

**December 12, 2019**  
**BOARD OF COUNTY COMMISSIONERS**  
**ORANGE COUNTY, FLORIDA**  
**IFB Y20-727-RC ADDENDUM NO. 2**  
**ORANGE COUNTY CORRECTIONS CASSADY BUILDING ROOF REPLACEMENT**  
**REVISED BID OPENING DATE IS: December 19, 2019**

This addendum is hereby incorporated into the bid documents of the project referenced above. The following items are clarifications, corrections, additions, deletions and/or revisions to, and shall take precedence over, the original documents. Underlining indicates additions, deletions are indicated by ~~strikethrough~~.

**A. The bid opening date has been revised from ~~December 17, 2019~~ to December 19, 2019 at 2:00 P.M.**

**B. CHANGES TO PROJECT SPECIFICATIONS AND DRAWINGS:**

This addendum includes deletions, and revisions that take precedence over the original bid documents. Below is a list of the information contained herein:

**SPECIFICATIONS:**

1. Revised Specification Section 00 01 10 – “Project Manual Index”
2. Revised Specification Section 01 11 00 – “Summary of Work”
3. Revised Specification Section 02 25 29 – “Existing Conditions Assessment”
4. Revised Specification Section 07 54 16 – “Thermoplastic Membrane”
5. Added Specification Section 11 24 00 – “Rooftop Horizontal Fall Protection”

**DRAWINGS:**

1. Revised Sheet A02

**C. ACKNOWLEDGEMENT OF ADDENDA**

- a. The Bidder/Proposer shall acknowledge receipt of this addendum by completing the applicable section in the solicitation or by completion of the acknowledgement information on the addendum. Either form of acknowledgement must be completed and returned not later than the date and time for receipt of the bid or proposal.
- b. All other terms and conditions of the IFB remain the same.  
**Receipt acknowledged by:**

\_\_\_\_\_  
Authorized Signature

\_\_\_\_\_  
Date Signed

\_\_\_\_\_  
Title

\_\_\_\_\_  
Name of Firm

**IFB Y20-727-RC**  
**Addendum #2**  
**December 12, 2019**

## **SPECIFICATION LIST**

### **Division 1 - General Requirements**

Section 01 09 00	Reference Standards
Section 01 11 00	Summary of Work
Section 01 26 00	Contract Modification Procedures / Change Orders
Section 01 26 13	Request for Information
Section 01 29 00	Payment Application Procedures
Section 01 30 00	Project Management and Coordination
Section 01 33 00	Submittal Procedures
Section 01 40 00	Quality Requirements
Section 01 45 00	Cutting and Patching
Section 01 50 00	Temporary Facilities and Controls
Section 01 63 00	Product Requirements/Options/Substitutions
Section 01 70 00	Project Closeout Requirements

### **Divisions 2 – Existing Conditions**

Section 02 25 29	Existing Condition Assessment
Section 02 41 19	Selective Demolition

### **Divisions 6 – Wood, Plastics and Composites**

Section 06 10 00	Rough Carpentry
------------------	-----------------

### **Divisions 7 – Thermal and Moisture Control**

Section 07 51 00	Preparation for Re-Roofing
Section 07 54 16	Thermoplastic Single-ply Membrane Roofing
Section 07 62 00	Sheet Metal Flashing and Trim
Section 07 63 00	Roof Penetration Flashing
Section 07 90 00	Joint Sealers

### **Divisions 8 – Openings**

Section 08 63 00	Metal Framed Skylight
------------------	-----------------------

### **Divisions 9 – Existing Finishes**

Section 09 90 00	Minor Painting
------------------	----------------

### **Divisions 11 – Equipment**

Section 11 24 00	Rooftop Horizontal Fall Protection
------------------	------------------------------------

### **Divisions 22 – Plumbing**

Section 22 07 19	Piping Insulation
Section 22 14 13	Plumbing Piping
Section 22 14 26	Roof Drains

### **Divisions 23 – Heating, Venting and Air-conditioning (HVAC)**

Section 23 00 00	Mechanical Equipment
------------------	----------------------

### **Divisions 26 – Electrical**

Section 26 05 00	Basic Electrical Requirements
Section 26 41 13	Lightning Protection

### **Drawings and Details**

#### Plans

C01	Cover Sheet, Site Plan, Vicinity Map General Notes and Drawing Index
A01	Roof Plan, Physical Characteristics Schedule, Repair Legend and Specific Notes
A02	Partial Roof Plan – Northwest Quadrant, Partial Roof Area 1/B & 2/B, Repair Legend and Specific Notes
A03	Partial Roof Plan – Northeast Quadrant, Partial Roof Area 1/B & 2/B, Repair Legend and Specific Notes
A04	Partial Roof Plan – Southwest Quadrant, Repair Legend and Specific Notes
A05	Partial Roof Plan – Southeast Quadrant, Partial Roof Area 3/B, Repair Legend and Specific Notes
B01	General Roofing Notes, Roof Component Fastening Schedule and Abbreviations
B02	Parapet and Edge Flashing Details
B03	Area Divider and Base Flashing Details
B04	Edge Metal Fabrication Details
B05	Edge Fabrication and Skylight Flashing Details
B06	Fabrication and Curb Flashing Details
B07	Mechanical Flashing and Pipe Support
B08	Pipe Flashing and Roof Drainage Details
B09	Roof Drainage and Lightning Protection Details
B10	Typical Flashing Details

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Project Description and Location
2. Description of Work.
3. Contractor use of Site and Premises.
4. Owner Occupancy.
5. Work Sequence/Schedule
6. Rain Days, Interior Inspection and Exterior Inspection, Procedures and Forms

1.2 PROJECT DESCRIPTION AND LOCATION

A. Project Scope:

1. Project Scope consists of roof removal and replacement at the Orange County Sheriff's Office Annex / Cassidy Bldg. located at 2450 33<sup>rd</sup> St., Orlando, FL 32839
  - a. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Specification Sections, apply to work on this contract.
  - b. The Contractor's Duties include:
    - 1) Provide and pay for all labor, materials, and equipment and installation costs of items described within these documents. Provide and pay for all costs associated for all necessary tools, construction equipment, and protection of Existing Work.
    - 2) Comply with all listed and applicable Codes, Standards and Specifications.

1.3 DESCRIPTION OF WORK: The scope of work is considered to be as follows:

**A. Roof Access:**

1. Provide Exterior Scaffolding Stair system for roof access. Regular access thru facilities elevator shall not be allowed.

**B. Existing Conditions:**

1. Upper Roof Areas (A/1-A/18 & B/1) - Existing Single-ply membrane fastened thru an insulation system composed of non-tapered perlite over tapered isocyanurate insulation (ISO) on structural metal deck.
  - a. Large Skylight (Kalwall) Structure
2. Lower roof Areas (D/1, E/1, F/1, F/2, G/1 & H/1) – Existing Single-ply membrane fastened thru an insulation system composed of gypsum coverboard over tapered isocyanurate rigid insulation (ISO) on metal deck.

C. Proposed Work - (A/1 thru H/1) :

1. Remove existing roof top lightning protection system. Undamaged and non-deteriorated conductors and air terminals to be re-installed. Damaged components to be replaced with "as-kind".
2. Remove all associated edge metal, expansion joint bellows, metal flashings, moisture relief vents and counterflashings. Skirt metal to remain in place.
3. Replace damaged or deteriorated pressure treated wood blocking along perimeter edge of roof system. Include 100 linear feet of 2x4 blocking and 150 linear feet of 2x8 blocking replacement in base bid.
4. Remove abandoned curbs and in-fill deck per details.

D. Existing Large Skylight (Upper Roof Area 'A') :

1. Remove existing skylight system and replace with new on existing curb. Coordinate with specification **08 63 00** for engineering and design. Fabricate new pan flashing receiver at curb prior to new skylight installation.
2. Remove two (2) light fixtures mounted at interior ridge of skylight and replace with two (2) New LED light fixtures. Existing electrical conduit to be reworked. Locate at or near previous locations. Coordinate with owner.
  - a. Basis of Design – "Popular Up-Down Lightning LED Pendant Light"; LL0112120SUD – 120 W. Model No. LL0112120SUD
  - b. Provide Mounting brackets as required to install.
3. Existing hurricane framing to be removed. Coordinate with Owner for storage or Disposal.

E. Upper Roof Areas (A/1 thru B/1) :

1. Remove existing Single-ply membrane and perlite insulation down to existing tapered rigid isocyanurate. Replace damaged or deteriorated rigid ISO with new, matching slope. Include replacement of 150 SF of tapered rigid insulation in base bid
2. Mechanically fasten a base sheet thru existing ISO board down to structural metal deck.
3. Replace existing roof drains with new in existing locations, create a new 4/0 x 4/0 x 3/4" per foot slope sump at each drain. Install new overflow drains at existing locations. Connect to existing leader pipe and rod, blow &/or snake all drain leader lines to ensure they are fully functional.
4. Adhere 1.75" of non-tapered rigid ISO to the base sheet adhere per the manufacturer approved adhesive patterns for the project design pressures to the preliminary roof. (Base sheet intention was for sequencing; base sheet can be omitted and larger fasteners used to fasten new insulation thru to metal deck in place of adhering to base sheet).
5. Apply a 1/4" gypsum roof cover board over the rigid insulation, and secure with an approved insulation adhesive.
6. Raise vent stacks to a minimum of 8" above finished roof as necessary.
7. (Roof Area A/2) –

- a. Install new weather head curbs & fabrications. Reroute conduit below deck and re-attach to large HVAC units.
- b. Existing roof hatch to be raised at existing curb.
8. (Roof Area A/14) –
  - a. Relocate primary drain a minimum of 24" from existing screen enclosure support. Connect to existing leaderline below deck.
  - b. Install new bellow at existing expansion joint curb.
9. Fully adhere a thermoplastic flashing strip along the roof edge and mechanically fasten edge metal system, (PVC coated aluminum over existing skirt metal), per the project details.
10. Fully adhere a single ply thermoplastic roof system to the gypsum roof board per the manufacturer's recommendations, heat weld all seams and edges. Provide supplemental mechanical fastening as may be required by the roof membrane manufacturer. Heat weld along perimeter drip edge.
11. Install the set on accessories and flash in accordance with project details. Install pre-formed "boot" flashings at all pipe penetrations and enclosure support posts.
12. Re-install and inspect rooftop lightning protection system per project specifications, provide U.L. "Letter of Findings".
13. Roof system manufacturer to provide a 20 year, no dollar limit (NDL) weather tightness warranty with a wind uplift rider for (actual) 112 mph and (ultimate) 144 mph winds.

F. Lower Roof Areas (D/1 thru H/1) :

1. Remove existing Single-ply membrane and insulation system down to structural metal deck. Replace damaged or deteriorated metal deck. Include 30 SF of metal deck replacement in base bid.
2. Mechanically fasten a new 1/4" per foot tapered rigid ISO insulation system to metal deck.
3. Replace existing roof drains with new in existing locations, create a new 4/0 x 4/0 x 3/4" per foot slope sump at each drain. Install new overflow drains at existing locations. Connect to existing leader pipe and rod, blow &/or snake all drain leader lines to ensure they are fully functional.
4. Apply a 1/4" gypsum roof cover board over the rigid insulation, and secure with an approved insulation adhesive.
5. Raise vent stacks to a minimum of 8" above finished roof as necessary.
6. Install two-piece reglets and receiver's fabrications per details. Saw-cut where indicated and grind smooth block surface as required.
7. (Roof Area E/1) –
  - a. Add tapered edge strip along curbs at base of wall.
8. (Roof Area F/1 & F/2) –
  - a. Construct new area divider curb.
9. Fully adhere a thermoplastic flashing strip along the roof edge and mechanically fasten edge metal system, (PVC coated aluminum), per the project details.
10. Fully adhere a single ply thermoplastic roof system to the gypsum roof board per the manufacturer's recommendations, heat weld all seams and edges.

Provide supplemental mechanical fastening as may be required by the roof membrane manufacturer. Heat weld along perimeter drip edge.

11. Install the set on accessories and flash in accordance with project details.
12. Re-install and inspect rooftop lightning protection system per project specifications, provide U.L. "Letter of Findings".
13. Roof system manufacturer to provide a 20 year, no dollar limit (NDL) weather tightness warranty with a wind uplift rider for (actual) 112 mph and (ultimate) 144 mph winds.

#### 1.4 CONTRACTOR USE OF SITE AND PREMISES

- A. Limit use of site and premises to allow
  1. Owner Occupancy.
  2. Work by Others (if still in progress)
  3. Use of site and premises by the public.
- B. Access to Site: Limited to agreed-upon staging areas and access route.
- C. Emergency Building Exits During Construction: Maintain at all times.
- D. Time Restrictions for Performing Interior Work: As Required.
- E. Utility Outages and Shutdown: Allowed only upon coordination with and notification of the Owner. Limit to after-hours.
- F. Be responsible for items of work and material stored on premise.
- G. The roof shall be secured from unwanted entry at the end of each work day.
- H. Background checks will be required for all Contractors and their personnel working onsite. Background Checks for the Contractor's staff must be approved by the County prior to working in any County facility. Contractors are responsible for obtaining a Criminal History Report for each employee that will be present on the property. The Criminal History Report is conducted at the FDLE website ([www.fdle.state.fl.us/](http://www.fdle.state.fl.us/) - there is a cost to the Contractor – most recently, \$24 per inquiry, but can change at any time). Contact [Bruce.Heffelbower@ocfl.net](mailto:Bruce.Heffelbower@ocfl.net) for specifics before obtaining any Criminal History Report for specific
- I. For security purposes and to maintain privacy when submitting FDLE Background Checks via e-mail the subject line of the email must contain the following:  
\*\*\*EXEMPT\*\*\* Due to the time required to process background checks, the Contractor should allow 2-3 weeks turn-around time. The person submitting the reports will be advised of the results.
- J. Contractor's employees will not be allowed in Orange County Facilities without completed and approved background investigations.

- K. Orange County will inform the Contractor of their Background Check results. Upon Background Check approval, the Contractor's supervisor shall arrange an appointment with the Orange County Project Manager to obtain an Orange County Vendor ID Badge. An affidavit of identification form (issued by Contractor) and a State of Florida ID or Driver's License will be required. All County Vendor ID Badges must be returned to Orange County at the completion of the project.

#### 1.5 OWNER OCCUPANCY AND ACCESS

- A. The Owner will occupy the premises during the entire period of construction. Allow for the conduct of normal operations.
- B. Cooperate with Owner to minimize conflict, and to facilitate Owner's operations.
- C. Schedule the Work to accommodate this requirement.
- D. Comply with established Owner Policies regarding safety requirements (Assurant Contractor Safety Manual guidelines).
- E. Maintain "Good Housekeeping" on site as directed by Owner and Architect.
- F. Access for ongoing inspections to the premises and work underway by the Owner and Architect shall not be restricted.

#### 1.6 WORK SEQUENCE/SCHEDULE

- A. A progress schedule shall be made to include:
  - 1. A start date.
  - 2. A reasonable progression of work by Phase, Building, Task, etc.
  - 3. A start and finish date for construction materials and components listed in Divisions 2 thru 26. This is identified by Section 01 30 00 of these Specifications.
- B. Sequence work on the various roof areas to minimize construction traffic over completed roof areas.

#### 1.7 PROJECT RAIN DAY INSPECTION AND FORM

- A. Maintain on a daily basis and submit with each Application for Payment, the "Project Rain Day Form" attached at the end of this Section. The "Project Rain Day Form" shall be signed by the Owner's Representative or Architect daily. **Rain days will only be allowed for the period of work of the current Application for Payment. Requests for approval of rain days within prior Application for Payment periods will not be considered.**

#### 1.8 INTERIOR INSPECTION AND FORM

- A. Prior to beginning work, inspect with Owner's Representative or Architect, building interior(s). Log conditions of ceiling tiles, lights, walls and flooring materials using the



Interior Inspection Form attached at the end of this Section. Confirmation of existing conditions shall be made with video camera recordings.

- B. Submit two copies of form signed by the Contractor, Owner's Representative or Architect and one copy of video disc.

#### 1.9 EXTERIOR INSPECTION AND FORM

- A. Prior to beginning work, inspect with Owner's Representative or Architect, existing building exterior(s) and site conditions. Log, as required, conditions of exterior walls, building attachments, sidewalks, miscellaneous paving and landscaping using the Exterior Inspection Form attached at the end of this Section. Confirmation of existing conditions shall be made with video camera recordings.

- B. Submit two copies of form signed by the Contractor, Owner's Representative or Architect and one copy of video disc.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

- A. The information included within and attached to this section has been provided as information to the Bidder to assist with their understanding of the existing project conditions, the design intent of the documents, and their minimum responsibilities as a contractor to confirm the existing conditions.
- B. None of the information or recommendations contained within any of the documents attached to this section may be referenced in an effort to determine the design intent of the bidding documents.
- C. Section Includes:
  - a. Test Cut Data from October 26, 2018 (Roof Area A/1), 1 page
  - b. Test Cut Data from October 26, 2018 (Roof Area D/1-H/1), 5 pages
  - c. Thermal Calculations at Roof Areas A/8 (Upper Roof), 1 page
  - d. Thermal Calculations at Roof Areas D/1 – H/1 (Lower Roofs), 4 pages
  - e. Link to website with field investigation photographs.
- D. Related Sections:
  - 1. Section 01 11 00 – Summary of Work

1.2 EXISTING PROJECT / SITE CONDITIONS

- A. Field Investigation: A field investigation of the Juvenile Justice Center was conducted by A/R/C Associates, Incorporated on October 26, 2018. During which times the exposed conditions were observed and the under-roof conditions were determined to the best extent observable without destructive methods. Limited existing construction record drawings and specifications were available for A/R/C to verify. The details of the project indicated and existing conditions are based off typical construction practice. A/R/C offers no assurance that all varying conditions have been discovered, or that any Owner-furnished information is completely accurate. It shall be the responsibility of each bidder to make additional inspections as they may judge to be a necessity.
- B. Verification of Dimensions: The approximate dimensions shown for each roof area are the result of reconstruction of the building design from record drawings provided by the Owner and field measurements taken by A/R/C Associates. This information is given to assist prospective Bidders in establishing the approximate scope of the project. As a prerequisite for bidding the project, however, all dimensions shall be field verified by each Bidder so that the dimensions and areas utilized in bidding the project will be confirmed or corrected by the Bidder.

- C. Additional Information Available: Various testing and investigative reports may have been performed by the Owner previously and/or in conjunction with the performance of other work which may be available for review through the Owner. We believe most pertinent information available from these sources has already been integrated into these bidding and construction documents.
- D. Roof System Test Cuts: As part of those site investigations, six (6) test cuts were performed at various locations on the three roof areas of the Warehouse Building. Data from those test cuts are attached at the end of this section, and included only for informational purposes.
- E. Field Photographs: As part of that site investigation, our office also took numerous photographs of the various conditions for reference during our design process, those are also being made accessible through a website, the link for which is:

[https://www.dropbox.com/sh/c26fysuy26xwk72/AADR6kYEH4qRTGucn9BoPd\\_5a?dl=0](https://www.dropbox.com/sh/c26fysuy26xwk72/AADR6kYEH4qRTGucn9BoPd_5a?dl=0)

Contact A/R/C Associates for link: [Jewel@arc-arc.com](mailto:Jewel@arc-arc.com) or call 407 896-7875

- F. Condition of Structure:
1. The Owner assumes no responsibility for actual condition of the structure.
  2. Conditions existing at time of inspection for bidding purposes will be maintained by Owner in so far as practicable. However, variations may occur by Owner's operations.
  3. Prior to bidding, inspect and verify visible existing conditions of Project, including elements subject to damage or to movement during reroofing.
    - a. Conflicts and problems shall be reported to the Architect for resolution prior to bidding.
    - b. Failure to report these conflicts places the responsibility on the Prime Contractor to complete the work in accordance with the Documents at no additional cost to the Owner.
  4. During construction, inspect conditions affecting installation of Products, or performance of work.
    - a. Report unsatisfactory or questionable conditions to Architect in writing; do not proceed with work until Architect has provided further instructions.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION

## PART 1 GENERAL

### 1.1 SUMMARY

- A. Section Includes:
  - 1. Drawings, the general provisions of the Contract, including General and Supplementary Conditions and Division 01 requirements apply to work in this Section
  - 2. Single-ply thermoplastic roofing system, insulation, flashing and roofing accessories, integrally related to roof installation,
  - 3. Manufacturer's Notice of Intent to Issue Roof Warranty form, to be submitted at the time of bid.
  - 4. Applicator Warranty for Roofing form, to be submitted upon completion of the project.
  
- B. Related Sections:
  - 1. Section 02 41 16 – Selective Demolition:
  - 2. Section 06 10 53 – Rough Carpentry: Wood nailers, blocking and curbs.
  - 3. Section 07 51 00 – Preparation for Re-Roofing
  - 4. Section 07 62 00 – Sheet Metal Flashing and Trim

### 1.2 REFERENCES

- A. ASTM International
  - 1. ASTM D 471 - Test Methods For The Effects of Rubber- Liquid Properties
  - 2. ASTM D 751 - Test Method of Coated Fabrics
  - 3. ASTM D 882 - Test Method for Tensile Properties of Thin Plastic Sheathing
  - 4. ASTM D 1204 - Test Method for Linear Dimensional Changes of Non-rigid Thermoplastic Sheeting or Film at Elevated Temperature
  - 5. ASTM D 2136 - Test Method for Coated Fabricates -Low Temperature Bend Test
  - 6. ASTM D 2240 - Test Method for Rubber Property
  - 7. ASTM D 6754 - Standard Specification for Ketone Ethylene Ester Based Sheet Roofing
  - 8. ASTM E 84 - Test Method for Surface Burning Characteristics of Building Materials
  
- B. NFPA
  - 1. NFPA 255 - Test of Surface Burning Characteristics of Building Materials
  
- C. FM Global
  - 1. FM - Roof Assembly Classifications
  - 2. FM DS 1-28 – Wind Loads to Roof Systems and Roof Deck Securement
  - 3. FM 4450 – Approval Standard for Class 1 Insulated Steel Deck Roofs
  
- D. NRCA (National Roofing Contractors Association)
  - 1. NRCA - Roofing and Waterproofing Manual

- E. Underwriters Laboratories, Inc.
  - 1. UL - Fire Hazard Classifications
  - 2. UL 723 - Tests for Surface Burning Characteristics of Building Materials
  - 3. UL 790 – Tests for Fire Resistance of Roof Covering Materials.
  - 4. UL 1256 – Fire Test of Roof Deck Construction
  - 5. UL 1897 – Uplift Tests for Roof Covering Systems.

### 1.3 DESIGN REQUIREMENTS / PROJECT DESCRIPTION

- A. Fully adhere PVC / Elvaloy based thermoplastic single-ply membrane with woven polyester fabric reinforcement to a 1/4" thick gypsum roof board which has been fully adhered to new Rigid Board System.
  - 1. Insulations Systems (A1-B/A) Non-tapered rigid polyisocyanurate insulation adhered to mechanically attached base sheet. (D/1-H/1) Tapered rigid polyisocyanurate insulation 1/4" per FT slope, mechanically fastened to metal deck.
  - 2. Upon completion a 20 year NDL manufacturer's weather tightness warranty with a wind rider for the project design pressures is to be provided.
- B. Install tapered rigid insulation prior to gypsum roof cover board application at isolated and defined locations to form drainage crickets between the roof drainage scuppers.

### 1.4 SUBMITTALS

- A. Submit under provisions of Division 01.
- B. Product Data: Provide membrane materials, base flashing materials, insulation, fanfold insulation board and vapor retarders.
- C. Manufacturer's Installation Instructions: Indicate special precautions required for seaming the membrane.
- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- E. Manufacturer's Field Reports: Submit under provisions of Division 01.
- F. Contractor shall submit certification from a Florida Registered Engineer showing that the new roof system meets or exceeds current ASCE 7-10 requirements. (Provide supporting calculations)
- G. All products used shall be asbestos free.

### 1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with NRCA Roofing and Waterproofing Manual except where NRCA details differ from the project manual details.
- B. Maintain one copy of the NRCA document on site.

- C. Work that is closely associated with flexible sheet roofing, including vapor barriers, insulation, flashing and counterflashing, expansion joints (if applicable), and joint sealers, is to be performed by the installing applicator of the primary roofing system.

#### 1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing the products specified in this section with five years current documented experience.
- B. Applicator: A single installer specializing in performing the work of this section with three current years documented experience and approved by system manufacturer.
  - 1. The installation shall be done by a roofer approved in writing by the manufacturer of the thermoplastic material 10 days prior to Bidding.
- C. Supervisor: Maintain a full-time non-working supervisor, on job site during roofing work in progress. Supervisor shall have five current years minimum documented experience of roofing work similar to scope of specified roofing.
- D. Manufacturer's Field Inspection and Services Representative:
  - 1. Manufacturer of the roofing materials shall provide qualified personnel to observe field conditions of surfaces and installation, quality of workmanship as applicable, and to make appropriate recommendations.
  - 2. Representative shall visit the Project throughout progress of the work.
    - a. Initial pre-installation meeting.
    - b. Site visits at maximum of one week intervals.
    - c. Prior to Substantial Completion inspection, a final inspection shall be made by manufacturer's representative.
    - d. Called meetings.

#### 1.7 REGULATORY REQUIREMENTS

- A. Conform to applicable code for roof assembly fire hazard requirements and regulations of jurisdictional authorities, 2017 (Sixth) Edition Florida Building Code.
- B. All roofing materials to be Class A as tested in compliance with ASTM E 108 -Standard Test Methods for Fire Tests of Roof Coverings.
- C. Thermal Resistance: Roofing system with thermal resistance properties of insulating materials, designated by R-values, as noted in Construction Documents.
- D. Material Safety Data Sheets (MSDS): For all roofing products.
- E. Contractor shall submit certification from a Florida Registered Engineer showing that the new roof system meets or exceeds ASCE 7 requirements. (Provide supporting calculations or Florida product approvals of a tested system.)

## 1.8 CERTIFICATION

- A. Materials: For each material specified with a standard or reference material designation, certification labels shall appear on each package of bulk-shipments to project with certificate of compliance.
- B. Installer: Provide two copies of all certifications to Architect prior to beginning roofing work.

## 1.9 PRE-INSTALLATION CONFERENCE

- A. Convene meeting one week prior to commencing work of this section at project site, with 72 hours' minimum notice to participants. Meeting to include Contractor, Roofer, and Subcontractors, governing authorities, test agencies, product manufacturers, Architect and the Owner Representative.
- B. Review requirements, Contract Documents, submittals, sequencing, availability of materials and installation facilities, proposed installation schedule, requirements for inspections and testing or certifications, forecasted weather conditions, governing regulations, insurance requirements, and proposed installation procedures.
- C. Record discussion on matters of significance; furnish copy of recorded discussions to each participant. Discuss roofing system protection requirements for construction period extending beyond roofing installation/

## 1.10 DELIVERY, STORAGE AND HANDLING

- A. Deliver to site, store, protect, and handle products under provisions of Division 1.
- B. Deliver material in manufacturer's original, unopened containers with manufacturer's labels intact and legible.
- C. Deliver material requiring fire resistance classification to the job with labels attached and packaged as required by labeling service.
- D. Deliver enough material to allow continuous work.
- E. Store rolls, cans and drums of cements, primers, and coatings, on end and over clean raised platforms.
- F. Store and handle materials to protect them from.
  - 1. Moisture, whether due to precipitation, or condensation.
  - 2. Damage by construction traffic.
  - 3. Temperatures over 110 degrees F or below 40 degrees F.
  - 4. Temperatures over 110 degrees F or below 40 degrees F.
  - 5. Mud, dust, sand, oil and grease.
- G. Select and operate material handling equipment and store materials to keep from damaging existing construction or applied roofing.

- H. Immediately remove and dispose of wet materials.
- I. Comply with fire, safety, and environmental protection regulations.
- J. Do not store materials on roof decks, nor position roofing installation equipment on roof decks, in concentrations exceeding design live loads.
- K. Take special precautions against traffic on roofing when ambient temperature is above 80-degree F. Avoid heavy traffic on the work during installation.

#### 1.11 PROJECT CONDITIONS

- A. Existing Conditions:
  - 1. The roofing applicator and sheet metal installer shall verify existing conditions, such as soundness of perimeter conditions, and varying deck and wall thickness for length of anchoring services required and other visible conditions prior to Bidding.
  - 2. Report conflicts and problems to the Architect for resolution prior to Bidding. Failure to report these conflicts and problems places the responsibility on the Prime Contractor to complete the work in accordance with the Documents at no additional cost to the Owner.
  - 3. Replace or restore to original condition any materials or work damaged during construction.
  - 4. Surfaces not designated to receive the system shall be properly masked or otherwise protected against accidental spillage or application of the material to those areas.
  - 5. Failure to install the work in strict accordance with provisions of this Section, is subject to total rejection of work specified herein.

#### 1.12 ENVIRONMENTAL REQUIREMENTS

- A. Do not apply roofing membrane during inclement weather ambient temperatures below 40 degrees F.
- B. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day.
- C. Proceed with roofing work when existing and forecasted weather conditions permit work to be performed in accordance with requirements of this section and warranty compliance requirements.

#### 1.13 SAFETY REQUIREMENTS

- A. All work shall be in compliance with OSHA safety standards and regulations with emphasis on Section 29 CFR 1910, including but not limited to the following requirements.
  - 1. Provide facility administrator one-day prior notice before commencing with work or moving to new areas.



2. Proper identification and clothing, to work at all times. Only the facility administrator is permitted in the facility.
  3. The Contractor shall provide sufficient temporary barricades in order to contain passage ways around tankers, trash chutes, hoisting areas and areas below roof edges where work is conducted.
  4. Fire extinguishers are required, one on the ground and one on the roof deck.
  5. Seal all possible seepage areas, before using liquids or adhesive materials.
  6. Powder driven shot fasteners are not permitted.
  7. No flammable or explosive substance or equipment for repairs or alterations shall be introduced in a building of normally low or ordinary hazard classification while the building is occupied unless the condition of use and safeguards provided are such as not to create any additional hazard or handicap to egress beyond the normally permissible conditions in the building.
  8. Protect building and adjacent surfaces from spillage and repair or replace damaged materials at no cost to Owner.
- B. All toxic substances enumerated in the Florida Substance List established pursuant to S.442.103 that are to be used in the construction, repair or maintenance of educational facilities are restricted to usage according to the following provisions:
1. Before any such substance may be used, the Contractor shall notify the Owner in writing at least three working days prior to using the substance. The notification shall contain:
    - a. The name of the substance to be used;
    - b. Where the substance is to be used; and
    - c. When the substance is to be used.
  2. The Owner shall take all reasonable actions to ensure that the Contractor complied with the safety precautions and handling instructions set forth in the material safety data sheet for each substance used by the Contractor so that usage of the substance poses no threat to the health and safety of residents, instructors and the general public.

#### 1.14 COORDINATION

- A. Coordinate work under provisions of Division 1.
- B. Coordinate the work with installing associated wood blocking and nailers, roofing, expansion joints and area dividers, and metal flashing as the work of this section proceeds.

#### 1.15 SEQUENCING

- A. Organize operations so work can simultaneously proceed on the various aspects including roofing and flashing so at the end of each day the work done that day will be substantially complete.
- B. Roof area shall be substantially complete prior to beginning another roof area; utilize multiple crews for multiple roof area construction. Phasing of roof construction by area is not permitted.

- C. Sequence equipment removal with covering of deck openings with plywood strong enough to prevent injuries from falling through. Contractor shall install waterproof covering over plywood and tie-in to existing membrane to achieve complete watertightness.

## 1.16 WARRANTY

- A. Applicator's Warranty: Three (3) year workmanship warranty. (Refer to "*Applicator's Warranty for Roofing*" at end of this Section). Submit upon completion of Work.
- B. Manufacturer's Warranty: Twenty (20) year total roof system warranty inclusive of roofing materials, included products and accessories from deck to finish membrane (Refer to "*Manufacturer's Notice of Intent to Issue Roof Warranty*" at end of this Section). Submit at time of bid.
- C. Manufacturer's roof warranty will cover the cost of removal and replacement of damaged or wet insulation that is the result of leaks from poor workmanship or failed material.
- D. A Project Acknowledgment Form shall be executed by the Manufacturer that acknowledges project design, lists primary/secondary material approvals, and pre-approved for roofing contractor.
- E. A non-prorated, non-penal sum manufacturer's roof warranty is required.
- F. Manufacturer's roof warranty will cover the cost of removal and replacement of damaged or wet insulation that is the result of leaks from poor workmanship or failed material.
- G. The Contractor is responsible to submit and provide components required by the roofing system manufacturer for the specific warranty.
- H. Warranty will not exclude from coverage damage to the roof system for wind gusts as defined in the **Manufacturer's Notice of Intent to Issue Roof Warranty** at end of this Section. Warranty may exclude damage for wind launched debris or projectiles which are not part of this system.
- I. A Contractor's Final Statement of Compliance shall be issued by the roofing contractor.

## PART 2 PRODUCTS

### 2.1 THERMOPLASTIC ROOFING SYSTEM

- A. New single-ply thermoplastic roofing membrane shall be either smooth or fleece backed and intended to be fully adhered to the underlying roof substrate material from the following category of chemical composition. Roofing membrane system shall have Florida Product Approval and comply with ASCE 7 and the 2017 (Sixth) Edition Florida Building Code wind uplift requirements as defined by the documents for this project:

1. PVC thermoplastic, 60 mil minimum thickness, polyester reinforced membrane which meets or exceeds all requirements of ASTM D-4434, Type III. Color is to be neutral cream or white. Approved products are as follows:
  - a. Carlisle / Syntec Sure-Flex PVC 60
  - b. Duro-Last Roofing, Inc. Duro-Last 60
  - c. GAF Materials Corporation EverGuard EGSR 60
  - d. Johns Manville JM PVC 60
  - e. Sika Sarnafil S327
  - f. Versico VersiFlex PVC 60
  - g. Flex Membrane International Flex 60
  
2. Elvaloy (KEE) thermoplastic, 45 mil minimum thickness, polyester reinforced membrane which meets or exceeds all requirements of ASTM D 4344, Type III or D 6754, and with a minimum Elvaloy content of 25% by weight. Membrane is to be fully adhered; all seams and joints are to be heat-welded. Provide supplemental mechanical fastening as may be required by the roofing membrane manufacturer. Color is to be neutral cream or white. Approved products are as follows:
  - a. Carlisle Syntec Systems Sure-Flex KEE Membrane
  - b. Duro-Last, Inc. Duro-Last EV Membrane
  - c. Flex Membrane International Flex MF/R Membrane
  - d. GAF Building Products Everguard PVC XK Membrane
  - e. Johns Manville JM PVC Membrane
  - f. Seamen Corporation Fibertite 8540 SM Membrane
  - g. Versico Roofing Systems VersiFlex –E KEE HP
  - h. At the contractor's option, a fleece-backed membrane may be used of equivalent or greater PVC membrane thickness.

B. Manufacturers and Approved Products:

1. Obtain primary thermoplastic roofing from a single manufacturer and provide secondary materials only as recommended by the manufacturer of the primary material, as specified.
2. The Drawings are generic and not based on a specific manufacturer. Detail deviations will be accepted so as to permit utilization of the selected manufacturer's standard products and details when, in the Design Professional's judgment, such deviations do not materially detract from the original design concept or intended performance.
  - a. Submit proposed deviations to Design Professional for approval in writing prior to ordering materials that are in the category of substitutions.
3. Membrane substitutions are not permitted without prior approval by the architect.

## 2.2 MECHANICAL FASTENERS

- A. For mechanically fastened anchorage of roof system components base sheet and rigid board insulation: Fastener type shall be ES Twin Loc-Nail (or architect approved

equivalent). The attachment pattern to be as defined by the manufacturer based on the specific project conditions and published test reports for their product.

- B. For fastening flashing to wood: Stainless steel annular threaded, 11 or 12 gage shanks, 1" long, driven through a minimum 30 gage 1" diameter flat stainless steel cap.
- C. For all other locations: Provide size, type, material and finish as required, matching material being fastened.

### 2.3 SHEET MATERIALS:

- A. Base Sheet: ASTM D-4601, Type II glass fiber base sheet.

### 2.4 ROOF MEMBRANE ADHESIVE

- A. Membrane Adhesive:
  - 1. Manufacturer approved adhesive for selected membrane.

### 2.5 BITUMINOUS MATERIALS

- A. Dry-in Membrane: 40 mil thick, polyester reinforced, SBS modified asphalt waterproofing and underlayment membrane sheet, approved products are limited to the following:
  - 1. Boral TileSeal HT
  - 2. Interwrap Titanium PSU 30
  - 3. Protecto-Wrap Rainproof-40
  - 4. Soprema Sopralene Stick
  - 5. Tamko TW Metal and Tile underlayment.
  - 6. Architect approved (prior to bidding) equivalent product.
- A. Asphalt Primer: ASTM D41.
- B. Plastic Cement: ASTM D4586, Type II, cutback asphalt type (non-asbestos).
- C. Modified Bitumen Adhesive: SBS modified asphalt adhesive; such as; "Matrix SB" by US Intec, or manufacturer-approved equivalent.

### 2.6 INSULATION AND ROOF COVER BOARD ADHESIVE

- A. Membrane Adhesive:
  - 1. Manufacturer approved adhesive for selected membrane.
- B. Insulation and Roof Cover Board Adhesive:
  - 1. Acceptable adhesives: Any FM Listed Foam Adhesives or Adhesives approved by roofing system manufacturers
- C. Contractor to submit certification based on pull tests showing adhesive meets current ASCE 7 and 2017 (Sixth) Florida Building Code wind up-lift requirements.

## 2.7 INSULATION

- A. Polyisocyanurate Insulation: Closed cell glass fiber reinforced type, conforming to the following:
1. Board Density: 2.0 pounds per cubic foot.
  2. Board Size: 4 feet x 4 feet.
  3. Board Thickness-
    - a. (Upper Roofs) Non-tapered board, 1.75" starting thickness.
    - b. (Lower Roofs) 1/4" per ft. tapered board, 3.5" starting thickness.
  4. Tapered Crickets: 1/2" per foot tapered board to counter primary slope.
  5. Compressive Strength: 25 psi per ASTM D 1621
  6. Facing: Factory applied skin of glass fiber facing on both faces.
  7. Board Edges: Square.
  8. Water Absorption: Maximum of 1% (volume) in accordance with ASTM C209.
  9. Foam Core Flame Spread: 25 Max. - ASTM E-84 (Tunnel Test).
  10. UL Fire Rating: Conforms to ANSI / UL, Class A.
- B. Tapered Edge Strips for Use with Tapered Insulation: 12" wide, 1/2" per foot tapered preformed units of material matching insulation at crickets. 12" x 1 1/2" at perimeter where occurs, see plans.
- C. Batt Insulation: ASTM C665; preformed glass fiber batt conforming to the following:
1. Thermal Resistance: R of 19 for walls. R of 13 for expansion joint curbs.
  2. Facing: Faced on one side with asphalt treated Kraft paper.
  3. Flame/Smoke Properties: In accordance with ASTM E84.

## 2.8 GYPSUM ROOF BOARD

- A. Gypsum Roof Board (Glass fiber reinforced/faced gypsum): as approved for use within a 20 year warranted roof system by the roofing manufacturer, with the following characteristics:
1. Board Type: manufacturer standard product for use over polyisocyanurate insulation and over metal decks.
  2. Manufacturer and Product: Georgia-Pacific Corporation, Gypsum Division, Dens-Deck Prime Roof Board or approved equal.
  3. Board Size: 4 feet x 4 feet x 1/4" thick.
  4. Compressive Strength: Nominal 900 psi in accordance with ASTM C 473
  5. Water Absorption: Maximum 10% in accordance with ASTM C 1177
  6. Board Edges: Square.
  7. UL Fire Rating: Conforms to ANSI/UL, Class A.
  8. Flame Spread/Smoke Developed: ASTM E 84 – 0/0
- B. Contractor's Option: Gypsum Roof Board (Glass fiber reinforced with no face layer) : as approved for use within a 20 year warranted roof system by the roofing manufacturer, with the following characteristics:
1. Board Type: manufacturer standard product for use over polyisocyanurate insulation and over metal decks.
  2. Manufacturer and Product: United States Gypsum Company, Securock Roof Board or approved equal.

3. Board Size: 4 feet x 4 feet x 1/4" thick.
4. Compressive Strength: Nominal 1800 psi in accordance with ASTM C 473.
5. Water Absorption: 10 In accordance with ASTM C 1177
6. Board Edges: Square.
7. UL Fire Rating: Conforms to ANSI/UL, Class A.
8. Flame Spread/Smoke Developed: ASTM E 84.

## 2.9 DOUBLE SIDED ADHESIVE FLASHING TAPE

- A. Flashing Tape: Double sided, grey extruded or preformed, 99% solids, crosslinked polyisobutylene compound, non-sag, non-toxic, non-staining, permanently elastic self adhesive tape. 1/8" minimum thickness, 3/4" minimum width unless noted otherwise on the drawings.
1. Pecora Corporation    Extru-Seal Glazing Tape
  2. Tremco Construction Products    440 II Tape
  3. Equivalent products as approved by the Owner and Architect

2.10 SEALANTS: As specified in Section 07900.

2.11 SEALANT PRIMER: As recommended by the sealant manufacturer to suit application.

2.12 MISCELLANEOUS MATERIALS:

- A. All other materials and accessories, not specifically described, but required for a complete and proper installation of roofing, shall be products of, or recommended by the primary roof material manufacturer and with Architect's approval.

## PART 3 EXECUTION

### 3.1 GENERAL

- A. Total Installation Concept:
1. The specified system is a total roofing system, not a patched up, chopped up, spliced or added to or on roofing system. Therefore, this type of application will not be acceptable.
  2. If a section of roof requires reworking or patching, the entire area or section of roofing shall be replaced. This shall mean from edge to edge of roof.
- B. Manufacturer's Installation Requirements:
1. In addition to the specified procedures, the roofing installer shall install roofing in accordance with the procedures required by the roofing material manufacturer for the proper execution of the work and issuance of the warranty.
  2. The roofing installer shall review the specified procedures for possible conflicts, prior to Bidding, for resolution by Architect.
- C. Watertightness Imperative:
1. The work specified shall not preclude the use of procedures that will maintain the building watertight. Therefore, the Contractor, while conforming to these

- contract documents, shall utilize skill and procedures to keep water out of these buildings while construction is in progress.
2. At the end of each day's roofing installation and prior to the onset of inclement weather, the new section of roofing shall be temporarily sealed with cut-offs to the unfinished substrates, projections through the roof and to the surrounding intersections so that no moisture may enter roofing or into structure before work resumes. Remove cutoffs before work resumes.
- D. Insurance Code Compliance:
1. Install system for (and test where required to show) compliance with governing regulations and with the following requirements.
    - a. Underwriters Laboratories "Class A" Fire Classified.
    - b. Current Florida Building Code and ASCE 7 wind up-lift resistance criteria
- E. Coordinate the installation of insulation, roofing sheets, flashing, stripping, coatings and surfacings, so that membrane edges are not exposed to precipitation or exposed overnight. Provide cutoffs at end of each day's work to cover exposed sheets and insulation.

### 3.2 EXAMINATION

- A. Verify that surfaces and site conditions are ready to receive work.
- B. Verify deck is supported and secured.
- C. Verify deck is clean and smooth, free of depressions, waves, or projections, properly sloped to eaves.
- D. Verify deck surfaces are dry.
- E. Verify roof openings, curbs, pipes, conduit, sleeves, ducts, roof drains and vents through roof are solidly set.
- F. Roof membrane manufacturer's technical representative is to inspect the roof deck / substrate conditions prior to application of roofing materials to verify the substrate is acceptable to receive the proposed roofing system in compliance with the appropriate Florida Product Approval Installation Instructions. A written report stating such is to be submitted to the Owner and Architect for their review and records

### 3.3 INSTALLATION REQUIREMENTS

- A. Protect other work from spillage of roofing materials and prevent liquid materials from entering or clogging drains and conductors. Replace/restore other work damaged by installation of roofing system work.
- B. Insurance/Code Compliance: Install system for (and test where required to show) compliance with governing regulations and with the following requirements:

1. Underwriters Laboratories "Fire Classified" and "Class A", the 2017 (Sixth) Edition Florida Building Code and ASCE 7 for **Nominal 112 mph**; Ultimate **144 mph** wind up-lift resistance.

### 3.4 PREPARATION OF EXISTING CONCRETE OVER CEMENTITIOUS WOOD FIBER DECK

- A. Test the deck dryness with moisture meter.
- B. Insure that deck surface is sufficiently clean and free of debris to receive the application of the preliminary roof membrane. Fully prime concrete deck surface.

### 3.5 APPLICATION OF BASE SHEET (UPPER ROOF AREAS)

- A. Venting Base Sheet:
  1. Start with 18" width at the low edge, followed by full width sheets.
  2. Lap the venting base sheet 4 inches at edges and ends.
  3. Mechanically fasten base sheet in accordance with the prescribed attachment requirements as detailed within the project documents, or as determined by the roof system manufacturer due to the project wind uplift criteria (most stringent to govern).
  4. At parapet walls, extend the venting base sheet up and over the wall covering and wood blocking where necessary for venting.
    - a. Nail venting base sheet to the wall at 8" on center in each direction.
    - b. Apply flashing adhesive at side laps (or end laps) and over nail heads to keep wall flashing watertight until the multiple ply flashing and modified bitumen flashing is installed.

### 3.6 APPLYING BOARD INSULATION SYSTEM

- A. System descriptions:
  1. Roof Areas A/1-A/18 & B/1: 1.75" thick Non-Tapered Rigid Insulation.
  2. Roof Areas D/1-H/1 : ¼" per foot sloped Tapered insulation with a 3½" thick base layer.
- B. General:
  1. The Contractor shall confirm all field dimensions for proper sizing of board in relation to the existing deck, cut board as required to fit in between.
  2. Install only as much board insulation in any one day as can be covered by the completed membrane in the same day.
  3. Ensure preliminary roof membrane is clean and dry.
- C. Rigid Board Insulation Attachment and Gypsum Roof Board Installation:
  1. (A/1-A/18 & 1/B) Adhere insulation boards with adhesive over the base sheet and existing rigid board on metal deck, mechanically fasten to the existing metal roof deck below only if necessary to secure temporarily.
  2. (D/1-H/1) Mechanically fasten non-tapered polyisocyanurate insulation to metal deck using the approved fastening pattern. Install 1/2" per foot finish slope tapered insulation at cricket locations shown in the plans provided.



3. Apply boards laid in parallel courses with long joints continuous and no joints broken. Mitering of taper boards at valleys, in lieu of lacing is required.
4. Edge of boards shall be butted firmly to adjoining board with no gaps. Smooth any surface irregularities or unevenness between boards in top layer of boards prior to roofing.
5. Contractor shall insure that slopes indicated on the drawings are "finish" slopes, regardless of irregularities and deviations in the roof deck or substrate.
6. Upon completion of insulation placement, adhere 1/4" gypsum roof board over insulation, (stagger joints), mechanically fasten to the existing metal roof deck below only if necessary to secure, or required by the roofing manufacturer.
7. Prior to roof membrane application, remove excess dust from surface of board insulation by brooming, blowing and/or vacuuming.

### 3.7 APPLYING THERMOPLASTIC ROOFING SYSTEM (FULLY ADHERED)

- A. General:
  1. Organize the various aspects of the work so at the end of each day the area completed on that day is substantially complete.
- B. Field Sheets (Prefabricated Rolls)
  1. Un-roll approximately 30 feet of the membrane and position the roll over the properly installed/prepared substrate. Pull the tail back over the roll to expose a workable area (approx. 30') of substrate.
  2. Apply a 100% continuous coat of adhesive to the substrate, (and underside of membrane if using "contact" adhesive).
- C. Procedure:
  1. The amount of substrate that can be coated with a workable amount of adhesive will be determined by application method, ambient temperature, humidity and available man power.
  2. To insure proper application and curing of the adhesive, it is recommended that the outside air temperature be above 40 F.
  3. Adhesive may be applied by roller or by spraying.
  4. Roller applied adhesive should utilize a solvent resistant 1/2" nap roller.
  5. Spray applied adhesive must be spread out by roller to insure a smooth, even, 100% coverage of the substrate with no globs, puddles or similar irregularities.
  6. Allow the solvents in the adhesive to dissipate to the point that the adhesive is stringy to the touch. Do not allow adhesive to "dry out" completely.
- D. Hot Air Welding:
  1. General:
    - a. All field seams exceeding 10 feet in length shall be welded with an approved automatic welder.
    - b. All field seams must be clean and dry prior to initiating any field welding.
    - c. Remove foreign materials from the seams (dirt, oils, etc.) with acetone or approved alternative. Use clean cotton cloths and allow approximately five minutes for solvents to dissipate before initiating the automatic welder. Do not use denim or synthetic rags for cleaning.

- d. All welding shall be performed only by qualified personnel to ensure the quality and continuity of the weld.
2. Hand Welding
  - a. The lap or seam area of the membrane would be intermittently tack welded to hold the membrane in place.
  - b. The back "interior" edge of the membrane shall be welded first, with a thin, continuous weld to concentrate heat along the exterior edge of the lap during the final welding pass.
  - c. The nozzle of the hand-held hot air welder shall be inserted into the lap at a 45° angle to the lap. Once the polymer on the material begins to flow, a hand roller shall be used to apply pressure at a right angle to the tip of the hand welder. Properly welded seams shall utilize a 1-1/2" wide nozzle, to create a homogeneous weld, a minimum of 1-1/2" in width.
  - d. Smaller nozzles may be used for corners and other field detailing, maintaining a minimum 1" weld.
3. Automatic Machine Welding:
  - a. Proper welding of the membrane can be achieved with a variety of automatic welding equipment. Refer to manufacturer's specific recommendations and requirements.
  - b. Follow all manufacturer's instructions for the safe operation of the automatic welder.
  - c. Follow local code requirements for electric supply, grounding and surge protection.
  - d. The use of a dedicated, portable generator is highly recommended to insure a consistent electrical supply, with fluctuations that can interfere with weld consistency.
  - e. Properly welded seams shall utilize a 1-1/2" wide nozzle, to create a homogeneous weld, a minimum of 1-1/2" in width.

### 3.8 FLASHING

- A. Clean all vents and stacks to bare metal. All protrusions must be properly secured to the roof deck with approved fasteners. Remove and discard all lead, pipe and drain flashing. Flash all penetrations according to approved details.
- B. Remove all loose and/or deteriorated flashing.
- C. All flashing shall be fully adhered to properly prepared, approved substrates with manufacturer's recommended mastic applied in sufficient quantity to insure total adhesion.
- D. The base flange of all membrane flashing shall extend out on to the plane of the deck, beyond the wood nailer to a maximum width of 8 inches.
- E. Vertical flashing shall be terminated no less than 8 inches above the plane of the deck with approved termination bar and counterflashing or metal cap flashing.

- F. Complete all inside and outside corner flashing details with the manufacturers preformed corners or an approved field fabrication detail.
- G. Probe all seams with a dull pointed probe to insure the weld has created a homogeneous bond.
- H. Install penetration accessories in strict accordance with approved details. Insure penetrations accessories have not impeded in any way the working specification.

### 3.9 METAL FLASHING

- A. All flashing metal to be bonded to the roof membrane are to be fabricated from manufacturer approved PVC coated 0.040" aluminum. Refer project details and to Section 07 62 00 – Sheet Metal Flashing and Trim.
- B. Fasten all metal flashing to wood nailers or approved substrate with approved fasteners 8 inches on center.
- C. Break and install coated metal in accordance with approved details. Insure proper attachment with 1/4-inch expansion joints and the installation of a minimum 2-inch bond breaker tape prior to sealing the joint.

### 3.10 COMPLETION

- A. Remove any and all debris, excess materials and scrap of any kind from the roof and surrounding premises prior to demobilization.
- B. Inspect all field welds, detailing and terminations to insure a 100% watertight installation.

### 3.11 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed under provisions of Contract Documents.
- B. Correct identified defects or irregularities.
- C. Require site attendance of roofing and insulation materials manufacturers during installation of the Work.

### 3.12 CLEANING

- A. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and comply with their instructions.
- B. Repair or replace defaced or disfigured finishes caused by work of this section.
  - 1. Trash and scraps are a hazard and shall be collected and disposed of immediately.

2. The applicator shall remove all masking protection equipment, materials and debris from the work and storage areas and leave those areas in an undamaged and acceptable condition.
3. Where existing sod has been damaged, install new sod in an acceptable manner blending the edges of new sod to existing surrounding sod.
  - a. Do not place new sod over existing sod. Excavate so that top plane of new sod will conform to adjacent plane of existing sod. Match new sod with existing sod type

### 3.13 PROTECTION

- A. Protect building surfaces against damage from roofing work.
- B. Protect surfaces where traffic must continue over finished roof membrane.
- C. Upon completion of roofing work (including associated work) advise Owner of recommended procedures for surveillance and protection of roofing during remainder of construction period. At the end of the construction period, or at a time when remaining construction work will in no way affect or endanger roofing, make a final inspection of roofing and prepare a written report to Owner and Architect describing nature and extent of deterioration or damage, if any, found in the work.
- D. Repair or replace the roofing and associated work to a condition free of damage and deterioration at time of substantial completion.

END OF SECTION

## PART 1 GENERAL

### 1.1 SECTION INCLUDES

- A. Personal Fall Arrest Anchorage Systems:
  - 1. System design and certification.
  - 2. Fall protection roof anchors.
  - 3. Horizontal lifelines.
  - 4. Training.

### 1.2 RELATED SECTIONS

- A. Section 07 54 00 - Membrane Roofing.

### 1.3 REFERENCES

- A. Occupational Safety and Health Administration (OSHA):
  - 1. OSHA 1910, Subpart D - Walking and Working Surfaces.
  - 2. OSHA 1910.66, Subpart F - Powered Platforms.
  - 3. OSHA 1910.66, Appendix C - Personal Fall Arrest Systems.
  - 4. OSHA Procedures and Precautions for Employees Using Decent Control Equipment.
- B. American National Standards Institute: ANSI Z 359 - Fall Protection Code.
- C. American Institute of Steel Construction (AISC): Load and Resistance Factor Design.
- D. ASTM International:
  - 1. ASTM A 36 - Standard Specification for Carbon Structural Steel.
  - 2. ASTM A53 – Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
  - 3. ASTM A 276 - Standard Specification for Stainless Steel Bars and Shapes.
  - 4. ASTM A 492 - Standard Specification for Stainless Steel Rope Wire.
  - 5. ASTM A 500 - Standard Specification for Cold Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
  - 6. ASTM A 572 - Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel.
- E. American Welding Society: AWS D1.1 - Structural Welding Code.

### 1.4 PERFORMANCE

- A. System Performance
  - 1. The Anchor Post(s) shall provide a secure attachment means to the supporting structure in conjunction with the manufacturer's requirements. The Anchor Post shall provide compatible connections with the applicable anchorage connector. All components shall be designed by the fall protection system supplier and shall meet the applicable fall protection ANSI standards and applicable OSHA regulations.
  - 2. The Fall Protection Horizontal Lifeline System shall be designed to

allow users to walk the entire length of the system without having to disconnect from the system to pass through intermediate support points. The system shall be designed to support required number of users in case of a fall and to prevent the users from free falling more than 6 feet. All components shall be designed by the fall protection system supplier and shall meet the applicable fall protection ANSI standards and applicable OSHA regulations.

B. Structural Performance:

1. Structure supporting the Horizontal Lifeline system must be capable of withstanding design loads as required by governing regulations and codes. Where component design loads are specified herein, they represent design minimum requirements.
2. Structure supporting Anchor Post(s) must be capable of withstanding the design loads as required by governing regulations and codes. Where component design loads are specified herein, they represent design minimum requirements.
3. All fall protection components and systems shall be designed with a minimum 2:1 safety factor per reference 1.3.A.

1.5 SUBMITTALS

A. Submit under provisions of Section 01 30 00.

B. Product Data: Manufacturer's data sheets and detail drawings for each product to be used, including:

1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Product literature, material specifications.
4. Installation details and methods.
5. Dimensions of product components.
6. Finishes of anchor components.

C. Shop Drawings

1. Shall be to scale and clearly show dimensioned layout of system components.
2. Include details for each specified product to indicate materials, dimensions, accessories, rated load, and ultimate load. Details shall clearly indicate attachment to building structure and welds shall be indicated by AWS welding symbols, distinguishing between shop and field welds, and show size, length and type of each weld.
3. Include notes to indicate proper use of system
4. Shall bear the seal of the supervising registered professional engineer. Professional engineer shall be licensed in the jurisdiction where the project is located.

D. Safety Plan:

1. Provide Roof Plan indicating safety equipment location

E. Close-out Submittals:

1. Provide a Fall Protection Anchorage System Log Book to include:
  - a. Requirements for inspection and re-certification.
  - b. Statement by supervising qualified fall protection engineer that system was designed and installed in accordance with ANSI Z359.6 and is

- certified for use.
- c. As-built Drawings to indicate as-installed anchorage locations, details, and user notes.
- d. Manufacturer's 1 year standard warranty document commencing on date of project substantial completion. Manufacturer's warranty is in addition to any warranties as required by project contract documents.

#### 1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications:
  - 1. Provide products from a manufacturer that specializes in the design, fabrication, and installation of fall protection anchorage systems with a minimum of five years of documented experience. Companies such as miscellaneous steel fabricators that do not normally design and fabricate fall protection anchorage components are not acceptable.
  - 2. Manufacturer shall carry specific liability insurance (products and completed operations) in an amount not less than \$5,000,000 to protect against product failure.
  - 3. Manufacturer shall provide samples of product for inspection or outside agency testing at the request of the owner. Manufacturer shall be compensated for additional product.
- B. Installer Qualifications:
  - 1. Installation contractor shall be trained or qualified by manufacturer.
  - 2. The fall protection install contractor shall maintain appropriate insurances as applicable for the installation of fall protection systems. Installer shall have specific liability insurance (products and completed operations) in an amount not less than \$5,000,000. Proof of these insurance listings shall be supplied with the submittals listed in herein.
  - 3. Welding methods shall comply with AWS D1.1 and welding personnel shall be certified in accordance with AWS requirements.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store and handle materials and products in strict compliance with manufacturer's instructions and recommendations and industry standards.
- B. Inspect products prior to installation and replace damage products.
- C. Store products indoors in manufacturer's or fabricator's original containers and packaging, with labels clearly identifying product name and manufacturer. Protect from damage.

#### 1.8 SEQUENCING AND COORDINATION

- A. Coordinate installation of products that connect to the work of other trades. Furnish setting drawings and directions for installing products that are to be embedded in concrete or masonry. Deliver such items to the project site in time for installation.
- B. General Contractor shall be immediately made aware of any site conditions that may interfere with proper installation and intended use of anchorage system.

#### 1.9 PROJECT CONDITIONS

- C. Maintain environmental conditions (temperature, humidity, and ventilation) within

limits recommended by manufacturer for optimum results. Do not install systems under environmental conditions outside manufacturer's recommended limits.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Acceptable Manufacturers:
- a. Peak Fall Protection, Inc., which is located at: 817 Center St. P. O. Box 965 ; Apex, NC 27502; Toll Free Tel: 866-387-9965; Tel: 919-387-9965; Fax: 919-387-9914; Email: [info@peak-fp.com](mailto:info@peak-fp.com) Web: [www.peak-fp.com](http://www.peak-fp.com)
  - b. Guardian Fall Protection Inc., 6305 South 231st Street Kent, WA, phone 800-466-6385, fax 800-670-7892,
  - c. 3M Fall Protection; DBI-SALA® UniRail™ System.
  - d. Diversified Fall Protection, 24400 Sperry Rd. Westlake, OH 44145, (440)-348-9460 [www.fallprotect.com](http://www.fallprotect.com)
  - e. or equivalent

### 2.2 DESIGN REQUIREMENTS

- A. System Design Requirements:
- a. System shall comply with current OSHA, ANSI, and applicable state regulatory requirements.
  - b. System shall be designed by a qualified fall protection engineer with experience in the design of horizontal lifeline systems.
  - c. Provide rooftop edge access to designated roof areas where parapet height does not meet OSHA/ANSI requirements for fall prevention. Refer to building drawings for extent of fall protection system.
- B. Fall Protection Anchorage Design Requirements:
- a. Fall Protection Roof Anchors: Capable of sustaining a minimum ultimate load of 5000 lbs (2268 kg) in any direction the load may be applied without fracture or failure.
  - b. Fall Protection Roof Anchors: Capable of sustaining a minimum proof load of 2500 lbs (1134 kg) in any direction the load may be applied without damage Or permanent deformation.
- C. Horizontal Lifeline Design Requirements:
- a. The horizontal lifeline shall be designed for a minimum of two users, each using an energy absorbing lanyard which limits the force applied to the horizontal lifeline to 900 lbs (or as designated by the Qualified Fall Protection Engineer, not to exceed 1,800 lbs).
  - b. Horizontal lifelines designed for multiple users shall be analyzed using lumped mass or sequential fall calculations.
  - c. Termination anchors, intermediate anchors, and cable components shall maintain a minimum safety factor of 2:1 as required by OSHA, specifically 1926.502(d)(8).
  - d. Permanently installed horizontal lifelines shall be designed for fall arrest in accordance with ANSI Z359.6 section 6.2.2.2.
  - e. Horizontal lifeline required clearance shall be less than or equal to the available clearance for the system. Clearance safety margin shall comply with ANSI Z359.6.

### 2.3 MATERIALS



- A. Steel: Minimum strengths.
  - a. Structural Steel W-Shapes: ASTM A 572, Grade 50, Fy= 50 ksi.
  - b. HSS (Tube): ASTM A 500, Grade B, Fy = 46 ksi.
  - c. Angles, Channels, and Plates: ASTM A 36, Fy = 36 ksi.
  - d. Stainless Steel Shapes: ASTM A 276, Type 304.
  - e. Stainless Steel Wire Rope: ASTM A 492, Type 316, 5/16 inch (8 mm) minimum diameter.
- B. Aluminum: 6061-T6 alloy.
- C. Fasteners: Provide stainless steel Type 304 for exterior fasteners exposed to weather. Diameter of bolt sizes per designer/engineer.
- D. Non Stainless Steel Materials: Hot dipped galvanized.

## 2.4 MANUFACTURED UNITS

- A. Fall Protection Roof Anchors:
  - a. U-Bars: Minimum 0.75 inch (19 mm) diameter type 304 stainless steel with 1.5 inch (39 mm) eye opening.
  - b. Anchor Posts: Hot dipped galvanized HSS with minimum height as designated by General Contractor to provide not less than 8 inches (203 mm) above finished roof or as necessary to allow proper flashing per roof manufacturer requirements.
  - c. Baseplates: Minimum 5/8 inch (8 mm) or as designed by manufacturer. Hot dipped galvanized.
  - d. Fasteners: As designed and provided by manufacturer for proper attachment to substrate. Exposed fasteners are to be Type 304 SS.
- B. Horizontal Lifelines:
  - a. Horizontal Lifeline system shall be composed of galvanized steel fall protection anchors and stainless steel wire rope. Extent of system is as noted on contract Drawings.
  - b. Wire rope shall be minimum 5/16 inch (8 mm) diameter. Wire rope and wire rope termination components shall be stainless steel.
  - c. Shall allow user to bypass intermediate anchors without detachment or reattachment to the system.
  - d. Provide two stainless steel cable runner devices capable of attachment and removal at any point along the system.
- C. Personal User Equipment
  - 1. OSHA/ANSI Z359 Compliant Full Body Harnesses. QTY = 2 Units.

## 2.5 FABRICATION

- A. Product manufacturing shall be constructed without defects in appearance or defects damaging to the performance of the product.
- B. Anchors shall be checked for any material (including but not limited to welding material build-ups) and are free of sharp edges or abrasions that can cause damage to workers ropes.

## PART 3 EXECUTION

### 3.1 EXAMINATION AND PREPARATION

- A. Inspect and prepare substrates for compliance with anchorage requirements using the methods recommended by the manufacturer for achieving best result for the substrates under project conditions.
- B. Do not proceed with installation until substrates have been prepared using the methods recommended by the manufacturer and deviations from manufacturer's recommended tolerances and conditions that will be detrimental to the anchorage system are corrected. Commencement of installation constitutes acceptance of conditions.
- C. If preparation is the responsibility of another installer, notify Architect in writing of deviations from manufacturer's recommended installation tolerances and conditions.

### 3.2 INSTALLATION

- A. Install products in accordance to manufacturer's instructions and approved shop drawings.
- B. Coordinate installation with General Contractor to ensure an approved water-tight roofing and flashing method will be used.
- C. Clean mounting surfaces to insure direct and even bearing of base plates.
- D. Torque fasteners to manufacturer's required rating.
- E. All fasteners threads shall be deformed by mechanical, chemical or welding methods to prevent accidental removal or vandalism.
- F. All welders must be certified to applicable American Welding Society (AWS) standards.
- G. After installation, clean and paint as necessary any field welds with cold galvanizing compound to prevent corrosion.

### 3.3 FIELD QUALITY CONTROL

- A. Anchors utilizing adhesive studs shall be tested using a load cell test apparatus in accordance with manufacturer's written instructions.
- B. Equipment shall be tested and inspected on site in accordance with manufacturer's recommendations and under the supervision of a professional engineer. Testing should be conducted in accordance with applicable OSHA/ANSI standards. Testing data shall be recorded and submitted with system log book.

### 3.4 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

### 3.5 ADJUSTMENT

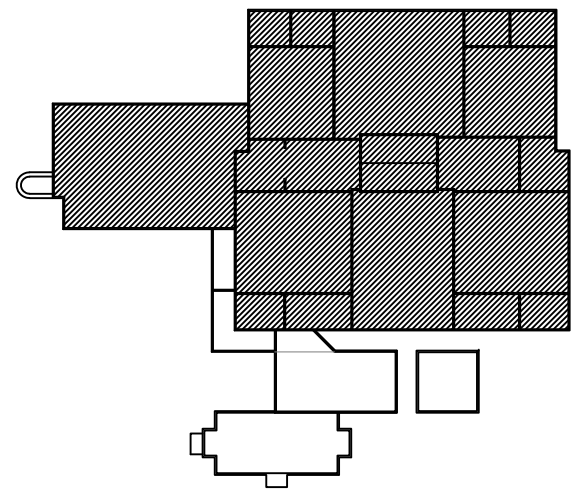
- A. Verify that products have been installed in accordance with manufacturer's instructions. Adjust as necessary to ensure compliance.

- B. Correct component deficiencies to assure compliance prior to substantial completion.

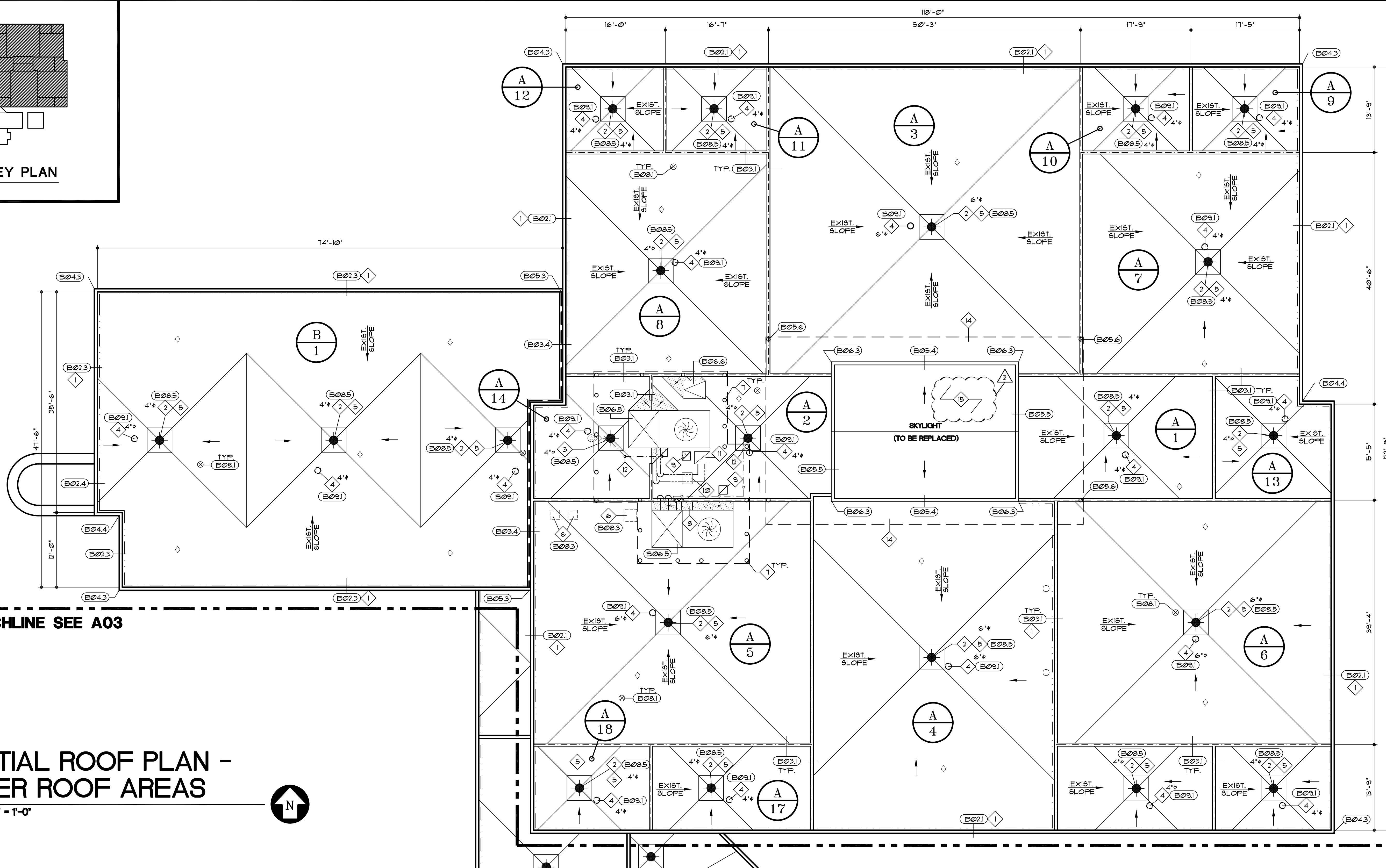
### 3.6 TRAINING

- A. Provide on-site instruction by manufacturer's certified technician for owner's designated operators in proper use of personal fall arrest anchorage system. Provide at least one 2 hr training session and one bound copy of training materials.

END OF SECTION



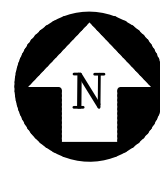
KEY PLAN



MATCHLINE SEE A03

**PARTIAL ROOF PLAN -  
UPPER ROOF AREAS**

SCALE: 1/8" = 1'-0"



**SPECIFIC NOTES**

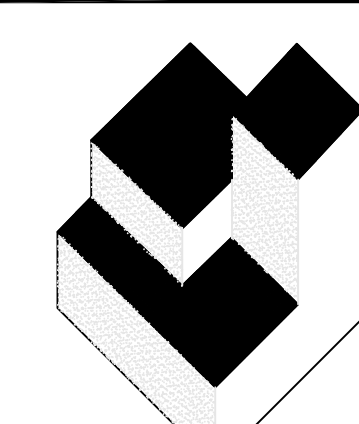
- 1 REMOVE AND STORE EXIST. LIGHTNING PROTECTION SYSTEM - REINSTALL AFTER NEW ROOF SYSTEM IS IN PLACE - SEE DETAILS (B023.4) (B023.5) (B023.6) - REPLACE ANY DAMAGED EQUIPMENT.
- 2 REMOVE & REPLACE PRIMARY ROOF DRAIN AT EXIST. LOCATION (MATCH EXIST. DRAIN SIZE), PROVIDE NEW 4"Ø x 4"Ø x 3/4" PER FOOT TAPERED SUMP & RECONNECT TO THE EXIST. LEADER PIPING TO BE REUSED.
- 3 RELOCATE PRIMARY DRAIN A MIN. OF 2' FROM SCREEN ENCLOSURE POST SUPPORT. (MATCH EXIST. DRAIN SIZE), PROVIDE NEW 4"Ø x 4"Ø x 3/4" PER FOOT TAPERED SUMP & RECONNECT TO THE EXIST. LEADER PIPING BELOW DECK. EXISTING LEADER PIPING TO BE RE-USED.
- 4 REMOVE & REPLACE OVERFLOW ROOF DRAIN AT THE EXIST. LOCATION (MATCH EXIST. DRAIN SIZE), RECONNECT TO THE EXIST. LEADER PIPING. FLASH PER DETAIL NOTED.
- 5 ROD, BLOW &/OR SNAKE ALL EXISTING DRAIN LEADER LINES TO ENSURE THEY ARE CLEAR AND FULLY FUNCTIONAL, INFORM OWNER OF ANY DRAINAGE PROBLEMS.
- 6 REMOVE EXISTING ABANDONED & CAPPED CURB - CONSTRUCT NEW DECK INFILL PER DETAIL NOTED.
- 7 EXISTING ENCLOSURE SUPPORT POST FLASHING DETAIL, FULLY PREP AND CLEAN PRIOR TO INSTALLING A SQUARE PRE-FAB FLASHING "BOOT" PER DETAIL (B024)
- 8 INSTALL 1/2" PER FOOT TAPERED RIGID CRICKET BETWEEN AREA DIVIDER AND LARGE HVAC UNIT.
- 9 LOCATE NEW WEATHERHEAD CURB, INSTALL FABRICATION AND FLASH AS INDICATED PER DETAIL (B021). ROUTE CONDUIT BELOW AND PENETRATE THRU DECK AS REQ'D. DISCONNECT AND REINSTALL ELECTRICAL AS REQUIRED. FIELD VERIFY ROUTE THRU EXISTING FLENUM SPACE. COORDINATE ON-SITE WITH OWNER AND ARCHITECT'S REPRESENTATIVE.
- 10 EXISTING HEAVY DUTY ALUMINUM PLATFORM TO REMAIN. RAISE AS REQUIRED TO ADJUST FOR NEW ROOF THICKNESS. PLACE ADDITIONAL MEMBRANE ALONG BASE.
- 11 EXISTING WEATHERHEAD CURB AND FABRICATION HOOD TO REMAIN. CLEAN AND PREP TO INSTALL NEW FLASHING PER DETAIL (B024)

- 12 PROVIDE NEW A/C CONDENSATE DRAIN USING FIELD PAINTED, UV RESISTANT PVC PIPING ON COMPOSITE SUPPORT BLOCK AT 4'-0" O.C. MAX. SEE DETAIL (B021.6)
- 13 THRU WALL PVC PIPE PENETRATION FOR PRIMARY AND SECONDARY DRAINAGE. FLASH SIMILAR PER DETAIL (B023) AT VERTICAL SURFACE. APPLY 2'x4' SACRIFICIAL MEMBRANE BELOW OPEN PIPE.
- 14 REPLACE ALL FASTENERS AT HURRICANE SAFETY ENCLOSURE WITH NEW STAINLESS STEEL NEOPRENE BACKED WASHERS ONE SIZE LARGER THAN EXISTING. FIELD VERIFY FASTENER SIZE AND QUANTITIES.
- 15 REPLACE EXISTING SKYLIGHT WITH NEW. SEE SPECIFICATION 08 63 00.

**SYMBOLS LEGEND**

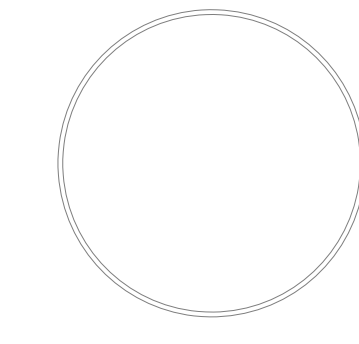
- PARAPET WALL
- TAPER LINE
- EXPANSION JOINT
- AREA DIVIDER
- SCUPPER (TO BE REMOVED)
- LIGHTNING PROTECTION
- SCREEN ENCLOSURE
- ROOF DRAIN W/ 3/4" SLOPE SUMP
- EXIST. OVERFLOW DRAIN
- WEATHERHEAD
- ABANDONED CURB (TO BE REMOVED)
- VENT STACK
- EXIST. MOISTURE RELIEF (TO BE REMOVED)
- EXIST. COLUMN SUPPORT
- GOOSENECK
- LARGE HVAC
- SCUPPER AT HIGH SIDE OF CURB & INSIDE CORNERS
- ROOF HATCH
- SPECIFIC NOTE
- ROOF AREA IDENTIFICATION
- WALKWAY AREA IDENTIFICATION
- SPECIFIC NOTE TAG

PARTIAL ROOF PLAN - UPPER ROOF AREAS, SYMBOLS LEGEND AND SPECIFIC NOTES



**A/R/C**  
Associates  
Incorporated

Architecture  
Roof Consulting  
Construction Technology  
L.L.C. NBR AAC000932  
601 North Fern Creek Avenue  
Suite 100 Orlando, FL  
32803-4899  
Tel. (407) 898-7875  
Fax. (407) 898-6043  
COPYRIGHT © 2019 A/R/C ASSOCIATES, INC.



JAMES W. RIPLEY AR-0012758  
JOSEPH J. WILLIAMS AR-0007564

REVISIONS		
NO.	DATE	BY:
2	12/11/19	TG

PROJECT FOR:  
**ORANGE COUNTY CASSADY  
BUILDING ROOF REPLACEMENT**  
2430 33rd Street, Orlando FL 32839

JOB NO.: 18049.00  
DRAWN BY: TG  
CHECKED BY: JW  
DATE: 07/19/2019  
SCALE: NOTED  
PLOT SCALE: 1=1

**A02**  
SHEET NO.:  
3 OF 14 SHEET(S)

FOR CONSTRUCTION/PERMITTING