. A full-time certified visual construction observer (VCO) will be provided during the roof system installations for verification of adequate wind resistance. Please provide the Atlanta Operations Plan Review office of FM Global notes and pictures detailing the roof system components and installation.

3. The checklist indicates the FM Approved flashing will have a max wind rating of 120 mph and installed in accordance with FM Global Property Loss Prevention Data Sheet 1-49, *Perimeter Flashing*. Roof edge flashing should be FM Approved for a minimum wind uplift rating of as required for the field of the roof (1-90). FM Approved perimeter flashing systems can be found at www.RoofNav.com. All flashing systems should be factory fabricated and not fabricated on site. **Please forward the flashing RoofNav approval number and chosen assembly to us for review.**

4. There should be no component substitutions or deviations from the proposed RoofNav assembly. Use of individually FM Approved components, not FM Approved for use together does not constitute an FM

Approved or recommended assembly. All FM Approved materials are *required* to have the FM APPROVAL mark on the packaging or the material itself. Materials without proper labeling are not FM Approved. If alternatives are desired, a different RoofNav assembly should be chosen and submitted for review.

Recommendations to Reduce Hazards during Installation:

5. Thorough supervision by the building owner's qualified representative should be provided during construction/installation to ensure adherence to specifications and quality of workmanship.

6. Hot work of any kind should be avoided. If there is a practical and safer way to do the job without hot work, the alternative method should be used. If hot work is unavoidable, precautions such as those outlined on the FM Global Hot Work Permit System should be taken during any such work.

This review is for property insurance purposes only in accordance with FM Global standards and guidelines. Nothing should be inferred from this review regarding compliance with any rules, regulations or requirements of government agencies, state or local codes or any other jurisdictional authority. We are retaining the copy of your submitted plans for our files.

Sincerely,

Que-Anh Cooney
FM Global Plan Review Consultant
queanh.cooney@fmglobal.com

Loss Prevention Resources:

FM Global Property Loss Prevention Data Sheets (http://www.fmglobaldatasheets.com)
FM Global Loss Prevention Training (https://fmglobaltraining.skillport.com)
Approval Guide (http://www.approvalguide.com)
RoofNav (http://roofnav.fmglobal.com)

Distribution:

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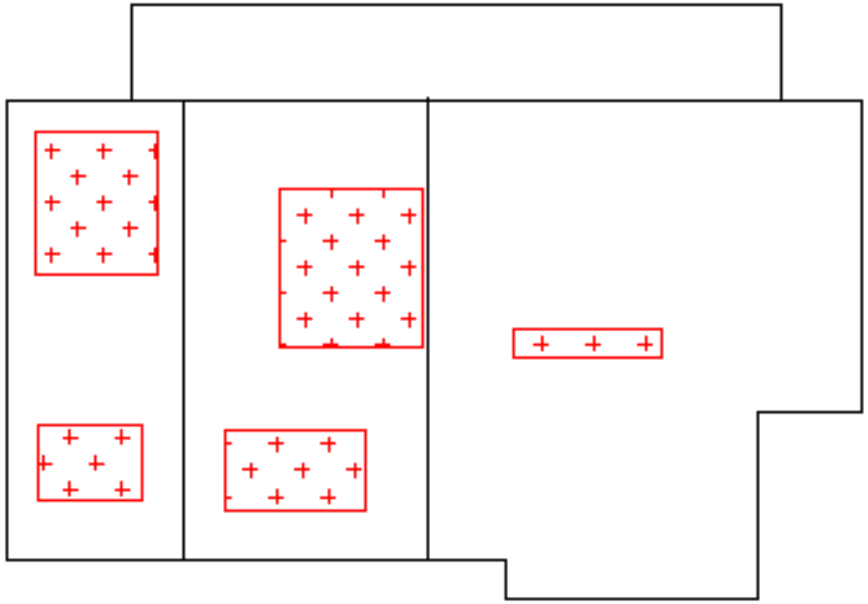
Sam DeFir, FM Global Manager, Office Engineering and Training, samuel.defir@fmglobal.com

Attachments:

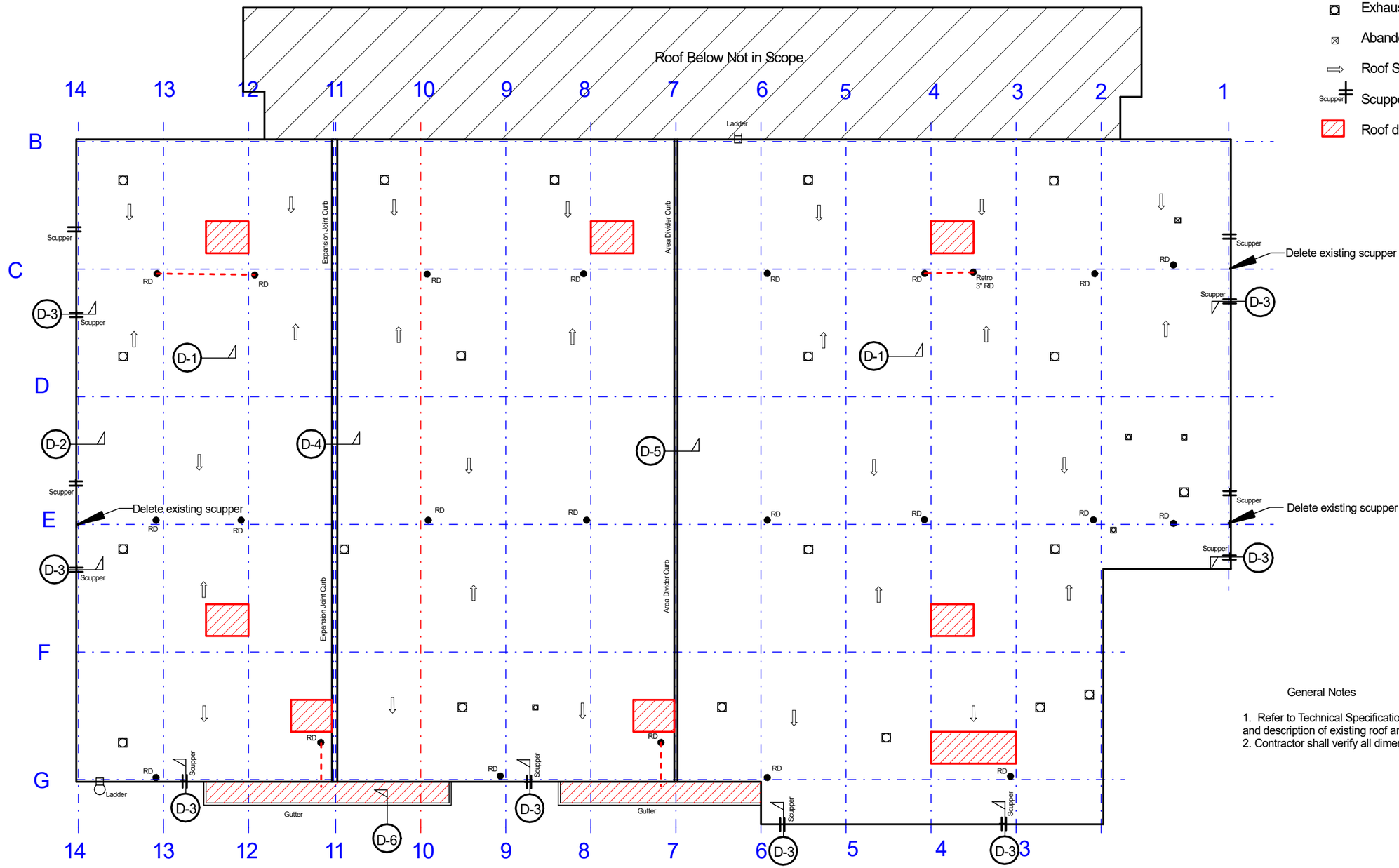
FM Global Property Loss Prevention Data Sheet 1-29, *Roof Deck Securement and Above-Deck Roofing Components*

JEA CWSC



Denotes intermittent wet

February 4, 2018 from 6:30-8:00p.m.



Legend

- RD — Roof Drain
- OD — Overflow Drain
- Exhaust Fan Curb
- Abandoned Curb
- Roof Slope Direction
- Scupper — Scupper
- Roof deck replacement

Schematic Roof Plan

0 25 50 100

Approx. Scale: 1-inch = 50-feet if printed on 11" x 17" paper

General Notes

1. Refer to Technical Specifications for Scope of Work and description of existing roof and structure.
2. Contractor shall verify all dimensions and quantities.

Loefgren & Associates, Inc.
Certificate of Authorization # 28224

Kenneth H. Loefgren, PE
Florida PE License #34873

JEA Commonwealth Service Center (CWSC)
6672 Commonwealth Avenue
Jacksonville, Florida 32254

Schematic Roof Plan

1-30-2019

R-1

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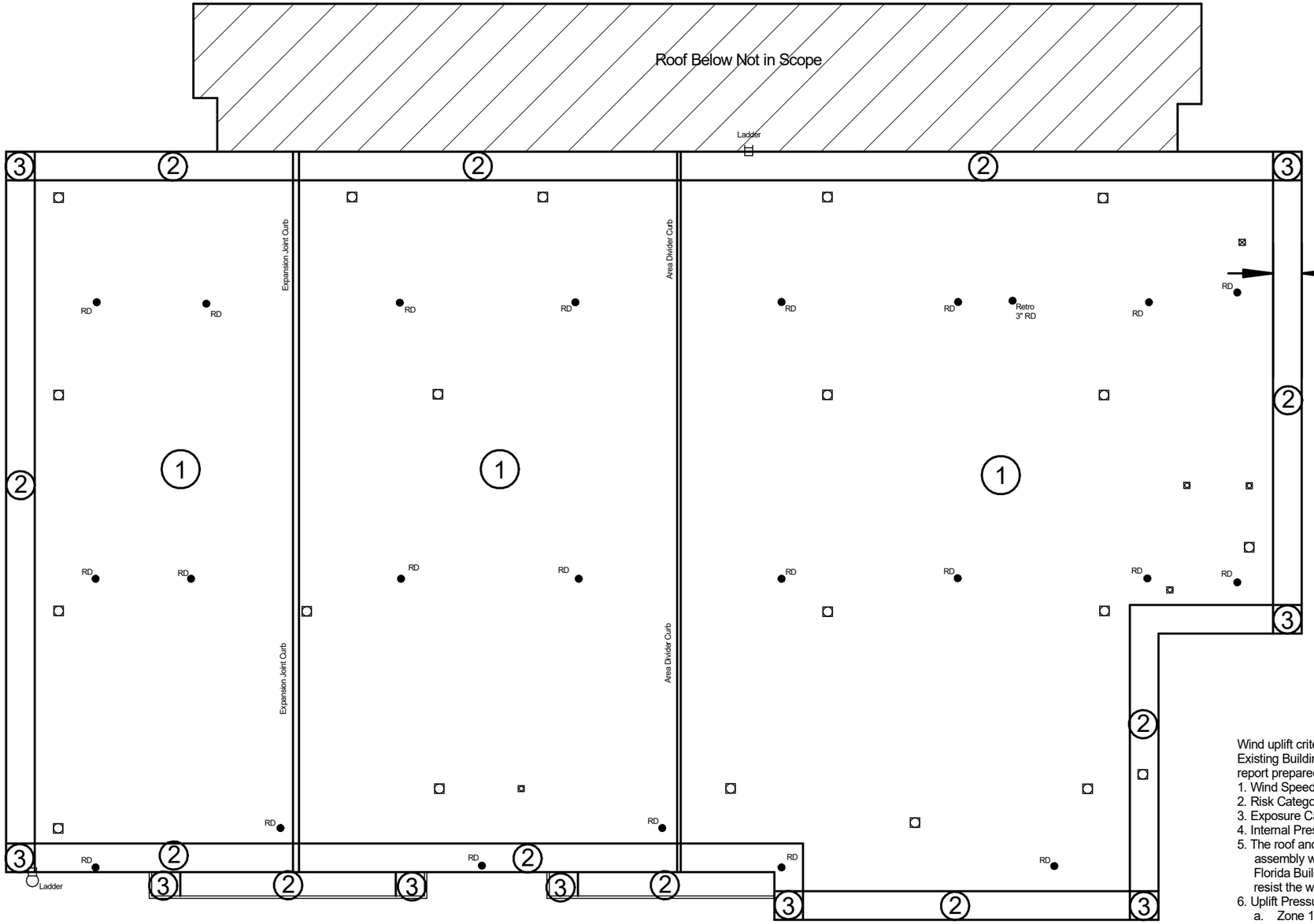

Legend

- RD — Roof Drain
- OD — Overflow Drain
- Exhaust Fan Curb
- Abandoned Curb
- Roof Slope Direction
- Scupper — Scupper

Wind Uplft Design Notes

Wind uplift criteria is based on the Florida Building Code, Existing Building, Sixth Edition (2017), ASCE 7-10, and a report prepared by Atlantic Engineering Services, Inc.

1. Wind Speed, Vult = 133 mph
2. Risk Category = III / IV
3. Exposure Category = C
4. Internal Pressure Coef. = -0.55 (partially enclosed)
5. The roof and insulation system shall consist of an assembly with FM Global Roof Nav Assembly and Florida Building Code Product Approval tested to resist the wind uplift pressures below.
6. Uplift Pressures:
   a. Zone 1 (Field of roof) = -86 psf ultimate
   b. Zone 2 (Perimeter Zones) = -144 psf ultimate
   c. Zone 3 (Corner Zones) = -216 psf ultimate
7. Roof pressures have been calculated in accordance with the Florida Building Code based on ultimate wind speed, Vult, and should be used in conjunction with ASCE 7-10 load combinations. Pressures can be converted to nominal values by multiplying by 0.6.
8. The corner and perimeter zone width is 12'-6".

Roof Plan - Wind Pressure Zones

0 25 50 100

Approx. Scale: 1-inch = 50-feet if printed on 11" x 17" paper

Loefgren & Associates, Inc.
Certificate of Authorization # 28224

Kenneth H. Loefgren, PE
Florida PE License #34873

JEA Commonwealth Service Center (CWSC)
6672 Commonwealth Avenue
Jacksonville, Florida 32254

Roof Plan - Wind Pressure Zones

1-30-2019

R-2

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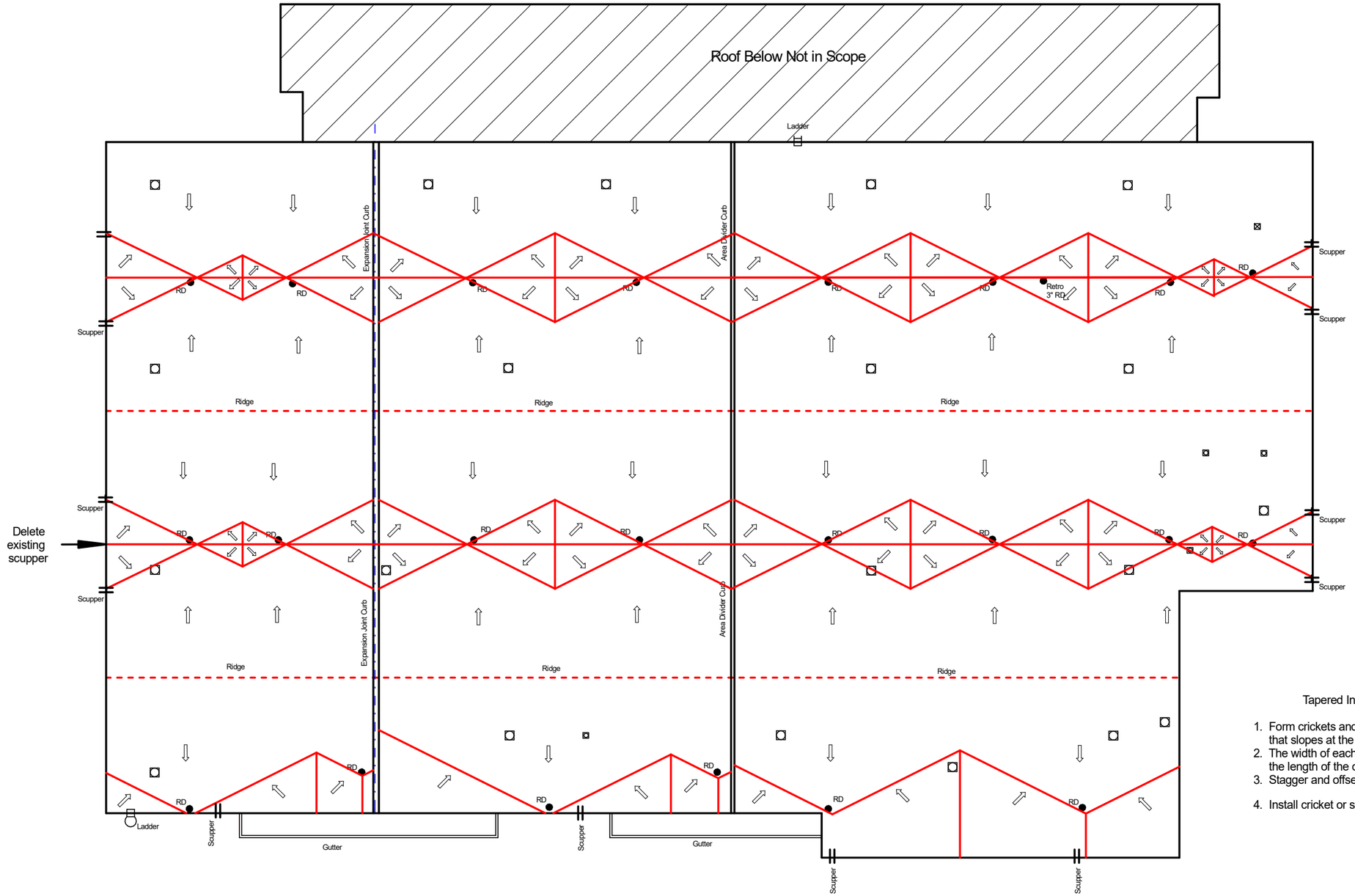
Legend

- RD — Roof Drain
- OD — Overflow Drain
- Exhaust Fan Curb
- Abandoned Curb
- Roof Slope Direction
- Scupper



Tapered Insulation Notes

1. Form crickets and saddles with tapered insulation that slopes at the rate of one-half inch per foot.
2. The width of each cricket or saddle shall be one-third the length of the cricket or saddle.
3. Stagger and offset all insulation board joints.
4. Install cricket or saddle below cover board.

Roof Plan - Tapered Insulation

0 25 50 100

Approx. Scale: 1-inch = 50-feet if printed on 11" x 17" paper

Loefgren & Associates, Inc.
Certificate of Authorization # 28224

Kenneth H. Loefgren, PE
Florida PE License #34873

JEA Commonwealth Service Center (CWSC)
6672 Commonwealth Avenue
Jacksonville, Florida 32254

Roof Plan - Tapered Insulation

1-30-2019

R-3

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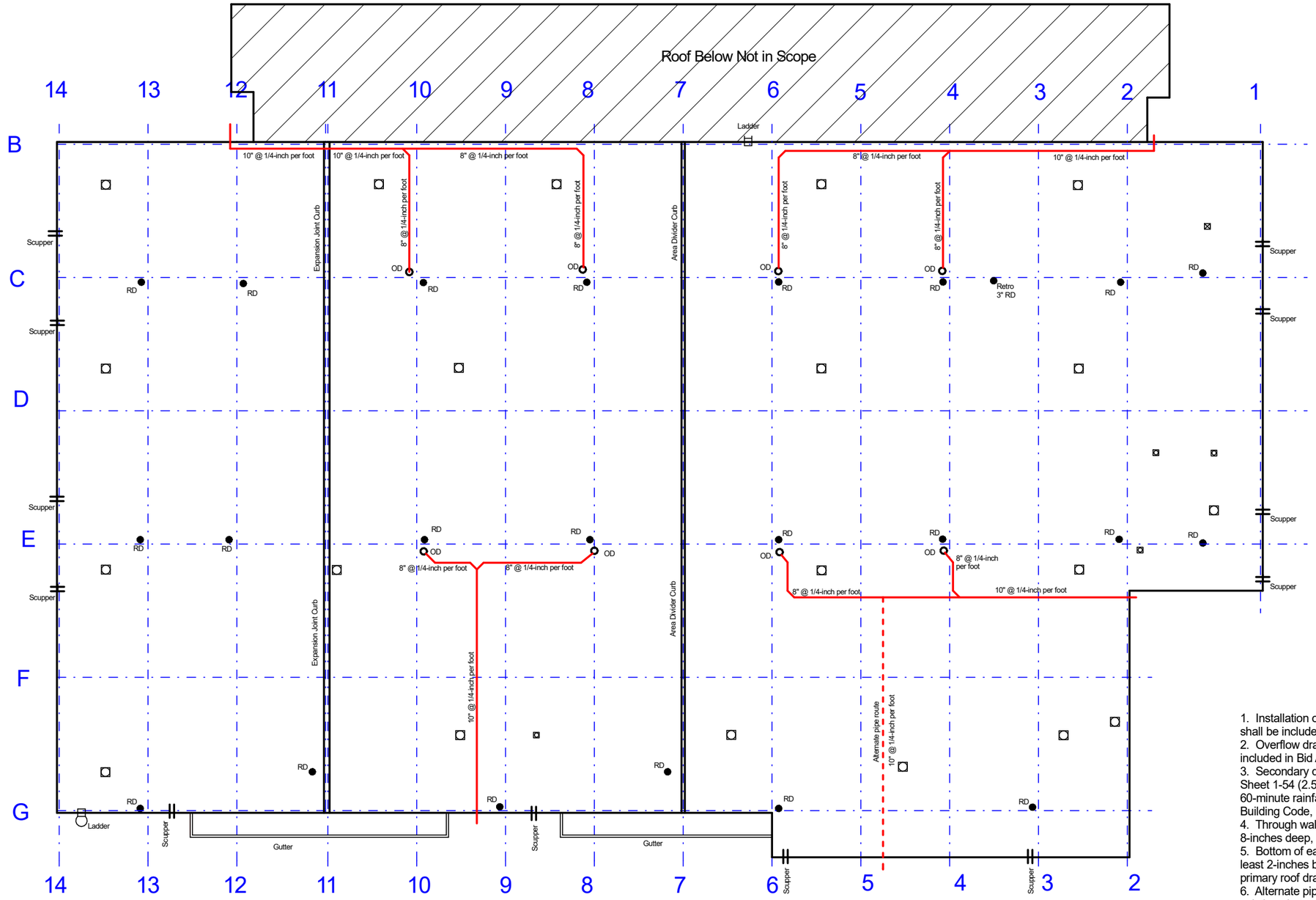

Legend

- RD — Roof Drain
- OD — Overflow Drain
- Exhaust Fan Curb
- Abandoned Curb
- Roof Slope Direction
- Scupper

Overflow Drain Notes

1. Installation of overflow scuppers indicated on plan shall be included in Base Bid.
2. Overflow drains and piping indicated on plan shall be included in Bid Alternate 2.
3. Secondary drainage design based on FM Global Data Sheet 1-54 (2.5.4.1.3.B) which is two times the 100-year, 60-minute rainfall intensity required by the 2017 Florida Building Code, Plumbing - Chapter 11.
4. Through wall scuppers shall be 12-inches wide and 8-inches deep, unless noted otherwise.
5. Bottom of each scupper or overflow drain shall be at least 2-inches but not more than 4-inchs above nearest primary roof drain.
6. Alternate piping routing may be required due to existing obstructions.

Roof Plan - Overflow Drainage

0 25 50 100

Approx. Scale: 1-inch = 50-feet if printed on 11" x 17" paper

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Certificate of Authorization # 28224

Kenneth H. Loefgren, PE
Florida PE License #34873

JEA Commonwealth Service Center (CWSC)
6672 Commonwealth Avenue
Jacksonville, Florida 32254

Bid Alternate 2
Overflow Roof Drain Plan

1-30-2019

R-4

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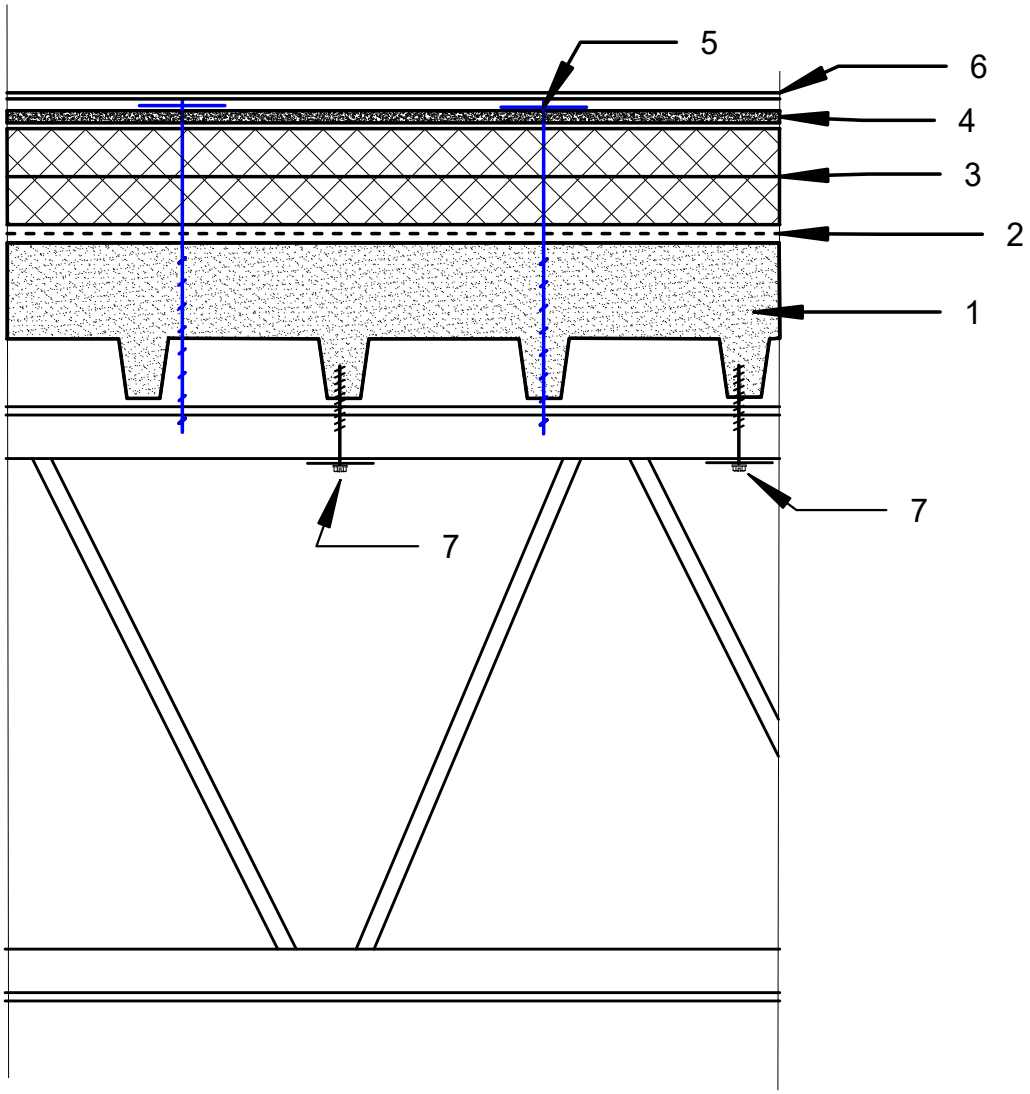

Legend

1. Existing lightweight insulating fill on steel roof deck
2. Ventilated base sheet
3. Two (2) layers of polyisocyanurate insulation board
4. Gypsum cover board
5. Insulation board fasteners with metal plate washers
6. Two ply mineral surfaced SBS modified bituminous roof membrane
7. #12 screws and fender washers

L&A Loefgren & Associates, Inc. Florida Certificate of Authorization 28224 Kenneth H. Loefgren, PE RRC Florida PE License 34873	New Roof Assembly	Date: 1-30-2019 Scale: Not to scale
	Project: JEA Commonwealth Service Center (CWSC) Jacksonville, Florida	Sheet: D-1

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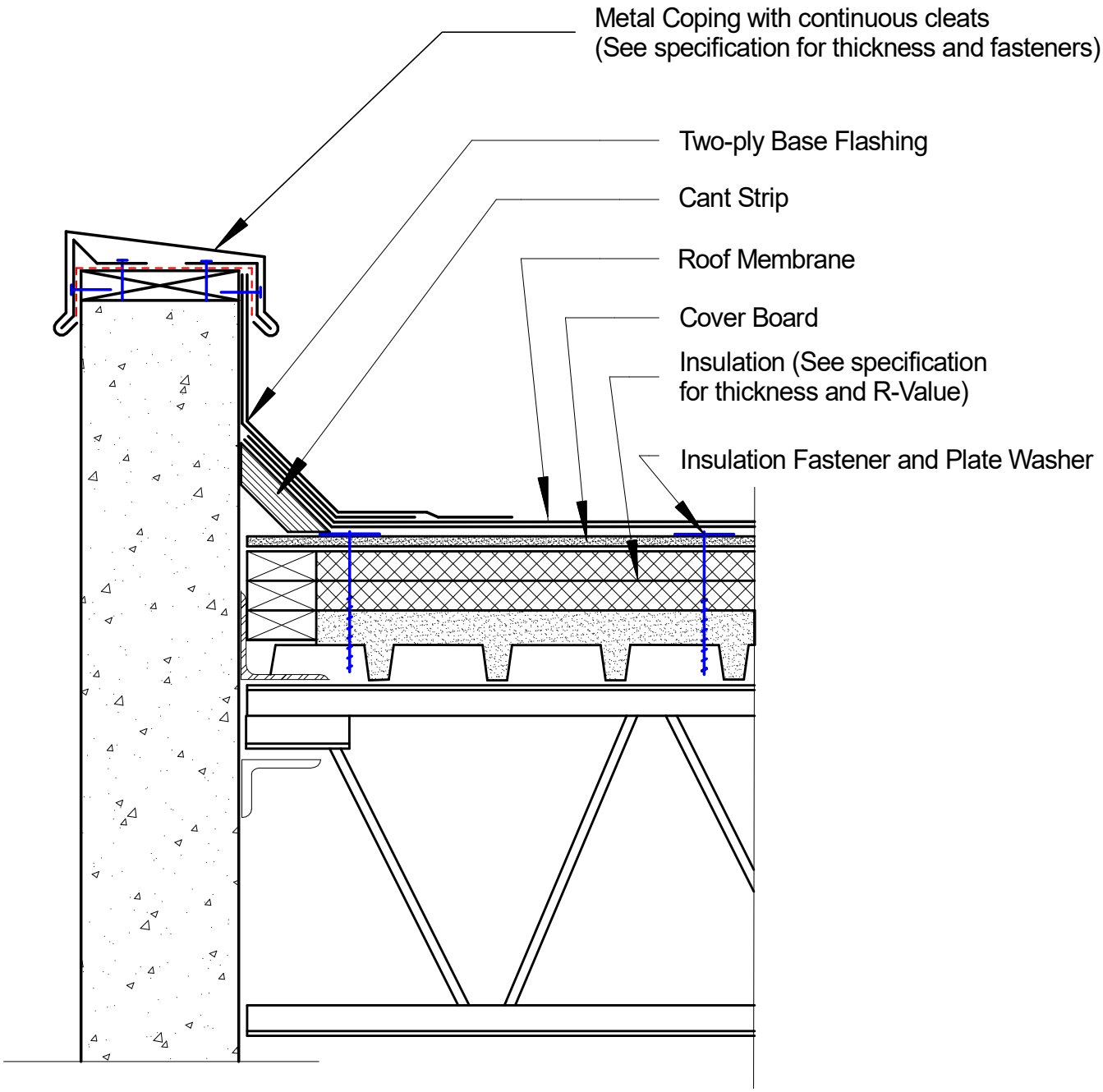

L&A

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Kenneth H. Loefgren, PE RRC
Florida PE License 34873

Base Flashing and Wall Coping Detail

Project: JEA Commonwealth Service Center (CWSC)
Jacksonville, Florida

Date: 1-30-2019

Scale: Not to scale

Sheet: D-2

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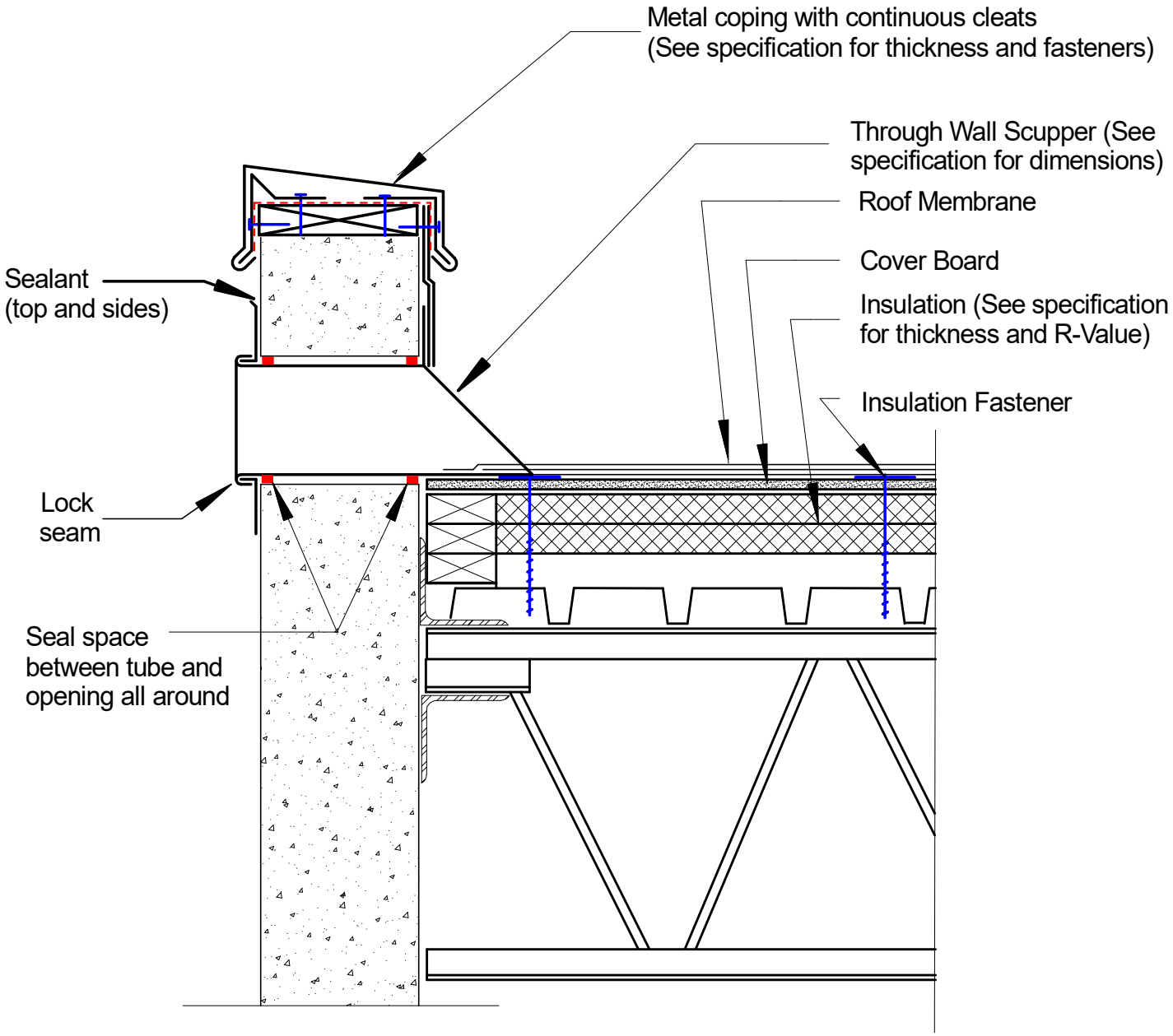

L&A

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Florida Certificate of Authorization 28224

Kenneth H. Loefgren, PE RRC
Florida PE License 34873

Overflow Scupper Detail

Project: JEA Commonwealth Service Center (CWSC)
Jacksonville, Florida

Date: 1-30-2019

Scale: Not to scale

Sheet: D-3

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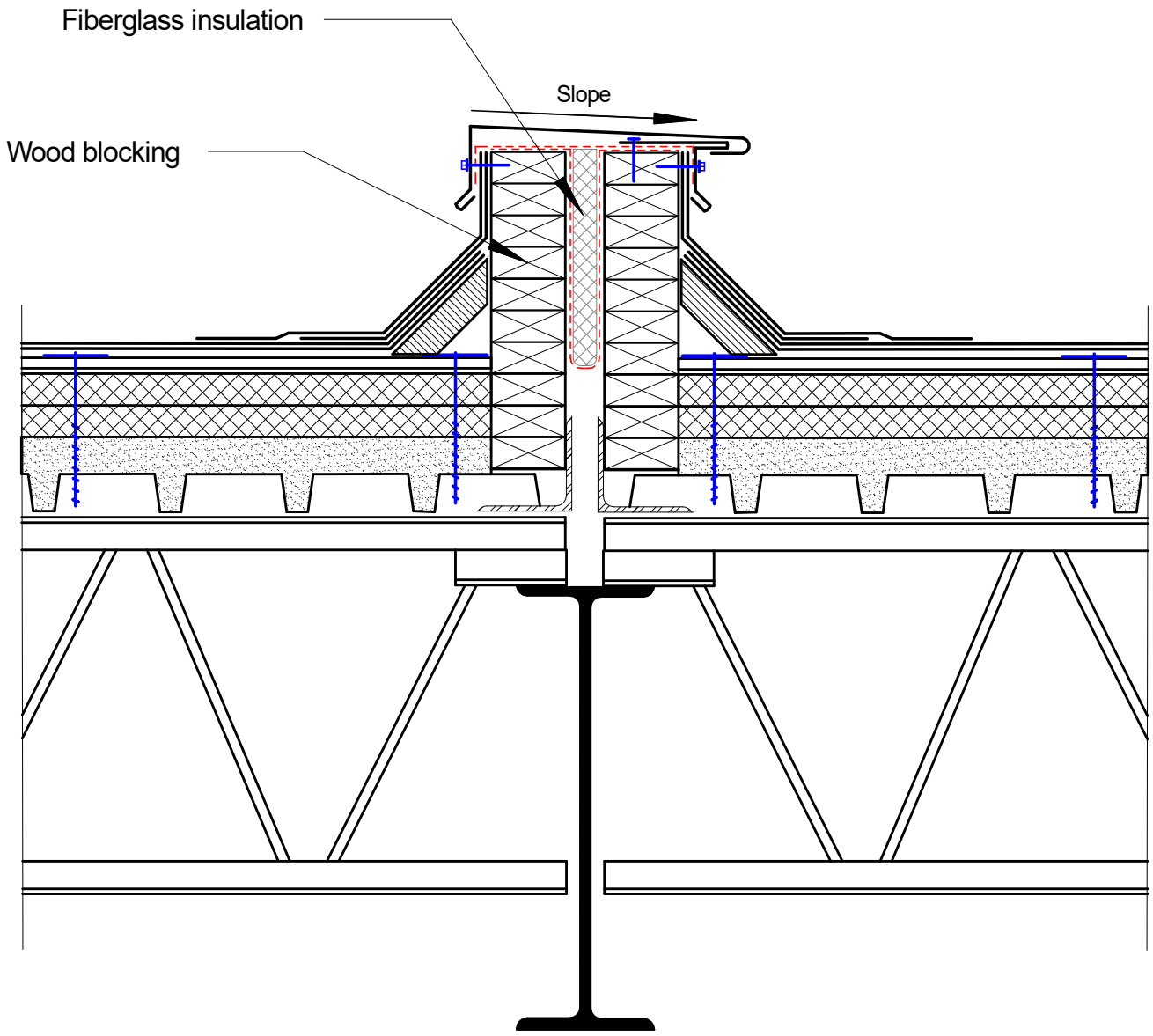

L&A

Loefgren & Associates, Inc.
Florida Certificate of Authorization 28224

Kenneth H. Loefgren, PE RRC
Florida PE License 34873

Expansion Joint Curb

Project: JEA Commonwealth Service Center (CWSC) Jacksonville, Florida

Date: 1-30-2019

Scale: Not to scale

Sheet: D-4

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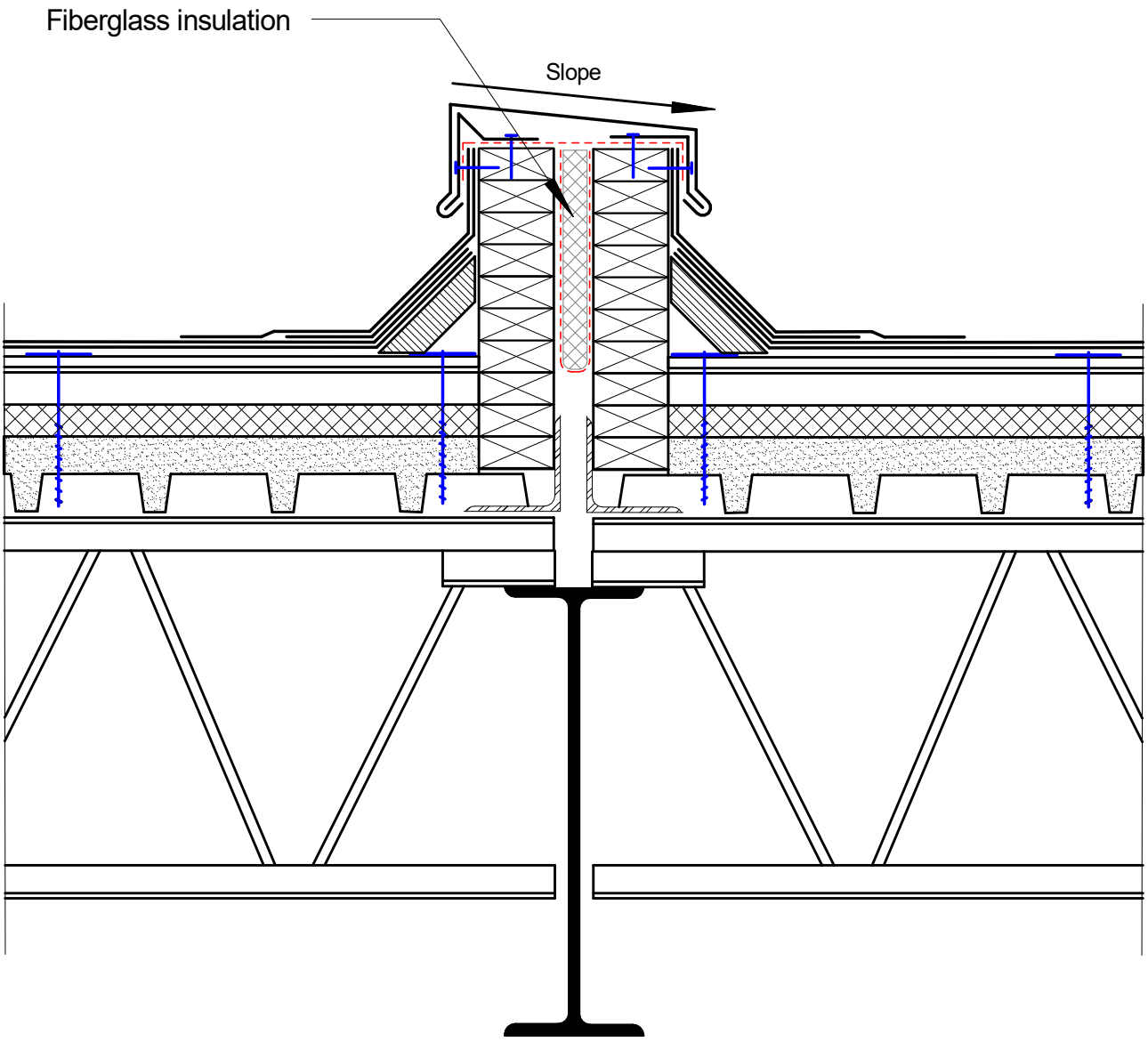

L&A Loefgren & Associates, Inc. Florida Certificate of Authorization 28224 Kenneth H. Loefgren, PE RRC Florida PE License 34873	Area Divider Curb	Date: 1-30-2019
		Scale: Not to scale
	Project: JEA Commonwealth Service Center (CWSC) Jacksonville, Florida	Sheet: D-5

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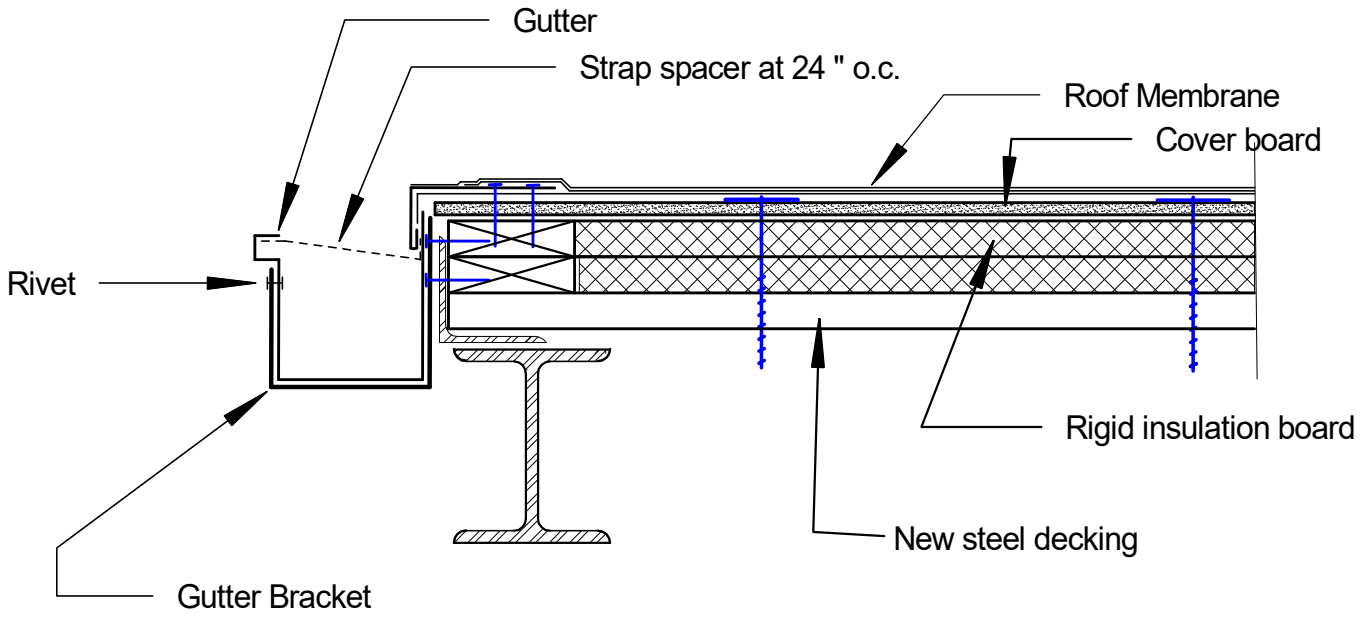

Gutter and Downspout Notes:

1. Gutter, downspout and expansion joint details shall be based on SMACNA details.
2. Gutters and downspouts shall be shop fabricated from 0.040-inch aluminum. Color shall be selected by Owner from manufacturer's standard colors.
3. Gutter brackets shall be 1/4-inch x 1-inch aluminum flat bar spaced not more than 24-inches on center.
4. Gutter dimensions shall be a minimum 6-inches wide and 6-inches deep unless drainage calculations require larger sizes.
5. Gutter shape shall be "Style A" per SMACNA Figure 1-2.
6. Downspouts shall be located at existing downspout locations. Size shall be minimum 5-inch square unless drainage calculations require larger sizes.
7. Downspout strap brackets shall be spaced 5-feet apart.
8. Where downspouts discharge at grade, furnish and install concrete splash blocks.
9. Reference details = SMACNA Architectural Sheet Metal Manual, 6th Edition (2003).

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Florida PE License 34873

Gutter Detail

Project: JEA Commonwealth Service Center (CWSC)
Jacksonville, Florida

Date: 1-30-2019

Scale: Not to scale

Sheet: D-6

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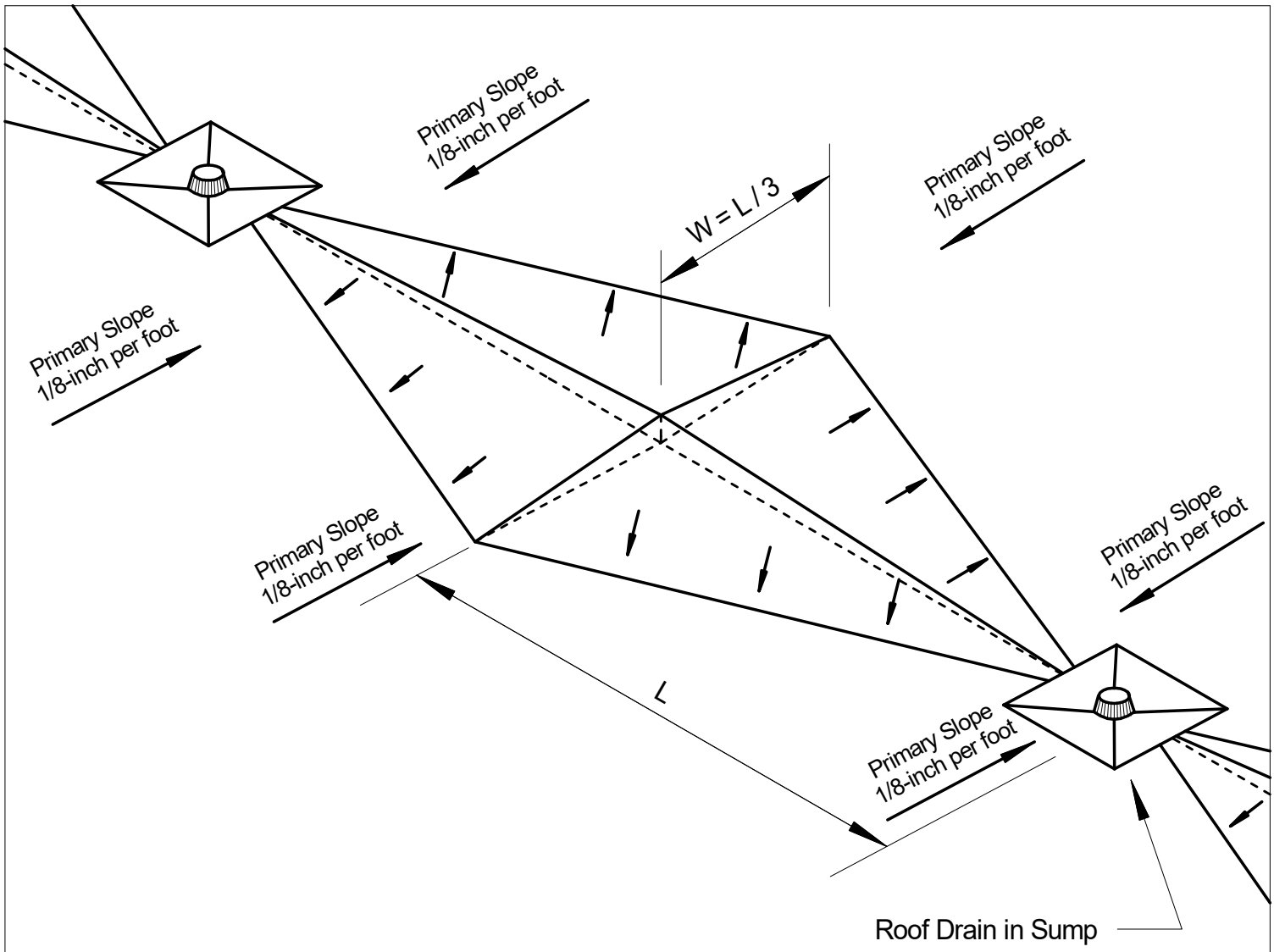

Tapered Insulation Notes

1. Form crickets or saddles with 1/2-inch per foot rigid tapered insulation.
2. Saddle or cricket width shall be one-third of the length of the saddle or cricket. Length is generally one-half the distance between drains.
3. Stagger or offset all laps.
4. Install tapered insulation cricket or saddle below the top layer of insulation or cover board.

L&A

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Florida Certificate of Authorization 28224

Kenneth H. Loefgren, PE RRC
Florida PE License 34873

Tapered Insulation Cricket or Saddle

Project: JEA Commonwealth Service Center (CWSC) Jacksonville, Florida

Date: 1-30-2019

Scale: Not to scale

Sheet: D-7

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ROOFING SYSTEM CONTRACTOR PACKAGE

CONTACT INFORMATION

OVERVIEW OF WORK

Building Name/Number:		**Area of Roof:**	Field
Roof Area:		**Index Number (Optional):**	
Created In RoofNav:	Dec 18, 2018	**Assembly #:**	191843-48573-0
Type of Work:	New Roof	**Min 3ft (1 m) Continuous Parapet:**	

ROOF AREA CLASSIFICATIONS

Roof Area Properties	Site Properties	Fire / Hail	Wind Uplift Ratings
Dimensions:	**Surface Roughness:**	**Internal Fire:**	**Field:**
Height:	**Wind Speed:**	**Exterior Fire:**	**Perimeter:**
Slope:	**Wind Borne Debris Risk:**	**Hail:**	**Corner:**

RATINGS FOR FM APPROVED ASSEMBLY#:

Internal/Exterior Fire:	Max Slope:	Hail:	*Wind Uplift Rating:
1/A	1.0000 in 12 (4.8°)	SH	120 psf

Assembly limited to use with noncombustible walls only:

No

* FM Approved roofs must also have corner and perimeter enhancements and FM Approved perimeter flashing. For details, see FM Global Property Loss Prevention Data Sheets 1-29 and 1-49. For Standing/Lap Seam roofs, see Property Loss Prevention Data Sheet 1-31.

ASSEMBLY DETAIL COMMENTS

SIGNATURES

Signature of Installing Contractor: _____

Title: _____ **Date:** _____

Signature of Designer/Observer: _____

Title: _____ **Date:** _____

Signature of Client/Property Owner: _____

Title: _____ **Date:** _____

1. Coating/Surfacing

Comments: none

2. Cap Ply

Comments: 4 in. (102 mm) wide side and 6 in. (152 mm) wide end laps.

Cover, Multi-ply (Cap Ply)

Company: Johns Manville Corp, Roofing Systems Group
Trade Name: DynaWeld Cap 180 FR
Backing: (none)
Width: 1,000.0000 mm
Material: modified bitumen, SBS
Reinforcement: polyester
Surface Type: granules
Comments: none

Securement (Sheet Lap)

Comments: none

Weld (Torched)

Company: Generic
Trade Name: torched
Comments: Minimum 4 in. (100 mm) wide side and 6 in. (150 mm) wide end laps.

3. Securement from 2. Cap Ply to 4. Base Ply

Comments: none

Weld (Torched)

Company: Generic
Trade Name: torched
Comments: none

4. Base Ply

Comments: Laps constructed according to manufacturer's specifications

Cover, Multi-ply (Base Ply)

Company: Johns Manville Corp, Roofing Systems Group
Trade Name: DynaWeld 180 S
Backing: (none)
Width: 1,000.0000 mm
Material: modified bitumen, SBS
Reinforcement: glass fiber/polyester
Comments: none

Securement (Sheet Lap)

Comments: none

Weld (Torched)

Company: Generic
Trade Name: torched
Comments: Laps constructed according to manufacturer’s specifications.

5. Securement (Cover) from 4. Base Ply to 6. Cover Board

Comments: none

Weld (Torched)

Company: Generic
Trade Name: torched
Comments: none

6. Cover Board

Comments: none

Cover Board

Company: United States Gypsum Company
Trade Name: SECUROCK Gypsum-Fiber Roof Board
Material: gypsum
Min Board Size: 48.00 x 48.00 in
Board Profile: flat
Min Thickness: 0.5000 in
Max Thickness: 0.6250 in
Min Density: 0.0000 lb/ft3
Comments: 48 x 96 in. (1220 x 2440 mm) minimum board size.

7. Securement (Board Stock) from 6. Cover Board to 9. (Deck) Steel

Comments: none

Fastening System (Stress Plate)

System: SSSP14973

Company	TradeName
OMG	OMG #12 Standard
OMG	OMG 3 in. Galvalume Steel Plate

System Comments none
Row Spacing: 0.0000 in
On Center: 0.0000 in
Fasteners per Plate/Clip: 1
Field Rows: No
Field Row on Center: 0.0000 in
Number of Field Rows: 0
Application Method: n/a
Contributory Area: 1.7800 ft2
Embedment: 0.0000 in
Comments: none

8. Insulation (Board Stock)

Comments: none

Insulation (Board Stock)

Company: Johns Manville Corp, Roofing Systems Group
Trade Name: ENRGY 3
Material: polyisocyanurate/polyurethane
Min Board Size: 48.00 x 48.00 in
Board Profile: flat
Min Thickness: 2.0000 in
Max Thickness: 12.0000 in
Min Density: 0.0000 lb/ft3
Comments: none

9. (Deck) Steel

Comments: none

Deck (Steel)

Company:	See Separate Steel Deck Manufacturer Listing
Trade Name:	steel deck, 22 to 18 ga., wide rib (>90 psf)
Acoustical:	No
Design Thickness:	0.0295 in
Rib Type:	Type WR
Max Span:	72.0000 in
Min Depth:	1.5000 in
Min Grade:	33.0000 ksi
Max Depth:	1.5000 in
Min Thickness:	0.0281 in
Min Width:	24.0000 in
Max Width:	36.0000 in
Comments:	none

Securement (Deck Lap)

Comments:	none

Fastening (Fastener)

Company:	ITW Commercial Construction North American
Trade Name:	#10 HWH Teks 3
Material:	steel
Row Spacing:	0.0000 in
On Center:	24.0000 in
Field Rows:	No
Field Row On Center:	0.0000 in
Fastener Diameter:	0.0000 in
Number of Field Rows:	0
Min Length:	0.7500 in
Application Method:	n/a
Max Length:	0.7500 in
Embedment:	0.0000 in
Contributory Area:	0.0000 ft2
Steel Deck Fastener:	Yes
Comments:	none

10. Securement (Deck) from 9. (Deck) Steel to 11. Structure

Comments: none

Fastening (Fastener)

Company:	ITW Commercial Construction North American
Trade Name:	#12 HWH Teks 5
Material:	steel
Row Spacing:	72.0000 in
On Center:	6.0000 in
Field Rows:	No
Field Row On Center:	0.0000 in
Fastener Diameter:	0.0000 in
Number of Field Rows:	0
Min Length:	1.2500 in
Application Method:	n/a
Max Length:	1.2500 in
Embedment:	0.0000 in
Contributory Area:	0.0000 ft2
Steel Deck Fastener:	Yes
Comments:	none

11. Structure

Structure Type:	steel
Max Spacing:	72.0000 in
Min Thickness:	0.2500 in
Min Strength:	36.0000 ksi
Comments:	none

Fastener Placement

Now that the configuration is complete for the field of the roof, you must select the required fastener placement from the Fastener Placement Figures 3–6 in FM Global Property Loss Prevention Data Sheet 1-29.

Corner/Perimeter Enhancements

Now that you have selected a fastener placement, you must select enhancements for the corners and perimeters. Refer to FM Global Property Loss Prevention Data Sheet 1-29.

> If you have sufficient detail about the roof assembly, you can select enhancements that have been approved for roofs with your specifications from Table 1A: Recommended Rating of Field, Perimeter and Corner Areas (Zones 1, 2 and 3) for Enclosed Buildings.
>
> Otherwise, you can select the appropriate prescriptive enhancements from section 2.2.1.5.1.

Also, the deck must be secured per the requirements in Data Sheet 1-29. For a steel deck, see section 2.2.1.5.6. For installation instructions, see section 2.2.13.2.

Perimeter Flashing

Now that you have selected enhancements for the corners and perimeters, you must select an FM Approved perimeter flashing that meets a Class X rating, where X is the Wind Uplift rating for your roof. For more information, see FM Global Property Loss Prevention Data Sheet 1-49.

You can find FM Approved perimeter flashings in RoofNav. To do so, click Products. On the Product Search page, select Other for the Category and Perimeter Flashing for the Subcategory. Specify any other criteria as needed and then click Search.

ROOFING SYSTEM CONTRACTOR PACKAGE

CONTACT INFORMATION

OVERVIEW OF WORK

Building Name/Number:		**Area of Roof:**	Field
Roof Area:		**Index Number (Optional):**	
Created In RoofNav:	Dec 18, 2018	**Assembly #:**	315007-48573-0
Type of Work:	New Roof	**Min 3ft (1 m) Continuous Parapet:**	

ROOF AREA CLASSIFICATIONS

Roof Area Properties	**Site Properties**	**Fire / Hail**	**Wind Uplift Ratings**
Dimensions:	**Surface Roughness:**	**Internal Fire:**	**Field:**
Height:	**Wind Speed:**	**Exterior Fire:**	**Perimeter:**
Slope:	**Wind Borne Debris Risk:**	**Hail:**	**Corner:**

RATINGS FOR FM APPROVED ASSEMBLY#:

Internal/Exterior Fire:	**Max Slope:**	**Hail:**	***Wind Uplift Rating:**
1/A	2.0000 in 12 (9.5°)	SH	270 psf

Assembly limited to use with noncombustible walls only:

No

* FM Approved roofs must also have corner and perimeter enhancements and FM Approved perimeter flashing. For details, see FM Global Property Loss Prevention Data Sheets 1-29 and 1-49. For Standing/Lap Seam roofs, see Property Loss Prevention Data Sheet 1-31.

ASSEMBLY DETAIL COMMENTS

SIGNATURES

Signature of Installing Contractor: _____

Title: _____ **Date:** _____

Signature of Designer/Observer: _____

Title: _____ **Date:** _____

Signature of Client/Property Owner: _____

Title: _____ **Date:** _____

1. Coating/Surfacing

Comments: none

2. Cap Ply

Comments: 4 in. (102 mm) wide side and 6 in. (152 mm) wide end laps.

Cover, Multi-ply (Cap Ply)

Company: Johns Manville Corp, Roofing Systems Group
Trade Name: DynaWeld Cap 180 FR
Backing: (none)
Width: 1,000.0000 mm
Material: modified bitumen, SBS
Reinforcement: polyester
Surface Type: granules
Comments: none

Securement (Sheet Lap)

Comments: none

Weld (Torched)

Company: Generic
Trade Name: torched
Comments: Minimum 4 in. (100 mm) wide side and 6 in. (150 mm) wide end laps.

3. Securement from 2. Cap Ply to 4. Base Ply

Comments: none

Weld (Torched)

Company: Generic
Trade Name: torched
Comments: none

4. Base Ply

Comments: Laps constructed according to manufacturer's specifications

Cover, Multi-ply (Base Ply)

Company: Johns Manville Corp, Roofing Systems Group
Trade Name: DynaWeld 180 S
Backing: (none)
Width: 1,000.0000 mm
Material: modified bitumen, SBS
Reinforcement: glass fiber/polyester
Comments: none

Securement (Sheet Lap)

Comments: none

Weld (Torched)

Company: Generic
Trade Name: torched
Comments: Laps constructed according to manufacturer’s specifications.

5. Securement (Cover) from 4. Base Ply to 6. Cover Board

Comments: none

Weld (Torched)

Company: Generic
Trade Name: torched
Comments: none

6. Cover Board

Comments: none

Cover Board

Company: United States Gypsum Company
Trade Name: SECUROCK Gypsum-Fiber Roof Board
Material: gypsum
Min Board Size: 48.00 x 96.00 in
Board Profile: flat
Min Thickness: 0.5000 in
Max Thickness: 0.6250 in
Min Density: 0.0000 lb/ft3
Comments: none

7. Securement (Board Stock) from 6. Cover Board to 9. (Deck) Steel

Comments: none

Fastening System (Stress Plate)

System: SSSP22213

Company	TradeName
Johns Manville Corp, Roofing Systems Group	UltraFast Fasteners #12 Phillips Head
Johns Manville Corp, Roofing Systems Group	UltraFast Square Recessed Metal Plate

System Comments: none
Row Spacing: 0.0000 in
On Center: 0.0000 in
Fasteners per Plate/Clip: 1
Field Rows: No
Field Row on Center: 0.0000 in
Number of Field Rows: 0
Application Method: n/a
Contributory Area: 1.0000 ft2
Embedment: 0.0000 in
Comments: 32 fasteners per 4x8 board

8. Insulation (Board Stock)

Comments: Optional subsequent layers of the same insulation may be adhered to the first.

Insulation (Board Stock)

Company: Johns Manville Corp, Roofing Systems Group
Trade Name: ENRGY 3
Material: polyisocyanurate/polyurethane
Min Board Size: 48.00 x 48.00 in
Board Profile: flat
Min Thickness: 1.5000 in
Max Thickness: 12.0000 in
Min Density: 0.0000 lb/ft3
Comments: 48 x 48 in. (1220 x 1220 mm) maximum board size.

9. (Deck) Steel

Comments: none

Deck (Steel)

Company:	See Separate Steel Deck Manufacturer Listing
Trade Name:	steel deck, min 80 ksi, 22 to 18 ga., wide rib (>90 psf)
Acoustical:	No
Design Thickness:	0.0295 in
Rib Type:	Type WR
Max Span:	72.0000 in
Min Depth:	1.5000 in
Min Grade:	80.0000 ksi
Max Depth:	1.5000 in
Min Thickness:	0.0000 in
Min Width:	24.0000 in
Max Width:	36.0000 in
Comments:	none

Securement (Deck Lap)

Comments: none

Fastening (Fastener)

Company:	ITW Commercial Construction North American
Trade Name:	#10 HWH Teks 3
Material:	steel
Row Spacing:	0.0000 in
On Center:	24.0000 in
Field Rows:	No
Field Row On Center:	0.0000 in
Fastener Diameter:	0.0000 in
Number of Field Rows:	0
Min Length:	0.7500 in
Application Method:	n/a
Max Length:	0.7500 in
Embedment:	0.0000 in
Contributory Area:	0.0000 ft2
Steel Deck Fastener:	Yes
Comments:	none

10. Securement (Deck) from 9. (Deck) Steel to 11. Structure

Comments: none

Fastening System (Stress Plate)

System: SSSP15442

Company	TradeName
ITW Commercial Construction North American	#12 HWH Teks 5
Generic	3/4 in. washer

System Comments none
Row Spacing: 72.0000 in
On Center: 6.0000 in
Fasteners per Plate/Clip: 1
Field Rows: No
Field Row on Center: 0.0000 in
Number of Field Rows: 0
Application Method: n/a
Contributory Area: 0.0000 ft2
Embedment: 0.0000 in
Comments: 2 fasteners per attachement point.

11. Structure

Structure Type: steel
Max Spacing: 72.0000 in
Min Thickness: 0.2500 in
Min Strength: 36.0000 ksi
Comments: none

Fastener Placement

Now that the configuration is complete for the field of the roof, you must select the required fastener placement from the Fastener Placement Figures 3–6 in FM Global Property Loss Prevention Data Sheet 1-29.

Corner/Perimeter Enhancements

Now that you have selected a fastener placement, you must select enhancements for the corners and perimeters. Refer to FM Global Property Loss Prevention Data Sheet 1-29.

> If you have sufficient detail about the roof assembly, you can select enhancements that have been approved for roofs with your specifications from Table 1A: Recommended Rating of Field, Perimeter and Corner Areas (Zones 1, 2 and 3) for Enclosed Buildings.
>
> Otherwise, you can select the appropriate prescriptive enhancements from section 2.2.1.5.1.

Also, the deck must be secured per the requirements in Data Sheet 1-29. For a steel deck, see section 2.2.1.5.6. For installation instructions, see section 2.2.13.2.

Perimeter Flashing

Now that you have selected enhancements for the corners and perimeters, you must select an FM Approved perimeter flashing that meets a Class X rating, where X is the Wind Uplift rating for your roof. For more information, see FM Global Property Loss Prevention Data Sheet 1-49.

You can find FM Approved perimeter flashings in RoofNav. To do so, click Products. On the Product Search page, select Other for the Category and Perimeter Flashing for the Subcategory. Specify any other criteria as needed and then click Search.

OMG
ROOFING
PRODUCTS
153 BOWLES ROAD
AGAWAM, MA 01001
413·789·0252
800·633·3800
FAX: 413·789·1069
WWW.OLYFAST.COM

October 18, 2018

I have enclosed the Job Report Number PT-01894 from the job referenced above. The report was recorded by Kaleb Rowland, OMG Technical Service Representative.

OMG is interested in your feedback on our services. Please visit www.omglistens.com to take a brief, 2-3 minute survey to help us understand how we did on this project, and more importantly, anything we can do better next time. We value your time and input, and thank you in advance for your participation.

If you have any further questions, please feel free to call.

Sincerely,

Pull Test Report

Job Name	JEA Building
Job Location	Jacksonville, FL
Roof Area (sqft)	170,000
Building Height (ft)	30'
Project Type	Re-roof
Thickness of Existing Roof Assembly	5"
Roof Cover Type	M/A Single Ply
New System Manufacturer	Johns Manville
Fastener(s) Tested	High Load, All Purpose, Ultrafast

Report Number	PT-01894
Test Date / Time	10/17/2018 10:00:00 AM
Ambient Temperature	85°F
Ground Roughness	B
Tester Manufacturer	DMD Force-2000
Max Cap of Tester (lbs)	2,000
Test Performed By	Kaleb Rowland
Test Cut Area Repaired By	Jim Callahan
Test Witnessed By	Jim Callahan

Insulation Manufacturer	Insulation Type	Thickness
Johns Manville	Securock	.5"
Johns Manville	ISO	1.5"

Deck Type	Thickness
Steel	Unknown

Disclaimer: Manufacturer's installation requirements shall be followed when using any of the tested fasteners or adhesives. Neither the technician performing the pullout tests, nor his/her company is responsible for the waterproofing integrity of the repairs. This test report does not certify the structural integrity of the roof deck.

Test Results

Test Location Number	Pull Value (lbf)	Fastener Tested	Penetration (in)	Bit Diameter (in)	Comments
1	720	Johns Manville High Load	1"		
2	680	Johns Manville High Load	1"		
3	851	Johns Manville High Load	1"		
4	810	Johns Manville High Load	1"		
5	550	Johns Manville High Load	1"		
6	508	Johns Manville High Load	1"		
7	573	Johns Manville High Load	1"		
8	658	Johns Manville High Load	1"		
9	642	Johns Manville High Load	1"		
10	649	Johns Manville All Purpose	1"		
11	617	Johns Manville All Purpose	1"		
12	513	Johns Manville All Purpose	1"		
13	761	Johns Manville All Purpose	1"		
14	428	Johns Manville All Purpose	1"		
15	425	Johns Manville All Purpose	1"		
16	936	Johns Manville All Purpose	1"		
17	450	Johns Manville All Purpose	1"		
18	471	Johns Manville All Purpose	1"		
19	509	Johns Manville Ultrafast	1"		
20	881	Johns Manville Ultrafast	1"		
21	607	Johns Manville Ultrafast	1"		
22	524	Johns Manville Ultrafast	1"		

Test Results

Test Location Number	Pull Value (lbf)	Fastener Tested	Penetration (in)	Bit Diameter (in)	Comments
23	605	Johns Manville Ultrafast	1"		
24	511	Johns Manville Ultrafast	1"		
25	466	Johns Manville Ultrafast	1"		

Roof Image/Diagram

JEA Building

End of Report

ATLANTIC ENGINEERING SERVICES

Roof Evaluation
Jacksonville Electric Authority
Commonwealth Service Center
Jacksonville, FL

Prepared For

Loefgren & Associates, Inc.
2558 Huntington Way
Orange Park, FL 32073-5705

Prepared By

Atlantic Engineering Services of Jacksonville
6501 Arlington Expressway, Building B, Suite 201
Jacksonville, FL 32211

AES Project No. 317-386
December 14, 2018

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December 14, 2018

Mr. Kenneth H. Loefgren, P.E., RRC
Loefgren & Associates, Inc.
2558 Huntington Way
Orange Park, FL 32073-5705

Re: Roof Evaluation
Jacksonville Electric Authority (JEA)
Commonwealth Service Center
Jacksonville, FL

AES Project: #317-386

Dear Kenneth:

This report presents the findings and recommendations of Atlantic Engineering Services of Jacksonville regarding the structural condition assessment of the Jacksonville Electric Authority (JEA), Commonwealth Service Center roof. Our evaluation is based on a review of the existing drawings for the Ford Motor Company, Jacksonville Parts Depot by the Ford Motor Company Plant Engineering Office dated February 6, 1967 (see Appendix A); a review of the existing drawings for the JEA, Commonwealth Service Center by Saxelbye, Powell, Roberts, & Ponder, Inc. dated July 18, 1994 (see Appendix B); and a site visit on November 16, 2018. Present at the site were Mr. Mark J. Keister, P.E.; Mr. Russell T. Hollman, E.I.T.; Mr. Kenneth H. Loefgren, P.E., RRC; and Mr. Laurence Costa. As I understand it, the Jacksonville Electric Authority would like to determine if the roof structure can meet the wind criteria prescribed by Factory Mutual (FM).

BACKGROUND

The JEA Commonwealth Service Center is the former Ford Motor Company, Jacksonville Parts Depot located at 6674 Commonwealth Avenue in Jacksonville, Florida. It is a one-story warehouse of approximately 222,500 square feet with a steel framed roof supported by interior steel columns and perimeter concrete walls. The roof deck spans are larger than those tested and approved by FM, therefore the roof system must be analyzed per ASCE 7 using FM requirements. The design wind speed is 133 mph, using a 1700-year mean recurrence interval (MRI) that effectively includes the FM-required importance factor of 1.15. Continuing the calculations per ASCE 7-10 and applying the FM-required safety factor of 2.0, the roof system is required to meet 86, 144, and 216 psf ultimate wind pressure ratings in the field, perimeter, and corner zones respectively (52, 87, and 130 psf allowable).

OBSERVATIONS

The existing drawings did not indicate the profile, gauge, or attachment of the roof deck, but these details were determined in the field via visual evaluation, tape measure, and digital micrometer. Two (2) different roof decks were observed; the typical original deck and a more recent deck used to infill mechanical unit areas (see Photograph 1). The original deck appears to be a 1 5/16 inch “Multi-Rib” form deck, approximately 16 ga. as measured in the field (see Photograph 2 and Appendix C). The patching deck is narrow-rib decking, the gauge of which could not be determined via nondestructive methods, thus 22 ga. was conservatively assumed for calculation purposes.

All original decking appeared to be a minimum three-span continuous, and with a typical maximum span of 7'-6" per the existing drawings. The patch deck appeared to be a minimum two-span continuous with the same typical span. The existing drawings indicate lightweight insulating concrete, which was confirmed in the field. The thickness of the insulation could not be determined via nondestructive methods, thus the dead load listed in the existing drawings was used. The original deck appeared to be attached at approximately every third flute with arc puddle welds (assumed 5/8 inches in diameter). The patch deck did not appear to have lightweight insulating concrete but rather rigid insulation. It appeared to be attached at approximately every other flute with arc puddle welds (also assumed 5/8 inches in diameter). The existing drawings indicate that the deck was designed for 12 psf dead load, 20 psf live load, and 25 psf wind load.

EVALUATION AND RECOMMENDATIONS

As stated in the "Background" section, the roof was analyzed using ASCE 7-10 per the 2014 Florida Building Code. A basic wind speed of 133 mph was used with exposure class "C" to determine wind pressures for the enclosed building. A mean roof height of 24'-4" was used per the existing drawings. The ASCE 7-10 wind pressures were increased to FM wind pressures using a factor of safety of 2.0, resulting in 86, 144, and 216 psf ultimate wind pressures for the field, perimeter, and corner zones respectively (52, 87, and 130 psf allowable). Clearly these FM wind pressures are much higher than the design wind pressure – over 5x the design pressure at the corners of the roof.

Regardless, the roof was analyzed using observations taken in the field. The calculations can be found in Appendix C. The roof framing was determined to be adequate. The original deck was determined to be adequate, however the deck attachment is not adequate in the perimeter and corner zones. The patch deck itself is severely inadequate for uplift in every pressure zone and even slightly inadequate for downward loading, assuming 22-gauge thickness as stated in the "Observations" section of this report. The attachment is also inadequate for the perimeter and corner zones, but the patch decking does not occur in these zones. The attachment is adequate for the field zone.

The original deck must be reinforced or completely replaced in order to meet FM requirements. We suggest drilling #12 screws between the gap in the joist top chords to the underside of the deck at every unattached flute in the perimeter and corner zones. The perimeter and corner zones are defined by a 12'-6" inset around the entire perimeter of the building. The screw head diameter will be smaller than the gap in the joist top chords, so fender washers or plate washers will also be needed. Pull tests should be performed to confirm the pull-out strength of #12 screws in the original roof deck. This solution is the least disruptive method for satisfying the required wind pressures.

The patch deck must either be reinforced or completely replaced in order to meet FM requirements. We suggest completely replacing the patch deck with 1 1/2" – 18 ga. metal decking attached with 5/8" puddle welds in a 36/5 pattern. This deck and accompanying attachment satisfy the FM required wind pressures.

CONCLUSIONS

The existing roof will require reinforcement or replacement in order to meet FM requirements. Additional deck attachments will be required for the original deck in the perimeter and corner zones, defined by a 12'-6" inset around the entire perimeter of the roof. The narrow-rib patch deck should be completely replaced with wide-rib deck.

It has been a pleasure serving you as a consulting structural engineer. Please contact our office if there are any questions regarding this correspondence, or if you need any additional information.

Very truly yours,
ATLANTIC ENGINEERING SERVICES OF JACKSONVILLE
FLORIDA CERTIFICATE OF AUTHORIZATION #791

Russell T. Hollman, E.I.T.
Staff Engineer

Mark J. Keister, P.E.
Principal

RTH/MJK/drg

Photograph 1

Photograph 2

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APPENDIX A

EXISTING DRAWINGS FOR FORD MOTOR COMPANY JACKSONVILLE PARTS DEPOT FEBRUARY 6, 1967

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APPENDIX B

EXISTING DRAWINGS FOR JACKSONVILLE ELECTRIC AUTHORITY COMMONWEALTH SERVICE CENTER JULY 18, 1994

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APPENDIX C

CALCULATIONS

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APPENDIX D

EXISTING STRUCTURAL CONDITIONS EVALUATION CRITERIA

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EXISTING STRUCTURAL CONDITIONS
EVALUATION CRITERIA

EXCELLENT

Meets or exceeds current structural code requirements.
Capable of safely carrying proposed occupancies.
No significant vibrations, cracking or deflections.
No structural reinforcement or repairs required.
Very minor, if any, maintenance required.

GOOD

Meets current structural code requirements.
Capable of safely carrying proposed occupancies.
Deflections, cracking, vibrations may be observable.
No structural reinforcement required.
Minor structural repairs required.
Some significant maintenance repairs required.

FAIR

Majority of structure meets structural code requirements.
Portions of structure are not capable of carrying proposed occupancies.
Deflections, cracking, vibrations, structural distress is observable.
Structural reinforcement required in limited portions of the structure.
Structural repairs required generally.
Many significant maintenance repairs required.

POOR

Majority of structure does not meet structural code requirements.
Much of the building is not capable of carrying proposed occupancies.
Deflections, cracking, vibrations, structural distress commonly observable throughout the structure.
Major reinforcement or reconstruction of the structure is required.
Major maintenance repairs are required.

EXTREMELY POOR

Collapse of structure is imminent.
Structure exhibits significant deflections, cracking, vibrations, structural distress.
Structure requires extensive reinforcement or reconstruction of impractical scope.

NOTE: Some parts of each definition may not apply.